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Use of Retrieval Bag Using Drain Bag *vs* Direct Extraction of Gall Bladder Specimen After Laparoscopic Cholecystectomy: Our Experience With 600 Patients

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Abstract

Since the introduction of laparoscopic surgery for gallbladder stones, different types of retrieval devices have been used to extract the gallbladder from the peritoneal cavity. These ranged from simple non-powdered gloves to several types of commercially produced bags. We compared the advantages and disadvantages of using a retrieval bag (using simple drain cover) with direct extraction of gall bladder specimen through the epigastric port in 600 patients. We concluded that using a retrieval bag (simple drain cover) for specimen retrieval in laproscopic cholecystectomy is a simple and cheap method with advantages of low rates of spillage andwound infection in comparison to direct retrieval of the specimen.

Keywords: Lap cholecystectomy; Retrieval bag; Wound infection.

Introduction

Laparoscopic cholecystectomy is the gold standard treatment for symptomatic cholelithiasis since the last 15–20 years[1] (Zehetner et al. 2007). Since the introduction of laparoscopic surgery for gallbladder stones, different types of retrieval devices have been used to extract the gallbladder from the peritoneal cavity. These ranged from simple non-powdered gloves to several types of commercially produced bags.[2,3] Laparoscopic cholecystectomy is associated with greater chances of intra-abdominal stone spillage and implantation (Figs. 1, 2 and 4) as well as port-site contamination (Fig. 3) during retrieval of gall-bladder specimen.[4] The use of retrieval devices have been advocated for several reasons, including the prevention of wound infection and avoidance of port site metastasis.[5,6] In laparoscopic cholecystectomy, their use is thought to provide the further benefit of reducing the risk of stone spillage into the peritoneal cavity and the port site. However, the use of retrieval bags can make removal of the specimen more difficult, requiring enlargement of the port site incision and potential risk of abdominal organ damage during bag insertion and retrieval[7,8] and increase in the retrieval time.

In our study, we compared the advantages and disadvantages of using a retrieval bag (simple polythene drain cover) in Group A patients with direct extraction of gall bladder specimen through epigastric port in Group B patients.

Materials and Methods

This comparative prospective study was conducted in the department of general and minimal access surgery GMC Baramulla for a

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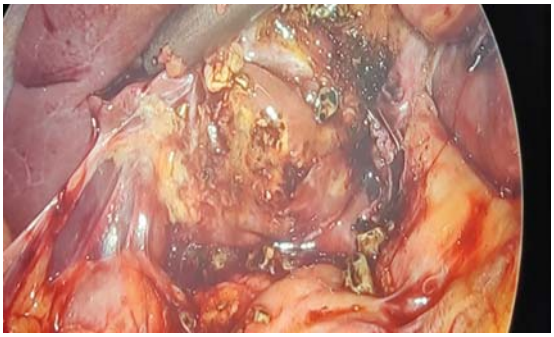

Fig. 1: Intra abdominal Spillage of Bile and Stones.

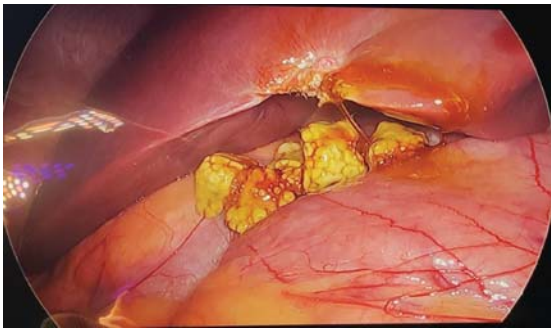

Fig. 2: Intra abdominal spillage of stones.

Fig. 3: Port site spillage of bile during gall bladder extraction through epigastric port.

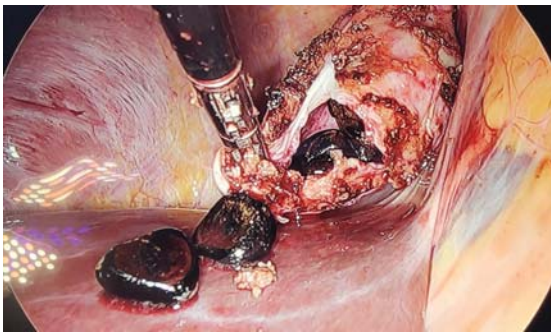

Fig. 4: Intra abdominal gall bladder puncture and spillage of stones during extraction through epigastric port.

period of two years from June 2017 to April 2019. This study included 600 patients of either sex who underwent laparoscopic cholecystectomy for cholelithiasis. The study group was randomly divided into Group A consisting of 288 patients in whom a retrieval bag using a simplepolythene drain cover was used for specimen retrieval through 10 mm epigastric port (Figs. 5, 6 and 7) and Group B consisting of 312 patients in whom direct removal of specimen was done through the epigastric 10 mm port. All patients included in the study were admitted one night prior to surgery. A through history, physical examination and investigations were done in all patients. The operative protocol, antibiotics use, pre- and post-operative management of patients was the same in bothgroups. All patients were operated under general Anesthesia using four ports consisting of 10 mm epigastric port, 10 mm umblical port and two 5 mm ports. The patients were discharged on 1st or 2nd POD and were followed at 1 week, 1 month, 3 months and 6 months after surgery. The ethical clearance was taken from the ethical committee of the hospital prior to the study and informed consent was obtained from all the patients. The results of the two groups were compared using SPSS Data.

Data was analyzed by Chi-square test statistic and the *p*-value was obtained.

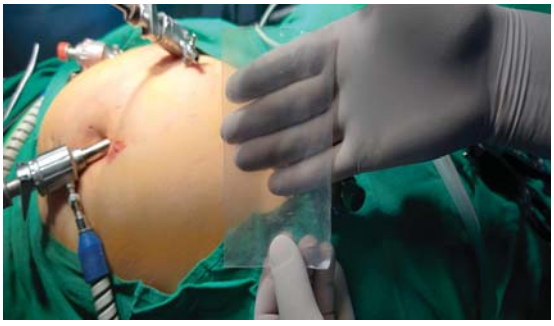

Fig. 5: Simple polythene drain bag.

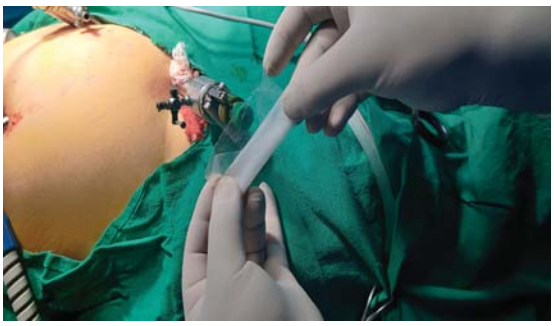

Fig. 6: Drain bag being folded before insertion.

Fig. 7: Drain bag being inserted through epigastric port.

Results

Six-hundred elective laparoscopic cholecystectomies were performed during the study period which included 82% (*n*–492) females and 18% (*n*–108) males. The mean age of the patients was 46.2 years (min. age 15 years and max. 72 years). The mean age in Group A was 47 years (min. age 21 years and max. 72 years) and in Group B was 44.4 years (min 15 years max 69 years).

Retrieval bag using polythene drain cover (Figs. 8, 9 10 and 11) was used in 288 patients (48%) and direct retrieval of the specimen through epigastric port was done in 312 patients (52%.)

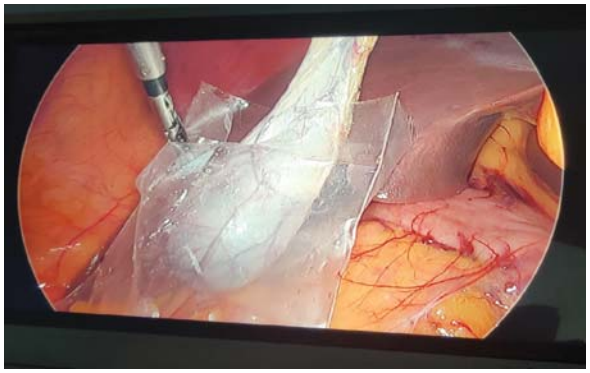

Fig. 8: Intra abdominal transfer of Gall bladder into Endobag (polythene drain bag).

Fig. 9: Gall bladder extraction through epigastric port in polythene drain bag (Internal view)

Fig. 10: Gall bladder extraction through epigastric port in polythene drain bag (External view)

Fig. 11: Removal of specimen from the polythene drain bag.

In Group A 178 patients (61.8%) had multiple stones and 110 patients (38.1%) had solitary calculus. In Group B 215 patients (68.9%) had multiple stones and 97 patients (31.0%) had solitary calculus. In Group A 32 patients(11.1%) had mucocele/pyocele and in Group B 39 patients (12.5%) had Mucocele/ pyocele.

In Group A intra-abdominal spillage of stones was seen in 12 patients (4.1%) and bile in 31 patients (10.7%) either during gall bladder separation from liver or during transfer of specimen into drain bag. 6 patients had port site spillage (2.08%) because of endo bag puncture during removal. In Group B Intra-abdominal Spillage of Stones Was Seen in 38 Patients (12.1%) and Bile in 64 Patients (20.5%). 44 (14.1%) patients had port site spillage. Port site wound infection was seen in 48 patients (8%), with 36 patients (75%) being from Group B where no retrieval bag was used for specimen retrieval. The Statistical Analysis showed the difference in port site spillage ($p < 0.00001$) and wound infection ($p = 0.000883$) between the two groups was statistically significant.

All superficial wound infections were treatedwith oral antibiotics/dressings and required no further intervention. There were 5 recorded deep wound infections, 2 in Group A and 3 in Group B. All of them required drainage of wound collection.

An extension of port site incision in the fascia was required in 36 patients (6%) with 28 patients (77.7%) being from Group A in whom a retrieval bag was used. The Statistical Analysis showed that difference was significant (p-value 0.000226) between the two groups.

The mean operative time taken in Group A was 49 minutes and in Group B was 43 minutes with minimum time of 15 minutes to maximum time of 95 minutes. The Statistical Analysis showed that difference was insignificant between the two groups.

In Group A in 202 patients (70.13%) no drain was placed and in 82 patients (28.4%) intraabdominal tube drains were placed and removed on 1st or 2nd post-operative day. 4 patients (1.38%) were discharged along with drain for bilious drainage which settled in 7 to 10 days after which the drain was removed. In Group B in 221 patients (70.8%) no drain was placed and in 85 patients (27.2%) intra-abdominal tube drains were placed and removed on 1st or 2nd post-operative day. 5 patients (1.6%) had bilious drain and were discharged with drain which was removed on 7 to 10 day and in 1 patient (0.32%) re-exploration laproscopy was done for persistent bile leak (more than 200 ml/ 24 hours) and on exploration an accessory duct of lushka was found in gall bladder fossa which was clipped. The Statistical Analysis showed that difference between the two groups was insignificant.

No patients presented with the port site malignancy in both the groups and none of the patients in either group had histological evidence of malignancy.

In Group A 4 patients (1.38%) presented with port site hernia and In Group B 2 patients (0.64%) presented with port site herniaon follow-up. The Statistical Analysis showed that difference between both the groups was insignificant.

Discussion

After lap cholecystectomy, there is a lot of controversy regarding removal of specimen through epigastric or umblical port and using or not using endobag, for specimen retrieval. In laparoscopic cholecystectomy, the ratio of gall-bladder perforation and gallstone spillage reaches up to 36% (Mohiuddin 2006).[9] Gall-bladder perforation (10–40%) and stone spillage (6–30%) are the two most common complications encountered during dissection (75%) and removal (25%) of gall-bladder in laparoscopic cholecystectomy (Brockmann 2002;[10] Wood field 2004;[11] Sathesh-Kumar 2004.[12]) Kimura T et al.[18] 26.3% bile leak and 2.7% spilled stones, Rice DC et al.[19] 28.9% bile leak and 9.7% spilled stones, Diez J et al.[20] 17% bile leak and 6.9% spilled stones., Schafer M et al.[21] 5.7% spilled stones, Memon M A et al.[22] 12.3% Sarli L et al.[23] 11.6% spilled stones. In our study group gall-bladder perforation and bile leak was found in 10.76% in Group A and 20.5% in Group B while spillage of stones in 4.1% in Group A and 12.1% in Group B patients. Intra-abdominal spillage can be controlled by the use of endobag so that intraoperative and post-operative morbidity due to spillage of stones and bile can be reduced. In the present study, overall 8% of our patients developed port site infection mostly epigastric. it was seen mainly in patients who had bile and stone spillage. Memonet al.[13] (2013) also reported 5% umbilical port sepsis in patients with acutely inflamed gall-bladder specimen despite of using endobag for its retrieval. Ali & Siddiqui[4] (2013) and Helme et al.[14] (2009) stated that best way to avoid complication of spilled gall-stones and port site contamination is to use endobag. Another study reported port site wound infection 1.02% and port site hernia 1.38% (Sharma et al. 2013)[15]. Singh DP et al.[23] report port

site infection rate of 4%, Memon JM et al.[24] 5.11%, Den Hoed PT et al.[25] 5.3%, Shindoholimath W et al.[26] 6.3%, Colizza S et al.[27] less than 2%. In our study, epigastric port site hernia occurred through epigastric port in 1.38% in Group A patients and in 0.64% in epigastric port in Group B patients. Memonet al.[13] (2011) reported 2.14% umbilical port site hernia despite using endobag for gall-bladder retrieval. Not performing the fascial closure at the port site and large sized stone may be cause for increased incidence of hernia. The mean operating time in Group A was 49 minutes and in Group B was 43 minutes. The results were comparable with other studies. Kirshtein B et al.[16] reports mean time of 42.5 min in drain group and 37 min in patients without drain. Makama JG and Ameh EA[17] report mean operating time of 37 min.

In a study done by Memon AI et al., port site spillage was 0.88%.[13]

In this study there was no case reported of port site malignancy.

Port site hernia occurred in some patients who came for follow-up after laparoscopic cholecystectomy. Memon AI et al.[13] reported 3.66% port site hernia, Uslu HY et al.[28] 5.4%, Coda A et al.[29] 0.38%. Not performing the fascial closure at the port site and large sized stone may be cause for increased incidence of hernia.

Conclusion

We conclude that using a retrieval bag (simple drain cover) for specimen retrieval in laproscopic cholecystectomy is a simple and cheap method with advantages of low rates of spillage of bile and stones in comparison to direct retrieval of specimen. Gall bladder retrieval with endobag reduces the port site infection rate and using a simple polythene drain bag is cost effective.

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Fine-Needle Aspiration Cytology of Clinicaly Palpable Breast Masses With Histopathologic Correlation

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Abstract

Background: The purpose of the study is to know the diagnostic accuracy of fine needle aspiration cytology over histopathological examination in clinically palpable breast masses and its reliability in planning definitive surgical treatment.

Methods: A prospective study conducted in 50 female patients admitted with clinically palpable breast masses in all surgical units at ESI Medical College, Gulbarga, during the study period of 18 months (from January 2018 to Sepetember 2019). All women underwent FNAC with subsequent Histopathological correlation. The cytological diagnoses were classified as: malignant, suspicious, benign or unsatisfactory. Histopathological correlation was based on either, an excisional biopsy, or a mastectomy specimen.

Results: A total of 50 fine-needle aspirations performed during the study period, on women being evaluated for a clinically palpable breast mass were included in the study. Out of 50 cases there were 19 (38%) malignant FNAC diagnoses, 2 (4%) cases diagnosed as suspicious on FNAC and histopathology revealed as malignant. There were no false-positive cases. Of the 27 (54%) cases interpreted as benign, only 1 (2%) was false negative, which later on histopathology diagnosed as infiltrating duct carcinoma. Two cases (4%) had unsatisfactory samples.

Conclusions: The study showed a very high sensitivity (95.45%), specificity (100%), positive predictive value (100%), and negative predictive value (96.29%), with minimal false-negative rates (4.54%) and without any false positive rates. The overall accuracy was 96 percent. This study, confirms that FNAC is safe, simple, quick, cost-effective, reliable and accurate method in the initial diagnosis of clinically palpable breast masses. When correctly performed and interpreted by an experienced cyto-pathologist FNAC can be a valuable tool in the diagnosis of breast masses, hence to plan definite treatment.

Keyword: Fine Needle aspiration; Histopathology; Breast Mass.

Introduction

The breast has always been a symbol of womanhood of ultimate fertility. Mammary glands or breasts are a distinguishing feature of mammals. They have evolved as milk producing organs to provide nourishment to the offspring which are born in a relatively immature and dependent state. The act of nursing the young provides physiological benefit to the mother by aiding in postpartum uterine involution and to the young in transference of passive immunity.

The three most commonly diagnosed types of cancer among women in 2009 will be cancers of the breast, lung and bronchus, and colon and rectum, accounting for 51% of estimated cancer cases in women. Breast cancer alone is expected to account for 27% (192, 370) of all new cancer cases among

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women. Breast cancer is the most common site-specific cancer in women and is the leading cause of death from cancer for women age 40 to 44 years. Breast cancer is the second commonest malignancy of females in our country and is the leading cause of mortality in prime of their lives.[1]

Along with complete medical history and good clinical examination, a need for a less invasive, cosmetically approved and more accurate method for diagnosing the breast lesions is vital. Fine needle aspiration cytology is a least invasive technique for obtaining a cell diagnosis and is very accurate if both operator and cytologists are experienced.

By using FNAC in the routine examination of breast, unnecessary open biopsy of cystic changes is avoidable. It also allows the surgeon to triage which patients should have a 1-stage inpatient procedure with frozen section and which patients should have an excisional biopsy as an out-patient under local Anesthesia.

Aims and Objective

To study the diagnostic accuracy of fine needle aspiration cytology over histopathological examination in palpable breast masses and its reliability in planning definitive treatment.

Materials and Methods

The present study emphasizes the role of Fine Needle Aspiration Cytology in the diagnosis of clinically palpable breast masses. Out of 367 cases admitted with clinically palpable Breast masses during the study period, only 50 cases satisfied all the criteria's for the study.

We performed a prospective study of 50 Fine needle aspiration cytology and further Histopathological correlation, performed in female patients admitted with clinically palpable breast masses in all surgical units at ESI Medical College, Gulbarga .During a study period of 18 months (from Jan 2018 to September 2019).

On admission, detailed medical history of the patient and thorough clinical examination were elicited and the details were entered in a precised proforma. The procedure was explained to the patients including the reliability, limitations and complications with consent obtained in each case. No prior preparation of the patient is required and the procedure can be performed even on an out-patient basis.

Requirements

1. Syringe: 10-20 ml disposable and of strong rigid material to provide good negative pressure.
2. Needle: 23–22 G with 2.54 to 3.8 cm length.
3. Glass slides: Clean, dry, free of grease and dirt.
4. Ethyl alcohol fixative
5. Gloves.
6. Skin disinfectants, cotton swabs, and sterile dressings.

Procedure

The patient is made to lie in a supine position and the breast mass immobilized with thumb and index finger of left hand, with the overlying skin stretched and cleaned with a sterile swab.

The needle attached to the syringe is inserted in to the lesion and when it enters the target site there is a change in consistency of feel to the needle. Adequate negative pressure is applied (to hold the tissue against the sharp cutting edge of needle) and needle is moved back and forth in various directions. Usually 4–6 passes through the lesion are adequate, indicated by the appearance of the material in the hub of the needle.

The negative pressure is released before the needle is withdrawn from the lesion site. In large lesions, aspirations were performed from multiple sites. After the procedure, pressure was applied to the site of aspiration to minimize the formation of local hematoma.

The material is then expressed on clean, grease free microscope slides taking care to avoid splashing. The material is spread by using another slide or a 4 mm cover slip. The slides are immediately wet-fixed in alcohol for papanicolaou's stain and few air-dried for Giemsa stain.

The cytological diagnoses were classified as malignant, suspicious, benign or unsatisfactory. Malignant and benign diagnoses were rendered in cases which unequivocally had either the presence or absence of cancerous cells respectively. A suspicious diagnosis was assigned if the cytological features were suggestive but did not completely fulfil the criteria for being malignant (i.e., high nuclear to cytoplasmic ratio, prominent nucleoli, hyperchromasia, thick irregular nuclear membrane) and unsatisfactory if the specimens were inadequate.

The tissue for Histopathological correlation was obtained by Biopsy, Lumpectomy or Mastectomy specimens. And the specimens were been send to Pathology department for histopathological examination. Tissue processing: The bits of tissue were fixed, dehydrated, cleared and embedded in paraffin. Sections of 4–5 microns thickness were cut, flattened and fixed on slides and stained with Haematoxylin and Eosin.

Results

Present study included 50 patients out of 367 patients full filing all the criteria. Patients underwent for Fine needle aspiration cytology of clinically palpable Breast masses with Histopathologic correlation of 50 breast lesions selected randomly from patients admitted in all surgical units.

The youngest and oldest patients in the study were of 17 years and 75 years respectively with a mean age of 46 years (Table 1).

Table 1: Age distribution of patients according to type of breast lesion

Age in years	Benign		Malignant	
	No. of cases (n = 27)	Percent	No. of cases (n = 23)	Percent
15–25	13	48.15	–	–
26–35	9	33.33	3	13.05
36–45	5	18.52	9	39.13
46–55	–	–	10	43.47
56–65	–	–	–	–
66–75	–	–	1	4.35
Age at Menarche				
<13	5	18.52	8	34.78
13–15	20	74.07	15	65.22
>15	2	7.41	0	0
Age at menopause				
Reproductive	22	81.48	3	13.04
35–40	4	14.81	2	8.70
41–45	1	3.70	8	34.78
46–50	–	–	10	43.47
Marital status				
Married	16	59.26	21	91.3
Unmarried	11	40.74	2	8.7
Parity				
0	12	44.44	6	26.09
1	10	37.04	13	56.52
2	4	14.81	2	8.69
3	1	3.71	1	4.35
4	–	–	1	4.35

Present study, out of 50 cases Fibro-adenoma was the most common benign lesions diagnosed in 21 cases (42 percent), followed by Fibrocystic changes in 4 cases (8 percent) and Benign phyllodes tumor in 2 cases. Out of 23 malignant cases diagnosed almost all the cases where diagnosed as Duct carcinoma in 22 cases, except for one case of inflammatory carcinoma (Table 2).

Table 2: Incidence of Various type of Breast lesions

Type of lesion	No. of cases	Percentage
Benign lesion	27	54
Fibradenoma	21	42
Fibrocystic change	4	8

Type of lesion	No. of cases	Percentage
Benign phyllodes tumor	2	4
Malignant lesion	23	**46**
Duct carcinoma	22	44
Inflammatory carcinoma	1	2
Total	50	100

In 27 cases with a benign diagnosis, smallest and largest lesion sizes were of 1.5 cm and 16 cm respectively with a mean size of 8.75 cm (Table 3).

In benign cases diagnosed, surgery was advised to prevent complications, know the nature of the lesion and in few cases for cosmetic reasons. 21 cases of fibro-adenomas were diagnosed cytologically histopathological correlation was done in all cases. All except one proven to be benign on histopathological correlation, 1 case with unsatisfactory sample also turned to be fibro-adenoma on histology (Table 4).

Table 3: Size of Breast Lumps

Sl. No.	Lesion	<2 cm	2–4.99 cm	5–9.99 cm	>10 cm	Total
		No. of cases (Percent)	No. of cases (Percent)	No. of cases (Percent)	No. of cases (Percent)	No. of cases (Percent)
Benign Lesion						
1.	Fibra-denoma	6 (22.22)	15 (55.56)	–	–	21 (77.78)
				–	–	
2.	Fibro-cystic change	2 (7.41)	2 (7.41)	–	–	4 (14.82)
				–	–	
3	Benign phyllodes tumor	–	–	1 (3.7)	1 (3.7)	2 (7.40)
		–	–			
Total Benign		8 (29.63)	17 (62.97)	1 (3.7)	1 (3.7)	27 (100)
Malignant Lesion						
1.	Duct carcinoma	–	8 (34.78)	13 (56.52)	1 (4.35)	22 (95.65)
		–				
2.	Inflammatory carcinoma	–	–	–	1 (4.35)	1 (4.35)
		–	–	–		
Total Malignant		0 (0)	8 (34.78)	13 (56.52)	2 (8.7)	23 (100)

Table 4: Cytohistological correlation in present study

Lesions		HPE Benign	Cytological diagnosis			
			Malignant	Suspicious	Unsatisfactory	
Benign						
1.	Fibroadenoma	21	20	0	0	1
2.	Fibro cystic changes	4	4	0	0	0
3.	Phylloides	2	2	0	0	0
Malignant (carcinoma)						
1.	Ductal	22	1	18	2	1
2.	Inflammatory	1	0	1	0	0
Total		50	27	19	2	2

Final histopathological correlation was available in all 50 cases which revealed 21 cases as truly positive, 26 cases as truly negative. One case was falsely negative but no case was falsely positive. A sensitivity of 95.45 percent and specificity of 100 percent was obtained. The single false negative case was diagnosed as fibro-adenoma cytologically, proved to be infiltrating duct carcinoma histologically, resulting in a negative predictive value of 96.29 percent. The overall diagnostic accuracy of this study was 96 percent (Table 5).

Table 5: Specificity and sensitivity of FNAC with clinical diagnosis.

Statistical indices	Result (Percent)
Sensitivity	95.45%
Specificity	100%
Positive predictive value	100%
Negative predictive value	96.29%
False positive ratio	0%
False negative ratio	4.54%
Diagnostic accuracy (efficacy)	96%

Discussion

The present study includes 50 cases of breast aspirations performed during the period of 18 months (Jan 2018 to September 2019). All aspirations were performed under aseptic precautions and guided manually. Although rare complications like hematoma and pneumothorax have been reported in literature,[2,3] no complications were observed in our study. Palpable breast lesions occurred between 17 years to 75 years with a mean age of 46 years. Usually the breast lesions occur during the reproductive period and later. This is in accordance with various studies described in literature. The benign lesions occurred with a high frequency in both nulli-parous and multi-parous women, whereas the malignant lesions were more common in women who were nulli-parous or of low order parity.[4,5]

Among 27 benign cases in females only 5 cases (18.52%) had menarche before 13 years, whereas out of 23 malignant cases in females 8 cases (34.78%) had menarche before 13 years (Table 4). This is consistent with the literature that early age of menarche predisposes to cancer.[4,5]

In the present study, maximum number of lumps were located in upper outer quadrant in 23 cases (46%) followed by upper inner quadrant and lower outer quadrant in 7 cases each (14%) and lower inner quadrant in 3 cases (6%). Similar observations were also made by A Kim et al.[6] Maximum number of lumps were located in upper outer quadrant in 23 cases (46%) followed by upper inner quadrant and lower outer quadrant in 7 cases each (14%) and lower inner quadrant in 3 cases (6%).[6]

In the present study, fibro-adenoma was the most common benign lesion diagnosed in 21 cases (42%) which is in comparison other studies. In the study by Rocha et al.[7] fibro-cystic changes was the commonest lesion observed in 285 cases (34.05%), but in our study is was second commonest Benign lesion found in 4 cases (8%).

The results of the various studies show a fairly wide range of sensitivity (91.66–98%), specificity (78%−100%), positive predictive value (92–100%), negative predictive value (91–98%) and diagnostic accuracy (87.5–99%).[8,9]

In the present study, sensitivity was 95.45%, approximately equivalent to Sneige and JF Silverman et al.[10] The highest sensitivity of 98% was reported by Reshma et al.[11] As far as the specificity is concerned, the present study showed 100% specificity as that of JF Silverman et al.,[10] Sreenivas et al.[12]

The diagnostic accuracy of the present study was 96%, which is comparable with other studies. The present study confirms the view, that FNAC of breast is one of the most valuable diagnostic tools in the assessment and management of benign and malignant breast lesions and diagnosis of cancer by FNA appears to be as safe as diagnosis by open biopsy.

Conclusion

It is an important diagnostic toll in management of patients presenting with palpable breast lump. In recent years FNAC has grown by many folds and has become valuable tool for diagnosing the palpable breast masses. This adds to advantage of being sensitive, specific, expedient, economical and relatively safe. This method is beneficial to patients by absolutely avoiding requirement of local or general Anesthesia making them more comfortable.

FNAC technique is free from complications, except in few cases where slight haematoma is seen. The quickness in the aspiration, staining, and reporting makes it unique in the diagnosis of Breast lesions. Procedure can be performed several time. Rapidness of the technique helps in early diagnosis, so that the treatment can be started at an early stage depending on the results of FNAC.

FNAC is safe, simple, quick, cost-effective, reliable and accurate method in the initial diagnosis

of clinically palpable breast masses Thus it is commonly used as part of diagnostic triad in cases with palpable breast lump, which in addition with FNAC included clinical breast examination and mammography.

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Original Research Article

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Spectrum of Scrotal Diseases and its Management in A Rural Medical College

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Abstract

Scrotal complaints are common surgical problems encountered in men for whom patients report in surgical out patients department as well as in emergency department. Scrotum is present at a place which is easily accessible, yet patients suffer for long time before presenting.

Objectives: A prospective study was done in department of General Surgery, FH Medical College, Etmadpur, Agra from July' 2016 to December' 2019 to know the correct incidence of pathologies affecting the scrotum, their mode of presentation, diagnosis and the management done for these conditions.

Material & Methods: We identified a total of 184 patients who came to us with some scrotal complaints and followed up all patients in pre, peri and post-operative phases.

Results: Most of the scrotal diseases were seen in individuals below 30–40 years, which is the most productive earning age for the men. Hydrocele was the commonest condition. The most common presenting symptom was swelling in the scrotum (n = 153). Other complaints were pain (n = 76), heaviness, fever or absence of testes. Ultrasound of the scrotum was performed on all patients to confirm the diagnosis. Most common surgical procedure done was eversion of sac.

Conclusion: Hydrocele is the most common disease of scrotum for which patients report. They mostly belong to 30–40 years of age group. The presentation is swelling of scrotum. Ultrasound is primary investigation of choice. Eversion of sac was done for all patients with hydrocele. Patients with no significant pathology were reassured and managed conservatively.

Keywords: Scrotal swelling; Scrotal pain; Hydrocele.

Introduction

Scrotal complaints are common surgical problems encountered in men for whom patients report in surgical out patients department as well as in emergency department.

Scrotum is present at a place which is easily accessible for self examination and assessment, yet due to several factors patients suffer for a long time before presenting to a surgeon. These factors are- poverty, lack of awareness, hesitation and taboo. Due to the long time gap they are diagnosed at an advanced stage with high morbidity and mortality.[8]

According to David JE[1] scrotal pain may be presentation of many extra scrotal conditions e.g., ruptured or dissecting abdominal aortic aneurysm, peritonitis, strangulated inguinal hernia. These conditions require urgent diagnosis and management.

The spectrum of cystic scrotal swellings consists of hydrocele (most common), epididymal cysts,

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spermatocoele, haematocoele, pyocoele, chylocoele, parasitic cyst and sebaceous cysts.[3] Chronic testicular pain has numerous etiologies, including infection, tumor, hernia, torsion, hydrocele, spermatocele, varicocele, referred pain, trauma and a prior operation.

A prospective study was done in department of General Surgery, FH Medical College, Etmadpur, Agra to know the correct incidence of pathologies affecting the scrotum in this part of India, their mode of presentation, diagnosis and the management done for these conditions.

Materials and Methods

Ethical committee approval was taken before starting the study.

This prospective study was done from July' 2016 to December' 2019. We included patients who presented to us in our outdoor as well as in emergency department of FH Medical College, Etmadpur, Agra with scrotal complaints. Patients were investigated in OPD or in emergency and were admitted to surgical ward if required.

Each patient's history and examination was recorded on a specially prepared proforma created for this study. This includes the mobile number of patient also. We contacted the patient on phone, if he did not come for follow-up.

We also recorded all biochemical and radiological investigations done during the course of treatment. Themedical treatment and surgical intervention were also recorded.

We identified a total of 184 patients who came to us with some scrotal complaints and followed up all patients.

Inclusion criteria

1. Patients who came to us in surgery OPD as well as in emergency department of FH Medical College with some scrotal complaints, during July' 2016 to December' 2019.
2. Patients willing to be included in the planned study.
3. Patients who were having testicular or extra-testicular symptoms and swellings.
4. Swellings arising from skin were also included.
5. Patients of all age groups were included.

Exclusion criteria

1. Patients who refused to give written consent.
2. Patients having inguino-scrotal swellings
3. Systemic diseases involving scrotum.

We included all the patients who fulfilled our inclusion criteria which included the written consent.

Besides recording in the case sheets, we recorded all the data in the study proforma created for this study. We recorded all pre operative and peri and post-operativedata in our proforma.

At the time of admission tetanus prophylaxis was given, if it was not already received by the patient.

At the time of induction antibiotic prophylaxis was given as per the institution policy. Operative steps and findings were also recorded. Corrugated drains were used in most of cases, and were removed within 48 hours, if no drainage was noted.

In post-operative phase we gave scrotal support to all patients. Antibiotics, analgesics and anti-inflammatory medication were given as per our policy. Treatment was modified as per the condition of patient. Complications were also recorded and their management was done and recorded.

All patients were instructed to come for regular follow-up. Lost patients were contacted on phone and were persuaded to visit the OPD.

Results

In our prospective study we studied total 184 patients who reported to us between July 2016 to December 2019 in out patients and emergency department.

Most of scrotal swellings were hydrocele (n = 67, 36.41%) in adults and congenital hydrocele in children (n = 18, 9.78%). Varicocele was also a common problem (n = 16, 8.7%). Inflammatory conditions were also common - Acute Epididymo-orchitis (n = 18, 9.78%), Chronic Epididymo-orchitis (n = 4, 2.17%), Scrotal abscess (n = 8, 4.35%), Abscess testes (n = 3, 1.63%), Filarial scrotum (n = 2, 1.09%). No significant abnormality was found on clinical as well as on radiological investigations in 29 patients (Table 1).

Congenital causes were present in form of congenital hydrocele and absence of testes.

Table 1: Incidence of various diseases

S. No.	Disease	Number	Percentage (%)
1	Hydrocele	67	36.41
2	No clinical abnormality	24	13.04
3	Congenital hydrocele	18	9.78
4	Acute Epididymo-orchitis	18	9.78
5	Varicocele	16	8.70
6	Scrotal Abscess	8	4.35
7	Testicular tumour	7	3.80
8	Haematocele	6	3.26
9	Epididymal Cyst	5	2.72
10	Chronic Epididymo-orchitis	4	2.17
11	Scrotal Calcinosis	4	2.17
12	Absence of Testes	3	1.63
13	Testicular torsion	2	1.09
14	Filarial Scrotum	2	1.09
Total		184	

Most of the scrotal diseases were common in 30–40 years old individuals, which is the most productive earning age for the men. Hydrocele was the commonest condition. Congenital hydrocele was common in less than ten years old children (Table 2).

Table 2: Age vise distribution of diseases

	0–10 yrs	10–20 yrs	20–30 yrs	30–40 yrs	40–50 yrs	>50 yrs	Total
Hydrocele		17	17	19	5	9	67
NAD	5	5	5	9			24
Cong hydrocele	18						18
Ac epididymoorchitis		5	6	5	2		18
Varicocele		6	4	3	2	1	16
Scrotal abscess			3	4	1		8
Testicular tumour		2	2	1	1	1	7
Haematocele				4	1	1	6
Epididymal cyst		1	2	1	1		5
Chepididymoorchitis			2	1		1	4
Scrotal calcinosis			2	1	1		4
Abscence of testes	3						3
Testicular torsion	2						2
Filarial scrotum				1		1	2
Total	28	36	43	49	14	14	184

Most common presenting symptom was swelling in scrotum (n = 153) for which patient came to us. Other complaints were pain (n = 76), heaviness, fever or absence of testes. Most patients are having multiple symptoms (Table 3).

Most of the patients with acute symptoms reported to us in first week of illness (n = 52) (Table 4).

Table 3: Presenting symptoms of patients

S. No.	Presenting symptoms	Number	Percentage (%)
1	Swelling in scrotum	153	83.15
2	Pain/Heaviness in scrotum	76	41.30
3	Fever	28	15.22
4	Absence of testes	3	1.63

Table 4: Duration of symptoms

	<1 week	1–4 weeks	1–3 months	46 months	>6 months	Total
Hydrocele	3	4	12	26	22	67
NAD	4	20				24
Cong hydrocele	8	10				18
Acute epididymo-orchitis	18					18
Varicocele		6	10			16
Scrotal abscess	8					8
Testicular tumour				3	4	7
Haematocele	6					6
Epididymal cyst				2	3	5
Chepididymoorchitis				2	2	4
Scrotal calcinosis					4	4
Abscence of testes	3					3
Testicular torsion	2					2
Filarial scrotum		2				2
Total	52	42	22	33	35	184

Most common investigation done was ultrasound of scrotum which was the initial ordered investigation and was done in all of our patients (Table 5).

Treatment was done according to diagnosis of patient. Table below depicts the various treatments done (Table 6).

Table 5: Investigations done to confirm diagnosis

S. No.	Investigations	Number	Percentage (%)
1	Ultrasound of scrotum ± Abdomen	184	100.0
2	CT / MRI	21	11.4

Table 6: Treatment done

S. No.	Treatment done	Number
1	Eversion of sac	67
2	Conservative treatment	48
3	Ligation of congenital sac, herniotomy	18
4	Incision & Drainage	17
5	Ligation of veins in inguinal canal	16
6	Excision of testes	7
7	Cyst excision	5
8	Excision of scrotal calcinosis	4
9	Exploration and fixing the testes	2

Discussion

Scrotal complaints are common surgical problems encountered in men for whom patients report in surgical out patients department as well as in emergency department.

Scrotum is present at a place which is easily accessible for self examination and assessment, yet due to several factors patients suffer for long time before presenting to a surgeon. These factors are-poverty, lack of awareness, hesitation and taboo. Due to long time gap they are diagnosed at an advanced stage with high morbidity and mortality.[8]

A prospective study was done in department of General Surgery, FH Medical College, Etmadpur, Agra to know the correct incidence of pathologies affecting the scrotum, their mode of presentation, diagnosis and the management done for these conditions.

We included all patients who came in out patients department as well as patients who reported directly to the emergency department.

A detailed history including sexual history was taken and recorded on study proforma. It was followed by thorough general and local examination. A fully informed consent was also taken from patients for including them in the study.

Key points that were recorded in the history of a man with scrotal swellings[7]

1. Age
2. Duration of swelling
3. Onset of swelling (sudden or gradual)
4. Presence of pain
5. Fever
6. Associated lower urinary tract or infective symptoms
7. Recent trauma
8. Previous scrotal surgery including orchidopexy
9. Previous testicular tumour
10. Family history

Key points in the examination of a man with scrotal swelling[7]

1. Site
2. Size
3. Tenderness
4. Irregular/smooth
5. Solid/soft/fluctuant
6. Can upper border be palpated?
7. Transillumination
8. Scrotal appearance
9. Auscultation
10. Inguinal lymphadenopathy (for superficial pathology)

After the history and examination patient was investigated by Ultrasound and Doppler study of scrotum if needed. Biochemical investigations were also done to rule out systemic diseases as Diabetes and sexually transmitted diseases, and various viral diseases. Various tumour markerswere also done if required – Alpha feto protein (AFP), beta subunit of human chorionic gonadotropin (β-HCG), Lactate dehydrogenase (LDH).

According to David JE[1] scrotal pain may be presentation of many extra scrotal conditions e.g., ruptured or dissecting abdominal aortic aneurysm, peritonitis, strangulated inguinal hernia. These conditions require urgent diagnosis and management. If process vaginalis is patent then pus, blood or bowel may reach up to scrotum. Blood within the scrotum may lead to an ecchymotic appearance referred to as "the blue scrotum sign of Bryant." Torsion of the appendix testis is diagnosed by the presence of a small painful, firm paratesticular nodule located at the superior pole of the testis. Inspection of the scrotum may reveal a "blue-dot" sign, which represents the infarcted appendage as seen through the scrotal skin.[1]

Age is an important factor because many conditions responsible for acute scrotum commonly occur in certain age groups. For example, testicular torsion has a peak incidence in the neonatal and postpuberal stages. In contrast, torsion of the appendices (testis and epididymis) most often occurs during early adolescence. Epididymitis occurring in prepuberal boys may be associated with abnormalities involving the genitourinary tract. In adolescent and young adults, most cases are secondary to sexual transmitted diseases.[1]

Our maximum patients were in the age Group 31–40 years (n = 49, 26.63%). 43 patients were belonging to age Group 20–30 years (23.37%). In a study by Kumar he found the same findings. In his study 68 (40%) cases were seen in the age group of 31–40 years.[3] Kemparaj foundthe maximum number of subjects in the 41–50 years age group (n = 52) accounting for 28%, followed by the 31–40 years age group (n = 43).[4]

The spectrum of cystic scrotal swellings consists of hydrocele (most common), epididymal cysts, spermatocoele, haematocoele, pyocoele, chylocoele, parasitic cyst and sebaceous cysts.[3] Chronic testicular pain has numerous etiologies, including infection, tumor, hernia, torsion, hydrocele, spermatocele, varicocele, referred pain, trauma and a prior operation. In many chronic testicular pain no obvious pathology was found in up to 25% of patients.[2] In our study 13.04% (n = 24) patients did not have any significant pathology even after all investigations and were managed conservatively and reassured about not having any significant disease.

In our study hydrocele was most commonly encountered disease. 36.41% patients were having hydroceles (n = 67). Congenital hydrocele (n = 18, 9.78%), acute epididymo-orchitis (n = 18, 9.78%) and varicoceles (n = 16, 8.7%) were other common diseases.

Swelling in scrotum was most common presentation (83.15%), followed by pain, heaviness and fever. Many patients were having combination of symptoms.

Until 1970's clinical examination of the scrotum including palpation and transillumination, was the main stay for the evaluation of the scrotal pathology. This method was however far from adequate because of tender swelling and gross scrotal contents resulting in low sensitivity and specificity often eluding the best of the clinicians. Sonography of the scrotum is simple to perform, safe, easily available noninvasive, without any radiation hazard, relatively inexpensive, widely available and portable. Colour flow imaging allows visualization of morphology and parenchymal blood flow characteristics and has led to increase in the clinical applications of scrotal sonography. It has largely replaced testicular scintigraphy, which had been the examination of choice in patients with suspected torsion.[5]

Magnetic resonance (MR) imaging, because of its superior soft-tissue contrast and multiplanar capabilities, is increasingly being used as a supplemental diagnostic problem-solving tool in cases where scrotal US findings are inconclusive or nondiagnostic. In addition to morphology, lesion location, and tissue characterization (e.g., fat, blood products, granulation tissue, and fibrosis), scrotal MR imaging provides important information that can affect surgical planning and improve patient care. MR imaging also is helpful for differentiating testicular and extratesticular lesions, distinguishing between benign and malignant lesions, and evaluating the local extent of disease.[6]

Ultasound of scrotum and abdomen was our initial basic investigation and was done in all of our patients. Magnetic resonance or CT scan was required in only 11.4% of patients (n = 21).

In 13.04% of our patients no obvious pathology was found on clinical examination and no significant pathology was detected on biochemical and radiological investigations. Patients were managed conservatively and reassured for any pathology. Patients were kept on follow-up.

The testis is covered by two layers of the tunica vaginalis, which have both secretory and absorptive ability. The balance of the secretory and absorptive functions of these layers results in only a small accumulation of fluid; deficient absorption of fluid causes hydrocele.[9] 36.41% of patients were diagnosed as vaginal hydrocele. Preoperative assessment was done and all patients were treated by jabouley's procedure, which is most popular surgical technique to treat hydrocele patients in our institution. 9.78% of patients were having congenital hydrocele which was managed by herniotomy under general Anesthesia.

A varicocele is a dilatation of the testicular vein and the pampiniform venous plexus within the spermatic cord. Although rare in pediatric populations, the prevalence of varicoceles markedly increases with pubertal development to approximately 15% by the late teenage years, a rate similar to that in adult populations.[10,11] Patients should be examined in a warm room in standing and supine positions and with and without a Valsalvamanoeuvre. Classically, varicoceles are graded according to the following criteria: Grade 1 (small): palpable only with Valsalvamanoeuvre Grade 2 (medium): palpable with the patient standing Grade 3 (large): visible through scrotal skin, palpable with the patient standing. After examining in an upright position, the patient should be reexamined in the supine position. Idiopathic varicocele is more prominent in the upright position and disappears in the supine position. Secondary varicoceles, especially on the right side, can be caused by retroperitoneal tumors or lymphadenopathy and do not change size as noticeably as in the supine position.[12] In adults, treatment is straightforward and is proposed whenever

1. there is a palpable varicocele,
2. there is documented infertility,
3. it has been confirmed that there is no female infertility problem, and
4. there is at least 1 abnormality found on semen Analyzis.[13]

Treatment options include open surgical approaches, laparoscopic varicocele ligation, and percutaneous transvenous embolization.[12] 8.7% of our patients were diagnosed as a case of varicocele and were treated by ligations of spermatic veins at inguinal canal.

Acute epididymo-orchitis is an acute inflammatory disease of both the epididymis and ipsilateral testis. It most often presents unilaterally and occurs because of a specific or nonspecific urinary tract infection (urethritis, prostatitis, or cystitis) that seeds to the epididymis and testis through the lymphatic vessels or *ductus deferens*. It can also be the result of viral infections, trauma, and autoimmune disorders. A bladder outlet obstruction, transurethral diagnostic or surgical manipulations, surgeries on the lower urinary tract,

or even different urogenital malformations is also thought to play a significant role. Treatment should be started immediately after diagnosis and includes antibiotics, analgesics, and, if necessary, surgery.[14] In our study we got 9.78% of patients with acute epididymo-orchitis. All patients were managed conservatively and improved with antibiotics and anti-inflammatory drugs.

Epididymal tuberculosis is a rare extrapulmonary form of tuberculosis that occurs in young adults.[15] Patients with this disease may have no obvious clinical symptoms or only mild symptoms. The disease typically develops slowly and early diagnosis is difficult; delayed diagnosis and misdiagnosis are common. Recently, due to the emergence of multi-drug resistant bacteria, anti-tuberculosis drug resistance, and the widespread use of glucocorticoids, the incidence of male genital tuberculosis, including epididymal tuberculosis, has been increasing worldwide. Surgical treatment combined with chemotherapy has been the preferred treatment approach for this disease.[16] Reproductive system tuberculosis can occur in any age, mainly in men 30–50 years old.[17] All our cases were more than twenty years old.

Scrotal calcinosis is a benign disease of the scrotal skin. It is defined as the existence of multiple calcified and asymptomatic nodules of the scrotum skin wall. Some authors think that it is the result of dystrophic calcifications of preexisting structures such as epidermal cysts, others did not find any evidence of preexisting cystic structures and believe this condition to be idiopathic.[18] We had 4 cases of scrotal calcinosis in our study. All cases were investigated and involved tissue was excised.

Lymph scrotum is a condition characterized by the presence of lymphatic vesicles on the surface of the scrotal skin that can easily rupture, giving rise to drainage of the whitish secretion typical of the disease. This secretion serves as an excellent culturing medium that favors repeated bacterial infections. It may trigger progression of the condition to lymphedema and scrotal elephantiasis.[19] We had two cases of filarial scrotum with us during this study. They were treated with anti-filarials and improved with the treatment.

In suspected cases of testicular tumour we performed high inguinal orchiectomy. In Biopsy report two cases were of yolk sac tumour, two cases were mixed cell type of embryonal carcinoma and seminoma, and one case of each seminoma, teratoma and mixed embryonal and yolk sac tumour. After the biopsy report we sent the patient to oncologist for chemotherapy and radiotherapy.

Treatment for various diseases was according to condition of the disease, which ranges from conservative treatment to operative intervention namely eversion of sac, herniotomy, incision & drainage, excision of cyst and calcinosis, fixing of testes and ligation of veins.

Conclusion

Scrotal complaints are common surgical problems encountered in men for whom patients report in surgical out patients department as well as in emergency department. Spectrum of diseases varies from Hydrocele, congenital hydrocele, varicocele, epididymo-orchitis, abscess, tumour etc. No significant abnormality was also found in many patients. Patients were managed by operation as well as by conservative treatment also.

Public should be made aware about self examination of scrotum. So the patients will be able to report to the surgeon early with better outcome.

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Effectiveness of Mannheim Peritonitis Index in Predicting the Morbidity and Mortality of Patients With Hollow Viscous Perforation

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Abstract

Background: Peritonitis is an inflammatory response of peritoneum to different stimuli caused by bacteria. It can also be fungal or chemical. Secondary peritonitis is due to spillage of gastrointestinal or genitourinary organisms in to peritoneal cavity due to breech in the mucosal barrier. Mannheim peritonitis index (MPI) was developed by Wacha and Linder in 1983. The Mannheim Peritonitis Index (MPI) is a specific score which has a very good accuracy and serves as an easy way to assess clinical parameters allowing the determination of the individual prognosis of patients with peritonitis.

Methods: This prospective observational study was conducted by the Department of General Surgery at Dhanalakshmisrinivasan medical college and hospital from July 2012 to July 2013. A total of 60 patients were included in the study where in diagnosis of peritonitis due to hollow viscous perforation was made by history and clinical examination and relevant investigations.

Results: The mean age group of the subjects was 45.72 years ranging from 15 to 75 yrs. In our study group, 33.3% of the patients had morbidity where in MPI score more than 29 had the highest morbidity (72%) where in the overall mortality rate in our study was 12%.

Keywords: Peritonitis; Mannheim Peritonitis Index; Hollow viscous perforation.

Introduction

There is a wide variety of advances being made in the medical field but still peritonitis continues to be one of the major infectious problem confronting the surgeon. Peritonitis is an inflammatory response of peritoneum to different stimuli caused by bacteria. It can also be fungal or chemical. Secondary peritonitis is due to spillage of gastrointestinal or genitourinary organisms in to peritoneal cavity due to breech in the mucosal barrier.

Peritonitis secondary to hollow viscous perforation carries high risk of morbidity and mortality. A good scoring system is required for stratifying patients in different groups, use of different treatment modalities and monitoring outcome and improving standard of care.[1, 2] Many scoring systems had been developed successfully to grade the severity and prognosis of patients of acute peritonitis like, Acute physiology and chronic health evaluation (APACHE) II score, Simplified acute physiology score (SAPS), Sepsis severity score (SSS), Ranson score, Imrite score and Mannheim peritonitis index (MPI).

Mannheim peritonitis index (MPI) was developed by Wacha and Linder in 1983 (3–6).

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The Mannheim Peritonitis Index (MPI) is a specific score which has a very good accuracy and serves as an easy way to assess clinical parameters allowing the determination of the individual prognosis of patients with peritonitis. Hence this study was carried out to evaluate MPI in predicting morbidity and mortality of patients with peritonitis due to hollow viscous perforation.

Materials and Methods

Source of Data

This prospective observational study was conducted by the Department of General Surgery at Dhanalakshmisrinivasan Medical College and Hospital from July 2012 to July 2013. A total of 60 patients were included in the study where in diagnosis of peritonitis due to hollow viscous perforation made by history and clinical examination and relevant investigations.

Inclusion Criteria

1. Patients with clinical suspicion and investigatory support for the diagnosis of peritonitis due to hollow viscous perforation who are later confirmed by intra operative finding.

Exclusion Criteria

1. Patients with hollow viscous perforation due to trauma.
2. Patients with associated injuries to other organs.
3. Patients with associated vascular and neurogenic injuries.

Procedure

The detailed history and proper clinical findings were entered in a proforma case sheet. The clinical examination was done and necessary investigations were carried out to establish the diagnosis. MPI scoring system was done in all the patients and patients were classified those with score less than 21, 21 to 29 and more than 29. Patient evolution was followed, occurrence of complications and discharge due to improvement or death. Out-patient follow-up was continued for 30 days to establish perioperative morbidity and mortality. Analyzis was done with each variable in the scoring system as an independent predictor of morbidity or mortality and the scoring system as a whole.

Statistical Analyzis

The data was analyzed using SPSS software version 16.3. Each variable in the MPI score along with other patient variables was analyzed using chi-square Analyzis with various outcomes that were noted in the study. *p*-value <0.05 was taken as significant in this study. The results were averaged (mean + standard deviation) for each parameter for continuous data and numbers and percentage for categorical data presented in table and figure. Proportions were compared using Chi-square test of significance.

Results

In this study, 60 patients with diagnosis of secondary peritonitis were included. Patient with age 16 yrs to 75 yrs was part of study. Males accounted for 62% of the patients in the present study.

Out of 60 subjects enrolled into the study, maximum 28 (46.7%) were in the age group of 31–45 years followed by 21 (35%) from the age Group 45–60 years. Majority of the subjects were male 41 (68.3%) compared to females 19 (31.7%). The mean age of the patients was 45.72 (SD14.66) years ranging from 15 to 75 yrs.

Table 1: Age and sex wise distribution of study subjects

Age	Sex (Male)	Sex (Female)	Total
16–30	5 (83.7%)	1 (16.3%)	6 (10%)
31–45	18 (64.3%)	10 (35.7%)	28 (46.7%)
46–60	14 (66.7%)	7 (33.3%)	21 (35%)
>60	4 (80%)	1 (20%)	5 (8.3%)
Total	41 (68.3%)	19 (31.7%)	60

Morbidity in form of post-operative complications in form of MPI score was recorded. High risk group with MPI>29 (72%) has more complications than intermediate with MPI Score 21 to 29 and low risk group with MPI <21 (4.5%).

Table 2: Morbidity and MPI score

Mpi Score	Wound Infection	Normal	Total
<21	1 (4.5%)	21 (95.5%)	22
21–29	6 (30%)	14 (70%)	20
>29	13 (72%)	5(28%)	18
Total	20 (33.3%)	40 (66.7%)	60

Mortality rate was 28% in high risk group (MPI score >29). There was no mortality in low risk group (MPI score <21). Mortality rate was 10% in intermediate risk group (MPI Score 21–29).

Table 3: Mortality and MPI score

MPI Score	Mortality	Discharged	Total
<21	0 (0%)	22 (100%)	22
21–29	2 (10%)	18 (90%)	20
>29	5 (27.8%)	13 (72.2%)	18
Total	7 (12%)	53 (88%)	60

Discussion

The mean age group of the subjects was 45.72 years ranging from 15 to 75 yrs. The mean age of presentation (in years) in various studies done by Ohmann C et al.[7] which was at 56 yrs and Corroea et al.[8] was at 58.9 which were a bit higher compared to our study but studies done by Murlidhar V A et al.[9] the mean age group was 43.8 respectively which was in consistent with our study.

In our study group, 33.3% of the patients had morbidity where in MPI score more than 29 had the highest morbidity (72%) as compared to (10%) among subjects with MPI Score 21–29 and the least was recorded among subjects with MPI score less than 21. The positive predictive value of MPI score for morbidity is 75% with sensitivity 84.65%and specificity 92.34%.

The overall mortality rate in our study was 12% which was in consistent with the study done by Kumar v et al.[10] where in the mortality rate was 22%, Muralidhar VA et al.[9] where in the mortality rate was 14% and Nachiappan M et al.[11] where in the mortality rate was 16%. The positive predictive value of MPI score for morbidity is 86.34% with sensitivity 100%and specificity 90.16%.

Conclusion

Mannheim peritonitis index (MPI) is specific to particular disease and it is easy for predicting the mortality in patients with peritonitis. Increased scores are associated with poorer prognosis, needs intensive care and hence it can routinely be used in clinical practice. This is a validation study of the Mannheim peritonitis index scoring system for predicting the morbidity and mortality in patients with peritonitis due to hollow viscous perforation. The results of this study proves that MPI scoring system is a simple and effective tool for assessing this group of patients, and can be used as a guiding tool to decide on the management of the patient after the definitive procedure is done.

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A Comparative Study of Platelet-Rich Fibrin (PRF) in Treating Diabetic Foot Ulcers

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Abstract

Aim: To compare the efficacy of autologous platelet-rich fibrin (PRF) over moist sterile saline/ povidone-iodine dressing in diabetic foot ulcers.

Objective: To compare the mean reduction in ulcer area at the end of 4 weeks of dressings.

Methodology: 60 diabetic patients with foot ulcers from the department of general surgery, general medicine, endocrinology, and cardiology were prospectively studied. Detailed clinical history was obtained, the ulcer was evaluated and the presence of wound infection was assessed for all the patients. Patients were randomised into two groups of 30 patients each. While one group received PRF dressings, the other received saline/povidone-iodine dressings. The wound healing was then compared in the two groups. The efficacy of platelet-rich fibrin dressing over moist saline/povidone-iodine dressings was assessed by comparing the percentage reduction of the ulcer area, at the end of four weeks, using chi-square test and A NOVA test.

Results: It was found that there was a better reduction in the area of the ulcer at the end of four weeks in patients who received platelet-rich fibrin dressings than in moist saline/povidone-iodine dressings.

Conclusion: PRF dressing was superior to moist saline/povidone-iodine dressings.

Keywords: Diabetes; Foot ulcer; PRF.

Introduction

Foot ulcer is a devastating complication of diabetes mellitus, particularly in the elderly. The majority of diabetic foot ulcers may heal, whereas a smaller percentage will remain active and finally lead to gangrene and amputation of the limb.[1,2] With increasing duration of the ulcer and the increasing age of the patient, the risk of amputation also rises. Thus early prevention plays a vital role.

Wound dressings constitute a major part of the management of diabetic foot ulceration. An ideal dressing will have to reduce the symptoms, give adequate protection of the wound and promote good healing. Platelet-rich fibrin (PRF) prepared from the patient's own blood is used in the fields of orthopedics and dentistry to promote wound healing. PRF transfers growth factors to the wound surface. The use of autologous preparation reduces the risk of allergic reactions. There are very few studies comparing the efficacy of PRF with other dressing materials. This study comparee the efficacy of PRF dressing with moist saline/povidone-iodine dressing in diabetic foot ulcers.

Materials and Methods

The period of study was between February 2015 and February 2016. It was an open-labeled

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prospective randomised control trial. 60 diabetic foot ulcer patients were randomised into two groups of 30 each. While the study group (Group 1) received PRF dressings, the control group (Group 2) received saline/povidone-iodine dressings. The wound healing was then compared in the two groups by comparing the percentage reduction of the ulcer area, at the end of four weeks.

Ulcers in patients of 18 years or older, having an area of 1 cm × 1 cm to 5 cm × 5 cm were included in the study, after obtaining an informed consent. Ulcers of other etiology (ischaemic ulcers, venous ulcers and ulcers with underlying vasculitis), patients with osteomyelitis affecting the area of the ulcer, and ulcers with exposure of tendons or bones, were excluded. Also excluded were pregnant and lactating patients, and those with a platelet count less than 1,50,000/mm^3.

Detailed clinical history and other relevant data were collected. Each patient was followed up to the end of four weeks, with ulcer area measured at the end of each week. The ulcer area was calculated by multiplying the greatest length by the greatest breadth. Digital photography taken at the beginning and end of treatment. Wound swabs were obtained prior to first dressing and the patient was started on culture-sensitive antibiotics.

Preparation of platelet-rich fibrin (PRF): 10 to 15 ml of patient's blood was collected in sterile containers without any anticoagulant, which was then centrifuged at 3000 rpm for about 10 minutes. This resulted in a lower part with red blood cells and the upper part with plasma. Between the 2 layers was the fibrin clot, with trapped platelets. (Figs. 1 & 2)

Fig. 1: Following centrifugation sample separates to form fibrin clot & RBCs.

Fig. 2: Separated PR for application.

Dressing procedure: PRF was applied over the wound surface in a thin layer and covered with a sterile saline gauze (primary dressing) followed by cotton pad and roller bandage (secondary dressing), as shown in (Fig. 3). The dressing was left in place for 1 week. After 1 week, all PRF remnants were removed with water and sterile gauze. Following this, the next PRF treatment was instituted. A total of four PRF treatments at weekly intervals were given for a total duration of 4 weeks. Group 2 received only sterile saline-soaked gauze dressing with povidone-iodine, which were changed daily.

Fig. 3: Dressing procedure.

The data was analyzed using STATA. The test variables were compared using the chi-square test for two-sided independent samples to compare means across dichotomous variables. The one way ANOVA test was done for comparison of means across multilevel variables. Simple calculations like percentages, proportions and mean values were derived. A Type I error of 0.05 was considered in all Analyzis. *p*-value of less than 0.1 was considered to be statistically significant.

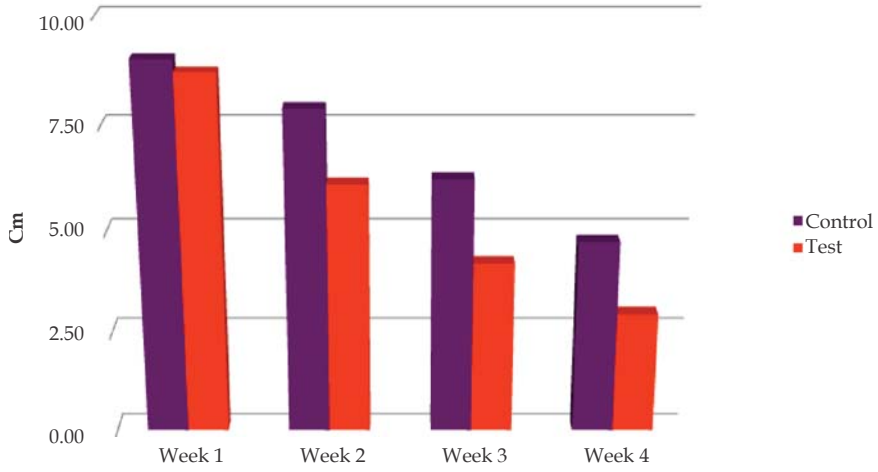
Results

The two groups were found to be matched in terms of the age and gender of the patient, and also the presence of co-morbid factors.

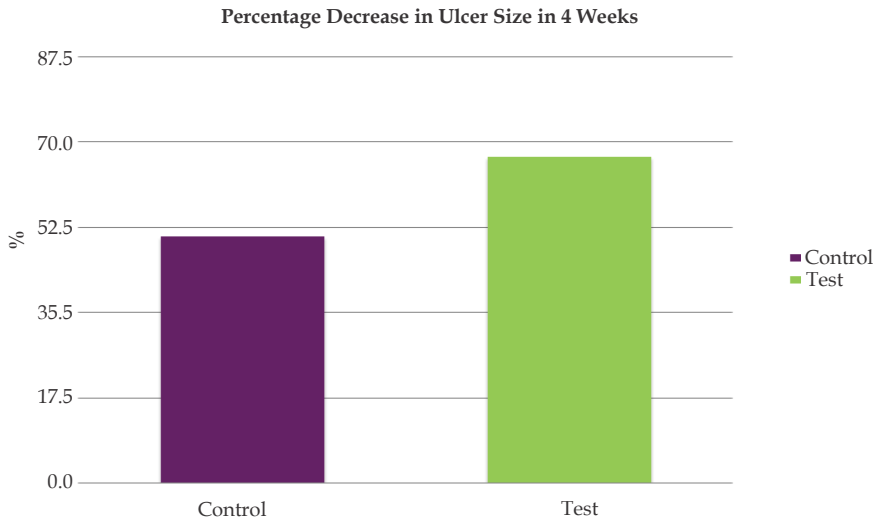
The weekly reduction in ulcer area was compared between control and test groups, as well as the percentage reduction in area.

Table 1: Reduction in ulcer area at the end of 4 weeks

	Saline		PRF		
% reduction of ulcer area at the end of 4 weeks	Mean	SD	Mean	SD	*P*-Value
	50.5	17.4	66.9	18.2	<0.01



Garph. 1: Weekly Reduction in Ulcer Area.



Graph. 2: Reduction in ulcer area at the end of 4 weeks.

Discussion

It has been well established that diabetic foot ulcers increase the morbidity and, consequently, the financial toll on the society. Therefore, early prevention of diabetic foot ulcers is of paramount importance. Once an ulcer has formed, proper care should be instituted at the earliest to prevent it from progressing to produce extensive damage and possible need for an amputation.

Ulcer care involves the choice of an ideal dressing to aid in satisfactory healing of wounds. Of the many dressing materials available, platelet-rich fibrin, a platelet aggregate prepared from the patient's own blood, has been the subject of research.

PRF preparations yield a platelet concentrate that aggregates on to a fibrin membrane that favors wound healing. It has abundant growth factors, which are released when platelets are activated on application over the wound.[3] Activated platelets release growth factors that help in the repair of tissue by the process of angiogenesis, collagen production, formation of granulation tissue and re-epithelialisation.[4] It also initiates tissue regeneration and response. 60 biologically active substances are found in platelets that are helpful in repair mechanisms including cell proliferation, intracellular matrix deposition, chemotaxis, immune modulation, antimicrobial response, angiogenesis and remodelling.[4–7]

PRF is better than Platelet Rich Plasma (PRP),[6–9] because it is easy to prepare and cost-effective. Bovine thrombin, which has toxic effects on the cells, is required to convert fibrinogen to fibrin while preparing PRP. The conversion of fibrinogen to fibrin, in PRF, happens slowly with the naturally available thrombin that is present in the patient's own blood sample collected, thus rendering a physiological environment that is favourable for wound healing. A better cell proliferation and migration takes place that is led by the naturally formed fibrin matrix.[6–10] It can release platelet cytokines during the remodelling phase of the healing process.[6–12] Growth factors concentration in platelet-rich fibrin is three times more than in platelet-rich plasma (Yazawa et al.). The release of growth factors is slower from PRF than from PRP and there is better healing with the use of platelet-rich fibrin.[11]

Valbonesi et al. conducted a study of its use on non-healing ulcers, wherein the results were found to favorable in 11 out of 14 non-healing ulcers that were treated with platelet-rich fibrin dressings. It was also found that growth factors had a controlled release over a period of one week when the dressing was kept intact.

Findings in our study show that there is a significant reduction in ulcer area at the end of 4 weeks, in PRF treated diabetic ulcers (66.9%) than in the saline/povidone-iodine group (50.5%), which was statistically significant (p-value <0.01). Thus, it was concluded that PRF dressings produce better healing than saline/povidone-iodine dressings. It may also be noted that the use of PRF dressings in diabetic ulcers can minimize the exhaustion of dressing materials, as it is done only once a week. The ease of preparation of PRF also makes it convenient for dressings. Its application, is thus, very useful in bedridden patients, since they can be provided better wound care.

Conclusion

Foot ulcers pose a real threat to diabetic patients in terms of morbidity and expense. Dressing materials and techniques should be tailored according to the needs of the patient. Platelet Rich Fibrin (PRF), when used for dressing in diabetic foot ulcers, had better and faster healing in comparison with saline/povidone-iodine dressing. PRF is easy to prepare. Being an autologous preparation, it has the least adverse reactions. PRF has its best effect when left undisturbed for a week since it has the property of slow release of growth factors. PRF dressing is ideal for bedridden patients.

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Original Research Article

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A Study to Evaluate Role of Gender in Difficult Laparoscopic Cholecystectomy

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Abstract

Introduction: Though laparoscopic cholecystectomy provides for a faster recovery, there have been reports of intra operative difficulties in the laparoscopic technique, often necessitating the conversion to open procedure. A number of factors influencing this has been studied but the role of gender on the intra operative difficulties and post-operative complications is unclear. This study was an attempt to understand the role of gender in the intra and post-operative complications following laparoscopic cholecystectomy.

Methodology: This was a prospective observational study conducted among 100 patients undergoing laparoscopic cholecystectomy in Victoria Hospital. Patient details such as age, sex, BMI, intra operative details such as duration of surgery, CBD injury, biliary leak and conversion to open surgery, post-operative complications such as jaundice and pancreatitis, and duration oh hospital stay were noted down. This data was analyzed using student *t*-test and chi-square test.

Results: Of the 100 patients, 68% were females and 32% were males. The mean operative time for male patients 75.31 ± 37.95 minutes while that for female patients was 56.76 ± 29.36 minutes. Of the 32 males patients, 1 (3.125%) patient had CBD injury while 4 (12.5%) patients had conversion to open procedure. 4 (5.8%) of the surgeries were converted to open procedures among female patients, with no CBD injury noted. The mean post-operative hospital stay in male patients was 5.0 ± 2.52 days while that in female patients was 3.64 ± 1.40 days ($p < 0.05$). Post-operative jaundice was observed among one male patient while it was not observed among female patients. Post-operative biliary leak was observed among 2 male patients and 1 female patient.

Conclusion: The intra operative and post-operative morbidity was comparable among males and females undergoing laparoscopic cholecystectomy, with the male gender having a longer duration of surgery and a higher duration of hospital stay.

Keywords: Male gender; Laparoscopic cholecystectomy; Post-operative complications; Difficult laparoscopic cholecystectomy.

Introduction

Laparoscopic cholecystectomy is one of the most widely performed surgeries in recent times.

It has been accepted as the treatment of choice for patients with symptomatic cholelithiasis, by the National Institute of Health.[1]

Although the advantages of laparoscopic surgery over the open technique in terms of early post-operative recovery have been established, there are still reports of intra operative difficulties in the laparoscopic technique, often necessitating theconversion to open procedure.[2,3]

Conversion rate and iatrogenic injuries during laparoscopic cholecystectomy are still high despite significant improvement. Hussain A et

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al. reported that, depending on the technique of cholecystectomy, the degree of gall bladder inflammation, patient comorbidities, and surgical experience, the conversion rate was reported between 0.18% and 30%, whereas the incidence of iatrogenic injuries was from 0% to 0.6%.[4]

The factors influencing these difficulties have been widely studied. Risk factors for difficulty were increased age, acute and thick wall chronic cholecystitis, wide and short cystic duct, cholecystodigestive fistula, previous upper abdominal surgery, obesity, liver cirrhosis, anatomic variation, cholangiocarcinoma, and low surgeon's caseload.[4]

Although the female sex has been established as a risk factor for the development of cholelithiasis,[5] the role of sex in the intra operative difficulty of laparoscopic cholecystectomy has been ambiguous.[4,6,7]

This study was an attempt to understand the influence of gender on the level of difficulty of laparoscopic cholecystectomyin our institution.

Materials and Methods

This was a prospective observational study conducted among patients diagnosed with symptomatic cholelithiasis undergoing laparoscopic cholecystectomy in Victoria hospital between the months of May to August 2019.

Inclusion criteria

- Patients above 18 years of age
- Patients diagnosed with symptomatic cholelithiasis undergoing elective cholecystectomy

Exclusion criteria

- Patients below 18 years of age
- Patients undergoing cholecystectomy as a part of another procedure
- Patients with ASA grade III and above
- Patients not consenting for participation in the study

Hundred patients fulfilling the above criteria were chosen and included in the study after obtaining verbal consent.

Patient details such as age, sex, BMI were noted. Intra operative details such as duration of surgery from skin incision to skin closure, CBD injury, biliary leak and conversion to open surgery were noted down.

The patients were followed up till discharge and were observed for the development of post-operative jaundice and pancreatitis. The duration of hospital stay was also noted.

The above details were tabulated and analyzed. SPSS v26 was used for the statistical Analyzis. The data was described in terms of mean and standard deviation. Student *t*-test and chi-square test was used to test the difference of significance between the two groups. A *p*-value of less than 0.05 was considered statistically significant.

Results

A total of 100 patients undergoing elective laparoscopic cholecystectomy for symptomatic cholelithiasis were included in the study.

Of the 100 patients, 68% were females and 32% were males (Fig. 1).

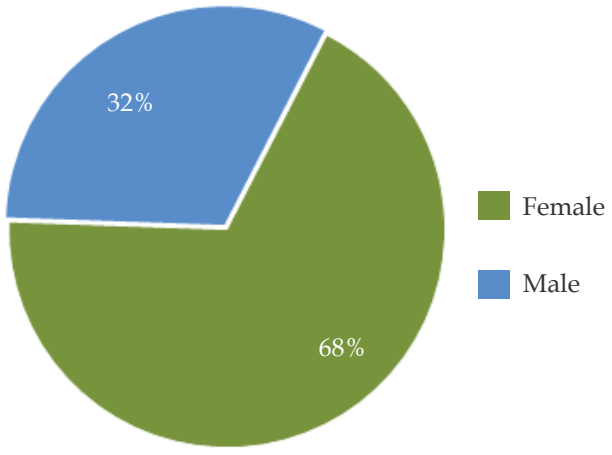

Fig. 1: Sex distribution of patients.

The mean age of the patients was 37.96 ± 10.49 years. The mean age of female patients was 37.73 ± 9.24years while that of male patients was 38.43 ± 13.04 years. The mean BMI of female patients was 25.88 ± 3.56 kg/m^2 while that of male patients was 26.08 ± 3.59 kg/m^2. There was no statistically significant difference between the two groups in terms of age and BMI ($p > 0.05$).

On comparison of the intra operative morbidity, it was found that the mean operative time for male patients 75.31 ± 37.95 minutes while that for female patients was 56.76 ± 29.36 minutes. This difference was found to be statistically significant ($p = 0.009$). Of the 32 males patients, 1 (3.125%) patient had CBD injury while 4 (12.5%) patients had conversion to open procedure. Of the 4 patients who underwent conversion to open procedure, 1 was due to bile duct injury, two due to arterial injury and one due to bile duct and stone spillage. Of the 68 female patients who underwent laparoscopic cholecystectomy, 4 (5.8%) of the surgeries were converted to open procedures in view of arterial injury. There was no CBD injury observed among the female patients. These results were not statistically significant (Table 1).

Table 1: Comparison of intra operative morbidity

Parameter	Males	Females	*p*-Value
Operative time in minutes	75.31 ± 37.95	56.76 ± 29.36	0.009
CBD Injury	1	0	0.32
Conversion to open procedure	4	4	0.26

On comparison of the post-operative morbidity, it was found that the mean post-operative hospital stay in male patients was 5.0 ± 2.52 days while that in female patients was 3.64 ± 1.40 days (statistically significant with $p = 0.001$). Post-operative jaundice was observed among one male patient while it was not observed among female patients. Post-operative biliary leak was observed among 2 male patients and 1 female patient. Post-operative pancreatitis was not observed among any of the patients. These differences were not statistically significant (Table 2).

Table 2: Comparison of post-operative morbidity

Parameter	Males	Females	*p*-Value
Hospital Stay	5.0 ± 2.52	3.64 ± 1.40	0.001
Post-operative Jaundice	1	0	0.32
Post-operative Biliary Leak	2	1	0.23

Discussion

The effect of gender in the difficulties faced in laparoscopic cholecystectomy were analyzed in this study. There was a statistically difference between males and females in terms of duration of surgery and duration of hospital stay while no such difference was observed in terms of intra and post-operative complications such as CBD injury, conversion to open procedure, post-operative jaundice, biliary leak and pancreatitis.

Slightly varied results were encountered by Bazoua G et al. who reported a significantly higher durationof surgeryin male patients as compared to females.[6] Such a statistical difference was not observed in terms duration of hospital stay, conversion to open surgery and post-operative morbidity.

Rakan Alqahtani et al. reported similar results as our study with respect to a statistically significant difference between the genders in terms of duration of surgery andduration of hospital stay. However they also reported a significant difference among the genders in terms of rate of conversion to open surgery also, with male gender having a higher conversion rate. But the post-operative morbidity observed was comparable among both the genders.[8]

Saurabh Kumar et also concluded that gender has little role as far as overall morbidity and conversion to open surgery are concerned in patients undergoing laparoscopic cholecystectomy.[9]

However Peter C Ambe et al. concluded that the male gender was an independent risk factor for complication in patients undergoing laparoscopic cholecystectomy for acute cholecystitis.[10] The difference could be due to the exclusion of emergency surgeries in our study.

Conclusion

Though the number of male patients undergoing laparoscopic cholecystectomy are fewer than females, the intra operative and post-operative morbidity was comparable among males and females, with the male gender having a longer duration of surgery and a higher duration of hospital stay.

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Original Research Article

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A Comparative Study Between APACHE II and Ranson Scoring Systems Inpredicting the Severity of Acute Pancreatitis

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Abstract

Background: Acute pancreatitis is a sudden inflammation of the pancreas. Acute pancreatitis (acute hemorrhagic pancreatic necrosis) is characterized by acute inflammation and necrosis of pancreas parenchyma, focal enzymic necrosis of pancreatic fat and vessel necrosis (hemorrhage). The early diagnosis and precise scoring of disease severity are important goals in the initial evaluation and the management of pancreatitis. Pancreatitis not only must be differentiated from a myriad of other potential diagnoses, but patients also must be stratified to identify those with severe disease and to guide appropriate therapy.

Methods: This prospective observational study was conducted by the Department of General Surgery at Dhanalakshmi srinivasan medical college and hospital from July 2012 to July 2013. A total of 32 patients were included in the study on the basis of the non probability (purposive) sampling method. Multiple clinical and laboratory variables of both Ranson's and APACHE II scoring system and the final score of the patient from both the scoring systems were assessed.

Results: The mean age group of the subjects was 37.72 years ranging from 20 to 70 yrs. As sensitivity, specificity, positive predictive value and negative predictive value and accuracy are found to be the same for Ranson's and APACHE II score, Ranson's score is equally efficacious as APACHE II scoring system in the prognostication of acute pancreatitis.

Keywords: Pancreatitis; APACHE II score; Ranson's score.

Introduction

Acute pancreatitis is a sudden inflammation of the pancreas. Acute pancreatitis (acute hemorrhagic pancreatic necrosis) is characterized by acute inflammation and necrosis of pancreas parenchyma, focal enzymic necrosis of pancreatic fat and vessel necrosis (hemorrhage). Acute pancreatitis may be a single event, it may be recurrent or it may progress to chronic pancreatitis are associated with high mortality, even with optimal management.[1] Acute pancreatitis includes a wide spectrum of disease, from one with mild self limiting symptoms to fulminant process with multiorgan failure and high mortality. Acute pancreatitis is the most terrible of all the calamities that occur in connection with the abdominal viscera. The suddenness of its onset, the illimitable agony which accompanies it and the mortality attendant upon it, all render it the most

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formidable of catastrophes. The early diagnosis and precise scoring of disease severity are important goals in the initial evaluation and the management ofpancreatitis.

Pancreatitis not only must be differentiated from a myriad of other potential diagnoses, but patients also must be stratified to identify those with severe disease and to guide appropriate therapy. Of the several scoring systems used, commonly used Ranson's and APACHE II scoring systems guide in the prediction of the severity of the disease, but the efficacy between these two scoring systems remains a debate and hence the need for the study.

Materials and Methods

Source of Data

This prospective observational study was conducted by the Department of General Surgery at Dhanalakshmi srinivasan medical college and hospital from July 2012 to July 2013. A total of 32 patients were included in the study on the basis of the non probability (purposive) sampling method. Multiple clinical and laboratory variables of both Ranson's and APACHE II scoring system and the final score of the patient from both the scoring systems were assessed to know their efficacy in predicting the severity of the disease (higher the score more severe the disease).

Inclusion Criteria:

1. Patients diagnosed with acute pancreatitis based on the clinical suspicion and elevated serum amylase

Exclusion Criteria

1. Hyperamylasaemia due to othercauses
2. Chronicpancreatitis
3. Acute on chronicpancreatitis
4. Previously diagnosed case of acutepancreatitis
5. Age less than 20 years. And more than 70 years

Procedure

The detailed history and proper clinical findings were entered in a proforma case sheet. The clinical examination was done and necessary investigations were carried out to establish the diagnosis. The subjects were assessed with multiple clinical and laboratory variables of both Ranson and Apache II scoring system and the final score of the patient from both the scoring systems are assessed to know their efficacy in predicting the severity of the disease (higher the score more severe the disease). The sensitivity, specificity, positive predictive value andnegative predictive value of Ranson's and APACHE II scoring system in relation to the raised serum amylase level were evaluated and compared with standard publishedliterature.

Statistical Analyzis

The data was analyzed using SPSS software version 16. Sensitivity, specificity, positive predictive value, negative predictive value and accuracy were calculated. A *p*-value of less than 0.05 was considered to be statistically significant. The results were averaged (mean + standard deviation) for each para meter for continuous data and numbers and percentage for categorical data presented in table and figure. Proportions were compared using Chi-square test ofsignificance.

Results

In this study, 32 patients were included. According to Atlanta Revised criteria, 21 patients had mild pancreatitis and 11 patients had severe pancreatitis. Of the 32 patients, 26 patients had Ranson's score less than or equal to 8 and 6 patients had a score of more than 8. Patient with age 20 yrs to 70 yrs was part of study. Males accounted for 62% of the patients in the present study.

Out of 32 subjects enrolled into the study, maximum 13 (40.6%) were in the age group of 31–40 years followed by 10 (31.3%) from the age Group 41–50 years. The mean age of the patients was 37.72 (SD14.66) years ranging from 21 to 70 yrs (Table 1).

Table 1: Age and Sex Wise Distribution of Study Subjects

Age	Mild Pancreatitis	Severe Pancreatitis	Total
21–30	5	3	8 (25%)
31–40	8	5	13 (40.6%)
41–50	8	2	10 (31.3%)
51–61	0	1	1 (3.1%)
61–70	0	0	0
Total	21 (65.62%)	11 (34.38%)	32

Majority of the subjects were male 27 (84.4.3%) compared to females 5 (15.6%) (Table 2).

In our study only 5 patients had score more than 3, suggesting that only 15.6% of them were considered to be having severe pancreatitis as per Ranson's criteria (Table 3).

Table 2: Sex wise Distribution of Study Subjects

Sex	Mild Pancreatitis	Severe Pancreatitis	Total
Male	18	9	27 (84.4%)
Female	3	2	5 (15.6%)
Total	21 (65.62%)	11 (34.38%)	32

Table 3: Ranson Scoring System Results

Score	Frequency	Percentage
<3	27	84.4
3–4	5	15.6
>5–6	0	0
>6	0	0
Total	32	100

(Score >3 suggests severe pancreatitis)

In our study 8 patients were diagnosed to have score more than 8 of the 32 cases, suggesting that 24.24% had severe pancreatitis as per APACHE II scoring criteria (Table 4).

Table 4: Apache Scoring System Results

Score	Frequency	Percentage
0-5	21	65.6
6–10	9	28.1
11–15	2	6.3
>15	0	0
Total	32	100

(Score > 8 suggest severe pancreatitis)

Assensitivity, specificity, positive predictive value and negative predictive value and accuracy are found to be the same for Ranson's and APACHE II score, Ranson's score is equally efficacious as APACHE II scoring system in the prognostication of acutepancreatitis (Table 5).

Table 5: Prediction of Severity by Two Scoring Systems

	Sensitivity	Specificity	PPV	NPV	Accuracy
Ranson Score	91.61	93	92.62	94	93
APACHE Score	94.23	95	95.12	96	95

Discussion

Assessment of the severity of acute pancreatitis is important for early identification of patients who may benefit from additional supportive and specific therapeutic procedures. It is also important to standardize clinical data for comparison of results between centres.[2] The mean age group of the subjects was 37.72 years ranging from 21 to 70 yrs. The mean age of presentation (in years) in various studies done by Barreto SG et al.[3] which was at 40 yrs and Haloneena KI et al.[4] was at 42.7 which were in consistent with our studies but studies done by Larvin et al.[5] show the mean age to be around 62 yrs which was higher than the studies done. Increased incidence was seen in males which was in consistent with the other studies done by Barreto SG et al.,[3] Haloneena KI et al.[4] and Larvin at al.[5]

The sensitivity, specificity, positive predictive value and negative predictive value were compared with other studies in prediction of severity and it was higher than studies done by Larvin at al.,[5] Wilson et al.[6] but was in consistent with studies done by Maheshwar A et al.[7]

Table 6: Comparative Study between Ranson and APACHE II Scoring Systems

	Ransons scoring system				APACHE II scoring system			
	Study	**Larvin et al.[5]**	**Wilson et al.[6]**	**Maheshwar A et al.[7]**	**Study**	**Larvin et al.[5]**	**Wilson et al.[6]**	**Maheshwar A et al.[7]**
Sensitivity	91.61	75	87	87.5	94.23			83.3
Specificity	93	68	71	97.2	95			86.1
PPV	92.62	37	49	95.5	92.12			80
NPV	94	91	94	92.1	95			88.6
Accuracy	93	69	75	NA	96			NA

Conclusion

From this study, we can conclude Ranson's scoring system is equally as good as APACHE II scoring system, in predicting the severity of acute pancreatitis. Ranson's scoring system is a simple, cheap, easy to remember/recollect and easy to calculate too. Above all this Ranson's scoring system was developed specifically for acute pancreatitis. In developing countries like India, where cost effectiveness is an important factor, Ranson's scoring system can be used in place of APACHE II scoring system.

The Ranson's scoring system accurately predicts the outcome in patients with acute pancreatitis and compares favourably with almost all physiological scoring systems available for prediction of severity and outcome for acute pancreatitis, the only disadvantage being a 24 hour delay. According to our study, the Ranson's scoring system accurately predicts the outcomes in patients with acute pancreatitis compared with the physiological scoring systems (APACHE II scoring system) in the prediction of disease severity for acutepancreatitis.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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A Comparative Study Between Light Weight 3D Polyester Mesh *vs* Light Weight Polypropylene Mesh in Laparoscopic e-TEP Inguinal Hernia Repair

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Abstract

Context: A hernia is the bulging of part of the contents of the abdominal cavity through a weakness in the abdominal wall. Synthetic mesh implants are one of the commonly used materials in many surgical interventions, especially during hernia repair. Mesh repair is now standard procedure which is widely accepted and superior to primary suture repair. Nowadays we use mainly three groups of material regarding to non-absorbable meshes: polypropylene, polyester and polytetrafluroethylene. They are non-absorbable mesh and provoke less tissue reaction.

Aims: To compare use of light weight 3d polyester mesh *vs*. light weight polypropylene mesh in laparoscopic e-tep inguinal hernia repair.

Settings and Design: Prospective study

Methods and Material: This study was conducted on patient of inguinal hernia admitted from May 2018 to September 2019 in Sir T. Hospital Bhavnagar. This study involving 60 patients with inguinal hernia, who were classified into two groups. Group I: 30 patients with inguinal hernia who were operated by e-TEP hernia repair using light weight polypropylene mesh. Group II: 30 patients with inguinal hernia who were operated by e-TEP hernia repair using light weight 3D-polyester mesh. All patients provided informed consent to participate in the trial and for the surgical procedure. Both groups are compared with certain parameter and result obtained.

Results: In our study, Group II has lesser mesh fixation time, less incidence of post-op pain and discomfort, less use of additional analgesic with less incidence of seroma as compared to Group I.

Conclusions: The use of 3D-polyester mesh for laparoscopic e-TEP inguinal hernia repair offers many advantages as compared to lightweight polypropylene mesh.

Keywords: e-TEP hernia repair**,** light weight polypropylene mesh, light weight 3D-polyester mesh

Introduction

A hernia is the bulging of part of the contents of the abdominal cavity through a weakness in the abdominal wall.[3]

Synthetic mesh implants are one of the commonly used materials in many surgical interventions, especially during hernia repair.

The term 'mesh' refers to prosthetic material, either a net or a flat sheet, which is used to strengthen a hernia repair. Mesh can be used:

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- to bridge a defect: the mesh is simply fixed over the defect as a tension-free patch;
- to plug a defect: a plug of mesh is pushed into the defect;
- to augment a repair: the defect is closed with sutures and the mesh added for reinforcement.

The concept of mesh repair in hernias was introduced over 50 years ago. Mesh repair is now standard procedure which is widely accepted and superior to primary suture repair.

Nowadays we have mainly three groups of material regarding to non-resorbable meshes: polypropylene, polyester and polytetrafluroethylene. They are non-absorbable mesh and provoke less tissue reaction.[1,2]

Polypropylene mesh makes a strong monofilament mesh. It does not have any antibacterial properties but its hydrophobic nature and monofilament microstructure impede bacterial in-growth. PPM is classified on the basis of density of the material and its surface area as heavyweight (90 gm/sq meter to 100 gm/sq meter); middle weight (45 gm/sq meter to 50 gm/sq meter) and light weight (less than 45 gm/sq meter).[4,5]

Polyester mesh is a braided filament mesh. This structure may allow infection to take hold, aided by its hydrophilic property. However, this property also allows rapid vascular and cellular infiltration within the fibrils, aiding host immune responses to infection and providing a stronger host–tissue interface. It's key benefits of being is more malleable so deployment time intraoperative is less.

Materials and Methods

This was a prospective observational comparative study conducted on patient of inguinal hernia admitted from May 2018 to Sept 2019 in Sir T. Hospital Bhavnagar.

Inclusion Criteria

(1) Patients with uncomplicated inguinal hernias.

(2) Age between 15 to 65 years.

(3) Patients fit for laparoscopic surgery.

Exclusion Criteria

(1) Patients not fit for laparoscopic surgery.

(2) Those who are unwilling.

This study involving 60 patients with inguinal hernia, who were classified into two groups:

1. Group I included 30 patients with inguinal hernia who were operated by e-TEP hernia repair using light weight polypropylene mesh.
2. Group II included 30 patients with inguinal hernia who were operated by e-TEP hernia repair using light weight 3D polyester mesh.

Randomization: randomization was done on odd-even method i.e. every alternate patient was given the same method.

Gender distribution of patients

Table 1: Gender distribution of patients

Gender	No. of patient
Male	60
Female	00

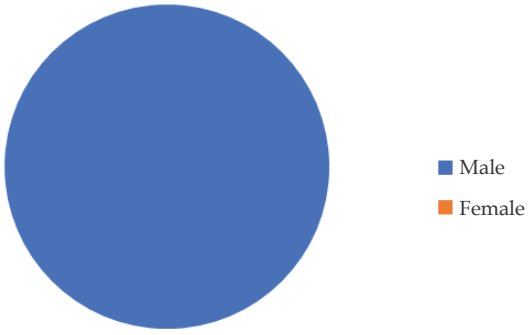

Fig. 1: Gender distribution of patients

Graphic representation of gender distribution in our study

After admission patients fulfilling the inclusion criteria were taken into study. written informed consent about their willingness to participate in study and also they were informed regarding method by which they would be operated upon and the data was collected: clinical history, examination, diagnosis, investigations, detail of previous operative procedure.

Investigations include routine preoperative hematological, biochemistry, serological and microbiological and radiology as well as specific such as ultrasonography and for some recurrent cases, CT or MRI of abdomen.

All patients provided informed consent to participate in the trial and for the surgical procedure.

Post-operative follow-up

Following parameters was evaluated:

1. Mesh fixation time
2. post-operative pain
3. post-operative discomfort
4. Use of additional analgesia
5. Seroma
6. Recurrence

Post-operative pain assessment was done according to the visual analog scale in first post-operative day and analgesia given accordingly.

Post-operative follow-ups were taken.

1. At the time of discharge
2. At 1 month
3. At 3 months

The patients were instructed to avoid lifting heavy objects and other strenuous activities for at least 6 weeks, and then return to normal activity gradually.

Results

Our study conducted on 60 patient of inguinal hernia admitted from May 2018 to September 2019 in Sir T. Hospital Bhavnagar in which all patient are male.

In our study, mean mesh fixation time in Group I (light weight polypropelene mesh) was 14.5 min which was higher than the Group II (light weight 3D polyester mesh) 8.5 min.

The incidence of severe immediate post-operative pain was higher in Group I (polypropylene mesh) 12 patient than Group II (poyester mesh). Post-op discomfort were much common in Group I than Group II (10 and 6 patient respectively)

Analgesic given post-operatively in form of i.m injection of 1 ampoule of diclofenac injection in all patient undervent e-TEP hernia repair. Additional analgesic needed more in Group I patient than Group II (& patient and 4 patient respectively)

The post-operative seroma was less in using light-weight 3D polyester mesh, than polypropylene mesh (2 patient and 1 patient respectively).

No recurrence of hernia observed after 6 months follow-up in both group.

Table 2: Mean mesh fixation time in groups

Parameter	Group I (light weight polypropylene mesh)	Group II (light weight 3D polyester mesh)	*p*-value
Mesh fixation time (Mean value)	14.5 min	8.5 min	–
post-operative pain	12 patient	5 patient	0.0449 (significant)
Post-operative discomfort	10 patient	4 patient	0.0670
Use of additional analgesia	7 patient	3 patient	0.1658
Seroma	2 patient	1 patient	0.5535
Recurrence	0	0	–

Discussion

Inguinal hernias are associated with reduced daily activities and high socio-economic costs for its operations. The use of mesh has reduced risk of surgical failure.

The study was conducted to assess the e-TEP repair of inguinal hernia in comparison of light weight 3D polyester mesh *versus* light weight polypropylene mesh.

To achieve this aim, 60 patients were included in this study who were divided into two groups: Froup I included 30 patients with inguinal hernia who were operated on by e-TEP repair using polypropylene and Group II included 30 patients with inguinal hernia who were operated by e-TEP repair using light weight 3D polyester mesh.

Regarding to mean mesh fixation time, group I (light weight polypropelene mesh) require more time in comparision to Group II (light weight 3D polyester mesh) with *p*-value, thereby using light weigt 3D polyester mesh, operative time for hernia repair can be reduced.

Complain of immediate post-operative pain occured in 12 patient of Group I, out of which 10 patient felt post-op discomfort whereas in Group II, post-op pain oocured in 9 patient out of which 6 patient felt post of discomfort.

Need of additional analgesia required in 7 patient of Group I whereas in Group II, 4 patient need additional analgesia in form of i.m injection of diclofenac injection.

The post-operative seroma was less in using light-

weight 3D polyester mesh, than polypropylene mesh.

There was no hollow viscous injury or vascular or mesh related complication reported in both groups of this study.

No recurrence observed in both group after 6 month of follow-up.

Conclusion

The use of three-dimensional polyester mesh (3D mesh) for laparoscopic e-TEP inguinal hernia repair is a safe and viable option. It offers many advantages in terms of less mesh fixation time, lesser incidence of post-operative pain and discomfort thereby decrease need of additional analgesia, less incidence of seroma as as it is more malleable compared to lightweight polypropylene mesh.

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Conflict of Interest: Nil

Key Messages: Nil

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Effectiveness of Various Modalities of and Protocol for Optimal Management of Chronic Leg Ulcers

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Abstract

Context: Based on the cause and type of wound, numerous products are available in the market, making the selection a very difficult task.

Aims: To study the Effectiveness of various modalities of and protocol for optimal management of chronic leg ulcers

Settings and design: The present study was a hospital based observational descriptive study carried out in Government Medical College, Latur

Methods: The study population was all patients with leg ulcers with complaint duration of more than 6 weeks. The patients were subjected to appropriate investigations like complete blood counts (Hb gm%, total leucocyte count and platelets), blood sugar (random blood sugar). Colour Doppler study of lower limb vessels was done in patients with suspected vascular disease of lower extremity, X ray of affected leg to rule out any bone involvement in clinically suspicious cases.

Statistical Analyzis: Chi-square for proportions and ANOVA for continuous variables was applied.

Results: Healthy granulation formation and mean follow-up period was significantly less in VAC method. Healthy granulation formation and mean follow-up period was significantly lesser when silver nitrate was used. Mechanical debridement was required in only one case when silver nitrate was used.

Conclusion: Out of all the available dressing methods for conservative management of ulcer in this setup, vacuum assisted closure/negative pressure wound therapy is superior followed by conventional dressing method. Placental extract is better for ulcers with no or minimal slough for accelerated formation of granulation tissue. Any ulcer with any etiology of size more than 5 cm^2 mostly requires surgical intervention.

Keywords: Management; Therapy; Dressing; Placental extract; Tissue.

Introduction

Ulcer on the legs of duration of more than six weeks and non-healing nature even three months or more in spite of treatment is called the chronic leg ulcer. Among all the types of ulcers of the legs, venous ulcer seems to be the most common type. Arterial ulcer and neuropathic ulcer are other two common types seen in daily clinical practice. 70% of the cases of leg ulcers are venous type and others like diabetic, traumatic, malignant, vascular etc constitute remaining 30% of the cases. There is pain, improper healing of the wound, foul odour is some of the common clinical characteristics of the chronic leg ulcers. It affects the quality of life of the person.[1]

It has been estimated that the prevalence of chronic leg ulcers in the age group of sixty years

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and more ranges from 0.6–3% and then it increases as the age increases.[2]

There is lack of data on chronic leg ulcers in countries like India. One study has reported that the prevalence of chronic leg ulcers was 0.45%.[3]

There are many factors, which govern the rate at which a wound heals. These factors can be divided into three groups like focal in which depending upon the site, mechanism of wounding, local factors like blood supply and systemic factors like malnutrition, diabetes.[4]

To protect the wound from contaminations, various methods can be tried like bandages etc.[5]

The objective of the modern dressing is rapid healing apart from covering it. They promote healing. The method of adoption of the modern dressing depends upon the type of chronic leg ulcer. Hence it is not easy to select the one method for one type in one patient. The products differ for different types.[6]

Present study was carried out to study the Effectiveness of various modalities of and protocol for optimal management of chronic leg ulcers

Materials and Methods

The present study was carried out in Government Medical College, Latur from December 2017 to November 2019 department of General Surgery. The present study was a hospital based observational descriptive study. The study population was all patients with leg ulcers with complaint duration of more than 6 weeks. Patients were recruited as cases using the below mentioned inclusion and exclusion criteria. All patients age more than 12 years with chronic leg or footulcers for more than 6 weeks and are willing to participate in the study were included in the present study. Patients with Burns, Immunocompromised patients, Patients less than 12 years of age and Malignant ulcers were excluded. The study was granted by the institutional ethical committee of the tertiary care institute and the concerned university authorities. The patients were subjected to appropriate investigations like complete blood counts (Hb gm%, total leucocyte count and platelets), blood sugar (random blood sugar).

Pus/Discharge from ulcers were sent for culture and sensitivity and gram staining at the time of presentation to the tertiary care institute. Colour Doppler study of lower limb vessels was done in patients with suspected vascular disease of lower extremity, X ray of affected leg to rule out any bone involvement in clinically suspicious cases.

Liver function test, kidney function test and seropositive status, (HIV/HBsAg) as a part of routine pre Anesthetic work up. Electrocardiograph (ECG), X-ray chest and echocardiography (ifrequired) was done to assess the cardiorespiratory status of selected old age patients with history of cardiorespiratory diseases. Appropriate advice was taken from physician for cardiorespiratory diseases and diabetes when ever indicated. Patients with chronic leg ulcer were treated depending on the cause of ulcer and they were followed up for healing of the ulcer, reduction in size of ulcer, or flaring up of the ulcer.

Plan of management of ulcer was based on aetiology of ulcer, presence of infection and viability of tissue and size of ulcer. Patients with small ulcer with pale or healthy granulation tissue and minimal slough or infection were treated by conservative management and patients having spreading ulcer were treated with surgical debridement on the day of admission to remove necrotic tissue, slough and eschar from the ulcer.

Patients were given one of the following methods of regular dressings in the wards. These included:

Conventional dressing

Modern dressing: Collagen dressing (due to non-availability of other types of modern dressing methods in our set up and financial constraints of the patients only collagen dressing could be done whenever possible.)

Vacuum assisted closure: Also, regular bedside mechanical debridement was done when ever needed and this was recorded in the case proforma.

Conventional dressing

Patients receiving conventional dressing were treated with one of the following 4 available solutions in this study-

1. Hydrogen peroxide betadine
2. EUSOL
3. Silver nitrate
4. Placental extract

All patients were given empirical IV antibiotics, and were later shifted to specific antibiotic after pus culture sensitivity report. Regular dressing with respective solution was done in wards till appearance of healthy granulation tissue. Following this, the patients were either discharged if the ulcer is small or was surgically treated. The ulcers of size

more than 5 cm^2 were surgically managed either by split skin grafting or flap surgery in cases where bone or tendon was exposed.

Modern dressing/ collagen dressing

The patients in this group were treated with either collagen sheets or collagen granules after mechanically debriding the wound. These patients were also given IV antibiotics, initially empirical and later specific.

Vacuum assisted closure

The ulcers of patients in this group were mechanically debrided and vacuum dressing was applied under all aseptic precautions. The dressing was changed every 3rd day and findings were recorded.

The procedure done for VAC in our study is as follows

1. Wound was debrided and thorough wash was given
2. Autoclaved sponge was kept over the wound.
3. Ryle's tube was kept over the sponge and it was covered with another sponge taking care that all holes of Ryle's tube are covered in the sponge.
4. This was covered with sterile pads.
5. This was covered with Steridrape taking care that it is air tight.
6. Dressing was done and Ryle's tube was connected to suction machine intermittently.

IV antibiotics were given to the patients in a similar method as the other groups.

The co morbidities were controlled and treated in all patients. Depending upon the etiology of the ulcer, further treatment was decided. Diabetic ulcer and infective ulcer were treated with dressing of one ofthe above-mentioned methods till appearance of granulation tissue and later depending on the size either discharged and followed up for complete healingor were treated with split skin grafting.

All venous ulcers found in study were due to involvement of superficial venous system and incompetence of perforator. Deep venous system was normal in all participants. Multiple perforator ligation, ligation of saphenofemoral junction and stripping of veins were performed accordingly in patients with venous ulcers with no signs of healing by conservative management. A study of recurrences of venous ulcers could not be made due to inadequate time for follow-up. Traumatic ulcers were debrided and regular dressing was done till appearance of healthy granulation tissue. Later flap surgery or split skin grafting was done as a part of surgical intervention if the ulcer size was big and if bone or tendon exposed.

Ulcers due to vascular insufficiency were treated conservatively in cases were collateral circulation was established. In cases with gangrenous changes with secondary bacterial infection or clear line of demarcation and on doppler showing poor collaterals were amputed at appropriate level.

General treatment given to all cases of chronic leg ulcers were-

- Rest to the affected limb
- Elevation of limb above heart level
- Dressing with magnesium sulphate to reduce oedema
- NSAIDS and opiate analgesics were given to alleviate pain
- Nutritional supplementation with high protein diet, vitamins, irontablets.
- Systemic antibiotic for control of infection.
- Strict control of diabetes, correction of anaemia.

Statistical Analyzis

Data obtained was compiled on a MS Office Excel Sheet. Descriptive statistics like frequencies and percentage for categorical data, Mean & SD for numerical data has been depicted.

Results

Table 1 shows inter group comparison of Healthy granulation formed in vs dressing method. There was a statistically significant/highly significant difference seen for the values between the groups ($p < 0.01, 0.05$) with higher values in Collagen group and least in VAC.

Table 1: Inter group comparison of Healthy granulation formed in vs dressing method

Dressing method	*N*	Mean ± SD	*F*-value	*p*-value
Conventional	93	16.9 ± 8.6	9.516	0.000
Collagen	2	30 ± 14.14		
Vacuum assisted closure	9	6.22 ± 1.39		

Table 2 shows inter group comparison of follow-up in weeks vs dressing method. There was a statistically significant/highly significant difference seen for the values between the groups ($p < 0.01$, 0.05) with higher values in Collagen group and least in VAC

Table 2: Inter group comparison of follow-up in weeks vs dressing method

Dressing method	*N*	Mean ± SD	*F*-value	*p*-value
Conventional	95	4.09 ± 1.67	5.935	0.004
Collagen	2	7.5 ± 2.12		
Vacuum assisted closure	7	3 ± 0.57		

Table 3 shows inter group comparison of healthy granulation formed in vs solution used. There was a statistically significant/highly significant difference seen for the values between the groups ($p < 0.01$, 0.05) with higher values in HPB and least in SN

Table 3: Inter group comparison of healthy granulation formed in vs solution used

Solution used	*N*	Mean ± SD	*F*-value	*p*-value
Eusol	26	18.88 ± 9.026	12.774	0.000
Hydrogen peroxide	27	22.3 ± 9.09		
Placental extract	11	18.73 ± 5.38		
Silver nitrate	30	10.4 ± 4.768		

Table 4 shows inter group comparison of follow-up in weeks vs solution used. There was a statistically significant/highly significant difference seen for the values between the groups ($p < 0.01$, 0.05) with higher values in HPB and least in SN

Table 4: Inter group comparison of follow-up in weeks vs solution used

Solution used	*N*	Mean ± SD	*F*-value	*p* - value
Eusol	27	4.22 ± 1.783	8.327	0.000
Hydrogen peroxide	29	5.07 ± 1.71		
Placental extract	10	4.5 ± 1.269		
Silver nitrate	30	3.07 ± 1.258		

Table 5 shows comparison of frequency of solution used vs mechanical debridement. There was a statistically significant/highly significant difference seen for the frequencies between the groups ($p < 0.01$, 0.05) with higher free for SN with not done

Table 5: Comparison of frequency of solution used vs mechanical debridement

Solution used	Mechanical debridement			Chi-square	*p*-value
	Done	Not done	Total		
Nil	10	0	10	76.050	0.000
Eusol	24	3	27		
Hydrogen peroxide	26	4	30		
Placental extract	11	0	11		
Silver nitrate	1	29	30		

Table 6 shows comparison of frequency of solution used vs slough. There was a statistically significant/highly significant difference seen for the frequencies between the groups ($p < 0.01$, 0.05) with higher frequency forslough 1 with EUS and SN while 1, 2 with HPB

Table 6: Comparison of frequency of solution used vs slough

Solution used	Slough				Chi-square	*p*-value
	0	1	2	3		
Nil	0	10	0	0	46.396	0.000
Eusol	0	16	8	3		
Hydrogen peroxide	0	14	14	2		
Placental extract	3	7	1	0		
Silver nitrate	0	25	5	0		

Table 6 shows comparison of frequency of solution used vs slough. There was a statistically significant/highly significant difference seen for the frequencies between the groups ($p < 0.01, 0.05$) with higher frequency forslough 1 with EUS and SN while 1, 2 with HPB.

Table 7: Comparison of surgery vs size of ulcer

Surgery	Size of ulcer				Chi-square	*p*-value
	< 5	5–7	> 7	Total		
Amputation	8	1	0	9		
Conservative	39	9	9	57		
Flap	0	0	14	14	97.45	0.000
Split skin grafting	0	0	22	22		
Trendelenburg Procedure	6	0	0	6		

Table 7 shows comparison of surgery vs size of ulcer. There was a statistically significant / highly significant difference seen for the frequencies between the groups ($p < 0.01, 0.05$) with higher frequency for <5 with conserve, >7 with SSG and Flap.

Table 8: Comparison of frequency of etiology vs surgery

Etiology	Surgery						Chi-square	*p*-value
	Amputation	Conservative	Flap	Split skin grafting	Trendelenburg Procedure	Total		
Diabete 3s	0	22	0	3	0	25		
Infection	0	27	0	15	0	42		
PVD	7	0	0	0	0	7		
Trauma	2	7	14	4	0	27	230.603	0.000
Varicose	0	1	0	0	6	7		

Table 8 shows comparison of frequency of etiology vs surgery. There was a statistically significant/highly significant difference seen for the frequencies between the groups ($p < 0.01, 0.05$) with higher frequency for trauma with flap and inf & DM with conserve

Discussion

About 52.7% were managed conservatively i.e. wound dressing only and 47.3% managed by surgical intervention of surgical intervention, split skin grafting comprised 43.1%, flap surgery comprised 27.4%, amputation comprised 17.6%, Trendelenburg's procedure comprised 11.7%.

A study done by Rahman GA et al.[7] reported that 43.3% of their patients had wound debridement only, 28.3% had debridement with dressingand spilt skin graft placement and 2 patients needed cross flap leg after the debridement was done. Kahle B et al.[8] summarised the evidence-based treatment for treatment of chronic leg ulcers in their study.

The average days required for formation of granulation tissue in the conservative method in our study was found to be 16.89 days with std deviation of 8.5 days. The mean time required for healing of

ulcer was found to be 4.09 weeks. This comprised of daily dressing either with hydrogen peroxide betadine, EUSOL, silver nitrate or placental extract. The ulcers where debrided mechanically in all cases except for patients being treated with silver nitrate. In case of hydrogen peroxide-betadine solution, the average daysrequired for formation of granulation tissue was 22.30 days. For EUSOL, 18.88, For silver nitrate, the average days for granulation tissue formation was 10.40 days

In a study conducted by Khandelwal S et al., dressings with antiseptics likebetadine, hydrogen peroxide and EUSOL, mean ulcer healing time is not significantly different in the three groups.[9]

About 8.3% patients were treated with vacuum assisted closure. Granulation tissue was formed in these ulcers with mean of 6.22 ± 1.3 days. The ulcer healed in about 3 weeks in our study. McCallon et al. observed an average decrease of 28.4% (924.3) inwound size in the VAC group as compared to 9.5% (916.9) average increasein wound size in the control group (treated by saline-moistened gauze dressings).[10]

In our study, collagen sheets were used in about 2% of the patients due to non-availability of the same in our hospital setup and financial constraints of the patients. In our study it was found that the complete healing of ulcer took 7.5 weeks with collagen dressing.

A comparative study by KM Rai et al. (1986) with collagen granules showed that ulcers took a mean of 39 days to heal. All ulcers treated with collagen healed whereas 8% in control failed to heal after 9 months of treatment. Thus, there is similarity with our results where 70% ulcers healed after six weeks treatment.[11]

Majority of participants with venous leg ulcer (85.7%) needed surgical intervention and rest were managed conservatively. Trendelenburg operation was done as surgical intervention in cases of chronic venous ulcers. 14.28% of the ulcer were found to be not healed on follow-up in which surgical intervention could not be done.

A study conducted by Gokhale Y et al.[12] inferred that 10 out of 40 cases were of venous origin. Among them 1 completely healed, 5 had reduction in size, 3 case did not show signs of healing and one case was lostto follow-up.

Study participants were followed at 4 weeks, 6 and 8 weeks after treatment. 2.7% patients were lost in follow-up, while 1% patient showed no signs of healing, while 96.3% patients showed complete healing of ulcer.

Conclusion

Out of all the available dressing methods for conservative management of ulcer in this setup, vacuum assisted closure/negative pressure wound therapy is superior followed by conventional dressing method. In conventional dressing methods, silver nitrate solution gives better results with respect to granulation tissue formation and wound healing. However, its action on ulcers with dense slough and necrotic tissue islimited without mechanical debridement. EUSOL showed better results than hydrogen peroxide betadine combination with respect to removal of slough and formation of granulation tissue. Placental extract is better for ulcers with no or minimal slough foraccelerated formation of granulation tissue. Conservative line of management of ulcer can be done for infectiveulcer, traumatic ulcer and ulcer with co morbidities like diabetes mellitus provided the ulcer size is less than 5 cm. However, ulcer with peripheral vascular disease or varicose veinsusually require operative intervention for complete healing of ulcer. Traumatic ulcers with bone or tendon exposed or of size more than 5 cm^2 require flap surgery or split skin grafting respectively. Any ulcer with any etiology of size more than 5 cm^2 mostly requiressurgical intervention.

Key messages: Conservative line of management of ulcer can be done for infective ulcer, traumatic ulcer and ulcer with co morbidities like diabetes mellitus provided the ulcer size is less than 5 cm. However, ulcer with peripheral vascular disease or varicose veins usually require operative intervention for complete healing of ulcer.

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Original Research Article

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Prospective Study of Esophageal Stricture in Acid Poisoning Treated By Esophageal Dilatation

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Abstract

Background: Both Conservative and aggressive surgical strategies have been advocated for the treatment of corrosive injuries of the upper gastrointestinal tract but the optimal management is still a dilemma. The aim of this study was to report our experience with caustic upper gastrointestinal tract injuries in adult patients treated with a endoscopy-based therapeutic protocol.

This prospective clinical study 50 cases was carried out on patient of a Oesophageal stricture due to corrosive ingestion admitted in Surgery Department, Govt. Medical College & Sir T. Hospital, Bhavanagar from Aug 2018 to Aug 2020 who had given inform written consent, after fulfillment of exclusion and inclusion criteria

Result: In this series, out of 50 cases, 20 cases were male, 30 female. 40 (80%) cases were age group of 31–45 year, 05 (10%) were age group of 15–30 & 46–60 year with mean age of 36 year. Most common mode of ingestion was suicidal 39 (78%) compare to accidental 11 (22%) with the most common substance was House hold bleaches (5% Na Hydrochloride). Most common symptoms was Dysphagia, Vomiting, Weight loss

Conclusion: Esophageal dilatation for post corrosive injury esophageal stricture relatively safe, acceptable and easy in uncomplicated post acid ingestion esophageal stricture. Patient can start taking liquid diet on same day and can resume his or her routine activites quickly with little or no discomfort or pain. However Patient with uncomplicated post acid ingestion esophageal stricture require repeated upper G.I. scopy guided esophageal dilatation at regular interval.

Keywords: Esophageal dilatation; Non surgical management; Post acid ingestion esophageal stricture; Repeated dilatation.

Introduction

Ingestion of corrosive substances remain an important public health issue in despite education and regulatory efforts to reduce its occurrence. Ingestion of corrosive agents is an common cause of benign strictures of the upper aerodigestive tract in India. Easy availability of hydrochloric acid in the form of a cheap toilet cleaner is a frequent cause of acid poisoning leading to esophageal strictures.

Esophageal Dilatation is one of the common treatment for post corrosive patient who doesn't required definitive surgical management like colonic pull through or gastric pull through. In our study most common agent for acid ingestion is hydrochloric acid and sulfuric acid in Young female with suicidal intention. It is advisible to perform upper GI Endoscopy after 21 days in acid ingestion patient. Esophageal dilation is minimal invasive, relatively safe, least complicated, palliative treatment for patient with post corrosive esophageal stricture. However patient require

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repeated esophageal dilation under short general anesthesia for post corrosive esophageal stricture.

Materials and Methods

This prospective clinical study 50 cases was carried out on patient of a Oesophageal stricture due to corrosive ingestion admitted in Surgery Department, Govt. Medical college & Sir T. Hospital Bhavanagar from Aug 2018 to Aug 2020.

Fifty Patient of post corrosive esophageal stricture were included in study who had given inform written consent, after fulfillment of exclusion and inclusion criteria.

Inclusion Crieterias

1. Post acid ingestion esophageal stricture patient.
2. Age between 15 to 60 year.
3. Both sex

Exclusion Crieteria

1. Patient not giving written inform consent.
2. Patient having other associated esophageal disease.
3. Patient not fit for short general anesthesia.

After admission patient detail history taken and examination of patient done. Patient under gone routine blood investigation and radiological examination done to get finess for short general anesthesia which is require for upper GI Endoscopy and Esophageal Dilation. All information recorded on standard CRF

After fitness getting fitness from anesthesia department all patient of post corrsive esophageal stricture were posted for upper GI Scopy with esophageal dilation with help of SG dilator.

After taking written inform consent from patient, wide bore IV line taken. Patient given left lateral position and mouth gage inserted in mouth. After short general anesthesia given Upper GI Scopy perform to decide ecxact location of corrosive esophageal stricture. After the narrow lumen of stricture identified flexible tip guide wire inserted through side channel of Upper GI Scop through the stricture under IITV guidation into the stomach. Once the tip of guidewire cofirm inside the stomach, Upper GI scope withdrawn over guide wire with keeping guidewire insitu. After that SG dilator were lubricated with lignocaine jelly (2%) and insertated in Esophagus over guidewire under IITV successive esophageal stricture dilated with SG dilator from size 5 mm to 15 mm in all patient.

After dilation is over checke upper GI endoscopy is perform to check location, length and number of esophageal stricture lookedfore, and condition of stomach and pylorus also looked for any post corrosive changes. After procedure is over patient shifted into the ward patient. All patients on second day of dilation.

All data collected according to the standard parameter into CRF Form and recorded on it.

Results

Age Group Distribution

In the present study Incidence of esophagial stricture was commonest in age group (31–45 years) 80% of total patient with mean age of 36 years with SD is ±7.12 years. In Carmen Cabral et al. study mean age group was 40 years with SD is ± 15.55 years.

Table 1: Age Group Distribution

Age Group (In years)	No. of patients in our study (%)
15–30	05 (10%)
31–45	40 (80%)
46–60	05 (20%)
Total	50 (100%)

Gender Distribution

In present study Acid ingestion was more common in Female sex. Out of 50 cases 30 patient were Female (60%). This may be due to social factors affecting like marital problem. Females are more involved in psychological stress and attempting suicidas now days.

In Carmen Cabral et al. study 56.2% patient were female which is quite nearer to female patient in our study.

Table 2: Gender Distribution

Sex	No. of patients in our study	No. of patients in Carmen Cabral et al. study
Male	20 (40%)	138 (43.8%)
Female	30 (60%)	177 (56.2%)
Total	50 (100%)	315 (100%)

Mode of Ingestion

In present study Incidence of esophagial stricture due to suicidal attempt was 39 patient (78%), Acccidental 11 patient (22%) which is Comparble

to Carmen Cabral et al. study where number of the patients with suicidal attempt were 239 out of 315 (75.9%), accidental ingested was 73 (23.2%).

Table 3: Mode of Ingestion

Mode of Ingestion	No of patients in our study	No. of patients in Carmen Cabral et al. study
Suicidal	39 (78%)	239 (75.9%)
Accidental	11 (22%)	73 (23.2%)
Total	50 (100%)	315 (100%)

Most Common Acid

In presence study common agent for corrosive injury for esophgeal stricture is House hold bleaches (5% Na Hypochlorite) 36 (72%) and sanitary cleansing agent (HCL) 14 (28%). which is Comparble to Rodriguez Vargas BO et al. study where common agent for corrosive injury for esophgeal stricture is House hold bleaches (5% Na Hydrochloride) 71 out of 91 (78%) and sanitary cleansing agent (HCL) 14 (20%).

Table 4: Most Common Acid

Type of Acid	No of patients in our study
House hold bleaches (5% Na Hydrochloride)	36 (72%)
sanitary cleansing agent (HCl)	14 (28%)

Symptoms

Incidence of complaints in esophagial stricture Dysphagia 50 (100%) vomiting/regurgitation 50 (100%) which is comparable to shivkumar at al. study where common symptom were Dysphagia 50 out of 50 (100%) and vomiting/Regurgitation 47 out of 50 (94%).

Table 5: Symptoms

C/O	No of patients in our study
Dysphagia	50 (100%)
Vomiting/regurgitation	39 (78%)
Weight loss	28 (56%)

Discussion

In our study of 50 cases of post acid ingestion esophageal stricture treated by upper GI scopy guided Esophageal Dilatation were studied and data were collected and analyzed. In this series, out of 50 cases, 20 cases were male, 30 female. 40 (80%) cases were age group of 31–45 year, 05 (10%) were age group of 15–30 & 46–60 year with mean age of 36 year.

Most common mode of ingestion was suicidal 39 (78%) compare to accidental 11 (22%) with the most common substance was House hold bleaches (5% Na Hydrochloride). Most common symptoms was Dysphagia, Vomiting, Weight loss.

Conclusion

From this prospective study of 50 cases of post acid ingestion esophageal stricture it is concluded that Most common cause for acid ingestion is sulfuric acid with more common in Female sex and Young age group with most common mode is Suicidal. Conservative & non operative management like NG tube (to prevent stricture), dilatation relatively safe, acceptable, easy, noncomplex, can resume the eating same day, drinking and other activites quickly, little discomfort or pain, effective at relieving esophageal stricture, side effects are usually minimal (such as a sore throat). Patient require repeated dilatation for esophageal stricture at regular inerval.

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Validation of New Wound Based Diabetic Ulcer Severity Score (DUSS)

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Abstract

Context: Diabetic ulcer severity score (DUSS) was by Beckert considering palpable pedal pulses, probing to bone, ulcer location and presence of ulcerations assess outcome.

Aims: To calculate DUSS in the patients with diabetic foot andassess the outcome.

Settings and Design: A single center Prospective Analytical study in Tertiary care center among 150 Diabetic patients of 20–80 years with foot ulcers

Methods and Material: Medical history, physical examination, investigation results are entered into data collection forms. Patients were followed for 6 months.

Statistical Analyzis used: Median and inter quartile range, Kaplan-Meier Analyzis, Cox regression.

Results: Mean age was 53 ± 14 years. Males were 58%. DUSS 3 score was common, 50.66% had amputations. The probability of healing with Score 0 was 93.75%, 92.86% with Score 1, 75% with Score 2, 15% with Score 3 and 0% with Score 4.

Conclusions: DUSS scoring system provides an easy diagnostic tool for anticipating probability of healing/ amputation and need for surgery by combining four clinically assessable wound based parameters.

Keywords: DUSS score; Amputation; Skin grafting; Secondary healing.

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Introduction

Foot ulcers are a common complication of diabetes and represent a major source of morbidity. The incidence of foot ulcers with diabetes is around 2% per year.[1] Fifteen percent of diabetics develop foot ulcers during their life time with significant health related decrease in quality of life and consumption of a great deal of healthcare resources.[2]

Foot ulceration occurs as a combination of many contributing factors like peripheral neuropathy, peripheral vascular disease, foot deformities, external trauma and peripheral edema. Most commonly due to peripheral neuropathy, foot deformity and trauma.[3] Up to 70% all non-traumatic amputations in the world occur in diabetics.[4] Many of these amputations are preventable as 85% are preceded by a foot ulcer.

Many classification systems for diabetic foot ulcers have been proposed in the past. Some are based on extensive diagnostic work up and complex grading or scoring schedules, while others do not include all diabetic foot complications. Several attempts have been made to establish classification systems that help to assess the severity of disease.

A clinical severity score is considered to be superior to a classification system because, a clinical severity score should be based on a standardized clinical assessment of wound-based parameters facilitating the categorization of wounds into specific severity subgroups for comparison of outcome with respect to the clinical course of wound repair.

A severity scoring system called Diabetic ulcer severity score (DUSS) was designed by Beckert et al.[3] considering the four clinically defined parameters, namely palpable pedal pulses, probing to bone, ulcer location and presence of multiple ulcerations to outcome this problem, and have found that healing was independently associated with Peripheral arterial disease, ulcer depth & site and ulcer number.

According to Beckert et al.[3] a lower DUSS score was strongly associated with healing and it is simple, provides an easy diagnostic tool for predicting probability of healing or amputation, which can be applied in daily clinical practice without need of any advanced investigative tool. Diabetic Ulcer Severity Score is one of the latest simple wound based clinical score which needs to be evaluated for its effectiveness in predicting the outcome of foot ulcers in patients with diabetes.

This study was undertaken to analyse the efficacy of DUSS scoring system in diabetic foot ulcers for prediction of clinical outcomes on the patients and its applicability in day-to-day practice in tertiary care hospital, as the prevalence of diabetes and diabetic foot ulcers is more in our part.

Materials and Methods

Study Area and Population: The patients with diabetic foot attending to surgical outpatient clinic or admitted in Tertiary Care Hospital.

Study Design: A single centre Prospective Analytical study

Sample Size: Sample size for the present study was calculated based on the formula and it was 150. Sample Size (SS) = $Z\alpha/2^2 * (p) * (1-p)/C^2$

Inclusion criteria

1. Male and female patients between age group 20–80 years.
2. All patients suffering from diabetes mellitus who had foot ulcers

Exclusion criteria

1. Venous stasis ulcers with Diabetes mellitus.
2. All patients with less than two follow-up visits during observation period.
3. Ulcers above the ankle.

Sampling Procedure: All eligible patients, who are satisfying inclusion and exclusion criteria are included in the study, hence no sampling is done.

Study Duration: February 2015 to October 2016.

Data Collection Methods: After admission, data for the study is collected from the medical records and from the patients included in the study. Direct interview with patient or patient's relatives/bystanders and obtaining history. Clinical examination–general condition, Pulse rate, respiratory rate, Blood pressure & Temperature. Investigations–Complete blood count & relevant investigations depending on further evaluation.

Data Collection Forms: All the data pertaining to the research, Including the medical history, physical examination, investigation results are entered into data collection forms.

Ulcers were labelled infected if a purulent discharge was present with two of the local signs mentioned below. Wound depth was evaluated using a sterile blunt probe. The ability to probe to bone with the presence of local inflammation (warmth, erythema, lymphangitis, lymphadenopathy, edema, pain) or signs of systemic infection and suggestive radiological features provided a clinical diagnosis of osteomyelitis.

Peripheral vascular disease was clinically detected by the absence of both pedal pulses, patients were categorized into groups having either single or multiple ulcerations on the same foot. In patients with multiple ulcers, the wound with the highest grading was selected for Analyzis. For wounds with identical grading, the larger wound was chosen. Unhealed ulcers were followed up for a minimum period of 6 months. Once a patient's ulcer had healed completely either by primary healing or skin grafting or a lower-limb amputation performed, the outcome was noted and the patient was deemed to have completed the study.

Diabetic Ulcer Severity Score (DUSS): Ulcers were Scored by the below mentioned variables. Diabetic Ulcer Severity Score (DUSS) was calculated by adding these separate scored variables to a theoretical maximum of 4.

Variables	Score 0	Score 1
Palpable Pedal pulses	Presence	Absence
Probing to bone	No	Yes
Ulcer site	Toes	Foot
Ulcer number	Single	Multiple

Healing was defined as complete epithelisation or healing after skin grafting. Amputation rate was defined as the percentage of patients undergoing either minor or major amputation within the observation period. Toe or forefoot amputations were taken as minor amputation and below- or above-knee amputation were taken as major amputation.

Follow-up: Dressings were done every day but, these patients were followed up in the surgical outpatient clinic for DUSS scoring once in fortnight for 1st month, then once in a month till the ulcer healed or for a minimum period of up to 6 months. Ulcer healing was assessed as mentioned earlier.

Statistical Analyzis: A descriptive statistics based on the study on "DUSS" was analyzed and expressed in percentages. Baseline characteristics were expressed as median and inter quartile range. Kaplan-Meier method was used to calculate the probability of healing. Cox regression was used to find the correlation between DUSS and healing.

Results

Most common age group affected with Diabetic foot was between 36–50 years, second group being between 51–65 years. Mean age group was 53 ± 14 years. Median age was 52.5 (IQR = 40 to 65 years). Males were more affected by Diabetic foot ulcers i.e. 58% in our study.

Table 1: Age-wise distribution of study population

Age distribution in years	No of patients	Percentage (%)
21–35	21	14.0
36–50	49	32.7
51–65	46	30.7
66–80	34	22.7
Total	150	100.0

Table 2: Distribution of DUSS score among study population

DUSS score	Number of patients	Percentage (%)
0	16	10.7
1	28	18.7
2	36	24.0
3	40	***26.7***
4	30	20.0
Total	150	100.0

Table 3: Amputation distribution among study population

Amputation	Number of Patients	Percentage (%)
Done	76	50.66
Not Done	74	49.34
Total	150	100.00

Table 4: Distribution of type of amputations among study group

Amputation	No. of patients	Percentage
Major	30	20.00
Minor	46	30.67
Total	76	50.67

Table 5: Major amputation among the study population

Amputation		Major	
		No. of Patients	Percentage (%)
Done	Above Knee	7	4.7
	Below Knee	23	15.3
Not Done		120	80.0
Total		150	100.0

Above Knee Amputation was done in 5% of the population while Below Knee Amputation was done in 15% of population.

Minor Amputation was done for 30.7% in our study. Fore Foot Amputation was done in 25% of the population while Toe Amputation was done in 6% of population.

Table 6: Minor amputation among the study population

Amputation		Minor	
		No. of Patients	**Percentage (%)**
Done	Fore Foot	37	24.7
	Toe	9	6.0
Not Done		104	69.3
Total		150	100.0

Table 7: Pattern of ulcer healing with DUSS Score 0 in each follow-up visit *n* = 16

DUSS score	Follow-up visits	Healed	Amputation	Not healed
		***n* (%)**	***n* (%)**	***n* (%)**
0	1	0 (0%)	0 (0%)	16 (100%)
	2	10 (62.5%)	0 (0%)	6 (37.5%)
	3	2 (33.3%)	0 (0%)	4 (66.7%)
	4	3 (75%)	1 (25%)	0 (0%)
	5	0 (0%)	0 (0%)	0 (0%)
	6	0 (0%)	0 (0%)	0 (0%)
	7	0 (0%)	0 (0%)	0 (0%)

Ten (62.5%) ulcers out of 16 got healed by 2nd follow-up, 2 healed by 3rd follow-up and remaining 3 healed by 4th follow-up and 1 underwent amputation during 4th follow-up.

Table 8: Pattern of ulcer healing with DUSS Score 1 in each follow-up visit *n* = 28

DUSS score	Follow-up visits	Healed	Amputation	Not healed
		***n* (%)**	***n* (%)**	***n* (%)**
1	1	0 (0%)	0 (0%)	28 (100%)
	2	0 (0%)	0 (0%)	28 (100%)
	3	17 (60.7%)	0 (0%)	11 (39.3%)
	4	7 (63.6%)	1 (9.1%)	3 (27.3%)
	5	1 (33.3%)	0 (0%)	2 (66.7%)
	6	1 (50%)	1 (50%)	0 (0%)
	7	0 (0%)	0 (0%)	0 (0%)

Majority of ulcers i.e. 17 (60.7%) healed by 3rd follow-up, 7 got healed by 4th follow-up, 1 healed by 5th follow-up and remaining 1 healed by 6th follow-up, 1 underwent amputation during 4th and 6th follow-up visits respectively.

Table 9: Pattern of ulcer healing with DUSS Score 2 in each follow-up visit *n* = 36

DUSS score	Follow-up visits	Healed	Amputation	Not healed
		***n* (%)**	***n* (%)**	***n* (%)**
2	1	0 (0%)	0 (0%)	36 (100%)
	2	0(0%)	0 (0%)	36 (100%)
	3	6 (16.67%)	1 (2.77%)	29 (80.6%)
	4	17 (58.6%)	2 (6.89%)	10 (34.5%)
	5	4 (40%)	5 (50%)	1 (10%)
	6	0 (0%)	1 (100%)	0 (0%)
	7	0 (0%)	0 (0%)	0 (0%)

Six (16.67%) ulcers out of 36 healed by 3rd follow-up, 17 healed by 4th follow-up, 4 healed by 5th follow-up, 1 underwent amputation by 3rd follow-up, 2 underwent amputation by 4th follow-up, 5 underwent amputation by 5th follow-up, 1 underwent amputation by 6th follow-up.

Table 10: Pattern of ulcer healing with DUSS Score 3 in each follow-up visit *n* = 40

DUSS score	Follow-up visits	Healed	Amputation	Not healed
		n **(%)**	***n*** **(%)**	***n*** **(%)**
3	1	0 (0%)	0 (0%)	40 (100%)
	2	0 (0%)	0 (0%)	40 (100%)
	3	0 (0%)	0 (0%)	40 (100%)
	4	1 (2.5%)	11 (27.5%)	28 (70.0%)
	5	2 (5%)	16 (57.2%)	10 (35.7%)
	6	2 (2.0%)	5 (50.0%)	3 (30.0%)
	7	1 (2.5%)	2 (66.7%)	0 (0%)

One (2.5%) ulcer out of 40 healed by 4th follow-up, 3 healed by 5th follow-up, 2 healed by 6th follow-up, 1 healed by 7th follow-up. 11 underwent amputation by 4th follow-up, 15 underwent amputation by 5th follow-up, 5 underwent amputation by 6th follow-up, 2 underwent amputation by 7th follow-up.

Table 11: Pattern of ulcer healing with DUSS Score 4 in each follow-up visit *n* = 30

DUSS score	Follow-up visits	Healed	Amputation	Not healed
		n (%)	***n*** (%)	***n*** (%)
4	1	0 (0%)	0 (0%)	30 (100%)
	2	0 (0%)	0 (0%)	30 (100%)
	3	0 (0%)	0 (0%)	30 (100%)
	4	0 (0%)	6 (20%)	24 (80%)
	5	0 (0%)	12 (40%)	12 (40%)
	6	0 (0%)	11 (36.7%)	1 (3.3%)
	7	0 (0%)	1 (3.3%)	0 (0%)

All the ulcers with DUSS Score 4 underwent amputation, 6 of them by 4th follow-up, 12 by 5th follow-up, 11 by 6th follow-up and 1 underwent amputation by 7th follow-up.

The above Tables 7–11 showed that ulcers with lower score healed earlier when compared to those ulcers with higher scores. Majority of ulcers with Score 0 healed by the end of 2nd follow-up, most ulcers with Score 1 healed by 3rd or 4th follow-up, most ulcers with Score 2 healed by 5th follow-up.

Patients with Score 3, One healed and 11 underwent amputation by 4th follow-up, 2 healed and 16 underwent amputation by 5th follow-up, 2 healed and 5 underwent amputation by 6th follow-up, 1 healed and 2 underwent amputation by 7th follow-up.

All the ulcers with Score 4 underwent amputation, 6 of them by 4th follow-up, 12 by 5th follow-up, 11 by 6th follow-up and 1 underwent amputation by 7th follow-up.

Table 12: Comparison of DUSS score with amputation (major + minor)

DUSS Score	Amputation	
	Done	**Healed Ulcers**
	n **(%)**	***n*** **(%)**
0	1 (6.3%)	15 (93.8%)
1	2 (7.1%)	26 (92.9%)
2	9 (25%)	27 (75%)
3	34 (85%)	6 (15%)
4	30 (100%)	0 (0.0%)
Total	76 (50.66%)	74 (49.34%)

For DUSS Score 0, 1, 2 number of persons with Healed ulcers is more while for DUSS Score 3, 4 number of persons with Amputation done is more.

Chi-Square Test

Ho: There is no association between DUSS score and Amputation

H1: There is association between DUSS score and Amputation

χ^2 =95.63, df = 4, $p < 0.001$

Here, p-value < 0.001 we can conclude that there is an association between DUSS score and Amputation.

Total of 2 (5.6%) of 36 people with Score 2 had major amputations; 9 (22.5%) out of 40 people with Score 3 had major amputations and 19 (63.3%) out of 30 people with Score 4 had major amputations in our study. None of the patients with Score 0 &1 had major amputation.

Table 13: Comparison of DUSS score with major amputation

DUSS score	Major amputation	
	Done	Not done
	n (%)	*n* (%)
0	0 (0%)	16 (100.0%)
1	0 (0%)	28 (100.0%)
2	2 (5.6%)	34 (94.4%)
3	9 (22.5%)	31 (77.5%)
4	19 (63.3%)	11 (36.7%)
Total	30 (20.0%)	120 (80.0%)

Chi-Square Test

Ho: There is no association between DUSS score and Major Amputation

H1: There is association between DUSS score and Major Amputation

χ^2 = 51.059, df = 4, p-value <0.0001

Here, p-value <0.001 we can conclude that there is an association between DUSS score and Major Amputation.

One (6.3%) of 16 patients with Score 0 had minor amputation; 2 (7.1%) of 28 patients with Score 1 had minor amputation, 7 (19.4%) of 36 patients had minor amputation with Score 2, 25 (62.5%) of 40 patients with Score 3 had minor amputations and 11 (36.7%) of 30 patients with Score 4 had minor amputations. Minor Amputations were more common in patients with DUSS Score of 3 in our study.

Table 14: Comparison of DUSS score with minor amputation

DUSS score	Minor amputation	
	Done	Not done
	n (%)	*n* (%)
0	1 (6.3%)	15 (93.8%)
1	2 (7.1%)	26 (92.9%)
2	7 (19.4%)	29 (80.6%)
3	25 (62.5%)	15 (37.5%)
4	11 (36.7%)	19 (63.3%)
Total	46 (30.7%)	104 (69.3%)

Chi-Square Test

Ho: There is no association between DUSS score and Minor Amputation

H1: There is association between DUSS score and Minor Amputation

χ^2 = 33.48, df = 4, p-value <0.00001

Here, p-value <0.001 we can conclude that there is an association between DUSS score and Minor Amputation.

Toe amputation was done in total 9 (14.4%) out of 150 patients. One (6.25%) patients with DUSS Score 0, 2 (7.14%) patients with Score 1, 6 (16.67%) of patients with DUSS Score 2.

Fore foot amputation was done in total of 37 (24.67%) of patients. None of the patients with DUSS Score 0 and 1, 1 (2.78%) of patients with DUSS Score 2, 25 (62.5%) of patients with DUSS Score 3, 11 (36.7%) of patients with Score 4 had forefoot amputations.

Below knee amputation was done in total of 23 (15.3%) of patients.

None of the patients with DUSS Score 0 and 1, 2 (5.6%) of patients with DUSS Score 2, 9 (22.2%) of patients with Score 3, 12 (40%) of patients with Score 4 had below knee amputations.

Above knee amputation was done in total of 7 (4.6%) of patients. None of the patients with DUSS Score 0, 1, 2 and 3, 7 (23.3%) of patients with DUSS Score 4 had above knee amputations. There were no revision amputations in our study.

Table 15: Comparison of DUSS score with types of amputation

DUSS score	Toe Amputation	Fore Foot Amputation	Above Knee Amputation	Below Knee Amputation
	n (%)	*n* (%)	*n* (%)	*n* (%)
0	1 (6.25%)	0 (.0%)	0 (.0%)	0 (.0%)
1	2 (7.14%)	0 (.0%)	0 (.0%)	0 (.0%)
2	6 (16.67%)	1 (2.78%)	0 (.0%)	2 (5.57%)
3	0 (0%)	25 (62.5%)	0 (0%)	9 (22.2%)
4	0 (0%)	11 (36.67%)	7 (23.33%)	12 (40%)
Total	9 (6%)	37 (24.67%)	7 (4.67%)	23 (15.33%)

Chi-Square Test

Ho: There is no association between DUSS score and Type of Amputation

H1: There is association between DUSS score and Type of Amputation

$\chi^2 = 72.38$, df=4, *p*-value <0.00001

Here, *p*-value <0.001 we can conclude that there is an association between DUSS score and Type of Amputation.

Majority of foot ulcers among study population with DUSS Score 0, 1 and 2 healed by secondary healing or split skin grafting. However among those with Score 3 and Score 4 majority required amputation i.e., 33 (82.5%) and 30 (20.0%) respectively.

Table 16: Distribution of ulcers (DUSS Score 0-4) with study endpoints

DUSS score	Secondary healing	SSG	Amputation	Total
	n (%)	*n* (%)	*n* (%)	*n* (%)
0	13 (81.3%)	2 (12.5%)	1 (6.3%)	16 (100.0%)
1	25 (89.9%)	1 (3.6%)	2 (7.1%)	28 (100.0%)
2	1 (2.7%)	26 (72.3%)	9 (25.0%)	36 (100.0%)
3	0 (0%)	6 (15%)	34 (85%)	40 (100.0%)
4	0 (0%)	0 (0%)	30 (20.0%)	30 (100.0%)
Total	39 (26%)	35 (23.3%)	76 (50.6%)	150 (100%)

Chi-Square Test:

Ho: There is no association between DUSS score and Study Endpoints H1: There is association between DUSS score and Study Endpoints

$\chi^2 = 181.09$, df = 8, $p < 0.001$.

Here, *p*-value < 0.001 we can conclude that there is an association between DUSS score and Study Endpoints.

Majority of foot ulcers among study population with DUSS Score 0, 2, 3 and 4 are with >11 years (37.5%), (38.9%), (40%) and (36.7%) respectively while for DUSS Score 1 majority is duration 6–10 years (50.0%).

Table 17: Distribution of ulcers (DUSS Score 0–4) with duration of Diabetes

DUSS score	Duration of Diabetes (*n*)				
	1–5 yrs	6–10 yrs	11–15 yrs	16–20 yrs	21–25yrs
0	5	5	4	1	1
1	8	14	0	5	1
2	9	13	8	4	2
3	11	13	10	5	1
4	9	10	5	5	1

Table 18: Distribution of ulcers (DUSS Score 0-4) with duration of Diabetes

DUSS score	Duration of Diabetes			Total
	1–5 yrs *n* (%)	6–10 yrs *n* (%)	>11 yrs *n* (%)	
0	5 (31.3)	5 (31.3)	6 (37.5)	16
1	8 (28.6)	14 (50.0)	6 (21.4)	28
2	9 (25.0)	13 (36.1)	14 (38.9)	36
3	11 (27.5)	13 (32.5)	16 (40.0)	40
4	9 (30.0)	10 (33.3)	11 (36.7)	30

Chi-Square Test

Ho: There is no association between DUSS score and Duration of Diabetes

H1: There is association between DUSS score and Duration of Diabetes

$\chi^2 = 3.94$, df = 8, *p*-value = 0.87.

Here, *p*-value > 0.05 we can conclude that there is no association between DUSS score and Duration of Diabetes.

Overall DUSS Score is significant (i.e. *p*-value < 0.0001). In terms of levels, considering DUSS Score 0 as reference, DUSS Score 2 and 3 are significant.

The probability of healing with Score 0 was 93.75%, 92.86% with Score 1, 75% with score2, 15% with Score 3 and 0% with Score 4.

Table 19: Cox Regression Analyzis for DUSS scores

DUSS score	Coefexp (coef)	se (coef)	z	Pr (>|*z*|)
–1.1175	0.3271	0.1076	-10.38	<2e-16

DUSS score	exp (coef)	lower .95	upper .95
0.3271	3.057	0.2649	0.4039

DUSS Score	*p*-value	95.0% CI for Exp (B)	
		Lower	Upper
0			
1	0.23981	0.354074	1.29665
2	0.00011	0.146495	0.53284
3	7.27E-12	0.009105	0.07363
4	0.99576	0	Inf

Table 20: Kaplan-Meier Analyzis for DUSS scores Case processing summary

DUSS Score	Total N	N of Events	Censored	
			N	Percent %
0	16	1	15	93.75
1	28	2	26	92.86
2	36	9	27	75.00
3	40	34	6	15.00
4	30	30	0	0.00
Overall	150	76	74	49.33

Chi-Square Test

Ho: There is no significant difference between healing times across the levels of DUSS Scores

H1: There is significant difference between healing times across the levels of DUSS Scores

$\chi^2 = 147$, df = 4, p-value = 0.00000001

Here p-value < 0.0001 we can conclude that there is significant difference between healing times across the levels of DUSS Scores.

Table 21: Median of Survival Time for DUSS scores

DUSS score	*N*	Events	Median	0.95 LCL	0.95 UCL
0	16	15	28	24	74
1	28	26	55	50	75
2	36	27	85	76	88
3	40	6	163	130	NA
4	30	0	NA	NA	NA

Table 22: Log rank or Mantel Hansel Test

DUSS Score	N	Observed	Expected	(O- E)^2/E	(O- E)^2/V
0	16	15	3.09	46.01	49.67
1	28	26	7.72	43.33	51.55
2	36	27	16.14	7.31	9.74
3	40	6	26.19	15.56	25.16
4	30	0	20.87	20.87	30.48

Chi-Square Test

Ho: There is no significant difference between healing times across the levels of DUSS Scores

H1: There is significant difference between healing times across the levels of DUSS Scores

$\chi^2 = 138$, df = 4, p-value = 0.00000001

Here p-value < 0.0001 we can conclude that there is significant difference between healing times across the levels of DUSS Scores.

Table 23: Wilcoxon Test

DUSS	N	Observed	Expected	(O- E)^2/E	(O- E)^2/V
0	16	13.10	2.57	43.20	54.97
1	28	20.97	6.53	31.89	44.56
2	36	18.79	12.76	2.86	4.73
3	40	3.18	19.12	13.29	26.95
4	30	0	15.06	15.06	27.91

Discussion

In our study, most common age group affected with Diabetic foot was between 36–50 years. Mean age group was 53 ± 14 years. Median age was 52.5 (IQR = 40 to 65 years). Males were more affected by Diabetic foot ulcers i.e. 58% in our study.

In study done by Harindranath H. R et al.[5] of 226 patients, 61.5% were male and 38.5% were female, mean age of presentation being 62 years.

In Mohit Sharma et al.,[6] study among 100 patients 68 were Male & 32 were Female and mean age of presentation being 70 years. In Kummankandath SA et al.[7] study most common age group affected with diabetic foot was between 51–60 years. Mean age group was 54.6 ± 12.4 years. 59% of them were males affected by diabetic foot ulcers.

In Kumar ST et al.[8] study out of 100 patients 81 were male and 19 female. Most common age group affected with diabetic foot was 51–60 years with mean age of study group was 57 ± 12 years. In Shashikala et al.[9] study among 100 patients 68 were male & 32 were female and mean age of presentation being 52+/-2 years. In Beckert et al.[3] study of 1000 patients, 67.5% were male and 32.5% were female, mean age of presentation being 69 years.

Most commonly ulcers in the present study were of DUSS score of 3 followed by Score 2 in the study. 50.67% (76) patients underwent amputation of which 20% (30) patients had Major amputations which was nearly equal to Kummankundath SA et al.[7] study (18.5%), but Shashikala et al.[9] study results showed 25% patients who had major amputation. however, on the other side Beckert et al.[3] and kumar ST. et al.[8] studies showed lesser incidence, 2.6% and 11% respectively in major amputations compared to present study.

Forty-six (30.7%) cases had minor Amputations in the present study which was significantly high compared to Beckert et al.[3] (9.9%) and Shashikala et al.[9] (27%), however it was low when compared to other studies Kummankundath SA et al.[7] (35%), Kumar ST. et al.[8] (34%). The differences in incidence might be due to variation in diabetic population, geographical distribution and other risk factors in the selected population in the respective studies.

Most of the patients with DUSS 3 & 4 underwent amputations in the present study similar to other studies. In present study with zero DUSS score there was 6.3% of amputation, whereas no amputations with other studies. With DUSS Score 2 there was 25% amputations in present study similar to Kumar ST et al.,[8] slightly higher to Mohit sharma et al.[6] (22.2%) and lower compared to Kummankundath SA et al.[7] (30.5%). 7.1% amputations were observed in present study with DUSS Score 1 whereas it was 9.4% in Kumar ST et al.[8] study & higher results were observed in Kummankundath SA et al.[7] (24.2%) study and were no amputations in Mohit sharma et al[6] study with DUSS Score 1.

Most of the patients with DUSS Score 3 & 4 underwent major amputation in the present study similar to other studies, except with the original study (Beckert et al.[3]) showed an unexpected low major amputation rate of 3.8% associated with a DUSS score of 4. This can be explained major amputations and by the low number of patients in this subgroup. None of the patients with Score 0 & 1 had major amputation as do with other studies, but study done by Shashikala et al.[9] showed 4.5% & 8.3% with Score 0 & 1 respectively and 2.4% with Score 1 in Beckert et al[3] study. 5.6% patients with Score 2 underwent major amputations in the present study which was found to be less compared to Kumar ST. et al.[8] (14%), Shashikala et al.[9] (14%) studies, whereas Mohit Sharma et al[6], Harindranath H.R et al.[5] and Kummankundath SA et al.[7] showed null results.

In the present study too, as the DUSS score increased, the percentage of amputations increased and the percentage of ulcers healed was 49.34%.

Table 24: Comparison of DUSS Score (0–4) With Minor Amputation (%):

Score	Present study	Mohit Sharma et al.[6]	Harindranath H.R et al.[5]	Kumar ST. et al.[8]	Kummankundath SA et al.[7]
0	6.3	0	0	0	0
1	7.1	0	0	15.90	21.2
2	19.4	22.22		66.66	33.9
3	62.5	55.56	40.2	71.42	49.2
4	36.7	34.78	37.2	42.850	40

Table 25: Comparison of DUSS Score (0-4) With Probability of Healing (Kaplan Meier Analyzis) (%)

Score	Present study	kumar ST. et al.[8]	Kummankundath SA et al.[7]	Shashikala et al.[9]
0	93.75	100	10000.00	95.0
1	92.86	84	78.79	91.6
2	75.00	19	66.10	85.7
3	15.00	0	20.34	52.6
4	0	0	5.71	28.5

Conclusion

DUSS scoring system provides an easy diagnostic tool for anticipating probability of healing/ amputation and need for surgery by combining four clinically assessable wound based parameters. It can be very helpful for the stratification of study groups depending on severity of ulcers and it provides a simple, streamlined approach in a clinical setting without the need of any advanced investigative tool. Lower DUSS score was strongly associated with healing and higher score with amputation.

Acknowledgement: NILL

Conflict of Interest: NILL

Key Messages: DUSS score is simple, provides an easy diagnostic tool for predicting probability of healing or amputation, can be applied in daily clinical practice without need of any advanced investigative tool.

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Original Research Article

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Application of Modified Alvarado Scores in Acute Appendicitis

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Abstract:

Context: Acute Appendicitis is a commonest surgical emergency. Manytimes, the diagnosis is made by clinical examination only. There is no definitive diagnosis preoperatively. The definitive diagnosis of acute appendicitis confirmed at time of surgery and after histopathologic examination of the appendix specimen. However, Investigations like USG, CT scan are used in diagnosis. Despite this, negative appendectomy rates are high. Hence better diagnostic tool, a scoring system was explored to diagnose appendicitis. Present study was conducted for evaluation of Modified Alvarado Scoring System for diagnosis of acute appendicitis. Alvarado scoring systemis based on history, clinical examination of patient and certain laboratory findings.

Aims: To evaluate the diagnostic value of Modified Alvarado Scoring System in patients with acute appendicitis.

Settings and Design: Prospective study

Methods and Material: A prospective study was conducted on 100 patients with sign and symptom suggestive of acute appendicitis and were subsequently underwent operative management from November 2018 to November 2019 over a period of one years at Sir T. Hospital Bhavnagar. All patients underwent surgery and grouped according to the variables of Alvarado scoring system and then divided into two groups. Group I patients (score 7 or more), group II patients (score ≤6). Diagnosis was confirmed by histopathological examination.

Results: Pre-operatively Modified Alvarado Score was assigned to all patients and the results were compared with operative and histopathological diagnosis reports. The sensitivity and specificity of MASS in this study counted accordingly.

Conclusions: This scoring system is Reliable and more accurate diagnostic modality in the diagnosis of acute appendicitis, thus avoiding unnecessary surgery.

Keywords: Acute Appendicitis; Alvarado score.

Introduction

Acute appendicitis is one of the most common causes of acute abdomen with a lifetime prevalence of approximately 1 in 7 worldwide. The traditional signs and symptoms of acute appendicitis first described by Reginald Heber Fitz in 1886.[3]

It is estimated that as much as 6% to 7% of the general population will develop appendicitis during their period of lifetime, with more incidence in the second decade of life. The diagnosis of acute appendicitis is mainly clinical depending on history, clinical examination of patient and certain laboratory investigations (such as total leukocyte count, CRP). Imaging modalities are not done on routine basis as it provide little information in early stage of disease unless there are complications. The definitive diagnosis of acute appendicitis confirmedat time of surgery and after histopathologic examination of the appendix specimen.[1]

Early diagnosis and immediate operative

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intervention is the key for successful management of acute appendicitis.[2]

Delay in diagnosis and management of acute appendicitis may result in significant morbidity and, mortality due to its complications. A number of scoring systems have been developed for aiding early diagnosis of acute appendicitis.[4]

The modified Alvarado score is presently in use for establishing diagnosis of acute appendicitis. Alvarado scoring system, introduced in 1986, is one of these systems whichis based on history, clinical examination of patient and laboratory findings.

Table 1: Modified Alvarado Scoring System (MASS)

Symptoms	Score
Migratory right iliac fossa pain	1
Nausea/Vomiting	1
Anorexia	1
Signs	
Tenderness in right iliac fossa	2
Rebound tenderness in right iliac fossa	1
Elevated temperature	1
Laboratory findings	
Leucocytosis	2
Shift to left	1
Total	10

Materials and Methods

This study was carried out on 100 patients admitted to the Surgical Ward of Sir T. Hospital Bhavnagar with the sign and symptoms suggestive of acute appendicitis and were subsequently operated from November 2018 to November 2019. Data included age, sex, sign, symptoms and laboratory findings such as total leukocyte count, differential leukocyte count, CRP etc. were recorded.

In addition, urine for routine and microscopic examination and Plain X-Ray KUB was done in certain cases. USG of abdomen and pelvis was performed when the diagnosis of appendicitis was doubtful especially in female patients to exclude any other gynecological etiology. Diagnosis of acute appendicitis made clinically and decision for appendectomy was taken.

The sums of all the scores were calculated for each patient and according to the score, patients were divided into two groups according to their score:

Group I patients→ Score >6

Group II patients→ Score ≤6

All the patients underwent appendectomy kept under observation for certain period of time, and the surgical specimens were sent for histopathological examination.

Diagnosis was confirmed by histopathological examination of resected appendix specimen.

Results

Study was conducted on 100 patients with clinical features of acute appendicitis. Among these patients 34 were female (34%) and 66 were male (66%).

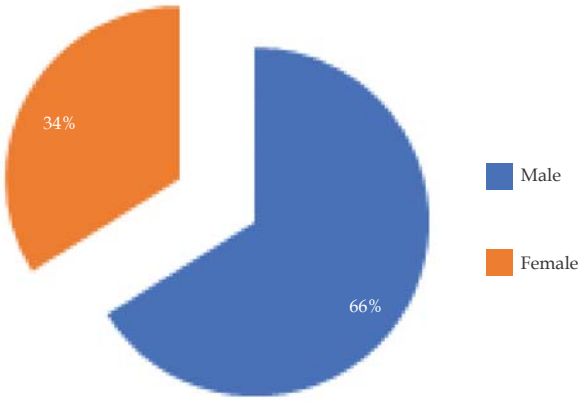

Fig. 1: Gender-wise Distribution

Table 2: Patient group according to Alvarado score

Alvarado Score	Number of patient
>6	72
≤6	28
Total	100

Table 3: Histopathological confirmation of appendicitis according to Alvarado score

Modified Alvarado Score	Histopathology report		Total
	Positive	Negative	
>6	69	3	72
≤6	5	23	28
Total	74	26	100

Table 4: Pathology types in 100 appendix specimens

Type	Number of case
Gangrenous	9
Purulent	12
Perforated	7
Inflamed	46
Normal	26

In this study, 72 patients had a MASS of more than six and the remaining 28 patients had MASS six

and below six. All patients in this study underwent appendectomy. In all of these, inflammed appendix was the most common intra-operative findings affecting 46 patients. Seven patients had perforated appendix, Nine patients had gangrenous appendix and twelve patients had purulent appendix.

Histological examination confirmed appendicitis in 74 patients (74%). The remaining 26 patients were found to have normal appendix giving a negative appendicectomy rate of 26%.

The sensitivity and specificity of MASS in this study was 93.24% and 88.46% respectively. The PPV was 95.83% and NPV was 82.14%. The accuracy of MASS was 92.00%.

Discussion

Although Acute appendicitis is the most common cause of acute abdomen, it is remains a challenging diagnosis because it is primarily based on clinical diagnosis with much differential diagnosis to rule out other condition mimic as appendicitis. However now-a-days most of the clinician prefer CT scan or ultrasonography prior to evaluation.

Alvarado scoring systems can be safely used by general practitioners and primary health care medical personnel to determine need for referral to a qualified surgeon. In present study we observed that the acute appendicitis has male preponderance wit male and female ratio is 2:1.

The use of modified Alvarado scoring system in the diagnosis of acute appendicitis has been reported to improve the diagnostic accuracy and thereby reduces negative appendectomy and complication rates. This study was conducted for evaluation of diagnostic value of Modified Alvarado Scoring System in patients with acute appendicitis in our hospital.

In this study, the course of illness in most of patients was three days and most of patients were admittedafter 24 hours at onset of illness. The reasons for delay in intervention in this study due to delay in referral from peripheral hospitals, lack of money to for the medical services and for transport and lack of awareness regarding to such disease.

Delayed presentation is associated with higher rate of morbidity and mortality due to appendicular perforations and peritonitis. The rate of perforation in our study was 7%.

Delayed presentation, delay in diagnosis, or failure to accept surgical intervention, are contributory factors for high appendicular perforation rates.

The overall negative appendicectomy rate in our study was 26%. The reason for high negative appendectomy rate in our hospital may be due to appendectomies that were done to patients who presented with other conditions mimicking acute appendicitis.

Conclusion

The diagnosis of acute appendicitis is primarily a clinical that is based on proper history and repeated clinical examination of patient.

The Modified Alvarado scoring system is is easy, simple, cheap, non invasive reliable diagnostic modality with increase the accuracy in the diagnosis of acute appendicitis, thus avoiding unnecessary surgery, Thus the application of this scoring system improves diagnostic accuracy and thereby reduces reduce negative appendectomy and complication rates.

Acknowledgement: Nil

Conflict of Interest: Nil

Key Messages: Nil

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The Role of Antibiotic Therapy in Infected Wounds: Ccorrelation Between Clinical Judgment and Microbiological Assesment

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Abstract

Context: Microbiological culture and sensitivity though gold standard, takes time to convey report which can delay rational treatment for the infection of the wound that take place after surgery.

Aims: To assess the efficacy of clinical assessment of infected wounds in terms of bacteriology in comparison to culture and sensitivity

Settings and design: Hospital based observational diagnostic evaluation study was carried out at department of General Surgery, Government Medical College, Latur.

Methods: Detailed history, thorough clinical examination including systemic examination of all the patients and local examination of the wound of all the patients was carried out and the data was recorded. Swabs taken on sterile swab sticks and sent for culture within 1 hr. Where swabs cannot be taken pus, samples are taken and sent for culture. Antibiotic regimen started as per the clinical judgement from history and examination. Comparison between the swab reports and the suspected organism done and observations noted.

Statistical Analyzis: The data was analyzed using sensitivity, specificity, positive predictive value and negative predictive value

Results: The sensitivity of the clinical assessment of the infected wound for positivity was found to be 87% with same rate for Positive predictive value. But it has been observed that the clinical assessment lacked the specificity. The sensitivity of the clinical assessment of the resistant infected wound was found to be 100% with same rate for negative predictive value. Specificity was 98.9% and a Positive predictive value was found to be 83.3%. The sensitivity of the clinical assessment of the type of organism was found to be 100% with same rate for negative predictive value. Specificity was 78.3% and a Positive predictive value was found to be 84.4%.

Conclusion: Commensal flora of organisms is responsible for infections in almost 80 percent of wounds as the wounds are due to trauma causing break in the epithelial barrier. This can be identified clinically and can be treated accordingly before the microbiological report appears

Keywords: Infection; Clinical assessment; Wounds; Correlation; Therapy.

Introduction

Wound infection after surgery is a common challenge for any operating surgeon. This situation is in spite of modern developments in the surgical techniques, more focus on patient prophylaxis by giving perioperative antibiotics. But this situation remains a challenge. It has been considered as a very common complication even today. They come under the term nosocomial infections. It is a global issue. It has been estimated that the incidence of these wound infections after surgery can range between 11.32–15.45%. Naturally infection of the

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wound occurring after surgery puts unnecessary burden on the patient, his family and the care givers. Cost of the therapy also increases. Not only patient and his family but also it puts extra burden on the existing health care system. These things increase the morbidity of the patients. There can be increased deaths due to infection of the wounds after operation. Therefore based on this above mentioned background about the infection of the wound that may take place after operation, USA based the Surgical Infection Society as well as CDC have recommended that in any hospital it should be a standard practice to carry out surveillance of the infection of the wounds that take place after surgery.[1]

Risk of the infection of the wounds that take place after surgery depends upon what surgery was performed and the type of technique adopted for the operation by the operating surgeon. Classically the operations can be divided as those are very clean, operations that are clean but get contaminated, operations that are absolutely contaminated and operations that are really dirty. Operations that are clean are those where the incision was given on the non inflamed tissue the place where ultimately the wound will be closed. In this type aseptic technique is meticulously followed with not opening of the viscus and at the same time there is closed drainage system. The second type which are classified as clean but contaminated are those where there is minor problem or breach in the aseptic technique used which is generally seen in the emergency surgeries which is otherwise clean, the cut was given on the non inflamedskin, where GI tract, bladder are opened.

The third type of wound i.e. contaminated wound are those where they are usually traumatic with a duration of six hours or less and inflamed GI tract and obstructed bladder were opened and the contents spilled. These are also associated with major breaks in sterile techniques. When the pus was present along with formation of the abscess or there is any perforation of the viscera and traumatic wound with duration of more than six hours are classified as dirty wound.[2]

Treatment of these infected wounds that take place after surgery demand an understanding of the commonly infecting organisms, their resistance pattern and what antibiotics are available at that local place. Based on this suitable antibiotics can be given to prevent further complications and to prevent further morbidity and mortality. This knowledge also constitutes the hospital infection control measures. Hence it is very important to carry out the culture and sensitivity of the infection of the wounds that take place after surgery. This type of investigation is very much required to find out the resistance of the infecting organism to the class of antibiotics that are available at the local place.[3]

Anaerobic bacteriology is costly. Special facilities are required. Expert staff is required to perform it. Much hospital won't have these facilities especially in non industrialized countries. Hence this is reason that studies from these countries barely include these data on anaerobic bacteriology. As a matter of fact, anaerobic organisms play a very important role in the infection of the wound that take place after surgery.[4]

With this background, present study we attempted to first assess clinically based on certain factors what organism may be involved, their resistance pattern and then confirm them from after sending to culture and sensitivity.

Materials and Methods

Study design: Hospital based observational study

Study period: November 2017 to April 2019

Study participants: All patients with infected wounds during the study period

Sample size: 100 eligible cases willing to participate in the present study were finally included with infected wounds

Ethical aspects: Institution Ethics Committee permission was taken before the start of the study. Written informed consent was taken from all eligible cases. All cases were given proper Follow-up and treatment till the infection is resolved.

Inclusion criteria

1. Patients with infected wounds that need urgent debridement under anesthesia
2. Willing to participate in the present study

Exclusion criteria

1. Severe other co morbidities
2. Bed ridden patients
3. Not able to cooperate due to any reason

Materials and Methods

Detailed history, thorough clinical examination including systemic examination of all the patients and local examination of the wound of all the patients was carried out and the data was recorded in the pre designed, pre tested, semi structured study questionnaire developed for the present study.

History pertaining to age, presence of any co morbidities, recent treatment with any antibiotics, pattern of infected wound, progression of the infected wound, Possible site of inoculation–trauma, fungal infections, History of previous cellulitis, Travel history, Risk for atypical organisms like Profound immunosuppression, Animal or human bites, Sea or freshwater exposure (to broken skin) including pools and spas, Exposure to animals, fish, or reptiles, Intravenous drug use (including skin-popping) etc was noted.

The other major clinical aspect is the evaluation of the local wound and the site of the wound. As different sites of the body harbor different commensals they also have a predisposition to infection by a specific variety of organism. The bacteria live in the superficial layers of the stratum corneum and in the upper parts of the hair follicles. Some bacteria, however, reside in the deeper areas of the hair follicles and are beyond the reach of ordinary disinfection procedures. These bacteria are a reservoir for re-colonization after the surface bacteria are removed.

Swabs taken on sterile swab sticks and sent for culture within 1 hr. Where swabs cannot be taken pus samples are taken and sent for culture. Antibiotic regimen started as per the clinical judgement from history and examination. Comparison between the swab reports and the suspected organism done and observations noted.

Statistical Analyzis

The efficacy of the clinical assessment was measured by sensitivity, specificity, positive predictive value and negative predictive value.

Results

Table 1 shows comparison clinical assessment and microbiologically positive culture reports. The sensitivity of the clinical assessment of the infected wound for positivity was found to be 87% with same rate for Positive predictive value. But it has been observed that the clinical assessment lacked the specificity.

Table 1: Comparison of positivity between clinical assessment and microbiologically positive culture reports

Clinical assessment	Microbiologically positive		Total
	Yes	No	
Positive	87	13	100
Negative	0	0	0
Total	87	13	100
Sensitivity	87%		
Specificity	0		
Positive predictive value	87%		
Negative predictive value	0		

Table 2 shows comparison of resistance between clinical assessment and microbiological reports. The sensitivity of the clinical assessment of the resistant infected wound was found to be 100% with same rate for negative predictive value. Specificity was 98.9% and a Positive predictive value was found to be 83.3%.

Table 2: Comparison of resistance between clinical assessment and microbiological reports

Clinical assessment	Microbiologically Resistant		Total
	Yes	No	
Resistant	5	1	6
Non resistant	0	94	94
Total	5	95	100
Sensitivity	100%		
Specificity	98.9%		
Positive predictive value	83.3%		
Negative predictive value	100%		

Table 3 shows clinical entity and the pathogen found. In one case of diabetic foot, pathogen found was Methicillin resistant staphylococcus aureus, in one case it was gram negative, in one case it was pseudomonas and in one case it was mixed flora. In Diabetes with multiple abscesses the pathogen found was Methicillin resistant staphylococcus aureus. In Necrotizing fasciitis pathogen found was pseudomonas. In Lower limb gas gangrene pathogen found was clostridium. In Inguinal abscess pathogen found was clostridium. In Lower limb necrotizing fasciitis pathogen found was clostridium. In Spreading perianal abscess pathogen found was gram negative. In Fournier's gangrene pathogen found was gram negative. In Diabetic necrotizing fasciitis pathogen found was gram negative.

Table 3: Clinical entity and the pathogen found

Clinical entity	Pathogen found
Diabetic foot	Methicillin resistant staphylococcus aureus
Diabetes with multiple abscesses	Methicillin resistant staphylococcus aureus
Diabetic foot	Pseudomonas
Necrotizing fasciitis	Pseudomonas
Lower limb gas gangrene	Clostridium
Inguinal abscess	Clostridium
Lower limb necrotizing fasciitis	Clostridium
Diabetic foot	Gram negative
Spreading perianal abscess	Gram negative
Fournier's gangrene	Gram negative
Diabetic necrotizing fasciitis	Gram negative
Diabetic erysipelas	Staphylococcus/Streptococcus
Fournier's gangrene	Staphylococcus/Streptococcus
Diabetic foot	Mixed flora
Crush injury	Mixed flora

Table 4 shows comparison on type of organism between clinical assessment and microbiological reports. The sensitivity of the clinical assessment of the type of organism was found to be 100% with same rate for negative predictive value. Specificity was 78.3% and a Positive predictive value was found to be 84.4%.

Table 4: Comparison on type of organism between clinical assessment and microbiological reports

Clinical assessment	Microbiologically Report		Total
	Commensal	Other	
Commensal	54	10	64
Other	0	36	36
Total	54	46	100
Sensitivity	100%		
Specificity	78.3%		
Positive predictive value	84.4%		
Negative predictive value	100%		

Discussion

The sensitivity of the clinical assessment of the infected wound for positivity was found to be 87% with same rate for Positive predictive value. But it has been observed that the clinical assessment lacked the specificity. The sensitivity of the clinical assessment of the resistant infected wound was found to be 100% with same rate for negative predictive value. Specificity was 98.9% and a Positive predictive value was found to be 83.3%. The sensitivity of the clinical assessment of the type of organism was found to be 100% with same rate for negative predictive value. Specificity was 78.3% and a Positive predictive value was found to be 84.4%.

Akinkunmi EO et al.[5] found that all specimens showed the presence of the bacterial pathogens.

Candida was seen in 12.4% of the cases. Most common organism seen was Staphylococcus aureus in 18.3% of the cases which constituted 126 in numbers of all the cases. Pseudomonas aeruginosa and Bacillus sp were found in 11.1% of the cases each. E. coli was found in 10.3% of the cases. Coagulase negative staphylococci were seen in 8.7% of the cases. On sensitivity pattern the authors found that *β*-lactam antibiotics were found to be resistant in 98% of the cases. It was also observed that more than 70% of the organisms isolated in the study were found to be resistant to erythromycin. Thus the authors concluded that multiple organisms were found in the culture results and multidrug resistance was widespread. They recommended the use of drugs like ofloxacin, ciprofloxacin and quinolones as leading drugs while treating the patients who developed infection of the wound that took place after surgery. The authors did not study the efficacy of the clinical assessment of the organisms in relation to microbiological culture reports which we studied.

Melaku S et al.[6] found from their study that the incidence of infection of the wound that took place after surgery was 17.1% of the 961 cases who underwent surgery in the surgery department, 21% of the 333 cases who underwent surgery in the in the obstetrics department and 13.5% of the 89 cases who underwent surgery in the gynecology department. Total incidence rate was 17.8%. The incidence of urinary tract infection was 48%. The incidence of surgical site infections was 45.6%. 52.6% of the cases it was found that the infection was due to gram negative bacteria and 47.4% of the cases it was found that the infection was due to gram positive bacteria. 19.5% of the cases were due to E. coli. The authors concluded that the incidence of SSI was very high in the study settings and antibiotic resistance is common.

Tesfahunegn Z et al.[7] found the incidence of nosocomial infection rate as 27.6%. 53% of the cases it was found that the infection was due to gram negative bacteria. More than 80% of the cases were resistant to first line antibiotics like ampicillin, gentamicin, amoxicillin, trimethoprim-sulphamethoxazole etc. the authors concluded that prevalence of hospital acquired infections is very high and resistance is widespread. They felt that there is need to have a good infection control system and surveillance.

Ako-Nai AK et al.[8] isolated 190 bacteria from patients and 120 bacteria from the environment of the ward. In their study males were 39 and females were 21. The authors reported that the distribution of the bacteria obtained from patients and those obtained from the environment of the wards was totally different and on statistical Analyzis, was significantly different. Similarly they also reported that resistance pattern of the bacteria obtained from patients and those obtained from the environment of the wards was totally different and on statistical Analyzis, was significantly different

Fierheller M et al.[9] observed that skin temperature was a good indicator of infection of the wound that take place after surgery. The r value was found to be 0.939 which was statistically highly significant. Temperature of the skin around the wound and the probability of the infection of the wound that take place after surgery were highly correlated with a large *F*-value of 44.238. They reported that characteristics of the patients and the characteristics of the wound were not found to be correlated with the infection of the wound that take place after surgery. But we found that sensitivity, specificity are good for clinical assessment and matched well with the microbiological reports.

Blokhuis-Arker MH et al.[10] reported that diagnosis of infection of the wound that take place after surgery is usually based on the infection signs. Swabs are generally taken whenever the infection of the wound that take place after surgery is suspected. The author condemned both these methods i.e. clinical assessment as it is subject to errors and microbiological reports as it takes several days to start the rational treatment. Hence author emphasizes that an easy diagnostic tool should be developed which will be simple, cost effective, and giving results quickly. The authors attempt to study the role of enzymes in this case. They included 81 cases with acute as well as chronic wound. They used three enzymes. They reported that all three models of the enzyme were found to be statistically significant. The authors also commented that clinical judgment did not correlate with swab reports of wound. But in the present study we found that sensitivity and the specificity of the clinical assessment was good. The authors concluded that enzyme Analyzis should be used for fast results instead of wound swabs.

Conclusion

Commensal flora of organisms is responsible for infections in almost 80 percent of wounds as they are due to trauma causing break in the epithelial barrier. The history clinical examination and the inciting mode of infection form a very vital aspect in treatment of the patient. Resistant strains can also

be suspected from comorbid condition of patients and the presentation.

Key messages: As per the present study results, clinical assessment can be used to determine which organisms are involved as well as their resistance pattern can be assumed while awaiting the culture and sensitivity reports so that patient is benefitted.

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Original Research Article

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Hormone Receptor Status in Breast Cancer and its Relation to Age and Other Prognostic Factors at Tertiary Care Hospital at Central India

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Abstract

Introduction: Breast cancer is a major concern in modern India. The growing population of the patients and the increased death toll require immediate attention from the scientific and medical community.

Material and Methods: In this study, we have conducted a rigorous survey between 2012 and 2014 and investigated all possible contexts in relevance to the disease. Detail Analyzis was done for 112 patients. The focus was made on vital information n such as parity, age during first live birth, complaint details, location and exact clinical features of the problem, association of axillary lymph node, hormone receptor Analyzis, histopathological grading, and TNM staging.

Results: Our study showed that the age of menarche, the presence of lump in a specific quadrant was quite specific and supported the recently reported data. We have found that the mean age of the patient has declined as discussed in some of the recent studies. Only 8% of the participant patients were found to be nulliparous. Very less number of patients (11.60%) were found to link with the disease hereditarily. We observed that presence of positive nodes were almost triple than the patients with negative lymph nodes, thus, chances of survival in those patients were comparatively lower. Statistical co-relation was found between ER status, PR status, lymph nodes and age of the patients.

Conclusion: We expect this study will increase the present understanding of breast cancer in India. Detail Analyzis with larger population may yield confirmation to our Analyzis.

Keywords: Hormone receptor; ER status; PR status.

Introduction

A growing number of cases every year for almost all types of cancers is the cause of concern for the present medical system. The rising death toll irrespective of age, sex and geographical locations and lack of a cure, made the situation alarming and warrant immediate action from the global scientific and medical communities. For women, breast cancer is observed in almost all age groups irrespective of the geographical location and race a person belong to. The WHO based Globocan cancer monitoring and survey Analyzis suggested that in 2018 alone, 2,088,849 (11.6%)newcases have been reported in all age groups for men and women together.[1] In the same year, the number of the death toll due to breast cancer was reported as 6,26,679, i.e., 6.6% of the total death (9,555,027) caused by cancer.

Among Indian women, breast cancer turned out to be the most lethal form of cancer with an average age-adjusted rate of 25.8/100,000 women and calculated mortality of 12.7/100,000 women.[2] Detail

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inspection of the data suggested that the higher age-adjusted cases were observed in Delhi (41), Chennai (37.9) and Bangalore (34.4) followed by Thiruvananthapuram District (33.7).[2] Estimations suggested that the number of cases is higher in the urban and metropolitan regions of India whereas reports are less in the rural areas. Surprisingly, the mortality-to-incidence ratio has shown an opposite outcome with 66 in rural and 8 in the urban region. Age,[3,4] genetic makeup and genes,[5] economic condition,[6] lifestyle,[7] food habits, cultural beliefs, awareness, frequency of medical check up are vital in relation to the disease onset and progression. Griffith et al. recently reported the prognostic effect of somatic mutation in ER-positive breast cancers and emphasizedon the TP53, NF1, PIK3CA, and PIK3R1 genesas the prognostic driver sir respective of the clinical variables accounted for a particular case.[8] Thus, understanding the relationship of breast cancer with hormone receptor status and relevant prognostic factors is of immense importance. With this objective, we have attempted to focus on the correlation of these factors in women less than 45 years of age with respect to hormone receptor status (ER/PR). In this study, correlation of hormone receptor status (ER/PR) with lymph node status and histopathological grading and staging of breast cancer was investigated for the patients under 45 years of age.

Materials and Methods

The present study on the hormone receptor status and its relation with age and important prognostic factors was carried out in the Department of Surgery in central India at tertiary rural hospital, during the period of May 2012 to June 2014.

All the subjects those who were part of the study underwent detail physical and clinical examination and relevant information about them was collected and tabulated from hospital information system. Under diagnostic investigation, stage of the disease was detected using the standard TNM staging process, FNAC report, histopathology report, tumor grade, axillary lymph node status was considered. Inaddition, ER/PR status, primary treatment condition, adjuvant therapy related information, presence of any further complications due to surgery or chemotherapeutic treatment, and histopathological reports were also keenly observed and documented for this Analyzis.

All women of all age groups with breast cancer and who have undergone aunilateral mastectomy were included in the study. Patients who received neo-adjuvant chemotherapy were not considered in this study. The patients who did not undergo mastectomy or had undergone a bilateral mastectomy and received neo-adjuvant as part of their chemotherapy were excluded from the study. Statistical Analyzis was conducted using the SPSS 26 environment. Continuous variables were represented as mean ± SD and the categorical variables were presented as n (%). Chi-squaretest and Pearson's correlation Analyzis was used to find the association between different parameters. Pearson's correlation Analyzis was conducted between the ER statuses, PR status, Lymphnodeisolated, Lymph node histological parameter, and the histopathological outcome. *P*-values less than 0.05 was considered to be significant.

Results

The observation of the incoming patients suggests that 11,18,615 patients visited the hospital for treatment during the study phase of May 2012 to June 2014. The surgery outpatient department was attended by 1,03,916 patients. A large number of patients (73,811) took admission for one or the other treatment requirement and 13,812 patients received treatment from the Department of surgeryasan inpatient.

The number of malignant patients was 4927 and out of this 2139 patients had surgical malignancy. The observed malignant patient in Breast was 193 (9.02% of the 2139 malignant patients). Incidence of breast cancer was 9.02% of all the surgical malignancies.

Different relevant descriptive statistics were noted and analyzed in relation to breast cancer.

Detail information on the patients' age, age at menarche, parity status of breast cancer, age of the patient at the first child birth, breast feeding habit by the patient, the status of the menopause, family history was collected and analyzed.

Discussion

Identifying the prognostic factors and implementing them as essential disease markers and indicators may allow timely diagnosis, treatment and plausible cure for breast cancer. Several prognostic factors such as micro RNA (mir-24–3p) in metastasis process of breast cancer[9] and expression of androgen receptors in triple-negative breast Cancer[10] are being explored recently.

In Indian peninsular region, breast cancer was observed in the patients over 40 years of age, especially between 45–65 years of age[11] Reports suggest that till menopause, the risk of having breast cancer doubles every 10 years for women.[12] We have observed in this study that 48.21% of patients were present in the age Group 25–45 yrs. The youngest patient was 27 years and the eldest patient was of 72 years.

Early menarche is associated with an increased risk of breast cancer in females.[13] Our study suggested that 38 (33.92%) patients achieved menarche at the age of 13 years and 30 (26.78%) at the age of 14 years. Only 4 (3.57%) patients reported menarche at the age of 17 years. The mean age of the patients to have menarche was 14.03 years.

We have found 9 (8.03%) patients were nulliparous and majority of the patients (82%)had less than two children. Only, 5% of the total patients had more than 4 children, whereas 16%of patients were a mother to 3–4 children. In addition, 21 out of 112 patients had delivered more than 2 children. Nulliparity is associated with the breast cancer risk factor.[14] Therefore, 8% of our observation is under the increased risk compared to others. Our reports were found in accordance with the earlier reports by Lodha et al.[15]

Analyzis of the literature suggests that those mothers breastfeed the child is having almost 33%of lower risk of breast cancer compared to those women who do not breastfeed at all.[16] Our data suggested that out of 103 patients 97 (94.17%) performed breast feeding whereas only 6 patients (5.82%) did not breastfeed the child. Analyzis of the menopausal status suggested that 54 patients (48.21%) were having premenopausal and 58 (51.78%) patients reported postmenopausal. The ratio of pre and postmenopausal was 1:0.93. Further, our inspectionon the presence of family history revealed that 13 patients (11.60%) were having a family history of the disease whereas 99 (88.39%) were not having any such history.

Interestingly, most of the patients reported the presence of the painless lump (76.78%) whereas only 5.35% complaint about having a painful lump. The obtained report of pain less lump further indicates the lack of awareness in women about the symptoms of breast cancer and seeking immediate medical attention in the earlier stage of the disease. Burgess et al., stated a similar reason for delaying initial reporting earlier.[17]

Probably due to the late reporting of the disease or lack of awareness in the patients, most of the patients of this study population were found to have a tumor size of >5.1 cm (56.25%). Following next was the patients who had tumor size between 2.1 cm – 5 cm (37.50%) Only 6.25% of the total patients had a lump of less than 2 cm in size with lymph node involvement as we did not include early breast cancer in ourstudy.

Histopathological grading Analyzis revealed that out of a total 112 patients, 78 (69.64%) were in Grade III and 34 (30.35%) were in Grade II. None of the patients in Grade I was considered for the study. The obtained data suggested that majority of the patients (65 in number, 58.03%) under consideration were in Stage III (a + b + c), followed by Stage II (42 in number, 37.50%). Patients found in Stage I and Stage IV were only 2 (01.78%) and 3 (2.67%) respectively. The detail of the various Staging and sub staging information is providedin (Table 1). Most numbers of patients were found in Stage IIIa (37, 33.03%) followed by Stage IIIb (16, 14.28%) and Stage IIIc (12, 10.71%) respectively. TNM staging may not bedirectly impacting the decision making and treatment direction determination[18,19] but it helps a lot in grouping and subgrouping the patient population and categorizing them as per the clinical relevance.

Table 1: Observation outcome of the TNM staging for the study population.

TNM Stage	No. of patients (%)
Stage I	2 (1.78)
Stage II	42 (37.5)
Stage IIIa (T_{1-2} N_{1-2} M_0)	37 (33.03)
Stage IIIb (T_4 N_{0-2} M_0)	16 (14.28)
Stage IIIc (T_{any} N_3 M_0)	12 (10.71)
Stage IV (T_{any} N_{any} M_1)	3 (2.67)
Total	112 (100)

Clinical inspection of the lymph nodes was conducted and 88 patients (78.57%) were foundtohave palpable lymph node whereas 24 patients (21.42%) were having non-palpable lymphnodes. Axillary lymph nodes frequency and the patterns of lymphnode involvement have been rigorously studied earlier.[20,21] The observed involvement of the axillary lymph nodes suggests that 48.21% (54 patients) of the total patients were having 6–9 axillary lymph nodes followed by more than 10 nodes were found in 40 patients (35.71%). Presence of positive and negative nodes was found to be 73.21% and 26.78% respectively. An excellent study has established that higher the number of negative lymph node, better the survival chance for the patient after invasive surgical treatment.[22] The lymph node ratio (LNR) also proved to be a better predictor of survivalin breast cancer patients compared to the pN classification technique.[23]

Hormonal prognostics factors are important and reliable to understand the disease condition and progression. Up and down-regulation of Estrogen and Progesterone hormones and inter activity of their respective receptors, i.e., Estrogen receptor (ER) and Progesterone receptor (PR) are related and have a deep influence in breast cancer formation and progression. Table 2 represents the outcome of the Analyzis pertaining to the status of ER and PR observed. The maximum number of patients (56 patients, 50%) were found in ER+ group for the patient category of ≥46 years and similar category of the PR counter part was having 46 patients (41.07%). The estimated Chi-square values were found to be significant. Thus, most of the patients (72 patients, 64.28%) were found under the ER+/PR+ group in this study, followed by ER+/PR-(17.83%), ER-/PR-(12.5%) and ER-/PR+(5.35%).

Table 2: Observed Estrogen receptor(ER) and Progesterone receptors (PR) status of the patients andstatistical estimation.

ER status				PR status				Total patients
<45 years		≥46 years		<45 years		≥46 years		
+	–	+	–	+	–	+	–	112
36	18	56	2	32	22	46	12	
32.14	16.07	50	1.79	28.57	19.64	41.07	10.71	Percentage
10.7				4.58				2-value
0.0001				0.032				*p*-value

Additional Analyzis of the hormone receptor categories in the patients with relation tolymphnode status is presented in Table 3. The outcome depicted that the presence of ER and PR simultaneously also coexisted with lymph nodes in 92.85% of the patients. Surprisingly, the absence of both ER and PR showed the presence of lymph nodes in the considered patients (Table 3).

Research reports have outlined that ER influences the expression of PR genes[24] ER and PR expression are higher and lower in premalignant and malignant lesionsin comparison to the neighboring healthy tissues[25] Therefore, ER and PR levels are used as a prognostic indicator for the clinical purpose to understand the course of the disease and assess the adjuvant hormonal therapy response. Further, the clinical and molecular investigation revealed that ER+/PR+ patients survive long and respond to hormonal therapy than ER-/PR- patients. Individually, ER or PR is not sufficient to act as an excellent prognostic factor, thus, a combination of both are used to solve the purpose. In breast cancer, ER+/PR+ was found to be associated with parity, age at menarche, age at first childbirth, BMI, and waist-hip ratio. We have reported that Estrogen receptor, tumor staging axillary node metastasis and histopathological grading are related to each other in many aspects. An earlier study also supported such an outcome.[26]

Table 3: Hormone receptor status and its relation with lymph node status formetastasis.

Hormone receptor status	Total cases	LN +VE	LN –VE
ER+/PR+	28	26 (92.85%)	02 (7.14%)
ER+/PR–	8	06 (75%)	02 (25%)
ER–/PR+	4	03 (75%)	01 (25%)
ER– /ER–	14	14 (100%)	00 (00%)

Table 4 reflects the distribution of hormone receptors and the observed TNM staging in this study. No patient's data was under the Stage I, Stage IV and Grade1.

The probable correlation was investigated for ER and PR with age of the patient, lymphnode status and histopathological grading. Estimation of the correlation was done by Pearson Correlation and its significance was conducted through a two-tailed test. To improve and confirm the obtained outcome, bootstrap was set to 1000 along with a 95% confidence interval. Following the study objective, correlation Analyzis was done between the ER status, PR status and two important age related variable, ie., actual age of the patient and age of the patient at menarche. Patient's age was found to be negatively correlated with the ER and PR status. Age at menarche of the patients also displayed the similar trend for the PR status. However, the relation between ER status and PR status was found to be strongly correlated. The other Analyzis was conducted between receptor status (ER and PR), age and lymphnode status which further confirmed the probable relation between the ER and PR. Patient age was also found to be associated with the lymphnode status. Correlation Analyzis of the ER, PR status and the staging did not show any statistically significant relation al information, even though the outcome hinted towards probable positive correlation. Rest of the parameters did not show any correlation. Study with a larger patient population may provide a better outcome.

Table 4: Relation of hormone receptor status and staging of breast cancer and histopathologicalgrading

Hormone Receptor status	Total	Stage I	Stage II	Stage III	Grade 2	Grade 3
ER+/PR+	28	0	12 (42.85%)	16 (57.1%)	11 (39.28%)	17 (60.71%)
ER+/PR–	8	0	03 (37.5%)	05 (62.5%)	04 (50%)	04 (50%)
ER–/PR+	4	0	01 (25%)	03 (75%)	01 (25%)	03 (75%)
ER–/ER–	14	0	0	14 (100%)	02 (14.28)	12 (85.71%)

Conclusion

Most of the participant patients in this study were having early menarche by 14 years of age (63.92%), and mother of two or more children. Several patients were found to have young age (48%) and were within the age group of 25–45 years. Out of all, 8% of the patients were found nulliparous, thus, having increased disease risk. Interestingly, most of the participant patients were not having any hereditary link to the disease. An attempt was made to investigate the probable relationship between the clinical and social features considered herein. We believe this study will help future breast cancer related epidemiological studies in India and will serve as a knowledge resource.

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A Comparative Study to Assess and Predict the Responsiveness to Conservative Management and Ultrasound Guided Percutaneous Aspiration for Amoebic Liver Abscess

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Abstract

Background: Amoebic liver abscess is an important cause of inflammatory space occupying lesion of liver. It is a common condition in India; a serious problem and associated with higher morbidity and mortality; if not managed properly. This study is conducted to know the clinical presentation, management and efficacy of conservative management and percutaneous aspiration in amoebic liver abscess.

Materials and Methods: A total of 30 patients of amoebic liver abscess were selected for the study in Vydehi Institute of Medical Sciences and research centre, Bangalore. Their clinical presentation, lab findings and treatment in the form of conservative (in abscess less than 5 cms diameter and volume of 125 cm^3) and ultrasound guided percutaneous aspiration (in abscess more than 5 cms diameter and volume of 125 cm^3 or more) were studied.

Results: This study showed that the amoebic liver abscess was more common in low socioeconomic middle aged male patients. Male to female ratio was 6:1. Mean duration of symptoms 7.5 days in conservative management and 7 days in percutaneous aspiration patients. Pain and fever were the most common symptoms. USG abdomen was very useful in early diagnosis and assessing prognosis. Most of the abscess was solitary and more common in right lobe of liver. Liver function tests helps in knowing effectiveness of the treatment and the prognosis. None of the patients were positive for cysts in the stool.

All 30 (100%) patients were positive for anti amoebic antibody. Conservative management was more effective in patients with cavities less than 5 cms (125 cm^3 volume). Two patients were converted to percutaneous aspiration. Percutaneous aspiration was more effective in patients with cavities more than 5 cms. In none of the cases of amoebic abscess surgical drainage was employed. There was mortality due to complications.

Conclusion: The study conclusion includes Amoebic liver abscess is more commonly seen in young to middle aged males. Ultrasonography helps in early diagnosis and reducing morbidity and mortality. It also confirms the site, size and number of amoebic liver abscess and knowing the prognosis. Liver function tests helps in knowing the effectiveness of the treatment and prognosis.

Amoebic liver abscess less than 5 cms are effectively treated by conservative management and abscess more than 5 cms by percutaneous aspiration. Resolution of abscess cavity is faster in patients treated by percutaneous aspiration as compared to conservative treatment, but duration of hospital stay is more in patients treated by percutaneous aspiration due to retained pigtail catheter for drainage for long duration. Metronidazole effective in most of the amoebic liver abscess.

Keywords: Amoebic; Liver abscess; Metronidazole.

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Introduction

Amoebic liver abscess is an important cause of inflammatory space occupying lesion of liver in the tropics,[1] like India. India being a tropical country and large number of unclean food and alcohol consumption add up to the risk. Decreased immunity secondary to intake of cytotoxic drugs, diabetes mellitus, and HIV infection etc. Further increases susceptibility to liver abscess.[2] Amoebic liver abscess is a serious problem in India. Management of this disease includes anti amoebic drugs, percutaneous aspiration in cases like (secondary infection, fever and pain persisting for more than 3 to 5 days, if rupture is suspected) and occasionally catheter drainage in case of failure of repeated aspiration. In India, however most of the patients present with large abscess cavities and toxic features needing frequent aspiration of the abscess.

The review of literature reveals that the smaller Amoebic liver abscesses (multiple or single) can be treated conservatively.[3] Larger Amoebic liver abscesses or amoebic liver abscess with complications (rupture, jaundice, etc.) require intervention in the form of either percutaneous aspiration, closed or open drainage. Regarding conservative treatment there are no studies indicating draw backs of prolonged conservative treatment and there are no studies which shows efficacy of needle aspiration in such cases. Further there are no studies which show complications and need of reaspiration in patients who have been treated with radiologicaly guided percutaneous aspiration as an initial line of management. Hence this study is conducted to know the immediate and late effect of, metronidazole alone and a regimen comprising needle aspiration and metronidazole. The present study was conducted to study the clinical presentations, investigations, diagnosis and management of amoebic liver abscess. To study the efficacy of conservative management in amoebic liver abscess and to study the efficacy of ultrasound guided percutaneous aspiration in amoebic liver abscess.

Materials and Methods

Source of Data

All patients diagnosed with liver abscess in Vydehi institute of medical sciences and research Centre, Bangalore. The study conducted on 30 cases amoebic liver abscess. All the patients age above 18 years.

Methodology

After obtaining clearance and approval from the institutional ethical committee, patients fulfilling the inclusion/exclusion criteria were included in the study, after obtaining informed consent. Detailed history of all patients is taken with thorough clinical examination; required Investigations were done. After establishing diagnosis, Tab. Metronidazole 800 mg TID or Inj. Metronidazole 500 mg IV TID treatment was initiated from day of admission, in case of secondary infection; antibiotics (Fluroquinalones or 3rd Generation cephalosporin's) were added in the treatment (Figs. 1,2,3).

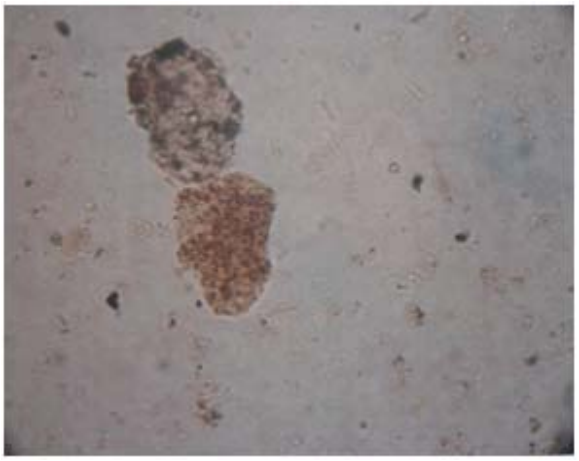

Fig. 1: E. Histolytes, iodine stainshowing trophozoites.

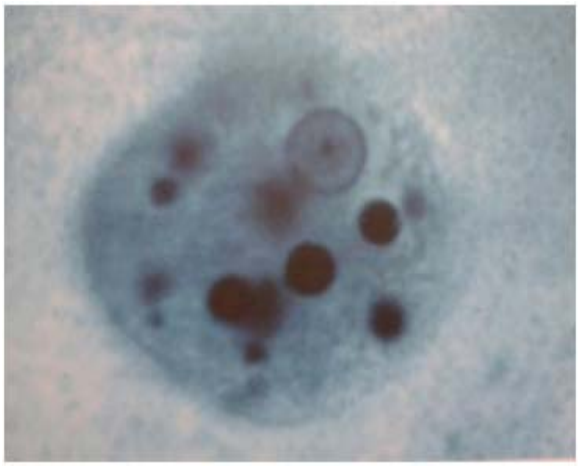

Fig. 2: E.histolytica, trophozoites with ingested red blood cells.

Fig. 3: USG guided pigtail catheterisation of liver abscess.

Therapeutic aspiration reserved for the following cases where: Size of abscess is more than 5 cm in diameter (125 ml). When pain and fever persist for more than 3 to 5 days after starting Antiamoebic therapy. Four clinical variables-abdominal pain, fever, anorexia, and hepatomegaly-were assessed on first, fourth, and 10th day. Hematological (ESR, and total and differential counts) and biochemical studies (serum aspartate and alanine aminotransferase activities, and alkaline phosphatase activity) were carried out in all patients on first, fourth, and 10th day. A raised ESR rate of more than 30 mm in 1st hour, total leukocyte count of 12.0 × 10^{9} /l, serum alkaline phosphatase activity of more than 13 King Armstrong units and aspartate aminotransferase activity more than 40 U/l were considered abnormal and successful outcome was marked by a normalization of these variables. The patients were asked to visit for reassessment once a month for 3 months.Each treatment modality studied separately for the proportion of patients with successful outcome under each category were calculated, Chi-square test, Fishers, *t*-test and ANOVA tests were applied.

Results

A total of 30 patients of amoebic liver abscess were included in Vydehi institute of medical sciences and research Centre, Bangalore. Following data were collected and analyzed. Out of the 30 cases, 21 (70%) patients had right lobe liver abscesses, 5 (17%) Patients had abscesses in left lobe of liver and both lobes of liver in 4 (13%) of patients (Table 1).

Table 1: Lobe of liver involvement

Lobes	No of Cases	Percentage
Right	21	70
Left	5	17
B/L	4	13
Total	30	100

Out of 30 patients, 22 (73%) patients had one abscess, 6 (20%) had two abscesses and 2 (7%) of patients had 3 abscesses (Table 2).

Table 2: Number of abscess

No of Abscess	No of Cases	Percentage
1	22	73
2	6	20
3	2	7
Total	30	100

All patients with amoebic abscess cavity size less than 5 cms were treated conservatively. In Patients treated by percutaneous aspiration, 12 were having cavities ranging 11–25 cms and 5 with cavities ranging 6–10 cms (Table 3).

Table 3: Distribution of size of amoebic liver abscess on the day of admission

Diameter of Abscess Cavity in cms	No of Cases	
	Conservative Group	Aspiration Group
<5	12	0
6–10	0	5
11–25	0	12
>25	0	1

Sixty percent of patients were treated by ultrasound guided percutaneous aspiration and 40% of patients were treated by conservative management (Table 4).

Table 4: Treatment modality

Treatment	No of Cases	Percentage (%)
C	12	40
A	18	60
Total	30	100

Ten patients treated by conservative management showed improvement and two patients had no improvement in clinical and laboratory signs and symptoms. Out of 18 patients treated by ultrasound guided percutaneous aspiration 14 patients had improved symptomatically (Table 5).

Table 5: Symptoms on day 4th of treatment

Symptoms	Conservative	Aspiration
Day 4 Improved	10 (33%)	(14) 47%
Day 4 Not Improved	(2) 7%	(4) 13%

Patients treated by percutaneous aspiration showed marked decrease in size of abscess cavity, as 6 patients were having cavities less than 5 cms and 11 patients in the rage of 6–10 cms. Only one patient not improved (Table 6).

Table 6: Distribution of size of amoebic liver abscess on 4th day of admission and reduction ofsize of cavity.

Diameter of Abscess Cavity in cms	No of Cases	
	Conservative	Aspiration
<5	12	6
6–10	0	11
11–25	0	0
>25	0	1

All patients treated either by conservative or percutaneous aspiration showed statistically significant ($p < 0.001$) symptomatic improvement, except one case with secondary infection in aspiration group (Table 7).

Table 7: Symptoms on day 10th of treatment

		Treatment		
		C	A	Total
Day 10	I	12	17	29
		100.0%	94.4%	96.7%
	NI	0	1	1
		0.0%	5.6%	3.3%
Total		12	18	30
		100.0%	100.0%	100.0%

All patients treated either by conservative or percutaneous aspiration showed statistically significant ($p < 0.001$) regression in size of amoebic liver abscess cavity, except one case with secondary infection in aspiration group (Table 8).

Table 8: Distribution of size of amoebic liver abscess on 10th day of admission and reduction of size of cavity.

Diameter of Abscess Cavity in cms	No of Cases	
	Conservative	Aspiration
<5	12	17
6–10	0	0
11–25	0	0
>25	0	1

There is statistically significant ($p < 0.00$) improvement in liver function tests in all patients except one patient with secondary infection both on day 4 and day 10th of treatment (Table 9). One patient expired in our study due to complications and remaining patients were recovered from the illness.

Table 9: Distribution of LFT on 4th and 10th day of treatment

LFT (SGOT, SGPT)	I		NI		Total	
	No of Patients	%	No of Patients	%	No of Patients	%
Day 4	16	53.3	14	46.7	30	100.0
Day 10	29	96.7	1	3.3	30	100.0

Discussion

Worldwide, amoebic liver abscess is the third most common parasitic cause of death. Global incidence of infection is 12% and 50% of asymptomatic people may harbour amoebae in tropical and subtropical regions. The incidence is ten times more common in adults than in children, males are affected 3 to 10 times more commonly than females[4]. A study conducted by Wells, Christopher D. et al. showed that Amoebic liver abscess is the most common extra intestinal manifestation of infection with Entamoeba histolytica, and it is associated with significant morbidity and mortality[5]. Hence early diagnosis and treatment of the illness can prevent the complication and sequelae.

This study consists of 30 patients admitted to Vydehi institute of medical sciences and research centre, Bangalore. All cases met inclusion and exclusion criteria. The clinical presentations, diagnosis and management of amoebic liver abscess by conservative management in one group of 12 patients and another group of 18 patients by ultrasound guided percutaneous aspiration are discussed. In the present study the common age group was found between 31–50 yearscomprising 16 (53.3%) cases. Similar results have been reported by several workers, which are comparable with the present study as shown in the following table no:-

Table 10: Age incidence of liver abscess in different studies

Authors	Age group	Percentage (%)
Mishra et al.[6]	30–40	82
Turrill & Burnham[7]	20–24	92.0
Barbour & Juniper[8]	21–50	84.0
Present study	31–50	53.3

In our study 30 patients were included, 26 were males constituting 87% of the study population. In the present study the male to female ratio was 6:1. The increased ratio may be due to the fact the patients in our study belonged to the lower socioeconomic status and alcohol intake in the patients.

Table 11: Sex incidence of liverabcess in different studies

Authors	Male (%)	Female (%)	Male:Female
Habibullah et al.[9]	91.8	8.2	11:1
Galen et al.[10]	85	15	5:1
Turrill et al.[7]	86	14	6:1
Katzenstein et al.[11]	85	15	5:1
Present study	87	13	6:1

In present study out of 30 patients who had amoebic liver abscess, 26 were males (87%). The results of the present study are comparable with the study done other authors. All the patients in the study were from lower socio economic status. It is well known that amoebiasis is common in slum dwellers due to bad sanitation, poverty, ignorance and their poor nutritional status. Alcohol is believed to be one of the predisposing factors in the pathogenesis with statistics showing a more than five-fold incidence of ALA among drinkers.[12] 47% of patients were alcoholic in present study. History of alcoholism was found in 20–30% of cases by Kini and Mammi.[13] Hai et al. found a history of alcohol consumption in 85% of patients with ALA.[12] Joshi et al.[14] found a higher mortality rate in those consuming large quantities of alcohol.

The commonest clinical feature was pain abdomen in our study. Pain was a complaint in all the cases in this study (100%) it was present in right hypochondriac area ofabdomen. The nature of the pain was dull aching in majority of the patients andsharp stabbing nature in few patients. The incidence of pain in various studies is compared with the present study in following table 12.

Table 12: Incidence of pain in various studies

Authors	Percentage (%)
Kapoor et al.,[14]	100
Mehta & vakil[15]	87.4
Katzenstein et al.[11]	88
Present study	100

Fever was the next common symptom present in 25 cases (83%) in present series. In the majority of cases fever was of low grade and continuous. In 20 (66%) patients belonging to both conservative and percutaneous aspiration groups fever had subsided by day 4th of treatment. One case with secondary bacterial infection had persistent fever. The incidence of fever in the literature and the present study is compared in the following table 13.

Table 13: Incidence of fever in various studies

Authors	Percentage (%)
Mehta & Vakil[15]	90.0
Galen et al.[10]	94.0
Present study	83.0

In the present study 11 cases (37%) had history of diarrhoea in past week. This finding is comparable with other studies. But there is wide variation in reported studies. Craig has enumerated the findings of various authors. He states that 60–90% give previous history of diarrhoea/dysentery. Raghavan et al. recorded 9.8% of the 193 cases with diarrhoea symptoms.[16] Barbour & Juniper[8] in the study of 33 cases could record history of accompanying dysentery in 50% of cases. Chaves et al. reported 22% of their cases with past history of dysentery.[17] Jaundice was seen in 5 (17%) of cases. Majority of them belonging to aspiration group, Sharma et al. detected jaundice in 30% of the patients. 36% (11) of patients in our study were having hepatomegaly. Kapoor[14] study showed 100%, Ramachandran et al.[9] detected 70.5% to have hepatomegaly.

In our study inter costal tenderness was noted in 8 cases (26%). Mehta & vakil[15] reported 19% of their cases had Intercostal tenderness, where as Barbour &Juniper found in 71.2% of their cases.[8] In the present study one case (3.3%) with secondary

bacterial infection had pleural effusion, which was very minimal in quantity. Raghavan et al.[16] reported pleural effusion in 19 cases (15.5%) and consolidation of the right lung base in 45 of 126 cases studied. Involvement of pleura manifestated as dry pleurisy in 5 cases, pleurisy with effusion in 17 cases and bursting of liver abscess into pleura into 2 cases. Lung involvement resulted in collapse in 2 cases, consolidation in 3 cases and bursting of liver abscess into lung in 2 cases.

In the present study, the mean duration of symptoms at presentation in the conservative group was 7.5 days. While the mean duration of symptoms in percutaneous aspiration group was 7 days. Statistically no significant difference was found between the two groups.

In our study duration of symptoms varied from 7 days to 2 months, when compared to other studies mentioned as further: Studies in literature have reported the shortest duration was one day and the average was from ten days to two weeks in acute group; in the chronic group, the longest duration was three years and the average from three to six months.

In other cases, the duration of illness prior to presentation has been reported to be from one day to three years with a median of one to eight weeks.[17] Another studyhas reported that the duration of illness prior to presentation varied from eight days with a range of three days to four and a half months.[18] Other authors reported the duration of symptoms to vary from 4 days to 12 weeks but majority of patients had presented within two weeks of symptoms.[19] The average duration of symptoms has also been reported to be 2½ months (range 8 days to 9 months)[20], which is at variance with another report that the average duration of presentation was 2 to 12 weeks. 15 The present average duration of symptoms in our study is, therefore, same as reported in earlier studies.

In our study 18 (60%) patients had elevated WBC counts. Leucocytosis was found to be raised in the range of 4600–19000 cells/cu mm. mean counts were 8238 ± 4007. This is one of the parameters in assessing the improvement after initiation of the drug therapy. Various workers reported leucocytosis in liver abscess as follows. Katzenstein found leucocytosis in 63 cases of 67 cases studied.[11] Usually polymorpho-nuclear leucocytes predominate.

The correlation between degree of anaemia, leucocytosis and duration of illness reveal that patients with a short history tend to show no anaemia but appreciable leucocytosis, where as those with long history show appreciable anaemia with less marked leucocytosis.

Anaemia is one of the common findings accompanying liver abscess. Haemoglobin of less than 12 gms was found in 5 cases (17%) in this study. Anaemia is very common in chronic infection. The serum bilirubin was raised (>1 mg/dl) in 7 cases (23%) of the present study. 5.8% of patients treated conservatively and aspiration (16.2%), respectively had raised serum bilirubin. Serum transaminases (>40 IU) were raised in 15 (50%) patients in this study. Serum transaminases was raised in 50% of cases in Katzenstein et al.[11] series.

Out of 30 cases of amoebic liver abscess in the present study none of cases had Entamoeba histolytica cysts in the stools. DeBakey & Oschner[21] found Entamoebahistolytica. trophozoites in 15.4% of cases. In our study Amoebic serology (anti amoebic antibody) was positive in all 30 patients. Kraoul compared the capability of rapid enzyme immuno assay (EIA) to detect Antiamoebic antibodies during hepatic amebiasis with those of indirect haemagglutination and latex agglutination. Enzyme immuno assay of 143 patient's sera yielded a specificity, a sensitivity, and positive and negative predictive values of 100, 93, 100, and 97.1, respectively. This test could thus be considered another valuable tool for the diagnosis of hepatic amebiasis.[22]

A study in central Vietnam had reported a 94.5% prevalence of anti-amoebic antibodies in cases of amoebic liver abscess. Another study had reported 77% cases of liver abscess to be positive for amoebic serology.[23] In another study, 79 out of 82 patients (96.3%) of amoebic liver abscess were reported to be positive for amoebic serology. Up to 10% of the patients with acute amoebic liver abscess may have negative serological findings. Asymptomatic carriers of E.histolytica are also known to develop antibodies, thus serological tests are helpful in assessing the risk of invasive amoebas in asymptomatic cyst passers in an endemic area[24]. The value this diagnostic test in the setting of acute disease in endemic areas is less because they remain positive for many years.

In the present study Most of the of patients 21 (70%) had right lobe amoebic liver abscesses; 5 (17%) patients had abscesses in Left lobe and both lobes of liver involved in 4 (13%) of the patients. 22 (73%) out of 30 (100%) patients had one abscess; 6 (20%) had two abscesses. 2 (7%) patients had 3 abscesses. Galen et al. in their studies showed that

the majority of the amoebic liverabscesses were solitary.[10] Our study was consistent with their study. In the present study elevation of right hemi diaphragm was found in 11 patients (36%) and one (3.3%) patient with minimal pleural effusion on right side. Similar findings have been reported by the various workers. In Ramachandran et al., 3.6% were found to have pleural effusion. Habibullah et al. 60% of cases[9] and Chaves found positive results in 60% of the cases.[17] In our study 12 (40%) patients were treated conservatively and 18 (60%) patients were treated by percutaneous aspiration and conservative management. In our study; liver abscess aspiration was done in 20 patients (66.6%) because 2 patients of conservative group didn't responded. The amount of pus drained, varied from 50 to 300 ml. The colour of the pus, which was aspirated from the liver, was anchovy sauce in colour. In one patient it was reddish green that had secondary bacterial infection. Manson-Bahr expresses that the mere presence of anchovy sauce signifies positive diagnosis of amoebic liver abscess.[25] If the abscess is connected with the biliary tree then the aspirate becomes greenish.

In our study the pus in 29 cases was sterile bacteriologically and trophozoites of E.histolytica were not demonstrated in any one of them. Barbour and Juniper;in 33 cases of amoebic liver abscess, could find trophozoites in the pus ofonly 4 cases.[8] 10 cases had trophozoites in the walls of the abscess cavity.

In our study none of the cases of amoebic abscess; surgical drainage was employed. Out of 12 patients who were treated conservatively, 2 cases did not respond to conservative treatment, and ultrasound-guided aspiration was performed. Out of 18; 17 patients who were treated by percutaneous aspiration responded well to the treatment and one patient did not responded to aspiration and died due to complications ofsecondary infection, signs of right sided pleural effusion and rupture of abscess into pleural and peritoneal cavity and died on 25th day due to septicaemia. Miedma and Dineen[26] presented a series of 106 patients with pyogenic hepatic abscess and reported thatdespite easier diagnosis, the mortality rate remained high (53%).

In our study clinical, biochemical and ultrasound findings at the time of admission, on day 4th and on day 10th were considered to know the efficacy of conservative management and percutaneous aspiration of amoebic liver abscess. Out of 12 patients who were treated by conservative treatment 2 patients were converted to pigtail catheter drainage due to persistent of fever, increased WBC count, deranged liver function tests even on day 4 of the treatment. All patients with the initial insertion of pigtail catheter improved and did not require change in the modality of treatment. There was statistically significant decrease in the size of cavity on the 4th day and 10th day of treatment in case of percutaneous aspiration as compared to patients who were treated by conservatively.

In one study by Kapadia et al., the pigtail drainage was reported tohave marked resolution of liver abscess, when it was considered to be successful, ultrasound was suggestive of total resolution or reduction of size to <3 cm. This study had reported the complete resolution of liver abscess in 88% of cases within 4 months. But in this study the pigtail catheter drainage was done in abscess size >5 cm,[26] and there was no comparison with patients of similar size treated by conservative management.

In one study by Sheeny TW et al.[27] open surgical drainage or needle aspiration of pus or both in combination did not appear to shorten the resolution time of an ALA. Rajak CL et al. mentioned that the average time taken by pigtail catheter for reduction of the abscess cavity to 50%of its original size was 5 days[28]. Berry M et al. study had reported complete resolution in only three out of 44 patients (6.8%) after medical therapy.[29] When compared, our study revealed at 3 months of Follow-up of 18 patients out of 30 had complete resolution of cavity, in aspiration Group 13 patients and in conservative Group 5 patients.

In our study 11 patients had lost the Follow-up and one case died and in remaining cases cavity was completely resolved. But resolution of cavity size was earlier in case of percutaneous aspiration as compared to the delayed resolution in case of conservative treatment. On the basis of ultrasound findings;when the size of abscess was found to be markedly decreased; pigtail catheter removal done. The period ranged from 10 to 45 days with the mean of 15.6 days. Kapadia S and Sheen LS[26] studies had reported that the pigtail was removed when the patient had become asymptomatic, pus drainage was less than 10 ml in 24 hours for 2 consecutive days and the sonogram showed a negligible cavity.

Thus our study clearly proves that the improvement in clinical and laboratory parameters in case of conservative treatment (where cavity size less than 5 cms and volume of 125 cm^3) on day 4th and day 10th was statistically significant; which is similar to percutaneous aspiration group. However the rate of decrease in size of the abscess cavity was

lesser in the conservative groupthan in percutaneous aspiration group. The study clearly indicates that uncomplicated abscess measuring less than 5 cms (125 cm^3) are better treated by conservatively and cavities more than 5 cms (125 cm^3) are treated by ultrasound guided percutaneous aspiration.

Conclusion

Amoebic liver abscess is more commonly seen in young to middle aged males. Ultrasonography helps in early diagnosis and reducing morbidity and mortality. It also confirms the site, size and number of amoebic liver abscess and knowing the prognosis. Liver function tests helps in knowing the effectiveness of the treatment and prognosis. Amoebic liver abscess less than 5 cms are effectively treated by conservative management and abscess more than 5 cms by percutaneous aspiration. Resolution of abscess cavity is faster in patients treated by percutaneous aspiration as compared to conservative treatment, but duration of hospital stay is more in patients treated by percutaneous aspiration because of retained pigtailcatheter for drainage for longer duration. Metronidazole is effective in all cases of amoebic liver abscess. No complications encountered in case of percutaneous pigtail catheterization. Mortality was encountered in one patient with secondary infection of amoebic liver abscess who had both complication of rupture into peritoneal and pleural cavities.

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Original Research Article

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Herniotomy in Children Under Intravenous Ketamine and Local Anesthesia

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Abstract

This is a review of 197 patients of inguinal hernia operated at the Indian Institute of Medical Science and Research, Warudi over a period of 6 years. Ketamine is a rapid acting potent analgesic agent, that is safe, effective and with no respiratory depression. Herniotomy is a simple procedure recommended for children with inguinal hernia. It can be safely done under sedation with local Anesthesia using ketamine. In this study intravenous (i.v.) ketamine was given at dose of 2 mg/kg and local infiltration was done with 1% lignocaine solution. Patients were kept on spontaneous respiration with oxygen by face mask.

Keywords: Herniotomy, ketamine, local Anesthesia

Introduction

Repair of congenital groin hernia or hydroceole is the most common surgical procedure performed by paediatric surgeons.[1] Inguinal hernia in the paediatric age group is commonly diagnosed by clinical examination.[2] Herniotomy can be safely done in paediatric patients under i.v. ketamine with local infiltration with lignocaine.[3]

In majority of the paediatric inguinal hernias, herniotomy alone is adequate but some patients with larger hernia and wide internal ring may need narrowing of the internal ring or even repair of posterior wall in addition to herniotomy. Nyhus classification assigns the patients for the procedure depending on clinical and operative findings.[4]

Table 1: Nyhus classification

Hernia type	Procedure assigned for
Paediatric Nyhus 1 (PN1)	Herniotomy alone
Paediatric Nyhus 2 (PN2)	Herniotomy + deep ring narrowing
Paediatric Nyhus 3 (PN3)	Herniotomy + posterior wall repair

Materials and Methods

A review was done of patients of hernia operated at this institute over a period of 6 years, between 1st January 2012 and 31st December 2018. A total of 963 patients of inguinal hernia were operated of which 197 were paediatric patients of age less than 12 years. 163 patients had herniotomy done under i.v. ketamine and local Anesthesia. 34 patients were done under spinal Anesthesia.

Patients were premedicated with injection midazolam 0.05 mg/kg. Injection ketamine 2 mg/kg was given. Patients were kept on spontaneous ventilation with oxygen via face mask. Out of 163 patients only 4 patients required intubation and muscle relaxants. The rest of the patients were maintained on spontaneous respiration throughout the procedure. Local infiltration was done at the surgical site with 1% lignocaine.

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Results

76 patients were less than 5 years of age. 89 patients were between the age of 5 to 10 years and 32 patients were between 10 to 12 years (Table 2).

Table 2: Age wise distribution of patients

S. No	Age (in years)	Number of patients
1	<5	76
2	5–10	89
3	10–12	32

Sixty-five patients had herniotomy without opening of the inguinal canal. In 132 patients inguinal canal was opened to reach the internal ring for ligation of the sac. Herniotomy was done in 193 patients while herniotomy with repair of posterior wall was done in 4 patients (Bassini's repair) where the posterior wall appeared weak with a defect. Out of 132 patients who needed opening of inguinal canal, only 4 needed repair (Table 3).

Table 3: Procedure done for hernia

S. No	Procedure	Number of patients
1	Herniotomy alone	65
2	Herniotomy with narrowing of deep ring	128
3	Herniotomy with repair of posterior wall	4

Discussion

Herniotomy is the most common procedure performed by paediatric surgeons. Ketamine administered systemically is a potent Anesthetic and analgesic. Hernia operation can be safely done in paediatric patients under intravenous ketamine and local infiltration with lignocaine.[3]

Paediatric Anesthesia is as challenging for the Anesthesiologist as paediatric surgery is for surgeons. Ketamine is a non-competetive antagonist at the NMDA receptors.[4] It produces a 'dissociative anesthesia' as a result of functional dissociation between cortical and limbic systems.[5] Protective airway reflexes and spontaneous respiration are not depressed with use of ketamine.[6] Hence endotracheal intubation is often not required. Ketamine is a potent analgesic with rapid onset of action.[7] Use of benzodiazepines reduces the sympathomimetic effects of ketamine[8] and is also effective in reducing emergence phenomenon produced by ketamine. I.v. ketamine can also be used for perioperative pain management.[9]

In younger children, less than 5 years of age, the inguinal canal is short and external and internal inguinal rings are almost overlapping. Hence the neck of the sac which lies at the internal ring can be reached in most of the cases without opening the inguinal canal. But in older children inguinal canal has to be opened in order to reach the internal ring.

The rate of recurrence of hernia in children after herniotomy is low but at least one year Follow-up is needed to rule out recurrence. Inguinal hernias have a significant risk of complication, hence early surgical intervention is needed.[11]

In our series, majority of the paediatric herniotomies were done with i.v. ketamine and local Anesthesia with no significant complications. Only 4 patients who needed repair of the posterior wall required use of muscle relaxants and intubation. Some selected patients like older children were given spinal Anesthesia. I.v. ketamine with local Anesthesia is a safe technique with rapid recovery and minimal side effects and can serve as an alternative to deep sedation.[12]

Conclusion

Herniotomy is a very common procedure in paediatric patients. Early operation is needed as there is significant rate of complication in herniotomy. General Anesthesia with intubation and muscle relaxation can be avoided in children and i.v. ketamine with lignocaine infiltration can be used as an alternative, which is safe and effective for herniotomy in children.

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Clinical Study of Various Treatment Modalities in Haemorrhoids

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Abstract

Background: Haemorrhoids are tormenting human race since ancient times. It affects all people irrespective of gender, age, race, socioeconomic status and cultural differences. The exact prevalence can't be estimated accurately. Many patients don't seek medical guidance. This causes severe discomfort for patients and cause complications. There are many treatment modalities available for this condition. This study is aimed at evaluating those various modalities available.

Objectives: 1. To study the various modalities of treatment options available for the treatment of haemorrhoids at our hospital (Open Haemorrhoidectomy, Closed Haemorrhoidectomy, Rubber Band Ligation and conservative management). 2. To evaluate advantages and disadvantages of one modality over the other.

Methods: Clinically diagnosed case of haemorrhoids in a Tertiary care hospital, Kalaburagi. 50 patients clinically diagnosed case of haemorrhoid presenting between December 2017 to June 2019 (18 months) at our hospital. The presenting complaints were noted, detailed examination, diagnosis was made and treated accordingly. The relevant data was collected. Post-operative complications were noted and post-operative Follow-up was done on day 7, 1 month and 3 month.

Results: The mean age of presentation was in the fourth decade (41.36 ± 13.26 years). The disease was more in males. The major presenting complaint was Bleeding per rectum + Mass per rectum (28%) followed by Bleeding per rectum (26%). On detailed examination 11 (22%) cases were diagnosed as External Haemorrhoids, 39 (78%) cases as internal haemorrhoids, further internal haemorrhoids were graded as 9 (18%) Grade-1 cases, 10 (20%) Grade-2 cases, 10 (20%) Grade-3 cases and 10 (20%) Grade-4 cases. As treatment modality, 9 (18%) cases were managed conservatively, in 15 (30%) cases Closed Haemorrhoidectomy, in 16 (32%) Open haemorrhoidectomy and in 10 (20%) cases Rubber Band ligation was done. Post-operative pain was more in Open haemorrhoidectomy 10 (62.5%) cases, Closed haemorrhoidectomy 6 (40.0%) cases and 2 (20.0%) of cases had post-operative pain in whom RBL was done. Post-operatively bleeding was seen in 7 (43.75%) cases who underwent Open haemorrhoidectomy, 4 (26.6%) cases under Closed haemorrhoidectomy, 2 (20%). One case each under Open haemorrhoidectomy and RBL had post-operatively discharge per rectum and developed recurrence. Comparison was done between different treatment modalities; statistical Analyzis was done. Surgery was beneficial compared to conservative approach. RBL was better than other modalities with lesser rate of complication, early resumption of work and short hospital stay. Closed haemorrhoidectomy had lesser post-operative pain, bleeding and complications, when compared to Open haemorrhoidectomy.

Conclusion: Surgical intervention is better than conservative approach. In the surgical techniques RBL was better followed by Closed haemorrhoidectomy and Open haemorrhoidectomy in respect of post-operative complications, hospital stay and better wound healing.

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Keywords: Rubber Band Ligation (RBL) Open Haemorrhoidectomy, Closed Haemorrhoidectomy, Bleeding per rectum, Mass per rectum.

Introduction

Haemorrhoids are the cause of suffering for the mankind since centuries. It's one of the oldest diseases suffered by mankind.[1] It affects millions of people in the world. The exact incidence and prevalence can't be determined, as some of the patients having haemorrhoids do not have any complaints and some even if they have symptoms, they do not seek medical intervention due to personal, socioeconomic and cultural reasons. However, few epidemiological studies show prevalence of haemorrhoids ranging from 4.4% in adults in United States of America to 30% in London.[2,3]

The word Haemorrhoid is a derivative of a Greek work "Haemorrhoides" (Haem-blood, rhoos-flowing) meaning flow of blood and the word "Piles" is a derivative of a Latin word "Pila" meaning a ball or a pill. Haemorrhoids are best defined as "enlargement and distal displacement of the anal cushions." The abnormal dilatation and irregular distortion of the vessels together with damage to the supporting connective tissue is seen within the haemorrhoids.[6] A wide variety of therapeutic options have evolved over a period of time. However, no single option can be considered as the gold standard of treatment. Understanding the mechanisms of haemorrhoid development significantly helps in deciding the best therapeutic option. Among them some are Open haemorrhoidectomy, Closed haemorrhoidectomy, Banding, Infrared photocoagulation, Bipolar diathermy, Stapler haemorrhoidectomy, Injection sclerotherapy, Cryosurgery, MIPH, IRC, HAL-RAR and LASER Hemorhoidopexy

Materials and Methods

Source of data

This study was conducted in Department of General Surgery of our institution at Kalaburgi. The study group consisted of 50 cases, clinically diagnosed as a case of Haemorrhoids, for the time period of December 2017 to June 2019.

Sample size

Fifty clinically diagnosed cases of haemorrhoids, who presented to the outpatient department of general surgery of our institution from December 2017 to June 2019.

Inclusion Criteria

1. Patients who present with hemorrhoids to department of surgery of our institution, diagnosed as a case of haemorrhoid
2. Patients >18 years of age.

Exclusion Criteria

1. Patients not willing for any intervention.
2. Patients diagnosed case of portal hypertension and hepatic cirrhosis.
3. Patients with coagulation disorder or anticoagulation drugs.
4. Patients with thrombosed piles, associated with other rectal and anal diseases like anal fissure, fistula, inflammatory bowel disease and others.

Follow-up

Follow-up was done on post-operative day 7, one month and 3 months.

Results and Observations

Study observes that, maximum number of cases 28 (56.0%) belongs to the age group of 31–50 years, followed by 11 (22.0%) cases belongs to the age group of 21–30 years, 5 (10.0%) cases > 60 years, 4 (8.0%) cases belongs to age Group 51–60 years and 2 (4%) cases belongs to age Group 11–20 years. The mean age of males was 42.85 ± 15.64 and females were 39.83 ± 11.76. (Table 1 and Figs. 1, 2)

There was no statistically significant difference of age among males and females ($p > 0.05$)

Table 1: Age and sex wise distribution of cases

Age in years	Males		Females		Total	
	No.	%	No.	%	No.	%
11–20	0	0.0	2	8.7	2	4.0
21–30	8	29.6	3	13.0	11	22.0

Age in years	Males		Females		Total	
	No.	%	No.	%	No.	%
31–40	7	25.9	7	30.4	14	28.0
41–50	5	18.6	9	39.1	14	28.0
51–60	3	11.1	1	4.4	4	8.0
>60	4	14.8	1	4.4	5	10.0
Total	27	100.0	23	100.0	50	100.0
Mean ± SD	42.85 ± 15.64		39.83 ± 11.76		41.36 ± 13.26	
t-test value *p*-value			$t = 0.762$ $p = 0.450$ NS			

NS = not significant, S = significant, HS = highly significant, VHS = very highly significant

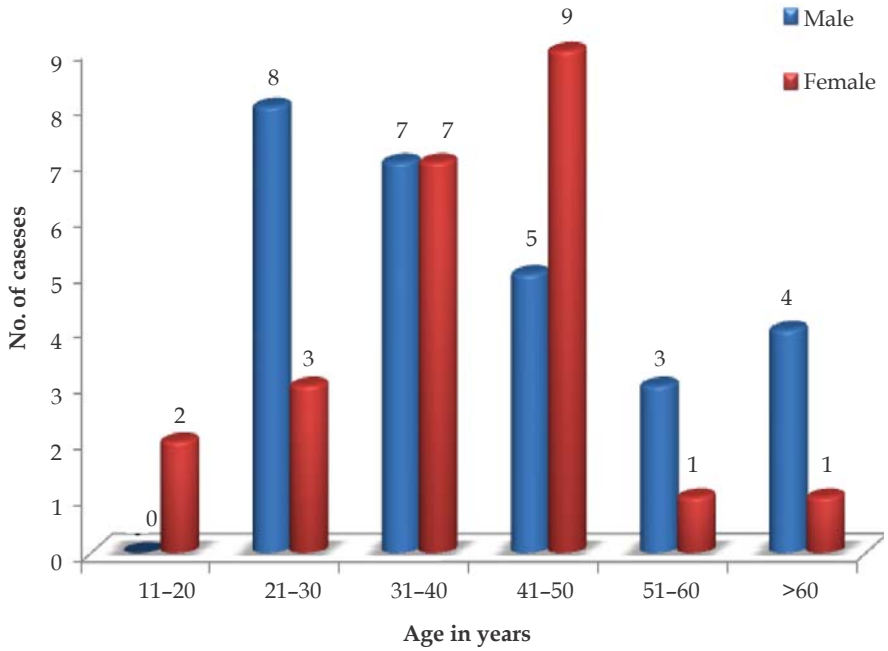

Fig. 1: Multiple bar diagram represents age and sex wise distribution of cases.

In the present study the patients who presented with only bleeding per rectum cases were 13 (26.0%), only Mass per rectum cases were 6 (12.0%), maximum number of cases were bleeding per rectum + Mass per rectum 14 (28.0%), Bleeding per rectum + Constipation cases were 8 (16.0%), Bleeding per rectum + Painful defecation cases were 3 (6.0%) Bleeding per rectum + Mass per rectum + Constipation cases were 4 (8.0%) and Bleeding per rectum + Mass per rectum + Painful defecation cases were 2 (4.0%) (Table 2 and Fig. 3)

Table 2: Presenting complaints wise distribution of cases

Presenting complaints	No. of cases	Percentage (%)
Bleeding per rectum	13	26.0
Bleeding per rectum + Mass per rectum	14	28.0
Bleeding per rectum + Constipation	8	16.0
Bleeding per rectum + Painful defecation	3	6.0
Bleeding per rectum + Mass per rectum + Painful defecation	2	4.0
Bleeding per rectum + Mass per rectum + Constipation	4	8.0
Mass per rectum	6	12.0
Total	50	100.0

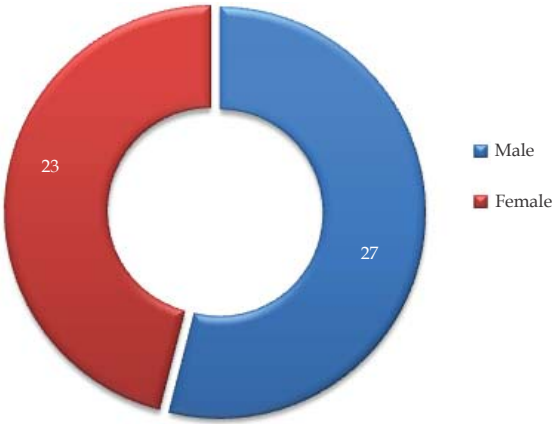

Fig. 2: Pie diagram represents sex wise distribution of cases.

Out of 50 cases, 10 (20%) cases had hemoglobin level less than 10 gm% and 40 (80%) cases had hemoglobin more than 10 mg% (Table 3).

Proctoscopy was done at the time of admission in 9 (18%) cases undergoing conservative management, 10 (20%) cases undergoing Rubber band ligation, 16 (32%) cases undergoing Open haemorrhoidectomy and 15 (30%) cases undergoing Closed haemorrhoidectomy. Sigmoidoscopy was done in 1 (2%) case undergoing Open haemorrhoidectomy which had normal findings. Colonoscopy was done in 1 (2%) case undergoing Closed haemorrhoidectomy, it was normal findings (Table 4).

Table 3: Hemoglobin level

Hemoglobin (gm%)	Number of cases	Percentage (%)
<10	10	20
>10	40	80
Total	50	100

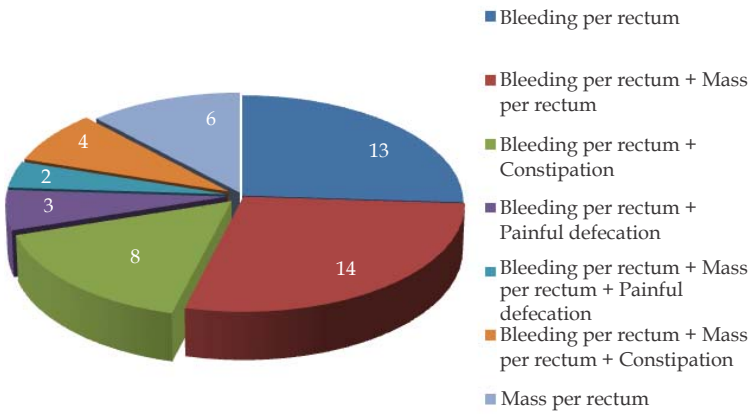

Fig. 3: Pie diagram represents Presenting complaints wise distribution of cases.

Table 4: Investigations done

Modalities of treatment	Sigmoidoscopy	Colonoscopy	Proctoscopy
Conservative[9]	–	–	+ (9)
Rubber band ligation[10]	–	–	+ (10)
Open haemorrhoidectomy[16]	+ (1)	–	+ (16)
Closed haemorrhoidectomy[15]	–	+ (1)	+ (15)
Total cases	1	1	50

In the study out of 50 cases, 11 (22.0%) cases had External Hemorrhoid and 39 (78.0%) cases had internal hemorrhoid, among internal Hemorrhoid, cases were divided in to four grades. In the Grade-1: 9 (18.0%) cases, Grade-2: 10(20.0%) cases, Grade-3: 10 (20.0%) cases and Grade-4: 10 (20.0%) cases (Table 5 and Fig. 4).

Table 5: Distribution of cases according to types of Hemorrhoid

Types of Hemorrhoid		No. of cases	Percentage (%)
External Hemorrhoid		11	22.0
Internal Hemorrhoid	Grading	–	–
	Grade 1	9	18.0
	Grade 2	10	20.0
	Grade 3	10	20.0
	Grade 4	10	20.0
	Total	50	100.0

Along with surgical procedure of open and closed haemorrhoidectomy, lords dilatation was done for all cases undergoing surgical treatment 15 (30%) in Closed haemorrhoidectomy and 16 (32%) in Open haemorrhoidectomy (Table 6).

Table 6: Procedure done along with main treatment

Procedure	Lateral sphincterotomy	Lords dilatation
Conservative	–	–
Rubber band ligation	–	–
Open haemorrhoidectomy	–	+ (16)
Closed haemorrhoidectomy	–	+ (15)

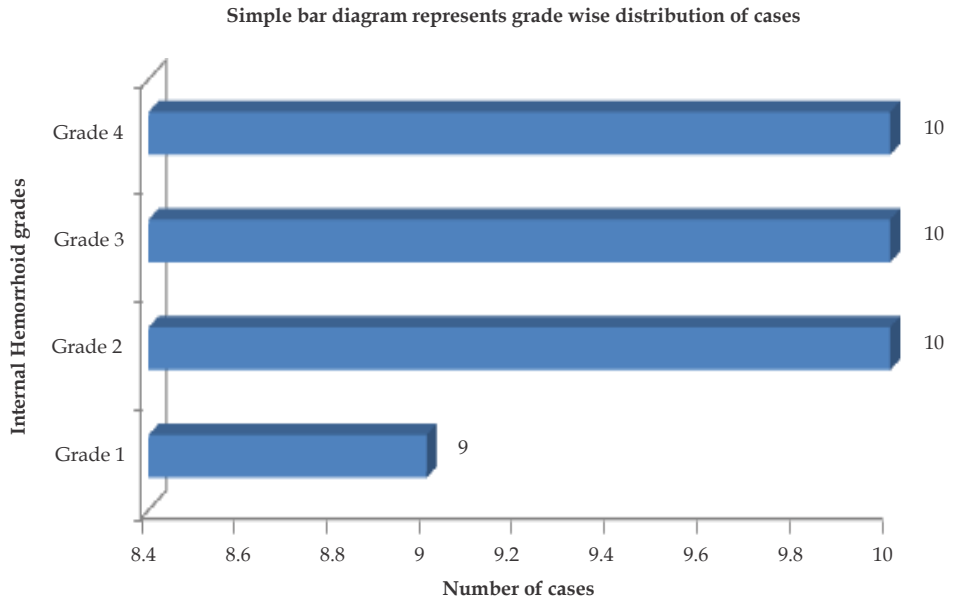

Fig. 4: Simple bar diagram represents grade wise distribution of cases.

Conservative management

It was done in 9 (18%) cases, it was done in early stage haemorrhoids and in patients who are not fit for surgery. They were managed as outpatients. They were followed up on day 7, 1 month and 3 month. Out of 9 (18%) cases, 6 (12%) cases developed recurrence during 1 month and 3 month follow-up.

Table 7: Types of anesthesia wise distribution of cases

Types of anesthesia	No. of cases	Percentage (%)
Spinal anesthesia	30	73.2
Local anesthesia	11	26.8
Total	41	100.0

Out of 50 cases, 9 (18.0%) cases Conservative method was followed as an outpatient hence no anesthesia given and 41 (82.0%) cases had given anesthesia, among them 30 (60.0%) of cases had given spinal anesthesia and for 11 (22.0%) of cases were given local anesthesia. The duration of surgery was more for closed haemorrhoidectomy, duration was 50 minutes average, followed by open haemorrhoidectomy, average duration was 40 minutes and the least for Rubber band ligation, average duration was 30 minutes (Table 7 and Fig. 5).

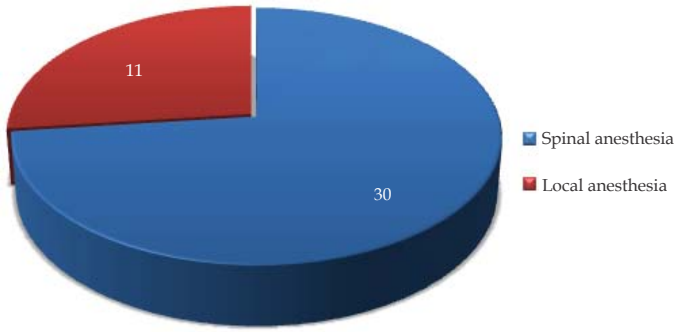

Fig. 5: Pie diagram represents types of anesthesia wise distribution of cases.

In the study Open haemorrhoidectomy was performed in 16 (32.0%) cases, Closed Haemorrhoidectomy was performed in 15 (30.0%) cases, Rubber Band Ligation (RBL) was performed in 10 (20.0%) cases and Conservative management was done in 9 (18.0%) cases as an outpatient procedure (Table 8).

Table 8: Modalities of treatment wise distribution of cases

Modalities of treatment	No. of cases	Percentage (%)
Conservative	9	18.0
Rubber Band Ligation (RBL)	10	20.0
Open haemorrhoidectomy	16	32.0
Closed Haemorrhoidectomy	15	30.0
Total	50	100.0

In the study, out of 11 external hemorrhoid cases, 6 (54.5%) cases had managed by closed haemorrhoidectomy and 4 (36.40%) of cases were managed by open Haemorrhoidectomy and 1 (9.1%) case managed by conservatively (Table 9 and Fig. 6).

Table 9: Modalities of treatment wise distribution of external Hemorrhoid cases

Modalities of treatment	External Hemorrhoid cases	
	No. of cases	Percentage (%)
Closed Haemorrhoidectomy	6	54.5
Open haemorrhoidectomy	4	36.4
Rubber Band Ligation (RBL)	0	0.0
Conservative	1	9.1
Total	11	100.0

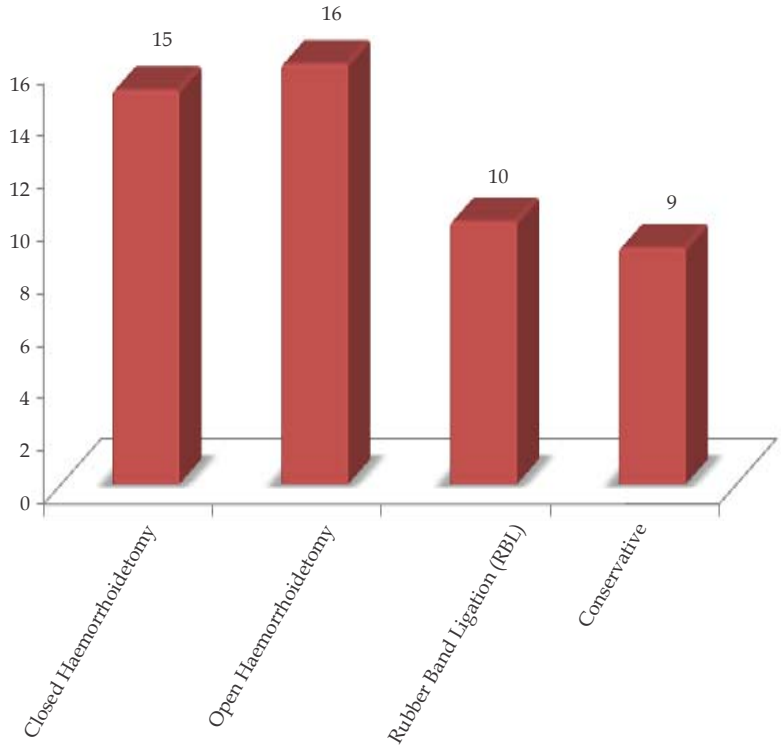

Fig. 6: Simple bar diagram represents Modalities of treatment wise distribution of cases.

Grade-1: 8 cases were managed by conservative approach, in 1 case RBL was done. In Grade-2: in 2 cases Closed haemorrhoidectomy, in 3 cases Open haemorrhoidectomy and in 5 cases RBL was done. In Grade-3: in 2 cases Closed haemorrhoidectomy, in 4 cases Open haemorrhoidectomy was done and in 4 cases RBL was done. whereas in Grade-4: in 5 cases Closed Haemorrhoidectomy and in 5 cases Open haemorrhoidectomy were done (Table 10 and Fig. 7, 8).

Table 10: Comparison of Modalities of treatment with grades of internal Haemorrhoid

Modalities of treatment	Grades				Total
	Grade 1	Grade 2	Grade 3	Grade 4	
Conservative	8	0	0	0	8
Rubber Band Ligation (RBL)	1	5	4	0	10
Open haemorrhoidectomy	0	3	4	5	12
Closed Haemorrhoidectomy	0	2	2	5	9
Total	9	10	10	10	39

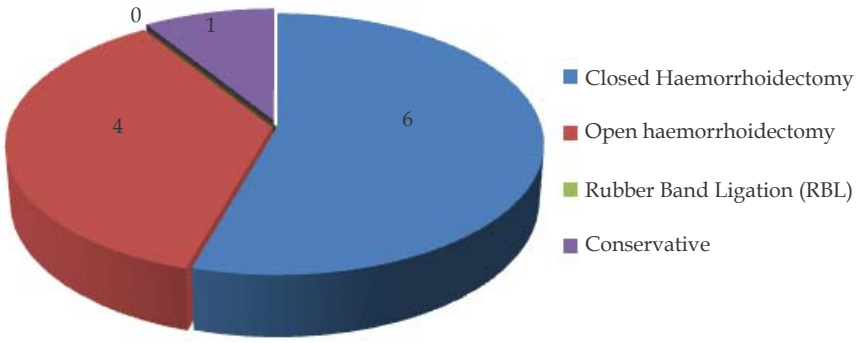

Fig. 7: Pie diagram represents Modalities of treatment wise distribution of external Hemorrhoid cases.

In Open haemorrhoidectomy 16 (32%) cases and closed haemorrhoidectomy 15 (30%) cases sharp method of dissection was done (Table 11).

For open haemorrhoidectomy 16 (32%) cases vicryl 2–0 round body was used for ligation of pedicle. In closed Haemorrhoidectomy 15 (30%) cases vicryl 2–0 was used for ligation of pedicle and closure (Table 12)

Table 11: method of excision

Surgery	Method of dissection
Open Haemorrhoidectomy 16 (32%)	Sharp dissection
Closed haemorrhoidectomy 15 (30%)	Sharp dissection

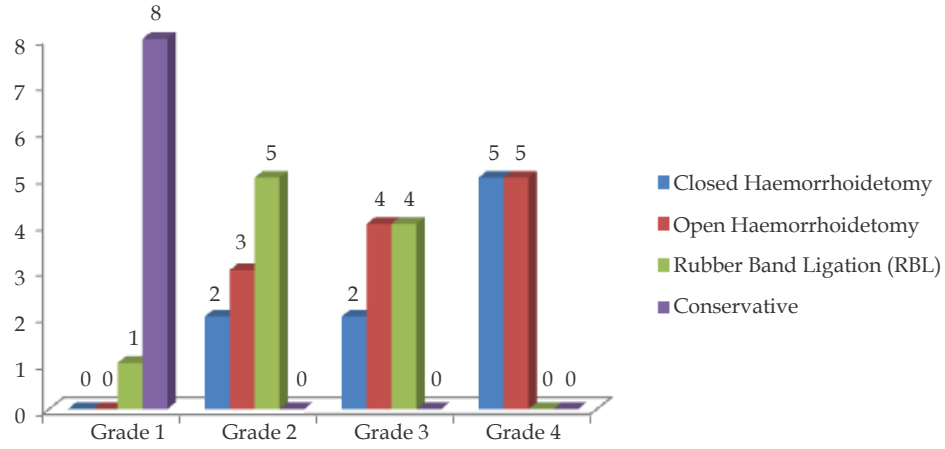

Fig. 8: Multiple bar diagram represents Comparison of Modalities of treatment with grades of internal Hemorrhoid.

Table 12: for suture materials used for surgery

Surgery	Suture material used
Open Haemorrhoidectomy 16 (32%)	Vicryl 2–0 round body (polyglactin 910)
Closed haemorrhoidectomy 15 (30%)	Vicryl 2–0 round body (polyglactin 910)

In the study 18 (36.0%) cases developed post-procedural complication of pain. Out of which the cases who underwent open haemorrhoidectomy procedure, maximum number of post-operative complication of pain was seen, that was 10 (62.5%) casesfor an average duration of 3 days. In cases who underwent Closed Haemorrhoidectomy procedure, post-operative complication of pain was seen in 6 (40.0%) cases for average duration of 2 days and 2 (20.0%) of cases had post-procedural pain in whom RBL procedure was conducted, for an average duration of 1 day. There was statistically highly significant difference of treatment procedures with post-procedural complications pain ($p < 0.01$). This pain was managed by injection tramadol 1 ampule in 100 ml NS given intravenously twice daily along with sitz bath three times daily and following passing stools (Table 13 and Fig. 9)).

Table 13: Comparison of Modalities of treatment with post-procedural complication of pain following procedure

Modalities of treatment	No. of cases	Post-procedural complication Pain	
		No.	%
Conservative	9	0	0.0
Rubber Band Ligation (RBL)	10	2	20.0
Open haemorrhoidectomy	16	10	62.5
Closed Haemorrhoidectomy	15	6	40.0
Total	50	18	36.0
Chi-Square Test & *p*-value		$\chi^2_{yates} = 9.31$, $p = 0.009$, HS	

In the study 13 (26.0%) cases developed post-procedural complication of bleeding per rectum (BPR) following procedure. Out of which Open haemorrhoidectomy and Closed Haemorrhoidectomy surgery cases had post-operative complication of bleeding per rectum (BPR) more 7 (43.75%) for an average duration of 4 days and 4 (26.6%) for an average duration of 1 day respectively and rubber band ligation (RBL) had minimal bleeding per rectum (BPR), only in 2 (20%) cases for an average duration of 1 day. There was statistically significant difference of treatment procedures with post-procedural complications bleeding per rectum (BPR) following procedure ($P < 0.05$). the post procedural complication of bleeding per rectum was treated with Injection Tranostatfor three days and the bleeding was resolved (Table 14 and Fig. 10).

Table 14: Comparison of Modalities of treatment with post-procedural complication of Bleeding Per Rectum (BPR) following procedure

Modalities of Treatment	No. of cases	Post-procedural complication BPR	
		No.	%
Conservative	9	0	0.0
Rubber Band Ligation (RBL)	10	2	20.0
Open haemorrhoidectomy	16	7	43.75
Closed Haemorrhoidectomy	15	4	26.7
Total	50	13	26.0
Chi-Square Test & *p*-value		$\chi^2_{yates} = 7.13$, $p = 0.027$, S	

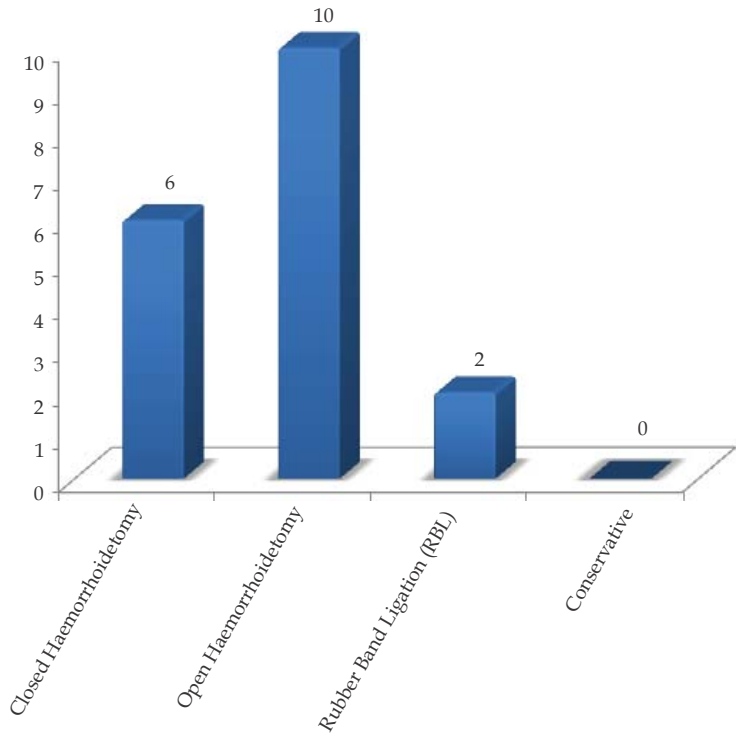

Fig. 9: Simple bar diagram represents Comparison of Modalities of treatment with post-procedural complication of pain.

In the study 2 (4.0%) cases developed post-procedural complication of discharge per rectum (DPR). Out of which Open haemorrhoidectomy case had post-operative complication of discharge per rectum (DPR) 1 (10%) case for average duration of 15 days and Rubber Band Ligation (RBL) surgery procedure had 1 (6.25%) case of discharge per rectum for a duration of 1 day. Wound healing was better in closed haemorrhoidectomy for an average duration of 10-20 days and 20-40 days in Open haemorrhoidectomy (Table 15 and Fig. 11).

Table 15: Comparison of Modalities of treatment with post-procedural complication of Discharge Per Rectum (DPR) following procedure

Modalities of treatment	No. of cases	Post-procedural complication DPR		Type of discharge
		No.	%	
Conservative	9	0	0.0	–
Rubber Band Ligation (RBL)	10	1	10.0	Serous
Open haemorrhoidectomy	16	1	6.25	Serous
Closed Haemorrhoidectomy	15	0	0.0	–
Total	50	2	4.0	Serous

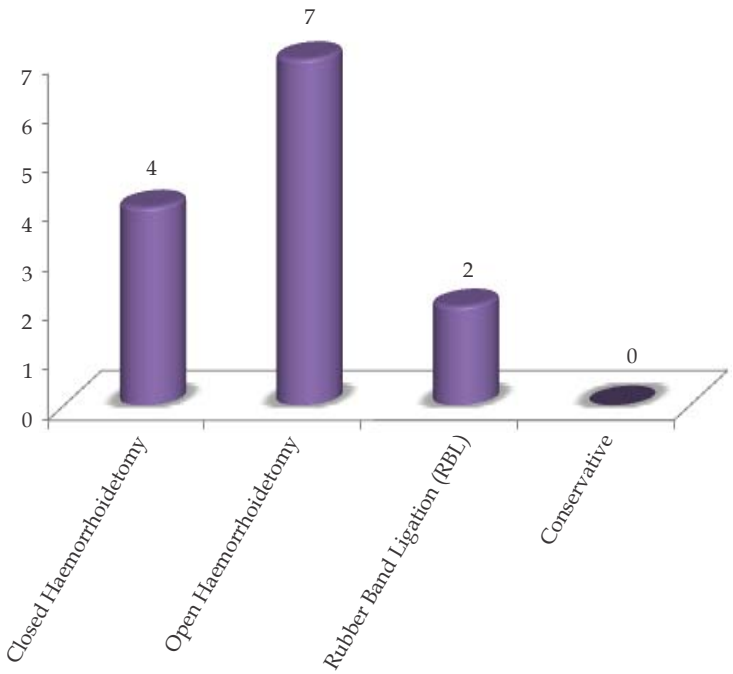

Fig. 10: Simple bar diagram represents Comparison of Modalities of treatment with post procedural complication of bleeding per rectum (BPR) following procedure.

In the study 8 (16.0%) cases had post-treatment complication of recurrence. Out of which maximum recurrence were seen with the conservative procedure 6 (66.7%), followed by Open haemorrhoidectomy and Rubber Band Ligation (RBL) each had one case of recurrence. There was statistically significant difference of management procedures with post- complications of recurrence ($p < 0.05$) (Table 16 and Fig. 12).

Table 16: Comparison of Modalities of treatment with post-treatment complication of Recurrence (R)

Modalities of treatment	No. of cases	Post-treatment complication Recurrence	
		No.	%
Conservative	9	6	66.7
Rubber Band Ligation (RBL)	10	1	10.0
Open haemorrhoidectomy	16	1	6.25
Closed Haemorrhoidectomy	15	0	0.0
Total	50	8	16.0
Chi-Square Test & *p*-value		$\chi^2_{yates} = 7.13$, $p = 0.027$, S	

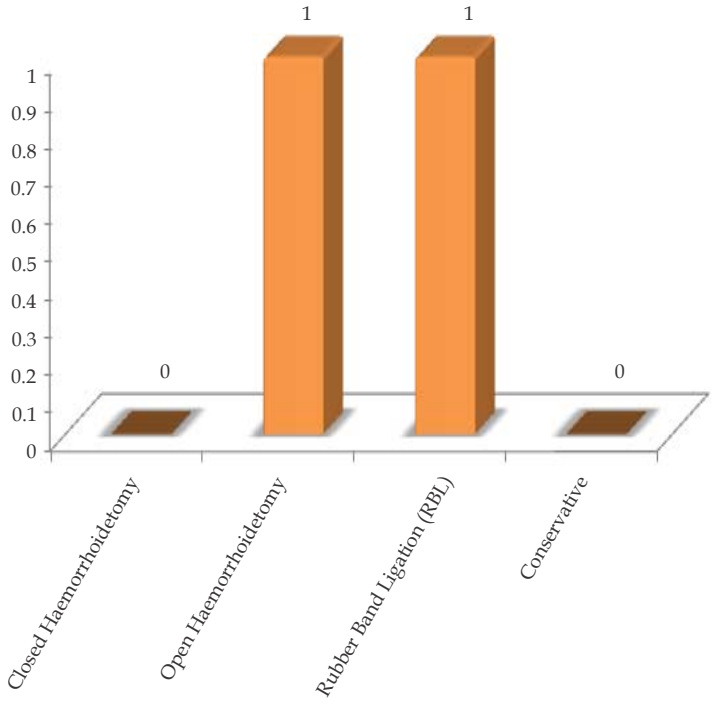

Fig. 11: Simple bar diagram represents Comparison of Modalities of treatment with post-procedural complication of DPR following procedure.

Table 17: Comparison of Modalities of treatment with post-procedural follow-up

Types of Treatment	No. of cases	Complications	Post-procedural follow-up		
			PPD 7	1 Month	3 Month
Conservative	9	Pain	0	0	0
		BPR	2	0	0
		DPR	0	0	0
		R	0	6	6
Rubber Band Ligation (RBL)	10	Pain	0	0	0
		BPR	0	0	0
		DPR	0	0	0
		R	0	0	1
Open Haemorrhoidectomy	16	Pain	4	0	0
		BPR	2	0	0
		DPR	0	0	0
		R	0	0	1
Closed Haemorrhoidectomy	15	Pain	1	0	0
		BPR	0	0	0
		DPR	0	0	0
		R	0	0	0

Study observed that, post-operative follow-up in the procedure of Closed Haemorrhoidectomy only one case had seen painat post-procedural day (PPD) 7th day and no cases of bleeding per rectum (BRP), discharge per rectum (DPR)and recurrence(R) at PPD 7, 1 month and 3 month were seen. In the Open haemorrhoidectomy 4 cases had pain and 2 cases had Bleeding Per Rectum on POD 7 and 1 case developed recurrence on 3 month Follow-up. Cases who underwent Rubber Band Ligation had no pain, Bleeding Per Rectum and Discharge Per Rectum on Post-procedural Follow-up. One case had recurrence on 3 month Follow-up visit. Out of 9 cases which were managed conservatively 6 cases developed recurrence by 1 month and remained till 3 month Follow-up visit (Table 17).

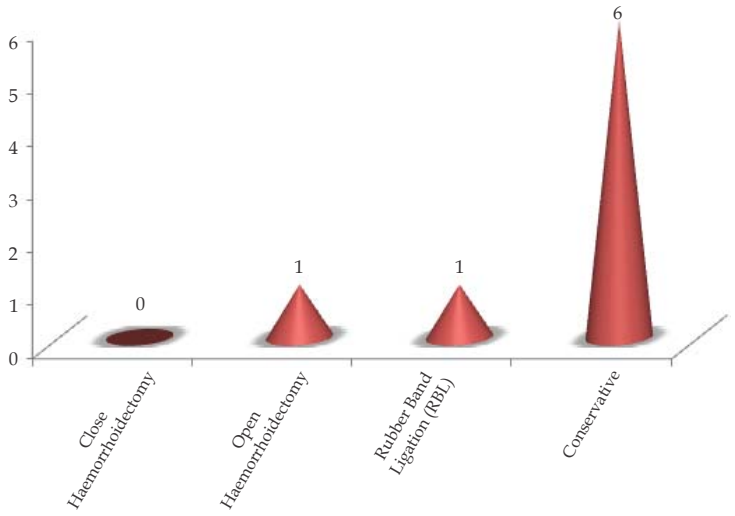

Fig. 12: Simple bar diagram represents Comparison of modalities of treatment with post-treatment complication of Recurrence.

Study reveals that, there was statistically very highly significant difference of treatment procedures with post-procedural hospital stay ($p < 0.001$). In the procedure of Open haemorrhoidectomy the mean hospital stay in days was significantly more, followed by Closed Haemorrhoidectomy and in the procedure of RBL the mean hospital stay was very less as compare to Open and closed haemorrhoidectomy. The minimal hospital day was 0 days in conservative management which were treated as an outpatient. The maximum hospital stay was 6 days in Open Haemorrhoidectomy (Table 18 and Fig. 13).

Table 18: Comparison of Modalities of treatment with post-procedural hospital stay

Modalities of Treatment	No. of cases	Post-Procedural Hospital stay in days
		Mean ± SD
Conservative	9	0.0 ± 0.0
Rubber Band Ligation (RBL)	10	1.40 ± 0.51
Open haemorrhoidectomy	16	4.19 ± 0.88
Closed Haemorrhoidectomy	15	3.27 ± 0.68
ANOVA Test & *p*-value		$F = 41.21$, $p = 0.000$, VHS

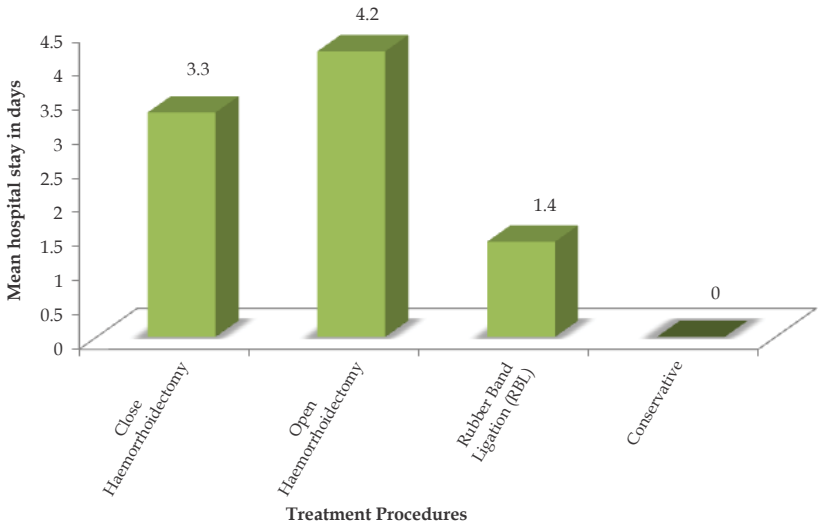

Fig. 13: Simple bar diagram represents comparison of Modalities of treatment with post-procedural hospital stay.

Discussion

Haemorrhoids is among the earliest diseases suffered by humans. It's presumed that it's since the time human assumed the erect posture.[7] The exact prevalence of this disease is not exactly known. Lack of education and awareness about it might be few causes. There have been various modalities for treatment of haemorrhoids. But then again, each modality has their own advantages and complications. The treatment depends on grade of haemorrhoids and patient fitness for surgery.

Demographic Data

In our study the mean age distribution for males was 27–58 (42.85 ± 15.64) years and for females was 28–52 (39.83 ± 11.76) years. The overall mean age distribution was 28–55 (41.36 ± 13.26) years. This was comparable to study conducted by El nakeeb et al.[8] the age distribution was 15–90 years. In study conducted by Arbman et al.[10] the mean age of distribution was 25–81 years. In study conducted by Hemant Borse et al.[11] the mean age of distribution was 31–40 years (Table 19).

Table 19: Age Distribution

Studies	Arbman et al.[10] (2000)	EL Nakeeb et al.[8] (2008)	Hemant Borse et al.[11] (2016)	Present study (2019)
Age distribution	25–81 years	15–90 years	31–40 years	28–55 (41.36 ± 13.26) years.

In this present study haemorrhoids was predominantly seen in males, which is consistent with the findings of other studies by El nakeeb,[8] Hemant Borse.[11] In these studies, male predominance was observed. In our study males were 27 cases (54%) and female were 23 cases (46%). (Table 20)

Table 20: Gender Distribution

Studies	Male	Female
El nakeeb[8] (2008)	627	123
Hemant Borse[11](2016)	56	14
Present study (2019)	27	23

In our study the major presenting complaints were Bleeding per rectum 13 (26%) cases, Mass per rectum 6 (12%), Bleeding per rectum + Mass per rectum 14 (28%) cases, painful defecation 5 (10%) and constipation 12 (24%). The major presentation was Bleeding per rectum and Mass per rectum, which are comparable to the study conducted by Arbman et al.[10] 74 (94.8%) patients presented with Bleeding per rectum, 61 (79.2%) patients presented with Mass per rectum and 61 (79.2%) patients presented with painful defecation, no cases were mentioned regarding constipation. In study conducted by Hemant Borse et al.[11] the major complaint was Bleeding per rectum 90% (63), mass per rectum 63% (44.1) and painful defecation was 34% (23.8), no cases reported of constipation. In study conducted by El Nakeeb et al.[8] major presenting complaint was bleeding 63 (90%) cases, followed by mass per rectum 496 (63%) cases, painful defecation was 30 (4%) cases and 267 (35.68%) had constipation (Table 21).

Table 21: Complaints

Presenting complaints	Arbman et al.[10] (2000) 77 cases	El nakeeb et al.[8] (2008) 750 case	Hemant Borse et al.[11] (2016) 70 case	Present study (2019)
Bleeding	74 (94.8%)	612 (81.6%)	63 (90%)	44 (88%)
Prolapse (Mass per rectum)	61 (79.2%)	496 (66.13%)	44 (63%)	26 (52%)
Painful defecation	61 (79.2%)	30 (4%)	24 (34%)	5 (10%)
Constipation	–	267 (35.6%)	–	12 (24%)

Pre-operative findings proctoscopy

Patient who presented with following complaints were done a thorough examination and 11 (22%) were diagnosed a case of External Haemorrhoid, 39 (78%) cases were diagnosed a case of Internal haemorrhoid, out of which 9 (18.0%) cases were

Grade 1 internal haemorrhoid. 10 (20%) cases were Grade-2; 10 (20%) cases were Grade-3 internal haemorrhoid; 10 (20%) cases were Grade-4 internal haemorrhoid.

Conservative management

It is suitable for early haemorrhoids in initial stages Grade 1 and 2 and for the patient who are not surgically fit.

The relief of symptoms is minimal.

The rate of recurrence is very high.

Not a definitive modality of treatment.

In a study conducted by El Nakeeb AM et al.,[8] RBL was compared with other modalities for treatment of haemorrhoids. Post-operative pain was seen in 31 (4.13%) cases, bleeding was seen in 31 (4.13%) cases, recurrence was seen in 71 (11.04%), no cases of discharge per rectum. In another study by G. Accarpio[92] of 7850 cases, post-operative pain was seen in 1934 (24%) cases, bleeding was seen in 209 (2.6%) cases and recurrence was seen in 750 (9.5%) cases, no cases were reported of discharge per rectum. It was shown that RBL is a simple, effective and safe method, which do not alter ano-rectal function. It can be done as an out-patient procedure or a day care surgery purpose. Similar findings were noted in our study, RBL was safe, effective with minimal post-operative pain 2 (20%) cases, Bleeding per rectum 2 (20%) cases, Discharge per rectum 1 (10%) case and 1 (10%) case had recurrence, with minimal post-operative hospital stay of 1–2 (1.40 ± 0.51) days. These were statistically less when compared to other modalities. Hence RBL was simple, effective, provided better quality of life, immediately from the post-operative period (Table 22).

Table 22: Studies corelating RBL with other techniques:

Post-operative complaints	El Nakeeb AM et al.[8] (2008) 750 case	G. Accarpio (2002) 7850 cases	Present study (2019) 10 case
Pain	31 (4.13%)	1934 (24%)	2 (20%)
Bleeding	31 (4.13%)	209 (2.6%)	2 (20%)
Recurrence	71 (11.04%)	750 (9.5%)	1 (10%)
Discharge per rectum	–	–	1 (10%)
Hospital stay	–	–	1–2 (1.40 ± 0.51) days

In a study conducted by You S Y et al.,[9] showed 45 (56%)cases developed pain following open haemorrhoidectomy and only 15 (18.7%) cases pain following closed Haemorrhoidectomy, no cases of bleeding per rectum and discharge per rectum nor recurrence. The days of hospital stay was 2 days in each group. In a study conducted by Hemant Borse et al.,[11] 22 (77%) cases had pain following Open haemorrhoidectomy and 18 (51%) cases had post-operative pain following Closed haemorrhoidectomy. The average duration of hospital stay was 5.2 days in Open haemorrhoidectomy and 3.8 days in Closed haemorrhoidectomy, no cases had bleeding per rectum, discharge per rectum and recurrence post-operatively. Similar findings were noted in our study 10 (62.5%) cases developed post-operative pain following open haemorrhoidectomy and 6 (40%) cases developed post-operative pain following closed haemorrhoidectomy. The duration of hospital stay was 4.19 ± 0.88 days in Open haemorrhoidectomy and 3.27 ± 0.68 days in Closed haemorrhoidectomy. 7 (43.75%) cases following Open haemorrhoidectomy had post-operative bleeding per rectum and 4 (26.6%) cases had Bleeding per rectum following Closed Haemorrhoidectomy. 1 (6.25%) case had Discharge per rectum and 1 (6.25%) case had Recurrence following Open haemorrhoidectomy. It was noted that time duration of complete wound healing during Follow-up visits was 20–40 days in Open haemorrhoidectomy and 10–20 days in Closed haemorrhoidectomy. Other complications like anal canal stenosis, stricture, incontinence, anal fissure and submucosal abscess was not seen in our study during the Follow-up visits. The open haemorrhoidectomy is the most commonapproach followed, but it has higher hospital stay, delay in wound healing and need more days for resumption of work. Closed haemorrhoidectomy is an alternative approach it is safe newer modality, it has better wound healing, early resumption of work less post-operative pain (Table 23).

Table 23: Studies corelating Open haemorrhoidectomy vs Closed haemorrhoidectomy

Studies	Open haemorrhoidectomy			Closed haemorrhoidectomy		
	You S Y et al.[9] (2005) 80 case	Hemant Borse et al.[11] (2016) 70 case	Present study (2019) 16 out of 50 cases	You S Y et al.[9] (2005) 80 case	Hemant Borse et al.[11] (2016) 70 case	Present study (2019) 15 out of 50 cases
Post-operative pain	45 (56%)	22 (77%)	10 (62.5%)	15 (18.7%)	18 (51%)	6 (40%)
Hospital stay	2 days	5.2 days	4.19 ± 0.88 days	2 days	3.8 days	3.27 ± 0.68 days
Discharge per rectum	–	–	1 (6.25%)	–	–	-
Bleeding per rectum	–	–	7 (43.75%)	–	–	4 (26.6%)
Recurrence	–	–	1 (6.25%)	–	–	-

Conclusion

When conservative management was compared with surgical procedures:

Conservative management shows benefit of reliving symptoms and minimising the risk of bleeding in most cases. It can be used in early stages of haemorrhoids and in the patients, who are not fit for surgical interventions. It plays a minor role in complicated haemorrhoids. On irregular Follow-up, there are high chance of recurrence.

Haemorrhoidectomy is the superior modality for treatment of haemorrhoids when compared with conservative and other approaches. It has a better long-term result.

RBL is a simple and effective method of treatment of symptomatic haemorrhoids, specially in Grade 1 and 2.

It can also be done as an outpatient procedure or a day care surgery.

It has fewer post-operative complications like bleeding per rectum, discharge per rectum and recurrence.

It has lesser rate of complication, early ambulation, short hospital stay and is cost effective.

It's a beneficial procedure in patient who is not fit for a surgical procedure, or in an operation apprehensive patient.

Haemorrhoidectomy is the definitive modality for the treatment of haemorrhoid, with better long-term result. Commonly done surgical procedure is open haemorrhoidectomy popularized by Miligan-Morgan. Modification of this was closed haemorrhoidectomy popularized by Ferguson.

Post-operative pain and bleeding is more in open haemorrhoidectomy less with closed haemorrhoidectomy.

Post-operative hospital stay and post-operative course is more with open haemorrhoidectomy less with closed Haemorrhoidectomy.

Wound healing and early resumption of work is better with closed haemorrhoidectomy. Its delayed in Open haemorrhoidectomy.

Recurrence is less with Closed Haemorrhoidectomy compared to Rubber Band Ligation (RBL), Open Haemorrhoidectomy and Conservative management.

So Closed haemorrhoidectomy is preferred over Open haemorrhoidectomy.

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Original Research Article

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Comparative Study of Laparoscopic Appendicectomy Under General and Regional Anesthesia: Randomized Control Trial

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Abstract

Laparoscopic appendicectomy is normally performed under general Anesthesia which is said to be necessary for tolerance of pneumoperitoneum and muscle relaxation. The efficacy of laparoscopic appendicectomy under spinal Anesthesia has been documented in few selected studies so far. In view of the above consideration, this clinical study was performed to evaluate the feasibility of laparoscopic appendicectomy under spinal Anesthesia.

Fifty patients underwent laparoscopic appendicectomy under spinal Anesthesia which were selected randomly. Intra operatively, out of the 50 patients, 4% experienced anxiety and 6% complained of shoulder/neck pain. None of the patients developed intraoperative nausea/vomiting and hypotension. 10% of the patients who underwent under spinal Anesthesia required sedation either due to shoulder/neck pain or anxiety. Out of these, 2 (4%) of the patients required conversion to general Anesthesia. Patients who underwent laparoscopic appendicectomy under spinal anesthesia experienced lesser post-operative pain as compared to those who underwent laparoscopic appendicectomy under general anesthesia.

Our data in this prospective study has confirmed the efficacy of laparoscopic appendicectomy under spinal Anesthesia. Moreover, it appears that spinal Anesthesia is more effective than the standard general Anesthesia on post-operative pain control during the patient's hospital stay. From these data, it appears that spinal Anesthesia is a promising method of Anesthesia for laparoscopic procedures, and with proper refinements, it could potentially evolve as the new gold standard Anesthetic approach for laparoscopic appendicectomy in healthy patients.

Keywords: Laparoscopy; Appendicectomy; Pneumoperitoneum, Anesthesia.

Introduction

Appendicitis is the most common abdominal-related emergency seen in the ER, as well as the most common reason to have urgent surgery.[1] The standard treatment for acute appendicitis is surgical removal of the appendix.[2] This may be done by an open incision in the abdomen (laparotomy) or through a few smaller incisions with the help of cameras (laparoscopy). Surgery decreases the risk of side effects or death associated with rupture of the appendix.[3]

Laparoscopic appendectomy has been established as the treatment of choice since last few decades. Laparoscopic appendectomy (LA) has shown to have considerable advantages over open appendectomy; such advantages include less postoperative pain, better cosmetic results, a shorter hospital stay, and a lower complication rate.[4]

Laparoscopic surgeries are normally performed under endotracheal general anesthesia to prevent aspiration and respiratory embarrassment

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secondary to induction of pneumoperitoneum. The low pneumoperitoneum pressure, good musculature relaxation, pain free and spontaneous breathing are an advantage of spinal Anesthesia for laparoscopic procedures.

Various study already established the feasibility and safety of spinal Anesthesia for laparoscopic surgery.[5,6] This study aims to compare laparoscopic appendectomy under regional and general Anesthesia with respect to pperioperative tolerance using parameters like Neck/shoulder pain, hypotension, requirement of per operative sedation and need for conversion to general anesthesia in cases of regional anesthesia.

Objectives

To compare the peri-operative tolerance and post-operative complications in patients undergoing laparoscopic appendectomy in general and spinal anesthesia.

Materials and Methods

Source of data

Data will be collected from patients admitted to Department of General Surgery, Vydehi Institute of Medical Sciences and Research Centre who presented with acute appendicitis and underwent laparoscopic appendectomy during the study period (Oct 2017-Sept 2019).

Method of collection of data

Diagnosis of acute appendicitis was confirmed using clinical examination and investigations like ultrasound abdomen, total counts and differential counts.

A total of 100 patients who underwent laparoscopic appendectomy were randomly selected based on computer generated numbers and divided into 2 groups.

Study group (50 patients): Patients undergoing laparoscopic appendectomy under spinal Anesthesia.

Control group (50 patients): Patients undergoing laparoscopic appendectomy under general Anesthesia.

Comparison of patients undergoing laparoscopic appendectomy under regional and general Anesthesia was done using a pre-designed proforma.

Data was analyzed using the Students *t*-test, Chi-square Analyzis and *p* - value of < 0.05 was considered significant.

Inclusion criteria

- Patients with acute appendicitis who underwent laparoscopic appendectomy

Exclusion criteria

- Patients with previous history of abdominal surgeries
- In whom General Anesthesia was contraindicated
- Patients with appendicular mass

Results

The results of the Analyzis of data on 50 patients who underwent laparoscopic appendicectomy under spinal Anesthesia and another group of 50 patients, who underwent laparoscopic appendicectomy under general Anesthesia are as follows.

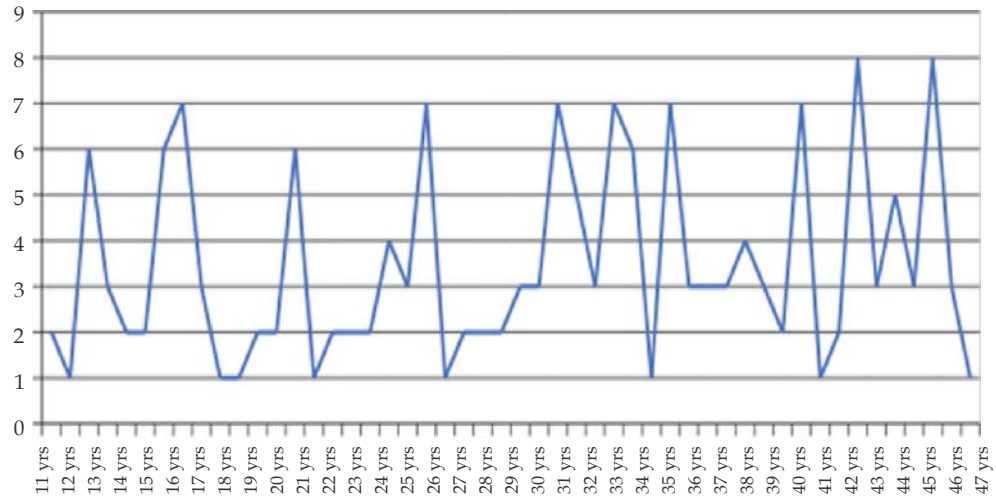
The mean age of the patients in laparoscopic appendicectomy under spinal and general Anesthesia was 26.2 and 25.38 years respectively.

Pain was measured using visual analogue scoring and a score of more than 5 was taken as significant.

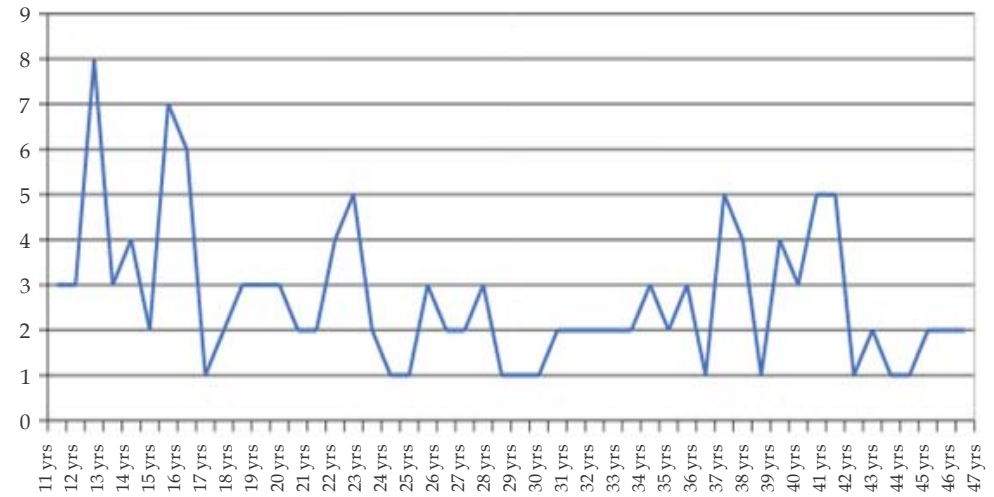
Table 1: Distribution of patients with respect to age and sex

Laparoscopic Appendicectomy	Characteristic				Total
	Spinal		General		
	N	%	*N*	%	
Patients analyzed	50	50	50	50	100
Sex					
Male	27	54	23	46	
Female	23	46	27	54	
Age (years)					
11–15	5	10	7	14	
16–20	11	22	12	24	

Laparoscopic Appendicectomy	Characteristic				Total
	Spinal		General		
	N	%	*N*	%	
21–25	9	18	8	16	
26–30	9	18	10	20	
31–35	2	4	7	14	
36–40	10	20	5	10	
>40	4	8	1	2	
Mean ± SD	26.2 ± 10.51		25.38 ± 8.64		



Graph 1: Distribution of pain score in GA patients.



Graph 2: Distribution of pain score in SA patients.

Post-operatively analgesics (intravenous diclofenac) were given on demand to patients who complained of pain. Pain was measured using visual analogue scoring and a score of more than 5 was taken as significant. Patients who underwent laparoscopic appendicectomy under spinal anesthesia experienced lesser post-operative pain as compared to those who underwent laparoscopic appendicectomy under general anesthesia. This study showed significant difference between the two groups in post-operative pain (p-value <0.050). Pain score on an average was higher in older

patients in the general anesthesia group wherein younger patients complained of pain following surgery under SA.

The patients were evaluated for:

Perioperative Tolerance

1. Neck/shoulder pain - 3 (6%) patients who underwent laparoscopic appendicectomy under spinal anesthesia complained of neck/ shoulder pain intraoperatively
2. Hypotension - No patient in either of the group developed hypotension intraoperatively
3. Per operative sedation - 5 (10%) patients who underwent laparoscopic appendicectomy under spinal anesthesia required sedation intraoperatively.
4. Conversion to GA - Of the 5 patients who were given sedation, 2 (4% of the total) patients required conversion to GA intraoperatively.

Operative Complications

1. Nausea/ Vomiting - No patient in either of the group developed post-operative nausea/ vomiting
2. Urinary retention - No patient in either of the group developed urinary retention postoperatively
3. Post-operative pain - 3 (6%) patients who underwent laparoscopic appendicectomy under spinal anesthesia complained of pain post-operatively. 12 (24%) patients who underwent laparoscopic appendicectomy under general anesthesia complained of pain post-operatively.

Discussion

Appendicitis is the most common intra-abdominal condition requiring emergency surgery. In this study we have compared laparoscopic appendectomy under regional and general Anesthesia and assessed the perioperative tolerance and post-operative complications in patients.

The goal of Anesthetic management is

- Management of pneumoperitoneum
- Achieving adequate level of sensory blockade
- Management of shoulder tip pain
- Provision of postoperative pain relief
- Ambulation as early as possible

Spinal Anesthesia fulfils all the above criteria and aids in the quick and uneventful postoperative recovery and thus has been suggested to be a suitable alternative Anesthetic method for laparoscopic appendicectomy.

Collins LM, Vaghadia H. studied Regional anesthesia for laparoscopy. And concluded that the key benefits of regional anesthesia include less emesis, less postoperative pain, shorter postoperative stay, improved patient satisfaction, and overall safety.[7]

Rajeev Sinha, et al. did a study on laparoscopic surgery using spinal anesthesia. The advantages of a uniform total muscle relaxation, a conscious patient, and relatively uneventful recovery after spinal anesthesia on the one hand and the protection from potential complications of general anesthesia on the other, were the main reasons for selecting spinal anesthesia as the first choice.[8]

There is no risk of intubation-related airway obstruction, little risk of unrecognized hypoglycemia in a diabetic patient, excellent muscle relaxation, decreased surgical bed oozing, and a more rapid return of gut function when laparoscopic surgery is done using spinal anesthesia compared with general anesthesia. This is in addition to the obvious advantages in an old patient or those with chronic obstructive pulmonary disease or other systemic diseases like hepatic and renal disease and diabetes.[9]

The study conducted by Purvi J Mehta, et al. on comparative Analyzis of spinal versus general anesthesia for laparoscopic cholecystectomy has not only confirmed the feasibility of safely performing laparoscopic cholecystectomy under spinal anesthesia as the sole anesthetic procedure but also shown superiority of spinal anesthesia in terms of better postoperative pain control as compared to general anesthesia.[10]

Pain assessed throughout any time in the postoperative period during the patients' hospital stay was significantly lesser in spinal group as compared to general anesthesia group, which is due to residual analgesic effect of local anesthetic in subarachnoid space and decrease in discomfort due to avoidance of general anesthesia. Pain relief, a component for rapid and smooth recovery, was seen in spinal anesthesia group.

Conclusion

On analyzing the data, we found a similar in outcome between laparoscopic appendicectomy

performed under general and spinal Anesthesia in a properly selected patient.

There was no statistical difference in the peri operative tolerance between the two groups.

Post-operatively, patients who underwent laparoscopic appendicectomy under spinal Anesthesia had lesser pain as compared to those undergoing under general Anesthesia. Pneumoperitoneum, shoulder tip pain and anxiety are the factors whose interplay leads to conversion to General Anesthesia.

In conclusion, laparoscopic appendectomy under spinal Anesthesia is safe and effective. It can be done with low intraoperative and post-operative complications with an advantage of early ambulation and cost effectiveness. But careful evaluation of the technique is appropriate particularly in patients with compromised cardiorespiratory conditions.

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Original Research Article

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A study on Altemeier's Perineal Procedure for Rectal Prolapse in Adults

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Abstract:

Rectal prolapse is a condition in which protrusion of full thickness of rectum of 4 cm or more occurs through the anal canal. Though worldwide literature shows that it is more common in females with a weak pelvic floor, incidence of this condition is seen more in males in India. This report is a retrospective study of cases who underwent perineal proctosigmoidectomy (Altemeier's procedure) for the rectal prolapse presented as an emergency irreducible rectal prolpse as well as recurrent reducible rectal prolapse during the period of two and half yrs. (January 2016 to June 2018). The study was done on 12 operated patients. The procedure was done in 4 patients as an emergency. The patients were followed up for immediate complications like bleeding, suture dehiscence, infections or abscess. They were also periodically assessed for delayed complications like constipation and recurrence. None of the complications were reported during the Follow-up period, except in one patient. He was having recurrent prolapse.

Keywords: Rectal prolapse; Perineal proctosigmoidectomy; Altemeier's procedure; Perineal procedures; Defaecation pressure; Obstructive defaecation.

Introduction

Rectal prolapse was even described as early as 4000–5000 BC in Egyptian mummies. Hippocrates had described about rectal prolapse and the treatment was hanging the patient upside down and chemical cauterisation or touching a burning stick to prolapsed rectal mucosa.

Full thickness rectal prolapse is a formidable condition to the patient. The various modes of presentation are mass coming per rectum, incontinence, mucosal discharge, bleeding, incomplete evacuation and constipation. It is diagnosed with a detailed history and clinical examination. The only curative treatment is surgery. The aim of treatment is not only to correct rectal prolapse, but also to restore continence and defecation function.

Though more than 100 surgical procedures have been described to correct rectal prolapse, there was no convincing controlled trial ever done to demonstrate the superiority of one procedure over the other. Precise aetiology and treatment for rectal prolapse have not been established till now. Most of the studies is based on case series and no single procedure is found to be superior or give better results. Abdominal and perineal procedures are described. Abdominal procedures are done in young patients with a theoretical advantage of lesser recurrence. But sexual function may be affected by retrorectal dissection and injury to the presacral nerves. Laparoscopic abdominal procedures are described to have lesser complications. In 1971 Altemeier popularised the perineal proctosigmoidectomy even though it was described earlier by Mickulics and Miles. Perineal procedures were suggested in old debilitated patients who are unfit for major abdominal procedures under general Anesthesia. But it is said that there is an increased chance of recurrence with

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the perineal procedure. Thiersch wiring is not at all advisable in rectal prolapse. The other perineal surgery is Delorme's procedure. The investigations advised are pudendal nerve conduction study, anal manometry and defaecography. The role of these studies in diagnosing the aetiology of rectal prolapse is debated. A colonoscopy can be done to exclude other causes of rectal prolapse.

Here we are reporting a study of patients who were operated with Altemeier's procedure over a period of 2.5 yrs in our unit. There were two categories of patients. One presented as emergency non reducible rectal prolapse and the other category belonged to the patients came to OPD with history of recurrent prolapse. They were having complaints of mass coming per rectum and mucosal discharge with occasional bleeding. None of them had incontinence. We followed up the patients to see any described complications. Aim of the study was to see the results of Altemeier's procedure and to establish its effectiveness even in elective cases and young patients without much complication.

Materials and Methods

The patients with history of full thickness rectal prolapse presented with acute irreducible prolapse (Fig. 3) and the outpatient caseswho came to our unit is included in this study over a period of 2.5 yrs. 4 cases presented with a/c irreducible rectal prolapse. 8 cases presented to the outpatient department with history of rectal prolapse which was manually reducible by the patients themselves. One patient presented with h/o rectal prolapse for which he was operated with sigmoid resection alone 3 yrs. back. Oldest patient we operated on was 88 yrs. and the youngest was 30 yrs. History was of a mass coming per rectum, mucosal discharge with soiling of inner wear and constipation. One RP patient was presented with h/o fall and rectal tear through which small bowel were prolapsed out (Fig. 1). This case is not included in the study as this is managed by laparotomy. None of them gave history of incontinence. The symptoms were affecting their personal life and one of the patients was having hypothyroidism which was corrected with thyroxine supplementation. There were 8 males and 4 females. Other than the emergency cases all were investigated with limited colonoscopy after taking detailed history. Sphincter tone was assessed by doing per rectal examination. RP was assessed by feigning defaecation at toilet (Fig. 2). Dyssenergic (obstructive) defaecation was not present in our elective cases which was established by doing a clinical test using a Foleys catheter, condom and a sphygmomanometer. The Condom is tied to the Foleys catheter proximal to the bulb after breaking it. The Condom is inserted into the rectum through the anal canal. The Urinary channel is connected to the sphygmomanometer for reading pressure. Pressure is raised in the bulb i.e. in the condom and the condom is inflated by connecting inflating bulb of sphygmomanometer to water channel. In the study the inflated condom is expelled when the pressure is raised between 80–90 mm of Hg and found that no obstructive defaecation was present in our series (Fig. 4). Detailed evaluation of the patient was done before surgery.

Fig. 1:

Fig. 2:

Fig. 3:

Fig. 4:

The Surgery was done under spinal Anesthesia except one case where GA was given. The patients were positioned in lithotomy position and catheterised. An encircling incision was put 1.5 to 2 cm proximally to the dentate line up to the serosa of outer rectum. Then the rectum and sigmoid colon were gradually pulled down ligating and dividing the mesorectum and mesocolon sequentially till no redundant colon could be pulled out. Harmonic scalpel and electro cautery were used to divide meso rectum and mesocolon and tied with 1 o vicryl. The peritoneum was opened anteriorly and sutured to the sigmoid above the line of resection of the inner tube. After making sure no more colon is redundant, the inner tube of the rectal prolapse i.e. the sigmoid colon is resected and the distal part is removed.

Now, the proximal end of the inner tube of bowel is anastomosed to the lower end of outer tube of anus i.e. close to the dentate line with 1 o vicryl in interrupted sutures. The length of the resected recto-sigmoid colon varied in different cases and it does not affect the post-operative outcome[1]. In cases where we found weak pelvic floor, an anterior levataroplasty was done with 2 o vicryl by putting interrupted sutures between levator ani. Patients were kept 10 degree head down position for 2 days after surgery. Clear fluids were given orally on the next day with supplementing IVF. None of them complained of pain in the postoperative period but we gave injection voveran on the first post-operative day.

The post-operative period was uneventful. Liquid diet was started on the 3rd day. Patients were discharged within 5–6 days after passing the motion. Advice was given to take high fibre diets and use only European toilet without straining to pass motion. They were also advised not to do any sternous work which will increase intra-abdominal pressure. Follow-up of patients were done at 2 weeks, 6 weeks, 3 months and 6 months. The data is depicted in Table 1.

Table 1:

Period of Study	January 2016 to June 2018
Total Number of Cases	12
Male Patients	8
Female Patients	4
Emergency Surgery	4
Complication (Recurrence)	1

Results and Discussion

Earlier perineal procedures were reserved for old debilitated patients who are unfit for GA and had less life expectancy as it was believed that there is a high chance of recurrence in perineal procedures. Later on many case series have shown that morbidity and recurrence are less even with perineal procedures[1,4,10] So, people are doing Altemeier procedure not only in emergency cases but also as an elective treatment of rectal prolapse in young patients. There were no immediate complications like bleeding, infection or abscess formation in our study. All cases were done under SAB, except one. Hence economically better in comparison to an abdominal surgery. Incidence of rectal prolapse is more in male as per Indian statistics contradictory to western literature.[6,7] Males are common in our case series also. Perineal procedure will not disturb the sexual function unlike an abdominal surgery.[10] On detailed evaluation, 2 patients opined that they have a better sexual life after the surgery. Post-operative period is painless as we are not putting any skin incision and there are no respiratory complications as seen in abdominal surgeries. There is no mass or mucosal discharge per anum in the operated cases and that itself is a great relief for the patients. The two old female patients are leading a better quality of life after surgery. One of the patients was having incontinence and recurrence. The patient complained of incontinence probably because his sigmoid colon was not dilated to accommodate large volumes of faecal matter. And on taking history it was understood that he used to strain for complete evacuation of bowel that explains the recurrence. We repeated the Altemeier's procedure and anterior levatoroplasty in that patient after 7 months of the 1st surgery and he is doing fine till date. Anal manometry and pudental nerve conduction study was not done in our series. We tried to exclude obstructive defaecation by assessing defaecation pressure by the technique described above.

Conclusion

Though various procedures are described for rectal prolapse, we found that Altemeier's procedure is associated with less morbidity and complications. This procedure was done not only in emergency irreducible rectal prolapse but also in recurrent cases of rectal prolapse. And it is done even in young males without any fear of sexual dysfunction as a complication. Incidence is more in males in our

region. Levatoroplasty has some role in preventing recurrence after perineal procedure for RP. Even though this is a short period of Follow-up, we could categorically say that there is no complication in patients who have good compliance.

We do not hesitate to admit that Altemeier's procedure is an acceptable procedure for rectal prolapse with minimal morbidity and without much complication.

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A Study of Port Site Infection After Laparoscopic Cholecystectomies at Tertiary Care Hospital in Western Rajasthan

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Abstract

Background: Port site infection though rare, shall be evaluated and studied so as to improve the quality of healthcare.

Materials and Methods: This prospective study was conducted in the Department of General Surgery, Sardar Patel Medical College & P.B.M. Hospital, Bikaner, Rajasthan. 300 patients of all age group and both sexes with symptomatic cholelithiasis undergoing laparoscopic cholecystectomy.

Result: Out of 300 patients studied only 12 patients presented with port site infection. Most common organism was enterobacter specius (25.00%), Staphylococcus auras spp (16.67%), Enterobacter spp. (16.67%) and E. coli (8.33%).

Conclusion: It is concluded that port site infection are rare in elective laparoscopic cholecystectomy and can be further reduced by proper selection of patients, and strictly following basic principles of laparoscopic cholecystectomy.

Keywords: Laparoscopic cholecystectomy (LC); Port site infection; Micro-orgnism.

Introduction

Laparoscopic cholecystectomy (LC) is now the gold standard treatment of symptomatic gallstones and is the commonest operation performed laparoscopically worldwide. Gall bladder perforation and spillage are the common complications encountered during dissection and removal of gall bladder (25%).[1,2] However there has been increasing report of infectious complications due to un-retrieved stones and spillage of bile. Such complications mask not only the advantages of minimal access surgery but also increase the economic burden on the patient. Work load on the staff is also increased and the reputation of hospital and attending surgeon bears the brunt.

The total complication rate of laparoscopic surgeries was 3.6/1000 procedures and the rate of major complication was 1.4/1000 procedures.[3] Current practice of immersing laparoscopic instruments for 20 min in 2% alkaline glutaraldehyde should be re-examined, according to a recent study.[4] They also recommend that disinfectant solution used for sterilisation was responsible for port site infections.[5]

Aim of our study is to assess the port site infections in laparoscopic surgeries and its management. To prevent the infection, proper sterilisation and storage of instruments is recommended. The centers for Disease control & prevention classification (CDC) categorised Surgical Site Infection (SSI) in to incision site infection and organ space infection. The incision site infection is divided in to superficial and deep infection. Superficial means only skin and subcutaneous tissue infection whereas deep means fascia and muscle involvement.

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Materials & Methods

Study design: Retospective &prospective hospital based study.

Study duration: Total duration 3 Year (1 July 2016 to 30 June 2018 Retospectively & 1 July 2018 to 30 June 2019 prospectively)

Study place: Dept. of Surgery, S.P. Medical College and P.B.M Hospital, Bikaner

Study population: Patients of all age group and both sex who underwent laparoscopic surgeries during the above period was include in the the study.

Sample size: All patients reporting to the Surgery dept. within study duration and eligible as per inclusion criteria will be included in the study.

Sampling Method: Convenience sampling

Inclusion Criteria: Patients of all age group and both sex who underwent laparoscopic surgeries during the above period will be include in the the study.

Exclusion Criteria: Those patients who were converted to open procedures was excluded from the study.

Procedure of Data Collection

After taking consent Details of cases was recorded including history, clinical examination and investigations done. In all the patients preoperative preparation will be done by complete bath prior to surgery using antiseptic soap and the parts will be prepare by shaving method. All patients received prophylactic antibiotics during induction of general Anesthesia. All surgeries was done under general Anesthesia. Pneumoperitoneum created using veress needle in supra or infra umbilical incision. Through the same incision, a 10 mm safety trocar (primary trocar) introduced in to the abdominal cavity. The time duration from abdominal incision to primary trocar entry will be calculate. All the specimens like gallbladder and appendix will be extracte without endobag. All 10 mm port closure will be done by hand sewn intermittent suture. All laparoscopic instruments will be sterilise by 2% glutaraldehyde solution with a contact time of 20 minutes. Before surgery, all the instruments was washwarm saline.

Data Analyzis

To collect required information from eligible patients a pre-structured pre-tested Proforma was used. For data Analyzis Microsoft excel and statistical software SPSS will be used and data was analyzed with the help of frequencies, figures, proportions, measures of central tendency and appropriate statistical test wherever required p-value < 0.05 was considered as significant.

Results

In present study, Maximum patients (40.33%) were from 46–60 yrs age group followed by 24.67% patients 31–45 yrs age group and 21.00% patients were more than 60 Yrs. 62.67% patients were female and 37.33% patients were male.

Table 1: Prevalence of port site infection

Port site infection	No of patients	Percentage (%)
Present	12	4.00
Absent	189	96.33
Total	300	100.00

In our study 4.00% cases were present with port site infection (Table 1).

Table 2: Type of port site infection

Port site infection	No of patients	Percentage (%)
Superficial	9	75.00
Deep	3	25.00
Total	12	100.00

In our study 75.00% port site infections were superficial and 25.00% were deep (Table 2).

Table 3: Microorganism wise distribution

Microorganism	No of patients port site infection present	Percentage (%)
Enterobacter spp	3	25.00
Staphylococcus auras spp	2	16.67
Enterobacter spp.	2	16.67
E. coli	1	8.33
Mixed	2	16.67
No growth	2	16.67
Total	12	100.00

In our study most common organism was enterobacter specius (25.00%), Staphylococcus auras spp (16.67%), Enterobacter spp. (16.67%) and E. coli (8.33%) (Table 3).

Table 4: Managment wise distribution

Treatment	No of patients	Percentage
Antibiotic prophylaxis	12	100.00
Incision and drainage	3	25.00

In our study 100.00% patients treat by antibiotic prophylaxis and 25.00% patients were treated by I & D with antibiotic (Table 4).

Discussion

In present study, Maximum patients (40.33%) were from 46–60 yrs age group followed by 24.67% patients 31–45 yrs age group and 21.00% patients were more than 60 yrs. 62.67% patients were female and 37.33% patients were male.

Ravindranath GG et al.[6] was found that among the 328 patients, 229 (69.8%) were females and 99 (30.2%) were males.

Pabitra Kumar Goswami et al.[7] was found that laparoscopic cholecystectomy was performed in 200 patients, which included 122 females (61%) and 78 males (39%). Their age range was between 20–72 years.

In present study, out of 300 patients only 6.00% Diagnostic Laparoscopy and 94.00% Lap cholecystomy. 3.67% cases were present with port site infection. 75.00% port site infections were superficial and 25.00% were deep.

Ravindranath GG et al.[6] was found that 6.4% of the patients had port site infections. This was in accordance to a study by Mir et al. who observed a PSI of 6.7% in patients after elective cholecystectomy by laparoscopy. The cause of the incidence was accredited to the reusable trocars.[8]

PSI was 5.7% in a study by Sujith Kumar et al[9] 6.3% by Shindholimath et al.,[10] 5.3% by Den Hoed et al.[11] and 5.5% by Atul K[12] et al. in their studies. Atul K et al. pointed out that proper sterilization of instruments is the most crucial step in prevention of PSI.[12]

Ravindranath GG et al.[6] was found that all the port site infections were superficial or subcutaneous, with no serious complications. Similar was the case in a study by Adisa et al., where 75% of the cases had superficial infections. Similar cases were reported form other studies.[13–15]

No surgical wound is completely immune to infections[16] Despite the advances in the fields of antimicrobial agents, sterilization techniques, surgical techniques, and operating room ventilation, PSIs still prevail.[17] Wound infection is the most common complication of almost every open surgery. Same applies to laparoscopic surgery. Although laparoscopic surgeries have less incidence of wound infections,[18] still they can produce undesirable effects and increase morbidity. Mycobacterial infections due to atypical mycobacteria at the laparoscopic port site are a common menace encountered in patients undergoing laparoscopic surgery. Atypical mycobacterial colonies often exist in tap water, natural waters and soil and so can easily contaminate solutions and disinfectants used in hospital settings. These infections have been a source of significant morbidity for patients recovering from laparoscopic surgeries. Port Site Wound infections in laparoscopy can be of two types.[19]

- The first type occurs immediately within 1 week of laparoscopic surgery due to gram negative or positive bacteria derived from infection acquired during surgery from the infected gall bladder or from the skin or the surgical procedure itself and can be treated by common antibiotics and local wound dressing.
- The second type is caused by atypical mycobacteria which includes the group of mycobacterial species that is not part of the M. tuberculosis complex having an incubation period of 3 to 4 weeks which do not respond to common antibiotics.

Infections with atypical mycobacteria have been primarily reported after laparoscopic procedures.[20] This is because, unlike open surgery, the instruments used for laparoscopic surgery have a layer of insulation that restricts the use of the autoclave in the sterilization process as the high temperatures involved destroy the insulation on them. The higher incidence of port site infections in our study may be due to the use of reusable metallic ports. as the cost of disposable ports for every case is not affordable either by the patient nor by the hospital. All instruments are re-used frequently after sterilization in CIDEX (CIDEX-OPA Solution, containing 0.55% ortho-phthalaldehyde,[21] is a fast and effective way to high level disinfect a wide range of endoscopes and other semi-critical devices) at least 3 to 4 cases per OT-day. The standard sterilization procedure has been a 20 minute exposure to CIDEX. At the current exposure time, these solutions act only as disinfectants and not sterilise thus allowing bacterial endospores to survive. Also, when proper mechanical cleaning of the instruments is not done, blood and charred tissue deposits are left in the joints of the instruments during laparoscopic surgery. These Contaminated instruments deposit

the endospores on to the subcutaneous tissue during the surgery which then germinate following which clinical symptoms appear after an incubation period of 3 to 4 weeks.[22]

Conclusion

It is concluded that port site infection are rare in elective laparoscopic cholecystectomy and can be further reduced by proper selection of patients, and strictly following basic principles of laparoscopic cholecystectomy

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Original Research Article

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Outcome of Various Skin Incisions in Abdominal Surgeries: A Randomized Controlled Study

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Abstract

One hundred and forty patients were studied in prospective, randomized trial in order to determine whether a vertical, transverse or oblique abdominal incision is the more satisfactory in producing sound wounds. Thirty-five patients were randomized between vertical midline and para-median, transverse and oblique incisions respectively, and followed up for 6 months post-operative. All these patients are compared among all four groups based on age, sex, BMI, length of incision, direction of incision, type of closure, suture material used and chronic illness. All the values are statistically insignificant indicating there is no significant difference in the predisposing factors among the groups.

In our study Para median incision is found to be the most difficult of all the four types of incisions. Time taken for closure is found to be significantly more in Para median incision. Immediate post-operative pain is significantly less in patients with transverse incisions.

Wound infection is found to be more in patients with midline incisions but the results are not statistically significant. No significant difference in wound dehiscence in all the groups. Wound sinus formation is found to be more in patients with midline incisions but the results are not statistically significant. No significant difference in wound dehiscence in all the groups. Healing time is found to be significantly prolonged in patients with transverse incisions. No significant difference in scar hypertrophy among the groups. Incisional hernias are seen to be more in midline group but the result is not statistically significant.

Keywords: Incision; Laparotomy; Hernia; Infection.

Introduction

A significant proportion of the population has undergone one or the other forms of surgical procedures at one or more points in the life time of an individual. Surgery has become an integral part of global health care, with an estimated 234 million operations performed yearly. The World Bank in 2002 reported that an estimated 164 million disability-adjusted life years, representing 11% of the entire disease burden were attributable to surgically treatable conditions.[1]

The measures used to close the abdomen may vary from surgeon to surgeon depending on training, circumstance and comfort level. However basic principles govern all abdominal closures.

The ideal method of abdominal wound closure should be technically simple and should be free from the post-operative wound complications like wound infection, wound dehiscence, incisional hernia, suture sinus formation and should leave a reasonably aesthetic scar.

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Wound infection and wound dehiscence are two of the most common complications after surgery which predispose an incisional hernia likely to develop within months or perhaps a few years.[2] The reported incidence of incisional hernia varies widely between 0.5 per cent to 13.9 per cent of patients undergoing abdominal operations.[3]

Many factors influence the surgeon's choice when making an abdominal incision. Surgery and organ involved, matters the most important factor. However, there are many occasions when either a vertical or transverse incision would be appropriate and only personal preference or convention selects the route of final choice. There have been few prospective, randomized trials objectively comparing the healing and complications of these options.

This study aims to identify the parameters which influence the outcome of various methods of abdominal wall closure for a period of 6 months.

Aim

- To compare vertical and horizontal/oblique skin incisions in elective abdominal surgeries

Objectives

To compare the outcome of vertical and horizontal/ oblique skin incisions in elective abdominal surgeries

- With regard to following parameters
- Difficulty levels while incising and closure
- Post-operative pain
- Surgical site infection
- Wound dehiscence
- Scar hypertrophy
- Incisional hernia

Materials and Methods

This study is a hospital-based time bound prospective comparative study. All the patients undergoing elective abdominal surgeries in JSS hospital during the study period which include October 1st 2017 to 31st December 2019 fulfilling the inclusion and exclusion criteria were included in the study. A preformed proforma was prepared. The relevant data was collected and entered.

Sample size: 140 cases A total of 140 patients were analyzed using suitable statistical methods. Of these 140, 35 patients belong to vertical midline incision group, 35 to vertical paramedian incision group, 35 to transverse incision group, rest 35 to oblique incision group.

Data was analyzed using the Students *t*-test, Chi-square Analyzis and *p* - value of <0.05 was considered significant.

Inclusion Criteria

1. All patients undergoing elective abdominal surgeries of age above 14 years

Exclusion Criteria

1. Laparoscopic abdominal surgeries
2. Emergency abdominal surgeries
3. Post-operative patients presenting with incisional hernia for which elective abdominal surgeries planned.

Results and Discussion

In our study vertical midline, vertical para median, transverse and oblique abdominal incisions are compared. A total of 140 patients are included in the study with 35 patients in each group.

All these patients are compared among all four groups based on age, sex, BMI, length of incision, direction of incision, type of closure, suture material used and chronic illness. All the values are statistically insignificant indicating there is no significant difference in the predisposing factors among the groups (Tables 1–3).

Table 1: Age Distribution

Type of incision	Mean age (in years)
Midline	54.1 ± 12.9
Para median	53.8 ± 13.5
Transverse	44 ± 12.8
Oblique	37.3 ± 15.9
p-value = 0.152	

Table 2: Distribution of cases according to BMI

Type of incision	Mean BMI
Midline	22.3 ± 1.6
Para median	22.1 ± 1.5
Transverse	22.5 ± 1.8
Oblique	21.4 ± 1.1
p-value = 0.312	

Table 3: Distribution of incision closures based on the suture material used

Type of suture material	Midline	Para median	Transverse	Oblique
SNM	23	26	24	24
	66%	74%	68%	68%
SAM	9	7	9	9
	25%	35%	26%	26%
SAP	3	2	2	2
	35%	6%	6%	6%
p-value = 0.99				

SNM: Synthetic Nonabsorbable Monofilament
SAM: Synthetic Absorbable Monofilament
SAP: Synthetic Absorbable Polyfilament

In our study Para median incision is found to be the most difficult of all the four types of incisions. A similar study conducted by Donaldson D R etal.[4] also concluded that this technique is more complex resulting in increased opening time and bleeding is found to be significantly more in patients who have transverse incisions. A similar study conducted by Greenall M J[5] stated that transverse incision is accompanied by more blood loss than midline incision. Time taken for closure is found to be significantly more in Para median incision. Immediate post-operative pain is significantly less in patients with transverse incisions. A similar randomized trial conducted by Armstrong et al.[6] showed a significant reduction in post-operative pain in patients that received a transverse incision. Surgical site infection is found to be more in patients with midline incisions but the results are not statistically significant (Table 4).

Table 4: Comparison based on Surgical Site Infection

Type of incision	Surgical Site Infection
Midline	4 (11%)
Para median	2 (6%)
Transverse	2 (6%)
Oblique	1 (3%)
p-value: 0.521	

No significant difference in wound dehiscence in all the groups (Table 5). A similar study conducted by Brown S.R. and Tieman. J[7] also concluded that there is no significant difference in the wound dehiscence among vertical and transverse group. None of nine randomized trials was able to show asignificant difference in wound dehiscence rates after different types of abdominal incisions. Only Waldhausen et al.[8] reported a 1.7% wound dehiscencerate after midline and a 0.25% rate after transverse incisions in a retrospective study in a paediatricsetting ($p <$ 0.001) (19). When reviewing all data, the transverse incision seems to cause less wound dehiscence than the midline and paramedian incisions, but numbers are too small to speak of an actual trend. Healing time is found to be significantly prolonged in patients with transverse incisions (Table 6).

Table 5: Comparison based on wound dehiscence

Type of incision	Wounds dehisced
Midline	8 (23%)
Para median	6 (17%)
Transverse	8 (22%)
Oblique	8 (23%)
p-value: 0.917	

Table 6: Comparison of healing time

Healing time	Midline	Para median	Transverse	Oblique
Normal	5 (14%)	16 (46%)	2 (8%)	15 (43%)
Prolonged	30 (86%)	19 (54%)	33 (92%)	20 (57%)
p-value: <0.0001				

No significant difference in scar hypertrophy among the groups. A similar study conducted by Proske et al.[9] have significantly favoured transverse incision cosmetically. No significant difference in chronic scar pain among the groups (Table 7).

Table 7: Comparison based on scar hypertrophy

Type of incisions	Scar hypertrophy
Midline	5 (14%)
Para median	3 (9%)
Transverse	2 (6%)
Oblique	1 (3%)
p-value: 0.327	

Incisional hernias are seen to be more in midline group but the result is not statistically significant. A similar study conducted by Lip et al.[10] reported an incisional hernia rate of 14% for midline incisions and 1% for transverse incisions ($p < 0.05$). A comparison of midline with oblique incisions was performed in two studies. A retrospective study by Blomstedt et al.[11] reported a 14% hernia rate after midline and a 4% hernia rate after oblique incisions (Table 8).

Table 8: Comparison based on development of incisional hernia

Type of incision	Incisional hernia
Midline	6 (17%)
Para median	1 (3%)
Transverse	2 (6%)
Oblique	1 (3%)
p-value: 0.062	

Three prospective randomized clinical trials compared lateral paramedian with midline incisions andfound no incisional hernias after the lateral paramedian incision. The difference with the midline incision was significant in all three studies. In our study the insignificant incisional hernias in midline group is probably because of less Follow-up period of 6 months.

Conclusion

Although the midline incision is easy and fast, there should be caution with its use, because of the high incidence of incisional hernia. A significant reductionof incisional hernia can be accomplished by the use of a unilateral transverse incision, or by the use ofthe lateral paramedian incision. Although these incisions take more time to perform, the unilateral transverse incision should be the preferred incision forsmall unilateral operations, while the lateral paramedian incision should be used for most major electivelaparotomies. The use of midline incision should belimited to emergency surgery and exploratory surgeryin which unlimited access to the entire abdominalcavity is necessary or useful.

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Original Research Article

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To Study the 3 Port *vs* 4 Port Lap Cholecystectomy Comparision at Tertiary Care Hospital in Western Rajasthan

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Abstract

Background: Present study was conducted to evaluate and compare the safety outcome and advantages of three-port and four-port LC.

Methods: This prospective study included 100 patients presenting with symptomatic gall stone disease or gall bladder polyp more than 1 cm at base. Patients with jaundice and choledocholithiasis were excluded. Patients were divided into two groups: A and B, who underwent three-port and four-port LC respectively.

Results: The mean age of Group A patients was 46.4±8.53 Yrs and Group B was 45.24 ± 10.34. 63% of the operated patients were females and 37% males. Adhesion was seen in 24.00% patients in Group A and 22.00% patients in Group B. In the three-port group, 45 cases were completed successfully without any need for conversion. 4 patients were converted to four-port procedure and 1 patient was converted to open cholecystectomy. In the four-port group, 3 cases were converted to open cholecystectomy for completion. The average operative time was slightly more in the three- port LC group as compared to the four-port group. It was 46.3 +11.2 minutes for three-port cholecystectomy, ranging from 25 to 75 minutes. In the four-port cholecystectomy group, it was 42.4 ± 15.4 minutes, ranging from 20 to 100 minutes. Pain at 6 hours and 24 hours post-operatively was found to be less in the three-port group than the four-port group. The mean Visual Analog Score was 5.71 ± 0.84 and 6.60 ± 0.83 at 6 hours; and 2.80 ± 0.81 and 3.60 ± 0.80 at 24 hours in the three-port and four-port groups respectively. The average number of hours of hospital stay was slightly less in the three-port group (37.8 ± 10.8 hours) as compared to the four-port cholecystectomy group (39.2 ± 5.6 hours).

Conclusions: Three-port procedure is safe and appears to be more cost effective than four-port LC.

Keywords: Three-port; Four port; LC.

Introduction

Diseases of the Gallbladder constitute a majority of digestive tract disorders. Among these, gall stone disease is the most common biliary pathology.[1–3]

It has been noted that people living in the Indo-Gangetic belt are highly susceptible to the formation of gall stones, so much so that cholecystectomy is the single most commonly performed surgical procedure in this part of the world.[4,5]

Reduction in the size and number of ports has been proposed as a method of reduced pain and duration of hospital stay post-operatively. The most practical option is by reducing the number of the ports from four to three.[11] The lateral fourth port is used to grasp the gall bladder funds and retract it laterally (American technique), so as to expose the Calot's triangle, facilitating dissection in this region. The use of this port was omitted in the three-port technique and results from recent studies have been encouraging.[12] This prospective

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comparative study was conducted to evaluate and compare the safety outcome and advantages three-port and four-port laparoscopic cholecystectomy, in terms of: duration of surgery, complication rates, nature of complications, post-operative pain, duration of hospital stay, return to work and cosmetic outcome.

Based above fact we are planning to conduct the study 3 port vs 4 port lap cholecystectomy comparision at tertiary care hospital in western rajasthan.

Materials and Methods

Stu*dy design:* Hospital based prospective study.

Study duration: 12 months.

Study place: Dept. of Surgery, S.P. Medical College and P.B.M Hospital, Bikaner

Study population: Patients of chronic cholecystitis, symptomatic cholelithiasis, recurrent biliary pancreatitis, Gall Bladder (GB) polyp.

Sample size: 100 consecutive patients who fit into the inclusion criteria was included in the study. 50 patients will be include in the 3 port cholecystectomy arm and 50 in the 4 port cholecystectomy.

Sampling Method: Convenience sampling

Inclusion Criteria:

- Acute cholecystitis with wall thickness <3 mm.
- Age of patient between 18 and 65 years
- Diagnosis of chronic cholecystitis, symptomatic cholelithiasis, recurrent biliary pancreatitis, Gall Bladder (GB) polyp
- Controlled DM, HT, obesity, hypothyroidism.

Exclusion Criteria:

- Severe co-morbid conditions (uncontrolled diabetes, hypertension or presence of IHD)
- Diagnosis of acute cholecystitis with wall thickness more tthan 3 mm, Mirizzi syndrome, suspicion of GB cancer
- ASA Grade-4
- DM, HT, COPD, bleeding disorders patients.

Data Collection:

The details of preoperative assessment, intraoperative observation, postoperative course and postoperative Follow-up with reference to following points were recorded in a proforma

Data Analyzis:

To collect required information from eligible patients a pre-structured pre-tested Proforma was used. For data Analyzis Microsoft excel and statistical software SPSS was used and data was analyzed with the help of frequencies, figures, proportions, measures of central tendency, appropriate statistical test.

Results

The mean age of Group A patients was 46.4 ± 8.53 yrs and Group B was 45.24 ± 10.34. The both group were comparable. 63% of the operated patients were females and 37% males and there was no significant difference among the two groups (Table 1).

Table 1: Comparison of age in study groups

Parameter	Group A	Group B	*p*-Value
	Mean ± SD (*n* = 50)	Mean ± SD (*n* = 50)	
Age (yrs)	46.4 ± 8.53	45.24 ± 10.34	>0.05 (NS)

Adhesion was seen in 24.00% patients in Group A and 22.00% patients in Group B (Table 2).

Table 2: Intraoperative findings of anatomical variations, adhesions

Intraoperative observations	Group A (*n* = 50)	Group B (*n* = 50)	Total (*n* = 100)	*p*-value
Anatomical variation	1 (2)	0 (0)	1 (1)	0.23
Adhesions	12 (24)	11 (22)	23 (24)	0.16

In the three-port group, 45 cases were completed successfully without any need for conversion. 4 patients were converted to four-port procedure and 1 patient was converted to open cholecystectomy. In the four-port group, 3 cases were converted to open cholecystectomy for completion. This result was not statistically significant (Table 3).

Table 3: Conversion rates in both groups

Conversion	Group A (*n* = 50)	Group B (*n* = 50)	Total (*n* = 100)	*p*-value
Open	1 (2.00)	3 (6.00)	4 (8.00)	0.236
4 port	4 (8.00)		4 (8.00)	

The average operative time was slightly more in the three- port LC group as compared to the four-port group. It was 46.3 + 11.2 minutes for three-port cholecystectomy, ranging from 25 to 75 minutes. In the four-port cholecystectomy group, it was 42.4 ± 15.4 minutes, ranging from 20 to 100 minutes. The difference however was found to be statistically insignificant. Pain at 6 hours and 24 hours post-operatively was found to be less in the three-port group than the four-port group and the results were statistically significant. The mean Visual Analog Score was 5.71 ± 0.84 and 6.60 ± 0.83 at 6 hours; and 2.80 ± 0.81 and 3.60 ± 0.80 at 24 hours in the three-port and four-port groups respectively. The average number of hours of hospital stay was slightly less in the three-port group (37.8 ± 10.8 hours) as compared to the four-port cholecystectomy group (39.2 ± 5.6 hours). However, the difference was not statistically significant (Table 4).

Table 4: Comparison of post-operative variable in study groups

Parameters	Group A		Group B		*p*-value
	Mean	SD	Mean	SD	
Duration (min)	46.3	11.2	42.4	15.4	0.452
VAS at 6 hours	5.71	0.84	6.60	0.83	0.01
VAS 24 hours	2.80	0.81	3.60	0.80	0.01
Hospital stay (Days)	37.8	10.8	39.2	5.6	0.136

Discussion

100 patients were considered for inclusion in the study. A fully informed written consent was taken from all patients. All the patients were sequentially divided into two separate Groups A and B. Group A patients were subjected to three-port laparoscopic cholecystectomy and Group B patients were subjected to conventional fourport laparoscopic cholecystectomy. All the surgeries were performed by the same operating team.

The mean age of Group A patients was 46.4 ± 8.53 yrs and Group B was 45.24 ± 10.34. The both group were comparable. 63% of the operated patients were females and 37% males and there was no significant difference among the two groups.

Age and gender distribution was almost similar in the two groups. Gall stone disease is a female preponderant disease, mostly affecting middle aged females. Few studies have linked the etiology to estrogen hormone.[6] Most of the patients in either groups had multiple calculi with chronic symptom.

In the three-port group, 45 cases were completed successfully without any need for conversion. 4 patients were converted to four-port procedure and 1 patient was converted to open cholecystectomy. In the four-port group, 3 cases were converted to open cholecystectomy for completion. This result was not statistically significant.

Kumar P et al. was observed that there were 3 conversions to four-port and 1 conversion to open cholecystectomy in the Group A patients. A fourth port had to be introduced for various reasons like, difficult anatomy of the Calot's triangle with aberrant relations of the cystic duct and cystic artery in one case and distended Hartman's pouch obscuring the anatomy of the Calot's triangle in another. Third case had a long right hepatic artery which had to be traced high up in the gall bladder fossa, along with a long cystic duct before joining the common hepatic duct. The case which was converted to open cholecystectomy had injury to common bile duct which underwent primary repair and was managed successfully. There were 3 conversions to open cholecystectomy in the four-port group. Two cases had dense adhesions of the gall bladder with surrounding structures. Third case was an hour glass type of gall bladder with a long cystic duct in which there was a cystic artery bleed due to the slippage of the clips applied on the stump of cystic artery, which could not be controlled laparoscopically. Further evaluation of these patients was not done in the study as the variables assessed were disproportionate to those included in the study. Other authors have reported similar causes of conversion. Few other causes reported include cholecysto-digestive fistula, choledocholithiasis, intrahepatic adhesions and equipment failure.[7-9]

The average operative time was slightly more in the three-port LC group as compared to the four-port group. It was 46.3 + 11.2 minutes for three-port cholecystectomy, ranging from 25 to 75 minutes. In the four-port cholecystectomy group, it was 42.4 ± 15.4 minutes, ranging from 20 to 100 minutes. The difference however was found to be statistically insignificant.

Kumar P et al. was observed that the mean operative time in the four-port group was found to be sightly less than the three-port group. This is probably because the addition of the fourth port facilitates dissection of the Calot's triangle as it is better exposed due to laterally retracted gall bladder. Mixed results have been found in literature in this regard. While some authors have reported similar findings, some have reported three

port procedure to be shorter than fourport.[10–11] They have explained this on the basis of less time required to create an additional port. We believe that three port cholecystectomy is a relatively new technique and with increasing experience, mean procedural time is likely to reduce.

Pain at 6 hours and 24 hours post-operatively was found to be less in the three-port group than the four-port group and the results were statistically significant. The mean Visual Analog Score was 5.71 ± 0.84 and 6.60 ± 0.83 at 6 hours; and 2.80 ± 0.81 and 3.60 ± 0.80 at 24 hours in the three-port and four-port groups respectively. The average number of hours of hospital stay was slightly less in the three-port group (37.8 ± 10.8 hours) as compared to the four-port cholecystectomy group (39.2 ± 5.6 hours). However, the difference was not statistically significant.

Kumar P et al. was observed that the Three-port cholecystectomy scores over the four-port technique in terms of various post-operative outcomes. Post-operative pain at 6 and 24 hours and use of analgesics were statistically less in the three-port group and so was the duration of return to work and normal activity. Mean duration of hospital stay was also slightly less in the three-port group. The cosmetic effect of the surgery in both groups was evaluated one month after surgery and patient satisfaction was overall found to be better in the three-port group. The main reason for partial satisfaction was that the patients in four-port group were aware of the fact that the number of scars could have been reduced.[11]

Conclusion

Three-port procedure is safe and appears to be more cost effective than four-port LC.

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Original Research Article

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Comparative Study of Various Surgical Techniques (Anatomical Repair, On-Lay Mesh Plasty, Ultra Pro Hernia System) of Umbilical Hernia Repair

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Abstract

Context: Umbilical hernia is treated by conventional anatomical suture method, mesh and suture repair. Ultra Pro-hernia System is recently introduced for umbilical hernia treatment. Present study was aimed to compare all three methods in treatment of umbilical hernia.

Aims: In this study we aimed to investigate whether use of a UHS was better in reducing recurrence, postoperative pain compared with suture repair and on-lay mesh repair for umbilical hernias.

Settings and Design: Prospective randomized clinical trial

Methods and Material: Sixty consecutive patients diagnosed with a primary umbilical hernia were enrolled for the study. They were randomized and underwent elective repair of umbilical hernia using the UHS, anatomical repair, or on-lay repair with mesh. Data for the time required for the surgical repair methods, length of hospital stay, postoperative pain, analgesic necessity, and return to work, and early and late complications were recorded, and compared with respect to the repair procedure.

Statistical Analyzis used: All data are compared by ANOVA followed by post hoc Analyzis either tukey method for parametric or kruskal –Wallis.

Results: The mean operating time, VAS score, were higher in the anatomical repair and on-lay mesh method as compare to UHS. Patient in UHS have significant less requirement of analgesics, less hospital stay and less recurrence as compared to anatomical repair and on-lay mesh repair.

Conclusions: UHS have better advantage in terms of less post-operative pain, low rate of recurrence, less hospital stay and early return to normal activity over the traditional anatomical method and on-lay repair with mesh.

Keywords: Ultrapro Hernia System; Umbilical hernia; Anatomical repair; On-lay mesh rpair.

Introduction

Hernia is protrusion of a viscus or a part of it through the abdominal wall and in Umbilical hernia abdominal contents are protruded in umbilical cord or centre of a congenital weak umbilical scar or through a defect adjacent to the umbilicus. Umbilical hernia is defined as a midline abdominal wall defect around 3 cm above to 3 cm below the umbilicus, and is a common diagnosis in adults, with a global prevalence of 2%.[1]

There is a high tendency for incarceration, strangulation, and emergency repair is often necessary for these types of hernias.[2] A literature review search suggested that no firm consensus currently exists on the best technique for primary repair of these hernias.[3] The recurrence rates after

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tissue repair are variable, with reports ranging from 15 to 40%,[4] while the use of prosthetic material for open umbilical hernia repair had reduce the recurrence rates.[3]

Mesh repair, preaponeurotic (onlay), retromuscular or preperitoneal (sublay) and intra-abdominal (underlay) placement or even combinations have been described with acceptable results.[5] This study was designed to study the different techniques of repair of umbilical hernias with special emphasis on Ultrapro hernia System (UHS) and onlay mesh repair and their outcome in terms of operative time, ease of procedure, hospital stay, complications and recurrence.

Materials and Methods

This prospective study was conducted from October 2016 to august 2018 after getting clearance from Institutional Review Board and included 60 adult patients with primary uncomplicated umbilical or paraumbilical hernias.

Patients of 18–64 year age with primary umbilical hernia with a diameter of 1–4 cm were included in the study. Informed and written consent for Anesthesia and Surgery was taken from each patient in their local language. Exclusion criteria were recurrent umbilical hernia, incarcerated umbilical hernia, incisional hernia or epigastric hernia, an American Society of Anesthesiologists (ASA) classification higher than ASA III, or one or more of the following diseases in their medical history: midline laparotomy, laparoscopy with an umbilical entrance port, ascites, peritoneal dialysis, or liver cirrhosis.

Total 60 patients were randomized into 3 groups using computer generated random numbers in sealed envelopes numbered serially to ensure concealed allocation of patients.

Procedure

Suture repair of the umbilical defect consisted of adaptation of the fascia in the midline by either interrupted or continuous, non-absorbable, monofilament, polypropylene sutures of thickness 0/0 (monofilament Prolene suture).

Mesh repair was done with a flat polypropylene mesh (Prolene polypropylene mesh) placed in the preperitoneal plane. Fixation of the mesh was achieved using 0/0 individual, non-absorbable, monofilament sutures (Prolene).

The overlap of the mesh had to be at least 3 cm in each direction of the circular mesh. If the surgeon had to enlarge the umbilical defect during the operation to place the mesh in the preperitoneal plane, this information was recorded in the case record form.

To protect the damage to viscera, it was possible to place the remains of the hernia sac between the viscera and the mesh. The fascia defect was closed over the mesh by sutures when this was possible in a tension-free manner to protect the mesh from contact with the skin. The use of drains was permitted. Closure of the subcutaneous tissue and skin could be achieved using absorbable suture such as 2′0 polyglactin.

UHS (Ultrapro hernia system) It has three points of protection with an onlay patch that cover and protect, a connector that virtually eliminates migration, and the underlay patch that provides posterior support. The onlay patch, connector, and underlay patch of UHS are manufactured from approximately equal parts of absorbable poliglecaprone monofilament fiber and nonabsorbable polypropylene monofilament fiber. After making space between peritoneum and abdominal sheath, UHS mesh lower fold place between peritoneum and abdominal sheath and spread mesh. Then upper fold of mesh spread over fascia and mesh sutured with polypropylene. Ensure adequate haemostasis.

The placement of 'subcutaneous stitches' is optional, but in large patients they can be used to close the potential space between sheath and skin. If placed, use an absorbable suture such as 2′0 polyglactin. Securing the umbilicus to the sheath is another optional step. Skin closure is with an ethilon 2′ 0 or 3′ 0 suture and kept a negative drain.

Statistical Analyzis

The chi-square, Mann-Whitney U, and Kruskal-Wallis tests were used for statistical analyzes.

Results

Total 60 patients were divided in 3 groups and operated for anatomical repair (Group A), On-lay mesh plasty (Group B), UHS (Group C). Mean age group of all three groups were compared and all were non-significant (means all groups were comparable) in terms of demographic data and disease characteristics as shown in (Table 1).

Table 1: Demographic and disease characteristics of study groups

	Group 1 (Anatomical repair)	Group 2 (On-lay mesh plasty)	Group 3 (Ultra pro hernia system)	*p*-value
Age (Mean ± SEM)	51.8 ± 0.76	54.5 ± 1.01	53.75 ± 0.87	0.07
Gender (M/F)	15/5	16/4	14/6	0.08
Predisposing Risk factors present (Number of patient)	8	7	8	0.06
Diameter of Hernia				
1–2 cm	14	15	15	0.68
3–5 cm	6	5	5	

Data were compared by AwwNOVA and post hoc test by Tukey or kruskal-wallis method.

In Group A the mean operative time for surgery was (38 ± 6.7 min) less than the on-lay mesh plasty which was significant ($p < 0.05$) but not significant with UHS (Table 2). The mean length of hospital stay was significantly longer in the onlay repair with mesh group as compare to anatomical repair ($p < 0.05$). No statistically significant difference was detected between the UHS group and Anatomical repair group. According to the VAS, there were no statistically significant differences between the groups on the first day, but on the second and on the seventh days the patients in the UHS group described minimum pain that was statistically significant ($p < 0.05$). The mean analgesic intake in the Anatomical repair, onlay repair and UHS, groups were 6.4 ± 1.3, 8.3 ± 2.1, and 5.2 ± 1.5 tablets, respectively. Compared to the other groups, the need for analgesics was significantly less in the UHS group ($p < 0.05$). The development of postoperative complications such as seroma haematoma, wound infection, and recurrence was similar among the all procedures (Table 3). The patients were followed-up for a period of 12 months. Two recurrence (4%) was encountered in Group A and none in Group B and C (Table 2).

Table 2: Comparison of outcome parameters among the study groups

		Group 1 (Anatomical repair)	Group 2 (On-lay mesh plasty)	Group – 3 (Ultra pro hernia system)	*p*-value
Duration of Surgery (Min.)		38 ± 6.7	54 ± 9.8*	45 ± 8.6	<0.05
VAS score	1st Day	30.12 ± 8.2	36.2 ± 5.2	23.98 ± 8.7	>0.05
	2nd Day	16.41 ± 6.2	21..6 ± 6.5	11.37 ± 4.8#	<0.05
	7th Day	4.5 ± 2.6	10.2 ± 2.8	1.89 ± 0.86#	<0.05
Hospital Stay		3.4 ± 1.1	4.9 ± 1.3	3.3 ± 1.4*	>0.05
Analgesic Intake (Tablets)		6.4 ± 1.3	8.3 ± 2.1	5.2 ± 1.5#	<0.05
Return to work (Days)		10.6 ± 2.1	13.45 ± 1.8	9.23 ± 2.4	<0.05*
Recurrence		2	0	0	>0.05

*$p < 0.05$, as compared with anatomical repair.

#$p < 0.05$ as compared to On-lay mesh plasty. Data were compared by ANOVA and post hoc test by Tukey or kruskal-wallis method.

Table 3: Complication among the study groups

Complications	Group 1 (Anatomical repair)	Group 2 (On-lay mesh plasty)	Group 3 (Ultra pro hernia system)
Seroma	1	1	0
Hematoma	0	1	1
Wound Infection	1	1	1
Other	0	0	0

Data were compared by ANOVA and post hoc test by Tukey or kruskal-wallis method

Discussion

Umbilical hernia in adult population is relatively common and it is acquired defect in around 90 percent cases with high chances in fifth and sixth decades of life.[6] Many surgical techniques have been suggested for this surgical disease. Open repair of umbilical hernia is considered the preferred

procedure by most of surgeons. The conventional Anatomical repair technique is still one of the most often preferred surgical technique in hospitals all over the world.[7,8] Other side, due to other complications like wound infection and recurrence, this technique loses it place. After introduction of mash materials for repair of umbilical hernia has been shown to reduce recurrence rate and also decrease in infection like complications.[9–11] UHS is 3-in-1 design, especially the connector, makes it ideal for umbilical hernia repair. Basically, it is a combination of 3 techniques, such as Stoppa–plug–onlay mesh repair, that seems to offer an advantage in protecting against recurrence.[12,13]

The present study suggest that mean VAS score of day 1 is not significant in all groups but at day 2, day 7 mean vas score for UHS is less than anatomical repair, on-lay mesh plasty ($p < 0.05$). Cafer Polat et al., suggest the same finding that VAS score of onlay and anatomical repair is higher than the UHS and PHS (Prolene Hernia System). Undue tension on the abdominal wall accounts for the increased postoperative pain.[7] The on-lay repair with mesh requires an excessive dissection of soft tissue and suturing, which augment postoperative pain. In the UHS technique, less dissection and few interrupted sutures are necessary on the anterior rectus sheath. This explain that patients in the UHS group may feel less postoperative pain because of less dissection and suturing and less consumption of analgesics.

Compared to the UHS, the onlay repair with mesh technique, anatomical repair conferred significantly higher postoperative pain, longer surgery time, and longer hospital stay and time to return to work.

Several studies suggest that there is a high rate of recurrence after the Anatomical repair, ranging from 10% to 30% in many studies.[2,14,15] Due to tension free techniques with mesh materials, these high recurrence rates have been reduced to minimum. Many surgeons consider prosthetic mesh repair as the gold standard in the treatment of midline aponeurotic defects, including umbilical hernias.[16–18] In present study, although it was not statistically significant, we diagnosed 2 recurrences in the anatomical repair group. No recurrences were recorded among patients who underwent prosthetic mesh repair (UHS and on-lay mesh).

UHS have better advantage in terms of less post-operative pain, low rate of recurrence, less hospital stay and early return to normal activity over the traditional anatomical method and on-lay repair with mesh.

Key Message

The UHS seemed to be useful for umbilical hernia repairs against anatomical repair and on-lay mesh plasty as it caused minimal postoperative pain and less analgesic necessity, less recurrence.

Conclusion

The UHS seemed to be useful for umbilical hernia repairs against anatomical repair and on-lay mesh plasty as it caused minimal postoperative pain and less analgesic necessity, less recurrence.

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Original Research Article

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A Study of Correlation of Preoperative Fine Needle Aspiration Cytology (FNAC) With Postoperative Histopathological Examination (HPE) in Thyroid Swellings

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Abstract:

Context: FNAC is cost effective, cheap, more patient compliant compared to histopathology. It is not only screening tool but has been considered as gold standard also. But it is not without limitations. Hence studies are required to prove its feasibility and accuracy compared to histopathology in different settings.

Aims: To correlate FNAC results before surgery with histopathology reports after surgery.

Settings and design: Present hospital based diagnostic evaluation prospective study was carried out at Government Medical College, Latur.

Methods: Detailed history was recorded in the pre designed, pre tested, semi structured study questionnaire prepared for the present study. Thorough clinical examination including general, local and systemic examination for each and every patient included in the present study was carried out. All patients were subjects to routine investigations. FNAC and USG of the thyroid gland was carried out for all the included patients. FNAC report was obtained from the pathology department.

Statistical Analyzis: Sensitivity, specificity, positive predictive value and negative predictive value was calculated for FNAC

Results: All cases had swelling of thyroid gland and majority on right side. Majority (73.4%) swelling was non neoplastic and 95.7% were females and 38.3% were in 41–60 years group. Out of 94 FNAC studies majority i.e. 33 cases as colloid goitre with cystic degeneration. Among the 69 non neoplastic lesions, 28 cases were colloid goitre with cystic degeneration. Among 25 neoplastic lesions 12 cases were benign neoplastic lesions. FNAC and HPE correlated well in majority of the cases i.e. 92.6% of the cases.

Conclusion: High rate of diagnostic accuracy can be achieved by use of ultrasound guidance with strict adherence to adequacy criteria and meticulous examination of all the smears.

Keywords: Histopathology; Smears; Cases; surgery; Goitre.

Introduction

Largest endocrine gland for humans is thyroid gland. It develops first during the fetal life. It is superficial and easily palpable. It is the only gland which is easily approachable to direct physical, cytological and histopathological examination. It faces a lot of disturbances not only from physiological processes but various pathological processes like hyperplastic, inflammation, developmental etc. Lesions of the thyroid gland are very commonly globally and hence in day to day practice they are commonly seen.[1]

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It has been estimated that in general population the thyroid swelling prevalence is 4–10% while in pediatric population it is 0.5–1.2%.[2]

Diseases of the thyroid gland shows a great geographical variation all over the world. The incidence of thyroid lesions is higher in endemic areas. Age is one of the most important factors in occurrence of goitre. Incidence of disease is higher among females.[3]

Nodules of the thyroid gland are common. They are seen as swelling in the neck. Palpable thyroid can be seen in about 4–7% of the adults. Whereas non palpable swellings of the thyroid are said to be 10 times more common. Majority of these are benign in nature while <5% can be neoplastic.[4]

Nodules of the thyroid gland and cancer of the thyroid gland may occur due to exposure to ionizing radiation during pediatric age group. Due to advanced imaging technology and awareness among the general population, more and more new numbers of nodules of the thyroid gland are seen. Hence it has been said that nodule of the thyroid gland in asymptomatic patient finding is common.[5]

Differential diagnosis for nodule of the thyroid gland is required for proper management of it. In India, common diseases of the thyroid gland are goitre, deficiency of iodine disorder, hyperthyroidism, Hashimoto's thyroiditis and cancer of the thyroid.[6]

In India, cancer of the thyroid constitutes of all cancer of endocrines about 92% and among neck and head malignancies about 1%. In women, it is 0.7% of all malignancies and lesser i.e. 0.2% in men. Among malignancies, papillary carcinoma is most common.[7]

For evaluation of the swellings of the thyroid gland, FNAC is taken as gold standard. It is not only simple and cost effective but also can be done several times with ease quickly at the outpatient basis. Compliance of the patient is also more due to minimum invasion the procedure. The condition is that the sample must be representative of the gland and cytologist must be experienced.[8]

But there are limitations of FNAC also. Sample may not be adequate. Skill to obtain sample may be doubtful. Difficulty to differentiate between cancerous and benign neoplasms is also one concern. Some papillary carcinomas are also difficult to diagnose on FNAC.[9,10]

The present study was carried out to study the efficacy of FNAC before surgery as compared to histopathology obtained after surgery.

Materials and Methods

Study design: The present study was a Prospective Cohort Study with Follow-up of patients with FNAC and HPR reports.

Sampling: Simple Random Sampling procedure was followed in the present study.

Ethics: Study was initiated after obtaining permission from ethical committee of Government Medical College and Hospital & Head of Department of General Surgery, ENT and Pathology & consent from the patients.

Study duration: 24 months - from September 2017 to august 2019.

Source of data: Patients admitted from Surgery OPD and ENT OPD of Government Medical College & Hospital, fulfilling inclusion criteria.

Sample size: The sample size was calculated based on 5% significant level and 10% allowable error. This was estimated by using the formula $x = 4PQ/L2$.

Where P and Q are the prevalence in a study and L is the 10% allowable error. The prevalence of benign swellings in the study done by Kiran Rao et al.[31] was 81%. So, $P = 81$, $Q = 19$ and L is 8.1 (10% allowable error). Putting the values in the formula we got the sample size as roughly 94.

Methods of collection of data

Patients attending OPD of ENT and surgery department and got diagnosis of swelling of the thyroid gland formed the study population. Detailed history was recorded in the pre designed, pre tested, semi structured study questionnaire prepared for the present study. Thorough clinical examination including general, local and systemic examination for each and every patient included in the present study was carried out. All patients were subjects to routine investigations. FNAC and USG of the thyroid gland was carried out for all the included patients. FNAC report was obtained from the pathology department.

Inclusion criteria

1. Swelling of the thyroid gland
2. Euthyroid status of the patient
3. Willing to participate in the present study

Exclusion criteria

1. Thyroiditis
2. Not fit for surgery
3. Refused to undergo surgery

Statistical Tools

The data was entered in the excel sheet. Sensitivity, specificity, positive predictive value and negative predictive value were calculated.

Results

Table 1 shows clinical presentation of thyroid lesions. All cases had swelling of the thyroid gland. 11.7% of the cases complained of dysphagia and 3.2% of the cases complained of pain.

Table 1: Clinical presentation of thyroid lesions

Chief Complaints (No. = 94)	No. of Cases	Percentage (%)
Swelling in Neck	94	100.0
Difficulty in Swallowing (Dysphagia)	11	11.7
Pain	3	3.2

Table 2 shows percentage of side of thyroid gland involvement. 27 cases had swelling of both the lobes of the thyroid gland. 36 cases had it on only right side. 30 cases had it on only left side while one case the swelling was isthmic.

Table 2: Percentage of side of thyroid gland involvement

Side	Number	Percentage (%)
Bilateral	27	28.7
Right	36	38.2
Left	30	31.9
Isthmic	1	1.2
Total	94	100.0

Table 3 shows percentage of non-neoplastic and neoplastic lesions of thyroid. Majority i.e. 73.4% of the cases the swelling was non neoplastic in nature and remaining were neo plastic. Amon the neo plastic cases, 12.8% were benign and 13.8% were malignant.

Table 3: Percentage of non-neoplastic and neoplastic lesions of thyroid

Type of lesion		Number	Percentage (%)
Non neoplastic		69	73.4
Neoplastic	Benign	12	12.8
	Malignant	13	13.8
Total		94	100.0

Table 4 shows sex distribution of thyroid lesions. In present study both male and female patients were included. Out of 94 cases, 90 (95.7%) were females and 4 (4.3%) were males. In Non-neoplastic lesions out of total 69 cases 66 were females and 3were males.

Table 4: Sex distribution of thyroid lesions

Sex	Thyroid lesions			Total	Percentage (%)
	Non-neoplastic	Benign-Neoplastic	Malignant		
Female	66	12	12	90	95.7
Male	3	0	1	4	4.3
Total	69	12	13	94	100.0

Table 5 shows Distribution of the study subjects as per age. Most commonly affected age group was 41–60 years of age in which 38.3% of the cases can be seen. Next most commonly affected age group was 26–40 years of age in which 37.2% of the cases can be seen. Younger age group of 15–25 years of age was found to be least affected with only 9.6% of the cases in it.

Table 5: Distribution of the study subjects as per age

Age (years)	Thyroid lesions			Total	%
	Non-neoplastic	Benign-Neoplastic	Malignant		
15–25	5	2	2	9	9.6
26–40	26	3	6	35	37.2
41–60	28	5	3	36	38.3
61–80	10	2	2	14	14.9
Total	69	12	13	94	100.0

Table 6 shows FNAC Diagnosis. Out of these 94 FNAC studies, 22 cases were reported as colloid goitre, 33 cases as colloid goitre with cystic degeneration, 16 cases as follicular Neoplasm, 7 cases as Nodular Goitre, 6 cases as benign follicular nodule, 5 cases as Nodular goitre with cystic changes, 4 cases as Papillary carcinoma and 1 case as Atypia of undetermined significance.

Table 6: FNAC Diagnosis

FNAC Diagnosis	Number	Percentage (%)
Colloid goitre	22	23.4
Colloid goitre with cystic degeneration	33	35.1
Nodular Goitre	7	7.4
Nodular goitre with cystic changes	5	5.3
Benign Follicular Nodule	6	6.4
Follicular Neoplasm	16	17.1
Atypia of Undetermined significance	1	1.0
Papillary Carcinoma	4	4.3

Table 7 shows non-neoplastic Lesions. Among the 69 non neoplastic lesions, 28 cases were reported as colloid goitre with cystic degeneration, 22c ases as colloid goitre, 10 cases as multinodular goitre, 6 cases as nodular goitre, and 3 cases as lymphocytic thyroiditis.

Table 7: Non-neoplastic Lesions

Histopathological Diagnosis	No. of cases	Percentage (%)
Colloid goitre	22	31.9
Colloid goitre with cystic degeneration	28	40.6
Multinodular goitre	10	14.5
Nodular goitre	6	8.7
Lymphocytic thyroiditis	3	4.3
Total	69	100.0

Table 8 shows neoplastic lesions of Thyroid. Out of the 25 neoplastic lesions 12 cases were reported as benign neoplastic lesions and 13 as malignant neoplastic lesions. Among the 13 malignant neoplastic lesions 6 cases were reported as papillary carcinoma and 7 cases as follicular carcinoma thyroid.

Table 8: Neoplastic lesions of Thyroid

HPR diagnosis		Number	Percentage (%)
Benign neoplastic	Follicular adenoma	12	48
Malignant	Papillary carcinoma	6	24
	Follicular carcinoma	7	28
Total		25	100

Table 9 shows correlation between FNAC AND HPE. FNAC and HPE correlated well in majority of the cases i.e. 92.6% of the cases while it was not found to be correlated in only 7.4% of the cases.

Table 9: Correlation between FNAC AND HPE

FNAC and HPE correlation	Number	Percentage (%)
Correlated	87	92.6
Not correlated	7	7.4
Total	94	100.0

Discussion

In the present study we observed that 11.7% of the cases had dysphagia. This proportion was found to be very high when it was compared with the findings of dysphagia from the study done by Gupta A et al.[11]

In the present study, females were more than males which is 22.5 females for one male thus telling that swelling of the thyroid gland are more common in females which is high in comparison to studies by Kumar et al.[12]

Involvement of thyroid gland on right side was seen in 38.3% of the cases in the present study. Gupta A et al.[11] found this in 49% of the cases which is more than that found in the present study.

Out of total 94 cases, 56 (59.5%) specimens were obtained by hemithyroidectomy, 31 (33%) were obtained by total thyroidectomy, 6 (6.4%) was obtained by subtotal thyroidectomy and 1 (1.1%)was by near total thyroidectomy which is comparable with studies done by Sudarshan K et al.[13] study showed 38 (78%) cases underwent hemithyroidectomy, cases 4 (8%) specimens were obtained by lobectomy, 4 (8%) cases underwent total thyroidectomy and 3 (6%) cases underwent near total thyroidectomy. Dhanaram et al.[14] study shows 89% cases underwent hemithyroidectomy and 11% cases underwent total thyroidectomy. Ashwini et al.[15] in their study of 179 thyroidectomies, 4 (2.2%) specimens were obtained by lobectomy, 80 (44.6%) specimens were obtained by hemithyroidectomy, 8 (4.4%) specimens were obtained by total thyroidectomy, 21 (11.7%) specimens were obtained by near total thyroidectomy and 66 (36.8%) specimens were obtained by subtotal thyroidectomy.

Out of the received 94 gross specimens for histopathological examination following initial cytological evaluation by fine needle aspiration cytology. In present study non neoplastic lesions accounts for 69 cases and neoplastic lesions accounts for 25 cases. The ratio between nonneoplastic and neoplastic thyroid lesions in this study is 2.76:1.

In the present study concordance between Fine Needle Aspiration Cytology and Histopathology is 92.6% which is significantly correlated with the other studies prevalent. In the present study we had True positive 11/94 cases, True negative 81/94 cases, False negative 2/94 cases. Sensitivity, Specificity, Diagnostic accuracy, Positive Predictive Value (PPV) and Negative Predictive Value (NPV) were calculated using the formulae. In the present study the total number of cases are 94 (N = 94) The number of cases that gave a positive report for malignancy on FNAC and were found to be malignant on Histopathological examination too were 11 cases (True Positive cases). The number of cases that gave a negative report for malignancy on FNAC but were found to be malignant on HPR are 2 cases (False Negative). The number of cases which were negative on both FNAC and HPR were found to be 81 cases (True Negative). The number of cases that were positive on FNAC but negative on HPR were found to be 0 cases (False Positive).

Conclusion

High rate of diagnostic accuracy can be achieved by use of ultrasound guidance with strict adherence

to adequacy criteria and meticulous examination of all the smears. In the present study the anatomy and the histological features of thyroid gland were studied and the origin of various malignancies from it. Various disorders of the thyroid gland comprising of the non-neoplastic lesion and the various neoplastic lesions are described. Through the present study, the correlation between Preoperative F.N.A.C. report and post-operative H.P.E. report was asserted and a significant correlation was seen. The incidence of Thyroid lesions is more common in females as compared to male population in all thyroid disorders. The incidence of malignancy is more common in the age Group 25 to 50 years of age.

Key messages

FNAC can be used as an alternative to histopathology in low resource settings.

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Retrospective Study on Patients Undergoing Laparotomy to Assess the Risk Factors of Re-Laparotomy

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Abstract

Introduction: Abdominal surgery that has to be redone in association with initial surgery is referred to as re laparotomy. Re-laparotomy is associated with 22 to 513% morbidity and mortality, therefore it's the final choice of surgery. The main aim of this study was to find out the incidence of re- laparotomy and to identify the risk factors i.e. predictors of re laparotomy in patients undergoing general surgery operations.

Materials and Methodology: This was a retrospective study involving 100 patients, done from 1st Jan 2016 till 1st June 2017 Patients with age more than 18 years, those requiring laparotomy for both general and trauma surgery were included. Those with initial laparostomy, with only flank drain placement, any Laparotomies during colostomy or ileostomy closure, those with Initial laparoscopic procedure, minimal invasive procedure like ultrasound guided drainage etc. Were excluded. Data was analyzed using SPSS Software. The Results were expressed in percentage. Associations were analyzed using chi-square or '*t*' test depending on outcome variables.

Results: The incidence of revision laparotomy in this study was 7% and the incidence of second revision laparotomy was 1%. The indications for relaparotomy were anastamotic leak 2/7 (20%), burst abdomen 2/7 (20%), pancreatic injury 1/7 (10%), bladder injury 1/7 (10%), negative laparotomy 1/7 (10%). The variables with significant *p*-value are systemic hypertension, COPD, CAD, intra-op and post-op inotoropic support, wound infection, wound dehiscence and intra-abdominal abscess. These data can thus be used in future to formulate a prediction scoring system.

Keywords: Laparotomy; Re-lapaprotomy; Post-op peritonitis; Burst abdomen.

Introduction

Laparotomy is the surgical incision into the abdominal cavity, for diagnosis or in preparation for major surgery. From its origins in a private house in the backwoods of Kentucky in 1807, a large number of patients undergo various operative procedures every day, out of which laparotomy forms a major proportion.

Abdominal surgery that has to be re-done in association with initial surgery is referred to as re laparotomy. Laparotomy has to be re done due to complications like biliary peritonitis, faecal fistula, anastamotic leak, burst abdomen etc. Of these, post-operative peritonitis and intra abdominalsepsis[1] are the most common cause. Clinical and haematological parameters and radiological evidence form the basis of re laparotomy. Incidence of relaparotomy differs accordingto patient characteristics, initial surgery and post-op care. The surgeon factors include hesitation to decide on second surgery, focus more on conservative treatment. Need for supervision under a qualified surgeon.[2] Despite developments in preoperative and postoperative

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care, surgical materials, and techniques, vigilant and vigorous management could help reduce the rate of redo laparotomies. However when how and what depends upon the individual surgeons dilemma.

The basic steps of laparotomy is to give a peritoneal lavage to drain abscesses or fluid collections, debride necrotic tissues and address the primary issue and close the abdomen or leave it open as laparostomy or bring a diversion like stoma. Relaparotomy, if needed at the correct time, could be life saving. When not performed it could also lead to death in spite of correctable hidden cause. With the advent of additional methods of diagnosis of post-op complications the fatality after re-laparotomy can be reduced. CT scans have proved to be accurate in detecting postop inflammatory lesion and percutaneous drainage can be done ifneeded.

Depending upon time, its goal and nature of urgency, re-laparotomy can be classified into early or late, radical or palliative, planned or unplanned.[3,4] Recognition of patients at high risk of relaparotomy after initial surgery has significant patient outcome. Redo laparotomy are called On demand[4,5] if laparotomy has to be redone because of patient condition. It is called planned[4,5] if the second laparotomy is decided upon during the course of first surgery itself. In case of severe intra abdominal sepsis or post damage limitation surgery. The planned strategy may lead to early detection of persistent peritonitis or a new infectious focus but harbors the risk of potentially unnecessary re-explorations in critically ill patients. The causes for re-explorations following emergency or elective laparotomy are obstruction, wound dehiscence, fistula, anastomotic leak, hemorrhage, post-op peritonitis, perforation, circumscribed and diffuse peritonitis without perforation and suture line insufficiency due to necrosis of pancreas and biliary peritonitis.[6]

The pathophysiology after a redo surgery is to trigger inflammatory response such as the release of cytokines like IL 6 leading to hypotension and inotropic support, multiple redo surgery have a cumulative effect resulting in SIRS which will worsen the prognosis this is one reason to avoid redo. The other effects of redo surgery includes alteration of coagulation profile by destruction of coagulation factors by proteolytic enzymes, renal failure and also multiple organ dysfunction.[7]

Opening of abdomen has its own consequences like adhesions, injury to blood vessel and hollow organs, ileus, wound dehiscence and malnutrition. Thus re-laparotomy is associated with increased morbidity and mortality, as high as 22% to 51.3%.[8] Therefore it's the final choice of surgery. The surgical treatment is primarily aimed at eliminating the source. Prognosis and outcome of these patients depend upon early diagnosis and timely intervention.

The main aim of this study wasto find out the incidence of re-laparotomy. To identify the risk factors/predictors of re laparotomy in patients undergoing general surgery operations. The primary objective of this study is to better define those patients who require further surgical management. It is often very difficult to decide which patient need operative intervention and which need careful observation on an already operated patient who has developed sepsis or SIRS eventually in intensive care for a prolonged period. To identify the risk group patients emphasis was placed on preoperative and intraoperative variables that would be available to the surgeon before abdominal closure of the initial laparotomy. A scoring system thus developed to assess patients at risk for re laparotomywill surely make it easier to decide whether to re-open or not. Thus Standardization in the approach to patients will help in making diagnosis, to take resuscitative measures and to rush to operating room.

Materials and Methods

This retrospective study done from 1st Jan 2016 till 1st July 2017 was based on data collected from the patients undergoing laparotomy in the department of general surgery at our institution. It is an observational study and the results are based on retrospective Analyzis. 100 patients from were recruited. The study participants were divided into two groups laparotomy and revision laparotomy group according to inclusion and exclusion criteria. Patients with Age more than 18 years, Patients requiring laparotomy, who underwent laparotomy for both general and trauma causes, were included. Patients with initial laparostomy, only flank drain placement, Laparotomies during colostomy/ ileostomy closure, Initial laparoscopic procedure, Minimal invasive procedure like ultrasound guided drainage etcwere excluded. The 100 consecutive laparotomies performed in between the year 2016 to 2017 were taken out of which the variables were entered in a datasheet and analyzed. The variables were selected in accordance with similar studies, the variables included were pre-op, intra-op and post-op characteristics. Pre-op characteristics: In pre-op

characteristics patient demographics, co morbids, personal habits, pre Anesthetic assessment in which ASA (American Society of Anesthesiologist-physical status classification) class were taken into consideration. Laboratory values like serum potassium and albumin were included Intra-op characteristics: Intra operative characteristics like intra-op findings, duration of surgery (<2 hours, 2 to 4 hours, >4 hours), intra-op blood loss (<500 ml, 500–1000 ml, >1000 ml), inotropic support, site of pathology (foregut, midgut, hindgut, multiple site), contamination of wound whether its clean, clean contaminated, contaminated or dirty. Post-op characteristics: Post-op variables include post-op inotropic support, ventilator support, number of days in intensive care, days spent in hospital, and complications relating to surgery like local and systemic complications. Factors like the type of incision, the ranking of operating surgeon and type of incision used were also included. All these variables were retrospectively collected from hospital information system and entered in data sheet, the data sheet was designed from similar studies in which new variables were included as per study requirements. The data was initially entered into a Microsoft excel data sheet. This was subsequently imported into SPSS 22. statistical software. Simple descriptive statistics were used for percentages. Univariate Analyzis were used to define the relationship between certain measured variables, Chi-square test was used to find significant *p*-value. The demographic details like age, sex were expressed in descriptive statistics. The incidence of laparotomy/relaprotomy is expressed as percentage. Relaprotomyis dependent variable. All the other variables are independent variable. The risk factors associated with re laparotomy was foundout by subjecting them to univariant Analyzis, each variable was tested using test of significance using chi-square test to look for significant *p*-value.

Results

This is an observational study conducted in department of general surgery, PSG hospitals Coimbatore. This is a retrospective Analyzis and the study period was 2016 to 2017. It was decided to take 100 laparotomies during the period of study. The following acute abdomen cases were included and the indications for re-laprotomy are shown in table. The 100 samples were selected according to inclusion criteria. The demographic details like age, sex were expressed in descriptive statistics. The incidence of laparotomy/relaprotomy is expressed as percentage. Relaprotomy is dependent variable. All the other variables are independent variable. The risk factors associated with re laparotomy was found out by subjecting them to univariant Analyzis, each variable was tested using test of significance using chi-square test to look for significant *p*-value. Of these 100 laprotomies totally 7 underwent relaparotomy. Thus the incidence of relaprotomy was 7% with 95% CI and one in those 7 patients under went a 2nd re-laparotomy. The incidence of 2nd relaprotomy was 1% with 95% CI. Only one second revision was done. The revision was done and the major cause of that is the anastomotic leak and burst abdomen.

The age range was between 18 to 85 and the mean age was 49.6. The male to female ratio was 7:3 showing male predominance. Male participants were more in both group when compared to women. Among the 68 males who underwent laparotomy, only 5 needed relaprotomy. Among the 25 females who underwent laparotomy, only 2 needed relaprotomy. 34 cases were ASA 1 (onecrevision laparotomy), 42 cases were ASA 2 (no revisions), 23 cases were ASA 3 (5 revision laparotomies), one patient was class 4, who underwent revision laparotomy. patient in laparotomy group belonged to ASA class 2 (42/93) and patients in relaparotomy group actively belong to ASA Class 3. Assesing the comorbid status, among the 100 patients, 26% of participants were hypertensives, 21 were diabetics, 12 had CAD, 11 had COPD, 1 had PVD, 16 had malignancy (1 ca breast, 1 ca cervix, 4 ca colon, 2 ca rectum, 1 ca stomach, 1 ca endometrium, 2 renal cell carcinoma with brain mets. 1 with recurrence), 2 underwent radiotheraphy. Among all of them, as per chi-square Analyzis for association with relaparotomy, SHT, CAD and COPD showed significant *p*-value (0.012, 0.036, 0.028) respectively. When the duration of surgery was categorised and taken into criteria it showed that 34/93 and 5/7 underwent surgery for 2 to 4 hrs, 51/93 and 1/7 underwent surgery for <2 hours and 8/93, 1/7 underwent surgery for > 4hrs. The *p*-values were 0.053, 0.106 and 0.494 respectively. The site of pathology contributing for laparotomy was also studied though it did not show any significant *p*-value, table shows that 30/93, 4/7 had pathology in forgut, 52/93, 3/7 had pathology in mid gut, 14/93, 1/7 had pathology in hindgut and 17/93, 2/7 patients had pathology in multiple sites. 30/93, 4/7 had pathology in forgut with a *p*-value of 0.224. Though a significant *p*-value was not obtained 4/7 patients in re laparotomy group predominantly had pathology in forgut. Classification of wounds were also taken as a variable but it also did not show any

significance, only 5/93 (5%0, 0/7 (0%) were clean wounds, 20/93 (20%), 1/7(1%) clean contaminated, 36/93 (36%), 2/7 (2%) were contaminated wounds, 34/93 (34%) & 4/7 (4%) were dirty wounds. The timing of surgery was also considered whether it was planned or elective to know the percentage of laparotomy being done as elective or emergency. It was found that 68/93 & 5/7 were the number of cases underwent emergency laparotomies 25/93 & 2/7 underwent elective surgery. Blood loss during surgery did not show any significance, 73/93 & 3/7 had blood loss <500 ml, 16/93, 3/7 had blood loss 500 to 1000 ml, 3/93 & 1/7 had blood loss between 1000–1500 ml and 1/93 & 0/7 had blood loss >2000 ml. The patients in the relaparotomy group predominantly has extended midline incision 5/7. Wound infection showed significant *p*-value in which 20/93 and 5/7 had wound infection, whereas 73/93 & 2/7 did not have infection. Wound dehiscence had a significant *p*-value where 10/93 and 3/7 had wound dehiscence, 83/93 & 4/7 did not have wound dehiscence. Intra-abdominal abscess showed a significant *p*-value of 0.04. 3/93 & 3/7 had abscess, whereas 90/93 & 4/7 had negative findings. The intra-op and post-op inotropic support had a significant *p*-value of 0.002 & 0.003 respectively, pre-op inotopic support were started in 7/93 & 4/7 patients, 86/93 & 3/7 did not require inotropic support. Post-op inotropic support were required in 15/93 & 5/7 and 78/93 & 2/7 did not require inotropic support. When studying the variables using pre-op, intra-op and post-op characters variables with significant *p*-value has been identified, in this retrospective study the factors with significant *p*-value are SHT, CAD, COPD, pre-op and post-op inotropic support, wound infection, abscess and wound dehiscence. (Table 1).

Table 1: Factors leading to re- laparotomy which were statistically significant

S. No	Patient characteristics	*p*-value
	Pre-op Characteristics	
1	Systemic hypertension	0.012
2	Coronary artery disease	0.036
3	COPD	0.028
	Intra-op Characteristics	
4	Ionotropic support	0.002
	Post-op Characteristics	
5	Ionotrophic support	0.003
6	Wound infection	0.010
7	Wound dehiscence	0.045
8	Intra abdominal abscess	0.004

The mean number of days spent in icu for laparotomy group was 2 days and the mean number of days spent in icu for revision laparotomy group was 11 days. The mean days spent in ventilator for laparotomy group and revision laparotomy group are 0.5 and 5 days respectively, the mean number of days spent in hospital for laparotomy group is 12 days and the mean number of days spent in hospital for revision group is 32 days. The expected post-op day in which the patient has undergone re do surgery is between 4th to 15th day. The lab values like serum k and albumin did not have any significant outcome. The other complications were non specific causes like alcohol withdrawal, ARDS, basal atelectasis, bed sores, burst abdomen, CHD stricture with pleural effusion, focal seizure, Hypokalemia, sepsis, shock, metabolic acidosis, paralytic ileus, pleural effusion, Pneumonia, Seizure and Type 2 respiratory failure. To know the laparotomy outcome the patient discharge status was considered and analyzed. 3/7 pts went home, 3/7 pts went Against medical advice, 1/7 needed LTAC (long-term assistance care). In total irrespective of the number of laparotomies 72/100 went home, 15/100 went against medical advice, 2/100 needed LTAC, 3/100 died. The rank of operating surgeon was considered in which 16/93 & 1/7 were performed by Senior residents, 43/93 & 3/7 by Assistant professor and 14/93, 3/7 by Professors, for 20 surgeries the details of surgeon were not available.

Discussion

PSG hospital is a tertiary care centre where it serves lakhs of people in and around Coimbatore district. Patient admission, operation details and discharge summary are recorded in computarized system. Incidence of relaparotomy in this study was 7%,

various studies have found different incidence rates in various scenarios which is as low as 1.9% (5) to as high as 24% (4), Incidence varies from study to study due to different variables and study design. 1/7 patient underwent initial surgery else where, 1/7 patient underwent 2 revision laparotomy. The indications for relaparotomy were anastamotic leak 2/7 (20%), burst abdomen 2/7 (20%), pancreatic injury 1/7 (10%), bladder injury 1/7 (10%), negative laparotomy 1/7 (10%), anastamotic leak and burst abdomen seems to be the leading cause of revision laparotomy in similar studies too[2]. The re exploration rate for anastamotic leak and burst abdomen were high while the re exploration rate for peritonitis, wound dehiscence or fistula was either low or not done[5]. This study has a good number of therapeutic relaparotomy indicating that all these patients abdomen were opened only for good. The incidence of negative revision laparotomy was only 10% (1/7), which coincides with a study conducted Matthias et al.[4] where in the incidence of negative revision laparotomy was 9%. The incidence of multiple revision laparotomy is 10% (1/7), the indications of revision laparotomy are more or less the same, the only difference is the incidence of each indication. The number of relaparotomy does not increase the significance it's the time of intervention which matters. The total number of relaparotomy was 7 in which 5/7 were performed in emergency set up. Many of the patients requiring repeat laparotomy in which the index surgery were done as emergency basis. Another study also shows that the maximum re laparotomies are taken as emergency surgery only. The number of planned relaparotomy were 2/7, emergency re laparotomy were 5/7. The percentage of emergency re laparotomy is consistent with a study conducted by Matthias et al. which is 85%.[7] The mean duration between laparotomies depends upon the index surgery, surgical technique and post-op factors and it varies according to ICU and hospital set up. In this study the mean duration between laparotomies were 8.85 days and it ranges from 4 to 15 day. The mean duration between first and second relaparotomy is 5 th day. This study was designed in such a way that the cause of relaparotomy and the factors leading to re exploration were analyzed by selecting variables, each variable starting from pre-op to intra-op and post-op were chosen and studied using univariant Analyzis, the significant variable with p-value < 0.05 was obtained which was consistent with other study. The pre-op factors included patient demographics and co morbids, the intra-op characters included were the site of pathology, duration of surgery, blood loss and inotropic support, where as the post-op characteristics included surgery related complications. Gender wise distribution of relaparotomy was higher in male patients which is comparable to similar study, the male:female ratio is 7:3, the male participants were more in both laparotomy and revision laparotomy group. The mean age of the participants was 49.6 (10) The mean age of participants were 50 with male dominance in a study conducted by Unalp HR et al. The pre-op factors with significant p-value are SHT, CAD, COPD. Systemic hypertension was present in 26%, diabetes mellitus was present in 21%, coronary artery disease was present in 12%, COPD was present in 11% and peripheral vascular disease was present in 1%. The percentage of CAD and COPD was found to be 21% and 14% respectively in a study conducted by Oddeke van et al. which is very well similar to this study. CAD with significant p-value was also found in a study conducted by Jerry J. Kim et al.[3] Intraopertive characteristics like site of pathology, classification of wound, duration of surgery, type of incision, blood loss and need for inotropic support were studied. When site of pathology was considered nothing was significant but majority in the group had forgut 30/93, 4/7. and 52/93, 3/7 midgut pathology and minority of the group had pathology in hindgut 14/93, 1/7-hindgut and multiple site 17/93, 2/7. Blood loss also was studied but it failed to show any significance but patients on intra-op inotropic support had significant p-value. The patient in laparotomy group had all types of midline incision whereas 5/7 had extended mid line incision. Among the 100 patients studied, 3 were clean cases, 19 were clean contaminated, 40 were contaminated and 38 were dirty.

Most of the above mentioned factors were studied by Jerry J Kim. et al. and the results were more or less the same. As per expectations complications related to revision laparotomy are high and our results were no different when post-op complications were analaysed it was found that wound infection, wound dehiscence[9] and intra -abdominal abscess had significant p-value which is consistent in a study conducted by Koirola et al.[5] The other post-op complications taken into account were pulmonary complications, septicaemia, dyselectremia, cardiovascular complications, stroke, tracheostomy, enterocutaneous fistula, laparostomy and others. 1/7 had tracheostomy and 2/7 had laparostomy in this study. The need for multiple laparotomies is associated with worse outcomes in terms of ICU care, ventilator dependency and increased hospital stay. The mean

number of days spent in ICU for laparotomy group was 2 days and the mean number of days spent in icu for revision laparotomy group was 11 days, The mean days spent in ventilator for laparotomy group and revision laparotomy group are 0.5 and 5 days respectively, the mean number of days spent in hospital for laparotomy group is 12 days and the mean number of days spent in hospital for revision group is 32 days. The expected post-op day in which the patient has undergone re do surgery is between 4th to 15th day and the mean post-op day was 8.7. The rank of operating surgeon was considered in which 16/93 & 1/7 were performed by Senior residents, 43/93 & 3/7 by Assistant professor and 14/93, 3/7 by Professors, for 20 surgeries the details of surgeon were not available. Junior two ranks performed majority of the index surgeries this is attributed to the staffing ratio of the hospital, whereas it was not possible. to bring out the leak rate or complications related to surgery. This has no impact on the study. What is shown here is emergency theatres which were performed by junior two consultants. Similar findings are shown in a study conducted by professor BFK Odimba et al. This forms a deficit in co-relation between experience of Surgeon and impact on surgical outcome, which can be focused upon in the next study. Thus 8 variables with significant *p*-value have be obtained and shown in the (Table 2).

Among the variables a minimum of 2 to a maximum of 6 variables were present in relaparotomy group.

Table 2: Significant variables noted in re-laparotomy

Sl. No	SHT	CAD	COPD	Inotropes pre-op	Inotropes post op	Infection	Dehiscence	Abscess	Total
1	1	0	0	0	0	1	0	0	2
2	1	1	1	0	1	0	0	0	4
3	1	1	1	0	0	0	1	1	5
4	0	0	0	1	1	1	1	1	5
5	1	1	1	1	1	1	0	0	6
6	1	0	0	1	1	1	1	1	6
7	0	0	0	1	1	1	0	0	3

Conclusion

Although repeat laparotomies create a huge stress for the patient in the post-operative period, due to lack of adequate pre-operative nutritional preparation, further worsened by the pathology from the disease/previous surgery, the need for re-laparotomy supersedes these risks in view of worsening clinical status of the patient. The decision for re-laparotomy has to be made by an experienced surgeon and with all relevant investigations needed without any time delay. The major result of our study was the incidence of revision laparotomy 7% and the incidence of second revision laparotomy was 1%. This was an observation study and the results were based on retrospective data available with which some significant predictors were obtained and the findings were observed in the other studies. The major limitation of this study can be overcome by randomized control trial which will have ethical consideration. Anyhow this study incidence was concordance with major studies and the scoring system should be developed with the important predictors listed.

Limitations

Among the patient demographics BMI and personal habits could not be studied as there were many missing data in patient records. Though alcohol usage and smoking have shown to be significant in a other studies since this study is retrospective correct information regarding personal details were not available. Burst abdomen was a major indication in our study. The suture material used for abdomen closure could have also been considered. The mortality rate could not be calculated as significant number of patients went AMA which could be due to increased financial constraints considering patient affordability they could not have been able to continue ICU treatment.

Recommendations

To develop a scoring system with the important predictors listed. All the necessary investigations and pre-op preparation has to be made once the decision for revision laparotomy has taken the patient has to be shifted to operating room without any time delay. Utmost post-op care has to be

given to prevent revision laparotomy associated morbidity and mortality.

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Original Research Article

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A Clinical Study of Use of Silver Nitrate in Chronic Wound Management

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Abstract

Context: More and more silver based products are becoming available and therefore it is necessary to prove beyond doubt the effectiveness of these products by research

Aims: To study effects of use of Silver Nitratein healing of chronic wound

Settings and design: Longitudinal observational study was carried out in a tertiary care academic hospital.

Methods: 100 Patients were recruited as cases using inclusion and exclusion criteria. Age, Gender, Occupation and Detailed history pertaining to Pain associated with wound, discharge from wound, site of wound, and duration of wound. Clinical examination was done. Local examination and Investigations were carried out.

Statistical Analyzis: Data was coded and analyzed in statistical software, STATA version 10.1, 2011. Descriptive statistics like mean and standard deviation were calculated to summarize continuous variables. Frequency and percentages were used to summarize categorical variables. *p*-value < 0.05 was considered statistically significant.

Results: Most common etiology was trauma (61%) followed by infections. 33 had diabetes out of which 16 were above 60 years. 64 patients healed completely on Silver Nitrate dressing only with varied time of duration and 36 patients have required Split Thickness Skin grafting. 9 patients had wound of size 1–3 cm, 27 patients had 4–5 cm, 28 patients had 6–7 cm, 30 patients had 8–10 cm and 06 patients had 11–12 cm. 8–10 cm was most common wound size. Patients with wound size ≤ 7 cm has successfully healed with Silver Nitrate dressings only but patients with wound size >7cm required STSG. Wound with size >7 cm when managed with Silver Nitrate dressings it is found to have increased duration of hospital stay.

Conclusion: It is concluded that Silver Nitrate is found to be very effective in early healing of chronic wound.

Keywords: Clinical study; Silver nitrate; Chronic; Wound, Management.

Introduction

It is the time since 18th century that silver has been used in the management of the wounds. Silver nitrate use has since been documented for the wound treatment successfully.[1]

The mechanism of action of silver ions that they kill the microbial was recognized in the 19th century. US Food and Drug Administration (FDA) accepted the colloidal silver as a method of choice in the treatment of the wounds. US Food and Drug Administration (FDA) found that silver nitrate was very useful in the treatment of the wounds in 1920.[2]

But in 1940 with the introduction of penicillin as an effective antibiotic, use of silver nitrate diminished. As penicillin was very effective and gave results very fast use of silver nitrate reduced overall. It took another 20 years to start the use of silver nitrate in 1960 when it was being used in the

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management of wounds due to burns. This time it was being used as 0.5% of silver nitrate solution.[3]

In 1968, silver sulfadiazine cream was being used which was a combination of silver nitrate with sulphonamide antibiotic. This gave rise to the use of broad spectrum antibacterial activity in the management of the wounds. This cream was commonly used for the management of wounds which were occurred due to the burns.[4]

Now a day due to increasing resistance of the bacteria to the drugs, wound dressings has been done with different proportions of silver nitrate by the clinicians. This action is very natural as the bacteria have been acquiring the resistance to the antibiotics.[5] Now a days there are a variety of options available related to the proportions of the silver nitrate like for example, acticoat and actisorb to mention a few. They offer a greater range of treatment options and give flexibility to the treating clinicians in the management of the infections. They are used to stimulate the healing in wound that is indolent. They can also be used as protective use for those at risk of acquiring the wound infections and also can be used in managing the wounds that have been critically colonized.[6]

Catheters used in urinary as well as vascular structures are also now silver based. Thus more and more silver based products are becoming available and therefore it is necessary to prove beyond doubt the effectiveness of these products by research.[7]

Hence present study was carried out to study effects of use of Silver Nitratein healing of chronic wound, to study the advantages and disadvantages of using Silver Nitrate on chronic wounds and to study the impact of silver nitrate on duration of hospital stay.

Materials and Methods

The present study was carried out in a tertiary care academic hospital from September 2017 to August 2019 over a period of 2 years as an obligation for MS degree in General Surgery.

Study Design

The present study was a tertiary care hospital based longitudinal observational study on a sample size of 100 patients.

Study Population

The study population was all patients with chronic wounds admitted in the hospital.

Study Subject

Patients were recruited as cases using the below mentioned inclusion and exclusion criteria

Inclusion Criteria

1. Patients above age of 18 yrs.
2. Patients of all healing and non healing wound.
3. Patients of all diabetic wounds, neuropathic wounds, bed sores and burn wounds.
4. Patients of post-operative chronic wound.

Exclusion Criteria

1. Patients less than 18 yrs of age.
2. Patients not willing for study.

Sample Size

Sample size 100 Patients are to be studied based on medical record statistics of last 3 years before starting the study. Final sample turned out to be 100 based on the inclusion and exclusion criteria of total patients during the study period.

Ethical Clearance

The study was granted by the institutional ethical committee of the tertiary care institute and the concerned university authorities.

Study Factors

Using a proforma the following study factors were studied and data recorded was entered into an excel sheet and analyzed using statistical software STATA version 10.1, 2011.

Demographic factors

Age: (in years at the time of presentation of disease was recorded as a continuous variable).

Occupation: involving prolonged standing has an important role in causation of chronic leg wound (present occupation of the patient noted)

Detailed history

1. Pain associated with wound, discharge from wound, site of wound, and duration of wound.
2. Cause of wound: Traumatic, Infective, Vascular insufficiency, Malignant Ulcer, Chronic Burn Wounds.

3. Associated conditions: Anemia, diabetes, hypertension, rheumatoid arthritis and sickle cell disease.

Clinical examination

Following parameters were recorded at the time of presentation of Chronic wound to tertiary care centre.

1. Pulse rate per minute
2. Blood pressure in millimetre of mercury (right brachial artery),
3. Body temperature in Fahrenheit (F0) at the time of presentation

Local examination

The Patients were examined in an examination room in day light, after completely exposing the part of body involving wound.

Following points were noted in proforma.

1. Exact site of wound
2. Number of wound/s
3. Size of wound
4. Edges of wound
5. Floor of wound

On palpation of wound following parameters were noted:

1. Tenderness at the site of wound
2. Induration of base and surrounding area of wound

Investigations

Biochemical Studies

The patients were subjected to appropriate investigations like complete blood counts (Hb gm%, total leucocyte count and platelets), blood sugar (fasting and post meal).

Microbiological Assessment

Pus/Discharges from wounds were sent for culture and sensitivity and gram staining at the time of presentation to the tertiary care institute.

Colour Doppler study of lower limb vessels was done in patients with suspected Vascular Disease of lower extremity.

X-ray of affected leg to rule out any bone involvement in clinically suspicious cases. Wound with duration of more than 6 months and not responding to conservative treatment and wounds which were clinically suspicious of malignancy were biopsied from the edge of the wound.

Liver function test, kidney function test and seropositive status (HIV/HBsAg) as a part of routine pre Anesthetic work up. Electrocardiograph (ECG), X ray chest and echocardiography (if required) was done to assess the cardiorespiratory status of selected old age patients with history of cardio respiratorydiseases. Appropriate advice was taken from physician for cardiorespiratory diseases and diabetes whenever indicated.

Patients with chronic wound were treated depending on the cause of wound and they were followed up for healing of the wound, reduction in size of wound, or flaring up of the wound. Silver nitrate solution was sprayed with the help syringe in a dose of 1 ml/cm^3 daily once.

Outcome factors of the study

1. Complete healing of wound in terms of management
2. Reduction in size of wound
3. Infection or recurrence of wound

Statistical Analyzis

Data was coded and analyzed in statistical software, STATA version 10.1, 2011. Descriptive statistics like mean and standard deviation were calculated to summarize continuous variables. Frequency and percentages were used to summarize categorical variables.

p-value < 0.05 was considered statistically significant.

Implication of the study

1. Identification of different aetiological factors for chronic wound, different types of chronic wound.
2. Identification of different associated co morbid condition existing with chronic wound.
3. Different plans of treatment based on aetiological factors.

Results

Table 1 shows number of patients according to age. Total 100 patients were studied in this study out of which most common age group is above 60 years of age. Mean age for study is 54.

Table 1: Number of patients according to age

Age group (years)	No. of patients
<30	10
31–40	16
41–50	15
51–60	15
>60	44
Total	100

Table 2 shows sex Incidence. Total 100 patients were followed with Silver Nitrate dressing out of which 79 were male patients and 21 were female patients.

Table 2: Sex Incidence

Sex	No. of patients
Male	79
Female	21
Total	100

Table 3 shows number of patients according to Etiology. Most common etiology among study group is of Traumatic origin and second most common etiology is of Infectious origin. Out of 100 patients 61 patients are of Traumatic origin, 32 patients are of Infectious origin, 1 patient is of vascular insufficiency, 1 patient of malignant ulcer and 5 patients are of Burn.

Table 3: Showing number of patients according to Etiology

Etiology	No. of patients
Traumatic	61
Infectious	32
Vascular insufficiency	01
Malignant	01
Burns	05
Total	100

Table 4 shows number of Diabetic patients according to Age. Diabetes is an essential factor affecting healing of wound and hence affects the duration of hospital stay of patients managing with Silver Nitrate dressings. Among the sample size of 100 patients, 33 were having diabetes mellitus with 16 patients having age above 16.

Table 4: Showing number of Diabetic patients according to Age

Age	No. of patients
<30	2
31–40	5
41–50	6
51–60	4
>60	16
Total	33

Table 5 shows number of Traumatic patients according to Age. Among sample size pf 100 patients, 61 patients have developed wound due to traumatic cause. 23 patients out of 61 are found to be above 60 years of age.

Table 5: Number of Traumatic patients according to Age

Age distribution	No. of patients
<30	5
31–40	12
41–50	9
51–60	12
>60	23
Total Patients	61

Table 6 shows number of Traumatic patients according to Age. Out of 100 patients treated with Silver Nitrate dressing 64 patients have healed completely on Silver Nitrate dressing only with varied time of duration and 36 patients have required split thickness skin grafting.

Table 6: Number of Traumatic patients according to Age

Age distribution	No. of patients
<30	5
31–40	12
41–50	9
51–60	12
>60	23
Total Patients	61

Table 7 shows number of patients and treatment underwent. Out of 100 patients treated with Silver Nitrate dressing 64 patients have healed completely on Silver Nitrate dressing only with varied time of duration and 36 patients have required split thickness skin grafting.

Table 7: Showing number of patients and treatment underwent

Treatment modality	No. of patients
Silver Nitrate	64
STSG	36

Table 8 shows average duration of hospital stay according to size of wound. Duration of hospital stay have been observed among sample size of 100 patients according to the size of wound as following: Average duration of hospital stay for wound size of 1–3 cm was 13.9 days, for wound size of 4–5 cm was 20 days, for wound size of 6–7cm was 28.75 days, for the wound size of 8–10 cm was 32.67 days and for the wound size of 11–12 cm was 35.83 days.

Table 8: Showing average duration of hospital stay according to size of wound

Size of wound (in cm)	Average Duration of hospital stay in Days
1–3	13.9
4–5	20.00
6–7	28.75
8–10	32.67
11–12	35.83

Table 9 shows duration of healing in days with number of patients. Average duration of wound healing with Silver Nitrate dressings is found to be 10–15 days for 15 patients, 16–20 days for 14 patients, 21–25 days for 16 patients, 26–30 days for 32 patients, 31–35 days for 17 patients, 36–40 days 2 days, 41–45 days for 4 patients.

Table 9: Showing-duration of healing in days with number of patients

Duration of wound healing in days	No. of patients
10–15	15
16–20	14
21–25	16
26–30	32
31–35	17
36–40	2
41–45	4

Table 10 shows patients distribution according to size of wound. Out of total sample size of 100 patients 09 patients were found to have wound of size 1–3 cm, 27 patients were found to have wound of size 4–5 cm, 28 patients were found to have wound of size 6–7 cm, 30 patients were found to have wound to have size of 8–10 cm and 06 patients were found to have wound of size 11–12 cm. 8–10 cm were most common wound size group of study.

Table 10: Showing patients distribution according to size of wound

Size of wound	No. of patients
1–3 cm	09
4–5 cm	27
6–7 cm	28
8–10 cm	30
11–12 cm	06
Total	100

Table 11 shows duration required for wound healing according to size of wound. Duration of wound healing has been observed among sample size of 100 patients according to the size of wound.

Duration of wound healing was found to be 14.1 days for wound size of 1–3 cm, 20.18 days for wound size of 4–5 cm, 29.17 days for wound size of 6–7 cm, 33.17 days for the wound size of 8–10 cm, 35.83 for the wound size of 11–12 cm.

Table 12 shows formation of Pink Granulation Tissue on Day 10 according to size of wound. Out of 100 patients of study sample, 97 patients formed pink granulation tissue on Day 10 of Silver Nitrate dressing. Out of these 97 patients, 8 patients of size 1–3 cm, 27 patients of size 4–5 cm, 26 patients of size 6–7 cm, 31 patients of size 8–10 cm and 5 patients of size 11–12 cm formed pink granulation tissue respectively on Day 10 of Silver Nitrate dressing.

Table 12: Formation of Pink Granulation Tissue on Day 10 according to size of wound

Size in cm	Day 10			Total
	0	2	3	
1–3	1	0	8	9
4–5	0	0	27	27
6–7	0	1	26	27
8–10	0	0	31	31
11–12	0	1	5	6
Total	1	2	97	100

Discussion

Majority of the study subjects were in the age ranging above 60 years followed by 30 to 40 years and 50 to 60 years.

Total 100 patients were followed with Silver Nitrate dressing out of which 79 were male patients and 21 were female patients. In present study percentage of male population (79%) was higher than that of female population (21%) in each age group.

Most common etiology among study group is of traumatic origin (61%) and second most common etiology is of infectious origin (32%).

Out of 100 patients 61 patients are of traumatic origine, 32 patients are of infectious origin, 1 patient is of vascular insufficiency, 1 patient of malignant ulcer and 5 patients are of burn

Diabetes is an essential factor affecting healing of wound and hence affects the duration of hospital stay of patients managing with Silver Nitrate dressings. Among the sample size of 100 patients, 33 were having diabetes mellitus with 16 patients having age above 16.

With the use of Silver Nitrate dressings diabetic wound has shown good response as much as like

non diabetic patients.

With the use of Silver Nitrate dressing there is delay of 4–5 days in healing of diabetic wound is found than healing of non diabetic wound within each age group.

Use of Silver Nitrate dressings has healed 64 patients wound out of 100 sample sizes and only 36 patients' required secondary management with STSG.

Patients with wound size less than or equal to 7 cm has successfully healed with Silver Nitrate dressings only but patients with wound >7 cm required STSG accordingly.

Wound with size >7cm when managed with Silver Nitrate dressings it is found to have increased duration of hospital stay.

Average duration of wound healing with Silver Nitrate dressings is found to be 10–15 days for 15 patients, 16–20 days for 14 patients, 21–25 days for 16 patients, 26–30 days for 32 patients, 31–35 days for 17 patients, 36–40 days 2 days, 41–45 days for 4 patients.

Average duration of hospital stay for wound size of 1–3 cm was 13.9 days, for wound size of 4–5 cm was 20 days, for wound size of 6–7cm was 28.75 days, for the wound size of 8–10 cm was 32.67 days and for the wound size of 11–12 cm was 35.83 days

Duration of wound healing has been observed among sample size of 100 patients according to the size of wound.

Duration of wound healing was found to be 14.1 days for wound size of 1–3 cm, 20.18 days for wound size of 4–5 cm, 29.17 days for wound size of 6–7 cm, 33.17 days for the wound size of 8–10 cm, 35.83 for the wound size of 11–12 cm.

Out of 100 patients of study sample, 97 patients formed pink granulation tissue on Day 10 of Silver Nitrate dressing.

Out of these 97 patients, 8 patients of size 1–3 cm, 27 patients of size 4–5 cm, 26 patients of size 6–7 cm, 31 patients of size 8–10 cm and 5 patients of size 11–12 cm formed pink granulation tissue respectively on Day 10 of Silver Nitrate dressing.

Tredget EE et al.[7] observed from their study that removal of dressing with acticoat was having less pain compared to the removal of the dressing with silver nitrate. But the application pain was comparable. Ease of use comparison between the silver nitrate and the acticoat was also comparable. But the acticoat dressing provided better protection from bacterial infections compared to the silver nitrate dressing of the wounds. Secondary bacterial infections rate was also low with the acticoat dressing compared to the silver nitrate dressing of the wounds. Thus the authors concluded that acticoat was better than silver nitrate.

Muangman P et al.[8] compared to groups which were similar for age and TBSA. Both the groups were found to be comparable in terms of infection of the wounds and also the LOS as the *p*-value was more than 0.05. Topical as well as systemic treatment using antibiotics was found to be very successful. Split thickness skin graft was better in 1% AgSD group in comparison to patients in the acticoat group but there was no statistical difference. Acticoat group patients have shown statistically significant low pain scores compared to the other group.

Brown M et al.[9] compared two groups of patients i.e. acticoat and aquacel and found that both the groups were comparable in terms of epithelisation on 10th day. Both the groups did not show significant adverse effects. Number of changes in the dressings was less in aquacel group patients. Author found that both types of dressing were effective. But concluded that aquacel Ag dressing was superior to acticoat.

Caruso DM et al.[10] also found that Aquacel Age dressing group patients experienced less pain as well as anxiety, required changes of dressings less, less time for nursing, burning was less. There was more flexibility with the silver sulfadiazine and also the movement ease was less. It was also cost effective.

Huang SH et al.[11] studied 20 patients. They found that Aquacel Ag with Vaseline gauze the patients in theirgroup had less score of the visual analog scale when compared to the patients with SSD group. This difference was found out to be statistically significant. Labor cost was also significantly lesser in aquacel Ag group.

Conclusion

It is concluded that Silver Nitrate is found to be very effective in early healing of chronic wound. Advantage of using Silver Nitrate as dressing solution is that Small wounds of size less than or equal to 7 cm healed completely with use of Silver Nitrate dressings without the need of skin grafting. Use of Silver Nitrate dressings for large wounds greater than 7 cm size helped in early formation of healthy granulation tissue for grafting purpose.

We also found that overall healing rate, graft survival and patient compliance were better with the use of Silver Nitrate dressings. Disadvantage of using Silver Nitrate as dressing solution is that it is expensive solution as compared to other dressing solutions. When not used appropriately and judicially silver nitrate solution causes hyper granulationin some patients it also caused burning sensations. Silver Nitrate showed faster healing of chronic wound, therefore overall hospital stay of chronic wound patient was reduced when Silver Nitrate was used for wound dressings.

Key messages:

Silver nitrate can be used in the management of the wounds

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Case Report

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Asymptomaic Infected Hepatic Hydatid Cyst: An Unusual Presentation

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Abstract

Hydatid cyst disease is a common worldwide zoonosis. Most of the cysts are located in the liver. Abscess formation due to infection of the hydatid cyst is an important complication. Pyogenic hydatid cyst of liver are extremely rare. We report a case of solitary, hydatid cyst in the liver with secondary infection. A 14-year-old female was admitted to our hospital with chief complaints of abdominal pain in the right upper quadrant and loss of appetite. Physical examination revealed a mass filling the right-upper quadrant. Diagnosis was made of hydatid cyst was on the basis of ultrasonography and computed tomography. Course of 21 days of albendazole was given preoperatively and patient was taken for surgery. During operative procedure on opening the cyst cavity, about 1 litre of pus came out along with daughter cysts, biliary communication was not found and pericystectomy was done. Patients condition improved and was discharged on 8th post-operative day.

Keyword: Hepatic Hydatid Cyst; Pericystectomy; Abdominal pain.

Introduction

Hydatid cyst is a parasitic disease which is distributed worldwide. Seventy five percent of all hydatid cysts are hepatic. Patients may remain asymptomatic for years and usually present with nonspecific complaints. However any hydatid cyst at any time can undergo any complications which can be life threatening unless treated early.[1] Although hepatic hydatid cysts can be treated by surgery,[1,2] chemotherapy,[3] percutaneous aspiration,[4,5] surgery still remains the mainstay of treatment. For entire spectrum of disease surgery is the only treatment which is applicable.[6]

Case report

A 14-year-old female was admitted to the Shaheedhasan khan mewatigovenment medical college, nalhar, nuh, haryana with complaints of loss of appetite and right upper quadrant abdominal pain. Patient was afebrile with pulse rate of 86 beats/min, respiratory rate of 20 breaths/min and blood pressure of 110/70 mm Hg. Abdominal examination revealed a mass filling the right-upper quadrant and extending down to umbilicus.

Laboratory findings were as follows: total white cell count 7400 cells/cu mm, haemoglobin 9.7g/dL, platelet 1.68 lakh/cu mm, blood urea 43.3mg/dL, creatinine 1 mg/dL, aspartate aminotransferase 120U/L, alanine aminotransferase 87.2U/L, alkaline phosphatase 2344.3 U/L, total bilirubin-0.8 mg/dl, bilirubin conjugated-0.5 mg/dl, bilirubin unconjugated-0.3 mg/dl and absolute eosinophil count- 296/cumm. Ultrasonography (USG) of the abdomen revealed multiple cysts of variable sizes in liver largest of size 78 mm.

Computed tomography (CT) was suggestive of large multiloculated cystic lesion with

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peripheral calcification seen in segment 4a and 4b of liver measuring approximately 15.3 × 11.4 × 14.5 cm (Fig. 1). The lesion was displacing the portal confluence and right and left portal veins posteriorly. Liver was enlarged in size and measured 21.57 cm in craniocaudal axis (Fig. 2). Impression was Hydatid cyst. Patient was given 21 days course of albendazole and then was taken for surgery. Intraoperatively on opening the cyst about 1 litre of frank pus came (Fig. 3) along with daughter cysts and no biliary communication was found (Fig. 4).

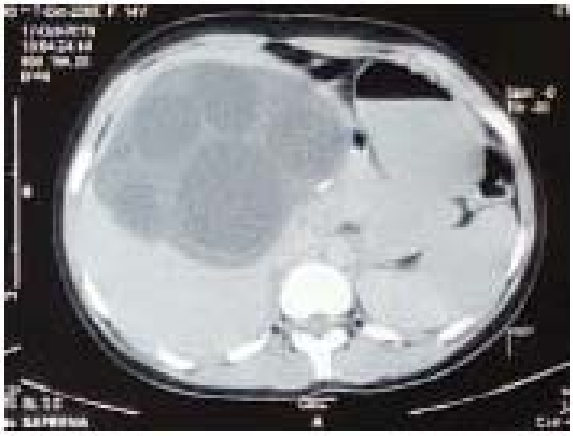

Fig. 1: Large multiloculated cystic lesion with peripheral calcification seen in segment 4a and 4b of liver.

Fig. 2: Lesion was displacing the portal confluence and right and left portal veins posteriorly. Liver was enlarged in size and measured 21.57 cm in craniocaudal axis.

Fig. 3: Opening the cyst about 1 litre of frank pus came.

Fig. 4: Pericystectomy was done along with Cholecystectomy.

Pericystectomy was done along with cholecystectomy. Pus was sent for culture and senstivity. Intravenous ceftriaxone 1g and metronidazole 500 mg were given post-operatively the drain removed on 6th postop day and was switched to oral antbiotic thereafter. Patient was discharged on 8th post-operative day in satisfactory condition.

Discussion

Liver Hydatid cysts are usually asymptomatic but sometimes severe complications and even death can occur due to the rupture of the cyst. Small cysts which are calcified and lesions which are serologically negative can be followed up without any surgical intervention.[7]

The cyst-bearing lobes can be atrophied because of the pressure effect of cyst itself, or its pressure on portal vein or biliary channels. Liver abscesses can be the presentation of hydatid cyst once it get infected. Percutaneous puncture of such infected cyst may lead to intraperitoneal dissemination of the infection so its diagnosis is very important and puncture of such infected cyst should be avoided. Surgery remains the treatment of choice for hepatic

hydatid cyst with complications that is primary and secondary suppuration.[8]

Specific management and long-term outcome of primarily infected hydatid cyst of the liver has not been evaluated extensively. This complication has been reported in the literature as occurring in about 5% to 40% of patients.[9] Most of primarily infected hydatid cyst are discovered intra-operatively because history of travel to an endemic area and presence of eosinophilia are not very much impressive in most of the cases. Often symptoms and signs are not specific and severe disease may occur followed by benign course.

A number of factors are thought to be responsible for benign clinical presentation of hepatic hydatid cyst in some patients like small cystobiliary communications that leads to partial decompression of cyst, low virulence of the infectious agent and presence of pericyst, which prevents the spread of infection to the liver parenchyma. Most characteristic clinical manifestation are- pain right upper quadrant of abdomen along with fever. In hydatid liver abscesses number of abnormal laboratory findings may be found. The nonspecific white blood count elevation is usual and the sensitivity of eosinophilia or specific serological tests is low due to dead parasite, reduced absorption of the antigen, and impaired immune reaction.[10]

Various imaging techniques are used for differential diagnosis of hydatid cyst. Chest or/ and right upper quadrant X-ray films or isotopic scanning are valuable diagnostic tools. Presence of hepatic calcification, right pleural effusion, atelectasis, elevated hemidiaphragm or right upper-quadrant air-fluid level on plain X-ray are some of the non specific findings of hepatic hydatid cyst. Liver scans are useful (sensitivity varying from 80% to 97%), but the etiology of the liver image filling defect can not be assessed with liver scan.

More recently, USG (sensitivity 85% to 95%), CT (sensitivity 95%) and Magnetic resonance imaging (MRI) have been utilized. Depending on the user experience and technique, diagnostic accuracy of ultrasound reach close to 90%. This is presently the screening method of choice, due in part to accessibility even in small, rural medical centers, cost containments, and portability of the device.[11] Ultrasound is not only helpful for diagnosis, but also useful in post-treatment monitoring. On Ultrasonography hydatid cyst can be seen as cystic lesion or solid appearing pseudotumors.

Daughter cysts and water lily signs are characteristic signs of hydatid cyst but they are not always present. Calcification can also be seen. Calcification can cause death of hydatid cyst, but calciation does not always mean that the cyst is dead.[12] CT features of hydatid cyst are; well-defined, hypoattenuating lesion with a distinguishable wall. For better demonstration of the pericyst, matrix, and daughter cysts MRI is better option than CT because of its better resolution on both T1 and T2 images.

Most of the times primarily infected hydatid cysts, present as typical liver abscesses but sometime presence of peripheral calcification can reveals the diagnosis. During preoperative period imaging techniques are used for evaluation of extra hepatic disease, detailed hepatobiliary anatomy and rupture of a cyst. These techniques are also useful in the post-operative follow-up. Open surgery remains the treatment of choice for the primarily infected hydatid cyst of the liver.[13]

During exploration, avoid spillage, inactivate/ sterilize the cavity, and select the appropriate management of the residual cavity. Depending on number of cysts, location of cysts, and their connection with adjacent structures surgical approach can be transperitoneal or retroperitoneal. Whatsoever be the approach, incision should be lenghthy enough, so that whole of the hepatobiliary system and its surrounding structures can be dealt easily through this single incision.

During exploration it is adviced to first aspirate the cyst and that too at its most superficial point, in closest proximity of liver capsule. Explaination for this aspiration is that by doing this we are preventing the exposure of healthy liver tissue to infective purulent material. Since the introduction of antibiotics/scolicidals, the improvement in surgical techniques and the management of seriously ill patients, the transperitoneal approach has become the gold standard, as it gives the additional advantages of being able to drain all infected hydatid cysts, irrespective of size and location within the liver, and of allowing a thorough exploration of the abdomen.

For appropriate exposure of biliary tract, common bile duct and for incidental cholecystectomy, which sometimes can be required, abdominal approach is best suited. For management of ''difficult'' encapsulated abscess cavities and to demonstrates the most direct route for puncture wide exposure of diseased part is a rule. Based on the existing literature and on our own experience, there is a relative diagnostic and treatment algorithm preoperatively and post-operatively.

Localized inflammatory process causes minimal signs and symptoms which make the diagnosis of primarily infected hepatic hydatid cyst extensively difficult. A lengthy incision is used in most of the open surgical exploration of hydatid cyst because it avoid healthy liver tissue to come in contact with infected purulent material. External drainage of the infected cyst should always a priority of surgeons while carrying an exploration of cyst. With early diagnosis, proper use of chemotherapeutic agents and attentive perioperative management the outcome of surgical treatment can be improved.

Since the chances of anaphylaxis and peritoneal seedling are more with PAIR or laparoscopic surgery so open surgery is still the main treatment modality for managing a complicated hydatid cyst.

Conclusion

Complications occurring in hydatid cyst are responsible for its clinical presentation otherwise, even being a worldwide zoonosis, it mostly remains asymptomatic. It is rare for he infected hydatid cyst to remain asymptomatic.

Surgery, chemotherapy, PAIR are the treatment options available for hepatic hydatid cyst but surgery is the management of choice for infected hydatid cyst.

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Case Report

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Non Functioning Paraganglioma of the Urinary Bladder Presenting as Micturition Syncope

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Abstract

Syncope is a clinical presentation which is a transient loss of consciousness for a short period of time. Micturition (or post-micturition) syncope is fainting during or immediately after micturition due to a severe drop in blood pressure. Micturition syncope is most common in elderly men and usually occurs at night after a deep sleep.

Paraganglioma of the urinary bladder are tumors of chromaffin tissue originating from the sympathetic innervations of the urinary bladder wall and are extremely rare. Paraganglioma of the urinary bladder is one of the causes of micturition syncope in early postmenopausal women who usually present with severe dysuria, hypertension and post-micturition syncope with elevated Plasma and Urinary metanephrine levels.

In our case it is a silent paraganglioma of the urinary bladder that presented only with severe dysuria, hypertension and post-micturition syncope with normal Plasma and urinary catecholamine levels.

In this report we analyse the clinical presentation, investigations and management of bladder pheochromocytoma.

Keywords: Micturition syncope; Bladder pheochromocytoma.

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Introduction

The micturition syncope occurs immediately after or during urination and was first reported by Rugg-Gunn in 1946. The main reason for this syndrome is the vasodilatation and decreased vascular resistance due to vaso-vagal reflex related to urination.

Paraganglioma is an extra adrenal site of pheochromocytoma. It is reported to account for 10% of pheochromocytomas, and 10% of cases occur in the bladder. Vesical Paraganglioma is a very rare disease and accounts for 0.06% of all bladder tumors.[1,2]

Paraganglioma of the urinary bladder are extremely rare and are usually functional and symptomatic. In our case it is a silent paraganglioma of the urinary bladder that presented only with severe dysuria, hypertension and post-micturition syncope with normal Plasma and urinary catecholamine levels.

Case Report

A 48-year old post menopausal woman presented with severe dysuria and recurrent post-micturition syncope for 2 months. Physical examination was unremarkable. Urine Analyzis showed plenty of red blood cells and few pus cells hence Urine culture was done which did not grow any microorganisms.

Ultrasound KUB demonstrated a homogenous mass in the Right lateral wall of the bladder, measuring 2.5 × 2.0 cms (Figs. 1,2).

Figs. 1,2: USG KUB.

MRI Pelvis was done which showed a 3 × 2 cms growth in the right lateral wall of the urinary bladder (Fig. 3).

She was on alpha and beta blockade for 14 days on an outpatient basis for hypertensive crisis. In view of post-micturition syncope, urinary catecholamine levels were estimated and were found to be within normal limits. Urine cytology was negative.

Fig. 3: MRI Pelvis.

Cystoscopy revealed a smooth, well-vascularized mass on the Right lateral wall of the bladder, close to the ureteric orifice. In view of the tumour located near to the right ureteric orifice patient underwent Partial Cystectomy with complete excision of the vesical mass (negative frozen section) and Right Ureteric re-implantation in view of its proximity to the Right ureteric orifice. During handling of the bladder mass intraoperatively, the patient became severely hypertensive. Her blood pressure raised up to 280/180 mm Hg and pulse rate dropped to 38/min. Intraoperatively the Hypertensive crisis was managed with intravenous beta blockers and atropine. Postoperative recovery was uneventful and she was weaned off the antihypertensive medications.

Histopathology showed bladder wall lined by attenuated transitional epithelium overlying a well circumscribed, encapsulated neoplasm composed of cells arranged in organoid nests and alveolar pattern. The cells were round to oval with vesicular nuclei, mild pleomorphism, fine chromatin and inconspicuous nucleoli (Fig. 4). Many of the cells showed fine granular eosinophilic to clear cytoplasm (Fig. 5). The thin stroma in between the cells showed thick walled capillaries and mild inflammation. HPE report was consistent with bladder pheochromoctoma with deeper tissues showing no evidence of tumor.

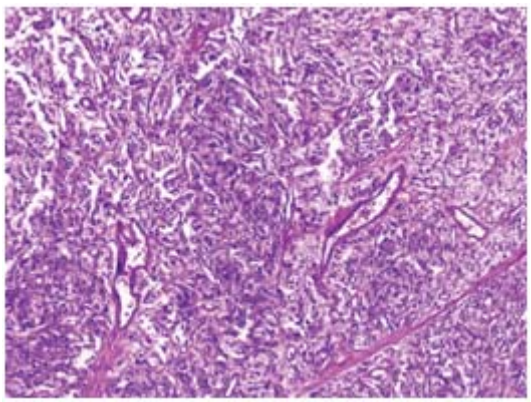

Fig. 4: Bladder wall with organoid nests of tumor cells (H&E 40x).

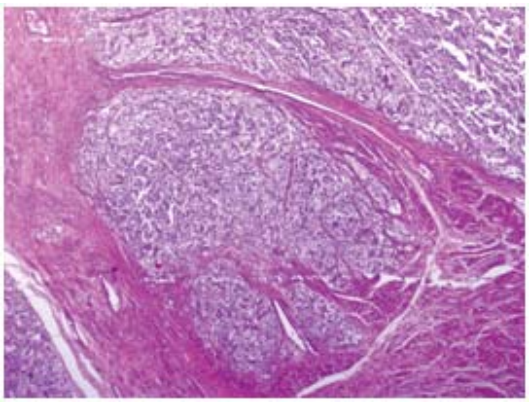

Fig. 5: Tumor cells with abundant granular cytoplasm, mild pleomorphism and fine chromatin (H&E 40x).

Immunohistochemistry Report

- The neoplastic cells expressed strong cytoplasmic staining for Synaptophysin and NSE.
- Most of the cells were S100 positive.

Patient is on regular follow-up with physical examination, plasma and urinary metanephrine levels, Ultrasonography and Cystoscopy. For the past 12 months, on follow-up, there is no tumor recurrence and no antihypertensive medications.

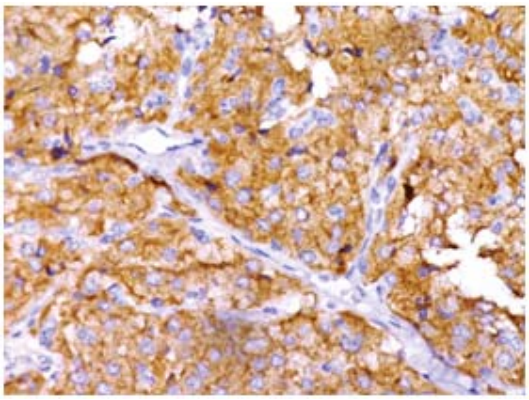

Fig. 6: Neoplastic cells expressing strong cytoplasmic staining with synaptophysin (IHC: 40x).

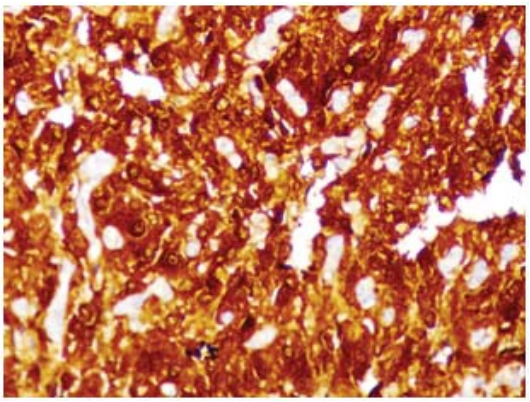

Fig. 7: Neoplastic cells expressing strong cytoplasmic staining with NSE (IHC: 40x).

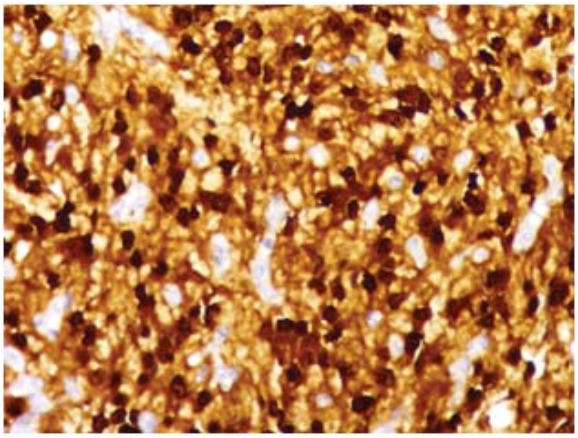

Fig. 8: Neoplastic cells expressing strong cytoplasmic staining with S100 (IHC: 40x).

Discussion

Vesical Paraganglioma are tumors of chromaffin tissue originating from the sympathetic innervations of the urinary bladder wall which are extremely rare and are most commonly situated at the trigone of the bladder-may be nonfunctional or functional. Vesical Paraganglioma is usually a benign tumor, but 5–10% of Vesical Paraganglioma tumors may have malignant changes. 10% of Vesical Paragangliomas are nonfunctional tumour and can be asymptomatic.

Usually patients will present with hypertensive crisis, headache, micturition syncope and palpitation. Micturition syncope are aggravated by digital rectal examination, defecation, ejaculation and urethral instrumentation. Vesical Paraganglioma is one of the causes of post micturitional syncope in post menopause patients. Elevated Urinary and Plasma metanephrines are more sensitive and specific for these lesions. 24-hours urinary and serum concentrations of vanillylmandelic acid (VMA), epinephrine, nor-epinephrine, and metanephrine are functional assessments of plasma and urine catecholamine levels in the initial workup and after surgical excision for follow-up. Serum metanephrines are more sensitive and specific than urinary metanephrines for these lesions.

The Vesical Paraganglioma is usually sub mucosal or intramural with intact vesical epithelium, the most common location being trigone. Most commonly seen in 4th decade with female to male ratio of 3:1. Paraganglioma in the bladder can be benign or malignant-histopathology showing atypical nuclei, increased mitotic activity, increased pleomorphism, vascular invasion, and infiltrating growth pattern.

Micturition syncope is a situational type of neurally mediated syncope syndrome.[3] Emptying of a full bladder stimulates the mechanoreceptors in the bladder wall. The afferent stimulus passes to brainstem through the vagus nerve, parasympathetic activity is triggered and bradycardia occurs. The inhibition of sympathetic activity results in arterial dilation and hypotension. Voiding in full bladder stimulates the mechanoreceptors in the bladder wall. The afferent stimulus passes to brainstem through the vagus nerve, parasympathetic activity is triggered and bradycardia develops. The inhibition of sympathetic activity results in arterial dilatation and hypotension.[4,5]

UItrasonography, CECT Urogram, Magnetic Resonance image of the pelvis are useful noninvasive imaging modalities. For the detection and spread of the Paraganglioma of the bladder tumor Metaiodinebenzylguinidine (MIBG) scan has shown to have a very high sensitivity and specificity.

Partial cystectomy or wide local excision of the bladder tumour is the better option over Trans-urethral resection of bladder tumor as majority of these tumors extend in the deep layers of the detrussor muscle.[2,3,5] Chance of recurrence is high following deep resection. Following complete surgical excision, frozen biopsy will show negative margin

Conclusion

Paraganglioma of the urinary bladder is a rare tumor that may be misdiagnosed as urothelial cancer, but a high index of suspicion, and search for the characteristic histological features and supportive immunohistochemical studies should lead to a correct diagnosis.

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Case Report

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Anterior Horse Shoe Fistula: A Case Report

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Abstract

A 28 years female presented with discharge in the perineal area from 1 month. No history of previous surgeries and comorbidities. On examination of the perianal region, 2 external openings were noted at 11° and 1° clock positions and on per rectal examination internal opening was noted in the 12° clock position 1cm from the anocutaneous junction. MRI fistulogram showed bilateral intersphincteric perianal fistula communicating with each other and a common internal opening at midline anteriorly at 12° clock position. Patient was posted for surgery and fistulotomy was done. Patient was discharged on 2nd day and is being followed on outpatient basis. Wound healing was noted at the 2nd week. Since anterior horse shoe shaped fistulas are rare we present this case report.

Keywords: Horse Shoe Fistula; Goosalls Rule; Fistulotomy.

Introduction

Horseshoe fistulae, a special type of branching fistula are a well recognized and particularly difficult variety of anal fistulae to treat.[1] Horse-shoe fistulas usually have an internal opening in the posterior midline and these posterior tracts can extend in the superficial retroanal space, anteriorly to the anococcygeal ligament or deeper, in the deep retroanal space, posteriorly to this ligament.[2] These can wrap around the body in a U shape, with external openings on both sides of the anus.

Anterior horseshoe fistulas are much less common and represent a major therapeutic problem due to a significant risk of postoperative incontinence resulting from the lack of protection of the pubic-rectal muscle of the anterior circumference of the anal canal. The tracts of the anterior branching fistulas can run towards the perineal skin, approach or communicate with the vaginal lumen, or reach the scrotal skin in men. Even more extensive tracts can penetrate into the soft tissue of the buttock or groin. In very rare cases, they can even pierce the fascia, e.g. in the posterior femoral surface, and run between muscle bellies.

The challenge in the management of fistulas is to define the course of the track between these openings so that the appropriate surgical option can be used. Until recently, imaging had a limited role in the preoperative assessment of perianal fistulas. Magnetic resonance (MR) imaging has been shown to demonstrate accurately the perianal anatomy. Ultrasound examination of the anal canal (endosonography) and pelvic magnetic resonance imaging are performed to determine the location of the fistula canal, determine the location and the number of secondary tracts, the internal opening and the residual abscess as well as to assess the morphological picture of anal sphincters.[3–7]

Case Report

A 28 years female presented with discharge in the perineal area from 1 month. No history of previous

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surgeries and comorbidities. On examination of the perianal region, 2 external openings were noted at 11° and 1° clock positions and on per rectal examination internal opening was noted in the 12° clock position 1cm from the anocutaneous junction.

MRI fistulogram showed bilateral inters-phincteric perianal fistula communicating with each other and a common internal opening at midline anteriorly at 12° clock position. Patient was posted for surgery and fistulotomy was done. Patient was discharged on 2nd day and is being followed on outpatient basis. Wound healing was noted at the 2nd week.

Since anterior horse shoe shaped fistulas are rare we present this case report.

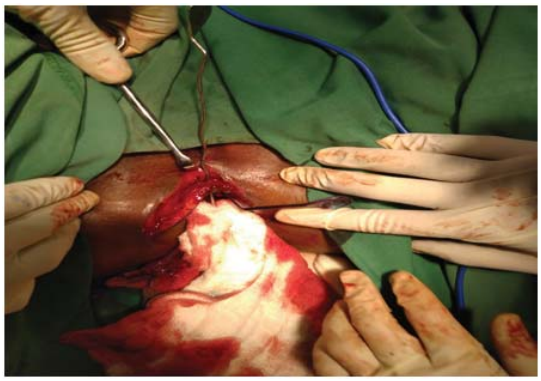

Fig. 1:

Treatment of Horseshoe Fistulas:

The surgical technique for the treatment of horseshoe fistulas generally involves the introduction of a drainage seton and resection/ transection or draining the fistula tracts.

In anterior fistulas, a seton involving the internal opening with the sphincteric mass involved by fistula can be used and Penrose drain can be passed across through the distal tracts of fistula; this is a modified Hanley[8] procedure proposed by Utynoski.[9]

In posterior fistulas, the side tracts should be first dissected with spared anococcygeal ligament, then the affected crypt should be identified and the volume of sphincter involved by the fistula should be assessed. If less than 50% of sphincter is involved by fistula, fistulotomy can be theoretically performed. In other cases, seton drainage should be used.

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Standard journal article

[1] Flink H, Tegelberg Å, Thörn M, Lagerlöf F. Effect of oral iron supplementation on unstimulated salivary flow rate: A randomized, double-blind, placebo-controlled trial. J Oral Pathol Med 2006; 35: 540–7.

[2] Twetman S, Axelsson S, Dahlgren H, Holm AK, Källestål C, Lagerlöf F, et al. Caries-preventive effect of fluoride toothpaste: A systematic review. Acta Odontol Scand 2003; 61: 347–55.

Article in supplement or special issue

[3] Fleischer W, Reimer K. Povidone-iodine antisepsis. State of the art. Dermatology 1997; 195 Suppl 2: 3–9.

Corporate (collective) author

[4] American Academy of Periodontology. Sonic and ultrasonic scalers in periodontics. J Periodontol 2000; 71: 1792–801.

Unpublished article

[5] Garoushi S, Lassila LV, Tezvergil A, Vallittu PK. Static and fatigue compression test for particulate filler composite resin with fiber-reinforced composite substructure. Dent Mater 2006.

Personal author(s)

[6] Hosmer D, Lemeshow S. Applied logistic regression, 2nd edn. New York: Wiley-Interscience; 2000.

Chapter in book

[7] Nauntofte B, Tenovuo J, Lagerlöf F. Secretion and composition of saliva. In: Fejerskov O,

Kidd EAM, editors. Dental caries: The disease and its clinical management. Oxford: Blackwell Munksgaard; 2003. pp 7–27.

No author given

[8] World Health Organization. Oral health surveys - basic methods, 4th edn. Geneva: World Health Organization; 1997.

Reference from electronic media

[9] National Statistics Online—Trends in suicide by method in England and Wales, 1979–2001. www.statistics.gov.uk/downloads/theme_health/HSQ20.pdf (accessed Jan 24, 2005): 7–18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

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