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Fine Needle Aspiration Cytology Versus Incisional Biopsy in Breast Carcinoma

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Introduction

Mammary glands or breasts are distinguishing features of mammals from puberty to death. The breast plays constant physical and physiological role in women's life, related to important life events such as menses, pregnancy, gestation, lactation and menopause. This is unique because its development and growth is under constant control of numerous hormones.

Currently accurate diagnosis of breast lesions depends on a "Triple Assessment Approach" comprising clinical, imaging and pathological examination, for the pathological assessment of breast lumps Fine Needle Aspiration Cytology and incisional biopsy are considered.

Materials and Method

This is a random prospective study of 50 cases of female patients presenting with complaint of breast lumps alone or associated with other symptoms suspicious of malignancy of breast to the hospital during the period of 2011 to 2013 was carried out.

Clearance from Institutional Ethical Committee was taken for conducting the study.

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After taking informed consent the patients were methodically evaluated for assessment of breast lump by history, physical examination which was supplemented with biochemical and radiological or imaging examination.

Following clinical and radiological work-up the patients were subjected to Fine Needle Aspiration Cytology. The patients who were found to have malignant cytology on Fine Needle Aspiration Cytology were only considered for the study and subject to Incisional/Excisional biopsy.

The findings of Incisional/Excisional biopsy were then compared with the findings of Fine Needle Aspiration Cytology to find out the specificity of Fine Needle Aspiration Cytology.

Results

On collecting and analyzing the data of 50 patients in breast, following observation is found.

Disease	Diagnosis on Incisional/ Excisional Biopsy	Percentage
Benign	06	12
Malignant	44	88
Total	40	100

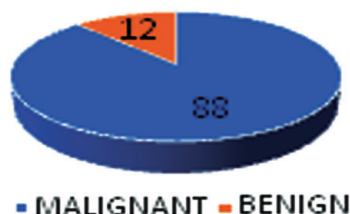


Fig. 1: Benign and Malignant Findings on Incisional Biopsy of All Fine Needle Aspiration Cytology Proven Malignant Cases.

- Hence out of the 50 fine needle aspiration cytology proven malignant cases which were subject to incisional/excisional biopsy 6 cases are found to be benign and 44 cases to be malignant.

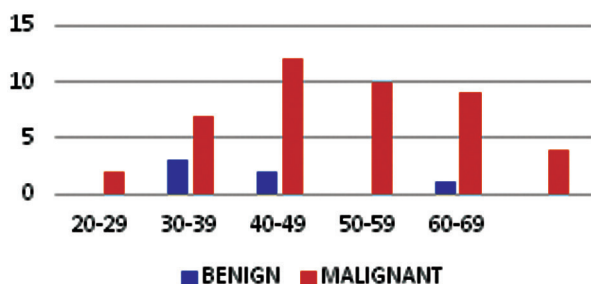


Fig. 2: Age Incidence of Benign & Malignant Breast Lump According to Incisional Biopsy In Present Study.

Age	No. of Cases		Percentage	
	Benign	Malignant	Benign	Malignant
20-29	0	2	0	4
30-39	3	7	6	14
40-49	2	12	4	24
50-59	0	10	0	20
60-69	1	9	2	18
70 and 70 Above	0	4	0	8
Total	6	44	12	88

- Maximum incidence of benign breast disease is seen in the age groups of 30 to 39 years while maximum incidence of malignant breast disease is seen in the age group of 40-49 years.

Discussion

- The present study was conducted on 50 female patients having a palpable breast lump with clinical diagnosis of malignancy, each of whom underwent a Fine Needle Aspiration Cytology of the lump, followed by Incision/Excision biopsy. Only those cases which had

Fine Needle Aspiration Cytology proven malignancy were considered and subject to Incisional/Excisional Biopsy. The Fine Needle Aspiration Cytology findings were then matched with the histology report of the Incision/Excision Biopsy to see as to how accurate Fine Needle Aspiration Cytology was.

- In the 50 consecutive women in this study, the age ranged from 20 to 70 years. The maximum (14 patients) was found in the age group of 40 to 49 years, followed by 10 patients in the age group of 30 to 39 years, 50-59 years and 60-69 years each.
- In study done by Nasir Malik M. A. et al 40 on 954 patients, malignant more commonly found in 40 to 60 years of age group. Similar study done by Kassim Fawzi Abdelkarim et al 41 showed similar age patterns.
- In study done by R. S. Jr et al 42, breast cancer is the most common form of cancer in women between the age group of 40 to 44 years.
- In this study, maximum patients (26 patients) with lump in the breast with Fine Needle Aspiration Cytology proven malignancy had age of menarche around 13 years.
- In this study the right breast was involved in 27 patients, while the left breast was involved in 23 patients.
- The upper & outer quadrant was the commonest site of the lump in this study & that was in maximum (32) patients, while the lower outer quadrant was involved in 6 patients, the upper inner quadrant in 10 patients & the lower inner quadrant in 1 patient. There was 1 patient who had lump in a central quadrant.
- In a similar study was done Khemka et al⁴³, the maximum number of lumps in one particular quadrant was in the upper & outer quadrant, which was in 16 out of 50 patients. So, the quadrant in which there was the maximum number of palpable lumps was the outer & upper quadrant.
- Lymph node involvement of the axillary group was studied in present study & it was found that 31 cases had enlarged ipsilateral axillary lymph nodes.
- As mentioned above, the primary aim of this study was to assess how accurate & reliable was Fine Needle Aspiration Cytology in diagnosing breast pathology which could help in proceeding towards definitive

excisional & often mutilating surgery without having an unpleasant surprise at the final histology report of the specimen.

- In this study incisional biopsy finding for benign lesions sensitivity is 100.00%, specificity is 95.55%, accuracy is 96.55%, positive predictive value is 87.50% & negative predictive value is 100.00%. On the other hand, incisional biopsy finding for malignant breast lesions, sensitivity is 100.00%, accuracy is 96.55%, positive predictive value 100.00% and negative predictive value is 100.00%.
- According to Pinder S. E. Et al. The efficacy of Fine Needle Aspiration Cytology relies heavily on the experience of both the aspirator and the pathologist and regular audit shows that the most experienced aspirators have the highest success rate & low number of technically poor specimens; the inadequate rate can range from 9.8% to 45.9% from single experienced aspirators to inexperienced group of aspirators. Other factors that influence the success rate of Fine Needle Aspiration Cytology is the size & cellularity of lesion, but by adopting the triple approach to diagnosis the sensitivity & specificity of Fine Needle Aspiration Cytology can be extremely high. The sensitivity ranges from 75-96% and the specificity approaches 100% in most series and false positives are extremely rare.
- The 1 false patient occurred in lactating women.
- According to Heber AK we had accuracy of 100% for benign lesion and 93.10% for malignant lesion with false negative rate of 6.9% and false positive rate of zero with fine needle aspiration cytology in the diagnosis of palpable breast lesion.
- Apart from high sensitivity rate of fine needle aspiration cytology, this technique is quite attractive because of easy execution and interpretation, its low cost and its low rate of morbidity.
- Some raise risk of implantation of cells from needle aspiration but these largely resulted from use of larger cutting needle (18 gauge) rather than fine needle (22 gauge).
- The use of fine needle aspiration cytology as main and direct indicator for mastectomy (without the need for biopsy) remains controversial.
- The major danger is for false positive diagnosis, leading to unwarranted mastectomy.

- Fine needle aspiration cytology is highly pathologist dependent. An expert pathologist is required to stamp or confirm the diagnosis of breast carcinoma on fine needle aspiration cytology. The danger of misdiagnosis is studiously avoided by maintaining a cautious and a conservative threshold for diagnosis a cancer. The results depends upon pathologists and histological findings.
- Any questionable diagnosis that is stated to be suspicious, an open biopsy is suggested where in centers an intraoperative frozen section is not available.

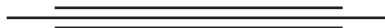
Conclusion

- The fine needle aspiration cytology is an important diagnostic adjuvant in the management of a patient with breast lump. Recently fine needle aspiration cytology has become very popular technique utilized in the diagnosis of palpable breast masses, owing to its distinct advantage of being sensitive, specific, economical and safe. It greatly compliments the clinical and radiographic examination and permit rapid diagnosis. Thus, it is commonly used as a part of triad in the case of breast lump, which in addition to fine needle aspiration cytology includes clinical breast examination and mammography.
- In this study 50 cases were included during period of 2 years from 2011 to 2013. A prospective study of 50 cases of patients presenting with complains of breast lumps alone or associated with other symptoms coming to hospital is carried out.
- 50 cases having lump in breast clinically suspicious of malignancy were studied.
- 28% cases were involved in 40-49 age group.
- All cases presented with complain of breast lump (100%)
- Axillary lymph nodes involvement was seen in 31 cases.
- Out of 50 cases which were diagnosed as malignant on fine needle aspiration cytology, 44 were confirmed as malignant on histopathological examination by incisional/excisional biopsy.
- Out of 50 cases diagnosed as malignant by fine needle aspiration cytology, 6 cases were confirmed as benign on histopathological findings of incisional/excisional biopsy.

- Hence from our study data and its comparison with other statistics we can say fine needle aspiration cytology is a patient friendly, easy, reliable, and simple diagnostic test. When performed by an expert surgeon, the diagnostic accuracy of fine needle aspiration cytology is high. Others factors that influences the success rate of fine needle aspiration cytology is the size and cellularity of lesion, but by adopting the triple approach to diagnosis the sensitivity and specificity of fine needle aspiration cytology can be extremely high.
- As in this study 6 cases were false positive, thus we conclude that fine needle aspiration cytology is highly predictive but it lacks reliability and without having a confirmed tissue diagnosis by Incisional/Excisional biopsy the patient may be subject to unnecessary surgical intervention and scary findings of a benign histopathological finding on surgically excised specimen.
- Thus, we have no hesitation in concluding that fine needle aspiration cytology is a very useful investigation but incisional biopsy is a very important preliminary diagnostic test in palpable breast lumps before proceeding for any further intervention or management.

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Silveron Gel (Nano Silver Formulation): A Powerful Antimicrobial for the Future

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Ajay Gupta/Silveron Gel (Nano Silver Formulation): A Powerful Antimicrobial for the Future/New Indian J Surg. 2021;12(4):209-214.

Abstract

Introduction: Nano silver itself is not new. It has been used for various applications in consumer and commercial products over the past century without showing adverse effects on patients. Nano-silver dispersions were used as medical products already in the 19th century. Additionally, the concept of Nano-silver being used as a topical antibacterial dates back to the days of Sushrut in the 6th century where finely powdered Silver was used as a topical antibacterial/antiseptic after surgery. **Material and Method:** Silver ions and the compounds made like nanosilver exhibit a broad antimicrobial profile against bacteria, fungi and virus and also have low toxicity towards animal cells. Various studies have also demonstrated definitive antibacterial property of nanosilver against *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Escherichia coli*, *C. albicans*, *V. Parahaemolyticus*, *S. enterica*, *B. anthracis*, *B. Cereus*, *Bacillus subtilis*, *Salmonella enterica* and *Pseudomonas aeruginosa*. **Result:** Nano silver particles have ability to alter the expression of matrix metallo-proteinases (proteolytic enzymes that are important in various inflammatory and repair processes), suppress the expression of tumor necrosis factor (TNF- α), interleukin (IL)-12, and IL-1b, and induce apoptosis of inflammatory cells. Therefore, nano silver gel also

displays an anti-inflammatory action. **Conclusion:** In conclusion, Silveron gel due to its nano silver particles and unique formulation has the power to protect, penetrate, and heal in cuts, wounds, burns, diabetic foot ulcer, and surgical dressings.

Keywords: Silveron Gel; Antimicrobial; Nano Silver.

Introduction

The use of silver for the treatment of various maladies or to prevent the transmission of infection dates back to at least 4000 BC. Medical applications are documented in the literature throughout the 17th and 18th centuries as a non-toxic, safe inorganic antibacterial agent capable of killing about 650 microorganisms that cause various diseases. Silver has possibility for various biological applications such as preventing infections, antibacterial agents for antibiotic resistant bacteria, anti-inflammatory and healing wounds. Silver has also been authorized by EU EFSA as E174 for coloring food. Over the last few years, especially in last decade, the world has witnessed remarkable progress in the field of Nanotechnology. Nanotechnology deals with the study of nanoparticles having a size range of 1-100 nm. Nanoparticles are of nice interest, owing to their small size and huge surface to volume quantitative relation. This leads to chemical and physical variations in their properties compared to a bulk of similar compounds.

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Nano silver itself is not new. It has been used for various applications in consumer and commercial products over the past century without showing adverse effects on patients. Nano-silver dispersions were used as medical products already in the 19th century. Additionally, the concept of Nano-silver being used as a topical antibacterial dates back to the days of Sushrut in the 6th century where finely powdered Silver was used as a topical antibacterial/antiseptic after surgery. It was also noticed that tribal women who wore silver jewelry had lesser incidences of skin disease or sickness. The finely pulverized silver was called “chandibhasma” and was used intelligently to heal patients who had undergone surgery, or had suffered trauma or had a skin infection or inflammation.

The stellar properties of silver were then used to combat these conditions and many years later with the advent of nanotechnology the age old therapy is back to help mankind combat topical infections once again. Silver nanoparticles cause less toxicity to human health but are highly toxic to microorganisms⁵. Due to this, silver nanoparticles have found good applications in antimicrobial, biomedical, human health, catalysis, and environmental remediation etc. (Figure 1).⁵

Due to unique and desirable nano-related properties of silver nanoparticles like intrinsic antimicrobial and non-toxic nature, it is being widely explored in the biomedical field in wound dressing, tissue scaffold, catheters, stents, bandages, surfaces including wheelchair seats and door handles, protective clothing applications, bio magnetic separations, bio-detection and labelling, imaging, drug delivery, bone cement etc.

In some Southeast Asian countries, nanosilver is used frequently in public; it has been sprayed in Hong Kong subways. Silver nanoparticles also play a role in protection of human health. They are used in cosmetic industry in products like sun protection lotions, skin creams, UV protection ointment and creams, lipsticks and toothpaste. Silver nanoparticles can also be utilized in the environmental bioremediation; in air disinfection, water disinfection, surface disinfection etc.⁵ The antimicrobial properties are discussed in detail in subsequent sections. Overall, nanosilver has a wide range of applications and is very effective in making the human life good, easy, and safe.

Owing to this widespread use, nanosilver production has been estimated at 250–312 tons worldwide. The Silver Nanotechnology Working Group—an industry group formed to collect and disseminate data on nano silver has argued

enthusiastically for its usefulness and safety, noting as well that most applications use very small quantities of the material.¹⁻¹⁰



Fig. 1: Applications of Silver nanoparticles (Reproduced from Agarwal et al).

Material and Method

Nanosilver A Powerful Antimicrobial

Silver ions and the compounds made like nanosilver exhibit a broad antimicrobial profile against bacteria, fungi and virus as well (Figure 2) and also have low toxicity towards animal cells. The anti-pathogenic effect of nanosilver is proven to be better than those exhibited by silver ions by various experimental studies. The nanosilver has an additional advantage of their large surface to volume ratio owing to its nanoscale size which improves their dispersion and stability, and avoiding aggregation.

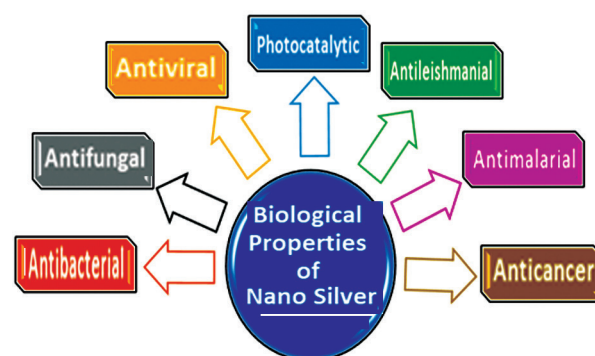


Fig. 2: Biomedical application of Silver nanoparticles (Reproduced from Ullah Khan et al).

Nanosilver particles release more amount of silver ions when compared to micro silver particle of the same weight. As the amount of silver ions released from nanosilver particles will be high, it will exhibit a higher antimicrobial activity while requiring less material. Another advantage is the depot effect of nanosilver particles wherein the depot releases just

small amounts of silver ions, sufficient for along lasting antimicrobial effect. Various studies show antibacterial effect of the nanosilver particles by interaction with the bacterial membrane, penetrate the cell, thus producing a drastic disturbance regarding proper cell function, structural damage, and cell death, hence they have broad bactericidal effects against both Gram-negative and Gram-positive bacteria. Various studies have also demonstrated definitive antibacterial property of nanosilver against *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Escherichia coli*, *C. albicans*, *V. parahaemolyticus*, *S. enterica*, *B. anthracis*, *B. cereus*, *Bacillus subtilis*, *Salmonella enterica* and *Pseudomonas aeruginosa*.

Several studies have demonstrated synergistic effects of combination of nanosilver with antibiotics leading to a greater effect of the antibiotics against microorganisms. This can be attributed to the increase in cell wall penetration by antibiotics with the nanoparticles. This synergistic effect of the antibiotics like *vancomycin*, *novobiocin*, *lincomycin*, *oleandomycin*, *penicillin G*, and *rifampicin*, in association with nanosilver increased the effectiveness against tested microorganisms (*S. enterica*, *E. coli*, *V. parahaemolyticus*, *B. anthracis*, and *B. Cereus*). Some studies have demonstrated anti fungal activity of nanosilver, wherein it was found to be an effective and a fast-acting fungicide against a broad spectrum of common fungi including genera such as *Aspergillus*, *Candida*, and *Saccharomyces*. The antiviral activity of nanosilver is an emergent field and studies show nano silver around 25 nm or less had outstanding potential in viral infection

inhibition. In addition, size-dependent (1-10 nm) antiviral activity of silver nanoparticles has also been shown with HIV-1 virus.³¹

Result

Nanosilver also plays a protective role in prevention of progression of foot, ankle, and leg ulcers in diabetes by their use in special socks, shoes, and bandages; in preventing trench foot for military personnel, athlete's foot, and other fungal infections; and now also in clothing of close-contact sports to slow the spread of MRSA and other bacterial infections. A major concern of the worldwide health care system is represented by antibiotic-resistant infections and there is a powerful incentive to develop new antimicrobial tools, and nanosilver offers great potential to fill this gap. Various new nanosilver-based gels were proven in laboratory tests to kill strains of methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant enterococci (VRE) within minutes and are also approved by FDA for wound care. These gels are also now being approved by the EPA for use as a disinfectant for hard nonporous surfaces.⁶ On similar lines, Silveron Gel, introduced in Year 2014 has spherical particles of nano silver of 80 to 200 size nm which adheres firmly to pathogens for cidal action.

Owing to the nano silver particles it should similarly mimic antimicrobial activities against bacteria (even *Staph aureus*, *pseudomonas*, *MRSA* and *VRE* etc.), *fungi*, *viruses*, and also effective in burns, wounds, diabetic foot ulcers, and in surgical

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- Covers E.coli & S. Aureus largely seen in skin & soft tissue infections.
- Nano particles with solid spherical shape ensure better killing power.
- Gel forms a protective film which protects lesion against pathogens.
- Hydrophilic nature enables faster re-epithelization naturally.
- Nano particle does not form compounds with chlorides, avoids chelating effect on skin.
- No resistance developed over decades.

In...

- » Cuts
- » Wound
- » Burns
- » Diabetic foot ulcer
- » Surgical dressing

E-coli, MRSA, Staph, VRE

Fig. 3: Silveron Gel Properties and Uses. (Source: Provided by Author.)

dressings (Figure 3, Figure 4). The nanosilver accelerates wound healing due to the reduction of local matrix metalloproteinase activity and the increase in neutrophil apoptosis within the wound. The Silveron Gel is used for wound healing which forms a protective film that protects the lesion against pathogens but on the other hand allows for oxygen to pass through and expedites the healing process. The hydrophilic nature of the gel enables faster re-epithelialization in cases of cuts wounds and burns. In sharp contrast to ionic preparations of silver, nano silver does not form compounds with chlorides and avoids chelating effect on the skin

which reduces its cidal activity. Despite several centuries of use of Nano Silver, Silveron Gel is also a potential candidate to treat antibiotic-resistant infections and this makes it superior to other topical agents like Neomycin, Framycetin, etc.¹¹⁻²⁰ In addition to the above, recent evidence suggests that nanosilver also has potent anti-inflammatory effects. They (nano silver particles) have ability to alter the expression of matrix metallo-proteinases (proteolytic enzymes that are important in various inflammatory and repair processes), suppress the expression of tumor necrosis factor (TNF- α), interleukin (IL)-12, and IL-1b, and induce apoptosis

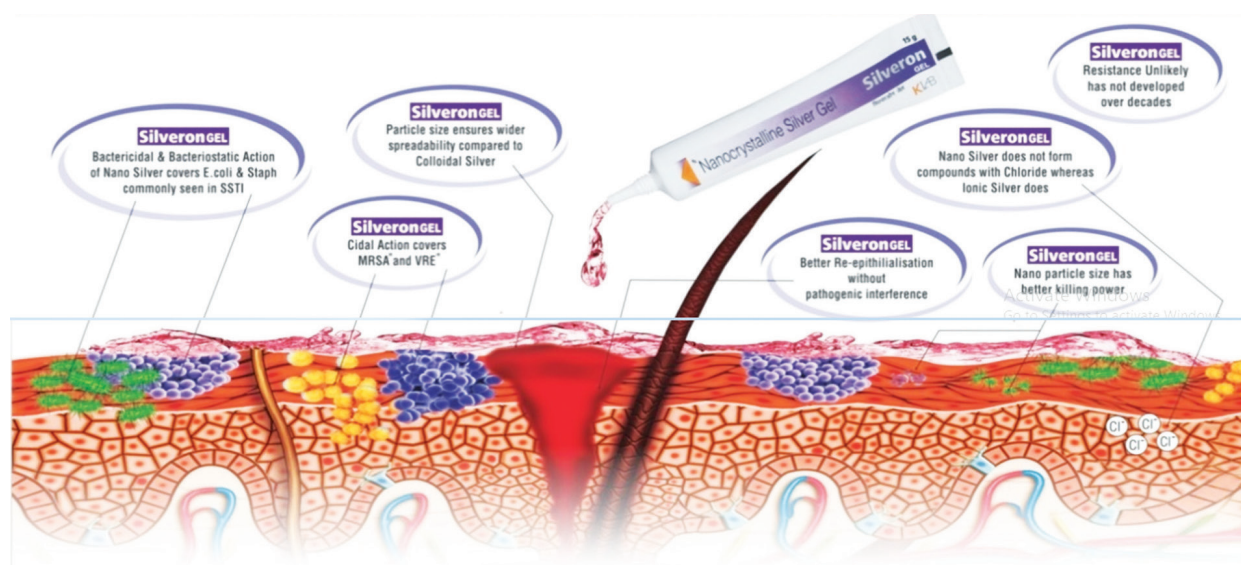


Fig. 4: Silveron Gel Antimicrobial Action. (Source: Provided by Author.)

of inflammatory cells. Therefore, nano silver gel also displays an anti-inflammatory action.²¹⁻³¹

Conclusion

In conclusion, Silveron gel due to its nano silver particles and unique formulation has the power to protect, penetrate, and heal in cuts, wounds, burns, diabetic foot ulcer, and surgical dressings. The gel also has a potential to act as a powerful antimicrobial tool for antibiotic-resistant infections.

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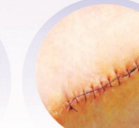
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A Clinical Study of Scrotal Swelling and its Various Treatment Modalities

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Abstract

Aim: To study the etiology, clinical presentation, investigations, treatment modalities & their outcomes, post operative complications for scrotal swellings and follow up.

Materials and Methods: The cases admitted to the surgical wards over a period of one and a half years i.e., November 2018 to May 2020, formed the material for this study. During this period 100 cases with h/o scrotal swelling admitted in various surgical units, selected at random were studied in detail as per proforma.

Sampling Method: A Simple Random Sampling

Results: 100 cases of scrotal swellings were studied and compared based on age, occupational distribution, mode of presentation, duration of symptoms, predisposing factors, treatment modalities and post operative complications.

Conclusions: Scrotal swelling was commonest symptom. The other symptoms included pain/heaviness of scrotum, fever, etc.

- Definitive surgery was done in 90 cases.
- Various forms of hydrocele constituted a major portion of the study (50 cases).
- Varicocele was the second commonest cause comprising of 13 cases.

- A total of 9 cases of Fournier's gangrene, 6 cases of torsion of testis including one with scrotal abscess.
- There were 09 cases of epididymo-orchitis, 4 cases of testicular tumor, 3 cases each of sebaceous cyst and encysted hydrocele of cord and 2 cases of hydrocele with hernia.

Keywords: Treatment modalities; Scrotal swellings; Hydrocoele; Varicocele; Outcome.

Key Message: Scrotal swellings and early testicular tumours can be cured using different modalities.

Introduction

Scrotal swellings are one of the commonest clinical entities in surgical practice. Though the scrotum lies hanging down from the lower abdomen and is easily accessible for self examination. It is pitiable to note that even today we come across some late case of testicular tumor, which are curable if diagnosed early.

Scrotal swelling has got wide spectrum of conditions, varying from hydrocele to testicular tumours. Therefore there is a need to study the common conditions, so many benign scrotal swellings and early testicular tumours can be cured by using different modalities.

Need for the Study

The scrotum is a cutaneous bag containing the right and left testes, the epididymis and the lower parts of spermatic cords.¹ Scrotal swellings are one of the commonest clinical entities which one comes

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across in surgical practice. Though the scrotum lies hanging down from the lower abdomen and is easily accessible for self examination it is pitiable to note that even today, we come across some late cases of testicular tumor, which is a curable disease if we diagnose it early.

Hydrocele is an abnormal collection of serous fluid in a part of the processus vaginalis, usually tunica vaginalis.² Primary vaginal hydrocele is the commonest scrotal swelling. It remains painless and can attain very large size without causing much discomfort to the patient. The mortality from this (due to tapping as a mode of treatment) is unknown now-a-days. Because of its hanging down position and mobility, the scrotum is less liable to traumatic injury, resulting in collection of the blood in the loose areola tissue. The testis often escapes injury because it is withdrawn into the sub-inguinal pouch with a strong contraction of the cremasteric muscle.

There are many reasons for scrotum to swell ranging from hydrocele, the commonest cause, to some rare causes like gumma of the testis or malignant tumors of the epididymis.

The scrotum contains abundant quantity of sebaceous glands which can get infected and obstructed forming sebaceous cysts. Due to the presence of hair follicles, the scrotum is one of the sites for folliculitis (Boil), etc.

Because of the close proximity of the testis and epididymis to the urinary system, urinary tract infections can involve them, as can sexually transmitted diseases causing epididymo-orchitis. Sometimes scrotum can become swollen without any apparent cause. This condition, known as idiopathic scrotal edema, is thought to be caused by streptococcus hemolyticus and Cl. Welchii.

Scrotum can become swollen due to systemic illnesses causing generalized edema, as in congestive cardiac failure (CCF), nephritic syndrome, cirrhosis of liver and hypoproteinaemic states. In the coastal areas, elephantiasis of the scrotum can occur by microfilarial infection, W. Bancrofti, having a complex treatment modality. Fournier's gangrene of scrotum is a condition thought to be caused by obliterative endarteritis of scrotal vessels with superinfection. Fournier's gangrene is usually a polymicrobial infection with microaerobes, anaerobes, and gram-positive and gram-negative organisms.³

Eventually testicular tumors occur predominantly in young population. About 99% of these tumours are malignant.⁴ With

the knowledge of specific tumor markers, the advances in the field of radiology and the advent of cisplatin combination chemotherapeutic agents, the treatment of testicular tumors has undergone a sea of change with complete remission (disease free state) possible in most of the early cases and good survival rates up to five years in late cases. Also self palpation of testis is being thought of as a screening procedure for early detection of testicular cancers, just like self examination of the breast, in females.

Patients expectation are very high. There is need to study the different modalities of treatment. Definitely it is rewarding. Different types of scrotal swelling in different age groups. Therefore there is a need to study the age wise distribution.

Scrotal swellings are managed according to type of scrotal swelling. There is a need to study correct treatment for different scrotal swellings.

The purpose of taking this dissertations

- Scrotal swellings are a common day to day clinical entity.
- They are of varied aetiology & easily accessible for clinical examination.
- Testicular tumours are today being considered as the hallmark for curable cancer, while considering other malignancies treatment.

Materials and Methods

The cases admitted to the surgical wards over a period of one and a half years i.e., November 2018 to May 2020, formed the material for this study. During this period 100 cases with h/o scrotal swelling admitted in various surgical units, selected at random were studied in detail as per proforma.

Sampling method : Simple Random Sampling

The method of study consists of;

- a. Detailed history taking and physical examination.
- b. Local examination of scrotum and its contents with relevant lymphatic and systemic examination.
- c. Routine laboratory investigations including examination of hydrocele fluid in some cases.
- d. Relevant special investigations.
- e. Surgical treatment according to the merits of the case as decided by the attending surgeon, under suitable anaesthesia.
- f. Operative findings, post operative course and treatment.

- g. Post operative complications, histopathological correlation (if any), duration of hospital stay and follow up was tabulated in a master chart.

Statistical Analysis

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 analysis 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

100 cases of scrotal swellings admitted over a period of one and a half years i.e., November 2018 to May 2020 were studied.

Incidence

Scrotal swellings formed about 2.18% of the surgical admissions.

Age Incidence

The youngest patient was 12 years old (case no. 81), which was the minimum age for inclusion in the study who was diagnosed as a case of torsion testis and the oldest patient was 76 years old (case no. 74), which was a case of epididymo-orchitis. The highest incidence was in the third decade, i.e. 21-30 years (27%) followed by fourth decade, respectively (Table 1).

Table 1: Age Incidence of Scrotal Swellings.

Age in Years	Number of Cases	Percentage
12-20	15	15%
21-30	27	27%
31-40	25	25%
41-50	17	17%
51-60	08	08%
>60	08	08%

Occupational Distribution

Most of the patients in this study belonged to agricultural class (38%) followed by coolie (30%), students (19%), and private workers (5%).

Mode of Presentation

Scrotal swelling was the commonest presenting symptom (100%). Pain or heaviness of scrotum was seen in 30 patients (30%) and fever was seen in 12 patients (12%). One case of testicular tumor presented with weight loss.

Duration of Symptoms

The duration of symptoms ranged from as early as eight hours in a case of testicular torsion to 2 years in a case sebaceous cyst (case no.9). Majority of the patients presented within 1-3 months of onset of symptoms (Table 2).

Table 2: Duration of Symptoms.

Duration	Number of Cases	Percentage
0-7 days	25	25%
8-30days (upto 1 month)	17	17%
1month-3months	43	43%
4-6months	09	09%
7months-1year	04	04%
> 1 year	02	02%

Predisposing Factors

In a majority of patients in the study, in about 84 % of the cases the cause could not be ascertained, i.e. idiopathic. There was an overlap of more than one cause in three cases. Trauma was the predisposing factor in three patients. In two patients it was the immediate cause for presenting symptom (Table 3). Exposure to STD was the cause in two cases. Tuberculosis was present in two cases. Culture positive UTI was found in six patients and E.Coli was the commonest organism. Klebsiella was isolated 1 one case.

Table 3: Predisposing Factors (Aetiology).

Factors	Number of Cases	Percentage
Idiopathic	84	84%
Trauma	6	6%
Exposure to STD	2	2%
Tuberculosis	2	2%
UTI(culture positive)	6	6%

Side distribution of scrotal swelling

Scrotal swelling was common on left side, i.e. 49% and right side was affected in 31% of the patients. It was bilateral in 20% of patients.

Type of Lesion

Various types of hydrocele formed the majority of the cases (50) in this study, out of which primary vaginal hydrocele (45%) was the commonest followed by varicocele (13%). Epididymo-orchitis accounted for 9% of the cases out of which 7 were acute epididymo-orchitis due to UTI (E.Coli, Proteus, Klebsiella). Chronic epididymo-orchitis due to tuberculosis was seen in two. There were nine cases of Fournier's gangrene, out of which three cases had a h/o of trauma as a predisposing cause. There were six cases of torsion of testis out of which three cases underwent orchidectomy of the affected side. There were 4 cases of testicular tumors, All underwent high orchidectomy, and were subsequently diagnosed as seminomas. There were three cases of sebaceous cysts of scrotum and one case each of scrotal abscess with torsion and infertility (Table 4).

Table 4: Type of Lesion.

Diagnosis	Number of Cases	Percentage %
Hydrocele		
-Primary vaginal hydrocele	45	45
-Encysted hydrocele of cord	03	03
Epididymo-orchitis		
Acute	07	07
Chronic-tubercular	02	02
Varicocele	13	13
Torsion of testis	05	05
Testicular tumor	04	04
Fournier's gangrene	09	09
Hernia with hydrocele	02	02
Scrotal abscess	05	05
Scrotal abscess with torsion of testis	01	01
Sebaceous cyst of scrotum	03	03
Infertility	01	01

Treatment Modality

Out of the 100 cases in this study, definitive operation was done for 90 cases. For one case testicular biopsy was done for diagnosis of infertility. 09 cases were put on medical line of management line of management, 2 cases among these were diagnosed to be secondary to tuberculosis and were put on ATT (Table 5).

Type of Anaesthesia

84 cases were operated under spinal anaesthesia, 1 cases were operated under general anaesthesia and 6 cases (including biopsy) under local anaesthesia.

Table 5: Treatment Modality.

Nature of Treatment	Number of Cases	Percentage
Surgical treatment Definite operation Biopsy	90	90%
	01	01%
Medical treatment (conservative)	09	09%
Total	100	100

Emergency vs elective operation

A total of 20 cases were done on emergency basis. These were 5 cases of torsion testis, 9 cases of Fournier's gangrene, 5 cases of scrotal abscess and one case of scrotal abscess with torsion.

Nature of definitive operative treatment

Jaboulay procedure was the most common surgery done for hydrocele followed by Lord's plication and partial excision. Open varicocelectomy was done in 11 cases and laparoscopic in 2 cases. Orchidectomy was done in 7 cases, four for testicular tumor and 3 cases were for torsion testis. Orchidopexy was done in 3 cases of torsion where the affected testis was found viable. Debridement and Incision Drainage were done for Fourniers and Scrotal abscess respectively (Table 6).

Table 6: Nature of Definitive Operative Treatment.

Operation Done	Number of Cases	Percentage(%)
Jaboulay's Procedure	30	32.9
Lord's Plication	09	10.2
Partial excision and ever-sion of sac	06	6.88
	11	12.5
Varicocelectomy		
Open	02	2.2
Laparoscopic	07	8.45
Orchidectomy	03	3.4
Derotation and Orchi-	05	5.68
dopexy Incision and Drain-	09	11.2
age Debridement	06	6.7
Excision of cyst		
Excision of sac with hernio-plasty Biopsy	02	2.2
	01	1.4

Post Operative Complications

The post operative complication rate in this study (39.5%) was quite high. The criteria were mild

edema of scrotum, haematoma of scrotum and wound infection. Edema/haematoma was seen in 20 cases and were treated conservatively. Wound infection cases responded to regular change of dressings with antibiotics (Table 7).

Table 7: Post Operative Complications.

Complication	Number of Cases	Percentage %
Hematoma/edema of scrotum	20	22.00
Wound infection	16	17.5
Uncomplicated	55	60.5

Distribution of complication according to mode of surgery

The above table shows the distribution of complications with various surgeries. The highest complication rate was seen with emergency surgeries mainly comprising of torsion testis, Fournier's gangrene etc. In surgeries for hydrocele, the highest complication rate was seen with Jaboulay's procedure (40%) and partial excision of sac (33.3%). Incidence of haematoma, edema and wound infection in various hydrocele surgeries.

The commonest complication following any surgery on the scrotum was edema of the scrotum. In this study which was seen in 11 cases, haematoma in 09 cases, and wound infection in 16 cases (Table 8).

Table 8: Incidence of Haematoma, Edema and Wound.

Name of Surgery	No. of Cases	No. of Haematoma	No. of Edema	No. of Wound Infection
Jaboulay's procedure	30	3	2	7
Lord's plication	9	1	0	1
Orchidectomy	7	1	0	2
Partial exc./eversion of sac	6	0	0	2
Orchidopexy	3	0	1	0
Others	36	4	8	4

Duration of Hospital Stay

All of the 100 cases admitted received treatment. Most of the cases (76%) were discharged within 10 days of admission.¹⁷ cases were discharged between 11-20 days of admission. Only one case stayed for 34 days (Case no. 64).

The shortest duration of hospital stay was 3 day and the longest was the above case of 34 days. He was admitted for Fournier's gangrene.

Discussion

Incidence of Haematoma in Various Series of Hydrocele Operations

The results of the present study are comparable to that of previous workers. Haematoma was seen in 1 case operated by Lord's plication. In those treated by partial excision/ excision of sac haematoma was seen in 3 cases. This study shows that compared to conventional methods of treatment of hydrocele, i.e. excision/partial excision of sac, Lord's plication gave rise to less complications and morbidity.

The plication procedure avoids the opening of the cleavage between the sac and surrounding tissue, thus reducing the oozing and subsequent haematoma formation. High incidence of complications by conventional methods have been reported by other workers, i.e. Campbell 12/502 (24%)⁷, Effron and Sharkey (1967) 9/30 (30%)⁹ (Table 9).

Table 9: Incidence of Haematoma in Various Hydrocele Operations.

Author and Year	Procedure Lord's Plication No. of Haematoma Cases	Excision/eversion of Sac No. of Haematoma Cases
Present study	9	1
Peter lord (1964)	22	NIL
Effron, Sharkey (1967) ⁹	29	1
Dahl et. al. (1972)	25	-
Reddy, Srinivas (1973) ⁵	400	NEG.
Rai, Goyal, Singh (1979) ⁶	50	-
Campbell (1927) ⁷	-	-

Comparison of Hydrocele operation Results with the Recent Studies (O.P. Agarwal, 1983)⁸

The results of the present study are fairly comparable to that of Agarwal series, except the high rate of infection seen with Jaboulay's/Excision of sac (Table 10).

Table 10: Comparison of Hydrocele Operation Results with the Recent Studies.

Nature of Operation	Number of Cases Agarwal Present		Post Operative Complications			
	Series	Study	Haematoma		Infection	
			Agarwal	Present	Agarwal	Present
Lord's Plication	50	9	Nil	1(11.1%)	Nil	1(11.1%)
Excision of Sac	50	39	14(28%)	3(7.7%)	8(16)	9(23%)

Conclusion

- The study was compared with available literature and other studies and scrotal swelling was found to be a common presentation accounting for about 2.18 % of surgical admissions.
- Scrotal swellings were common between the second and third decade, i.e. younger patients were affected more often.
- Agriculture related workers formed the majority occupation in this study. This is probably due to the fact that this hospital situated at B G Nagara caters to mainly rural population.
- Scrotal swelling was commonest symptom with which the patient presented. The other symptoms included pain/heaviness of scrotum, fever, etc. All the patients had scrotal swelling on examination.
- No cause could be detected in 84 cases (i.e. idiopathic).
- Predisposing factors included UTI, trauma, exposure to STD, and tuberculosis. Trivial trauma brought to notice a pre-existing swelling in some cases.
- Unilateral left side involvement of scrotum was common, accounting for 49% of cases.
- Relevant investigations were done. In this study there were thirteen cases of varicocele of which 9 had oligospermia. Post operative semen analysis could not be done in any of the patients because of poor follow up.

The patients were treated with surgery or conservative medical line. Definitive surgery was done in 90 cases. Penicillin /cephalosporins/ ampicillin/gentamicin were commonly used antibiotics.

- Most of the surgeries were done under spinal anaesthesia (84%).
- Various forms of hydrocele constituted a major portion of the study (50 cases), followed by varicocele.

- Jaboulay's procedure was the commonest operation done (30 cases) followed by lord's plication in 9 cases.
- Amongst the various operations for hydrocele, Lord's plication was associated with the least number of complications. Of the 9 cases treated by this procedure , one case had haematoma and 1 case had wound infection.
- The results of this study were compared with that of Peter Lord (1964), Effron and Sharky (1967), Dahl et al., (1972), Reddy and Srinivas (1973), Rai, Goyal and Singh (1978), Campbell (1927) and fair similarities were observed.
- When compared with Agrawal series (1983) this study showed increased incidence of wound infection. One of the contributory factors may be due to more trauma and tissue handling during surgery.
- Varicocele was the second commonest cause for scrotal swelling. There were 13 cases of varicocele of which 3 were bilateral ,07 cases were on left side and 03 were on right side.
- A total of 9 cases of Fournier's gangrene were seen in this study. Most of the patients were above 40 years and there was a h/o trivial trauma in three cases. All cases were surgically treated with debridement and antibiotics.
- There were 6 cases of torsion of testis including one associated with scrotal abscess. Orchidectomy was done in three cases and Orchidopexy was done in the remaining cases.
- There were 09 cases of epididymo-orchitis, out of which 7 were acute in onset and 2 were chronic secondary to tuberculosis. Most of the patients were treated with Antibiotics/ ATT analgesics and scrotal support.
- There were 4 cases of testicular tumor. All were subjected to high Orchidectomy and histopathology turned out to be Seminoma in 3 cases, one showed NHL. One patient

received adjuvant chemotherapy and rest were lost during the follow up period.

- There were 3 cases each of sebaceous cyst and encysted hydrocele of cord and two cases of hydrocele associated with hernia.
- There was 1 case of scrotal abscess with torsion testis.

There was one case of infertility for which testicular biopsy was done to detect defective sperm production, the report for which turned out to be normal.

Declaration

Ethical committee clearance: taken

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Conflict of interest: none

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Study on Incidence of Benign Breast Diseases and Carcinomabreast in Breast Lump Cases of 200 Patients in a Tertiary Care Center in Southern Kerala

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Abstract

Introduction: Breast cancer accounts for about one third of female cancer. Of all lesions, benign breast diseases have been found to be commonest. The aim of study was to analyze the incidence of breast diseases over the period of 3 years and to study the spectrum of diseases and age distribution.

Methods: Retrospective cross-sectional study of breast lump cases at general surgery department of Travancore medical college over a period of 3 years.

Result: Of the total 200 cases up looked into, 27 out of 200 cases were found to be malignant. Fibrocystic disease was the commonest (43%), followed by fibroadenoma (34.5%), 67 had lumps in right breast, 87 in the left breast and 46 patients had lump in both breasts.

Conclusion: From the study we found that, most of the breast lesions are benign and there is increase in the number of cases each year. Some of the benign lesions may remain undetected and lead to malignant change. So early detection of breast carcinoma and public awareness is crucial to save the patient from morbidity and mortality.

Keyword: Breast Diseases; Carcinomabreast; Fibrocystic disease.

Introduction

Breast cancer accounts for one-third of female cancers and approximately one-fourth of all malignancies.¹ Breasts are susceptible to numerous benign and malignant conditions, varying from an inflammatory lesion to malignancy. Pain and a Palpable lump are the most common presentations. Some lesions are common in younger age group while others are common in elderly age group. Early detection and accurate diagnosis of the condition is crucial as it alleviates anxiety of patients as well save them from morbidity and mortality.

Over the years, breast lesions have gained global attention due to rising number of malignancies and due to ardent spread of awareness among women. Numerous studies have been conducted worldwide on spectrum of breast lesions, diagnostic methods and treatment protocols. Of all the lesions, benign breast disease has been found to be the commonest. Benign lesions range from developmental disorders, inflammatory lesions and proliferative lesions. Malignant lesions include ductal carcinoma, lobular carcinoma, colloid carcinoma, and medullary carcinoma.

In Asia, the incidence of breast cancer is increasing and may occur in younger age groups. About 25% of breast cancer occurs in younger patients in developing Asian countries as compared to Western countries.² Treatment may range from oral medications to surgical procedure depending on the type of lesion viz. neoplastic vs non neoplastic

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or benign vs malignant, few of them even resolve without treatment. The aim of the present study is to analyze the incidence of breast disease over a period 3 years and also to study the spectrum of the lesions and age distribution.

Materials and Methods

This is a retrospective cross-sectional study of Breast lump cases during 2016-2018 conducted at the Department of General Surgery, Travancore Medical College. All the findings were recorded in the database. From the patient's clinical data and histopathological reports, the age, sex, nature of the specimen, hospital numbers, laboratory numbers and histopathological diagnosis was taken. Male patients were excluded from the study.

Statistical Analysis

Microsoft excel was used to generate tables.

Results

1. A Total of 200 cases were looked into over a

period of 3 years. The age of the cases ranged from 14 to 74. Fig. 1 shows that the mean age of presentation was 37.36 with a standard deviation of 12.591.

Table 1: The mean age of presentation for benign lesions was 35.62 with a standard deviation of 12.140 and that of malignant lesion was 48.44 with a standard deviation of 9.5.

Age Group	Type of Neoplasm	Numbers	Percentage
14-24	Benign	38	19%
	Malignant	0	
25-34	Benign	45	23%
	Malignant	1	
35-44	Benign	48	28%
	Malignant	8	
45-54	Benign	28	19.5%
	Malignant	11	
55-64	Benign	9	7%
	Malignant	5	
65-74	Benign	4	3%
	Malignant	2	

The study population were divided into 6 age

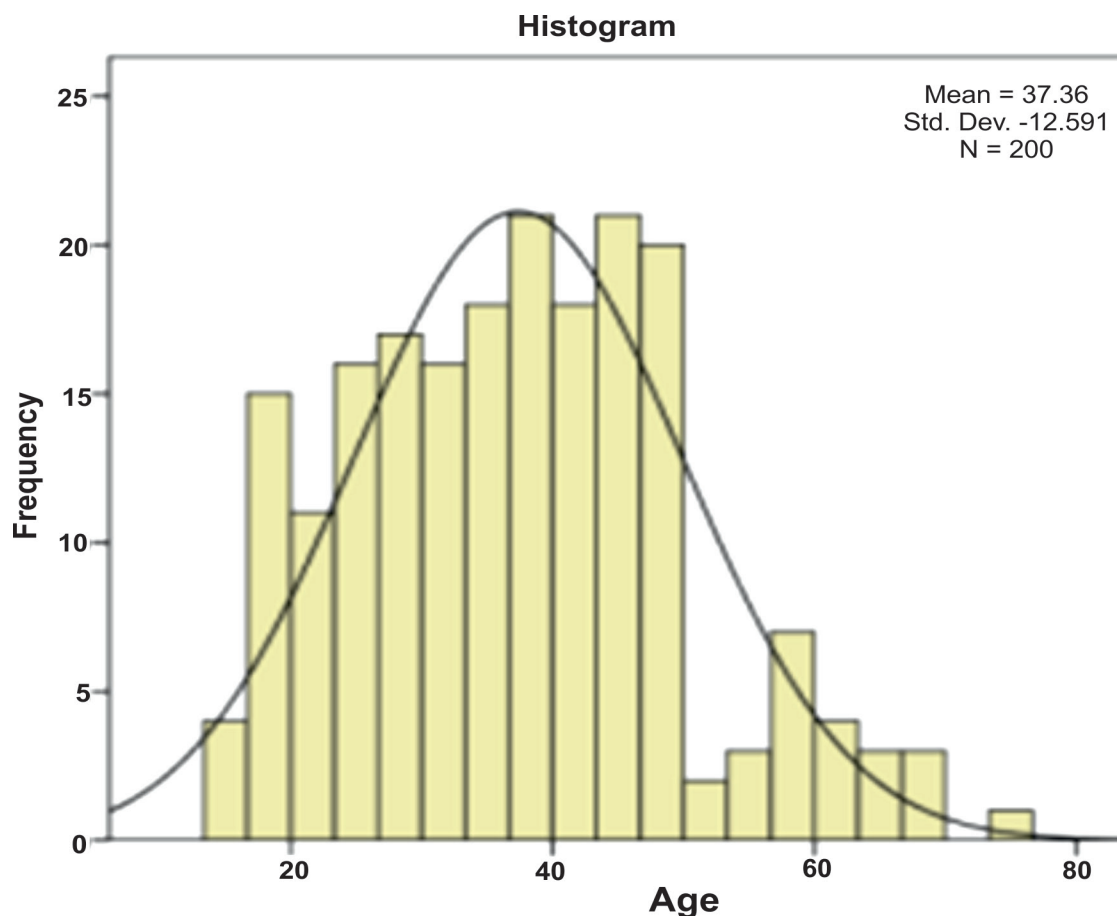


Fig. 1: Age wise distribution.

groups as shown in Table 1. Maximum number of cases belonged to age group of 35-44 (28%). Age group of 45-54 showed highest number of malignant cases (11 out of 27 cases, around 40.7%).

2. There has been an increase in number of cases in each year. Out of 200 cases studied over 3 years, maximum number of cases were in the year 2018 (72) and minimum in 2016 (59) (Figure 2).

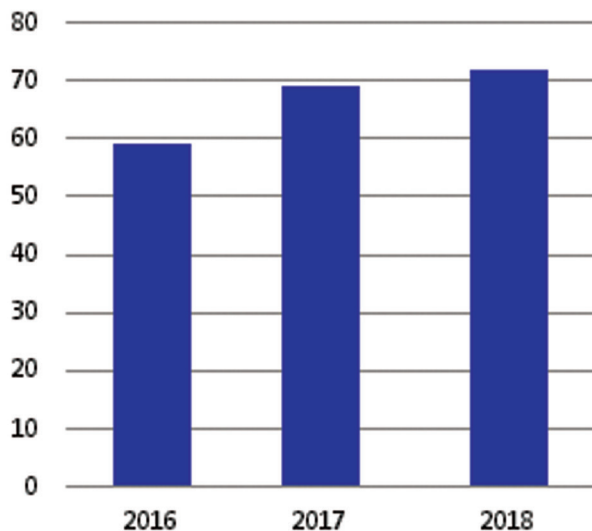


Fig. 2: No of Cases in Each Year.

3. 27 out of 200 cases were found to be malignant (13.5%), thus benign lesions occupying a major share (86.5%).

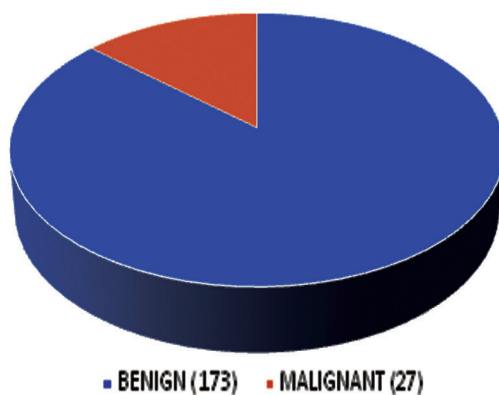


Fig. 3: Type of Neoplasm.

4. Among 200 cases studied, 27 breast lumps were found to be malignant (14%) and rest of them benign fibrocystic disease (44%) was the most common lesion among the study population followed by fibroadenoma (35%). 9% of the cases comprised of other lesions like granulomatous mastitis, galactocoele, breast abscess etc. (figure 4).

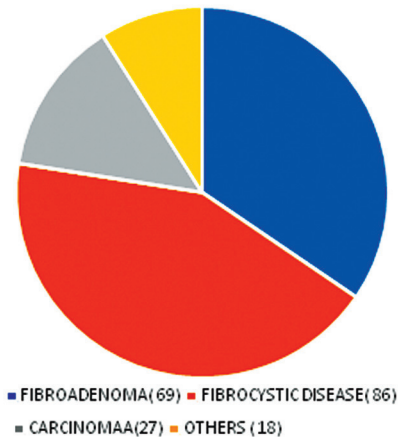


Fig. 4: Histopathological Diagnosis.

5. Out of 200 cases 67 had lumps in right breast (33.5%), 87 patients in left breast (43.5%) and 46 patients had lump in both breasts (23%) (Figure 5).

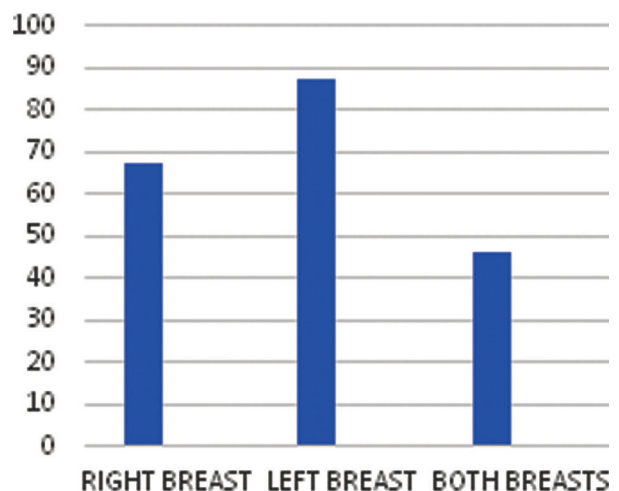


Fig. 5: Site of Lesion.

Discussion

Breast is an important feature of female anatomy and representing femininity.³ They are ectodermally derived modified sweat glands. They are composed of specialized epithelium and stroma. The human breast consists of six to ten major duct systems. The overlying skin of the breast is lined by keratinizing squamous epithelium that dips into the orifices of the nipple and then abruptly changes to a double-layered cuboidal epithelium that continues to line the ducts. The larger ducts further branch and eventually lead to the terminal duct lobular unit. Two cell types line the ducts and lobules. They are the luminal epithelial cells that overlay the epithelial cell.⁴

The physiological changes occur in three stages:

1. Growth and involution related to age.
2. Changes associated with menstrual cycle.
3. Changes due to pregnancy and lactation.

The benign spectrum of breast lesions includes fibroadenoma, phylloides tumor, mastitis and breast abscess and malignant spectrum includes ductal carcinoma, lobular carcinoma, mucinous carcinoma, medullary carcinoma, papillary carcinoma and metaplastic carcinoma.

In our study of 200 cases 86.5% comprised benign breast lesions while 13.5% of cases was constituted by malignant cases. A percentage of 10 and 21 have been observed in studies conducted in western countries and Africa, respectively.^{5,6} The most common lesion was found to be fibrocystic disease (43%). Fibrocystic disease is also known as fibroadenosis and it is a condition where the breasts are painful, lumpy, or dough. Early menarche, late or no pregnancies are important risk factors. It is not an actual disease but represents normal breast changes and needs to be distinguished from the malignant lesion.⁷ Next commonly occurring lesion in our study was Fibroadenoma (34.5%). It is usually the commonest among benign breast lesions.^{8,9}

In present study, maximum patients were seen in age group 35-44 years (56) followed by 25-34 years (46). Ellis et al (5) found that there were 254 breast lesions, histologically diagnosed in 3-year review period. The overall mean age of patients with breast lesion was 25.18, SD $\pm$ 11.73 with a wide age range of 12-74 years. Age group of 45-54 showed maximum number of malignant cases followed by 35-44. The mean age of presentation of malignant lesion was found to be 48.44.

Conclusion

From the study we could conclude that most common breast lesions are benign and there was an increase in number of cases in each year. The peak age of malignancy was around 4th decade. As we could see the peak age of occurrence of

breast lesions were around 3rd decade, it clearly emphasizes the need for breast cancer screening to be initiated in all women of age as early as possible for early diagnosis of breast cancer. Breast cancer screening and awareness programs must be implemented globally and the women should be motivated to report to the doctor at the earliest for prompt diagnosis and timely interventions so as to decrease the morbidity and mortality associated with breast cancer.

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To Study the Efficacy of Placental Extract Gel in Chronic Non Healing Foot Ulcer

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Introduction

Wound healing is a complex and regulated process that is critical in maintaining the skin barrier function. The numerous disease processes can affect the events involved in wound healing, resulting in chronic, non-healing wounds. These would subject them to significant discomfort and distress and drain the medical system resources enormously.^{1,2}

A chronic wound can be defined as that does not heal in an orderly set of stages and in a predictable amount of time or within three months. They remain in the inflammatory phase for too long and never heal or may take years.^{3,4} Chronic leg and foot ulcers occur in many adults with diabetes, chronic venous insufficiency, arterial disease, prolonged pressure, or neuropathy.⁵

Chronic ulcers may last for 12 to 13 months and even recur in 60-70% of cases. They cause loss of function and decreased quality of life and significant morbidity.^{6,7} These chronic ulcers are predominantly seen in elderly, becoming more prevalent and more difficult to treat and are associated with high treatment costs.⁸

So wound care has become essential in these ulcers, and surgical debridement and dressings are the cornerstones. Many wound dressings like gauze, films, hydrocolloids, gels, foams etc. were

developed to both protect the healing wound from infection and to promote the healing process.¹

Placental extract gel is a rich source of various peptides, amino acids, nucleotides, PDRNs and carbohydrates, which are believed to support the healing process.⁹ Application of placental extract preparation increases collagen synthesis, increases tissue protein, accelerates neoangiogenesis, and epithelialization.¹⁰ It has an immunotropic effect and causes the release of Epidermal growth factor, Fibroblast growth factor at the tissue level. It also reduces surrounding tissue inflammation and oedema and reduces microbial burden.¹¹ Its application accelerates healing because of amino acids, nucleotide and vitamins that improve healing.

Diabetes mellitus is the common cause of foot ulceration and is thought to affect 15% of people with diabetes at some time in their lives.¹² This is because of the complex association of various factors like Ischemia, Neuropathy and Infection. Micro-angiopathy, hypercoagulable status, atherosclerosis, and hyperglycemia may lead to the above complex, thus leading to the diabetic lesion and its complications.^{13,14,15} People with diabetes are between 15 and 70 times more likely to undergo lower-limb amputations than people without diabetes.¹⁶

As diabetes is the common cause of non-healing ulcers in our setting, we considered patients with diabetic foot and the dressing was done with Placental extract gel to determine its efficacy

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in healing the ulcer compared to conventional dressing techniques.

Materials and Methods

Type of Study: A Prospective Interventional study to determine the efficacy of Placental Extract Gel in chronic non-healing foot ulcer.

Study Setting: Department of general surgery, Tertiary Care Centre

Study Period: November 2017 to September 2019

Study Sample: 100 cases, divided into two groups by random allocation technique. Group A and Group B with 50 cases in each group.

Inclusion criteria

- Male and female patients between 20 to 75 years.
- Patients with chronic lower limb ulcers due to diabetes in the non-weight-bearing area of the foot, and <5% total body surface area.
- Patients who gave consent for the study.

Exclusion criteria

- Patients of age group < 20 and >75 years.
- Chronic lower limb specific ulcers due to malignancy, TB, Leprosy, arterial and venous pathology.
- Chronic Renal Failure, chronic liver failure patients.

Methodology

Institute Ethical Committee clearance certificate obtained for the study. Patients attending the surgical outpatient department with diabetic foot ulcer formed the study subjects.

Demographic data of the patients, recorded in the proforma. Investigations like haemoglobin, renal function test; screening, fasting, postprandial sugars were sent and recorded. All cases underwent debridement to remove the slough and antibiotics given according to culture and sensitivity. Cases were considered for the study once the wound is sterile as evident from culture and sensitivity report, was recognised as the study start point.

Patients were then grouped into two by Random Allocation Technique. Group A (cases) patients had a conventional method of dressing along with the application of Placental extract gel. Group B (controls) patients had a traditional way of dressing with povidone-iodine, peroxide alone.

The dressing was done every day. The wound progress studied in two groups, with the following parameters wound size, time taken for the appearance of healthy pink granulation tissue, the total duration of hospital stay with the endpoints like SSG, secondary healing depending on the size of the ulcer.

Wound size measured with a graph paper plotting the wound edges on it and measuring the large and small boxes measured in cm.² Size is measured at the study start point and on the day of appearance of red granulation tissue. At the end of the study, the results of the two groups measured comparing the following events.

- Percentage reduction in the surface area of the wound at the time of starting and endpoint of the study.
- Days took for the full granulation, i.e. pink, pinpoint velvety tissue that bleeds on touch to appear.
- The total duration of hospital stay, taken from the start point to endpoint i.e. after SSG or secondary closure or secondary healing of the wound.
- Complications if any encountered in each group.

Statistics

Microsoft Excel was used to construct a master chart using SPSS 22.0. Mean, and percentages for descriptive analysis. 'p' values are used to determine the significance in the difference noted between the two groups.

Results

Age Distribution

Table 1: Age Distribution in the Study Groups (N=100).

Age in Years	No. of Cases		
	Group A	Group B	Total
21-30	1 (1%)	0	1
31-40	13 (13%)	9 (9%)	22
41-50	6 (6%)	9 (9%)	15
51-60	20 (20%)	18 (18%)	38
61-70	9 (9%)	14 (14%)	23
>70	1 (1%)	0	1
Total	50	50	100

The mean age of cases in Group A is 51.68 years.
The mean age of cases in Group B is 53.94 years.

Table 2: Sex Distribution in the Study Groups (N=100).

Sex	Group A	Group B	Total
Male	38	34	72
Female	12	16	28
Total	50	50	100

Male to female ratio in the study was 2.6:1.

Table 3: Initial Surface Area of ulcer in the Study Groups (N=100).

Area of ulcer in cm ²	Group A	Group B
<10	4	8
10 -15	18	8
15-20	6	11
20-25	7	6
25-30	4	5
>30	11	12

Table 4: Mean ulcer size in the Study Groups (N=100).

Mean ulcer size in cm ²	Group A	Group B
Initial size	20.7	21.8
At end of second week	16.1	19.6
At end of third week	11.2	18.5

Table 5: Mean% Reduction of ulcer size in the Study Groups (N=100).

Mean % reduction in ulcer size	Group A at 2nd week	Group B at 3rd week
Split skin graft	17.24%	14.6%
Secondary Healing	36.7%	29.6%
Over all cases	30.9%	24.5%

Table 6: Mean days of the appearance of granulation tissue, hospital stay, Final treatment.

	Group A	Group B
Mean days of the appearance of granulation tissue	11.9 days $\pm$ 2.4	24.4 days $\pm$ 2.8
Mean days of hospital stay	16.2 days $\pm$ 4.5	29.1 days $\pm$ 3.05
Skin Grafting	15	35
Secondary healing	17	33

Table 7: Comparison of Sample Size & Mean Age.

Study	Group A				Group B			
	Sample size	Mean age	Male	Female	Sample size	Mean age	Male	Female
Sudhir et al ²⁰	30	57	23	7	30	56.8	21	9
Vivek Vardhan et al ²¹	50	55.7	35	15	50	57.9	37	13
Present study	50	51.68	38	12	50	53.94	34	16

Discussion

As the chronic wound has deranged normal healing process, application of placental extract gel has the following effects.

- Increases the epithelial proliferation from the edges.
- Accelerates neoangiogenesis by providing growth factors.
- Stimulates the fibroblast proliferation and thus the formation of granulation tissue.
- Helps in the contraction of the wound.

In the cases where there appeared an excellent granulation tissue culture was done and was posted for skin grafting if the size of the wound is more. If the wound size is less and if the patient is ready for follow up, cases were followed regularly on an outpatient basis, and regular application of placental extract gel decreased the wound size and contracted it allowing for secondary healing.

Management of diabetic foot is mainly by controlling the sugars, preventing infection, appropriate and timely debridement, adequate closure of the wound surface with a skin graft or allowing the wound to heal spontaneously. The placental extract increases collagen synthesis, increases tissue protein, accelerates neo-angiogenesis, and epithelialization. It has immunotropic effect, EGF, Fibroblasts and growth factors. It supports ossification and reduces surrounding tissue inflammation and edema.^{17,18,19}

Conclusion

Foot ulcers are the common morbidities noted in diabetic patients. A timely intervention like debridement and appropriate dressing care will reduce the amputation rates. Among the several dressing techniques available from my study I conclude that Placental Extract Gel application along with Povidone-iodine instead of Povidone-iodine and normal saline will

- Decrease the wound size significantly
- Allows granulation tissue formation at an early stage
- Help in early wound coverage by skin grafting.

Table 8: Comparison of Mean Reduction in Wound Size, Appearance of Granulation Tissue, Hospital Stay, Final Outcome.

Study	Group A				Group B			
	Mean reduction	Granulation tissue	Hospital stay	Final outcome	Mean reduction	Granulation tissue	Hospital stay	Final outcome
V. Vardhan et al ²¹	65.4	14.9	20	SSG 44 SH 6	72.7	20.2	25	SSG 19 SH 31
Sudhir et al ²⁰	-	14.2	19.8	-	-	23.4	28.2	-
Present study	30.9	11.9	16.2	SSG 15 SH 35	24.5	24.4	29.1	SSG 17 SH 33

- Thereby decrease the duration of hospital stay there by the cost of the patient.

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Conflict of Interest: Nil

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Diagnostic Accuracy of FNAC in Solitary Thyroid Nodule A Single Institutional Experience

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Abstract

Background: In this study, we aimed to evaluate the value of FNAC in the diagnosis of solitary thyroid nodule, and assess the correlation with the histopathology. **Materials and Methods:** Prospectively FNACs of 90 cases of solitary thyroid nodule was compared with histopathology from July 1 2013 till June 31 2015. **Results:** The sensitivity and specificity of FNAC in our study is 77.7% and 98.7 respectively, the positive predictive value and negative predictive value is 87.5% and 97.5% respectively. **Discussion:** In our study, FNAC is proved to be an invaluable tool for pre-operative diagnosis of thyroid lesions, and its Bethesda system concords with histopathology results.

Keywords: Solitary thyroid nodule; Fine needle aspiration cytology; Thyroid malignancy; Sensitivity; specificity.

Introduction

Solitary thyroid nodules are present in about 4% individuals in the United States, while thyroid cancer has a much lower incidence of 40 new cases per 1 million. Abnormalities of the thyroid gland are frequently encountered during clinical practice, either by physical examination of the patient

or incidentally during radiographic evaluation. Here, our focus lies on the solitary thyroid nodule (STN), which is a discrete swelling in an otherwise impalpable gland.¹ Through palpation itself, its incidence in the American population is 4%-7%, while ultrasound scanning detects 20%-76% of these cases.² In a majority of patients, the STN is a benign lesion such as an adenoma, a degenerative nodule, or secondary to thyroiditis.³ However, the possibility of thyroid cancer cannot be ignored as the incidence of malignancy in a STN ranges from 4.7% to 18.3%.⁴

Fine Needle Aspiration cytology (FNAC) has quickly become the most valuable test in evaluating patients with a thyroid nodule as it is safe, reliable and cost effective. It is the most appropriate investigation to define the nature of a thyroid nodule and decide about the need for surgical intervention.⁵⁻⁷ Through our study, we attempt to derive a correlation between pre-operative FNAC reports and post-operative histopathology, thereby testing the accuracy of our diagnosis in terms of sensitivity and specificity. However, the definitive diagnosis of thyroid malignancy in a Solitary thyroid nodule is through post-operative histopathological evaluation of the lesion.

Materials and Methods

This study has been reviewed and approved by the Kasturba Medical Hospital, Manipal review board.

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Case material for the present clinicopathological study of Solitary thyroid nodule is obtained from the patients admitted in Kasturba Hospital Manipal from July 1st, 2013 till June 31st, 2015. It is a prospective study consisting of 90 cases of solitary thyroid nodule proven by ultrasound and substantiated by histopathology, whereas patients with multinodular goitre or diffuse thyroid swelling have been excluded. All the patients diagnosed with solitary thyroid nodule satisfying the above-mentioned criteria have been involved and taken informed consent. Cases were studied in detail clinically and recorded as per proforma. Routine investigations and specific investigations including FNAC, thyroid profile, indirect laryngoscopy, Ultrasound of neck were done in all cases. All the specimens obtained were subjected to histopathological examination. Patients were grouped according to different variables like age, sex, FNAC reports and histopathological reports. Variables were analysed using IBM SPSS software version 26, and Z test was done for the comparison of proportion. The study was compared with previous similar studies conducted elsewhere and conclusions were drawn.

Results

Demographically, it was noted that the incidence of solitary thyroid nodule was highest between the 4th and 5th decade (28.88%). Moreover, women are significantly more affected than men with a ratio of 3.1:1. All patients presented with a swelling in the neck.

Table 1: FNAC Diagnosis.

	FNAC	No. Patients	%
Thy 1	Non-diagnostic	7	7.77
Thy 2	Benign	57	63.33
Thy 3	Follicular neoplasm	18	20
Thy 4	Suspicious	4	4.44
Thy5	Malignant	4	4.44
	Total	90	100

Table 3: FNAC and Histopathology correlation.

HPE → FNAC ↓	Colloid nodule	Thyroiditis	Adenoma	Papillary carcinoma	Follicular carcinoma	Medullary carcinoma	Total
Non-diagnostic	4	-	3	-	-	-	7
Benign	44	6	7	-	-	-	57
Follicular lesion	-	-	16	-	2	-	18
Suspicious	-	-	1	2	-	1	4
Malignant	-	-	-	4	-	-	4
Total	48	6	27	6	2	1	90

Additional features such as change in voice, dyspnoea, pain and cervical lymphadenopathy were noted in a minority that aided a clinical diagnosis. The distributions of initial cytological diagnoses according to Bethesda categories (Table 1) were as follows: benign in 57(63.33%) cases which included 51 colloid nodule and six thyroiditis, follicular neoplasm in 18(20%) cases, malignant in four(4.44%) which included four papillary carcinoma, Suspicious in four(4.44%) and non-diagnostic in seven(7.77%) cases. On the basis of FNAC, all benign patients (57) underwent hemi thyroidectomy. Patients with follicular neoplasm underwent hemithyroidectomy with frozen section, and completion thyroidectomy was performed in two patients with follicular carcinoma. Malignant or suspicious of malignancy patients underwent total thyroidectomy followed by central or functional neck dissection. Central neck dissection was performed in all patients along with total thyroidectomy, but functional dissection was performed only in case of radiological or clinical evidence of enlarged cervical lymph nodes.

Table 2: Histopathological Diagnosis.

HPE Report	No. Patients	Percentage (%)
Colloid nodule	48	53.33
Thyroiditis	6	6.6
Adenoma	27	30
Papillary carcinoma	6	6.6
Follicular carcinoma	2	2.2
Medullary carcinoma	1	1.1
TOTAL	90	100

Histopathological analysis and the results obtained (Table no. 2) showed 90% of the cases studied are benign in origin which included 48 colloid nodule, six thyroiditis and 27 adenoma, and 10% were proven malignant which included six papillary carcinoma, two follicular carcinoma and one medullary carcinoma. The correlation between cytological and histological diagnoses is given in (Table no.3). of the 90 patients included in the

study, seven were non-diagnostic (Bethesda-1) by FNA out of which histopathology reported as colloid nodule in four patients and adenoma in three patients.

Table 4: Comparison of FNAC with Histopathology.

FNAC Finding	HPE Finding		Total
	Malignant	Benign	
Malignant cells present	7	1	8
Malignant cells absent	2	80	82
Total	9	81	90

Of the 57 benign (Bethesda-2) Cytologies, histopathology reported as colloid nodule, thyroiditis and adenoma in 44, 6 and 7 patients respectively. Histopathology confirmed adenoma in 16 patients and follicular carcinoma in two patients in patients with Bethesda-3 cytology. of the seven suspicious cytologies (Bethesda-4), histopathology confirmed papillary carcinoma in two patients, and adenoma and medullary carcinoma in one patients each. All four patients in Bethesda-5 category had papillary carcinoma in histopathology.

The sensitivity and specificity of FNAC in our study is 77.7% and 98.7% respectively, and the positive predictive value and negative predictive value is 87.5% and 97.5% respectively.

It is evident from the results that the FNAC failed to diagnose malignancy in two patients (22%). So both the patients underwent hemithyroidectomy initially followed by completion thyroidectomy on obtaining the frozen section results. In one patient FNAC was suggestive of malignancy, so total thyroidectomy was carried out as FNAC was the preferred diagnostic tool in our study, but histopathology showed opposing results.

It is worth mentioning that the incidence of malignancy in our study is 10%, and papillary carcinoma is the most common histopathological type accounting for about 6.6% of all solitary thyroid nodules.

Discussion

Thyroid malignancy accounts for about 1% of all malignancies.⁸ Early diagnosis and treatment increases the life expectancy as thyroid nodules have low malignancy potential, and malignancies are slowly progressive. FNAC is an apt investigation in evaluating thyroid nodule as it has resulted in 25-50% decrease in the need for surgery in patients with thyroid disease, while increase in the number of malignant results in the operated group of patients.⁹ Currently, in the early stage of evaluating

thyroid nodule FNAC is the preferred modality of investigation.¹⁰ In our study, the sensitivity and specificity of FNAC is 77.7% and 98.7% respectively which correlates with the published series which ranges between 65-98% for sensitivity and 73-100% for specificity.¹⁰⁻¹⁴ Disagreement in the categorisation of follicular neoplasm and suspicious for malignancy is the most common reason for such wide range of sensitivity and specificity. In addition, natural difficulties in differentiating benign and malignant follicular lesions, inadequacy in sample, and inadequate experience of cytologists are the other factors that reduce the efficiency of FNAC. Moreover, some literatures have classified follicular lesions as benign, whereas others classify these as malignant.^{10,11,15} In our study, we have considered follicular lesions in the benign category. In the various literature, false-negative and false-positive were reported between 1%-7% and 1%-11.6%.^{10,11,12,16} In our series, the rate of false-negative and false-positive is found to be 2.2% and 1.1% respectively. False positive can cause over diagnosis which may lead to excessive treatment, specifically unnecessary thyroidectomy. In one of the study cases, preoperative cytology reported as suspicious for malignancy, post thyroidectomy it turned out to be a follicular adenoma. False negative can lead to underdiagnoses and hence under treatment. We report 2 cases reported benign preoperatively, and post-surgery both results came as follicular carcinoma category.

In our study, non diagnostic FNAC result is 7.77% which is within the reported range in the literature i.e., 1.6-20%.^{10,11,17} Cystic degeneration, calcification and sclerotic nodule are the common cause for non-diagnostic sample. This error can be reduced by using Ultrasound.^{17,18} The overall incidence of malignancy in solitary thyroid nodules varies from 4.7%-18.3% according to various studies.¹ In our study, the overall incidence of malignancy in solitary nodule was 10%. The limitations of the study includes; limited number of cases studied, ultrasound guided sampling could have yielded better sampling.

Conclusion

FNAC is an invaluable tool for pre-operative assessment of thyroid lesions, but malignancy can still come as a surprise on postoperative histopathological examination. Ultrasound guided sampling, on-spot cytological examination during ultrasound guided sampling, fulfilling the criteria for adequacy etc, can decrease the false negative rates.

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The Role of Indigenous Four Layer Regenerative Scaffold in the Management of Post Burn Raw Area

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Abstract

The understanding of wound healing has led to the inclusion of tissue regeneration therapy as an armamentarium to deal with both acute and chronic wounds. The bio constructs that aid in wound regeneration was made using natural, artificial, or a combination of both, widely known as regeneration scaffolds. The components of regeneration scaffolds promote the inherent self-renewal property of the skin and speed up the healing process by providing growth factors/stem cells. The scaffolds are in use for so many years. But the commercially available scaffolds are very expensive. Hence an indigenous scaffold was made use of multiple components like non-cultured keratinocytes, amniotic membrane, collagen, and silicone. Which was found to be in no way inferior to any of the commercially available scaffolds.

Keywords: Regeneration Scaffold; Post Burn Raw area; Dermal Regeneration; Regenerative Therapy.

Introduction

The World Health Organization(WHO) estimates that, annually, over 3 lakh deaths are due to thermal burn injuries. Millions are suffering from the

physical and emotional consequences of burns.¹ 6.5 million individuals suffer from chronic skin ulcers caused by prolonged pressure, venous stasis, or diabetes mellitus.² Regeneration therapy is a good option that can be considered in the management of wounds. Regeneration of wounds is done by stimulating the innate ability of the skin for self-renewal. The gradual understanding of the biological processes of wound healing has led to the development of biological constructs that actively promote tissue regeneration using regeneration platforms, or scaffolds, as well as the incorporation of cell-signaling elements such as Growth Factors and Stem Cells. But the commercially available Regeneration scaffolds are very expensive, the cost may range between Rs. 20000 to Rs 30000. Hence we decided to make an indigenous regenerative scaffold using the materials available in the ward. In this article, we share our experience of making a regenerative scaffold with four layers in the management of a post-burn raw area patient.

Materials and Methods

This study was conducted in the Department of Plastic Surgery at a tertiary care center after getting the departmental ethical committee approval. Informed written consent was taken from the patient. The details of the patient in the study are as follows: A young female was admitted with

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a history of thermal flame burns involving 23% TBSA second-degree superficial and a few second-degree deep burns. Mostly involving the parts of anterior and left lateral aspect of torso, left axilla, and left upper limb (Figure 1a and 1b). After the initial fluid resuscitation, she was initially managed with dry collagen heterografting, and later the dry collagen was replaced with a 4-layer regeneration scaffold. The regeneration scaffold was prepared in the department of Plastic surgery using materials already available in the department.



Fig. 1: a and b.

The four layers from outer to inner are as follows:

1. Silicone
2. Collagen
3. Amniotic membrane
4. Non-cultured keratinocytes

The description of each layer is as follows.

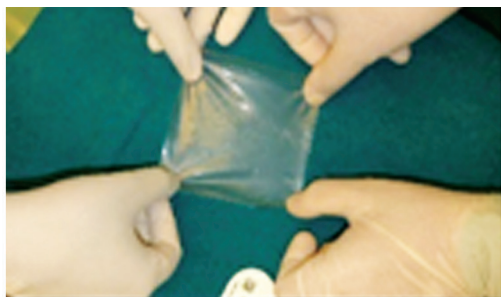


Fig. 2: Silicone Layer.

A self-Adhesive collagen dressing sheet was used.



Fig. 3: Collagen Layer.

The Collagen we used was in the form of dry sheets,

commercially available bovine origin, multiple layers of the collagen were used.



Fig. 4: Amniotic Membrane Layer.

Amniotic membrane was harvested from the Obstetrics Department of the same institution. The amniotic membrane was taken from a healthy woman, who had a healthy pregnancy, who was screened for Hepatitis B and C, HIV 1 and 2, and VDRL, taken after a Cesarean birth. The amniotic membrane was irrigated with Saline and treated with Heparin, antimicrobials, antifungals, and stored in glycerol under refrigeration.



Fig. 5: Non-Cultured Keratinocyte Layer.

The Non-cultured Keratinocytes were harvested using microdermabrasion, and the keratinocytes were mixed with Mupirocin ointment to make a paste.

Steps of Preparation

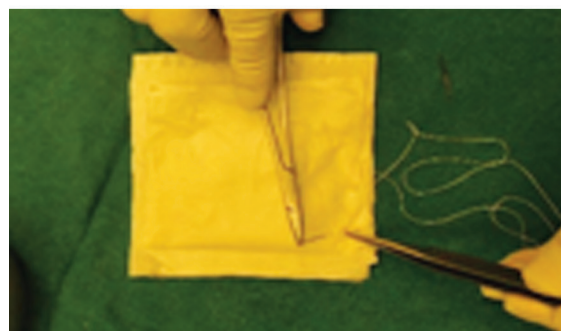


Fig. 6: Scaffold sutured together.

All the three layers from out to in were placed one over the other and were sutured together using absorbable undyed 4.0 polyglactin sutures (Figure 6) and Non-cultured keratinocyte -mupirocin paste was applied evenly over the third layer to complete all the four layers. The Four-layer regeneration Scaffold was applied once a week under anesthesia after debridement and the patient was treated with antibiotics according to culture and sensitivity and also nutritional support.

Result

The four layers regeneration scaffold is effective in regenerating the wound following the flame burns (Figure 7).



Fig. 7: Healed Raw area.



Fig. 8: Materials Required.

The length of hospital stay was almost identical to patients who underwent allografting. No complications were noted during the study.

Discussion

Thermal wounds have been divided into three zones by Jackson; Zone of coagulation, Zone of stasis

Zone of hyperemia. Inadequate fluid resuscitation wound infection or poor perfusion can lead to a superficial burn developing into a more severe and deeper wound. The treatment of the wound may be conservative or surgical, usually followed surgical treatments are: excision of eschar to prevent wound infection, wound coverage with an autologous split-thickness skin graft. In case of larger parts of the total body surface area have been involved then, autologous skin grafts meshed to enlarge the size of the graft.

The disadvantages of such practices are morbidity, like pain at the donor site, corrugated scar as the recipient site. In cases of total or near-total full-thickness skin injuries, donor sites may be inadequate. In that case, other treatment options like allograft, or heterograft are used. Such allografts represent temporary measures for immediate wound coverage in the acute stages post-injury. Allografts can be live donor skin grafting or a cadaveric skin graft. Disadvantages of using allografts with live or cadaveric human skin are donor shortage, limited availability, moral objections, risk of viral transmission, etc. All these disadvantages of allografts make space for fully synthetic, biocompatible skin bio-construct which can help in the regeneration of scar-free skin. Tissue-engineered skin grafts aim to enable complete and natural and accelerated wound regeneration.

A scaffold or template is a 3-Dimensional supporting framework for tissue regeneration, also preventing wound bed contraction throughout the stages of healing.³ The framework, or scaffold, should further serve as a platform for cellular localization, adhesion, and differentiation, as well as guide the development of new functional tissues.⁴ Scaffold materials may be of natural, synthetic, or composite origin. The mixing of materials of different classes to obtain composite scaffolds helps to overcome the individual limitations of a single material scaffold.⁵ The ideal skin regeneration scaffold should actively direct tissue formation and prevent scarring. Thus, much focus has been channeled into creating suitable biomimetic structures that can act as delivery vehicles for stem cells or Growth factors.

The synergistic tissue regenerating effects of a smart scaffold cocktail comprises scaffold surface patterns, growth factors, and stem cells which have the realistic potential of overcoming current barriers and enabling fast and complete skin regeneration. During natural wound healing, interactions between components of the extracellular matrix and surrounding cell-signaling molecules are

responsible for the expression of growth factors and cytokines. These interactions elicit cellular responses that ultimately lead to new tissue formation. Overwhelming activation of the inflammatory system and prolific recruitment of contractile cells typically leads to scar formation, often resulting in disfigurement and functional disability. Now a days, some wounds are closed aseptically using sutures that obviate the need for a vigorous contractile response, creating more time for complete tissue regeneration. Here, external modulation of cell-signaling events via a finely tuned delivery of Growth factors or stem cells is thought to alter the wound environment, enabling orderly regeneration.

In our study, we have materials of different origins to make a composite scaffold which can help to overcome the limitations of each. All four components are already well documented and proven.

Conclusion

The four-layer regeneration scaffold is simple, cost-effective, easy to prepare, and without any complications. The length of hospital stay was almost identical to the patients who were treated with allograft. The quality of scar formed is good.

But a multi-center and larger volume study is required to comment on the exact findings.

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Declarations: Author's contributions

All authors made contributions to the article

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Study of Prevalence of H Pylori Infection in Dyspeptic Patients

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Abstract

Background: *Helicobacter pylori* infection occurs worldwide, affecting more than half of the world population. The clear aetiology of dyspeptic symptoms is still unclear but *helicobacter* infection is main contributing factor for it we investigated *Helicobacter pylori* prevalence in dyspepsia.

Methods: 100 cases of dyspepsia attended Adichunchanagiri hospital and research center, studied over a period of 18 months (January 2020 to June 2021), were subjected to upper gastrointestinal endoscopy, during which 4 biopsies, two each from the antrum and the pathological areas were taken. Two biopsy specimens, one of the antral area and the other of the pathological finding were immediately inoculated into freshly prepared urea broth containing phenol red as the indicator. Positive test for *Helicobacter pylori* was indicated by change in colour of the medium from yellow to pink or red. The other two biopsy specimens were sent for routine histopathology. The case was taken as *Helicobacter pylori* positive when the rapid urease test and/or histopathological examination were positive.

Results: Out of 100 dyspeptic patients who were included in the study, there were 65 male patients and 35 female patients. In which 71 patients were found to have been infected with *Helicobacter pylori* (71%).

Conclusion: In this study, we found that in Dyspepsia the *Helicobacter pylori* was consistently associated and its well proved with various studies done in past and present. Thus we conclude *Helicobacter pylori* infection definitely have role in the aetiopathogenesis of dyspepsia.

Keywords: Giemsa; *Helicobacter Pylori*; Peptic ulcer disease; Urease; Ulcerative dyspepsia.

Introduction

Dyspepsia is defined as persistent/recurrent pain or discomfort localized to upper abdomen, may or may not be related to meals. It includes symptoms like pain, bloating, nausea and early satiety. Once the patient has been evaluated for dyspepsia, he or she will be categorized as having either organic dyspepsia (eg PUD, gastric Ca, NSAID gastropathy) or functional or non-ulcer dyspepsia.

Causes of dyspepsia includes GERD, diseases of stomach, gallbladder and pancreas.

Helicobacter pylori (*H. pylori*) is a gram negative microaerophilic bacterium that colonizes the gastric

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mucosa of more than half of the world's population with high geographic variability.¹ H.pylori infection is generally acquired during childhood and persists life-long in the absence of treatment with antibiotics. Most of the infected individuals remain asymptomatic for a long period.

As a result, long term colonization of H. pylori can damage the gastric mucosa causing various diseases of the upper gastrointestinal tract such as chronic gastritis, peptic ulcer, and gastric malignancies, particularly gastric cancer and gastric mucosa-associated lymphoid tissue (MALT) lymphoma.²⁻³ H.pylori has been recognized as a Class I carcinogen by the International Agency for Research on Cancer.⁴ As one of the strongest known risk factors for gastric malignancies.⁵⁻⁸ Approximately 89% of all gastric cancers are attributed to H.pylori infection and the eradication of this infection has known to reduce gastric cancer incidence.^{9,10}

The probable routes of transmission of H.pylori are feco-oral, oro-oral, and intra-familial, thus rendering the risk factors for H. pylori infection closely associated with food and personal hygiene.¹¹

Other known risk factors associated to H. pylori infection include age, socioeconomic status, number of siblings, household crowding, ethnicity, migration from high prevalence regions, infection status of family members, and sanitary facilities.¹²⁻¹⁴

This study aimed to identify the prevalence of H.pylori infection in patients with dyspepsia and the various upper GI endoscopy findings in patients with dyspepsia. The symptoms of dyspepsia affects physical, mental, social aspect and health related quality of life. Several studies have revealed the association of Helicobacter pylori in 70-75 percent of patients with dyspepsia. Endoscopic studies have shown that, Helicobacter pylori is found in 80-100 per cent of patients with duodenal ulcers and 60-75 per cent of patients with gastric ulcers.¹⁵⁻¹⁷

Methods

Source of data

The study was conducted at the department of general surgery, Adichunchangiri hospital and research center, teaching hospital attached to Adichunchanagiri institute of medical sciences B.G.Nagara, Nagamangala taluk, Mandya district, on an out patient basis or seeking admission in Adichunchanagiri hospital and research center, from January 2020 to June 2021.

- Study period: 18 months (January 2020 to June 2021).
- Study design: hospital based observational study.
- Sample size: 100 cases.
- Sampling method: purposive sampling.

Inclusion Criteria

- Patients with dyspepsia aged >14years & <70years.
- Patients having dyspeptic symptoms for more than 3 months.
- Patients giving consent for the study.

Exclusion Criteria

- Patients with dyspepsia aged <14 years & >70 years.
- Patients with gall bladder or pancreatic diseases may present with dyspepsia. They are excluded from the study.
- Patients who are not willing and unfit for endoscopy.
- Patients who already have take H.pylori medication.
- Patients who are immunocompromised and are known coagulopathy disorders.

Statistical Analysis

Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean±SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5% level of significance.

Chi-square/Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups, Non-parametric setting for Qualitative data analysis. Fisher Exact test used when cell samples are very small. The Statistical software namely SPSS 22.0, and R environment ver.3.2.2 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc.

Ethical committee clearance

Ethical clearance was given by the ethical research committee of Adichunchanagiri institute of medical sciences, B.G. Nagara, Bellur.

Results

In this clinical study maximum number is seen in 30-40 and 41-50years age group (50 patients) and minimum in <30 years (13 patients) (Table I).

Table 1: Age distribution of patients studied.

Age in Years	No. of Patients	%
<30	13	13.0
30-40	25	25.0
41-50	25	25.0
51-60	23	23.0
60-70	14	14.0
Total	100	100.0

Mean $\pm$ SD: 45.82+/-13.26

Out of 100 patients 35 are females, that is 35% and 65 are males that is 65% (Table II).

Table 2: Gender distribution of patients studied.

Gender	No. of Patients	%
Female	35	35.0
Male	65	65.0
Total	100	100.0

This chart shows distribution of symptoms among the cases studied, pain abdomen(epigastrium) is main symptom in 82 patients, followed by nausea in 75 and vomiting in 74, belching in 71 and lastly bloating in 58 patients (Table III).

Table 3: Clinical features in patients studied.

Clinical features	Gender		Total (n=100)
	Female (n=35)	Male (n=65)	
Pain Abdomen (Epigastrium)	30(85.7%)	52(80%)	82(82%)
Vomiting	25(71.4%)	49(75.4%)	74(74%)
Nausea	24(68.6%)	51(78.5%)	75(75%)
Bloating	14(40%)	44(67.7%)	58(58%)
Belching	29(82.9%)	42(64.6%)	71(71%)

Out of 100 patients, 64 were smokers and 65 patients were alcoholic (Table IV).

Table 4: Tobacco & Alcohol abuse among the patients studied.

Variables	Gender		Total
	Female	Male	
Tobacco Abuse			
No	28(80%)	8(12.3%)	36(36%)
Yes	7(20%)	57(87%)	64(64%)
Alcohol Abuse			
• No	32(91.4%)	3(4.6%)	35(35%)
• Yes	3(8.6%)	62(95.4%)	65(65%)
Total	35(100%)	65(100%)	100(100%)

Out of 100 patients there was history of drugs (NSAIDS & corticosteroids) intake in 12 patients (Table V).

Table 5: Drug intake (NSAIDS & corticosteroids).

Drug Intake (Nsaids & Corticosteroids)	Gender		Total (n=155)
	Female (n=50)	Male (n=105)	
No	30(85.7%)	58(89.2%)	88(88%)
Yes	5(14.3%)	7(10.8%)	12(12%)
Total	35(100%)	65(100%)	100(100%)

P = 0.606, Not Significant, Chi-Square Test.

This chart shows distribution of dyspepsia among rural/urban population in which 76 patients (76%) are in rural and 26 patients (26%) are in urban locality (Table VI).

Table 6: Urban/Rural Distribution of Patient Studied.

Urban/Rural	Gender		Total
	Female	Male	
Rural	28(80%)	48(73.8%)	76(76%)
Urban	7(20%)	17(26.2%)	24(24%)
Total	35(100%)	65(100%)	100(100%)

P=0.492, Not Significant, Chi Square Test

In the study on endoscopy 23% had duodenal ulcer, 12% had Gastric ulcer, 40% had GS/DS, 3% had GERD, 21% had FD and 1% had Gastric Ca (Table VII).

Table 7: Endoscopic findings distribution.

	No		Yes	
	Number	%	Number	%
DU	77	77.0%	23	23.0%
GU	88	88.0%	12	12.0%
GS/DS	60	60.0%	40	40.0%
GERD	97	97.0%	3	3.0%
FD	79	79.0%	21	21.0%
Gastric CA	99	99.0%	1	1.0%

In the study among 33 patients who had tested for RUT, 23(69.69%) were positive for RUT and 10(30.30%) were negative for RUT (Table VIII).

Table 8: Rapid Urease Test.

		Count	% (of 100 Patients)
Rapid Urease Test (Total 33 tested)	Negative	10(30.30%)	10.0%
	ND	67	67.0%
	Positive	23(69.69%)	23.0%
	Total	100	100.0%

P=0.737, Not Significant, Chi-Square Test.

In the study of HPE for H Pylori, 71% were positive and 29% were negative (Table IX).

Table 9: Histopathologic diagnosis for H Pylori.

		Count	%
Histopathology	Negative	29	29.0%
	Positive	71	71.0%
	Total	100	100%

P=0.321, Not Significant, Chi-Square Test.

In the study among HPE positive subjects 76.9% were positive in RUT and among HPE negative subjects 57.1% were negative (Table X).

Table 10: Association between Histopathology and Rapid Urease Test.

		Histopathology			
		Negative		Positive	
		Count	%	Count	%
RUT	Positive	3	42.9%	20	76.9%
	Negative	4	57.1%	6	23.1%
	Total	7		26	

$\chi^2 = 3.03$, df = 1

Among 71 patients were H.pylori positive and received triple therapy, 68 patients came for follow up and got cured, 29 patients who received PPI, 25 patients came for follow up (Table XI and XII).

Table 11: Therapy of disease.

Patients	No. of Patients	%
Triple therapy	71	71%
PPI	29	29%
Total	100	100.0

Table 12: Response to therapy.

Patients	No. of Patients	Response	
		Yes	No
Triple therapy	71	68(95.7%)	3
PPI	29	25(86.2%)	4
Total	100	93(93%)	7

Discussion

After the discovery of *Helicobacter pylori* by Marshall and Warren in 1983, many studies were conducted to confirm the association of *Helicobacter pylori* with various acid-peptic diseases and carcinoma stomach. The following observations were made:

- The treatment of *Helicobacter pylori* led to the reversal of gastritis in patients with chronic non-specific gastritis.
- The eradication of *Helicobacter pylori* decreases the relapse of peptic ulcer to 1%-3% when compared to 80% relapses inpatients with persistent *Helicobacter pylori* infections after medical management.

In spite of the above findings, the cause-and-effect relationship between *Helicobacter pylori* and peptic ulcer disease is not proved and furthermore many people infected with *Helicobacter pylori* did not develop peptic ulceration. The association of *Helicobacter pylori* with non-ulcer dyspepsia is controversial. Therapeutic trials in non-ulcer dyspepsia patients with *Helicobacter pylori* infection produced conflicting results. Thus, at this stage in the history of dyspepsia and its association with *Helicobacter pylori*, the causation or association between the two is still unclear.

Thus we at the "Department of Surgery, Adichunchanagiri Medical College, B.G.Nagara" have made a sincere attempt to explore the possibility of proving this association between *Helicobacter pylori* and dyspepsia. We have also compared our studies with other studies done previously. A brief outline of the studies compared is given below.

The prevalence of *Helicobacter pylori* in dyspeptic patients(investigated cases) in our hospital is around 71% and this is comparable with other studies. In our study 100 patients diagnosed as ulcer in upper GI endoscopy were all included ,in which 65 are males(65%) and females are 35(35%).

Lower number of patients are seen in age group <30 that is 13 patients in which 3 are females and 10 are males. In our study of 100 patients, total 71 are positive for H.pylori (histopathology) in both males and females. In our study clinical symptoms out of 100 patients pain abdomen(82%) is main symptom in 82patients, followed by nausea(75%) in 75 and vomiting(74%) in 74, belching(71%) in 71 and lastly bloating(58%) in 58 patient so predominantly epigastric pain and vomiting are more common.

Out of 100 patients tobacco abuse in 64 patients (64%) and alcohol abuse in 65(65%) and drug (NSAIDS & corticosteroids) intake in 12(12%) are seen, so majority are tobacco and alcohol abuse.

Conclusion

This was a prospective study conducted to determine the role of *Helicobacter pylori* in dyspepsia. This

study design was based on clinical study and endoscopic findings and biopsy of gastric mucosa (and duodenal mucosa whenever necessary). In 100 patients with a history of dyspepsia, the upper Gastro Intestinal endoscopy performed and endoscopy confirmed the diagnosis.

Rapid urease test and Giemsa staining were conducted on endoscopy biopsy specimens and *Helicobacter pylori* positivity was based on either Rapid urease test and/or Histopathological examination.

From the present study it is evident that,

- *Helicobacter pylori* infection is more common in males than females.
- Increasing trend of prevalence of *Helicobacter pylori* with increasing age in dyspeptic patients.
- Prevalence of *H. Pylori* in patients with dyspeptic symptoms attending Adichunchanagiri hospital.(both outpatient and inpatient) is 71%.
- There was no specific symptoms attributable to *H.pylori* infection.
- In Peptic ulcer disease patients *H.pylori* is strongly associated with duodenal ulcer (82.6%) than gastric ulcer(75%)
- *H.Pylori* is one of important factor in developing peptic ulcer diseases.
- *H.Pylori* is more commonly associated with ulcer dyspepsia than non ulcer dyspepsia(functional dyspepsia).
- Patients from Rural and semi urban areas are more associated with *H.pylori* infection.
- *Helicobacter pylori* is consistently associated with dyspepsia, which is proved well with studies done in past so also in this study hence, *Helicobacter pylori* infection definitely have a strong role in the aetiopathogenesis of dyspeptic disease.
- Early diagnosis and eradication of *helicobacter Pylori* not only improves the symptoms of dyspepsia but also helps to cure the organic disease & its complications.

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A Study of Initial Experience of Trans-Abdominal Pre-Peritoneal Inguinal Hernia Repair at a Tertiary Care Center

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Abstract

Introduction: Inguinal hernia surgery remains till date one of the most commonly performed surgeries. Overall decrease in recurrence rate along with shorter hospital stay, faster return to normal activities and a lower incidence of post-operative pain has led to the widespread acceptance of laparoscopic hernia repair especially Laparoscopic Transabdominal Preperitoneal repair in the management of inguinal hernia. The study was done to evaluate the initial experience of a tertiary care center in the laparoscopic hernia repair including the intra and post-operative complications and associated technical difficulties.

Methodology: This prospective, descriptive study was performed in 22 patients during the period of 2018 to 2021. The patients were evaluated thoroughly for the predisposing factors, technical aspects of the procedure, intra-operative details, post-operative complications and the time taken for the procedure were noted. The patients were also followed up for a period of 6 months for late complications.

Results: All the patients in the study group were male and majority of them were older than 40 years. Majority of the patients had heavy work as the risk factor and all of them presented with inguinal or inguino-scrotal swelling which reduced by itself. Majority of patients had right indirect and incomplete inguinal hernia. The mean operative time in initial

cases were longer, but on acquiring experience, the operating time came down to approximately 90 minutes. The complications associated with the procedure were minimal with a return to normal routine in a mean of 15 days.

Conclusion: Laparoscopic hernia repair is a significantly lengthier procedure especially in the learning phase of the surgeon's team, but the operative time decreases with increasing experience. Good technique and knowledge about laparoscopic anatomy of inguinal region ensures minimal complications and faster recovery.

Keywords: TAPP; TEP; Laparoscopic Hernia Repair; Inguinal Hernia Surgery.

Introduction

Inguinal hernia surgery remains till date one of the most commonly performed surgeries. Reference to the surgical treatment of an inguinal hernia date back to the 1st century; however formal descriptions of hernia repairs did not appear until the 15th century. The cause of an inguinal hernia is far from completely understood but it is undoubtedly multifactorial. Patent processus vaginalis of posterior inguinal wall is one of the factors associated with inguinal hernia occurrence.

The Hernia surgery has gone through a major evaluation from the days of truss & castration to present days of laparoscopic surgery. Inguinal hernia repair using tension free mesh technique gives a better result than a conventional sutured repair. Overall recurrence rate is decreased along

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with shorter hospital stay, faster return to normal activities and a lower incidence of persisting pain. With the advent of the laparoscope and increasing spectrum of minimally invasive surgery, it was only a matter of time that the laparoscopic surgery which started with laparoscopic cholecystectomy in 1987 entered the realm of inguinal hernia surgery too.

Refinement of laparoscopic technique to the now widely accepted trans abdominal pre-peritoneal hernioplasty (TAPP) approach and total extra peritoneal (TEP) technique has established a sound base for laparoscopic approach to repair of groin hernias.

TAPP the revolutionary concept in laparoscopic hernia surgery was introduced by Arregui¹ in early 1990's. Laparoscopic herniorrhaphy has several advantages as evidenced by several studies. First and foremost aspect from the patient point of view is the reduced post-operative pain and short recovery period. Second, the entire myopectineal orifice can be inspected allowing repair of any unexpected hernias thereby reducing the chance of recurrence. Third, laparoscopic herniorrhaphy avoids the previous operative scars site in patients with recurrent hernias.

The disadvantages of laparoscopic repair include the need for general anesthesia, longer operative time, cost of procedure and the steep learning curve for the surgeon.

The study is to evaluate the feasibility, learning curve of the surgical team, institution shortcomings, scope for improvements, and effectiveness during initial period of starting laparoscopic trans-abdominal pre peritoneal hernia surgery at tertiary care center.

Material and Methods

This prospective, descriptive study was conducted in Department of Surgery, Rabindra Nath Tagore Medical College and attached Maharana Bhupal Government Hospital, Udaipur, Rajasthan during the study period of 2018 to 2021.

Patient Selection

The following criteria were used to select patients to undergo laparoscopic TAPP hernia repair for the purpose of this study.

- Age between 15 to 70 years.
- Clinically diagnosed with inguinal hernia, unilateral or bilateral, primary or recurrent, direct or indirect.

- Fit from cardio-pulmonary point of view to undergo general anesthesia.
- Patients who gave informed consent to undergo the study and be available for follow up.

The following criteria were used to exclude patients from study:

- Patient with strangulated, incarcerated and obstructed inguinal hernia.
- Patient with large, complete, indirect inguinal hernia which are only partially reducible or irreducible. Sir Ganga Ram Hospital Classification Grade-V groin and ventral abdominal wall hernias.²
- Patient with previous operation scar for previous laparotomy with possibility of adhesions to underlying parietal peritoneum.
- Patient with uncontrolled cardio pulmonary conditions like chronic obstructive pulmonary disease (COPD), Hypertension, congestive heart failure (CHF), coronary artery disease (CAD) and otherwise high risk for surgery as per American Society of Anesthesiologists ASA criteria.
- Patients with history of pelvic irradiation.

Preoperative workup

Patients were admitted in the general surgery with the diagnosis of inguinal hernia. After admission preoperative data for laparoscopic inguinal hernia repair (TAPP) were collected on a structured proforma including presenting or abdominal complaints, complete past medical and surgical history (specifically previous hernia surgery). A comprehensive general physical examination along with systemic examination was done. Local examination of hernia sites was carefully done including reducibility, impulse on coughing in inguino-scrotal or purely inguinal swelling.

Operative Procedure

During the surgery, note was made about the anatomical abnormalities, type of hernia, (Direct/ Indirect/both), extent of sac in the inguinal canal, intra-operative complication (like tear of peritoneum, any visceral or vascular injury, bleeding) need for division and ligation of sac or complete reduction, size of mesh applied and whether fixed with tackler and operative time.

Patients were operated under general anesthesia, in a supine position and were catheterized in operation room itself.

Operative Steps

After aseptic skin preparation pneumoperitoneum was created using Veress needle at sub umbilical fold. Insufflation was commenced and was continued until a pressure of 12 mm Hg was reached. A 10mm port was placed through the sub umbilical incision. A 30° telescope attached to the camera, was introduced and the groin area was visualized. Two 5mm lateral working ports were placed under vision, at the level of umbilicus in the mid-clavicular line.

The hernial defect was inspected and the type of hernia (direct or indirect) was confirmed by the position of defect in relation to the inferior epigastric vessels and cord structures.

The peritoneal incision was given from right to left at a point that is midway between the groin crease and the umbilicus. Dissection of direct & indirect hernial sac was done. A polypropylene mesh of 15cm (transverse) X 15cm (vertical) size was rolled and introduced via 10mm port. The mesh was unrolled covering the myopectineal area of hernial side. After the placement of mesh, the peritoneal flap was closed over the mesh using either tackers or sutures. All carbon-dioxide gas was evacuated & ports were removed after lifting the anterior abdominal wall. The 10 mm port was closed with vicryl suture and skin sutures applied. Operation time was noted from the time of first incision to the last skin suture applied.

Post-operatively patient was kept fasting for 6 hours. All the patients received one to three days IV antibiotic and oral antibiotic for 5 days. Patient was mobilized immediately after recovery. Patients were allowed orally when tolerable. Patients were discharged when they were willing and comfortable, were ambulatory and taking orally. Patients were sent home with discharge ticket mentioning type of surgery, per op finding and oral treatment advised. Patients were called on 7th post op day in the OPD for follow up.

Follow up: The patients were received in the OPD for follow up in OPD for complications like hematoma, wound infection, early recurrence etc. Patients were asked if they had resumed work and if not why. They were also asked about their satisfaction about surgery and cosmesis as completely satisfied, moderately satisfied or dissatisfied. Skin suture or staples are removed. The follow up after 1 month and 6 months was obtained by visit.

Data collection and analysis

The proforma was filled systematically for each patient. All the data were compiled on a master chart. Software SPSS 21.0, Stata 8.0 were used for the analysis of the data. Microsoft word and Excel have been used to generate graphs, tables etc.

Observations

This study was done in patients who presented with inguinal hernia in department of general surgery in R.N.T. Medical College, Udaipur. Total 22 patients included in the study were all repaired by TAPP method. None of the patients required conversion from laparoscopic to open method. All patients in the present study were male.

The patients included were in the age group of 15 to 70 years old. The youngest patient was 19 years and oldest patient was 70 years of age. Most of patients (27.27%) fell in age group of 41 to 50 years, followed by 18.18% each in the age group of 21 to 30 years, 51 to 60 years and 61-70 years.

In our study majority (13; 59.09%) of the patients had heavy work as the most common risk factor followed by cough and prostatism each (6; 27.27%) and constipation was least common (2; 9.09%). Multiple risk factors were present in 4 (18.18%) patients.

All the cases in our study presented with inguinal or inguino-scrotal swelling which was reduced by itself or by lying down or manually. All patients presented with bulge or impulse on cough and 63.63% patient were having pain & dragging sensation.

Majority of patents had right (10; 45.45%), indirect (14; 63.63%) and incomplete (20; 90.9%) inguinal hernia and (6; 27.27%) patients had bilateral inguinal hernia.

Table 1: Duration of surgery in the present study.

Type of Operation	No. of Cases	Mean time (Minutes) (Range)
TAPP initial cases	18	106.81 (75-140)
TAPP later cases	04	93.75 (80-105)
TAPP Converted to open	0	0

Operative time was noted in each case from the time of first incision to the last skin stitch applied. The mean operative time in an initial 18 cases of TAPP method was 106 minutes (75-140), in last 4 cases was 93.75 minutes (80-105).

The mesh was fixed with Securestrap (Ethicon) tackers in 20 (90.90%) patients and rest of the patients with ProTack (Covidien) tackers.

In laparoscopic TAPP only in one case (4.54%) tear of inferior flap peritoneal flap was noted due to densely adherent hernial sac with cord structure and there were no major complication like bladder injury, bowel injury or major vascular injury.

There were no post-operative urinary retention, hematoma, hydrocele, port site infection, mesh infection, orchitis and numbness/paresthesia noted. Only one (4.54%) patient developed seroma which was considered as a result of inadequate strapping.

Most of the patients (14; 63.63%) were discharged till 5th post-operative day. Five patients (22.72%) were discharged on post-operative day 6 and rest (3; 13.63%) were discharged on post-operative day 8. Patients were given instructions to decide their own course of hospital stay and most of them wanted to stay back more.

(On the basis of intraoperative & post-operative complications, post-operative pain, hospital stay & return to work).

Table 2: Patient's opinion about surgery in the present study.

Opinion	No. of Patients (%)
Complete satisfaction	21(95.45%)
Moderate satisfaction	1(4.54%)
Dissatisfaction	0

All patients were asked to give their opinion about surgery after removal of the stitches on 8th post-operative day and cosmesis in form of complete satisfaction, moderate satisfaction or dissatisfaction. 21 (95.45%) patients were completely satisfied about their surgery. They had no complication post-operatively and were symptom free on 8th day. One (4.54%) patient had moderate satisfaction about their surgery as they had bilateral hernia.

Table 3: Return to work of the patients in the present study.

	Return to work (In days)
Range	14-25
Mean	18.13
Median	15.5

The mean time of return to work for TAPP repair was 18.13 days & the median time was 15.5 days. There were no case recurrence reported on follow up after 1 month and 6 month is obtained by visit. The median doses of post-operative parenteral analgesic requirement for TAPP repair cases

were 4 doses. The range of duration of parenteral antibiotic use was 2-8 days and median was 3 days. The removal of Foley's catheter in most (7; 31.81%) of cases was on 2nd post op day. There are many problems we faced during our study e.g. anesthetic fitness for general anesthesia, procedure cost (costly tacker), no availability soft mesh and long duration of procedure etc.

Discussion

The present study was carried out on 22 patients admitted in Department of Surgery, R.N.T. Medical College and MB Hospital Udaipur with clinical diagnosis of inguinal hernia from 2018-2021. During the last several decades numerous innovative and creative techniques have been introduced in an effort to manage patients with inguinal hernia. Despite the development of many newer technologies including that of optics, the treatment of inguinal hernia by laparoscopic method has still eluded many of our patients.

An ideal hernia repair should be durable, produce low level of morbidity, allow rapid return to work or recreational pursuits and should be cost effective. The use of prosthetic mesh has emerged superior and procedure of choice; it reduces recurrence by around 50%. The quality of life indicators for hernia repair as assessed by the post-operative pain and return to work strongly favors tension free and laparoscopic approaches.

Laparoscopic hernia repair was first described in 1982 by Ger3 but it was not until 1990 that laparoscopic hernia achieved enough notice to ignite controversy. The long learning curve of laparoscopic repair of inguinal hernia coupled with lack of proper documentation has and is delaying the proficient application of this procedure to the masses though several large published series have reported their experience with laparoscopic mesh repair of inguinal hernia.

The place of laparoscopic inguinal hernia repair is a subject of intense debate and its routine use is controversial. The short-term benefits of laparoscopic repair in terms of less post-operative pain, marginal advantage in reducing time of work and its obvious advantages in recurrent and bilateral hernias are established. Recurrence rate is similar to that of open mesh repair.

Demographic data

Inguinal hernias are more common in elderly male with low socioeconomic status and heavy weight lifting workers. Direct inguinal hernias are more

common in old age group. All the patients in our study were male, which was probably due to the low incidence of inguinal hernia in female in general population. In a study conducted by Malagoni⁴ it was noted that all patients were male. The patients were in the age group of 18 to 70 years. Mean age in the TAPP group was 42.1±15.7 years (p value = 0.411) and Jayaprakash⁵ reported the prevalence of hernia to be more in males than females by ratio of 7:1 & men are 25 times more likely to have a groin hernia than women.

In our study the patients included were in the age group of 15 to 70 years. The youngest patient was 19 years and oldest patient was 70 years. Majority of patients were distributed in age group of 41-50 51-60, and 61-70 years i.e. 27.27%, 18.18% and 18.18% respectively and 36.36% in remaining age group, showing age dependency as reported by Malagoni⁴ and Jayaprakash.⁵

In our study 10 (45.45%) patients had right sided hernia, 6 (27.27%) had left sided and 6 (27.27%) cases had bilateral inguinal hernia. These figures are similar to reported by Malagoni⁴, that inguinal hernia are more common in right side probably because of delay in atrophy of process vaginalis and slower descent of right testis.

Operative time

Operative time was noted in each case from the time of first incision to the last skin stitch applied. The mean operative time of trans-abdominal pre-peritoneal (TAPP) in our study was 106.81 minutes (75-140) in first eighteen cases and 93.75 minutes (80-105) in last four cases, which was in agreement with Corne ll6 (81min), Millikan 7 (79min), Vogt 8 (63min), Stocker 9 (50 min) and Swanstrom 10 (92 min). The reason for this slight difference might be due to learning curve.

Conversion

In our study none of patient needed conversion to open procedure likely because of proper case selection, sound anatomical knowledge and commitment to completion of procedures laparoscopically. Lal¹¹ and Lau¹² have also reported zero percent conversion rates in their series. In previous studies one of the common causes of conversion to open procedure was cardiorespiratory complications developed intra-operatively. This was in broad agreement to Vogt⁸ (1-2%), Stoker⁹ (1%), Swanstrom¹⁰ (1%), Meddern¹³ (0.5-1%).

Complications

In our study one intra-operative complications, tear in inferior peritoneal flap (4.54%) was noted due to densely adherent hernial sac with cord structure. Other studies have shown variable intra-complication rates, e.g. 5.8% observed by Ramshaw¹⁴, 1.2% reported by Tetik¹⁵ (18 out of 15114 cases) & 0.18% by Felix¹⁶ (2 out of 1115 cases). These intra-complications included nerve injury, vascular injury, and peritoneal injury. All these intra-complications did not develop with TAPP repairs in our study.

In our study there was no bladder or bowel injury. Bladder injuries have been reported (0.6%)¹⁴ as have been bowel injuries (0.13%).¹⁶

In a study on 1514 patients¹⁵, there was a 0.8% complication rate related to laparoscopic technique, 0.2% due to hernia repair technique & 0.6% related to anesthesia.

The incidence of complication in our group was low, which may have been due to commitment as well as due to a smaller number of cases in our series as compared to Tetik¹⁵ & Felix.¹⁶ However, Fitzgibbon¹⁷ reports 5.4% complication rate due to laparoscopic technique.

Regarding post-operative complications, only one (4.54%) patient developed seroma formation which was considered as a result of inadequate strapping, urinary retention was absent in our cases and also no mesh infection was noted. Tetik¹⁵ reports urinary complications in 1.5% & local complication like seroma, hematoma formations in 6.2% patients. Fitzgibbon¹⁷ reported urinary involvement in 5.8% of cases & seroma formation in 3.5% cases.

The higher incidence of seroma formation in these studies was probably related to extensive dissection and intra-operative oozing with use of electrocautery. However we did not note any other complications like hematoma, hydrocele, port site infection and neurological complications in our study. These have been reported to vary between 2.7-13.6% as reported by Felix¹⁶, Tetik¹⁵ and Crawford.¹⁸ Liem¹⁹ reported 1.8% hematoma formation, 4% incidence of wound infection and 1.5% wound abscess. Lal²⁰ reported incidence of minor wound infection but we did not encounter any of these minor complications. This could be due to careful meticulous technique of initial port insertion, pre-operative routine bladder emptying of all patients, routine catheterization and secondary port insertion under vision.

Overall we found laparoscopic technique (TAPP) to be a useful and safe operative procedure for

carefully selected patients with inguinal hernia. A commitment to performing the procedure laparoscopically, close attention to patient and hernia characteristic, adherent to standard operative techniques and anatomic landmarks are likely to go a long way in ensuring good results.

Conclusions

Laparoscopic hernia repair is a significantly lengthier procedure especially in the learning phase of the surgeon, but the operative time decreases with increasing experience. Case selection is important especially in early learning phase when surgeon should select patient with smaller indirect hernia like bubonocoele to prevent difficult dissection of sac. The learning curve for laparoscopic repair is considered to be between 100-200 repairs. Results in this study represent a single surgeon experience and early learning curve should be seen in this light. Use of large size mesh 15x15 cm in TAPP reduces chances of recurrence but may be a major factor for higher cost of laparoscopic repair. Good technique and knowledge about laparoscopy anatomy of inguinal region with experience in laparoscopic repair is essential to prevent serious complications like bladder, bowel or other vascular injuries.

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Ultrasonography as a Diagnostic Tool in Breast Carcinoma

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Abstract

Introduction: Breast cancer is one of the leading causes of death among females. This necessitates a proper screening modality for early diagnosis and treatment of breast cancer. Due to limited resources in few setups it would be difficult to get an access to mammography. Hence in our study we are trying to evaluate the diagnostic accuracy of ultrasonography to use it as an alternative to mammography in breast cancer patients.

Materials and Methods: A prospective study was conducted on 80 women presenting with breast condition. All patients underwent sonomammography followed by histopathological assessment of the lump.

Results: Irregular shape with irregular margins on sonomammography was found to be significant marker of malignancy with extensive vascularity. Calcification in malignancy was 7.92 times more common than benign. The diagnostic accuracy of sonomammography was 75% with sensitivity and specificity of 72.58% and 83.33% respectively.

Conclusion: Our study concluded that sonomammography can be used as a diagnostic

modality for breast conditions in resource limited facilities.

Keywords: Breast Cancer; Sonomammography; Benign lesion of breast; Diagnostic accuracy of sonomammography; BIRADS.

Introduction

Breast cancer is one of the leading causes of death among females. In India the incidence is 25.8 per 1,00,000 individuals with mortality rate of 12.7 per 1,00,000 individuals.¹ Further, breast cancer stands first in position in terms of morbidity and mortality in Indian cities like Delhi, Mumbai, Bangalore, Pune, Kolkata and Thiruvananthapuram.² This necessitates a proper screening modality for early diagnosis and treatment of breast cancer. Mammography is considered to be gold standard in screening the patients for breast cancer.³ Whereas, USG, MRI are not considered as primary screening modality but used as an adjunct modality to assess the abnormalities in mammography.³ However, use of mammography in young patients is difficult due to risk of radiation damage and in dense tissue in breast due to limited sensitivity.⁴ Also due to limited resources in few setups it would be difficult to get an access to mammography. Hence in our study we are trying to evaluate the diagnostic accuracy of ultrasonography to use it as an alternative to mammography in breast cancer patients.

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Materials and Methods

A prospective study was conducted in Bowring and Lady Curzon hospital of Bengaluru. Study was conducted after obtaining ethical committee clearance and informed consent from patients. 80 patients were included in our study.

Inclusion Criteria

- Age above 30years.
- Women presenting with palpable breast lump, nipple discharge, nipple retraction.

Exclusion Criteria

- Age <30years
- Recurrent breast lump
- Pregnancy and lactating women

Ultrasonography

80 patients underwent sonomammography. Various characters observed on ultrasonography such as shape, margin, boundary, echo pattern of the lesion were used to categorize the lesion into benign and malignant.

Histopathological Examination

All the patients following ultrasonography of breast underwent trucut biopsy or excision biopsy and the sample was sent for histopathological examination for confirmation of the diagnosis.

Statistical analysis

The data were analysed using SPSS software. Version 21. Level of significance is set at 5%.

Results

Among 80 patients 18 were benign and 62 were malignant which was confirmed on histopathological examination. Most of the malignant lesions showed irregular shape, irregular margins, hypoechoic with extensive vascularity and calcification on sonomammography. Benign lesions showed oval shaped, well defined margins, hypoechoic with mild vascularity. (Table 1).

Calcification were significantly noted in malignant lesion with odds ratio of 7.92 proving that calcification on sonomammography is 7.92 times higher in malignant lesion compared to benign lesion (Table 2).

Table 1: Sonoammography findings of patients in relation to histopathology.

Sonoammography	Histopathology		Total-80	P value
	Benign - 18	Malignant - 62		
Shape				
Not commented	6	17	23	
Irregular	1	29	30	
Oval	6	7	13	0.0071
Lobulated	5	9	14	
Margin				
Not commented	5	9	14	<0.005
Well defined	9	7	16	
Ill defined	1	21	22	
Irregular	0	22	22	
Spiculated	3	3	6	
Echo pattern				0.8889
Hypoechoic	7	27	34	
Heterogenous	2	9	11	
Isodense	0	1	1	
Anechoic	3	11	14	
Mixed echoic	6	14	20	
Vascularity				<0.0001
Mild	13	8	21	
Moderate	5	21	26	
Extensive	0	33	33	

Table 2: Efficacy of calcification in differentiating malignant and benign lesions.

	Calcification		Total	P value	Odds ratio
	Present	Absent			
Benign	4	43	47	0.0003	7.92
Malignant	14	19	33		

Table 3: BIRADS score of patients in relation to histopathological findings.

BIRADS	Histopathology		Total	P value
	Benign	Malignant		
1	2	6	8	
2	10	5	15	
3	3	6	17	<0.05
4	2	12	10	
5	1	33	34	
6	0	0	0	

The relation between BIRADS score on sonomammography and histopathological examination was confirmed and was statistically significant with p value <0.0001 (Table 3). Among 80 patients 45 were tested true positive, 15 true

Table 4: Correlation of BIRADS score with histopathology findings of patients.

	TP	FP	TN	FN	Sn	Sp	PPV	NPV	Accuracy
Birads Score	45	3	15	17	72.58%	83.33%	93.75%	46.88%	75%

negative, 3 false positive, 17 false negative. Sensitivity of the test was 72.58% specificity 83.33%. Diagnostic accuracy of test was 75%. (Table 4).

Discussion

Ultrasonography has been widely accepted as diagnostic tool for evaluating breast conditions.⁵ Especially if the patients are of younger age and with small lesions ultrasonography is better imaging study.^{6,7} Studies have established the importance of ultrasonography in differentiating benign from malignant breast condition.⁸ Few studies have also shown that ultrasonography has better sensitivity and specificity compared to mammography in malignant breast diseases in women upto 45 years of age.^{9,10,11}

In our study the most common finding of a malignant lesion was irregular shape and irregular margin with hypoechogenicity. However, the echo pattern finding was not statistically significant. Most of the malignant lesions showed extensive vascularity and this finding was statistically significant. It also showed that malignant lesions had 7.92 times higher chances of calcification compared to benign lesion with P value of 0.0003 hence proving statistically significant.

Our studies showed statistical significance between BIRADS score on sonomammography when correlated with histopathological finding with p value being <0.05. However, it had 27.41% of the malignant tumors showed false negative features on sonomammography with sensitivity of 72.58% and specificity of 83.33%. Positive predictive value and negative predictive value were 93.75% and 46.88% respectively. Overall, diagnostic accuracy of sonomammography in diagnosing breast condition was 75%.

Conclusion

Our study concluded that sonomammography can be used as a diagnostic modality for breast conditions in resource limited facilities. However, one should be careful if the sonomammography reported as benign in a patient with strong clinical suspicion of malignancy. Further the ultrasound reporting is subjective and it depends on the radiologist performing ultrasonography.

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Risk Stratification of Thyroid Nodules Comparative Study Between Ti-Rads, Cytology and Histopathology

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Introduction

A thyroid nodule is defined as a lesion that is distinct and may be differentiated from the surrounding thyroid parenchyma by clinical examination, Ultrasound or other sensitive imaging modalities.¹ The prevalence varies from 4 to 7% by just palpation^{2,3} When patients were assessed by ultrasound, the prevalence of a thyroid nodule was as high as 80% among the iodine-deficient parts of India.⁴ This is much higher than diagnosed on clinical examination. The nodules discovered with imaging studies are called "thyroid incidentalomas."^{5,6} The correlation between imaging methods and the prevalence reported at surgery and autopsy ranges between 50 and 65%.⁷

The importance of the evaluation of thyroid nodules is the possibility of malignancy. The incidence of thyroid cancer is low (1-1.8 per 100,000).⁸ There are vast differences in the reported percentage of malignancy among the clinically or thyroid nodules detected by radiologically.

The average prevalence of malignancy rates across the world in thyroid nodules, from 4.0 to 6.5% on evaluation by an invasive procedure.^{9,10} There are well-established ultrasound findings

that differentiate benign and malignant thyroid nodules.^{11,12,13} There are several classification systems which categorise thyroid nodules according to the risk of cancer.^{14,15,16}

The ultrasonographic characteristics of a thyroid nodule associated with a higher incidence of malignancy include hypo echogenicity, increased intra-nodular vascularity, irregular margins, micro calcifications, absent halo, and a taller than-wide shape measured in the transverse dimension.¹⁷

Several benign and malignant ultrasound gray scale and Doppler features have emerged in the last decade that may be used in various ways to assign probabilities, along with another method based on the Breast Imaging Reporting and Data System (BIRADS), Thyroid Imaging Reporting and Data Systems (TIRADS) of thyroid nodules have been proposed for risk stratification.¹⁸

Fine-needle aspiration (FNA) is considered a cost-effective method and accurate for evaluating thyroid nodules, for the differential diagnosis of these thyroid nodules, with high diagnostic sensitivity and specificity.^{19,20,21}

The purpose of the current research is to evaluate the reliability of TIRADS in determining the malignancy in the thyroid nodules that invasive cytology and surgery can be avoided in the low-risk group.

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Materials and Methods

Type of Study: Prospective observational study.

Study Setting: Department of General Surgery, Tertiary Care Centre.

Study Period: November 2017 to September 2019.

Study Sample: 77 cases admitted in General Surgery Ward with nodular thyroid enlargement and underwent thyroidectomy.

Methodology

Demographic data and risk factors for thyroid malignancy, along with the history of the patient were recorded in the proforma. All selected cases subjected to Ultrasonography, and ACR-TIRADS score obtained. FNAC was done and reported according to the Bethesda system of Cytopathology reporting.

Patients posted for thyroidectomy, and Histopathological report of the specimen collected. In the end, TIRADS score compared with the FNAC, and HPE reports in assessing or predicting the malignancy in a thyroid nodule.

Results

Table 1: Age distribution in the study population.

Age in years	No of Cases	Percentage
13-20	1	2
21-30	10	13
31-40	23	28
41-50	24	31
51-60	12	16
61-70	5	7
>70	2	3
Total	77	100

Table 2: Sex distribution in the study population.

Sex	No of Cases	Percentage
Male	10	13
Female	67	87
Total	77	100

Table 3: Composition of the Thyroid Nodules.

Composition	Score	No of Cases	Percentage
Cystic/spongiform	0	0	0
Mixed cystic & solid	1	58	75
Completely solid	2	19	25

Table 4: Echogenicity of the Thyroid Nodules.

Echogenicity	Score	No of Cases	Percentage
Anechoic	0	8	10
Hyper or isoechoic	1	47	61
Hypoechoic	2	22	29
Very hypoechoic	3	0	0

Table 5: Shape of the Thyroid Nodules.

Shape	Score	No of Cases	Percentage
Wider than tall	0	67	87
Taller than wide	3	10	13

Table 6: Margin of the Thyroid Nodules.

Margin	Score	No of Cases	Percentage
Smooth /ill-defined	0	71	92
Lobular /irregular	2	6	8
Extra thyroidal extension	3	0	0

Table 7: Echogenic foci in the Thyroid Nodules.

Echogenic foci	Score	No of Cases	Percentage
None or comettail artefact	0	44	57
Macrocalcifications	1	8	10
Peripheral rim calcification	2	1	2
Punctate echogenic foci	3	24	31

Table 8: TIRADS score for the Thyroid Nodules.

TIRADS	Grade	No of Cases	Percentage
Benign	TR1	0	0
Not suspicious	TR2	32	42
Mild suspicious	TR3	16	21
Moderately suspicious	TR4	12	15
Highly suspicious	TR5	17	22

Table 9: FNAC of the Thyroid Nodules.

FNAC	Bethesda Class	No of Cases	Percentage
Non diagnostic	I	0	0
Benign	II	52	68
AUS/FLUS	III	1	2
Suspicious of follicular neoplasm	IV	5	6
Suspicious for malignancy	V	7	9
Malignant	VI	12	15

Table 10: Histopathology Report of Thyroidectomy specimen.

Histopathology Report	No of Cases	Percentage
Nodular Goitre	44	57
Hashimotos Thyroiditis	9	12
Papillary Carcinoma	18	23
Follicular Adenoma	4	5
Follicular Carcinoma	2	3

Table 11: Comparison of TIRADS, FNAC and Histopathology Reports.

TIRADS Grade		FNAC			HPE	
		Benign	Malignant	Follicular lesion	Benign	Malignant
TR1	0	-	-	-	-	-
	32	32	-	-	32	-
TR2	(41.5%)	(100%)			(100%)	
	16	15	1	-	15	1
TR3	(21%)	(93.7%)	(6.3%)		(93.7%)	(6.3%)
	12	5	2	5	9	3
TR4	(15.5%)	(41.7%)	(16.6%)	(41.7%)	(75%)	(25%)
	17	1	16	-	1	16
TR5	(22%)	(5.8%)	(94.2%)		(5.8%)	(94.2%)

Table 12: Comparison of TI-RADS with FNAC.

	FNAC Malignant (Positive)	FNAC Benign (Negative)	Total
TR4, TR5 (Positive)	23	6	29
TR2, TR3 (Negative)	1	47	48
Total	24	53	77

Table 13: Comparison of TIRADS with histopathology.

	HPE Benign	HPE Malignant	Total
TR2, TR3 (Negative)	47	1	48
TR4, TR5 (Positive)	10	19	29
Total	57	20	77

Discussion

Initial analysis of thyroid nodules based on the following.

- Proper history, along with a clinical examination of the patient,
- Lab tests -thyroid function tests,
- Thyroid USG, and
- USG-guided FNAC based on TI-RADS features.²²

It is similar to the triple assessment of the breast lumps. Unlike breast lumps, TI-RADS US features are still not routinely used in several medical institutes.²³

The accessibility of TI-RADS and validation of this USG classification system by the ACR permit a precise both clinical and pathological correlation.

As noted from the previous studies, a robust clinical and pathological correlation will guide in defining the risk of malignancy and proper direct management of thyroid lesions.²⁴⁻²⁷ However, a general agreement not yet mentioned gives the difficulty in reproducing different classification systems or even the low correlation between the USG reports and FNAC.²⁸

Of all the systems, the classification proposed by ACR-TIRADS is simple and similar to BIRADS system, which is in use for many years and is familiar to many radiologists. Therefore, we assessed thyroid nodules based on ACR-TIRADS.²⁹⁻³⁸

Age and Sex Distribution

In this study, the peak incidence noted in the age group of 41-50 years. The youngest patient was 18yrs, and the eldest was 72 yrs. In this study, 67 were female, and 10 were males. A female to male's ratio in the study was 6.7:1.

Abdelkader et al.³⁹ studied 100 patients; 22 males and 78 females with mean age 43.7 ±11.5; range: 22-60 years.

In Periakaruppan, et al.,⁴⁰ A total of 184 patients included in the study, out of which females are 156. These nodules mostly found among 30-60 years of life. The patients in this age group are 137 patients, about 75% of our study population.

In Chandramohan, et al.⁴¹ Out of 272 nodules, 154 benign nodules (119 were females, 35 were males) and among 118 malignant nodules (75 were females, 43 were males). Malignancy was more common among male patients presenting with a thyroid nodule (P=0.01).

When comparing our results with the results of a study done by Singaporewalla et al.⁴² the US of thyroid nodules in our study had a comparable sensitivity in predicting malignancy (82.45% versus 71.5%) and specificity (95% versus 84%). We also had a better NPV of TI-RADS score predicting malignancy (65.5% versus 91.5%) and PPV 97.92%.

In our study, there were no cases with TR1. Among the 32 cases in TR2 FNAC and histopathology was proved to be benign in all the 100% cases. 16 cases were in TR3 among them FNAC and histopathology showed benign aetiology in 15 and malignant features in 1 case subsequently. In 12 cases with TR4 5 were benign, two were malignant, and 5 showed follicular lesions on FNAC, and on histopathology 9 turned out to be benign lesions, and three were of malignancy. Among the 17 cases in TR5 16 were malignant and one was benign on FNAC and histopathology.

Among 77 cases, of a total 48 cases which labeled as benign (mostly TR2, TR3), 47 cases are also proven to be benign, and only one case turned out as malignant on FNAC. Of a total of 29 cases which labelled as malignant (TR 4, TR 5) on TR-RADS, 23 are proven to be malignant on FNAC, and only six turned out as benign on FNAC.

According to these findings, TI-RADS have a sensitivity of about 95.83%, Specificity of approximately 88.67%, the positive predictive value of approximately 79.31%, the negative predictive value of approximately 97.92% compared with FNAC (cytology).

Among 77 cases, of a total 48 cases which labeled as benign (mostly TR2, TR3), 47 cases are also proven to be benign, and only one case turned out as malignant on HPE. Of a total of 29 cases which labeled as malignant (TR4, TR5) on TR-RADS, 19 are proven to be malignant, and 19 turned out as benign on HPE.

According to these findings, TI-RADS have a sensitivity of about 82.45%, Specificity of about 95%, positive predictive value (PPV) of approximately 97.92%, negative predictive value (NPV) of approximately 65.52% compared with HPE.

In Singaporewalla et al.⁴² study, they had 20 patients classified as TI-RADS 5 (malignant on the US), FNAC biopsy showed only 12 confirmed as malignant, and the remaining were benign. That gives them a 60% accuracy of US in predicting malignancy. Similarly, in this study, they found that among the 14 cases categorized as TIRADS 5, 10/14 cases had an FNAC biopsy established as cancer (71.4% accuracy).

Ultrasound impression of thyroid nodules had lower sensitivity in predicting malignancy (70.6% compared to 88%) but higher specificity (90.4% compared to 49%). They also had a higher positive and negative predictive value of TIRADS score predicting malignancy as well (60% compared to 49%, and 93.8% compared to 88%, respectively). Accuracy was 83% overall. In this study, the risk of malignancy for the different TIRADS categories was 0% (TIRADS2), 9.5% (TIRADS 3), 33.3% (TIRADS 4) and 60% (TIRADS 5).

Abdelkader et al.³⁹ study in 55 patients with thyroid nodules of probably benign (TI-RADS3) nature and FNA cytology established the same in 45/55 patients showing 82% concordance rate between US and FNAC.

Among the 31 cases that categorized as TI-RADS4 (indeterminate), 8/31 cases were benign on FNAC (Bethesda II), 1/31 cases had an FNAC biopsy established as cancer. Remaining 22/31 patients were under Bethesda III, IV, and V, giving a 70.9% concordance rate between the US and FNAC.

Among the 14 cases that categorized as TI-RADS 5 (malignant on the US), 2/14 patients were benign on FNAC biopsy (false-positive of the US), 5/14 cases were suspicious on FNAC (Bethesda IV), and 7/14 cases had an FNAC biopsy established as cancer giving a 50% concordance between the US and FNAC. From the previous results, the overall concordance rate between US TI-RADS and Bethesda is 67.6%.

The final concordance rate of US TI-RADS with the final histopathological results for predicting malignancy was 75.4% with a sensitivity 76.9% and specificity 91.3%, PPV 71.4%, and NPV 76.4%. The concordance rate of FNAC with the final HPE findings for identifying malignancy was 95% with a sensitivity and specificity of 81.8% and 98% respectively, PPV 90%, and NPV 96%.

In Chandramohan, et al.⁴⁴ study in 168 cases, The PPV for malignancy of TIRADS 2, 3, 4a, 4b, 4c, and 5 categories was 6.6%, 32%, 36%, 64%, 59%, and 91%, respectively. In conclusion, the PPV for malignancy was high for TIRADS category five and 4c nodules. Reassigning TIRADS category 4a nodules as TIRADS3 will improve the PPV and specificity of TIRADS. In Kwak et al.⁴⁵ describes 0%, 1.7%, 3.3%, 9.2%, 44.4–72.4%, and 87.5% risk of malignancy for TIRADS 2, 3, 4a, 4b, 4c, and 5 categories, respectively. However, in a subsequent retrospective validation study, the authors found a 7.3% and 8.3, 96.6% risk of malignancy in TIRADS 3 and TIRADS 4,5 categories of thyroid nodules.

According to Periakaruppan, et al.⁴⁰, study out of the 184 nodules, 117 categorised under TIRADS 2, none turned out to be under Bethesda IV or higher, which means none of the nodules turned out to be malignant. Thirteen classified under TIRADS4, and 9 as TIRADS 5 category. Among the 45 nodules labelled as TIRADS 3, 42 nodules are Bethesda II and one nodule each in Bethesda I, III, and IV, on FNAC respectively.

Few nodules which appeared suspicious on USG are classified as TIRADS 4 and TIRADS5 but turned out to be benign in FNAC according to Bethesda classification. Considering all nodules, the proportion of nodules being malignant classified as TIRADS2 were 0.0, TIRADS3 were 7.7, TIRADS 4 was 38.4, and TIRADS5 was 53.9%. In this study, sensitivity is 92.3%, specificity is 94.15%, and PPV is 54.54%, and NPV is 99.38%. A significant association is noted between TIRADS and Bethesda system of classification ($P < 0.001$). In a study by Stephanie A. Fish⁴³, a total of 832 nodules evaluated with ultrasound before FNA cytology. Seventy-nine nodules measured lower than 1cm and removed from the study. Another 251 nodules excluded due to indeterminate cytology results. The final study included 502 nodules in 477 patients.

Thirty-six (7.2%) nodules determined to be malignant. In general, strictly following the recommendations from the risk-stratification systems decreased the number of FNAs to between 17.1% and 53.4%. The most effective method was ACR TIRADS, which would have reduced the biopsy number by greater than half (53.4%) with 2.2% false-negative rate. The false-negative rate was due to nodules with a final diagnosis of malignancy, but no biopsy recommendation based on the risk-stratification system. Many more biopsies recommended as most of the systems had similar discriminatory capacities to identify malignancy. K-TIRADS was the poor performer, as it reduced the number of biopsies by only 17.1%. Eleven nodules diagnosed as malignant would have misclassified as not requiring FNA by at least one of the TIRADS systems. All five systems missed three cancers; which were either isoechoic or hyperechoic and had no other suspicious features. The best performance is by ACR TIRADS by classifying more than half of FNA cytology as unnecessary with only 2.2% false-negative rate.

Conclusion

In conclusion, from the study, it was made out that the PPV for malignancy was high for TIRADS

category 5 and 4 nodules. TIRADS is a straight forward and practical method of assessing thyroid nodules and can be used in practice as the overall agreement between observers for assigning TIRADS category was substantial.

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Conflict of Interest: Nil

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Failure of Laparoscopic Cholecystectomy Preoperative Factors as Predictors

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Abstract

Introduction: Laparoscopic cholecystectomy is the gold standard procedure for gall stone disease. Few cases of acute calculous cholecystitis require conversion to open procedure which can increase the morbidity and financial burden to patient. Hence, through this study we are trying decide regarding the parameters which would help to assess the patient preoperatively and predict the outcome of laparoscopic cholecystectomy.

Aims and Objectives: To assess the preoperative parameters to predict conversion of laparoscopic cholecystectomy to open cholecystectomy in patients with acute calculous cholecystitis.

Materials and Methods: A prospective study was conducted at a tertiary care hospital. Study was conducted after obtaining ethical committee clearance and informed consent from patients. 100 patients were included in the study.

Results: 100 patients of acute calculous cholecystitis were taken for laparoscopic cholecystectomy of which 80 patients successfully completed the procedure and remaining 20 patients had to undergo conversion to open procedure.

Conclusion: Male gender, older age, patients with higher pain (VAS) score, raised TLC, raised total

bilirubin, raised serum ALP are associated with failure of laparoscopic cholecystectomy.

Keywords: Acute calculous cholecystitis; Cholecystectomy; Laparoscopic cholecystectomy; Failure of laparoscopy; Conversion to open cholecystectomy.

Introduction

Laparoscopic cholecystectomy is the gold standard for treating symptomatic gall stones.¹ Langenbuch was the first to do laparoscopic cholecystectomy in 1800's.² Erich Muhe in 1985 was first to document about laparoscopic cholecystectomy.³

About 1-13% of patients undergoing laparoscopic cholecystectomy will be converted to open technique.⁴ The common causes for conversion are: obscure biliary anatomy, presence of dense pericholecystic adhesions, intraoperative bleeding, failure of progression and suspicion of choledocholithiasis.^{5,6} Conversion from laparoscopic to open is associated with longer postoperative stays and morbidity and mortality.⁷ Hence, it is important to find such patients who are prone for failure of laparoscopic cholecystectomy. In our study we are using few parameters as predictors of failure of laparoscopic cholecystectomy.

Aims and Objectives

To assess the preoperative parameters to predict

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conversion of laparoscopic cholecystectomy to open cholecystectomy in patients with acute calculous cholecystitis.

Materials and Methods

A prospective study was conducted at a tertiary care hospital. Study was conducted after obtaining ethical committee clearance and informed consent from patients. 100 patients were included in the study.

Inclusion Criteria

- Age above 18 years.
- Confirmed cases of Acute calculous cholecystitis on ultrasonography.
- Patients undergoing cholecystectomy within 3 days of onset of symptoms.

Exclusion Criteria

- Age <18 years.
- Presence of other hepatobiliary pathologies.
- Pregnancy
- Uncontrolled diabetes and uncontrolled hypertension.
- Patient previously who had undergone major abdominal surgery.

Parameters Observed

- Age
- Sex
- Duration of symptoms (in days)
- Pain score (Visual analogue score VAS)
- Total Leucocyte Count (TLC)
- Serum alkaline phosphatase IU/L (ALP)
- Total bilirubin mg/dL
- Intra operative severity grading 10, 11
- I. Edematous
- II. Mucocele
- III. Gangrenous
- IV. Empyema

Statistical analysis

The data were analysed using SPSS software. Version 21. Data was described using mean and standard deviation. Tests like Chi-square test, unpaired t test were applied to the data obtained. Level of significance is set at 5%.

Results

100 patients with confirmed cases of acute calculous cholecystitis presenting between 1 to 3

days of onset of symptoms underwent laparoscopic cholecystectomy. Among 100 patients 80 of them underwent successful completion of laparoscopic cholecystectomy and 20 patients had to undergo conversion to open cholecystectomy.

Patients were categorised according to age (Table 1) and distribution was studied among successful versus failed laparoscopic cholecystectomy. On applying Chi-square test it was not significant ($p = 0.19$). However, mean age distribution in successful laparoscopic approach was 45.89 years whereas the mean age for failed group was 58.43 years and was found to be significant ($P = 0.0312$).

There were 30 male and 70 female patients in our study. Among them 22 male and 58 females underwent successful laparoscopic cholecystectomy. Whereas, 8 male and 12 females had to undergo conversion to open cholecystectomy. Statistically the values were not significant with p value of 0.275.

Further, on observing the age distribution with respect to intraoperative severity grade it was found that higher the age severe was the intraoperative finding grade $p = 0.032$ (Table 2). And the severity grade was higher in males compared to females and this was found to be significant ($p = 0.028$).

The mean duration of symptoms in patients undergoing surgery was 2.5 days. However, there was no significant difference found in duration of symptoms between patients undergoing successful laparoscopic cholecystectomy and conversion to open cholecystectomy (Table 3).

During the time of presentation patients' pain was assessed using visual analogue scale (VAS score) and was found that mean VAS in patients undergoing successful laparoscopic procedure was 4.61 and in patients undergoing conversion to open procedure was 8.33 and the data was statistically significant ($p = <0.0001$).

Preoperative laboratory parameter - Total leucocyte count, total bilirubin, serum ALP was assessed. All the three parameters were found to be raised in patients with failed laparoscopic cholecystectomy compared to patients undergoing successful laparoscopic cholecystectomy (Table 3). And the data of above three parameters were statistically significant ($p = <0.0001$).

Intraoperative severity grades were found to be significantly associated ($p = <0.0001$) with failure and success of laparoscopic procedure (Table 4). More severe the grading had more chances of conversion to open procedure.

Table 1: Age and gender distribution of patients undergoing successful and failed laparoscopic cholecystectomy (Chi-square test).

Age	Laparoscopic Cholecystectomy		Total	P Value
	Successfull	Failed		
25-35 yrs	10	1	-	0.1900
36-45yrs	19	2	21	
>/=46yrs	51	17	68	
Total	80	20	100	
Gender				
Male	22	8	30	0.2752
Female	58	12	70	
Total	80	20	100	

Table 2: Age and gender distribution of patients with intraoperative severity in acute cholecystitis (Chi-square test).

Age	Intraoperative Severity				Total	P Value
	I	II	III	IV		
25-35 yrs	9	1	0	1	11	0.032
36-45yrs	10	2	1	8	21	
>/=46yrs	32	21	6	9	68	
Total	51	24	7	18	100	
Gender						
Male	10	9	5	6	30	0.028
Female	41	15	2	12	70	
Total	51	24	7	18	100	

Table 3: Comparison of preoperative factors between Successful and failed laparoscopic cholecystectomy (Unpaired t Test).

Duration of Symptoms	n	Min	Max	Mean	SD	P Value
Laparoscopic Cholecystectomy	80	1	3	2.05	0.86	0.420
Successful						
Failed	20	1	3	2.00	0.89	<0.0001
TLC	80	4000	12000	7.13	2.04	
Laparoscopic Cholecystectomy						
Successful						
Failed	16	9900	26000	13.52	4.72	<0.0001
Total bilirubin (mg/dL)	80	0.3	1.1	0.66	0.24	
Laparoscopic Cholecystectomy						
Successful						
Failed	20	0.9	3.2	2.08	0.79	<0.0001
ALP (IU/L)	80	40	130	69.41	23.01	
Laparoscopic Cholecystectomy						
Successful						
Failed	20	111	260	186.4	48.24	

Table 4: Distribution of intraoperative severity grades in patients with successful versus failed laparoscopic cholecystectomy (Chi-square test).

Intraoperative Severity	Laparoscopic Cholecystectomy		Total	P Value
	Successful	Failed		
I.	50	1	51	<0.0001
II.	21	3	24	
III.	1	6	7	
IV.	0	18	18	

Discussion

Laparoscopic cholecystectomy is gold standard surgical approach for gall stone disease. However, due to various factors intraoperatively the patients may require conversion to open procedure. According to some studies it is shown that the conversion rate is around 1-13%.⁴ In our study the chances of conversion were slightly higher i.e., 20%. According to few literature the rate of conversion to laparotomy during laparoscopic cholecystectomy in acute calculous cholecystitis is 2 to 25%.^{8,9} Conversion of laparoscopic cholecystectomy has been associated with a longer operative time, the use of more anaesthetic drugs, increased overall morbidity, higher rate of infective complications, longer recovery time, longer hospital stay, higher cost and patient dissatisfaction.^{10,11} To avoid these untoward occurrences we conducted a study by using few preoperative parameters. Many studies have shown that the age above 50 years is a significant risk factor for difficult laparoscopic cholecystectomy.¹² In our study the mean age of patients who had conversion to open procedure was 58.43 years (p=0.0312).

Most of the studies have shown that the male gender having significant higher risk of conversion to open during laparoscopic cholecystectomy.^{13,14,15} Further the risk of failure of laparoscopic procedure for acute cholecystitis was 1.76 times (odds ratio) higher in males compared to females. Also, the intraoperative severity grade was higher in males.

Duration of symptoms did not show any significant difference with respect to failure of laparoscopic procedure. Pain score using visual analogue scale showed significant association with success or failure of laparoscopy with higher VAS having higher chances of laparoscopy failure.

According to Tokyo guidelines few markers were identified to grade the severity of acute cholecystitis such as duration of symptoms and TLC count^{16,17}. In our study association of duration was not found to be significant. Rattner et al¹⁸, concluded that the degree of leucocytosis to be associated with intraoperative severity and the results of our study is also consistent with it. In our study raised levels of TLC, total bilirubin, serum ALP were significantly associated with failure of laparoscopic cholecystectomy and intraoperative severity.

Intraoperative severity grade 1 had lesser chances of failure of laparoscopic approach and grade 4 had higher chances of failure.

Conclusion

- Higher the age more chances of laparoscopy failure and more severe is the intraoperative finding.
- Male patients are at 1.76 times higher risk of laparoscopic cholecystectomy failure and higher is the intraoperative severity grade.
- Duration of symptoms between 1 to 3 days was not associated with failure of laparoscopic cholecystectomy.
- Pain (VAS score) was significantly associated with success or failure of laparoscopic cholecystectomy.
- Total leucocyte count, total bilirubin, serum alkaline phosphatase was significantly associated with outcome of procedure and severity of cholecystitis.
- Intraoperative severity grade in acute cholecystitis was significantly associated with success or failure of laparoscopic cholecystectomy.

Male gender, older age, patients with higher pain (VAS) score, raised TLC, raised total bilirubin,

raised serum ALP are associated with failure of laparoscopic cholecystectomy.

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Study of Intestinal Obstruction in Pediatric Age Group

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Abstract

Context: Pediatric intestinal obstruction is a fascinating subject. Because of the specificity of age group, the etiology and management will vastly differ from adult patient and pediatric patients will need very careful management. Because of poor symptomatology and thereafter management initially by either paramedical personnel or unexperienced personnel, the patient suffers a great deal, and early diagnosis and treatment gets usually delayed. Moreover, due to unavailability of trained institutes, morbidity and mortality in this age group significantly rise. In the light of present knowledge, it is possible to outline therapeutic principle which if applied promptly and skillfully, should result in a gratifying outcome to both patient and surgeon in a vast majority of cases. Intestinal obstruction in pediatric age group, due to many differences in aetiology and pathological effects in the body, differs considerably from adult age group. Due to anatomical and physiological difference between these two, the pathological picture and clinical manifestations will vary and accordingly, management also differs. A pediatric patient requires a great deal of scrutinization at every stage of management, diagnosis, pre-operative, postoperative etc. The present study is a retrospective study of 30 cases of small intestinal obstruction in pediatric age group which makes a genuine effort to find out the aetiological factors,

modes of presentation and special management in them.

AIMS

- To study various clinical presentations in pediatric patients of small intestinal obstruction.
- To study the age and sex distribution of different etiological factors.
- To study etiopathology of small intestinal obstruction in pediatric patients.
- To study different treatment modalities in these patients.
- To evaluate the outcome in pediatric intestinal obstruction.

Methods and Materials

- Study Settings: Department of General Surgery of teaching hospital attached to medical college
- Study period: Two year
- Sample Size: 30 Cases
- Study Type: Retrospective Study

Results: Intestinal obstruction is one of the commonest intra-abdominal pathology encountered in paediatric age group. Cause of intestinal obstruction varies from intussusception, intestinal atresia, worm infestation and obstructed inguinal hernia. The cause of intestinal obstruction also varies with age. Success in treatment of intestinal obstruction depends largely upon early diagnosis, skillful management which comprises of investigations and treatment. Preop-resuscitation, per op-ventilatory and fluid management and post op fluid, nutrition and electrolyte management have an equally important role to play like the surgery itself.

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Improvement in surgical and anesthetic technique and advances in neonatal and pediatric health care have improved the final outcome in intestinal obstruction. However, being in developing country with a non-ignorable bulk of children suffering from malnutrition and communicable disease, a high degree of suspicion from pediatrician, radiologist and a surgeon working simultaneously for a common task shall always be beneficial for the society.

Better understanding of pediatric intensive care and endoscopic advances in the field of surgery shall be able to extend the boundaries of curative treatment and thus further decrease the morbidity and mortality rates.

Keywords: Intestinal obstruction; Pediatric age group; Intussusception; Obstructed inguinal hernia; Worm infestation; Early diagnosis; Treatment.

Introduction

Pediatric intestinal obstruction is a fascinating subject. Because of the specificity of age group, the etiology and management will vastly differ from adult patient and pediatric patients will need very careful management. Because of poor symptomatology and thereafter management initially by either paramedical personnel or unexperienced personnel, the patient suffers a great deal, and early diagnosis and treatment gets usually delayed. Moreover, due to unavailability of trained institutes, morbidity and mortality in this age group significantly rise. Hypothermia and coagulopathy is common in neonates.

In the light of present knowledge, it is possible to outline therapeutic principle which if applied promptly and skillfully, should result in a gratifying outcome to both patient and surgeon in a vast majority of cases.

Intestinal obstruction in pediatric age group, due to many differences in aetiology and pathological effects in the body, differs considerably from adult age group. Due to anatomical and physiological difference between these two, the pathological picture and clinical manifestations will vary and accordingly, management also differs. A pediatric patient requires a great deal of scrutinization at every stage of management, diagnosis, pre-operative, postoperative etc.

The present study is a retrospective study of 30 cases of small intestinal obstruction in pediatric age group which makes a genuine effort to find out the aetiological factors, modes of presentation and special management in them.

Methodology

Materials

- Study Settings: Department of General Surgery of teaching hospital attached to medical college
- Study period: Two year
- Sample Size: 30 Cases
- Study Type: Retrospective Study

Inclusion criteria

- Patient clinically diagnosed as small bowel obstruction with clinical features like abdominal pain, vomiting, abdominal distension and constipation.
- Diagnosed cases of small bowel obstruction (more than 4 air-fluid levels on plain X-ray abdomen).
- Patients who underwent exploratory laparotomy for acute small bowel obstruction or conservative management for small bowel obstruction.
- Age less than 12 years.

Exclusion criteria

- Age more than 12 years.
- Patients having large bowel obstruction.

Methods

This retrospective study was carried out on data obtained from 30 pediatric patients who underwent exploratory laparotomy for acute small bowel obstruction or conservative management for small bowel obstruction. Study was carried out for a period of 2 year from May 2018. Data collection includes a detailed record of the patient's history, physical examination, and necessary investigations like baseline blood investigations, X-ray abdomen erect and supine in all cases, ultrasound abdomen and CT scan was recorded based on the requirement for each case. Treatment and Intra-operative findings were recorded and histopathological reports collected for the operated cases. Postoperative treatment, follow up immediate and delayed up to 1 month were recorded.

Results

- The present retrospective study was conducted by reviewing the records of paediatric patients admitted with symptoms and signs of intestinal obstruction in

Department of General Surgery of teaching hospital attached to medical college.

Table 1: Age wise Distribution of Pediatric Intestinal Obstruction.

Age Group	No. of Cases	Percentage (%)
0-1 month	03	10.00
1-12 months	05	16.67
1-5 years	18	60
5-12 years	04	13.33
0-12 years	30	100

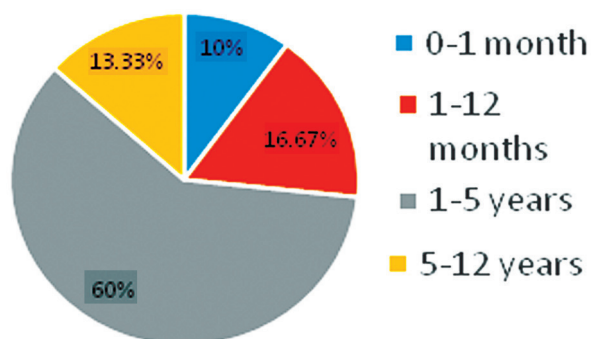


Fig. 1: Age wise case distribution.

In this study most common age group was 1-5 years which consisted of 18 patients. Age group 1-12 month consisted of 5 patients and the least common age group was <1 month consisting of 3 patients.

Table 2: Sex Wise Distribution of Paediatric Intestinal Obstruction.

No.	Sex	No. of Cases	Percentage (%)
1.	Male	15	50
2.	Female	15	50
Total		30	100

Sex Distribution

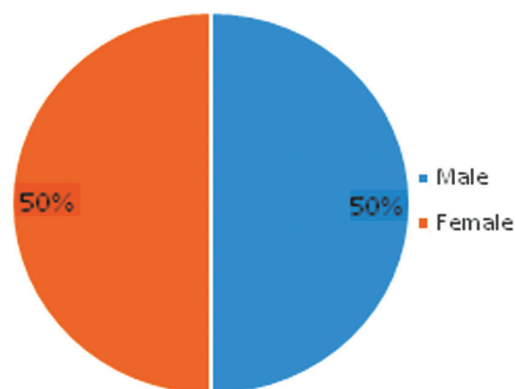


Fig. 2: In this study out of 30 cases 15 were males and 15 were females.

As in the other diseases where sex distribution is influenced by socio-economic status, nutritional status and environmental factors, but pediatric intestinal obstruction is distributed equally in both sexes.

Table 3: Distribution of Cases According to Clinical Presentation.

Clinical Presentations	Number of Cases	Percentage (%)
Abdominal Pain	16	53
Vomiting	24	80
Constipation	05	17
Abdominal Distension	12	40
Diarrhea	02	07
Blood in stool	02	07
Fever	08	27
Other	05	17

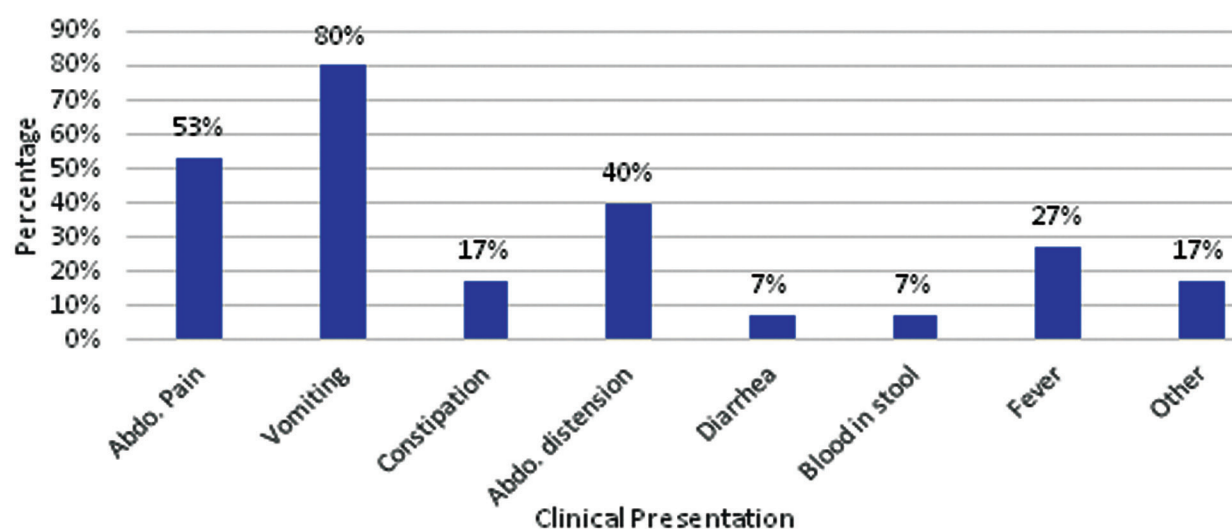


Fig. 3: Clinical Presentation

In this study most common presenting symptom was vomiting which was present in 80% cases followed by abdominal pain (53%), abdominal distension (40%), fever (27%), constipation (17%), blood in stool (07%) and diarrhea (07%).

Vomiting being the commonest symptom suggests that there are more chances of proximal small bowel involvement in intestinal obstruction.

Fig. 4: Distribution of Cases According to Clinical Finding.

Clinical Finding	Number of Cases	Percentage (%)
Abdominal Distension	12	40
Tenderness	25	83
Guarding	04	13
Rigidity	04	13
Visible peristalsis	01	03
Inguinal swelling	01	03
Red currant jelly stool	07	23

Commonest finding in clinical examination while dealing with paediatric patients of intestinal obstruction in this study was Abdominal Tenderness (83%), followed by Abdominal Distension (40%), Red Currant jelly stool (23%), Rigidity (13%), Guarding (13%) and Visible Peristalsis (3%).

This suggests that usually the inflammation sets in early even at the time of presentation and it is reflected as tenderness on palpation of abdomen.

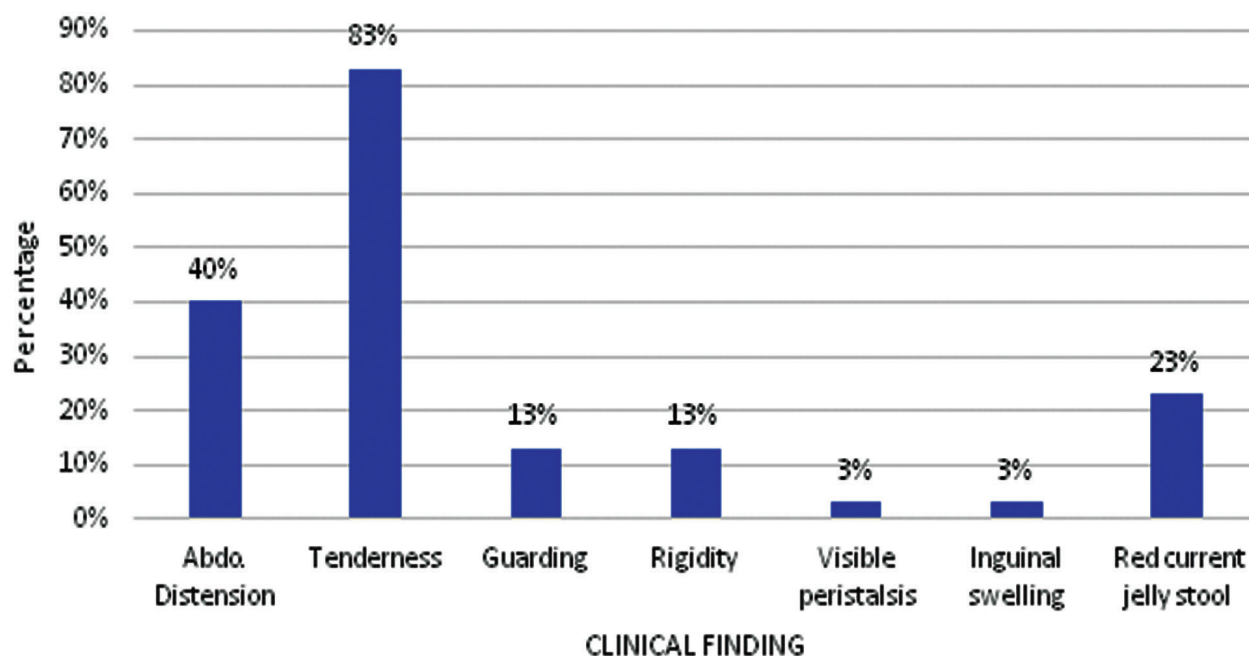


Fig. 4: Distribution of cases according clinical finding.

Radiological Investigation

X-ray Finding	Number of Cases	Percentage (%)
Plain X-ray Abdomen		
Gas Filled Bowel Loops	28	93.33
Multiple Air fluid level	28	93.33
Double bubble sign	01	3.33
Triple bubble sign	01	3.33

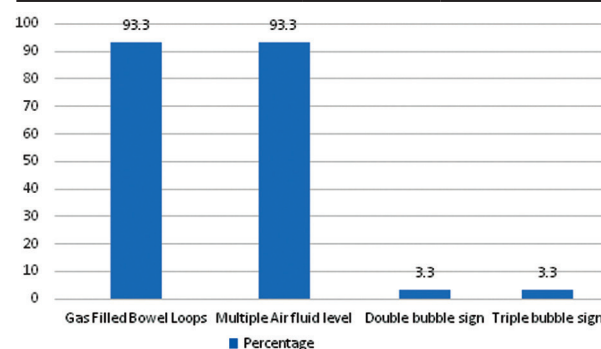


Fig. 5: X-Ray Finding.

B. Ultrasonography Finding

Usg Abdomen	Cases	Percentage
Dilated Bowel Loops / Excessive Gas Filled Bowel Loops	25	83%
Intussusception	24	80%
Stomach appears distended, rest of the bowel appears collapsed	02	07%

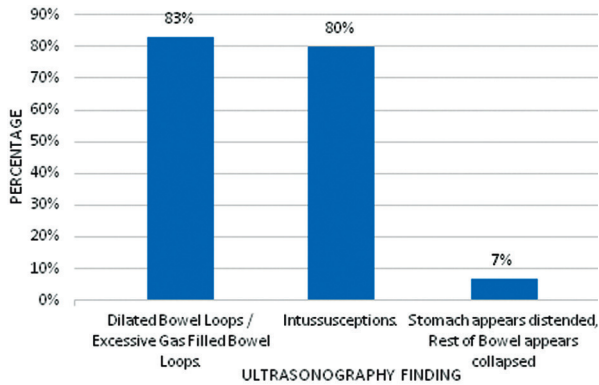


Fig. 6: Ultrasonography finding.

In this study clinical features were supplemented by X-ray abdomen and ultrasonography in most of the cases and other special investigation wherever indicated such as CECT abdomen done in 1 case. Gas filled bowel loops were noted 28 cases (93.33%) while multiple air fluid level was seen in 28 cases (93.33%) of plain X-ray of abdomen and double bubble sign seen in 1 case (3.33%) and triple bubble sign seen in 1 case (3.33%).

USG abdomen in Pediatric intestinal obstruction patients shows dilated bowel loops and/or excessive gas filled bowel loops in 25 cases and finding of intussusception in 24 cases. 2 cases were reported in which stomach appears dilated and rest of the bowel appears collapsed. CECT abdomen was done in 1 case which was suggestive of small bowel obstruction due to ileo-colic intussusception involving terminal ileum and caecum.

This study shows that radiological investigations like x-ray abdomen in erect and supine position demonstrates multiple air fluid levels and dilated bowel loops whereas ultrasonography reveals dilated bowel loops and intussusception, with type of intussusception which guides us about the location of obstruction as well as the type of intussusception.

Etiology

Etiology	Number of Cases	Percentage (%)
Intussusception	24	80
Obstructed inguinal hernia	01	3.33
Duodenal atresia	01	3.33
Jejunal atresia	01	3.33
Worm infestation	01	3.33
Not known	02	6.66
Total	30	100

In this study intussusception was the most common pathology (80%). Next in frequency was small bowel atresia (6.66%), worm infestation (3.33%), right obstructed inguinal hernia in 1 case (3.33%) and in 2 cases etiology was not known (6%). In this study, 2 cases of intussusception had acute appendicitis and 1 case of intussusception had small bowel adhesion as intra operative finding.

This study shows that acquired causes of intestinal obstruction i.e. intussusception is more common than congenital causes.

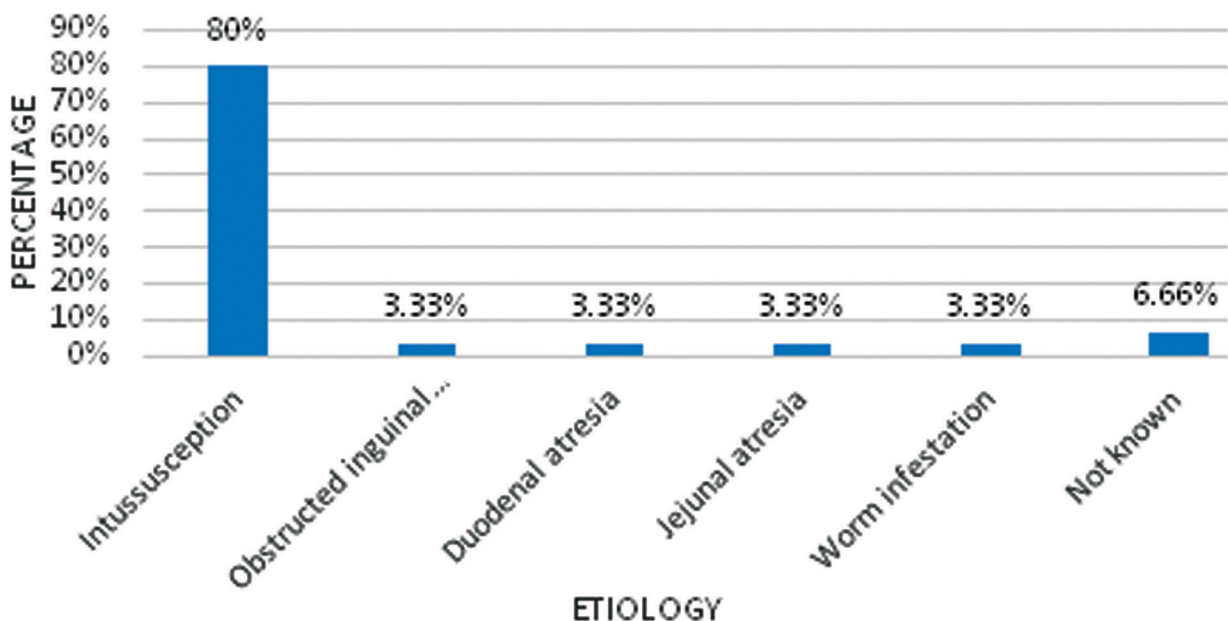


Fig. 7: Etiology.

Treatment Modality

Treatment Modality	Case	Percentage (%)
Conservative	18	60%
Usg Guided Hydrostatic Reduction	05	16.66%
Operative	07	23.33%

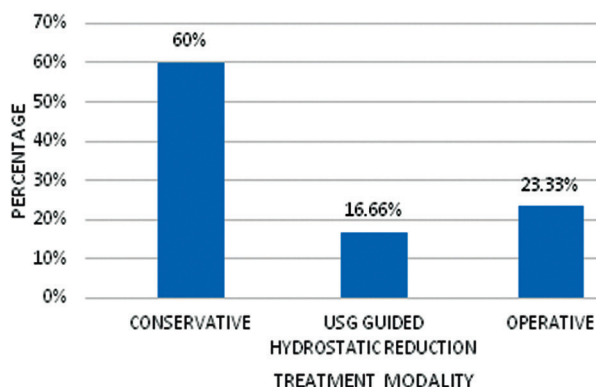


Fig. 8: Treatment Modality.

In this study out of 30 cases, 23 cases treated conservatively which include 18 cases (60%) without any intervention and 05 cases (16.66%) of intussusception treated with ultrasonography guided hydroreduction. 07 cases (23.33%) treated by operative management, of which 06 cases underwent exploratory laparotomy and 01 case treated by right inguinal herniotomy with right orchidectomy. Conservative management includes nasogastric tube insertion, active aspiration, nil by

mouth, enema, antibiotic, IV fluid administration and electrolyte correction.

Operative Finding

Operative Finding	Number of Cases	Percentage (%)
Intussusception with acute appendicitis with dilated Bowel Loop	02	29
Intussusception with inter bowel adhesion with Dilated Bowel Loop	01	14
Duodenal atresia	01	14
Jejunal atresia	01	14
Worm filled bowel loop with ileal twisting	01	14
Necrosis of testis with small bowel in hernial sac with dilated bowel loop	01	14
Total Cases	07	100%

In this study 30 cases were taken from that 23 cases treated conservatively and 7 case was operated from that 2 patient having intussusception with acute appendicitis with dilated bowel loop and 1 patient having intussusception with interbowel adhesion with dilated bowel loop and 1 patient having duodenal atresia and 1 patient having jejunal atresia and 1 case have worm filled ileal loop with ileal twisting.

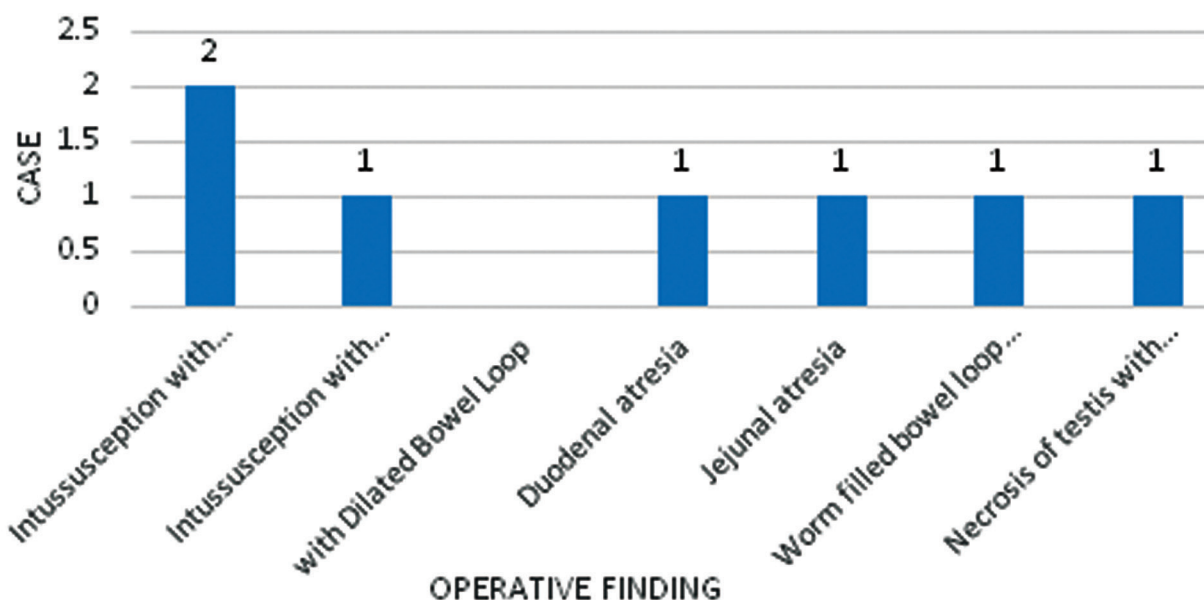


Fig. 9: Operative Finding.

Surgical Modality of Treatment

Treatment Modality	Cases	Percentage (%)
Exploratory laparotomy with manual reduction of Intussusception with appendectomy	02	28.7
Exploratory laparotomy with manual reduction of Intussusception with interbowel Adhesiolysis	01	14.3
Duodenal resection with duodenoduodenostomy	01	14.3
Jejunal resection with jejunojejunal anastomosis	01	14.3
exploratory laparotomy f/b manual derotation of ileum f/b manual emptying of worm filled ileum	01	14.3
Herniotomy with orchidectomy	01	14.3

In this study 23% cases managed by operative intervention and rest 77% case managed conservatively. Operative intervention includes Exploratory laparotomy with manual reduction of Intussusception with appendectomy 2 case (28.7%), Exploratory laparotomy with manual reduction of Intussusception with interbowel Adhesiolysis 1 case (14.3%), Duodenal resection with duodenoduodenostomy 1 case (14.3%),

Jejunal resection with jejunojejunal anastomosis 1case (14.3%), exploratory laparotomy f/b manual derotation of ileum f/b manual emptying of worm filled ileum 1 case (14.3%) and Herniotomy with orchidectomy 1 case (14.3%).

Outcome

Outcome	Our Study
Recover	93%
Death	07%

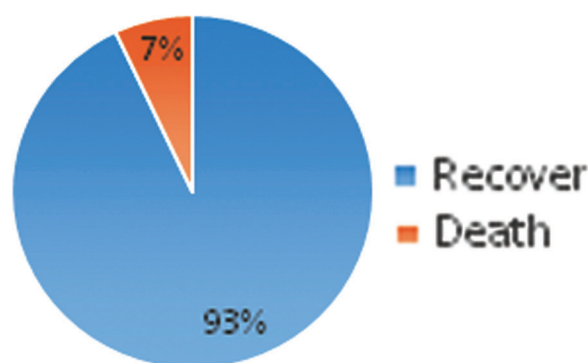


Fig. 11: In our study, mortality is 7%.

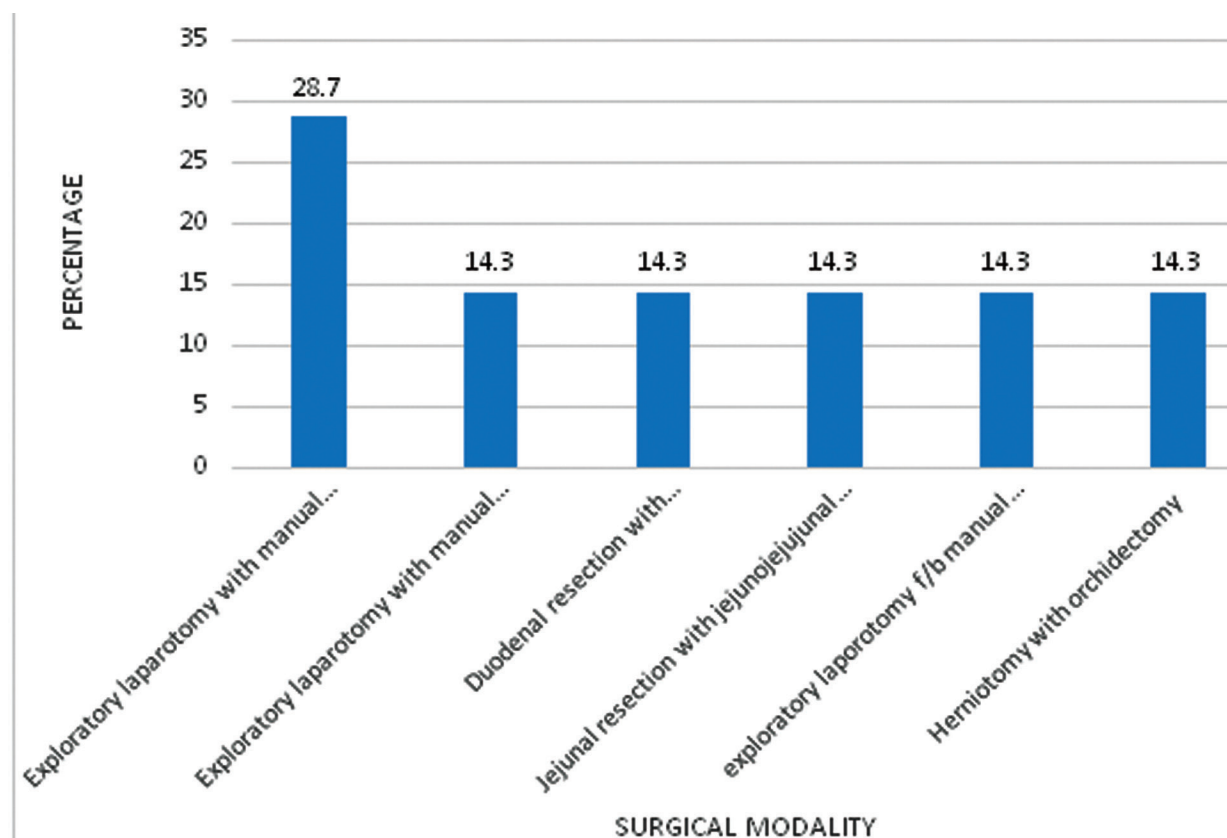


Fig. 10: Surgical Modality

Discussion

Intestinal obstruction is a common paediatric surgical problem and cuts across the different age groups in children. Its occurrence in children may be acute or chronic. Presentation in the neonate is usually acute and is usually the most common emergency surgical condition seen in them. Intestinal obstruction occurs in all age groups. The causes of intestinal obstruction in the general population (neonate and children) may vary considerably from country to country as well as from time to time.

This study has been compared with various studies of intestinal obstruction done in other regions or country and the study done in same institute before 30 years.

Table : Age distribution.

Age	Ogundoyin et al (2009) 04(%)	Soomro & Mughal al02(2013) (%)	Anil Jatav et al (2015) 03(%)	Same institute study (1990) 91(%)	This study (%)
0-1 year	61.54	29.8	62.9	50	27
1-5 years	23.08	26.3	24.4	25	60
>5 years	15.38	13.9	12.6	25	13

Maximum number of cases of obstruction are in age group of 1-5 year (60%) followed by 27% in 0-1 years of age and 13% of more than 5 years.

Ogundoyin et al (2009) in their study reported incidence of 62.9% for the age group of 0-1 year and another 24.4% for 1-5 years and 12.6% in for more than 5 years.

Another study Soomro and Mughal (2013) observed 59.81% for <1 year of age and rest 40.2% were more than 1 year.

Anil Jatav et al (2015) study shows maximum number of cases of intestinal obstruction were in age group of 0-1 year 62.9%. Followed by 24.4% in 1-5 years of age and 12.6% of more than 5 years.

Similar study undertaken in same institution in 1990 shows that maximum number of cases of intestinal obstruction were in age group 0-1 year: 50% followed by 1-5 year: 25% and 5-12 year: 25%.

Peak incidence of intestinal obstruction is usually under 1 year of age. In present study, as in other compared studies, showed that intestinal obstruction was more prevalent in 1-5 year of life may be due to delayed weaning.

Table: Sex Ratio.

Sex	Ogundoyin et al (2009)	Soomro & Mughal et al (2013)	Anil Jatav et al. (2015)	Same institute study	Present study
Male	1.9	2.9	4.4	1.2	1
Female	1	1	1	1	1

In this study out of total 30 cases of intestinal obstruction 15 (50%) male and 50% females. Male to Female ratio 1:1. Ogundoyin et al (2009) reported Male:Female ratio of 1.9:1, Soomro and Mughal et al (2013) observed 2.9:1. In year 2015 Anil Jatav et al shows male to female ratio 4.4:1. Same institutional study 30 years back had male:female ratio 1.2:1 and present study has same sex ratio. The important reason of male female similarity is the fact that there is increased female sex ratio and increase in awareness and education amongst people and free health related service in this institution.

Clinical Presentation

Clinical Presentation	Ogundoyin et al (2009) (%)	Soomro & Mughal et al (2013) (%)	Anil Jatav et al (2015) (%)	Same institute study (%)	Our study (%)
Vomiting	62.79	85.45	82.6	80	80
Abdomen pain	34.88	89.09	28.1	65	53
Abdomen distension	43.41	81.81	61	95	40
Constipation	34.88	100	63	45	17
Bleeding per rectum	24.03	18.18	22.6	10	07
Fever	31.01	21.81	-	15	27
Diarrhoea	6.20	-	-	-	07

In this study clinical features includes vomiting (80%), abdominal pain (53%), abdominal distension (40%), Fever (27%), constipation (17%), abdominal lump (12%), bleeding per rectum (07%), and diarrhoea (07%).

Same institutional study reported that clinical features included abdominal distension (95%), vomiting (80%), abdominal pain (65%), constipation (45%), bleeding per rectum (10%) and fever (15%).

In year 2009 Ogundoyin et al reported that clinical features included vomiting (62.79%), abdominal pain (34.88%), abdominal distension (43.41%), constipation (34.88%), bleeding per rectum (24.03%), fever (31.01%) and diarrhoea (6.20%). In the year 2013 Soomro and Mughal observed that the main presenting features were not passing stool (100%), abdominal pain (89.09%), vomiting (85.45%), abdominal distension (81.81%), fever (21.81%) and

bleeding per rectum (18.18%). In year 2015, Anil Jatav et al showed that included vomiting (82.6%), constipation (63%), abdominal distension (61.1%), abdominal pain (28.1%), abdominal lump (25.9%) and bleeding per rectum (22.6%).

It has been observed in this study that proximal small intestinal obstruction is still more common than distal small intestinal obstruction as also suggested by other studies.

Etiology

Etiology	Ogundoyin et al (2009) (%)	Soomro & Mughal et al (2013) (%)	Anil Jatav et al (2015) (%)	Same institute study (%)	This study (%)
Intussusception	29.3	27.3	23.1	10	80
Small bowel atresia	-	-	-	-	6.66
Meckel's diverticulum	-	16.4	3.3	05	-
Band and adhesion	8.46	16.4	11.9	15	-
Volvulus and Malrotation	3.08	3.6	4.4	-	-
Hirschsprung disease	13.85	7.3	13.7	-	-
Infection (Typhoid and TB)	-	11	-	5	-
Imperforate Anus (Anorectal malformation and Bowel atresia)	25.39	-	13.7	45	-
Obstructed Inguinal Hernia	16.92	14.5	3	5	3.33
Umbilical hernia	1.54	3.6	-	-	-
Round worm obstruction	0.77	-	-	10	3.33
IHPS	0.77	-	10	-	-

In this study, intussusception constituted 80% of case, being the most common cause followed by small bowel atresia (6.66%), obstructed inguinal hernia (3.33%) and worm infestation (3.33%) and in 2 cases, etiology was not known.

In same institutional study, Imperforate Anus (Anorectal malformation and Bowel atresia) constituted 45% of case, being the most common cause followed by Band and Adhesion (15%),

Intussusceptions (10%), Round worm obstruction (10%), obstructed inguinal hernia (05%). In the year 2009, Ogundoyin et al described that the major causes of intestinal obstruction in their study were intussusceptions (29.23%), anorectal malformations (22.31%), obstructed inguinoscrotal hernia (16.92%) and Hirschsprung's disease (13.85%).

In the year 2013, Soomro and Mughal found that the causes of intestinal obstruction were intussusception (27.3%), Meckel's diverticulum with band causing obstruction (16.4%), obstructed inguinal hernia (14.5%), post-operative adhesions (9.1%), congenital peritoneal bands (7.3%), Hirschsprung's disease (7.3%), abdominal tuberculosis (5.5%), typhoid ileal perforation (5.5%), malrotation (3.6%) and umbilical hernia (3.6%).

Intussusception was the most common (23%) cause of paediatric intestinal obstruction in the Anil Jatav et al followed by intestinal atresia (13.7%), Hirschsprung's disease (13.7%), Infantile hypertrophic pyloric stenosis (10%), band obstruction (7.8%), malrotation and volvulus (4.4%), postoperative adhesion (4.1%) and Meckel's diverticulum 3.3%, peritonitis 4.8%, obstructed external hernia 3%.

As accepted in various studies, intussusception was found out to be the most common cause of paediatric intestinal obstruction. Bands and adhesions are at a lower place in the list of causative factors.

Treatment Modality

Treatment modality	Ogundoyin et al (2009) (%)	Soomro & Mughal et al (2013) (%)	Anil Jatav et al (2015)	Same institute study (1990) (%)	This study (%)
Conservative	-	12.8	24.5	20	77
USG Guided hydrostatic reduction	-	-	-	-	16.66
Exploratory laparotomy with Reduction of Intussusception	22	5.45	9.3	-	6.66
Bowel Resection and Anastomosis	26	20	27.5	15	6.66
Manual emptying of Worm filled bowel with ileal derotation	-	-	-	-	3.33
Band lysis and adhenolysis	-	16.36%	8.2%	5%	3.33
Derotation	-	3.63%	1.9%	-	3.33

Treatment Modality	Ogundoyin et al (2009) (%)	Soomro & Mughal et al (2013) (%)	Anil Jatav et al (2015) (%)	Same Institute study (1990) (%)	This study (%)
Diverticulectomy	-	16.36%	2.2%	-	-
Appendectomy	-	-	0.7%	-	6.66
Colostomy and ileostomy	29.23%	-	10.4%	30%	-
Pyloromyotomy	0.77%	-	10.0%	-	-
Duodeno-Duodenostomy	1.54%	-	2.6%	-	3.33%
Herniotomy	18.46%	18.18%	1.9%	-	3.33%
Enterotomy / Enterostomy	2.31%	-	-	-	-
Anoplasty	6.92%	-	-	10%	-
Pull through operation	8.46%	7.27%	-	-	-
Anorectoplasty	10%	-	-	-	-
Ladd operation	3.08%	-	-	-	-

In this study 77% cases were managed by conservatively and rest 23% case managed by operation. Operative intervention includes manual reduction of intussusception (10%), appendectomy (6.66%), Bowel Resection and Anastomosis (6.66%), Band lysis and adhenolysis (3.33%) and Derotation (3.33%).

Conservative management also includes USG guided hydrostatic reduction, fluid correction and serum electrolyte correction. In same institutional study colostomy and ileostomy procedure were done more commonly (30%), followed by conservative management (20%) and bowel resection and anastomosis (15%).

In Nigeria year 2005 study, all cases were managed operatively. In year 2013 Soomro and Mughal study, 12.8% of cases were managed conservatively and rest 87.2% of cases had undergone surgical intervention.

In Anil Jatav et al. 2015 study, out of 270 patients 75.5% cases had operative modality, where 24.5% cases had non operative approach.

Treatment modality of choice for acute intestinal obstruction is surgery in most other studies. However, in this study, the percentage of conservative treatment modality is higher. Since majority of cases, were of intussusception, they could be treated by conservative management, including USG guided hydrostatic reduction and very few cases underwent operative management.

Outcome

Outcome	Ogundoyin et al (2009) (%)	Soomro & Mughal et al (2013) (%)	Anil Jatav et al (2015) (%)	Same institute study (1990) (%)	Present study (%)
Recover	96.92	98.18	92.2	80	93
Death	3.08	1.81	7.8	20	07

In the present study, mortality is 07%.

In the same institutional study, mortality rate was 20%.

In year 2009 Ogundoyin et al. reported overall mortality rate to be 3.08%.

In year 2013, Soomro and Mughal described overall mortality was 1.81%.

In year 2015, Anil Jatav et al. found that overall mortality was 7.8%.

Acquired causes of intestinal obstruction are still more common than congenital causes. Congenital pathology most commonly occurs in neonatal age group.

Early diagnosis and management can help to decrease the morbidity and mortality associated with this condition. The high mortality in past was due to delayed diagnosis and referral, parental neglect, low socio-economic status, anaesthetic complications and lack of neonatal intensive care. But of late the mortality is coming down due to increased awareness, early referral, availability of staff trained in neonatal handling and better antibiotics, improved paediatric anaesthesia and improvement of post-operative care.

In this retrospective study, 30 pediatric patients of small intestinal obstruction up to 12 years of age group were studied in Department of General Surgery of teaching hospital attached to medical college.

After evaluating various clinical, bio-chemical and radiological parameters the following facts were found out:

- Majority of patients were of less than 5 years of age (87%). Male to female ratio in this study was found to be 1:1.
- Congenital anomalies were more common in neonatal age group.
- The most common cause of small bowel intestinal obstruction was intussusception (80%) followed by small bowel atresia (06%) & followed by obstructed hernia and others.
- Vomiting (80%) is the common symptom in this study followed by abdominal pain (53%), abdominal distension (40%), fever (27%) and

constipation (17%). This shows that small bowel was victim in majority of intestinal obstruction case.

- The commonest clinical finding was tenderness (83%) followed by abdominal distension (40%), red currant jelly stool (23%) and guarding/rigidity (13%).
- Clinical Assessment was supplemented by X-ray abdomen standing and Ultrasonography abdomen in all patients. Most common finding in X-ray Abdomen was patterned air fluid level and dilated gas filled bowel loops and in ultrasonography, was dilated and excessive gas filled bowel loops.
- Approximately 77% patients in our study were managed conservatively while rest of patients required some operative intervention. The operative management is required for congenital causes like small bowel atresia soon after birth and vary few cases of intussusception while operating these patients we found that in majority of them the bowel was dilated. Operative finding in most of the cases were dilated bowel loops which was followed by intussusception, acute appendicitis, interbowel adhesions, worm filled bowel loops and obstructed hernias etc. Conservative treatment includes nasogastric tube insertion, nil by mouth, bowel decompression, fluid management, correction of electrolyte imbalance and USG guided hydrostatic reduction. Mortality rate in this study was found to be 7%.
- Main stay of curative treatment for acute intestinal obstruction is conservative in acquired etiology and operative in congenital etiology.

Conclusion

Intestinal obstruction is one of the commonest intra-abdominal pathology encountered in paediatric age group. Cause of intestinal obstruction varies from

intussusception, intestinal atresia, worm infestation and obstructed inguinal hernia. The cause of intestinal obstruction also varies with age. Success in treatment of intestinal obstruction depends largely upon early diagnosis, skillful management which comprises of investigations and treatment. Preop-resuscitation, per op-ventilatory and fluid management and post op fluid, nutrition and electrolyte management have an equally important role to play like the surgery itself. Improvement in surgical and anesthetic technique and advances in neonatal and pediatric health care have improved the final outcome in intestinal obstruction. However, being in developing country with a non-ignorable bulk of children suffering from malnutrition and communicable disease, a high degree of suspicion from pediatrician, radiologist and a surgeon working simultaneously for a common task shall always be beneficial for the society.

Better understanding of pediatric intensive care and endoscopic advances in the field of surgery shall be able to extend the boundaries of curative treatment and thus further decrease the morbidity and mortality rates.

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