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NIJS

New Indian Journal of Surgery
Volume 13 Number 3 /July-September 2022

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Original Article

New Indian Journal of Surgery
Volume 13 Number 3/July-September 2022
DOI: https://dx.doi.org/10.21088/nijs.0976.4747.13322.1

To Compare the Outcomes of Dorsal Dartos Flap, Tunica Vaginalis Flap and Durham Smith De-Epithelialized Dartos Based Flap as Secondary Interposition Cover after Tubularized Incised Plate Urethroplasty in Reducing Post-Operative Complications

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How to cite this article:
Nitin Jain, Simmi K Ratan, Shasanka Shekhar et al./To Compare the Outcomes of Dorsal Dartos Flap, Tunica Vaginalis Flap and Durham Smith De-Epithelialized Dartos Based Flap as Secondary Interposition Cover after Tubularized Incised Plate Urethroplasty in Reducing Post-Operative Complications/New Indian J Surg. 2022;13(3): 99–104.

Abstract

Background: Interposition flaps are mainstay in the success of hypospadias surgery because they lead to decrease in complications of hypospadias repair significantly especially urethrocutaneous fistula by buttressing the neo urethral suture line. Many interposition flaps have been tried with varying outcome results. Most commonly used interposition flaps are Tunica vaginalis flap and dorsal dartos flap however, recently interest have also researched in Durham smith de-epithelialized dartos based overlay flap. Though there are many publications comparing outcome of dorsal dartos and tunica vaginalis flap but hardly any study that has compared all three interposition flaps. So, we aimed to compare the outcomes of dorsal dartos flap (DF), tunica vaginalis flap (TVF) and Durham smith de-epithelialized dartos based overlay flap as interposition layer in TIP urethroplasty.

Aim: To compare the outcomes of dorsal dartos flap (DF), tunica vaginalis flap (TVF) and Durham smith de-epithelialized dartos based flap as secondary interposition cover after Tubularized incised plate urethroplastyin reducing post-operative complication.

Materials and Methods: A retrospective study was conducted in which case records of 78 patients who had undergone repair for distal and mid-penile hypospadias with minimal chordee and favorable anatomy by the Tubularized incised plate urethroplasty with interposition flap over 2 years (2017-2019) were reviewed. Patients were divided in three groups with 26 subjects in each group. Group A consisted of patients with dorsal dartos interposition flap, Group B comprised of patients with Tunica vaginalis interposition flap and Group C consisted of patients with Durham smith de-epithelialized dartos based overlay cover. Outcome variables noted were the complications including wound dehiscence, Urethrocutaneous fistula, Meatal stenosis, Penile torsion, skin necrosis and preputial edema. Statistical methods were applied to compare these complications in all three groups.

Results: Total number of complications in group A were 11(42.3%) and most common complications were skin necrosis (n=7, 26.9%) and urethrocutaneous fistula (n=6, 23.1%). Total number of complications in group B were 7(26.9%) while Chordee and preputial edema (n=6, 23.1% each) were among the most common complications. 9(34.6%) patients developed

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Received on: 17.03.2022 **Accepted on:** 18.04.2022

complications in group C and most common complications were penile torsion (n=6, 23.1%) and urethrocutaneous fistula (n=4, 15.4%).

Conclusion: We have seen in our study that TV flap is a good option as second cover with lesser complications especially in terms of fistula related complications while Durham smith onlay cover found to be equally better option as it showed no skin complications and other complications were almost comparable to TV flap cover.

Keywords: Hypospadias; Dartos flap(DF); Tunica vaginalis flap (TVF); Urethrocutaneous fistula (UCF); Tubularized incised plate urethroplasty(TIP).

Introduction

Hypospadias is one of the common anomalies in boys. Many techniques of repair have been described.[1] The reported incidence of complications for hypospadias surgery by Snodgrass technique ranges from 0% to 53%.[2,3] Among all the complications, most common complication reported is urethrocutaneous fistula which forms >60% of all complications.[4] To decrease the rate of post-operative fistula complications many safety measures are undertaken including tissue handling, silicon catheter material, good quality suture material and several covering flap procedures as second vascular cover such as dorsal dartos, ventral de-epithelialized preputial dartos based cover or tunica vaginalis (TV) is known to minimize or avoid this complication.[5] This study aimed to compare the outcomes of dartos flap (DF), tunica vaginalis flap (TVF) and Durham smith de-epithelialized dartos based overlay flap1as secondary intermediate layerin TIP urethroplasty.

Material and Methods

It is a retrospective study where we collected, analyzed and followed up the data of 78 patients who had undergone single stage hypospadias repair by the Tubularized incised plate (TIP) urethroplasty with interposition flap. The case records of all patients, who have undergone Tubularized incised plate urethroplasty repair with interposition flap like dorsal dartos flap, tunica vaginalis flap or smith flap which is durham smith de-epithelialized dartos based overlay cover, were reviewed.

At our centre all these secondary interposition flaps are practiced for single stage hypospadias repair as per surgeon's preference. On case record review, those patients who underwent TIP repair with dorsal dartos interposition flapwere labelled as Group A. Group B comprised of patients with Tunica vaginalis interposition flap and Group C consisted of patients with Durham smith de-epithelialized dartos based overlay cover. Distal and mid-penile hypospadias with minimal chordee and favorable anatomy were included. Each group had 26 patients with similar distribution among the groups.

On review of the files post-operative findings including wound dehiscence, Urethrocutaneous fistula, Meatal stenosis, Penile torsion, skin necrosis and preputial edema were noted on post-operative day 10 at the time of removal of catheter. The outcome data points among the groups were tabulatedStatistical methods were applied to compare these complications in all three groups.

Operative Technique

Patients in all the groups were those who had already undergone hypospadias repair by Tubularized incised plate (TIP) technique. We describe here briefly about this technique. Here in this technique urethral plate is preserved and an

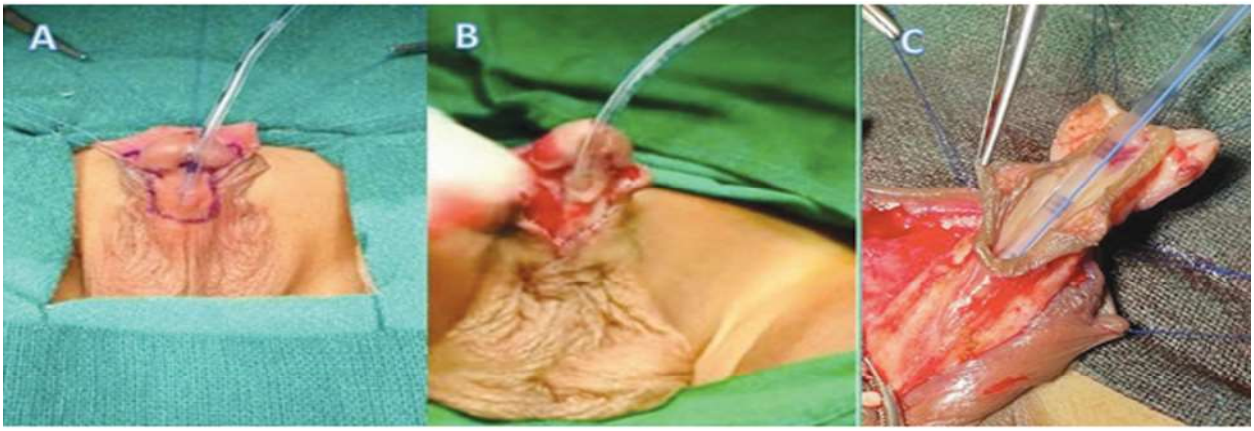

Fig. 1: Showing steps of Tubularized incised plate (TIP) technique.

inverted U-shaped incision is given encircling the meatus to the corona. After degloving, Gitte's test is done to evaluate the degree of chordee. Glans wings are raised. After an incision made over the urethral plate, and it isthen tubularized over an appropriate sized catheter using 6-0 vicryl subcuticular sutures. Second soft tissue cover is then used which was differed among the groups.(Fig. 1)

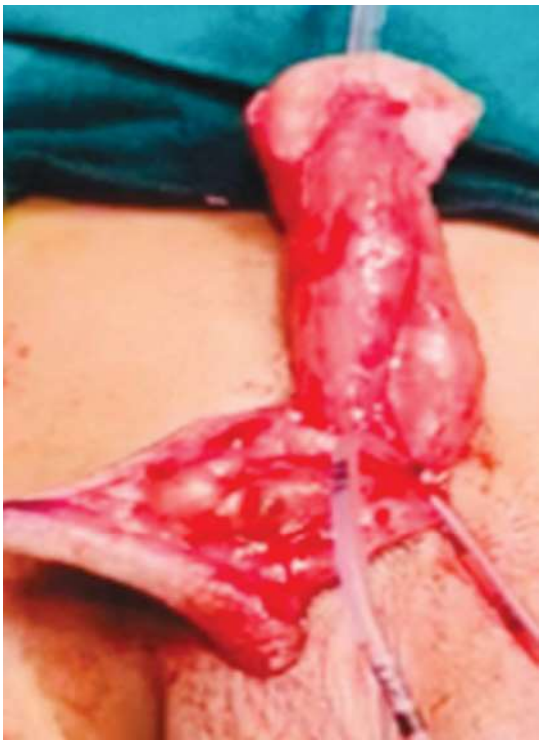

Fig. 2: Dorsal Dartos flap.

Fig. 3: Tunica Vaginalis Flap.

In group A, the dartos flap was used to provide soft tissue cover. It is harvested from the dorsal prepuce after careful dissection between the dartos and the skin. The dartos fascia is then mobilized ventrally over the ventral suture line and sutured using vicryl 6-0. (Fig. 2)

In group B, tunica vaginalis flap was used to provide soft tissue cover. In this procedure after degloving till the root of penis, testis is then delivered out. Tunica is incised near the lower pole and adequate length of TV flap is raised. This flap is then used to cover the entire length of suture line. (Fig. 3).

In group C, after urethral plate tabularization, the prepuce is split longitudinally on the dorsal surface as far as the coronal groove to create two lateral flaps.A strip of skin 3"2-4"8 mm wide is then de-epithelialized on one side to provide a raw surface of deep dermis.The medial edge of the shaved flap is brought across the urethroplasty tube, and sutured to fascial tissue beneath the other flap so that double breasting is done. (Fig.4).

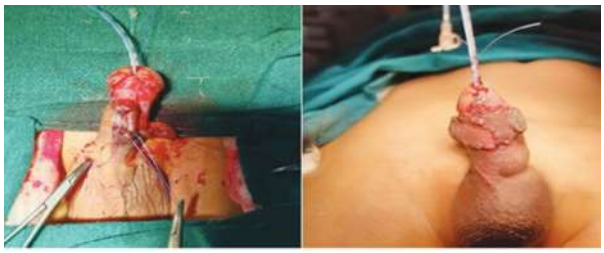

Fig. 4: Showing Durham smith de-epithelialized dartos based overlay flap and final result after double breasting.

Results

Patients were divided in three groups based upon the procedures performed viz. Dartos flap, Tunica vaginalis flap or Durham smith de-epithelialized flap after urethroplasty by Tubularized incised plate technique. Each group had 26 patients each. Results of each group is summarised in table 1.1.

Group A had median age of 4.2 years while 4.8 years for Group B and 4.4 years for Group C. 23 patientsin group A had distal-penile hypospadias, while 3 patients had mid-penile hypospadias. In group B, 18 patients had distal-penile hypospadias, while 8 patients had mid-penile hypospadias. In group C, 22 patients had distal-penile hypospadias, while 4 patients had mid-penile hypospadias. Chordee was present in 11 patients, 13 patients and 9 patients respectively in Group A, B and C.

In group A, after successful repair of hypospadias with Dartos flap as secondary soft tissue cover, urethrocutaneous fistula was seen in 6 patients (23.1%) while it is seen in 2 patients (7.6%) after TV flap repair in group B and in 4 patients (15.4%) in group C. Skin necrosis was seen in 7 patients (26.9%) in group A while 3 patients (11.5%) developed skin necrosis in group B but no patient developed skin necrosis in group C. Preputial edema was developed in 11 patients (42.3%) in Group A while it was seen among 6 patients (23.1%) in group B and 7 patients (26.9%) developed skin necrosis in group C.Wound dehiscence including all layers was seen among 3 patients (11.5%) in group.

A while it was observed in only 1 patient (3.8%) in group B and group C. Meatal stenosis was seen among 3 patients (11.5%) in group A while it was seen in only 1 patient (3.8%) in group B and group C. Outcome analysis is tabulated in Table 1 and depicted with Bar diagram in (Fig. 5.)

Table 1

	Group A (26)	Group B (26)	Group C (26)
Mean age (yrs.)	4.2	4.8	4.4
Variety Distal	23 (88.5%)	18 (69.2%)	22 (84.6%)
Mid-penile	3 (11.5%)	8 (30.8%)	4 (15.4%)
Total Number of Complications	11 (42.3%)	7 (26.9%)	9 (34.6%)
Chordee	4 (15.4%)	6 (23.1%)	5 (19.2%)
Penile Torsion	3 (11.5%)	2 (7.6%)	6 (23.1%)
Wound Dehiscence	2 (7.6%)	1 (3.8%)	1 (3.8%)
UC Fistula	6 (23.1%)	2 (7.6%)	4 (15.4%)
Skin Necrosis	7 (26.9%)	3 (11.5%)	0 (0%)
Meatal Stenosis	3 (11.5%)	1 (3.8%)	1 (3.8%)
Preputial edema	11(42.3%)	6 (23.1%)	7 (26.9%)

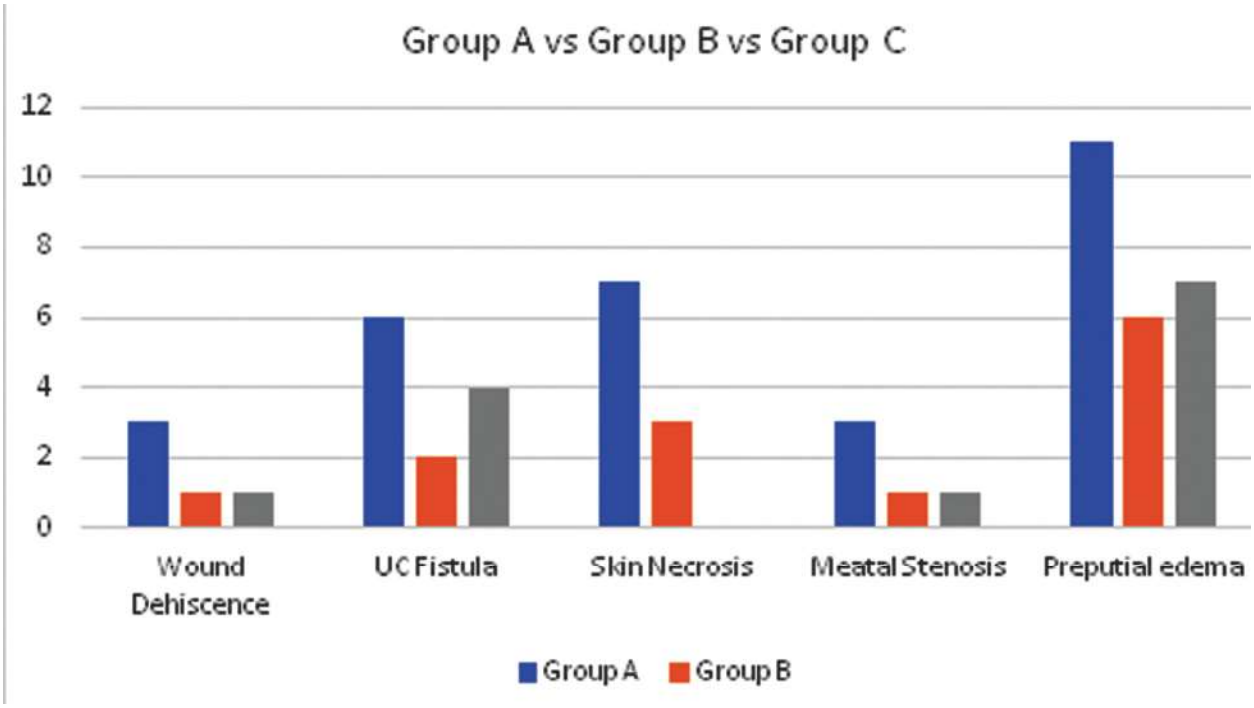

Fig. 5: Showing outcome analysis among patients in respective groups.

Discussion

Hypospadias surgery is always evolving and no single procedure is considered perfect. In the present study, we reviewed 78 patients where interposition flaps like dorsal dartos, tunica vaginalis orde-epithelialized dartos based overlay cover were used. In our study we recorded fistula rate of 26.9% among dorsal dartos group and 7.6% in tunica vaginalis group. Similar studies like Yogender et al.[6] reported 9% fistula rate and Shankar et al.[7] reported fistula rate of 11% in tunica vaginalis flap group. Dhua et al.[8] and Chatterjee et al.[9] reported 0% fistula rate with TVF group while 12% and 15-20% with dartos flap group. They have concluded that TIP with TVF could be the good option in a primary single stage repair of hypospadias. No similar study was found that compared outcome of Durham smith de-epithelialized dartos based

overlay cover after primary repair. Studies like Mohajerzadeh et al.[10] shows urethrocutaneous fistula rate of 41% after second stage Durham smith repair was carried out on 17 patients. In TVF group only 3.8% patients developed meatal stenosis which is better than Kamyar et al.[11] that reported 14% meatal stenosis.

In our study superficial skin necrosis is seen in 26.9% patients in Dartos flap group while 11.5% patients in TVF group. Similar studies like Jiwan et al.[12] reported 30% skin necrosis in dartos group and 0% in tunica vaginalis flap group. No patient developed skin necrosis in group C. Although skin necrosis was inconsequential in the long run, it did cause anxiety and distress to the families and invited more hospital visits.

Wound dehiscence including dehiscence of glans penis was seen in 11.5% among patients in group A and 3.8% in group B and C. Other similar studies like Moosa ZY[13] shows no wound dehiscence in both groups while Dhua et al.[8] reported wound dehiscence in single patient in TVF group but no dehiscence was reported among patients in Dartos flap group. In our study we reported preputial edema among 42.3% patients in group A and 23.1% patients in group B while 26.9% patients in group C. No similar studies found that compared preputial edema but we recorded higher incidence of preputial edema among patients belonged to Dartos flap group.

Both tunica vaginal flap and Durham smith de-epithelialized dartos based overlay coverhad good outcome but we have seen that TVF group patients had low incidence of urethrocutaneous fistula and meatal stenosis.

Limitations

Although there could be lots of factors that might affect the outcome of hypospadias surgery, especially the wide variability in technical aspects of surgery and complexity for individual cases, additional large sample size, well-designed studies need to be conducted for optimal comparisons between these two flap techniques.

Conclusion

We have seen in our study that TV flap is a good option as second cover with lesser complications especially in terms of fistula related complications but Durham smith de-epithelialized dartos based overlay coverfound to be equally better option as it showed no skin complications and other complications were almost comparable to TV flap cover.

Source of Support: Nil

Conflict of Interest: None declared.

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Original Article

New Indian Journal of Surgery
Volume 13 Number 3/July-September 2022
DOI: https://dx.doi.org/10.21088/nijs.0976.4747.13322.2

Study of Surgical Emergenices in Tertiary Care Hospital

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How to cite this article:
Navin Choudhary, Abhishek Chhabara, Sunder Kishor et al./Study of Surgical Emergenices in Tertiary Care Hospital/ New Indian J Surg. 2022;13(3):105–110.

Abstract

Introduction: In a country like ours, the increased number of surgical emergencies presenting to a hospital diverts majority of the resources towards the emergency department. Understanding this growing need makes it important to study and evaluate the distribution of these patients which shall help in developing a more efficient department.

Material and Methods: We conducted a prospective study of patients undergoing emergency surgeries from December 2019 to November 2021. Total 300 patients included and study was carried out in the Department of Surgery, S.P. Medical College and P.B.M Hospital, Bikaner.

Results: Majority of patients were from 21 to 40 years age group (43.66%). There were 208 males and 92 females. The male to female ration in our study was 2.26:1. Out of 300 patients, 82 patients (21.33%) had acute appendicitis 50 patients (16.66%) had hollow viscus perforation and 40 patients (13.33%) had intestinal obstruction. Most common surgical intervention done was exploratory laparotomy followed by appendectomy. The average hospital stay in our study was 6.6 days. Surgical site infection (n=23, 7.66%) and wound dehiscence (n=8, 2.66%) were the commonest postoperative complication noted in our study. Overall mortality rate in our study is 8.33%. Most common cause of death in our study population was septicemia. Majority of patients in our study were from low socioeconomic group.

Conclusion: Early diagnosis, aggressive resuscitation and timely definitive treatment is essential in order to decrease the mortality in patients undergoing emergency surgeries. It highlights the required positive change in current surgical and aesthesia practice that may be extrapolated to other such establishments.

Keywords: Emergency surgery; Emergency department.

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Received on: 14.02.2022
Accepted on: 15.03.2022

Introduction

In a country like ours, the increased number of surgical emergencies presenting to a hospital diverts majority of the resources towards the emergency department. The number of emergency cases presenting to hospitals have increased over years putting a lot of pressure on the hospital resources.[1]

Emergency Surgery can be defined as surgery that is required to deal with an acute threat to life, organ, limb or tissue caused by external trauma, acute disease process, acute exacerbation

of a chronic disease process, or complication of a surgical or other interventional procedure. The skills needed for emergency surgery include the ability to undertake those abdominal and pelvic (including urological), thoracic, vascular and soft tissue procedures that need to be performed within 24 hours.[2]

The emergency surgeon must understand the pathophysiology of acute disease, how it is influenced by pre-existing comorbidity and be able to rapidly optimise the acutely ill surgical patient.[3]

General Surgical Emergencies seen in hospital are Incarcerated and Strangulated Inguinal Hernias, Acute appendicitis, Acute intestinal obstruction, Blunt and penetrating abdominal and thoracic trauma, hollow viscus perforation and soft tissue infections etc.

After thorough investigation, most of these clinical patterns evolve into unambiguous diagnoses. Some of the clinical patterns that represent acute surgical disease are managed by emergency surgery. Moreover, in certain situations, only surgery leads to proper diagnosis. Other situations may be treated sufficiently by conservative management. Deferring surgery to daytime hours is appropriate in certain situations. On the other hand, inappropriate delaying of surgery may result increased morbidity and mortality.[4]

The objective of the management of acute surgical diseases is to save lives by controlling bleeding or contamination, or by improving organ perfusion. Resource availability along patient physiological and clinical parameters in the acute care arena justifies the development of triage tools and agreed criteria for proper timing of emergency operations.

Aims of this study were to assess the prevalence of different type of surgical emergencies, to assess the various complications and mortality and outcome of different type of emergency surgeriess.

Material and Methods

Present study was carried out in the Department of Surgery, S.P. Medical College and P.B.M Hospital, Bikaner. This is a prospective descriptive study and was carried out between December 2019 to November 2021. During the study period, 300 consecutive patients (Patients with 13years and above 13 years of age) admitted with clinical and radiological evidence of surgical emergencies, undergoing surgical intervention, regardless of gender were included.

Inclusion criteria

All Patients of age 13 years and above, regardless of gender, admitted with clinical and/or radiological evidence of general surgical emergencies and undergoing surgical intervention, enrolled in the study.

Exclusion criteria

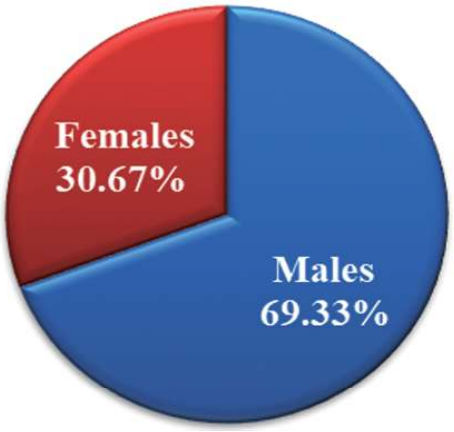
Patients below 13 years of age, Patients not willing to participate in study, Patients managed conservatively, patients not willing for surgical intervention and subsequently discharged against medical advice were excluded from study. Other emergency surgeries like neurosurgery, urology, orthopedics and pediatric surgery.

On admission detailed history regarding age and sex, onset, duration and progress of the symptoms, co-morbitites and past surgical history were recorded from the patients. After thorough clinical examination, appropriate laboratory and radiological investigations all patients were subjected to emergency surgery after written informed consent. All data recorded from perioperative period including type of anesthesia, any intraoperative complication, duration of hospital stay. Data was recorded from post-operative complications in hospital stay and in follow up period. Any mortality occurred was noted. The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel) and appropriate tests were applied.

Results

Out of total 300 patients studied 208 were males and 92 were females. The male to female ratio was 2.26:1.(Chart 1).

Chart 1: Sex-wise distribution of cases of emergency surgeries.



Majority of patients were from 21 to 40 years age group (43.66%) followed by 41-60 years age group (31.00%). 12.33% patients were from 61-80 years age group. Mean age was 40.2 years in present study. (Table1).

Table 1:

Age Group	Number of Patients	Percentage
13-20	36	12.00%
21-40	131	43.66%
41-60	93	31.00%
61-80	37	12.33%
>80	3	01.00%
Total	300	100

Out of 300 patients, 82 patients (21.33%) had acute appendicitis, 50 patients (16.66%) had hollow viscus perforation, 40 patients (13.33%) had intestinal obstruction, 34 patients(11.33%) had abscess, 26 patients (8.66%) had soft tissue infections (cellultis and necrotizing fasciitis) (Table 2).

Table 2:

Diagnosis	Number of Patients	Percentage
Appendicitis	82	21.33%
Cellulitis/Necrotizing fasciitis including fournier's gangrene	26	8.66%
Abscess	34	11.33%
Infected or fungating Breast mass	2	0.66%
Non-viable testis (torsion/ abscess)	10	3.33%
PVD/Gangrene	17	5.66%
Obstructed hernia	13	4.33%
Perineal tear	4	1.33%
Compartment syndrome	2	0.67%
Anal fissure	6	2.00%
Blunt trauma abdomen	6	2.00%
Hollow viscus perforation	50	16.66%
Intestinal obstruction	40	13.33%
Gastric outlet obstruction	6	2.00%
Pyoperitoneum	1	0.33%
Bleeding hemorrhoids	1	0.33%
Total	300	100%

Most common surgical intervention done was exploratory laparotomy (n=104, 34.66%) followed by appendectomy (n=82, 27.33%).[34] (11.33%) patients undergone incision and drainage and 26 (8.66%) patients undergone debridement.[17] (5.67%) patients undergone amputation. Among patients undergone exploratory laparotomy (n=104) most common surgical procedure done was primary repair of intestinal perforation (n=50, 48.07%) and resection and anastomosis of bowel (n=14, 13.46%) followed by release of bands and adhesions (n=13, 12.50%) (Chart 2).

Most patients were operated under regional anesthesia (n=154, 51.33%) followed by general anesthesia (n=117, 39%). 29 patients (09.66%) were operated under local anesthesia. (Chart 3).

Chart 2: Distribution of various types of emergency surgeries.

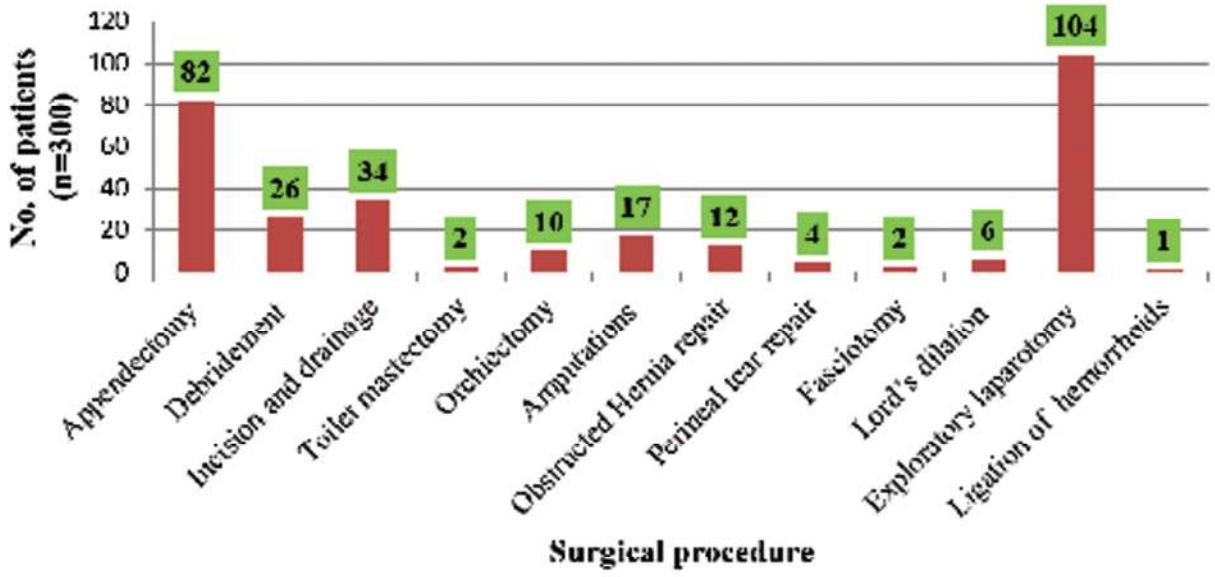
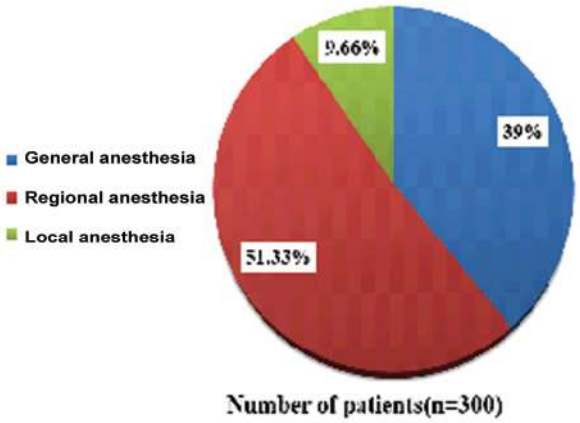


Chart 3: Distribution of patients undergone emergency surgeries according to type of anesthesia.

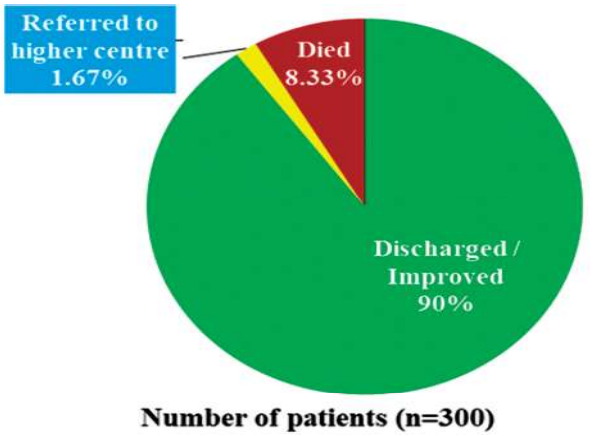


174 patients (58.00%) had hospital duration of <7 days. 88 patients (58.00%) had hospital duration of 7-14 days. 38 patients (12.66%) had hospital duration of >14 days. The average hospital stay in our study was 6.6 days. Majority of patients in our study were from low socioeconomic group according to B.G. Prasad's socioeconomic status.

In post-operative period 23 patients (7.66%) had surgical site infections as complication.Septicemia was noted in 18 cases (6%), Pneumonia was observed in 13(3.33%) patients. Burst abdomen was noted in 8 (2.66%) patients. (Chart 4).

Overall mortality rate in our study is 8.33% (n=25). 5 patients were referred to higher centre for further management and 270 patients (90%) were discharged home (Chart 5).

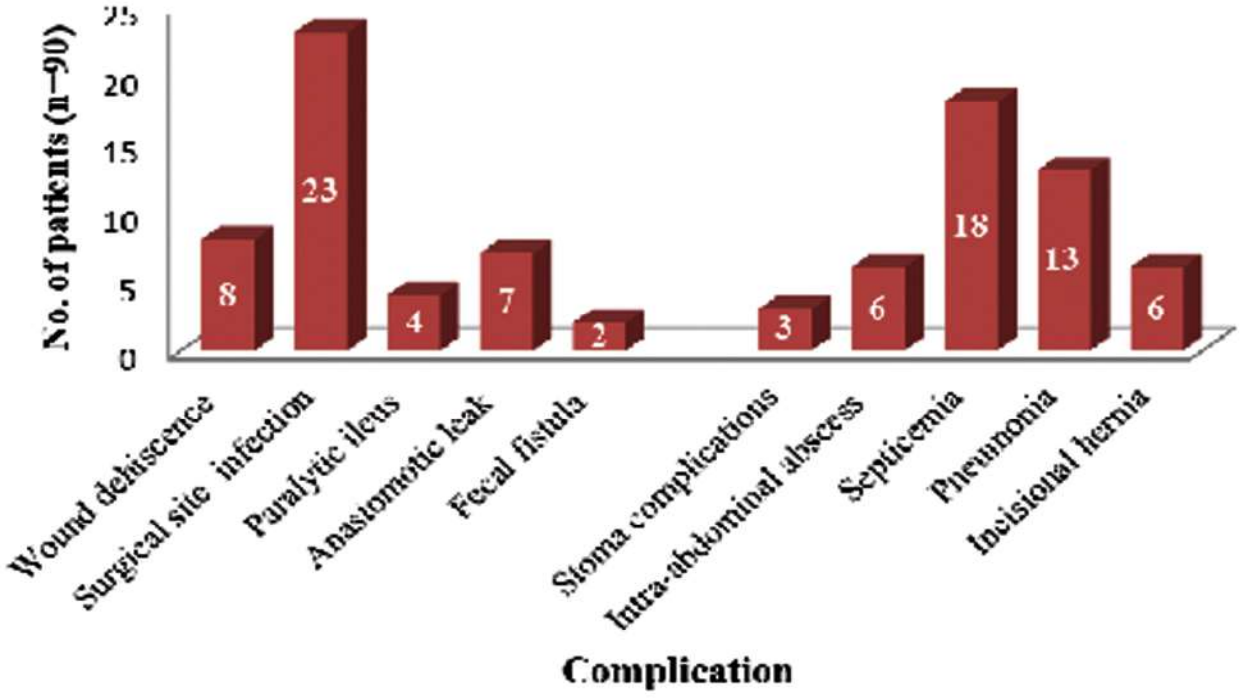
Chart 5: Outcome in Patients undergone emergency surgeries.



Discussion

In our study surgical emergencies were found to be more common in male when compared to females. Male to female ratio was 2.26:1. Present study confirms with Mahak kakkar et al[5] with male female ratio of 1.65:1 and Ndubuisi OC onyemaechi et al[6] with male female ratio of 2:1 and Amir Mushtaq Parray et al 2018[7] with male female ratio 2.49:1 and Anjali verma et al 2016[8] with male female ratio of 3.59:1 and Ibrahim et al 2015[9] with

Chart 4: Distribution of patients according to Post-operative complications.



male female ratio of 1.7:1. The minimum age of the patients was 13 years and the maximum age was 85 years, with most common age group between 21-40 years followed by 41-60 years with mean age of 40.2 years.

This confirms our study with study series of Ndubuisi OC onyemaechi et al 2019[6] having mean age of 33.7 years, Amir Mushtaq Parray et al 2018[7] having mean age of 47 years and Ibrahim et al 2015[9] having mean age of 44.9 years and A U Ekere et al 2005[10] 33 years. Surgical emergencies are common in people of this group because of their activities and stress and strains of life are prone for analgesic abuse, alcohol abuse and acid peptic disease and road traffic accidents.

In our study most surgical emergencies were gastrointestinal emergencies (including appendicitis (21.33%), Hollow viscus perforation (16.33%) and acute intestinal obstruction (13.33%) etc.) Most common emergency surgery performed was exploratory laparotomy (34.66 %) followed by appendectomy (27.33%). Present study confirms with Mahak kakkar et al 2020[5] with most common emergency surgery performed was exploratory laparotomy (56%) and Ndubuisi OC onyemaechi et al 2019[6] with most common emergency surgery performed was appendectomy (16.5%) followed by exploratory laparotomy. Our study also confirms with Anjali verma et al 2016[8] and Ibrahim et al 2015[9] with most common emergency surgery performed in both of studies were exploratory laparotomy followed by. appendectomy.

In our study Minimum days of hospital stay were 2 days and maximum were 22 days. Mean days of hospital duration were 6.6 days. In a recent study conducted by Ndubuisi OC onyemaechi et al 2019[6] had mean hospital stay of 16.9 days. Such difference is probably due to the fact that in our study most common surgical emergency was appendicitis those patients had eventually shorter hospital stay and In the study conducted by Ndubuisi OC onyemaechi et al 2019[6] had most common surgical emergency was road traffic accidents.

Mortality in our study was 8.33%, which is comparable with study conducted by Ndubuisi OC onyemaechi et al 2019[6] with mortality rate 7.8% and Amir Mushtaq Parray et al 2018[7] with mortality rate 12% and study conducted by Ibrahim et al 2015[9] with mortality rate of 12%. And study conducted by Ahmed A et al 2009[11] with mortality rate of 6% And study conducted by N Masiira-Mukasa et al 2002[12] with mortality rate of 6.66%.

Conclusions

Early diagnosis, aggressive resuscitation and timely definitive treatment is essential in order to decrease the incidence of bowel ischemia, necrosis, and perforation and the morbidity and mortality associated with gastrointestinal pathologies like intestinal obstruction. Poor socio economic status with a high prevalence of malnutrition, old age of the patients, delayed presentation of patients to the hospital leading to delayed diagnosis and treatment, associated systemic co-morbid conditions adversely affects the final surgical outcome of the patients.

A tertiary care hospital located in any district receives a high volume of emergency surgeries. Understanding this growing need makes it important to study and evaluate the distribution of these patients which shall help in developing a more efficient environment by health education, improve infrastructure to provide ICU care to these patients along with point of care laboratory, radiology and blood bank facilities.

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Original Article

New Indian Journal of Surgery
Volume 13 Number 3/July-September 2022
DOI: https://dx.doi.org/10.21088/nijs.0976.4747.13322.3

Role of Closed Incision Negative Pressure Therapy in Scar Management

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How to cite this article:
K Sriharsha Reddy, Ravi Kumar Chittoria, Nishad K, Neijo Thomas/Role of Closed Incision Negative Pressure Therapy in Scar Management /New Indian J Surg. 2022;13(3): 111–113.

Abstract

In recent years, there has been a greater emphasis on providing high-quality medical treatment to ensure patients' safety through improving recovery after surgery (ERAS), reducing postoperative stress, and restoring normal function quickly. Negative pressure wound care has revolutionized the way acute and chronic wounds are treated. The incision site is usually covered with an occlusive or semi-occlusive covering after primary wound closure. It is thought that using closed incisional negative pressure therapy on surgical wounds improves wound healing by better distributing shear stresses on wound edges and promoting the evacuation of wound fluids such subcutaneous seroma and hematoma.

Keywords: Closed incisional; Negative pressure therapy; Scar.

Introduction

Negative pressure wound care has revolutionized the way acute and chronic wounds are treated.[1,2] The incision site is usually covered with an occlusive or semi-occlusive covering after primary wound closure. The benefits of closed incisional negative pressure therapy (ciNPT) on surgical wounds after vascular surgery, hip replacement, or amputations have been proven in several investigations.[3-5] It is thought that using ciNPT on surgical wounds improves wound healing by better distributing shear stresses on wound edges and promoting the evacuation of wound fluids such as subcutaneous seroma and hematoma.[6-8] Furthermore, ciNPT minimizes wound dehiscence and the possibility of entering germs through its protective sealing.[6] This study aimed to investigate the impact of ciNPT on donor site healing and scarring. We hypothesized that ciNPT might have beneficial effects on donor site healing, scarring, and patient reported esthetic scar appearance.

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Received on: 23.02.2022
Accepted on: 15.03.2022

Material and Methods

This study was conducted in the Department of Plastic surgery in a Tertiary care center in South India. Departmental ethical clearance and consent from the subject were obtained. The details of the patient in study are as follows: 40 year old male (known diabetic) with history of left lower cellulitis for which he underwent debridement and subsequent split-thickness skin grafting; now has small residual 1.5x1cm raw area (figure 1). The epidermal graft was taken by using a size 15 blade and harvesting the epidermis alone. The harvested graft was applied into the raw area with the help of 2-octyl cyanoacrylate adhesive. The donor site was

closed primarily (figure 1) and negative pressure therapy was applied over it (ciNPT) (figure 2).

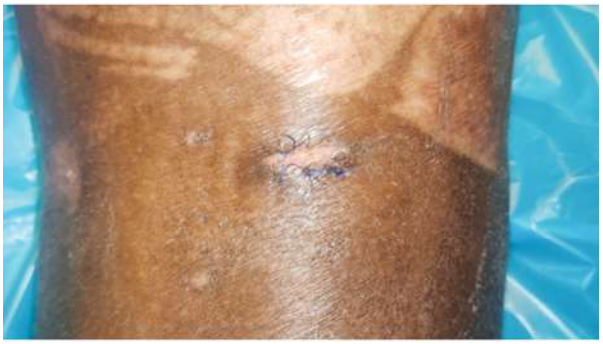

Fig. 1: Donor site closed primarily.

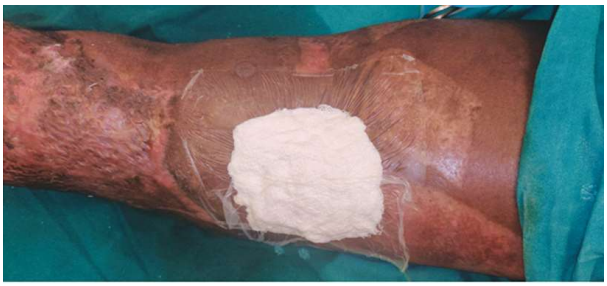

Fig. 2: ciNPT applied after primary closure of donor site.

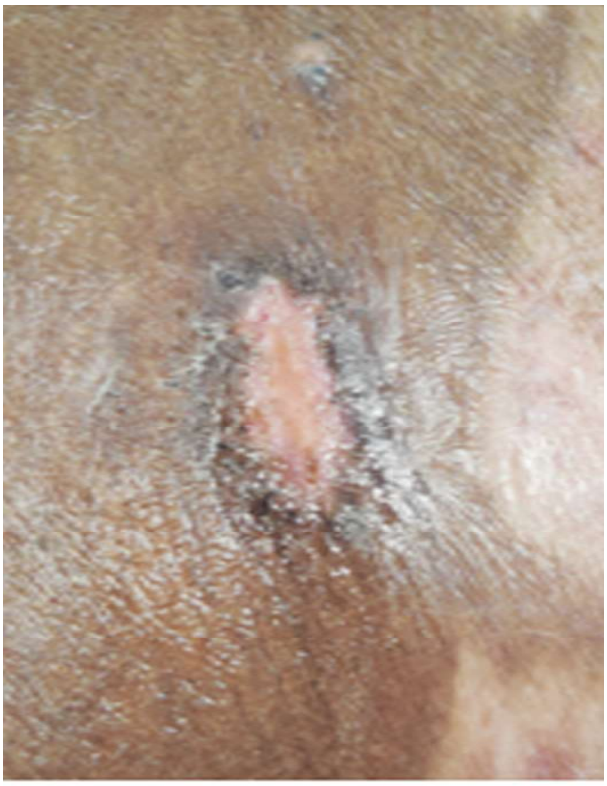

Fig. 3: Donor site at 3 weeks-minimal scar formation.

Results

The donor site healed completely with minimal scar formation (Vancouver scar scale score: 3) after 3 weeks post-operatively (figure 2).

Discussion

In recent years, there has been a greater emphasis on providing high-quality medical treatment to ensure patients' safety through improving recovery after surgery (ERAS), reducing postoperative stress, and restoring normal function quickly. Negative-pressure wound vacuum therapy (NPWVT) is a well-known treatment for infected or burst open surgical incisions. Its usage in closed surgical sites has recently become the topic of new investigation. In 2006, Gomoll et al. published their findings using a similarly modified incisional dressing, which was the first time NPWT was used on closed incisions (ciNPT).[12] Several NPWT mechanisms have been proposed.[9]

Macroscopic Effects of NPWT include: Shortens the time it takes to close a wound by creating and maintaining a moist wound environment; reduces oedema and seroma development in wounds; through macro deformation, it stimulates wound contracture; through a boosting effect, NPWT stabilizes mending tissues; provides both superficial and deeper healing tissues with opposing forces; reduces the size and intricacy of the wound while it heals.

Microscopic Effects of NPWT include: Increased expression of VEGF, IL-8 VEGF gradient increases toward the wound; vigorous angiogenesis in a parallel fashion, oriented toward the wound compared to fewer tortuous new vessels observed in controls; stimulates cell proliferation through micro-deformation; decreases local blood flow in those tissues in closest proximity to the ROCF; changes the colonizing flora of the wound, may increase or have no effect on overall bacterial load; increased neovascularization.

Siegwart et al. looked at the role of ciNPT in preventing abdominal donor site problems in 300 microsurgical breast reconstructions in a preliminary research. The authors discovered a considerable reduction in wound dehiscence after considering our findings.[10] ciNPT has been reported to be effective as a prophylactic treatment for the donor site of other flaps, where wound fluid collection is the primary cause of wound complications, allowing suction drains to be removed sooner. Experimental studies have shown that ciNPT reduces tension across the surgical incision, improving local blood flow and hence minimizing dead space and wound fluid collection.

The Vancouver Scar Scale (VSS) is a well-validated and well-established scale for evaluating hypertrophic scarring and scar quality, with a significant association to objective scar assessment techniques like the CutometerR.[11] However, there are a few limits to consider. The authors claim that combining ordinal (hypo-, hyper-, and mix-pigmentation) and numeric scales into a single score is impossible. They also don't make a clear distinction between "pigmentation" and "vascularity," as well as "contraction" and "pliability."

With regard to our study, we demonstrated that ciNPT is a cornerstone to improve scar quality and the esthetic scar appearance. As this a single case study, further large scale randomized control study is required to comment on its efficacy.

Conclusion

In summary, our results reveal a significant reduction in scar after ciNPT and a significant improvement in patient-reported scar quality at the donor site. We are also confident that the use of ciNPT can be a key contributor in reducing preventing hypertrophic scar formation donor site complications, accelerating patients' postoperative recovery.

Conflicts of interest: None

Authors' contributions: All authors made contributions to the article.

Availability of data and materials: Not applicable.

Financial support and sponsorship: None.

Consent for publication: Not applicable.

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Original Article

New Indian Journal of Surgery
Volume 13 Number 3/July-September 2022
DOI: https://dx.doi.org/10.21088/nijs.0976.4747.13322.4

Clinical Study of Deep Vein Thrombosis of Lower Limbs

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How to cite this article:
Amrish P Mehta, Riddhi S Upadhyay/Clinical Study of Deep Vein Thrombosis of Lower Limbs/New Indian J Surg. 2022;13(3):115–122.

Abstract

Background and Aim: Understanding the natural history of venous thrombosis is important for optimal management of this condition. Once risk factors are recognized it is possible to avoid these risk factors or to use active prophylaxis to reduce the morbidity and mortality. This study is targeted at identifying the risk factors of deep vein thrombosis in our set up, the role of Heparin in prophylaxis and to do a comparative study of low molecular weight Heparin with unfractionated Heparin in treatment of deep vein thrombosis of lower limb in Guru Gobind Singh Government hospital, Jamnagar.

Material and Methods: Study population consisted of 50 consecutive patients with deep vein thrombosis, admitted to Guru Gobind Singh hospital, Jamnagar. We have studied 50 patients above 18 years of age with proven deep venous thrombosis by Doppler ultrasound. A complete clinical history was taken to assess risk factors, level of immobility if present and thorough physical examination was done. Routine investigations such as hemogram, haematocrit, blood indices, and liver and renal function tests were done. Diagnosis of deep vein thrombosis was detected by radiographic imaging like Doppler ultrasonography.

Results: In our study, most of patients presented with complaints of swelling (70%) and pain (48%) of the affected lower limb. Few patients (4%) had symptoms of breathlessness (SOB), chest pain and orthopnea suggestive of pulmonary embolism. 34 patients in our study were having reasonably good level of haemoglobin while rests of all were having anaemia of different degree[4] patients had haemoglobin below 8gm/dl and that needed separate treatment also. Leukocytosis was present in 16 patients. 16 patients had smoking as associated risk factor along with other acquired risk factors and 5 patients had obesity along with other risk factors. The most common complication of DVT is pulmonary embolism which occurs due to dislodgement of thrombus.

Conclusion: Even though it is grievous, DVT can be prevented and treatable. Better and regular availability of drugs like LMWH and safer oral anticoagulants in the smallest possible region of the country can do wonders to save lives. Larger studies focusing more on coagulation cascade, molecular biology and genetics will be even bigger help to mankind.

Keywords: Doppler ultrasound; Hemoglobin; Pulmonaryembolism; Venous thrombosis.

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Received on: 06.01.2022,
Accepted on: 13.01.2022

Introduction

Deep vein thrombosis is formation of semisolid

coagulum within the venous system involving deep veins. Most commonly affects the deep veins of lower limb in legs, thighs or pelvis. The initial thrombus formation usually takes place in the paired calf veins, if not recognized and treated may result in continuous clotting and more proximal extension of the clot. DVT is the most common type of venous thrombosis. It is an important cause of morbidity and mortality worldwide.[1,2]

In the past decade, deep vein thrombosis has increasingly been recognized as an important and possibly preventable cause of morbidity and mortality in hospitalized patients. According to American heart association, more people suffer from deep vein thrombosis annually than heart attack or stroke. DVT affects approximately 0.1% of person per year that signifies estimated incidence of acute DVT is approximately 1/1000 per year.3,4 The life time prevalence of DVT is 3.1% and tends to rise in older age group. The incidence of venous thromboembolism is low in children. A study by Keenan and White revealed that African-American patients are the highest risk group for first time venous thromboembolism. The risk of recurrence in Caucasians is lower than that of African–American.

Understanding the natural history of venous thrombosis is important for optimal management of this condition. Once risk factors are recognized it is possible to avoid these risk factors or to use active prophylaxis to reduce the morbidity and mortality.[5] Deep vein thrombosis is generally related to factors included under the classical triad of stasis, vessel wall damage and hypercoagulability. In particular, the association of hypercoagulability with venous stasis, which allows accumulation of activated coagulation factors invenous valve sinuses of the calf, is presently regarded as the primary triggering mechanism in development of most venous thrombi.[6]

The primary (inherited) abnormalities in some of the natural inhibitors of coagulation are associated with an increased risk of venous thromboembolism. Deficiencies of Protein C, Protein S and Antithrombin-III in patients with venous thrombosis are higher as compared with normal population in the western study. Approximately 50% of cases of deep vein thrombosis were considered to be secondary (acquired) to major risk factors like immobilization, trauma, and recent surgery.[7,8] Among additional risk factors, increased age (over 60years), male gender, malignant neoplasm, heart failure, Systemic Lupus Erythematosus and arteriopathy were independently associated with the risk of acute deep vein thrombosis.[9,10] This study is targeted at identifying the risk factors of deep vein thrombosis in our set up, the role of Heparin in prophylaxis and to do a comparative study of low molecular weight Heparin with unfractionated Heparin in treatment of deep vein thrombosis of lower limb in Guru Gobind Singh Government hospital, Jamnagar.

Objectives of the studies are

- To study risk factors of deep vein thrombosis of lower limb.
- To study role of Heparin in prophylaxis of deep vein thrombosis.
- To do a comparative study of low molecular weight Heparin and unfractionated Heparin in treatment of deep vein thrombosis.

Material and Methods

Study population consisted of 50 consecutive patients with deep vein thrombosis, admitted to Guru Gobind Singh hospital, Jamnagar. We have studied 50 patients above 18 years of age with proven deep venous thrombosis by Doppler ultrasound. A complete clinical history was taken to assess risk factors, level of immobility if present and thorough physical examination was done. Routine investigations such as hemogram, haematocrit, blood indices, and liver and renal function tests were done.

All these patients of DVT were treated according to standard treatment guidelines with low molecular weight Heparin or unfractionated Heparin and simultaneous overlapping with tablet warfarin from 4th day of Heparin with monitoring of PT-INR (Prothrombin Time and International Normalised Ratio). Ambulation, as tolerated, was advised along with elastic compression stockings. The patients were examined daily in ward and clinical features recorded regularly.

Systemic antibiotics, analgesics along with limb elevation were advised in treatment. Average hospital stay was 7-10 days. The patients were discharged with advice of continuing oral anticoagulants and regular follow up with serial measurement of PT-INR.

Inclusion Criteria

- Patients with a radiographically (Doppler ultrasound) proven deep vein thrombosis.
- Age above 18 years.

Exclusion Criteria

- Age below 18 years.
- Colour Doppler did not confirm DVT.
- Patients who had superficial thrombophlebitis.

The detailed case history was taken and physical examination was done according to the enclosed proforma. Diagnosis of deep vein thrombosis was detected by radiographic imaging like Doppler ultrasonography.

Blood sample: With informed consent, blood samples were collected from patients suffering from deep vein thrombosis. This was done at the time of presentation before starting anticoagulants and then regularly during the treatment for monitoring.

The venous blood samples from all subjects were collected into one- tenth volume (1:9) of 3.2% trisodium citrate. Plasma was prepared by centrifugation at 2500x g for 15 minutes and kept at –70 degree Celsius until use. An EDTA blood sample was collected for complete hemogram study.

The investigations done in all the patients include blood count, peripheral blood smear, liver and renal function tests, platelet count, Prothrombin time (PT), activated Partial Thromboplastin Time (APTT), renal and liver function test assay were performed.

Results

We enrolled 50 patients admitted in Shree Guru Gobind Singh Hospital, Jamnagar and fulfilling the inclusion criteria. Our study period was of 2 years from 2019 to 2021. We studied demography, clinical presentation, comorbidities, acquired risk factors, site of thrombosis, treatment and outcome of all these patients.

Table 1: Age Distribution of Study Participants.

Age Distribution (Years)	Total
21-30	4
31-40	11
41-50	15
51-60	12
61-70	8

We enrolled patients from 21 years to 70 years of age. The highest incidence was seen between 41 to 50 years of age and that was followed by 51 years to 60 years.

Graph 1: Age distribution of study participants.

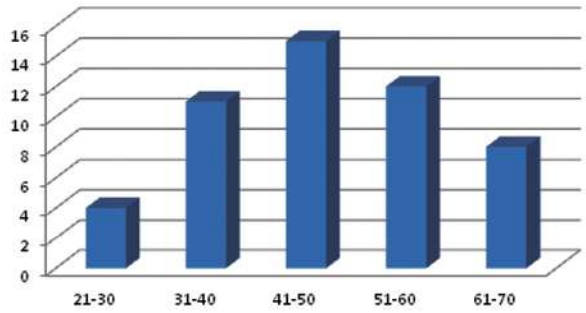


Table 2: Gender wise Distribution of Study Participants.

Sex	Number of Patients	Percentage
Total	50	100%
Male	27	54%
Female	23	46%

In our study, 27 were males and 23 were females. Male to female ratio was 1.08:1.

Graph 2: Gender wise distribution of study participants.

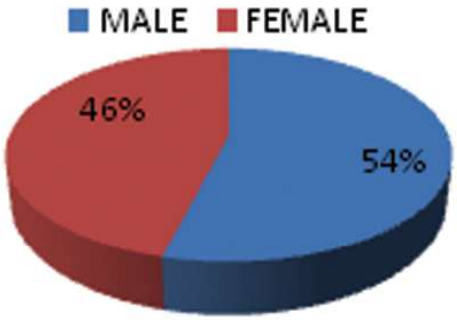
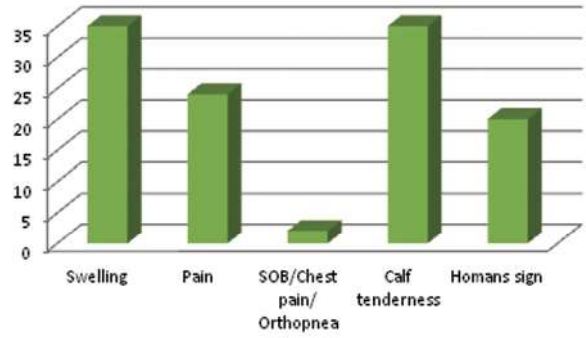


Table 3: Analysis of Symptoms and Signs of LimbDVT.

Symptoms and Signs	No. of Patients (N=50)	Percentage (%)
Swelling	35	70
Pain	24	48
SOB/Chest pain/Orthopnea	2	4
Calf tenderness	35	70
Homans sign	20	40

Graph 3: Analysis of symptoms and signs of Limb DVT.



In our study, most of patients presented with complaints of swelling (70%) and pain (48%) of the affected lower limb. Few patients (4%) had symptoms of breathlessness (SOB), chest pain and orthopnea suggestive of pulmonary embolism.

In our study, over 15% of the patients had type-2 diabetes mellitus and over 25% of the patients were suffering from various cholesterol related cardiac diseases like hypertension, coronary artery disease & ischemic heart disease and congestive cardiac failure. Others like cerebrovascular accident, chronic kidney disease and seizure were next to follow. In our study, proximal deep veins of lower limb like external iliac veins, femoral veins and popliteal veins were affected more than distal veins like anterior tibial veins and posterior veins.

Table 4: Color Doppler Findings.

Veins	Right Lower Limb		Left Lower Limb		Bilateral Lower Limb	
	Complete DVT	Partial DVT	Complete DVT	Partial DVT	Complete DVT	Partial DVT
External iliacvein	1	-	2	-	2	-
Femoral vein	5	1	12	3	-	-
Popliteal vein	2	2	4	4	-	-
Anterior tibial	1	1	6	-	-	-
Posterior tibial vein	1	-	2	1	-	-

Graph 5: Type of DVT and Limp Affected.

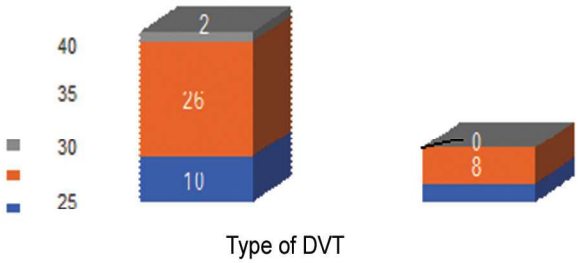


Table 5: Investigation Profile.

HB [GM/DL]	No. of Patients	WBC [Microl/ Cumm]	No. of Patients
<6.5	1	<5000	4
6.6-8.0	3	5000-10000	30
8.1-10.0	7	10000-150000	8
10.1-12	34	150000-20000	5
>12	5	>20000	3

PT (Sec)	No. of Patients	APTT (Sec)	No. of Patients	INR	No. of Patients
<11.0	3	<21.0	0	<0.80	1
11.1-12.5	8	21.1-26.0	3	0.81-0.90	20
12.6-13.0	25	26.1-31	8	0.91-1.0	5
13.1-13.5	10	31.1-35	32	>1.1	24
>13.5	4	>35	7		

34 patients in our study were having reasonably good level of haemoglobin while rests of all were having anaemia of different degree. 4 patients had haemoglobin below 8gm/dl and that needed separate treatment also.Leukocytosis was present in 16 patients. But rests of all patients were having total leukocyte count within normal limits. This might be due to early presentation of the patients.4 patients had altered prothrombin time, 7 patients had altered aptt and 5 patients had INR > 1.1.1 patient had altered renal function test. 10 patients had hypoalbuminemia.

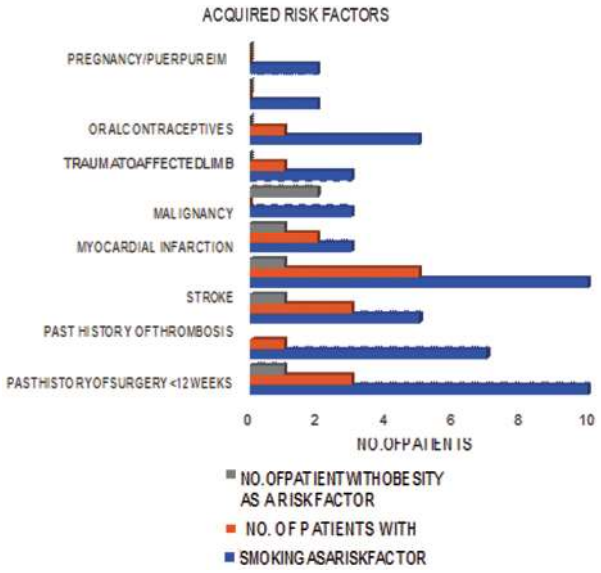
Table 6: Acquired risk factors.

Risk Factors	No. of patients having Smoking as Associated Risk Factor	No. of Patients Having Obesity as Associated Risk Factor	Total
Non-specific	3	1	10
Bed rest >3 days (immobilization)	1	0	7
History of Surgery <12 week	3	1	5
Past history of thrombosis	5	1	10
Stroke	2	1	3
Malignancy	1	0	3
Myocardial infarction	0	2	3
Trauma to the affected limb	1	0	5
Oral Contraceptive pills	0	0	2
Pregnancy/puerpuriem	0	0	2

16 patients had smoking as associated risk factor along with other acquired risk factors and 5 patients had obesity along with other risk factors. 5 patients were covid positive during the covid pandemic most common acquired risk factor is past history of thrombosis (20%) followed by immobilization (14%). Most common associated risk factor is smoking which is present in 32% of patients. 20% of the patient had no acquired risk factors. 10% patients had history of surgery in less than 12 weeks, 6% patients had acquired risk factor of stroke, malignancy and myocardial infarction

respectively. 10% patients had risk factor of trauma to the affected limb, 4% patients had risk factors of pregnancy and oral contraceptive pills use respectively.

Graph 6:



Out of 50 patients, 22 patients were given unfractionated Heparin and 28 patients were given low molecular weight Heparin. After 3 days oral anticoagulants were started. Low molecular weight Heparin is costlier, but due to better tolerability, better bioavailability and easy administration, it is preferred anticoagulant over unfractionated Heparin. 10 Patients were given Tab. Rivaroxaban (10 mg) and 40 patients were given Tab. Warfarin (5mg) started on fourth day depending upon the availability of the drugs.

Table 7: Outcome of the treatment.

Outcome	UFH (Out of 22)	LMWH (Out of 28)
Resolution of Pain	17	24
Resolution of Swelling	18	25
Reduction of Limb Girth	19	25
Prolonged APTT	6	0
Recanalization	17	22
Bleeding	3	-
Thromboembolism	2	-
Recurrence	2	1

In our study, we have compared two groups of patients each having lower limb DVT, first group of 22 patients who were administered unfractionated Heparin; second group of 28 patients, who were administered low molecular weight Heparin. We have compared the outcome of both anti- coagulants by clinical parameters, blood investigations and doppler ultrasound. The results of our study after one week are as follows:

77.27% of patients had resolution of pain after treatment with UFH & in 85.71% patients had resolution of pain after treatment with LMWH. 81.82% of patients had resolution of swelling after treatment with UFH & in 89.28% patients had resolution of swelling after treatment with LMWH. 86.36% of patients had reduction of limb girth after treatment with UFH & in 89.28% patients had reduction of limb girth after treatment with LMWH. 27.27% of patients had prolonged APTT after treatment with UFH & no patients had prolonged APTT after treatment with LMWH. 77.27% of patients had recanalization after treatment with UFH & in 78.57% patients had recanalization after treatment with LMWH. 13.6% of patients had bleeding after treatment with UFH & no patients had bleeding after treatment with LMWH. 9% of patients had thromboembolism after treatment with UFH & no patients had thromboembolism after treatment with LMWH. 9% of patients had recurrence after treatment with UFH & in 3% patients had recurrence after treatment with LMWH.

Table 8: Resolution of Clinical Signs.

Resolution of Clinical Sign	No. of Patient	%
Yes	44	88%
No	6	12%

In our study, carried out in 50 patients who developed DVT, 44 patients (88%) had complete resolution of clinical signs including cellulitis and reduction of limb girth. And 6 patients (12%) did not have resolution of clinical signs over duration of 6 weeks.Complications of DVT are inevitable if not properly treated with anticoagulants. The most common complication of DVT is pulmonary embolism which occurs due to dislodgement of thrombus. In our study, out of 50 patients, 4 patients (8%) developed pulmonary embolism, out of which 2patients died (4%), 2 patient (4%) developed varicose veins and 2 patient (4%) developed venous ulcer.

Out of 50 patients, minor bleeding in the form of hematuria occurred in 3 patients (6%). 28 Patients were on low molecular weight Heparin and 22 patients who were on unfractionated Heparin developed hematuria. Other complications like major bleeding – hematemesis, bleeding per rectal, conjunctival hemorrhage, petechiae or intra cranial bleeding were not noted.

Discussion

50 patients admitted with a diagnosis of deep vein thrombosis in lower limb, to Guru Gobind Singh hospital, Jamnagar were analyzed with respect to the demographic profile, clinical spectrum, presence of acquired/inherited risk factors for development of venous thrombosis, management and outcome of treatment.

In our study mean age of patients was 46.26 years with a most commonly affected age group is middle age group. According to Pal Naresh et al[11] study, maximum number of patients in male were in age group of 21-30 years as well as in females also and most common age group in both sexes were 21-30 years. According to Kasabe PS et al[12] study, most common age group affected were in 50–59-year age group.

Out of 50 patients, 27 patients were male (54%) and 23 patients were female (46%). The ratio of males to females is 1.08:1.According to a clinical study in Kasabe PS et al12 male to female ratio was 1:078.According to a clinical study in Pal Naresh et al[11] male to female ratio was 1:1.7.According to a clinical study in Anderson and Colleagues 13, 70% were males and 30% were females. The male to female ratio was 1.4:1.

In the 50 patients who presented with lower limb deep vein thrombosis, the most common presenting features were swelling of limb in patients (70%) and pain in patients (48%). On examination patients (60%) had pedal edema and calf tenderness was present in patients (70%).

O'Donnell et al[14] and Molly et al[15] study showed that pain (78%) and swelling (85%) were the most common symptoms; Homan sign (60s%) and tenderness (76%) were the common clinical signs. Kasabe PS et al[12] study showed that pain (100%) and swelling (100%) were the most common symptoms; Homan's sign (76%) and tenderness (94%) were the common clinical signs. breathlessness and chest pain suggesting pulmonary embolism.

In our study, 6 patients had hypertension, 8 patients had diabetes mellitus type-2, 4 patients had congestive cardiac failure/coronary artery disease, 3 patients had ischemic heart disease, 3 patients had history of CVA and one patient had history of chronic kidney disease and one patient had seizure. 3 patients had malignancy. And there were no comorbidities in 24 patients. Kniffins large study of venous thromboembolic disease in elderly patients found congestive heart failure in 265 of 7174 patients with pulmonary embolism and 14% of 8923 patients with DVT.

Deep venous thrombosis was diagnosed in 50 patients in our setup by Doppler study. 38 patients (76%) had proximal venous thrombosis and 12 patients (24%) had lower distal venous thrombosis in lower limb. According to western studies, Huisman MV et al16, multisegmented involvement of the proximal veins is most common, proximal veins like superficial femoral and popliteal veins being involved in 74% and 73% of patients respectively. However, isolated involvement of the iliac veins may occur in 2 to 5% of cases, 20 and 12 to 35% remain confined to the distal limb (calf) veins.17.2 patients (8%) had pulmonary embolism which was diagnosed by CT chest and echocardiography.

In our study 34 patients (68%) had DVT in left lower limb and 14 patients (28%) had DVT in right lower limb and bilateral lower limb were affected in 2(4%) patients. In a study by Pal Naresh and et al[11], 40.7% in right lower limb, 57.4% in left limb and 1.85% in bilateral lower limb. In a study by Kasabe PS1236% patients had right sided lower limb DVT, 64% patients had left sided lower limb DVT and 0 patients had bilateral lower limb DVT. According to Stamatakis & et al[18] study, major thrombi more frequently occurred in left lower limb.

10 patients (28%) had history of previous episode of venous thrombosis. In the population study by Anderson and colleagues, one third of episodes of acute VTE were recurrent.[13] In a larger series of patients followed up over a mean of 9.3 months period, new thrombotic events were observed in 52%.[19]

5 Patients had been hospitalized and underwent surgery within the past 12 weeks. The incidence of deep vein thrombosis following general or gynecologic surgical procedures is approximately 20% to 25%, and clinically significant pulmonary embolism occurs in 1% to 2% of these patients. There is 6% risk of developing lower limb DVT in patients undergoing major surgeries if prophylactic Heparin was not given in our setup, while there is 6.5% chance according to Eric J. Rydberg & et al[20] study and 20% chance according to Alexander CG Turpie et al[21] study to develop lower limb DVT postoperatively, if prophylaxis of Heparin was not given. According to Alexander CG Turpie et al[21] study, the chances of postoperative lower limb DVT reduces to 4% if prophylaxis with LMWH was given.

Out of 23 female patients with lower limb venous thrombosis, 2 patients (4%) were pregnant /puerperium. Western studies have proven that pregnancy is associated with an approximately sixfold increased risk of venous thromboembolism

although the incidence of deep vein thrombosis and pulmonary embolism has been estimated to be as high as 1%. 5 patients had BMI more than 29 kg/m2 who developed lower limb venous thrombosis.[22,23] Obesity was found to be an independent risk factor (relative risk 3.0) for symptomatic pulmonary embolism in the nurse's health study. Most common acquired risk factor is past history of thrombosis (20%) followed by immobilization (14%).

Most common associated risk factor is smoking which is present in 32% of patients. 20% of the patient had no acquired risk factors. 10% patients had history of surgery in less than 12 weeks, 6% patients had acquired risk factor of stroke, malignancy and myocardial infarction respectively. 10% patients had risk factor of trauma to the affected limb , 4% patients had risk factors of pregnancy and oral contraceptive pills use respectively.

All patients with venous thrombosis received LMWH and oral anticoagulants initially and later oral anticoagulants were continued. Out of 50 patients, 22 patients were given unfractionated Heparin and 28 patients were given low molecular weight Heparin.

Our study showed resolution of symptoms of DVT with LMWH were better than UFH while Rubina Naz & et al both studies show that complications with LMWH are lesser than UFH. 24 Low molecular weight Heparin has advantage over unfractionated Heparin, with benefit of lesser hospital stay, convenient subcutaneous mode of administration, and lesser complications like bleeding. LMWH has better outcome than UFH.

In our study, carried out in 50 patients who developed DVT, 44 patients (88%) had complete resolution of clinical signs including cellulitis and reduction of limb girth. And 6 patients (12%) did not have resolution of clinical signs.After treatment with anticoagulants, there is visible resolution in clinical features like swelling, pain and reduction in limb girth in most of the patients.

In our study, out of 50 patients, 4 patients (8%) developed pulmonary embolism, out of which 2 patients died (4%), 2 patient (4%) developed varicose veins and 2 patient (4%) developed venous ulcer. Complications of DVT are inevitable if not properly treated with anticoagulants. The most common complication post DVT is pulmonary embolism due to dislodgement of thrombus.

28 Patients were on low molecular weight Heparin and 22 patients who were on unfractionated Heparin developed hematuria. Other complications like major bleeding–hematemesis, bleeding per rectal, conjunctival hemorrhage, petechiae or intra cranial bleeding were not noted. Comparing our study with other studies, UFH had more complications than LMWH. Hence LMWH is comparatively safer with lesser complications.[22,23]

Conclusion

The ultimate aim of treatment of DVT is to prevent further extension of thrombus from deep veins, development of acute PE, recurrence and prevention of later complications such as post-thrombotic syndrome. So high index of suspicion should be kept in patients even if classical clinical signs are not present and prophylactic treatment should be given to these patients. Though costlier but better tolerable LMWH gives comparable success with UFH by its better bioavailability, easy dosage schedule, better treatment outcome and lesser complication. It is also worth for prophylaxis. At the end of this small study, we can conclude that even though it is grievous, DVT can be prevented and treatable. Better and regular availability of drugs like LMWH and safer oral anticoagulants in the smallest possible region of the country can do wonders to save lives. Larger studies focusing more on coagulation cascade, molecular biology and genetics will be even bigger help to mankind.

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Original Article

New Indian Journal of Surgery
Volume 13 Number 3/July-September 2022
DOI: https://dx.doi.org/10.21088/nijs.0976.4747.13322.5

To Compare the Outcomes of Dartos Flap and Tunica Vaginalis Flap as Secondary Cover after Second Stage Durham Smith Repair in Reducing Post-Operative Complications

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How to cite this article:
Nitin Jain, Shasanka Shekhar Panda, Simmi K Ratan, et al./To Compare the Outcomes of Dartos Flap and Tunica Vaginalis Flap as Secondary Cover after Second Stage Durham Smith Repair in Reducing Post-Operative Complications/New Indian J Surg. 2022;13(3):123–126.

Abstract

Background: The repair of severe hypospadias is always a major challenge to an operating surgeon. Two-stage repair is a good option that can be applied to almost any degree of deformity. Here in our study during the first stage, chordee correction was done and Durham smith first stage repair was carried out and during second stage after about 6 months, tabularisation was accomplished. This study aimed to compare the outcomes of lateral dartos flap (DF) and tunica vaginalis flap (TVF) as secondary intermediate layer after second stage Durham smith repair.

Aim: To compare the outcomes of dartos flap (DF) and tunica vaginalis flap (TVF) as secondary cover after second stage Durham smith repair in reducing post-operative complications.

Materials and Methods: It is a retrospective study where we obtained the data of 52 patients who had undergone Durham smith first stage repair and chordee correction initially and later preputial flap tabularisation with interposition of either Dartos or Tunica Vaginalis flap during second stage was done and data was collected over the duration for 2 years (2017-2019) and analyzed. Patients were divided in two groups with 26 patients in each group. Indications for staged repair included mid-penile (12 patients), proximal meatus (20 patients), peno-scrotal (18 patients) or perineal (2 patients), moderate or severe chordee and poor glans groove. Patients in Group A underwent Durham smith second stage repair with lateral Dartos soft tissue cover while Group B consisted of patients with TVF as soft tissue cover. We compared between these two groups regarding complications viz. wound dehiscence, Urethrocutaneous fistula, Meatal stenosis, skin necrosis and preputial edema.

Result: In group A wound dehiscence is seen in 2 (7.6%) patients, Urethro-Cutaneous Fistula in 8(30.7%), skin necrosis in 5(19.2%), meatal stenosis in 3(11.5%) and preputial edema in 10(38.4%) patients while in group B wound dehiscence is seen in 1(3.8%) patient, Urethro-Cutaneous Fistula in 3(11.5%), skin necrosis in 2(7.6%), meatal stenosis in 1(3.8%) and preputial edema in 5(19.2%) patients. We observed that tunica vaginalis flap was better than dartos flap especially in fistula formation and the difference was statistically significant.

Conclusion: We have seen in our study that TV flap is a good option as second cover with lesser complications as compare to Dartos flap.

Keywords: Hypospadias, Dartos flap(DF), Tunica vaginalis flap(TVF), urethrocutaneous fistula (UCF), Durham Smith Repair

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Received on: 17.03.2022
Accepted on: 18.04.2022

Introduction

Hypospadias is one of the common anomalies in boys occurring in approximately 1 in 250 male newborn children with proximal hypospadias (penoscrotal, scrotal, and perineal types) account for 20% of all cases.[1,2] Many techniques of repair have been described.[3] About 80-85% of hypospadias have a distal meatus and mild curvature, while the remaining present with a proximal meatus and severe curvature.[4]

Majority of cases can be treated in single stage but some cases with severe chordee where the penile curvature is severe and urethral plate is so poor and fibrotic that urethral plate needs to be sectioned to achieve an adequate straightening.[5] In our study we used staged Durham smith repair technique can be used to repair any degree of hypospadias.[6] This study aimed to compare the outcomes of lateral dartos flap (DF) and tunica vaginalis flap (TVF) as secondary intermediate layer after second stage Durham smith repair.

Material and Methods

It is a retrospective study where we collected, analyzed and followed up the data of 52 patients who had undergone second stage hypospadias repair with either Dartos flap cover or Tunica Vaginalis cover. The case records of all patients who have undergone DS II (Durham smith stage 2) repair were reviewed. At our centre both Dartos and Tunica vaginalis flaps are practiced for Durham smith stage 2 repair as per surgeon's preference. On case record review, those patients who underwent stage II repair with either Dartos flap were labelled as Group A and patients who underwent Stage II repair with Tunica vaginalis flap were labelled as Group B. Data was obtained over the duration for 2 years (2017-2019) and tabulated.

Approval from ethics committee of institution was taken. Both groups had 26 patients each. Indications for staged repair included - mid-penile (12 patients), proximal meatus (20 patients), peno-scrotal (18 patients) or perineal (2 patients), moderate or severe chordee (more than 30 degree of chordee) and poor glans groove. These patients had already undergone Durham smith first stage repair and during second stage after about 6 months, tabularisation was accomplished. On review of the files post-operative findings including preputial edema, skin necrosis, urethrocutaneous fistula, meatal stenosis and wound dehiscence on post-operative day – 10 were noted and compared. The outcome data points in both the groups were tabulated. The collected data were analysed and statistically evaluated using SPSS-PC V.17. Difference between proportions was tested by $\chi 2$ test and p value less than 0.05 was considered statistically significant. P value less than 0.05 considered as statistically significant.

Operative Technique

Patients in both the groups were those who had already undergone initial Stage I Durham smith repair and later second stage was accomplished after about 6 months of the first stage. We describe here briefly about Stage I Durham smith repair.[4]

First, the dorsal prepuce is cut longitudinally to the coronal groove. The preputial flaps are denuded of their inner layer and rotated from the dorsal to the ventral side. An area on the glans on either side of the central blind groove is denuded of epithelium to beyond the tip of the glans. At

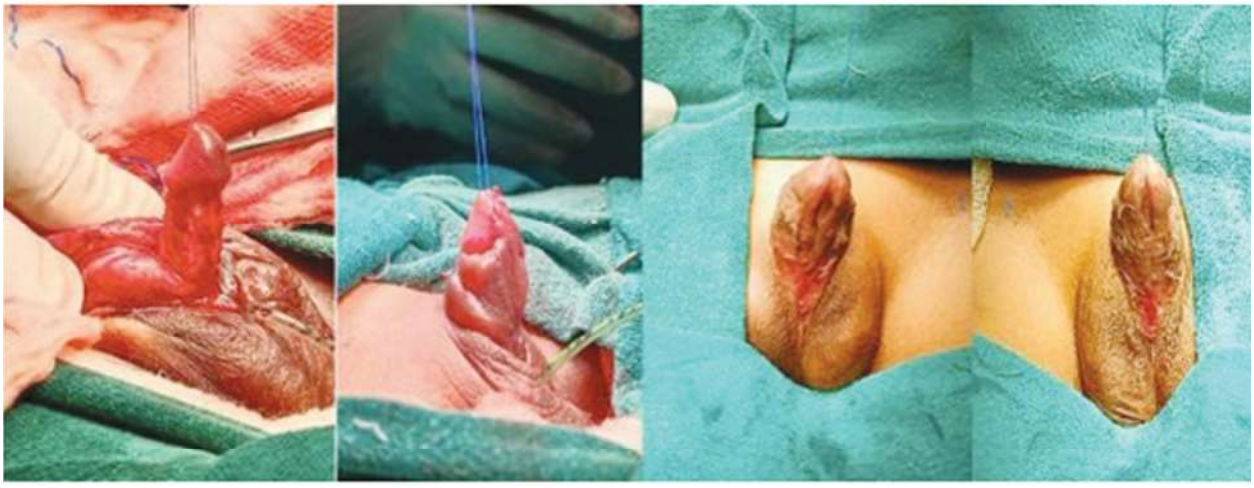

Fig. 1: Showing chordee correction, preputial flaps rotated ventrally and sutured to denuded glans surface and final outcome of Durham smith stage I repair.

this point, urethral plate is sectioned and two raw areas are joined by transverse incision which allows total release of all the penile skin and access to all the elements contributing to chordee (skin release, Buck's fascia, and central chordee band). After this, the preputial flaps are sutured dorsally and laterally into the coronal groove. The preputial flaps are then applied ventrally to the glans and sutured. (Fig.1).

Second stage is done usually after about 6 months. The second stage involves fashioning a complete skin tube to the tip of the penis, supported by overlapping skin layers and denuded of epithelium on one side to allow "double-breasting" of raw surfaces. We modified this technique as after completion of tabularisation of skin tube we put an interposition layer of either dartos or tunica vaginalis soft tissue cover, so double breasting is not needed. After fashioning of secondary soft tissue cover preputial skin is rearranged and sutured. (Fig.2) (Fig.3).

In group A, lateral dartos flap was harvested and used to provide soft tissue cover while in group B, tunica vaginalis flap was used to provide soft tissue cover.

Results

Patients were divided in two groups based upon the procedures performed viz. Dartos flap and Tunica vaginalis flap after urethroplasty after second stage Durham smith repair. Both the group had 26 patients each. Results of each group is summarised in table 1 and Fig.4.

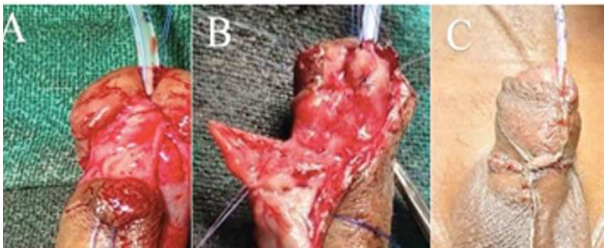

Fig. 2: Showing lateral Dartos cover and Final result after skin rearrangement

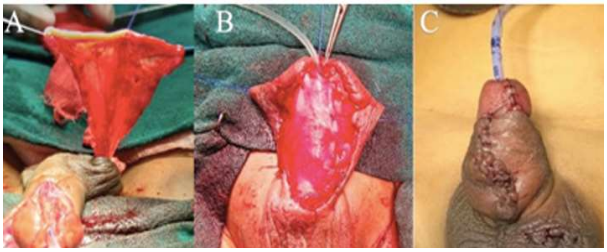

Fig. 3: Showing Tunica Vaginalis cover and Final result after skin rearrangement

Table 1:

		Group A (26)	Group B (26)	P value
Mean age (yrs.)		4.4	4.9	
Variety	Mid-penile	7 (26.9%)	5 (%)	-
	Proximal	10 (38.4%)	10 (38.4%)	
	Penoscrotal	8 (30.7%)	10 (38.4%)	
	Perineal	1 (3.8%)	1 (3.8%)	-
Complications				
Wound Dehiscence		2 (7.6%)	1 (3.8%)	0.281 (NS)
UC Fistula		8 (30.7%)	3 (11.5%)	0.046 (S)
Skin Necrosis		5 (19.2%)	2 (7.6%)	0.115 (NS)
Meatal Stenosis		3 (11.5%)	1 (3.8%)	0.153 (NS)
Preputial edema		10 (38.4%)	5 (19.2%)	0.065 (NS)

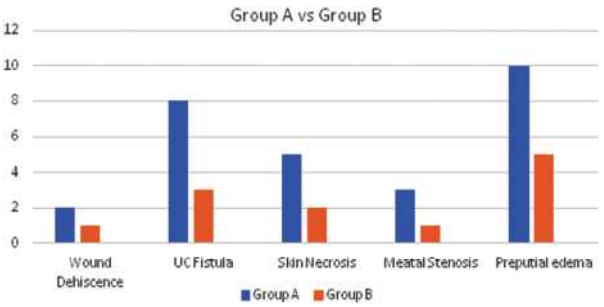

Fig. 4: Showing outcome comparison between Dartos (Group A) and Tunica Vaginalis Group (Group B)

Group A had median age of 4.4 years while 4.9 years for Group B. In group A, after successful repair of hypospadias with Dartos flap as secondary soft tissue cover, urethrocutaneous fistula was seen in 8 patients (30.7%) while it is seen in 3 patients (11.5%) after TV flap repair in group B and difference is statistically significant (p value 0.046, <0.05). Skin necrosis was seen in 5 patients (19.2%) in group A while 2 patients (7.6%) developed skin necrosis in group B and the difference is statistically insignificant (p value 0.115, >0.05).

Preputial edema was present in 10 patients (38.4%) in Group A while it was seen among 5 patients (19.2%) in group B and difference is statistically insignificant (p value 0.065, >0.05). Wound dehiscence including all layers was seen among 2 patients (7.6%) in group A while it was observed in only 1 patient (3.8%) in group B and difference was statistically insignificant (p value 0.281, >0.05). Meatal stenosis was seen among 3 patients (11.5%) in group A while it was seen in only 1 patient (3.8%) in group B and difference was

statistically insignificant (p value 0.153, >0.05).

Discussion

Hypospadias surgery is always evolving and no single procedure is considered perfect. In the present study, we reviewed 52 patients where interposition flaps like lateral dartos and tunica vaginalis were used. We found only few studies that compared the outcome of Durham smith staged urethroplasty technique with interposition secondary cover. In our study we recorded fistula rate of 30.7% in group A & 11.5% in group B and this difference was statistically significant. Studies like Mohajerzadeh et al.[7] shows urethrocutaneous fistula rate of 41% after Durham smith repair on 17 patients.

Other studies like Holland AJA et al.[8] on outcome analysis in terms of recurrent fistula shows approximately 9.1% of recurrent fistula rate after Durham smith repair on 34 patients. In Group B only 3.8% patients developed meatal stenosis and 11.5% patients developed meatal stenosis. In our study superficial skin necrosis is seen in 19.2% patients in Dartos flap group while 7.6% patients in TVF group. Although skin necrosis was inconsequential in the long run, it did cause anxiety and distress to the families and invited more hospital visits.

Wound dehiscence including dehiscence of glans penis was seen in 7.6% among patients in group A and 3.8% in group B. Mohajerzadeh et al.[5] shows meatal stenosis in 6% and complete dehiscence and failure in 6% patients. In our study we reported preputial edema among 38.4% patients in group A and 19.2% patients in group B. We have not found other similar studies that compared preputial edema and skin necrosis among two groups but we recorded higher incidence of preputial edema and skin necrosis among patients belonged to Dartos flap group although not statistically significant.

There are not too many studies that have compared outcome analysis of particularly Durham smith repair so additional large sample size study needs to be done so that results can be extrapolated on a large scale. Both tunica vaginal flap and dartos flap had good outcome but we have seen that TVF group patients had low incidence of Wound Dehiscence, skin necrosis, preputial edema, urethrocutaneous fistula and meatal stenosis.

Limitations

Although there could be lots of factors that might affect the outcome of hypospadias surgery, especially the wide variability in technical aspects of surgery and complexity for individual cases, additional large sample size, well-designed studies need to be conducted for optimal comparisons between these two flap techniques.

Conclusion

We have seen in our study that TV flap is a good option as second cover with lesser complications as compare to Dartos flap and our findings are going with other similar studies. TV flap has good vascularity and usually available in good length as compared to Dartos flap that need to be taken from the local skin that is already deficient. TV flap is better than dartos flap as secondary vascular cover.

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Original Article

New Indian Journal of Surgery
Volume 13 Number 3/July-September 2022
DOI: https://dx.doi.org/10.21088/nijs.0976.4747.13322.6

Role of Indigenous Cost Effective Two Layer Regenerative Scaffold in Wound Bed Preparation

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How to cite this article:
K Sriharsha Reddy, Ravi Kumar Chittoria, Nishad K, Neijo Thomas/Role of Indigenous Cost Effective Two Layer Regenerative Scaffold in Wound Bed Preparation/New Indian J Surg. 2022;13(3): 127–129.

Abstract

The quality of skin wound healing can be improved by the application of collagen scaffolds as biological dermal substitutes. Dermal extract helps to improves wound healing and quality of the scars. They serve as a scaffold into which cells can migrate and repair the injury. In the current scenario where in many biological and cellular engineering skin substitutes are available, wound management is a multimodality treatment with use of multiple available methods to augment wound healing at various levels. An excellent dermal substitute should be affordable, long-lasting, ready-to-use, analgesic, durable, flexible, non-antigenic, stops water loss, conforms to uneven wounds, anti-microbial, and may be applied in one sitting. In this study, we attempted to mimic the same technique in our two-layered regenerative scaffold, which is created locally and is cost-effective.

Keywords: Two-layered scaffold; Regenerative scaffold; Knee defect.

Introduction

The quality of skin wound healing can be improved by the application of collagen scaffolds as biological dermal substitutes. Dermal extract helps to improves wound healing and quality of the scars. They serve as a scaffold into which cells can migrate and repair the injury. In the current scenario where in many biological and cellular engineering skin substitutes are available, wound management is a multimodality treatment with use of multiple available methods to augment wound healing at various levels. Dermal substitute is defined as biomatrices which fulfill function of cutaneous dermal layer and provides matrices and scaffold for new tissue growth and thus increases rate of wound healing.[1] The collagen-GAG scaffold helps in supporting the in-growth of connective-tissue cell, thus causing regeneration of tissue providing the critical physiological functions of dermis.[2] In this article we have described the role of two-layered regenerative scaffold in wound bed preparation.

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Received on: 02.03.2022
Accepted on: 19.04.2022

Materials and Methods

This study was conducted in the Department of Plastic surgery in a Tertiary care center in South India. Departmental ethical clearance and consent from the subject were obtained. The details of the patient in study are as follows: 24 year old male with alleged history of RTA following which he sustained left open type 3C (Gustillo-Anderson) proximal tibia fracture. He had undergone Illizarov with CC screw fixation for fracture tibia. He now presented to our department with complaints of

a defect over left knee joint with underlying bone exposed (figure 1).

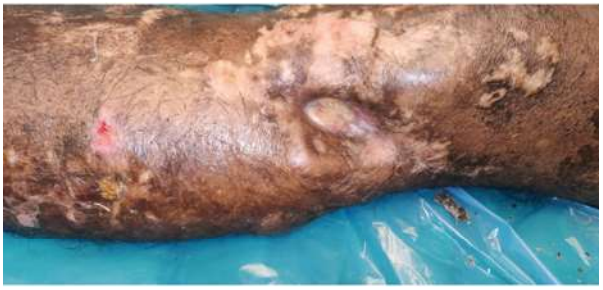

Fig. 1: Defect over left knee at initial presentation.

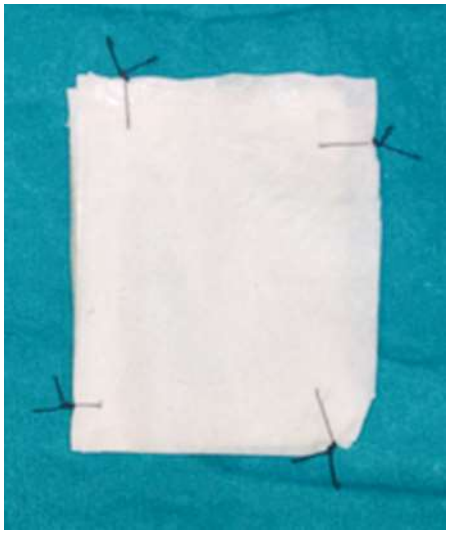

Fig. 2: Indigenous two-layered regenerative scaffold.

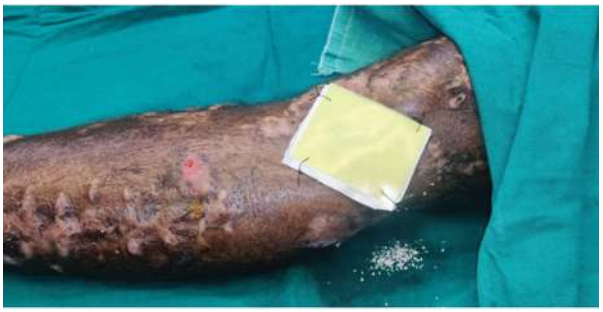

Fig. 3: Regenerative scaffold applied over the defect.

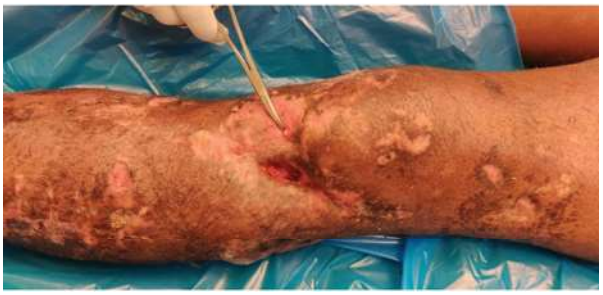

Fig. 4: Defect after 1 week of scaffold application.

Fig. 5: Defect after 2 weeks of scaffold application.

We created a two-layered regenerative scaffold from silicone sheet and collagen. The silicone gel sheet and dry collagen sheet used were of hospital supply. A silicone sheet with multiple layers of collagen sheets were used, which was sutured over the silicone gel sheet with absorbable sutures like poliglecaprone or polyglycolic acid (Figure 2). This template was meshed to allow the collections to come out. This template was then applied over raw area (Figure 3) and conventional dressing with gauze and cotton pad was done over it. The dressing was opened every 3rd day and only the outer layer of gauze and cotton pad was changed. On the 7th postoperative day, the collagen layer had completely resorbed and the silicon sheet layer was removed (Figure 4). This regenerative scaffold was applied for 2 sittings.

Result

The dermal regeneration template use in the raw areas helped in expediting the healing of wound with healthy granulation tissue formation within the defect (Figure 5).

Discussion

In their seminal work on the fundamental requirements of artificial dermal replacements, Yannas and Burke emphasized the utilization of wound healing. Collagen scaffolds, synthetic polymers, and cadaveric skin are some of the dermal substitutes available.[3] Engineered skin substitutes may provide temporary wound coverage until donor sites are ready to be collected for autograft, or may provide permanent wound closure if they contain autologous cells. There are now just a few permanent skin substitutes accessible, but advances in human skin tissue engineering are likely to soon produce improved models for expanded availability and wound healing.[6]

An excellent dermal substitute should be affordable, long-lasting, ready-to-use, analgesic, durable, flexible, non-antigenic, stops water loss,

conforms to uneven wounds, anti-microbial, and may be applied in one sitting.[4] Collagen is well known for its benefits, which include simplicity of removal, low cost, painless application, hypoallergenic properties, a wide range of sizes, the ability to store for three years, and the ability to combine medications and growth factors that are delivered in a regulated manner.[5]

Acellular dermal matrix *Integra*® Dermal Regeneration Template is well-known and widely used. Although it aids in the resolution of many difficult difficulties in reconstructive surgery, the product cost may make it a more expensive option than other reconstruction methods.[7] Since the 1980s, the Integra dermal regeneration template has been available for purchase. Burke and a colleague first described its use in 1981.[8] It's becoming a common treatment option for burns and scar contracture.[9,10]

A two-layered skin regeneration mechanism is the dermal regeneration template. The dermal regeneration template's exterior layer is constructed of a thin silicone film that mimics the epidermis of skin. The outer layer of the dermal regeneration template protects the wound from infection and regulates heat and moisture loss. The outer collagen Glycosaminoglycan (GAG) thermal layer acts as a biodegradable template, allowing the body to regenerate dermal tissue neodermis. A complex matrix of cross-linked fibers makes up the inner layer of the dermal regeneration template. The template's porous substance aids in skin regeneration.

The dermal regeneration template's cross-linked fiber material functions as a scaffold for the skin layer's rebuilding. The outer layer of the template is removed and replaced with a thin epidermal skin graft once the dermal skin layer has been regenerated. This treatment leaves the wound flexible and developing, allowing for long-term skin regeneration. It enables for rapid wound healing with minimum scarring.

We attempted to mimic the same technique in our two-layered regenerative scaffold, which is created locally and is cost-effective. The indigenous dermal regeneration template, which is made of silicone sheets and dried collagen sheets, is inexpensive and simple to make and apply to wounds. As a result, it can be employed in hospitals in developing nations where the cost of a commercial regeneration template is a big consideration.

Conclusion

The adoption of an indigenous, cost-efficient two-layered regenerative scaffold in wound bed preparation has been proven to be effective in this preliminary study. To confirm the findings, a large multicentric, double-blinded control research with statistical analysis is needed.

Conflicts of interest: None

Authors' contributions: All authors made contributions to the article

Availability of data and materials: Not applicable

Financial support and sponsorship: None

Consent for publication: Not applicable

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Original Article

New Indian Journal of Surgery
Volume 13 Number 3/July-September 2022
DOI: https://dx.doi.org/10.21088/nijs.0976.4747.13322.7

Outcome of Early Cholecystectomy in Mild Biliary Pancreatitis

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How to cite this article:
Tarun Kumar Jatawat, Abhishek Chhabara, Sunder Kishor, Manohar L Dawan, Irene Halam, Samridh Kumar/Outcome of Early Cholecystectomy in Mild Biliary Pancreatitis/New Indian J Surg. 2022;13(3):131–134.

Abstract

Introduction: Acute biliary pancreatitis (ABP) caused by gallstones and biliary sludge[1] is the most important cause of Acute Pancreatitis (AP).

Aim: Effect of early cholecystectomy in mild acute biliary pancreatitis.

Methods: This was a hospital based observational study, by convenience sampling recruited 60 patients of mild acute biliary pancreatitis eligible as per inclusion criteria within study duration of one year reported at Department of Surgery, Sardar Patel Medical College, PBM Hospital, Bikaner.

Results: mean age was 44.76±9.88 yr (range 30-70), 60% were female, 51.67% had pain & nausea as chief complaint, 71.66% patients had Cholelithiasis on MRCP. 6.68% had 3 CT severity score preoperatively whereas 1.66% had 3 CT severity score postoperatively. 56.67% cases had surgery after 72-96 hr. Success rate of early cholecystectomy was 98.33%. 56.67% cases had surgery after 72-96 hr mean 101.6± 14.89 hr. Only one case had recurrence on 3 months follow up.

Conclusion: Early Cholecystectomy for patients with acute mild gallstone pancreatitis was found to be a safe procedure when performed during the index admission.

Keywords: Early Cholecystectomy; Biliary pancreatitis.

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Received on: 04.03.2022
Accepted on: 05.04.2022

Introduction

Acute biliary pancreatitis (ABP) caused by gallstones and biliary sludge[1] is the most important cause of Acute Pancreatitis (AP), accounting for up to 75% of cases.[2] Although most cases of ABP are mild and Self-limiting, a small group (20%) of patients may develop severe pancreatitis, which is associated with high morbidity and mortality.[3] Commonly, after resolution of the initial attack of APB, patients may experience a recurrent attack (40% to 60%) within 2 weeks or other gallstone-related complications such as biliary colics, acute cholecystitis, acute cholangitis or common bile duct (CBD) obstruction.

Acute pancreatitis is a common disease in the emergency room with an annual incidence ranging from 4.9 to 35 per 100,000 population.[4] According to the Atlanta classification, 80% of patients with pancreatitis have mild acute pancreatitis.[5] Acute biliary pancreatitis is one of the most common types of acute pancreatitis, accounting for up to 40 to 70% of cases.[6-7,1]

Currently, laparoscopic cholecystectomy is the preferred method for treating acute gallstone pancreatitis and reducing its recurrence.[8] For

patients with acute severe pancreatitis, since there is a higher risk of complications with early surgical intervention, surgery is often performed after the inflammation has subsided.[9] For patients with Mild acute biliary pancreatitis (MABP), current international guidelines support the use of "early" laparoscopic cholecystectomy.

However, there is a lack of consensus regarding the definition of "early" in each guide. Diversification of early definitions may lead to bias in conclusions. The International Association of Pancreatology recommends cholecystectomy during the same admission.[10] While the American Gastroenterological Association suggests that LC should be performed within the period of hospital admission and not beyond 2 to 4 weeks after discharge.[11] In addition, some guidelines fail to advice on the timing of cholecystectomy for acute biliary pancreatitis.[5] The timing of surgery is focused on the safety and effectiveness of surgery.

It is generally believed that acute mild biliary pancreatitis should be treated with conservative symptomatic support treatment for 2 to 4 weeks or even longer before undergoing a cholecystectomy. Delaying surgery provides time for a detailed examination, finding the cause, avoiding unnecessary biliary exploration, avoiding early surgery that might aggravate the pancreatitis, and is conducive to recovery from acute pancreatitis.

Patients with mild acute biliary Pancreatitis, who incidentally form the major group (80%) in ABP do not have any associated organ dysfunction and thus are candidates who should be offered early laparoscopic cholecystectomy (ELC) during the first admission itself. This is all the more important to prevent a recurrent attack of acute pancreatitis, seen in as many as 30–50% of these patients during the waiting period for ILC and also to reduce the number of defaulters.[17-21.]

Aim

Effect of early cholecystectomy in mild acute biliary pancreatitis.

Methods

A hospital based observational study conducted on 60 patients with mild acute biliary pancreatitis recruited through convenient sampling within study duration and eligible as per inclusion criteria reported to Department of Surgery, S.P. Medical College, PBM Hospital, Bikaner. After obtaining permission from institution research board the present study was conducted data was collected from under study population through a pretested and semi-structured schedule.

Results

In our study, mean age of 44.76±9.88 yr. Maximum 52.59% had pain & nausea as chief complaint whereas Pain, Nausea & bilious Vomiting presented in 48.33% patients. Maximum 46.67% cases had complaints from 4–5 days whereas minimum 20% had from 6-7 days, with mean duration of 4.15± 1.47. Preoperative mean serum amylase was 938.53 ± 352.51 whereas 75.9 ± 15.00 after 72 hrs of Surgery. out of 60 cases only one had recurrence on 3months follow up. success rate of early cholecystectomy was 98.33%.

Table 1:

Age (years)	Frequency	Percent
30 – 40	26	43.33
41 – 50	19	31.67
51 – 60	10	16.67
>60	5	8.33
Sex Profile		
Male	24	40.00
Female	36	60.00
Residents		
Rural	33	55.00
Urban	27	45.00

Table 2:

Chief Complaints	Frequency	Percent
Pain & Nausea	31	51.67
Pain, Nausea & bilious Vomiting	29	48.33
Total	60	100.00
Duration (days)	Frequency	Percent
2 – 3	20	33.33
4 – 5	28	46.67
6-7	12	20.00

Preoperative mean serum Lipase was 798.61± 295.39 whereas 70.03 ± 14.22 after 72 hrs of Surgery. In our study maximum 71.66% patients had Cholelithiasis on MRCP followed by GB sludge and cholelithiasis in 16.67% and minimum 11.67% had GB sludge on MRCP.

Table 3:

Serum Amylase	938.53	352.51	75.9	15.00
Serum lipase	798.61	295.39	70.03	14.22
MRCP findings	**Frequency**		**Percent**	
GB sludge	7		11.67	
Cholelithiasis	43		71.66	
GB sludge and cholelithiasis	10		16.67	

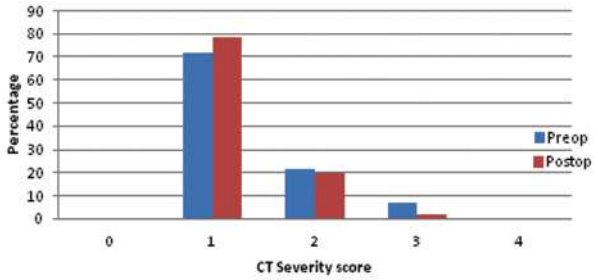

Fig. 1: Distribution of subjects according to their CT Severity score.

Table 4: Distribution of subjects according to Timing of Surgery after admission.

Timing of Surgery (hrs)	Frequency	Percent
Within 72	6	10.00
72 - 96	34	56.67
96 - 120	20	33.33
Post op stay (days)	Frequency	Percent
5 to 7	30	50.00
8 to 10	24	40.00
>10	6	10.00

Discussion

A hospital based observational study conducted on 60 patients with mild acute biliary pancreatitis recruited through convenient sampling within study duration and eligible as per inclusion criteria reported to Department of Surgery, S.P. Medical College, PBM Hospital, Bikaner.

In our study, maximum 43.33% patients were in 30-40 yr age group mean age of 44.76±9.88 yr (30-70yrs). In our study, maximum 60% were female whereas 40% were male and maximum 55% were rural whereas rest 45% was urban. We are at tertiary care and referral center the main inflow is from rural areas that's why rural patients are higher in our study. In our study, 51.67% had pain & nausea as chief complaint whereas Pain, Nausea & bilious Vomiting presented in 48.33% patients, with mean duration of 4.15± 1.47 days. The empirical features of acute pancreatitis were observed in our study also. Aboulian, Armen et al. (2010)[8] observed a median duration of symptoms of 2 days upon presentation.

Preoperative mean serum amylase was 938.53 ± 352.51 and mean serum Lipase 798.61± 295.39 whereas 75.9 ± 15.00 and 70.03 ± 14.22 after 72 hrs of Surgery, respectively. The serum markers are raised preoperatively and were seems to decreased after 72 hrs of surgery as a sign of recovery.

In our study, maximum 71.66% cases had 1 CT severity score whereas Minimum 6.68% had 3 CT severity score preoperatively while 78.33% cases had 1 CT severity score postoperatively whereas 1.66% had 3 CT severity score postoperatively. The improvement in ct severity score was statistically insignificant.

In our study, maximum 56.67% cases had surgery after 72-96 hr of admission whereas minimum 10% had within 72 hr of admission, with mean of 101.6± 14.89 hr. Maximum 50.00% cases had post operative stay of 5-7 days whereas minimum 10% had stay of >10days, with mean of 7.71 ± 1.74 days. Shir LiJee et al. (2018)51 found the hospital length of stay was 8 days. Also lower stay was observed by Aboulian, Armen et al. (2010)[8], found that out of 25 patients the hospital length of stay was shorter for the early cholecystectomy that is mean: 3.5 days. Also higher stay was seen by Orhan Alimoglu et al. (2003)[43] found that the mean hospital stays were 15.29 days (range 4–48 days). Also some studies conducted by Yang DJ et al. (2018)[53], Hamad Hadi Al-Qahtaniet al. (2014)[46] and Lyu YX et al (2018)[52] found that the length of hospital stay was shorter with Early cholecystectomy.

In our study, maximum 66.67% had no difficulty during surgery. 26.66% presented with adhesion whereas 6.67% had bleeding during surgery. David Wda Costa et al. (2015)[48] reported out of 266 cases, only one case had bleeding.

In our study, in lap operated patients 4 had pain abdomen and one developed diarrhea whereas in open surgery cases 6 had pain abdomen, 2 had diarrhea, 3 suture line abscess. Similarly Shir LiJee et al. (2018)[51] found that A total of 72 patients were 7.78%peri-operative complications. Also Yang DJ et al. (2018)[53] found that out of 2291 patients, rate of complications for Early Cholecystectomy was 6.8%. MarianneJohnstone et al. (2014)[47] found that of 523 patients with gallstone pancreatitis7% of patients had a complication related to cholecystectomy. Also Leonardo José Randial Pérez (2014)[14] Ten of 207 (4.83%) in the early cholecystectomy group showed some type of complication.

Other various studies conducted by Rozh Noel et al (2018)[54], Lyu YX et al (2018)[52], Shir LiJee et al. (2018)[51], van Baal, Mark C. Et al (2012)[15] found no significant differences in the rate of postoperative complications.

In our study, out of 60 cases only one had recurrence on 3 months follow up. The recurrence case was readmitted thus success rate of early cholecystectomy was 98.33%. Similarly van Baal, Mark C. Et al (2012)[15] found that Cholecystectomy was performed during index admission in 483 patients (48%) without any reported readmissions. Also Yang DJ et al. (2018)[53] reported rate of readmission was lower for Early cholecystectomy.

Conclusion

Early Cholecystectomy for patients with acute mild gallstone pancreatitis was found to be a safe procedure when performed during the index admission. It showed significant reduction in the length of hospital stay as well as in the recurrent bilio-pancreatic gallstone related events.

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