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Prediction of Ultrasound Guided Hydroreduction In Pediatric Intussusception Using Clinical Prediction Score

Geha Raj Dahal¹, Rudra Dahal², Dinesh Prasad Koirala³, Rameshwar Prasad Pokharel⁴

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Abstract

Context: Intussusception is a common disorder of children. The current treatment modality is non operative procedure either by pneumatic reduction or saline hydroreduction. The failure of hydroreduction is one of the disadvantages of non operative reduction. Clinical prediction score (CPS) has been designed by Khorana to predict the success or failure of non operative reduction.

Aims: The present study aims to identify the risk factors for the success or failure of saline hydroreduction.

Settings and Design: This is a prospective observational study conducted in a University Hospital in Kathmandu, Nepal.

Methods and Material: All children with intussusception were subjected to hydroreduction unless contraindicated. The outcome of hydroreduction was measured as 'Successful' or 'Unsuccessful' after the procedure. Clinical characteristics, ultrasound findings, and investigation results were compared between 'Successful' and 'Unsuccessful' groups. The accuracy of CPS for prediction of success was calculated.

Results: A total of 54 children underwent hydroreduction, among whom 47 (87%) were successful while 7 (13%) were unsuccessful. No

patients developed complications. Rectal bleeding, fever and abdominal distension were significantly different between successful and unsuccessful groups. CPS was found to have a significant prediction of outcome for saline hydroreduction ($P < .001$). At a cut-off score of 11, sensitivity, specificity, positive predictive value, negative predictive value were 96%, 86%, 98% and 75% respectively.

Conclusions: Rectal bleeding, fever and abdominal distension were independent risk factors for the failure of hydroreduction. CPS was a good predictor of the outcome of saline hydroreduction.

Key Messages: Hydroreduction is a standard procedure for pediatric intussusceptions. Failure of reduction is a major concern of the procedure. This study focuses different parameters for outcome of hydroreduction. Rectal bleeding, fever and abdominal distension were found as significant predictor of failure of hydroreduction.

Keywords: Intussusception; Hydroreduction; Risk factors; Clinical Prediction Score.

Introduction

Intussusception is the most frequent cause of bowel obstruction in infants and toddlers.¹ It can be seen in all ages of children but 90% of cases occur within three years of life.¹ Current modalities of treatment are non-operative and operative procedures. Pneumatic reduction, barium enema reduction, and saline hydroreduction (HR) are common non-operative procedures. Reduction of intussusception is monitored by fluoroscopy in

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pneumatic and barium enema while ultrasound is used to monitor saline HR. Saline HR is the procedure of choice at our institute because it can be done easily without any specialized instruments and does not expose the child to radiation. Failure of HR is one of the disadvantages of this procedure. Predictive factors of successful HR are not uniformly found in literature.^{2,4} In 2016, Khorana et al formulated a clinical prediction score (CPS) for prediction of non surgical reduction of intussusception.⁵ This includes ten variables of clinical characteristics, ultrasound findings and method of reduction with a minimum score of zero and a maximum of 16 (Table 1). A score >11 is associated with failed HR. In this study, we aimed to analyze different clinical characteristics and investigations and used CPS suggested by Khorana to predict the outcome of ultrasound-guided HR.

Table 1: Components of clinical prediction score.

Characteristics	Score
Weight	
≤ 12 Kg	2
> 12 Kg	0
Duration of symptoms	
≤ 48 Hours	0
> 48 Hours	1
Vomiting	
Yes	2
No	0
Rectal bleeding	
Yes	2
No	0
Abdominal distension	
Yes	2
No	0
Temperature ≥ 37.8	
Yes	2
No	0
Palpable mass	
Yes	1
No	0
Location	
Left	2
Right	0
Poor prognostic sign in ultrasound	
Yes	1
No	0
Method of reduction	
Hydrostatic	1
Pneumatic	0

Subjects and Methods

This was a prospective observational study in the pediatric surgery unit of Tribhuvan University Teaching Hospital, Institute of Medicine, Kathmandu, Nepal from July 2017 to September 2018. All children with intussusception who were suitable for HR were included in this study. Study variables were those characteristics included in CPS. The study was approved by the 'Institutional Review Board' of 'Institute of Medicine'. Informed consent was taken from the legal guardian of the child.

Management protocol

The diagnosis was confirmed by ultrasound in a child with clinical suspicion of intussusception in the pediatric emergency room. All patients were considered as suitable unless there was an absolute contraindication. Contraindications were peritonitis, bowel perforation and suspected bowel gangrene.

Procedure

The procedure was performed in the radiology procedure room without anaesthesia. The child was kept in the supine position and a Foley catheter no 18 was inserted in the rectum and the balloon was inflated. The other end of Foley catheter was connected to an enema cylinder containing one litre of warm normal saline kept at 100 cm high. Saline was infused into the rectum by gravity. The flow of saline into the colon and retrograde influx of saline into the ileum through ileocaecal valve was monitored by real-time ultrasound. The reduction technique consists of one to three attempts. Each attempt consisted of a maximum of three minutes of hydrostatic pressure. The procedure was repeated after three minutes if reduction was not achieved in the first attempt. Successful reduction was defined as the disappearance of the target appearance and visualization of fluid reflux into the distal ileum from the caecum through the ileocaecal valve. Failure of reduction even after three attempts was considered as 'Unsuccessful HR' and the child was taken for operative reduction. The procedure was abandoned if any complication occurred or the child could not tolerate the procedure.

Analysis

The outcome of HR was measured as 'Successful' or 'Unsuccessful'. Study variables between 'Successful' and 'Unsuccessful' groups were compared using SPSS version 20. Individual variables were compared using chi-square and

student t-test. Multivariate analysis was done for the significant variables produced in univariate analysis. CPS was compared between the groups using 11 as cut-off value. Receiving operating characteristics (ROC) curve was obtained to check for the best cut-off label in our study.

Results

During the study period, a total of 60 children presented with intussusception. Six children were excluded because one had peritonitis and five had spontaneous reduction of intussusception. Thus, a total of 54 children underwent hydroreduction out of which 47 (87%) procedures were successful and seven (13%) procedures were unsuccessful. Among successful patients, six had early recurrence within hospital stay and were successfully treated on repeat procedure. No patients developed complications.

The youngest patient was three months and the oldest was 70 months. A 68% of children were below two years of age. Other demographic characteristics of patients are shown in Table 2.

Table 2: Demographics of patients (n=54).

Characteristics	Value
Age (Months)	20.5 ± 16.6
Sex (Male: Female)	2.2 : 1
Weight (Kg)	10.2 ± 2.8
Duration of symptoms (Hours)	44 ± 34.3
Symptoms	
Inconsolable cry	48 (89%)
Vomiting	39 (72.2%)
Abdominal distension	8 (14.8%)
Fever	17 (31.5%)
Rectal bleeding	13 (24.1%)
Palpable mass	35 (64.8%)
Right	30
Left	5
Ultrasound findings	
Fluid trapped within the intussusception	5 (%)
Enlarged lymph node in intussusception	21 (%)
Hemoglobin (gm/ dL)	11.6 ± 1.1
Total Leukocyte Count (/mm ³)	11200 ± 3040

Data are presented as mean ± standard deviation or number (%) unless specified.

The individual clinical and ultrasound components of CPS were compared between successful and unsuccessful groups as shown in Table 3. Khorana et al had mentioned the method of reduction (pneumoreduction or hydroreduction) as one of the characteristics in his their prediction rule. We performed hydroreduction only in our

study and gave the score accordingly.

Table 3: Univariate analysis of variables with success and failure of hydroreduction.

Characteristics	Successful n (%)	Unsuccessful n (%)	P-value
Weight ≤12 kg (n=46)	40 (87%)	6 (13%)	0.96
Vomiting (yes) (n=39)	32 (82.1%)	7 (17.9%)	0.171
Rectal bleeding (yes) (n=13)	8 (61.5%)	5 (38.5%)	0.006
Duration ≥48 hrs (n=24)	19 (79.2%)	5 (20.8%)	0.221
Temperature ≥37.8 (n=17)	11 (64.7%)	6 (35.3%)	0.003
Abdominal distension (yes)(n=8)	4 (50%)	4 (50%)	0.006
Palpable mass (n=35)	29 (82.9%)	6 (17.1%)	0.4
Left sided mass (n=5)	4 (80%)	1 (20%)	1
Poor signs in USG (n=26)	15 (57.7%)	11 (42.3%)	0.699

Weight, duration and temperature were analyzed as binary variables as described in original CPS.

Age, sex, excessive cry, hemoglobin (Hb) and total leucocytes count (TLC) were other study characteristics in the study. Age, sex, excessive cry were not significant. Hb and TLC were significant in univariate analysis but failed to show significance in multivariate analysis. Rectal bleed, fever and abdominal distension were found to be statistically significant in both univariate and multivariate analysis (Table 4).

Table 4: Multivariate analysis.

Variables	P value (multivariate)	Odds Ratio
Rectal Bleeding	0.04	20
Temperature >37.8	0.03	25
Abdominal Distension	0.05	24
Hemoglobin	0.5	
TLC	0.3	

Table 5: Relation between CPS and outcome.

CPS	Successful (n=47)	Unsuccessful (n=7)	P value
≤11	45	1	<0.0001
>11	2	6	

The overall CPS ranged from three to 14. The mean score in the successful group was 6.6±2.2 and 11.4±2.7 in the unsuccessful group (P < 0.001). Taking cut-off value of score ≤11 as successful and

the score >11 as unsuccessful hydroreduction, the difference was significant (Table 5). At cut-off label of score 11, sensitivity, specificity, positive predictive value and negative predictive value were 96%, 86%, 98% and 75% respectively. We tried to calculate whether a different cut-off value exists. ROC curve was plotted to different scores. The area under the curve was 0.903 (standard error: 0.079, confidence interval at 95% = 0.747-1.000) (Fig 1). The optimum cut-off was found at a score of 11.

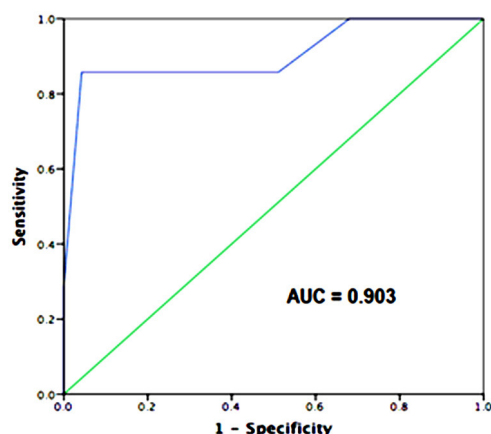


Fig. 1: Receiving operative characteristics of clinical prediction rule for predicting success of hydroreduction.

Discussion

The treatment of pediatric intussusception has changed from operative to non operative reduction over time. Since most of the intussusception is of ileocolic type, it is feasible to reduce by air or water enema. Ever since Kim et al¹⁶ reported the first successful hydroreduction in 1982, it has gained popularity worldwide. Currently, fluoroscopy-guided pneumoreduction or ultrasound-guided hydroreduction is the treatment of choice.⁷⁻¹⁰

For the last one decade at our institute, we practice ultrasound-guided HR as the first line of treatment for pediatric intussusception unless contraindicated. The safety of HR is well established. The complications of HR are intestinal perforation, fluid overload, vomiting and aspiration during the procedure but the incidence is quite low.^{8,11-13} Perforation occurs in preexisting gangrenous bowel.^{14,15} Even if HR fails in the first attempt, delayed repeated enema may result in a successful outcome without apparently increasing morbidity.¹⁶ Fortunately, we did not encounter any complications in the current series of patients. Barium enema reduction used to be a good method of reduction. However, this has a risk of radiation and severe chemical peritonitis occurs if bowel

perforates. We find less recent studies regarding barium enema reduction.

The biggest issue of ultrasound-guided HR is the failure of reduction. The success rate of HR varies from 70-96% in the literature.^{6,8,17,18} The probable reasons for this varied success rate are failure to choose appropriate patients and ignoring risk factors for failure. The present study showed a success rate of 87%. The risk factors for success or failure are also varied in literature. Duration of symptoms, rectal bleeding, and abdominal distension are important in many studies. Age, weight and vomiting are significant only in a few studies.

Duration of symptoms is a significant factor associated with the failure of hydroreduction as identified in various studies.^{2-4,19} In our study, the mean duration of presentation to the hospital was 49±27 hours in the success group and 84±58 hours in the failure group ($P < .01$). However, with regards to success and failure in patients presenting before 48 hours and after 48 hours, the duration was not statistically significant.

Khorana et al had concluded weight to be a risk factor stating small caliber of the intestine in low-weight infants to be a risk factor.²⁰ Avci et al and Khirallah et al failed to find association of weight and successful reduction.^{2,3} Our study doesn't find the association between weight and failure of hydroreduction.

Studies by Khirallah et al, Fallon et al and Khorana et al have shown that age <1 year is significantly associated with failed reduction.^{2,19,20} However, with increasing age of the child, there is a higher chance of the presence of pathologic lead point and thus the groups may not be comparable. Age is not a risk factor in other many studies.^{3,4}

Rectal bleeding is a classic symptom of intussusception and was found to be significantly associated with failed reduction by He et al and Karadager et al.^{21,22} Our study also found rectal bleeding to be an independent predictor of failure of hydroreduction. Rectal bleeding indicates that bowel ischemia has set in and has resulted in mucosal sloughing, and this may necessitate early intervention. However, this is not a contraindication for nonsurgical reduction. Avci et al failed to show rectal bleeding as a risk factor.³

Fever has been considered a risk factor for surgical intervention by Fike et al and Khorana et al.^{4,20} Fever may be due to systemic inflammatory response triggered by intra-abdominal inflammation. Our study also found fever (temperature >37.8 °C) to be

a significant risk factor for predicting the outcome of hydroreduction. Fever can be a manifestation of bowel ischemia. The need for intestinal resection significantly increases with fever.¹⁹

Presence of free intraperitoneal fluid, thick peripheral hypoechoic rim suggesting increased bowel edema, fluid trapped within the intussusceptum, enlarged lymph node within the intussusception, pathologic lead point and absence of blood flow in the bowel were considered as poor prognostic signs in the ultrasound.^{2,20,21} This study failed to find these factors as poor prognostic factors. Similarly, Gartner et al also showed that the presence of free fluid had no impact on the rate of success of intussusception reduction.²³

In the effort to make uniformity of these risk factors, some authors have suggested a scoring system for the management of intussusception. In 1986, Guo et al had devised a tool to predict the success of air reduction.²⁴ Rege modified Guo's scoring system and proposed a similar scoring system in 1991.²⁵ Weihmiller et al set up a decision tree to diagnose intussusception in 2011. This criterion however didn't include a scoring tool.²⁶ In 2016, Khorana et al formulated clinical prediction rules for failed nonoperative reduction of intussusception.⁵ This prediction scores ranged from 0 to 16. A high-risk group (scores 12-16) predicted greater chance of reduction failure while a low-risk group (scores 0-11) predicted a lower chance of reduction failure. Sensitivity, specificity, positive predictive value and negative predictive value were 98%, 22%, 59% and 94% respectively.

In this study, we termed this as clinical prediction score (CPS) and used the score to predict the success and failure of hydroreduction in children at our institute. The CPS was calculated for the patients and a ROC curve was plotted for the CPS. The optimal cut-off point was found to be 11 and the area under the curve was 0.903 (95% CI, 0.747-1). Sensitivity, specificity, positive predictive value, and negative predictive value were 96, 86, 98, 75 respectively.

Conclusion

Ultrasound-guided saline hydroreduction is an effective and safe procedure for pediatric intussusception. Rectal bleeding, fever and abdominal distension were independent risk factors for failure of hydroreduction. CPS was a good predictor of outcome for hydroreduction.

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Complications and Outcome of Percutaneous Nephrolithotomy (PCNL) procedures in our Institution: An Observational Study

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Abstract

Aim and Background: Percutaneous Nephrolithotomy (PCNL) is the primary treatment in renal stones more than 2 cms, staghorn calculi and difficult stone to fragment with ESWL. Outcome of stone disease with PCNL was studied here.

Materials and Methods: A prospective observational study was done in our institution to find the PCNL outcome/complications in relation to Guy's Stone Score (GSS). Statistical analysis was done by using Fisher's Exact Test, and ANOVA accordingly. P Value of <0.05 was considered significant.

Results: Total 50 PCNL were done. There were 25 males and 25 females. The mean age was 42.48 years. The mean stone burden average was 2.882 cm with a minimum of 2.5 cm and a maximum of 4 cm. Total complications noted was 25 (50%), but most were managed conservatively.

As the GSS score increases the residual stones, complications, operation time and length of hospital stay also increases (P Value <0.05).

Conclusion: Increase in GSS associated with increase in residual, complications, operation time and length of hospital stay.

Keywords: Percutaneous Nephrolithotomy; Complications; Outcome.

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Introduction

During the last two decades, the management of kidney stones has vastly changed. Prior to these modifications all the kidney stones were managed by open pyelolithotomy or nephrolithotomy which caused a significant morbidity for the majority of patient. Percutaneous Nephrolithotomy (PCNL) is the primary modality to treat patients with large stones size more than 2 cms, obstructing kidney stones (e.g., staghorn calculi) or stones with composition resistant to fragmentation with extracorporeal lithotripsy. PCNL has now largely replaced open surgery as a safe and effective treatment for renal stones.¹

It is now well recognized among surgeons that PCNL procedures have different degrees of complexity which affects stone clearance. The "Guy's Stone Score" proposed by Thomas K and Smith et al., is a valuable tool to stratify the complexity of PCNL procedures into four groups based on the stone burden and the anatomy of both patient and renal tract.^{2,3}

Materials and Methods

A Prospective observational study was done in Department of Urology, Government Mohan Kumaramangalam Medical College Hospital, Salem, during February 2017 to March 2019. Main objectives were to study the outcome of PCNL procedure in patients with renal stones and to study

the grading & complexity of PCNL procedures using "Guy's Stone Score".

Patients with renal stone undergoing surgery- Percutaneous nephrolithotomy in our department were included into the study. Patients not fit for surgery including bleeding diathesis, high cardiac risk, and infection/ sepsis were excluded.

The indications for surgery are studied and patient is taken up for the same after anaesthetic fitness. PCNL is done using standard techniques. The complexity of procedure is graded using radiological studies and the outcome assessed based on "Guy's Stone Score" and Modified Clavien system.

Guy's Stone Score (GSS)

Grade I : Solitary stone in mid / lower pole OR Solitary stone in pelvis with simple anatomy.

Grade II : Solitary stone in upper pole OR Multiple stones in patient with simple anatomy OR Solitary stone in patient with abnormal anatomy.

Grade III : Multiple stones in a patient with abnormal anatomy OR Stones in a caliceal diverticulum OR Partial Staghorn calculus.

Grade IV : Staghorn calculus OR Any stone in a patient with spina bifida/spinal injury.

The complications were graded and stratified using Modified Clavien grading. (Grade 4a and 4b that is life threatening complications sepsis, organ injury,intensive care are commonly Graded 4 in our study).

Modified Clavien grading

Grade 1: Any deviation from the normal postoperative course without the need for pharmacologic treatment or surgical, endoscopic, and radiologic interventions. Allowed therapeutic regimens include drugs such as antiemetics, antipyretics, analgesics, diuretics, electrolytes, and physiotherapy.

Grade 2: Complications requiring pharmacologic treatment with drugs other than allowed for Grade 1 complications. Blood transfusions and total parenteral nutrition are also included.

Grade 3a: Intervention not under general anesthesia

Grade 3b: Intervention under general anesthesia

Grade 4: Life-threatening complications,

urosepsis (including central nervous system complications) requiring intensive care unit stay.

Grade 4a: Single-organ dysfunction (including dialysis)

Grade 4b: Multiorgan dysfunction.

Grade 5: Death of the patient.

Stone outcome, Complications, Operative time and Length of hospital stay were analysed.

Statistical analysis was done by using Fisher's Exact Test, and ANOVA accordingly. P Value of <0.05 was considered significant.

Results

Total 50 patients underwent PCNL during the study period. There were 25 males and 25 females. Lowest Age of Patient was 11 years and highest was 70 years. The mean age was 42.48 years. The mean stone burden average was 2.882 cm with a minimum of 2.5 cm and a maximum of 4 cm.

According to Guy's stone score grade I, II, III, IV there were 32, 9, 6 & 3 patients respectively. Grade I patients had solitary pelvic, lower or middle calyceal calculus.

In Grade II, 5 patients had multiple calculi, 3 patients had upper pole calculus and 1 patient had a horseshoe kidney with solitary calculus. All Grade III patients had partial staghorn calculus while Grade IV patients had a complete staghorn calculus.

There was total of 25 complications noted in the 50 patients studied. Residual stones that are defined as those of size more than 4 mm were noted in 19 patients. These patients had to undergo ancillary procedures for stone clearances.

We usually did only a single puncture which were mostly subcostal. We did supracostal puncture in one patient who developed pleural injury who needed intercostal drainage and intensive care for recovery.

Fever was the presenting complaint in 8 patients; bleeding requiring only blood transfusion was seen in 11 patients and 2 patients needed open conversion for tackling the hemorrhage. A transient raise in serum creatinine was noted in one patient, which recovered with conservative management. Sepsis was seen in 2 patients who needed Intensive Care. 1 patient recovered after intensive care. 1 patient died of sepsis and associated cardiovascular condition (decreased Left ventricular function) in

the whole series [Figure.1].

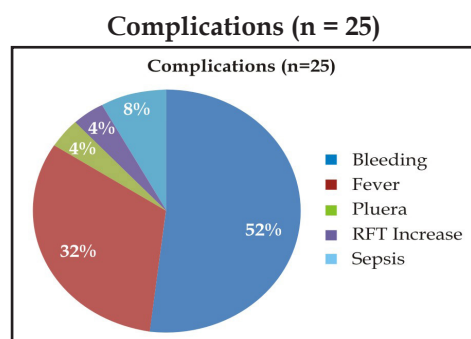


Fig. 1: Complications after PCNL

Residual stone was found in 19(38%) of patients. Ancillary procedure was required in 18 of the 19 patients. One patient died of sepsis in the post operative period. Of the 18 patients, 14(78%) underwent ESWL as the fragments were deemed small (less than 1.5 cm). Re look nephroscopy was required in two patients and in two patients conversion to open procedure was done.

The mean operating time overall for all GUY grades was 88.4 min. The mean operating times were 80.3 mins for Guy's Gr I and 110 mins for Guy's Gr IV (Figure. 2)

Minor Complications like fever & Bleeding Common in Guy's Gr I & II

Major Complications like sepsis, Death was seen in Guy's Gr III & IV

There is a trend towards major complications with increasing Guy's grades (Table. 1 & 2).

Table. 1: Guy's Grading and Modified Clavien Grading Correlation.

		Guy Grade								Total	
		Gr I		Gr II		Gr III		Gr IV			
		N	%	N	%	N	%	N	%	N	%
Clavien Grade	None	21	65.6	3	33.3	1	16.7	0	.0	25	50.0
	1	7	21.9	2	22.2	0	.0	0	.0	9	18.0
	2	3	9.4	1	11.1	3	50.0	2	66.7	9	18.0
	3b	1	3.1	2	22.2	0	0	1	33.3	4	8.0
	4	0	.0	1	11.1	1	16.7	0	.0	2	4.0
	5	0	.0	0	.0	1	16.7	0	.0	1	2.0
Total		32	100.0	9	100.0	6	100.0	3	100.0	50	100.0

Table. 2: Test For Significance Of Guy's Grading With Residual, Complications, Ancillary Procedures & Clavien.

Chi-Square Tests (Fisher's Exact Test)	Value	P-Value
Residual * Guy Grade	24.542	0.001
Complications * Guy Grade	30.930	0.001
Ancillary * GUY Grade	7.497	0.863
Clavien * Guy Grade	29.820	0.863

Guy's Grading had significant impact on stone

free rate & complication rate. Significant with P value of <0.05.

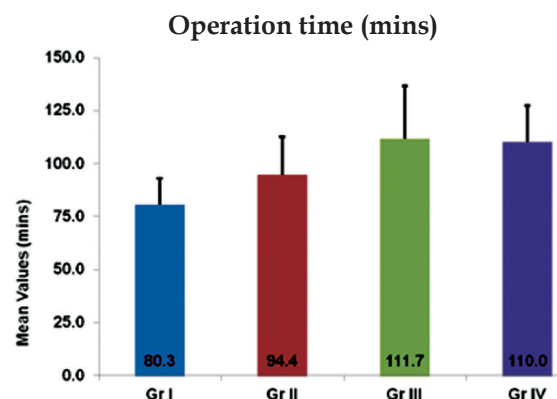


Fig. 2: GSS vs operation time.

The average duration of hospital stay was 7.46 days (range of 6 to 12 days). The mean hospital stay was 6.8 days for Guy's Gr I, it increased with Guy's Gr II 8.7 days and 9 days for Guy's Gr IV (Figure. 3). As the GSS grade increase the number of days hospital stay also increase, which was statistically significant (Table.2).

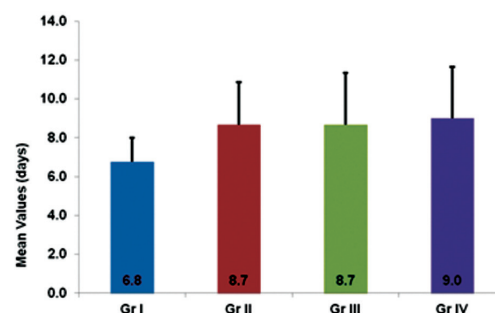


Fig.3: GSS Vs Hospital stay.

Table. 3: One way ANOVA to compare mean Hospital stay between Guy Grades.

Variables	Guy Grade	N	Mean	Std. Dev	P-Value
Hospital stay (days)	Gr I	32	6.75	1.244	Significant
	Gr II	9	8.67	2.179	
	Gr III	6	8.67	2.658	
	Gr IV	3	9.00	2.646	
	Total	50	7.46	1.919	

Table 4: One way ANOVA to compare mean Operation times between Guy Grades.

Variables OP time (mins)	Guy Grade	N	Mean	Std. Dev	P-Value
	Gr I	32	80.31	12.822	Significant
	Gr II	9	94.44	18.105	
	Gr III	6	111.67	24.833	
	Gr IV	3	110.00	24.833	

Gr IV	3	110.00	17.321
Total	50	88.4	19.416

Operating Time were minimal in low grades and increased with higher grades it was significant with P value of <0.05.

Discussion

In spite of the high success rates, serious complications such as blood loss adjacent organ injuries and life threatening infections can occur during percutaneous renal surgery. In a large study retrospective analysis of complications reported minor complications like fluid extravasation 7.2 % transfusion 11.2 – 17.5 % and fever 21.0 – 32.1 %, whereas major complications were septicaemia 0.3-4.7% and colonic or pleural injury 0.03-3.1% 30. Modified Clavien grading system has been shown to be reliable tool for more objective outcome comparisons.^{4,5}

The overall complications rate of 50% was seen in our patients. Which is much higher than reported larger studies. That is 20.5 %. However in comparison to similar prospective study by, they had an overall complication rate of 41.7% which is comparable to our study.^{6,7}

One reason for this could be the procedures were performed during the learning curve of surgeons. Another reason could be the prospective nature of study.⁸

Complications of grade II severity was the most common. Bleeding requiring blood replacement was most common individual complication, observed in 26% of patients.

This may be due to the poor body reserve of the low socio economic group of patients presenting to our hospital. Blood transfusion was done if the haemoglobin level was below 8 gm percentage.^{9,10,11}

Open conversion was done to manage bleeding in 2 patients. Fever in the postoperative period was the second common complication seen in 16% patients. Fever usually subsided with oral medication. Factors predisposing to fever after PCNL, include preexisting untreated urinary tract infection, infected urinary stones, duration of surgery.¹²

Pleural injury was seen in one patient who had supracostal puncture which was managed by intercostal drainage and intensive care for few days. Two patients had severe sepsis one recovered after intensive care, the other patient could not be revived. He died of sepsis superadded with cardiovascular complication. Septicemia can occur

as a result of infection introduced via the access to the kidney or if the stones are infected.^{6,7}

Though the number of complications might seem to be high in our study however most of complications are minor, that is modified clavien grades 1 & 2 only, which were managed conservatively.

As in previous study by Thomas et al., the GSS precisely predicted the Stone Free Rate after PCNL. The stone free rate for GSS Grade I is 87.5% for Grade II is 22.2 %, Grade III 16.7% and Grade IV 0%. This is was statistically significant with P < 0.001.^{2,3}

The complications rates were also minor, modified clavien grades 1 & 2 in majority of patients having low Guy's Stone score. There was a trend towards major complications as the GSS Grade increased. The mean operating time for GSS Grade I 80 min and Grade IV is 110 min. The mean hospital stay was also significantly low, 6.8 days in GSS Grade I & 9 days in GSS Grade IV. These findings were comparable with other studies done in other countries and in India.¹³⁻¹⁷

The main strength of the study is the prospective nature of the study. The limitations of the present study are the small sample size.

Conclusion

The complication rates after PCNL was around 50% mainly because of the learning curve in doing a new procedure. Most of the complications were minor which were treated conservatively.

The GSS predicted the stone free rates correctly with higher Guy's stones score needing ancillary procedures mainly in the form of extracorporeal shock wave lithotripsy for stone clearance.

GSS correlated well with the modified clavien system of grading for perioperative complications.

The GSS is easy to use and reproducible. It can be used as an objective and reliable method for describing the complexity of PCNL predicting the stone free rate, and stratifying cases between surgeons of different experience and reporting results.

As the GSS increase operative time and length of hospital stay also increased.

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Effectiveness of Amniotic Membrane Dressing Compared to Banana Leaves Dressing in Management of Partial Thickness Burn Wounds

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Abstract

Context: Morbidity and mortality are higher for burn injuries in low- and middle-income countries. The treatment should be effective and cost-effective also for patients from these countries.

Aims: To compare the outcome of Amniotic Membrane Dressing and Banana Leaves Dressing, in terms of pain during dressing change, comfort, recovery, hospital stay, complications and future need of skin grafting among partial thickness burn patients in Tertiary care centre

Settings and design: Hospital based comparative study was carried out at Burn care unit of Tertiary care hospital of Vilasrao Deshmukh Govt. Institute of Medical Sciences, Latur, Maharashtra, India.

Methods and material: Hospital based comparative study was conducted among 50 cases with partial thickness burns. They were assigned in equal number of 25 each. One group received amniotic membrane dressing (AMD) while the other received banana leaf dressing (BLD).

Statistical analysis: Mean scores of two group were compared with the help of independent t test. P value < 0.05 was considered as significant.

Results: Most common cause of partial thickness burn was scalds contributing (42%). Total burn surface (TBSA) area was 16%-30% in 60% of cases. Both groups were comparable for age, sex and TBSA. Patients in

AMD group had significantly less scores of pain during dressing removal, discomfort and significantly more scores for ease of dressing removal and less number of days for healing ($p < 0.05$). Signs of infection and need for skin grafting was comparable in two groups.

Conclusion: This study proved superiority of Amniotic Membrane Dressing (AMD) over Banana Leaves Dressing (BLD).

Key messages: Amniotic Membrane Dressing should be used among partial thickness burn patients for good results

Keywords: Effectiveness; Dressing; Amniotic membrane; Banana leaves; Burns.

Introduction

Burns are responsible for impacting the integrity of the skin.¹ Worldwide it is an important cause of trauma. It has been estimated that about 85% of burn injuries are from low and middle income countries. In these countries, the management standards of burn injuries are not up to the mark.²

India has an estimated 600,000–700,000 admission to burn units per year.³ Morbidity and mortality are higher for burn injuries in low- and middle-income countries. Currently, the burn size associated with a 50% case fatality in high-income countries is between 60% and 70% total body surface area (TBSA).⁴

Poor people are mainly affected by the burn injuries due to financial constraints. Burn injuries are leading cause of poor quality of life due to the intense pain associated with it and the cosmetic

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problems it cause among those who survive it. It is an important cause of burden on family and community. It affects the self confidence, capacity to work for an individual.⁵ They are classified depending upon the depth of the skin involved. If it is superficial, it is called as first degree burns. If the thickness of the skin is affected partially, then it is called as second degree burns and if the complete thickness of the skin is lost, it is called as third degree burns.⁶

Superficial partial-thickness skin burns as well as deep partial thickness skin burns are included in the category of partial thickness burns. They first one involves epidermis and extends to papillary layer of dermis. They are erythematous in nature. The later extends from papillary layer of dermis to reticular layer of dermis. They appear as mixed red or waxy white.⁶

Objective of burn wound management is to hasten the healing time or prevent the unlikely consequences like excessive scarring. Aim of partial-thickness burns management is minimize pain, prevent the infection, and promote healing and reduction in the occurrence of the disfigurement.⁷

For patients from developing countries, cost is a major factor. The therapy must be cost effective. Ideal dressing for burns should be long lasting, not irritable for the patients, protects from physical damage and infection, comfortable, and non toxic. It should also allow exchange of gases; topical therapeutic agents should not disturb the dressing and also helps in healing.⁹

There has been an agreement that prevention of trauma to the burn wounds helps healing faster. Hence occlusive non adherent dressing is recommended. For many years together and even now conventional gauze dressings is one which is commonly used. But the problem associated with gauze dressing is that they dry out easily and upon removal cause trauma thereby resulting in pain and affecting the healing of the wound. They also tend to leave the gauze fibers over the wound and thus may contribute to infection. The Human Amniotic Membrane is made using the fetal ectoderm. Hence it is like using another skin.⁹ It was first used by Davis in the year 1910 for transplantation of skin and afterwards it was used by Sabella and Stem in the year 1913 for the first time as a biological dressing of the burn.¹⁰ The aims and objectives of skin burn dressing are fulfilled by the Amniotic Membrane Dressing (AMD).¹¹

Banana Leaf Dressing (BLD) for the management of the skin burns is traditionally used. They are easily available.¹² They do not adhere to the wound,

effective in protecting the wound from any kind of trauma and also effective in preventing the dryness.¹³ It is very cost effective. "It is 11 times cheaper than (BPPB) Boiled Potato Peel Bandage, 160 times cheaper than Soframycin impregnated gauze, 1750 times cheaper than collagen sheet, and 5200 times cheaper than Skin temp biosynthetic dressing."¹⁴

Therefore in this study we sought to know the effectiveness of human placental Amniotic Membrane Dressing (AMD) over Banana Leaves Dressing (BLD) in partial thickness burn patients. Therefore this prospective study was conducted to compare the outcome of Amniotic Membrane Dressing and Banana Leaves Dressing, in terms of pain during dressing change, comfort, recovery, hospital stay, complications and future need of skin grafting among partial thickness burn patients in Tertiary care centre.

Materials and Methods

Study design: Hospital based comparative study.

Study settings: Burn care unit of Tertiary care hospital.

Study population: All the patients with partial thickness burns satisfying inclusion criteria admitted in Tertiary care centre.

Study period: 2 years & 3 Months (December 2018 to February 2021)

Sample size: 50

Sample size = $2 \times [Z\alpha + Z(1-\beta)]^2 \times P \times Q / (p1 - p2)^2$

Where P1 = clinically anticipated prevalence of complete recovery for Amniotic Membrane Dressing = 60 %

P2 = clinically anticipated prevalence of complete recovery for Banana Leaves Dressing = 22%

$P = p1 + p2 / 2 = 41\%$

$Q = 1 - P$

Level of significance (Alfa error) = 5% (0.05)

Power of test = 80% (0.84)

Sample size = 50

25 subjects were assigned in Amniotic Membrane Dressing (AMD) intervention group and 25 in Banana leaves dressing (BLD) intervention group.

Inclusion Criteria:

- Burn patients with partial thickness burns.
- Patients who got admitted with below 50% burns.

- Patients who are willing to participate in research study.
- All patients above the age of 18 year who can give consent for treatment.
- All patients above the age of 2 year whose parents can give consent for treatment.

Exclusion criteria:

- Burns patients who got admitted with co-morbid illness and wound complications.
- Patient who will not give consent for inclusion in the study.
- Burn patients with >50% burn area.
- Electric burns.
- Full thickness burn.

Methodology specified for data collection

Ethical Clearance: Ethical clearance was obtained from institutional ethics committee. Informed Consent was obtained from study subjects and was explained study procedure in local language. Permission from OBGY department HOD was obtained for getting Amniotic Membranes from mothers delivered normally or by LSCS. Also permission from local nursery Owner was obtained for getting fresh Banana Leaves for dressing.

Preparation of Amniotic Membranes: Before collecting the placenta in a sterile bowl it was ensured that it was from those who were not having any transmissible diseases like HIV and others. Placentas with conditions like toxemia of pregnancy, pre mature rupture of membranes, women with pelvic inflammatory diseases, women with endometritis, abnormal liquor or meconium stained liquor and other conditions were not used in this study. Separation of amniotic membrane was done using aseptic precautions. It was rinsed using sterile saline solution and care was taken to remove all clots. It was ensured that it is free from any bacteria by doing the culture. The material thus obtained was usable for next four days.

*Application of Membrane over Burn Wound:*¹⁵

Before applying the membrane to the wound, all aseptic precautions were taken and it was removed from container and allowed to drain in a kidney tray. This process helps make it less slippery. The burn wound was cleaned and debrided and the membrane were applied evenly with the glistening amniotic side in contact with the area of burn. It was inspected next day to ensure it was properly adherent. Non adherent part was removed and replaced by new

membrane and all these patients underwent regular examination on every alternate day.

Banana leaves were brought from local nursery with prior permission of owner. 40x60 cm size was used after cleaning them. They were kept in paper bags for autoclaving at 135°C for 20 minutes. These autoclaved banana leaves were used for Burn Wound dressing.

Data on pain of the wound, dressing removal pain, discomfort, ease of dressing removal among patients was collected with the help of Visual Analogue scale.¹⁶

Data collection: Informed consent was obtained from study subjects. Predesigned and pretested case record form was used as tool for data collection. Data regarding socio-demographic characteristics like age, sex, education status, occupation was collected. Also data regarding source of burn was obtained. Burns were classified according to depth of burn as partial thickness and full thickness burns. Patients with full thickness burns were excluded. Socioeconomic class of study subjects was decided by estimating per capita income as per modified BG Prasad classification.¹⁷

Data regarding clinical features, history of present illness, time for complete healing (Days) and other co-morbid conditions like diabetes, hypertension, immuno-suppression therapy was recorded. Also record of cases of partial thickness burns that undergone conventional dressing was obtained. All the enrolled subjects were in two intervention group. Subjects with even MRD number as per hospital records were allocated in Group 1 and age and sex matched subjects with odd MRD number were allocated in Group 2.

Group 1: Amniotic Membrane Dressing intervention group.

Group 2: Banana Leaves Dressing intervention group.

Data analysis: All the data collected was entered in Microsoft excel software. Descriptive variables like mean, standard deviation and percentages were estimated. Mean scores for pain during dressing removal, comfort and ease of dressing removal were estimated. Mean scores of two group were compared with the help of independent t test. P value <0.05 was considered as significant. For qualitative data association between independent factor and dependent factor was studied with chi square test. P< 0.05 was considered as significant.

Results

Table 1: Distribution of study participants according to Etiology of Burns (N=50).

Cause	Frequency	Percentage
Scalds	21	42 %
Flame	13	26 %
Flash	09	18 %
Contact	04	08 %
Others	03	06 %
Total	50	100

As shown in table 1, most common cause of partial thickness burn was scalds contributing 21 cases (42%) followed by flame burns 13 (26%), flash burns 9 (18%), contact burns 4 (8%) and others like chemical burns 3 (6%) respectively.

Table 2: Distribution of study participants as per Total Body Surface Area (TBSA) involved (N=50).

TBSA	Frequency	percentage
< 15 %	02	4 %
16%-- 30%	30	60 %
31%-- 45%	18	36 %
> 45 %	00	00 %

As shown in table 2 TBSA involved in majority of subjects was 16%-30% contributing 30 cases (60%) followed by 31% - 45 % in 18 (36%), < 15% in 02 (2%) of cases.

Table 3: Comparison of quantitative study variable among study groups (N=50).

Variable	AMD group		BLD group		p value
	Mean	SD	Mean	SD	
Age	36.04	14.38	36.72	14.18	0.86
TBSA	27.80	9.25	26.82	10.27	0.72

There was no statistical significant difference in two groups for age and TBSA involved when means of two samples were compared with independent samples t test. ($p > 0.05$) for both variables. (Table 3)

Table 4: Comparison of qualitative variable among study groups (N=50).

Sex	No. of subjects	AMD group	BLD group	P value
Male	27	14	13	0.7766
Female	23	11	12	
Total	50	25	25	

There was no statistical significant difference between sex compositions of subjects among two groups. ($p > 0.05$) (Table 4)

Table 5: Comparison between amniotic membrane dressing and banana leaves dressing groups in relation to outcome criteria (N=50).

Outcome criteria	AMD group		BLD group		t value	p value
	Mean	SD	Mean	SD		
Pain at dressing removal score	2.2	0.64	4.24	1.26	7.2118	< 0.0001
Discomfort score	2.28	1.24	4.0	1.47	4.472	< 0.001
Ease of dressing removal score	3.56	1.68	5.0	1.76	2.959	0.004
Healing time (Days)	8.48	1.29	9.28	1.20	2.270	0.027

There was significant statistical difference between outcome of AMD dressing and BLD dressing in terms of pain during dressing removal ($p < 0.0001$), discomfort score ($p < 0.001$), ease of dressing removal ($p = 0.004$) and complete healing time in days ($p = 0.0270$). (Table 5)

Table 6: Comparison between AMD dressing and BLD among study participants with relation to outcome criteria in qualitative variables (N=50).

Variable		AMD group	BLD group	Chi square	p value
Sign of infection	Yes	5 (20%)	7 (28%)	0.4386	0.5078
	No	20 (80%)	18 (72%)		
Need for skin graft	Yes	1 (4%)	4 (16%)	0.8889	0.345
	No	24 (96%)	21 (84%)		

There was no statistical significant difference between AMD dressing and BLD group in relation to outcome of signs of infection (Bad odor or pus) and need for skin grafting. ($p > 0.05$) (Table 6)

Discussion

Age distribution of study participants was studied. In present study it was observed that majority of study subjects belongs to age group 19-36 yrs contributing 40% followed by age group 37-54 yrs 18 cases (36%).

Mean age among Amniotic group was 36.04 with SD of 14.38 and mean age among BLD group was 36.72 with SD of 14.18. A similar study was done by Ali WG et al in which it was seen that mean age of study participants was 27.6 years with SD of 8.53. Also it was seen that age of subjects was in the range of 18-55 years. These findings are consistent with present study.

Sex distribution of study subjects in this study revealed that majority of study participants were males contributing 27 cases (54%) and female contributing 23 cases (46%). Male to Female ratio

was 1.17: 1. In study by Bose B 18 it was observed that 84.62% were males and 15.38% were females.

In this study it was observed that burns are more common in lower socioeconomic classes. Most commonly class III contributed 23 cases (46%) followed by class IV (22%), class II (20%), Class V (8%) and class I (4%) respectively.

Etiology of partial thickness burns among patients admitted at tertiary care hospital was studied in present study. It was seen that most common cause of partial thickness burn was scalds contributing 21 cases (42%) followed by flame burns 13(26%), flash burns 9(18%), contact burns 4(8%) and others like chemical burns 3(6%) respectively. A study by Mohammadi AA et al¹⁹ had shown contrasting results in which mechanism of burns was flame (63%), scald (18.5%) and flash (18.5%) A study by Ali WG et al¹⁵ had shown dry heat as most common cause of burn contributing 63.2% followed by moist heat 36.8%.

Total body surface area involved in partial thickness burn was estimated with the help of Wallace's Rule of Nine in this study. We found that TBSA involved in majority of subjects was 16%-30% contributing 30 cases (60%) followed by 31% - 45% in 18 (36%), < 15% in 02 (2%) of cases. In low-resource settings, oral rehydration therapy is routinely used for burns of less than 20% TBSA and has been successful in treating burns up to 40% TBSA.²⁰⁻²²

In present study it was seen that the two groups were comparable for age, TBSA, and gender. Outcome of this RCT was measured in relation to variables like pain during removal of dressing, discomfort felt by patients, ease of dressing removal with respect to adherence of dressing and mean healing time in days.

It was seen that mean pain score for BLD (4.24) was higher than AMD dressing. This difference was statistically significant ($p < 0.0001$). This proves superiority of amniotic membrane dressing over BLD. A study by Ali WG et al¹⁵ shown that the average dressing removal pain score was 2.3 ± 1.2 with BLD while that with ordinary it was 5.9 ± 1.2 .

Human Amniotic epithelial cells do not express HLA-A, B, C and DR or beta 2 microglobulin on their surface.²³ This could contribute to the lower inflammatory responses and less inflammatory mediators in the burn area and less pain sensation.

Saraswathy G et al²⁴ reported in their study that Amniotic Membrane was superior, from the standpoint of pain reduction during dressing changes, over the Tegaderm. Pain was described as

a primary endpoint and a visual pain analog scale was used for quantification. The majority of the patients tolerated the procedure very well.

Mean scores for discomfort between AMD dressing and BLD were 2.28 and 4.0 with SD of 1.24 and 1.47 respectively. In present study it was seen that mean discomfort score for BLD group was higher as compared to AMD dressing group.

This difference was statistically significant as $p < 0.001$. This indicates superiority of AMD dressing. A study by Ali WG et al¹⁵ stated that average discomfort score with BLD was 2.1 ± 1.3 while that with ordinary was 6 ± 1.5 .

Ease of dressing removal mean scores for both groups were estimated. Mean scores for AMD group and BLD groups were 3.56 and 5.0 with SD of 1.68 and 1.76 respectively. This difference was statistically significant ($p=0.004$) BLD groups shown more adherence of dressing to burn wound as compared to AMD dressing group.

A similar findings were seen in study by Ali WG et al¹⁵ in which it was observed that ease of dressing removal score average was 3.5 ± 1.9 with BLD while it was 7.4 ± 1.2 with ordinary.

Time for complete healing was observed. Mean time for complete healing in AMD group was 8.18 days with SD of 1.29 whereas mean healing time in BLD group was 9.28 with SD of 1.28. There was statistically significant difference between means of two groups ($p=0.027$). Partial thickness burn wound heals faster with AMD dressing as compared to BLD. Amniotic Membrane adheres to the wound immediately.

Several studies have shown that it is accompanied by rapid re-epithelialization and promotion of wound healing. 25-27 Amnion does not vascularize, however it stimulates angiogenesis through an unknown mechanism. It has also been suggested that the mechanism responsible for the rapid healing and developing granulation tissue is inhibition of the protease activity, thus reducing the infiltration of polymorph nuclear leukocytes.

These mechanisms explain the more rapid wound healing in the Amnion group. Signs of acute infection like bad odor and pus in partial thickness burn wound were studied. Among AMD group, 20 % of subjects shown signs of infection and in BLD group 28% patients had infected wound.

Proportion of burn wound infection was higher in BLD group as compared to AMD group. However this difference was not statistically significant ($p > 0.05$). Anatassov W et al²⁶ found a similar result.

The intimate adherent property of the Amniotic Membrane Dressing to an open wound in some way suppressed bacterial proliferation and helped to eliminate existing bacteria.

A number of factors may contribute to this effect. In a clean surgical wound, the collagen of the graft or biological dressing, via its haemostatic properties, will help to stop bleeding and thus prevent subsequent hematomas, which would provide opportunities for bacterial proliferation.³⁵

Branski L et al²⁸ found highly statistically significant low incidence of infection 2.6% under amniotic dressings compared with 7.1% with Tegaderm dressings ($P < 0.001$). Additional benefits of Amniotic Membrane Dressing therapy include pain reduction and improved cosmetic outcome of wounds healed by both primary and secondary intention.

Need of skin grafting was observed among study groups. Among AMD group 1 patient (4%) needed skin grafting whereas in BLD group 4 patients (16%) needed skin grafting. AMD dressing reduced the need of skin grafting in this study.

Amniotic Membrane Dressing needs less frequent dressing change (every 2-3 days) and does not traumatize the wound because Amniotic Membrane completely adheres to wound and does not need to be removed before a new Amniotic Membrane will be applied over it.

This prevention of repeated dramatization and deepening of the wound seems to be the cause of decreasing the need for skin graft in amnion group.

Conclusions

Amniotic Membrane has physical barrier effect, pleuripotency, rapid epithelialization, anti-inflammatory, anti-microbial, anti-scarring, anti-adhesive, non-immunogenic, low antigenicity, analgesic & anti-angiogenic effects and it was found to be cost effective as it accelerates wound healing, decreased pain, decreased usage of analgesia, has less frequent dressing change, decreased liability to infections and reduces hospital stay. Banana Leaves has waxy, non-adherent surface, cooling property, antioxidant property, reduce inflammation & fever, its polyphenol & allantoin has soothing effect, boost immunity, accelerates healing. Banana Leaves Dressing has significant outcome on burn wound healing process. Patients suffer less discomfort and less pain during dressing removal and removal of dressing was easier with BLD than with ordinary dressing. It is clear that BLD is cheaper, easy to prepare and make use in

Burn wounds, completely non-adherent, relatively painless, promotes healing, and reduces hospital stay. This study proved superiority of Amniotic Membrane Dressing (AMD) over Banana Leaves Dressing (BLD).

Limitation of the study: As only 50 study subjects were included in study with involvement of TBSA less than 50%, further studies are recommended to evaluate amnion efficacy in larger burned surface areas.

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Choledochal Cyst Excision and Preferred Anastomosis for Biliary Reconstruction in our Institution: A Retrospective Study

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Abstract

Aim and Background: To find out the common anastomosis done following choledochal cyst(CC) excision in our institution.

Material and Methods: A retrospective study in patients operated for choledochal cyst excision done at our institution was done for a period of 10 years.

Results: Total 41 patients operated for choledochal cyst excision. Hepatico-duodenostomy (HD) was the common anastomosis done in our patients.

Conclusion: HD was the common preferred anastomosis done in our institution.

Introduction

Choledochal cysts(CC) are dilated biliary tract, possibly due to congenital malformation of biliary-pancreatic duct mal-junction. With the long common channel and pancreatic juice reflux results in the weakening and dilatation of the tract is the most accepted theory. Now the preferred treatment is excision of the diseased part with primary reconstruction using hepaticoduodenostomy(HD)

or hepaticojejunostomy (HJ). HD is considered as most physiological one, but associated with higher incidence of ascending cholangitis, bile reflux and gastritis.¹² Here we compared our institution experience with HD and HJ for biliary tract reconstruction following choledochal cyst excision in the last 10 years for pediatric population.

Material and Methods

Retrospective study was done in our institution by collecting data from records of children operated for choledochal cyst for a period of 10 years (April 2009 to March 2019). Data regarding age, sex, type of anastomosis, postoperative complications, Hospital stay days and Mortality were collected. Paediatric surgeons opinion regarding the anastomosis following choledochal cyst excision was obtained by using semi-structured questionnaire created in Google Form TM, through Telegram MessengerTM group of paediatric surgeons. Data analysis was done accordingly by using online calculators and manually. P value of less than 0.05 was considered as statistically significant.

Results

Total number of children operated for choledochal cyst was 41. Total female children were 28 and male children were 13 with F:M ratio of 2.15:1. Among

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them less than 1 year was 6, one to five years was 14 and more than five years was 21 (Table. 1). Mean age of the children operated was 5.3.

Among the 6 children diagnosed less than one year, 3 were antenatally diagnosed cases.

Table 1: Age and sex distribution of the patients.

Age/Sex	<1 year	1-5 years	>5Years	Total
Female	5	8	15	28
Male	1	6	6	13
Total	6	14	21	41

Anastomosis performed were hepaticoduodenostomy (HD) in 26 patients and hepaticojejunostomy (HJ) in 15 patients (1.73:1). Among the HD group 17 were females and 9 males. In the HJ group 11 were females and 4 males (Figure.1).

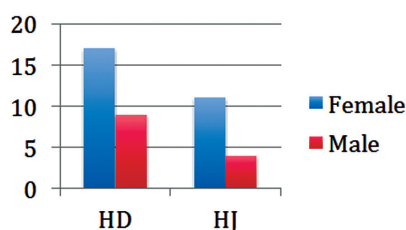


Fig.1: Sex wise distribution of anastomosis.

Age wise distribution of anastomosis were depicted in Table.2.

Table 2: Anastomosis distribution Age Wise.

Age/ Anastomosis	<1 year	1-5 years	>5Years	Total
HD	4	10	12	26
HJ	2	4	9	15
Total	6	14	21	41

Mean number of days hospital stay after HD was 11.6 days and HJ was 14.73 days.

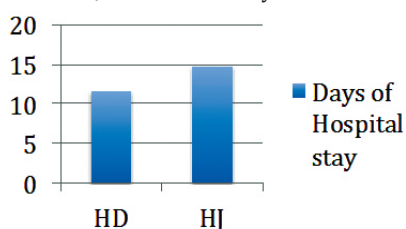


Fig. 2: Anastomosis Vs No of days stayed at hospital.

Table 3: Year wise distribution of anastomosis.

Year/Anastomosis	2009	2010	2011	2012	2013
HD	1	0	1	0	4
HJ	4	1	1	1	2
Year/Anastomosis	2014	2015	2016	2017	2018
HD	3	4	3	4	6
HJ	3	2	0	1	1

Preferred anastomosis done following choledochal cyst excision in our institution was HJ previously. Now a days the preferred choice of anastomosis was HD after the year 2014.

Operative time and hospital stay days were less for HD compared to the HJ group. Postoperative complications were comparable in both the groups.

Table 4: Comparison of variables between HD vs HJ.

	HD	HJ
Operative Time	126 minutes	158 minutes
Bile Leak	3	2
Cholangitis	1	0
Wound infection	1	2
Hospital Stay days	11.6	14.73
Intestinal Obstruction	1	2

Discussion

Female preponderance of CC was noted in most of the studies, in our study also similar preponderance noted.^{3,4,5} Few studies showed equal sex ratio or male predominance in their sample.^{1,6}

During first year of life CC cases identified were 6, among them 3 were diagnosed or suspected antenatally. Which might help in early treatment and reduce the chances of liver damage/morbidity related to the CC.

Mean age at surgery was comparable with the other studies done in India.³⁷

Common bilioenteric anastomosis recommended following CC excision were hepaticojejunostomy (HJ) and hepaticoduodenostomy (HD). HD was recommended for its Anatomical location, More Physiological, less operative time, less dissection, and less postoperative adhesions.^{5,3} But high bile reflux into stomach with erosion was blamed with HD. HJ was recommended by studies for its less chances of cholangitis and less gastric reflux of bile.⁸ Some studies show no difference in cholangitis between HJ and HD. Combining all complications HJ was associated with 3.6 times more complications, so some reserved it for difficult biliary anatomy as versatile option.⁹

Mean days of hospital stay in our study was reduced by 3 days in HD group, which was comparable with other studies. Other complications like bile leak, bleeding, operative time, cholangitis, anastomotic stricture, adhesive intestinal obstruction and reoperation rate were similar in both groups as per the metaanalysis.^{2,10}

Endoscopic asses was possible with HD group in case of stricture, In HJ group it needs percutaneous

transhepatic access¹¹. A study suggested HD was not an ideal option of biliary reconstruction due to its gastroduodenal bile reflux and a report of cholangiocarcinoma after 19 years following HD.¹²

After the year 2014 our institution surgeons preferred HD, possibly due to a senior surgeon from a respected institution shared his positive experience with HD. He was a guest faculty in our institution for a period of 6 months.

At present there was no consensus among surgeons to select a particular anastomosis.

Conclusion

HD was the common preferred anastomosis following choledochal cyst excision in our institution. HD was associated with less number of hospital days and less operative time compared to HJ.

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Various Foreign Bodies Causing Bladder Stones in Females: The Lessons Learnt

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Abstract

Background: Bladder stones are common in males but not so common in females. They account for nearly 5% of the urinary system stone disease. We here share our journey of bladder calculi in female patients and will let you know various foreign bodies that can cause bladder calculus, various treatment modalities that exist to treat them and the lessons that we learnt.

Methods: We did a retrospective study from August 2016 to July 2020 at SMBT IMS & RC, Nashik. A total nine patients were included out of the total twenty-three bladder stone patients. Diagnostic investigations included X-ray of kidney, ureter and bladder region, ultrasonography of abdomen and pelvis, computed tomography and if needed, cystoscopy before every planned surgical procedure.

Results: Nine patients of complicated bladder stone with or without foreign body were treated in the study. Two patients required open surgery. Six patients underwent per urethral cystolithotripsy for their stones and one patient underwent suprapubic percutaneous cystolithotripsy. Psychiatric evaluation was done for one patient. Clean intermittent catheterisation was advised for the neurogenic bladder patient.

Conclusion: To find and treat a bladder stone in a

female patient is much easy as compared to find out the cause of that stone. The reason being the rarity of bladder calculus in females, more so the secondary calculus. Therefore, whenever you find a bladder calculus in female patient you should find out the cause by taking prior proper history, doing proper clinical examination, ordering relevant investigations and treating them as per the current strategies.

Keywords: Bladder calculus females; Foreign body; Calculus over foreign body; Giant bladder calculus; Fragmented DJ stent.

Background

Calculus disease affects all parts of urinary system including urinary bladder. Vesical calculus accounts for nearly 5% of urinary system calculus.¹ They occur because of foreign bodies, obstruction, or infection. Vesical calculi are commonly classified as primary or secondary. Primary vesical calculi are stones which pass from kidney via ureter and lodge in the urinary bladder, while, secondary vesical stones are due to causes in the bladder or the outlet viz. bladder outlet obstruction, bladder diverticulum, trauma, catheterization, neurogenic bladder, foreign body, etc.²

Bladder stones in females are further rare. They account for around 5% of total bladder stones and are usually associated with foreign bodies (sutures, synthetic tapes, or meshes) or urinary stasis.³

Patient with bladder stone may be asymptomatic or complains of dysuria, haematuria, suprapubic pain, frequency, poor stream, urinary retention

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and recurrent urinary tract infection. Rarely some patients may develop serious complications such as hydronephrosis with impairment of renal function.⁴

We aim in this study to report our experience with this surgical problem and demonstrate the clinical presentation of the stones and associated foreign bodies, their nature, and methods used to remove them.

Methods

In our retrospective study, all the female patients admitted through casualty and outpatient department of SMBT IMS & RC, village - Dhamangaon, post-Ghoti, taluka - Igatpuri, district-Nashik, Maharashtra, India with bladder calculus from August 2016 to July 2020 were included out of total twenty three bladder stone patients. After admission, all the patients were evaluated with case history, clinical examination, routine blood and urine investigations and a urine culture & sensitivity test, plain X-ray of KUB (kidney, ureter and bladder) region, ultrasonography (USG) of abdomen and pelvis and computed tomography (CT scan) of the KUB region, if needed. Every patient underwent cystoscopy first for direct visualization of the calculus within the urinary bladder and cystoscopic removal attempted. If cystoscopic removal failed, then PCCL or open cystolithotomy was performed to remove it.

Results

Twenty three patients of bladder stone with or without foreign body were treated between August 2016 and July 2020, but nine patients with complicated bladder stones were included in the

study. Two patients required open surgery. Six patients underwent per urethral cystolithotripsy for their stones and one patient underwent suprapubic percutaneous cystolithotripsy (PCCL). Patients were aged between the age group 28 - 70 years. The mean age was 44.77 years (Table 1).

Of the total nine bladder stones, only one was primary and rest were secondary stones. Of the total eight secondary stones, one was due to neurogenic bladder and rest were stones over various foreign bodies. The causes and various types of foreign bodies are shown in the table and the images.

The operative time for endoscopic cystolithotripsy was 15-45 minutes. It was more in cases of open cystolithotomy and was 45-60 minutes. The operative time in PCCL was also around 30-45 minutes. Per urethral catheter (PUC) was removed next day in endoscopic cystolithotripsy cases. The suprapubic catheter was removed first in PCCL and urethral catheter was removed 24 hours later. In open cystolithotomy the PUC was removed after seven days. No post-operative complications were observed except mild discomfort due to PUC in open surgery cases. Complete stone clearance was achieved in all the patients.

The patients were discharged after 24-48 hours of the cystoscopic removal of the calculus, 28-72 hours after PCCL and 3-4 days after open cystolithotomy. They were followed up after 1 week, 1 month and 3 months of discharge from the hospital.

Psychiatric evaluation was done for one patient, where ring was used for sexual pleasure and clean intermittent catheterisation was advised for the neurogenic bladder patient. In rest of the cases regular follow up with the surgeon was advised.

Table 1:

S. No.	Age (years)	Type of Calculus	Cause of stone formation	Method of removal
1.	56	Primary	Migration from kidney	Cystoscopic
2.	70	Giant bladder calculus (Fig. 1)	Neurogenic bladder	Open cystolithotomy
3.	45	Stone over Cu-T (Fig. 2,3)	Migration of Cu-T	Laposcopic assisted Cystoscopic
4.	38	Stone over sling (Fig. 4,5)	Migration of sling used for uterine prolapse	Cystoscopic
5.	52	Stone over DJ stent (Fig. 6)	Forgotten DJ stent	Percutaneous cystolithotripsy
6.	43	Stone over DJ stent	Forgotten DJ stent	Cystoscopic
7.	28	Stone over Foley's bulb fragments	Non-deflating bulb of foley's catheter that was blasted later on and forgotten fragment	Cystoscopic
8.	35	Stone over non-absorbable suture	Non-absorbable suture used during previous surgery - Iatrogenic	Cystoscopic
9.	36	Stone over ring (Fig. 7&8)	Ring used for sexual arousal	Open cystolithotomy and ring removal



Fig. 1: Giant Bladder Calculus.



Fig. 2: X-ray Stone over Cu-T.

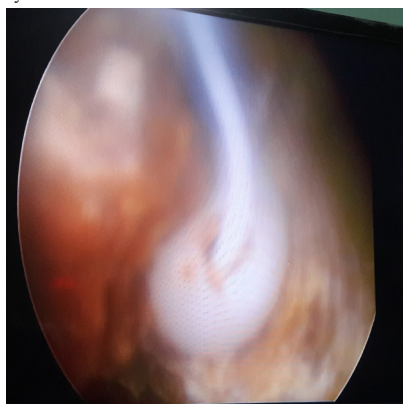


Fig. 3: Cystoscopic view of Stone over Copper T.

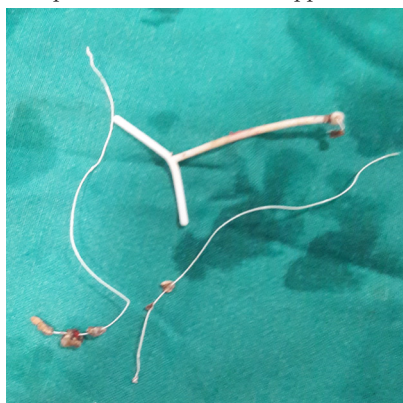


Fig.4: Removed CuT unit.



Fig. 5: Stone over sling but sling not visible

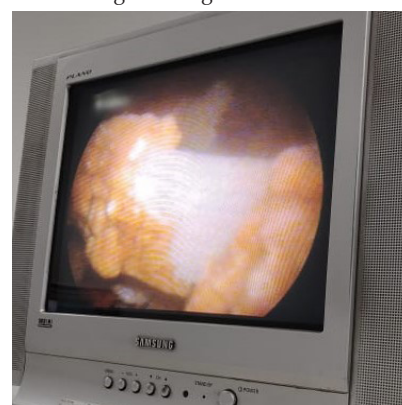


Fig. 6: Cystoscopic view of sling inside the calculus.



Fig. 7: Removed Sling.



Fig. 8: Stone over Forgotten DJ stent.



Fig. 9: Stone over Ring.

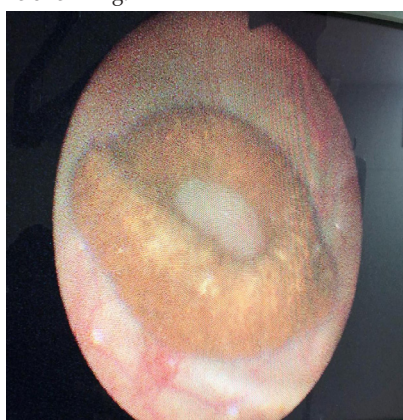


Fig.10: Cystoscopic view of stone over ring.

Discussion

The presence of bladder stones in females has always been an interesting topic representing a challenge of diagnosis and management to the urologist. Various treatment options for the removal of bladder stones are endoscopic, laparoscopic assisted (if doubt of foreign body originating outside the bladder), percutaneous, Cystolithotripsy and open surgery.² In some cases, a combination of techniques is required. But endoscopic retrieval is the preferred treatment among urologists. The method of choice for extraction varies according to the size and mobility of the stone inside the bladder. In addition, the availability of surgical instrumentations and urologist experience plays an important role. The aim of each procedure is to achieve complete stone-free state in shortest possible time, with short hospital stay and minimal complications.

Although urinary stones in female patients is a rare phenomenon, there should always be a doubt in the mind of the urologist regarding its cause. Most of the times the stone occurs over a foreign body inside the urinary bladder. Primary urinary bladder stone looks further rare in this situation.

The vesical calculi primary or over foreign body have a varied presentation from completely asymptomatic to symptoms of suprapubic pain, urgency, dysuria⁵, intermittency, frequency, hesitancy, nocturia, and urinary retention, terminal gross haematuria and sudden termination of voiding. Sometimes the pain referred to the labia, perineum, back, or hip. The discomfort could be dull or sharp and can be aggravated by sudden movements and exercise. The pain is sometimes relieved by assuming a supine, prone, or lateral head-down position by causing it to roll back into the bladder. In our study, 88.8% of the patients presented with obstructive/storage lower urinary tract symptoms except one patient (11.1%) who presented late with symptoms of renal failure.

Large vesical calculus can block the ureteral orifices and cause hydronephrosis. This occurs when it goes undiagnosed and increases in size slowly to obstruct the ureters. This longstanding obstruction compromises renal function and leads to renal failure.⁶ A vesical calculus can be formed over a prolonged retention of foreign bodies, and can cause renal failure.⁵ In our series also, 11.1% patients presented with renal failure.

The cause of bladder stone in females could be migration from kidney, bladder outlet obstruction, neurogenic voiding dysfunction, urinary tract infections (UTIs) or foreign bodies.⁷ In our study most of the stone 77.7%, were formed over a foreign body. One patient with giant vesical calculus has neurogenic bladder and in other it was a primary bladder calculus (22.2%).

Vesical calculus is basically diagnosed very easily with X-ray KUB. Infact, most of the times the type of foreign body, if present, is also seen clearly. Ninety percent of the vesical calculus can be diagnosed with a plain x-ray KUB. In our study 100% calculus were diagnosed on the x-ray KUB.

The sonography confirms the presence of stone and the type of foreign body, if present. CT scan is needed sometimes when there are associated complications like formation of vesico-vaginal fistula, renal failure, to find out the extent of the foreign body, etc. In our study, we did CT scan in 11.1% of the cases to look for the extent of the calculus and to map the renal system.

Usually, the bladder stones can be easily dealt with minimal invasive cystoscopic lithotripsy. However, for removing different bladder stones over foreign bodies we require different instruments to grasp the stone or the foreign body. These include stone basket-flexible/rigid^{9,10}, grasping forceps - flexible/

rigid¹¹, stone punch, snares, endoscopic scissors-flexible/rigid and other modified instruments.¹² Success rate for cystoscopic removal of bladder stones over foreign body ranges from 50 to 94%.¹¹ In our study we used nearly all the endoscopic instruments (including resectoscope, nephroscope) and manoeuvres to fragment and remove the stones and/or foreign bodies.

Sometimes, removal of bladder stones is not possible with cystolithotripsy alone. It may require suprapubic, laproscopic assistance or open cystolithotomy. Suprapubic assistance in the form of percutaneous cystolithotripsy (PCCL) is required when the stone size is 2-4 cms. This is because per urethral cystoscopic removal risks the urethra in long term with respect to stricture formation. We did PCCL in 11.1% of the cases in our study. Laproscopic assistance is required when there is stone over the foreign body and one of the ends of the foreign body is embedded in the bladder wall. Laproscopy helps in identifying the outer end of the foreign body and removal of that end if needed. We did diagnostic laproscopy in 11.1% of the patients to confirm the outer end of copper-T.^{13,14}

Open cystolithotomy is required in cases of giant bladder calculi¹⁵ or in cases where endoscopic method is not suitable or it has failed viz. when there is stone over the foreign body, when we can't remove the foreign body endoscopically.¹⁶ Open surgery allows complete removal of the stone or the foreign body and reduces the chances of complications like vesico-vaginal fistula, perforation of bladder or stricture urethra.^{17,18} In our study we did open cystolithotomy in 22.2% cases. In 11.1% cases it was a giant calculus as the indication and in other 11.1%, it was the stone over the ring and the ring was difficult to remove endoscopically.

Psychiatric evaluation should be done in patients with stones over foreign bodies in the bladder when that foreign body was used for sexual arousal. This is due to the high chances of psychiatric disease, mental retardation, and dementia in these patients.¹⁹ In our study we had one such patient and psychiatric evaluation was done by the psychiatrist and was normal.

Conclusion

Endoscopic retrieval of the bladder stone though, easier, may become challenging sometimes. It sometimes surprises the surgeon when he/she finds a foreign body inside it. It can be treated successfully by endoscopy. However, open surgery

still has a role in cases with large sized bladder stones or stones over migrated or impacted foreign bodies. Open surgery is also indicated if endoscopic equipments are not available or the surgeon lacks the experience with the endoscopic procedures and manoeuvres. The increased usage of synthetic material in reconstructive pelvic floor surgery in women has led to increase incidence of vesical calculus on intravesical foreign bodies. Each woman should be investigated for bladder stones when she presents with storage or obstructive bladder symptoms or recurrent urinary tract infection. Lastly, always suspect a foreign body whenever a female comes with a bladder stone.

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Prospective Clinical Study of Varicose Vein

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Abstract

Context: The varicose vein is a common chronic peripheral vascular disease affecting the lower limbs. They have significant impact on the quality of life. Even though considerable advances in understanding venous pathophysiology and modern imaging techniques have revolutionized the lower limb varicosity management, whether these inferences hold good for our population is a pertinent question.

Aims: To evaluate the clinical presentation and surgical outcome of management of varicose vein.

Settings and Design: Prospective observational study.

Methods and Material: Prospectively patients with symptoms and signs of varicose vein are evaluated. Precise proforma used to collect patient's demographic details, clinical features, and investigation reports; during the study from August 2016 to November 2018.

Statistical analysis used: univariate analysis, percentages.

Results: This study includes 132 patients, seventy-two (54.54%) are males, and sixty (45.45%) are females. In this study, varicose veins are commonly seen in the 40–50yr's age, and the right limb was affected in 51.38% than the left limb 88 (48.62%). The incompetence of the Saphenofemoral junction valve is seen in 24 (13.26%) patients, saphenopopliteal Valve incompetent in 17 (9.39%) patients & below knee perforator in 32 (17.67%) patients. Twenty-one out (15.90 %) of one thirty-two had a complication in our study; the commonest was surgical site infection

in twelve (7.2%) patients.

Conclusions: The varicose veins of lower limbs are a disease of the all-age adult group, common in fourth and fifth decades of life. Patients usually presents with complications rather than the disease itself. The wound infection is the common postoperative complication.

Keywords: Flush Ligation; Saphenofemoral junction; Perforators; Varicose vein; Venous disease.

Key Messages: Management of varicose vein is technology driven, Good results can be achieved by proper selection of patients and appropriate procedures.

Introduction

Varicose veins (VVs) of lower limbs are prevalent in the general population 10-30%.^{1,2} Varicose veins prevalent all over the world, influenced by activity and lifestyle. Varicose veins are more common in women than in men. Venous reflux is because of the failed functioning of valves in the Great saphenous and short saphenous veins, resulting in retrograde flow and stasis of venous blood in the saphenous vein and its tributaries. Stasis will be evident clinically in the form of varicose veins, reticular veins, and telangiectasias. Early stages of venous reflux may occur in as many as 25% of women and 15% of men.¹ Later stages of venous reflux, such as venous ulceration, may occur in 5% of the population.^{3,4} Ambulatory venous hypertension is the underlying cause of venous ulcers. The determinants of ambulatory venous pressure are complex and include venous reflux, obstruction, and calf muscle pump dysfunction.⁵ In

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addition to valvar dysfunction, a poor calf muscle pump mechanism may worsen venous reflux. The patients with venous disease usually present with aching, heaviness, throbbing, burning, or bursting over the affected area or whole lower limb. Varicose veins, though a common condition, many times remain asymptomatic. In developed countries, patients present early with cosmetic reasons (telangiectasia, reticular veins, dilated tortuous veins); however, in our Indian scenario, patients present with disease sequel like eczema nonhealing ulcer, lipodermatosclerosis. Varicose veins are common surgical problems in low socio-economic class people, which compel the patient to change his occupation. Treatment modalities tumescent ablations (endothermal, laser, radiofrequency), nontumescent ablations [ultrasound-guided foam sclerotherapy, catheter-directed sclerotherapy, mechanicochemical ablation, endovenous glue, open surgical methods (saphenofemoral ligation with stripping of Great Saphenous Vein (GSV), saphenopopliteal junction ligation with stripping of Short Saphenous Vein (SSV), Adjunctive techniques like phlebectomy, perforator ligation)] used to treat the varicose vein. With recent advances in evaluating venous anatomy and hemodynamics, the therapy for varicose veins is changing. This study is done to access the risk factors, clinical profile of patients, management, and outcome at a southern Indian tertiary care center.

Materials and Methods

This is a prospective observational study performed on patients presenting with symptoms or referred to us for varicose veins management in our tertiary care hospital. The study was done with institutional ethical committee approval and written informed consent from the study participants. Clinical material consists of one hundred thirty-two patients (n=132) presenting to the surgical outpatient department with symptoms of varicosities of the lower limbs from august 2017 to September 2019.

Inclusion criteria

- Patients diagnosed with a primary varicose vein or with its sequelae in lower limbs due to valve or perforators incompetence.
- Patients aged more than eighteen years.
- Participants willing to give consent to study.

Exclusion criteria

- Secondary varicose veins.

- Pregnant ladies.
- Recurrent varicose veins.
- Patients with lymphedema.

All patients presenting with varicose vein symptoms underwent clinical evaluation, duplex ultrasonogram, and evaluated for secondary varicose veins. Patient's demographic details, symptoms, and signs, investigating test results, superficial venous mapping, and incompetent perforator are marked before surgery, procedure details, postoperative outcomes, are entered in Microsoft excel sheet in a precise format. Data analysis percentages and proportions are done.

Results

Two hundred thirteen patients visited the surgery outpatient department with symptoms of varicose vein on evaluation. One hundred thirty-two patients are suitable for this study (n=132) According to the inclusion and exclusion criteria. Seventy-two (54.54%) are males and sixty (45.45%) are females. Twenty-five (18.93%) patients have a family history with more than two members, first or second-degree relatives involved.

Age distribution

In this study, most of the patients belong to the age group of forty-one to fifty years (Table:1); Youngest was nineteen years, and the older one was sixty-nine years, with the median age of occurrence is forty-three years, the mean age of the study population is 43.24 yr's.

Table 1: Age distribution.

S.No.	Age in years	No. of patient	Percentage (n=132)
1.	18-20	2	1.51%
2.	21-30	15	11.36%
3.	31-40	27	20.45%
4.	41-50	66	50%
5.	51-60	12	9.09%
6.	61-70	10	7.57%

Abbreviations: [n= number of patients]

Table 2: Occupation of Patients.

S. No.	Occupation	No. of Patient	Percentage
1.	Business	11	8.33%
2.	Driver/Conductor	15	11.36%
3.	Schoolteacher	16	12.12%
4.	Farmer	21	15.90%
5.	Housewife	18	13.63%
6.	Construction field worker	13	9.84%
7.	Hotel worker	38	28.79%

Table 3: CEAP Classification (N=181)

Type	Number of limbs	Percentage	Type	Number of limbs	Percentage
Clinical			Etiological		
C ₀ : No signs of venous disease	4	2.21%	EC: Congenital	1	0.76%
C ₁ : Telangectasia reticular veins	20	11.04%	E.P.: Primary	168	92.81%
C ₂ : varicose veins	65	35.91%	E.S.: Secondary	12	6.62%
C ₃ : Edema	22	12.15%	EN: No venous cause identified	0	0
C _{4a} : Pigmentation and Eczema	18	9.94%	Anatomic		
C _{4b} : Lipodermatosclerosis or Atrophie blanch	17	9.39%	AS: Superficial veins	139	76.78%
C ₅ : Healed venous ulcer	20	11.04%	A. P.: Perforating veins	32	17.67%
C ₆ : Active venous ulcer.	15	8.28%	Ad: Deep veins	10	5.52%
S-Symptomatic	166	91.71%	An: No venous location identified	0	0%
A- Asymptomatic	15	8.28%			
Pathophysiology					
Pr: Reflux	156	86.18%	Pr,o: reflux and obstruction	15	8.28%
Po: obstruction	10	5.52%	Pn: no venous pathophysiology identifiable	-	-

Table 4: Features of involvement.

Limb involvement	No of limbs	Percentage
Unilateral limb	83	62.88%
Bilateral	49	37.12%
Left Limb	88	48.62%
Right Limb	93	51.38%
System involved		
Saphenofemoral junction	24	13.26%
Saphenopopliteal Valve	17	9.39%
Perforator	32	17.67%
Saphenofemoral + perforator	76	41.99%
Saphenofemoral + sapheno poplital + perforator	32	17.67%

Table 5: Procedures Performed.

Procedure	Number	Percentage
Shapaneo femoral flush ligation (SFL)	24	14.45%
SFL with stripping of GSV up to Knee	20	12.04
SFL with stripping of GSV up to the ankle	8	4.81%
Subfacial perforator ligation (SFPL)	21	12.65%
SFPLwith segmental phlebectomy	11	6.62%
SFL with SFPL	48	28.91%
Shapaneo popliteal junction ligation (SPL)	17	10.24%
SFL+ SPL + SFPL	22	13.25%
SFL with stripping of GSV up to Knee + SFPL	10	6.02%
Total	166	

Table 6: Postoperative Complications.

Complications	Number of limbs 166	percentage
Surgical site infection	12	7.2%
Hematoma	4	2.40%
Saphenous Neuritis	1	0.60%
Lymphorrhea	1	0.60%
Wound dehiscence	2	1.20%
<i>Vascular injury</i>		
Femoral vein	1	0.60%
Femoral artery	-	-
Deep vein thrombosis	-	-
Post Phlebitis limb	-	-

Occupational Distribution

Out of 132 patients observed in this study, the majority belonged to the prolonged standing or hard-working group (Table: 2).

Family history

Twenty-five patients had a family history with two or more members belonging to first or second-degree relatives involved by the varicose vein.

Clinical manifestation

Patient clinical presentation grouped according to CEAP classification. (Table : 3), Limb involvement and venous system involvement (Table: 4).

Incompetence System

In this study, the patients have incompetence of valves at multiple sites. Most of them had combined saphenofemoral and perforator incompetence (Table 4), followed by combined sapheno-popliteal and perforator incompetence. Less commonly isolated site incompetence seen.

Management

Venous stocking advised to asymptomatic and patient not willing for surgery. Patients with venous ulcers are treated by four-layer compression dressing for a maximum of six times each for a week to ten days. The patient with eczema, edema, cellulitis is treated until surgery was feasible in these patients with stockings, limb elevation, antibiotics.

Procedure performed

Most of the patients underwent a combination procedure. For statistics, analysis limbs are

counted rather than the individual patient. A more common procedure performed is saphenofemoral flush ligation and subfacial perforator ligation, followed by Saphenopopliteal ligation along with Saphenofemoral flush ligation and subfacial perforator ligation. Details in Table 5.

Outcome of surgery

Twenty-one patients had complications in the postoperative period for a variable period of one month to two years six months. The most typical complication in this duration was surgical site infection at a subfacial perforator ligation site, followed by Hematoma, Saphenous Neuritis, Wound dehiscence, Lymphorrhea (Table 6).

Discussion

Varicose veins are a common clinical problem that starts early in life but assumes a silent course for a variable period before developing complications due to venous hypertension. On a broad basis, Varicose veins are classified into two types, namely: primary and secondary varicose veins. Defective valve functioning and decreased elasticity in the vein wall, resulting in reflux (reversed flow in the vein circuit), are primary causes of varicose veins. Valve damage is the most common etiology of primary varicose veins, leading to increased pressure and elasticity.⁶ The real etiology of these malfunctioned valves remains exclusive but is likely multifactorial. In this study, patient's occupation with prolonged standing constituted the most significant factor in 38(28.79%) patients (Table 2).

Demographic

In our study of 132 patients, seventy-two (54.54%) are males, and sixty (45.45%) are females is similar to previous studies; more male populations were affected than females, probably due to occupationally related risk factors.^{7,1} In other studies, however, females have preponderance.^{8,9,10,11} A study on the outcome of surgical management and recurrences of varicose veins, by Das K et al., showed that patients were found mostly in the age group of 41 to 60, and the second most common age group was between 21-40 yr's of the age.¹¹ In this study, sixty-six patients (50%) belong to the age group of 40-50 yr's followed by twenty-seven (20.45%) patients belong to 31-40 yr's, fifteen patients (11.3%) belong to a group of 21-30 yr's (Table 1). In few other studies, 41-50 yr's patients are commonly affected.¹² In some other series, 21-40 yr's are affected.^{8,13}

Clinical manifestation & management

Concerning limb affection in our study, right limb 93(51.38%) were affected more than left limb 88 (48.62%). Eight three (62.88%) patients had Unilateral limb Involvement & forty-nine patients (37.12%) had bilateral limb involvement (Table 3). This is similar to other studies that right-sided varicose veins account for 69.9% and bilaterality in 46.2-61.3%.^{13,10,9,8} However, other study series found left-sided involvement in the range of 53.8-65%^{17,20,21,24} because venous drainage through the pelvis follows a more tortuous course in the left lower limb since the right common iliac artery traverses over the left common iliac vein enhancing the risk of the left side.¹³

In terms of the venous system affection in this study, SFJ was incompetent in 24 (13.26%) patients, SPVincompetent in 17 (9.39%) patients, only below knee perforator in 32 (17.67%) patients, Saphenofemoral junction with perforator seen in 76 (41.99%) Saphenofemoral + saphenopopliteal + perforator in 32 (17.67%). Studies have shown that the superficial veins of the GSV were involved in 72.4%, closely followed by perforator incompetence.^{14,15} Varicose veins usually come to the patient's attention because of the symptoms and signs, otherwise referred to as varicose veins complications. Pramod M et al. found that complications like abnormal skin sensation (itching, aching, and tingling), leg pain, limb fatigue and heaviness, swelling, and restless leg syndrome constitute treatment indications.¹⁶ Our findings are all the same as these studies & agree with these study results (Table 3).

Presently the diagnosis of varicose veins is clinical and diagnostic Doppler ultrasound scanning. In this study, all patients had duplex scanning as a mandatory preoperative workup. Patients with chronic DVT, asymptomatic, were excluded from surgery. Earlier, Trendelenburg, Perthes, Linton, Schwartz tests, including Morison cough impulse tests, Pratt test, and Fegan method, were used to diagnose varicose veins. However, several studies have validated the inaccuracy of these acronyms' tests.^{17,18} Patients with a venous ulcer, eczema, edema are treated by the Bisgaard regime (bandaging, elevation, exercise, massage, antibiotics). The combination of surgical procedures done in our study (Table 5) depending upon the system involved (Table 4) Combination of flush ligation, division, stripping, and multiple stab avulsion standards for varicose vein surgery. Other newer treatment modes are technologically driven and include radiofrequency ablation, endovenous

laser treatment, and endovenous laser ablation. Recently radiofrequency ablation started in our institute to manage varicose vein patients and was not included in the study due to nonavailability at the beginning of this study.

Complications

The various surgeries for varicose veins are associated with complications as of any surgical procedures. Preoperative assessment and the principles of elective surgical procedure for a pathological vein are essential in reducing complications. Defty C et al. reported around 18-20% of post-op complications. There was no incidence of deep vein thrombosis or pulmonary embolism postoperatively in this series.¹⁹ Other literature shows the incidence to be very low at 0.01%. Twenty-one out (15.90%) of one thirty-two had a complication in our study, no significant differences seen. Surgical site infection noted in twelve (7.2%) patients, Hematoma in four (2.40%), Saphenous Neuritis in one (0.60%) patient, Lymphorrhagia in one (0.60%), Wound dehiscence in two (1.20%), Vascular injury in the form of needle injury to Femoral vein in one (0.60%) patient.

Conclusion

The varicose veins of lower limbs are a disease of the all age group, occurring more commonly during the fourth and fifth decades of life. The occupations involving prolonged standing and violent muscular efforts are more prone to developing varicose veins. Another contributory factor is the presence of family history. Majority of the patients presented with complications rather than the disease itself. The presence of prominent swellings in the lower limb and pain was the most typical presenting symptoms. The presence of more than one valvular incompetence is more common than individual incompetence. Saphenofemoral junction flush ligation with multiple subfascial ligations of perforators was the most routine operation in our hospital. Other procedures are done depending on the requirement in the management of a patient. The wound infection is the common postoperative complication in this study

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Conflict of Interest: NIL

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Is Tip Repair in Hypospadias is a Confidence Building Procedure? Analysis of early Hundred Cases at A Pediatric Surgical Centre

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Abstract

Purpose: The tubularized incised plate (TIP) technique for hypospadias repairs a well-known procedure for urethroplasty. The authors in this study analyze the application and outcome of TIP by the Pediatric Surgeon. They describe how this procedure helps to start hypospadias surgery services especially to the newly established centres. The procedure can provide surgeons required confidence and prepare them to undertake the complex surgeries for hypospadias.

Method: This is a prospective study done on all cases of hypospadias operated with TIP technique in a newly established centre for Pediatric Surgery for a period of two years. The results were evaluated on the basis of outcome in the form location and shape of meatus, correction of curvature. The complications were noted and individually treated.

Results: Total 100 patients were operated with TIP technique during the study period. The Distal type of the hypospadias was the main variety treated (n=64) followed by mid penile and proximal penile type of hypospadias (n=21 and n=13 respectively). All patients were offered TIP as the method of urethroplasty and were operated by a single surgeon. The procedure was well tolerated by all the patients. There were few complications, mainly meatal stenosis and urethrocutaneous fistula. No Major complications were found. The cosmetic and functional outcome was good in all cases.

Conclusion: The TIP urethroplasty offers a considerable safe technique in the patients of

hypospadias. It can be easily learnt and reproduced. There is a learning curve associated with the procedure. The authors can conclude that the procedure of TIP in the cases of hypospadias brings a good amount of confidence in a Pediatric Surgeon to offer the services of hypospadias surgery especially in newly established setup.

Keywords: Hypospadias; Pediatric; Fistula; Hypospadias.

Introduction

With among the most common congenital urogenital disorder, hypospadias poses a challenge for all Surgeons involved in Pediatric Urology as the ideal management is still being evolved. The correction of the hypospadias is being done by Plastic Surgeons, Pediatric Surgeons, Urologists and even General Surgeons leading to a wide variation in the Surgical Procedures. Popularised by Mr Warren T Snodgrass the Tubularised Incised Plate urethroplasty (TIP) repair offers a safe method with satisfactory results in hypospadias Surgery in most of the cases of hypospadias. It is in fact simple, versatile and produces satisfactory cosmetic results.¹ The present paper describes the management of 100 children with hypospadias with TIP repair and their subsequent outcome by a Pediatric Surgeon. Although most performed surgery for hypospadias it is still associated with frequent complications. The TIP procedure helps to start hypospadias surgery services especially to the newly established centers. The procedure can provide surgeons required confidence and prepare them to undertake the complex surgeries for hypospadias. The TIP urethroplasty can be done in

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most cases of hypospadias, but one should refrain from doing it desperately.

Methods

The study is a prospective study with a total of 100 patients with hypospadias who were repaired with TIP from January 2018 to December 2019 in a newly established Pediatric Surgery centre at a tertiary teaching hospital. All patients were operated by a single Surgeon in a tertiary teaching institute. The hypospadias patients with severe defects and those needing redo surgeries were excluded from the study. The preoperative assessment included the location of meatus, condition of the urethral plate and amount of chordee. Pre-operative testosterone gel was used in 5 cases to gain the phallic length. The surgery was done in general anaesthesia with caudal block in all cases. Total occlusive dressing was applied in all cases. Postoperative outcome was assessed based on terminalizing slit meatus, residual chordee, presence of fistula, meatal stenosis and any other complication related to the procedure.

Surgical Procedure

All cases were operated under general anaesthesia with caudal block. The stay suture was taken just distal to the proposed meatus by a round body prolene suture. The haemostasis was maintained by a tourniquet applied by a thin layer of gauze piece applied circumferentially around the penis. It maintained adequate haemostasis while not being over tight. The urethral plate was marked in a U fashion and mobilised and tubularised with continuous subepithelial PDS6.0 inverting sutures commonly on 7 Fr (range 6-8 Fr) Infant feeding tube along with glansplasty. The neourethral coverage was provided by the dartos in most of the cases. Few patients (n=3) it was done by tunica vaginalis. A penile wash was given with warm saline and antiseptic ointment was applied over it. In all patients total occlusive dressing was done. The patients received iv antibiotics in the post-operative period. The stent is removed 7th post-operative day along with the dressing. They were observed till the passage of urine and subsequently discharged. Follow-up was after one week, fifteen days and one month followed by every three months for first year. All patients with meatal stenosis were calibrated in the follow up with infant feeding tube up to 8 Fr.

Results

There were 64 cases with distal hypospadias with minimal chordee, of whom 13 had meatal stenosis that needed meatal calibration before surgery. 13 cases were proximal hypospadias with wide urethral meatus and significant chordee. 21 patients had mid penile hypospadias with glanular tilt. 2 patients had circumcision done before coming to this institute (Table-1).

Table 1: Type of Hypospadias.

Type of hypospadias	Number	Percentage
Distal Hypospadias	64	64
Midpenile hypospadias	21	21
Proximal hypospadias	13	13
Circumcised hypospadias	2	2

Average operative time was 90 minutes and TIP was performed in all cases with dartos flap neourethral coverage in all but three patients in whom tunica vaginalis flap was put. The degloving was not needed in twenty-one patients of distal hypospadias and paraurethral penile skin was utilised for dartos cover over the neourethra in these cases. Seventy-Nine patients the penile degloving was done with correction of the chordee and preputial dartos cover was given for neourethra. Only 2 patients had dorsal plication to correct the glanular tilt. Mean hospital stay was 7 days. Meatal stenosis was found in Twelve patients who were calibrated and maximum 5 sittings of calibration were needed. Nine patients developed postoperative fistula which were repaired later. All but one patient is having normal urinary stream with no evidence of reoccurrence of fistula during follow-up. One patient developed recurrent fistula which is being planned for a redo surgery. Residual chordee was found in one patient (Table-2).

Table 2: Associated anomalies.

Associated anomaly	Number	Management
Undescended testes	3 (Left in 2 and Right sided in 1)	Orchiopexy was done in all before hypospadias repair
Penoscrotal transposition	3	Correction was done before hypospadias repair in one case.
Penile torsion	2	Corrected along with hypospadias repair
Inguinal Hernia	2	Repair done before TIP
VUR	1	Waiting for reimplantation
Anorectal malformation	1	Colostomy followed by PSARP done before TIP.

None of the patient developed skin or glans dehiscence Cosmetic appearance was satisfactory in 94 patients and the parents were happy with the outcome of the surgery(Figures 1-3).



Fig. 1: TIP in distal hypospadias.



Fig. 2: TIP in mid penile hypospadias.

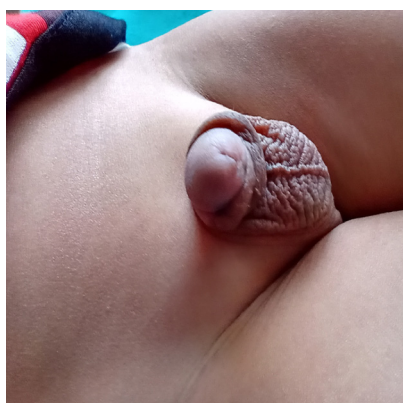


Fig. 3: TIP in proximal hypospadias.

Discussion

Who should operate the hypospadias? General surgeons, General urologists, Pediatric surgeons, Pediatric urologists, or hypospadiologists? As

hypospadias surgery is technically demanding, any one of them can, provided the surgeon has a temperament for hypospadias surgery, has mastered common techniques in hypospadias and has at least 40-50 cases to operate per year. Experience in hypospadias surgery has a definite co-relation with a successful outcome. There is a significant difference in outcome of hypospadias surgery done by Pediatric urologists vs. other surgical specialists.²

The method of Snodgrass repair also known as tubularised incised urethroplasty repair (TIP) needs no introduction. It is now an established method of repair of hypospadias, especially the distal ones. The aim of TIP is widening of the narrow urethral plate for a wide neourethra to be made. The TIP repair is now learnt by all Pediatric Surgeons and it remains a preferred method of urethroplasty whenever condition permits. The first TIP repair was done in March 1990 on a 9-month-old boy with coronal hypospadias, when it was realized that the urethra can be slit deep in the midline without any adverse consequences. The first proximal TIP was done in August 1993 on a patient with a proximal shaft defect, and it was observed that TIP potentially could be used for both distal and proximal repairs.³ It was also reported that reported that the plate groove, described as “deep” or “shallow,” does not correlate with urethroplasty complications.³ Two series^{4,5} found that pre-incision plate width <8 mm increased complications, but one of these authors subsequently stated that the plate may have been tubularised too far distally. In one report the authors measured the pre-incision width in 186 consecutive prepubertal boys undergoing primary TIP and found that 86% were <8 mm. There was no difference in urethroplasty complications (5 fistulas, 6 glans dehiscence's) in those with plate widths <8 vs. >8 mm.⁶ In our study the urethral plate was satisfactory in most cases except in some patients with proximal and mid penile varieties.

The best options for proximal hypospadias repair remain unclear. TIP can be done when the urethral plate remains intact after penile straightening, and the ventral curvature was <30 degrees after degloving.⁷ There are inherent problems associated with this method of hypospadias repair amounting to some high incidences of meatal stenosis and subsequent urethro cutaneous fistulae formation. In 2002, Lorenzo and Snodgrass concluded that dilatation of the neourethra is unnecessary after TIP urethroplasty, and the calibration and uroflowmetry after 6 months of surgery may be useful to detect subclinical obstruction. They attributed the meatal

stenosis detected in other series (El bakry 2002) to the technical error including failure to deeply incise the plate and/or tubularisation of urethral plate too far distally.⁸ In our series the patients were operated by a single surgeon and the urethral plate was tubularised with continuous subepithelial PDS 6.0 sutures without tension over the 6-8 Fr infant feeding tubes and neourethral coverage was given by well vascularised dartos flap. This series also had 12 patients who developed meatal stenosis after TIP may be attributed to the tubularisation of the urethral plate too distally. Urethrocutaneous fistula, followed by hypospadias reconstruction, is one of the most common complications. Post-surgery fistula in children could occur as the result of one or more factors, such as meatal stenosis, urethral stricture, hematoma, infection, poor surgical technique, etc.⁹ However, a lot of patients, especially those in the developing countries, go to outpatient department for treatment when they are grown up, possibly restrict to economic factors, unsuccessful surgery history or other reasons. There are a few other reports specifically concerning the hypospadias surgical outcomes among the youth population. Some studies reported higher complication rate occurs among adults than children using the same techniques.¹⁰ In our series 9 patients developed urethro-cutaneous fistula which in our scenario could be attributed to the meatal stenosis. However, some patients had very poor and thin dartos to cover the neourethra and this could be the cause of development of urethro cutaneous fistula in these cases. One study in 2018 concluded that Urethral defect length and urethral operation history should be taken into consideration when planning hypospadias surgery. The study discovered that the risk of developing urethro- cutaneous fistula after hypospadias repair is associated with urethral defect length and urethral operation history. Age, surgical procedure, type of surgical repair, chordee degree and other factors were not obviously related to the development of urethro-cutaneous fistula.¹¹

The frequency of associated anomalies increases with the severity of hypospadias. For isolated anterior or middle hypospadias, laboratory studies are not usually necessary. Screening for urinary tract anomalies should be considered in patients with posterior hypospadias and in those with an anomaly of at least one additional organ system.¹² Our series had associated anomalies in 12 patients, most common being undescended testes (n=3) and penoscrotal transposition (n=3). All of them had proximal type of hypospadias. One patient had anorectal malformation (high type) was found in

one case that needed colostomy followed by ano-rectoplasty and then hypospadias repair (Table-3).

Table 3: Complications.

Complication	Number	Management
UCF	9	Layered closure -5
		Layered closure +glansplasty in 2 coronal fistulae.
		Recurrence of fistula-1
Meatal Stenosis	12	Meatal calibration
Residual Chordee/Rotation	1	followed-up
Dehiscence	0	-

He also had proximal Hypospadias. One patient had high grade unilateral Vesico ureteral reflux (VUR) with severe meatal stenosis preoperatively. He underwent meatotomy and kept on IV antibiotics for urinary tract infection. He underwent elective hypospadias repair and had uneventful outcome. He is being followed up for VUR.

One of the most controversial aspects of modern hypospadias surgery is the election of an appropriate wound dressing.¹³ In fact, there may be as many different types of dressing as there are types of surgical repair. Multiple dressings after hypospadias surgery have been previously reported.¹⁴ Dressing prevents postoperative edema and hematoma formation, maintaining the phallus in an upright position. We applied a complete occlusive dressing (Fig-4) in all patients without any problem which was removed on 7th post-operative day along with the catheter.

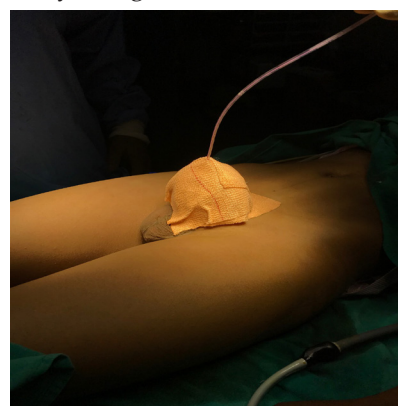


Fig. 4: Occlusive Dressing.

The dressing sticks properly and effectively reduces the edema and promotes healing. To improve the functional and cosmetic results, the use of hormonal stimulation before hypospadias correction has been accepted as a relatively common

practice for some decades. Because of the scarcity of randomized and controlled clinical trials on this topic, the establishment of a standard protocol has not been concluded yet.¹⁵ We used Testosterone gel in 5 patients and were able to get increase in length and glanular width for effective TIP repair. Since topical medications are not absorbed through the gastrointestinal system, they don't undergo first pass hepatic metabolism and are associated with minimal side effects.¹⁵ It may be difficult to do hypospadias repairs who had circumcised penis due to lack of skin required for the repair. However, we operated 2 such cases who had circumcision done before their distal hypospadias became noticed. The TIP repair was successful in these patients with utilization of the para urethral skin dartos for the neourethral coverage. Snodgrass compared patients who circumcised before diagnosis of defects of urethra and who had not been circumcised. Results showed that prior circumcision had not been complicate subsequent hypospadias repair in males whose urethral anomaly was concealed by an intact prepuce.¹⁶

Conclusion

The patients of hypospadias are amenable for surgical correction. However, the treatment needs to be individualised and surgeons should learn different procedures to manage different kind of hypospadias. The TIP is an effective surgical procedure for the management of most of the cases of hypospadias. It gives good results in experienced hands but there is definitively a learning curve for this procedure. The Pediatric Surgeon starting to provide surgical services to these children can do TIP to gain enough confidence to perform more complex procedures especially at newly established Pediatric surgical centres. Most common associated postoperative complications are meatal stenosis and urethro cutaneous fistulae. Case selection is important for optimal results in TIP repair and one should refrain from doing desperate Snodgrass repair (TIP).

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Perforating Pilomatrixoma of The Male Breast, A Rare Lesion Simulating Breast Cancer: A Case Report

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Abstract

Pilomatrixoma is a rare benign skin appendage tumor of hair matrix origin. It is commonly seen in the first two decades of life, most often presenting on the face, neck or upper extremities. Pilomatrixoma of the breast is uncommon, and can mimic breast malignancy. Male breast Pilomatrixomas an extremely rare entity with only 9 cases reported in English literature. We report a rare presentation of perforating Pilomatrixoma of the breast in a male patient aged 35 years.

Keywords: Pilomatrixoma; Male breast; Calcifying epithelioma; Pilomatricoma.

Introduction

Presentation of a male patient with a breast lump opens the possibility of a variety of differential diagnoses, ranging from relatively innocuous conditions like gynecomastia to malignancy.¹ In particular, the finding of a hard lump in the breast is very likely to lead the clinician to suspect a malignant tumour of the breast. However, there could be both non-neoplastic (fat necrosis) and benign

neoplastic conditions, also presenting with a hard breast lump, presenting a diagnostic dilemma [2]. Ulceration associated with the lump, in particular, is all the more suggestive of a malignant neoplasm. Clinical features and thorough evaluation usually help in arriving at the correct diagnosis. We present this case of pilomatrixoma of the breast in a 35 year old male patient who presented with a hard lump in the left breast with ulceration. This case is presented due to the rarity of site and manner of presentation.

Case report

A 35-year old male presented with a painless lump in the left breast since 4 years and increase in size over the last 6 months. There was a history of ulceration of skin over the lump since 2 months. There was no family history of breast cancer. On examination there was 6x5 cm lump in the outer quadrants of the left breast. There was bluish-red discolouration of the skin with a 2 cm x 1.5 cm ulcer over the summit [FIG 1].

There was whitish, hard material on the floor of the ulcer with indurated base. The lump was hard and mobile over the underlying muscles. There was no axillary lymph node enlargement. Ultrasonogram (USG) of the breast revealed epidermal cyst with calcification. Fine Needle Aspiration Cytology (FNAC) showed features suggestive of benign skin adnexal tumor.

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Fig. 1: Photograph showing bluish discolored swelling with ulceration in the left breast.

In view of hard lump, wide excision with primary closure was done. Post-operative period was uneventful. The histo-pathological examination revealed pilomatrixoma (Calcifying epithelioma of Malherbe) with the surgical margin free of tumour. On immunohistochemistry, p63 was found to be positive in basaloid cells.

Discussion

Pilomatrixoma, also known as pilomatricoma is a benign tumor of hair matrix differentiation. The first case was reported in 1880, by Malherbe and Chenantais³ as a calcified tumour originating from the sebaceous glands, and was initially named 'calcifying epithelioma of Malherbe'. In 1961 the name was changed to 'pilomatrixoma' by Forbis and Helwig who established that the origin was from the outer sheath cell of the hair follicle root.³

Pilomatrixoma mainly occurs in the first two decades of life, though some authors have described a bimodal age distribution with a second smaller peak of occurrence in the fifth and sixth decades. Most authors have reported a female preponderance of up to 2 : 1⁴ with some stating that it occurs equally in both genders.⁵ Common sites are the head (peri-auricular and juxta-parotid areas), neck or upper extremities. Occurrence over the breast is very rare (1:100000 individuals). These lesions can originate from the peri-areolar piliferous bulbs and mimic a breast malignancy. It presents clinically as a slow-growing, painless mass in the deep dermis or subcutaneous tissue. The skin over the swelling may appear normal, or have a bluish-red discoloration, and it may occasionally ulcerate. Such a tumour with ulcerated overlying skin has been referred to as a perforating pilomatrixoma.⁶ On palpation it is found to be superficial, solitary, firm to hard and mobile.^{3,7} Its occurrence in the male breast is extremely rare, with only 9 cases reported in English literature according to Clark

A et al.¹ These tumors can easily be misdiagnosed because of clinical and radiological resemblance to breast malignancy.^{1,8,9}

The exact cause for the pilomatrixoma has not been identified though several theories have been proposed. A familial predisposition has been noted, as a genetic component has been postulated in the occurrence. Some external factors have also been considered in the etiology including trauma, insect bites and surgery.¹⁰ Pilomatrixomas exhibit mutations of CTNNB1, which is the gene encoding β -catenin, a signaling protein involved in the development of the pilous follicles.¹¹ Active mutations of the beta-catenin gene have been reported in 75% of human pilomatrixomas.¹² Another hypothesis by Forbis and Helwig is that, pilomatrixomas are hamartomas.¹³

Typical cases of pilomatrixoma show normal overlying skin colour and are hard in consistency and small nodules. They typically measure between 3-30 mm in diameter.¹⁴ Tumours more than 5 cm in size are generally regarded as giant.¹⁵ They are usually solitary. Multiple lesions are associated with Gardner Syndrome, Turner Syndrome, myotonic dystrophy and sarcoidosis and are reported in 2-10% of cases. Atypical variants described in literature include lymphangiectatic, anetodermic and ulcerated.¹⁴

The diagnosis of breast neoplasms can be made by clinical examination, mammography, USG, USG-guided fine needle aspiration cytology/core needle biopsy. On mammogram, pilomatrixomas exhibit nodular opacities with pleomorphic coarse irregular calcifications. On USG, the lesions appear as hypoechoic nodules with irregular margins and hyperechoic spots (calcification). Imaging findings often overlap with characteristic findings of malignant breast neoplasms. In such cases an ultrasound-guided core needle biopsy is helpful in establishing the diagnosis.^{8,16}

On histology, pilomatrixomas characteristically show epithelial cells organized in nodular aggregates in a connective matrix with scattered inflammatory-like elements. The tumour is characterized by the presence of both basophilic cells derived from hair matrix cells, and shadow cells which are equivalent to the hair cortex.¹⁴ Each nodular aggregate has two types of epithelial cells with different organization: densely packed basophilic cells in the peripheral part and eosinophilic cells known as "ghost" or "mummified" cells in the centre of the nodule. Hair, calcifications, foci of necrosis and multinucleated giant cells are rarely seen.¹⁶ On immunohistochemistry, p63 was found to be

positive in basaloid cells [Fig 2, 3].

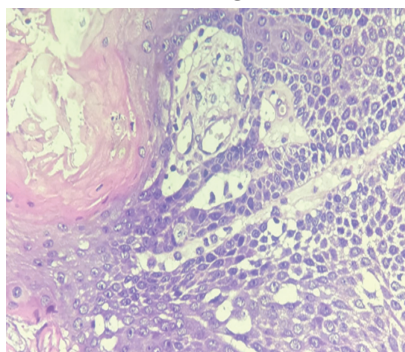


Fig. 2: Tumour shows sheets and strands of basaloid cells with peripheral palisading of nuclei.

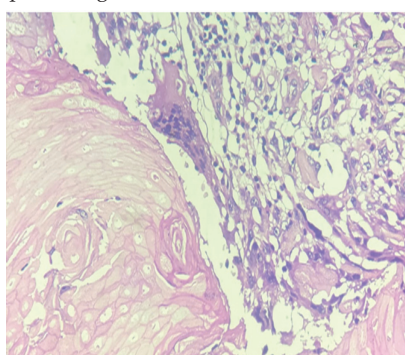


Fig. 3: Tumour shows shadow cells in sheets and stroma shows foreign body granulomatous reaction.

The differential diagnosis includes sebaceous cyst, calcified giant hemangioma, giant dermatofibroma, atypical mycobacterial infection, ossifying/calcified hematoma, giant cell tumor, foreign body reaction, cutaneous lymphoma, sarcoma, cutaneous metastasis, basal cell carcinoma, benign and malignant breast diseases.^{3, 7, 17}

The treatment of benign Pilomatrixoma involves complete surgical excision of the lesion or wide excision when diagnosis is uncertain. Spontaneous regression has never been reported. Considering the benign nature of this lesion, the prognosis is excellent.¹⁸

The recurrence rate is around 4%, and could be related to incomplete excisions. There have also been speculations whether these tumours with recurrence were the rarer malignant pilomatrixomas which were misdiagnosed to be benign on initial evaluation. If there is recurrence, wider excision with detailed histopathologic examination is necessary.¹⁷

Malignant pilomatrixomas are extremely rare and were first described in 1980 by Lopansri et al.,¹⁹ Pilomatrix carcinoma (malignant pilomatrixoma, 'trichomatrical carcinoma' or 'calcifying epitheliocarcinoma of Malherbe') is a

very rare tumor and commonly seen in the head and neck region in adults. Typically it is larger than Pilomatrixoma and more common in older males (in contrast to pilomatrixoma, which shows a female predominance). Metastases are less frequent, but this condition has a high potential for recurrence.^{19,20}

Conclusion

Pilomatrixoma is a rare, benign hair matrix tumor and rarely diagnosed in the male breast. Clinical and radiological findings of Pilomatrixoma overlap with characteristic findings of breast malignancy. It is therefore difficult to distinguish between Pilomatrixoma and other benign/malignant breast disease without complete evaluation including histopathology. Treatment involves complete surgical excision of the lesion, with recurrence of benign Pilomatrixoma being rare.

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A Fascinating Experience with A Rare Case of Granulomatous Mastitis

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Abstract

We Report a case of Idiopathic granulomatous mastitis in a 30 year old pregnant woman who came to our hospital with complaints of painful lump in her right breast because the results of initial aspiration cytology was mammary abscess with focal mastitis, incision and drainage was performed when MRI breast showed intermediate concern for malignancy – Excision biopsy was done. However the final histopathological diagnosis was granulomatous mastitis with no evidence of malignancy.

A review of literature revealed that idiopathic granulomatous mastitis has a tendency to affect young woman with a history of child birth on oral contraceptive usage. Clinical diagnosis and imaging has often been difficult. Complete resection or corticosteroid therapy can be recommended as appropriate treatment. Since recurrence rate is as high as 50%, long term follow up is indicated in such patients.

Keywords: Idiopathic granulomatous mastitis; Corticosteroid therapy; Pregnancy.

Introduction

Idiopathic granulomatous mastitis (IGM) is a rare, chronic inflammatory disease of the breast

of unknown etiology. IGM most commonly affects young, healthy women and usually presents as an ill-defined breast lump simulating malignancy. Women often present with painful, unilateral, discrete breast masses that have a tendency to recur.¹ IGM is also considered a variant of periductal mastitis by some experts.² The pathologic and imaging diagnoses of IGM remain difficult. Histologically, IGM demonstrates noncaseating granulomas limited to the mammary lobules with or without associated microabscesses resulting from a local immune process.³ Possible etiologies include an autoimmune process, trauma, infection, oral contraceptive use, and prolactinemia.^{4,5} IGM may also be confused with other conditions besides malignancy, conditions such as tuberculosis, sarcoidosis, erythema nodosum, and Wegener granulomatosis. Thus, it is important to confirm evidence of IGM on histopathology.⁶ The ideal treatment of IGM also remains unclear. Studies have demonstrated moderate success with varying options including observation, steroids, and immunosuppressants.⁷ Often, surgical management is the last resort, although lesions may recur and result in poor aesthetic outcomes.⁶

Case report

A 30-year-old woman, G2P1 with history of 3 months of amenorrhea, presented with painful lump in the right breast for the past 4 months, she also had history of febrile episodes. There was no family

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history of breast carcinoma. She delivered her last child 4 years before presentation and had breastfed continuously for 2 years. On physical examination, the patient was febrile (38.68 C), an ill-defined hard tender lump occupying upper medial quadrant with no associated nipple discharge or retraction. Left breast being normal. There was no appreciable axillary lymphadenopathy. Clinical diagnosis of focal mastitis was made and treated conservatively with ciprofloxacin and metronidazole elsewhere. Patient was symptomatically feeling better but still clinically palpable lump was present at the upper medial quadrant. Patient was treated again with linezolid after a gap of 10 days. Patient was brought to Bangalore with tender lump in the upper medial quadrant with bilateral lower limb edema. Patient was re-investigated. A comprehensive laboratory and radiologic workup was subsequently undertaken. Significant laboratory findings included a leukocytosis of 14,100 cells/cumm with neutrophilia (84%), ESR-54 mm/hr and CRP-74mg/L (normal range: 0-6mg/L). Sonographic evaluation revealed ill-defined area of altered echogenicity seen in upper inner quadrant extending into subareolar region of the right breast with mild hypoechoic thickening of the ducts and focal increased vascularity-findings suggestive of focal mastitis. Fine needle aspiration cytology revealed suppurative lesion-mammary abscess and advised excision biopsy to rule out malignancy. She was started on antibiotics and repeat ultrasound of the breast after a week revealed right breast extensive abscess showing fluctuant turbid fluid from 11-70 clock position with right axillary lymphadenopathy. As a result the decision of incision and drainage of the abscess was made and performed. Pus culture and sensitivity yielded no growth. Following which she had recurrence of her symptoms. MRI of the bilateral breast was done which showed right breast cystic/heterogeneous intraglandular space occupying lesions in the medial quadrant with deep seated lesion close to the intermammary cleft and associated marked regional non-mass enhancement. Type II/III time-signal intensity curves around the space occupying lesion of the right breast on a background of low ADC values-suggesting intermediate concern for malignancy (Differential includes-chronic organizing mastitis) with no significant finding in the left breast. Evaluation for tuberculosis were negative. The decision for excision biopsy of the right breast lump was made and performed under general anesthesia. (Fig 1 & 2) shows the intra operative pictures. Histopathology revealed Right breast-Cystic neutrophilic granulomatous mastitis

with adjacent breast showing fibrocystic disease. Postoperatively she was treated with antibiotics (augmentin) for a week and discharged. She started noticing hardness in the right breast after 10 days (Fig 3), hence decision taken to start oral corticosteroids (wysolone 10 mg tid for a week and tapering of the dosage was done thereafter). Patient responded very well and improved symptomatically with corticosteroid. After the corticosteroid therapy breast felt soft and no evidence of lump in the breast.



Fig. 1: Picture showing inflamed mammary tissue extensively with arrows showing prominent blood vessels.

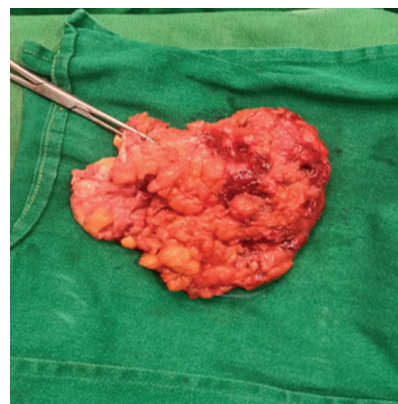


Fig. 2: Picture showing multiple cavities filled with greenish pus.



Fig. 3: Picture showing serous discharge (tissue fluid) from the sutured site.

Discussion

Kessler and Wolloch first described IGM in 1972 as a rare benign chronic inflammatory disease of the breast, characterized by presence of noncaseating granulomas confined to the breast lobules.⁸⁻¹² The exact pathogenesis of IGM is unknown, although it is thought to be immunologically mediated.⁸⁻¹⁴ IGM affects young healthy parous women and is often associated with pregnancy and lactation.⁸⁻¹² IGM is diagnosed after exclusion of infection, malignancy, foreign body reaction and other autoimmune disorders.⁸⁻¹² The absence of caseating necrosis and a predominantly neutrophilic background with multiple cavities on histopathology were important clues favoring a diagnosis of IGM.¹³ IGM often has a chronic, relapsing course without an established standard treatment approach.⁸⁻¹² The principle treatment options include antibiotics, surgery, corticosteroid agents, or a combination of them.^{9,15-17} Some investigators suggest that systemic corticosteroid therapy may be the initial treatment of choice in IGM, whereas surgical resection should be reserved for recalcitrant lesions.^{12,15,18} The thought process behind this approach is that systemic corticosteroids usually melt the breast mass, allowing for a more conservative surgical resection should the disease persist.^{14,16,18} Nonsteroidal immunosuppressive drugs including azathioprine and methotrexate have been used successfully in managing IGM.^{9,12,14,18} Immunosuppressive therapy should be continued until a complete remission is reached, as recurrence rates as high as 50% have been reported.¹⁷ A recent prospective cohort study of 49 women with IGM found that the treatment period required to achieve a full remission varied from 3 to 18 months.¹⁵ Alternatively, some investigators propose that IGM should be treated with wide local excision at the onset of disease, citing a lesser chance of recurrence with surgical therapy.¹⁵⁻¹⁶ However, review of the literature finds that relapses can still occur despite surgical resection, and it may require repeated, potentially deformative surgeries to cure the condition.^{11,15} Prompt diagnosis and medical treatment of this rare condition is important, as it may prevent patients from undergoing potentially disfiguring surgery. We advocate for an initial trial of corticosteroid therapy, as it proved to be very successful in our patient.

Conclusion

After treating the patient with anti-biotics and surgical excision, the author noticed recurrence of symptoms and administered corticosteroid 10 mg

TID for 12 days with a tapering dose of 10 mg BD for 12 days and 10mg OD for 12 days. On assessment there was disappearance of tumor clinically. Hence the author recommends administration of corticosteroid to achieve symptomatic relief.

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In-Situ Anterolateral Thigh Flap for Lower Abdominal Reconstruction: Versatile Way for Reconstruction

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Abstract

A case of Osteomyelitic sinuses of the ilium with lower abdominal defect following a run over accident is treated with primary excision of sinuses with bone and reconstruction using pedicled anterolateral thigh flap. The Anterolateral thigh flap is a versatile pedicled flap^{1,2} for the reconstruction of the abdominal wall more effective and efficient than the fascia lata flap or other rotation flaps. Here is a case report describing the procedure and outcome in a complicated case.

Keywords: Anterolateral thigh flap; Abdominal defects; Osteomyelitis of the pelvic bones; Sinuses of lower abdominal regions.

Introduction

Anterolateral thigh flap is one of the most widely used flaps for the reconstruction in various parts of our body. This flap is commonly used as free flap based on the feeder, the descending branch of the lateral circumflex artery.⁴ The flap is well known for its reliability and wide skin paddle, attached fascia lata, or muscle the vastus lateralis for the reconstruction.

We are reporting a case of an in situ ALT flap for

the reconstruction of the lower abdominal defect. The defect was due to an old run over accident with loss of tissue and primary reconstruction done with skin grafting. The patient had multiple sinuses due to osteomyelitis of the ilium and sacroiliac joint region. The defect was well covered and the osteomyelitic bone well revascularised due to vascularity of the flap.⁷

Case report

28 years old male patient reported with recurrent fistula in the left iliac crest area and the posterior part of the ileum near the sacroiliac joint following a run over accident 4 yrs back. He was treated with wound repair and skin grafting initially, and later by curettage of the bone many times.

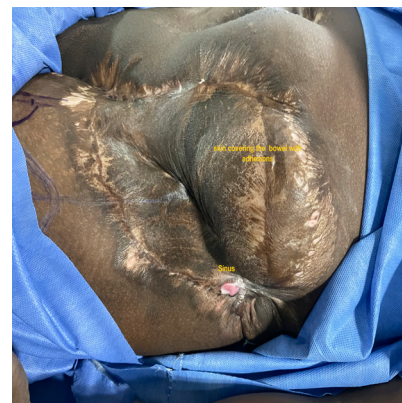


Fig.1: Preoperative picture.

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When the patient presented to us, he had multiple sinuses over the ilium - left side and the posterior side of the ileum near the sacroiliac joint extending deep to the bone with sequestrum. There was a large defect of 25 x 15 cm in the left lower abdomen with bowel adhesions to the skin. There was no attachment of the muscles or tendons to the iliac crest-detached defect.

Xray showed osteomyelitic bone with sequestrum and osteonecrotic areas left ileum and sacroiliac joint. MRI revealed osteomyelitic lesions showing sequestrum with collection in the deep plane.



Fig. 2: Xray showing the destroyed bone.



Fig. 3: MRI report of the case.

Procedure

Under General anaesthesia, the sinuses were explored by putting superior-crest incision, excising the sinus and the scarred tissue down to the inner iliac plate. The sinus was penetrating the iliac plate and going posteriorly. The dead bone removed and the sinuses cleared. Posterior sinus over the sacroiliac region was explored by detaching the gluteal muscles. The exposure was extended upto the sciatic foramen. The sinus with the dead bone

and granulations removed completely. The lower abdominal defect was delineated and the bowels released from the adherent skin. The peritoneum was mobilised and approximated over the defect. A mesh of 10 x 12 cm placed in the extraperitoneal space. Then the ALT flap is elevated and the pedicle is traced upto the major pedicle and rotated to the defect by tunnelling. The flap is inset in the defect and closed. Postoperative period was uneventful and follow up for 6 months showed well healed wound with no hernia or sinuses.

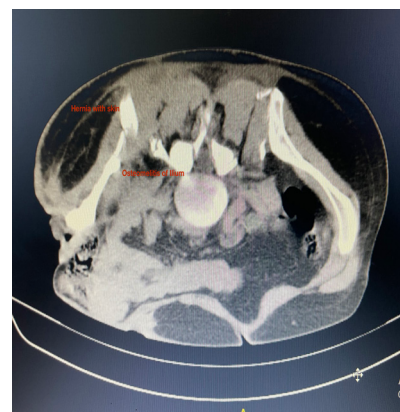


Fig. 4: Planning of the flap.



Fig. 5: Intraoperative.



Fig. 6: Rotation of the flap.

Technique of Raising The Flap

A line is drawn from the anterior superior iliac spine to the supero-lateral point of the patella. The junction between the upper one-third and the lower two-third corresponds to the first perforator. These perforators are identified by hand-held Doppler. The flap is designed in such a way that adequate paddle or skin is marked on the medial and lateral side equally. The flap raising is done from medial side in the subfascial plane till the medial border of the vastus lateralis. The perforators to the flap are identified over the surface of the vastus lateralis or through the fibres and these perforators with the septum or muscle is elevated and the pedicle is traced towards the base under the quadriceps femoris. Once the pedicle is identified and separated, we will start dissection from the lateral side. Then the lateral dissection in the subfascial plane including the fascia lata is done towards the medial side. In our case, we have included a part of vastus lateralis muscle for increasing the vascularity at the inset site. By dividing the skin above the upper end of the flap, the pedicle is rotated at 180 degrees and flap inset is given.



Fig. 7: Post operative picture.

Discussion

High velocity run over accidents are very common and mostly associated with pelvic fractures and sliding injury with loss of tissues in the hip region. The defects of abdominal wall in such cases are managed by abdominal muscles rotation or sliding flaps with or without skin grafting. There are situations where in this procedure is not sufficient and there will be a residual defect and is covered with skin graft for later reconstructions. The ALT flap is a good flap used for such lower abdominal reconstruction. In our case there were multiple sinuses due to osteomyelitis of the bone and hence the challenge of removing the dead bone

and clearing the osteomyelitis was an additional procedure.

The ALT flap is a skin with subcutaneous tissue based on the descending branch of the lateral circumflex artery. This can be added with fascia lata and vastus lateralis muscle too.^{3,5,6} We planned the defect closure with ALT and the pedicle length was extended by dissecting deep down to its major vessel. The hernia defect was delineated first and anatomical dissection done. Once the bowel was separated the surface was covered with peritoneum. It was done by mobilising the peritoneum and approximating without tension. In our case the peritoneum of the lateral abdominal wall was dissected for some distance and the same was mobilised to approximate over the bowel without tension. Once the defect is covered with peritoneum a mesh was placed to reinforce the defect. The defect with no tendinous attachment or muscle attachment. The defect may be reinforced with mesh and the lower end must be fixed to the iliac crest with non absorbable sutures.

The fascia lata component is used to reinforce the mesh like external oblique aponeurosis which is again fixed to iliac crest. In this case even though the sinuses were there the defect over the bone could be covered with muscles on both sides of the ileum i.e. iliacus muscle on inner side and gluteal muscles over the outer side.

The flap is rotated 180 degrees and the surfaced over the mesh. Once a vascularised tissue is placed over an infected area the healing is better and it will control the infection and vascularise the tissue (the basic principle of the flap).

We are presenting this case because these types of lower abdominal defects are very common and ALT flap is a very good option for such defects.

Conclusion

In complex situations like large defects of abdominal wall with herniations and lack of tissue for reconstruction pedicle anterolateral thigh flap is a good option. It can be taken as fasciocutaneous flap or with fascia lata to reinforce the defect. This flap can be taken as musculocutaneous flap with Vastus lateralis. So a diversified complex tissue transfer can be done using the pedicled ALT flap.

In our case two issues were there viz, the osteomyelitic bone with sinuses and herniation with no abdominal wall. So by using a vascularised tissue transfer the healing is better and it helps in revascularisation of the bone too. Hence we are reporting this case.

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