



Original Article

Effect of Suprapubic Cystostomy in Urogenital Trauma- A Study of 100 Cases

Islam NF^{*1}, Manzur RM², Salam F³

Abstract

Background: Suprapubic cystostomy is an essential emergency procedure for urogenital trauma, particularly urethral injuries, providing significant patient relief. This study aimed to find out the different patterns of complications and immediate outcome in patients who undergo suprapubic cystostomy for urogenital trauma in the casualty block of Dhaka Medical College Hospital.

Methods: This prospective type of observational study has been carried out on 100 patients having urogenital injury requiring suprapubic cystostomy, admitted in casualty block of Dhaka Medical College Hospital.

Results: The ages of patients in our study ranged from 5 to 68 years, with the highest incidence in the 16-30 age group. Of the 100 patients, 90 were male. The primary mode of injury was motor vehicle accidents (55%), followed by falls (40%), with minor cases of iatrogenic injuries (2%), gunshot wounds (1%), and others (2%). Injury types included only urethral injury in 68% of cases, bladder injury in 12%, and both in 20%. Suprapubic cystostomy was performed via the open method in 68% of cases and percutaneous method in 32%. While over half of the procedures went smoothly, difficulties were noted, including bladder identification (16%), catheter introduction issues (11%), and balloon inflation outside the bladder (7%). Post-operative complications included wound infection (4%), hematuria (10%), and urinary leakage (6%). Patients with urethral injuries required long-term SPC drainage and experienced delayed complications such as urinary tract infections (38.63%) and skin excoriation (5.68%).

Conclusion: Young aged people are more vulnerable to urogenital trauma and suprapubic cystostomy can play a major role as a safer, effective emergency procedure to manage the patients.

Keywords: Urogenital Trauma, Suprapubic Cystostomy (SPC), Emergency Procedure.

TAJ 2014; 27: No-2: 32-38

¹ Nadia Farzana Islam, Assistant Registrar, Casualty Unit 1, Dhaka Medical College Hospital, Dhaka

² Raquib Mohammad Manzur, Medical Officer, National Institute of Traumatology and Orthopedic Rehabilitation, Dhaka

³ Farhana Salam, Medical Officer, Dhaka Medical College Hospital, Dhaka

Introduction

The World Health Organization predicts a dramatic worldwide rise in the burden of disease caused by road traffic accident and war.¹ This rise will directly influence the incidence of urogenital trauma. Genitourinary injuries frequently occur in the setting of multiple organ system traumas, and although other life-threatening injuries must be addressed first, the emergency department physician must be alert to the clues pointing to the presence of these injuries.² Urologic injuries occur in 10% to 20% of major trauma patients and may be result of either blunt or penetrating trauma.² Urethral and genital injuries are suspected only in the setting of the wound to the pelvis, the perineum and the buttocks.¹

Traumatic injuries to the bladder may be subdivided into blunt versus penetrating and intraperitoneal versus extraperitoneal.² Blunt injuries to the bladder resulting from motor vehicle accident, falls and direct blow to the abdomen comprises to the majority of the cases ranging from 60 to 80%.^{2,3} Penetrating injuries to the bladder may be caused by stab injury or gunshot.⁴ Approximately two-third of the bladder injuries are extraperitoneal (56-78%) and one-third are intraperitoneal (17-39%) and combined injuries may occur in 5 to 20% of cases.² Urethral trauma is anatomically divided into posterior and anterior urethral components.³ Posterior urethral trauma is usually associated with pelvic fractures and multisystem trauma. Up to 10% of male and 6% of females with pelvic fractures also suffer from a posterior urethral injury.³ Anterior urethral trauma is usually an isolated injury commonly found after a straddle accident involving blunt trauma to bulbar urethra.^{2,4} Early recognition and diagnosis and careful minimal intervention are crucial to successful management and preventing long term complications.⁵ Significant delay in diagnosis with massive urinary extravasation may result in sepsis and severe necrotizing infection which may present with swelling discoloration and frank necrosis of overlying perineal and genital skin.⁶

When placement of a urethral catheter is contraindicated or unsuccessful, suprapubic cystostomy is a commonly performed procedure. Suprapubic cystostomy (SPC) is a surgery to create a stoma through the abdomen and into the urinary bladder.⁷ This deviate urine from the traumatized area, relieves retention, avoid extravasation and remove all immediate dangers. Suprapubic catheter placement allows for continuous and when necessary long term bladder drainage.^{1,7} Suprapubic cystostomy is better than urethral realignment and catheterization as primary management because in case of urethral trauma attempts to urethral catheterization may not only further damage the mucosa but also encourage local edema and delay healing.⁸ Urogenital injuries are a common occurrence in trauma patients. In Bangladesh the exact magnitude of the problem and its management is not yet known. There are very few studies done to date in Bangladesh on SPC and a detail analysis of the procedure

may help us to establish new guidelines regarding a better management of the procedural and postoperative problems of SPC.

Material and Methods

This study employs a prospective, observational design. This was conducted in the Casualty Block of Dhaka Medical College Hospital among 100 admitted patients with urogenital trauma requiring suprapubic cystostomy from July 2011 to June 2012. A non-random sampling method was employed. Patients with urogenital trauma and managed with perurethral catheterization, presented with additional intra-abdominal injuries, and referred from other departments within DMCH for suprapubic cystostomy due to non-traumatic factors were excluded during data collection. In conducting this prospective observational study on urogenital trauma, we interviewed all patients admitted to the Casualty Block of Dhaka Medical College Hospital. Initially, informed written consent was obtained from each patient before proceeding with the interviews. Using a standard questionnaire, we gathered essential social demographic data and information relevant to the study topic. For an extensive evaluation, patients were closely observed with the help of a standardized data record form that captured pertinent details related to their conditions. Additionally, we assessed the general medical condition of the patients through a combination of thorough medical history, physical examination, and necessary investigations. The diagnoses were subsequently confirmed by the respective consultants and professors involved in the study. Throughout their care, we adhered to established protocols, such as Advanced Trauma Life Support (ATLS), while implementing other available measures. This included the timely administration of fluid resuscitation, blood transfusions, broad-spectrum antibiotics, and tetanus prophylaxis as required. Furthermore, laboratory tests and radiological investigations were conducted based on the clinical needs of the patients to ensure comprehensive care.

Suprapubic cystostomy was done to create a stoma through the abdomen and into the bladder. The main outcome variables of the study included several key aspects related to urogenital trauma cases requiring suprapubic cystostomy. First, the percentage of different types of urogenital trauma cases that necessitated this procedure was carefully analyzed. Additionally, the age distribution among the patients was documented to identify any trends or correlations. The study also considered the sex distribution of the patients to understand demographic factors influencing urogenital injuries. Furthermore, the causes of urogenital trauma were thoroughly examined, contributing to a comprehensive understanding of the issue. The modes of presentation of these injuries were evaluated to gather information on how patients typically seek care. Alongside these factors, the study detailed various procedural problems encountered during the suprapubic

cystostomy and identified immediate postoperative complications that arose during the management process. Lastly, the types of interventions required for managing urethral trauma were recorded to inform future practices

and improve patient outcomes. This thorough approach ensured that all relevant data were collected and analyzed, providing valuable insights into urogenital injuries and their management.

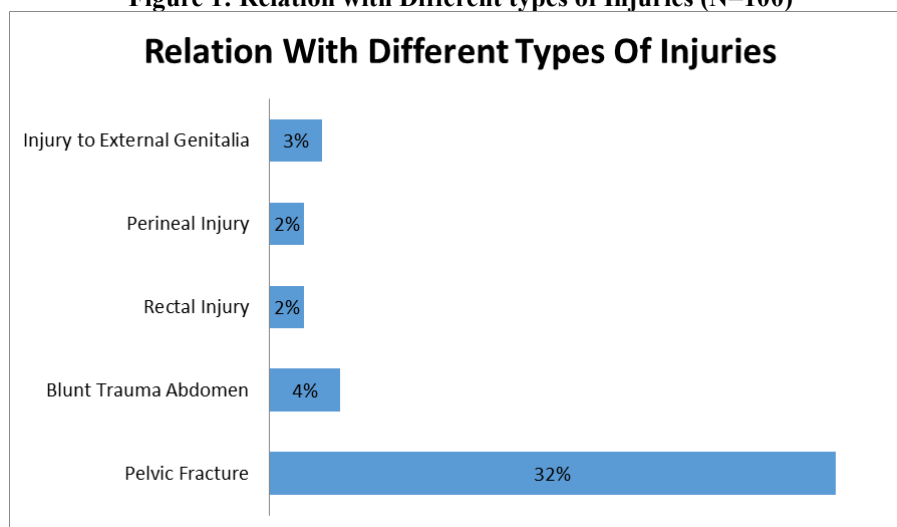
Results

Table 1: Demographic and Clinical Features During Admission of Patients (n=100)

Attributes	No of patients	Percentage
Age Group (Years)		
5-15	6	6
16-30	46	46
31-45	36	36
46-60	8	8
61-68	4	4
Mean± SD=30.27±3.20, Range=10-68		
Sex		
Male	90	90
Female	10	10
Clinical Features		
Symptoms: Pain	100	100
Inability to void	100	100
Signs: Anemia	29	29
Bleeding Per urethra	68	68
Distention of bladder	48	48
Bleeding Per rectum	02	02
Extravasation of urine	17	17
Tenderness at lower abdomen	21	21
Muscle guard at lower abdomen	8	8
Haemodynamic status		
Stable	68	68
Hypotensive	22	22
Shock	10	10
Mode of injury		
Motor Vehicle Accident	55	55
Falling Astride	40	40
During Faulty Catheterization	2	2
Gunshot Injury	1	1
Other Cause	2	2
Visceral Injury		
Urethral Injury	84	84
Bladder Injury	12	12
Concomitant Bladder and Urethral Injury	4	4
Blood Transfusion	38	38

Out of 100 patients, 6% were aged 5 to 15 years, 46% were 16 to 30 years, 36% were 31 to 45 years, 8% were 46 to 60 years, and 4% were 61 years and older. The youngest patient was 10 years old and the oldest was 68, with a mean age of 30.27 years. 90% of the patients were male, and all presented with pain and inability to void. Other symptoms included anaemia in 29 patients, bleeding per urethra in 68, bladder distention in 48, lower

abdominal tenderness in 21, and urine extravasation in 17. Hemodynamically, 68% were stable, 22% hypotensive, and 10% in shock. Injury modes included 55% from motor vehicle accidents and 40% from falls. 84% had urethral injuries, 12% had bladder injuries, and 4% had both. Blood transfusions were needed for 38% of patients (Table 1).

Figure 1: Relation with Different types of Injuries (N=100)

The total 100 patient's 32 percent had pelvic fracture, 4 percent had blunted abdominal trauma, 3 percent had

injury to the external genitalia and 2 percent each had associated genital and rectal injury.

Table 2: Outcome of Suprapubic Cystostomy and Complications (N=100)

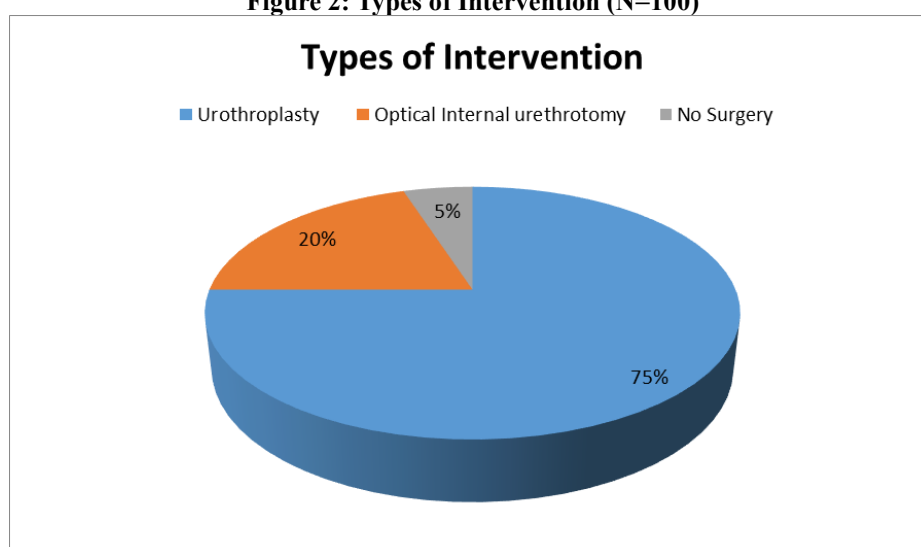
Attributes	No of patients	Percentage
Types of suprapubic cystostomy		
Open method	68	68
Percutaneous method	32	32
31-45	36	36
46-60	8	8
61-68	4	4
Mean± SD=30.27±3.20, Range=10-68		
Type of Anaesthesia		
Local anaesthesia	86	86
General anaesthesia	2	2
Spinal anaesthesia	12	12
Per operative difficulties (n=45)		
Identification of bladder	16	36
Introduction of catheter	11	24
Introduction of catheter into false space	8	18
Inflation of balloon outside the bladder	4	9
Opening up of peritoneum	6	13
Early postoperative complication (n=35)		
Wound Infection	4	11
Haematuria	10	29
Clot Retention	9	26
Leakage of Urine	6	17
Coming out of Catheter	4	11
Peritonitis	2	6
Delayed complications (n=55)		
Wound site Infection	4	7
Excoriation of skin	5	9
Blockage of catheter	4	7

UTI	34	62
Per urethral dribbling	5	9
Psychological Problem	3	6

(Table 2) stated that, in this study of 100 patients undergoing suprapubic cystostomy, 68 procedures were performed using the open method and 38 via the percutaneous method. Most (86%) were done under local anaesthesia, while 2% required general anaesthesia and 12% spinal anaesthesia. Preoperative difficulties were noted in 45 patients, including bladder identification issues (36%), catheter introduction problems (24%), false space insertion (18%), balloon inflation outside the bladder (9%), and accidental opening of the peritoneal cavity (13%). Postoperatively, 36 patients experienced

complications: 11% had wound infections, 29% hematuria, 26% clot retention, and 17% urine leakage. Additionally, 11% had catheters dislodged, and 6% developed peritonitis. At three months follow-up, 55 patients reported late complications, including wound infections (7%), skin excoriation (9%), and catheter blockage (7%). The most common late complication was urinary tract infection (62%), with less common issues like urethral dribbling (9%) and psychological problems (6%).

Figure 2: Types of Intervention (N=100)



The 100 patient's 75 percent patients were advised for urethroplasty and 20 percent patients were advised for

optical internal urethrotomy and only 5 percent patients did not need any surgical intervention.

Discussion

Urogenital injuries are found in 10% to 20% of major trauma patients. While these injuries are rarely life-threatening, improper evaluation and treatment can lead to significant long-term morbidity. They often occur alongside multiple organ injuries, making it essential for emergency physicians to be vigilant. This study examined 100 patients with urogenital injuries treated with suprapubic cystostomy at Dhaka Medical College Hospital, Bangladesh. The patients' ages ranged from 5 to 68 years, with the highest incidence (46%) in those aged 16 to 30, predominantly affecting males (90%) due to their increased risk of trauma. Common symptoms included pain and inability to void, with 68% presenting blood at the external urethral meatus. Most injuries were caused by motor vehicle accidents (55%) and falls (40%), with 84% having urethral injuries. The study noted that suprapubic catheter insertions were mostly performed under local anesthesia (86%), often via an open method (68%). Challenges included locating the

bladder and insertion difficulties, and the high cost of percutaneous equipment limited its use. The mean age in this study aligns closely with findings from other studies in Egypt and Karachi.^{5,9}

A male preponderance (90%) was noted, with a male to female ratio of 9:1, reflecting greater male vulnerability to trauma, particularly in road traffic and machinery accidents. Urethral injuries are predominantly seen in males due to the length and mobility of the female urethra, which rarely sustains injuries outside pelvic fractures. However, intraperitoneal bladder rupture is more common in women, possibly due to thinner bladder wall musculature. A study reported a male incidence of 89.5%.¹⁰ All patients presented with pain and inability to void. Blood at the external urethral meatus was observed in 68%, with 17% showing urine extravasation and 21% experiencing lower abdominal tenderness. A study indicated bleeding per urethra in 74% of patients and inability to urinate in 26%.⁵ In this survey, 10% of

patients were in shock, 68% were stable, and 22% were hypotensive, with 38% requiring blood transfusions. Bladder and urethra injuries rarely cause significant shock alone but often accompany hemodynamic pelvic fractures. A related study found that 52% of pelvic fracture patients had a systolic blood pressure under 90 mm Hg, with 30% needing blood transfusions. All the insertions of suprapubic catheters were done in the operation theater of the Casualty Block. Most (86%) of the procedures were done under local anaesthesia & 12% needed spinal anaesthesia and only 2% patient needed general anaesthesia. Spinal anaesthesia was mainly needed where some form of concomitant injury was present. Those patients requiring general anaesthesia had some form of intraabdominal viscus injury needing laparotomy and were excluded from this study. In this study, 68% of the operations was done by open method & 32% was done by percutaneous method. In the study done by Hasan *et al.*, in Karachi, 82% of the procedures were performed percutaneously and 7% were converted to open method. This is quite different from our study.⁹

In 35 patients some post-operative complications were observed early after operation which include wound infection in 11% of cases, haematuria in 29% cases, clot retention in 26% of cases, leakage of urine in 17%, coming out of catheter in 11% and features of peritonitis in 6% cases which correspond to other studies.^{8, 9} Papanicolaou *et al.*, noticed that by distending the bladder during placement of suprapubic cystostomy catheter, adjacent bladder loops have been displaced superiorly or laterally and are less likely to be injured.¹¹ Patients having urethral injury was followed for 3 months & was found to have some late complications, like wound site infection in 4 patients, excoriation of wound site skin in 5 patients, blockage of catheter in 4 patients, UTI per urethral dribbling in 5 & psychological problem observed in 3 patients.¹⁰ All the complications were managed accordingly & with the help of respective department. Blockage of catheter and gross haematuria was observed in 36% and 5% of patients respectively in a series reported by McDermid *et al.*⁵ and 38% catheter blockage by Barnes *et al.*^{12, 13} All patients with urethral injury were referred to the urology department for treatment. In a study of 88 patients with urethral trauma, 75% were advised to undergo urethroplasty, 20% were recommended for optical internal urethrotomy due to stricture formation, while the remaining patients did not require surgery. Mohammad Abd-alla Elgammel found stricture formation in only 38% of patients, significantly lower than in this study.⁵ Park *et al.*, noted that strictures requiring intervention were high (88% for suprapubic diversion vs. 100% for urethral catheterization).¹⁴ Early suprapubic cystostomy may limit inflammation and reduce stricture severity. A catheter can trigger a foreign body reaction, exacerbating inflammation. Surgery's primary role is to assess the injury extent and divert urine appropriately. Cystourethroscopy can aid in visualizing injuries, though it may not always be feasible in

emergency settings, making suprapubic diversion beneficial. We advised follow-up for the 88 patients in the urology department after three months to assess the need for surgery.

Conclusion

This research shows suprapubic cystostomy is safer, effective emergency procedure. Proper supervision can reduce related complications.

Acknowledgements

We express our appreciation to the participants for their enthusiastic cooperation with this study.

Ethics Approval: Before data collection, both verbal and written informed consent was taken from patients.

Consent for Publication: All authors have approved this manuscript for publication.

Competing Interests: The authors declare that they have no competing interests.

Funding: This research received no funding.

Authors' contributions

NFI, RMM participated in the design of the study, data interpretation and drafted the manuscript. NFI, RMM, FS contributed to the data design, data interpretation and data analysis. NFI, RMM, FS did critical review of the manuscript.

References

1. Vanni AF, Wessells H, McAninch JW. Injuries to the urogenital tract; In: ACS Surgery, Principles and Practices. Edited by Wilmore DW, Cheung LY, Harken AH, Holcroft JW, Meakins JL, Soper Decker Intellectual Properties NJ 2003; p449-453.
2. Dreitlein DA, Suner S, Basler J. Genitourinary Trauma. Emergency Medicine Clinics of North America. August 2001; 19(3): 569-89.
3. Morey AF, Rozanski TA. Genital and lower urinary tract trauma. Chapter 83. In: Campbell-Walsh Urology. Editors- Wein AJ, Kavoussi LR, Novick AC, Partin AW, Peters CA. 9th edition.; Vol 3: p 2658-60.
4. Gary C. Bellaman MD. Transvesical access. Chapter 77. In Smith's Textbook of Endourology. Editors Smith AD, Badlani GH, Bagley DH, Clayman RV, Jordan GH *et al*; Quality Medical Publishers 1996; 1249-54.
5. Elgammal MA. Straddle injuries to the bulbar urethra: Management and outcome in 53 patients. International Braz J Urol 2009; 35(4): 450-58.

6. Waxman D. Basic Medical Skills: Suprapubic Bladder Aspiration or Catheter Placement. Chapter 30: In special operation forces medical handbook, second edition, 2008. P831-832.
7. Salam MA. Suprapubic catheterization. In Principles and Practice of Urology- A Comprehensive Text. MAS Publications 2002; 803-804.
8. Ahluwalia RS, Johal N, Kouriefs C, Kooiman G, Montgomery BSI, Plail RO, 2006, The surgical risk of suprapubic catheter insertion and long term sequelae. Ann R Coll Surg Engl 2006; 88:210-213.
9. Hasan AT, Fashiuddin Q, Sheikh MA. Suprapubic Cystostomy: Urinary tract infection and other short term complications. JPMA 2002; 52: 555-63.
10. Adisa AO. Traumatic Urologic Injuries in Ile-Ife, Nigeria. J Emerg Trauma Shock 2010; (4): 311-313.
11. Papanicolaou N, Pfister RC, Nocks BN. Percutaneous, Large Bore, Suprapubic Cystostomy: Technique and results. American Journal of Radiology 1989; 152: 303-306.
12. Barnes DO, Shaw PJR, Timoney AG et al. Management of neuropathic bladder by suprapubic catheterization. J Urol 1993; 72: 169-72.
13. McDiarmid SA, Arnold EP, Palmer NB et al. Management of spinal cord injured patients by indwelling Suprapubic catheterization. J Urol 1995. 154: 492-94.
14. Park S, McAninen JW. Straddle Injuries to Bulbar Urethra. Management and Outcome in 78 patients. J Urol 2004; 171(2): 722-5.

All corresponds to
Dr. Nadia Farzana Islam
 Assistant Registrar, Casualty Unit 1 Dhaka Medical College Hospital,
 Dhaka