

# AN AUDIT OF GENITOURINARY TRAUMA AT INSTITUTE OF KIDNEY DISEASES PESHAWAR

Liaqat Ali, Faiza Hayat, Nasir Orakzai

Institute of Kidney Diseases (IKD), Hayatabad Medical Complex, Peshawar - Pakistan

## ABSTRACT

**Objectives:** To study the audit of clinical presentation, radiological diagnosis and outcome of Genito-urinary trauma.

**Material & Methods:** It is a descriptive study, conducted in department of Urology at Institute of Kidney Diseases, Hayatabad Medical Complex, Peshawar, Pakistan from January 2009 to May 2017. Total numbers of 183 patients with genitourinary injuries in due course of time was include in the study Genitourinary trauma was diagnosed on history, examination, high index of suspicion, labs and imaging, per-operative findings and even delayed presentation of urological trauma. Data was collected on structured proforma and was analyzed on SPSS.

**Results:** The median age was 32.5 years (range 2-81years). Total number of male patients were 115 (62.8%) while 68 (37%) were female. Total number of 91 (49.7%) patients presented with renal trauma, 9 (5%) patients with ureteric injuries, 29 (15.8%) patients with bladder injuries, 13 (7%) patients with genital trauma and 41 (33.8%) patients presented with urethral trauma. Regarding the etiology of trauma, blunt trauma to abdomen was most frequent cause of renal injuries in 62 patients while 29 patients had penetrating renal injuries. Associated injuries were found in 35 patients; the majority being intestinal and solid organ injuries. The ureteric injuries were mostly iatrogenic 7 out of 9 patients. Regarding bladder injuries in 29 patients, 8 patients suffered blunt trauma, 4 patients had penetrating injuries while 17 patients had iatrogenic bladder injury. We also recorded genital injuries in 13 patients amongst them 7 patients had sexual excess trauma in form of penile fractures, 3 patients had penile amputations while 3 patients had penile skin avulsion injuries. The main cause of urethral trauma in our 41 patients was iatrogenic i.e. in 29 patients. Over all Mortality was recorded in 9 (4.9%) patients out of total 183 patients.

**Conclusion:** Urogenital organs are frequently involved in trauma setting. Renal, Urethral and bladder injuries predominate in overall urological trauma in our setup.

**Key Words:** Urological Injuries, Iatrogenic, trauma, Surgical Audit.

---

**This article may be cited as:** Ali L, Hayat F, Orakzai N. An audit of genitourinary trauma at institute of kidney diseases Peshawar. *J Med Sci* 2018; 26: (1) 58-62.

---

## INTRODUCTION

Trauma is the leading cause of death below 40 years of age across the globe. Millions of dollars are spent each year in management and rehabilitation of patients.<sup>1,2</sup> The catastrophe of natural disasters like October 8, 2005 earthquake in Pakistan, Tsunami and growing level of terrorism in world have established a consensus to develop disaster plans. A team approach is desired to reduce the morbidity and mortality of pa-

tients in emergency situation. Genitourinary trauma is responsible for about 10% of trauma admissions in USA. However beside acute trauma settings, the anatomical variations and anomalies predispose the genitourinary system for iatrogenic injuries.<sup>3,4</sup>

Kidneys are most frequently involved (67%) organ in trauma followed by bladder (18%), genitalia (17%) and urethra (16%)<sup>5,6,7</sup>. Genitourinary injuries are associated with non urological injuries in 59% cases. The majority organs that are involved are solid abdominal viscera like liver and spleen, intestine, mesentery, orthopedic and chest injuries.<sup>8</sup> Management of Urological injuries is a specialized topic, yet several controversies still prevails in management of urological trauma; however most of the controversies have been solved by evolving consensus statement on urological trauma serially published in BJUs.<sup>9,10,11,12</sup> The morbidity and mortality of urological

---

**Liaqat Ali** (Corresponding Author)  
Associate Professor  
Institute of Kidney Diseases (IKD), Hayatabad Medical Complex, Peshawar - Pakistan  
Cell: +92-334-0966665  
Email: liaqat\_99@yahoo.com

**Date Received:** October 26, 2017  
**Date Revised:** January 8, 2018  
**Date Accepted:** February 20, 2018

trauma can be reduced by its prompt diagnosis, timely investigations and treatment. The aim of presenting our audit of genitourinary trauma lies in a fact that we have observed some unusual findings which were contrary to international literature. Moreover we also want to share the experience of healing which is the cornerstone of medical history.

**MATERIAL & METHODS**

This was a Descriptive study, conducted in the Department of Urology, Institute of Kidney Diseases, Peshawar, Pakistan. The study period was from January, 2009 to May, 2017. Total numbers of 183 patients were collected by non probability convenient sampling. We included all the patients with genitourinary trauma; diagnosed on history, examination, high index of suspicion, labs and imaging, peroperative findings and even delayed urological trauma presentation. All the patients fulfilling above mentioned criteria were included in the study. Complete history with special emphasis on impact of trauma, previous history of urological surgery and status of renal functions were carried out in all the patients.

Routine laboratory investigations and conventional ultrasonography were performed in all the cases. The grade and severity of urological injuries were selectively assessed by using Intra venous urography IVU, CT scan, Cystogram, Retrograde pyelography, Antegrade and Retrograde urethrography etc. The patients with penetrating injuries to abdomen and patients who were hemo-dynamically unstable to undergo radiological survey were surgically explored. All the data was collected on structured proforma and was analyzed on SPSS.

**RESULTS**

The median age was 32.5 years (range 2-81 years). Total number of male patients were 115 (62.8%) while 68 (37%) were female. The mean duration of admission in the hospital was 7.4 days with range of 3 to 37 days. The relative distribution of urological injuries are shown in Figure 1 out of 91 patients with renal injury, 62 (68%) patients had history of blunt abdominal trauma mostly due to road traffic accidents in 35 patients, history of row in 13 patients, Natural disaster injury in 10 and history of fall on blunt object in 4 patients; while 29 patients had penetrating injury amongst which 21 had firearm/ Bomb blast injuries and 8 had stab wounds in abdomen.

The grading of blunt renal injuries were possible in 55 patients are shown in Table 1. The remaining 7 patients were haemo-dynamically unstable with associated non renal injuries. Majority of the blunt renal injuries 52 patients were treated conservatively with

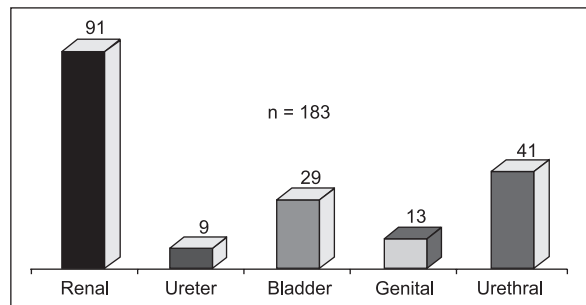


Figure 1: Bar diagram showing distribution of urological injuries

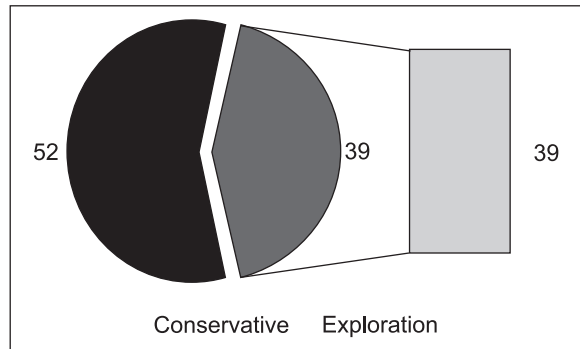


Figure 2: Pie chart showing different treatment modalities for Blunt road trauma

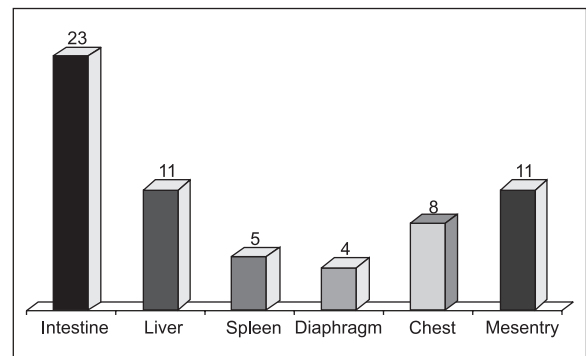


Figure 3: Bar diagram showing non urological injuries associated with renal trauma

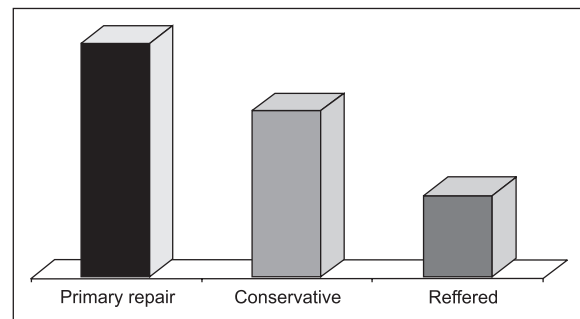


Figure 4: Bar diagram showing different treatment plans for bladder injury

successful recovery in 50 patients especially in grade I, II, III patients. Surgical exploration in form of exploratory laprotomy was performed in 39 patients. As shown

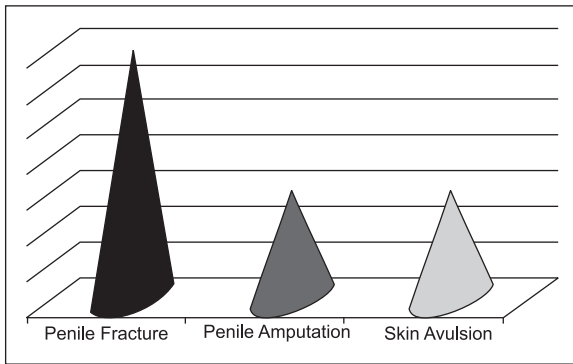


Figure 5: Different patterns of genital injuries in 11 patients

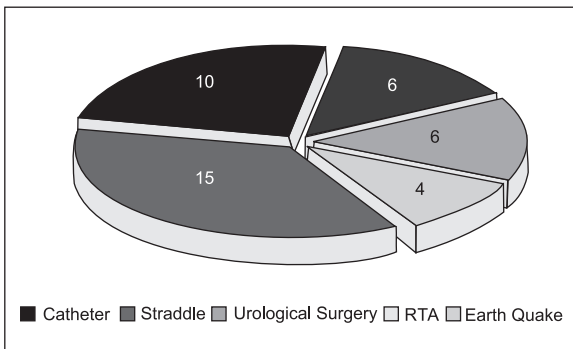


Figure 6: A pie graph showing etiological factors of urethral trauma (n=41)

Table 1: Patient's distribution according to grade of blunt renal trauma (n=55)

Grade	No. of patients and %ages
I	25(45.4)
II	12(21.8)
III	11(20)
IV	05(09)
V	02(3.6)
Total	55(100)

Table 2: Etiology of urinary bladder injuries (n=29)

Etiology	No. of patients
Blunt trauma	8
Penetrating	4
Iatrogenic	17

in graph, 39 patients were explored through mid line incision under general anesthesia. Nephrectomy was performed in 10 patients, while salvage of kidney was achieved in 29 patients. 35 patients had associated non urological abdominal injuries, which are shown in Figure 3.

We also encountered 9 (4.9%) ureteric injuries out of total 183 patients. 2 patients developed ureteric

injuries after inflicting multiple firearm injuries; however iatrogenic trauma was found to be most common cause of iatrogenic trauma i.e. 7 patients. Amongst which 5 patients had history of gynecological surgery, 1 patient developed ureteric injury during right hemicolectomy and 1 patient during abdominoperineal resection for adenocarcinoma rectum. Regarding treatment of ureteric injuries, primary repair over stent was performed in 3 cases; ureteric reimplantation was performed in 4 patients while 2 patients were referred to tertiary care hospital in Peshawar.

We received 29 patients with urinary bladder trauma. The etiology of bladder injuries are shown in Table 2. It was again found in our study that obstetrical trauma was most frequent cause 13 patients out of 17 patients with iatrogenic bladder injuries followed by 2 urological and 2 general surgical operations. The management plans of urinary bladder trauma is shown in Figure 4. We recorded 13 (7.1%) patients with genital trauma. The details of which are shown in Figure 5. Primary repair was performed in all the patients with sexual excess trauma (7 patients). Perineal urethrostomy in 2 patients and primary skin closure in 3 patients.

We received 41 (22.4%) patients with urethral trauma. 15 patients developed urethral trauma after faulty urethral catheterization; amongst which 18 catheterization were performed by paramedical staff while 5 were carried out by house surgeons. 6 patients developed iatrogenic urethral trauma due to urological procedures mainly urethral dilatation by bougies i.e. 4 cases. The details of etiological factors for urethral trauma is shown in Figure 6.

Regarding management of patients with urethral trauma; supra pubic catheterization was performed in 36 patients, while 5 patients had started spontaneous voiding and they were treated conservatively. The 36 patients with supra pubic catheters underwent ante-grade & retrograde urethrogram during third week of their illnesses. We lost 7 patients in follow up, the remaining 29 patients underwent cystourethroscopy & optical urethrotomy which proved to be successful in 25 patients (86.2 %). The remaining 4 patients with blind urethral strictures were referred to specialized centers in Peshawar and Islamabad. Our overall mortality was recorded in 9 (4.9%) patients out of 183 patients. The obvious cause of death was poly trauma in 4 patients, sepsis in 2 patients, duodenal leak in 2 patients and disseminated intravascular coagulation DIC in 1 patient.

## DISCUSSION

Trauma is the leading cause of mortality as well as morbidity all over the world. Genitourinary trauma is usually overlooked in acute trauma setting, usually

other life threatening trauma takes priority in immediate resuscitation and probably this has been the reason that a urologist is not formally member of trauma team and is brought late in management of urological trauma. Yet it is a fact that urological trauma is associated with significant morbidity and even mortality.

The strength of our study is that we are presenting an overall audit of genitourinary trauma from tertiary care hospital of Khyber Pakhtunkhwa. This is probably first study in present setting, moreover very few large sample size audit has been published on this topic in national literature. Although we have presented enormous data on different etiological factors of overall urinary trauma and have tried to encompass different treatment modalities carried out for the management of trauma. The weakness of our study is convenient sampling technique. More over our main data is based upon in-patient status i.e. from date of admission to date of discharge from hospital. Due to poor compliance of patients in proper follow up, we are unable to find long term complications, morbidity and mortality in our patients.

It is hard to decide whether to treat a patient of blunt renal trauma conservatively without surgery or to go for operative management. In a study by Robert and colleagues has stated that in patients with blunt renal lacerations, a careful and closely monitored conservative approach is recommended. An article by French colleagues Al Khader K and Mihidia A that stage 3 renal trauma with urinary extravasation can safely be treated non operatively. Although blunt renal trauma often responds to conservative treatment, some patients should undergo surgery as stated by Italian author in his study on renal trauma management. An analysis on Uro-trauma in Scotland by S.V Bariol and colleagues stated that majority of urological trauma patients have multiple injuries and require multi disciplinary approach.

Trauma and surgical procedures, mostly obstetric are the two main causes of ureteric injuries. Surgery adjacent to or intra ureteric might result in iatrogenic injury to the ureter. These injuries can be trivial with minimum long term sequel or they may cause severe morbidity and inconvenience to the patients, management of ureteric injuries during gynecological procedures — A ten year experience by Panos Sakellariou et al concluded that early recognition of ureteric injury is the key to a successful repair while injuries recognized late can be morbid and complicated. A study published in BJUI by Steven Brandes and Micheal Coburn states that early recognition of ureteric injury and prompt action whether minimally invasive or reconstructive has fruitful outcomes.

Urethral trauma consisting of posterior urethral injuries mostly due to perineal injuries due to any cause and anterior urethral injuries inflicted mainly by inexperienced catheterization and cystoscopy. As with any type of injury, early detection and appropriate surgical management undertaken can avoid future complications. According to Z.F Doborwolski and colleagues presented a data on urethral injuries emphasizing the use supra pubic catheter in post. Urethral injuries and proper training of medical personnel to avoid inappropriate methods of catheterization and students to follow principles of cystoscopy. Authors from UK carried out a survey of current practice for management of urethral trauma caused by pelvic fractures quoted that pelvic fracture associated urethral injuries are rare and the management differs depending upon expertise.

Male external genitalia injury though rarely life threatening needs prompt planning to minimize sexual and psychosocial stress to the patient. Alicia M. Mohar and fellows in a study with 10 year duration classified injuries to external genitalia by AAST. Penile scrotal injuries were mostly treated non operatively and in some patients orchiectomies were done. However on follow up no complication as infertility or impotence were noted.

Future implications of this study can be proved helpful to urologists, general and trauma surgeons. Statistical data and various references added strengthen our study in terms of applications of various conservative and operative approach in a patient with trauma.

## CONCLUSION

Revel urethral and bladder injuries were commonly seen in urological trauma in this setup.

## REFERENCES

1. McAninch JW, Santucci RA. Genitourinary injuries. In: Walsh, Retik, Vaugh, Wein eds, Campbell's Urology, 8th edn, Vol.IV. Chapt 105. Saunders: Elsevier Science, 2002: 3707.
2. Bain IM, Kirby RM, Cook AL, Oakley PA, Templeton J. Role of the general surgeon in a British trauma centre. *Br J Surg* 1996; 83:1248-51.
3. "Accidents" The Health of the Nation. Department of Health, London: HMSO, 1992: 102-15.
4. Srinivasa R, Akbar S, Jafri S, Howells G. Genitourinary trauma: a pictorial essay. *Emerg Radiol*. 2008;85-87.
5. Hammer CC, Santucci RA Effect of institutional policy of non-operative treatment of grade I to VI renal injury. *J Urol* 2003;169:1751-53.
6. Härkki-Sirén P, Sjöberg J, Tiitinen A. Urinary tract injuries after hysterectomy. *Obstet Gynecol*. Jul 1998;92(1):113-18.

7. Elliott SP, McAninch JW. Ureteral injuries from external violence: the 25-year experience at San Francisco General Hospital. *J Urol*. Oct 2003;170(4 Pt 1):1213-16.
8. Beard D, Henry JM, Grant PT. National audit of the management of injured patients in 20 Scottish hospitals. *Health Bulletin* 2000; 58:118-26.
9. Santucci RA, Wessells H, Bartsch G, Descotes J, Heyns CF, McAninch JW, Nash P, Schmidlin F. Evaluation and management of renal injuries: consensus statement of the renal trauma subcommittee BJU Int. 2004 May;93(7):937-54.
10. Gomez RG, Ceballos L, Coburn M, Corriere JN Jr, Dixon CM, Lobel B, McAninch J. Consensus statement on bladder injuries. *BJU Int*. 2004 ; 94(1):27-32.
11. Morey AF. Consensus statement on urethral trauma. *J Urol* 2005;174 (3):968-69.
12. Allen F. Morey, Michael J. Metro, Kenneth J. Carney, Kennon S. Miller and Jack W. McAninch. Consensus on genitourinary trauma: external genitalia. *BJU Int* 2004;94( 4 ):507-15.
13. Meyer T, Rasmussen L, Lund L, Quist N. Blunt kidney trauma in children, Article in Danish.
14. Annital Chir conservative versus non conservative treatment of renal blunt injury- article in Italian *Ungania S1*.2003;74(4)445-52.
15. Robert M, Drianno N, Muir G, Delboso, Guiter J. Management of major blunt renal laceration:surgical and non operative approach. *European urology* 1996:30(30):335-39.
16. El Khader K, Mhida A,Ziade J, Patard JJ, Guille F, Lobel B. Conservative treatmentof stage 3 kidney injury. *Act a Urology Belgium*.1998:66(4)25-28.
17. Richard A Santucci, Bradely Fields, Schwartz. Urethral trauma, Feb 2017.
18. JP Blandy, DF Badenoch, CG Fowler, BJ Jenkins, N.W.M Thomas. Early repair of iatrogenic injury to the ureter and bladder after gynecological surgery. 1991:46(3)761-65.
19. Panos Sakellariou, Anthanasios G, Protopapasb, Zannis Voulgaris. European journal of obstetrics and Gynae and reproductive biology. Management of ureteric injury during gynecological operation-10years experience. 2002:101(2)179-84.
20. Steven Brandes, Micheal Coburn, noel Armewakas, Jack Mc Anninch. Diagnosis and management of ureteric injuries. An evidence based analysis. 2004 BJUI.
21. Z.F.Dobrowolski, W.Weglarz, P.Jakubila, W.Lipzynski, B.Dobrowolska. Treatment of posterior and anterior urethral trauma. 2002, BJUI.
22. Daniela E Andrich, Tamsin J Greenwell, Anthony R Mundy. Treatment of pelvic fracture related urethral trauma. A survey of current practice in UK. 2005, BJUI.
23. Alicia M.Mohar, Annette M. Pham, Robert.F.Lavery, Ziad Sitri, Vladislav Bargman, David H.Livingston. Management of trauma to male external genitalia-The usefulness of American Association for Surgery of trauma organ injury scales. 2003:170(6) 2311-15.

**CONFLICT OF INTEREST:** Authors declare no conflict of interest

**GRANT SUPPORT AND FINANCIAL DISCLOSURE NIL**

#### **AUTHOR'S CONTRIBUTION**

Following authors have made substantial contributions to the manuscript as under:

**Ali L:** Main Idea.

**Hayat F:** Statistical, bibliography.

**Orakzai N:** Overall supervision.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.