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Original Research Article

A Study on Analysis of Urological Injuries in Blunt Injury Abdomen

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Abstract

Aims: To study the various modes of injury, presentationand other distributions of urological trauma patients.

Materials and Methods: This is a prospective study of various aspects of Urological Trauma encountered in 32 numbers of cases have been recorded in the study.All patients aged from 12 to 70 yearspatients admitted with blunt injury abdomen above 12 yrs patients having clinical, radiological evidence of urological injuries in blunt injury abdomen and intaoperative evidence of urological injuries in blunt injury abdomen.

Results: The commonest cause of genitourinary tract injury is due to road traffic accident. Males are more often affected by road traffic accident than females due to their outdoor nature of work. Middle aged patients are the victims when compared to either extremes of age. Most common injury to the genitourinary system is lower urinary tract injury. Among these, urethral injury is most common and it is commonly associated with pelvic bone fracture. Hemodynamically unstable patients are most commonly associated with other intra abdominal visceral organ or vascular injury.

Conclusions: Early resuscitation and laparotomy along with methodical exploratory technique is essential for penetrating injuries and blunt injuries. Investigations such as X ray, CT scan and blood tests are useful to diagnose urological trauma.

Keywords: Urological Trauma, Resuscitation, Laparotomy, Penetrating injuries, Blunt injuries.

Introduction

Trauma is evolving as the leading cause of death in the world. It is also a major mortality next to coronary artery disease in India. Urological trauma victims due to various modes of injury like RTA, penetrating injury, blunt injury, accidental fall and others. The initial evaluation of the patient to know about the mechanism of injury and its extent. Early resuscitation is needed to improve the outcome. The signs and symptoms of urological trauma is often masked by associated injuries and hence requires, careful and repeated evaluation. [1,2,3]

Urological trauma accounts for 10% of total trauma and trauma is currently the sixth leading cause of death in the world. Advancement of Radiological imaging helps to evaluate the patient needed for intervention.[4,5]In present study the various modes of injury, their presentation, age, sex, etiology, associated injuries, investigation tools for diagnosis, various treatment patterns, prognosis and other distributions of urological trauma patients were studied.

Materials and Methods

This is a prospective study of various aspects of Urological Trauma encountered in during the period of December 2019 October 2020. 32 numbers of cases have been recorded in the study.

Inclusion Criteria

All patients aged from 12 to 70 years patients admitted with blunt injury abdomen above 12 yrs patients having clinical, radiological evidence of urological injuries in blunt injury abdomen and intaoperative evidence of urological injuries in blunt injury abdomen.

Exclusion Criteria

Age group below 12 yrs

All the data's from the time of presentation of urinary tract injuries, to the definitive surgical treatment have been collected and processed in the form of tabular columns. Various aspects of Urological Trauma are discussed in the study including their presentation, evaluation and management. The time intervals between sustaining of injury and that of admission have been noted and their significance also studied.

The various modes of injury causing Urological Trauma and their surgical treatment were studied. The hemodynamic status and associated injuries were assessed and noted and they are managed accordingly. Routine biochemical testing for sugar, urea, creatinine and hemoglobin estimation was done for all patients prior to surgery. Radiological evaluation of the patient to rule out the associated injuries has been done.

Results

In our study 102 cases admitted with history of blunt injury abdomen. Among them 32 cases were Urological Trauma and other cases are with bowel injury, spleen injury, liver injury, retroperitoneal hematoma and pelvic bone fractures treated accordingly. Out of 32 cases of urological trauma 28 patients were Males and 4 patients were Female. Among these 11 patients met with upper urinary tract injury, 13 patients met with lower urinary tract injuries and 3 Patients met with genital injury and 1 patient met with both upper and lower urinary tract injury.

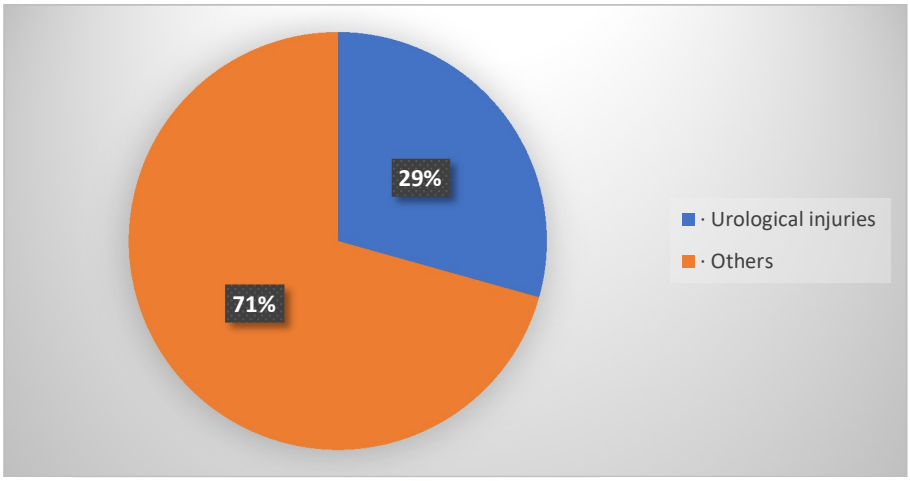

Figure 1:

Table 1: Incidence and sex distribution of urological trauma

Organ	Male	Female	Total	Percentage
Kidney	9	2	11	34.375
Ureter	-	-		0
Bladder	6	-	6	18.75
Urethra	10	-	10	31.25
Genitalia	4	-	4	12.5
Combined	1	-	1	3.125
Total	30	2	32	100
Percentage	93%	7%	100	

According to our data, 11 patients had renal injury, of all 5 patients had isolated renal injury, one patient had associated splenic injury and 3 other patients had associated liver and chest injury and other 2 patients had polytrauma. The mode of injury in most of patients is road traffic accident and accidental fall.

Table 2: Causes of renal injury

Mode of injury	No of cases
Road traffic accident	9
Accidental fall	1
Wall collapse	-
Total	10

All the ten cases were received in our Emergency department within 24 hrs of sustaining injury. Among them few cases were presented with severe abdominal pain, distension, hematuria and urinary retention. In our study, five patients had bladder injury. Three patients were due to Road traffic accident, among of them, two cases associated with pelvic bone fracture. Another one case was due to wall collapse

Table 3: Causes of bladder injury

Organ Injured	Mode of Injury	No of Cases
Bladder	Road traffic accident	3
Bladder	Accidental fall	1
Bladder	Wall collapse	1
Total		5
COMBINED(bladder and renal)	Accidental fall	1

Figure 2: Contrast CT– intra peritoneal rupture of bladder

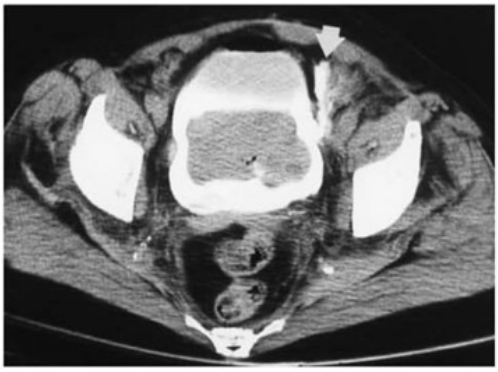

Figure 3: Contrast CT – extra peritoneal rupture of bladder

Figure 4: Rupture Bladder

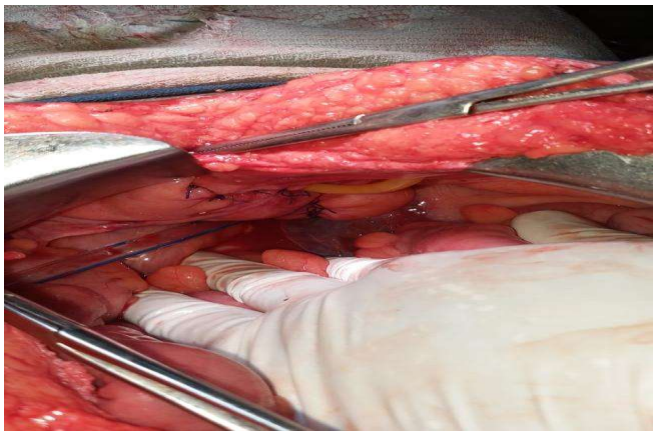

Figure 5: Bladder repair done

One patient had both bladder and renal injury due to accidental fall.

One patient admitted with abdominal pain, hematuria, urinary retention, abdominal distension, had a history of accidental fall .Emergency CT and USG taken it showed fat stranding.

present in the pelvic region patient proceeded with emergency laparotomy and intraoperative findings were blood stained fluid present in the peritoneal cavity and tear in the posterior wall of the bladder. All other solid organs were normal. bladder closed in two layer with open SPC and foleys catheter. peritoneal lavage done, DT kept. wound closed in layer. Another case due to road traffic accident associated with pelvic bone fracture had abdominal distension, guarding, rigidity and hemodynamic instability, hematuria. Patient resuscitated with blood transfusion and IV fluids. Emergency ultrasound showed hyper echoic collection in the bladder and peritoneal cavity. During emergency laparotomy, blood in the peritoneal cavity aspirated and found 4cm tear in the doom of the bladder which is closed in two layers along with SPC and Foley's catheterization. Post operative clear urine drained. Patient managed by orthopedician for pelvic bone fracture. Both the patients managed postoperatively with IV fluids, Ryle's tube aspiration, antibiotics, analgesics and discharged after voiding clear urine. In our study, 8 patients had urethral injury. All cases were male, mode of injury follows; Out of 10 cases of urethral injury, 7 cases were managed with supra pubic cystostomy initially and 3 cases managed with gentle catheterization. Evaluation of urethra by retrograde urethrogram after stabilization of pelvic bones, urethroplasty reconstruction done in 3 cases later. Other cases managed with optical internal urethrotomy.

In our study, 4 patients had genital injury. All of them were male. Among these patients 3 patients had penile hematoma, 1 patient had scrotal injury with retracted testis, penile laceration.

Among these three, one patient had buck's fascia tear and penil hematoma, sutured and hematoma treated conservatively. The another patient due to RTA and had swelling in the right inguinal region with penile laceration and empty scrotum on right side.Inguinal region explored and testis found to be in the right inguinal region and right orchidopexy done,penile laceration sutured. Patient voids urine freely in post operative period.

Discussion

Ureteral injuries resulting from blunt trauma areuncommon and represent less than 1% of all traumaticgenitourinary injuries [6]. Bilateral ureteral injuries haveonly been previously reported in 10 cases [6,7,8,9,10,11,12,13].According to the National Trauma Data Bank (2002-2006), ureteral injuries are seen in approximately 3 per10,000 trauma admissions and occur less often in blunttrauma than in penetrating trauma [14,15,16] The current study includes, the observation made in 32 cases of Genitourinary trauma patients admitted in our hospital. In our study, most commonly affected were fourties of about 33.3%.Teens, twenties, thirties were about 18.5 % affected each. The male and female ratio was 26:2 i.e., 93% of cases were male and 7% of cases were female. The increased incidence of male is probably due to the outdoor nature of their occupation and aggressive behavior in male.

The age distribution shows that males of age between 41-50 years exhibit maximal number of cases, which is most commonly due to Road traffic accidents and accounts for 70% of cases. Followed by accidental fall this accounts for 18.5% of cases and train traffic accident accounts for 7.5% and wall collapse accounts for 4% of cases urological injuries associated with other injuries 52% only uroloical injuries 48% Regarding the organs injured in the genitourinary system kidney is most commonly injured, this accounts for 37% of cases followed by urethral, bladder, external genitalia this accounts for 29.5%, 18.5%, 11% respectively.

In this study, all the cases were admitted in our hospital emergency ward within 24 hours of injury. At the time of admission only five cases were hemodynamically unstable, this accounts for 18.5% of cases. They were managed by resuscitation and surgery .these unstable patients were associated with visceral organ injury and vascular injury. The hemo dynamically stable patients accounts for 81.5% of cases. These cases were most commonly associated with pelvic bone fractures. It accounts for 37% of total cases. These patient most commonly had urethral injury.

Regarding renal injuries blunt injury is more dangerous. Hematuria is most common presentation. Decision to operate is mainly based on CT abdomen. CECT is investigation of choice. Our foremost aim in surgery for renal trauma is to preserve as much as renal tissue as possible. Nephrectomy rate in our study was 7.5%.

When compared to upper urinary tract injuries lower urinary tract injury is most common due to road traffic accidents which are most commonly associated with pelvic bone fractures. Cystogram is most valuable in diagnosing bladder injury followed by CT cystogram which demonstrates site, size and displacement of the bladder resulting from pelvic hematoma. Closure of the bladder wall with vicryl suture material. In urethral injuries diagnostic catheterization is strongly condemned except single gentle catheterization. Retrograde urethrogram is the safest and simplest procedure to provide a diagnosis of urethral injury. With the development of end viewing endoscope, the approach to investigating rupture of urethra has been completely changed. Turner and Wardwick recommend complete excision of para urethral fibrosis in initial reconstruction procedures. Urethroplasty done in after three months. Genital injuries are rare due to its mobility. [17]

Caparo et al [18] studied the trauma panels' tests such as sodium, glucose, white blood cell (WBC) count, hematocrit, platelets, prothrombin time, activated partial thromboplastin time, aspartate aminotransferase (AST), alanine aminotransferase (ALT), amylase, lipase, and urinalysis in pediatric patients with blunt trauma.

Conclusion

The commonest cause of genitourinary tract injury is due to road traffic accident. Similar to many large series males are more often affected by road traffic accident than females due to their outdoor nature of work. Middle aged patients are the victims when compared to either extremes of age. Most common injury to the genitourinary system is lower urinary tract injury. Among these, urethral injury is most common and it is commonly associated with pelvic bone fracture. Hemodynamically unstable patients are most commonly associated with other intra abdominal visceral organ or vascular injury. Early resuscitation and laparotomy along with methodical exploratory technique is essential for penetrating injuries and blunt injuries. Investigations such as X ray, CT scan and blood tests are useful to diagnose urological trauma.

References

1. Djakovic N, Plas E, Martínez-Piñeiro L, et al. Guidelines on Urological Trauma. Arnem, the Netherlands: European Association of Urology: 2009. Mar, Accessed August 3, 2011.
2. Avey G, Blackmore CC, Wessells H, et al. Radiographic and clinical predictors of bladder rupture in blunt trauma patients with pelvic fracture. AcadRadiol. 2006;13:573–579.
3. Carroll PR, McAninch JW. Major bladder trauma: mechanisms of injury and a unified method of diagnosis and repair. J Urol. 1984;132:254–257. [PubMed] [Google Scholar]
4. Flancbaum L, Morgan AS, Fleisher M, Cox EF. Blunt bladder trauma: manifestation of severe injury. Urology. 1988;31:220–222.
5. Sandler CM, Goldman SM, Kawashima A. Lower urinary tract trauma. World J Urol. 1998;16:69–75.
6. Sabzghabaei A, Shojaee M, Safari S, Hatamabadi HR, Shirvani R. The Accuracy of Urinalysis in Predicting Intra-Abdominal Injury Following Blunt Traumas. Emerg (Tehran). 2016 Winter;4(1):11-5.
7. Ainsworth T, Weems WL, Merrell WH: Bilateral ureteral injury due to non-penetrating external trauma. J Urology 1966, 96:439-42.
8. Boston VE, Smyth BT: Bilateral pelviureteric avulsion following closed trauma. Br J Urol 1975, 47:149-51.
9. Drago JR, Wisnia LG, Palmer JM, et al:Bilateral ureteropelvic junction avulsion after blunt abdominal trauma. Urology 1981, 28:169-71.
10. Elliot SP, McAninch J: Ureteral injuries from external violence: the 25-year experience at San Francisco General Hospital. J Urology 2003, 170:1213-6.
11. Lowe P, Hardy BR: Isolated bilateral blunt renal trauma with pelviureteric disruption. Urology 1982, 29:420-2.
12. Siram SM, Gerald SZ, Greene WR, et al:Ureteral trauma: patterns and mechanisms of injury of an uncommon condition. Am J Surg 2010, 199:566-70.
13. Smedley FH, Kerwin R, MacFarlane DA, et al:Bilateralpelviureteric rupture following blunt injury. Injury 1986, 17:59-60.
14. White MA, Kepros JP, Zuckerman LJ: Bilateral partial ureteropelvic junction

disruption after blunt trauma treated with indwelling ureteral stents. Urology 2007, 69:e15-e7.
15. Yagi H, Igawa M, Shiina H, et al:Bilateral upper ureteric disruptions caused by a traffic accident. Injury 1999, 30:221-3.
16. Johnson JM, Chernov MS, Cloud DT, et al:Bilateral ureteral avulsion. J PediatrSurg 1972, 7:723.
17. Smith TG 3rd. Current management of urethral stricture disease. Indian J Urol. 2016 Jan-Mar;32(1):27-33.
18. Capraro AJ, Mooney D, Waltzman ML. The use of routine laboratory studies as screening tools in pediatric abdominal trauma. PediatrEmerg Care. 2006;22(7):480–4.