

FIVE YEARS CHARACTERISTIC OF URETHRAL TRAUMA IN TERTIARY HOSPITAL IN WEST JAVA FROM 2013-2017

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ABSTRACT

Objective: In this study, we try to describe the characteristics of patients with urethral trauma in Hasan Sadikin Hospital Bandung from 2013 to 2017. **Material & Methods:** The data were taken retrospectively from medical records in the Department of Urology with the permission of the ethical committee. The patient characteristics were then classified according to their age, etiology of trauma, location of trauma, grade of trauma, associated trauma, and initial management. **Results:** The number of trauma cases in Hasan Sadikin Hospital during 2013-2017 was 20.489, 477 of which (2.33%) were urogenital trauma. Of the total urogenital trauma, there were 124 patients with urethral trauma, male patients were more common (84.67%), with an average age of 34.67 (1-82) years. Seventy two patients (58.06%) were iatrogenic trauma (catheter instrumentation 44.35%, circumcision 6.45%, and others 7.25%), and fifty two patients (41.94%) were non-iatrogenic trauma (traffic accident 31.45%, falls from a height 7.25%, and occupational accident 3.22%). In non-iatrogenic trauma group, 40 patients (76.92%) had posterior urethral trauma and 12 patients (23.08%) had anterior urethral trauma. We found 22 (42.31%) of 52 patients with non-iatrogenic trauma were AAST grade I-II and 30 patients (57.69%) were AAST grade III-V. In patients with posterior urethral trauma, 25 patients (62.5%) had pelvic fractures. There were 10 patients (19.23%) who underwent primary endoscopic realignment within the first 72 hours while 30 patients (57.69%) underwent delayed urethroplasty 3 months after trauma, and the rest (23.08%) were treated conservatively. **Conclusion:** Urethral trauma in males occurs more frequently than in females, with the most common cause were catheter instrumentation (iatrogenic) and traffic accidents (non iatrogenic). Posterior urethral traumas had higher incidence than anterior urethral traumas, which were commonly associated with pelvic fractures.

Keywords: Urogenital, trauma, urethra, characteristics.

ABSTRAK

Tujuan: Pada studi ini kami mencoba mendeskripsikan karakteristik pasien trauma urethra di Rumah Sakit Hasan Sadikin Bandung sejak tahun 2013-2017. **Bahan & Cara:** Penelitian ini bersifat retrospektif, dengan pengumpulan data dari rekam medik dan status khusus di bagian bedah urologi dengan persetujuan komite etik. Karakteristik pasien dikelompokkan berdasarkan usia, etiologi trauma, lokasi trauma, grading trauma, trauma yang menyertai serta tatalaksana awal. **Hasil:** Jumlah trauma di RSHS selama 2013-2017 sebanyak 20.489 kasus, 477 kasus (2.33%) diantaranya adalah trauma urogenital. Dari total trauma urogenital, terdapat 124 pasien dengan trauma urethra, dimana pasien laki-laki lebih banyak (84.67%), dengan usia rata-rata adalah 34.67 (1-82) tahun. Sebanyak 72 pasien (58.06%) merupakan trauma iatrogenik (instrumentasi kateter 44.35%, sirkumsisi 6.45% dan lainnya 7.25%), dan 52 pasien (41.94%) merupakan trauma non iatrogenik (kecelakaan lalu lintas 31.45%, jatuh dari ketinggian 7.25%, kecelakaan kerja 3.22%). Dari 52 pasien trauma non iatrogenik, terdapat 40 pasien (76.92%) merupakan trauma urethra posterior dan 12 pasien (23.08%) merupakan trauma urethra anterior. Kami menemukan sebanyak 22 dari 52 pasien (42.31%) mengalami trauma uretra AAST grade I-II dan 30 pasien (57.69%) dengan trauma uretra AAST grade III-V. Pada pasien dengan trauma uretra posterior, kami menemukan sebanyak 25 dari 40 pasien (62.5%) mengalami fraktur pelvis. Terdapat 10 pasien (19.23%) yang menjalani primary endoscopic realignment dalam 72 jam pertama sedangkan 30 pasien (57.69%) menjalani operasi delayed urethroplasty 3 bulan setelah trauma, lainnya konservatif (23.08%). **Simpulan:** Trauma urethra laki-laki terjadi lebih sering daripada wanita, dengan penyebab tersering adalah instrumentasi kateter (iatrogenik) dan kecelakaan lalu lintas (non iatrogenik). Trauma urethra posterior memiliki insidensi lebih tinggi dibandingkan trauma uretra anterior, dimana lebih sering disertai dengan adanya fraktur pelvis.

Kata Kunci: Urogenital, trauma, uretra, karakteristik.

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INTRODUCTION

Trauma is the sixth leading cause of death worldwide, accounting for approximately 10% of all deaths. From all trauma types, urogenital trauma accounted for 5% of all traumas. Lower rib fractures may be associated with kidney trauma and pelvic fracture may happen concurrently with bladder and urethral trauma. Among all types of urogenital trauma, urethral trauma accounted for 4% of urogenital traumas.^{1,2} Although uncommon, the increasing incidence of traffic accidents had also increased the incidence of urethral trauma. According to its location, urethral trauma is divided into anterior and posterior urethral trauma. According to its cause, urethral trauma is divided into iatrogenic and non-iatrogenic urethral trauma.¹⁻³

Urethral injuries occur frequently as a complication in pelvic trauma and about 24% of pelvic trauma had a concurrent urethral injury.⁴ According to gender, urethral injuries occurred in approximately 10% males and 6% females with pelvic fracture.² Geographically, urethral trauma occurrences were significantly higher in the United States and Europe (20%) compared to Asia, the Middle East, and Mediterranean (3%) regions. The difference may be caused by different trauma etiologies in the United States and Europe compared to Asia.⁵⁻⁷

The cause of urethral trauma is grouped as iatrogenic and non-iatrogenic causes. Iatrogenic urethral trauma may be caused by transurethral catheterization, transurethral surgery, surgical treatment of prostate cancer, radiotherapy in prostate cancer, major surgery of pelvis, and cystostomy.³

Non-iatrogenic urethral trauma may be caused by traffic accidents, falling from heights, or work-related accidents. Anterior pelvic ring or pubis symphysis fracture is almost always associated with urethral trauma.² Generally, non-iatrogenic traumas may be caused by blunt trauma (traffic accidents, falling, perineal traumas), sexual intercourse (penile fracture, intraluminal stimulation of urethra), penetrating trauma (gunshot wounds, stab wounds, dog bites, penile amputation), and constriction (paraplegics). Iatrogenic traumas may be caused by endoscopic instrumentations, catheter insertion, or urethral dilators. Urethral trauma can also be grouped into anterior and posterior urethral trauma according to its location.^{2,3,8}

American Association for Surgery and Trauma (AAST) has made a grading system for urethral traumas. The AAST grading stages are

grouped according to the size and length of urethral rupture. There are 5 grades of urethral trauma: Type I – contusion, type II – stretch injury without urethral rupture, type III – partial rupture of urethra, type IV – complete urethral rupture with the length of rupture < 2 cm, and type V – complete urethral rupture with the length of rupture > 2 cm. Grade I and II traumas accounted for 25% of urethral trauma cases, grade III in 25%, and grade IV and V accounted for 50% of cases.^{3,9,10}

Urethral trauma may cause several complications, such as erectile dysfunction, recurrent stenosis, and incontinence.¹⁻² Etiology of erectile dysfunction on urethral trauma patients are varied and multifactorial. Erectile dysfunction may be caused by cavernous nerve injury, arterial insufficiency, venous leak, and direct trauma to corporal bodies. Other factors such as symphysis pubis diastasis and lateral displacement of the urethra may cause erectile dysfunction. Although urethral trauma may not directly cause mortality, several comorbidities may occur if not properly managed, such as stricture, incontinence, and erectile dysfunction that may affect the patient's quality of life negatively.¹⁻³

OBJECTIVE

In Indonesia, the epidemiology of urethral trauma is not yet known clearly. The study aimed to describe the characteristics of patients with urethral trauma in Tertiary Hospital in West Java.

MATERIAL & METHODS

The data were analyzed using IBM SPSS V.25. This study design was retrospective descriptive study. The data source of the study was collected from medical records of patients with urethral trauma in the Department of Urology Hasan Sadikin General Hospital from January 2013 – August 2017. All patients with urethral trauma were included in the study and then divided into several categories.

The inclusion criteria were patients admitted to the emergency unit of Hasan Sadikin General Hospital or consulted from other departments diagnosed with urethral trauma from January 2013 – August 2017. The exclusion criteria were patients who had received definitive treatment for urethral trauma from other hospitals, patients that had refused definitive treatment or had force hospital discharge.

RESULTS

The trauma cases in RSHS during 2013–2017 were 20.489 cases, 477 cases (2.33%) were urogenital trauma. From all urogenital traumas, there were 124 cases of urethral trauma with the majority of patients were male (84.67%) with mean age of 34.67 (1–82) years.

There were 72 patients (58.06%) presented with iatrogenic trauma (catheter instrumentation 44.35%, circumcision 6.46%, and others 7.25%) and 52 patients presented with non-iatrogenic trauma (traffic accidents 31.45%, fell from heights 7.25%, work-related accidents 3.22%). From 52 patients with non-iatrogenic trauma, there were 40 patients (76.92%) had posterior urethral trauma and 12

patients (23.08%) had anterior urethral trauma.

We have found that 22 of 52 patients (42.31%) had urethral trauma AAST grade I–II and 30 patients (57.69%) had urethral trauma AAST grade III–V. On patients with posterior urethral trauma, we have found that 25 of 40 patients (62.50%) had a pelvic fracture.

Initial management of posterior urethral trauma without fracture was percutaneous cystostomy on 13 patients (86.6%) and urethral catheter insertion on 2 patients (13.33%). There were 10 patients (19.23%) that had primary endoscopic realignment in the first 72 hours and 30 patients (57.69%) had delayed urethroplasty 3 months after the initial trauma with the rest of the patients treated conservatively (23.08%).

Table 1. Characteristics of urethral trauma.

	Frequency	Percentages
Gender		
Male	105	84.67%
Female	19	15.33%
Age (Mean 34.67 ± 19.28 year)		
<21	28	22.58%
21–55	69	55.65%
>55	27	21.77%
Etiology		
Traffic accidents	39	31.45%
Falling from heights	9	7.25%
Work-related accident	4	3.22%
FC insertion	55	44.35%
Circumcision	8	6.45%
Others	9	7.25%
Trauma location		
Anterior	23.08%	31.45%
Posterior	76.92%	7.25%
AAST Grade		
Gr I-II	22	42.31%
Gr III-V	30	57.69%
Pelvic Fracture (posterior urethral trauma)		
With fracture	25	62.50%
Without fracture	15	37.50%
Initial management		
Percutaneous cystostomy	13	86.67%
Urethral catheter	2	13.33%
Definitive treatment		
Primary endoscopic realignment	10	19.23%
Delayed anastomosis	30	57.69%
Conservative	12	23.08%

DISCUSSION

Blunt trauma at the anterior urethra is most commonly associated with spongiosum contusion which complicates the determination of surgical borders during urethral debridement during acute phase management. Early urethroplasty is not recommended to anterior urethral blunt trauma. The therapy of choice for this kind of trauma is the suprapubic diversion of urine or realignment of the urethra through endoscopy with transurethral catheterization (PER / primary endoscopic realignment). Urinary diversion can be conducted after 2 weeks for partial anterior urethral blunt trauma and 3 weeks for complete urethral blunt trauma.¹¹⁻¹³

On posterior urethral trauma, the initial assessment and differentiation of partial or complete rupture are essential before initiating any treatment. There are several categories for the time of surgical intervention: Early (<48 hours after injury), Delayed (2 days–2 weeks after injury), Postponed (>3 months after injury).^{3,11,12}

Suprapubic catheter insertion is the best solution in emergencies. However, suprapubic catheter insertion is not without risks, especially on unstable trauma patients often presenting with displaced bladder due to pelvic hematoma or poor filling of the bladder due to hemodynamic shock or bladder injury. The suprapubic catheter may be inserted with or without ultrasound guidance.^{3,13}

Partial trauma of the posterior urethra may be managed with suprapubic or urethral catheter insertion. Urethrography must be performed in intervals of 2 weeks after trauma until complete recovery. This type of trauma may completely heal without scar or obstruction after treatment with urine diversion.^{3,13,14}

If a stricture does occur after trauma, however, it can be managed by internal urethrotomy if short and not obliterative, anastomotic urethroplasty if long and obliterative. For complete posterior urethral trauma, there are several choices for definitive treatment, such as immediate reanastomosis (PER) (approximation of urethral edge with catheter) and immediate urethroplasty (suture closure of urethral edges).^{2,3,11}

Due to high rates of impotence (56%), incontinence (21%), and stricture (69%), urethroplasty is not recommended and may only be performed by centers and surgeons experienced with the procedure.³⁻⁴ Another possible complication is uncontrollable hemorrhage on pelvic hematoma that may cause profuse bleeding.¹¹

With no immediate indication for exploration, posterior urethral trauma may be managed primarily in outpatient settings. Delayed primary realignment required placement of suprapubic catheter during the acute phase of injury management. Endoscopic-guided realignment may be performed in 14 days (before the formation of fibrosis) after the patient has stabilized and the majority of pelvic bleeding has healed. The aims and benefits from delayed primary realignment are identical with immediate urethral realignment.^{11,14}

Delayed primary urethroplasty may be performed in less than 14 days after the injury before the formation of fibrosis. If successful, the time-consuming suprapubic diversion may not be needed. The procedure, however, is generally not recommended due to lack of experience in performing it.^{3,15}

According to the study, we have discovered that the majority of urethral trauma patients in Hasan Sadikin General Hospital were mostly males, consisted of 84.67% of cases. The findings were concurrent with available literature that had suggested the incidence of urethral trauma was lower in females due to its anatomically shorter length of the female urethra and the location of urethra that may reduce the effect from concurrent pelvic fracture.²

From the age distribution, most of the urethral trauma patients were aged between 21-55 years. The main cause of iatrogenic urethral trauma was catheter instrumentation, accounted for 44.35% of cases. Meanwhile, the main cause of non-iatrogenic urethral trauma was traffic accidents, accounted for 31.45% of cases. The data was concurrent with current literature stating that the main cause of non-iatrogenic urethral trauma was traffic accidents with the highest incidence happening to age 15–25 years and the main cause of iatrogenic urethral trauma were transurethral catheterization.³

The majority of urethral trauma location was posterior (76.92%) and about 62.50% of posterior urethral trauma was presented with pelvic fracture. The results were concurrent with study findings by Chapelle C et al, and several other literatures that stated posterior urethral trauma was more common and frequently accompanied by pelvic fracture.^{11,12,14}

According to the grades of trauma, AAST grade III – V trauma (57.69%) occur more often compared to AAST grade I – II trauma. Several literatures had stated that AAST type I and II traumas occur in 25% of urethral traumas, AAST type III traumas in 25% of cases, and AAST type IV and V in 50% of cases.^{3,9,10}

The majority of initial treatment of urethral trauma in Hasan Sadikin General Hospital was cystostomy (86.67%). For definitive treatment, the patients either received primary endoscopic realignment or delayed reconstruction surgery. Suprapubic cystostomy has become a standard procedure for anterior and posterior urethral trauma.^{1,2,5} Primary endoscopic realignment in posterior urethral rupture with urethral catheter insertion may be performed on clinically stable patients. Delayed reconstruction may be performed 3 months after the urethra rupture has stabilized enough to be performed posterior urethroplasty. Primary anterior urethral realignment had given satisfactory results with small rates of stricture and erectile dysfunction on saddle trauma.^{1,5}

CONCLUSION

Males had higher incidence of urethral trauma compared to females with the most frequent cause was catheter instrumentation (iatrogenic) and traffic accidents (non-iatrogenic). Posterior urethral trauma had a higher incidence rate compared to anterior urethral trauma, and often presented with pelvic fracture.

Meatal bleeding was the most common sign and an indication for further examination. Minor urethral trauma may be managed with only urethral catheter insertion, while major urethral trauma required urine diversion with percutaneous cystostomy. In smaller proportions, several subjects received primary endoscopic realignment and the rest had delayed reconstructive surgery as definitive treatment.

This study has several limitations such as its retrospective descriptive design due to the limited time and resources available, with data from only one single center. Further multicenter study with bigger sample size and better study design is needed to better describe the characteristic of urethral trauma in Indonesia.

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