

**ANTERIOR URETHRAL RUPTURE WITH EXTRAVASATION OF URINE TO PENIS AND SCROTUM: A CASE REPORT****Setyo Sutanto, Rama Firmanto**

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**Abstract**

Urethral Trauma is a discontinuity of urethra which caused by external stress (pelvic fracture or straddle injury) or internal stress (catheter placement, urological procedures). There are several suitable techniques, including immediate exploration or urine diversion. The treatment used depend on the cause of the rupture, rupture length, as well as anatomical position of the rupture. A 46-year-old male suddenly presented with swollen penile and testicle after 1 day of hospitalization. One day before, patient suffers in high-speed motorcycle accident and sustains blunt trauma to the perineal area, hitting the handle bar of the motorcycle and brought to the emergency department. There was a palpable bladder distension during physical exam, with penis and scrotum enlargement. Laboratory findings show elevated WBC and elevated creatinine level. Urinalization test was within normal limit. Partial laceration found during urethroscopy approximately <1cm in size. Scrotal drainage and exploration are conducted due to scrotum being swollen progressively. There is uncertainty regarding these symptoms to be interpreted as a urethral injury because some of the classical symptoms are missing, although patient showed with palpable bladder distension. Due to the swollen penis and scrotum which are enlarged progressively, urethroscopy and scrotal exploration was performed. Small laceration on the bulbar area of the urethra is found, indicating anterior urethral rupture, the laceration is treated conservatively with the placement of transurethral catheter. Scrotal exploration then performed which pus and extravasation of urine is found within the scrotum. The precision on determining anterior urethral rupture as a diagnosis decides the management, prognosis and complication rate of anterior urethral rupture. Although, the initial urethral trauma management remains disputed, a bulbous urethral rupture with a complication of extravasation of urine into the penis and scrotum can be treated effectively with urine diversion and scrotal exploration.

**Keywords:** Urethral Rupture, Extravasation of Urine, Penis, Scrotum**INTRODUCTION**

Urethral injuries can be classified based on location as either anterior or posterior. Anterior urethral injuries are often as a result of blunt or penetrating trauma. On the other hand, posterior urethral injuries are most commonly as a result of pelvic fracture or iatrogenic trauma during pelvic surgeries. Blunt trauma of the anterior urethra, often the result of a “straddle injury” to the bulbar urethra, result in significant contusion to the spongiosus with possible significant to the perineum. As the penetrating anterior urethral injury, the mechanism of injury ranges from gunshot wound to self-inflicted sexual misadventures (Doiron & Rourke, 2019).

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Urethral injuries are categorized in terms of the anatomical location of the injuries. In men, the anterior section is comprised of the bulbar and penile urethra while posterior section is comprised of the prostatic and the membranous urethra. On the other hand females only have posterior section of the urethra due to its shorter in length (Palinruni, Kholis, Syahrir, Pakan, & Faruk, 2021).

Data at the Cipto Mangunkusumo Hospital during 2016-2020 shows that urethral injury contributed 10% of all urogenital trauma cases.(3) Iatrogenic urethral trauma (43%), PFUI (25%), Straddle injury (23%), penetrating injury (4%), penile fracture (4%) data is obtained from Saiful Anwar General Hospital during 2016-2020. The same research shows that most of the cases involving anterior urethral injury (70%), especially bulbar area, rather than posterior urethral injury (30%) (Palinruni et al., 2021).

The following is a case report conducted at the Cipto Mangunkusumo Hospital, in order to add scientific studies to medical studies on urethral injuries. Iatrogenic trauma is the most common cause of urethral injury, with the incidence of urethral catheterization in men is 13,4 per 1.000 insertion of catheter.(4) Trauma can be caused by forced insertion of catheter or catheter balloon inflation inside the urethra.(5) Clinically, both of the urethral injuries have a differences regarding etiology, clinical features, treatment, and prognosis (Shewakramani & Reed, 2011).

Hematuria and extravasation of urine can cause edema and ecchymosis on the scrotum, penis and/or perineum, depending on the extent of the trauma. These clinical features can be shown > 1 hour post trauma (Barratt, Bernard, Mundy, & Greenwell, 2018; Mundy & Andrich, 2011)

## RESEARCH METHOD

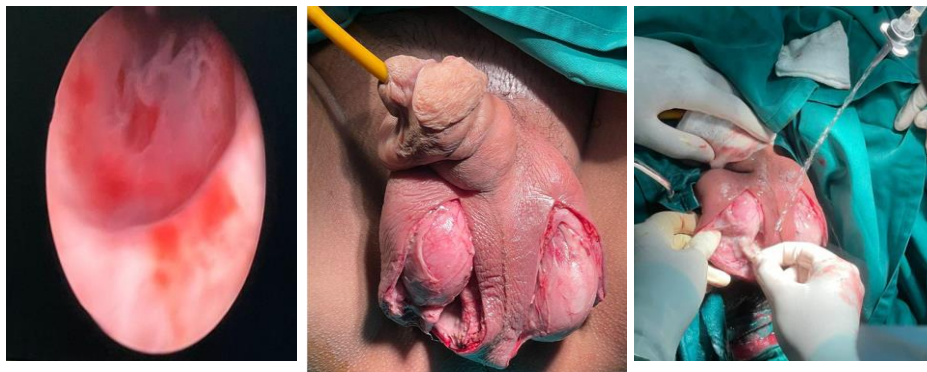
A 46-year-old male suddenly presented with swollen penile and testicle after 1 day of hospitalization, patient also presented with pain in voiding but the patient's has no complaint of inability to void. The urine output was normal in color, with normal turbidity without meatal bleeding. One day before, patient suffers in high speed motorcycle accident and brought to the emergency department. As the patient ride the motorcycle, he sustained blunt trauma to the perineal area, hitting the handle bar of the motorcycle with the chief complaint of referred pain from the left lower back to the buttock. On the initial assessment in emergency department, apart from the buttock pain, patient only presented with fever without any hemodynamic disturbance (Nugrahani & Hum, 2014).

On physical exam, patient's found with a distended bladder and presented with swollen penile and grossly swollen scrotum. There is no blood at the urethral meatus; Rectal toucher was performed, with the normal tone of sphincter ani as well as normal rectum ampule, there was no "floating prostate"; on the glove, there were feces and no blood from inside the rectum. The patient is fully able to void, however, the patient do feel pain while voiding. There is no hematoma over scrotum and perineum. Laboratory findings show elevated WBC and elevated creatinine level. Urinalization test was within normal limit, In terms of the Covid-19 screening, a chest X-ray showed no ground-glass opacity, and a Antigen rapid test was non-reactive. Catheter then placed successfully with urine production of 200 cc. However, due to swollen testis and swollen penis which are progressively bigger, thus uretheroscopy and scrotal exploration are scheduled immediately due to inavailability of retrograde urethrogram in our.



During the uretheroscopy, there was a partial laceration approximately <1cm above bulbourethral in which the urine extravasated onto the penile and scrotum through the tunica vaginalis. After we detected the possibility of urethral rupture, urine diversion is done using trans-urethral catheter. We proceed onto the next procedure which is exploration of scrotum. The procedure including, making two cuts of the scrotal skin exposing the testis which urine and pus were found during the process, therefore we irrigate the underlying tissue with copious amount of saline water and H<sub>2</sub>O<sub>2</sub> to treat the inevitable infectious process. We left it wide open for the urine to evacuate and to monitor the viability of the testis and the adjacent tissue.

After the procedure, patient left with catheterized urethra and wet dressing protecting wide-open scrotum which expose both testis. The patient was given an two intravenous broad-spectrum antibiotic (ceftriaxone 2gr q 12hr; Metronidazole 500mg q 8hr) that was administered for 4 days, along with analgesics drugs (Ketorolac 30mg q 8hr). No complication is noted regarding the procedure and the patient is discharge after 5 days of admission.



## RESULT AND DISCUSSION

Anterior urethral injury caused by non iatrogenic and iatrogenic (Mundy & Andrich, 2011). Urethra pars bulbosa become the most frequent area to receive blunt trauma, therefore, become the most fragile area from the impact of straddle injury (Latini, McAninch, Brandes, Chung, & Rosenstein, 2014). The significant pressure from straddle injury towards urethra pars bulbosa resulting urethra pars bulbosa to be pressed upward to the symphysis pubis which is damaging the urethra from the compression site. Other mechanism is direct blow to the perineum resulting penile fracture (Barros et al., 2017; Falcone, Garaffa, Castiglione, &

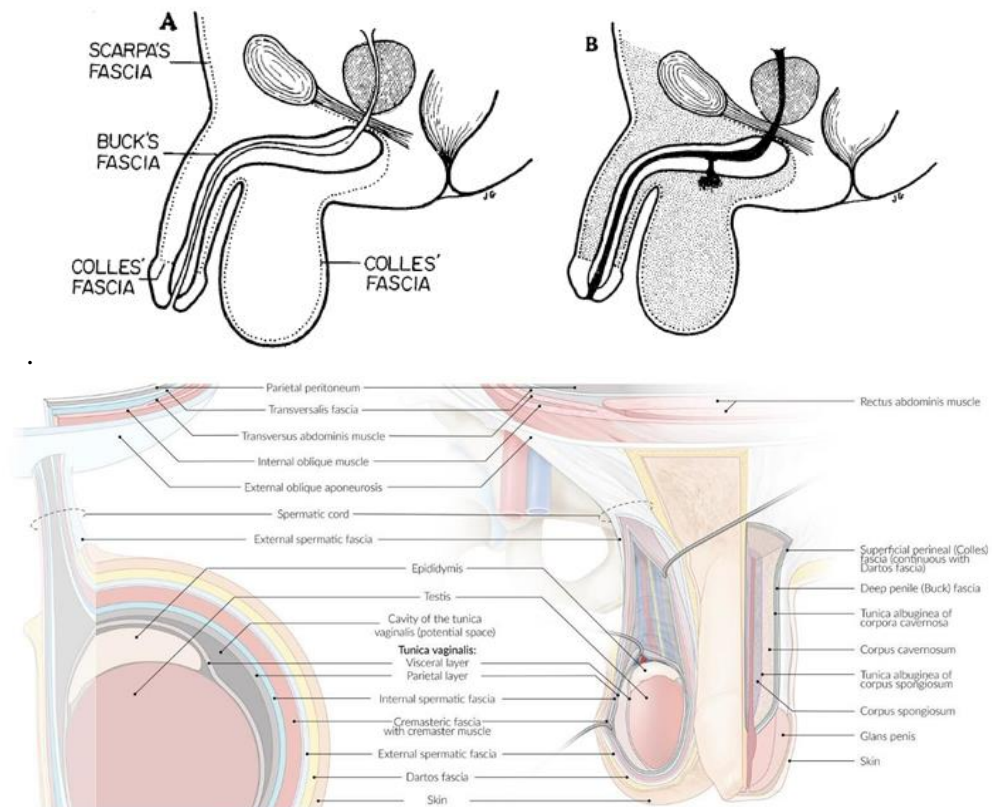
Ralph, 2018). Classification and proper description of urethral injuries are important to determine the treatment plans (Ghoniem, Moskowitz, & Nguyen, 2022). Several classification is exist, perhaps the most common is the classification by American Association for the Surgery Trauma (AAST) which divided into contusion, stretch, partial rupture, complete rupture (Daller & Carpinito, 2022).

The current patient suddenly presented with swollen penis and scrotum during 1 day of hospitalization after experiencing motorcycle accident 6 hours before seeking medical attention. There was no history of bleeding from the external urethral meatus, no hematoma over scrotum and/or perineum. Patient also shown voiding pain and distended bladder. However, there is uncertainty regarding these symptoms to be interpreted as a urethral injury because some of the classical symptoms are missing, although patient showed with palpable bladder distension (Palinrunji et al., 2021). We conducted blood test and urinalization, which showed elevated WBC indicating there is infection going on and we performed urethral catheterization. Due to the swollen penis and scrotum which are progressively bigger, urethroscopy and scrotal exploration was scheduled immediately to determine whether there is true urethral rupture.

Small laceration on the bulbar area of the urethra is found, indicating anterior urethral rupture, the laceration is treated conservatively then transurethral catheter is placed for 1-2 weeks. Scrotal exploration then performed which pus and extravasation of urine is found within the scrotum. After several irrigation using copious amount of saline water, the scrotum left wide open exposing both testis and protected by wet dressing which was replaced twice a day.

Extravasation of urine into the scrotum is a relatively uncommon occurrence (Noel & Velchik, 1986). Buck's fascia is penetrated and urine under pressure dissects the perineal and abdominal fascial planes under Colles' and Scarpa's layers (Weems & Hillis, 1977). Extravasated urine cannot pass posteriorly because of the origin of Colles' fascia, is limited laterally by the attachment of it to the ischiopubic ligament, and cannot find its way into the thigh because of the attachment of Scarpa's fascia to Poupart's ligament. Thus, urine can only be escape to the scrotum and penis, and finally into the anterior abdominal wall beneath Scarpa's fascia (Ishimatsu, Yoshizato, Kurokawa, Kawakami, & Okura, 2021). According to the W. L. Weems et al, When the extravasation involves the scrotum the suffused subcutaneous tissues of the scrotum are resected, leaving the testis intact. The scrotum then packed with gauze (Weems & Hillis, 1977) (Makama, Haruna, Stephen, & Aminu, 2021).

Extravasation involving the penis usually necessitates debridement of part or all of the penile skin



## CONCLUSION

Despite rarity of the urethral trauma, with the staggering incidence rate of 4% of all total urogenital trauma, urethral trauma can not be ignored. Prompt diagnosis and management are important in order to prevent later morbidity and mortality. The choice of urine diversion using trans urethral catheter and scrotum exploration is preferred in this case, given the complication shown in this patient which is extravasation of urine to the scrotum and penis. The catheter is expected to be monitored until 1-2 weeks after the procedure.

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