



Early Surgical Repair in a Patient with Post-Traumatic Complete Posterior Urethral Rupture Associated with both Vaginal and Rectal Injury

Hem Vajinal Hem de Rektal Laserasyon ile İlişkili Posttravmatik Komplet Posterior Üretral Rüptür Olgusunda Erken Cerrahi Onarım

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ABSTRACT

Posterior urethral rupture in females are uncommon. However, when it occurs it is usually a complete rupture often associated with vaginal laceration in 75%, and rectal injury in 33% of the cases. There are controversial approaches to the management of posterior urethral injuries, including primary repair of the urethral ends, primary cystostomy with delayed repair and endoscopic realignment of the urethral ends. Herein, we present a female child who developed complete urethral rupture associated with vaginal and rectal injury due to traffic accident which was urgently repaired after the traumatic event.

A 5-year-old-female patient was admitted to our emergency department with a blunt injury as a result of a traffic accident. Computed abdominal tomography revealed a hematoma around bladder neck, fracture of the superior pubic ramus, and a high-situated urinary bladder completely filled with extravasated contrast material. Urethroplasty was performed immediately through transpubic approach. The serosal defect of the rectum and the anterior aspect of lacerated proximal vagina were also repaired.

Early surgical repair of a complete post-traumatic urethral rupture associated with vaginal and rectal injuries yields satisfactory outcomes, as in our case.

Keywords: Urethral rupture, vaginal injury, urethral trauma

ÖZ

Kız çocuklarında posterior üretral rüptür nadirdir. Ancak kızlarda meydana geldiğinde genellikle tam rüptürdür ve vakaların %75'inde vajinal yırtılma ve %33'ünde rektal yaralanma eşlik eder. Üretral uçların primer onarımı, gecikmiş onarım ile primer sistostomi ve üretral uçların endoskopik olarak yeniden hizalanması dahil olmak üzere posterior üretral yaralanmaların tedavisinde tartışılmalı yaklaşımlar vardır. Bu çalışmada trafik kazası sonucu vajinal ve rektum yaralanmasına bağlı olarak tam üretra rüptürü gelişen ve yaralanma sonrası erken dönemde ameliyat edilen bir kız çocuğu sunulmuştur.

Trafik kazası sonucu künt yaralanma ile 5 yaşındaki bir kız çocuğu acil servisimize başvurdu. Abdominal tomografide, mesane boynu çevresinde hematoma, superior pubik ramus kırığı ve kontrast madde ekstravazasyonu ile birlikte yüksek yerleşimli ve kontrast dolu bir mesane saptandı. Transpubik yaklaşımla acil ürethroplasti yapıldı. Rektumun serozal defekti ve anteriordan lasere vajenin proksimali onarıldı.

Kızlarda travma sonrası komplet üretral rüptürün hemen onarımı, eşlik eden vajinal ve rektal yaralanmaların gösterilmesinde ve tedavisinde yararlıdır ve bizim olgumuzda da tatmin edici sonuçlar elde edilmiştir.

Anahtar kelimeler: Üretral rüptür, vajinal yaralanma, üretral travma

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INTRODUCTION

Urethral trauma in pediatric patients is most commonly caused by straddle injuries, pelvic fracture or iatrogenic urethral interventions. The estimated incidence of pediatric urethral rupture ranges between 1 and 5%^(1,2). Although the pathogenesis of urethral rupture in children is similar to that observed in adults, some

differences need to be considered a) traumatic injury of urethra in children is less predictable due to the intra-abdominal location of the bladder, b) distraction defects of the urethra tend to be longer due to the bladder prominently protruding upward into the abdomen, c) simultaneous injuries of the membranous urethra and bladder neck are more common, d) prepubertal perineal size may make it hard to reach the highly



located proximal urethral end, e) smaller diameter of the urethra⁽³⁾. The injuries most commonly associated with posterior urethral ruptures are pelvic fractures and their effects on urinary and sexual functions^(2,3). Posterior urethral rupture in girls has a lower incidence due to the higher mobility and shorter length of the female urethra. Disruption at the level of the proximal urethra is usually complete, with vaginal laceration seen in 75%, and rectal injury in 33% of the cases^(3,4).

There are several approaches to the management of posterior urethral injuries, including endoscopic realignment of the urethral ends and primary repair of the urethra. However, the widely accepted management is primary cystostomy and delayed urethroplasty with end-to-end urethral anastomosis using the transpubic approach^(1,3,5,6).

Herein, we present a female child who had complete urethral rupture associated with vaginal and rectal injury due to traffic accident and was operated immediately after injury.

CASE REPORT

A-5-year-old-girl was admitted to our emergency department with a blunt injury as a result of a traffic accident. On physical examination, abdominal distention and tenderness with bleeding from the urogenital region were detected. Contrast-enhanced computed abdominal tomography and subsequently taken lateral abdominal radiography showed a hematoma around bladder neck, a high-situated and contrast filled bladder associated with superior pubic ramus fracture and extravasation of contrast material (Figure 1). Retrograde urethrography demonstrated extravasation of the contrast material with empty bladder. The patient underwent emergency surgery at the 6th hour after the traumatic event to determine the site of injury and repair the injurious site once and for all. Complete distraction of the urethra at the level of the bladder neck and injury of anterior vaginal wall were detected by retrograde urethroscopy and vaginoscopy performed before surgical treatment. Through Pfannenstiel incision, completely transected posterior urethra and extremely elevated bladder were identified during exploration (Figure 2A). After evacuation and excision of massive hematoma, partially transected vagina was noted at the anterior cervix junction (Figure 2B). Then, the posterior vagina was explored and serosal laceration was detected in the anterior part of the rectum (Figure 2C). The serosal defect of rectum was sutured. Thereafter, the anterior side of lacerated proximal vagina was sutured

to the uterus following the insertion of a Fogarty balloon catheter. The proximal end of the urethra was detected just below the highly elevated bladder.

The distal part of the urethra was barely visible under the pubis. After a reverse Foley catheter was inserted into the distal urethra, the balloon of the catheter was inflated at the level of the external meatus of the urethra. The catheter was pulled up from the suprapubic region to elevate the urogenital diaphragm. Thus, the distal urethra could be exposed and a tension-free, end-to-end anastomosis was performed. While the last sutures were being placed, the reverse Foley catheter was removed and a Foley catheter was inserted into the bladder. There was no need for blood transfusion. This urethral catheter was left *in situ* for 3 weeks. While changing the Foley catheter, cystoscopic examination was performed which revealed lack of any urinary extravasation. The presence of a watertight anastomosis was confirmed with cystoscopy and vaginoscopy performed one month later and then the catheter was removed. Cystoscopic and vaginoscopic examinations performed during the

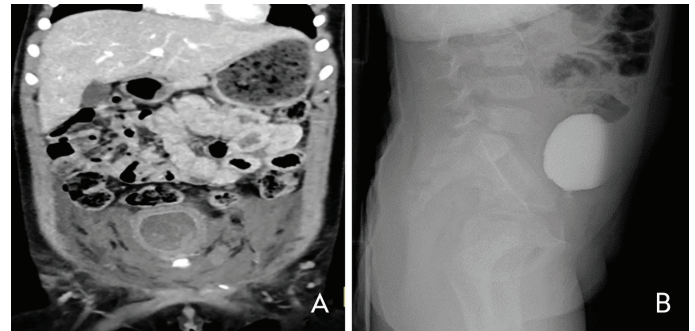


Figure 1. A) Computed abdominal tomography showing a hematoma around bladder neck, associated with fracture of superior pubic ramus and extravasation of contrast material. B) Subsequently performed lateral abdominal radiography demonstrating a high-situated bladder filled with contrast material

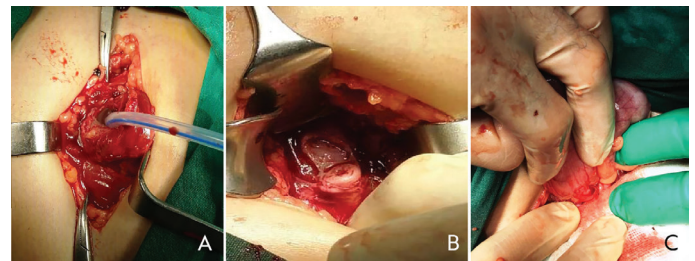


Figure 2. A) Completely transected posterior urethra and very highly-situated bladder. B) Partially transected vagina at the junction of anterior cervix. C) Serosal laceration at the anterior side of rectum

follow-up period lasting for 2 years could not reveal any evidence of stenotic urethral and vaginal anastomosis. Any sign of urinary incontinence was not observed. Written informed consent was obtained from the parents of the child.

DISCUSSION

The aim in the management of urethral rupture is to maintain urethral continuity and to minimize the risk of complications such as recurrent urethral stricture, impotence and urinary incontinence^(2,5,6).

If urethral injury is suspected in any child with pelvic fracture, appropriate evaluation has a critical importance when the patient's clinical condition is stable^(2,7). Urethral catheterization should be avoided to prevent worsening of the urethral injury. Computed tomography (CT) helps to examine the genitourinary system in detail. A CT scan also searches for major accompanying abdominal traumatic injuries and identifies the types of pelvic fracture. Plain abdominal X-ray after contrast-enhanced CT scan may disclose shape, position of the bladder, and extravasation of urine (if any). On radiologic imaging, a hematoma around the bladder neck or a high positioned bladder may be a sign of posterior urethral injury. On cystography, bladder neck closure is indirect evidence of the robustness of the proximal sphincter mechanism. An impaired bladder neck and extravasation of contrast medium may also be an evidence of a damaged proximal sphincter⁽³⁾. However, retrograde urethrography performed with the patient in the lateral oblique position is the most effective diagnostic examination to detect urethral injury. Extravasation of contrast material or complete loss of urethral continuity can be determined by retrograde urethrography^(8,9). Although radiographic and endoscopic findings provide information about the location and severity of the injury, the most accurate assessment is made during surgical exploration^(2,7). Since the distal urethral sphincter mechanism in the membranous urethra is damaged during trauma, preservation of the bladder neck sphincter mechanism in these cases is important to prevent development of incontinence after urethroplasty^(6,7).

Management of posterior urethral injuries can be performed urgently or may be delayed. Endoscopic urethral realignment or open surgery can be preferred for the repair of posterior urethral defects. The widely accepted management is primary cystostomy and delayed urethroplasty⁽⁶⁻⁸⁾. Before delayed urethroplasty, however, some authors recommend early endoscopic urethral realignment to shorten the distraction defect,

reduce the likelihood of developing strictures, and facilitate open repair. Furthermore, some authors suggest that early endoscopic urethral realignment which is easy to perform and requires only minimal manipulation may be successful as a definitive treatment and alleviate the need for open urethroplasty in a reasonable number of patients^(10,11).

The advantages of primary cystostomy and delayed urethroplasty or delayed primary endoscopic urethral realignment include elimination of the necessity of performing major operative procedure in acutely traumatized patients, minimal blood loss, shorter hospital stay, reduced likelihood of encountering infected pelvic hematoma, and prevention of injury to the penile nerve supply^(2,3,10,11). The disadvantages of primary cystostomy and delayed urethroplasty include the need for prolonged suprapubic drainage (3-6 months) and inevitable development of urethral stricture requiring one or more urethroplasties. Local complications such as urethral fistula, pseudo diverticulum, or stone may also occur secondary to delayed repair^(3,10). The disadvantages of primary endoscopic urethral realignment are that it cannot be performed in all patients and additional interventions are required in about half of the patients. Scarberry et al.⁽⁵⁾ suggested urethral reconstruction within 3-6 weeks when the lesions are stabilized after acute phase of trauma has passed and the perineum felt softened on physical examination.

Emergency urethroplasty for the repair of acute urethral rupture is a difficult procedure due to coexisting pelvic hematoma and edema. Also, anatomic reconstruction via suprapubic approach requires taking on a great challenge in finding the distal part of the urethra that is hidden below the pubis^(2,7,8). In our case, we planned to perform primary endoscopic urethral realignment, but we failed due to high-situated bladder. Therefore, we priorly decided to perform urethroplasty through a suprapubic approach and, if not possible we would proceed with primary urethral realignment.

Additionally, if possible, emergency urethroplasty during acute urethral rupture leads to a faster recovery process for the patient. However, if it is not feasible due to presence of hematoma and edema, other methods should also be considered.

Study Limitations

This study has several limitations. First of all, the results of this case report should be supported by data coming from further relevant studies. Besides, studies

with longer follow-up should be performed to assess long-term continence and late-term complications of surgical interventions performed to manage urethral ruptures.

CONCLUSION

In conclusion, immediate repair of a post-traumatic complete urethral rupture in girls is useful to demonstrate associated vaginal and rectal injuries and it also gave satisfactory results in our case such as shorter hospital stay, less psychological impact and treatment of associated injuries at the same time. If emergency urethroplasty is not possible, primary realignment of urethral cut ends can be done during open surgery.

Ethics

Informed Consent: Written informed consent was obtained from the parents of the child.

Footnotes

Author Contributions

Surgical and Medical Practices: A.S., S.C.K., Concept: A.S., Design: A.S., S.C.K., Data Collection or Processing: A.S., Analysis or Interpretation: A.S., S.C.K., Literature Search: A.S., Writing: A.S., S.C.K.

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