Firearm injury in a child: An uncommon case of penile trauma

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ABSTRACT

Genitourinary system injuries generally occur due to blunt and penetrating trauma. Approximately 10% of all injuries encountered in the emergency department are related to the genitourinary system. Male genital trauma is a urological emergency because of the high risk of infection and the priority of protecting the sexual, endocrine, and reproductive functions. Blunt injuries to the penis are more often seen due to the mobility and localization of the penis than due to penetrating injuries caused by firearms or cutting instruments. We aimed to present and discuss a case involving shrapnel that became lodged in the penis of a child in a war zone. After 2 weeks of medical treatment, the patient underwent surgery. Surgery includes primary repair to the penis and urethra.

Key Words: Firearm injury, penile trauma, urethra

INTRODUCTION

The use of firearms with high destructive force in wars and conflicts causes severe injuries and great civilian losses. Although penetrating firearm injuries of the external genital organs are extremely rare, they can cause serious urological problems. We herein present a case involving shrapnel that became lodged in the penis of a child in a war zone. To the best of our knowledge, no similar cases have been reported in the English literature.

CASE REPORT

A 3-year-old boy presented to our pediatric surgery polyclinic for evaluation of a penile deformity. The patient had come to Turkey as a refugee from Syria. While the boy was playing outside 4 months previously, an explosion occurred nearby and a piece of shrapnel had lodged in his penis. Urogenital system examination revealed an approximately 1-cm-wide circumferential, band-like stricture extending from the coronal to proximal level of the glans penis. The glans penis was rotated to the left approximately 70°. The diameter of the glans penis was 1.8 cm, and the diameter of the stricteured region was 0.9 cm [Figure 1]. A 10-Fr Foley catheter was placed in the bladder from the suprapubic region. Urethral catheterization was attempted, but the catheter could only be advanced 2 cm.

Physical examination revealed no other abnormal findings. Laboratory examination revealed mild leukocytosis; all other biochemical parameters were normal. Because abundant leukocytes were seen in the urine sample taken from the suprapubic catheter, a urine culture was performed. Appropriate intravenous antibiotic treatment was administered based on the culture results. After 2 weeks of the medical treatment, the patient was admitted for elective surgery. The glans penis was suspended and the skin was degloved. A full-thickness urethra rupture was present immediately below the glans penis, and there was a 1.5 cm gap between the glans penis and the corpus cavernosum. The glans penis was supplied with blood by vessels in the subcutaneous tissues. The distal urethra was located and catheterized. The length of the distal urethra was 2 cm; the proximal urethra could not be located. The bladder was explored. Using a 10-Fr catheter, retrograde catheterization was...
applied to the proximal urethra, which was then fixed between the distal cavernous parts. The proximal and distal ends of the urethra were dissected in preparation for end-to-end anastomosis [Figure 2]. Scar tissue at the distal aspect of the corpus cavernosum was excised and repaired with 3/0 vicryl sutures. Single full-layer 4/0 vicryl sutures were then placed over the 10-Fr Foley catheter, and primary anastomosis was applied. While protecting the circulation in the glans penis, the skin was closed primarily by suturing with 3/0 vicryl over the corpus cavernosum [Figure 3]. The patient was monitored for 20 days postoperatively while the Foley catheter and suprapubic catheter remained. The patient urinated normally after removal of the Foley catheter. No extravasation was observed on urethrography. The suprapubic catheter was removed and the patient was discharged. No problems were seen during the follow-up period of 3 months.

DISCUSSION

Genitourinary system injuries generally occur due to blunt and penetrating trauma. Approximately 10% of all injuries encountered in the emergency department are related to the genitourinary system. Apart from the external genital organs, the genitourinary system is well-protected from blunt and penetrating trauma in males because of the surrounding internal organs, musculoskeletal structures, and natural mobility.\(^1\) Blunt injuries to the penis are more often seen due to the mobility and localization of the penis than due to penetrating injuries caused by firearms or cutting instruments.\(^2\)

Male genital trauma is a urological emergency because of the high risk of infection and the priority of protecting the sexual, endocrine, and reproductive functions.\(^3\) Approximately 40% of penetrating urological injuries affect the external genitalia.\(^4\) The aim of treatment of these types of injuries is to preserve urethral integrity and sexual function.\(^5\)

A new classification of urethral trauma has recently become necessary. While anterior injuries are considered to be trauma, posterior injuries are classified as distraction injuries.\(^6\) If injury occurs as a result of trauma to the anterior urethra, even if the two ends of the urethra are completely separated, they do not deviate or separate though scar tissue can form during healing. In contrast, injury to the posterior urethra develops in the form of pullout or separation. The two ends are ruptured, the urethra deviates, and healing results in fibrosis between the two ends.\(^7\) The current case is different from previously reported cases in that following injury to the urethra and penis together, separate locations rotated, and healing produced scar tissue.

The treatment approach for urethral injuries accompanying penetrating penile trauma generally involved end-to-end urethral anastomosis. Urethral defects of up to 2.0–2.5 cm
can be easily repaired using this technique. When the urethral defect is large, grafts are necessary, and delayed elective surgical intervention is planned for at least 3 months later. Urethral substitution with surgical flap or graft placement should not be performed in the initial stages of any urethral injury because contamination or reduced blood circulation in the region renders this type of repair unsuccessful.\[8\]

The patient described herein presented to the hospital late, and primary repair was applied to the penis and urethra following treatment of infection. Because the urethral defect was not large, the urethra could be repaired by end-to-end anastomosis. Some authors have recommended suprapubic drainage following urethral repair while others have claimed that the placement of a urethral catheter is sufficient for urine drainage.\[9\] Both techniques were used in the present case.

The case presented herein is an event rarely seen in literature. The importance of this case is that an isolated piece of shrapnel had lodged in the penis of the child, causing rupture of the urethral and fibrosis in the distal cavernous body.

**CONCLUSION**

Although trauma to the penis, testis, and scrotum is rare, the correct treatment is essential to prevent physiological, sexual, and psychological damage in these patients. Genital injuries are rarely seen and are of varying severity; thus, no universal treatment strategy exists. Penile injuries may cause fertility disorders, penile curvature, pain, erectile dysfunction, and decreased self-confidence.

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**Conflicts of interest**

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