

Radiological evaluation and our surgical experience in patients with penile fracture

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Abstract

Aim: We aimed to investigate the clinical features, diagnostic methods and surgical methods and results of patients who presented with penile fractures.

Material and Methods: The data of 18 patients who underwent surgical treatment between December 2008 and 2018 in our clinic were evaluated retrospectively. Age and etiologic factors were evaluated. Following physical examination, all patients underwent superficial penile ultrasonography in the radiology clinic. Ultrasonically, length, location and side of the rupture were determined. The patients were questioned by the postoperative IIEF-5 questionnaire. Pre and post-operative complications were evaluated in patients. Postoperative erectile functions were evaluated.

Results: The mean age was 39.22 ± 14.47 (19-67). The time to contact the emergency department was 4.33 ± 1.97 hours (2-8 hours). In the history of the patients, the causes of the penile fracture included the forceful manipulation of the penis in 5 patients (27.8%), rolling over in the bed while sleeping in 5 patients (27.8%), sexual intercourse in 6 patients (33.3%) and masturbation in 2 patients (11.1%). Mean rupture in tunica albuginea was 12.66 ± 3.06 mm (8-20mm). While 11 (61.1%) of the defects were detected in the right corpus spongiosum, 7 (38.9%) were detected in the left corpus spongiosum. The tunica albuginea defect was located in the distal penile in 14 patients (77.8%), in the midpenile in 3 patients (16.7%) and in the proximal penile in 1 patient (5.5%). The mean hospital stay was 3 ± 0.90 days (2-5 days). Postoperative the IIEF-5 score was 26.05 ± 1.55 (23-29).

Conclusion: Penile fracture is a rare urologic emergency that can be diagnosed clinically. Radiological imaging may be required in suspected cases. Early surgical treatment provides successful results in terms of functional, cosmetic and erectile functions.

Keywords: Penis; fracture; radiological evaluation; surgical treatment.

INTRODUCTION

A penile fracture typically occurs in the setting of blunt penile trauma to the erect penis and rupture of the corpus cavernosum and/or spongiosum due to bending. The corpus cavernosum is responsible for erection and the tissue surrounding this structure is called tunica albuginea. The blood in the corpus cavernosum accumulates under the Buck fascia after the rupture of the tunica albuginea (1). If Buck's fascia is also ruptured, bleeding and hematoma can lead to a butterfly-like appearance through the Colles fascia, spreading towards the scrotal region and perineum (2). If it is accompanied by urethral injury, urethrorrhagia may also be seen. In the etiology, sexual intercourse is the most commonly observed cause of penile fracture, while masturbation or sudden position changes during night

erection are less frequently observed (3). Besides these etiological causes, other reported reasons include hitting somewhere during erection, and wearing pants (4,5). While the thickness of the tunica albuginea is normally 2 mm, this thickness decreases to 0.25 mm during erection and intracorporeal pressure increases due to trauma, leading to penile fracture (6-9). While the rupture is mostly unilateral, as the severity of trauma increases, bilateral or even urethral injury may be seen (10).

Typical findings start with patients experiencing a sudden snapping sound and may be accompanied by severe pain. Erection disappears quickly, swelling and ecchymosis occur due to hematoma on the side of the fracture and penis deviation is seen towards the opposite side of the fracture (5). While physical examination and anamnesis

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are usually sufficient for diagnosis, sometimes superficial penile ultrasound, penile Doppler ultrasonography, magnetic resonance imaging (MRI), cavernosography and urethrography can be used in the diagnosis in the cases describing urethrorrhagia (11). The guidelines recommend flexible cystoscopy in penile fracture patients with urethrorrhagia (12). Penile fracture is treated by a surgical repair of tunica albuginea in the early stage (13).

In this study, we aimed to investigate the clinical features, diagnostic methods and surgical methods and results of patients who presented with penile fractures.

MATERIAL and METHODS

The data of 18 patients, who underwent surgical treatment covering the period between December 2008 and December 2018 in our clinic, were evaluated retrospectively. The approval of the local ethical committee was obtained to conduct the study. Of the patients who were admitted to the emergency department, a detailed anamnesis was obtained from the majority. Age and etiologic factors of the patients were evaluated. Following physical examination, all patients underwent superficial penile ultrasonography in the radiology clinic. The length, location and side of the rupture were determined ultrasonically. No additional radiological examination was required as no patient had urethrorrhagia. The patients were informed about the risks by giving surgical information before the surgery. The patients were administered broad-spectrum antibiotherapy before the surgery and a Foley catheter was inserted. In all cases, subcoronal circumferential incision was made and penis skin was degloved. The hematoma was discharged and the rupture of the tunica albuginea was detected passing the subcutaneous tissue and the fascia. Then, the ruptures were sutured using vicryl. Following the skin suture, tight bandage was applied with Koban. On the 1st postoperative day, Foley catheter was applied to all patients. The duration of hospital stay was recorded. Patients were advised not to have sexual intercourse and masturbation for 6 weeks while they were being discharged. The patients were called to the outpatient clinic six weeks later and their physical examination was performed. The IIEF-5 form was filled out and they were asked whether there was curvature of the penis during erection and their answers were recorded.

Statistical analysis

In our study, data were calculated as mean \pm standard deviation, median and interquartile range. Statistical analyses were made using SPSS18.0 (SPSS Inc., Chicago, IL, USA) and MED CALC 11.0 (Ostend, Belgium) statistics software.

Results

The mean age of the patients who were admitted to the emergency department with sound of a sudden fracture in the penis was 39.22 ± 14.47 (19-67 years). (Table 1). The time elapsed from the occurrence of the case to the

admission to hospital was found to be 4.33 ± 1.97 hours (2-8 hours). In the history of the patients, penile fracture occurred due to the forceful manipulation of the penis in 5 patients (27.8%), rolling over in the bed while sleeping in 5 patients (27.8%), sexual intercourse in 6 patients (33.3%) and masturbation in 2 patients (11.1%). (Table 2). The physical examination revealed bruise, hematoma and swelling in the penis. In addition to these findings, butterfly-shaped bruise extending through the pubis was found in 2 patients. While 12 of the patients were operated under spinal anesthesia, 6 patients underwent general anesthesia. The mean rupture size in tunica albuginea, which was determined during surgery, was 12.66 ± 3.06 mm (8-20mm) and consistent with ultrasonography. While 11 (61.1%) of the defects were detected in the right corpus spongiosum, 7 (38.9%) were detected in the left corpus spongiosum. The tunica albuginea defect was located in the distal penile in 14 patients (77.8%), in the midpenyl in 3 patients (16.7%) and in the proximal penile in 1 patient (5.5%). The mean hospital stay was 3 ± 0.90 days (2-5 days). As the preoperative IIEF-5 scores of the patients could not be reached, no calculations can be made. However, the IIEF-5 score was 26.05 ± 1.55 (23-29 years) in late postoperative period (Table 1).

Table 1. Clinical data of patients

Age (years)	39.22 ± 14.47 (19-67)
The time to contact the emergency department (hours)	4.33 ± 1.97 (2-8)
Localization	
Right (%)	11 (61.1)
Left (%)	7 (38.9)
Localization of Rupture	
Distal (%)	14 (77.8)
Midpenyl (%)	3 (16.7)
Proximal (%)	1 (5.5)
Defect Length (mm)	12.66 ± 3.06 (8-20)
Average Hospitalization time (day)	3 ± 0.90 (2-5)
Postoperative IIEF-5 score	26.05 ± 1.55 (23-29)

IIEF-5: International Erectile Function Scale

Table 2. Etiology of penile fracture

Etiology	Number of Patients	%
Forceful manipulation of the penis	5	27.8
Turning in bed during sleep	5	27.8
During sexual intercourse	6	33.3
Masturbation	2	11.1

DISCUSSION

The penile fractures is a urological emergency, majority of which are caused by blunt trauma. Anamnesis and physical examination are typical. The incidence is not known clearly, but most cases are reported from Mediterranean and Far East countries (2,14,15). Penile fracture occurs

mostly due to intracavernosal pressure increase due to trauma (16). The laceration is generally in the transverse direction. Tunical rupture is mostly unilateral, occurs in the distal penile region and does not exceed the diameter of the corpus cavernosum (17).

In more than half of the penile fracture cases, a change in position during sexual intercourse is reported in the etiology. Manual manipulations during masturbation and sudden movements during sleep can cause it less frequently. In the studies reported from the Middle East and Arab countries, it is seen that manual bending of the penis to stop erection causes it in $\frac{3}{4}$ of the patients (18). The fact that patients do not give correct anamnesis as they feel embarrassed prevents their etiological causes from being fully revealed. Our findings were consistent with the literature.

Given the literature, the age range determined for penile fracture is between 16 and 82 (19). The mean age of our patients was 39.22 ± 14.47 years (19-67 years) and was consistent with the literature.

The typical anamnesis of the patients included a sudden snapping sound, loss of erection following this sound, swelling, bruise and penile deviation to the opposite side of the fracture. The hematoma, which is the cause of swelling and bruising, is mostly limited to Buck's fascia. Occasionally, the hematoma may cross the Buck fascia and be confined to the Colles fascia; which leads to a butterfly-like appearance extending to pubis and perineum (20). Only 2 of our cases had bruises extending to the pubis and perineum.

Anamnesis and physical examination are usually adequate but radiological imaging may be required in unclear cases. In the radiological imaging, superficial penile ultrasonography, penile color Doppler ultrasonography, MRI, cavernosography are the modalities used commonly. Ultrasonographic examination of the presence of hematoma, integrity of the tunica, defect size can be determined (21). Superficial penile ultrasonography was performed in all patients.

Penile fracture cases may be accompanied by urethral injury. This ratio varies between 10% and 30% in series (22). Urethrorrhagia and/or urinary failure may occur in these patients. Retrograde urethrography is helpful in these patients. None of our patients had urethrorrhagia.

Early surgical repair is important in penile fracture treatment. There are also publications defending the conservative treatment approach. Strict bandage, cold application, Foley catheter insertion, anti-biotherapy, fibrinolytic therapy and anti-inflammatory treatment are applied in the conservative treatment. In the surgical treatment, hematoma is discharged, followed by bleeding control and the repair of the primary rupture. As a result of the conservative treatment, painful erection, penile deviations and arteriovenous fistulas and related erectile dysfunction can be seen (23,24). The success rates of these two studies comparing these two treatments

were 92% in the surgical treatment group and 59% in the conservative treatment group (25). We applied early surgical treatment to all of our patients.

It was seen that morbidity rates of the patient who underwent surgical treatment were lower and they were hospitalized for a shorter period of time. As a result, erectile dysfunction is less common compared to conservative treatment (26). Preoperative IIEF-5 scores of the patients are not known, and given their postoperative IIEF-5 scores, it is seen that erectile functions are not disrupted. None of our patients had late complications such as penile curvature, pain during erection and sexual intercourse and erectile dysfunction.

For the repair of tunica albuginea defects in penile fracture, different incisions such as direct incision, dorsal longitudinal, penoscrotal, lateral or subcoronal circumferential incision can be used. With both subcoronal and circumferential induction, both corpus cavernosum and corpus spongiosum are clearly visible and do not pose a cosmetic problem after the operation. In cases of excessive hematoma and edema, it is difficult to reach proximal with subcoronal circumferential incision (27). Inguinal scrotal incision is recommended for excessive edema (28). We performed surgical treatment with a subcoronal circular incision as we thought that it provided good field of vision in all of our cases.

CONCLUSION

Penile fracture is a rare urologic emergency that can be diagnosed clinically. Radiological imaging may be required in suspected cases. Early surgical treatment provides successful results in terms of functional, cosmetic and erectile functions.

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