

Posttraumatic Penile Fracture– Clinical Experience

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Abstract

Introduction and Objectives. Penile trauma represents an important urologic emergency, both through the associated psychological implications and the sexual aspects resided from this pathology. The purpose of this study is to evaluate the pre- and postoperative characteristics of the post-traumatic penile fracture.

Material and Method. A retrospective study was carried out for a period of 10 years (January 2010 - January 2020), in the Urology Department of St. John’s Emergency Clinical Hospital in Bucharest. There were evaluated 192 patients who presented in the emergency room with penile fracture and benefited from surgical treatment. The operative indication was based on the clinical examination and penile ultrasound, which was performed in all cases. In some cases, male genitalia MRI, retrograde urethrography and cystoscopy were done. The patients were followed up at 3 months and/or 1 year with clinical examination and were interviewed about any evidence of erectile dysfunction, penile nodules, or curvature acquired after surgery, besides psychological sexual problems. 102 patients only showed up at the 3 months follow-up.

Results. The mean age of the patients was 34.4 years (20-57 years). Concerning the way of producing the rupture of cavernous bodies, in 145 cases occurred postcoital, and in 47 cases the rupture occurred post-traumatically self-induced (masturbation or penile manipulation). In all cases, the surgical treatment of the cavernous body rupture was performed, and in the cases affecting the urethra, there was done urethroplasty (9,3% of cases). In 170 patients unilateral rupture of the cavernous body was encountered (161 without urethral rupture, in 9 cases being accompanied by urethral injury), and in 22 patients bilateral rupture of the cavernous bodies was diagnosed (in 13 cases without the injury of the urethra, and in 9 cases accompanied by urethral rupture). 10 patients presented injury of the corpus spongiosum without affecting the urethra. In 157 patients, penile degloving was necessary, and in 35 cases the approach was used by incision at the level of the fracture and suture of the tunica albuginea was done at this level. The postoperative care was favorable. 21 cases presented minor postoperative complications (Clavien I), and in one case surgical re-intervention (Clavien IIIB) was required. The average hospitalization period was 5.2 days. At the periodic follow-up, 63 patients presented a penile nodule, 10 patients presented penile deviation, and 7 of them presented erectile dysfunction.

Conclusion. Penile trauma is often complex, due to the architecture of the area, with different structures superimposed in a small space. Emergency surgery favors the preservation of anatomical structures, reduces the risk of erectile dysfunction and postoperative complications.

Keywords: cavernous body rupture, post-traumatic rupture, penile fracture, trauma.

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Introduction and Objectives

Penile trauma represents an important urological emergency, both through the associated psychological implications and sexual aspect resided from this pathology.

Striking or crushing of the foreskin may cause local bruising or ecchymosis. Due to the thickness of the tunica albuginea, the penile contusions produced in the flaccid state do not cause its rupture^[1].

Penile fracture is defined as a disruption or tear of the tunica albuginea of the corpus cavernosum in the penis. The mechanism for this injury is most commonly the erect penis slipping out of the vagina and thrusting against the perineum or the pubic bone, causing a sudden bending of the penis and resulting in a buckling injury to the penis and a tearing of the tunica albuginea of the corpus cavernosum. Other causes of penile rupture include masturbation, rolling over in bed, penile manipulation, and Taqaandan, described as an intentional, forceful bending of the erect penile shaft, a cultural habit practiced in Middle East countries to provide relaxation and release tension.

Penile fractures require immediate exploration because delayed treatment results in higher rates of erectile dysfunction.

The purpose of this study is to present the pre-, intra- and postoperative aspects of the patients with post-traumatic cavernous body rupture.

Material and method

A retrospective study was performed on a number of 192 patients who presented to the emergency room of the St. John's Emergency Clinical Hospital in the last 10 years (January 2010 - January 2020) for the appearance of a post-traumatic penile hematoma, while the penis was erect.

The paraclinical investigations included usual blood tests, penile ultrasound with the display of the discontinuity in the point of rupture of the cavernous body, with adjacent hematoma. Only in 12 cases external genitalia MRI was available, highlighting the rupture. Retrograde urethrography was performed in 18 cases, and cystoscopy was performed in the cases with suspicion of urethral injury. The surgical protocol included penile degloving or longitudinal incision at the site of the rupture and suture of the tunica albuginea. In case of urethral injury, the treatment consists of tension-free end-to-end anastomosis under a transurethral catheter. A circular subcoronal incision followed by further penile degloving is the best described surgical ap-

proach, allowing good exposure of the corpus cavernosum and urethra. The patients were followed up at 3 months and/or 1 year with clinical examination and were interviewed about any evidence of erectile dysfunction, penile nodules, or curvature acquired after surgery, besides psychological sexual problems. 102 patients only showed up at the 3 months follow-up.

Results

The mean age of the patients was 34.4 years (20-57 years). In 145 cases the penile fracture was produced during sexual intercourse, and in 47 of the cases was occurred post-traumatically self-induced (masturbation, penile manipulation). 104 of the patients presented up to 8 hours after the onset of the trauma, in 21 of the cases the patients presented within the period of 8-24 hours, and in 67 of the cases the patients presented at more than 24 hours since the onset of the trauma. 180 of the patients reported rapid detumescence of the penis, while 167 admitted a sudden cracking or popping sound, and 18 patients had macroscopic hematuria or voiding symptoms. The clinical examination revealed edema and penile hematoma, with curvature of the penis towards the opposite side of the ruptured area. In 95 of the cases the rupture area of the cavernous body could be felt. In some cases, the hematoma was extended to the suprapubic or scrotal area.



Fig. 1: Penile hematoma.

Concerning the surgical intervention, in all cases was performed in emergency, in 157 cases penile degloving was used, with the evacuation of the hematoma, highlighting the rupture area and the suture of it. In the other 35 of the cases the approach was used by longitudinal incision at the level of the rupture and closure of the tunica albuginea at this level. 18 patients presented urethral injury, diagnosed by retrograde urethrography and urethroscopy. 10 patients presented injury of the corpus spongiosum associated, with-

out affecting the urethra. The patients with suspected urethral injury were done penile degloving, with exposure of the urethra, objecting the rupture. The urethra was repaired with 2/0 or 3/0 absorbable suture over the Foley catheter. The Foley catheter was left for 7-10 days postoperatively.

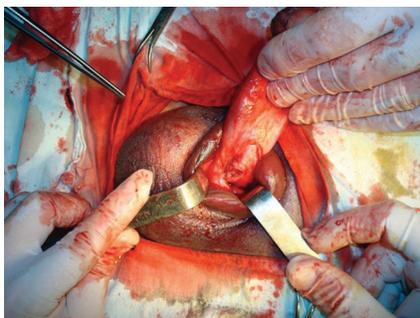
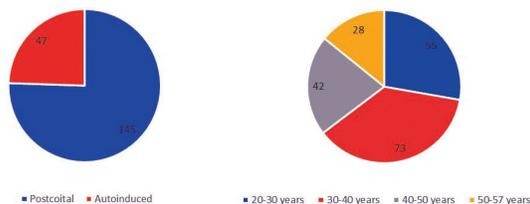


Fig. 2: Penile degloving highlighting the rupture of the cavernous body

The average hospitalization period was 5.2 days. The postoperative recovery of the patients was favorable. At the periodic follow-up 63 patients presented a penile nodule, 10 patients presented penile deviation, and 7 of them presented erectile dysfunction.

The way of producing the penile rupture The age of the patients with penile rupture



Discussions

Tunica albuginea is a structure with a very high elastic force [4,5,6]. At the time of erection, tunica albuginea extends and becomes thinner, reaching 0.25-0.5 mm in thickness, compared to 2 mm when the penis is in a flaccid state. In conclusion, the erect penis is much more vulnerable at the time of trauma, compared to the flaccid penis[1]. Clinically, after trauma occurs intense local pain and detumescence of the penis. This is followed by the appearance of a large penile hematoma ("Eggplant" shape or "Aubergine" sign). The penis is curved towards the healthy side, looking "in saxophone". Depending on the extension of the hematoma, the continuity solution at the level of the tunica albuginea may be felt. [2,3]

In our study the penile fracture was produced during sexual intercourse in 145 of the cases, in 47 of the cases was occurred post-traumatically self-induced rupture (masturbation, penile manipulation). Many patients delay the presentation to the doctor, reaching to

the emergency room with bulky hematomas, without being able to feel or highlight the area of rupture of the tunica albuginea. Bhushan Patil et al. showed that there is a link between the delayed presentation to the doctor and the postoperative sexual dysfunction[7], while Rodrigo Barros et al did not identify a statistical difference between the time of penile fracture repair and complications such as erectile dysfunction or penile curvature rates. [8] In our study 5 out of the 7 patients presenting postoperative erectile dysfunction arrived at the emergency room at more than 24 hours since the onset of the trauma.

Many authors consider that there is no need for additional paraclinical tests, since the diagnosis of penile fracture is eminently clinical. The typical presentation of hematoma, detumescence and snapping sound is a key diagnostic finding in the evaluation of the patients[8]. In a study conducted by Zargooshi, of 362 operated patients, 352 were intraoperatively proven to have penile fracture and 10 had penile venous injury only[9]. According to Rodrigo Barros et al, complementary examination is not necessary in cases of suspected urethral lesion in which penile degloving technique provides excellent exposure of the urethra and corpus cavernosum in all their extension.

In our study, the patients presented with a penile hematoma, with the deviation of the penis towards the opposite side of the rupture, due to the mass effect of the hematoma. 180 of the patients reported rapid detumescence of the penis, and 167 of them presented a snapping sound of the penis in the moment of the trauma. In our study the external genitalia MRI was done to the patients presenting only penile hematoma, without any other clinical symptom (snapping sound or penile detumescence). Concerning the urethral lesions, Barros et al consider that retrograde urethrography shows false-negative results in up to 28,5% of the cases[5]. We performed retrograde urethrography to the patients presenting hematuria, blood at the meatus or voiding symptoms, resulting in urethral injury diagnosis in all of the cases.

Although most of the authors use penile degloving as the standard technique, local longitudinal incision can be taken into account to repair the tunica albuginea without affecting the blood supply or lymph reflux, with low rate of complications. In our study, in 72 of the cases was used local longitudinal incision. This approach was practiced only in the cases presenting localized, small penile hematoma, with unilateral cavernosal injury.

The presence of urethral injury associated with penile fracture was reported as 3-38%. It is usually associated with high-energy trauma resulting in bilateral corpora cavernosa involvement. El-Assmy et al. reported 14 cases of urethral injury and all lesions were located at the same level as the corpus cavernosum, which were partial in 11 cases and complete in three. Barros et al observed urethral injury in 18,7% of the cases, including 39 partial injuries and 13 total injuries. In our study, 18(9,3%) patients out of 192 presented partial urethral injury. We did not encounter total rupture of the urethra. The urethral rupture was encountered more frequently in cases associated with bilateral rupture of the corpus cavernous, 9 out of 22 patients with bilateral cavernous rupture presenting urethral injury.

The postoperative duration of urethral catheterization depends on the complexity of observed lesions. Generally, the urethral catheter is left for 10-14 days in cases of partial injury and for 14-21 days in cases of complete lesion. To help prevent a missed cavernosal injury, the urologist can create an artificial erection by mixing saline with indigo carmine, creating a tumescence that will allow for evaluation of the repair and identification of any other corporal injuries.

In the literature, conservative treatment is associated with a complication rate of more than 30%. The cited complications are angulation, penile abscess after infection of the hematoma^[14], bacteremia, painful erection, forming of a fibrous plaque.

Emergency surgery was associated with shorter hospitalization, better postoperative outcomes, namely reducing the incidence of erectile dysfunction, preventing the appearance of fibrotic tissue, which causes penile curvature.

Conclusions

Penile trauma is often complex, due to the architecture of the area, with different structures superimposed in a small space. Management of penile fracture by emergency surgery favors the preservation of anatomical structures, which is beneficial for both patients and surgeons.

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