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Penile fracture in burkina faso: our experience on the management of 21 cases

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Abstract

Background Penile fracture is relatively a rare urological emergency and has been the topic of a few publications in the literature through clinical cases or case series. Despite this relative scarcity, it is increasingly reported as one of the andrological emergencies in Burkina Faso. The purpose of this study was to report our experience of the management of such andrological emergency in the two main university teaching hospitals of Burkina Faso.

Methods This was a cross-sectional study, including retrospectively patients managed for a penile fracture between January 2016 and September 2021, and having a minimum postoperative follow-up of 6 months. The literature review was performed by analyzing the content of the following documents: consultation logs, patient records, operative report protocol. The parameters studied were age, mechanism of occurrence, clinical data, delay of management, operative technique and functional and morphological results after surgery. Erectile function was assessed by the IIEF5 score and rigidity by the EHS scale.

Results Among the 24 cases of penile fracture, 21 patients were included with a median age of 32.7 ± 5.74 years (23–43 years). The most common mechanism was a coital misstep or coitus interruptus (14 patients or 66.7%). Forced self-manipulation/masturbation was noted in 4 cases (19%), and direct trauma to the penis was noted in 3 cases (14.3%). Urethrorrhagia was reported by 5 patients. The mean delay of management was 65 h (6–432 h). The main sign found was the painful swelling of the penis with an “eggplant” appearance. The surgical approach was a circumferential balanopreputial incision in all our patients. Involvement of the spongy body and urethra associated with involvement of the cavernous body was noted in 4 patients, with a single case of spongy body and urethral involvement. The mean length of hospital stay was 3 days. Postoperatively, erectile dysfunction was noted in 6 patients. A palpable nodule at the penis was observed in 12 patients. No patient reported curvature of the penis.

Conclusion Penile fracture is a clinical diagnosis requiring early exploration and surgical repair to ensure better functional and morphological outcomes.

Keywords Penile fracture, Management, Outcomes, Erectile dysfunction

1 Background

Penile fracture is a rare urological emergency defined as a traumatic rupture of the tunica albuginea of the corpus cavernosum [1, 2]. Most often, it affects one of the corpora cavernosa. It may extend to both corpora cavernosa, the corpus spongiosum, and/or the urethra [3]. It is a pathology of the young adult which is almost exclusively observed on an erect penis. It is caused by a non-physiological curvature of the penile axis leading to

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an intra-cavernous overpressure [2]. The epidemiological and etiological characteristics of penile fracture vary depending on sociocultural considerations [4]. It is often due to forced manipulation, vigorous sexual intercourse, masturbation, or any other mechanical trauma causing a forced bending of the erect penis [5]. Historically, management of penile fracture was conservative, but due to frequent sequelae, current management relies more on surgery. Among these sequelae, erectile dysfunction, palpable plaques and nodules, painful erections, and penile curvature are noted [6]. Few large population studies are addressing the subject of penile fracture, which makes it difficult to generalize the optimal treatment approach. In addition, only a few studies have focused on the evaluation of sexual function after surgical treatment of penile fracture [7]. In Burkina Faso, the only study conducted on penile fractures was carried out by Paré et al. [8]. For a better understanding of this pathology in our context, the present study aims to be broader, covering the two university teaching hospitals of Burkina Faso.

2 Methods

This is a cross-sectional study including retrospectively the 24 cases of penile fracture managed in the urology division of Sourô Sanou University Teaching Hospital (Bobo-Dioulasso) and the Yalgado Ouedraogo University Teaching Hospital (Ouagadougou) between January 2016 and September 2021. The parameters studied were the epidemiological, clinical, etiological, and therapeutic characteristics and the functional and morphological postoperative outcomes. Erectile function was evaluated using the IIEF5 (International Index of Erectile Function) score and the rigidity of the penis using the EHS (Erection Hardness Score) scale. For any numerical variables, a mean was calculated, and extremes were defined.

3 Results

In total, 21 patients among the 24 cases of penile fracture were identified during our study period. The mean age of the patients was 32.7 ± 5.74 years (23–43 years). All patients reported normal erections before the occurrence of the fracture.

The most frequent mechanism was “coitus interruptus” observed in 14 patients. Forced self-manipulation/masturbation was noted in 4 cases, and 3 patients, the fracture occurred as a result of direct trauma.

All our patients reported severe pain followed by immediate detumescence of the erect penis. These signs were preceded by a cracking sound heard during the penile fracture in 18 patients. Urethrorrhagia was reported by 5 patients.

Painful swelling of the penis in the “eggplant appearance” was the main sign found on physical examination as shown in Fig. 1.

The average time between fracture occurrence and the surgical intervention was 65 h (6–432 h).

The surgical approach was a circumferential balanopreputial incision in all our patients. The type of anesthesia used was spinal anesthesia in all our patients. Surgical exploration of the fracture revealed an average fracture length of 22.8 mm [10–40 mm]. The fracture site was located in the middle third of the penis in 8 patients, in the distal third in 7 patients, and in the proximal third in 6 patients.

The right corpus cavernosum was affected in 16 patients and the left side in 4 patients. The cavernous bodies were intact in one patient.

The associated urethral rupture was noted in 4 patients, with a single case of isolated urethral injury. The surgical technique performed was more or less complete denudation of the penis with access to the cavernous bodies, debridement of tissues, evacuation of the intracavernous hematoma followed by suture of the tunica albuginea tear in 16 patients, associated with urethrorrhaphy in 4

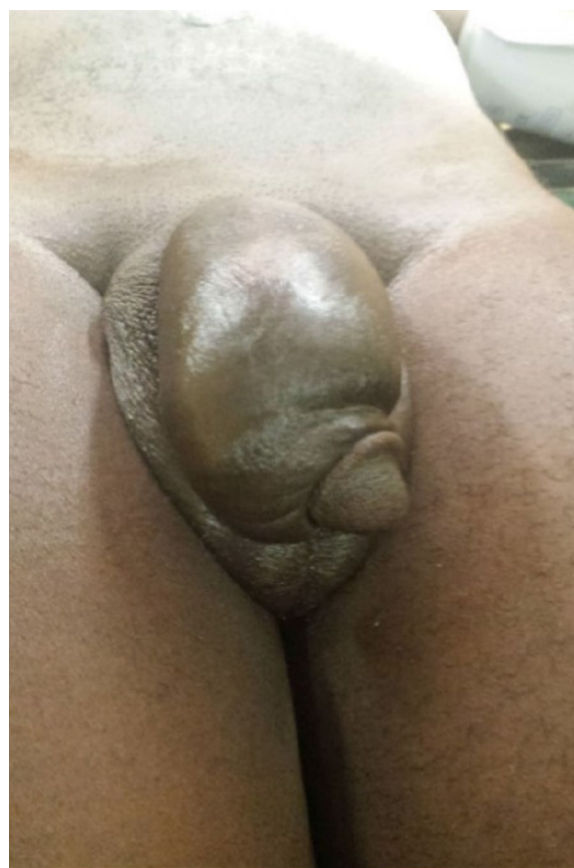


Fig. 1 Swollen penis with an “eggplant-like” appearance

patients (Fig. 2). Urethroplasty with a pedicle flap was performed in one patient who had an isolated urethral rupture with a 3 cm loss of urethral length (Fig. 3). Post-operative medication including antibiotics, analgesics, and diazepam was prescribed.

The average length of hospital stay was 3 days. Among our treated patients, 2 patients presented complications,

namely wound suppuration treated with local care and urethral stenosis.

The average time between surgery and completion of the questionnaire was 27 months (6–65 months). Our patients resumed sexual activity on average after 4 weeks (2–24 weeks). Erectile function was normal (IIEF-5 ≥ 20) in 15 patients. Erectile dysfunction was noted in 6

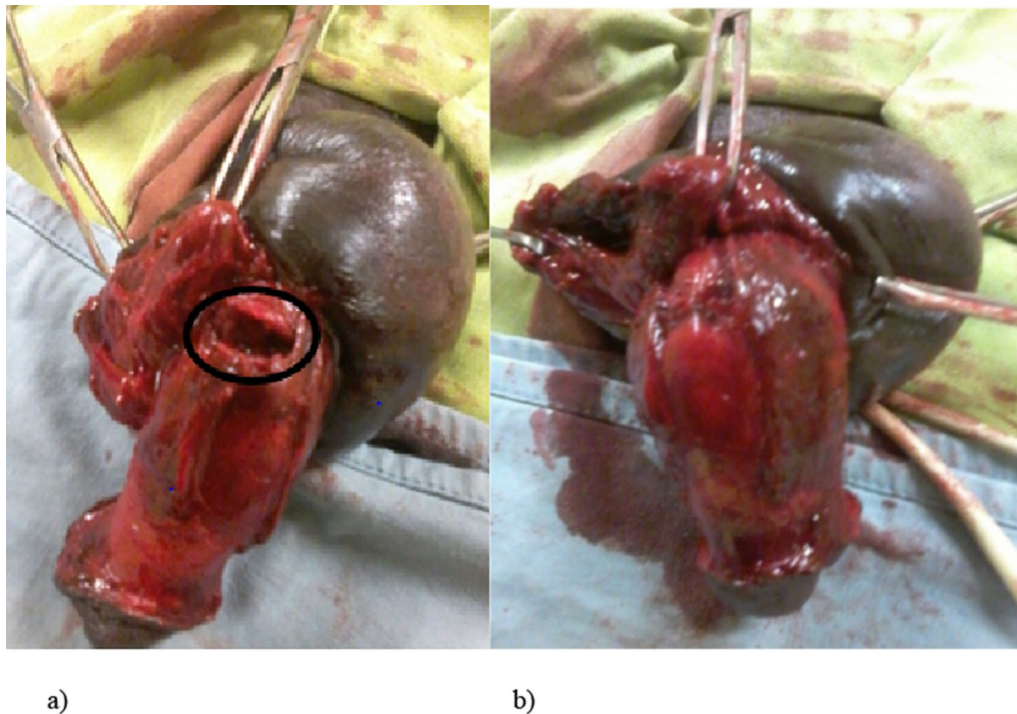


Fig. 2 Identification of the rupture of the corpus cavernosum (a) followed by albuginea suture (b)

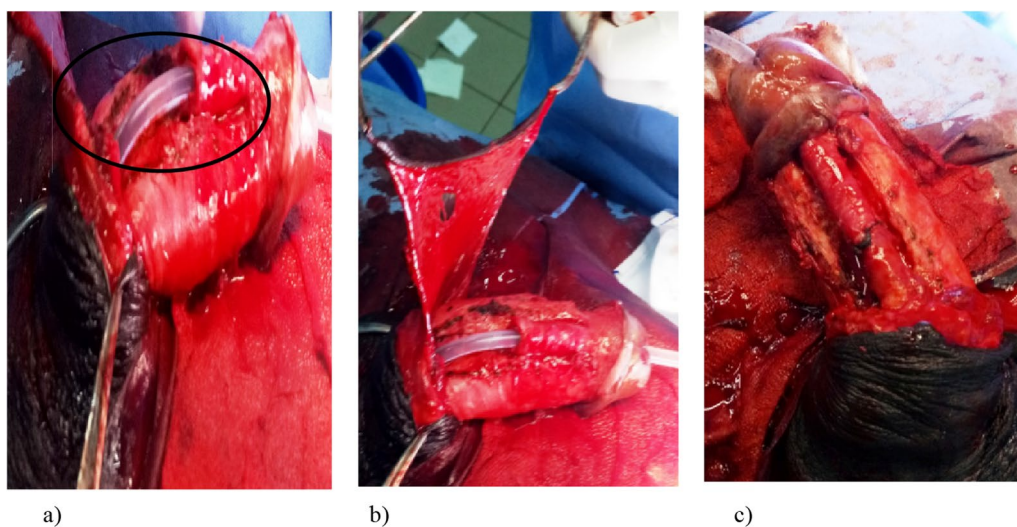


Fig. 3 Urethroplasty for urethral rupture (a) using a pedicled penile flap with a urinary catheter (b) and final intraoperative view (c)

patients, with 4 mild and 2 moderate cases. 17 patients had normal penile rigidity in the postoperative period with a score of 4 points. No patient reported painful erections or pain during intercourse. A nodule in the penis at the site of the penile fracture was palpable in 12 patients. No patient reported penile curvature in the postoperative period.

4 Discussion

Penile fracture is a rare pathology. Its frequency is certainly underestimated because many treated cases are not always published [8–10]. In Africa and the Middle East, in addition to underreporting, there is a lack of awareness of this condition by healthcare professionals and the low socioeconomic level of some patients prevents them from early consultation for such a genital injury [11]. Numerous studies have reported their series of penile fractures, but their cohorts remain limited in terms of sample size. We found 21 cases in our study conducted in the two main university teaching hospitals of the country. In the literature, the average age of patients varies from 33 to 40 years with extremes ranging from 16 to 75 years. Our results are consistent with this average age which reflects the fact that penile fracture affects more young individuals in full sexual activity, mainly related to vigor and more frequent sexual intercourse. The analysis of the literature suggests that the mechanism of penile fracture may vary due to numerous factors such as geographic region, sociocultural characteristics, marital status, and masturbation habits [4, 12]. The most common mechanism in the United States, Europe, and sub-Saharan Africa is penile trauma during sexual intercourse, known as the “coital misstep or coitus interruptus” [13]. This mechanism was mostly found in our study (66.7%). Masturbation or any other forced manipulation of the penis can also be the cause of this incident. In the Maghreb and the Middle East, the maneuver of Taghaandan, or the forced flexion of an erected penis to obtain immediate detumescence, ranks first among the causes of penile fractures [14–16]. The most widespread example of this practice was reported by an Iranian study where 269 out of 352 patients (76%) experienced penile fractures during the Taghaandan maneuver [14]. The most common reasons for this practice are relaxation of the penis and detumescence in inappropriate situations [14]. It was noted in 19% of the cases in our study. Other reported mechanisms of trauma in the literature include trapping an erect penis in tight pants and hitting a toilet seat or bedpost [17, 18]. In Japan, many reported cases were due to flipping over in bed with an erect penis [17–19]. We noted 14.3% of cases of direct trauma to the erect penis in our study.

The diagnosis of penile fracture is clinical. Associated urethrorrhagia should prompt the search for a rupture of the spongy urethra. However, the absence of this symptom does not exclude the possibility of urethral injury [20]. In our study, five patients presented with urethrorrhagia on anamnesis, with a rupture of the urethra found on exploration. Concomitant urethral involvement can worsen morbidity, especially in the long term, with a risk of urethral stenosis. No paraclinical examination is mandatory for the diagnosis of penile fracture in typical cases [21]. In many cases, imaging may be completely unnecessary and should not delay management, although the literature suggests that small delays are unlikely to affect management. Delaying surgical management can also make exploration of the penis more difficult [20, 22]. In different series, the delay in management varies generally from a few hours to a few days. Authors have explained the relatively long delays due to patients' reluctance to consult for this usually difficult-to-discuss issue, especially in Africa where modesty is an issue [8, 11, 20]. In addition to these reasons found in our study, we also noted the lack of knowledge of this condition by some healthcare professionals, which delayed management. Rupture of the tunica albuginea and corpus cavernosum is the most frequent in most studies. Isolated rupture of the corpus spongiosum is a rare entity. It may or may not be associated with a rupture of the urethra or corpus cavernosum [23]. This urethral rupture during a penile fracture is dependent on the violence of the trauma. It is much more frequent in bilateral fractures of the corpus cavernosum [20]. We noted a case of an isolated urethral rupture in our series and 4 cases in association with a rupture of the corpus spongiosum and one of the corpus cavernosum. The main principles of surgical treatment consist of evacuating the hematoma, achieving hemostasis of bleeding vessels, trimming and suturing the tear of the tunica albuginea of the corpus cavernosum, and finally, if present, repairing an associated urethral rupture [24]. A balanopreputial circumferential incision allows exposure of both the corpus cavernosum, the corpus spongiosum, and the urethra. It is indicated when the penile fracture is distal, bilateral, or associated with urethral rupture. It is preferable whenever the location of the fracture has not been identified preoperatively [25]. Thus, it allows for an exhaustive exploration of the lesions compared to the elective route on the fracture zone, but the latter has the advantage of being less traumatic, reducing the risk of postoperative infection [12]. A circumferential incision was performed on all our patients.

The repair of the tunica albuginea is generally done along the longitudinal axis of the penis using separate absorbable or non-absorbable sutures, size 2/0 or 3/0, after hematoma evacuation and good exposure of the

lesion [15, 26, 27]. The tunica albuginea of our patients was mostly sutured with absorbable Vicryl 3/0 suture. Associated urethral ruptures occur in 10–20% of cases and pose a little diagnostic challenge due to the frequent presence of urethrorrhagia. In case of doubt, intraoperative urethroscopy is performed. The urethral rupture is sutured, after trimming the edges, using separate points of absorbable thread. The duration of urethral catheterization depends on the severity of the observed injuries, which can last up to 6 weeks in case of complete rupture [26]. We noted 4 cases of associated urethral ruptures in which urethrorrhaphy was performed with Vicryl 3/0 on a transurethral catheter and one case of isolated urethral rupture that required urethroplasty with a pedicle flap. In studies, early postoperative complications were noted, such as surgical wound infection, urethral fistula, surgical wound dehiscence, skin necrosis, and urethral stricture that may result from urethral injury and cause voiding difficulties [10, 27, 28]. In our series, two patients (9.6%) presented with postoperative complications with wound suppuration and urethral stricture complicated by bladder stone. Erectile function is a major determinant of male sexual function. This does not mean that erectile potency is a dominant factor in overall sexual satisfaction [7]. The most frequent causes of erectile dysfunction (ED) after penile fracture and its surgical treatment are blood leaks, veno-occlusive dysfunction at the vascular hinge of the penis, and inadequate cavernous artery blood flow [29]. We noted 6 cases of ED, including 4 mild and 2 moderate cases. The moderate cases were treated with oral medication as phosphodiesterase-5 inhibitor (IPDE-5). Painful postoperative erection was not commonly reported. Morphological sequelae of penile fracture include curvature of the penis during erection and a palpable nodule secondary to wound fibrosis [17]. Complication as penile curvature was not reported in our study. However, we reported a higher rate of complications with palpable nodules on the penis (57%).

5 Conclusions

Fracture of the penis is a non-frequent urological emergency in Burkina Faso. It occurs mainly in young men during sexual intercourse with coitus interruptus as essential mechanism. The diagnosis of penile fracture is clinical and requires early exploration and surgical repair to ensure better functional and morphological outcomes.

Abbreviations

PF	Penile fracture
IIEF	International index of erectile function
IPDE 5	Type 5 phosphodiesterase inhibitor
ED	Erectile dysfunction
EHS	Erection hardness score

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Not applicable.

Author contributions

AO, AKP, MK took care of the preparation of the material, the collection and the analysis of the data. The first draft of the manuscript was written by AO, MK. The statistical analysis carried out by DY, MS. Proofreading and editing were contributed by BK, FAK, TK. All authors have read and approved the final manuscript.

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Availability of data and materials

All data used in this study are available from the corresponding author.

Declarations

Ethics approval and consent to participate

This study obtained the favourable approval of the ethics commission of the department of Surgery and surgical specialties of Sourou Sanou University teaching hospital under reference: CHUSS/CE 21.002. This is a retrospective hospital study, which did not require the consent of all patients.

Consent for publication

Written informed consent was obtained from two patients for publication of accompanying images (Fig. 1 for one patient and Figs. 2 and 3 for another case of penile fracture with urethral rupture).

Competing interests

The authors declare that they have no competing interests.

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