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VARIED PRESENTATION AND SURGICAL MANAGEMENT OF PENILE FRACTURE IN ABUJA NIGERIA

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ARTICLE INFO	ABSTRACT	ORIGINAL RESEARCH ARTICLE
Article History Received: October 2019 Accepted: November 2019 Keywords: Corpora rupture, de-gloving incision, surgery, and voiding, erectile dysfunction.	Penile fracture is a true urologic emergency resulting from a tear in the tunica albuginea as a result of blunt trauma in an erect penis. Even though it is a well-recognized clinical problem, it is relatively uncommon because it is often under-reported due to its embarrassing nature. Penile rupture occurs when the engorged penile corpora buckles and literally “pops” under the pressure of blunt trauma. Diagnosis is mainly clinical and the mainstay of treatment is surgery regardless of delay in presentation. This review aims at reporting our experience in the surgical management of penile fractures in Abuja, North Central Nigeria. In the management of penile fractures, current guidelines recommend immediate surgical exploration and repair upon presentation. In the event of delayed presentation (>48 hours after injury), immediate repair even though associated with increased risk of long term sequelae is still advocated. Relief of pain, prevention of erectile dysfunction and achieving normal voiding are the goals of treatment. The type and location of the incision for repair is surgeon dependant, the most popular being the distal circumferential sub-coronal de-gloving incision popularized by McAninch et al. We found this technique very satisfactory with adequate exposure and cosmetic appeal in our practice.	
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1. INTRODUCTION

Penile trauma poses a difficult physical and psychological problem which often comes with embarrassment to the man. (1)(2)(3) It is a relatively rare and underreported entity due to

the perceived embarrassing nature and sociocultural taboos associated with discussing sexual matters especially in sub-Saharan Africa. (1)(3) A gradual rise in the number of cases seen has however been reported in some

parts of Nigeria in the last decade.(3)(4)(5) The incidence of penile fracture differs from one region of the world to another depending on geographical location and sociocultural norms peculiar to that region.(5) It is higher in some eastern European countries where a case per week has been reportedly treated in busy emergency centers.(6)

Penile fracture occurs when the engorged penile corpora are forced to buckle and literally “pop” under the pressure of blunt trauma. The fracture which refers to the traumatic rupture of the tunica albuginea of the corpora cavernosa of the penis may also involve the corpora spongiosum and urethra. The definition of penile fracture does not apply to lesions on a flaccid penis. It was first reported in modern medical literature in 1924 by Malis et al.(7)(8)(9) There appears to be patient lack of awareness on the urgency of this problem and coupled with its embarrassing nature delay in presentation may not be unusual.(1)(3)(7) The diagnosis is usually clinical and the mainstay of treatment is surgical repair regardless of delay in presentation.(5)(4)(10)(11)

As the penis gets erect from a flaccid state the thickness of the tunica albuginea reduces from 2mm to 0.25 – 0.5mm. This results in loss of elasticity thus predisposing the penis to rupture. The tunica albuginea has remarkable tensile strength and it requires increases in intra-cavernosal pressure above 1500mmHg for it to rupture. An awkward bend in an erect penis may give rise to such an increase in the intra-cavernosal pressure which exceeds the tensile strength of the tunica leading to a transverse laceration of the shaft. (12)(13)

Sexual trauma accounts for penile fractures in roughly one third of cases and the most implicated position is the female dominant.(5) (14)(12)(15) This position is associated with more severe forms of penile injury such as bilateral fractures and urethral involvement. (5)(14) The mechanism of

injury is such that the penis slips out of the vagina during intercourse and strikes against the pubic symphysis or perineum. This is obviously more likely when the female partner is on top.(5)(14) (16) In some parts of Nigeria, the middle east and Asia penile manipulation has been reported to be commoner than sexual trauma in the etiology of penile fracture. (1)(3) (12)(17)(18) Examples of cases of penile manipulation- induced penile fracture are masturbation, forceful bending and Taqaadan, a common practice in Middle East province of Kermanshah where patients knead and snap the erect penis to rapidly achieve detumescence.(1)(12) Less commonly documented etiologies are rolling over in bed during nocturnal erection, direct blow, fall from heights and hastily removing or applying clothing when the penis is erect.(4)(12)(13)(15)(19)(20)(21)(22)

The diagnosis of penile fracture is mainly based on a stereotypical history and physical examination. (3)(5)(12) The classic triad of audible crack, detumescence, and pain is observed in most cases. (12)(16) The normal penile appearance is distorted and the ensuing swelling gives rise to the so-called egg-plant deformity (Aubergine sign) (12) as seen in Figure 1. The fractured penis usually deviates to the opposite side of the tunica tear as a result of the mass effect of the underlying hematoma. (12) Examination of the penis can often reveal the site of corporal tear as a palpable overlying hematoma. This firm, immobile hematoma, which is palpable as the penile skin is rolled over describes the “rolling sign”.(13) Except in situations where the diagnosis is not clear or when there is concomitant urethral injury ,extensive investigations like penile ultrasound, cavernosography and MRI are not required. (23)(24) A retrograde urethrogram is recommended in cases where urethral involvement is suspected but where applicable a diagnostic urethroscopy done intraoperatively just prior to the fracture repair is preferable.

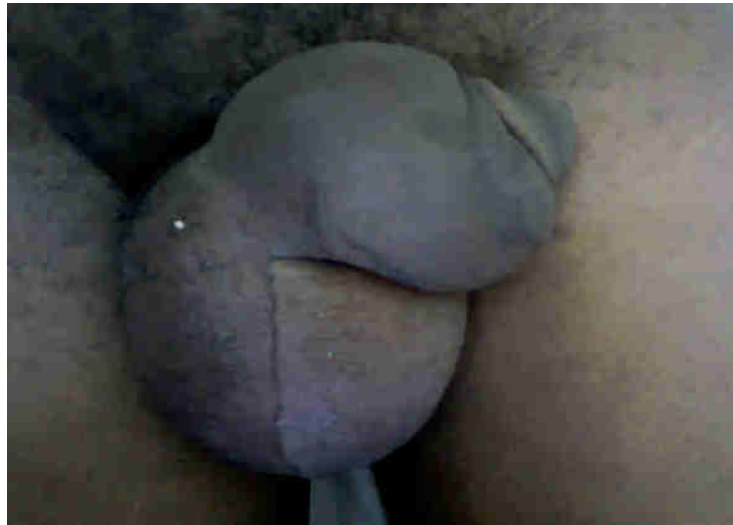


Figure 1. Eggplant (Aubergine) sign

Early surgical repair is currently advocated while conservative management is considered obsolete. (5)(4)(12)(13) The drawbacks of conservative management include a high incidence of complications such as infected hematoma, chronic pain, penile deformity, and erectile dysfunction. (5)(12)(13)(25) The benefits derived from surgical repair include good functional results with low morbidity and shorter hospital stay. Delay in the repair of up to 7days after penile fracture does not adversely affect the outcome of the treatment.(25)(12)

2. PATIENTS AND METHODS

This retrospective study was carried out in four hospitals rendering urologic services in Abuja, north-central Nigeria namely the University of Abuja Teaching Hospital, Garki hospital, Maitama and Asokoro District Hospitals. We analyzed 9 cases of penile fracture treated by urologists in these centers over a 12 month period from January 2016 to December 2016. We looked at the following parameters; mode of injury, age, time interval before the presentation and urethral involvement. The surgical technique used in the repair, hospital stay and outcome of surgery were also reviewed. Periodic follow up by hospital visits and phone calls to the patients were used to document the outcome of

treatment. The data were analyzed using Microsoft Excel version 2013.

3. SURGICAL TECHNIQUE

All the patients had general anesthesia administered and prophylactic antibiotics given routinely. Bladder catheterization was carried out, except in two cases where urethral injury was suspected and a suprapubic catheter was rather placed. A sub-coronal incision with penile de-gloving as popularized by McAnich was employed for all the repairs. This incision gave adequate exposure of the corpora cavernosum, urethra and fracture hematoma which is located under the buck's fascia. Figure 2. We utilized a penile tourniquet to limit blood loss and improve vision during surgery. Once the corpora cavernosa tear was identified in (Figure 3) and the hematoma evacuated, the tear was repaired by interrupted suture using polyglactin 910 3/0. In two cases with urethral rupture primary repair was done using interrupted polyglactin 910 4/0. Following the repair, the de-gloved penile skin was returned distally and closed using polyglactin 910 3/0 sutures with resultant good aesthetic appearance. Figure 4 A pressure dressing was applied and the urethral catheter maintained for 2 days in patients without urethral involvement and 3 weeks for those with urethral rupture. In the latter group, a peri-catheter urethrogram was done just prior to removing the urethral

and suprapubic catheters. Subjective assessment of voiding, erectile function, and cosmetic appearance was done for all patients during follow up visits to the clinic. Two

possible outcomes were documented as either normal if the patient was satisfied or abnormal if not satisfied.



Figure 2. Degloved Penis exposing haematoma overlying fractured site

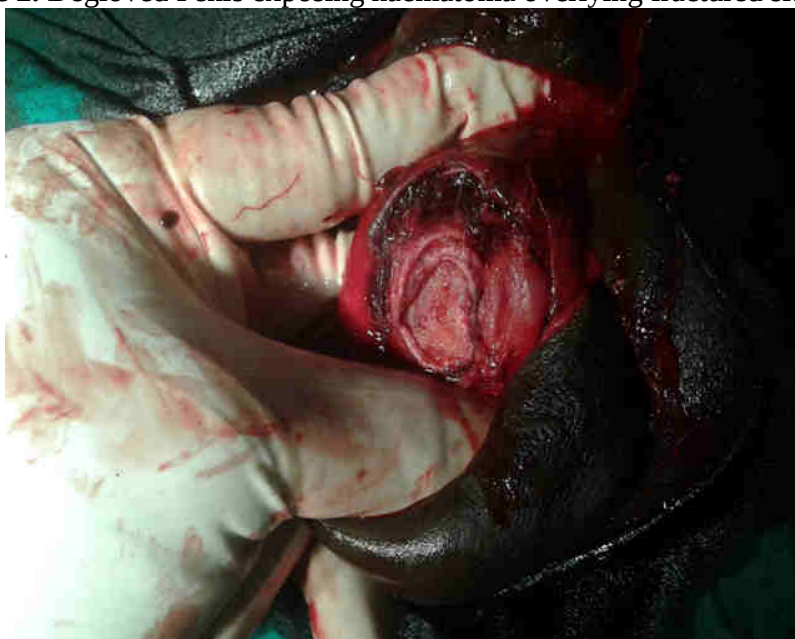


Figure 3. Exposed rent in the tunica albuginea after removal of hematoma



Figure 4. De-gloved penile skin approximated following repair.

4. RESULTS

The case notes of 9 patients were retrieved and studied. The mean age of the patients was 36.7 ± 5.5 years. Mean interval after penile fracture until the time of presentation was 23.9 ± 18.4 hours. In 7 (78%) patients the right corpora cavernosum was affected while the left corpus cavernosum was involved in 2 (22%). Sexual trauma was responsible for the fractures in almost two-third (67%) of the cases, whereas nonsexual causes accounted for 33% namely rolling over on the penis in 2 patients and one case of penile manipulation. Figure 5 All patients presented to the hospital within 48hours, four (44%) within 24 hours of the fracture while the remaining five (56%) within 48hours. The

classic triad of audible crack, immediate detumescence and pain were reproducible in the majority of patients (56%). The incidence of urethral involvement was 22%, case numbers 1 and 8 in Table 1, the presentation was blood at the meatus and acute urinary retention. The proximal shaft was the site of fracture in 5 patients (56%), mid-shaft in 3 patients (33%) and distal shaft in one patient (11%) as seen in Table 1. The aesthetic and functional outcome including satisfactory sexual intercourse and voiding were self-reported as normal in all patients. No complications either as a result of the pathology or intervention carried out were recorded during the 2 years follow up.

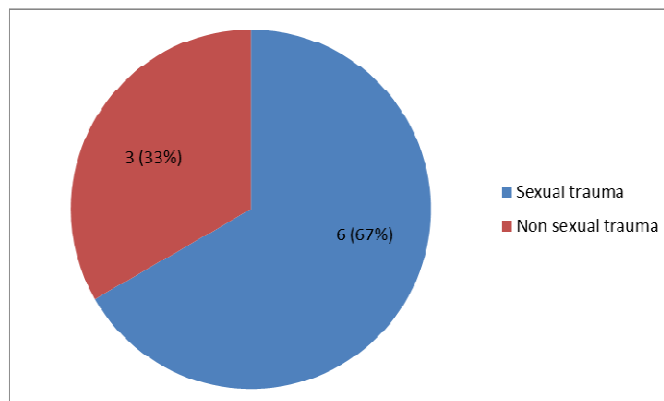


Figure 5. Etiology of penile fracture**Table 1.** Demographic characteristics, mechanism, and presentation of penile fractures amongst patients

Case no	Age (years)	Marital status	Injury Presentation interval (hours)	Mechanism	Presentation	Site
1	37	Married	4	Female dominant	blood at meatus	Right midshaft
2	25	Single	36	Female dominant	Classical	Right proximal
3	33	Married	48	Rolling over	Pain and swelling	Right proximal
4	40	Single	27	Doggy style	Classical	Left distal
5	36	Single	48	Rolling over	Pain and swelling	Right midshaft
6	43	Married	32	Doggy style	Classical	Left proximal
7	38	Married	12	Penile manipulation	Classical	Right proximal
8	43	Married	3	Female dominant	Pain, Swelling, Blood at the meatus, AUR	Right midshaft
9	35	Single	5	Female dominant	Classical	Right proximal

5. DISCUSSION

There are few reports in literature with significant numbers on penile fracture.(1)(5)(20) However, a rising incidence is being noted worldwide including Nigeria where some authors have cited improved health-seeking behavior and westernization of the locals as the reasons behind this trend.(3)(4)(5)(10) Abuja the most rapidly growing city in Africa is highly cosmopolitan with a rapidly westernizing population therefore it is not surprising that the number of cases of penile fracture is on the increase.(26) The incidence varies according to culture, sexual behavior and geographical location of people.(3)(5)(17) The age range of the patients in our study was 25 – 43 years with a mean age of 36.7+/- 5.5 years. Although younger and older age groups could be affected it is commonly a problem of the sexually active

men as reported by most authors. (3)(5)(13) The mechanism by which penile fracture occurs can be classified into sexual and non-sexual related events. Examples of non-sexual related events include penile manipulation, masturbation and rarely, falling or rolling over an erect penis.(3)(12)(13)(14)(15)(18) (19) (27)

The most common etiology of penile fracture in our series was sexual intercourse (n=6,67%) consistent with earlier studies from other urban centers in Nigeria, Europe, America, few Middle Eastern Asian.(3)(5)(4)(9) (10)(13) Only one third of our patients (n=3,33%) had non sexual related etiologies Table 1and Figure 5. This is in contrast to findings in some semi-urban centers in Nigeria and some Middle Eastern countries where penile manipulation as a cause of penile fracture was found to be commoner. (1)(3)(6)(17) The cases involving non-sexual

events we recorded occurred in 2 patients namely rolling over in bed and vigorous penile manipulation in an aroused impatient man who was denied sexual intercourse by his spouse who was menstruating. All our patients presented quite early to the hospital within 48 hours and this may be related to the improved health-seeking behavior of our people earlier alluded to by other authors. (5)(4)

The classic triad of cracking sound during intercourse, pain and rapid detumescence was the main mode of presentation in our series (n=5,56%) and this is consistent with findings in the literature. (5)(13)(16) A greater majority (n=7,78%) of the patients in our series had involvement of the right corpora cavernosum whereas only 2 (22%) involved the left corpora cavernosum. This occurrence was also noted by other authors who posited that the perceived anatomical weakness of the right side may have been responsible. (3)(5)(13)(27) The degree of injury varies from unilateral corporal tears to bilateral injuries and urethral involvement. (15)(18)(25) Our incidence of penile fracture with urethral involvement of 22% falls within the generally reported incidence of 10 – 30%. (5)(10)(15)(18)(25) What is interesting about these two cases is that they both adopted a similar position during sexual intercourse (female dominant position which carries a greater risk for more severe injury) (15) The proximal shaft was the most frequently identified point of rupture in 5, 56% of cases in our study. Higher incidences of proximal shaft involvement up to 75% and above have been reported by other authors in the United States of America and Europe. (13)(6). We could not deduce any reason for this finding.

Careful examination of the fractured penis can often reveal the site of corporal rupture by palpation of the hematoma overlying the rent. This is known as the rolling sign which describes a firm, immobile hematoma that is palpable as the penile skin is

rolled over. (13) Typical features of urethral involvement such as difficulty in voiding, urethral bleeding and hematuria may not always be apparent in all cases of penile rupture. (5)(15) In this series the two patients (22%) who presented with difficulty in voiding had failed attempts at urethral catheterization raising the suspicion of urethral involvement.

Detailed investigations are not usually required in cases of penile fracture except where the diagnosis is not clear. Penile ultrasonography, cavernosography, and MRI could provide additional information in such instances. (23)(24) For those with a suspected urethral injury where the diagnosis may not be obvious, a urethrogram is recommended to identify the location of the injury. (15)(24) Where feasible a diagnostic urethroscopy is preferable to a retrograde urethrogram in confirming urethral involvement. (23)(24) These investigation tools were not required in any of our patients with penile fracture since their clinical presentations were stereotypical.

Surgical repair of penile fracture is preferred to conservative management which is now considered obsolete. (4)(5)(12)(13) Conservative management is occasioned with a high incidence of complications such as infected hematoma, chronic pain, penile deformity and erectile dysfunction. (12)(13)(25) Immediate surgical repair has the advantages of good functional results with low morbidity and shorter hospital stay. Delay in repair of up to 7 days after injury does not in any way adversely affect the outcome of the treatment. (12)(25) (28) This makes delayed primary repair an acceptable option especially when time passes before seeking care either due to embarrassment or lack of specialist care. There is controversy over the best choice of incision to be used in the surgical repair of penile fractures. (3)(24) In the absence of any recommendations on the type of incision to be used the surgeon's preference suffices. Some surgeons favor a longitudinal incision over the suspected fracture site, while others like the authors in this series prefer a sub-coronal de-

gloving incision which they believe gives better exposure of the two corporal bodies and urethra. This incision is also simple to learn and use in our environment where most males are already circumcised. Furthermore, a sub-coronal incision offers good cosmetic appeal and minimizes the chance of accidentally missing any urethral injury especially in cases of multiple tunica injuries tears. (29)(30) A direct incision over the fractured site has also been described but this might miss associated concomitant tears in different locations. (13) In cases of extensive lacerations, some researchers have also proposed using an inguinoscrotal incision. Evangelos et al described using a midline ventral incision with the advantage of having direct access to both corpora and anterior urethra with a minimal skin incision. (29) Our technique involved evacuation of the fracture hematoma and repair of the tunica tear Figure 3 with polyglactin910 3/0 sutures. The de-gloved penile skin is thereafter approximated with polyglactin910 3/0 suture and a firm penile dressing applied.

The functional and cosmetic outcome of early surgical repair is known to be superior compared to conservative management. (13). Conservative management (including cold compress, pressure splinting, anti-inflammatory medications, fibrinolytic drugs and suprapubic diversion of urine was considered the treatment of choice in the past. This has, however, fallen out of favor due to the high risk of complications such as abscess formation, nodules at the fracture site, penile curvature, painful erections, and erectile dysfunction. (7) (13)

6. CONCLUSION

Treatment of penile fractures can be effective and safe in the hands of experts. Current guidelines recommend immediate surgical exploration and repair upon presentation. In the event of delayed presentation (> 48hours after injury), immediate repair even though associated with increased risk of long term sequelae is still advocated. Relief of pain, prevention of erectile

dysfunction and achieving normal voiding are the goals of treatment of the penile fracture. The type and location of the incision is surgeon dependant, the most popular being the distal circumferential sub-coronal de-gloving incision popularized by McAninch et al. In all 9 cases, we found this technique very satisfactory with adequate exposure and cosmetic appeal.

CONFLICT OF INTEREST: The authors have no conflict of interest to declare

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