ORIGINAL ARTICLE

Traumatic penile injuries: Mechanisms and problems of treatment in a tertiary institution in Nigeria

CK Oranusi, AME Nwofor

Department of Surgery, Urology Unit, Nnamdi Azikiwe University Teaching Hospital, Nnewi, Anambra State, Nigeria

Abstract

Background: Penile injuries are uncommon. The more severe injuries are often difficult to manage.
Objectives: We report our experience with penile injuries from different causes and treatment options available.
Patients and Methods: We analyzed retrospectively 23 cases of penile injuries presenting to the Urology Unit of a tertiary hospital in the Southeastern part of Nigeria from January 2007 to December 2012.
Results: The management for each patient varied depending on the nature and extent of the injury.
The mean age of the patients was 28.9 ± 14.4 years (range 3 weeks to 43 years). The mean duration before presentation was 22.7 ± 17.8 h (range 1–168 h). The causes of penile injuries were categorized as follows: Postcircumcision 3 (13.0%), genital mutilation (self-inflicted injury/attacks by assailants) 6 (26.1%), accident 4 (17.4%), penile fracture 8 (34.8%), and gunshot injury 2 (8.6%). Isolated blunt injuries to the corporal tissues as occurs in penile fractures was managed successfully with early exploration and closure of the tunical tear, while injuries to the penile skin was managed with dressing and secondary closure. Severe penile injuries resulting in partial or total phallic loss presented the most challenge to treatment.
Conclusion: Traumatic penile injuries are not common. Severe penile injuries could be challenging because of the nature of the injuries, delayed presentation and unavailability of modern technological tools and experience required for the treatment of such severe injuries. Expertise in the use of flaps for a neophallus are still been developed, and penile prosthetic devices are not readily available in our setting.

Key words: Injuries, management, penile, traumatic

Date of Acceptance: 10-Jun-2014

Introduction

Penile injuries are rare, but probably underreported urological emergencies. These injuries attract a lot of psychological, physical, functional, and emotional distress on the patients as well as to spouses and parents.[1] The penis is protected from injuries by its location and mobility. The penis is therefore prone to injuries when it is erect.[2] It is difficult to make a generalized classification of penile injuries due to the complexity of the injuries. However, a broad classification into blunt and penetrating or avulsion, penetrating and amputating injuries may suffice.[2] The extent of injury may vary from mild to severe and total amputation.[3,4] Penile injuries can also be classified anatomically into four types according to the structure(s) involved: Skin, erectile tissue, urethra, and complex injuries.[5] The severity of these injuries can be assessed using the American Association for the Surgery of Trauma (AAST) injury score.[6] This organ injury scaling is based on the magnitude of anatomic disruption and is graded as 1 (minimal), 2 (mild), 3 (moderate), 4 (severe), 5 (massive), and 6 (lethal).[6] Good results are expected if treatment is instituted early. The reconstructive goal is to reconstruct a penis of good conformation and to restore function.[2]

Address for correspondence:
Dr. Chidi-Kingsley Oranusi,
Department of Surgery, Urology Unit, Nnamdi Azikiwe University Teaching Hospital, P.M.B. 5025, Nnewi, Anambra State, Nigeria.
E-mail: chidex30@yahoo.co.uk

Access this article online	
Quick Response Code:	Website: www.njcponline.com
	DOI: ***
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The aim of this study is to report our experience in the management of penile injuries as seen in a tertiary institution of a developing country, with emphasis on common causes, pattern of presentation and the challenges encountered in the management of such cases.

Patients and Methods

We retrospectively analyzed cases of penile injuries presenting to the Urology Unit of a tertiary care center in the Southeastern part of Nigeria, from January 2007 to December 2012. Records of patients treated for penile injuries were obtained from the medical records department. Information on patients' age, mechanism of injury, and treatment offered were extracted. The patients' age, mechanism of injury, treatment offered, and outcome of treatment were analyzed. Results were analyzed using Microsoft Excel® and expressed in simple proportions.

Results

Twenty-three cases were treated during the period. Diagnosis of penile injury in all patients was made from physical examination, and the full extent of injury was assessed during surgery. The management and surgical techniques varied, depending on the type and extent of injury.

The mean age of the patients was 28.9 ± 14.4 years (range 3 weeks to 43 years). The mean duration before presentation was 22.7 ± 17.8 h (range 1–168 h). Table 1 lists the common causes of penile injuries in this study. Penile fractures and genital mutilation (self-inflicted injury/attacks by assailants) accounted for the most common causes of penile injuries. These occurred in 8 (34.8%) and 6 (26.1%) of the cases, respectively. Fourteen (60.9%) were severe injuries of the penis (AAST grades IV and V). Two-thirds of the cases of penile fracture was caused by forceful bending of the erect penis. Accidental injuries to the penis were mainly from occupational injuries from industrial machines, road traffic crash (RTC) and domestic injuries (accidental injuries from sharp objects, while playing in the home environment). The end result of these severe injuries varied from partial amputation, complete amputation, and crush injuries to the penis. Circumcision injuries were noted in 3 (13%) following attempt at circumcision by a poorly trained nursing staff.

Table 2 categorizes the various injuries observed in this series with the treatments offered to the patients. In patients with enough residual penile length after penile amputation, initial treatment after stabilization of the patient was to refashion the residual stump with stenting of the urethra with a catheter. Those with significant loss of penile length or complete amputation of the penis were offered a perineal urethrostomy (urethrocuteneostomy) as initial management and subsequently reassessed for further treatment in 3–6 months [Figure 1]. Isolated injuries to the penile skin usually vary from small lacerations to complete skin avulsions sometimes extending to the thigh and buttock [Figure 2a]. Minor skin lacerations were treated

Table 1: Causes and description of penile injuries

Causes	Description	Number	Percentage
Circumcision by untrained nurses	Postcircumcision	3	13.0
Genital mutilation	Self-inflicted injuries/ injuries caused by assailants	6	26.1
Accidents	RTC (motorcycle accident)	1	
	Domestic	1	
	Industrial	2	
	Total	4	17.4
Penile fracture	Forced bending	6	
	Sexual intercourse	2	
	Total	8	34.8
Gunshot		2	8.7
Grand total		23	100

RTC=Road traffic crash

Table 2: Injury description and treatment methods

Description of injury	Treatment	Number (*n*)
Postcircumcision amputation of glans penis	Immediate re-implantation	1
Partial amputation	Debridement plus refashioning of stump	10
Complete amputation	Debridement plus perineal urethrostosmy	1
Tunical tear from fracture	Penile exploration with suturing of the tear	8
Penetrating gunshot injuries	Penile exploration and debridement	2
Isolated skin laceration	Wound dressing	1
Extensive skin avulsion	Wound dressing with delayed skin grafting	2
Total		25

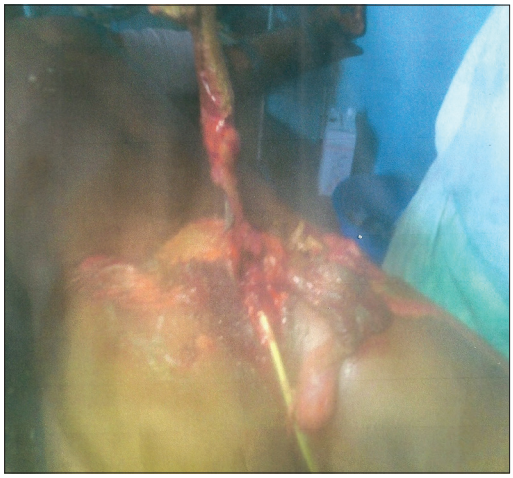

Figure 1: Completely crushed and amputated penis and testis with complete transection of the urethra

with wound dressings and delayed wound closure without on-toward consequences. Extensive skin avulsions often require debridement of devitalized skin with delayed skin grafting. Two patients (8.7%) 6 who sustained gunshot wounds to the penis with associated urethral injury were treated with suprapubic urinary diversion, minimal wound debridement, and the delayed urethroplasty (substitution urethroplasty) of the urethral stricture.

Duration of follow-up ranged from 1 to 24 months with a mean 13 ± 9.9 months. Those with complications and patients requiring further advanced surgeries were often follow-up for longer periods.

Discussion

Penile injuries are uncommon. The true incidence may be difficult to ascertain due to under-reporting.[7,8] Some cases can occur in isolation, or may be part of generalized trauma. Isolated injuries to the penile skin and prepuce can be caused by burns, zippers injury, ring impaction, and avulsion injuries. Injuries to the prepuce usually occur in children and adults who are uncircumcised.[9] Severe penile injuries usually involve more extensive part of the penis including varying degrees of amputations. It may also involve surrounding structures such as the scrotum, testes, thigh, and perineum. Common causes include burns, RTC, animal bites, self-amputation, ritual amputation, and industrial accidents.

Pattern of injury vary with geographic location. Perovic *et al*.[2] in their review of 43 patients in Europe with penile injuries noted that the most common causes of penile injuries was iatrogenic after repair of congenital penile anomalies and from traffic accidents and burns. From this study, injuries causing penile fractures, genital mutilation from self and attacks from assailants and accidents involving the penis accounted for the most common causes of injury to the penis. Iatrogenic injuries to the penis are not commonly reported as noted in this study. It is, therefore, difficult to ascertain the true incidence in our environment. The incidence of genital self-mutilation is thought to be on the increase, with a number of cases been reported in the literature.[10,11] In Nigeria, few cases have been reported.[12,13] Patients particularly at risk of genital self-mutilation are psychotics, schizophrenics with religious delusions and patients with character disorders like transsexuals.[14] Male circumcision, which is widespread amongst native Africans is sometimes regarded as a form of genital mutilation.[15]

Diagnosis of penile injuries can usually be made from the history and physical examination. In cases of penile fractures where the diagnosis is unclear from the history and physical examinations, additional information may be obtained from penile ultrasonography, cavernosography, and recently, magnetic resonance imaging.[16,17] These investigative tools were not needed in any of the patients with penile fracture. For patients with suspected urethral injury for which the diagnosis is not obvious, a retrograde urethrocystography is recommended to identify the area of injury.

Factors that influence treatment options for penile injuries include the mechanism of injury and time before the presentation. High impact injuries often portend complex injuries to the penis and early presentation and treatment will help prevent complications such as infection, penile curvature, and chronic pain.[2] In all cases, the goal of treatment is to reconstruct a penis that is functionally and aesthetically acceptable. From this study, isolated penile skin lacerations and penile fractures when identified early and treated usually resulted in a good functional outcome. We usually adopt a policy of staged management for the more complex injuries. This invariably reduces morbidity and improves outcome. Early and immediate microvascular anastomosis of amputated glans penis also achieves a good result in centers with adequate facilities for managing such cases. However, the norm in our environment is for delayed presentation, which often precludes the use of this method.

Mechanisms of injury and pattern of presentation of penile fractures in this study, share similar features with reports in the literature.[18-20] From this study, 88% occurred

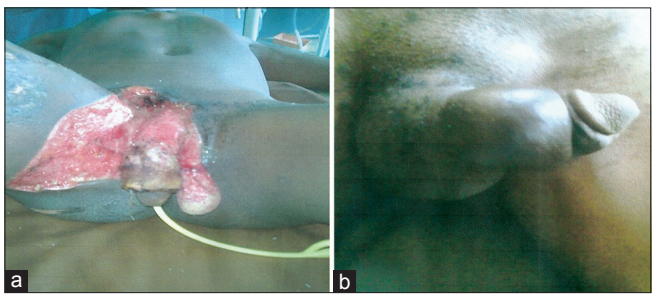

Figure 2: (a) Skin avulsion of the penis and perineum from accidental machine injury with loss of one testis. (b) Penile fracture with typical deviation of the penis. Proximal shaft rupture of the tunica on the right and on dorsal surface

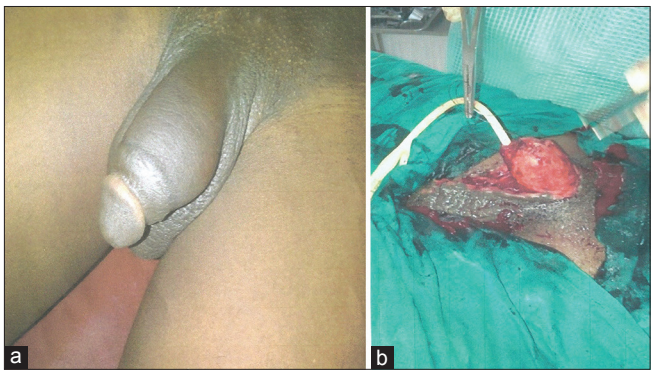

Figure 3: (a) Proximal shaft fracture on the left and ventral aspect of penis. (b) Traumatic partial amputation of the penis from accidental machine injury with loss of both testes

following attempts at forcefully bending of the erect penis [Figures 2b and 3a]. Penile exploration using the subcoronal circumferential incision was used for penile exploration in cases of penile fractures. This incision has the advantage of excellent exposure of the three corpora, avoids accidental missing of a urethral injury or multiple injuries of the tunica.[21,22] The outcome using this method was excellent, with good functional and esthetic result.

Management of patients with severe penile injuries is usually multi-disciplinary. Treatment options depend on the involved part, degree of injury, and remaining penile and local tissue.[2] Usually, the aim of treatment is to prevent complications by selecting appropriate procedures.[2] The more severe injuries of the penis present the most challenging to manage, especially those with extensive damage to the corporal tissues. With a large population of young adults and proliferation of small scale industries operating with little or no regulations, it is not surprising that penile injuries may occur in certain occupations such as those working in the bakery, as observed in this study [Figure 3b]. The most severe penile injuries, which resulted in crush injury to the penis from this study, was from the motorcycle crash. The scrotum and its contents were also avulsed [Figure 1]. Usually, the amputated genitals are not available at presentation. Initial treatment for these patients involved debridement of devitalized tissues and refashioning of stump (urethrocutaneostomy).

Secondary repair after this initial management require residual vascularized penile tissues to be augmented with judicious use of flaps, grafts, fillers, and prosthetic components.[2] Totally amputated penis would require different free transfer flaps or total phallic replacement.[23] Expertise on the use of these techniques are currently been developed.

Conclusion

The most common cause for penile injury from this study is from penile fractures and genital amputation from self and attacks from assailants. Treatment of mild to moderate injuries like penile fractures, skin avulsions and lacerations often gives a good esthetic and functional result. The treatment of severe injuries is usually very challenging requiring further advanced surgeries. Expertise in the use of flaps for a neo-phallus are still been developed, and penile prosthetic devices are not readily available in our setting.

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How to cite this article: ???

Source of Support: Nil, **Conflict of Interest:** None declared.