

Traumatic Penile Amputation Post Circumcision: A Series of 3 Cases

Orock Agbor Tanyi^{1,2*}, Mbassi Achille Aurele^{3,4}, Mekeme Mekeme Junior^{1,3},
Fouda Jean Cedrick^{1,3}, Owon Abessolo^{1,3}, Nwatchap Jean Jacques¹, Awoundja Christain¹,
Pierre Joseph Fouda^{1,3}

¹Department of Surgery and Subspecialties, Faculty of Medicine and Biomedical Sciences, University of Yaoundé 1, Yaoundé, Cameroon

²Surgery Service, Regional Hospital Ngoundere, Ngoundere, Cameroon

³Urology and Andrology Service, Yaoundé Central Hospital, Yaoundé, Cameroon

⁴Department of Surgery and Subspecialties, Higher Institute of Medical Technology, Yaoundé, Cameroon

Email: *agbortorock@yahoo.com

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Abstract

Circumcision remains a frequently performed surgical procedure and could be associated with various complications, ranging from mild to catastrophic. Penile amputation is a rare and severe complication usually complex and challenging to manage. We describe three cases of penile amputation injuries following circumcision referred within a week at the urological service of the Yaoundé Central Hospital. The first case was a 5-year-old who had complete penile amputation during circumcision by a nurse assistant at a rural health center. The second was a 7-year-old boy who sustained total penile glans amputation while undergoing circumcision by a nurse under local anesthesia at a rural health facility. The third involved a 6-year-old who had total penile amputation with loss of the amputated stump during circumcision by a traditional practitioner at home. Non-microsurgical penile re-implantations were done with diverse outcomes. The preservation of the amputated stump, the ischemic time and the severity of injury are factors affecting surgical outcome. The aim of this study is to evaluate our management experience and outcome of penile amputation injuries in resource-limited settings. Microsurgical replantation remains the gold standard in the management of penile amputation injuries. However, in resource-limited settings macroscopic replantation could be used as an alternative remedy to salvage the amputated penis.

Keywords

Circumcision, Penile Amputation, Surgical Management, Complications

1. Introduction

Circumcision is among the oldest and most frequently performed surgical procedures. Unfortunately, this procedure when performed by inexperienced persons could result in various complications which could be mild or even catastrophic [1]. Penile amputation remains a rare and serious complication which is cumbersome and challenging to manage even in the hands of experienced urologists. The first penile replantation was described by Ehrlich and colleagues in 1929 following a macro surgical penile anastomosis [2]. Microsurgical replantation was later reported in 1977 by Cohen *et al.* and since then it has become the gold standard of management. The largest documented case series of penile amputation injuries was reported in Thailand following penile amputation injuries on 18 men by their spouses as a result of infidelity in the late 1970s. A Literature review of 80 cases of penile amputation injuries from 1996 to 2007 reported only 37.5% of successful replantation. However, there were considerable variations in the patient's surgical techniques used and the outcome [3]. Penile reconstructive and implantation surgeries remain very challenging generally and specifically in infants due to the scarcity of adapted equipment [4]. We describe our management experience of three cases of penile amputation injuries following circumcision received within a week in July 2022 at the urological service of the Yaoundé Central Hospital in Cameroon. Non-microsurgical penile re-implantations were done with diverse outcomes.

The patients' parents gave consent for the publication of this case series.

2. Case Presentations

2.1. Case 1

The 5-year-old boy was referred to our urological service for complete penile amputation during circumcision by a nurse at a rural health facility 5 hours prior to arrival at the hospital. The amputated penis was packed with a compressive gauze dressing and the amputated stump was preserved in saline solution which was placed in an ice bag upon arrival at our health service.

Following the primary and secondary survey, the patient had vital parameters; heart rate: 118 beats/min, respiratory rate: 26 breathes/min, hemoglobin: 9 g/dl, blood group: O Rhesus+. After anesthetic assessment, the patient was immediately taken to the operating room for surgical exploration under general anesthesia. Examination in the operating room revealed complete transection at the mid 2/3 of the penile shaft 2 cm from the base of the penis, with sectioning of the corporal bodies and the bulbar urethra (**Figure 1(a), Figure 1(b)**). Hemorrhage was controlled by placing a rubber band as a tourniquet at the base of the penile shaft. Firstly urethral catheterization was done using a 10Fr silicon catheter which was introduced through the meatus of the distal amputated penile segment and then the urethra of the proximal amputated penile stump into the urinary bladder which was verified by the presence of urine in the catheter. Secondly, Anastomotic urethroplasty was done using PDS 6/0 over a 10Fr silicon transurethral catheter

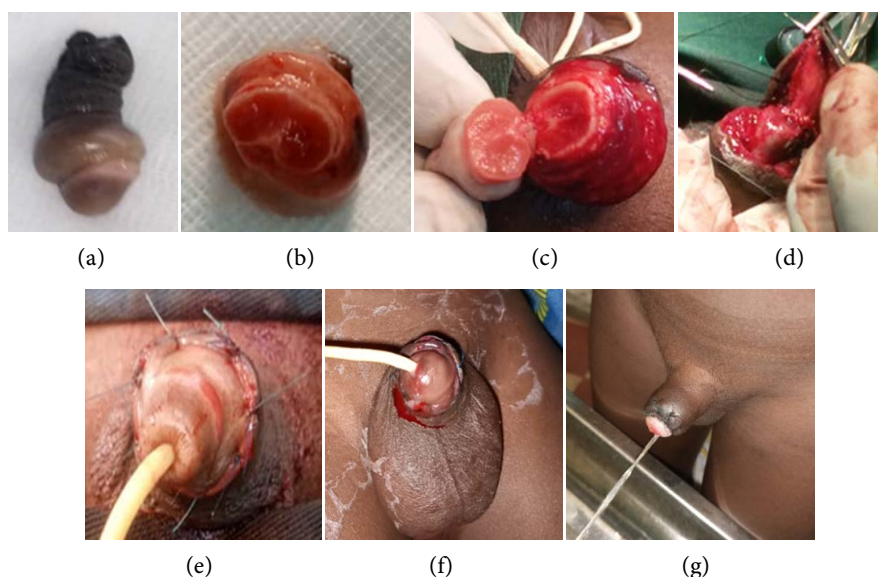


Figure 1. (a) Pre-operative complete amputated penis. (b) Transverse view of amputated penis showing the section corpora cavernosa bodies dorsally with section spongiosum and urethra ventrally. (c) Intra-operative anastomotic urethroplasty. (d) Intraoperative anastomosis of corpus cavernosum. (e) Penis appearance at end of re-implantation with change in coloration from blue to pink. (f) Postoperative venous congestion on 5th day post penile replantation. (g) Patient voiding with good urinary stream 5th month post re-implantation.

with the help of 2.5× magnifying surgical loupes (**Figure 1(c)**). Thirdly Carve-noplasty and spongioplasty were realized by approximating the sectioned corporal bodies using PDS 6/0 continuous sutures (**Figure 1(d)**). The dorsal venous complex could not be repaired due to a lack of adapted microscopic resources. Penile skin reconstruction was then achieved using monocryl 4/0 interrupted sutures. Glans coloration was observed to change from purple to pink at the end of surgery after the tourniquet had been removed (**Figure 1(e)**). The patient was placed on broad-spectrum antibiotics (3rd generation cephalosporins), analgesics, anti-cholinergic and was immunized for tetanus. He later had psychosocial support from a psychotherapist after recovery from surgery. Evolution was marked on the 4th day post-surgery by bluish discoloration of the glans and penile edema (**Figure 1(f)**). The urinary catheter was removed 14 days post-surgery with the patient voiding with the good urinary stream. The patient was reviewed 6 months later and had a glans sensation and voids normally and his father reports noticing occasional nocturnal erection (**Figure 1(g)**). However, the parents expressed concerns about the child's sexual and reproductive functions when he becomes an adult.

2.2. Case 2

The 7-year-old boy was referred from a rural health center following total penile glans amputation while undergoing circumcision by a nursing assistant using local anesthesia. Following injury, hemorrhagic control was achieved by compressive dressing using gauze and crepe bandage. The amputated glans was wrapped with

gauze and placed in a polythene bag upon arrival at the hospital 7 hrs post injury. Following primary and secondary surveys with heart rate: 110 beats/min, respiratory rate: 25 cycles/min blood group A rhesus+, an anesthetic assessment was done and the patient was immediately taken to the operating room. Surgery was done under general anesthesia and tracheal intubation. Hemorrhagic control was achieved using a vessel loop placed at the base of the amputated penis. The amputated stump was placed in normal saline after non-viable tissues were debrided. Urethral catheterization was done using a 12Fr silicon catheter which was introduced through the meatus on the amputated glans and then the urethra of the proximal stump of the amputated shaft into the urinary bladder which was verified by the presence of urine in the catheter. Termino-terminal urethral anastomosis was done using vicryl 6/0. Macro-surgical approximation of the glandular epithelium to the distal penile shaft was done using monocryl 5/0 interrupted sutures. Glans coloration was observed to change to purple at the end of surgery after the loop vessel had been removed. The patient was placed on antibiotics (amoxicillin/Clavulanic acid) anticholinergic and the urinary catheter was removed 14 days post-surgery. Evolution was marked by partial glans necrosis on the 5th day post-surgery which was managed by local wound care and sitz bath (**Figure 2(a)**). The urinary catheter was removed on the 12th day post-surgery and the patient voided with a good urinary stream. Eschar formation at the glans dropped spontaneously following continuous sitz bath and local wound care on the 14th day post replantation (**Figure 2(b)**). The patient was evaluated 5 months following surgery and had a good urine stream, preserved glans sensation and nocturnal erection (**Figure 2(c)**).

2.3. Case 3

The 6 year-old was brought to the emergency following the amputation of his penis with loss of the amputated stump which he sustained during a circumcision procedure performed by a traditional practitioner at home.

The patient arrived at the hospital 4 hours post-injury in a state of haemorrhagic shock with a blood pressure of 65/45 mmHg and heart rate of 128 beats/min. Following resuscitation, blood transfusion and anaesthetic evaluation he was taken to the operating room. Surgical exploration revealed a complete penile transaction located 0.5 cm from the penoscrotal junction with a complete section of the corporal bodies and the urethra. There was no amputated stump available for replantation. Management included control of haemostasis by ligation of bleeding vessels from the corporal stumps using Vicryl 3/0 sutures. The sectioned urethra was identified and catheterized using a 10Fr silicon catheter and penile skin closure was done using vicryl 4/0 interrupted sutures (**Figure 3**). Evolution was remarkable for the poor cosmetic appearance of genitalia and retraction of the residual urethral segment. The urinary catheter was removed after 21 days during which the patient voided with a poor urinary stream necessitating intermittent urethral catheterisation. Patient carers were being counselled on future

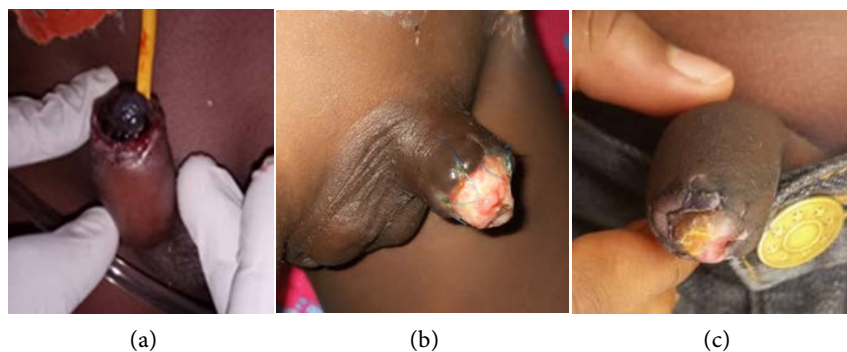


Figure 2. (a) Penile glans necrosis on 5th day post replantation. (b) Penis appearance of 14th day post replantation after removal of eschar and urinary catheter. (c) 5th month post penile glans replantation.



Figure 3. Urinary diversion in patient with penile amputation sustained during circumcision with loss of amputated stump.

penile reconstruction procedures but unfortunately patient became unreachable during subsequent follow-up appointments.

3. Discussion

Circumcision remains a common surgical procedure in urology, usually safe, simple and with low morbidity. Nonetheless, serious complications can result when this procedure is performed by unskilled persons. Circumcision-related complications could be diverse ranging from bleeding, and urethra-cutaneous fistulas to even penile amputation as it was in our cases presented [5].

Penile amputation remains a rare, complex and devastating injury which is usually challenging even to experienced urologists. In addition, it has a huge psychological and social impact on both the patient and caregivers coupled with associated long-term morbidity [6]. It requires emergent multidisciplinary surgical management and adequate postoperative care and follow-up. Reported penile amputation mechanisms include trauma, domestic violence, industrial accidents, self-mutilation, failed circumcision and animal bites [7].

The first successful penile replantation was documented in 1929. Since then, more than 100 cases have been reported with varying complications and salvage rates.

Morrison and colleagues reported that following penile replantation, 97.4% of the victims conserved their normal urinary function with the most common complication reported after penile replantation being skin necrosis (54.8%) and venous congestion (20.2%) [8]. Other replantation-related complications include; erection disorders, poor sensation, and poor cosmetic appearance of the genitalia [9]. We report our management experience and outcome of three patients with circumcision-related penile amputation injuries received at the Yaounde central hospital in Cameroon.

Reported factors which may influence the success of penile replantation surgeries include among others; the degree of injury, surgical technique used for replantation, preservation of the amputated stump and surgeon's experience. The length of ischemia endured by the amputated penile segment is a key factor that may influence surgical outcome with cold ischemia having a better prognosis [9]. Microsurgical replantation with anastomosis of the dorsal neurovascular bundles of the penis is the gold standard of management for these injuries. This technique increases the chances of graft survival and reduces postoperative complications. Unfortunately, this technique requires high training even more complex in the pediatric group due to the scarcity of adapted equipments in our setting. The return of normal color is a good intraoperative and postoperative indicator of graft survival [10] [11].

In situations of penile glans amputation or when instrumentation for microscopic surgery is not available, macroscopic replantation may be another reconstructive option to salvage the amputated penis [2] [12]. The first two patients presented had macroscopic replantation of the amputated glans and the penis with a favorable outcome with regards to voiding function and sensation during 8 months period of follow-up.

Penile stump replantation without repair of dorsal vessels of the penis could be considered as a graft. Thus the replanted graft will survive by imbibition by obtaining nutrients from the adjacent graft by diffusion [12]. The penile graft is successful because the dorsal and urethral arteries serve as an excellent source of blood supply to the corpus spongiosum and the glans. Blood circulation at macroscopic replantation could be reinstalled through the spongy tissue of the grafted penis [13]. Furthermore, the corporal sinusoidal blood flow could also act as diffusion for the composite graft in macro-surgical penile replantation. Complications such as fistula formation, loss of sensations, erectile dysfunction and skin necrosis have been reported with this technic [14].

Micro-vascular replantation is the current recommended treatment choice for penile amputation injuries because it yields better physiological micturition, good cosmetic restoration, preservation of sensation, and erectile function. Nonetheless complications including skin necrosis, urethral stenosis and fistulas have also been reported with this technique [11] [15].

In our third case, replantation was not attempted given the severity of the trauma and lack of the amputated segment which was lost. The extensive loss of penile tissue in this patient makes management decisions even more challenging.

Penile replantation will also depend on the condition of both the stump and the amputated segment. In patients with significant tissue loss including loss of amputated stump or poor wound conditions, debridement and stump closure followed by differed secondary penile reconstruction is usually preferred. Such patients may be candidates for phallic replacement. Microsurgical free forearm flap phalloplasty techniques have been used to manage patients who suffered from total penile amputation with loss of the amputated segment [16].

4. Conclusion

Penile amputation injuries are very rare but devastating circumcision-related complications. Management is urgent penile replantation. The preservation of the amputated stump, the ischemic time, the severity of injury and the surgeon's experience are some factors affecting penile replantation surgical outcome. Microsurgical replantation remains the gold standard in the management of penile amputation injuries. However in resource-limited settings macroscopic replantation by an experienced urologist could be used as an alternative remedy to salvage the amputated penis.

Conflicts of Interest

The authors declare no competing interests.

Consent for Publication

Informed consent was obtained from the parents of the patients for the publication of this case series.

Authors' Contributions

Patient management: Mbassi Aurele Achille, Owon Abesolo, Orock Agbor Tanyi and Pierre Joseph Fouda. Data collection: Nwachap Jean Jacques, Awoundja Christain. Manuscript drafting: Orock Agbor Tanyi. Manuscript revision: Mekeme Mekeme, Fouda Jean Cedrick. All authors read and approved the final manuscript.

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