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Complications of non-medical assisted circumcision in Burkina Faso. Clinical presentation, management, and outcomes - about 23 cases and literature review

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Summary *Objective: To report the clinical presentation of circumcision complications encountered at our center and evaluate their management and outcomes.*

Patients and methods: A retrospective and descriptive study was conducted at Souro Sanou University Hospital between January 1, 2014, and December 31, 2018. All patients presenting with circumcision complications were included. Parameters related to clinical aspects of circumcision complication, their management and outcomes were studied.

Results: During the study period, 23 cases of circumcision complications were reported. The average age of patients with circumcision complications was 8.3 years \pm 3.5 years, with ages ranging from 18 months to 65 years old. Circumcision was performed by nurses in 12 cases and traditional practitioners in 11 cases. Observed complications included post-circumcision bleeding and hematoma (n = 8), leading to surgical exploration and hemostasis; total or partial amputation of the glans (n = 4), requiring regularization and meatoplasty; infectious complications (n = 3), managed with combined resuscitation, antibiotic administration, and penile debridement; penile urethra-cutaneous fistulas (n = 2), which were repaired; and stenosis of the external urethral meatus (n = 2), treated by meatoplasty. No deaths were reported.

Conclusions: Circumcision complications presented various clinical manifestations, including hemorrhagic complications, glans amputation, infection, penile fistulas, and meatal stenosis. These complications were effectively managed from a functional perspective; however, aesthetic issues may persist. Emphasis should be placed on preventing these complications by ensuring circumcisions are performed by appropriately trained medical professionals.

KEY WORDS: Circumcision; Complications; Hemorrhage; Amputation; Prevention.

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INTRODUCTION

Circumcision involves the partial or complete removal of the foreskin. It is not only a religious requirement for Israelites, a custom for Muslims, and a rite of passage into adulthood for many Africans, but also a common surgical procedure used to treat various balanopreputial diseases

(1). In Africa, circumcisions are often not carried out in hospital settings and are typically performed by less-trained nurses and traditional practitioners. Circumcision complications can range from minor to major, impacting patients' vital or functional prognosis. This study aimed to review clinical presentations and evaluate the management and outcomes of circumcision at Souro Sanou University Teaching Hospital in Burkina Faso.

PATIENTS AND METHODS

This retrospective descriptive study examined all circumcision complications collected between January 1, 2014 and December 31, 2018, at the Urology Division in Souro Sanou University Hospital. All patients admitted to the Urology Division with circumcision complications were included. Variables considered included age, reason for visit, reason for circumcision, place of residence, admission delay, qualification of the practitioner who performed the circumcision, clinical presentation upon admission, medication, surgical revision technique, voiding quality, and aesthetic appearance of the penis for each subject included in this study. All patients or their parents or legal guardian when they are minor consent for the publication of chosen images to illustrate our clinical presentation. The study obtain the approval of the local ethical committee of the department of surgery of Souro Sanou University Hospital registered under the number N°007/2018.

RESULTS

We documented a total of 23 circumcision complications, averaging 4.6 cases per year. The patients' mean age was 8.33 years \pm 3.5 years, with a range spanning from 18 months to 65 years. Among the 23 patients, 22 underwent circumcision without medical indication, while one case involved circumcision for medical reasons due to phimosis. We identified three cases of hemophilia and one case of HIV infection.

Most patients (60.87%) lived in rural areas and worked in agriculture, compared to 39.13% who resided in urban areas. Nurses performed 52% of the circumcisions, while

traditional practitioners conducted 48%. The average consultation delay was 12 ± 8.5 hours, with a range between 2 hours and 15 days. According to patients or their relatives, all circumcisions took place without anesthesia. However, we could not determine if the general rules of asepsis were adhered to when nurses performed the circumcison. Consultation reasons included urine leakage through a urethrocutaneous fistula for two patients ($n = 2$), local hemorrhage with blood loss for patients with partial or complete glandular section or hematoma ($n = 8$), dysuria with urine retention for patients with external urethral stenosis or incomplete circumcison, and local signs of suppuration for patients. Table 1 lists the main consultation reasons that prompted patients to seek emergency care. Nurses employed the classic guillotine method for foreskin removal, a technique commonly used by various professionals. This method involves removing the fore-

skin by placing forceps over the glans and cutting it flat. Techniques performed by traditional practitioners are not described.

The study reported various types of complications, including hemorrhages ($n = 8$), penile amputations ($n = 4$), incomplete circumcisions ($n = 3$), external urethral stenosis ($n = 3$), urethrocutaneous fistulas ($n = 2$), and infections ($n = 3$). These complications are detailed in Table 2.

Figures 1 through 7 illustrate the different complications observed in this study. All patients admitted due to complications underwent both medical and surgical management. This comprehensive approach included medical resuscitation, antibiotic administration, tetanus prevention and serotherapy, as well as surgical treatments tailored to the specific complication.

Among patients with bleeding complications ($n = 8$), seven required an isogroup isorhesus blood transfusion to address anemia with signs of hypovolemic shock and hemoglobin levels below 7 g/dL. Additionally, three patients ($n = 3$) with hemorrhagic complications related to hemophilia necessitated collaborative management with hematologists. The various surgical management methods for circumcison complications are outlined in Table 3.

Table 1.
Main reasons of consultation.

Reasons of consultation	Frequency (n)	Percentage (%)
Local bleeding	10	26.08
Amputation of glans	4	17.39
Dysuria	3	13.04
Urinary leakage from fistula	3	13.04
Tumefaction of the penis	3	13.04
Local infection	2	8.69
Acute urinary retention	2	8.69

Table 2.
Circumcison complications reported.

Type of complication	Frequency (n)	Percentage (%)
Post-circumcison bleeding	6	26.08
Total amputation of the glans	3	13.04
Incomplete circumcison	3	13.04
External urethral stenosis	3	13.04
Urethro-cutaneous fistula	2	8.69
Gangrene of external genitalia	2	8.69
Post-circumcison hematoma	2	8.69
Necrosis of the glans	1	4.34
Partial amputation of the glans	1	4.34
Total	23	100

Table 3.
Distribution of patients by type of surgery.

Type of surgery	Frequency (n)	Percentage (%)
Revision of circumcison with hemostasis	6	26.08
Regularisation of the glans stump	4	13.04
Revision of circumcison/posthectomy	3	13.04
Meatoplasty	3	13.04
Cure of penile fistula	2	8.69
Gangrene of external genitalia	2	8.69
Evacuation of penile hematoma	2	8.69
Glanduloplasty	1	4.34
Total	23	100

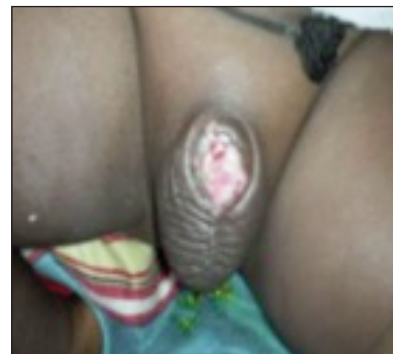


Figure 1.
Total amputation of the glans.



Figure 2.
Post-circumcison infection.



Figure 3.
Gangrene of external genitalia.



Figure 4.
Huge penile
hematoma
extended to
perineum



Figure 5.
Incomplete
circumcision.



Figure 6.
Urethro-cutaneous
fistula with glans
penis buria.

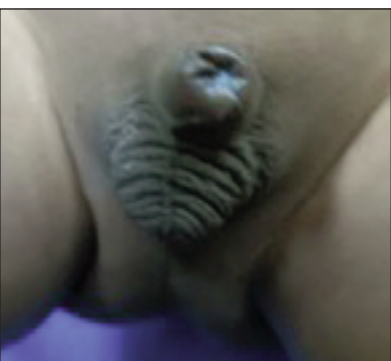


Figure 7.
Incomplete
circumcision with
phimosis.

In general, the management of circumcision complications led to delayed healing for the three patients (n = 3) experiencing infectious complications. The four patients (n = 4) who underwent glans amputations exhibited functional sequelae and an unaesthetic appearance of the glans, although they maintained good voiding quality.

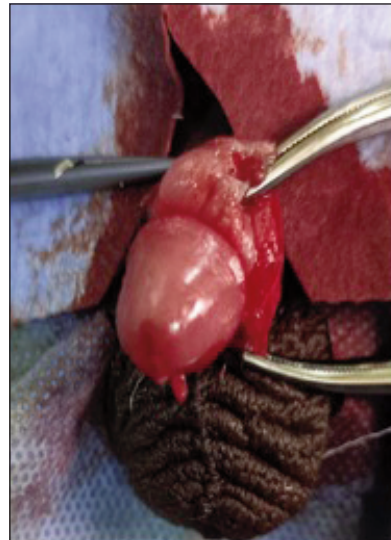


Figure 8.
Revision of
circumcision

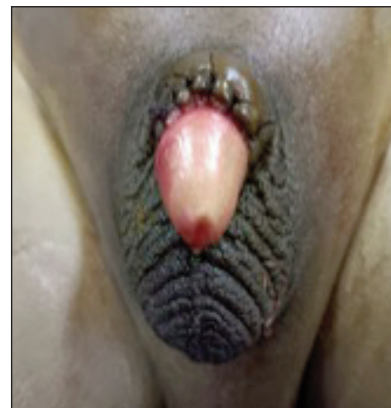


Figure 9.
Final appearance
of glans after
revision.

Psychological trauma was not assessed in this study, and no deaths were reported. Figure 8 and Figure 9 provide an example of re-circumcision following an incomplete procedure and the final appearance after the procedure's revision.

DISCUSSION

In 1997, *Bankolé et al.* (1) reported 22 cases of traditional circumcision and excision sequelae in *Abidjan*. *Sylla et al.* (2) documented 63 cases of circumcision complications in *Dakar* in 2003, while *Dieth et al.* (3) recorded 35 cases of circumcision accidents in *Abidjan* in 2008. *Kimassoum et al.* (4) reported 28 cases of circumcision complications in *Chad* in 2016. In the West, *Gross et al.* (5) studied ritual circumcision complications in *Paris* in 1986.

Many authors argue that circumcision reduces the risk of urinary tract infections in children, helps prevent penile cancer in adults, and plays a significant role in preventing sexually transmitted infections, including HIV (6, 7, 9, 11). In *Muslim* and *Jewish* communities, circumcision is practiced as a religious rite, while in others (particularly traditional ones), it is performed for sociocultural or initiation reasons, with fewer than 10% having a medical indication (6, 7, 3, 9).

In our series, the mean age of patients was 8.33 years, with a range between 1 month and 65 years. *Sylla et al.* (2) reported a mean age of 10.5 ± 6.7 years in their *Dakar*

series, while *Gross et al.* (5) in Paris published a mean age of under 16 months. This age variability can be attributed to the fact that in African countries, the age at which circumcision is performed depends on the sociocultural and ritual practices of the populations. In our work environment, circumcision is practiced in early childhood and represents a sacred act that confirms a child's male identity and anticipates flawless sexuality in adulthood. However, with the increasing influence of *Muslim* culture, neonatal circumcision is becoming more popular.

In our study, only complications requiring surgical management were referred to hospitals. This was the case for the 23 circumcision complications we collected over five years. In *Côte d'Ivoire*, *Dieth et al.* (3) reported 35 circumcision complications over 14 years, while in *Senegal*, *Sylla et al.* (2) had already reported 63 complications over 11 years. Numerous factors contribute to these complications, and they largely depend on the operator.

In our cases, 47.82% of patients were circumcised by traditional practitioners. This can be attributed to the influence of tradition, poverty, insufficient and inaccessible healthcare structures, and low education levels.

Circumcision is primarily a surgical procedure performed by a doctor, requiring knowledge of contraindications, adherence to rigorous asepsis during the procedure, understanding of anatomy, and expertise in circumcision techniques. Failing to meet these requirements can result in complications and does not guarantee safety in terms of infectious risks and iatrogenic injuries. In our study, 52.17% of patients had their circumcision performed by a nurse. This highlights the need for improved training, especially since studies (11) have shown that the prevalence of circumcision complications increases when the procedure is performed by untrained individuals.

In *Burkina Faso* and many other sub-Saharan African countries, there is a shortage of urologists. Considering these observations, it may be worthwhile to explore proposals from authors like *Dieth et al.* (2) and *Okeke et al.* (12), which suggest integrating circumcision into medical student curricula and training nurses to perform the procedure with minimal risk. In *Africa*, nurses are often the only healthcare workers available in remote rural areas. The average consultation time in our department was 11.89 days. *Kimassoum et al.* (4) in *Chad* reported an average consultation time of 896 days. This difference in average consultation time can be attributed to the higher representation of late complications in their series.

In our series, hemorrhage was due to a hemostasis defect ($n = 3$) or a hemostasis disorder, specifically hemophilia ($n = 3$). Hemorrhage is a common complication in countries where ritual circumcision is performed by nurses or traditional practitioners and often leads to early consultation due to parental concern. Three of our patients were hemophiliacs, emphasizing the importance of performing a coagulation test before any circumcision. Glans amputation, one of the most horrifying aspects of circumcision accidents, occurred in 13.04% ($n = 3$) of our patients. *Diabaté et al.* (10) in *Senegal* found similar results in 2016. In contrast, *Kimassoum et al.* (4) in *Chad* reported a significant number of amputation cases in their series ($n = 10$). This reflects the incompetence of the practitioner and is sometimes a direct consequence of poor child

immobilization during foreskin removal, lack of general anesthesia, and inadequate knowledge of the procedure. In the cases we collected, patients were seen late (more than 12 hours after the accident), making reimplantation impossible due to microvascular anastomosis challenges and insufficient technical resources. In our series, treatment consisted of a meatoplasty with satisfactory results in terms of urination but poor aesthetic outcomes, leading to an unfavorable social prognosis in a context where respecting the body's integrity is sacred. We report one case of penile denudation in our study, with similar results found in the literature (4, 10). This injury occurs after excessive removal of penile skin due to exaggerated traction of the skin covering the glans. Retraction of the proximal part leaves a completely exposed penile area. Treatment involved debridement and a wet oily dressing for healing, although other authors opt for a skin graft.

Some studies rank infectious complications as the second most common issue after hemorrhage (2, 10). These complications result from inadequate asepsis and the presence of skin flora (8). Locally, at the circumcision wound site, they cause delayed healing. Although rare, we observed two cases of necrotizing cellulitis of the external genitalia and perineum. Treatment for these cases required debridement, resuscitation with antibiotic therapy, and local care. Urethrocutaneous penile fistulas were the most frequent complication in *Kimassoum et al.* (4) series; however, in our study, we only recorded two cases. These fistulas are located in the balanopreputial groove where the urethra is more superficial, and adhesions increase its vulnerability. Inadequate hemostasis of the frenulum artery can also lead to urethral injury and subsequent fistula formation. Clinically, urine passes through the fistula during urination, negatively affecting body image. The urethrocutaneous splitting technique with separate suturing of the two planes was most commonly used in our series, yielding good results.

Stenosis of the external urethral meatus has a traumatic and/or infectious origin, with ligation of the frenulum artery implicated as well (8). The main symptom is dysuria, and rarely, urinary retention. It occurs at varying times after the healing process. A meatotomy is usually sufficient to remove the stenosis, but recurrences are frequent. Unusually, incomplete circumcision was noted in one of our patients. *Kimassoum et al.* (4) reported six cases in their series. This issue highlights the importance of anatomical knowledge and mastery of the learning curve before performing circumcisions. In our series, this patient underwent laborious adhesion lysis to expose the glans up to the balanopreputial groove before proceeding with the circumcision.

CONCLUSIONS

Accidents resulting from ill-timed and imprudent circumcision practices can sometimes be serious enough that this surgical procedure should either be reserved for expert hands or, at the very least, supervised. The challenge now lies in raising public awareness and providing appropriate training for everyone involved in circumcision practice, from medical students to doctors and even nurses, who remain the most widely distributed healthcare personnel in remote areas of the country.

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