Chapter 11

Circumcision Complications

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Abstract

Circumcision, a common surgical procedure characterized by the excision of the penile foreskin, traditionally integrates cultural, religious, and occasionally, medical contexts, continues to spark extensive discussion and research due to its spectrum of potential complications. Although generally considered safe, the complication rate varies between 2% and 10%. This study explores and categorizes the complications into common issues such as bleeding and infection; less common, yet notably impactful issues like injuries to the glans and urethra; and potential long-term psychological effects. A notable focus is directed toward procedural and post-operative aspects, examining different techniques like the Plastibell, Gomco clamp, and Alisclamp, each presenting varied complications and success rates. Furthermore, the exploration delves into specific cases, exemplifying potential catastrophic results like necrotizing fasciitis and significant urethral damage. Through a lens that balances clinical outcomes with ethical considerations, the discourse further ventures into the psychological and quality-of-life implications for affected individuals and their caregivers. This comprehensive analysis aims not only to highlight the physical and psychological risks associated with circumcision but also to catalyze a continual, multifaceted discussion among healthcare professionals to refine practice protocols, elevate patient safety standards, and examine the ethical contours enveloping non-medical circumcisions in pediatric populations.

Introduction

Circumcision is a surgical procedure involving the removal of the skin covering the tip of the penis. Often performed shortly after birth or during childhood, its reasons can range from religious and cultural rites to personal choice or medical necessity. Advocates highlight potential health benefits,

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such as a reduced risk of certain infections and conditions. On the other hand, concerns arise about the procedure's necessity, potential complications, and ethical considerations, especially when performed on minors without consent. Its prevalence varies worldwide, influenced by traditions, beliefs, and medical recommendations, making circumcision a subject continually explored in medical, ethical, and sociocultural discussions. Circumcision boasts an ancient history, remaining pivotal in diverse religious, cultural, and societal contexts. Archaeological discoveries from Egyptian tombs circa 4000 BC offer evidence of early circumcisions. The first documented instance hails from Egypt during the Sixth Dynasty, where artwork depicts the circumcision of young boys. Jewish traditions, tracing back to 1800 BC, dictate circumcision on the eighth day after birth, a ritual rooted in the Abrahamic covenant described in Genesis 17. Although not explicitly referenced in the Qur'an, circumcision is customary in Muslim societies, emulating the Sunnah of Prophet Muhammad; however, the age of circumcision varies widely within these communities. In parts of Africa, such as among the Xhosa tribe in South Africa, circumcision is deeply entwined with religious and cultural rites of passage. Meanwhile, certain Indigenous Australian communities historically practiced unique circumcision rites, including the sub-incision of the urethra, a procedure marked by its potential complications. Yet, this tradition, showcased in rock art at the in Kakadu National Park, underscores the profound cultural significance of circumcision practices throughout history (1-8).

Complications of the Circumcision

The complication rate of circumcision is between 2% and 10% when performed by experienced hands under sterile conditions. Circumcision, a surgical removal of the foreskin, can entail various complications. Issues like infection, excessive bleeding, and improper healing can occur. Sometimes, dissatisfaction with cosmetic outcomes arises. In rare instances, more serious complications like damage to the urethra or glans can happen, necessitating further medical intervention. Complications of circumcision can be summarized under the following headings (9-10):

1. Common Complications of Circumcision: Bleeding, Infection, Improper healing and scar formation
2. Less Common Complications: Injury to the glans, Urethral complications, Excessive or insufficient removal of the foreskin
3. Long-Term Complications: Post-circumcision strictures (narrowing), Regrowth of the circumcision skin, Loss or changes in sensitivity

4. Psychological Impacts

Common Complications of Circumcision

Bleeding is the most common complication following circumcision, occurring in approximately 1% of cases according to a large retrospective review (7-9). **Figure 1.** This bleeding may manifest along the skin edges between sutures or originate from a specific blood vessel, frequently at the frenulum. Attentive hemostasis during the procedure and sufficient skin edge compression during newborn circumcisions can prevent most incidents. However, blood clot displacement or cautery eschar dislodging can occur. Most post-circumcision bleeding is controllable with direct pressure. Rarely, wound exploration and suturing might be necessary. Hematologic evaluations are recommended only for patients who bleed persistently or significantly. A retrospective review of 48 patients from the Mayo Clinic Pediatric Hemophilia database, who possessed various coagulopathies and underwent circumcision, revealed 11 bleeding complications. Of these, three were severe, requiring red blood cell transfusions despite preoperative factor replacement. For hemophiliac patients requiring circumcision, preoperative and perioperative factor replacement is imperative. Fibrin glue has also proven effective in reducing the need for recombinant factor replacement without significantly impacting bleeding complications (11-14).

Figure 1 Bleeding after circumcision

Photograph Source: Feride Mehmetoğlu, Dortcelik Children's Hospital

Infections following circumcision are relatively rare thanks to the penis's robust dual blood supply. A study involving 5,521 circumcisions, comparing the Plastibell technique to the Gomco clamp, indicated a mere 23 (0.4%) infections, with the Plastibell group experiencing significantly more. All responded positively to topical and oral antibiotic treatments. The typical causative organisms are skin flora, but due to the diaper's unhygienic environment, colonic flora might also be implicated. Proper patient preparation, adhering to sanitary protocols, and diligent wound care, including cleaning and applying antibiotic ointment during diaper changes, can prevent most infections (15). The patients who underwent circumcision with Alisclamp also have several complications such as swelling, infection, edema and bleeding **(Figure 2-3).**

Figure 2: Circumcision with Alisclamp device

Photograph Source: Feride Mehmetoğlu, Dortcelik Children's Hospital

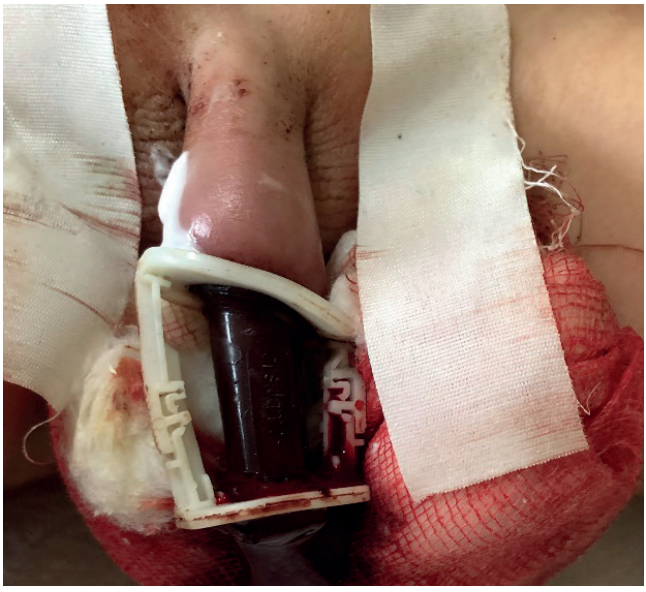

Figure 3: Bleeding after circumcision with Alisclamp device

Photograph Source: Feride Mehmetoğlu, Dortcelik Children's Hospital

However, severe infections, including necrotizing fasciitis, have been reported following Plastibell circumcisions. Symptoms like erythema, induration, pain, tachycardia, leucocytosis, or bandemia, especially when exceeding physical findings, have been noted. This polymicrobial infection, similar to adult cases, necessitates empiric broad-spectrum antibiotics to cover Gram-negative, Gram-positive, and anaerobic organisms. A recommended regimen might include an aminoglycoside, nafcillin, vancomycin, and clindamycin. Quick surgical assessment and assertive debridement of necrotic tissue are crucial (4-14-16).

Following neonatal circumcision, regardless of the utilized method, wound dehiscence and degloving injuries may arise. In instances of degloving, unintended entrapment and amputation of excess skin into the clamp can occur. There's also a less frequent risk of misjudging the amount of skin to remove during free-hand circumcision. Commonly, such injuries are addressed through diligent local wound care, enabling healing through secondary intention. Occasionally, reports highlight the success of autografting excised skin, achieving satisfactory cosmetic results. Ensuring meticulous technique and sharp focus during the procedure is crucial to mitigating these risks (8-16).

Less Common Complications

Glans injury during circumcision represents a distressing and noteworthy complication, with impacts that may transcend the immediate physical trauma, having potential psychological implications for both the individual and their caregivers. **Figure 4** This complication is especially disconcerting given that circumcision, often performed in neonatal stages, is intended to be a straightforward, low-risk surgical procedure. Glans injury can range from superficial damage to more grave injuries, which could, in severe instances, impact urinary function and sexual health in the long-term. Various factors, such as the surgical technique utilized, practitioner experience, and the anatomical specifics of the penis, may influence the risk of glans injury **Figure 5** (16-18).

Figure 4 Glans injury during circumcision

Photograph Source: Feride Mehmetoğlu, Dortcelik Children's Hospital

Figure 5 Bullous dermatitis of the glans after circumcision

Photograph Source: Feride Mehmetoğlu, Dortcelik Children's Hospital

Whether employing methods like the Plastibell, Mogen clamp, or Gomco clamp, or undertaking a freehand technique, the cruciality of safeguarding the glans during the procedure is unequivocal. Adequate training, thorough preoperative assessment, and judicious procedural care are imperative to mitigate risks. In the unfortunate event of glans injury, comprehensive management, encompassing immediate surgical intervention, potential long-term therapy, and psychological support, becomes vital. The scrutiny of this complication underscores the need for continuous evaluation and potential enhancement of existing circumcision protocols and practitioner training to safeguard against such traumatic eventualities. The emphasis must persistently linger on optimizing safety in this common procedure (14,15,17).

Urethral injury subsequent to circumcision warrants a profound exploration and critical analysis due to its potential to impart long-lasting ramifications on urinary function, sexual health, and overall quality of life. In a procedure, predominantly executed in neonates and often for non-medical, cultural, or religious reasons, the safety and minimization of complications should be paramount. Urethral injuries, though rare, are grave complications, embodying a spectrum from minor urethral meatus damage to complete urethral severance. These occurrences could be due to an assortment of factors including, but not limited to, the surgical technique,

practitioner expertise, adherence to safety protocols, and patient anatomy (14,15).

It's imperative to underscore the necessity of comprehensive preoperative planning and scrutiny of the patient's anatomy to mitigate the risk of urethral injuries. Selecting an appropriate technique, perhaps favoring those with a robust track record of safety, and ensuring the practitioner is well-versed and proficient in executing the procedure, are pivotal. The discourse around urethral injury also brings to light the question of the ethicality and appropriateness of performing non-medically indicated circumcisions, particularly in pediatric populations unable to provide informed consent (13-16).

In instances where urethral injury does occur, the management thereof is multifaceted, often necessitating immediate surgical repair and potentially, ongoing interventions to preserve urinary function. Not to be eclipsed by the physical repercussions, the psychosocial implications of urethral injury, encompassing potential self-esteem and body image issues, necessitate a compassionate and holistic approach to management, involving both physical and psychological therapeutic strategies (16-19).

This facet of post-circumcision complication demands continued research, enhanced practitioner training, and perhaps a revisitation of guidelines pertaining to circumcision. Constructive discourse and continual scientific inquiry into optimizing surgical techniques and post-operative care are essential to safeguarding the well-being of patients undergoing circumcision, ensuring that both their immediate and long-term health is uncompromised (14-19).

Long-Term Complications

Meatal stenosis, characterized by the narrowing of the urethral opening, is one notable adverse outcome. This condition can cause a myriad of urinary symptoms, including painful urination and a deflected urine stream. Its prevalence is believed to arise from the chronic irritation of the exposed meatus in a post-circumcision setting. **Figure 6** Another significant concern is the potential for insufficient or excessive foreskin removal, leading either to continued phimotic symptoms **Figure 7** or excessive exposure of the glans, respectively. Both scenarios can produce discomfort, aesthetic concerns, or functional problems during sexual activity. Scarring, though not universal, is another potential drawback. Acquired penile epidermoid cysts may present as an early or late complication after circumcision and hypospadias surgeries. (20) **Figure 8.** Poor cosmetic results and recurrent dermatitis are also common complications. **Figures 9-10**

Figure 6: Meatal stenosis after circumcision

Photograph source: Dortcelik Children's Hospital, Feride Mehmetoğlu

Figure 7: Secondary phimosis caused by insufficient removal of the preputium

Photograph source: Dortcelik Children's Hospital, Feride Mehmetoğlu

Figure 8 Skin bridge with inclusion cyst after circumcision

Photograph source: Dortcelik Children's Hospital, Feride Mehmetoğlu

Figure 9 Poor cosmetic outcome presumed to be suture-related after circumcision

Photograph source: Dortcelik Children's Hospital, Feride Mehmetoğlu

Figure 10 Healing after the development of glans dermatitis

Photograph source: Dortcelik Children's Hospital, Feride Mehmetoğlu

Depending on the healing process and technique used, some men experience cosmetically displeasing or functionally limiting scars (14,15,21-25). Moreover, there's the risk of altered penile sensitivity. While studies on this topic are varied, some men report reduced sensitivity, which they attribute to the loss of the protective foreskin and the keratinization of the exposed glans over time. Lastly, psychological and emotional repercussions cannot be discounted. Some men express feelings of loss, anger, or even resentment, particularly if the circumcision was performed in infancy without their consent. They may perceive their circumcision as a violation of bodily autonomy. While these feelings are subjective and not experienced by all circumcised males, they underscore the importance of informed decision-making processes. In conclusion, while circumcision offers specific health advantages, it's imperative that medical professionals and parents are cognizant of the potential long-term complications and weigh them against the benefits when considering the procedure (14,15,25).

Circumcision, a common surgical procedure involving the partial or complete removal of the prepuce (foreskin), has been practiced across cultures for diverse reasons, encompassing religious, cultural, and medical grounds. Nevertheless, an often-overlooked long-term complication might emerge when an extended length of the prepuce is left post-operatively: a condition occasionally referred to as redundant or excessive foreskin. The matter is not merely aesthetic; the implications may permeate various facets of an individual's life, spanning from psychological impacts to substantive medical complications.

When an extended prepuce is left, it may instigate issues related to hygiene, potentially amplifying the risk of infections, such as balanitis and urinary tract infections, especially in pediatric patients. Additionally, sexual function and satisfaction could be jeopardized due to the retained sensitivity or paradoxical desensitization of the glans. Psychologically, perceptions of normalcy and aesthetic concerns may also weigh heavily on individuals, potentially inducing anxiety or issues related to self-esteem and body image. Moreover, for parents who decide to circumcise their children due to cultural or religious practices, concerns regarding whether the procedure was performed 'correctly' or in alignment with cultural norms may emerge (18).

Medically, addressing this complication may necessitate further surgical interventions, which, aside from the inherent risks of any surgical procedure, might bring about additional psychological stress and financial burdens for the patient or their caregivers. As such, the healthcare community must engage in an encompassing dialogue concerning standardized post-circumcision outcomes and possible interventions to mitigate the impacts of an extended prepuce, ensuring the wellness of the individual across their lifespan (21).

It is paramount that adequate attention is paid not only to the immediate, short-term outcomes of circumcision but also to the lingering, long-term implications that may substantially affect an individual's quality of life. Consequently, forging an integrative approach that amalgamates surgical precision, cultural sensitivity, and a comprehensive understanding of long-term outcomes is imperative to circumvent the potential physical and psychological implications of an extended prepuce (14,15,25)

Psychological Impacts of Circumcision

Existing knowledge about male circumcision often hinges on accounts from individuals reaching out to organizations like the Circumcision Resource Center (CRC). Many of these men, circumcised as infants, report feelings of anger, loss, shame, and a sense of violation. Despite being unaware of their early-life circumcision, some correlate these negative emotions to the procedure. In societies where circumcision is less common, recognizing their altered state might lead to traumatic realizations for some circumcised individuals (26-28).

There are several reasons why circumcised men might not vocalize their feelings (26-30):

- Cultural beliefs about circumcision, often perceived as beneficial, deter introspection.

- The intense emotions linked to circumcision are distressing, prompting suppression.
- Fear of ridicule or rejection inhibits open expression.
- Early-life traumas, typically unconscious, manifest non-verbally, affecting attitudes and behaviors.

This internalized trauma might influence perceptions of masculinity. A prevalent fear among American men, potentially tied to circumcision, is the anxiety about penis size. This concern has been commercialized, with advertisements for enlargement methods prevalent. Interestingly, research suggests men might overemphasize the importance of size in attracting partners, though the influence of circumcision on this perception remains unclarified (28).

Negative feelings about the penis are intricately linked to body image, which encompasses judgments about the body's appearance to others and can deeply affect a man's day-to-day life. The notions of self-worth and body image are closely tied, influencing one's psychological well-being. A poor body image can hinder one's social and intimate connections. Individuals who have experienced bodily loss, such as through a mastectomy, often grapple with feelings of decreased attractiveness, desirability, and sexual satisfaction post-procedure. This diminished body image can also sap motivation, lower feelings of competence, power, and status, and even lead to depressive and suicidal tendencies (29).

Though the specific circumstances and age at the time of loss can vary, the emotional aftermath of feeling that a crucial part of one's body is absent is a shared experience among those who have undergone procedures like mastectomy and, for some, circumcision. This sensation, especially in the context of circumcision, can lead to profound distress, as the penis is traditionally associated with masculinity. An injury or alteration to this part can create not only a physical scar but also a psychological one, often manifesting in decreased self-esteem (30).

Over time, such symptoms might manifest as longer-term psychological repercussions. For instance, there's a potential connection between adult circumcision, decreased sensitivity, and impotence. Furthermore, infant circumcision, known to reduce sexual sensitivity, might play an overlooked role in the high rates of impotence observed among American men. In a study involving men between the ages of 40 and 70, over half reported varying degrees of impotence. This prevalence increased with age and was

linked to heightened levels of anger, depression, and decreased self-esteem (29-31).

Conclusions

Circumcision, while globally practiced, isn't without risks, and discussions surrounding it are often fraught with contrasting perspectives on cultural norms, ethics, and health benefits. Its complications range from common ones like bleeding and infection to rarer, severe ones like glans or urethral injuries. These physical complications not only present immediate health threats but also potential long-term psychological impacts. Preventive strategies, including meticulous technique and rigorous practitioner training, play pivotal roles in reducing risks. This practice demands ongoing scrutiny and debate, considering its ethical dimensions, particularly concerning non-medical circumcisions in minors. The alignment of cultural practices, medical ethics, and patient safety remains imperative, advocating a balanced approach that prioritizes the well-being of the individual above all.

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