



Pediatrics

Total glans amputation after neonatal circumcision

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ABSTRACT

Complete penile glans amputation is exceedingly rare in children with little known about the outcomes of management. We present a case of a 12-day-old male who underwent ritual circumcision complicated by total amputation of the glans, which was treated with reimplantation of the glans. Our technique was successfully carried out following reconstruction of anatomical planes with loop magnification and fine 7-0 sutures. We review the sparse literature in children and compare it to the techniques reported more commonly in adults.

Introduction

Circumcision is the most common surgery in the world. About a quarter of the world's males are circumcised.¹ Circumcision techniques are variable. Clamping techniques are particularly popular allowing a short procedure with minimal cost. Amputation of the glans is a rare complication of neonatal circumcision¹ and usually partial and ventral.¹ Complete amputation is exceedingly rare and reported mostly in adults, thus the techniques and outcomes of neonatal management require documentation. We report a case of total amputation of the glans occurring during a social circumcision, which was treated with reimplantation of the glans.

Case report

A 12 day old male, term baby with mild glanular hypospadias underwent ritual circumcision after the family had consulted and obtained approval from a pediatric urologist. He presented to emergency department with amputation of the entire glans performed by an experienced religious practitioner using the Mogen clamp technique. The practitioner, who had performed thousands of circumcisions, admitted a momentary lapse of attention and accidentally cutting proximal, rather than distal to the Mogen clamp. The excised glans was put on ice during transport. Two hours passed between the amputation and surgical intervention.

The intraoperative examination revealed a very pale glans (Fig. 1). The urethral meatus was visible at the ventral level of the glans, covered by a thin translucent skin bridge. A urinary catheter was put in place.

Intraoperatively, active bleeding from the right cavernosal artery was noted, but intentionally not cauterized. A tourniquet was put in place to control this bleeding for a total of 40 minutes. Using 2.5 magnification loupes, the corpora cavernosa were approximated by simple interrupted sutures using 7–0 PDS, without vascular anastomosis. Next, Buck's fascia was repaired with running sutures using 7–0 PDS. Simple interrupted urethral sutures were then followed with interrupted absorbable skin suture (Fig. 2). The dorsal neurovascular bundle was not manipulated during the procedure. The patient received antibiotic therapy for 10 days combined with application of polysporin.

In the initial postoperative period, the glans had a bluish color, which gradually resolved on postoperative day 3 (Fig. 3). The urinary catheter was removed one week after the surgical repair. An erection was visualized demonstrating good viability of the glans. A urethroplasty for the repair of his hypospadias was declined by the family at follow-up at 1 year of age. The family refused longer follow-up when contacted by phone.

Discussion

Circumcision, commonly performed for religious, cultural and medical reasons, is also a surgery with multiple medical benefits.¹ In general, its complications are minor and treatable.² Their frequency and severity increase when the procedure is performed by inexperienced practitioners, or the presence of non-sterile conditions and suboptimal equipment. Complications from circumcision appear to be greater in children over one year of age compared to newborns and infants.²

The median frequency of complications after circumcision reported

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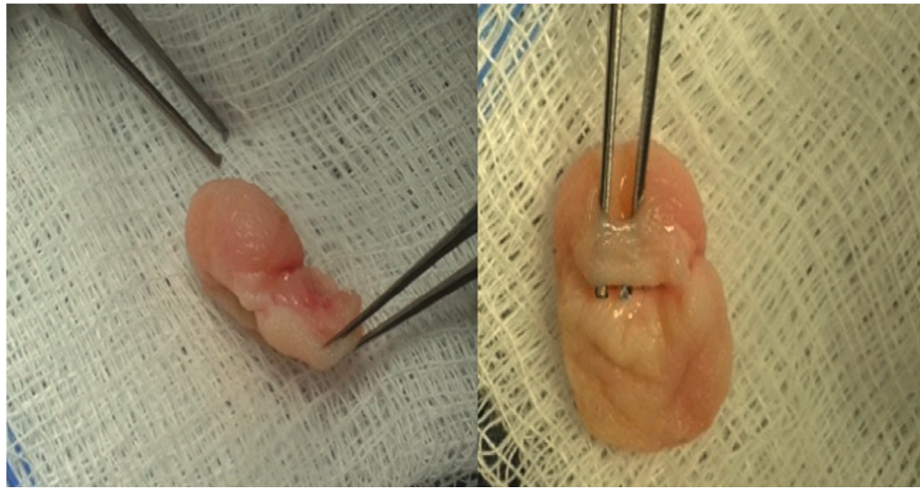


Fig. 1. Completely amputated glans with lateral view and ventral view.



Fig. 2. Reimplanted glans at the end of the surgical intervention.

in children of all ages included by Weiss et al. in a systematic review was 1.5%.² They consist mainly of intraoperative bleeding, wound infection, meatitis, penile edema, burns, incomplete circumcision, post-operative adhesions, glans necrosis, iatrogenic hypospadias and urethral lesions.^{2,3} Amputation of the glans or penis is a rarely described complication. It is a severe complication given the detrimental functional,

aesthetic and psychological impacts from infancy to adulthood if uncorrected.

The mechanisms of injury to the glans during circumcision are unclear. It has been hypothesized that using a Mogen clamp with a poor release of the ventral prepuce adhesions consequently injures the glans.¹ In some developing countries, circumcision is performed in the absence of anaesthesia and amputation would be the direct consequence of poor immobilization of the child or by a lack of anatomical knowledge.³

The amputated tissue is best transported in a sterile, cool container without direct contact with ice, which can cause ischemia to the tissue. The glans must be reimplanted as soon as possible, successfully reported up to 8 hours after the accident, though this case was a partial amputation.⁴ The repair technique of choice for penile amputation in adults is micro-surgical reanastomosis, yet outcomes are poorly documented. The stages consist of an end to end anastomosis of the urethra, of the corpus spongiosum, reapproximation of the tunica albuginea and finally Buck's fascia as well as the closing of the skin. Anastomosis of the arteries, veins and dorsal nerves should be completed when feasible. Macro-surgery in older children and adults without microvascular repair has been attempted but generally results in significant sequelae. Unlike in older children and adults, the vessel diameter does not allow a microsurgical repair for newborns and infants. In our case, reimplantation was successfully carried out following reconstruction of anatomical planes with loop magnification and fine 7-0 sutures. However, the results of long-term penile sensitivity remain unclear.

The complications reported after reimplantation of the glans are



Fig. 3. Initial bluish discoloration and gradual resolution of bluish discoloration.

often reversible, such as a urethral stenosis and urethro-cutaneous fistula.^{1,4} Hyperbaric oxygen has also been used in a child following discoloration in the distal part of the anastomosis to increase oxygenation and circulation with good results. Ancillary aids others have reported include leech therapy, winter shunt or groin flaps.⁵ The ischemic areas postoperatively in our newborn resolved spontaneously.

The complications of a neglected or unrecognized amputation of the glans are disastrous and difficult to manage. Loss of tissue can affect urination, sensitivity, penis length, appearance and self-esteem. The methods of reconstruction following a late discovery of an amputation after circumcision in children are only briefly described, with unsatisfactory results.^{1,3} They are better reported in adults after an amputation of the penis often requiring many surgeries to correct a dysmorphic glans, deviated urethra and urethral strictures.⁵

Conclusion

Practitioners who perform neonatal circumcisions should be comfortable with the procedure as well as recognition and referral for prompt management of its complications. Amputation of the neonatal

glans or penis is a rare and potentially devastating complication which can be repaired, though more data is needed on the optimal techniques and long term outcomes of esthetics, erectile function and sensation.

Declaration of competing interest

None.

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