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Glans amputation during routine neonatal circumcision: Mechanism of injury and strategy for prevention

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Abstract *Objective:* Glans injury during circumcision is an uncommon yet potentially devastating complication. Its mechanism remains poorly understood. Herein we critically evaluate a case series and, based on common characteristics, hypothesize the mechanism of injury as well as means to prevent it.

Methods: Retrospective review of circumcision-related glans amputation cases referred for evaluation and management, focusing on detection of common history and presentation patterns in order to evaluate possible underlying mechanisms.

Results: A neonatal elective circumcision was conducted using a Mogen clamp and an oblique injury to the ventro-lateral aspect of the glans was noted in 6 cases referred over a 5-year period, suggesting a similar trauma pattern. The urethra was consistently involved. The amputated segments were reattached as free composite grafts in 2/6 cases. Three patients underwent delayed glansplasty months after the trauma in an attempt to restore natural symmetry and cosmesis. In one case a buccal mucosa graft was employed to rebuild the ventral coronal sulcus.

Conclusions: Trauma pattern suggests that the ventral glans is at high risk for injury by traction on incompletely released ventral preputial adhesions with subsequent glans entrapment.

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Practitioners performing neonatal circumcisions, particularly with a Mogen clamp, should exercise adequate release of ventral adhesions to prevent this complication.

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Introduction

Circumcision is considered to be one of the most commonly performed surgical procedure in the world, frequently related to timeless rituals with important religious connotations, and distinctly being often performed for non-therapeutic reasons [1]. It is estimated that a quarter of the males worldwide are circumcised. In some communities almost all boys undergo ritual circumcision as newborns. Depending on cultural and social backgrounds the procedure may be performed by a myriad of health care providers with different backgrounds, as well as non-specialized physicians, non-medical health personnel or lay people, giving margin to different frequencies and types of complications [1,2]. In stark contrast with other medical interventions, even in jurisdictions with tight control over surgical practice, the ritual circumcision by practitioners with different levels of training and specialization is tolerated and accepted by legislation and the public. Not surprisingly, the reported incidence of circumcision-related complications varies in the literature, from 0.2% (in-hospital circumcisions, mostly conducted by trained health care practitioners) to >20% (out of hospital procedures, often performed by lay people) [2].

There are various techniques for circumcision. In particular, clamp techniques are popular as they can be performed quickly and inexpensively. They can also be easily taught and learned, without need for refined surgical expertise. Although most patients do well regardless of the selected technique, bleeding and infection remain relatively common complications that generate anxiety among family members and physicians. Fortunately these are easily addressed by compression, surgical exploration or medical treatment, with few long-term consequences. In contrast, glans injury during circumcision is an uncommon and possibly underreported yet devastating complication. Partial or complete glans amputation, caused by inadvertent transection during the foreskin-removing process, is particularly relevant due to its associated morbidity and long-term consequences. Unfortunately, prevention measures have been scarce and difficult to come by considering that its exact pathophysiology remains poorly understood.

In order to better understand the factors related to this iatrogenic injury, herein we report a retrospective series of glans amputation cases that were managed by (or in consultation with) a senior pediatric urologist, reflecting on possible mechanisms that may predispose to glans injury during this procedure.

Material and methods

A retrospective analysis of all cases of traumatic glans amputations complicating circumcisions referred for review or treatment by the senior author (JLPS) in a 10-year period

was conducted. Data were collected on technical operative details (including type of surgical procedure and instrumentation employed), obtained by history on admission or by review of the operative notes sent with the referrals. Narratives, histories and physical exam were reviewed to determine common factors detected in affected children. Management strategies and long-term outcomes are presented (when available).

Results

A total of 6 patients were identified, who underwent circumcision between 8 and 12 days of age. All infants underwent circumcision using a Mogen clamp, under local anesthesia. Non-surgical medical consultants (pediatricians or general practitioners) performed the procedure in all cases. All patients were hemodynamically stable on admission. None required blood transfusion, although post-circumcision anemia was reported in 5 of the 6 patients. In all cases partial glans amputation occurred in an oblique fashion, leaving more glanular tissue on the superior/dorsal aspect.

Two patients were seen soon after the procedure with the portion of amputated glans properly stored in normal saline, allowing for timely reimplantation (Fig. 1a–d).

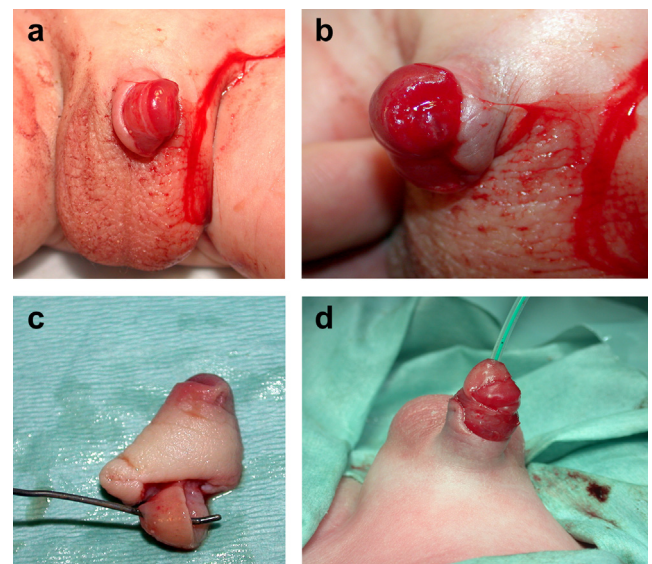


Figure 1 a and b – Appearance of penis following glans amputation after Mogen clamp circumcision. Note the oblique orientation of the injury, involving the distal urethra. c – Amputated distal penile portion consisting of prepuce and part of the glans. Preputial adhesions improperly released are clearly seen in the ventral aspect, around the frenulum. d – Early appearance of the reimplanted segment of amputated glans, showing good color and grossly viable.

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