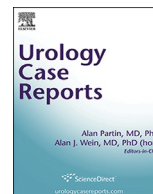




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Trauma and reconstruction

Surgical reconstruction and follow-up of penile strangulation injury

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treated with local wound care including silver impregnated dressing per plastic surgery recommendations. He was discharged home with plans for future operative debridement once the ischemic tissue margins had time to fully declare themselves.

Introduction

Penile strangulation by a foreign body is an uncommon urological emergency.¹ Previously reported mechanisms include metallic rings, washers, rubber bands, and hair tourniquets.^{2–4} These injuries classically lead to progressive edema, ischemia, and tissue necrosis and must be recognized and treated immediately in order to avoid irreversible tissue loss. The current body of literature often documents a detailed mechanism of injury in such cases; however, the progression of the injuries beyond initial presentation to include management and results in longitudinal follow-up are rarely captured.^{3,4} Our report addresses the full care episode and follow-up of a unique case of penile strangulation injury.

Case presentation

A 56 year-old male presented as a transfer from an outside hospital 3 days after a reported 6 hours of acute penile constriction inside of a lotion bottle. The penis was successfully extricated in the outside hospital emergency department. After removal, the glans and distal shaft were reported to be viable with some patchy necrotic shaft skin distal to a well-demarcated line of bottle constriction. He denied voiding problems. After 72 hours of observation, he was transferred to our institution for further management.

On our initial evaluation, he was noted to have decreased penile sensation with a distinct line of demarcation separating the proximal healthy shaft skin from the distal necrotic skin and ventral glans eschar (Fig. 1a). He was able to void without difficulty. He was

Operative intervention

At 1 month re-examination, there was a dorsal island of glans and shaft tissue which appeared to be well vascularized, but all of the ventral and lateral shaft skin distal to the previously documented line of demarcation was either necrotic or sloughed off. Urine appeared to be leaking from the proximal penile urethra at a site deep to the healthy proximal shaft skin.

He was taken to the OR for exam under anesthesia, cystoscopy, and penile debridement. All skin distal to the line of demarcation was non-viable and was debrided (Fig. 1b). The penile urethra was totally devascularized and had developed multiple fistulae. In several places where necrotic tunica albuginea was debrided, the underlying erectile tissue appeared congested and ischemic. The healthy-appearing dorsal shaft and glans tissue was preserved. Proximal to the line of demarcation at the proximal shaft, the skin, corpora, and urethra appeared viable. The distal bulbar urethra, membranous urethra, prostatic urethra, and bladder all appeared normal on cystoscopy. A suprapubic tube was placed to divert the urine. The penis was dressed with 0.25% sodium hypochlorite solution moistened gauze.

Two days later he returned to the OR for repeat debridement. Significant necrosis of the mid and distal corporal bodies as well as the penile urethra was again observed. The glans and dorsal neurovascular bundle continued to appear viable. The fossa navicularis was patent but stenotic. All of the necrotic corporal and penile urethral tissue was debrided, leaving a skeletonized but viable dorsal neurovascular bundle and glans with short fossa navicularis urethral segment (Fig. 2).

Post-operatively the patient was offered reconstruction with a radial forearm flap neophallus given the preservation of his glans and dorsal neurovascular bundle. He ultimately decided against the neophallus and opted to undergo glans reconstruction and urethroplasty.

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Fig. 1. A) Demarcation of penile strangulation on presentation prior to debridement B) Debridement of non-viable skin.

Penile reconstruction

He returned to the OR one week later. The glans and neurovascular bundle remained viable. We incised the ventral aspect of the stenotic fossa navicularis and anastomosed it to the dorsally-spatulated proximal segment of healthy urethra (Fig. 3a). This created a widely patent urethral meatus located just under the coronal sulcus. The intervening segment of dorsal neurovascular bundle was bunched up and placed between the glans and proximal corporal bodies.

We advanced the healthy proximal penile skin ventrally to the edge of the neomeatus and dorsally to the dorsal coronal sulcus. The skin coverage was secured with interrupted sutures and the intervening spaces packed with quarter-inch iodoform gauze. A 16-French Foley catheter was left in place through the neomeatus for 2 weeks.

Follow-up

At his 1 month visit the resulting penile stump remained viable with patent neomeatus, and his suprapubic tube was removed with successful trial of void. At that time, he denied any erectile function

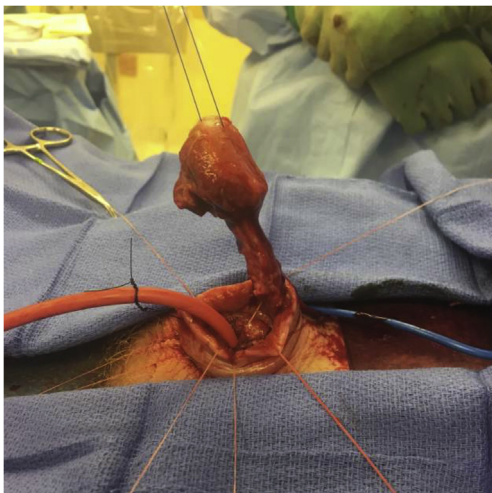


Fig. 2. Skeletonized dorsal neurovascular bundle with glans and fossa navicularis urethral segment.



Fig. 3. A) Anastomosed glans and neurovascular bundle to proximal healthy urethra B) Clinic follow-up at 2 months.

or sensation to the penile stump. At his 2 month visit, he reported full return of sensation and erectile function of his penile stump and glans (Fig. 3b).

Discussion

Our patient suffered near-complete penile loss following a reported 6 hour period of strangulation in a lotion bottle. Fortunately, his dorsal neurovascular bundle was spared and continued to provide blood flow to his glans. His reconstruction was aided by the spared glans, which was able to be brought down to his healthy proximal penile stump somewhat orthotopically. His proximal urethral stump was anastomosed in a fashion that allows him to successfully void per penis. Radial forearm flap reconstruction was a tempting choice for him, as it would have preserved penile length. He was reluctant to undergo the flap procedure primarily based on concern for increased potential complications.

Our case represents one of many potential outcomes for this mechanism of injury, in which the suitability of surgical reconstruction options may vary as widely as the heterogeneous ways in which these cases present. Prognosis depends on the degree and duration of the ischemic event as well as patient factors such as diabetes or smoking which are known to contribute to wound complications and reconstruction failure. Given the paucity of reported outcomes in the literature, our experience may guide physicians facing similar presentations.

Conclusion

Immediate penile extrication from the constricting mechanism is critical and time sensitive in the management of penile strangulation injury.^{1–5} Temporary urinary diversion with suprapubic tube may be necessary. Reconstructive surgery can be successful in select cases, with outcomes ranging from complete recovery to total amputation. Options for reconstruction should be based on a joint decision between the surgeon and patient in the context of a candid discussion of sexual and urinary functional outcomes.

Consent

Images were obtained with consent by the patient.

Declarations of interest

None.

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