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A case report of a complete degloving injury of the penile skin

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ABSTRACT

INTRODUCTION: Male genital degloving injuries are unusual and rarely caused by animal bite. Usually patients attend health care immediately if bitten in the genital area. Prophylactic antibiotics is routinely used (Gomes et al., 2000).

A penile degloving usually begins just proximal of the coronal line and progress down to the base of the shaft. Deep erectile tissue and the spermatic cord are seldom damaged and the endogenous skin of glans usually survives (Brown and Fryer, 1957; Morey et al., 2004; Finical and Arnold, 1999).

PRESENTATION OF CASE: A heavily smoking man with a previous history of bladder cancer presented himself to the emergency department 24 h after a dog bite degloved his penis. The avulsed skin was necrotic and subsequently excised. Antibiotic treatment was started. A bacterial swab was found positive for canine oral flora.

The skin defect was closed using a 1:1 meshed split thickness skin graft from the inner thigh. Smoking cessation was encouraged.

At the three month follow up the patient expressed satisfaction with both cosmetic and functional result and was now non-smoking.

DISCUSSION: Several approaches to reconstruct penile skin exist. Split thickness skin graft has been lifted as a preferable alternative (Brown and Fryer, 1957; Finical and Arnold, 1999; Paraskevas et al., 2003) [5]. In this case, the avulsed skin was necrotic and could not be used. A 1:1 meshed split-thickness graft was chosen with excellent results.

CONCLUSION: 1:1 mesh of the graft can be recommended for easy attachment with a good functional and esthetical result. The potential risk of losing intimacy appearance or having to go through repeated procedures in the genital area motivated smoking cessation for this patient.

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1. Introduction

When searching the scientific literature for references on male genital degloving injuries there are only few articles to be found. Though very few cases, the majority of the reported adult injuries are due to farm equipment accidents. A so called “power take-off injury” (PTO) model has been stipulated [2]. PTO describes an injury caused by power being transmitted from one place to another. The loose penile skin, entrapped by surrounding clothing is caught in a stationary machinery and then traumatically ripped off [2,3]. Other causes may be secondary to various devices such as penile rings, vacuum cleaners, or excessive trauma during sex [4]. Although animal bites are accounting for as many as 1% of all emergency visits in the U.S., very few cases involving the genital area has been

described in the literature. Among those that are described, utterly few are degloving injuries [1].

However, searching the literature, one article concerning penile degloving injuries by Finical et al. in 1999 [4] and one article describing genital trauma due to animal bites by Gomes et al. in 2000 [1] could be found.

Notably, it is described that degloving injuries of the penile skin is not a painful condition [2].

Importantly regarding PTO injuries, is that the skin tears loose at the corona, so that the glans is usually left intact. The separation also seems to follow the superficial, Dartos, fascia and does not damage deep erectile tissues or the spermatic cord [2]. The cutaneous blood supply of the penile shaft is derived from a pair of axial arteries in the superficial fascia whereas the glans has additional supply from the deep dorsal artery and corporal vessels [6]. This anatomical situation explains why different types of local flaps or split-thickness skin grafts have become the most popular ways to reconstruct the penile skin after a degloving injury if re-implantation of the endogenous skin is not possible. In the summary report by Finical et al., a one stage procedure to treat these injuries is presented [4]. This

Abbreviation: PTO, “power take-off injury”.

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Fig. 1. Degloved penis, skin still attached through a small bridge at the base, 24 h after injury.

type of split-thickness skin graft is also preferred by other authors [2,4]

2. Presentation of case

A 67 year old retiree, smoking about two packs of cigarettes per day, presented himself to the emergency department at Uppsala University Hospital approximately 24 h after being bit by a dog in his home. The patient recalled throwing ball, in the nude, with a German shepherd when the dog mistakenly bit his penis and ripped off the skin. A circumferential avulsion of the skin from the coronal sulcus to the base of the shaft, including a smaller part of the scrotal skin was seen. The erectile columns, urethra and testes were intact, the tissues split between Dartos' and Buck's fasciae, just as described for PTO injuries.

A skin bridge of about 1 cm in width was holding the degloved skin attached ventrolateral to the base of the shaft. The pendent skin was necrotic, black and foul smelling and thus subsequently excised. Presumably due to the double arterial supply of glans and the subcoronal region as described above, this area was intact.

Serum chemistry, hematology, and qualitative wound culture testing was performed. Tetanus-/diphtheriatoxoid vaccine and Piperacillin/Tazobactam 4 g q8 h was administered. The patient was advised immediately to stop smoking. The patient also gave oral and written informed consent to photography and scientific communication. Surgery was performed 36 h post injury (Fig. 1).

2.1. Intraoperative procedure

Due to the close nature of this wound to described power take off injuries, we chose to use the described technique by Finical et al. [4]. After having introduced a 12 Gauge urinary catheter, the penis was thoroughly washed with chlorhexidine soap, sodium chloride, and 1,5% hydrogen peroxide. A towel clamp was carefully introduced to distal glans for easier handling. Devitalised tissue was excised as were the skin edges. A small local skin flap was turned to complete the scrotum. A 0.3 mm (12/1000-in) split thickness skin graft was harvested from the left medial thigh, meshed 1:1, and sutured circumferentially end to end along the penile shaft and to the subcoronal and scrotal tissue. The axial row of sutures was carefully placed axially along the ventral aspect of the penis to mimic the natural raphe. An elastic compressive dressing was applied with Hypafix® in cross-wise L-shapes to keep the penis in an erect position for optimal take of the graft (Fig. 2).

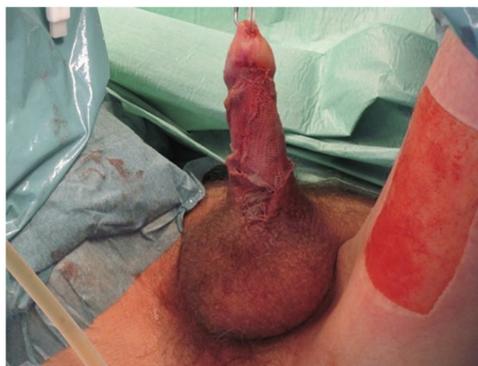


Fig. 2. Perioperative picture. A 1:1 meshed split thickness skin graft sutured in place.



Fig. 3. Three months postoperative.

2.2. Postoperative result

First postoperative week was uneventful. On first take-down slight clinical signs of infection were present with small areas of thick yellow/green debris but no redness, swollenness or pain.

From the bacterial swabs taken, *Neisseria Weaveri* (bacteria associated to canine flora), mixed coliform flora and flora associated to human skin was found.

By the time of discharge (six days post-operatively), Piperacillin/Tazocine intravenously was changed to a combination of Heracillin, 1 g, q8 h and Ciprofloxacin, 500 mg, q12 h for 14 days.

C-reactive protein and leucocyte count was measured with a declining trend over the hospital course.

Patient was discharged with regular controls in the out-patient clinic.

Three months postoperatively the penile and scrotal skin was completely healed. There were no signs of infection, no pain and the patient had returned to pre-trauma functional status. He continued to be smoke-free (Fig. 3).

3. Discussion

Penile skin avulsions are very rare injuries, as are animal bites in the genital region. However, animal bites in this region is routinely treated with prophylactic antibiotics [7]. Possibly this is why infections with typical canine oral bacteria in the genital area, to our knowledge, has not been reported previously [1]. This case is therefore special out of several perspectives.

Routinely the endogenous skin would have been washed thoroughly and immediately reattached as it was degloved in one piece, but the necrotic status of the skin made this approach impossible. Possibly due to the multiple and rich vascularisation of the penis, a reconstruction using a previously described split-thickness skin graft, along with antibiotic treatment has in this specific case given

an excellent result. In a few previous publications, split-thickness skin grafts has been lifted as a preferable choice for reconstructing the penile skin [2,4,5]. As a bonus, the patient, who previously continued smoking though suffering from urinary-bladder cancer, now permanently stopped. It may be postulated that the emotional distress of possibly losing intimacy appearance functioned as a potent factor for behavioural changes in this case.

4. Conclusion

Although superinfected, a split-thickness skin graft gave functional, and for the patient cosmetically acceptable, results for the covering of this complete degloving injury of the penis. The choice of 1:1 mesh made it possible to use any direction of the graft, with the suture line axially on the ventral aspect of the shaft, imitating raphe, giving a good cosmetic and functional result, was easily achieved and can be recommended.

Conflicts of interest

No conflict of interest.

Funding

No funding has been used for this research.

Ethical approval

No ethical approval has been applied for this case report study, only the written and oral consent by the patient.

Consent

A written consent has been obtained from the patient for publication of this case report and accompanying images and is available for review on request.

Author contribution

Both authors has contributed equally to the paper.

Guarantor

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