

Penile Degloving injuries, a quagmire riddled out: a case series

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Abstract

Penile Degloving injuries are rare among all genitourinary injuries. These injuries occur as a result of road traffic accidents, animal injuries (bites), industrial injuries, etc. Penile skin avulsion occurs due to traction injury or trapping of the skin resulting in tear of skin from underlying tunica albuginea. Due to excellent blood supply early primary repair if done early and possible results in the best outcome. Patients with skin loss can be managed by flaps mobilization from remaining skin. In occasional cases when primary closure is not possible, split skin grafting is required. The timely repair results in minimal short-term complications and excellent long-term cosmetic results without scarring and normal erectile function. Whenever possible these injuries should be primarily closed, employing grafts and flaps when required even in delayed presentation and animal bites. We describe degloving injuries in case series of two patients with unlike aetiologies. These were managed by primary closure with degloved skin after mobilization and debridement of nonviable skin after adequate washing with normal saline. Despite minor wound complication like wound infection, flap necrosis, penile oedema, ultimately wound recovered within few days. On follow up patients were able to void normally in addition cosmetic and aesthetic outcomes were excellent. Furthermore, patients were able to achieve good erections with no curvature. We concluded that penile skin if reposed early with good wound management results in excellent outcomes with minimal long-term scarring, voiding and erectile dysfunction.

Keywords: Degloving injury, Penis, graft or flap, fall, Animal bite

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Introduction

Background

Degloving injury of the Penis is a rare emergency. Purely degloving of the Penis is uncommonly reported in the literature. These injuries occur as a result of road traffic accidents, injuries due to trapping of skin in machinery in industries, animal injuries (sometimes bites), etc. other seldom reported causes are penile rings, vacuum cleaners, trauma during intercourse, animal and human bites. These injuries vary from a simple laceration to complete degloving of the Penis.

Penile skin has a special characteristic, dartos lying on loose areolar tissue with its vasculature from proximal as well as distal which leads to avulsion of skin in these injuries [1,2] Penile degloving injuries range from simple to complex, easy to difficult to repair, and associated with short- and long-term complications. These injuries are seldom endangering to life although have devastating psychological trauma. [1] In these injuries' restoration of normal penile anatomy and function is the primary objective. We present our case reports of two patients presenting with penile degloving injuries in our institution. We describe their presentation, management, and follow up

Case 1

A 45 years male sustained trauma to the penis, after falling from a height onto bushes under influence of alcohol. He got himself entrapped in bushes with tearing of clothes and injury to genitalia. He came to

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emergency services after 12 hours with complaints of bleeding and loss of skin over the penis. On examination, there was complete degloving of penile skin, from the base of the Penis including some scrotal skin to the glans Penis with urinary retention.

The corpus spongiosum, corpora cavernosa, tunica albuginea, bilateral testes were intact. There were no other associated injuries (Figure 1). He was started on analgesics, antibiotics, intravenous fluids. Emergency investigations showed, haemoglobin 13.5 gm%, TLC 6700/mm³, Urea/ creatinine 20/0.7 mg%.

He was taken to the emergency operation theatre and planned for repositioning of degloved skin. The wound was thoroughly irrigated with normal saline, hydrogen peroxide, and betadine. Penile skin was completely degloved and everted into the distal penis attached to glans. The exposed Penis shows no injury to the corpora cavernosa, urethra. Buck's fascia was intact over dorsal penile vessels. Devitalised penile skin was excised and the rest of penile skin was reposed. The reposed penile was sutured to the skin at the base of the Penis with ethilon 4-0. He was catheterized intraoperatively and the no urethral injury was seen. Postoperatively he was started on injection Piperacillin with tazobactam 4.5 gm and diclofenac 75 mg. He developed edema in reposed penile skin postoperatively. The daily dressing was done with normal saline and Neosporin ointment. Penile swelling subsided gradually and he was discharged on 7th postoperative day. He was advised to come for suture

removal on 10th postoperative day and continue antibiotics Augmentin 625 mg three times daily for three weeks. He was followed weekly until 6 weeks and at 3 months. At 3 months patient recovered well with normal erectile function and urinary stream. He had minimal scarring at the suture line with no curvature of the penis on erection. (Figure 2)

Case 2

An 11 years male child presented with a history of dog bite to genitalia 6 hours back. The dog was his pet and vaccinated for rabies. On examination, he was having degloved penile skin with bleeding from the Penis. Except for a small 2-3 mm, skin patch, whole skin was avulsed. Injection tetanus toxoid and rabies vaccine and serum were injected. (Figure 3). He was taken to the emergency operation theatre. The wound was irrigated with normal saline, hydrogen peroxide, and betadine. The skin was repositioned and sutured to the base of the Penis. Postoperatively antibiotics, analgesics were given. He developed penile skin swelling, edema, pain postoperatively. (Figure 4a,b)

Daily dressing with normal saline and Neosporin ointment was done. He developed a necrotic patch of 1 x 1 cm postoperatively which was excised. Penile skin swelling subsided gradually. He was prescribed augmentin for 3 weeks and reviewed weekly until three months. At 3 months he had minimal scarring with no urinary complaint. (Figure 4c,d)

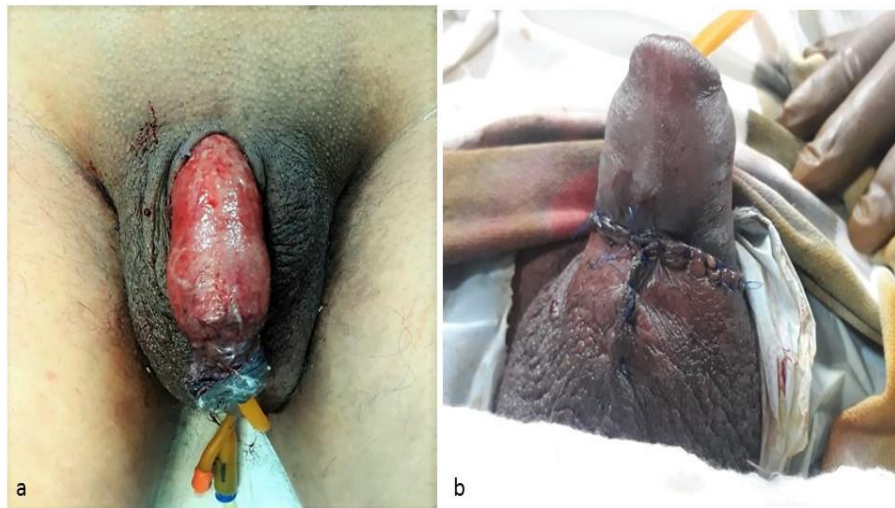


Fig 1:a,b (shows case 1) a. Avulsed Penile skin, degloved penile skin everted, and attached to coronal sulcus

b. Suturing of flaps after mobilization from the scrotum and penile base results in primary closure of the Penis



Fig 2:(a-c) Penile pictures at 3 months showing a minimal scar

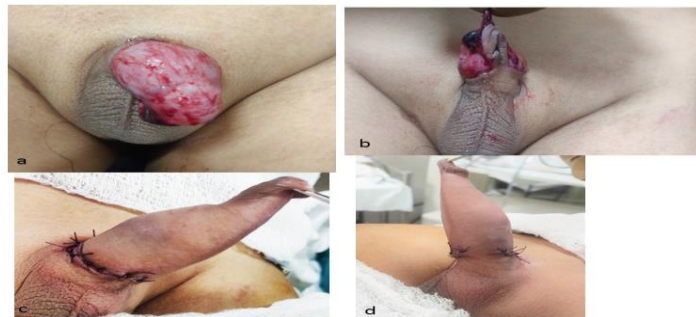


Fig 3: a-d (shows case 2). a. Avulsed penile skin exposing underlying deep fascia b. Penile skin attached with thin pedicle,c-d. After suturing with reposed penile skin

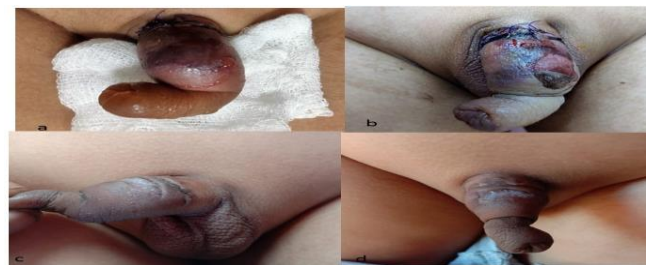


Fig 4. a. Show penile edema with discolored skin patch dorsally b. Discolored patch on skin developing into necrotic skin c-d. Follow up at 2 months show minimal scarring with minimally swelling distal penile skin

Discussion

Different mechanisms are proposed by different authors for degloving penile injury. The most agreeable theory is regarding the peculiar anatomy and location of the penis. The Penis is mobile and comparatively hidden and isolated interbetween thighs hence penile

injuries are infrequent. [3] Among all penile injuries, degloving isn't uncommon because of thin and elastic penile skin lying on loose connective tissue. [4] Avulsion injury force travels in loose areolar tissue plane deep to penile skin till attachment to the coronal

sulcus. As Buck's fascia is preserved, the corpora cavernosa and corpus spongiosum, including the urethra, are spared, as are the deep dorsal vein and dorsal artery, and nerve. This avulsion injury rips off the penile skin and anterior half of the scrotal till Colles' fascia attachment. Testicular sparing is that the rule with this injury, and therefore the cremasteric reflex has been implicated as a cause.[5]PTO(power take-off injury)" describes an injury caused by power being transmitted from one place to a different. The loose penile skin, entrapped by surrounding clothing, chains, traction injury avulse penile skin. [6,7].The cutaneous blood supply of the penile shaft springs from a pair of axial arteries within the superficial fascia whereas the glans has additional supply from the deep dorsal artery and corporal vessels. This anatomical situation explains why different types of local flaps or split-thickness skin grafts became the foremost popular ways to reconstruct the penile skin after a degloving injury if re-implantation of the endogenous skin isn't possible. [8]Industrial machines, like pulleys, chains, and rotary discs, account for genital injury once they hitch the worker clothes and drag out the skin of the Penis and scrotum. These types of injuries can occur in farming, fall, road traffic accidents, industries, and animal bites. [5,9]Animal bites leading to penile degloving injuries have been reported in the literature in few case reports. Animal bite injuries are unusual and associated with infectious complications as they involve polymicrobial. Dog bites, the foremost common animal bite, contain multiple pathogens like Pasteurella, Staphylococcus, Streptococcus species, capnocytophaga and anaerobes. The goal of management in animal bites is to minimize soft tissue damage, prevent rabies and infectious complications. These wounds should be thoroughly irrigated with soap, water, and povidone-iodine [10,11]. In traditional treatment, after cleaning and debridement of devitalized tissues, the exposed tissues are covered with viable flaps from the remaining skin. When there's no available skin, penile burial within the scrotum or the suprapubic region is performed. The utilization of posterior scrotal skin for primary closure of the scrotum is additionally supported by Finical and Arnold.[1] Posterior scrotal skin can usually be stretched to hide the defect and any subsequent defect from the expansion of the posterior scrotal skin, to hide the injured area, are often skin-grafted anteriorly. Prolonged exposure of the denuded Penis increases the danger of secondary infection also as it significantly compromise the vascularity. The foremost frequent complication of avulsion injuries is postoperative infection. If the graft doesn't take up in these patients

who undergo split-thickness skin grafting, the results are often devastating and complications like male erectile dysfunction, curvature, and fistula are related to risks. [1,12]Our first case presented to the emergency services in a delayed manner after 12 hours. His wound was irrigated properly with saline, betadine, and primary closure with native tissue was done. Preoperative and postoperative coverage with broad-spectrum antibiotics helped in the early resolution of penile trauma. Our second patient 11 years old child presented with a dog bite early within 6 hours. His wound was irrigated with soap water, normal saline. He was vaccinated with tetanus toxoid, rabies. Although controversial primary coverage of wound was done. He was managed with antibiotics, daily dressing, and followed closely. Despite developing postoperative swelling and minimal flap necrosis he recovered well. We concluded that penile skin is very vascular and mobile. So primary closure is justified in these patients even they presented in delayed fashion in the first case and animal bite in the second case. Proper management of these degloving injuries can result in minimal complications and excellent outcomes.

Conclusion

Degloving Penile injuries are rarely encountered. If these injuries are repaired timely and properly, results in minimal short-term complications with good cosmetic results in the long term with minimal scarring and normal erectile function. Whenever possible these injuries should be primarily closed, employing grafts and flaps when required even in delayed presentation and animal bites.

Consent:A written consent has been obtained from the patients for publication of this case series and accompanying images and is available for review on request.

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