

· Case Report ·

Repair of necrosis and defects of penile skin with autologous free skin flap

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Abstract

We described a 27-year-old case of avulsion and traumatic degloving of penile with extensive penis skin necrosis. Under general anesthesia, donor skin was partially resected from lower limbs according to defect area of penile skin. Then shear the shape of graft was sheared, sutured to hostage skin defect and enswathed with tension. The postoperative appearance and function of the penis were satisfactory. It is suggest the homologous free skin flap from lower limbs is suitable for penile skin repair and beneficial to patient resulting in satisfactory erection and shape. (*Asian J Androl* 2006 Nov; 8: 741–744)

Keywords: penis trauma; autologous free skin flap; repair

1 Introduction

Avulsion of the penile and scrotal skin is a rare urology emergency and is caused mainly by accidents with industrial machines and agricultural machine belts [1, 2]. Although not life threatening, such lesions are incapacitating and psychologically devastating [1]. Avulsions vary from simple laceration to virtual emasculations [3]. Generally, lesions reach only the skin, causing minimal bleeding without producing damage to the cavernous body, the spongy body or the testes [1, 3].

2 Case report

A 27-year-old metallurgist was admitted to our hospital in July 2004 suffering from trauma to the external genitalia because of a work accident caused by industrial machinery. Examination in the emergency room revealed total avulsion of the penile skin, which remained fixed to the penis through a pedicle formed by a flap in the coronal sulcus. The patient was taken to surgery approximately 2 hours after the accident. Following peridural anesthesia, the medical staff performed careful cleaning of the wound, and debridement of the devitalized tissues. The penis was viable because the pedicle had apparently good vascularization. After 5 days, the skin flap covering the penis became seared, atrophied and black in color, and a clear border was formed between the necrotic area and healthy skin (Figure 1). There was no bleeding or a sense of pain when a needle stabbed the flap area, which con-

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Figure 1. The skin flap covering around the penis became seared and atrophied and black in color, and a clear border formed between the necrotic area and healthy skin.

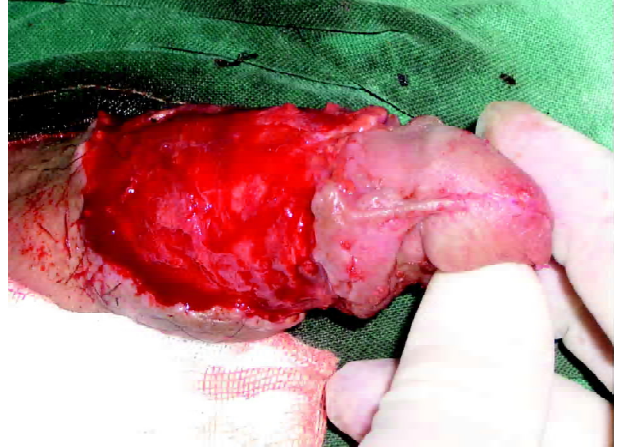


Figure 2. Debridement of devitalized hypodermic tissues was performed until fascia with fresh vessel supply and border of bleeding skin.



Figure 3. The graft was attached to the lesioned area of the penile skin, and stitched to the host penile skin with a 6-0 suture without tension.

firmed flap necrosis.

Seven days after the accident, the patient, under general anesthesia, underwent resection of the necrotic penile skin along the border between the necrotic area and the healthy tissues. Debridement of devitalized hypodermic tissues was performed to the extent of reaching fascia with vessels providing fresh blood supply (Figure 2). Meanwhile, a free skin graft was removed by Padgett type dermatomes (with thickness of 0.6 mm) from the



Figure 4. The growth of graft is healing and is without constriction.

lateral external area of the lower left limb with a size of 10×8 cm, according to the area of the penile lesion. The thickness of the graft was 0.5 mm. The wound area of the lower limb was bandaged with Vaseline gauze and bandage. The free skin graft was trimmed according to the shape of the penile skin lesion, attached to the injured area, and stitched to the penile skin with a 6-0 suture without tension. Redundant graft skin flap was pruned (Figure 3). The penis was enswathed with tension postoperatively. Urine was diverted using a Foley's catheter. The gauze was unfolded on postoperative day 7 and the suture and catheter were removed simultaneously. The growth of the graft was healing and was without

constriction (Figure 4).

The patient recovered and resumed normal sexual activity at 3 months postoperatively and there was no evidence of color difference between the graft and the host skin areas.

3 Discussion

Industrial machines, such as pulleys, chains and rotary discs, are responsible for genital injury when they snag the operators' clothes and pull out the skin of the penis. Although not common, this kind of injury occurs occasionally, particularly in the farm industry. Mechanized farming is involved in a majority of these injuries presented in most studies. Kubacek presented the first case report of this type of injury in 1958 [4]. In 1957, Brown and Fryer [5] first described the power takeoff injury, a typical scenario. The rotary link (power takeoff) between the back of the tractor and operating equipment often entangles the farmer. Straddling this rotating driveshaft, the operator can easily get the pants leg caught in the moving equipment and the operator is pulled into the machinery at the groin level. The redundant skin of the penis and scrotum is grasped by this mechanism and is most often taken off in one piece. The loose skin of the penis is usually torn behind the coronal sulcus, leaving the glans intact and pulling the skin off the penis down to its base. The anterior half of the scrotum is often included in the avulsed segment. Although these patients are psychologically traumatized, they often have very little physical pain at the time of presentation [6].

The anatomy of the penis and scrotum accounts for the reproducible nature of this injury. The skin of the penile shaft is loosed up to an area just behind the coronal sulcus. The glans penis is essentially fixed in position. The natural cleavage plane along the shaft of the penis is between the Buck's fascia and the loose areolar tissue that surrounds it. The avulsed segment of the skin from the penis includes the loose areolar tissue with its subcutaneous veins, the dartos fascia and the skin as a unit. Because the Buck's fascia is preserved, the corpus cavernosum and corpus spongiosum, including the urethra, are spared, as are the deep dorsal vein and dorsal artery and nerve. Because this avulsed tissue from the shaft of the penis is essentially a composite graft, its replacement as a graft is doomed to failure. The avulsion injury travels along the level of the areolar tissue on the underside of the penis, because the Colles' fascia is

included in the scrotum, and this most probably pulls the anterior half of the scrotal skin. Testicular sparing is the rule with this injury, and the cremasteric reflex has been implicated as a cause.

In traditional treatment, after cleaning and debridement of devitalized tissues, the exposed tissues are covered with viable flaps from the remaining skin. When there is no available skin, penile burial in the scrotum or in the suprapubic region is performed. The use of posterior scrotal skin for primary closure of the scrotum is also supported by Finical and Arnold [1]. Posterior scrotal skin can usually be stretched to cover the defect. Moreover, any subsequent defect from the expansion of the posterior scrotal skin to cover the injured area can be skin-grafted anteriorly. When scrotal remnants are available, the results are optimal as far as size, cosmetics and function measured by sperm count, are concerned [3]. Other techniques, such as banking of the testicles in the inner thighs or reconstruction of the scrotum by tissue expansion, as described by Still and Goodman [7], bear the disadvantage of time delay. Conley [8] has recognized the disadvantages that accompany multistage operations, namely, the negative psychological effects experienced by the patient of losing his sexual apparatus.

Some urologists use other methods, such as lower abdominal pedicled fascia flaps and paraumbilical island flaps. Reconstructions have survived in only half of the patients receiving lower abdominal pedicled fascia flaps, but success rates of 100% have been obtained with paraumbilical island flaps [2]. However, a second operation is required to resect the flap of the penis to form penis circumferentially. Our treatment required only one step to reconstruct the defect of the penis skin, as with other specialists who have adopted lateral arm flaps to reconstruct the penis [9]. In our treatment, skin from the lateral external portion of the lower limb was available to acquire enough flaps and was used to cover the injured area of the penis. Two points are very important during the surgery: firstly, the devitalized and necrotic tissues must be debrided enough till fresh fascia bleeding and border of the incision can be seen; secondly, the graft must be sutured to host skin without tension. Another key technique is to ensowathe the penis with tension postoperatively. In the present study, the graft was attached to hypodermic tissue with fresh blood supply.

Postoperative complications that have been reported in the published literature include edema, infection, hemorrhage and cicatricial retraction [2]. In the interest of the

patient, treatment of these complications must be the most conservative possible [3]. In conclusion, free skin graft from the lower limbs is available for replacement of the avulsed portion of the penile skin resulting in satisfactory shape and color of the penis.

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