A Case Report of a Complete Penile and Scrotum Skin Degloving Injury

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Summary: Male genital injuries are rare and only few of them are total penoscrotal degloving injuries. Though this kind of injury is not life-threatening, it could be psychologically devastating to patients if not treated appropriately. This report presents a case of total male genitalia degloving injury treated by sliding flap and skin graft, assisted by Vacuum Sealing Drainage. Via this therapeutic approach, the injured area was completely healed. Three months after surgery, there were still no scars that affected normal function of male genitalia. This approach, which has never been reported before, yields a satisfactory result for both aesthetic appearance and sexual functions. (Plast Reconstr Surg Glob Open 2018;6:e2029; doi: 10.1097/GOX.0000000000002029; Published online 21 November 2018.)

Penile and scrotum skin avulsions are rare in urology and plastic emergencies. The main reason accounting for such trauma is traffic or industry accidents, especially in developing countries such as China. Even though such injuries usually are not lethal, they are devastating to the patients psychologically if not treated properly. As the genitalia are mobile and testicles are protected by tunica albuginea and cremasteric reflex, wounds can only reach the skin without damaging cavernous bodies, the spongy body, or testes. However, the reconstruction is a real challenge as there are underlying risks of entering the pelvic hematoma, unstable tamponade, and even uncontrolled bleeding. This report presents a case of degloving injury of both penis and scrotum and a new method for scrotum reconstruction by 1-stage procedure. When searching the literature, this method has never been reported before. This therapeutic strategy yields a good functional and esthetical result. This study was approved by ethics committee of Linyi People’s Hospital.

CASE PRESENTATION

A 59-year-old worker got his clothes entangled in a grinding machine while operating the machine and was admitted to the Department of Burns and Plastic Surgery in Linyi People’s Hospital 5 hours after injury. The skin of penis and scrotum was completely torn off, with exposure of testes and entire shaft of penis. Only a very small piece of scrotum was left (Fig. 1). Bilateral testes and epididymis were only connected by spermatic cord. Ultrasound indicated the erectile tissues, urethra, and testes were not damaged, probably due to the reason illustrated above. Surgery was performed right after above examinations.

SURGICAL PROCEDURE

After introducing a urinary catheter, the surgery was performed under general anesthesia. Considering the potential for polymicrobial infection, the perineal area was sufficiently irrigated by normal saline and hydrogen peroxide. Necrosis tissues were excised. Considering anatomical structure of this area, bilateral pudendal-thigh flaps (2 × 5 cm) based on external pudendal arteries were designed as advancement flaps for the reconstruction of bilateral scrotum. Even though the blood supply of the left piece of scrotum was not optimal, subcutaneous tissue was still viable. This part (2 × 3 cm) was lifted to left, secured on left pudendal-thigh flap by direct sutures, forming the bottom of scrotum. The scrotum was reconstructed by sliding flaps. Then, the remaining wound, including penis and a small portion of scrotum, was covered by split-thickness skin grafts harvested from the left medial thigh, meshed 1:1 for drainage. Vacuum Sealing Drainage (VSD) was then applied on genitalia under erectile status in case of clinical structure of this area, bilateral pudendal-thigh flaps (2 × 5 cm) based on external pudendal arteries were designed as advancement flaps for the reconstruction of bilateral scrotum. Even though the blood supply of the left piece of scrotum was not optimal, subcutaneous tissue was still viable. This part (2 × 3 cm) was lifted to left, secured on left pudendal-thigh flap by direct sutures, forming the bottom of scrotum. The scrotum was reconstructed by sliding flaps. Then, the remaining wound, including penis and a small portion of scrotum, was covered by split-thickness skin grafts harvested from the left medial thigh, meshed 1:1 for drainage. Vacuum Sealing Drainage (VSD) was then applied on genitalia under erectile status in case of clinical structure of this area, bilateral pudendal-thigh flaps (2 × 5 cm) based on external pudendal arteries were designed as advancement flaps for the reconstruction of bilateral scrotum. Even though the blood supply of the left piece of scrotum was not optimal, subcutaneous tissue was still viable. This part (2 × 3 cm) was lifted to left, secured on left pudendal-thigh flap by direct sutures, forming the bottom of scrotum. The scrotum was reconstructed by sliding flaps. Then, the remaining wound, including penis and a small portion of scrotum, was covered by split-thickness skin grafts harvested from the left medial thigh, meshed 1:1 for drainage.
of contracture of grafts, hematoma, and infection. Additional VSD dressings were also applied on scrotum for similar reason (Fig. 2).

**POSTOPERATIVE RESULT**

The VSD dressing was taken down 7 days after surgery (Fig. 3). The graft take was close to 100%. There were no signs of infection or hematoma. Part of the flap turned into black, which was foreseen during surgery, as this part of skin was seriously crushed due to the injury. Patient was discharged 2 weeks after surgery with regular controls in out-patient clinic. Three months after surgery, the penoscrotal area was completely healed without any signs of necrosis or infection, and there were still no signs of serious scar contracture. The patient reported that he had returned to pretrauma status and he was satisfied with this result. During this therapeutic process, surgeons did not administrate systematic antibiotics.

**DISCUSSION**

Due to the relative isolation and mobility of genitals, the traumatic injury of penis is pretty rare. Among those that are described, few of them are degloving injuries and none of them are total penoscrotal skin avulsion. To our knowledge, this method for the treatment of total penoscrotal avulsion has never been reported before. Skin of the penile shaft has blood supply delivered by a couple of arteries in the superficial fascia and glans has additional supply from deep dorsal artery and corporal vessels. Because of abundant vascularization of penis, split-thickness skin graft along with antibiotic treatment is advocated by some authors for the reconstruction of penile skin. For total scrotal avulsion, Ahmed and Mbibu suggested testes should be placed in thigh pouches for protection. However, spermatogenesis may be affect-
ed after such procedure as spermatogenesis will be negatively influenced by thickness of skin cover.9 On the other hand, skin graft could result in contracture, restricting the mobility of scrotum and function of penis. Therefore, utilization of grafts and advancement flaps were combined in this case. Additionally, penis was immobilized under erectile condition, which could effectively reduce contracture. Even though a small portion of flap turned into black, which may indicate necrosis. However, this situation had been considered during the surgery. The flap was still used, as the underlying tissues still had enough blood supply. Moreover, VSD was also used for avoiding contracture of graft because of retraction of penis, as it has been proved to be effective for conforming the shape of various anatomical areas.10 In addition, VSD could also reduce the risk of infection and hematoma, facilitate generation of granulation tissue, and promote skin graft take.10,11 All these factors contributed to the satisfaction of the patient regarding both sexual function and esthetic appearance.

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