ABDOMINOPERINEAL DEGLOVING INJURY WITH AMPUTATION OF A TESTIS AND SCROTUM IN A PATIENT WITH FARMING MACHINE TRAUMA

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ABSTRACT Degloving injuries most commonly involve lower limbs and involvement of the abdominoperineal region with genitals is rare. These injuries are commonly sustained during industrial and farming accidents in which a large rotational force avulses the skin and subcutaneous tissue from the underlying fascia. Even though such injuries usually are not lethal but these are associated with morbidities and are devastating to the patients psychologically if not treated properly. Staged reconstruction with flaps or skin grafts or a combination of both is the main modalities described for treating such injuries to get satisfactory aesthetic results with normal voiding function and erection of the penis.

KEYWORDS Degloving, Injury, reconstruction, graft, flap

Introduction

Abdominoperineal injuries occur mainly due to harvesting machines in the agriculture field, industrial machines such as pulleys, chains and rotary discs when they catch the operators clothes and pull out the skin of the genitalia. Some authors have used the term “power take-off injury” (PTO) for this type of injury. To them, these injuries are caused by the transmission of power from one place to another.[1] The mechanism involves the loose penile skin, entrapped by surrounding clothing, getting caught in stationary machinery and then ripped off traumatically [1,2]. Penile rings, vacuum cleaners, or coital trauma are other attributed causes[3]. Usually, such injuries are not life-threatening but are incapacitating and affect the psychological well being of the patient besides being challenging because of the soft tissue loss involved [4]. Restoration of a durable, functional cover of the testes and shape of the scrotum is of paramount importance for physiological, social and psychological reasons, especially in young males. Multiple surgical options have been used for the closure of major scrotal wounds.

Case report

A 42-year-old male was referred to our centre from a primary health centre as a case of farming machine injury involving the abdominoperineal region. While working, he had got his clothes entangled in a harvesting machine while operating it. After ruling out any life-threatening injury and after stabilization of the patient, a clinical assessment of the injury was performed. On examination, the skin of penis, scrotum and lower abdominal wall up to umbilicus was completely torn off, with amputation of left testis involving the spermatic cord and complete exposure of right testis and entire shaft of the penis. The whole scrotum was missing. The spermatic cord only connected the right testis and epididymis. The patient was catheterized. Tetanus prophylaxis and broad-spectrum antibiotics were started. The patient was optimised and prepared for surgery.

The patient was operated in a supine position under general anaesthesia with endotracheal intubation. Debridement of the devitalized tissue followed by jet saline irrigation of the wound was done. Complete haemostasis was achieved. A subcutaneous pouch was created, and the right testis was placed inside the pouch in proper alignment and anchoring sutured applied. The split-thickness skin graft was harvested from the left thigh, the graft meshed (1:2), and the raw area was grafting involving the
Figure 1: Image showing the degloving injury involving lower anterior abdominal wall and perineum.

Figure 2: Image showing placement of the right testis in the subcutaneous pouch created on medial aspect of thigh.

Figure 3: Image showing coverage of the wound with meshed skin graft.

Figure 4: Image showing well taken skin graft on 2nd dressing.

Phallus. The wound in the perineum was closed primarily, and a glove drain was put in. Tie-over non-adherent dressing was done. The Frist dressing was done on 3rd post-operative day, and the drain was removed. Patient discharged after 2nd dressing after removal of the urinary catheter on 6th post-operative day. The graft take was excellent, and there was no hematoma or any signs of infection.

Discussion

Slack in 1952 described the nature of this injury as a form of torsional injury [5]. The mechanism involves large rotational forces such as a spinning tire causing traumatic avulsion of the skin and subcutaneous tissue from underlying musculoskeletal structures. The penis is covered by loose and elastic skin. As the penile skin is highly mobile to accommodate both the rigid and flaccid state of the penis, this loose base predisposes the skin to be torn off easily from the penis. From simple lacerations to virtual emasculations, avulsions vary in the spectrum. [6] However, due to the relative isolation and mobility of the genitals, traumatic injury of the penis is pretty rare.[7] Few of the injuries already described in the literature are degloving injuries, and none of them are total penoscrotal skin avulsions. The skin of the penile shaft has blood supply delivered by a couple of arteries in the superficial fascia, and glans has the additional supply from the deep dorsal artery and corporal vessels.[8] Because of abundant vascularization of the penis, split-thickness skin graft and antibiotic treatment are advocated by some authors for the reconstruction of the penile skin. Some authors suggested that testes should be placed in thigh pouches for protection [9]. However, spermatogenesis may be affected after such a procedure as spermatogenesis will be negatively influenced by the thickness of the skin cover.[10] In our case, the patient was married with three children and had completed his family. On the other hand, a skin graft could result in contracture, restricting the mobility of the scrotum and function of the penis. However, we grafted the penis in an erectile position to feed maximum skin graft and immobilized it under erectile conditions, which could effectively reduce contracture. No standard approach is used to treat soft tissue injuries to the penis mechanism of injury is quite varied. Individualised approaches should be used for each patient tailored according to the soft tissue loss and the reconstruction options available.
Conclusion
Invariably these injuries are seen in people who are wearing loose clothing over the lower half while operating machines; therefore, public awareness and ensuring strict adherence to workplace safety regulations will prevent these machine injuries to a great extent. Besides, all possible techniques of the reconstruction should be known to the surgeon to achieve optimal recovery.

Funding
This work did not receive any grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of Interest
There are no conflicts of interest to declare by any of the authors of this study.

References
1. Brown J.B., Fryer M.P. Peno-scrotal skin losses, repaired by implantation and free skin grafting: report of known normal offspring (preliminary report on total and deep losses) Ann. Surg. 1957;145(5):656–664.
2. Morey A.F. Consensus on genitourinary trauma: external genitalia. BJU Int. 2004;94(4):507–515.
3. Finical S.J., Arnold P.G. Care of the degloved penis and scrotum: a 25-year experience. Plast. Reconstr. Surg. 1999;104(7):2074–2078.
4. Finical SJ, Arnold PG. Care of the degloved penis and scrotum: a 25-year experience. Plast Reconstr Surg. 1999;104:2074.
5. Slack CC. Friction injuries following road accidents. Br Med J. 1952; 2: 262-264.
6. Gencosmanoglu R, Bilkay U, Alper M, Gurler T, Cagdas A. Late results of split-grafted penoscrotal avulsion injuries. J Trauma 1995;39:1201-3.
7. Shetty BSK, Rao PJ, Menezes RG. Traumatic degloving lesion of male external genitalia. J Forensic Legal Med. 2008;15:535.
8. Grossman JA, Caldamone A, Khouri R, et al. Cutaneous blood supply of the penis. Plast Reconstr Surg. 1989;83:213.
9. Aineskog H, Huss F. A case report of a complete degloving injury of the penile skin. In9. Wang DL, Wang YM, Zheng H, et al. [An experiment study and clinical observation of the testicle spermatogenesis after scrotum reconstruction]. Zhonghua Zheng Xing Wai Ke Za Zhi. 2004;20:203.
10. Wang DL, Wang YM, Zheng H, et al. [An experiment study and clinical observation of the testicle spermatogenesis after scrotum reconstruction]. Zhonghua Zheng Xing Wai Ke Za Zhi. 2004;20:203.