Degloving injuries are high-power injuries in which the skin is torn off from the underlying tissue, severing its blood supply. Road traffic accidents cause most degloving injuries. Industrial and agricultural accidents are other causes of degloving injuries, which mostly involve the upper and lower limbs. Penile and scrotal degloving injuries are rare. Most reported penile avulsion injuries are caused by farm equipment. Such injuries are called “power take-off injuries,” defined as injuries caused by power transmitted from one object to another. Penile injuries can be extremely disturbing to the physical and mental state of the patient, if not managed properly. We present the case of a 26-year-old man with traumatic degloving of penile and scrotal skin and exposed spongy body, cavernous bodies, and testicles caused by an accident on a farm tractor. The patient was presented to our emergency department 14 hours after his pants getting caught in the rotating driveshaft, which subsequently pulled him at the groin level, whereby the machine grasped the redundant skin of the penis and scrotum. The patient underwent single-stage surgical reconstruction using split-thickness skin graft 48 hours within initial presentation. Postoperative period was uneventful. He was discharged 6 days after operation. At the 8-week follow-up visit, he showed a satisfactory cosmetic outcome, well-healed scrotal and penile grafts, reestablished sexual function, and normal voiding. (Plast Reconstr Surg Glob Open 2020;8:e3024; doi: 10.1097/GOX.0000000000003024; Published online 14 August 2020.)

CASE STUDY

Case Presentation

A 26-year-old farmer presented to the emergency department approximately 14 hours after sustaining a penoscrotal degloving injury. The patient reportedly was trapped by a rotary link at the back of his tractor while performing his routine work at a farm outside Riyadh. He recalls his pants getting caught in the rotating driveshaft, which subsequently pulled him at the groin level, whereby the machine grasped the redundant skin of the penis and scrotum. Examination showed circumferential avulsion of the penile skin extending up to the coronal sulcus while leaving the glans. From above, the avulsion extended from just above the pubic symphysis downward to involve all the scrotal skin up to the perineum (Fig. 1).

The patient provided written informed consent for the use of photographs and to publish this article. Our institution does not require ethical approval for reporting case reports.

Surgical Management

The patient was taken to the operating theater for a 1-step reconstructive procedure 48 hours within his initial presentation.
presentation. Under general anesthesia, devitalized tissue and the skin edges were excised (Fig. 2).

Two split-thickness skin grafts (STSG) were harvested from the right thigh, with one remaining unmeshed while the other was meshed 1:1. To cover the penile shaft skin defect, an unmeshed sheet graft was sutured around the penile shaft, and Vicryl 3/0 (Ethicon, Inc., Somerville, N.J.) was used to suture the graft along the base of the penile shaft and to the subcoronal tissue, while a meshed split thickness skin graft was used to cover the skin defect of the scrotum with Vicryl 3/0 sutures. Framycetin sulfate gauze and tie-over dressing were applied, and a sponge kept the penile shaft erect for optimal take of the graft.

**Postoperative Management**

The patient was clinically and vitally stable and afebrile. Approximately 3 days after the operation, the dressing was changed under general anesthesia (Fig. 3). Next dressing was in the ward under adequate analgesia 5 days after the operation.

The patient was discharged 6 days after his operation, and he was placed on 625 mg oral amoxicillin/clavulanic acid 3 times a day for 5 days. After the Foley catheter was removed, the patient successfully passed urine.

At the 8-week follow-up visit, examination showed that the scrotal and penile grafts healed well, with no signs of infection and no scar contracture related to STSG (Fig. 4).

**DISCUSSION**

Encountering penoscrotal degloving injuries is unusual in clinical practice, and data published on these injuries are lacking. These injuries are not particularly life-threatening; however, they have been reported to inflict significant psychological sequelae. Thus, they present the need for the restoration of form and function. Furthermore, the mechanism typically associated with
these injuries is a power take-off incident, first described by Brown et al., making farmers and industrial workers particularly prone to this injury because of the machinery they handle. The success of reconstruction using a split-thickness skin graft along with the administration of prophylactic antibiotics is largely attributed to the abundant vascularity of penile tissue. The split-thickness skin graft used to cover the penile shaft was an unmeshed plane sheet, while that used to cover the scrotum was meshed 1:1. Ahmed and Mbibu suggested burying the testes in the thigh for protection. However, this method poses a threat to spermatogenesis. A meshed graft has the advantage of reducing graft failure because it inherently provides an outflow path for any discharge that may form. A sponge immobilized the penile shaft in the erect position, as described by Li et al. This helped reduce contracture formation and enhanced the success of the graft. Another method has been previously mentioned in the literature by Fang et al.; they managed a similar case of a massive traumatic penile and scrotal skin avulsion by combining split-thickness skin graft and dermal regeneration template with negative pressure wound therapy, which resulted in a satisfying outcome. In this report, the use of a split-thickness skin graft to cover the skin defects of traumatic penoscrotal degloving injuries demonstrated promising results cosmetically and functionally. Furthermore, the meshed graft used for the scrotal defect allowed the graft to take and provided adequate functionality. The unmeshed split-thickness skin graft used to cover the penile defect led to a more desirable cosmetic result. Therefore, we recommend the surgical management of traumatic penoscrotal injuries presented here; however, further research is needed to assess any potential unforeseen long-term complications, as well as the need for future clinical studies to use the valid and reliable visual analog scale in assessing the management outcome in using split-thickness skin graft to cover the skin defects of traumatic penoscrotal degloving injuries.

**SUMMARY**

Penoscrotal degloving injuries are rare. Proper safety measures and awareness are needed while working with industrial and agricultural machinery. Penile and scrotal skin form an integumental unit, which can be pulled in a power-takeoff incident, resulting in degloving injuries.

**PATIENT CONSENT**

The patient provided written consent for the use of his image.

**REFERENCES**

1. Krishnamoorthy R, Karthikeyan G. Degloving injuries of the hand. *Indian J Plast Surg.* 2011;44:227–236.
2. Gencosmanoğlu R, Bilkay U, Alper M, et al. Late results of split-grafted penoscrotal avulsion injuries. *J Trauma.* 1995;39:1201–1203.
3. Selikowitz SM. Penetrating high-velocity genitourinary injuries. Part I. Statistics mechanisms, and renal wounds. *Urolgy.* 1977;9:371–376.
4. Finical SJ, Arnold PG. Care of the degloved penis and scrotum: a 25-year experience. *Plast Reconstr Surg.* 1999;104:2074–2078.
5. Lumen N, Kuchhas FE, Djakovic N, et al. Review of the current management of lower urinary tract injuries by the EAU trauma guidelines panel. *Eur Urol.* 2015;67:925–929.
6. Morey AF, Metro MJ, Carney KJ, et al. Consensus on genitourinary trauma: external genitalia. *BJU Int.* 2004;94:507–515.
7. Brown JB, Fryer MP. Peno-scrotal skin losses, repaired by implantation and free skin grafting: report of known normal off-spring (preliminary report on total and deep losses). *Ann Surg.* 1957;145:656–664.
8. Ahmed A, Mbibu NH. Aetiology and management of injuries to male external genitalia in Nigeria. *Injury.* 2008;39:128–133.
9. Wang DL, Wang YM, Zheng H, et al. [An experiment study and clinical observation of the testicle spermatogenesis after scrotum reconstruction]. *Zhonghua Zhong Xing Wai Ke Za Zhi.* 2004;20:203–205.
10. Fang JJ, Li PF, Wu JJ, et al. Reconstruction of massive skin avulsion of the scrotum and penis by combined application of dermal regeneration template (Pelnac) and split-thickness skin graft with vacuum-assisted closure: a case report. *World J Clin Cases.* 2019;7:4349–4354.