

Scrotal Fasciocutaneous Flap for the Reconstruction of the Pubic Region After a High-voltage Electrical Burn

Yüksek Voltajlı Elektrik Yanığı Sonrasında Pubik Bölgenin Skrotal Fasyokutanöz Flep İle Rekonstrüksiyonu

Zeynep Altuntaş¹, İlker Uyar¹, Mehmet Dadacı¹, Bilsev İnce¹, Nurten Yavuz², A. Özlem Gündeşlioğlu¹

¹Department of Plastic, Reconstructive and Aesthetic Surgery, Necmettin Erbakan University, School of Medicine, Konya, Turkey

²Clinic of Plastic, Reconstructive and Aesthetic Surgery, Konya Training and Research Hospital, Konya, Turkey

Dear Editor,

Although the treatment of extremity injuries due to high-voltage electrical trauma has been well managed, the treatment of genital and perineal lesions contains some differences. These cases are very rare in the literature, and treatment requires a multidisciplinary approach, including plastic surgery and urologic and andrologic teams. Appropriate debridement, temporary wound coverage, and final adequate soft-tissue reconstruction management of genital and perineal lesions still remain controversial and challenging.¹

A 35-year-old male patient was consulted for the reconstruction of pubic and suprapubic open wounds due to a high-voltage electrical burn. On obtaining his history, the patient presented with full-thickness burns of the left arm, penis, and scrotum. On acute treatment, after cardiac and renal function resuscitation therapy, a transurethral catheter and suprapubic cystostomy were placed by the urologists; peripheral vascularization of the upper left limb was obtained by escharotomy serial debridement of burned areas was performed by preserving any tissues of questionable viability. However, his left arm was amputated at the glenohumeral level by the orthopedic team, and his penis was completely amputated due to necrosis. Both the spermatic cord and testicle appeared nonviable as bilateral orchiectomy and ureter ligation were performed by the urological team, leaving only the lower skin of the scrotum.

On his physical examination, there was a defect located on the symphysis pubis with the exposed bone and suprapubic region (Figure 1). The urine output had been provided by suprapubic catheterization, and there was contracted scrotal skin. He was consulted by urology, and in his pelvic magnetic resonance (MR) examination, the bladder, neck, and prostatic urethra were found to be intact. The neourethra was planned to be exteriorized to the skin endoscopically by the urological team, following skin defect closure.

During surgery, the contracted scrotal skin was prepared as a scrotal fasciocutaneous flap to close the exposed bone defect, while the upper part of the defect was reconstructed with the split thickness skin graft. The flap was prepared like a fillet flap, and the longitudinal incisions were made through the fascia to increase the length of the flap, so the flap could be sutured over the exposed bone without tension. Later, the upper part of the defect was closed with a split-thickness skin graft taken from the lateral thigh (Figure 2). No flap complication was seen. Partial loss of the graft that recovered secondary was seen due to urine leakage (Figure 3).

After closing the defect, the location of the urethra was found and exteriorized to the skin by endoscopically entering from the suprapubic catheter. Intermittent catheterization was applied to empty the urine. In the next step, neourethral and penile reconstruction were planned.

The reconstruction of a total penile amputation is very challenging as there are various reconstructive techniques have been described. It should be kept in mind that serial and conservative surgical debridement protecting the tissues suspected to be alive is the main initial treatment. Early soft tissue coverage of the lesions using autografts, biologic dressings, local flaps, and/or free flaps is recommended.² A vertical rectus abdominis flap is able to fill the pelvis and replace large defects of the perineal skin. Gracilis myocutaneous flaps could be an option in cases where the anterior abdomen is an unsuitable donor area. Posterior thigh flaps are particularly useful in patients who have undergone fecal and urinary diversion.³ In our patient, a vertical rectus abdominis flap, which is a good option for



Figure 1. Preoperative view



Figure 2. Peroperative view



Figure 3. Postoperative view

the closure of this defect, was not particularly preferred, and it was particularly protected as a safe and good local flap option for the future reconstruction of the penis.

Various techniques have been used for penile reconstruction such as pedicled flap including the superficial inferior epigastric skin flap, extended groin skin flap, rectus abdominis myocutaneous flap, tensor fascia lata myocutaneous flap, anterolateral thigh flap, and microsurgical free flaps, including the radial forearm flap, ulnar forearm flap, fibula flap, and parascapular flap.⁴

The reconstruction of neourethra with the penis is also challenging. A neourethra may be preconstructed by the burial of a full-thickness skin graft in the flap to be used for reconstruction at a later stage. The main stay of urethral reconstruction is flap or full-thickness skin graft, buccal, mucosal graft, or partially thick graft.⁵

During our consultation, a simple method was thought to close the pubic and suprapubic defects with contracted scro-

tal flap and split-thickness skin graft, respectively. In this way, the early closure of defects could be easily done by protecting the patient's abdomen, bilateral inguinal areas, and medial thighs were as a source of flap options for later penile reconstruction. In this patient, using a scrotal fasciocutaneous flap would provide a simple and effective early coverage.

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REFERENCES

1. Tiengo C, Castagnetti M, Garolla A, Rigamonti W, Foresta C, Azzena B. High-voltage electrical burn of the genitalia, perineum, and upper extremities: the importance of a multidisciplinary approach. *J Burn Care Res* 2011; 32(6): e168-71.
2. Landecker A, Macieira L. Penile and upper extremity amputation following high-voltage electrical trauma: case report. *Review. Burns* 2002; 28(8): 806-10. [CrossRef]
3. Hurwitz DJ, Swartz WM, Mathes SJ. The gluteal thigh flap: a reliable, sensate flap for the closure of buttock and perineal wounds. *Plast Reconstr Surg* 1981; 68(4): 521-3. [CrossRef]
4. Hage JJ, Bloem JJ, Suliman HM. Review of the literature on techniques for phalloplasty with emphasis on the applicability in female-to-male transsexuals. *J Urol* 1993; 150(4): 1093-8.
5. Hage JJ, De Graaf FH. Addressing the ideal requirements by free flap phalloplasty: some reflections on refinements of technique. *Microsurgery* 1993; 14(9): 592-8. [CrossRef]

Correspondence Author/Sorumlu Yazar: Zeynep Altuntaş, MD

E-mail/E-posta: zeynepkaracor@yahoo.com

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