

## Original Article

# The Versatility of the Medial Thigh Flap for Coverage of Large Perineoscrotal Defects

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## ABSTRACT

**Objective:** To study the versatility, aesthetic and functional outcome of medial thigh flap for coverage of large perineoscrotal defects

**Design:** Prospective

**Setting:** Al-Babtain Center for Burns and Plastic Surgery (State Government Institute)

**Subjects:** Seven patients with Fournier's gangrene seen between July 2005 and October 2006 at Al-Babtain Center for Burns and Plastic Surgery

**Intervention:** Reconstructive surgery for coverage of scrotal and perineal defects after debridement of Fournier's gangrene. Nine medial thigh fasciocutaneous flaps were performed under general anesthesia.

**Main Outcome Measures:** General aesthetic and functional results in the form of the range of motion of both hip joints.

**Results:** All flaps survived well with good aesthetic and functional results, with the exception of partial distal necrosis in two cases. This was managed conservatively in one case, while the other case needed debridement and minimal advancement of the flap.

**Conclusion:** The medial thigh fasciocutaneous flap offers a good option for coverage of perineoscrotal defects. The flap provided a single stage, stable, well vascularized soft tissue coverage in our patients with no significant complications.

KEY WORDS: fasciocutaneous flap, Fournier's disease, medial thigh

## INTRODUCTION

Perineoscrotal (Fournier's) gangrene is a rare potentially fatal clinical entity<sup>[1]</sup>. It is characterized by progressive spread of necrosis in the skin and subcutaneous tissue combined with severe systemic infection<sup>[2]</sup>. Following aggressive surgical debridement, major scrotal and perineal defects with exposed testes are a challenge for reconstructive surgeons<sup>[3,4]</sup>. Numerous techniques have been described for reconstruction of these defects including split thickness skin grafts<sup>[5,6]</sup>, muscle flaps (e.g., Gracilis flap<sup>[7,8]</sup>) and fasciocutaneous flaps (e.g., pudendal flap<sup>[9,10]</sup>, perineal flap<sup>[11]</sup> and anterolateral thigh flap<sup>[12]</sup>). This study presents the author's experience of using the medial thigh flap for coverage of scrotal and perineal defects after debridement of Fournier's gangrene.

## PATIENTS AND METHODS

Between July 2005 and October 2006 at Al-Babtain Center for Burns and Plastic Surgery medial thigh flap was performed in seven male adult patients.

Their mean age was 42 (range 33 - 52 years). All patients presented with soft tissue defects of the scrotal and perineal areas after extensive multiple debridement sessions for Fournier's gangrene. Broad spectrum systemic antibiotics were given and continued for five days postoperatively. Nine medial thigh fasciocutaneous flaps were performed (five unilateral and two bilateral). Patients were followed for 3 -18 months postoperatively.

**Anatomical basis of the flap:** The medial thigh flap located along the medial aspect of the thigh, is based on a septocutaneous branch of the femoral artery at the apex of the femoral triangle. The axis of the flap extends from the apex of the femoral triangle toward the medial femoral condyle. The skin territory of the flap extends from the inferior aspect of the femoral triangle to the junction of the middle and distal thirds of the medial thigh. The lateral borders of the flap are located between the lateral edge of the adductor longus and the medial edge of the rectus femoris muscle.

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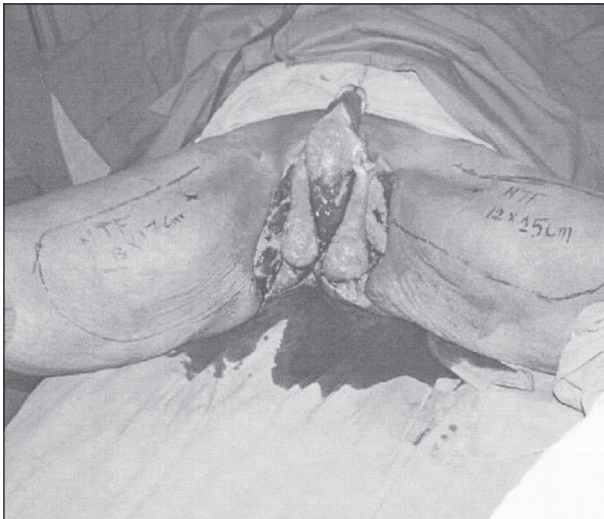
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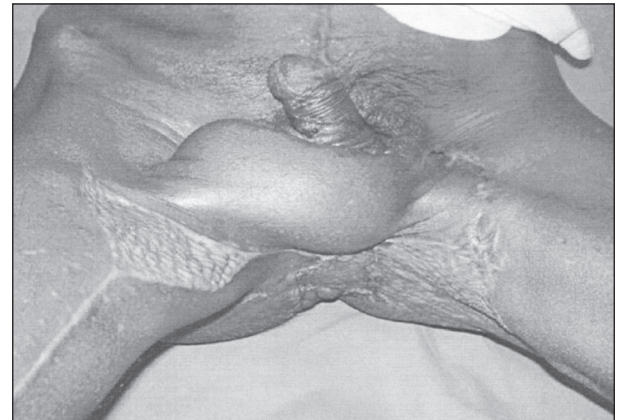
**Fig. 1:** A 37 year old male patient known to have uncontrolled diabetes, developed Fournier's gangrene. The area involved was the base of the penis, scrotum, perineum, medial aspect of the upper left thigh.



**Fig. 2:** Four weeks postoperatively showing the result of reconstructing the defect with a right medial thigh flap measuring 11 X 25 cm. The perineum, gluteal area, thigh and the donor site were grafted with a meshed split thickness graft.



**Fig. 4:** Eight weeks postoperatively, showing the inset of the flap with a good functional and aesthetic result



**Fig. 3:** A 48 year old male diabetic patient developed Fournier's gangrene after post-traumatic laceration of the scrotum. Extensive debridement was performed which resulted in a large raw area involving the scrotum, proximal penis and parts of the medial aspect of both upper thighs. Bilateral medial thigh flaps were mobilized measuring 13 X 17 cm (right) and 12 X 25 (left).

**Surgical technique:** All patients (Figs. 1 - 4) were done under general anesthesia with orotracheal intubation in lithotomy position. As previously described in the literature<sup>[13,14]</sup>, the axis of the flap was drawn as a line from the pubic tubercle to the medial femoral condyle. The base of the flap was designed to be over the femoral triangle. The dominant pedicle was located at the apex of the femoral triangle 6 - 8 cm below the inguinal ligament and the exact site was detected preoperatively by Doppler examination. The width of the flap was 7 - 10 cm according to the redundancy of the skin, while the length was 17 - 25 cm tapered distally to facilitate direct closure of the donor site. Elevation of the flap in a subfascial bloodless plane started from distal to proximal until few centimeters distal to the pedicle. This was followed by careful dissection of the pedicle and rotation of the flap as a hammock to cover the

testicles and the perineal area creating a scrotum with a tension free inset. Direct closure of the donor site with suction drain was done in all cases. A scrotal support was used postoperatively until dependent edema subsided. Patients were allowed to move out of their beds two weeks postoperatively to start gradual physiotherapy.

**RESULTS**

All flaps survived well, with the exception of partial distal necrosis in two cases. This was managed conservatively in one case, while the other case needed debridement and minimal advancement of the flap. Infection of the donor site suture line occurred in one case which was managed by frequent dressing.

**DISCUSSION**

Scrotal reconstruction after Fournier's gangrene remains a major challenge. Reconstruction of the

scrotum is important for functional, cosmetic and psychological reasons<sup>[12]</sup>. The ideal reconstructive approach would seem to incorporate the following flap features: a single stage procedure, excellent flap reliability, sensate flaps with a potential for normal function, minimal donor-site morbidity and simplicity<sup>[15,16]</sup>. Although simple split skin grafts could provide an adequate coverage and a very good aesthetic result, the highly vascular nature of these flaps is necessary because of the avascular and / or infection nature of these wounds. In addition, thicker soft tissue coverage of the testes would provide a better protective cushion. The medial thigh flap is a reliable fasciocutaneous flap which can be done in a reasonably short operative time (around 20-30 minutes for flap elevation). The donor scar is hidden in the medial aspect of the thigh. We have transposed the flap medially and used it to cover scrotal, penile, perineal and proximal thigh defects. The exact limitations on width and length of the flap are unknown, but the rich suprafascial plexus in this area allows safe elevation of flaps with a 3:1 length-to-width ratio<sup>[17]</sup>. Our largest flap measured approximately 10 cm X 25 cm. Wang *et al*<sup>[18]</sup> have described the vascular supply and innervation of the medial thigh fasciocutaneous flap. Hallock<sup>[13]</sup> reported the same flap for scrotal reconstruction following Fournier's gangrene. Although gracilis musculocutaneous flap share the same cutaneous territory and the donor site defect, medial thigh fasciocutaneous flap has the advantage of being easier and faster to raise, less bulky, easier to transpose and provides thin pliable skin<sup>[19]</sup>. In addition, elevating the medial thigh flap does not preclude the use of a Gracilis muscle flap, which may be raised on its own vascular pedicle at the same or later procedure<sup>[18]</sup>. We considered previous surgery (*e.g.*, femoral hernia repair and radical lymphadenectomy) or significant trauma to the groin as a relative contraindication to use the medial thigh flap. In such cases preoperative doppler study would be a must to evaluate and locate the septocutaneous branch supplying the flap if still present. Other pedicled thigh fasciocutaneous flaps have been described, though they appear less versatile than the medial thigh flap as the laterally based superomedial thigh flap, which is raised on the proximal medial thigh<sup>[20]</sup>. Hayashi and Maruyama<sup>[21]</sup> have used an anteromedial thigh fasciocutaneous flap for reconstruction of the groin and lower abdominal wall. Song *et al*<sup>[22]</sup> have previously described its use as a free flap for reconstruction of the neck and forearm and Yu *et al*<sup>[12]</sup> used the anterolateral thigh fasciocutaneous island flap in perineoscrotal reconstruction. This is more difficult to dissect, more bulky and it is far from the defect.

There are some drawbacks in our study. The comparison between the sperm count before and after surgery would be of a great importance to define the functional results of our flap. In addition, a larger population size was needed to study indications, contraindications and the range of different possible complications.

## CONCLUSION

The medial thigh fasciocutaneous flap offers a good option for perineoscrotal defects. The flap provided a single stage, stable, well vascularized soft tissue coverage in our patients with no significant complications.

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