



Scrotal Reconstruction with Bilateral Superomedial Perforator Fasciocutaneous Thigh Flap

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Abstract

Objective: To describe using the Superomedial Fasciocutaneous Thigh Flap (SMFCTF) for scrotal reconstruction secondary to Fournier's gangrene.

Methods: It is a retrospective analysis of patients underwent scrotal reconstruction with SMFCTF, as a surgical management of Fournier's gangrene in the period between 2018 and 2020, at our university hospital.

Results: In the current series, eleven patients were included with a mean age 53.7 years (36 to 74). The skin loss estimation at the scrotal region ranged from 75% to 100%. The definitive reconstruction was performed on average 37.1 days (27 to 51) after the initial debridement. The reconstruction mean surgical time was 83 min (60 to 100). The reconstruction for 10 cases in our study was performed as one stage procedure. In the current study, complications were observed in three cases (27.3%). The wound dehiscence was recorded in two cases. Also, we faced one area of epitheliolysis which corrected medically. The total length hospital stay after reconstruction was 8.2 days (3 to 20).

Conclusion: We can conclude that the use of SMFCTF is a versatile and reliable option for the reconstruction of scrotal and perineal defects post Fournier's gangrene, showing good functional and esthetic outcomes. The midline suturing of the two flaps leading to better aesthetic view which mimic to normal raphe of the scrotum.

Keywords: Scrotal reconstruction; Superomedial fasciocutaneous thigh flap

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Introduction

Perineal necrotizing fasciitis was first described in 1883; it is also called Fournier's gangrene with high morbidity and mortality rates [1]. Surgical drainage and extensive debridement are the main treatment with broad-spectrum intravenous antibiotic therapy and volume replacement [2]. The etiology may be related to urological, dermatological and colorectal diseases or surgical procedures such as complications of orchiectomy, hemorrhoidectomy, vasectomy, herniorrhaphy and proctectomy [3]. The literature data reported that, 20% to 60% of these patients are associated with Diabetes Mellitus (DM) [4].

The systematic review of Eke, 2000, reported that the dermatological infections were the most frequent ones followed by anorectal and urological cases (24, 21 and 19%, respectively) [3]. The role of reconstructive surgery is to maintain the physiological and esthetic characteristics, as much as possible. The natural ptosis of the scrotum and maintaining the thermoregulation of the testicles could be obtained by reconstruction with adequate skin and subcutaneous thickness, resistant to traction and movements with a little donor site morbidity [5,6].

The technique of the reconstruction usually based on multiple factors, such as the site and size of the defect with the availability of the donor site. There are multiple described techniques with no one can be considered ideal or even applicable to all cases [5]. The aim of our study, describe using the Superomedial Fasciocutaneous Thigh Flap (SMFCTF) for scrotal reconstruction secondary to Fournier's gangrene.

Methods

The current study is a retrospective analysis of patients underwent scrotal reconstruction with SMFCTF, as a surgical management of Fournier's gangrene in the period between 2018 and 2020, at our university hospital.

The mean age, etiology, associated penile involvement and presence of comorbidities were

analyzed. The number of surgical debridements and the time of reconstruction were evaluated. The scrotal skin loss percentage was relatively calculated. We were analyzed the flap dimensions and complications with the length of the hospital stay as well.

The procedures were performed in the lithotomy position. The outline of the flap was marked, it is roughly rectangular adjacent to the defect on the upper medial thigh, its anterior pedicle overlies the adductor longus muscle. The width of the flap should be more or less equal to the height of the defect.

The incision is carried as an arc from the inferolateral border of the defect along the lower edge of the thigh as the inferior border of the flap, up to 10 cm × 12 cm as pedicle can be transferred on each thigh.

Surgical technique

The superior medial thigh perforator flap based on perforators from deep external pudendal artery “DEPA” located at the groin crease, between the scrotum medially and the medial thigh laterally reaching posteriorly to the perineum. The DEPA originates from the femoral artery and crosses from deep to superficial reaching the subcutaneous layer. During the course of the artery it passes through the adductor longus muscle and giving off both abdominal and perineal branches at 4 cm to 6cm from the pubic symphysis.

The preparation of the recipient site started by positioning the patients in lithotomy position. General or regional anesthesia's (spinal or epidural) were used. Immediate pre-operative broad spectrum antibiotic was administered, fibrotic scars and excessive granulation tissue was excised followed by caudal dissection of the spermatic cord and the testacies reaching their anatomical position.

The reconstruction stage started by marking of the flap in a hatchet design with base: length ratio is about 2:1. The incision was made all-around the flap borders, dissection in the sub fascial plane from lateral to medial and caudal to cranial direction deep to the epimysium of the adductors and deep fascia of the pudendal region with very meticulous care during dissection while approaching near the origin of adductor and gracilis muscles nearly about 4 cm to 6 cm caudal to pubic symphysis preserving the maximum perforating vessels at the base of the flap.

The flap transposition 90° with sutures are made between the two flaps to the midline at the base of the penis and the perineum to simulate a saclike form of the scrotum with a scar in the midline of the sac like a scrotal and perineal raphe. The donor sites are primary closed in all patients with using a suction drain. Early mobilization is encouraged with using postoperative antibiotic and an analgesic, no



Figure 2: Immediate post-operative, both flaps were sutured in the midline and the donor site was closed primarily.

anticoagulation was needed in our cases (Figure 1, 2).

Results

In the current series we were assessed eleven patients with a mean age 53.7 years (36 to 74). Diabetes Mellitus (DM) was the most frequent comorbidity (6 patients, 54.5%). The etiology was identified in 7 cases (63.6%), anorectal abscess in 3 patients and skin infections were in the other 4 patients. The penile skin was involved in 8 cases (72.7%).

In our study, the skin loss estimation at the scrotal region ranged from 75% to 100%. The surgical debridement was the initial stage of our surgical management, it was a mean of 1.91 per patient, and it was one procedure in 8 cases and two in the other 3 patients. The definitive reconstruction was performed on average 37.1 days (27 to 51) after the initial debridement. The reconstruction mean surgical time was 83 min (60 to 100). The flap size range was 8 cm to 11 cm in the cross-sectional direction and from 10 cm to 14 cm in the longitudinal direction; it was bilateral in all cases.

The reconstruction for 10 cases in our study was performed as one stage procedure; we had one patient complicated by dehiscence which managed surgically. There was no penile skin graft needed in all our patients. The midline suturing of the two flaps leading to better aesthetic view which mimic to normal raphe of the scrotum (Figures 3-5).

In the current study, complications were observed in three cases (27.3%). The wound dehiscence was recorded in two cases, one of them was segmental (3 cm) and corrected medically. However, the other one underwent a second surgical interference (Figure 6). Also,



Figure 1: Pre-operative, bilateral defect of the scrotum.



Figure 3: Immediate post-operative.



Figure 4: One month postoperative.



Figure 5: Three months postoperative.



Figure 6: Complicated patient with complete dehiscence.

we faced one area of epitheliolysis which corrected medically. The total length hospital stay after reconstruction was 8.2 days (3 to 20).

Discussion

Fournier's in 1883 described male idiopathic severe genital gangrene and Wilson in 1952 explained it as necrotizing fasciitis [7].

The importance of good debridement and wound care cannot be overestimated for reconstruction. We use negative pressure wound therapy as an option in wound preparation after complete debridement of all devitalized tissues [8].

In literature reports show that to reconstruct scrotal defects of 50% or less simple surgical techniques such as secondary wound healing, or primary closure can be used. In these smaller losses, myocutaneous advancement flaps of the residual scrotum or primary suture are usually recommended [9]. For scrotal defects >50%, the indication should be for skin grafting or locoregional or even distant flaps [5]. Franco et al. [10] describe the use of locoregional flaps for

losses >2/3.

The use of SMFCTF was first described by Hirshowitz et al. [11] in 1980. The vascular supply from branches of the external pudendal artery, anterior branch of the obturator artery and branches of the medial femoral circumflex artery were described.

Perforator flaps are an excellent tool in scrotal reconstruction, including the thigh fasciocutaneous flaps as: Medial, superior and lateral, superomedial and anterolateral thigh flap. These flaps are technically not demanding with minimal donor site morbidity [12].

As in our study all the patients was having more than 75% scrotal defects plus perineal and penile defects we emphasize the need for bilateral flaps based on some aspects: Smaller flaps can be used, with easier and simpler closure of the donor areas, as well as the creation of a median raphe.

The advantages of SMFCTF are: (1) The thickness of the skin and subcutaneous tissue can be considered suitable. (2) Single stage reconstruction for the scrotal defects without changing the patient's position intraoperatively. (3) Donor site morbidity is limited. (4) The flap is technically simple, rarely shows ischemia, and provides excellent esthetic results [13].

As a disadvantage, the limitation of the cross-sectional diameter and the skin elasticity of the medial thigh region can be considered. Maguina et al. [14] also consider the potential technical difficulty in obese patients due to the thickness of the subcutaneous tissue.

Conclusion

We can conclude that the use of SMFCTF is a versatile and reliable option for the reconstruction of scrotal and perineal defects post Fournier's gangrene, showing good functional and esthetic outcomes. The flap is not time consuming nor technically difficult, and does not result in significant morbidity in the donor area. The midline suturing of the two flaps leading to better aesthetic view which mimic to normal raphe of the scrotum.

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