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SCROTAL RECONSTRUCTION WITH A PEDICLED GRACILIS MUSCLE FLAP AFTER DEBRIDEMENT OF FOURNIER'S GANGRENE: A CASE REPORT

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SUMMARY

As part of surgical management of Fournier's gangrene, multiple and extensive debridement of necrotic tissue is done which results in significant loss of scrotal skin and exposure of testes. This necessitates reconstruction of a neoscrotum to cover of the testes. Several scrotal reconstructive options are available including split thickness skin grafts, scrotal advancement flaps, local fasciocutaneous, muscle or myocutaneous flaps, and free tissue transfer. We report a case of a 34 year old African male who presented as a referral from a district hospital with a scrotal defect and exposed testes following extensive debridement of Fournier's gangrene. Scrotal reconstruction with a pedicled gracilis muscle flap was done. The pedicled gracilis muscle flap is close to the scrotal area and is ideal for coverage of large scrotal defects with deep pockets. It is well vascularised thereby providing greater resistance to infection, a good bed for skin grafting yet eliminating the risks associated with potentially non reliable skin paddle in the myocutaneous flap.

INTRODUCTION

Most scrotal defects are related to either trauma or infection particularly Fournier's gangrene (1). Fournier's gangrene is a polymicrobial, acute, rapidly spreading soft tissue necrotizing fasciitis of perineal, perianal and genital areas. It is more common in men but can occur in women. Although not limited to the scrotal region, Fournier's gangrene is an aggressive soft tissue infection that can lead to significant loss of skin and subcutaneous tissue in the scrotum and perineum. In its management, often multiple debridement are necessary to ensure that all nonviable tissue is removed and a granulation bed suitable for coverage is achieved (2). This results in varying scrotal skin defects even with exposure of testes. Reconstruction aims to create an aesthetically acceptable neoscrotum, provide good soft tissue cover for the testes and is important for psychological and social rehabilitation of the sexually active male (1, 3). We describe a case where scrotal reconstruction with a pedicled unilateral gracilis muscle flap was performed to meet all these functional and aesthetic goals.

CASE PRESENTATION

A 34 year old male patient, HIV seronegative, with no known chronic illnesses presented to the plastic department of our hospital as a referral from a district hospital with a scrotal defect and exposed testes following extensive debridement for management of Fournier's gangrene. Examination at the time

of presentation revealed a scrotal defect of size 10cmx10cmx15cm with 80% scrotal skin loss, exposed viable testes covered with good granulation tissue and a serous discharge. The phallus and the rest of perineum appeared normal. (Figure 1)

Figure 1

Scrotal defect after debridement for Fournier's gangrene with 80% scrotal skin loss, exposed testes covered with granulation tissue. Skin incision to harvest gracilis muscle was made 2-3 cm medial to a straight line drawn from the pubis to the medial femoral condyle



Various methods of scrotal reconstruction were discussed with the patient and the option of a unilateral pedicled gracilis flap with split thickness graft was chosen.

Baseline investigations were done preoperative. Full hemogram showed a neutrophilia of 72%, other parameters were within normal ranges. Random blood sugar result was normal. Culture and sensitivity done on a pus swab from the wound showed staphylococcus aureus sensitive to ciprofloxacin.

Intra-operative, debridement of wound until brisk bleeding was done. A gracilis muscle flap was raised from the right side using the standard technique and proximally based on the dominant pedicle- the ascending branch of the medial circumflex femoral artery. The flap was transposed medially and inset to cover the exposed testes and defect using bolster stitches. A meshed split thickness graft harvested from the right anterior thigh was then applied over the reconstructed scrotal sac and quilted with absorbable sutures. The donor site for the gracilis flap was closed directly in two layers with an open drain left in situ for 48 hrs (Figures 2,3,4). Wounds were dressed with Vaseline gauze(primary dressing layer) and povidone iodine soaked gauze(secondary dressing layer). The patient was started on IV Ciprofloxacin 500mg twice daily for five days.

Figure 2

The gracilis muscle was raised, divided at its insertion, rotated medially to allow insetting. Arrow indicates the vascular pedicle



Figure 3

The gracilis muscle flap inset and held in place with bolster stitches to simulate a scrotum. Note donor site closed directly



Figure 4

A Split thickness skin graft applied over the muscle flap and quilted



An Early graft check done on 3rd day post operative and on the 5th day showed 100% graft take; the flap was viable. However at subsequent dressing changes 50% of the graft was lost. The wound had a purulent surface discharge but the muscle flap remained pink and alive. Daily dressing with savlon resulted in marked improvement. No further systemic or local antibiotics treatment was instituted.

DISCUSSION

There are several reconstructive options available for scrotal defects secondary to Fournier's gangrene. These include split thickness skin grafts, scrotal advancement flaps, local fasciocutaneous flaps, local muscle or myocutaneous flaps, scrotal tissue expansion and free tissue transfer. The choice of the reconstructive method depends on size, location and severity of defect and availability of local tissue. (1, 2, 3, 4, 5, 6).

Split thickness skin grafts and scrotal advancement flaps are ideal for small to medium defects involving less than 50% of scrotal surface area with no perineal or abdominal wall involvement. Using Split thickness skin grafts alone for resurfacing has some disadvantages including difficulty applying the skin graft, scar contracture resulting in unsightly scar and scrotal irregularity and graft is not as durable in protecting from vulnerability to damage as fasciocutaneous and muscle flaps (2,3).

Local skin flaps, fasciocutaneous flaps like pudendal thigh flap; pedicled anterolateral thigh (ALT) flap, posterior thigh flaps, and myocutaneous flaps are indicated for larger scrotal defects involving more than 50% scrotal surface loss and where vital structures like tunica vaginalis, corporal bodies and urethra are breached. These reconstructions provide durable skin and a large area of soft tissue coverage which is superior to split thickness skin grafts with better functional and cosmetic outcomes. Muscle and myocutaneous flaps like gracilis, rectus abdominis, split gluteus maximus flaps are needed for large skin defects with deep pockets or cavities to eliminate the dead space (2,3).

The pedicled or free greater omental flap as well as scrotal tissue expansion have also been used for reconstruction (3,5,6).

In this case, we used a pedicled gracilis muscle flap from the right thigh with a split thickness skin graft for the scrotal reconstruction.

The gracilis muscle flap was one of the first myocutaneous flaps described in early 1970's by Mcraw and is a versatile pedicle flap from medial thigh with various indications including cover of defects in groin, perineum and scrotum. It is a type II muscle flap according to the Mathes and Nahai classification. The dominant pedicle, located proximally is the ascending branch of the medial circumflex femoral artery and the minor pedicles located distally are the 1st and 2nd branches of superficial femoral artery. It can be raised as a myocutaneous flap with a skin paddle or as muscle flap as in this case. It can be proximally or distally based.(7)

The gracilis muscle is a good candidate to fill large scrotal and perineal defects (more than 50% soft tissue loss) with deep pockets to eliminate dead space. It is well vascularised and reliable.

It is an easy flap to raise and is located close to the perineal and scrotal area to be covered.

The gracilis muscle flap has good vascularisation of tissues and therefore provides greater resistance to bacterial inocula in contaminated wounds (2,3). In this case, despite the presence of wound infection with 40% graft loss, the gracilis muscle flap remained alive with no wound dehiscence or underlying testicular infection. The donor site can be closed primarily with minimal donor site morbidity. In view of these advantages, the gracilis muscle flap is an ideal and good choice for scrotal reconstruction for defects secondary to Fournier's gangrene.

The gracilis myocutaneous flap has a disadvantage of an unreliable skin paddle particularly along the distal third of the muscle (8). Using a gracilis muscle flap as in this patient eliminates the risk of skin paddle loss and yet provides well vascularised bed of tissue with great chances of good graft take. Quilting further aids good graft application and good graft take on a rather uneven surface.

In conclusion, the pedicled gracilis muscle flap is a versatile and reliable flap for coverage of large scrotal defects with deep pockets secondary to Fournier's gangrene. It is in close proximity to scrotal area and so is easily elevated and inset into defect. It provides good soft tissue coverage for scrotal contents that is durable and less vulnerable to damage. The gracilis muscle is well vascularised which provides a good bed for skin graft take and also provides greater resistance to infection in contaminated wounds. Use of split thickness skin graft eliminates risks associated with the non reliable skin paddle in gracilis myocutaneous flap and improves the aesthetic appearance. The donor site can be closed primarily with minimal morbidity. The pedicled gracilis muscle flap is therefore a good choice for coverage of large scrotal defects secondary to Fournier's gangrene.

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