



## RECONSTRUCTION OF SCROTAL WALL DEFECT USING GRACILIS MUSCLE PEDICLED FLAP: A CASE SERIES

### Plastic Surgery

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### ABSTRACT

**Background:** Scrotal defect is attributed to multiple causes, most common being Fournier's gangrene. No classical road map for scrotal wall reconstruction has been described. In this study we evaluated scrotal reconstruction with pedicled gracilis flap & skin grafting.

**Methods:** From September 2018 to June 2019, 5 patients underwent scrotal reconstruction with pedicled gracilis flap. All the cases were due to Fournier's gangrene except one which was post traumatic. All patients underwent early surgical debridement followed by reconstruction with a gracilis muscle flap. The characteristics of defects of patients were studied and satisfaction was assessed.

**Results:** All patients recovered well. One patient developed wound dehiscence at scrotum. No haematoma formation was seen. Partial flap necrosis was observed in one case. One patient developed donor site abscess.

**Conclusions:** Scrotal Reconstruction through pedicled gracilis flap is an aesthetically acceptable & satisfying method.

### KEYWORDS

Fournier's gangrene, Scrotal wall reconstruction, Pedicled Gracilis flap

### INTRODUCTION:

The scrotal and perineal area serves a special function. It is the pelvic outlet for the gastrointestinal tract, urinary system, and sexual function. In the male, the scrotum allows testicular mobility to reduce trauma and allow optimal thermal regulation for spermatogenesis. Trauma, infection, and cancer resection create defects that require reconstruction. The reconstructive goal here is to obtain durable coverage, function, and lastly aesthetic outcome. Pedicled local and regional flaps are the mainstay for this area. Due to the special function and appearance of the scrotum, reconstructive options for total scrotal defect always fall far short of the native scrotum. On the other hand, perineal reconstruction is overall satisfactory (1).

Major scrotal defect with exposed testes and/or spermatic cords are a challenge for the reconstructive surgeon. The bacterial flora of the perineum, difficulty of immobilisation and the contour of the testes make testicular cover a difficult task. Etiology of Fournier's gangrene includes: 1) trauma or severe infection with gangrene and loss of the covering skin. 2) traumatic avulsion of the scrotal and penile skin commonly caused by clothing being caught in revolving machinery, automobile-pedestrian accidents and falls or the rare bull-horn avulsion injuries. 3) excision of scrotal skin diseases 4) genital burns (2).

Reconstruction should provide an aesthetically acceptable neoscrotum, provide good soft tissue cover for testes (3). In our study we used gracilis muscle pedicled flap for reconstruction of scrotal wall. Gracilis flap was first described by Orticochea in 1972 (4). It is Type II Muscle flap (5). It gets Blood Supply from Medial circumflex femoral artery or direct branch of profunda femoral artery and Minor perforators (6). Aim of our study to evaluate the effects of reconstruction on testicular coverage, to provide wound healing, limited function and acceptable appearance and to evaluate postoperative complications.

### MATERIAL AND METHODS:

From September 2018 to June 2019 we performed 5 cases of scrotal wall reconstruction using longitudinal gracilis muscle pedicled flap. In our study we included all the patients of scrotal wall defects with no exclusion criteria. The written informed consent from the patients was taken.

**Surgical procedure:** All cases were performed under spinal anaesthesia. Patient was operated in supine position with Hip abducted & flexed and knee flexed. First line was drawn from pubic tubercle to

medial femoral condyle and incision was taken parallel and 2 to 3 cm posterior to first line in proximal third of the thigh. Gracilis muscle was identified. Dominant pedicle was identified at approx. 10 cm inferior from pubic tubercle located with doppler preoperatively. Then we extended the same incision to deliver gracilis at distal end. Skin tunnel was formed upto scrotum and gracilis delivered through it to the scrotum. Proper coverage to testis and raw area with gracilis was given which was covered with skin grafting. Primary closure of the donor site was done over closed negative suction drain.

### Case 1:

40 year old male presented with traumatic avulsion of scrotal wall



Picture 1A: Pre-operative.



Picture 1 B: Postoperative follow up.

### Case 2:

46 year old diabetic male with post debridement scrotal defect followed by Fournier's gangrene



Picture 2A: Pre-operative



**Picture 2B: Postoperative**

**RESULTS:**

Fournier's gangrene was a cause of scrotal wall defect in all patients except one in which Traumatic avulsion was a cause. Age distribution of patients in our study was between 40 to 70years. Hematoma formation was not seen in any patient. Wound dehiscence was observed in one patient due to excessive tension which was recovered with dressing. Formation of abscess was seen in one patient at donor site. Partial flap necrosis was observed in one case.

**Table 1**

S.no.	Age	Etiology	Complications
1	44Y	Fournier's gangrene	Nil
2	40Y	Traumatic avulsion	Nil
3	53Y	Fournier's gangrene	Wound dehiscence
4	47Y	Fournier's gangrene	Donor site abscess
5	70Y	Fournier's gangrene	Partial flap necrosis

**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 (3,7,8,9,10,11). 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 (7,8). 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 (7,8). The pedicled or free greater omental flap as well as scrotal tissue expansion have also been used for reconstruction (8,10,11). 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 (12). 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 (7,8). 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 (13). 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.

**CONCLUSION:**

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 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 provides greater resistance to infection in contaminated wounds.

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