



## Scrotal Reconstruction for Fournier Gangrene Using the Isolated Island Groin Flap

### KEYWORDS

Fournier gangrene, Island groin flap, Isolated, Reconstruction, Scrotum.

**Dr. Richa jaiman**

Asso.Prof.General Surgery S.N Medical College Agra (UP)

**Dr Puneet Srivastava**

Astt.Prof General Surgery S.N Medical College Agra (UP)

**ABSTRACT** *Introduction: Grafts and flaps have been widely used to reconstruct scrotal defects due to Fournier's gangrene. Controversy still exists concerning the use of grafts and flaps because of the low protection provided by the grafts and the high volume of the flaps. We study the use of island groin flap for scrotum reconstruction.*

*Material & Methods:In the present study, 25 patients of Fournier gangrene with skin loss were treated by island groin flap surgical procedures and the results were evaluated.*

*RESULTS:The age of patients ranged from 7 to 60 years, with youngest patient of 7 year boy to oldest patient 60 year old and maximum incidence in the 21-40 years .Infection present in 3 patient & necrosis present in 2 patients.*

*Conclusion:To cover the testes, both the aesthetic and functional state should be taken into consideration. Therefore, a thin and durable cover is required for scrotal reconstruction.*

### Introduction

Infection of penoscrotal region is very commonly seen in our country especially Fournier's gangrene. Fournier's gangrene is necrotizing fasciitis of male genitalia and perineum that mainly involves subcutaneous tissue. In these cases the mortality may increase to 50% and the most common isolated agent is E.Coli after Klebsiella and staphylococcus aureus.

Fournier gangrene rarely involves deep fascial planes and musculature. Infection spreads along dartos and colles, scarpa fascia because these planes are continuous. Both aerobic and anaerobic organisms can cause infection. Most common of source of infection is colon, rectum or lower genitourinary tract. Other organisms which cause infection in Fournier ganguere – Enterococcus, staphylococcus, streptococci, Bacteroides fragilis, Pseudomonas aeruginosa.

Today with the development of newer techniques in the management of these injuries, hardly any viable exposed testes is amputated or buried in thighs.

With the availability of regional and local flaps, and microvascular free flaps, the extensive scrotal skin loss is managed comfortably now days with healthy coverage. Availability of better antibiotics, better surgical approach to excise the slough of Fournier gangrene of penoscrotal region has led to the limitation of destruction of penoscrotal skin up to great extent and the better methods of coverage has come to reconstruct these defects. All the cases were managed by island groin flap.

### Materials & Methods

In the present study, 25 patients of penoscrotal defects were treated by island groin flap. The age of patients ranged from 7 to 60 years, with youngest patient of 7 year boy to oldest patient 60 year old and maximum incidence in the 21-40 years. Any local systemic complication will be seen and appropriate management well be done.

Post operative photographic documentation will be done. Patients will be followed up in plastic surgery OPD, SNMC, Agra and necessary follow up photographic documentation will be done as and when required.

### Technique of island groin flap:

The arterial inflow to the groin flap is provided by the superficial circumflex iliac artery (SCIA), a branch off the external iliac/superficial femoral artery at the level of the inguinal ligament. Venous drainage is provided by a cutaneous vein that drains into the saphenous system below the inguinal ligament. The SCIA pierces the fascia at the medial aspect of the Sartorius muscle, making the Sartorius a key landmark in identifying the pedicle during dissection.

The patient is placed supine. If a long flap is expected, a well padded bump can be placed under the ipsilateral hip help ease exposure of the lateral aspect of the flap. The sartorius muscle, inguinal ligament, and iliac crest are all identified and marked to determine flap design [figure-1]. A pencil Doppler is used to determine the location of the arterial pedicle, usually approximately a finger-breadth below the inguinal ligament. The maximum width of the design is determined by pinching the skin to assess the potential tension of the closure after flap harvest. The flap dissection can be begun medially or laterally. Our preference is to make the superior incision and elevate from the distal superior aspect toward the medial origin of the flap. The incision is carried down to the deep fascia and the dissection begun over the deep fascia, identifying and ligating perforating vessels as one proceeds medially. At the level of the anterior superior iliac spine (ASIS), the interval between the tensor fascia lata and the sartorius muscle can is identified. In addition, the lateral femoral cutaneous nerve of the thigh is identified as it exits the deep fascia to enter the subcutaneous tissue in its inferior course. Depending on the course of the nerve, it may need to be transected [figure-2].

The Sartorius muscle is a key landmark in dissection. When the lateral aspect of the muscle is identi-

fied, the muscular fascia is incised along the lateral aspect, and the flap elevation plane is now conducted deep to the muscular fascia. Proceeding medially, the superficial circumflex iliac vessels become visible in the plane above the Sartorius heading into the muscular fascia. As the dissection proceeds, the skin incisions can be continued inferiorly and medially to relieve tension and without fear of transecting the pedicle. Any branches to the muscle are ligated. At the medial aspect of the Sartorius, the fascial plane around the pedicle is incised and the artery and vein are dissected free to their origin. The flap is mobilized on the vascular pedicle. The artery may arise directly from the femoral vessel or from the trunk of a parent vessel supplying the SCIA and the DCIA. The artery can also arise from a common trunk that gives off the SIEA. The vein will arise from the saphenous vein or from a branch off the superficial femoral vein. The donor area is closed after slight undermining superficial to the deep fascia. A layered closure over suction drains may need to be augmented with slight hip flexion if excessive tension is present [Figure-3]. The hip can be extended over the course of a few days.

## RESULTS

The age of patients ranged from 7 to 60 years, with youngest patient of 7 year boy to oldest patient 60 year old and maximum incidence in the 21-40 years. Fournier's gangrene cases were treated for 2-3 weeks by dressings & reconstruction was taken when the local infection subsided & wound showed healthy granulation tissue. All these patient of Fournier's gangrene were undernourished & of low socioeconomic status & had poor local hygiene & 2 of them had diabetic mellitus also. They all were put on combination of antibiotics cephalosporin group aminoglycoside & metrogyl/clindamycin. None of these patients showed fungal growth locally or systemically. Blood transfusion was an important part in bringing up the low Haemoglobin status in these patients. Local dressing was done with eusol, 1% acetic acid/Silver sulfadiazine & betadine ointment as and when required. Infection present in 3 patient & necrosis present in 2 patients.

## DISCUSSION

Fournier gangrene first described by Fournier in 1764 is a bacterial infection of the skin that affects the genitals and perineum and is an uncommon but not rare condition. Fournier's gangrene develops when bacteria infect the body through a wound, usually in the perineum, urethra or the colorectal area. Men with alcoholism, diabetes mellitus, leukemia, morbid obesity, immune system disorders are at increased risk for developing Fournier's gangrene [1]. It is a synergistic infection caused by combination of aerobic and anaerobic organisms creating a synergy of enzyme production that promotes rapid infection and spread of infection [2]. Staphylococcal bacteria clot the blood, depriving surrounding tissue of oxygen. The anaerobic bacteria thrive in this oxygen-depleted environment and produce molecules that instigate chemical reactions (enzymes) that promote further the spread of the infection.

Intense genital pain and tenderness that is usually associated with edema and progressive erythema of the overlying skin of the overlying skin and subcutaneous crepitation are the hallmarks of the condition. Early diagnosis and prompt medical as well as surgical treatment is the mainstay of management of Fournier's gangrene. Resuscitation of patient and initiation of broad-spectrum antibiotics is important before any surgical intervention. In the initial cellulitic stage, incision and drainage of scrotum with tissue diag-

nosis by frozen section and radical debridement in case of established gangrene is a surgery of choice. Our patient was a case of established spreading gangrene of the scrotum and therefore we preferred radical debridement of all the necrotic tissue until we found fresh oozing blood from the edges of the cut tissue.

Array of procedures like primary skin closure, thigh pouch, split thickness skin grafting is available for the coverage but each has its own advantage and disadvantage. We tried to provide the best cosmetic appearance after the coverage of testes by fashioning the pedicle fascio cutaneous flaps from the femoral triangles on both the sides. Two series were published one by Cannistra C et al [3], 2003 regarding scrotal reconstruction by inguinal flap and the other by Kochakarn W et al [4], 2001 regarding scrotal reconstruction by using thigh pedicle flap. We used isolated groin pedicle flap for coverage of bare testes and reconstruction of neoscrotum. The results were good as the final appearance was both cosmetically and socially acceptable for the patient. This fascio cutaneous pedicle flap provides thick protective cover for testes. Due to preservation of cutaneous nerve supply, the skin remains sensitive to touch. There are various use of isolated groin flap for cover of external genitalia defect [5,6,7,8]. Above all patients gets normal free movement of testes inside the neo scrotum. Complications like infection, collection beneath the flap, flap necrosis and flap rejection are possible but done properly under antibiotic cover with aseptic precaution the chances of complication are rare. We do not come across any complication as far as patient is under follow up for last 1 year.

## Conclusion

Fournier's gangrene is a rapidly spreading condition, needs prompt surgical intervention and delayed cosmetic repair.

## Key Message

Fournier's gangrene is necrotizing fasciitis of male genitalia and perineum that mainly involves subcutaneous tissue. It is very difficult to cover testes by primary suturing or skin grafting. Island groin flap is best option to cover testis with limited complication

**Figure- 1; Surface marking of groin island flap**



Figure -2; The groin flap is isolated on pedicle with final appearance after coverage of scrotum



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