

## Reconstruction after Fourniers Gangrene: A Surgeon's Experience

Chetan Satish

Associate Professor, Dept. of General Surgery, Sapthagiri Medical College, Bangalore, Karnataka 560090, India.

### How to cite this article:

Chetan Satish. Reconstruction after Fourniers Gangrene: A Surgeon's Experience. New Indian J Surg. 2018;9(6):721-24.

### Abstract

*Background:* Fournier gangrene often results in defects involving lower abdominal wall, perineum, scrotum with exposed testes. The coverage of these defects often is a challenge for the reconstructive surgeon. Reconstruction with coverage of exposed testes with skin grafts or flaps have been described with specific protocol. *Methods:* The study was done on consequent 17 male patients who presented with Fourniers gangrene from Jan 2015 to Jan 2017. Minimum follow up was 1 year. 4 patients were treated with scrotal advancement and closure, 3 patients were treated with testes deposition in medial thighs and closure and 8 patients were treated with skin grafts. 2 of our patients required pudendal flaps. *Results:* All patients healed well with no recurrence at 1 year follow up period. 2 patients with skin graft had partial graft loss which healed conservatively. *Conclusion:* Our results show that proper selection of method of treatment for Fourniers gangrene can give very good results in this debilitating condition with minimal recurrence. We have elaborated on the choice of surgical method while treating Fourniers gangrene and tried to simplify the treatment of Fourniers gangrene for the help of surgeons. Flap coverage over skin grafts has not proven to have much proven benefit. We recommend reconstruction with skin grafts or flap reconstruction for defects involving greater than 50 percent of scrotum where as simpler

techniques such as secondary intention healing or scrotal advancement is recommended for defects involving less than 50 percent of scrotum.

**Keywords:** Fourniers Gangrene; Skin Graft; Scrotal Advancement.

### Introduction

Fournier gangrene involves a fulminant fasciitis of the perineum and external genitalia spreading rapidly along adjacent fascia [1]. Apart from general resuscitative support with broad spectrum antibiotics the usual treatment demands radical debridement of necrotic tissue [2]. The sequelae of multiple debridements often results in major soft tissue loss around perineum and scrotum requiring reconstruction. The general aims of reconstructing Fournier defects are to provide adequate coverage of the testes, preserve testicular function with good cosmesis and minimal morbidity. Many of these patients have associated diabetes and other comorbidities which warrants a simpler procedure in their treatment [3]. No general consensus on the best method of reconstruction of exposed testes is presently available.

### Material and Methods

The study was done on consequent 17 male patients who presented with Fourniers gangrene from Jan 2015 to Jan 2017. Minimum follow up was 1 year. 4 patients were treated with scrotal advancement and closure, 3 patients were treated with testes deposition in medial thighs and closure and 8 patients were treated with skin grafts. 2 of our patients required pudendal flaps.

---

**Corresponding Author:** Chetan Satish, Associate Professor, Department of General Surgery, Sapthagiri Medical College, Bangalore, Karnataka 560090, India.  
E-mail: [drchetansatish5@gmail.com](mailto:drchetansatish5@gmail.com)

Received on 05 | 08 | 2018, Accepted on 15 | 09 | 2018

## Results

All our cases initially underwent aggressive debridements with broad spectrum antibiotic coverage. After the wounds had stabilized with no further evidence of progression of disease the cases were taken for reconstruction.

We recommend reconstruction with skin grafts or flap reconstruction for defects involving greater than 50 percent of scrotum which was done in 10 of our patients. Simpler techniques such as secondary intention healing or scrotal advancement is recommended for defects involving less than 50 percent of scrotum and in our series 7 patients were managed in this way. Out of these 7 patients, 3 patients had spermatic cord involved where deposition of testes in medial thigh pocket was done (Fig. 1 & 2).

Pre and post operative photos of patient who underwent skin grafting is shown (Fig. 3 & 4).

All patients healed well with no recurrence at 1 year



Fig. 1:



Fig. 2:

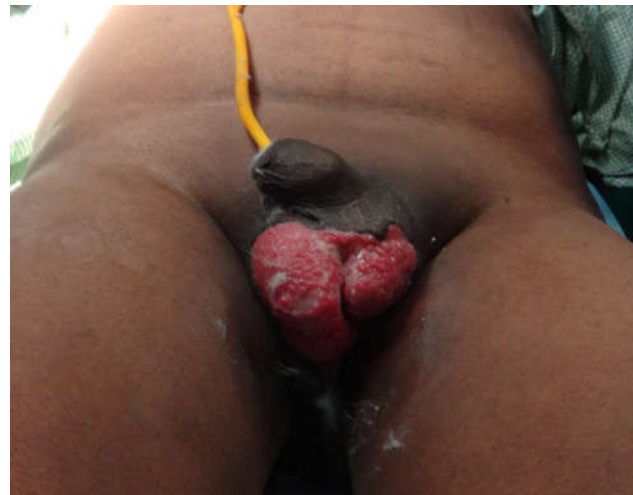


Fig. 3:



Fig. 4:

follow up period. 2 patients with skin graft had partial graft loss which healed conservatively.

## Discussion

When the literature for treatment of Fournier's gangrene was reviewed, Bhatnager et al. [4] described poor patient satisfaction and cosmesis after medial thigh pockets in his series of 26 patients. Literature on fertility of testes in medial thigh pockets suggests normal sperm counts and normal histology as reported by Badejo [5] in 10 patients, though he reported loss of 1 testes in 2 of his patients due to spermatic cord necrosis. Chen et al. (7) described success using the scrotal advancement flap for 11 patients but advised caution with use of this flap for defects larger than half the scrotum because the closure should be tension free. Otherwise wound necrosis often occurs with partial flap loss.

Tan et al. (8) performed bilateral medial thigh flaps but found the scrotal sac to be poorly formed and results were less cosmetically acceptable than skin grafts because of bulkiness of flaps.

Generally patients with Fournier's gangrene have other comorbidities and procedures should be technically simple and fast to go with shorter duration of anesthesia. Further as blood supply of testes and spermatic cord is different from blood supply of skin of perineum and scrotum, orchiectomy should never be required.

Fournier defects may be allowed to heal by secondary intention if they are relatively small and confined to less than 50% of the scrotum [3,4,9,10]. Loose wound approximation at the time of debridement is not recommended because of the associated risk of worsening infection.

Implantation of testes in subcutaneous thigh pockets is considered to be cosmetically and functionally unacceptable due to concerns over temperature regulation, psychological effects, and potential for pain [5-7]. Testes hidden in thigh is considered unnatural especially for younger patients. Also, fertility may be compromised due to high temperatures in the thigh [9,10]. Evidence regarding testicular histology and spermatogenesis is limited but suggests that placement of testes in the thigh is detrimental to both hormonal production by Leydig cells and spermatogenesis [11,12]. We recommend this procedure only when spermatic cord is involved.

Up to one-third of residual scrotum can be expanded to resurface the entire scrotum [3]. This involves undermining in all directions around the scrotal defect in the subcutaneous plane. Some authors advocate elevation as a musculocutaneous flap, with incorporation of the dartos [13].

We recommend reconstruction with skin grafts or flap reconstruction for defects involving greater than 50 percent of scrotum where as simpler techniques such as secondary intention healing or scrotal advancement is recommended for defects involving less than 50 percent of scrotum.

Skin grafting can be performed in a single stage, and can cover large defects with acceptable functional and cosmetic results [3,7,14]. The thin skin resembles normal scrotal skin and keeps the testes cool, preventing testicular dysfunction. The color and shape are close to normal scrotal skin. A healthy bed of granulation tissue is a prerequisite. The testicles are sutured together with interrupted absorbable sutures, and a meshed split-thickness skin graft is applied and stapled or sutured.

The most common complications of skin grafting are contraction and graft loss due to bleeding, shearing, or infection. In addition, some authors feel that the thin grafted skin is potentially vulnerable to trauma and may not provide as much protection of the testes compared with flap reconstruction [5]. Pain or discomfort due to lack of mobility between grafted skin and testes has also been reported [14,15].

Reported benefits of flap reconstruction include durable protection of the testes, provision of immediate coverage without waiting for granulation tissue formation, and lower incidence of contracture. Opinions about cosmesis after flap versus skin graft are conflicting. Some authors feel that the cosmetic results of flap reconstruction are suboptimal compared with skin grafting because flaps are much thicker than scrotal skin [7], whereas others support that acceptable cosmetic results are attained [3,5,7-9]. Flap reconstruction may be chosen as an option for Fournier defects larger than 50% of the scrotum or extending beyond the scrotum. However it should be noted that flap reconstructive procedures are longer and more complex than skin grafts and may be associated with increased donor-site morbidity. Some complications include partial or total flap loss, wound dehiscence and donor-site scarring, seroma, and hematoma. Also, testicular function may be compromised because of exposure to higher temperatures after flap reconstruction.

## Conclusion

Many methods of scrotal reconstruction after Fournier gangrene have been described but reliable coverage and protection of testicular function with an acceptable cosmetic result are often a challenge for the reconstructive surgeon.

Skin grafting or flap reconstruction is recommended for defects larger than 50% of the scrotum or extending beyond the scrotum, whereas scrotal advancement flap reconstruction or healing by secondary intention is best for defects confined to less than 50% of the scrotum that cannot be closed primarily without tension. When the spermatic cord is involved we recommend deposition of testes in medial thigh pocket. Further flap reconstruction is generally avoided as they are more bulky and can affect testicular temperature with an affect on testicular function. We recommend flap reconstruction only when in doubt of skin graft take with an uneven bed and poor granulation or when wound cultures are not conducive for skin grafting. With this simplified protocol the reconstructive surgeon should find it easier to treat Fournier's gangrene.

## References

1. Karian LS, Chung SY, Lee ES. Reconstruction of Defects After Fournier Gangrene: A Systematic Review. *Eplasty*. 2015 May 26;15:e18. eCollection 2015.
2. Erol B, Tuncel A, Hanci V, et al. Fournier's gangrene: overview of prognostic factors and definition of new prognostic parameter. *Urology*. 2010;75:1193-8. [PubMed].

3. Norton KS, Johnson LW, Perry T, Perry KH, Sehon JK, Zibari GB. Management of Fournier's gangrene: an eleven year retrospective analysis of early recognition, diagnosis, and treatment. *Am Surg.* 2002;68:709-13. [PubMed].
  4. Bhatnager AM, Mohite PN, Suthar M. Fournier's gangrene: a review of 110 cases for aetiology, predisposing conditions, microorganisms, and modalities for coverage of necrosed scrotum with bare testes. *N Z Med J.* 2008;121:46-56. [PubMed].
  5. Badejo OA. Management of scrotal gangrene. *Trop Geogr Med.* 1985;37:337-42. [PubMed].
  6. Chen SY, Fu JP, Chen TM, Chen SG. Reconstruction of scrotal and perineal defects in Fournier's gangrene. *J PlastReconstrAesthet Surg.* 2011;64:528-34 [PubMed].
  7. Tan BK, Rasheed MZ, Wu WT. Scrotal reconstruction by testicular apposition and wrap-around skin grafting. *J PlastReconstrAesthet Surg.* 2011;64:944-8. [PubMed].
  7. Okeke LI. Fournier's gangrene in Ibadan. *Afr J Med Med Sci.* 2000;29:323-4. [PubMed].
  8. Campbell RM. Dermatome grafting of the totally denuded testes. *PlastReconstr Surg.* 1957;19:509-13. [PubMed].
  9. Tiwari IN, Seth HP, Mehdiratta KS. Reconstruction of the scrotum by thigh flaps. *PlastReconstr Surg.* 1980;66:605-7. [PubMed].
  10. Yu P, Sanger JR, Matloub HS, Gosain A, Larson D. Anterolateral thigh fasciocutaneous island flaps in perineoscrotal reconstruction. *PlastReconstr Surg.* 2002;109:610-6. [PubMed].
  11. Wang DL, Wang YM, Zheng H, et al. [An experiment study and clinical observation of the testicle spermatogenesis after scrotum reconstruction]. *ZhonghuaZheng Xing WaiKeZaZhi.* 2004;20:203-5. [PubMed].
  12. Culp DA, Huffman WC. Temperature determination in the thigh with regard to burying the traumatically exposed testis. *J Urol.* 1956;76:436-8. [PubMed].
  13. Por YC, Tan BK, Hong SW, et al. Use of the scrotal remnant as a tissue-expanding musculocutaneous flap for scrotal reconstruction in Paget's disease. *Ann Plast Surg.* 2003;51:155-60. [PubMed].
  14. Maguiña P, Palmieri TL, Greenhalgh DG. Split thickness skin grafting for recreation of the scrotum following Fournier's gangrene. *Burns.* 2003;29:857-62. [PubMed].
  15. Boukind H, Ezzoubi M, Chafiki N, et al. Scrotal reconstruction after necrotizing cellulitis of the perineum and external genital organs. Apropos of 21 cases. *Ann Urol (Paris)* 1995;29:308-12. [PubMed].
-