Section: Plastic Surgery

Original Research Article

STUDY OF SOFT TISSUE COVERAGE FOR SCROTAL DEFECTS: VARIOUS OPTIONS

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Abstract

Background:

Scrotal defects are common and can be caused either because of infectious cause (fourniers gangrene), or trauma or malignancy or thermal burns.work has been done with the aim to study the outcome, advantages and disadvantages of different modalities of scrotal reconstruction. **Materials and Methods:** This Prospective Observational study was carried out at department of Plastic and Reconstructive Surgery of a tertiary care government institution, Thanjavur Medical College and Hospital in thanjavur, from January 2023 to December 2023. The total sample size was 15 cases. **Result:** In present study, a total of 15 patients were included for which different methods of scrotal reconstructions were performed. Majority of scrotal defects were caused by Fournier's gangrene. Trauma was the second most common cause of scrotal defect. Post traumatic defects were managed early whereas post infective defects were initially managed by serial debridements and delayed reconstructive procedures. Post operatively, graft uptake was excellent for all cases and no major flap compilcations were observed. long hospital stay observed in groin flap. Most of patients are satisfied. **Conclusion:** Depending upon patient age, general condition of the patient, wound status, and the patient's requirement, each case of scrotal defect needs an individual approach for scrotal reconstruction

INTRODUCTION

Scrotal defects are common and can be caused either because of infectious cause (fourniers gangrene), or trauma or malignancy or thermal burns. Among all, common cause of scrotal defects includes Fournier's gangrene and trauma.[1] Scrotal defects are a source of morbidity and of great concern to the patients as it is psychologically debilitating.[2-5] The various techniques used for scrotal reconstruction includes residual tissue re-arrangement, skin grafts, pedicled and free tissue transfer. The ideal reconstruction procedure should provide friction less tissues with minimum donor tissue morbidity, which can maintain both its form (cosmetic appearance) and function (thermoregulation).[6] The reconstruction technique should be individualised in each case taking into account the various factors- size of the defect, associated co-morbidities, surgeon and patients preference. With the availability of wide range of donor tissues, ranging from local to free flap, extensive scrotal defects are managed with ease, nowadays.[7] The objectives of this study was to discuss the options for the reconstruction of the scrotal defects, who were admitted in our institution in the year 2023.

MATERIALS AND METHODS

This Prospective Observational study was carried out at department of Plastic and Reconstructive Surgery of a tertiary care government institution, Thanjavur Medical College and Hospital in thanjavur, from January 2023 to December 2023. The total sample size was 15 cases after examining for all the below mentioned criteria.

Reconstructive procedures were tailored to each patient, taking into account, the following factors.

1. Age of the patient- Young patients were managed using flap cover whereas elderly patients were managed more conservatively or with simpler technique.

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2. Associated co-morbidity- Simpler options like grafting or local tissue rearrangements were preferred in patients with one or more co-morbidity.
3. size of the defect- patients with less than 25% of scrotum defect were managed by undermining and freshening the skin edges and secondary suturing a. Scrotal defects with 25-50% of scrotal skin loss were managed by either split thickness skin grafts or regional flap cover. More than 50% defects were covered using regional flaps.

Post traumatic scorotal and penile defects were covered early whereas scrotal defects caused by fourniers gangrene were initially managed by serial debridements and a delayed reconstruction. As most of the patients were elderly age group and with co-morbidities and of infective aetiology, most of them were managed with aggressive serial debridements along with strict glycemic control and improvement of general condition of patient and delayed reconstruction after optimizing the wounds.

Different Scrotal Reconstruction Techniques

1. Healing by secondary intention
2. Scrotal advancement flap
3. Partial thickness skin graft
4. Singapore flap
5. Medial thigh fasciocutaneous flap
6. Groin flap

RESULTS

In the present study, a total of 15 patients were included for which different methods of scrotal reconstructions were performed. Majority of scrotal defects were caused by Fournier's gangrene. Trauma was the second most common cause of scrotal defect. Post traumatic defects were managed early whereas post infective defects were initially managed by serial debridements and delayed reconstructive procedures. Post operatively, graft uptake was excellent for all cases and no major flap compilcations were observed. long hospital stay observed in groin flap. Most of patients are satisfied.

Figure 1: Scrotal advancement flap

Figure 2: Split thickness skin graft

Figure 3: Medial thigh flap

Figure 4: Groin flap

Table 1: Etiology of scrotal defects.

Fourniers gangrene	10
Trauma	4
Scrotal filariasis	1

Table 2: various modalities of scrotal reconstruction

Scrotal advancement flap	4
Split thickness skin graft	7
Medial thigh flap	2
Groin flap	2

Table 3: Satisfaction scoring

Linguistic expression	**Number of patients**
Very satisfied	9
Satisfied	5
Dissatisfied	1
Very dissatisfied	0

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DISCUSSION

In present study, Fournier's gangrene was responsible for maximum scrotal defects. Fournier's gangrene is a necrotizing fasciitis of the perineo-scrotal region. It is a medical and surgical emergency justifying a prompt multidisciplinary management.[8] Improvement of the functional and aesthetic outcome is still a big challenge for the medical community. Fournier's gangrene is a rapidly extensive necrotizing fasciitis of the perineum and external genitalia, resulting in extensive soft tissue necrosis.[9] First description made in the 10th century by Avicenne, it was then formalized by Jean Alfred Fournier in 1883.[10] The diagnosis is made on clinical grounds. The infection spreads along Colle's fascia, Buck's fascia, and the dartos according to the point of origin. It results in an inflammatory response leading to obliterative endarteritis with cutaneous and subcutaneous vascular thrombosis with corollary necrosis of soft tissues.[11] Most commonly associated co-morbidity in cases of Fournier's is diabetes. Most of the patients have more than 50% of scrotal skin loss. Reconstructive procedures were tailored according to the size of the defect, age of the patient and associated co-morbidities. Elderly patients with co-morbidities were managed by direct closure and skin grafts, where as young Patients without co-morbidities were managed by flap cover. In present study most common cause of scrotal defects is Fourniers gangrene, second common cause is trauma.

Skin grafting was done on healthy granulated wound beds which healed well without any graft loss. But skin graft wont provide any moist environment and will be dry and can easily break open in case of frictional forces. Conversely flaps give a stable cover which can with stand frictional forces. The only absolute indication for flap reconstruction is when vital structures such as the tunica corpora and urethra are breached.

1.Scrotal advancement flap

Advantages- like tissue, Simple, safe and easy one stage procedure, Short hospital stay

Less recovery time and acceptable cosmetic appearance

Disadvantages- scrotal defect area is less than half the scrotal surface area, Extensive undermining may cause scrotal flap loss or wound edge necrosis.

No comlications observed.

2. Split thickness skin graft

Advantages- like tissue, Simple, safe and easy one stage procedure, Short hospital stay

Less recovery time and skin resembles normal scrotal skin.

Disadvantages- STSG cannot be performed if testes have been stripped of tunica vaginalis, impaired spermatogenesis as a result of difficulty in maintaining optimum temperature in the testicle (35℃).

Minimal graft loss observed in one case.

3.Medial thigh flap

Advantages: donor site can be closed primarily, achieve reasonable aesthetic result. Very vascular and safe to use, even in diabetic and vasculopathy patients.

SSI at suture line observed in one case whichs settled with antibiotics according to culture report.

4.Groin flap

Advantages- donor site closed primarily, functional expandability, achieve reasonable aesthetic result

Flap is thin as compared to other fascio-cutaneous flaps. Testes maintains its retractile property.

Disadvantages- Two staged procedure, long hospital stay.

No Comlications observed.

The limitation of our study is a small sample size and lack of standardization, hence it is recommended to conduct randomized controlled trials to evaluate the different methods for soft tissue reconstruction of the scrotum.

CONCLUSION

Scrotal defects are common surgical problems which can be managed relatively easily when compared to soft tissue defects in other areas because of its innate property of elasticity and rich vascularity. Most common cause of scrotal defect is fourniers gangrene and trauma is the second most common cause. local tissue re-arrangement preferred in scrotal defects of less than 25% whereas STSG or Flap reconstruction can be considered for defects >50% of scrotum.

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