Versatility of Singapore Flaps in the Reconstruction of Scrotal Defects

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Abstract

Introduction: Scrotal raw areas can be a source of morbidity and of great concern to the patients inflicted with such a problem. These patient are commonly referred to the Plastic Surgery service for definitive treatment and coverage of the defect.

Objective: This case series is intended to present the results of scrotal reconstruction in 11 cases of near total to total scrotal defects using bilateral Singapore flaps.

Methods: A total of 11 patients were included in this study. All patients were male, with total or near total scrotal defects following debridement of Fournier’s gangrene. The patient’s ages ranged from 39 to 62 years old. Ten out of the eleven patients were known diabetics. Seven patients had near total scrotal defects and four patients had total scrotal defects. Bilateral pudendal thigh flaps (Singapore flaps) were used to reconstruct the scrotal defects in all cases.

Results: The flap survival rate was found to be 100% in all cases and none of the postoperative patients required revision of the flap. At the one month postoperative visit, all patients presented with stable, viable flaps. All flaps proved to be exceptional color matches to the surrounding tissue and demonstrated excellent pain and light touch sensation. All patients reported high levels of satisfaction in regards to the esthetic appearance as well as the functionality and sensation of their new scrotum.

Conclusion: Singapore flap reconstruction is a very versatile technique and can be achieved as a single stage procedure. We have concluded that the Singapore flap is a superior choice in scrotal defect coverage and reconstruction due to the excellent clinical results as well as the patient’s satisfaction in regards to the procedure outcome.

Key words: Singapore flap, Pudendal flap, Scrotal defect, Scrotal raw area, Scrotal reconstruction, Fournier’s gangrene, Scrotal coverage, Scrotum, Bilateral flaps, Flap reconstruction

Introduction

Scrotal raw areas are a source of morbidity and of great concern to the patients inflicted with this problem. These patient are commonly referred to the Plastic Surgery service for definitive treatment and coverage of the defect. Most of the cases of scrotal raw area are seen as a result of diabetic patients who develop Fournier’s gangrene and require radical debridement. Fournier’s gangrene is usually a consequence of a polymicrobial infection with E. coli (aerobic), bacteriods (anaerobic) and streptococci (aerobic and anaerobic) [1,2].

It can be fatal if not treated aggressively with wide radical debridement of the affected tissue and administration of intravenous antibiotic targeting both aerobes and anaerobes.

Once the initial wound debridement has been completed and the infection has been eradicated; the testicles are usually exposed between the medial aspects of the thighs. This mandates proper coverage of the defect and reconstruction of the scrotum [3]. The objective of this case series is to present the results of scrotal reconstruction, in 11 cases of near total to total scrotal defects, using bilateral Singapore flaps.

Methods

A total of 11 patients were included in this study. All patients were male, with total or near total scrotal defects following debridement of Fournier’s gangrene. The patient’s ages ranged from 39 to 62 years old. Ten out of the eleven patients were known diabetics.
known diabetics. Seven patients had near total scrotal defects and four patients had total scrotal defects (Table 1).

The same surgical protocol was followed in all cases:

• Wide surgical debridement of all infected tissues
• A wound swab was sent for culture and sensitivity
• Twice daily povidone iodine based wound dressing was done after the application of 1% acetic acid soaked gauze for 5 minutes
• All patients received intravenous clindamycin, which was then changed in some cases based on the sensitivity results
• Surgical planning was deferred until the wound was clinically clean and the repeated wound swab did not show any bacterial growth
• All cases were managed with bilateral Singapore flap (Pudendal thigh flap) which is based on the posterior scrotal artery from internal pudendal artery and innervated by the pudendal nerve and cutaneous branches from the posterior cutaneous nerve of the thigh [4,5].

The perforator of the flap was marked preoperatively using a hand held Doppler. It was consistently found to be located in the vicinity of the ischial tuberosity. The flap was designed in an inverted ‘U’ shape with length up to 15 cm and width 6-8 cm; in order to aid in the primary closure of the donor site defect (Figure 1).

The patients were put in lithotomy position, following the preoperative marking (Figure 2).

Table 1. Illustrates the age, scrotal defect before flap coverage, etiology of the defect for each patient, any complications following the surgery and the patients outcomes

<table>
<thead>
<tr>
<th>Age in years</th>
<th>Defect area</th>
<th>Etiology</th>
<th>Complications</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>Near total</td>
<td>Fournier gangrene/diabetic</td>
<td>None</td>
<td>*Healed well *Patient satisfied with cosmetic appearance and functionality</td>
</tr>
<tr>
<td>43</td>
<td>Near total</td>
<td>Fournier gangrene/diabetic</td>
<td>None</td>
<td>*Healed well *Patient satisfied with cosmetic appearance and functionality</td>
</tr>
<tr>
<td>45</td>
<td>Near total</td>
<td>Fournier gangrene/not diabetic</td>
<td>None</td>
<td>*Healed well *Patient satisfied with cosmetic appearance and functionality</td>
</tr>
<tr>
<td>53</td>
<td>Total</td>
<td>Fournier gangrene/diabetic</td>
<td>None</td>
<td>*Healed well *Patient satisfied with cosmetic appearance and functionality</td>
</tr>
<tr>
<td>59</td>
<td>Near total</td>
<td>Fournier gangrene/diabetic</td>
<td>None</td>
<td>*Healed well *Patient satisfied with cosmetic appearance and functionality</td>
</tr>
<tr>
<td>41 yrs old</td>
<td>Near total</td>
<td>Fournier gangrene/diabetic</td>
<td>None</td>
<td>*Healed well *Patient satisfied with cosmetic appearance and functionality</td>
</tr>
<tr>
<td>61 yrs old</td>
<td>Near total</td>
<td>Fournier gangrene/diabetic</td>
<td>None</td>
<td>*Healed well *Patient satisfied with cosmetic appearance and functionality</td>
</tr>
<tr>
<td>37 yrs old</td>
<td>Near total</td>
<td>Fournier gangrene/diabetic</td>
<td>None</td>
<td>*Healed well *Patient satisfied with cosmetic appearance and functionality</td>
</tr>
<tr>
<td>62 yrs old</td>
<td>Total</td>
<td>Fournier gangrene/diabetic</td>
<td>None</td>
<td>*Healed well *Patient satisfied with cosmetic appearance and functionality</td>
</tr>
<tr>
<td>43 yrs old</td>
<td>Total</td>
<td>Fournier gangrene/diabetic</td>
<td>None</td>
<td>*Healed well *Patient satisfied with cosmetic appearance and functionality</td>
</tr>
<tr>
<td>52 yrs old</td>
<td>Total</td>
<td>Fournier gangrene/diabetic</td>
<td>None</td>
<td>*Healed well *Patient satisfied with cosmetic appearance and functionality</td>
</tr>
</tbody>
</table>

Figure 1: Abstract drawing demonstrating the position of the patient, the defect area (shown in red), and the position of the flaps on either side.

Figure 2: A Pre-operative picture depicting a 45 years old male with a near total scrotal defect and exposed testis after radical debridement of Fournier’s gangrene.
Conclusion

Singapore flap reconstruction is a very versatile technique and can be achieved as a single stage procedure. It allows for exceptional color match and excellent sensation for both pain and light touch in the new scrotum. The patients in this study have attested to a high level of satisfaction in regards to esthetics and functionality of the new scrotum, and therefore, we have concluded that the Singapore flap is a superior choice in scrotal defect coverage and reconstruction.

References