Repair of the Fournier Gangrene Defects with Remnant Scrotum and Adjacent Tissues: Surgical Techniques

Fournier Gangreni Defektlerinin Etraf ve Geride Kalan Skrotum Dokuları ile Onarımı

**ABSTRACT Objective:** Many alternative procedures have been used for scrotal reconstruction. Some of them require complex or multiple surgical procedures. Their cosmetic and functional results are controversial. **Material and Methods:** We treated thirteen patients with large scrotal defects by primary closure. All defects included nearly almost scrotum and approximately 1-2 cm remnant scrotal tissue. **Results:** Postoperative periods were uneventful for all patients and the mean hospitalization period was 3 days, ranging between 1 to 5 days. At early postoperative period, strict scrotal relaxed after approximately two months. Superior testes displacement was dropped gradually. At postoperative sixth month, a spermiogram was performed for five patients. Their semen analysis was normal. **Conclusion:** The main conclusion of this study is the primary closure is an effective way to reconstruction of scrotal defect. Approximately 1-2 cm residual scrotum, remaining laterally and posteriorly in most cases, can be used for testes coverage.

**Key Words:** Scrotum, fournier gangrene

**ÖZET Amaç:** Skrotal defektlerinin onarımı için birçok alternatif yöntem tariif edilmiştir. Bunlardan bazıları karmaşık cerrahi girişimleri gerektirir, kozmetik ve fonksiyonel sonuçları da tartışmalıdır. **Gereç ve Yöntemler:** On üç yaşındaki skrotal defektli hasta primer onarım yöntemi ile tedavi edilmiştir. Defektler tamamen neredeyse sadece bir cm sağlam skrotum bırakacak şekilde idi. **Bulgular:** Ameliyat sonuçları sorunsuz geçen hastaların ortalama yaş süreleri 3 (1-5 gün) gündü. Başlangıçta gergin olan skrotumlar ameliyat sonrası yaklaşık iki aya kadar edilebilir gelişmişliğe ulaştı. Erken dönemde yüksek doyağılı doğru ilerlemi olan testisler tedrici olarak normal yerlerine indi. **Sonuç:** Skrotal defektli hastalarda az da olsa sağlam kalmış skrotum testis örtüsü için yeterli olabilmektedir. Kompleks cerrahi girişimlerden önce primer onarım akılda bulundurulması gereken bir seçenektir.

**Anahtar Kelimeler:** Skrotum; fournier gangreni

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Scrotal reconstruction after traumatic or infectious disease remains a major challenge. After prompt surgical intervention and medical treatment, majority of cases need reconstructive procedure. Scrotal reconstruction is important for functional and cosmetic reasons. Many alternative techniques have been used for this purpose, such as super thin groin flap, gracillis flap, neurovascular pedicled pudendal flap, anterolateral thigh flap...
and skin graft. These methods require local or distant tissue transfer and may lead to donor area morbidity. In this article, we present our experience use of primary repair for large-scale scrotal defects. We believe that majority of the scrotal defects can be repaired using this technique.

**MATERIAL AND METHODS**

Between 2004 and 2007, thirteen patients (Table 1) with large scrotal defects were treated with primary closure. All defects were caused by Fournier’s gangrene. After immediate surgical intervention, local wound care was established by daily saline dressing. All patients’ defects included near-total scrotal structure and exposed testes. Remnant scrotum was approximately 1-2 cm. Only one patient had partial scrotal necrosis. Patients were placed on the operation table in stirrups in dorsal lithotomy position. Superficial granulation tissue was removed and then dissection was started on sub-muscular plan on remnant scrotum. Dissection was extended to perineal direction and extended to the medial thigh going through inguinal crisis. After sufficient pouch was obtained for flabby testicular coverage, the dissection was terminated. Medial thigh dissection was performed on supra-facial plan and was on average 4 cm from inguinal crisis. After meticulously performed hemostasis, advancement flaps were medialised and attached to inguinal crisis with absorbable suture. Penrose drain was inserted in a new pouch. Lateral flaps were sutured to the midline like a raphe. In four patients, thick skin graft was used for penis resurfacing.

**RESULTS**

Initially, the scrotums were deformed but they were assumed to have a normal appearance after two months. Superior testes displacement descended gradually. There were no complications and wound problem at the postoperative period. Mean postoperative hospitalization period was 3 days, ranging between 1 to 5 days. At postoperative sixth month, a spermogram was performed for five patients. Their spermogram was normal. The others did not return to our clinic for follow-up spermogram. Some results are shown in Figure 1-3.

**DISCUSSION**

Scrotal defects should be repaired as soon as possible after debridement and infection control. Fournier’s gangrene often occurs in patients with advance age, diabetes, alcoholism and other preexisting problems, which may increase their operative risk, particularly in cases of longer or multiple procedures. The ideal method of coverage should be technically easy to perform and of low cost.

Many alternative techniques have been described for testes coverage. Simple and prior

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**TABLE 1: Patients’ Characteristics. All defects were caused by Fournier’s gangrene.**

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age</th>
<th>Post-operative period (Day)</th>
<th>Predispositions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>66</td>
<td>2</td>
<td>DM, Trauma</td>
</tr>
<tr>
<td>2</td>
<td>72</td>
<td>4</td>
<td>DM</td>
</tr>
<tr>
<td>3</td>
<td>56</td>
<td>5</td>
<td>DM, Alcoholism</td>
</tr>
<tr>
<td>4</td>
<td>48</td>
<td>2</td>
<td>Alcoholism</td>
</tr>
<tr>
<td>5</td>
<td>61</td>
<td>2</td>
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<tr>
<td>6</td>
<td>56</td>
<td>3</td>
<td>DM</td>
</tr>
<tr>
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</tr>
<tr>
<td>9</td>
<td>72</td>
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<tr>
<td>12</td>
<td>49</td>
<td>2</td>
<td>DM</td>
</tr>
<tr>
<td>13</td>
<td>78</td>
<td>5</td>
<td>Poorly hygiene</td>
</tr>
</tbody>
</table>

**FIGURE 1:** Near-total scrotal loss. The defect may require local or distant flap according to many reconstructive surgeons.
method was skin grafting. Although skin grafts are
considered to provide a thin covering, grafting pro-
cedure may cause stricture, not ensure a good cos-
metic result and require a long postoperative
dressing period. Furthermore, the graft may adhere
to the testes and cause contracture, which in turn
hinders the cremaster reflex necessary for the testes
not to be affected by external conditions.¹

In general, scrotal reconstructions were per-
formed with fasciocutaneous or musculocutaneous
flaps, such as neurovascular pedicled pudendal
thigh flap, groin flap gracilis musculocutaneous
flap, anterolateral thigh flap. Scrotal Reconst-
struction with these flaps alternatives doesn’t ensure
optimal cosmetic and functional results because
flaps are much thicker than the normal scrotal sac
and much lighter than scrotum skin that contains
more pigment than that of the surrounding areas.⁵
Additionally, coverage of testes with thick fascio-
cutaneous and muscle flap could inhibit spermat-
genesis.

An important principle of reconstructive sur-
gery is, when possible, to replace like with like. Pri-
mary closure of scrotal defects with remnant
scrotal tissue ensures the following:

1- Similar appearance with original scrotum.
2- Testes coverage is achieved by native tissue.
3- In this way, inguinal crisis and scrotal raphe
could be preserved.
4- Because testes are not covered by fasciocu-
taneous tissue, spermatogenesis is affected mini-
mally.
5- There was no donor area morbidity, com-
plex surgical procedure and high complication risk.
6- Primary closure of scrotal defects reduces
the hospital stay and cost.

In conclusion, from our clinical experience,
approximately 1-2 cm residual scrotum, remaining
laterally and posteriorly in most cases, can be used
for testes coverage. Because of rich blood supply,
elasticity, easy expansion capacity and musculocu-
taneous texture, the remnant tissue provides an
ideal coverage with native scrotum skin. Due to
this experience, maximum scrotal tissue preserva-
tion should be performed during debridement.
REFERENCES


