Tissue Expander Scrotal Reconstruction

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Summary: Fournier’s gangrene is a life-threatening soft tissue infection requiring aggressive debridement of the perineum. Surgical debridement results in large defects of the scrotum requiring reconstruction for functional coverage of the testes. Several studies have described scrotal reconstruction utilizing split thickness skin grafts or local flaps. These procedures create additional morbidity in an unhealthy patient population. This report describes a patient who presents for delayed scrotal reconstruction utilizing tissue expansion. Tissue expander-based reconstruction provides reconstruction of native scrotal soft tissue without additional donor site morbidity. A 40-year-old man presented to an outside hospital with Fournier’s gangrene and underwent significant soft tissue debridement. He had an almost complete loss of his native scrotum with his testes surgically banked in his bilateral thighs. He presented to our clinic for a delayed scrotoplasty. The patient was taken to the operating room and a single tissue expander was inserted into the perineum. He underwent serial insufflations in the clinic setting and returned to the operating room for expander removal and scrotal reconstruction. The patient followed up in clinic 4 months postoperatively with a well-healed scrotoplasty. Our case report demonstrates a 2-stage procedure for patients presenting with significant soft tissue loss of the perineum. This reproducible method of reconstruction can be considered for excellent aesthetic and functional scrotoplasty. (Plast Reconstr Surg Glob Open 2020;8:e2714; doi: 10.1097/GOX.0000000000002714; Published online 24 March 2020.)

INTRODUCTION

Fournier’s gangrene is a surgical emergency involving necrotizing infection of the external genitalia and perineum. Treatment for this disease involves early surgical intervention, aggressive debridement, antibiotics, and volume resuscitation with a 20–88% mortality rate.1 Following adequate treatment and surgical intervention, patients have significant soft tissue defects requiring reconstruction. For large soft tissue defects, autologous skin grafting is the first-line treatment of choice.2 However, large skin grafts lead to multiple surgical sites in a patient population with significant comorbidities with increased wound healing complications.3 Skin grafting is not a viable option for patients who present for delayed reconstruction with inadequate soft tissue coverage. This article presents an alternative reconstructive option with the use of tissue expansion followed by delayed scrotoplasty.

CASE PRESENTATION

A 40-year-old man with past medical history of hypertension and hyperlipidemia presented to an outside hospital with Fournier’s gangrene and underwent surgical debridement with placement of negative pressure wound therapy. At the time, his testes were surgically banked into the bilateral thighs. He presented to our clinic for a delayed scrotoplasty. The patient was taken to the operating room and a single tissue expander was inserted into the perineum. He underwent serial insufflations in the clinic setting and returned to the operating room for expander removal and scrotal reconstruction. The patient followed up in clinic 4 months postoperatively with a well-healed scrotoplasty. Our case report demonstrates a 2-stage procedure for patients presenting with significant soft tissue loss of the perineum. This reproducible method of reconstruction can be considered for excellent aesthetic and functional scrotoplasty.

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was placed over the area for port identification in clinic (Fig. 2). The patient tolerated the procedure well and discharged home on postoperative day 1.

The patient returned to the clinic for serial insufflations every 2 weeks until it was fully insufflated at 150 mL of normal saline. Four weeks following final insufflation, the patient had extrusion of the tissue expander and was admitted to the hospital 2 weeks before planned surgical scrotoplasty.

The patient was taken to the operating room in joint with the urology team. The tissue expander was identified through a scrotal opening and tubing was excised. The urology team made bilateral medial thigh incisions to harvest the testes and performed a bilateral orchiopexy (Fig. 3). We next elevated the scrotal tissue superiorly and debrided excess granulation tissue from reactive scar formation. A skin flap was elevated inferiorly and the testes were placed in situ. The superior and inferior flaps were re-approximated and closed. Postoperatively, he recovered well and was subsequently discharged from the hospital. The patient had a small amount of skin separation secondary to scrotal edema that was managed with local wound care and elevation with a scrotal sling. He was seen in the clinic 4 months postoperatively with a well-healed incision and intact scrotum (Fig. 4).

**DISCUSSION**

Scrotal reconstruction is a common challenge when faced with gangrene. This soft tissue infection often requires multiple operative debridements for adequate

![Fig. 1. Preoperative markings indicating planned pocket placement of a tissue expander. Patient had significant loss of volume of scrotum with superior band tethering the shaft of the penis.](image1.jpg)

![Fig. 2. Postoperative placement of the tissue expander with 4 cm incision at left aspect superior to scrotum and port site located suprapubic region and demarcated with silk suture for future clinic insufflations.](image2.jpg)

![Fig. 3. The urology team harvested the testes from the bilateral thighs and performed an orchiopexy in the new scrotal pocket.](image3.jpg)
Surgeons must consider reconstructive options once the infection has been successfully debrided and the wound bed is clean with healthy granulation tissue. Many studies and case reports have demonstrated that split thickness skin grafts are a viable option for large or small defects of the scrotum. These mesh skin grafts can be used to provide coverage of exposed testes even in cases with loss of the majority of the scrotum. However, this procedure requires an additional donor site in patients that most likely have significant comorbidities including diabetes and obesity. Studies have demonstrated that there are significantly higher wound healing complications and split thickness skin graft in patients with diabetes. This technique creates unnecessary donor surgical sites in patients with less than ideal surgical comorbidities. Secondary contracture of meshed skin grafts results in loss of scrotal volume and high riding testicles.

Numerous other options for scrotal reconstruction have been identified utilizing local myocutaneous flaps including gracilis and rectus abdominus flaps. Other local fasciocutaneous flaps involving the perineum and VY advancement of the bilateral inner thighs have also been described. All these flap reconstructive options have significant donor site morbidity and result in bulky coverage. These flaps provide a significant amount of subcutaneous tissue that is uncharacteristic of the native scrotum.

Tissue expansion was first demonstrated in 1957 to increase the amount of local soft tissue coverage through prolonged mechanical creep. This principle can be applied to patients who present for delayed or staged scrotoplasty. This may include patients with contracted split thickness skin grafts or loss of volume due to previous scrotal closure with testes stored in the inner thighs. Tissue expander reconstruction is an ideal choice for these patients’ reconstruction. Goodman first described a 2-tissue expander-based scrotal reconstruction for a traumatic injury in 1990. Expansion results in soft tissue coverage of native scrotal skin with no additional donor site morbidity. This leads to improved aesthetics and functionality of the cremaster muscle which provides an ideal environment for spermatogenesis. Limitations of this report include minimal native scrotal tissue upon initial consultation. A tissue expander-based reconstruction can also have a higher infection risk or possible extrusion. This presents the explicit steps and accompanied images, required to perform this technique without additional advancement flaps. Tissue expansion reconstruction can be repeated for any delayed reconstruction with loss of scrotal volume.

CONCLUSIONS

Patients with significant scrotal loss or contracture may present for scrotal reconstruction and orchiopexy. This reproducible step-by-step technique with a tissue expander can be utilized for an excellent aesthetic and functional outcome in delayed scrotal reconstructions.

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