

THREE LAYER CLOSING FOR THE RECONSTRUCTION OF EXTENSIVE URETHRAL DEFECTS GENİŞ ÜRETRA DEFEKTLERİNİN ONARIMINDA ÜÇ TABAKALI YÖNTEM

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ÖZET

Giriş: Penil kırığa sekonder fournier gangreni gelişmiş olan hastada oluşan geniş üretral defekti onarmak için; tam kalınlıktaki cilt grefti, tunika vajinalis flebi ve scrotal fasyokutan flebin kombinasyonu ile oluşan üç tabakalı onarım uygulandı. Ve üretral defektlerin olası tedavi yöntemleri tartışıldı.

Gereç ve Yöntem: 18 numara foley kateterin etrafına yaklaşık 3x6 cm boyutlarındaki tam kalınlıkta deri grefti tüp şeklinde sarılarak 4-0 poliglaktin suture ile greft uçları birbirine adapte edilerek yeni üretra oluşturuldu. Normal üretranın proksimal parçası ile yeni oluşturulan üretra uç uca anastomoz edildi. Daha sonra ikinci kat onarım için; sol testis üzerinden eleve edilen yaklaşık 8x3 cm boyutlarında tunika vajinalis flebi yeni oluşturulan üretranın üzerine transpoze edildi. Üçüncü tabaka tamir için skrotal fasyokutan flep eleve edilerek tunika vajinalis flebin üzerine transpoze edildi.

Bulgular: Postoperatif 12 aylık izlemde, proksimal anastomozun striktürü, flep nekrozu ve postoperatif enfeksiyon gibi hiçbir komplikasyon gözlenmedi.

Sonuçlar: Şiddetli panüretral defekt onarımları için; skrotal fasyokutanöz flep, tubularize cilt grefti ve tunika vajinalis flebin kombinasyonu ile yapılan üç tabakalı tamir üretral rekonstrüksiyonlar için iyi bir seçenek olabilir. Bizim olgumuzda oluşturulan yeni üretranın fonksiyonel sonuçları tatmin ediydi. Üstelik; üretrakutanöz fistüller gibi postoperatif komplikasyonların önlenmesinde bizim uyguladığımız tekniğin tek tabakalı onarım ürethroplastisinden daha etkili olduğuna inanıyoruz. Bu tekniğin devamlı kullanımı için daha çok vaka ve daha uzun izlem sürelerine ihtiyaç vardır.

Anahtar kelimeler: Üretral defekt, rekonstrüksiyon, üç tabakalı

ABSTRACT

Introduction: We present a surgical approach as combining full thickness skin graft, tunica vaginalis flap and scrotal fasciocutan flap usage for reconstruction of extensive urethral defect and skin loss of the penis in a patient with fournier gangrene due to penile fracture and discuss the possible treatment modalities in urethral defects.

Material and Methods: The 3x6 cm full thickness skin graft was tubularized over an 18F Foley catheter with 4-0 polyglactin suture to create the neourethra. End-to-end anastomosis was performed between the proximal part of normal urethra and the free skin graft neourethra with 4-0 polyglactin suture. After the second layer repair, a 8x3 cm tunica vaginalis flap over the left testis was elevated and transposed over to cover the neourethra, was completed. We used scrotal fasciocutaneous flap to form three-layer repair. The scrotal fasciocutaneous flap was elevated and transposed over the tunica vaginalis flap.

Results: At 12 months postoperative follow up, there were no complications such as stricture of the proximal anastomosis, necrosis of the flap, or postoperative infection.

Conclusions: Three-layer repair with combined longitudinal scrotal fasciocutan flap, tubularized skin graft and tunica vaginalis flap could be a good choice for urethral reconstruction in severe panurethral defect repairs. In our case, constructed neourethra survived successfully with satisfactory functional results. Moreover, we believe that our technique is more effective than a single layer repair urethroplasty for prevention of postoperative complications as urethrocutaneous fistula. Longer follow-up and more cases are needed to further evaluate the continued use of this technique.

Keywords: urethral defects, reconstruction, three-layer

INTRODUCTION

Primary urethral anastomosis remains the optimal technique for urethral reconstruction but is limited to relatively extensive urethral defects. Extensive urethral defects require substitution urethroplasty.¹⁻⁷ To our knowledge, no experimental and clinic study has been published to date to evaluate the value of three-layer repair in the management of urethral defects. Therefore, we report our experience using a combining full thickness skin graft, tunica vaginalis flap and scrotal flap.

MATERIAL AND METHODS

A 55-year-old man presented with extensive urethral defects and skin loss of penis and scrotum caused by fournier gangrene prior to penile fracture. Primary urethral anastomosis was thought to be impossible because of the length of the urethral defect, unhealthy penile skin, and poor quality of the urethral bed caused by repeated surgery. Surgery was performed under general anesthesia. The urethral defect was measured at 4 cm long from the base of glans to the proximal urethra [Fig.

1A). A full thickness skin graft was harvested from the left ilioinguinal region, 3 cm wide and 6 cm longer than the measured length. The 3X6 cm free skin graft was tubularized over an 18F Foley catheter with 4-0 polyglactin suture to create the neourethra [Fig. 1B]. End-to-end anastomosis was performed between the proximal part of normal urethra and the free skin graft neourethra with 4-0 polyglactin suture [Fig. 1B, 1C]. After than second layer repair, a 8x3 cm tunica vaginalis flap over the left testis was elevated and transposed over to cover the neourethra, was completed [Fig. 1C,1D]. Dissection of the flap did not go beyond 1 to 2 cm distal to the root of the penis. This preserves as much blood supply to the flap as possible. It was stitched to the periurethral tissue using 6-0 polydioxanone sutures. We used scrotal fasciocutan flap to form three-layer repair. The scrotal fasciocutan flap was elevated and transposed over the tunica vaginalis flap [Fig. 1E]. We performed scrotal skin and donor site reconstruction using available scrotal skin. The remaining penil defect was repaired skin mesh graft. We applied Coban [3M, USA] dressing around the penis in a stretched position. We placed a suprapubic catheter for bladder drainage and removed it 14 days after surgery. Postoperative urethral saline bathing was done every 3 hours for the first 2 days for the better survival of full thickness skin graft. We used oral antibiotics

[Pancef and Cefixime].

RESULTS

At last follow-up, the patient had stenosis at the anastomosis between the native and neourethra, which was treated successfully by periodic urethral dilation over 2 months. There were no complications related to the full thickness skin graft harvest site. There were no other complications such as stricture of the proximal anastomosis, necrosis of the flap, or postoperative infection [Fig. 2-4]. Twelve months postoperatively; the patient underwent retrograde urethrography, voiding cystourethrography, uroflowmetry, and cystourethroscopy. Retrograde urethrography did not reveal any narrowing of the lumen of the substituted neourethra. The case had normal functions of urination, erection.

COMMENT

Sufficient genital tissue may not be present to complete the repair. Numerous techniques have been described for urethral reconstruction requiring an extra genital tissue source. Local fasciocutan flaps, free skin graft and tunica vaginalis flap are commonly used for complex urethral repairs.^{8,9} Bladder mucosa, buccal mucosa and various genital skin flaps from hairless

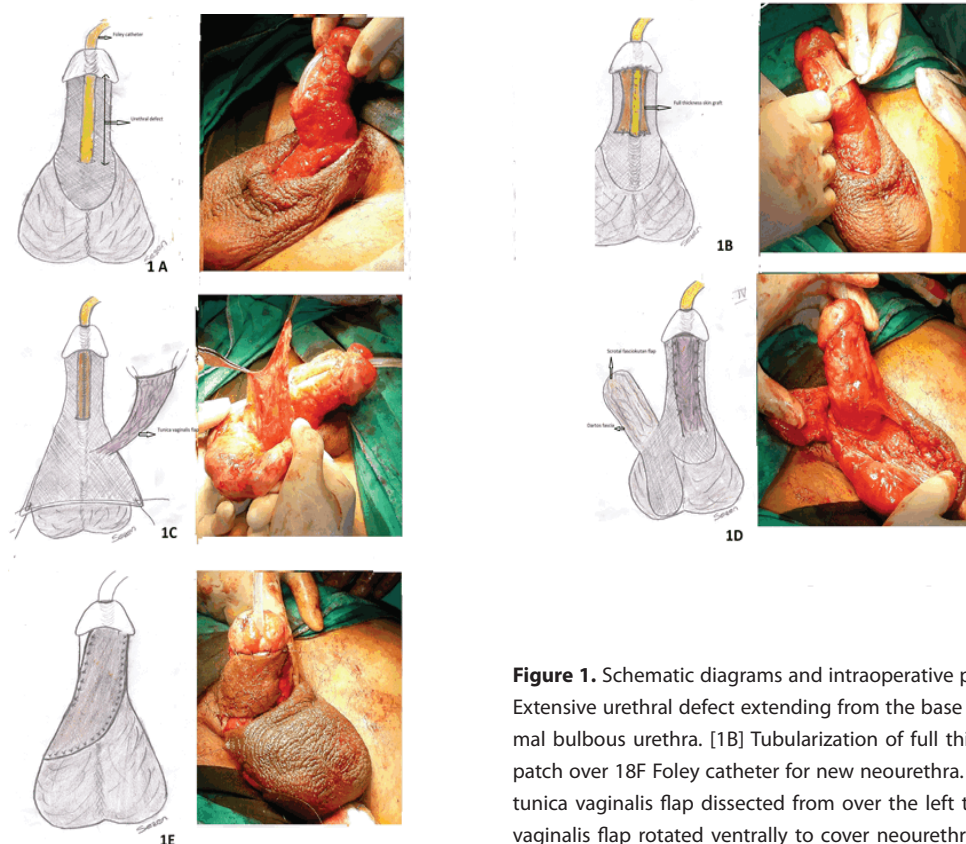


Figure 1. Schematic diagrams and intraoperative photographs. [1A] Extensive urethral defect extending from the base of glans to proximal bulbous urethra. [1B] Tubularization of full thickness skin graft patch over 18F Foley catheter for new neourethra. [1C] Vascularized tunica vaginalis flap dissected from over the left testis. [1D] Tunica vaginalis flap rotated ventrally to cover neourethra. [1E] Scrotal fasciocutan flap rotated laterally from opposite side; it overlaps tunica vaginalis and is sutured. Neourethra completely covered by tunica vaginalis flap and scrotal fasciocutan flap (it is formed by joining of the scrotal skin and its under the dartos fascia).



Figure 2, 3, 4. Postoperative outcomes after surgery.

areas are most commonly used tissues for urethral replacement.⁸ In younger patients, buccal mucosa is most popular, offering excellent patency rates.^{8,9} Our goal was to create urethra with a minimal complication rate. At present, we have left the use of buccal mucosa graft because, our patient does not agree with oral graft harvesting. Due to the extremely panurethral defects, we preferred full thickness graft from the hairless area of left inguinal region. To avoid complications described after urethroplasty, we used tubularized urethroplasty with full thickness skin graft of neourethra and tunica vaginalis flap for its two-layer repair and longitudinal scrotal fasciocutan flap for its three-layer repair. We have favored longitudinal tunica vaginalis flap over neourethra because, in our experience, the risk of complications appears to be less. The flap is abundant and well vascularized and follows the axial course of blood vessels in the best possible way. Tunica vaginalis has been used in urethroplasty as an additional layer to

cover the neourethra, protect the sutures and prevent the appearance of fistulae. Snow et al. reported good results for both correction and prevention of fistulae using tunica vaginalis.¹⁰ Chatterjee et al compared the use of the dartos fascia with the use of tunica vaginalis for preventing urethrocutaneous fistulae in distal hypospadias and detected a lack of fistulae in the tunica vaginalis group compared with 15% in the dartos fascia group.¹¹ Borer et al. noted that four of the five boys who developed fistulae in their series had no barrier layer interposed over the urethra, and suggested mobilization of a dartos or tunica vaginalis flap to decrease the incidence.¹²

The abundant subcutaneous fascial tissue of the flap covers all suture lines, thus preventing fistula formation. Moreover, mobilization of the flap is possible in this case with excellent postoperative cosmetic results. One minor complications related to the urethroplasty occurred and were solved by simple procedures. In the case, short stenosis was solved by ambulatory dilation. However, there was no fistula at the part of the new created urethra, which could be also considered a satisfactory outcome. In addition, closure of the urethrostomy is much easier compared with second-stage tubularized urethroplasty. Moreover, when a single or two-layer reconstruction is used, a fistula track can develop through the suture line next to the flap edge. In the case, we used three-layer repair for the urethral reconstruction. This provides more protection against fistula development. The three-layer reconstruction can be of great value in reducing this notably high incidence.

CONCLUSIONS

We present a novel solution for reconstructive surgeons when treating complex urethral defect. Three-layer repair with combined longitudinal scrotal fasciocutan flap, tubularized skin graft and tunica vaginalis flap could be a good choice for urethral reconstruction in severe panurethral defect repairs. In our report, constructed neourethra survived successfully with satisfactory functional results. Moreover, we believe that our technique is more effective than a single layer repair urethroplasty for prevention of postoperative complications as urethrocutan fistula. Three-layer repair with combined longitudinal scrotal fasciocutan flap, tubularized skin graft and tunica vaginalis flap do not hinder the healing power of the suture lines during glans closure, do not interfere with the excellent cosmetic outcome of the operation. Additional experiences may explicate a surgical indication for our method and reduce the postoperative complications and operation time to a minimum.

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