

Free Radial Forearm Flap in an Adult with Hypospadias

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A 22-year-old man presented with a scarred neophallus and complex hypospadias. The local penile skin was inadequate for urethral repair. A 16 cm free radial forearm flap was used for urethral replacement. Microvascular anastomosis allowed this flap to remain viable and functional. One year postoperatively, the patient had satisfactory functional and cosmetic outcomes. A small fistula developed in the course of the proximal anastomosis, and it was successfully repaired. Our case describes the successful use of a free radial forearm flap for urethral reconstruction. (*Chang Gung Med J* 2007;30:168-71)

Key words: free forearm flap, microvascular anastomosis, hypospadias

Urethral repair is a serious problem in patients with a large urethral defect or in patients who have undergone unsuccessful operations. Buccal mucosal grafts, meshed split-thickness skin grafts and tubularized incisional plates are a few of the more recent advances that have improved the surgeon's ability to restore urethral continuity.⁽¹⁻³⁾ Despite these advances there remains a distinct group of patients with extensive urethral disease or urethral loss in whom traditionally available reconstructive options are inadequate. We present a new dimension to urethral reconstruction. This approach is of scientific value and hopefully can be considered an alternative surgical procedure for adults with hypospadias.

CASE REPORT

A 22-year-old man born with perineal hypospadias and an imperforate anus with rectourethral fistula underwent repair in infancy. However all surgeries failed and he continued to void and defecate through a perineal opening. A posterior sagittal anorectoplasty and diverting colostomy were successfully per-

formed for repair of the imperforate anus with rectourethral fistula. Hypospadias repair was performed six months later. The ventral aspect of the phallus was scarred, and the remaining preputial or penile skin was insufficient (Fig. 1). A free 16 x 1.5 cm flap was obtained from the left forearm as the onlay graft (Fig. 2). The 16 x 0.5 cm posterior skin strip was preserved with a U-shaped incision to create the urethral plate. The onlay flap urethroplasty was performed by anastomosing the free radial forearm flap to the plate using 4-0 polydioxanone (PDS, Johnson-Johnson Ethicon, Somerville, NJ) (Fig. 3). A 12 French feeding tube was used as the urethral stent. The wings of the glans were wrapped over the glanular urethra with deep, epithelial sutures. A dorsal split of prepuce was done to cover the ventral preputial defect (Fig. 4). After exposing the superficial circumflex iliac artery and the draining vein in the right groin area, the long pedicle of the free flap was passed through the subcutaneous tunnel from the proximal perineal region to the groin area and a microsurgical anastomosis was done with 10-0 nylon suture. The patency of the vascular pedicle was monitored by ultrasonography as forearm skin cannot be

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Fig. 1 Previous failed perineal hypospadias reconstruction. The arrow indicates the urethral meatus located in the perineal region.



Fig. 2 Planning of the forearm free flap.

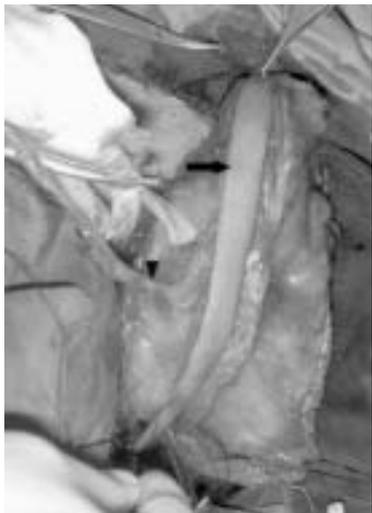


Fig. 3 The forearm free flap (arrow) was tailored to fit the posterior skin strip and anastomosis with 4-0 PDS. The vascular pedicle (arrowhead) anastomosis with the superficial circumflex iliac vessel through the subcutaneous tunnel is shown.



Fig. 4 The final appearance after the repair.

visualized after wound closure.

The postoperative course was unremarkable. The urethral catheter was removed on postoperative day 10. At the one-year follow-up, the patient had a satisfactory cosmetic outcome and a good urinary stream. A small fistula developed in the course of the proximal anastomosis. The fistula was successfully repaired one year later.

DISCUSSION

It has been widely reported and accepted that the repair of hypospadias and chordee must be individualized and tailored to each patient. For this reason there is continual introduction of new procedures and modifications of “accepted” methods to further reduce the various difficulties encountered in hypospadias repair and to achieve a good cosmetic configuration. A variety of grafts, such as extragenital skin, bladder mucosa and buccal mucosa, have been used for urethral replacement to create a neourethra. Skin and mucosal grafts require intimate contact with a well vascularized recipient bed. Success of repair requires ideal local conditions for complete graft survival. Any loss could result in recurrent stricture.

The advantage of using a vascularized skin flap for urethral reconstruction is that viability does not depend on the quality of the recipient bed. Many innovative local and regional flap options are

described in the literature.⁽⁴⁻⁸⁾ The technique described here provides an alternative solution to the problem of difficult hypospadias repair. The radial forearm flap provides skin that is relatively thin and pliable, making it suitable for urethral reconstruction. The obvious benefit of this approach is the ability to tailor the size of the neourethra to approximate the required urethral length and width, especially in extremely large urethral defects, such as in our case.

Several concerns arise with this technique. The expertise of a surgeon experienced with microvascular anastomosis is integral to the success of the flap. This surgery requires long hours and the patient must safely withstand lengthy anesthesia. The forearm skin flap is not visualized after penile and scrotal wound closure. The patency of the vascular pedicle must be monitored by ultrasonography. However, the radial forearm free flap we presented provides an alternative for complex hypospadias repair when other urethral reconstructive methods fail or when satisfactory results are difficult to obtain.

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對於成人困難的尿道下裂以游離前臂橈側皮瓣修補成功

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我們報告一位 22 歲男性尿道下裂的病人。他是屬於複雜的會陰型且經過修補失敗後，遺留厲害的疤痕且無包皮可供修補。16 公分長的游離前臂橈側皮瓣被使用作尿道修補。經由顯微血管的吻合，使得皮瓣存活並讓尿道顯示功能。經過一年的追蹤，病人有滿意的陰莖外表及正常的排尿功能。僅有一小小的尿道瘻管發生在近端的吻合處。我們也在一年後成功的將瘻管修補完全。我們提出這個病例，除描述成功的使用游離前臂橈側皮瓣作為尿道重建的方法外，也強調科系合作的重要。(長庚醫誌 2007;30:168-71)

關鍵詞：游離前臂皮瓣，顯微血管吻合，尿道下裂

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