

Case Report

Total anterior urethral reconstruction with the ‘BAES flap’ in a spinal cord-injured patient

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Study Design: A case report of urethral destruction in a spinal cord injured (SCI) patient.

Objectives: To report the reconstruction of the whole anterior urethra in one-stage using an epilated scrotal flap.

Setting: Institut Guttmann, Hospital de Neurorehabilitació, Barcelona, Spain.

Methods: A one-stage tubular substitution urethroplasty based on a bi-axial epilated scrotal flap design (‘BAES flap’) was performed successfully.

Results: Long-term follow-up of 6 years has confirmed the excellent adaptation of the flap to its urethral function.

Conclusion: The bipedicle epilated scrotal flap can effectively resolve this challenging urethral pathology.

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Keywords: urethra; spinal cord injuries; scrotum; surgical flaps

Introduction

Urologic complications constitute one of the main causes of morbidity and mortality in spinal cord-injured patients. Frequent instrumentation of the lower urinary tract produces a higher incidence of complex urethral lesions (necrotizing infections, stenosis) which demand special attention from the surgeon faced with the challenge of urethral reconstruction. We report a case of total anterior urethral substitution using the Biaxial Epilated Scrotal flap (‘BAES-flap’) in one surgical step in a SCI patient.

Case report

A 47-year-old quadriplegic man with neurogenic bladder since 1992 underwent endoscopic sphincterotomy due to urinary tract obstruction secondary to urethral sphincter dyssynergia in February 1993. Seven days post-surgery, he presented with necrotizing fasciitis of the penis resulting in total necrosis of the pendulous and distal bulbar urethra and the corpus cavernosum (Figure 1a). A permanent cystostomy tube was placed and remained until July 1994, when substitution urethroplasty with the Bi-Axial Epilated Scrotal flap was performed (Figure 1b and c).

Operative technique

Three months prior to surgery the skin of the scrotal flap was permanently epilated by selective thermocoagulation of the dermal papilla. A 5 cm-wide rectangle was marked on the stretched skin of anterior and posterior scrotal faces, centred over the mid-raphé. We proceeded to de-epithelialize the sides of the rectangle, leaving a central 3 cm-wide panel which was tubularized round a 20 CH catheter with 5-0 absorbable continuous suture. A second layer was made by suturing above the outer edges of the flap with interrupted sutures, resulting in a tube formed by a thick musculocutaneous wall (Figure 2a and b). The proximal end of this new urethra was passed to the internal plane through a buttonhole opened in the mid-line of the flap pedicle and anastomosed with the remaining portion of healthy bulbomembranous urethra using 5-0 absorbable interrupted sutures. The thick tubularized flap was inserted into the penile skin sheath as far as the base of the glans where its distal end, which constituted the new meatus, was anastomosed (Figure 3a).

Results

Reconstruction of the entire anterior urethra (15 cm long and 3 cm wide) was completed and, at the same time, a new penile body was created which permitted a urine collector to be fitted. Radiologic and endoscopic control of the neourethra after 6 years currently shows correct

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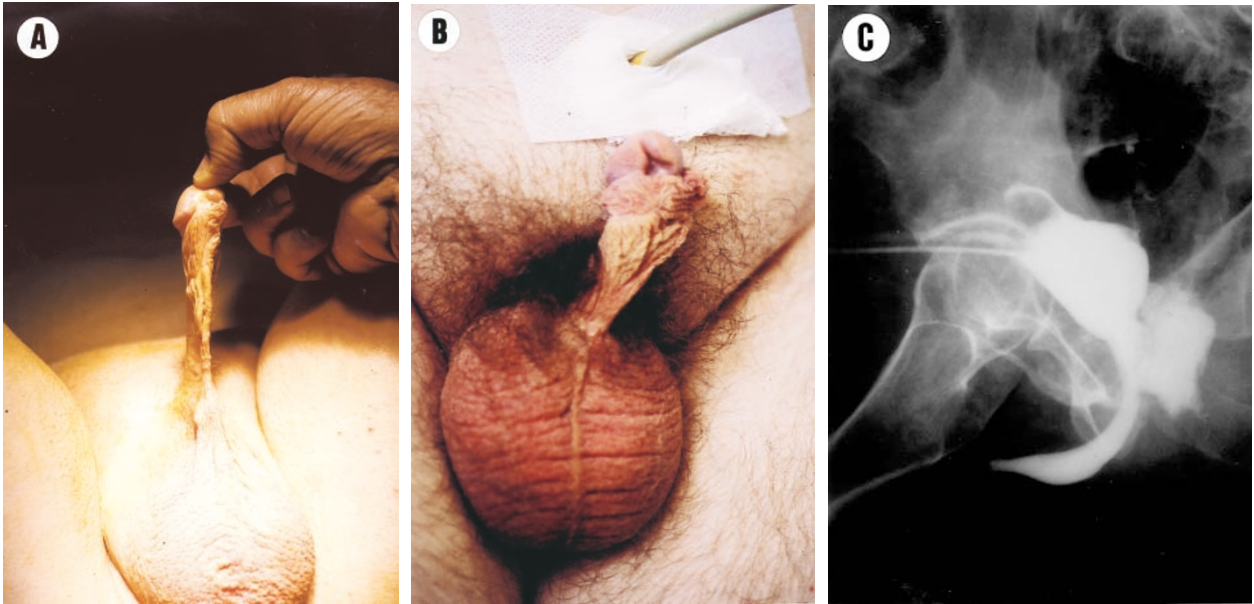


Figure 1 (a and b) Absence of penile shaft with a residual glans vascularized by external pudendal arteries. (c) Preoperative suprapubic cystourethrogram with extravasation in posterior urethra

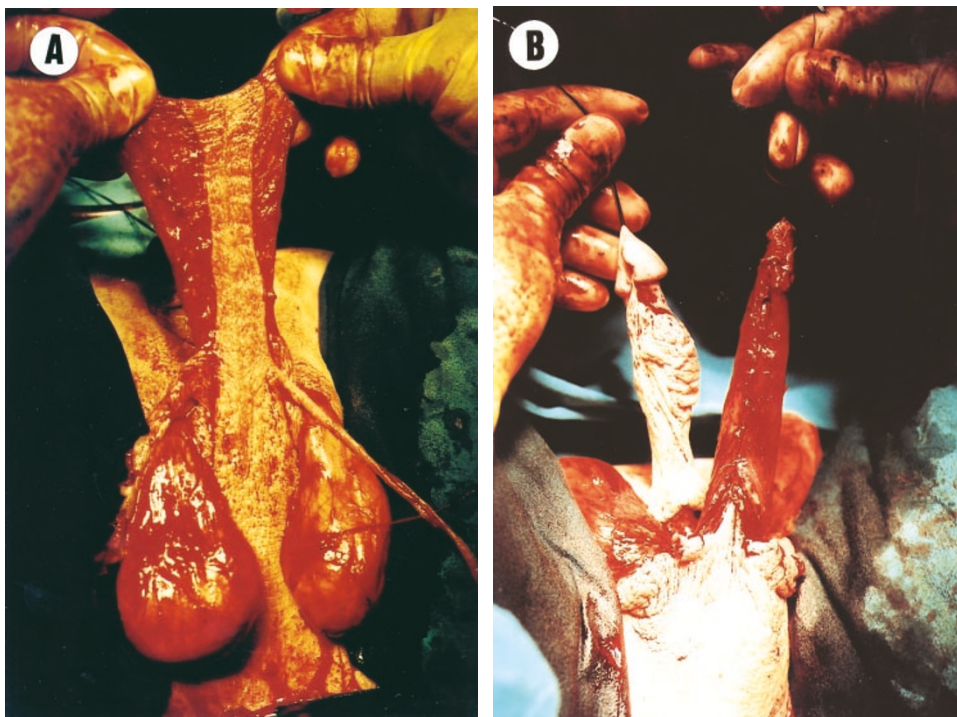


Figure 2 (a) Raised 'BAES flap' which maintains its double axial vascularization from both superficial perineal arteries. (b) Tubular configuration of the flap

morphology which confirms the perfect adaptation of the flap to its urethral function (Figure 3b). Two cystoscopic control studies of the neourethra were conducted at 1 and 3 years post-reconstruction. Both revealed very scant, isolated, non-calcified hairs along the anterior tubular neourethra which posed no problem.

Conclusions

While penile and prepuccial skin flaps are ideal for pendulous urethra reconstruction, there exist situations such as those of some paraplegic patients with extensive urethral lesions whose penile skin has deteriorated owing to repeated traumatic and infec-

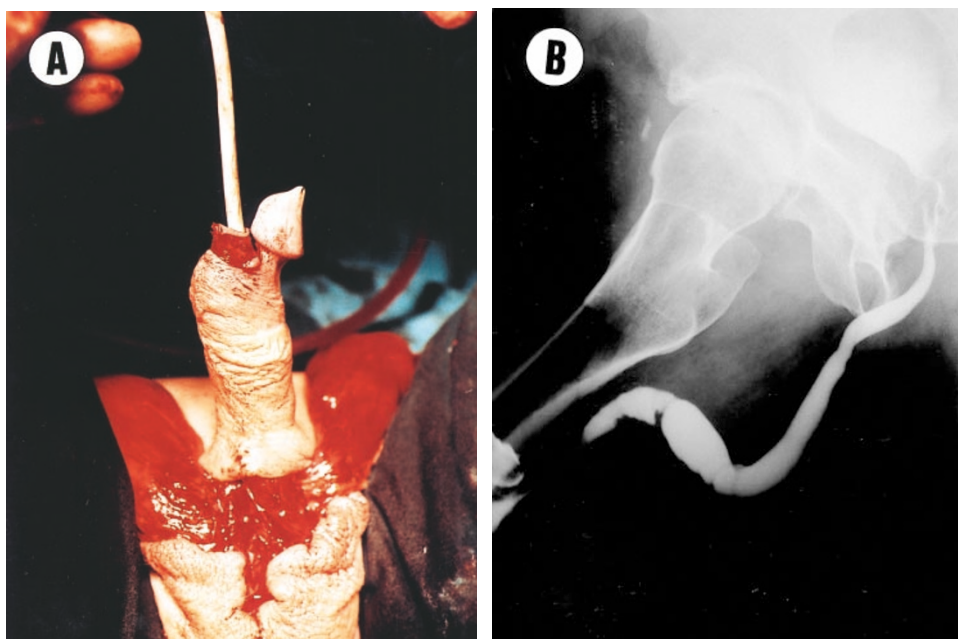


Figure 3 (a) Anterior urethra and penile body simultaneously reconstructed. (b) Retrograde urethrography 6 years later. An indent formed over this period of time by the urine collector fixing tape can be observed at the level of the penoscrotal angle

tious processes caused by urine collectors.¹ Catastrophic urethral lesions are often associated with both impaired blood supply and a limited amount of penile skin which prevents the use of fasciocutaneous penile flaps in selective urethral reconstructive surgery. In addition the ischaemic periurethral recipient bed will not support any type of free graft. In such cases, total urethroplasty using the BAES flap can be performed, since it reaches any segment of the urethra without tension and without suffering twists and stretching.

Many urologists are against the use of scrotal skin in urethral reconstruction since it is believed to become macerated, stenosed and may desquamate. In our opinion the poor tolerance to urine generally attributed to scrotal skin is due to a defective epilation technique which permits regrowth of numerous hairs producing accumulations, obstruction and persistent urinary infection, which in turn provokes folliculitis and chronic dermatitis in the poorly epilated neourethra.²

The BAES flap, thanks to its excellent vascularization and a permanently epilated skin, has permitted successful resolution of complex urethral pathologies, regardless of their extension, location and aetiology.³

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