Two-Sided Bulbar Urethroplasty Using Dorsal Plus Ventral Oral Graft: Urinary and Sexual Outcomes of a New Technique

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Abbreviations and Acronyms

AU = anastomotic urethroplasty

BM = buccal mucosa

DVG = dorsal plus ventral graft

EAU = extended anastomotic urethroplasty

EPA = excision and primary anastomosis

Qmax = peak flow rate

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Purpose: Repair of bulbar strictures using anastomotic techniques may cause sexual complications, while 1-side graft urethroplasties may not be sufficient to provide an adequate lumen in narrow strictures. We evaluated the urinary and sexual results of a 2-sided dorsal plus ventral graft urethroplasty by preserving the narrow urethral plate in tight strictures.

Materials and Methods: Between 2002 and 2010, 105 men with bulbar strictures underwent dorsal plus ventral graft urethroplasty. The results are reported in a homogeneous group of 73 of 105 cases in which buccal mucosa was used as a graft with findings after 1 year or more of followup. The urethra was opened ventrally, and the exposed dorsal urethra was incised in the midline to create a raw area over the tunica albuginea where the first graft was placed dorsal-inlay. Thereafter the urethra was augmented by the ventral-onlay second graft and the spongiosum was closed over itself. Successful urethral reconstruction was defined as normal voiding without the need for any postoperative procedure. Postoperative sexual dysfunction was investigated using a validated questionnaire.

Results: Mean followup was 48.9 months and mean stricture length was 3.3 cm. Of these 73 cases 64 (88%) were successful and 9 (12%) were treatment failures with restricture. Furthermore, of 49 of 73 cases who were preoperatively sexually active, none reported postoperative erectile impairment and all were satisfied with their sexual life.

Conclusions: In cases of tight bulbar stricture the dorsal plus ventral buccal mucosa graft provides adequate urethral augmentation by preserving the urethral plate and avoiding postoperative sexual complications.

Key Words: urethra, urethral stricture, transplants, mouth mucosa

BULBAR urethral strictures are treated with various reconstructive techniques.[1–4] Generally short strictures (less than 2 cm) are treated with excision and AU while longer strictures are repaired by patch urethroplasty, preferably using a buccal mucosa graft. In 1996 Barbagli et al introduced the dorsal grafting procedure through a dorsal urethrotomy approach.[5] Morey and McAninch reported results obtained with the ventral graft technique.[6] In 2001 Asopa et al described the dorsal graft urethroplasty using a ventral urethrotomy approach.[7] Recently the location of the patch has become a contentious issue with various series using the graft placed ventrally or dorsally to augment the urethra.[4,8,9] However, AU showed a significant incidence of sexual complications and 1-side graft procedures could be insufficient to provide a lumen of adequate width in strictures with a particularly narrow area.[2,10–13]

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Recently we described a new technique for the repair of tight bulbar strictures, consisting of a combined DVG urethroplasty, without transecting the urethra but augmenting the preserved narrow urethral plate to obtain adequate urethral augmentation and to avoid sexual complications.[14] In this report we describe our technique following further experience, functional results obtained in a larger population and with a followup of more than 1 year, and results in terms of sexual outcome.

MATERIALS AND METHODS

From March 2002 to March 2010, 105 male patients with tight bulbar urethral strictures underwent DVG urethroplasty at our center. We analyzed a homogeneous group of 73 of 105 cases in which BM had been used as graft and with a followup of 1 year or more. Seven patients were excluded from study because foreskin plus BM had been used as grafts, and 8 were excluded because heterologous porcine small intestinal submucosa was used as graft.[15] There were 17 patients excluded from analysis because followup was less than 1 year.

Mean ± SD patient age was 39.2 ± 14.48 years (range 8 to 78). Stricture etiology was unknown in 46 (63%) cases, catheter in 20 (27%), trauma in 3 (4%), instrumentation in 3 (4%) and infection in 1 (1%). Stricture length was 1 to 2 cm in 13 (18%) patients, greater than 2 to 3 cm in 33 (45%), greater than 3 to 4 cm in 19 (26%), greater than 4 to 5 cm in 4 (5%), greater than 5 to 6 cm in 2 (3%) and greater than 6 cm in 2 (3%). Mean stricture length was 3.3 cm (range 1 to 10).

A total of 51 of 73 patients (70%) had undergone previous treatments before referral to our center, with dilation in 2 (3%), internal urethrotomy in 29 (40%) and multiple treatments in 20 (27%). In cases previously managed with urethrotomy the number of urethrotomies ranged from 1 to 9 (mean 4). Preoperative evaluation included clinical history, physical examination, urine culture, uroflowmetry, retrograde voiding cystourethrography and urethroscopy.

Surgical Technique

With the patient in the lithotomy position, a Y-inverted perineal incision was made and the bulbocavernous muscles were divided, exposing the bulbar urethra. Using a ventral-sagittal urethrotomy the strictured urethra was opened with the aid of a guidewire and methylene blue previously injected to define the narrow lumen. This step avoided losing the lumen and did not damage the urethral plate during the urethral opening. The urethra was left open for 1 cm proximally and distally in the healthy urethra.

Dorsal Graft

As suggested by Asopa et al the exposed dorsal urethra was incised in the midline down to the tunica and the margins of the incised dorsal urethra were dissected from the tunica albuginea without lifting the 2 halves of the bisected urethra.[7] An elliptical raw area was created where the first graft was placed as a dorsal inlay, quilted to the corpora cavernosa and sutured to the urethral margins (fig. 1, *A*).

Ventral Graft

Following dorsal augmentation the urethra was also graft enlarged ventrally according to procedures reported by others.[6,12] The second graft was sutured laterally to the left mucosal margin of the urethral plate with a running 6-zero suture. The catheter was inserted, and the graft was rotated and sutured laterally to the right mucosal margin (fig. 1, *B*). Thus, a neourethra was created by anastomosis of the BM grafts in an inlay/onlay patch fashion to the mucosal margins of the bisected urethral plate. Finally, the spongiosum was closed over the ventral graft with a 4-zero running suture (fig. 2).

The double patch was used to better enlarge the urethra in tight strictures characterized by a narrow residual

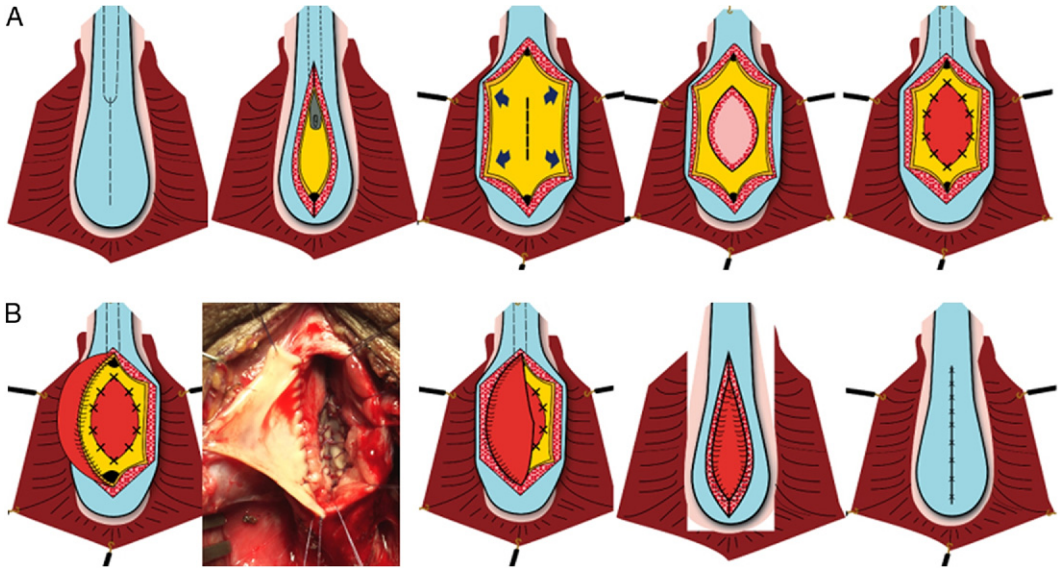

Figure 1. *A*, dorsal inlay graft urethral augmentation using ventral urethrotomy approach. *B*, ventral onlay graft completes urethral augmentation.