

# Surgery Illustrated – Surgical Atlas

## Ventral onlay oral mucosal graft bulbar urethroplasty

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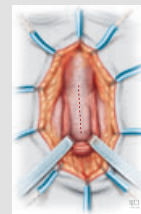
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### KEYWORDS

bulbar urethra, one-stage repair, oral mucosa, free graft, sparing technique

### INTRODUCTION

The current surgical approach to the uncomplicated bulbar urethral stricture began in 1993 when El-Kasaby *et al.* [1] described the repair of anterior urethral strictures using an oral mucosa graft, including eight patients who underwent bulbar urethroplasty. In 1996, Morey and McAninch [2] first described ventral onlay oral mucosa urethroplasty, suggesting suturing of the oral graft in the ventral surface of the urethra. In 1996, Barbagli *et al.* [3] described the dorsal free-graft urethroplasty, suggesting suturing the graft in the dorsal surface of the urethra, over the albuginea of the underlying corpora cavernosa. The location of the graft on the ventral or dorsal urethral surface has become a contentious issue, dating from the time these two techniques were described [2–4]. Success with bulbar oral mucosal grafts has been high with dorsal or ventral graft location and the different graft positions have shown no differences in success rates [5]. Recently, we developed a new muscle and nerve-sparing bulbar urethroplasty, avoiding fully opening the bulbo-spongiosum muscle, thus better preserving ejaculatory function [6]. The selection of a surgical technique for bulbar urethra reconstruction, in addition to respecting the status of the genitalia tissue and components, must also be based on the proper anatomical characteristics of the bulbar urethra, to ensure graft take and



survival. Further, sexual function can be placed at risk by any surgery on the genitalia, and dissection must avoid interference with the neurovascular supply to the penis and genitalia. Bulbar urethroplasty using grafts should not compromise penile length or cause penile chordee, and certainly should not untowardly affect penile and genitalia appearance.

## PLANNING AND PREPARATION

### INDICATIONS AND PATIENT SELECTION

Ventral onlay oral mucosal graft bulbar urethroplasty is suggested for all patients presenting with **atraumatic** urethral strictures in the **proximal bulbar** urethra,

ranging from 1 to 5cm in length. This technique may also be used in patients with previous failed bulbar urethroplasty or repeated urethrotomies. Patient age is not a factor in influencing the success rate and this technique should not be withheld from patients based on age.

### RECOMMENDED EQUIPMENT

- Plastic ring retractor with plastic hooks
- Mouth retractor
- Nasal speculum with modified tip
- Light titanium needle holder
- 6/0 polyglactin (Vicryl®) to suture the oral graft to the urethral mucosa
- 5/0 polyglactin to suture the spongiosum tissue
- 4/0 polyglactin to close the perineal wound

### PATIENT PREPARATION

Preoperative tests include urine culture, retrograde and voiding urethrography, urethral ultrasonography and urethroscopy. The patient's clinical history, the site, and length of the stricture are carefully examined, to better define the characteristics that the oral mucosal graft should have. The patient is intubated through the nose, allowing the mouth to be completely free. Two surgical teams work simultaneously at the donor and recipient sites, with each having its own set of surgical instruments including suction and bipolar cautery. The mouth retractor is provided with its own light, and using this instrument, only one assistant is sufficient for harvesting of the oral mucosa. The oral mucosal graft is harvested from the cheek according to the standard technique [7].

**Figure 1****Positioning**

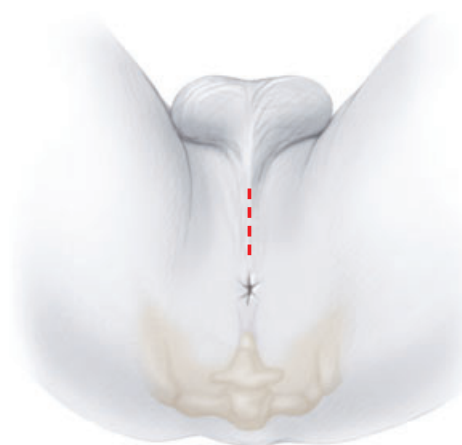
The patient is placed in a simple lithotomy position. The patient's calves are carefully placed in Allen stirrups with sequential inflatable compression sleeves and the lower extremities are then suspended by the patient's feet within the boots of the stirrups. Proper positioning ensures that there is no pressure on any aspect of the calf muscles and no inward boot rotation, so as to avoid perineal nerve injury. The skin of the suprapubic region, scrotum and perineum is shaved and this region is prepared and draped appropriately. Preoperatively, urethroscopy is performed and a Sensor 3 F guidewire is inserted through the urethra into the bladder. Methylene blue is injected into the urethra.

The distal site of the stenosis is identified by inserting a 16F plastic Nelaton catheter with a round tip and outlined, and a midline perineal incision is made (b).



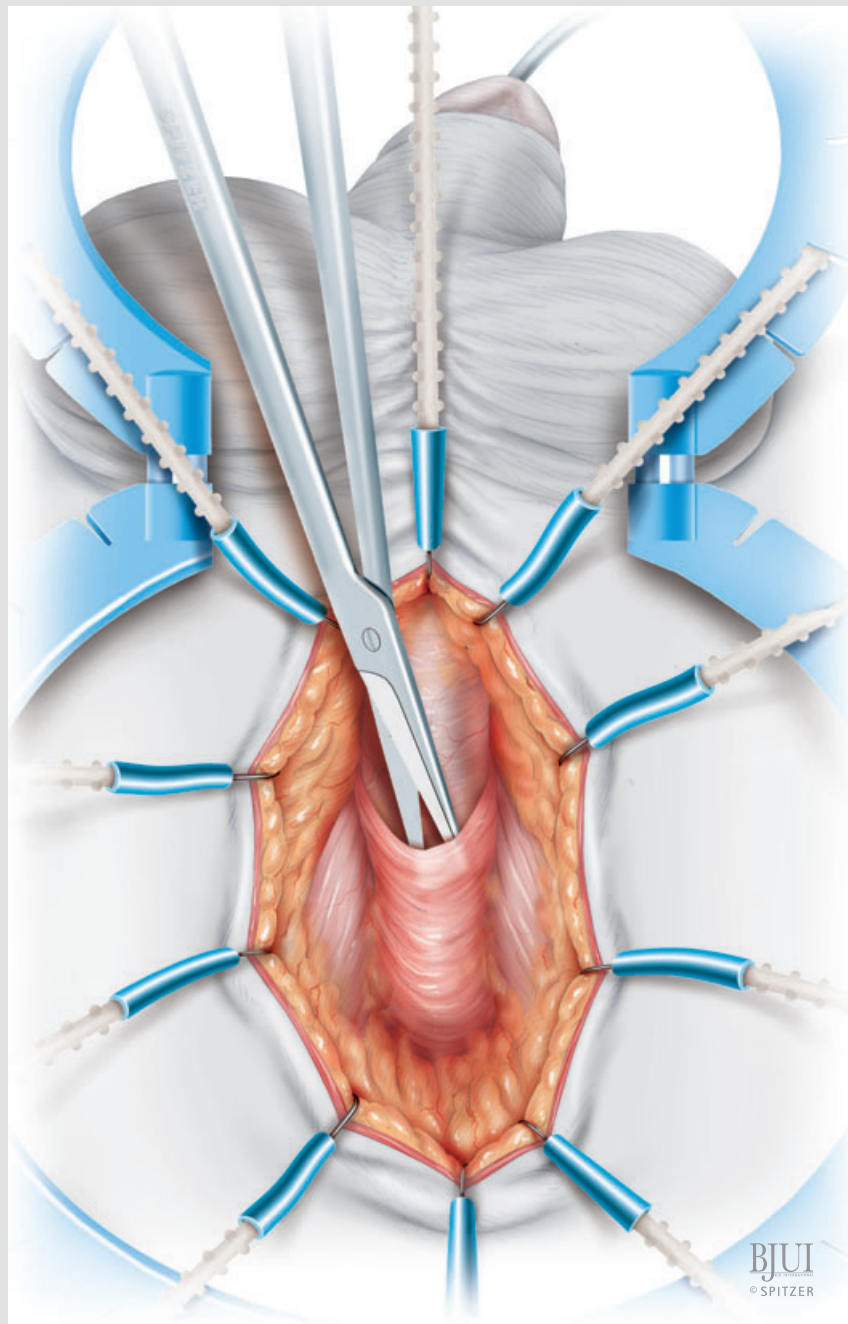
a

b

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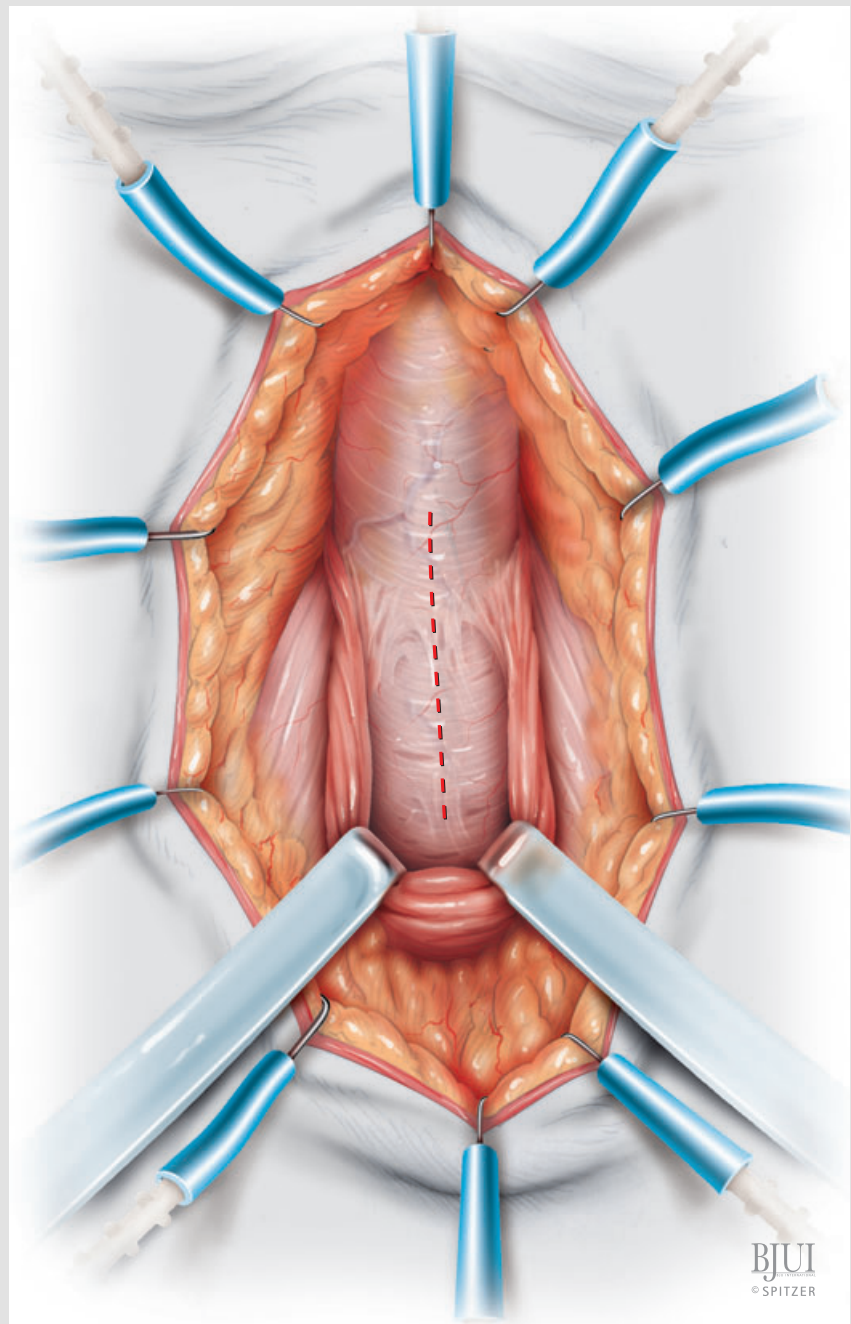
**Figure 2**

The bulbo-spongiosum muscle is separated from the corpus spongiosum of the bulbar urethra using delicate smooth scissors, leaving the lateral margins of the muscle and the central tendon of the perineum intact.



**Figure 3**

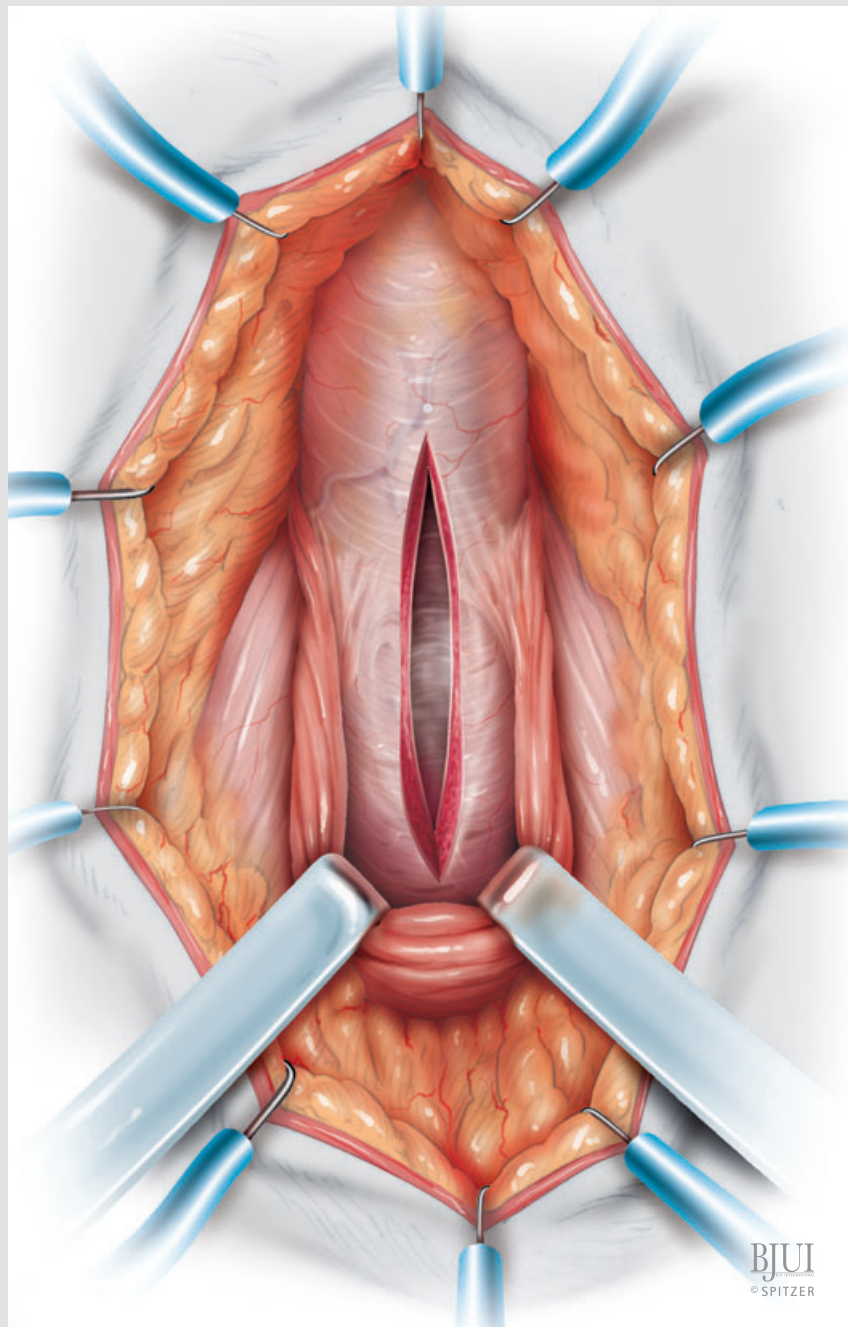
The bulbo-spongiosum muscle is pulled down using two small Farabeuf retractors and the ventral urethral surface is fully exposed.





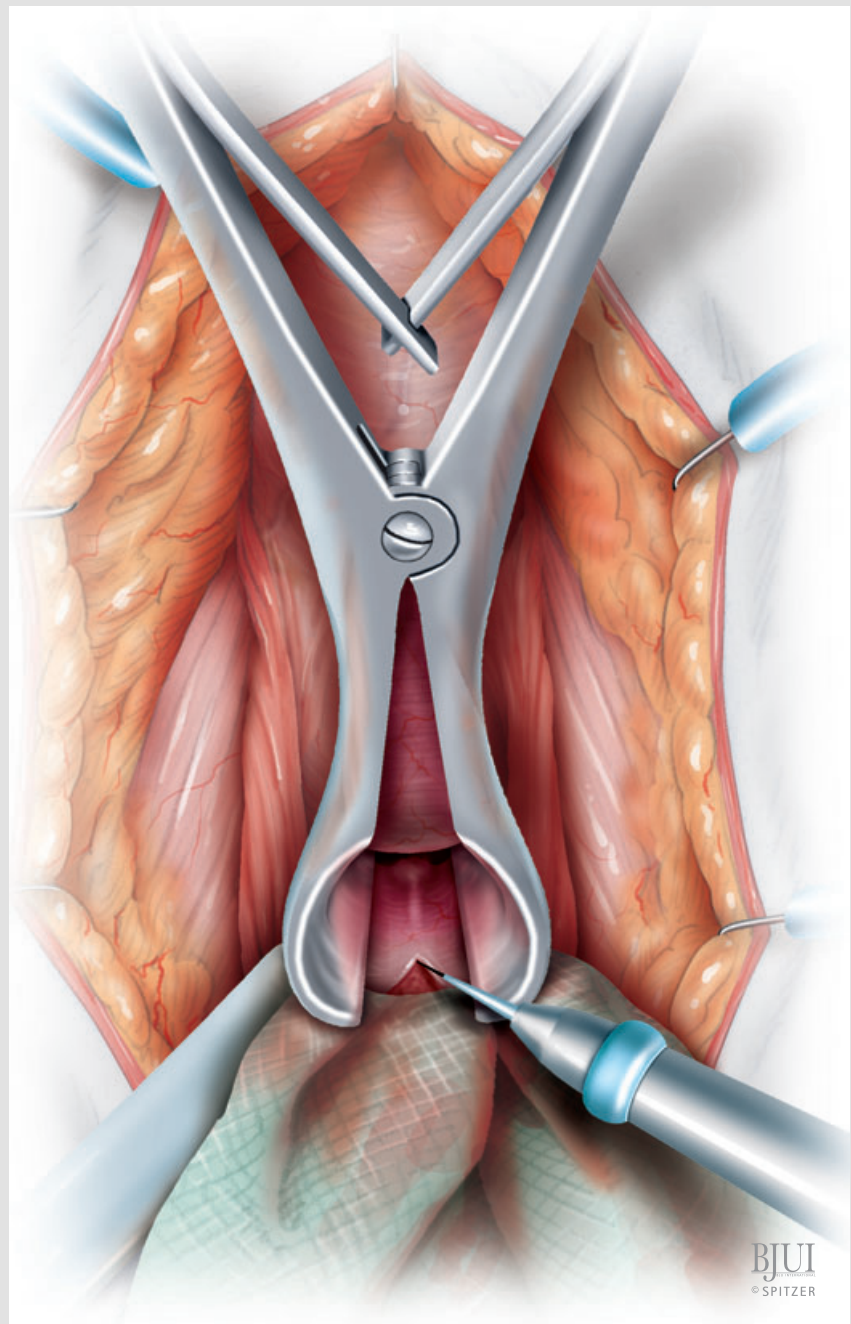
**Figure 4**

The corpus spongiosum is opened along its ventral surface, and the urethral lumen is fully exposed, extending the urethrotomy distally and proximally to the stenosis. Once the entire stricture has been fully opened, the length and width of the oral graft required for the augmentation of the urethral plate are measured.



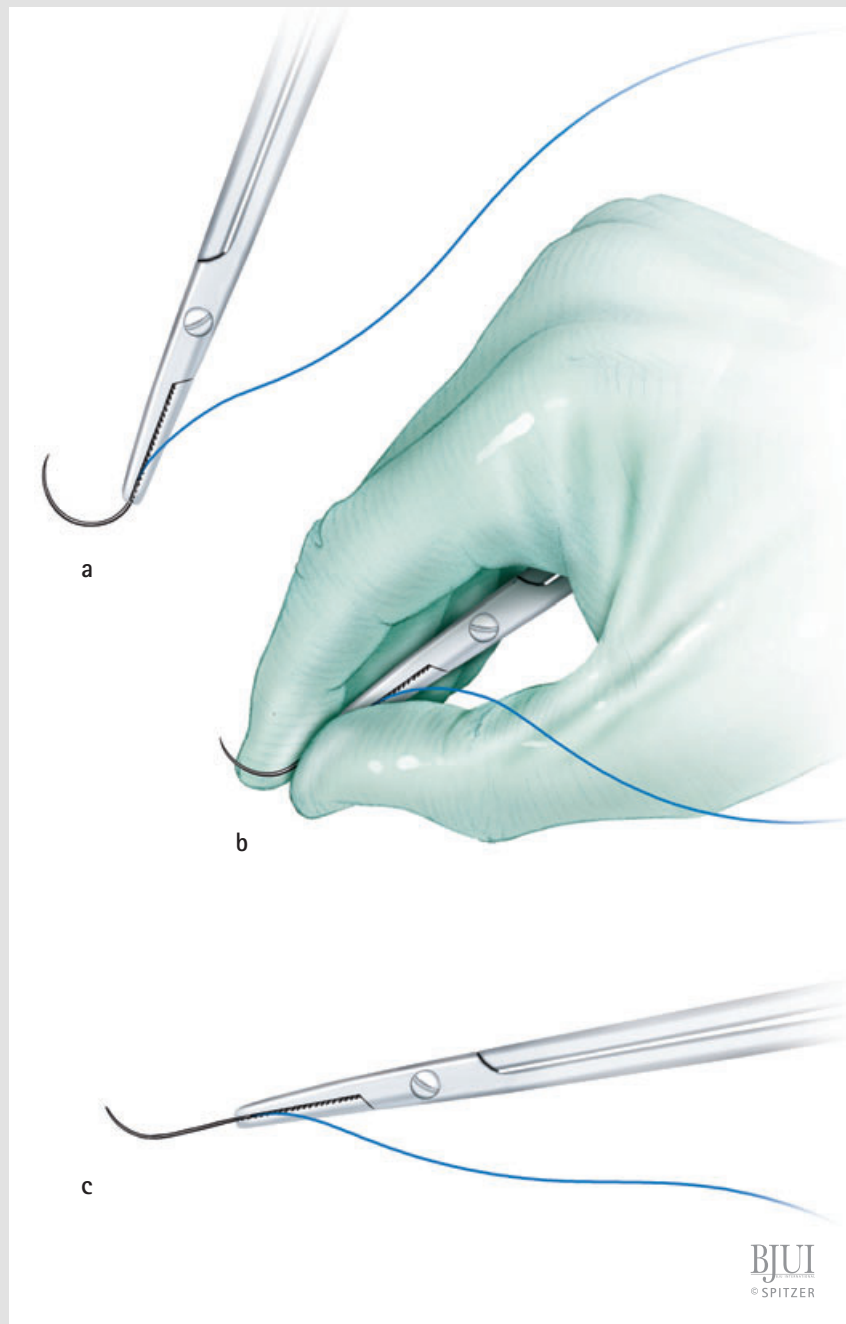
**Figure 5**

The nasal speculum is inserted into the proximal urethral opening, and the white mucosal ring is incised until pink mucosa is identified near the verumontanum. This incision should be limited to the urethral mucosa and does not involve the underlying spongiosum tissue, to avoid bleeding.



**Figure 6**

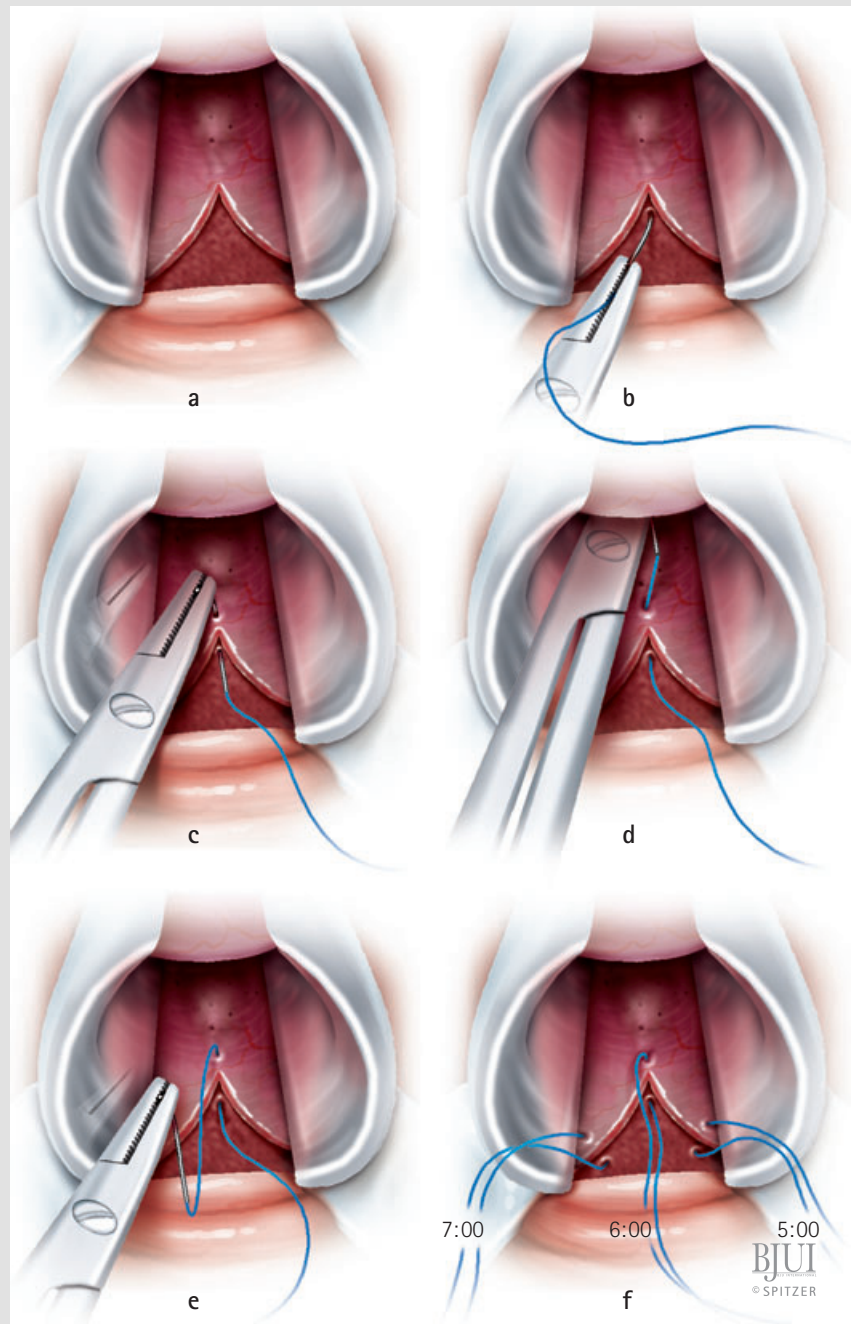
The needle used for a 5/0 polyglactin suture is modified by the surgeon into a J-shaped needle.





**Figure 7**

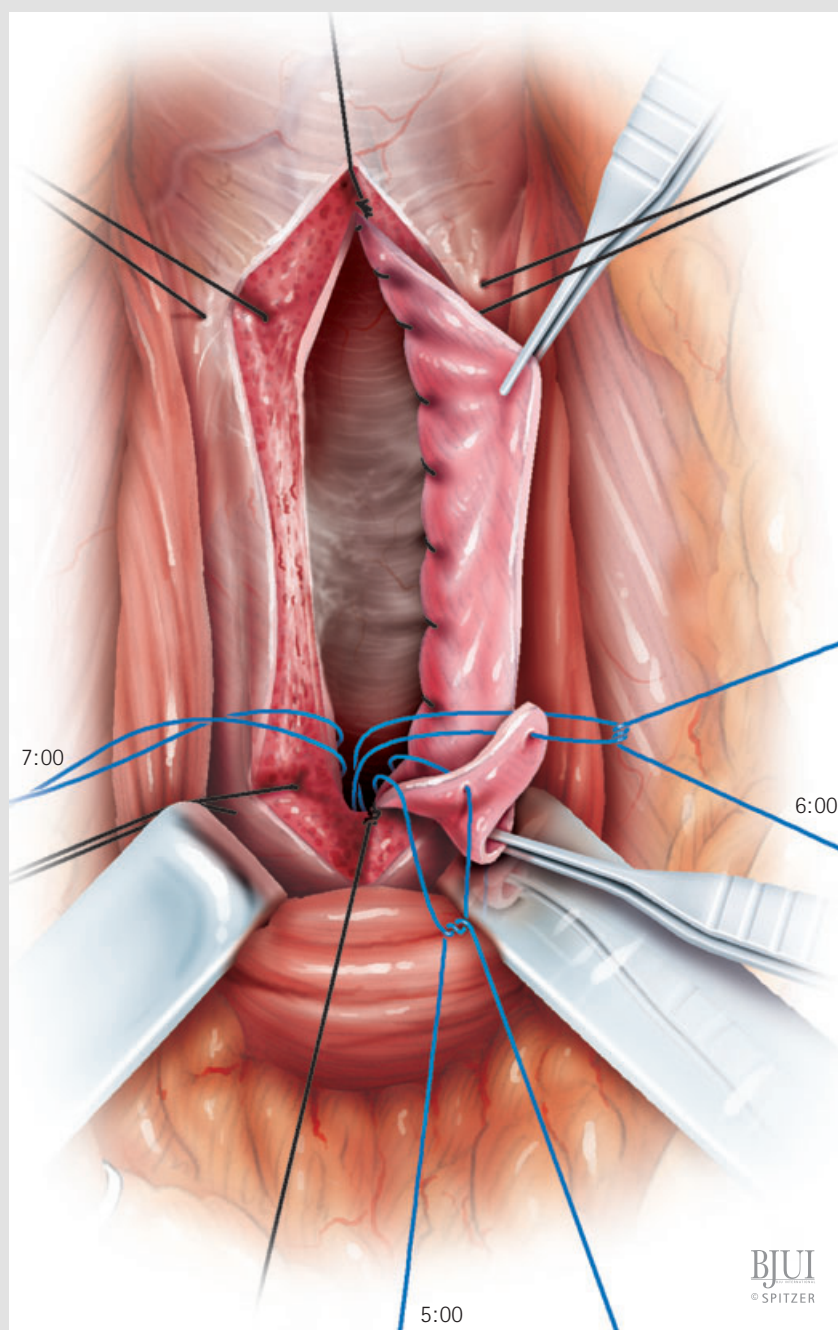
The J-shaped needle is passed through the spongiosum tissue in front up to the verumontanum (b–e). Using this technique, three sutures are passed in front up to the verumontanum, at the 5, 6 and 7 o'clock positions (f).



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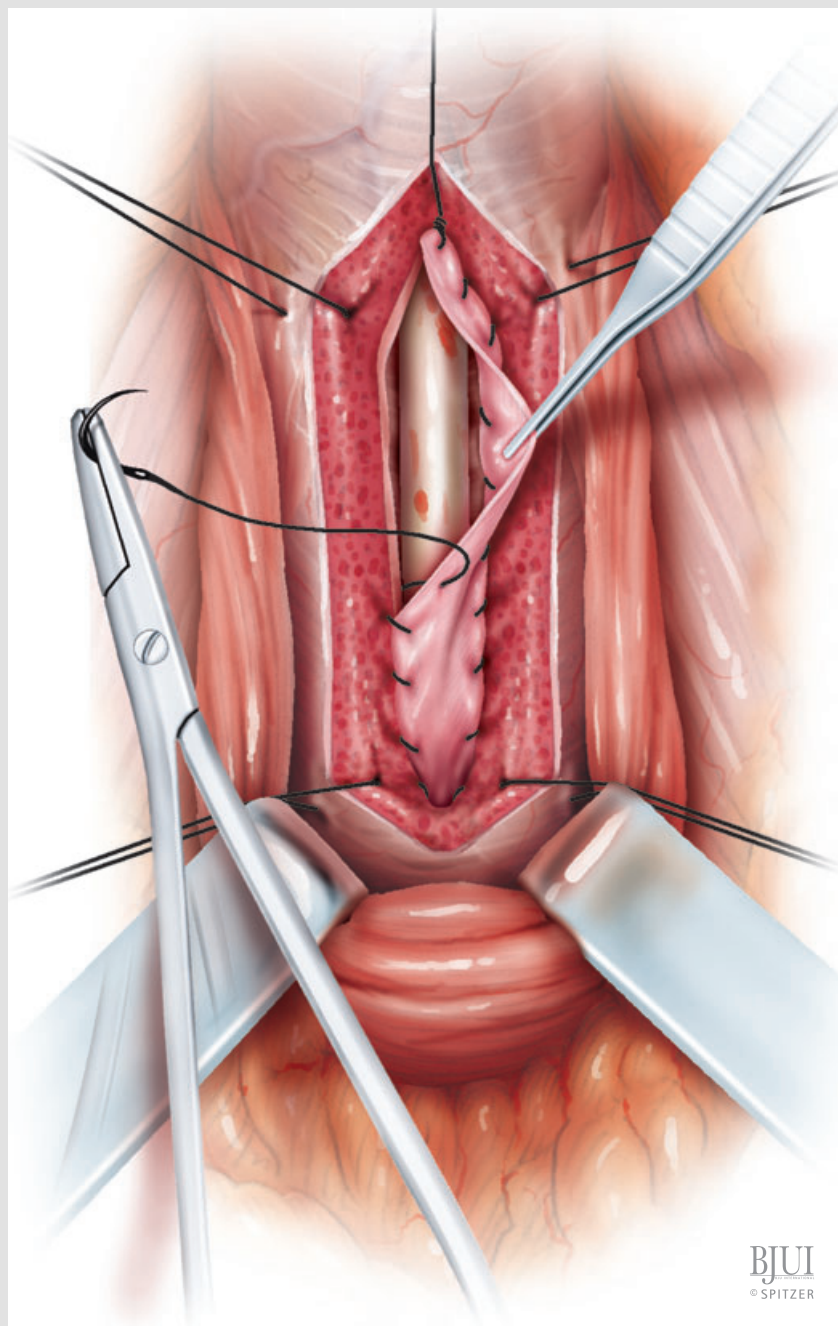
**Figure 8**

The oral mucosal graft is trimmed to its appropriate size, according to the length and width of the urethrotomy. The two ends of the graft are sutured to the proximal and distal apices of the urethrotomy and running 6/0 polyglactin suture is used to complete a watertight anastomosis between the left margin of the graft and the left margin of the urethral mucosal plate. The sutures previously placed at the 5 and 6 o'clock positions in front up to the verumontanum, are passed in the proximal oral mucosal graft edge. Using this step, the oral mucosa graft is pushed very deeply inside the healthy urethral mucosa near the verumontanum, where the mucosa is not involved in the scarring process.



**Figure 9**

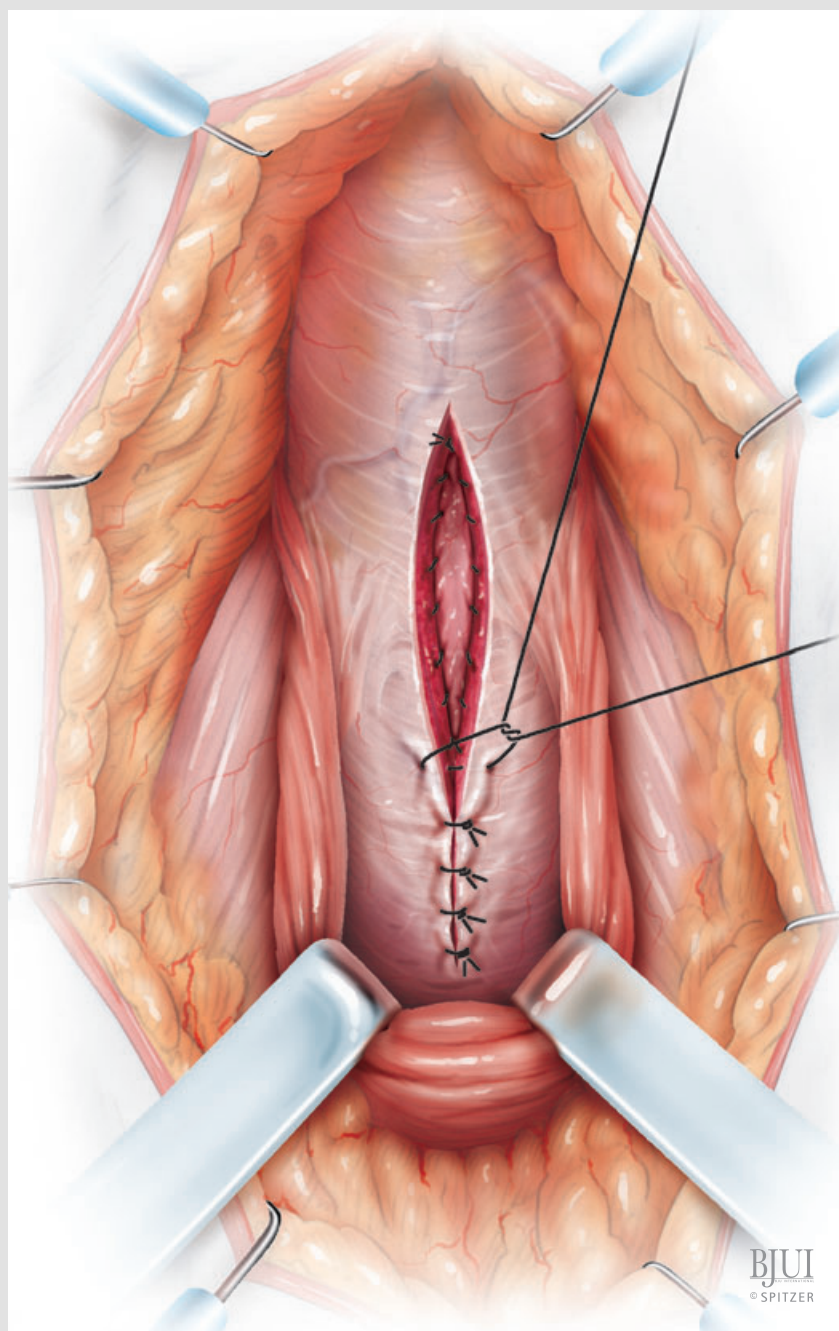
A Foley 16F grooved silicone catheter is inserted, and the suture previously placed at the 7 o'clock position in front up to the verumontanum, is passed in the proximal oral mucosal graft edge. The graft is rotated over the catheter and a running 6/0 polyglactin suture is used to complete a watertight anastomosis between the right margin of the graft and the right margin of the mucosal urethral plate.

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**Figure 10**

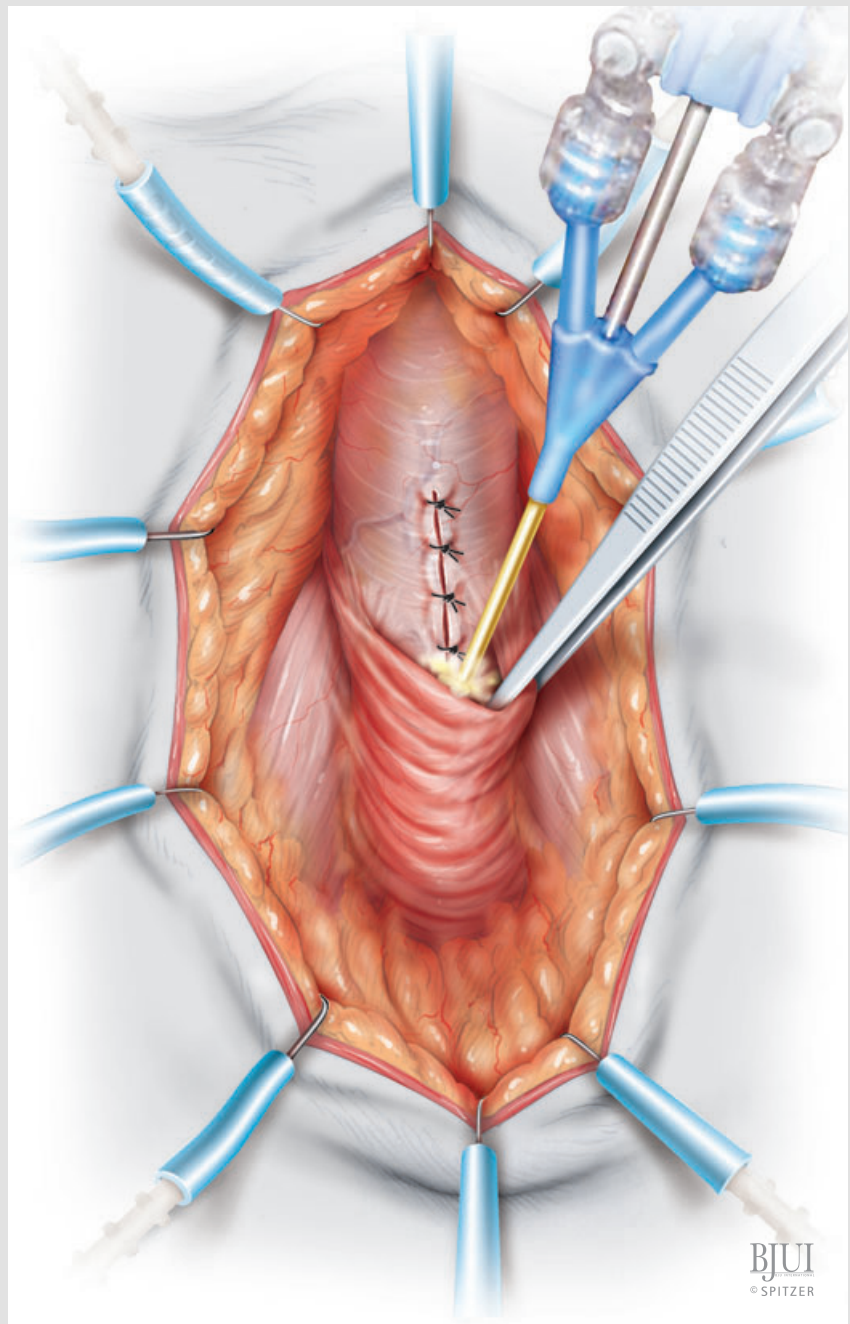
The spongiosum tissue is closed over the oral mucosal graft using interrupted 5/0 polyglactin sutures.



**Figure 11**

Fibrin glue (2 mL) is injected over the suture line of the corpus spongiosum.

The bulbo-spongiosum muscle is picked up to cover the spongiosum tissue. A drain is unnecessary. The catheter is left in place for 3 weeks.





## POSTOPERATIVE CARE

An ice bag is applied on the cheek to avoid pain and haematoma. A clear liquid diet and ice cream is given initially, and then advanced to a soft and regular diet. The patient ambulates on the first postoperative day and is discharged from the hospital 3 days after surgery. All patients receive postoperative broad-spectrum antibiotics and are maintained on oral antibiotics until the catheter is removed. At 3 weeks after surgery, the bladder is filled with contrast medium, the Foley catheter is removed and voiding cystourethrography is obtained.

## SURGEON TO SURGEON

To perform this kind of one-stage bulbar urethroplasty in a safe way the following steps are fundamental:

- use a double team
- use a simple perineal position
- use atraumatic retractors and hooks
- use fine suture material
- move the oral graft as proximal as possible

- suprapubic cystostomy is unnecessary
- perineal drain is unnecessary in most patients

## CONCLUSIONS

The technique that we describe is simple, reliable, and reproducible in the hands of any surgeon. The use of atraumatic appropriate surgical instruments and suture material, and meticulous technical performance are fundamental steps to obtain final satisfactory results and to avoid postoperative complications and sequelae. Using this technique it is possible to repair most proximal bulbar urethral strictures.

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