

Surgery Illustrated – Surgical Atlas

Perineal urethrostomy

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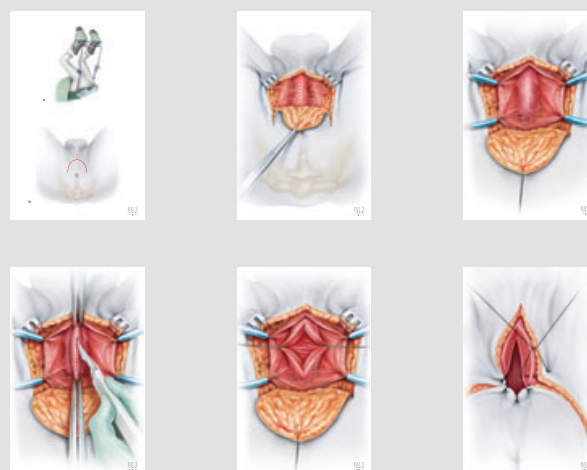
KEYWORDS

perineal urethrostomy, lichen sclerosis, urethra, stricture, reconstruction

INTRODUCTION

The surgical options for the treatment of anterior urethral strictures are extremely diverse. They include endoscopic procedures as well as a multitude of urethroplasty techniques [1–3]. The success rate of urethroplasty is excellent and for most techniques it is $\geq 80\%$ [4]. Despite this excellent success rate, there are several conditions that make urethral reconstruction challenging and may decrease its ultimate success. One example is lengthy strictures involving the entire anterior urethra. These 'panurethral' strictures can arise from various causes, but are notorious in the setting of lichen sclerosis. Other conditions, which decrease the success of anterior urethral reconstruction, are patients with multiple failed urethroplasties [5], history of hypospadias repair [6], and prior pelvic radiation therapy [7].

An alternative to urethroplasty in patients with unfavourable urethral pathology is perineal urethrostomy. A perineal urethrostomy is placed proximally in the bulbar urethra, just distal to the external sphincter allowing for diversion of urine proximal to the majority of the anterior urethra [8]. In addition to men with unfavourable urethral pathology, perineal urethrostomy is also a good option for men who do not desire extensive urethral reconstruction. Many of these men are older



and often they are not concerned with needing to sit to void after surgery.

PLANNING AND PREPARATION

INDICATIONS AND PATIENT SELECTION

Patients who choose to undergo perineal urethrostomy either have unfavourable urethral pathology for reconstruction or do not desire extensive surgery. Patients with contraindications to perineal urethrostomy are those with extensive disease proximal to the bulbomembranous junction such as prostatic urethral stenosis or bladder neck contracture. In addition, placement of an artificial urinary sphincter is not a good option after perineal urethrostomy and poor external sphincteric function especially

combined with a history of prostate resection or ablative procedures is a relative contraindication.

RECOMMENDED EQUIPMENT

- Perineal retractor (e.g. perineal Bookwalter, Lone Star retractor).
- Sacral bump.
- Atraumatic forceps.
- Bipolar cautery.
- Fine serrated dissecting scissors.

PATIENT PREPARATION

A preoperative urine culture is done to assure sterile urine in patients undergoing perineal urethrostomy. Patients are given immediate preoperative broad-spectrum antibiotics before making an incision. Sequential

compression devices are used during the operation.

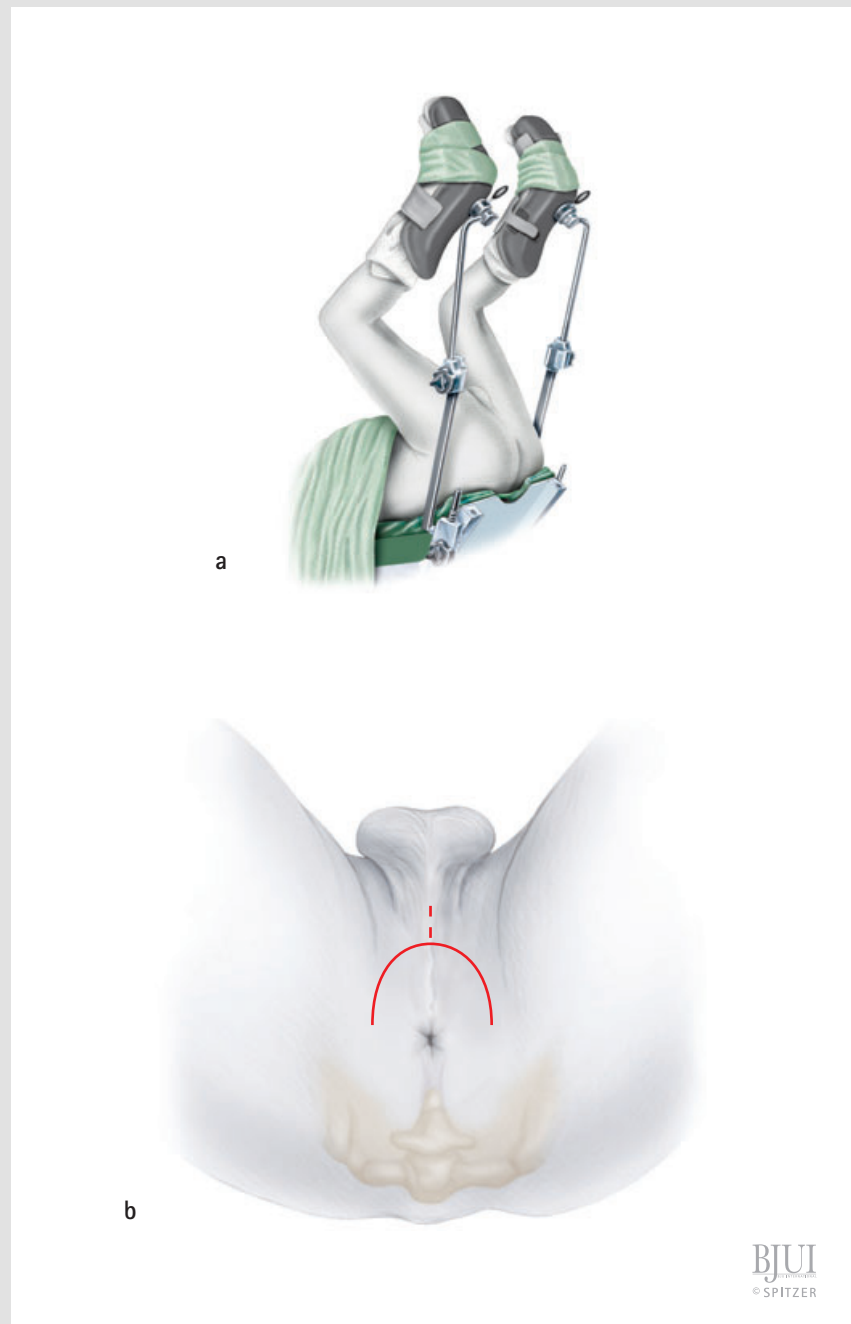
POSITIONING

After undergoing general endotracheal anaesthesia, patients are placed into a high lithotomy position using 'candy cane' stirrups. A sacral bump (we use a bean bag covered by a gel pad) is used to support and rotate the pelvis so the perineum and proximal urethra are easily accessible to the surgeon. Care is taken to make sure all pressure points are adequately padded. Complications in this position are rare [9], and should not occur if the duration of the operation is <5 h [10]. In addition to establishing an optimal position for access to the proximal urethra, the high lithotomy position allows two standing surgeons to operate side by side with ease.

Figure 1

After patients are positioned into the high lithotomy position (a) an inverted 'U'-shape incision is made (b). The apex of the inverted 'U' is located in the upper portion of the perineum just below the scrotum; this incision acts to relax the perineum and facilitates a tension-free anastomosis between the skin and urethra. This relaxing incision is especially important when patients are obese or have had previous perineal surgery.

In some cases, a midline incision extending cephalad from the apex of the inverted 'U' is made if the opening in the skin of the perineum is not large enough for the corresponding urethrotomy.



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Figure 2

An important component to the inverted 'U' incision and flap is the mobilization of a full thickness fat pad underneath it, directly off of the underlying bulbocavernosus muscle. This manoeuvre helps assure a good vascular supply to the apex of the flap.

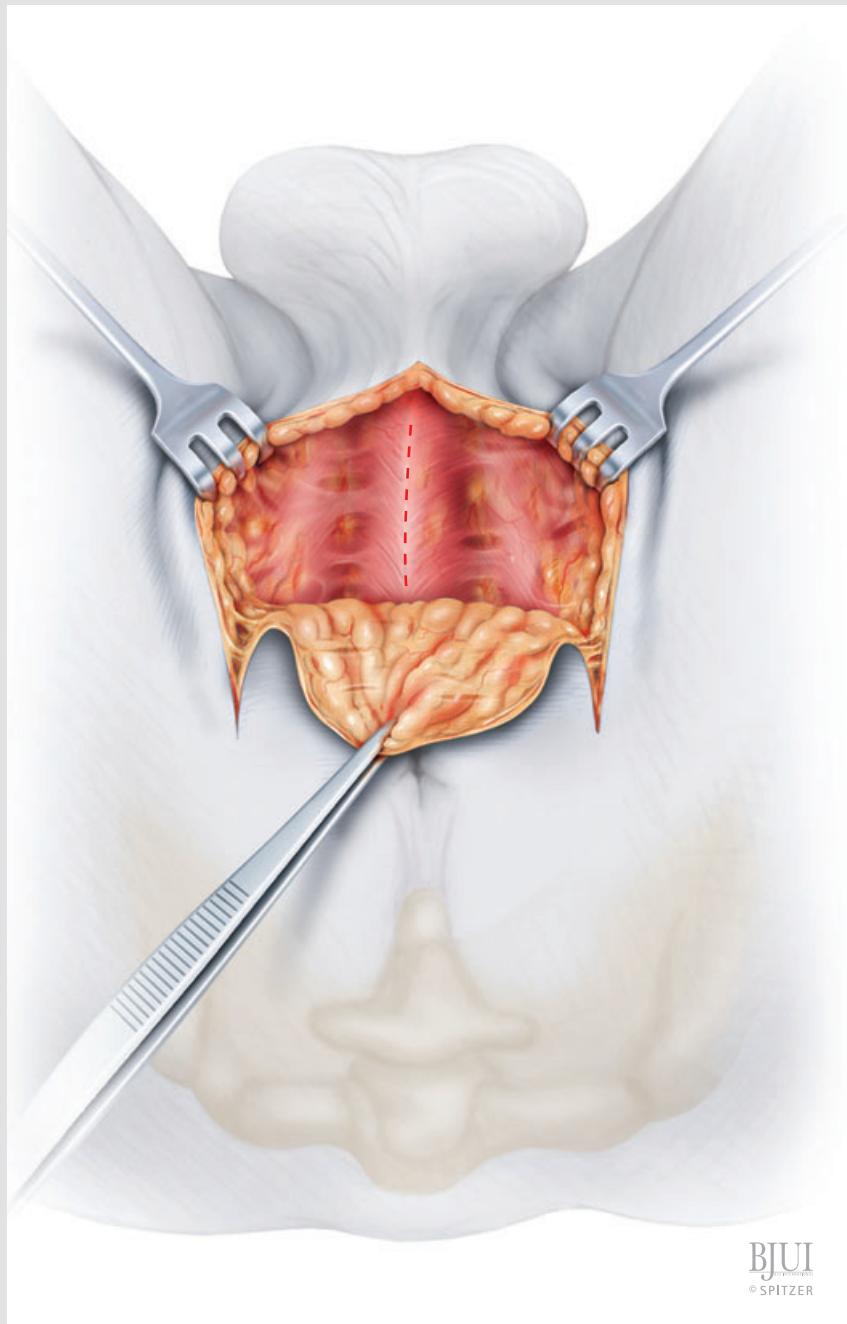
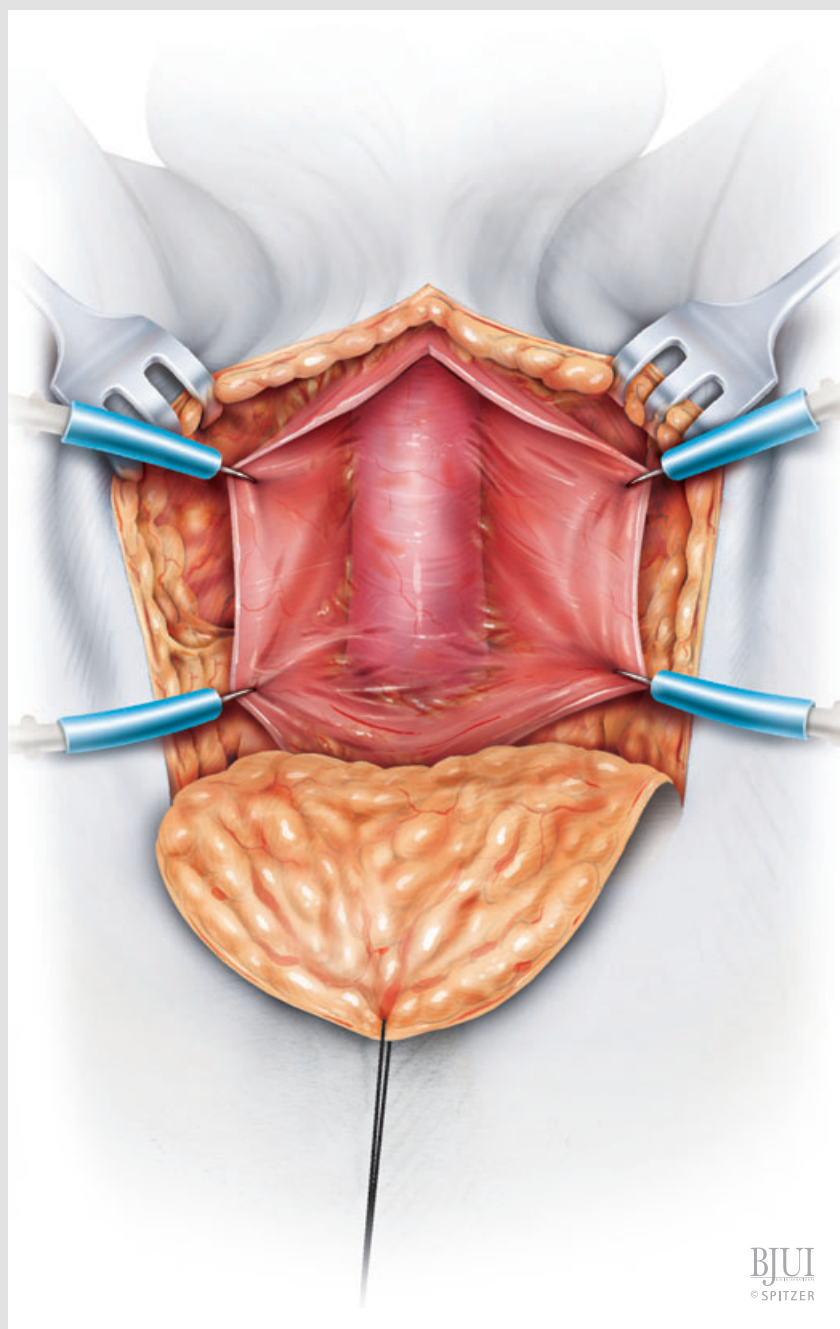


Figure 3

Once the inverted 'U' flap is developed, the bulbocavernosus muscle is separated, exposing the bulbar urethra.



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Figure 4

The urethra is then grasped with two pairs of forceps above and below the area of planned incision. A knife is then used to make a longitudinal incision ventrally into the urethra measuring ≈ 4 cm.

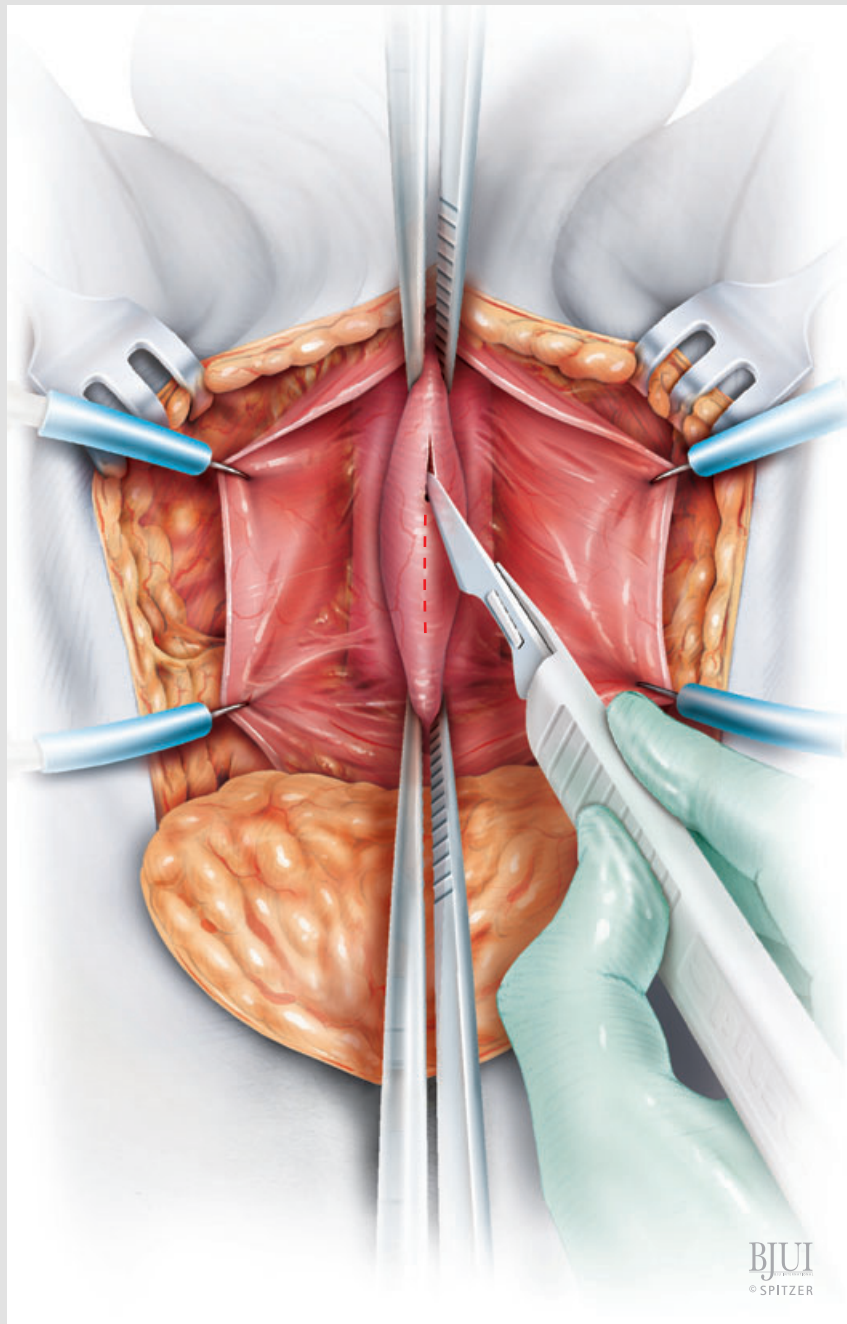


Figure 5

Stay sutures are placed and the urethra is calibrated with a bougie towards the bladder to make sure there is no stricture proximal to the urethrotomy. If strictured urethra is identified proximally, then the ventral urethral incision is extended towards the membranous urethra until an uninvolved area is found. Cystourethroscopy is performed to evaluate the distance to the external sphincter as well as to identify potential issues such as obstructive prostatic disease or bladder calculi.

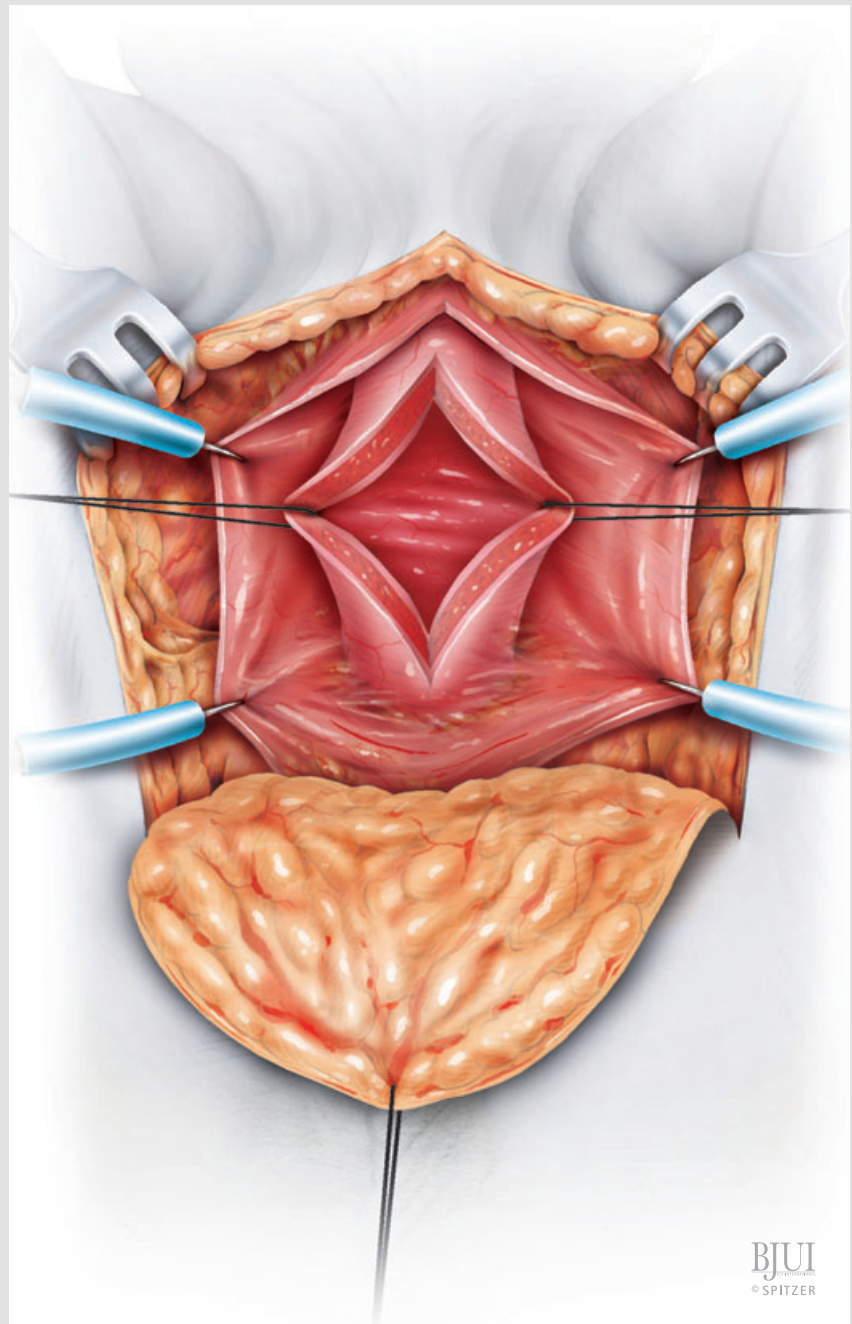
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Figure 6

The skin of the perineum is then sutured to the open urethrotomy preserving the dorsal urethral plate. This starts with bringing the apex of the inverted 'U' incision to the proximal margin of the urethrotomy. During placement of sutures, care is taken to incorporate three important layers: the urethral mucosal edge, the adventitial edge of the corpus spongiosum, and lastly the skin edge. This method preserves blood supply within the corpus spongiosum, in contrast to the effect of a full thickness suture through the corpus spongiosum. To help reduce any tension on the inverted 'U' flap, we also place several sutures in the subdermal tissue of the body of the flap, securing these sutures to dense tissue surrounding the bulbar urethra. Interrupted absorbable suture, consisting of 2-0 or 3-0 polyglactin (Vicryl, Ethicon Inc.), is used to mature the perineal urethrostomy.

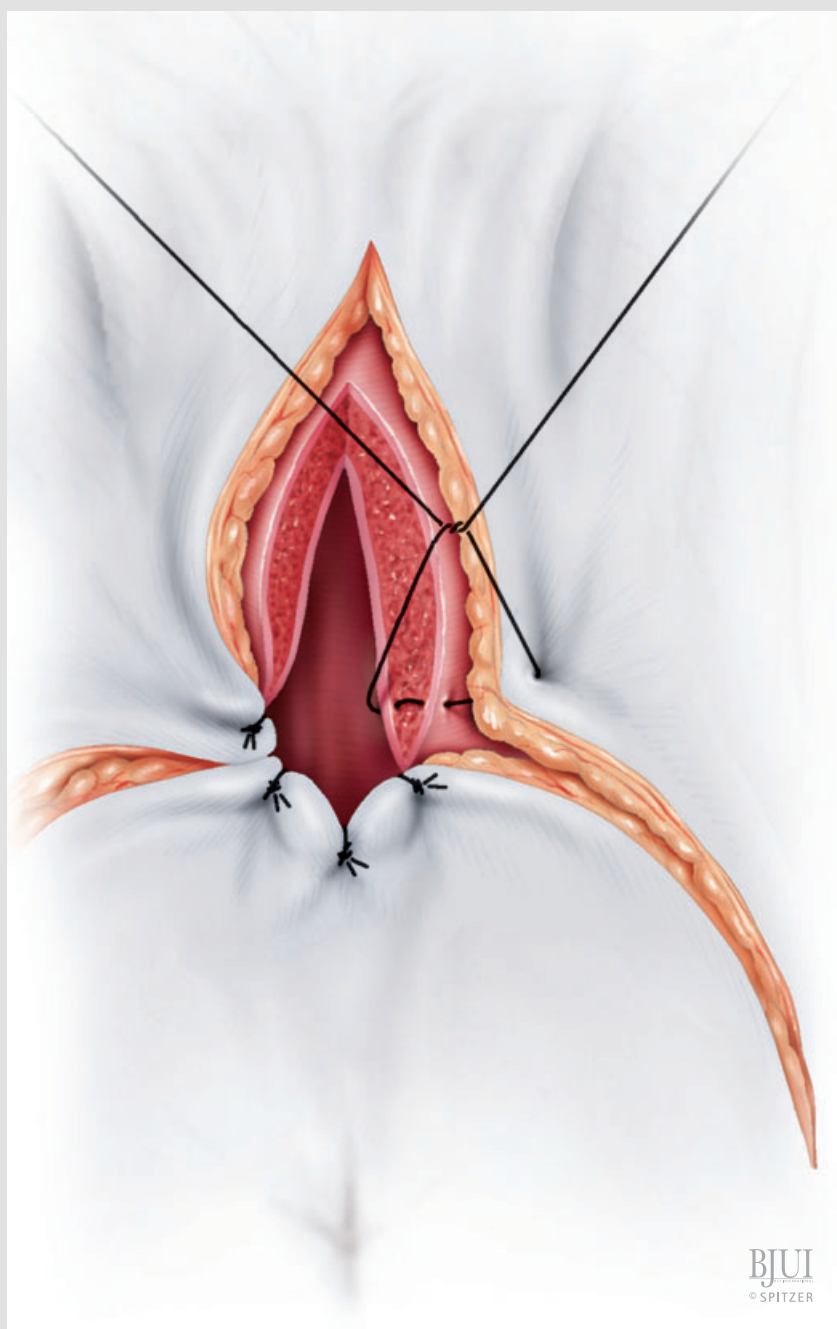
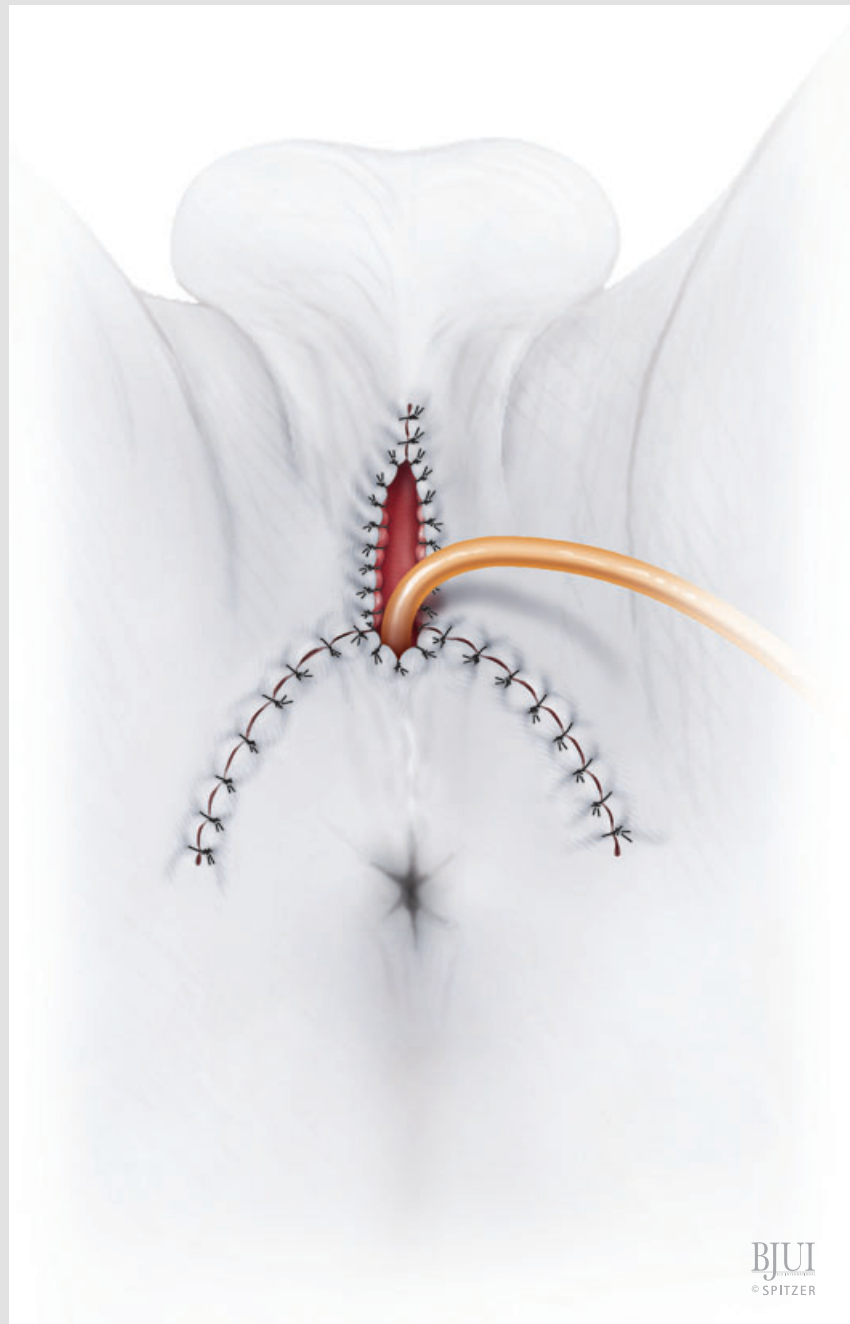


Figure 7

Once the skin is brought down to the urethra around the entire urethrotomy, two openings exist between the urethra and the skin. The proximal opening of the urethra leads towards the bladder and the distal urethral opening leads out towards the penis. The dorsal urethral plate remains intact, as well as the longitudinal blood flow within the corpus spongiosum. A Foley catheter is placed through the proximal portion of the urethrotomy into the bladder and patients are admitted to the surgical ward for recovery.

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POSTOPERATIVE CARE

Patients during the postoperative period are treated with antibiotics until the catheter is removed. Usually the catheter is left *in situ* for 4–7 days. If there is any concern about local tissue healing at the inverted 'U' advancement flap, then the catheter can be left for a longer period. Patients are followed at regular intervals in our clinic. Cystourethroscopy is performed at 3 and 12 months or if there is any concern of stenosis, based upon symptoms, UTI, a low urinary flow rate, or an increase in postvoid residual urine volume. After 1 year, patients are followed by symptoms, urinary flow rate and measurement of residual urine every 6–12 months.

SURGEON TO SURGEON

Patients who have anterior urethral stricture disease and have not had previous perineal surgery are ideal candidates for perineal urethrostomy. In most of these cases the proximal bulbar urethra is free of disease and has relative normal anatomy. The types of cases that might present in this manner are patients with lichen sclerosis involving the distal urethra, squamous cell carcinoma of the penis, or older men with stricture disease who do not want reconstruction but prefer the concept of perineal urethrostomy. Patients who represent more difficult cases are those with previous perineal surgery such as resection for Fournier's gangrene, previous failed perineal surgery for stricture disease, and morbidly obese men. In addition, caution must be advised in men with previous radiation for prostate cancer as we have found these men to be much more prone to postoperative stenosis of the perineal urethrostomy.

One technical aspect of the operation that can help is the high lithotomy position. This

position allows the best access to the proximal urethra and allows creation of the perineal urethrostomy up to the level of the external sphincter if necessary. An additional surgical pearl is to make sure the inverted 'U' flap extends up close to the junction of the scrotum. Once this inverted 'U' flap is released off of the bulbocavernosus muscle it contracts substantially. Especially in men with previous surgery or who are obese, the length of this flap is crucial to create a tension-free anastomosis between the apex of the flap and the proximal urethrotomy.

The most common intraoperative problem is stricture that extends from the area of the bulbar urethra towards the external sphincter. Usually this problem can be dealt with by extending the ventral urethrotomy up to the level of the external sphincter. On occasion the dorsal plate of the urethra is very diseased and not suitable for creation of the perineal urethrostomy. In these circumstances, it is worthwhile adding a dorsal buccal mucosal graft to recreate a dorsal plate for the length of the perineal urethrostomy, so that the area does not contract with wound healing and time.

CONCLUSIONS

Perineal urethrostomy represents a good alternative to urethral reconstruction in men with anterior urethral disease arising from various problems. The success rate, even when stricture disease is caused by conditions such as radiation therapy, lichen sclerosis, or failed urethroplasty, is excellent. We think that preservation of the dorsal plate and the longitudinal blood supply in the corpus spongiosum are critical factors in successful surgery.

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