

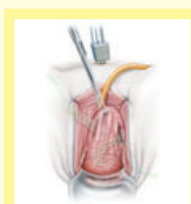
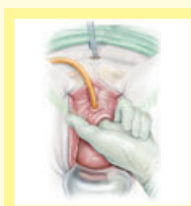
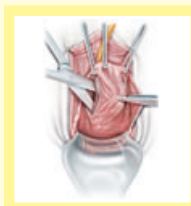
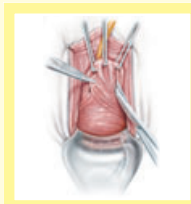
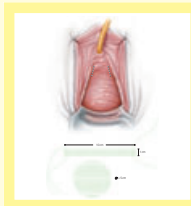
Surgery Illustrated

Surgical Atlas

Correction of cystocele

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ILLUSTRATIONS by STEPHAN SPITZER, www.spitzer-illustration.com



PLANNING AND PREPARATION

A cystocele should only be corrected in those patients with a symptomatic high-grade cystocele. These symptoms may include frequency, urgency, urinary incontinence, difficulty emptying, frequent UTIs, upper tract obstruction, or limitations of activity with a decrease in quality of life. A thorough evaluation should include a history and physical examination (documentation of vaginal prolapse, pelvic organ prolapse quantification score), urodynamic study and cystoscopy. In addition, MRI of the pelvis for prolapse allows a more accurate delineation of intrapelvic organs and proper planning of the repair for all compartments, i.e. cystocele, uterine prolapse, enterocele and rectocele.

The patient should receive preoperative i.v. antibiotics (e.g. ciprofloxacin, gentamicin) before the incision. The suprapubic, labial and perineal areas must be shaved. The patient is placed in a dorsal lithotomy position, and the lower abdomen and vagina are prepared and draped.

EQUIPMENT/MATERIALS

- 1 × 10 cm soft polypropylene mesh with a 0 polyglactin suture attached to each end, and soaked in dilute betadine solution;

- a 5 × 5 cm disk of soft polypropylene mesh soaked in dilute betadine solution;
- a ring retractor;
- a Lowsley retractor;
- a weighted vaginal speculum;
- a double-pronged passer;
- and a cystoscope.

SURGICAL STEPS

This is a transvaginal-paravaginal technique that simultaneously repairs four defects present in patients with a significant cystocele by: (i) supporting the hypermobile urethra by a sling procedure; (ii) approximating the cardinal ligaments back to the midline; (iii) repairing the central defect by approximating the perivesical fascia to the midline; and (iv) correcting the lateral defect by supporting the bladder neck and bladder base to the obturator fascia, using mesh. Should only the central defect be repaired the cystocele may recur (as there is no lateral support) and de novo incontinence may ensue because of the poorly supported and hypermobile urethra. However, if only a bladder neck suspension or plication procedure is done with no correction of the cystocele, the patient may develop aggravation of the prolapse, obstructive symptoms and urinary retention. High-grade cystoceles are rarely isolated occurrences.

DENG and RAZ

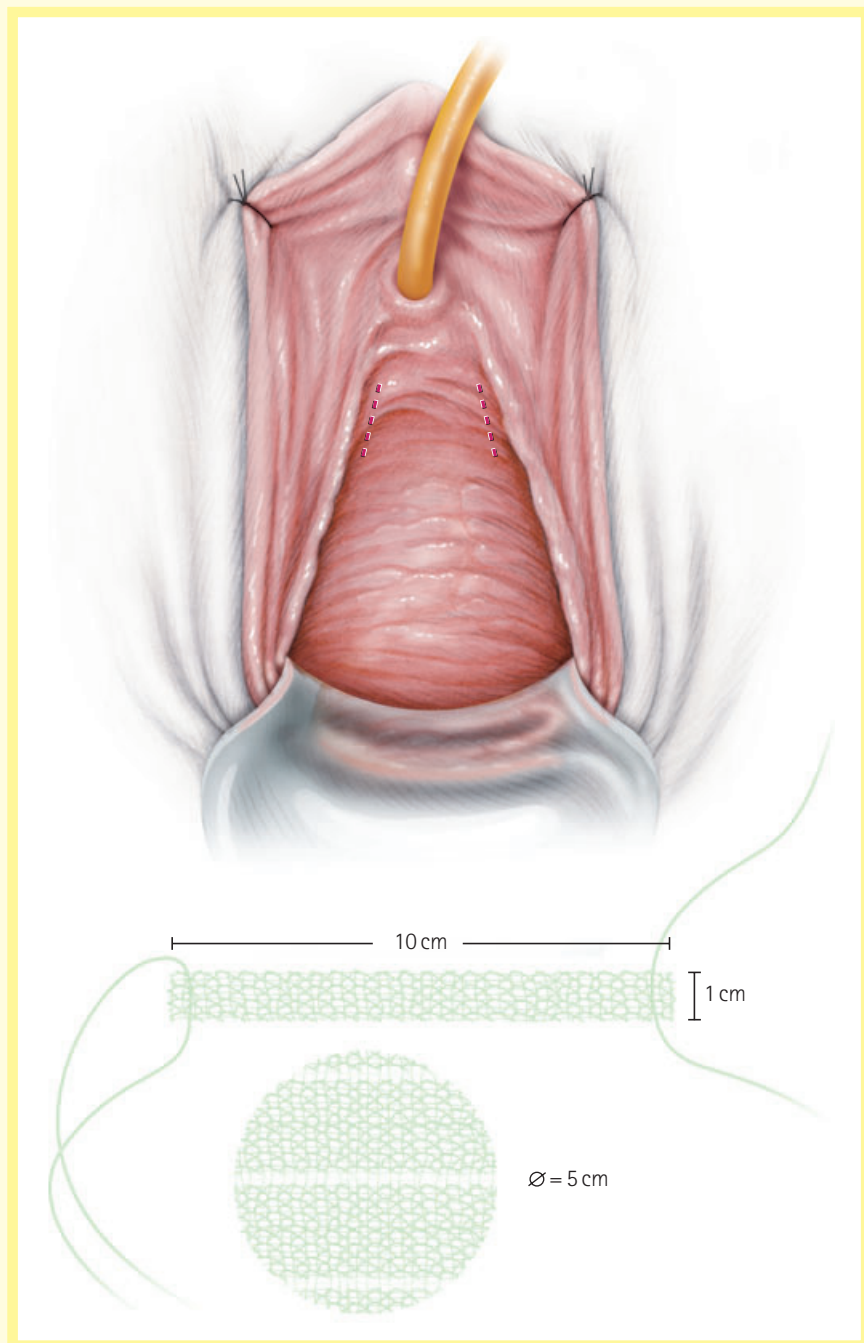
In patients having a cystocele repaired >90% require concomitant surgery to correct uterine prolapse, enteroceles or rectoceles.

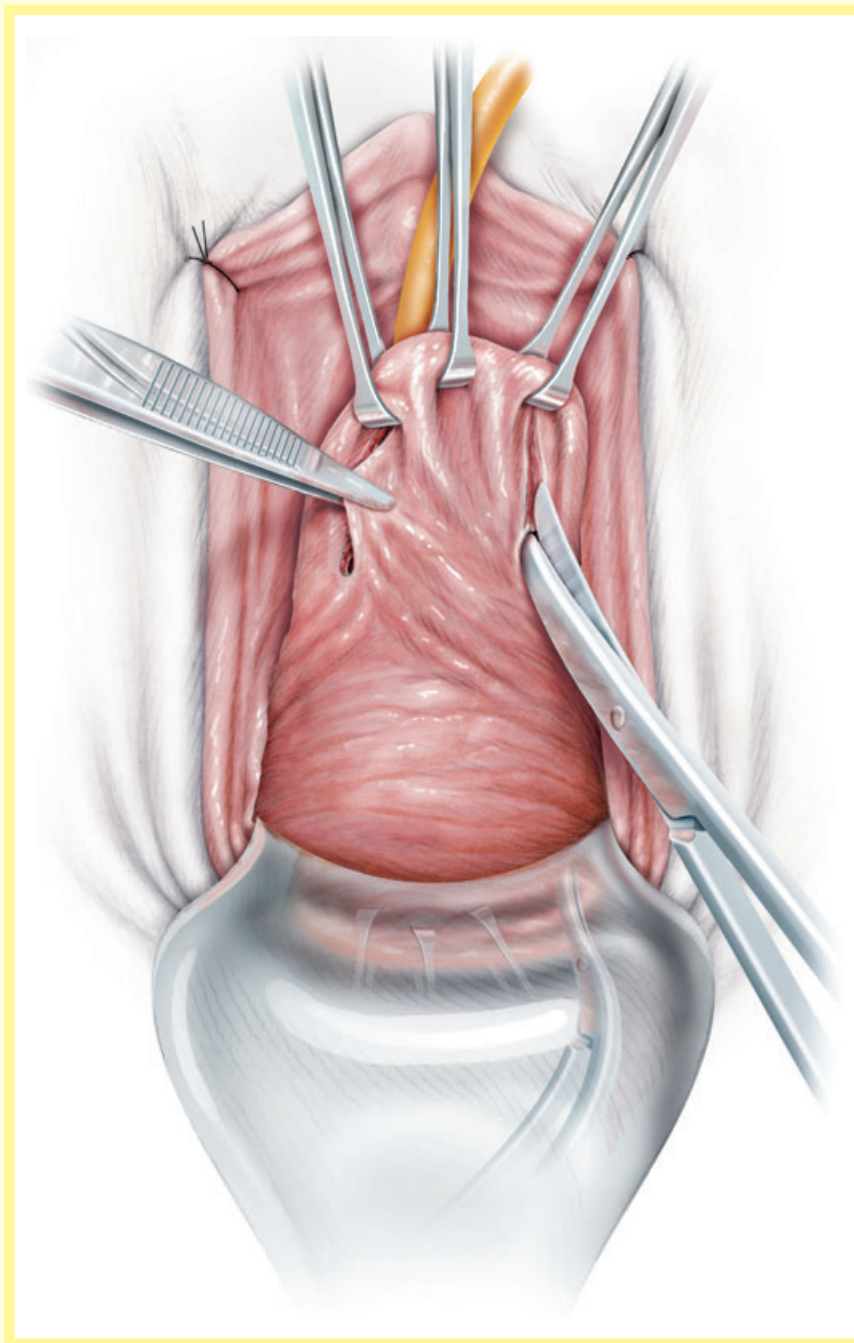
The following steps describe the distal urethral sling and cystocele repair. However, if total vaginal prolapse was present, the order of repair is as follows: transvaginal

hysterectomy, vault suspension sutures placed, enterocele repair with purse-string sutures, sling, cystocele repair, vault sutures tied, and rectocele repair.

Figure 1

The mesh is prepared (1×10 cm, 5×5 cm disk). Labial sutures are placed and the weighted speculum inserted. A suprapubic cystostomy tube (SPT) and urethral catheter are placed. The bladder is emptied by suction on both tubes. A ring retractor with multiple hooks is used for additional exposure. Three Allis clamps are used to grasp the anterior vaginal wall just proximal to the urethral meatus.

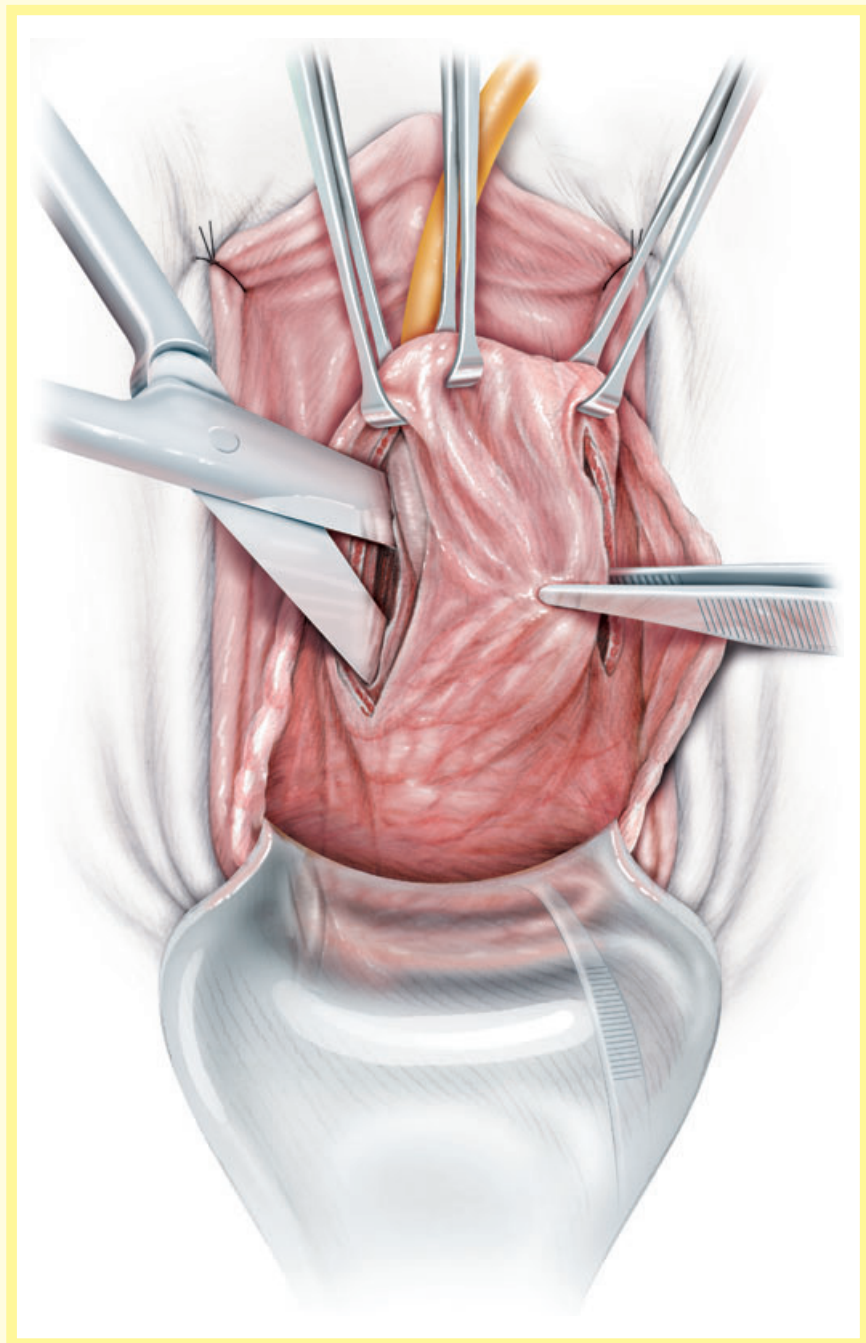


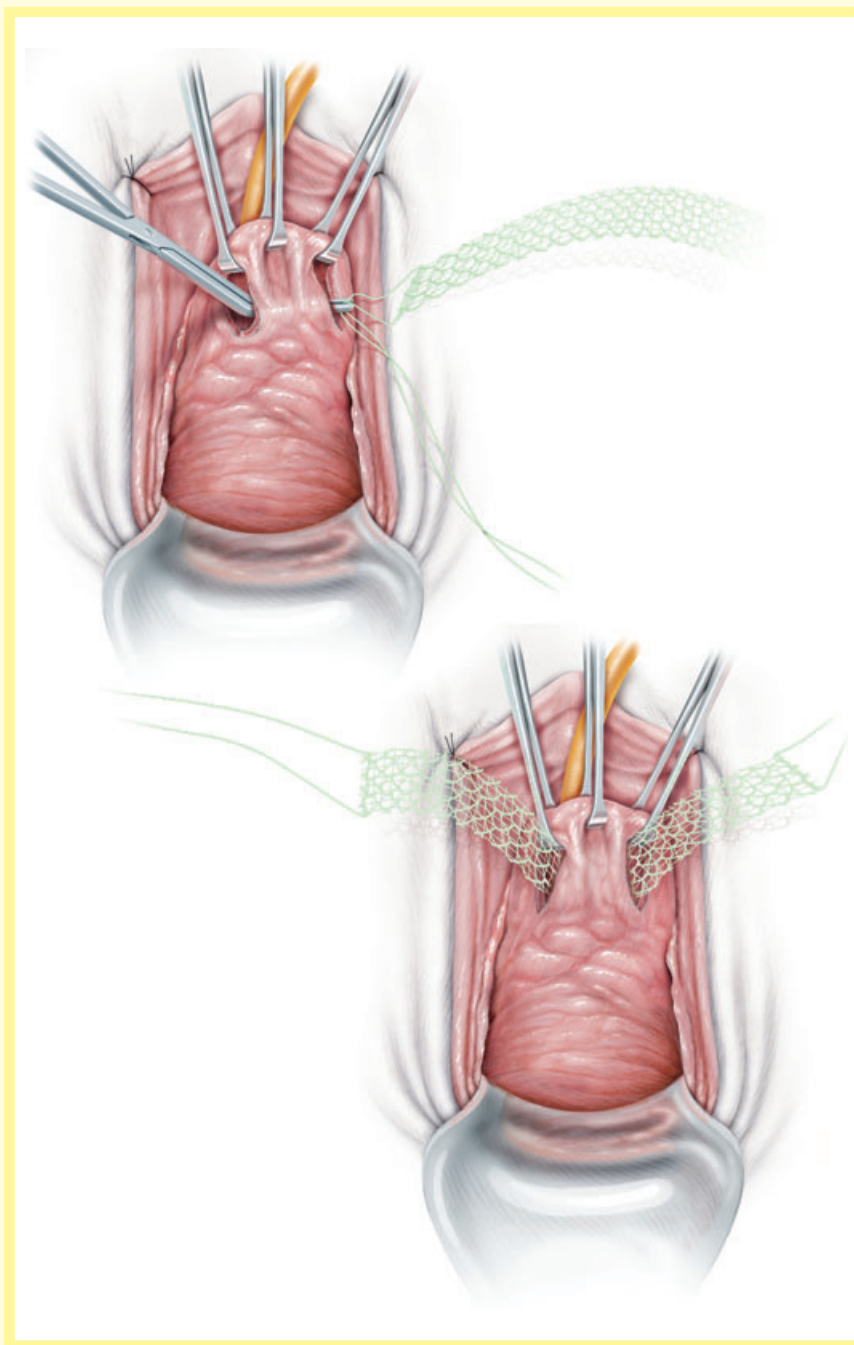
**Figure 2**

Two oblique incisions are made in the anterior vaginal wall between the mid and distal urethra, exposing the periurethral fascia. The incisions should not be > 2 cm long.

Figure 3

The vaginal epithelium is dissected laterally along the glistening white periurethral fascia, using fine Metzenbaum scissors towards the inferior ramus. Curved Mayo scissors are used to perforate the urethropelvic fascia at the level of the bladder neck toward the ipsilateral shoulder, hugging the underside of the pubis. A small window is made in the retropubic space sufficient to allow the passage of one finger. It is important that the dissection and penetration into the retropubic space be carried out at the level of the urethra; if it is at the perivesical level there is a greater risk of bladder penetration and damage.

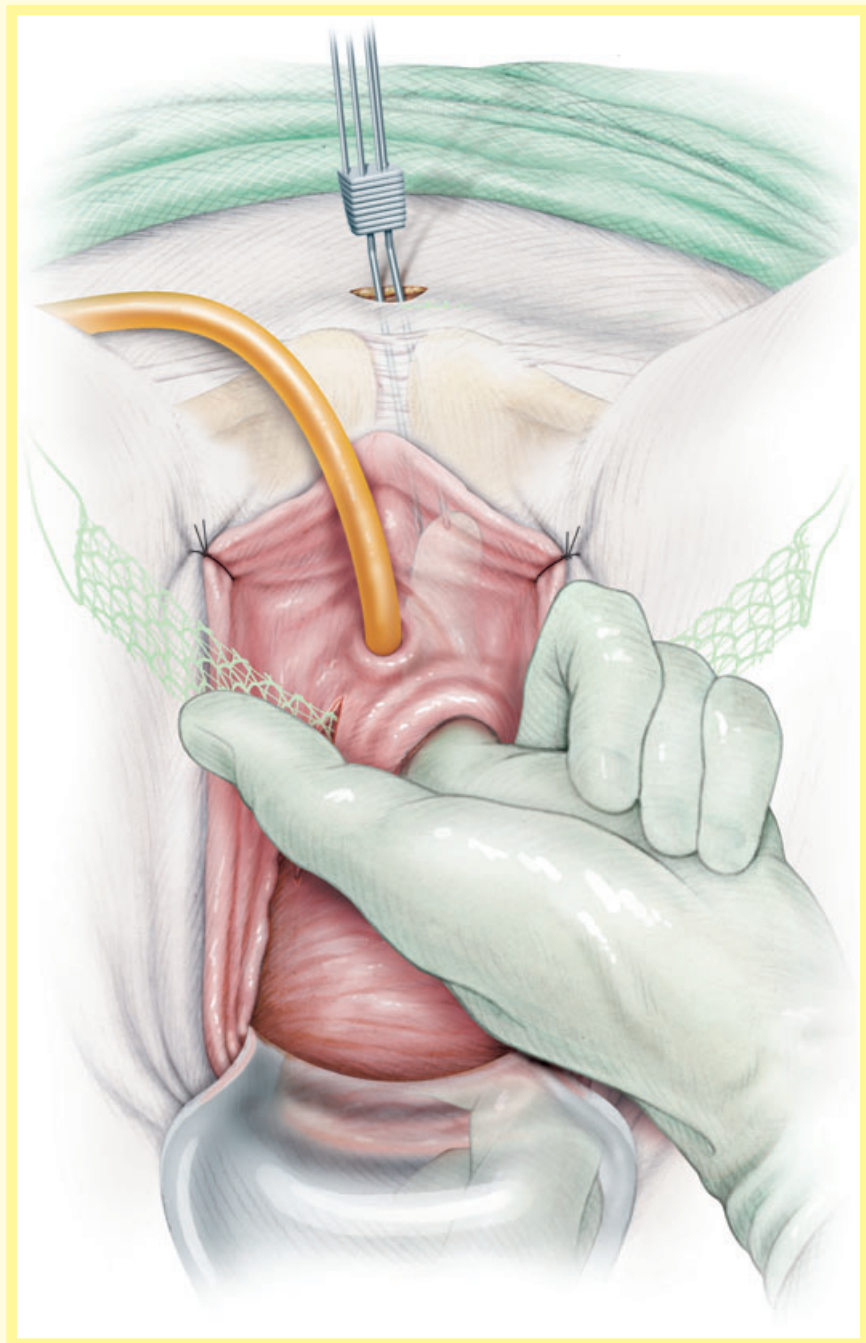


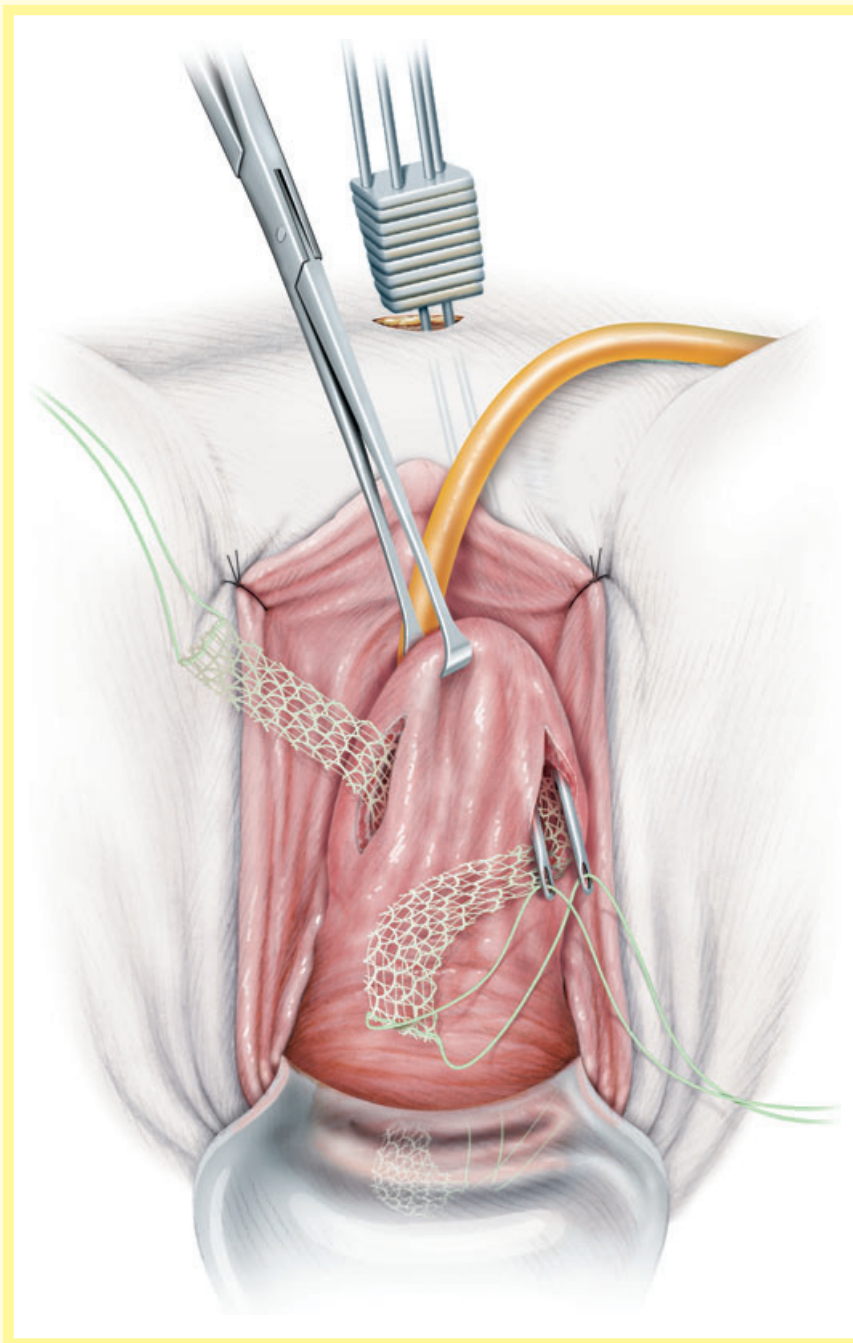
**Figure 4**

Using a right-angle clamp, a 2-cm wide tunnel is made under the vaginal wall, between the mid and distal urethra. More proximal placement can lead to worsening of the incontinence or obstruction. The 1 × 10 cm mesh is transferred underneath the tunnel and positioned in the centre of the incisions.

Figure 5

A 1-cm puncture is made in the suprapubic area over the superior margin of the pubic symphysis. A haemostatic clamp is used to create a pocket in the suprapubic area over the symphysis. A higher incision is not recommended because tying the suspending sutures over a mobile area of the anterior abdominal fascia may lead to pain and incomplete support. Under digital guidance a double-pronged ligature carrier is transferred from the suprapubic to the vaginal area, staying close to the midline and hugging the back of the pubic symphysis. The finger is in contact with the prongs of the passer at all times in the retropubic space, to prevent inadvertent penetration of the bladder or urethra.

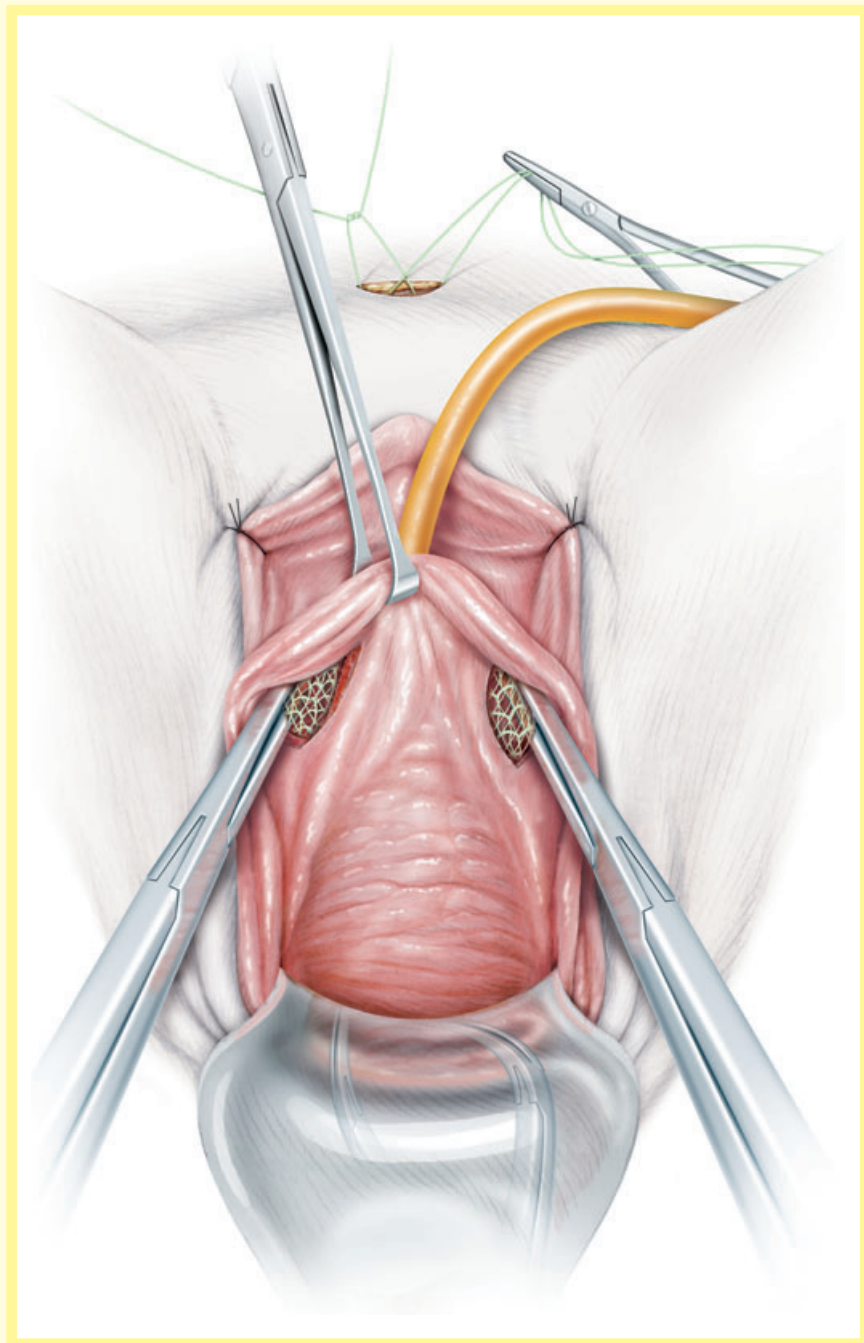


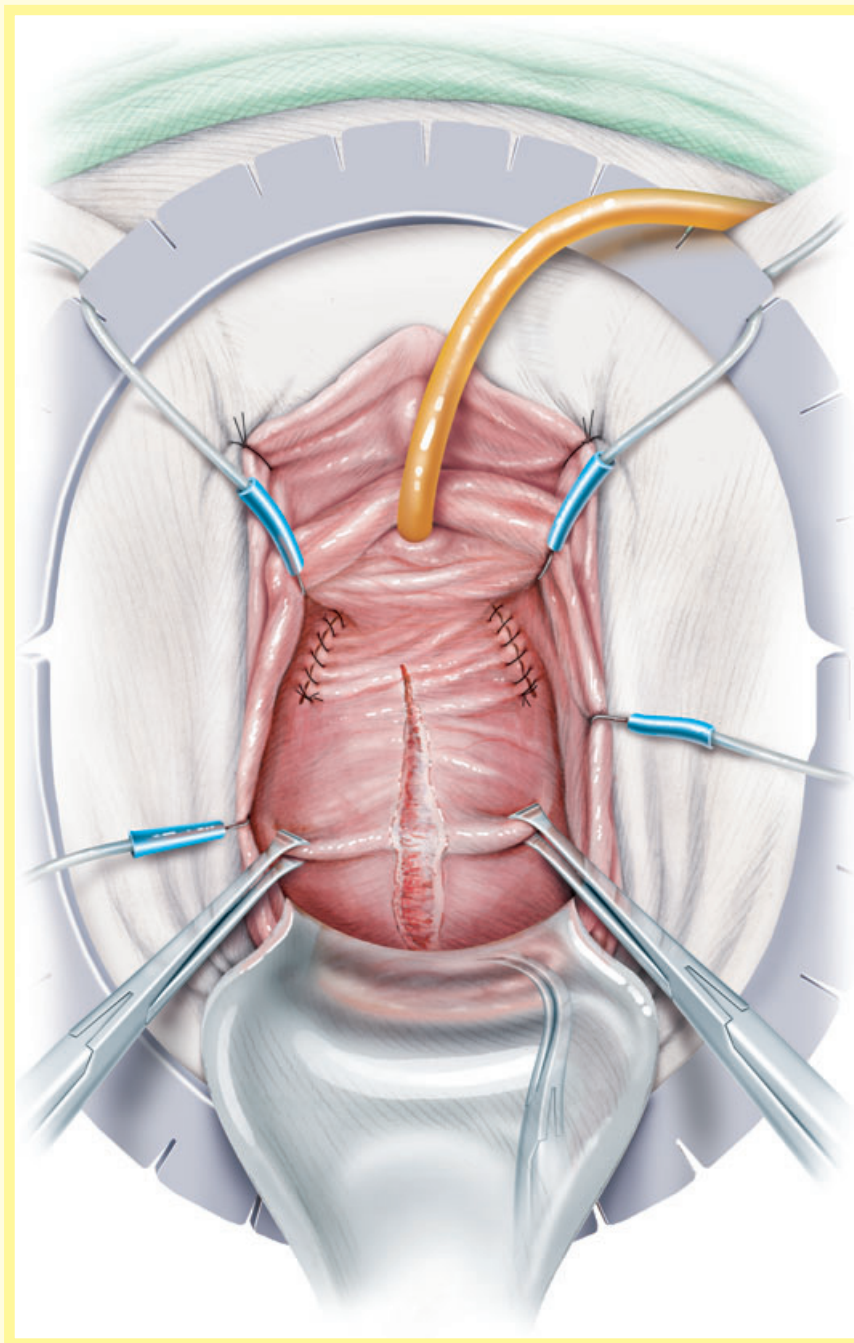
**Figure 6**

The tips of the passer are brought out of the vaginal incision. The polyglactin suture attached to the end of the mesh is threaded through the eyes of the needle. The passer is pulled upward, bringing the suture from the suprapubic incision. The same manoeuvre is repeated on the other side, with a clamp securing each set of sutures. A bridge of 1 cm is created between each suture.

Figure 7

An Allis clamp is used to hold the polypropylene mesh on each side of the vaginal incisions in a horizontal plane, while the suprapubic sutures are tied individually with four knots each just beneath the skin (not over the abdominal fascia). This manoeuvre prevents undue tension of the sling and decreases the risk of urethral obstruction. Dilute betadine solution is used to irrigate the retropubic space with a catheter-tip syringe. The vaginal incisions are then closed with running sutures of 3-0 polyglactin. The suprapubic incision is closed with a subcuticular suture.

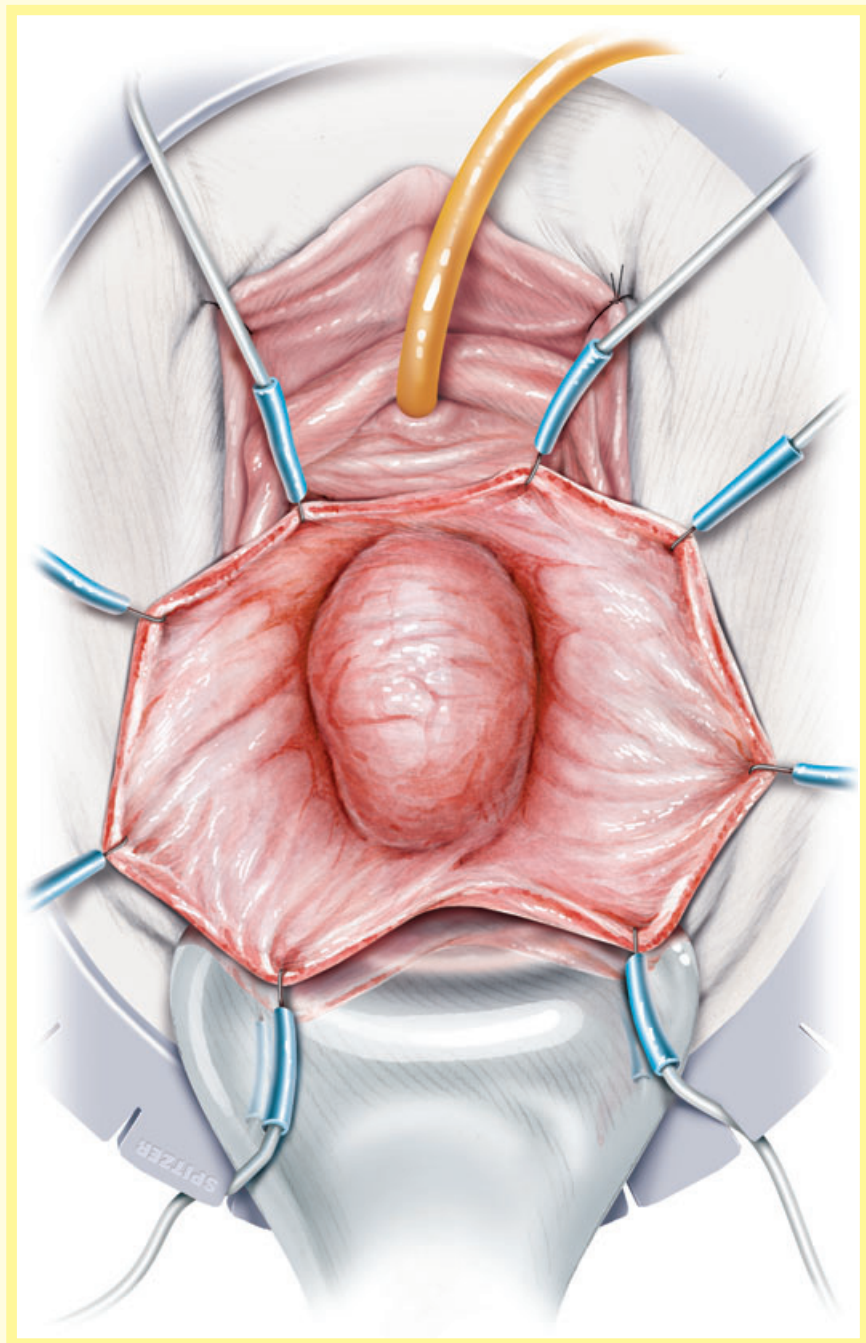


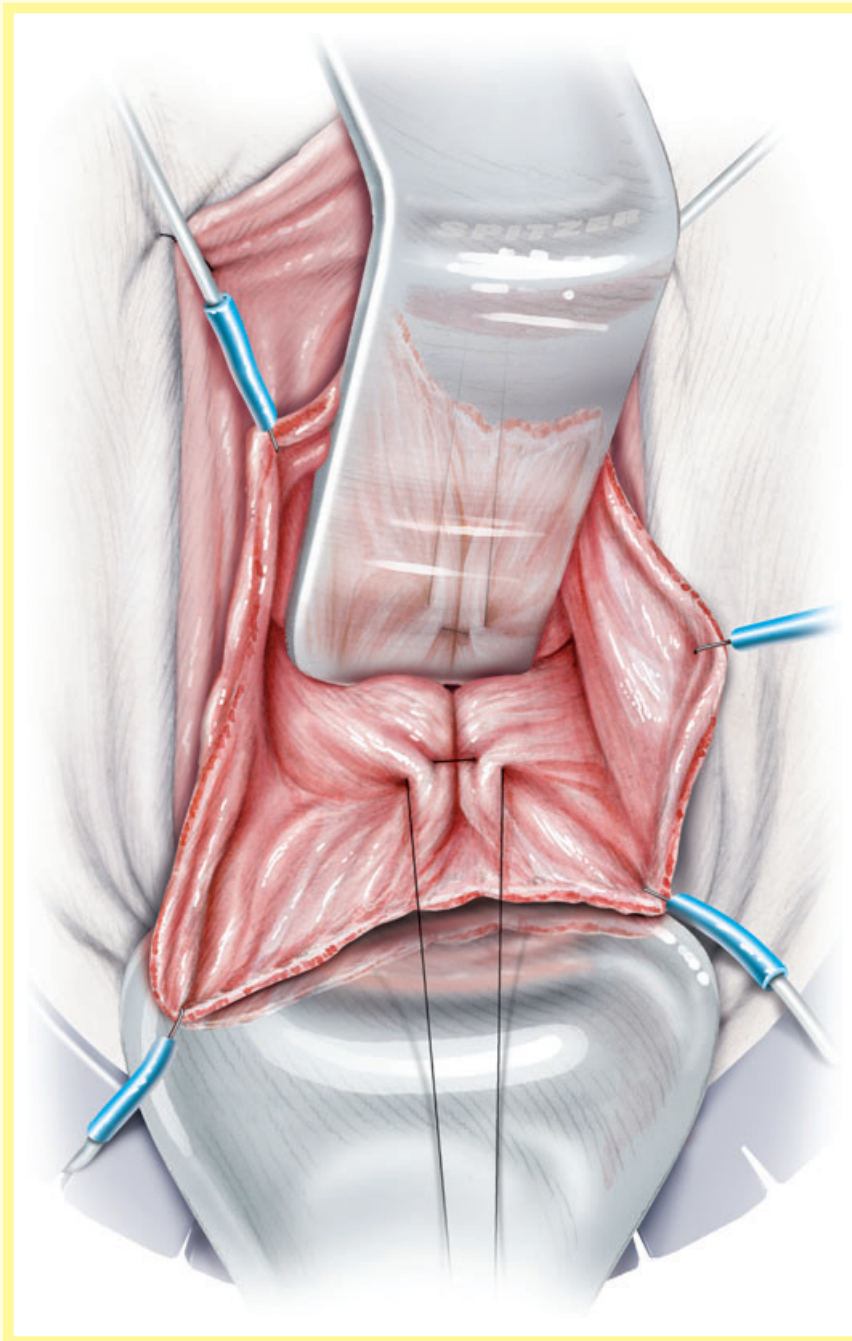
**Figure 8**

A vertical incision is made from the bladder neck to the vaginal cuff; the incision should be superficial enough to avoid bladder perforation but deep enough to expose the perivesical fascia.

Figure 9

The vaginal wall is dissected to expose the bladder. The dissection is carried out in the avascular plane between the vaginal wall and the bladder *laterally* toward the lateral pelvic wall and obturator fascia and *posteriorly* to expose the cardinal ligaments. The lateral dissection need only extend enough to easily palpate the inferior ramus.

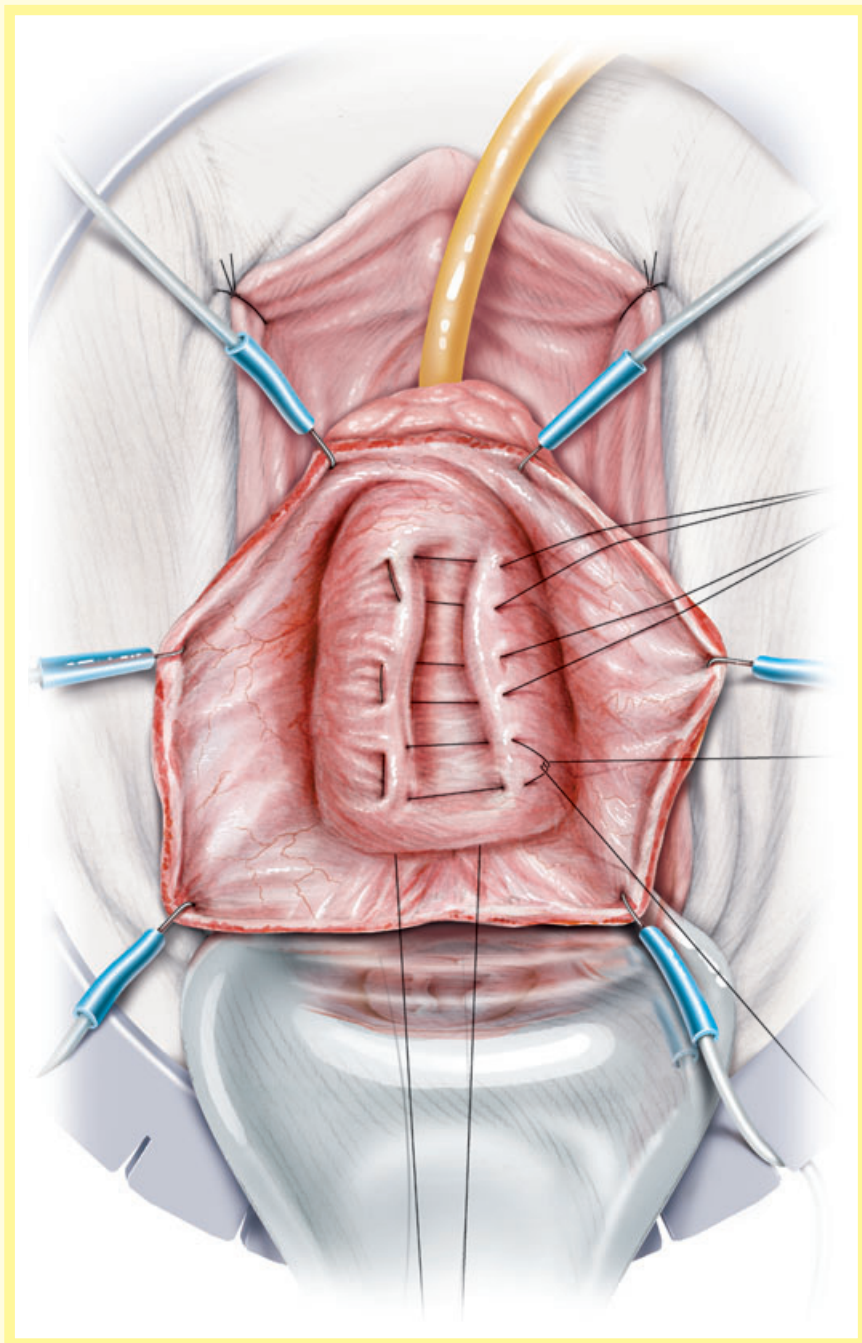


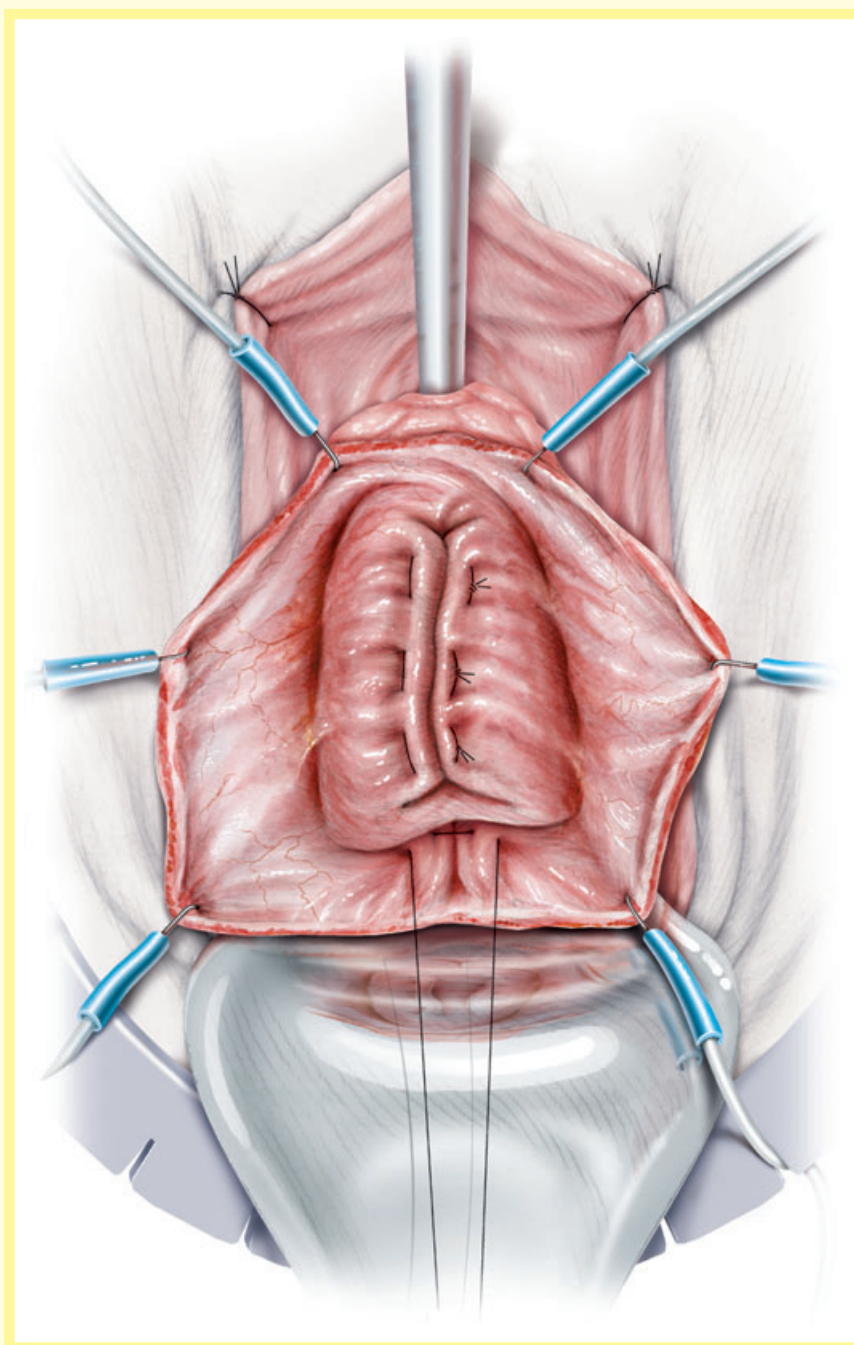
**Figure 10**

A figure-of-eight 2-0 polyglactin suture is applied to the cardinal ligaments to approximate them to the midline. The sutures are not tied at this time. The needle is left attached to the suture and will be used to anchor the mesh later. (If an enterocele is present, it is repaired with vault suspension sutures to the origin of the sacro-uterine ligaments and two purse-string sutures that include the pre-rectal fascia, lateral peritoneum and perivesical fascia. One of the purse-string sutures is left uncut with the needle attached and used to anchor the mesh later. This takes the place of the cardinal ligament suture). An intravenous injection with indigo carmine (5 mL) is then given, followed by a bolus of 500 mL saline.

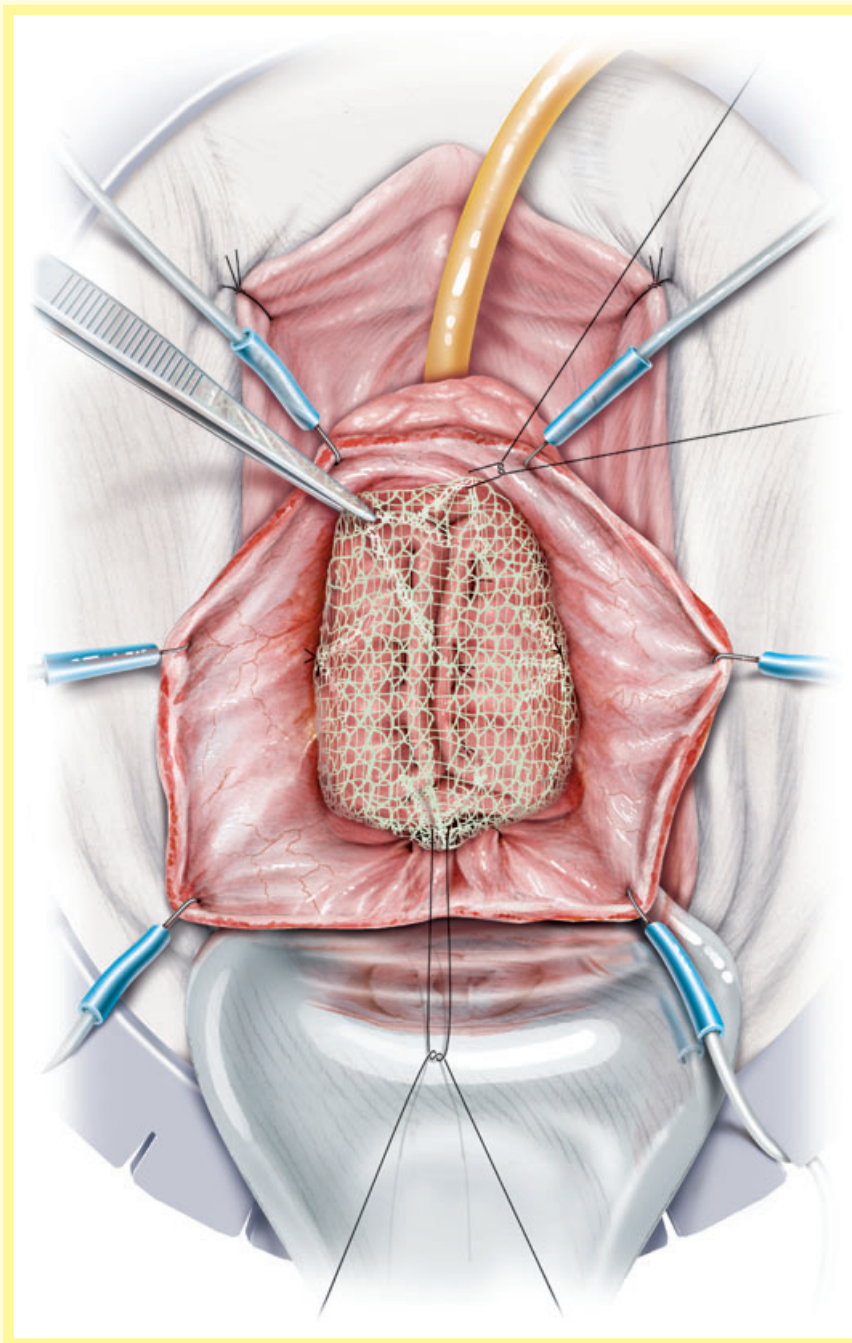
Figure 11

Interrupted horizontal mattress sutures of 3-0 polyglactin are applied to plicate the attenuated perivesical and periurethral fascia to the midline. The sutures are placed superficially but incorporate a wide segment of the perivesical fascia. Deep placement of the sutures should be avoided to prevent bladder injury or ureteric obstruction. This is not the strength of the central repair, but rather facilitates the reduction of the defect.



**Figure 12**

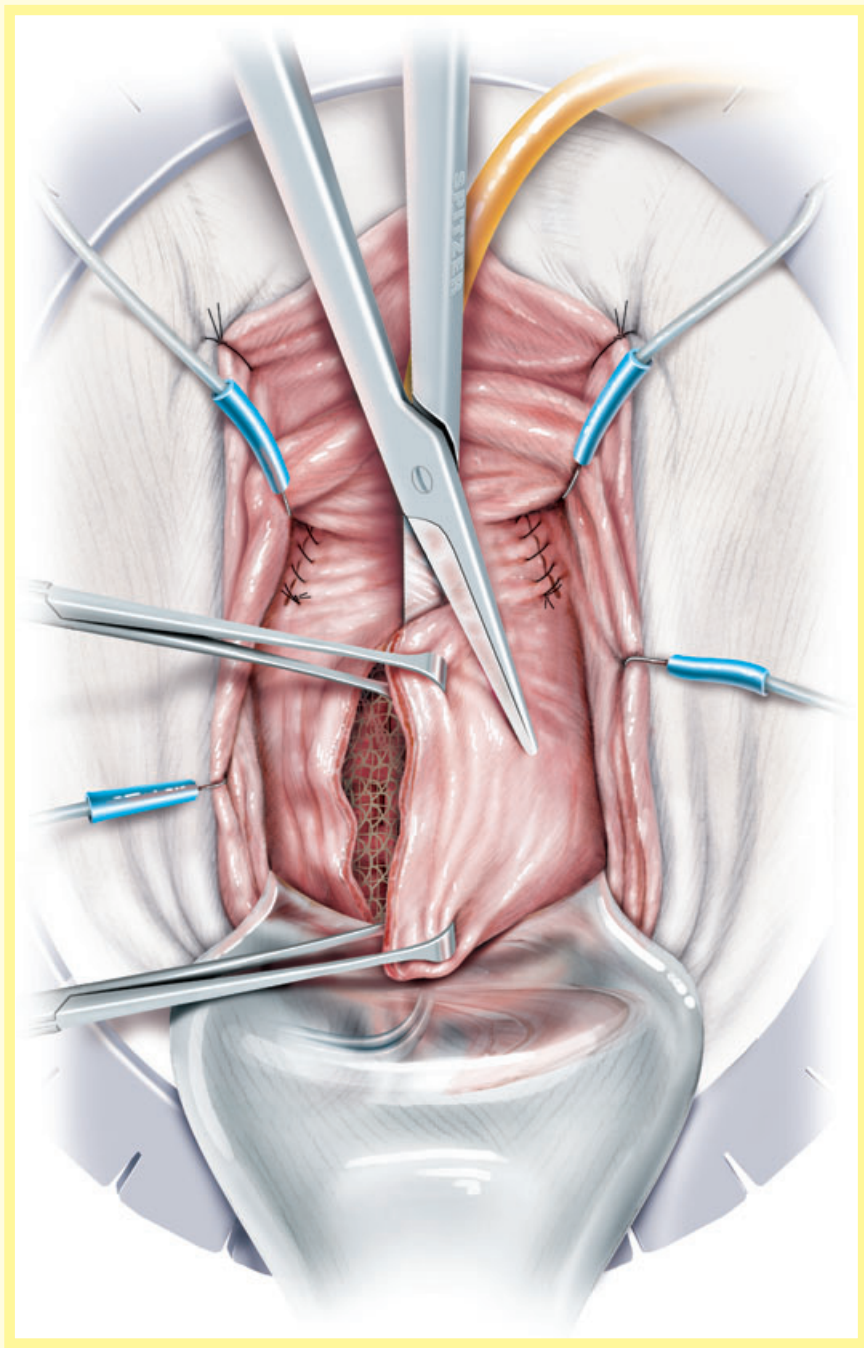
Cystoscopy is performed to assure that the SPT is in place, the bladder is free of injury, and the ureters excrete indigo-stained urine.

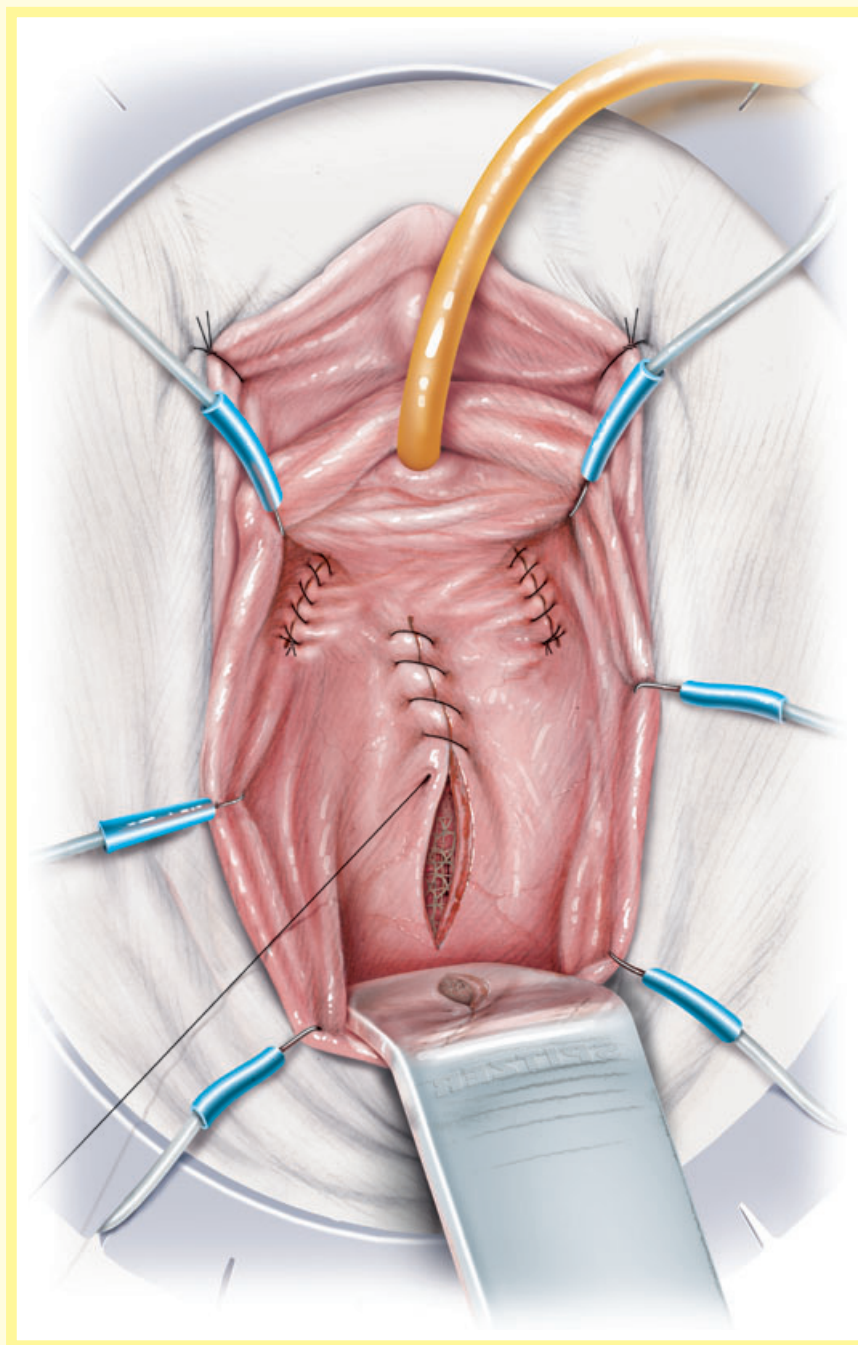
**Figure 14**

The circular 5 × 5 cm mesh is now used to cover the perivesical fascia and secure the repair. The already positioned obturator fascial sutures are used to fix the mesh laterally. Posteriorly, the mesh is fixed to the cardinal ligaments using the previously placed suture. Distally, two simple interrupted sutures of 3-0 polyglactin are used to secure the mesh on each side of the bladder neck, taking strong bites of the perivesical fascia. The mesh should be under tension to provide adequate support.

Figures 15 and 16

The excess vaginal wall is trimmed and closed with no tension using multiple runs of 3-0 polyglactin. A vaginal packing soaked in antibiotic cream (e.g. cleocin) is inserted.





POSTOPERATIVE CARE

The vaginal packing is left in place until discharge (2–24 h); 60–70% of our patients are discharged on the same day. The SPT is taped to the abdominal wall on moderate traction to minimize leakage around the catheter. It is plugged on discharge and the patient checks the residuals every 3–4 h or as needed. When the residuals are 10–15% of the total voided volume, the SPT may be removed. The SPT is left in place for ≥ 7 days to allow maturation of the tract, to prevent intraperitoneal leakage of urine. No urethral catheter is placed.

Patients are advised to avoid strenuous activity, such as heavy exercise or lifting, for 1 month. However, ambulation and all normal activities of daily living, including driving, are encouraged. Patients are discharged with pain medication, stool softener and a 5-day course of antibiotic (e.g. ciprofloxacin).

FROM SURGEON TO SURGEON

The specific intraoperative complications include bleeding, urethral or bladder

perforation, and ureteric obstruction by misplaced sutures. Paediatric laparotomy sponges can be placed into the retropubic space to tamponade any bleeding caused by dissection during sling placement. Most cases of vaginal bleeding subside with packing or placing a tampon. Alternatively, intravaginal inflation of a Foley catheter with 50–60 mL of water inserted posterior to the vaginal packing is quite effective for persistent venous oozing.

Any bladder injury should be repaired primarily using multiple layers of delayed absorbable sutures and prolonged bladder drainage. Consideration will need to be given to the use of mesh and the possibility of fistula formation after such an injury.

In this operation special attention should be given to the ureters because they are close to the operating site. The bladder and trigone should be retracted above the level of the pelvic floor when the midline colporrhaphy sutures are placed over the perivesical fascia. Cystoscopy confirms the patency of both ureteric orifices and if in doubt, a stent should be inserted. If ureteric obstruction is found the perivesical fascia sutures need to be

removed and replaced. Ureteric obstruction after surgery despite cystoscopic patency at the time of surgery results from kinking of the ureters. If endoscopic manoeuvres after percutaneous nephrostomy drainage are not successful, ureteric reimplantation is usually the final course. We prefer not to explore transvaginally the area of ureteric obstruction, to avoid undue damage of an otherwise good anatomical repair.

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Abbreviation: SPT, suprapubic cystostomy tube.