

ILEONEOBLADDER (HAUTMANN TYPE)

13

BOWEL DETUBULARIZATION AND W FORMATION

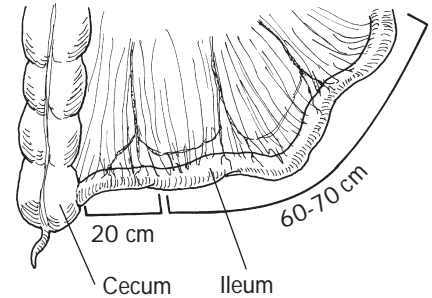
FIG. 13-1. From a point 20 cm proximal from the ileocecal valve, 60 to 70 cm of the bowel is measured. This segment and its mesentery are divided to accommodate its placement in the pelvis. The bowel is reanastomosed posterior to the ileoneobladder segment.

FIG. 13-2. The 60 to 70 cm small bowel segment is folded into a W formation and temporarily fixed with 2-0 stay sutures (1). The right arm of the W formation (2) should be longer and should be placed lower than the left arm since it will be used as the neobladder neck to be anastomosed to the distal urethral stump.

After the bowel is opened and cleared of its contents by saline so-

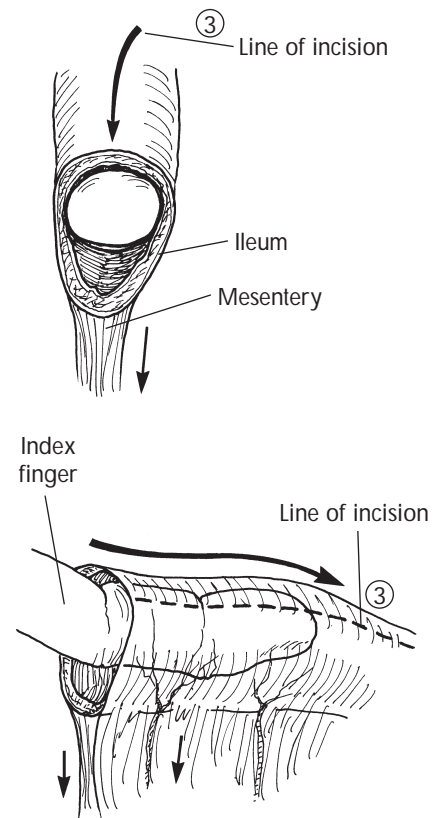
lution irrigation, it is divided at its antimesenteric line (3) for detubularization. The surgeon places the left index finger within the lumen and maintains tension against the antimesenteric line of the bowel while the right hand applies the Bovie cutter to open the bowel.

At the lower arm of the W formation, the detubularization is *not* performed at the antimesenteric line. At this point it is critical that the surgeon divide the bowel heading toward the mesenteric side, thus creating a lip or a flap at the lowermost part of the W formation (4). This lip of extra tissue will be important not only to create the neobladder neck but also to add extra length to reach the distal urethral stump with this W formation.¹

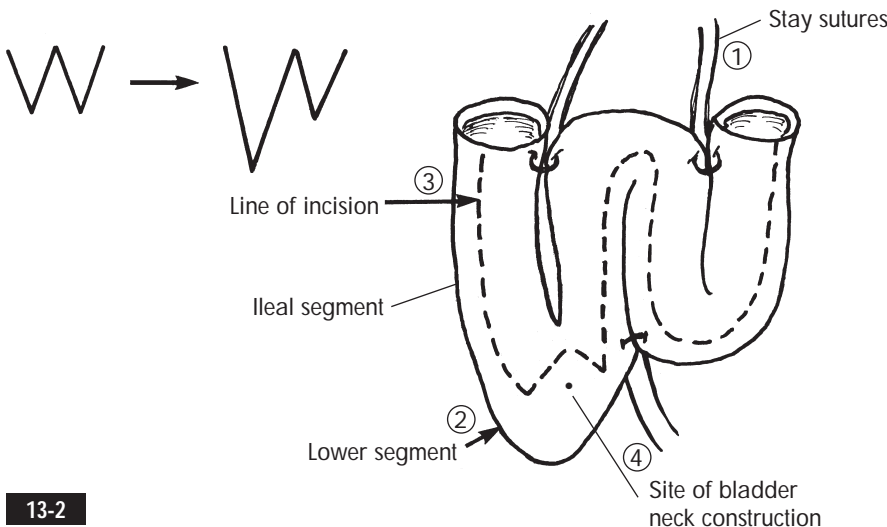


13-1

Division of Ileum



Modified W Formation



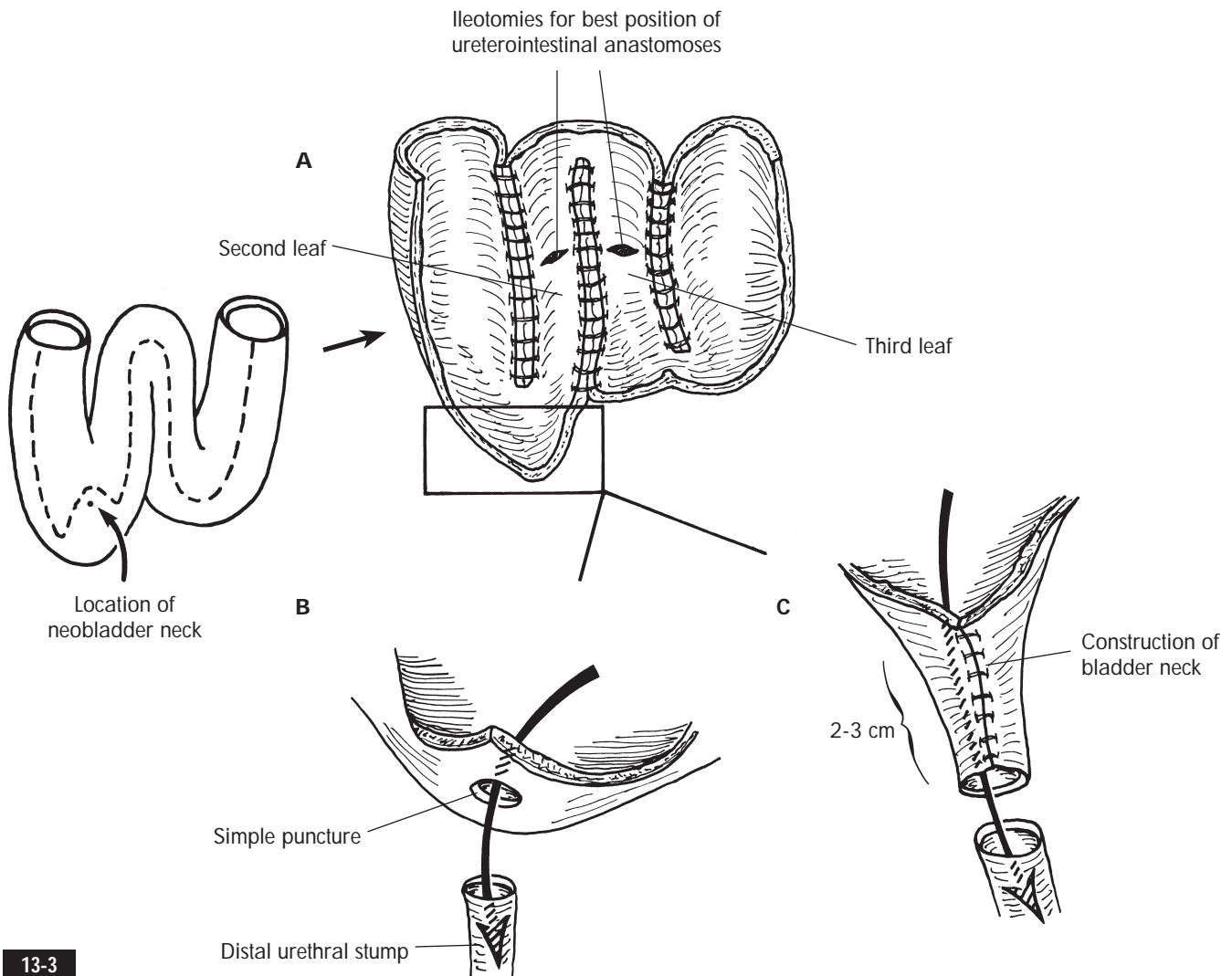
13-2

FIG. 13-3. The edges of the divided bowel are sewn together (A). The simplest and fastest approach is to perform a continuous stitch (2-0 Vicryl) using an atraumatic straight needle (Davis & Geck). An alternative maneuver is to use a “quick reloading” technique with a half-circle needle (see p. 122). Absorbable staples are awkward to apply and not efficient for the creation of this neobladder.

For the neobladder neck, there are two reconstructive options: at the lowermost W configuration of the neobladder, the surgeon can (1) simply puncture the lip (B) or (2) create a neobladder neck by

sewing together the cut edges, thus gaining another 2 to 3 cm in length and bringing the neck closer to the distal urethral stump (C). We prefer the latter option. If tension already exists when the neobladder is placed down into the pelvis, this extra 3 cm can be critical in producing the desired outcome.

While checking for tension of the mesentery and the bladder neck when the neobladder is in the pelvis, the surgeon should also estimate the position of ureterointestinal anastomoses on the middle and left leaves of the W formation.



URETERAL DISSECTION

As previously discussed in the section of radical cystectomy (see p. 85), the avascular line of Toldt is incised and both ureters are isolated. We continue the right incision around the cecum and up the mesenteric root. This maneuver makes the left ureteral tunneling much easier and shorter (see p. 85).

As in all urinary diversions, whether an ileal conduit, continent pouch, or neobladder, the more difficult ureteral anastomosis is always the left side. Therefore the surgeon should make sure that the left ureter and its adventitia are free up to the level of the lower pole of the kidney. The posterior parietal peritoneal tunnel must be wide enough to avoid any ureteral angulation, and the inferior mesenteric artery should not obstruct the passage of the left ureter to the right side. Some surgeons bring the ureter anterior to the peritoneum, but we prefer the peritoneal tunneling approach.^{2,3} By the time the cystectomy has been completed, the ureters will have become dilated with hydronephrosis if clipped as soon as the ureters are divided. This maneuver not only makes the ureterointestinal anastomoses easier but also prevents the ureters from twisting.

URETEROINTESTINAL ANASTOMOSES

It is important that the surgeon estimates the best position of the ureteral implantation while the neobladder is down in the deep pelvis.

In general, the left ureter is brought in on the left segment, whereas the right ureter is brought in on the middle segment of the W formation (see Fig. 13-3, A). It is better to make the ureteral entry too high than too low in the neobladder, thus avoiding ureteral tension, especially of the left ureter.

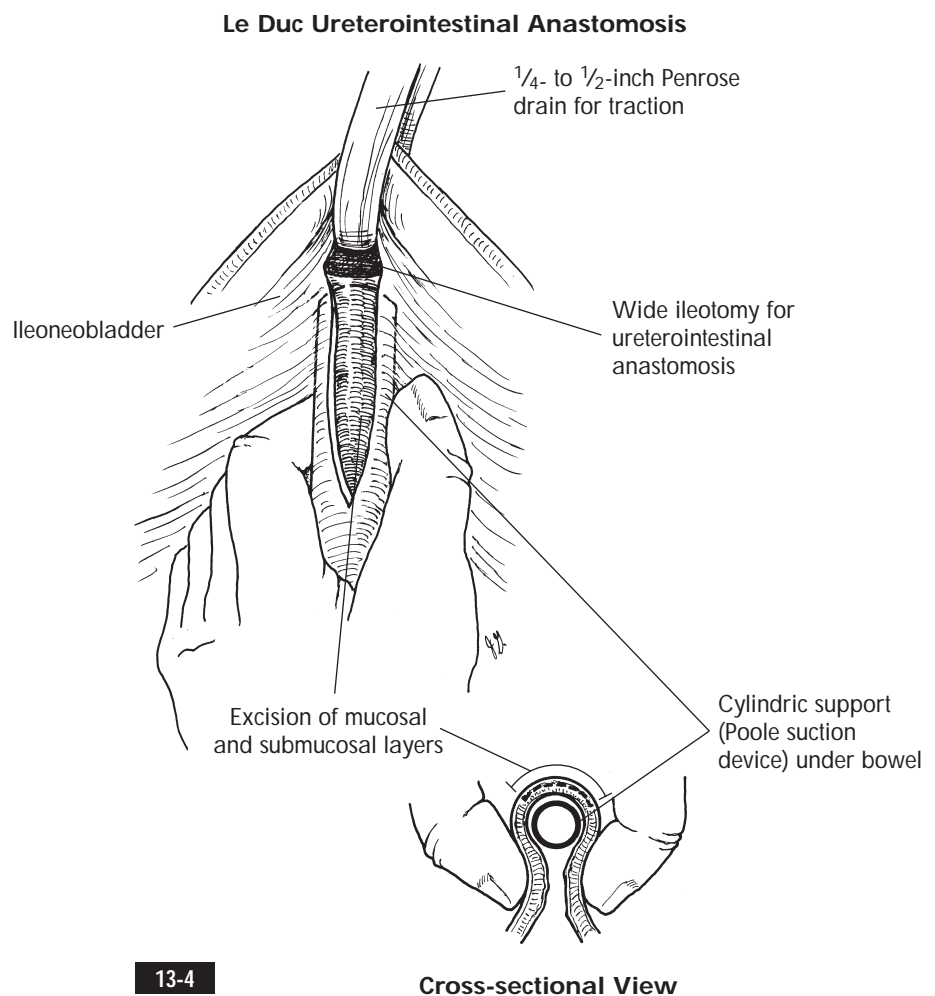
LE DUC URETEROINTESTINAL ANASTOMOSIS

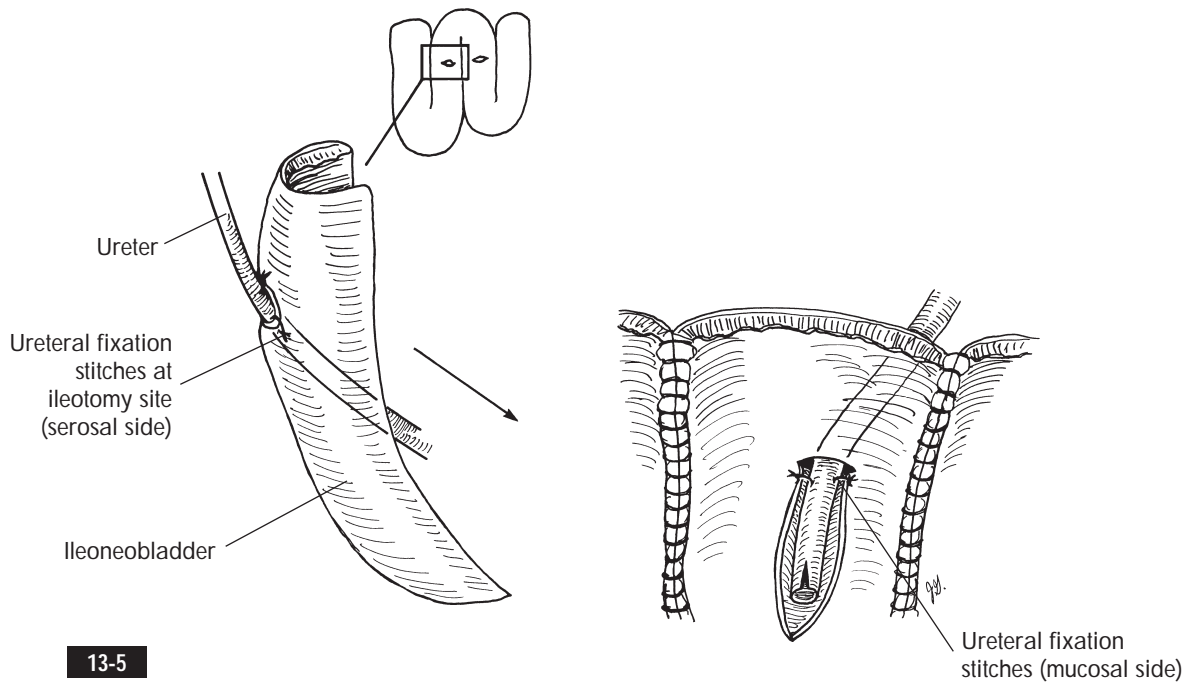
The left ureterointestinal anastomosis should be completed first because it is the more difficult to perform.

FIG. 13-4. The puncture of the neobladder for the ureteral implantation must be wide enough so that the ureter can slide back and forth freely. A common error is to make this puncture too small.

While the assistant applies traction upward on a 1/4- to 1/2-inch (0.5 to 1 cm) Penrose drain through the puncture site, the surgeon secures the thumb and index finger over the bowel segment, which is wrapped around a cylindric tube (i.e., Poole suction device).

After injecting saline solution into the mucosa, the surgeon cuts away a trough of mucosal and submucosal tissues.





Alternative Methods of Mucosoureteral Approximation (Cross-sectional Views)

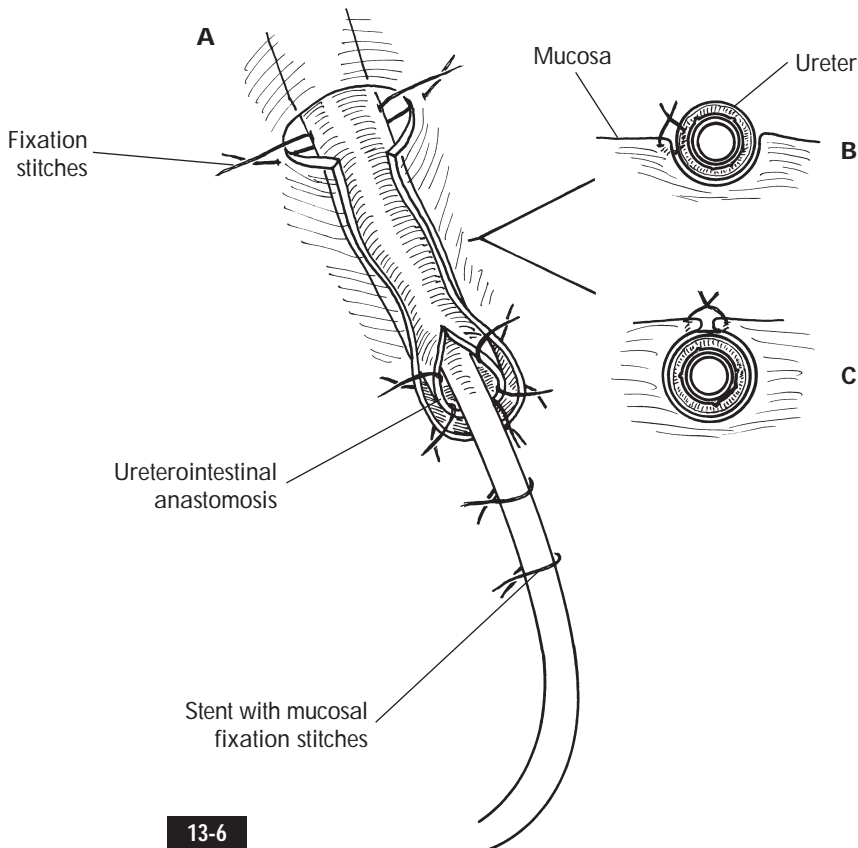


FIG. 13-5. The ureter is brought through the intestinal puncture site and fixed on both the serosal and the mucosal sides to prevent retraction. The surgeon must avoid strangulation of the ureteral vasculature by these fixation stitches.

FIG. 13-6. The spatulated ureteral meatus is fixed to the intestinal trough with deep stitches (4-0 Vicryl) and a Bard diversionary stent (8 Fr) is passed up to the kidney (A). The stents are fixed to the ileoneobladder with stitches (4-0 chromic).

According to Le Duc,^{4,5} there are two options for mucosoureteral antirefluxing fixation. The intestinal mucosa can be approximated against the two sides of the ureter (B) or, if there is redundant intestinal mucosa, the two edges of the mucosal layer can be approximated over the ureteral segment (C).

NEOBLADDER NECK AND DISTAL URETHRAL STUMP APPROXIMATION

FIG. 13-7. Before the neobladder is placed into the pelvis for the neobladder neck–urethral anastomosis, the distal half of the neobladder should be reapproximated with a running stitch (2-0 Vicryl) because it will be impossible to close once it is in the deep pelvis (**A**).^{1,6}

A Malecot catheter (24 or 26 Fr) is inserted at the top of the neobladder, and stents are brought through separate stab wounds or through the incision line. The upper half of the neobladder is left open until the neobladder neck–urethral anastomosis is completed (**B**).

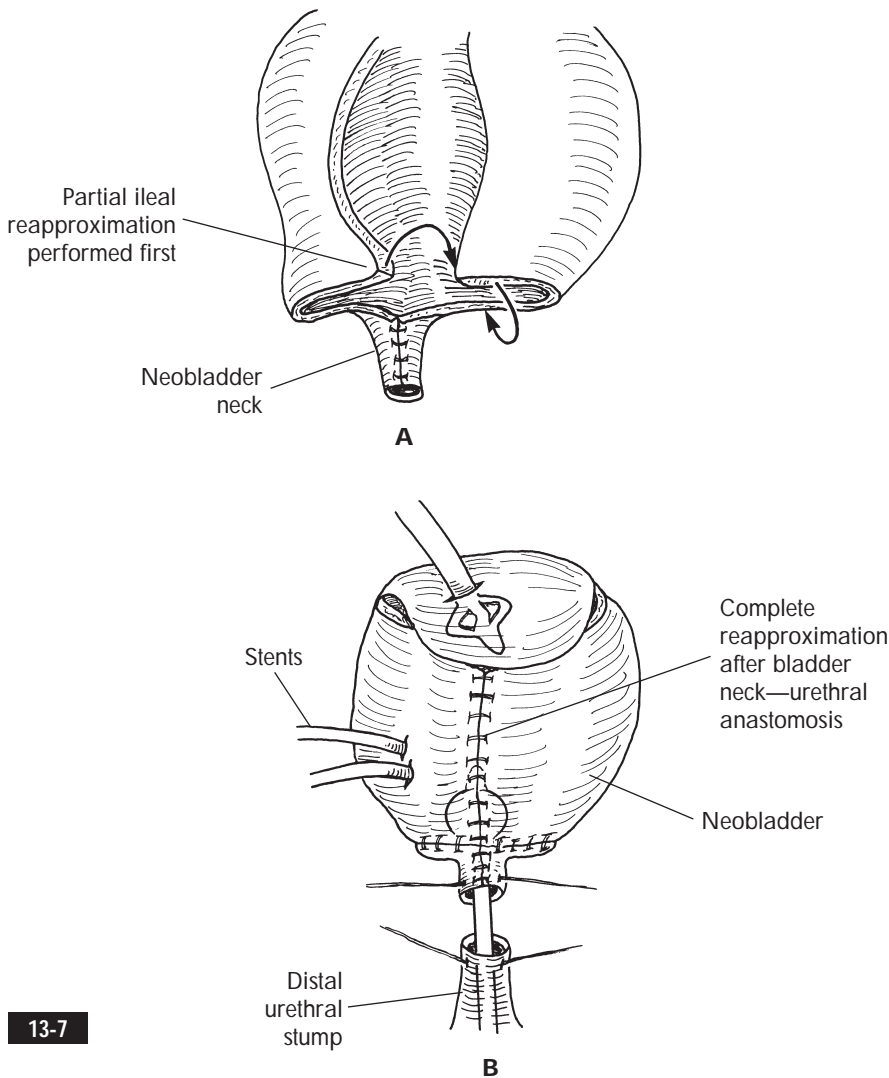
NEOBLADDER NECK–URETHRAL ANASTOMOSIS

A Foley catheter (18 Fr with 5 ml balloon) is passed from the urethral meatus through the neobladder neck.

Four to six anastomotic stitches (2-0 Vicryl) are placed circumferentially but are not tied.

The Foley catheter balloon is inflated to 10 to 15 ml, providing sufficient but not excessive traction to tie the anastomotic sutures down.

After inspection of all anastomoses, the upper half of the neobladder is closed. With the Foley catheter clamped shut, saline solution is infused through the Malecot catheter to fill the neobladder so that leakage at the suture lines can be checked.



KEY POINTS

- A small bowel segment 60 to 70 cm in length is used to create the pouch.
- The bowel is reanastomosed posterior to the neobladder.
- A W formation of the small bowel is constructed with an exaggerated droop of the right arm to serve as the bladder neck.
- In detubularization, a flap or lip is constructed at the most dependent position of the W formation (right) for the neobladder neck-urethral anastomosis.
- The left ureter must be free all the way to the lower pole of the kidney and tunneled behind the posterior parietal peritoneum.
- The location of the ureterointestinal anastomoses must be estimated.
- The distal half of the ileoneobladder should be closed before the distal neobladder neck-urethral anastomosis is performed. A Malecot catheter is placed proximally, and the stents are inserted.
- A Foley catheter (18 Fr with a 5 ml balloon) is passed through the neobladder neck, and the anastomotic stitches are placed.
- The remaining open portion of the proximal neobladder is closed.

POTENTIAL PROBLEMS

- *Diseased small bowel:* Use an Indiana pouch or ileal loop conduit diversion
- *Neobladder does not reach urethral stump:* Check for asymmetric W formation with lower right arm → create a bladder neck by anastomosis of the intestinal flap, if necessary
- *Left ureter is under tension:* Free ureter up to the kidney → ensure that posterior peritoneal dissection has no sharp angles
- *Inferior mesenteric artery syndrome* (see p. 65): Consider bringing the ureter to the anastomotic site via an anterior position rather than through a retroperitoneal tunnel

REFERENCES

- 1 Fair WR: Personal observations and communications, May 1995.
- 2 Hautmann RE et al: The ileal neobladder: 6-years' experience with more than 200 patients, *J Urol* 150:40, 1993.
- 3 Miller K et al: The ileal neobladder: operative technique and results, *Urol Clin North Am* 18(4):623, 1991.
- 4 Le Duc A, Camey M, Teillac P: Original antireflux uretero-ileal implantation technique: long-term follow-up, *J Urol* 137:1156, 1987.
- 5 Le Duc A: Mucosal groove antireflux uretero-ileal implantation. In Hohenfellner R, Wammack R, editors: *Société internationale d'urologie reports: continent urinary diversion*, London, 1992, Churchill Livingstone.
- 6 Fair WR: The ileal neobladder, *Urol Clin North Am* 18(3):555, 1991.

SUGGESTED READING

- Hautmann RE et al: The ileal neobladder, *J Urol* 139:39, 1988.