

REPAIR OF URETERAL PELVIC JUNCTION OBSTRUCTION

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Although many operations to correct ureteral pelvic junction obstructions are viable, we have found dismembered pyeloplasty to be the simplest, most versatile, and most reliable procedure for a successful outcome. Both a voiding cystourethrogram to rule out reflux and a retrograde pyelogram immediately before the procedure are helpful if the lower ureter has not been studied.

ISOLATION OF RENAL PELVIS AND URETER

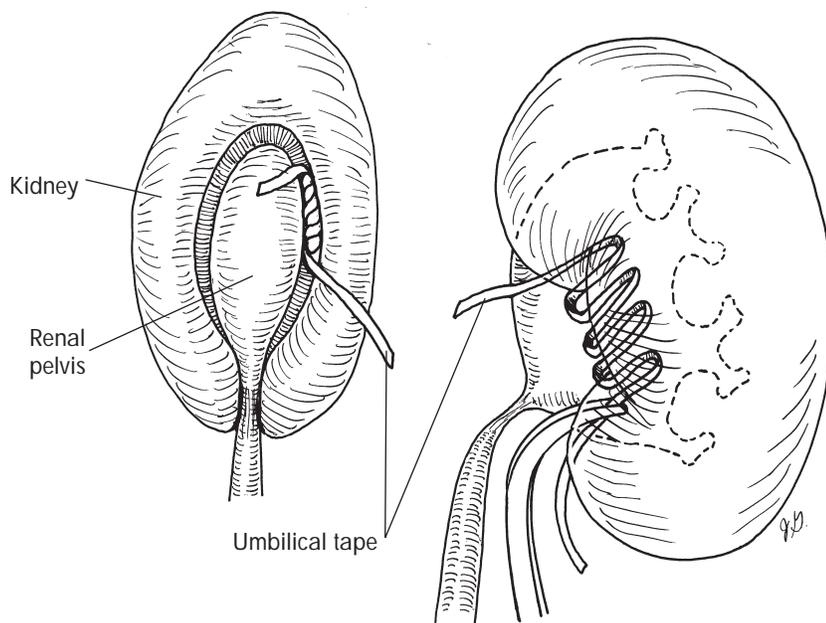
The surgeon uses a flank approach to expose the retroperitoneum and kidney (see pp. 31-33). The Gerota's fascia is divided, and the renal pedicle, renal pelvis,

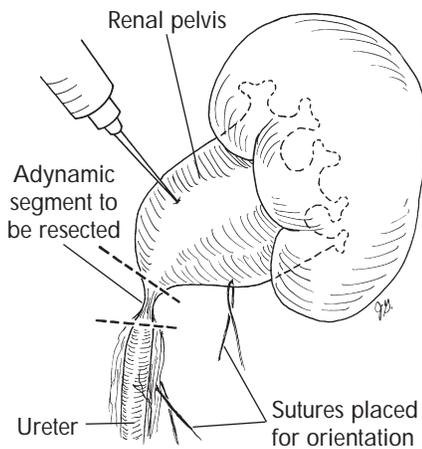
and ureters are identified and isolated.

The surgeon will need to dissect free 4 to 5 cm of the proximal ureter with its adventitia intact.

Although the radiologic studies may show a well-dilated renal pelvis, the surgeon will sometimes find the actual renal pelvis hidden within the renal cortex.

FIG. 4-1. With some contralateral traction applied to the ureter, the surgeon uses the forceps to gently push umbilical tape between the renal pelvis and the cortex and to establish a plane of dissection. With a vein retractor placed on the cortex, the surgeon can continue this gentle blunt dissection until the dilated renal pelvis is fully identified on both sides.





4-2

RESECTION OF ADYNAMIC URETERAL SEGMENT

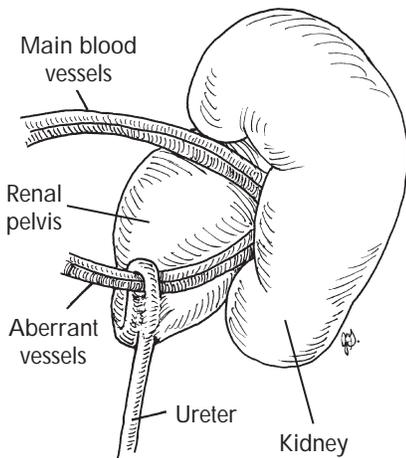
FIG. 4-2. By injecting saline solution into the renal pelvis to dilate it, the surgeon can locate the adynamic segment and plan the resection.

Marking stitches are placed on the renal pelvis side as well as the ureteral side before resection of the adynamic segment is performed. These marking stitches provide the correct orientation for the ureteral spatulation and the planned anastomosis of the pelvis and ureter.

RESECTION OF ADYNAMIC SEGMENT AND DISTAL URETERAL SPATULATION

Although the actual adynamic segment is usually 1 cm in length, it is important to remove it completely, even though spatulation of the ureter and pelvis reduces the effect of any residual muscle. The adynamic segment is resected, and ureteral spatulation is performed immediately while proper ureteral orientation is maintained.

A 5 or 6 Fr ureteral stent is passed down the spatulated ureter to prevent ureteral twisting.



4-3

ABERRANT CROSSING VESSELS

FIGS. 4-3 AND 4-4. Because aberrant crossing vessels are associated with an intrinsic abnormality of the ureter, correcting the crossing vessels alone will not resolve the problem.

We prefer to divide the renal pelvis slightly above the ureteral pelvic junction, resect the adynamic segment, and then transpose the renal pelvis anterior to the crossing vessels rather than to divide these aberrant vessels.

If the surgeon chooses to divide the aberrant vessels, a compression test of the crossing vessels can be performed before the procedure is undertaken to see if a portion of the renal parenchyma becomes dark with ischemia. If ischemia is noted, division and transposition of the renal pelvis should be performed rather than division of the vessels.

RESECTION OF A LARGE, DISEASED REDUNDANT RENAL PELVIS

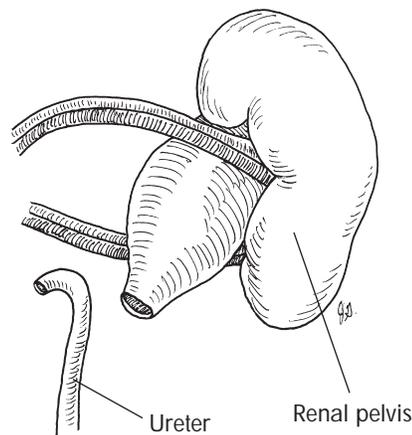
Although not always seen in children, the adult patient with longstanding renal disease usually has a large adynamic redundant renal pelvis that may require resection.

FIG. 4-5. After the renal pelvis is opened, the surgeon should wait until the renal pelvis has contracted to its stable state. If the redundancy remains large, then resection of the renal pelvis will be necessary.

The surgeon should first spatulate the renal pelvis (1) and estimate the line of resection on both sides (2).

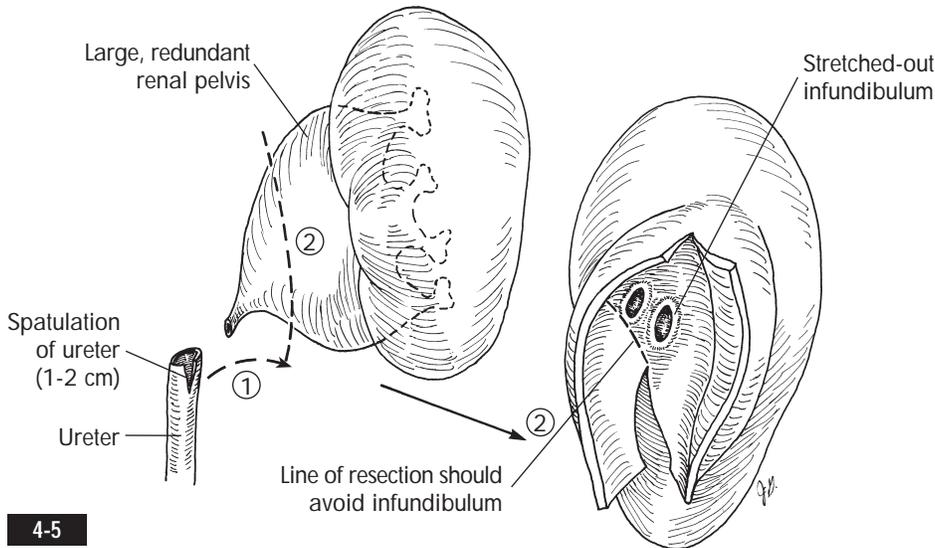
In diseased, dilated renal pelvises, the calyces are also stretched out. The surgeon should avoid cutting stretched calyces and should retain a good margin of resection for the anastomosis.

Transposition of Renal Pelvis and Ureter Anterior to Vessels

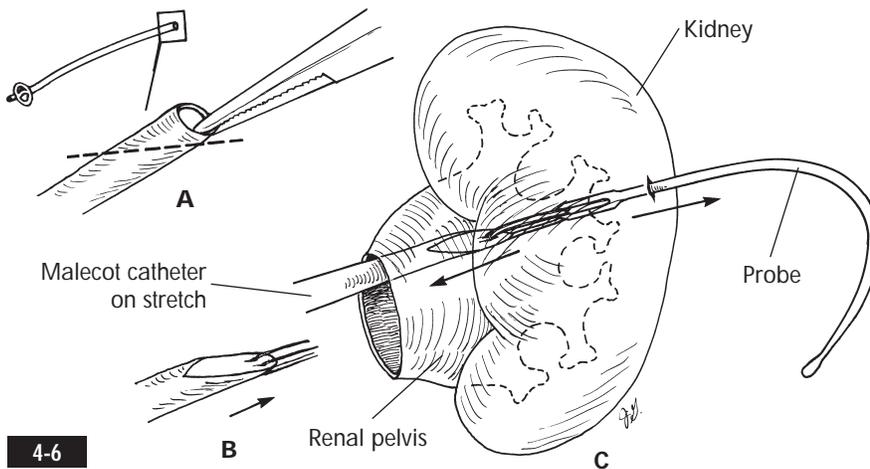


4-4

Resection of Redundant Renal Pelvis After Spatulation



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4-6

NEPHROSTOMY TUBE PLACEMENT BEFORE RECONSTRUCTION

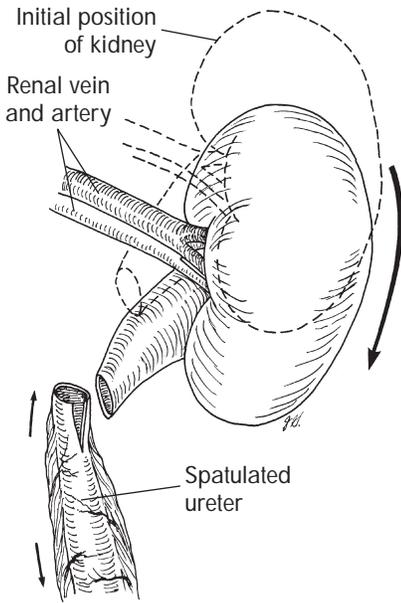
FIG. 4-6. If nephrostomy tube placement is indicated, we prefer to use a probe rather than a Randall's forceps for the maneuver.

After the proximal end of a Malecot catheter is cut diagonally (A), the surgeon secures it to the probe with a figure-of-eight stitch (0 silk). The placement of this type of stitch between the two ensures that the stitch will not tear out under tension (B).

The rounded, blunt distal end of the probe is passed into a selected calyx as well as through the pyramid and cortex.

As the probe exits the kidney and as the diagonal end of the catheter enters the renal parenchyma, the surgeon stretches the Malecot catheter while pulling it through the kidney (C). The assistant holds the kidney until the end of the Malecot catheter has passed through the cortex. With this stretching maneuver, the catheter lumen is narrowed while the catheter passes through the cortex. The elastic catheter acts as a tamponade of the renal puncture, with resultant decreased bleeding as compared with that which occurs with the use of Randall's forceps.

Mobilization of Kidney



4-7

RECONSTRUCTION OF URETERAL PELVIC JUNCTION

The ureteral stent previously passed into the bladder ensures no ureteral twisting or obstruction.

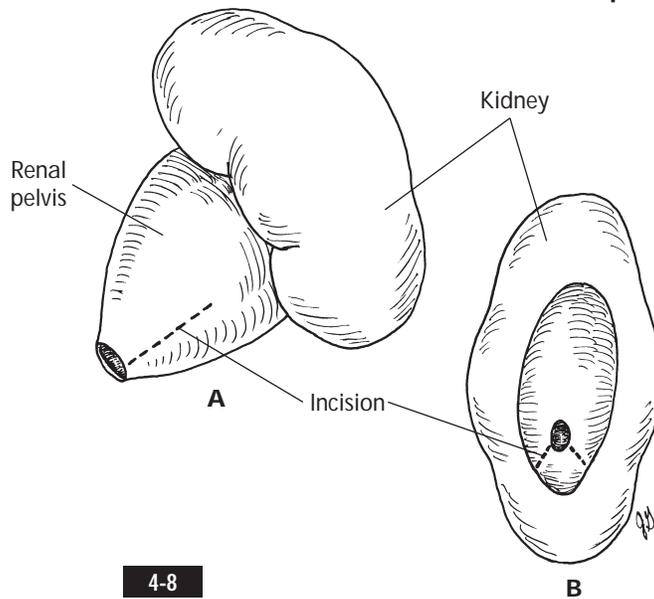
FIG. 4-7. If the most dependent portion of the renal pelvis marked with the silk stitch does not easily meet the spatulated ureteral end, the following maneuvers should be considered:

- 1 Mobilize the ureter with its adventitia further.
- 2 Dissect the kidney free from the Gerota's fascia, especially

at the superior pole, and free the renal artery and vein from the adjacent soft tissue. This maneuver permits a downward movement of up to 3 cm.

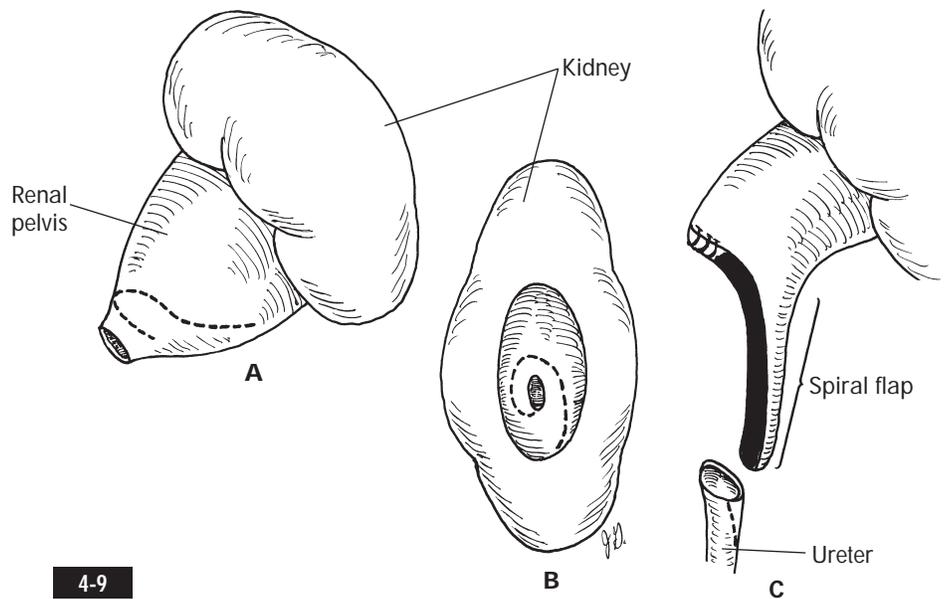
FIGS. 4-8 AND 4-9. After adynamic ureteral segment resection, the surgeon may modify the dismembered renal pelvis for a V-flap or perform any of a number of other techniques. The goal is dependent drainage, funneled ureteral pelvic junction, smooth anastomosis, and no twists.

Dismembered V-Flap



4-8

Dismembered Spiral Flap



4-9

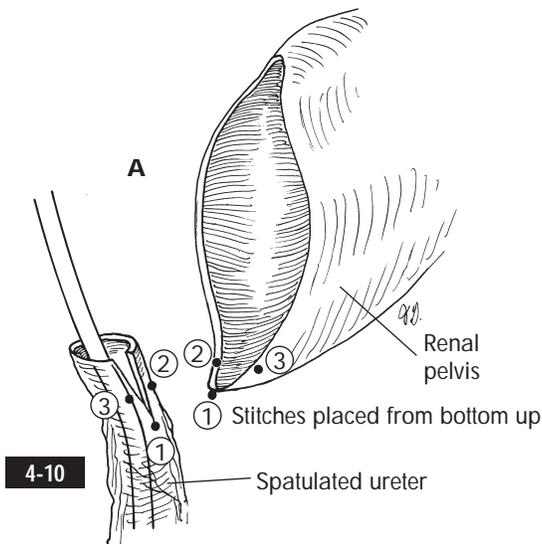


FIG. 4-10. When the ureter is reanastomosed to the renal pelvis, the best method is to begin from the lowest portion and to work upward. This approach ensures the widest lumen and allows for further tailoring of the renal pelvis above the anastomosis.

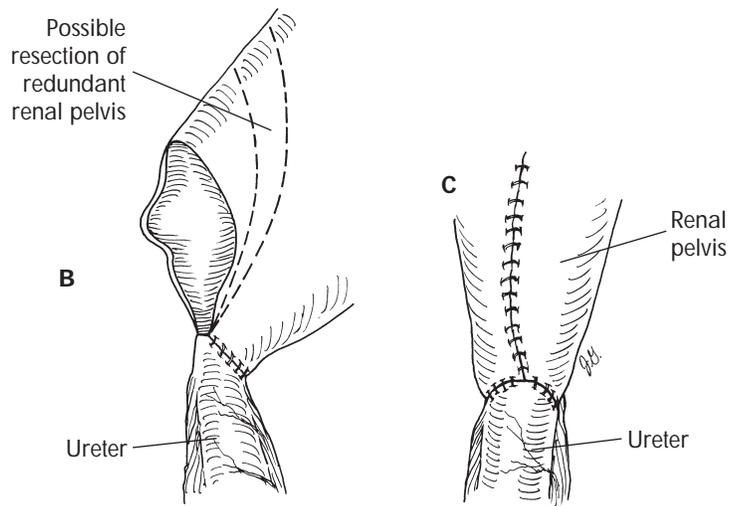
The surgeon should place three vertex interrupted stitches (4-0 Vicryl) at the spatulated end of the ureter to the most dependent portion of the renal pelvis.

After these three extremely important stitches have been made, a watertight stitch (4-0 Vicryl) is used to reapproximate the rest of the renal pelvis. A 2-0 Vicryl interrupted stitch can be placed at 2 cm intervals for reinforcement. The ureteral stent is removed.

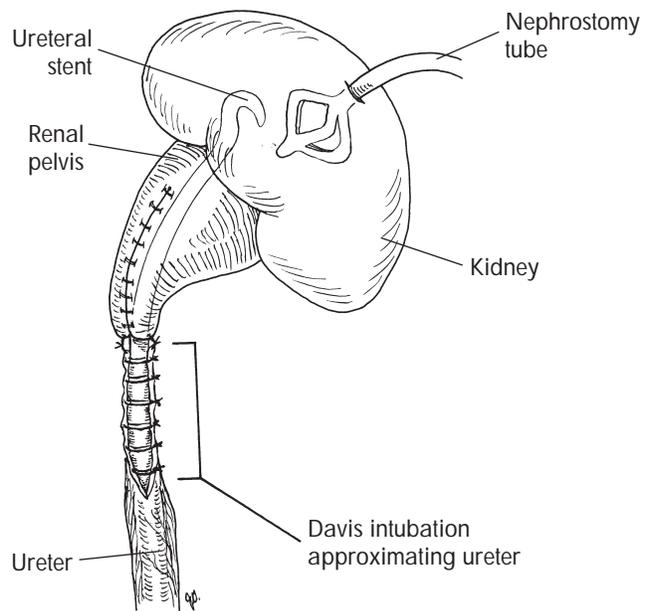
DAVIS INTUBATION FOR LONG URETERAL STRICTURE

In situations in which there is a long, strictured proximal ureter or the gap between the healthy renal pelvis and the ureter is greater than 2 cm, Davis intubation is an excellent procedure to re-create continuity.

FIGS. 4-11 AND 4-12. After a nephrostomy tube has been placed, the surgeon must bring the urothelium of the pelvis in contact with the urothelium of the ureter.



Davis Intubation

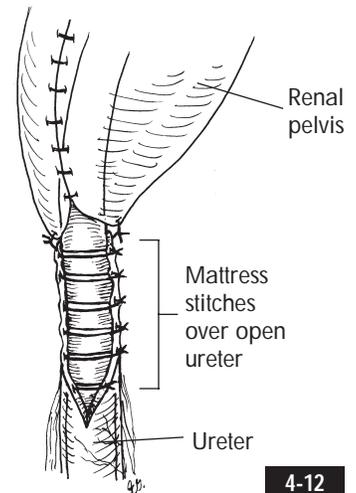


4-11

This contact point of urothelium can be accomplished by both kidney and ureteral mobilization.

The surgeon places mattress stitches (5 or 6 Fr) to fix the free margins of the narrowed ureter. A drain should be placed adjacent to the repair.

During a 3- to 6-week interval, the urothelium and muscle will grow around the ureteral stent and reestablish continuity between the ureter and renal pelvis. A nephrostogram will confirm continuity.



4-12

KEY POINTS

- The adynamic ureteral segment at the ureteral pelvic junction is located.
- Marking stitches are placed on the renal pelvis side and the ureteral side before resection of the adynamic segment.
- The adynamic segment is resected.
- Ureteral spatulation is performed immediately and a ureteral stent (5 or 6 Fr) is passed down the spatulated ureter into the bladder.
- The renal pelvis must be transposed anterior to any aberrant crossing vessels.
- The resection of a large, diseased redundant renal pelvis should be considered; however, cutting into a stretched calyx must be avoided.
- Further mobilization of the ureter and/or kidney should be considered if needed to avoid tension at the anastomosis site.
- The use of a V-flap or spiral flap can be considered.
- A nephrostomy tube is placed.
- Anastomosis should begin from the lowest portion of the renal pelvis and spatulated end of the ureter and continued upward.

- Three vertex interrupted stitches and running stitches are placed to reapproximate the ureter and the renal pelvis; in addition, interrupted stitches (2-0 Vicryl) are placed for support.
- The renal pelvis is tailored if needed.
- Davis intubation is constructed in the case of a long, strictured ureter.
- Drains are placed.

POTENTIAL PROBLEMS

- *Crossing aberrant vessels that are necessary for renal perfusion:* Transpose the cut renal pelvis anterior to the vessels
- *Resection of redundant pelvis with accidental calyceal injury:* Repair the calyx, leaving a margin more distal for the anastomosis, and cut the renal pelvis distal to it
- *Bleeding at nephrostomy tube site:* Apply manual compression → use Teflon felt sandwich technique if needed (see pp. 25, 44)
- *Large gap between renal pelvis and ureter:* Mobilize the ureter → mobilize the kidney and renal vessels → use a V-flap or spiral flap → construct Davis intubation