

# RETROPERITONEAL LYMPH NODE DISSECTION

# 5

## TRANSABDOMINAL APPROACH

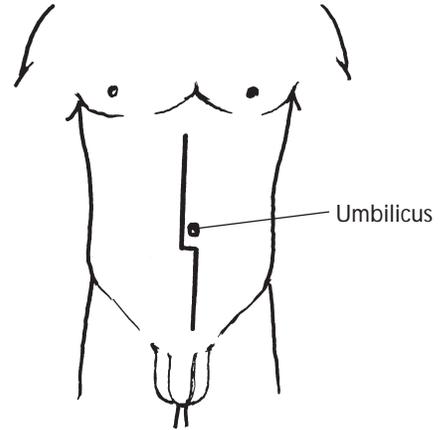
The transabdominal midline incision with complete bowel mobilization provides one of the best surgical exposures for retroperitoneal lymphadenectomy.

FIG. 5-1. The incision extends from the xiphoid process to 6 cm below the umbilicus.

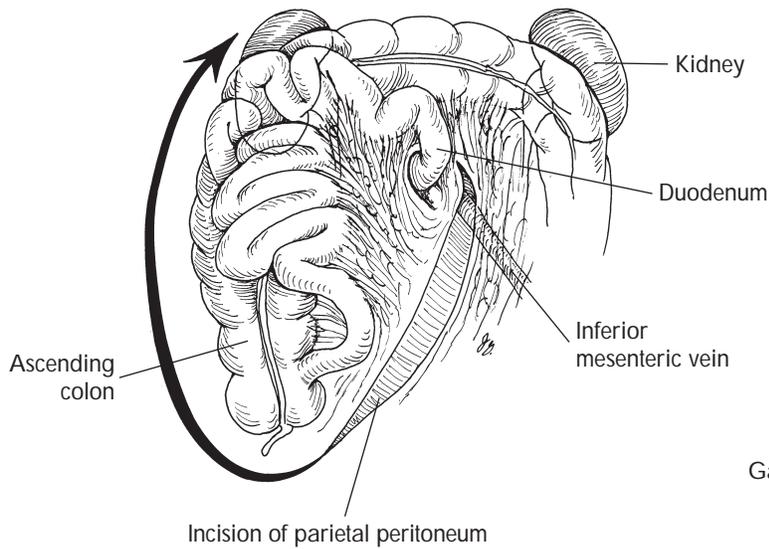
FIGS. 5-2 AND 5-3. For both left- and right-sided tumors, a right-sided,

posterior parietal peritoneal incision extends from the foramen of Winslow, around the cecum, and up the mesenteric root to the ligament of Treitz.

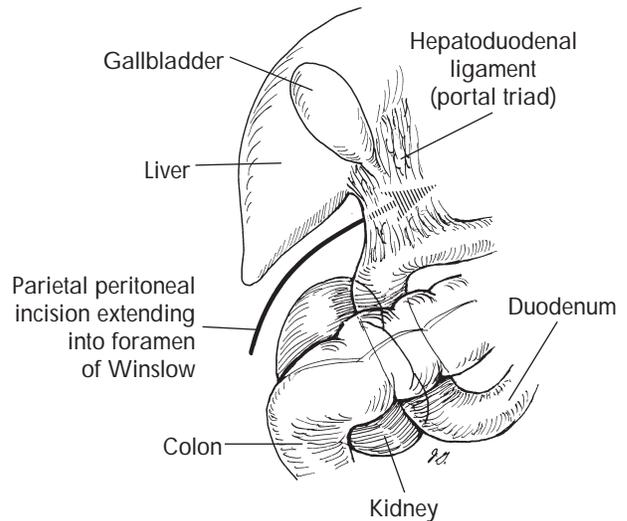
If there is bulky disease, it is critical to make the incision into the foramen of Winslow and to divide the ligament of Treitz itself. Small vessels within the ligament need to be coagulated.<sup>1</sup>



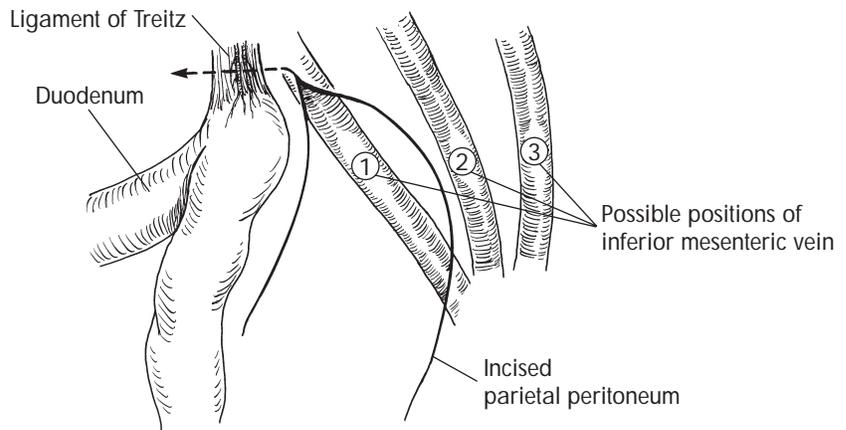
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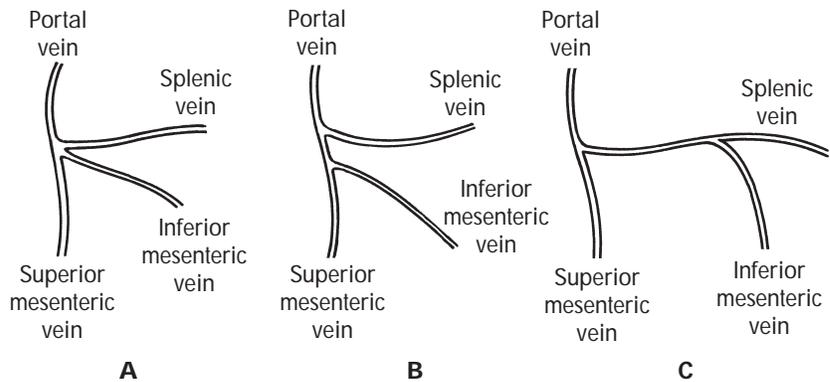


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**Variations in Anatomy of Inferior Mesenteric Vein**



5-5

FIGS. 5-4 AND 5-5. The inferior mesenteric vein drains part of the left transverse colon, the descending colon, and the rectum. The inferior mesenteric vein can vary in its location and may join the splenic vein laterally or medially or even the superior mesenteric vein directly. The superior mesenteric vein drains the ascending colon and right transverse colon. When bulky disease compresses the vena cava, this inferior mesenteric vein can become quite large. This vessel may be under tension after the bowel is mobilized. Depending on the location and size of the inferior mesenteric vein, we generally divide it to gain further exposure.

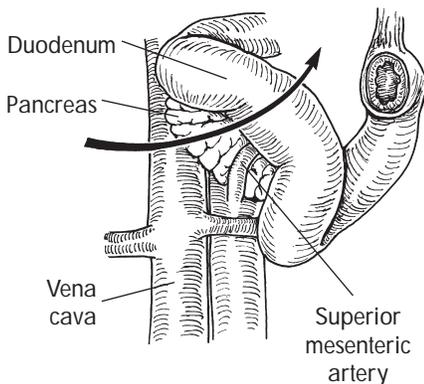
FIG. 5-6. The Kocher maneuver frees the duodenum, exposing the right kidney and part of the vena cava (see pp. 11-12).

The right colon, part of the transverse colon, and the small bowel are packed with a laparotomy pad into a bowel bag and placed over the chest wall. The laparotomy pad prevents the bowel from slipping out.

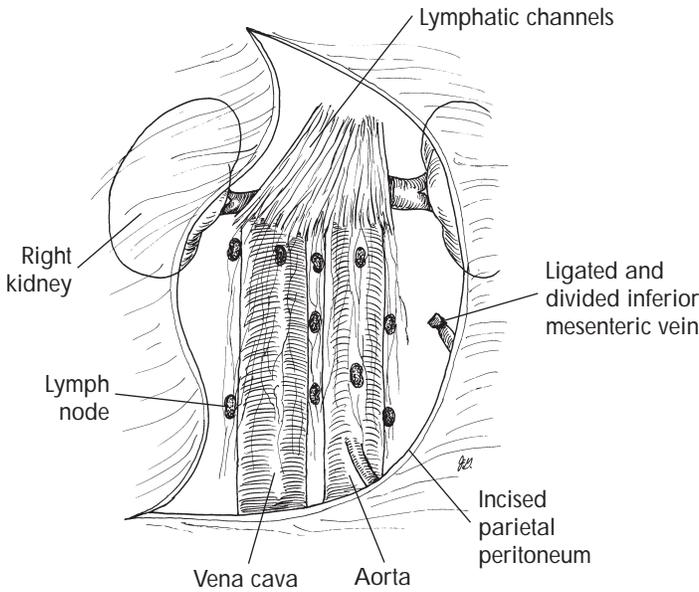
FIG. 5-7. Anterior to the superior mesenteric artery, pancreas, and renal pedicles, there are bands of small lymphatic tributaries that must be divided to gain the proper exposure.

FIG. 5-8. Part of the body of the pancreas is now reflected cephalad with the superior mesenteric artery and the duodenum. When the Harrington retractor blade is placed over the region of the reflected pancreas, the assistant should be aware that excessive compression causes pancreatic contusions.

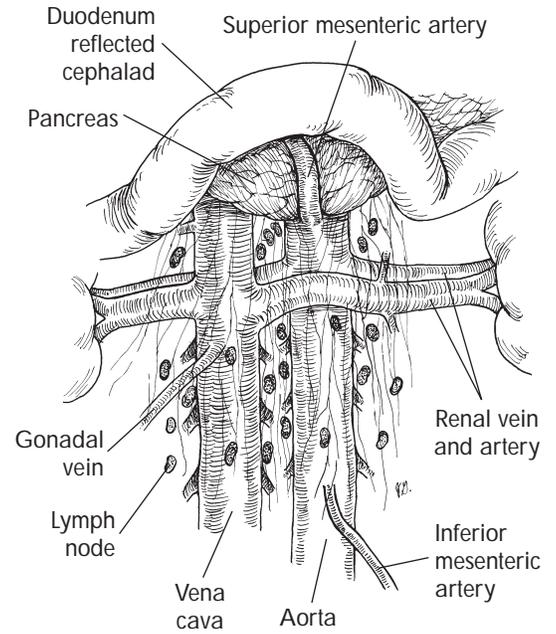
**Kocher Maneuver**



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5-7



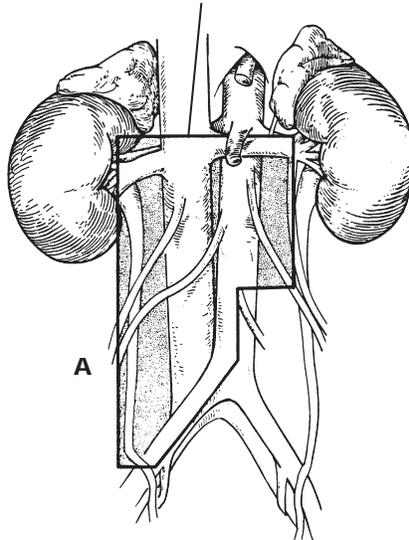
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**LYMPHADENECTOMY**

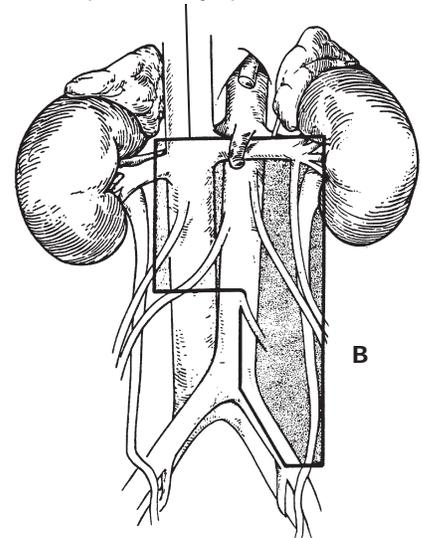
FIG. 5-9. We prefer to use the template method of lymphadenectomy for emission preservation<sup>2</sup> rather than a specific nerve-sparing dissection.<sup>3,4</sup> There is 95% chance of preservation of emission by the template method.

The templates shown here for right-sided and left-sided lymph node dissection represent a complete bilateral dissection above the level of the *inferior mesenteric artery* and a unilateral dissection below the inferior mesenteric artery. On the right side, the dissection is carried along the right renal hilar area to the level of the right ureter and down to where the ureter crosses the common iliac artery. The ipsilateral gonadal vessels are removed to the level of the deep inguinal ring and the previously ligated stump of the spermatic cord. For left-sided dissection, the template is similar, with the exception of the right lateral margin. Since nodal spread tends to occur from right to left, dissection is carried only to the lateral margin of the inferior vena cava rather than all the way to the right ureter.

Modified template for right-sided retroperitoneal lymph node dissection



Modified template for left-sided retroperitoneal lymph node dissection



From Richie JP: Modified retroperitoneal lymphadenectomy for patients with clinical stage I testicular cancer. In Lepor H, Rattliff TL, editors: *Urologic oncology*, ed 3, Boston, 1989, Kluwer.

5-9

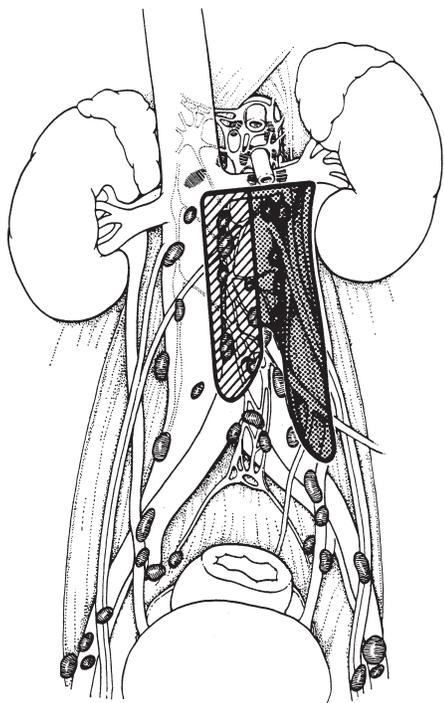


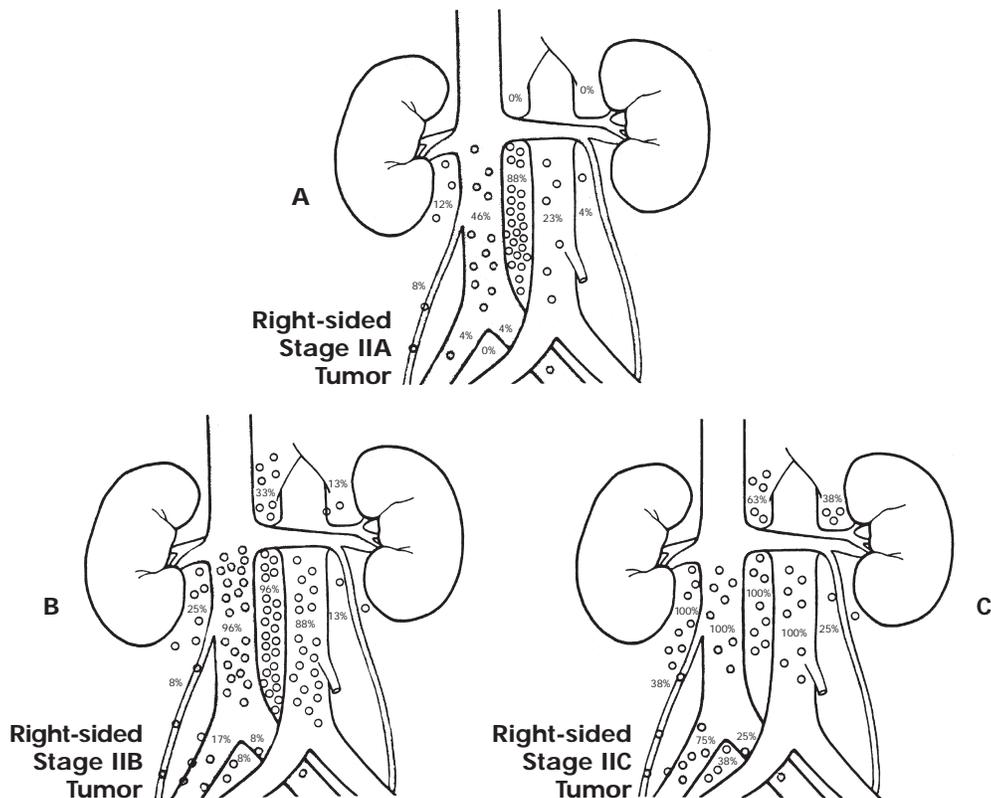
FIG. 5-10. The most common sites of involvement and the frequency of regional involvement for all stages are well documented.<sup>4,5</sup> The primary zone of metastatic spread for right testis tumors is the right paraaortic or interaortocaval zone (*cross-hatched area*). However, in standard retroperitoneal lymphadenectomy, for right-sided tumors the dissection template is routinely extended to include the right iliac and right paracaval nodes. The primary zone of metastatic spread for left testis tumors is the left paraaortic zone (*stippled area*).

FIG. 5-11. In their study of the distribution of nodal metastases in nonseminomatous testis tumors, Donohue, Zachary, and Maynard<sup>4</sup>

found that patients with right-sided stage IIA tumors (A) had an overwhelming preponderance of positive interaortocaval nodes (*circles represent the location of positive nodes*). In addition, precaval nodes were often involved. Suprahilar nodal involvement was absent and contralateral and iliac involvement was rare. In right-sided stage IIB disease (B), nodal distribution was more widespread and the suprahilar, preaortic right paracaval, and iliac zones were more often involved. Large, palpable tumors extended into the suprahilar zone in right-sided stage IIC disease (C). A larger number of positive iliac nodes, caused by the retrograde flow of lymph, were found.

From Donohue JP et al: *J Urol* 144:287, 1990.

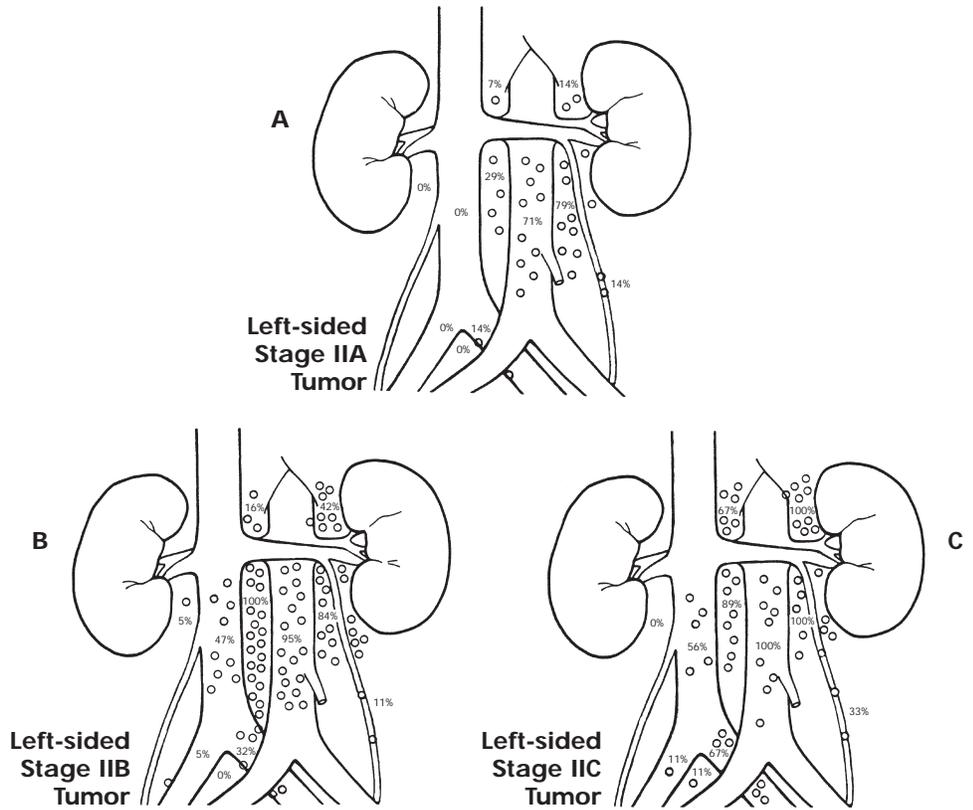
5-10



From Donohue JP, Zachary JM, Maynard BR: *J Urol* 128:315, 1982.

5-11

FIG. 5-12. In left-sided stage IIA disease, the left paraaortic zone below the renal vein and the preaortic zone were most commonly involved (A). Contralateral caval, paracaval, and iliac involvement was absent. In a few cases, the suprahilar nodes were involved but they were paraaortic and located just above the level of the renal arteries. Left-sided stage IIB tumors spread into the intraaortocaval, precaval, and suprahilar zones (B), whereas left-sided stage IIC palpable masses involved the suprahilar zones by direct extension of the tumor mass (C). In addition, in stage IIC disease, the iliac zones and precaval zones were often involved due to the tumor size.



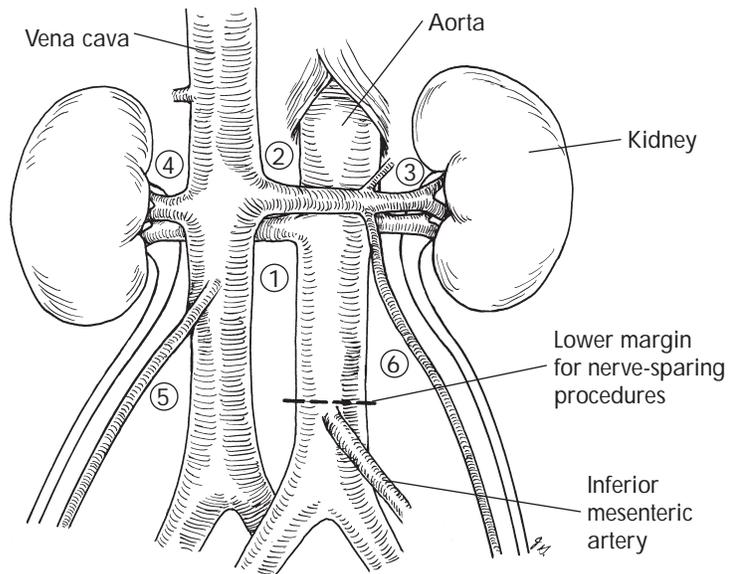
From Donohue JP, Zachary JM, Maynard BR: *J Urol* 128:315, 1982.

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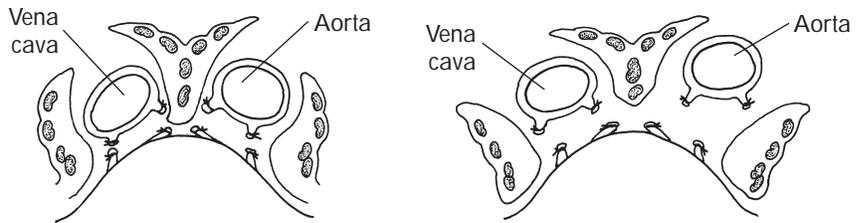
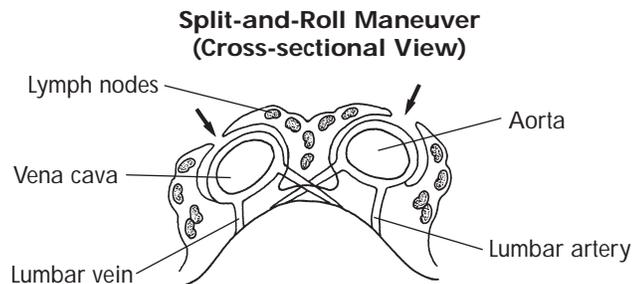
FIG. 5-13. Division of the retroperitoneum into zones is useful for orientation and sequential dissection. We prefer to send multiple specimens placed on a schematic diagram (as shown) for pathologic evaluation.

A large marking stitch (0 silk) is placed above the inferior mesenteric artery because this site is the inferior midline landmark. Before any dissection distorts the anatomy, marking stitches are placed to define template borders.

Zones for Template Tissue Parcels



5-13



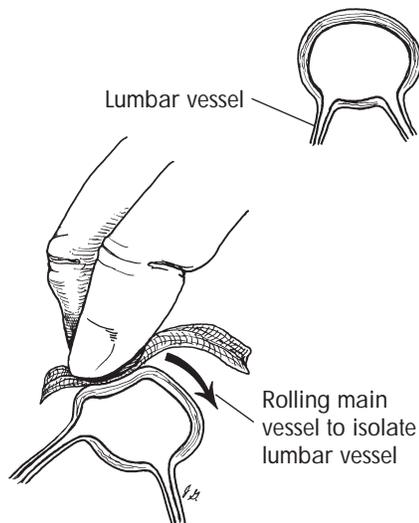
5-14

FIG. 5-14. The split-and-roll maneuver first described by Donohue<sup>5</sup> is the simplest approach for node dissection. After tissues are split anteriorly over the vena cava and aorta, the surgeon sweeps the great vessels away from adjacent fatty tissue and lymph nodes.

This maneuver is easiest if traction is applied with Singley forceps to hold the nodes laterally while the surgeon uses Kitner dissectors (tonsil clamp with ball of gauze clamped at tip) to push the vessels medially.

FIG. 5-15. With a thin layer of dry sponge between the surgeon's finger and the blood vessel, the surgeon gently rolls the vessel medially. The lateral lumbar vessels are thus easily exposed at the base.

In general, the three pairs of lumbar vessels below the renal pedicle can be divided without complication since most of the patients are young, healthy men. The surgeon should avoid ligating any lumbar arteries at or above the level of the renal pedicle to avoid the unusual but real complication of damage to the spinal cord.<sup>6,7</sup>



5-15

**VENOUS HEMORRHAGE**

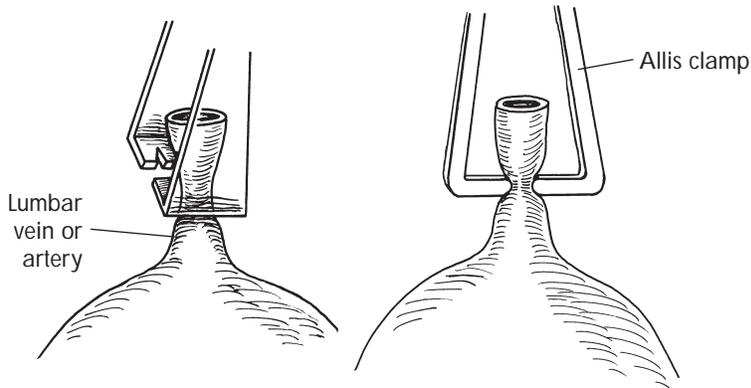
FIG. 5-16. During the dissection, inadvertent tears of the lumbar

veins are common. Under direct vision, the surgeon uses an Allis clamp to grasp the torn lumbar vein before it recedes into the soft tissues.<sup>8</sup>

FIG. 5-17. If a sudden tear of the vena cava occurs when it is nearly skeletonized, the surgeon can use a three-finger maneuver to arrest the bleeding. The index and middle fingers lift and compress the vessel while the thumb can move back and forth in preparation for the closure with a double-arm stitch (4-0 Prolene) for two rows of stitches.

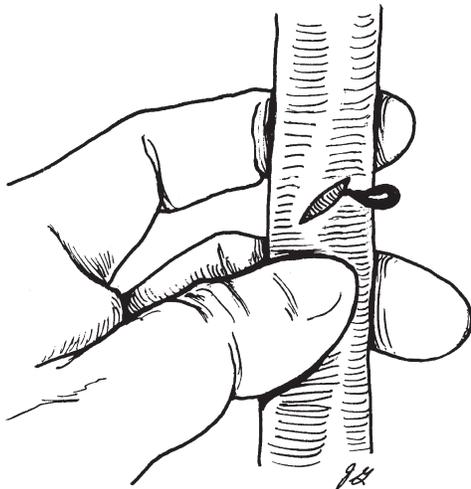
FIG. 5-18. If there is an early tear of the vena cava before the vessel is skeletonized, the surgeon can use two sponge sticks to compress the vena cava above and below the injury after the vena cava is freed from the aorta. Once the blood has been evacuated with laparotomy pads, the surgeon can repair the laceration. An Allis clamp is placed at each end of the laceration and the surgeon uses a running stitch (4-0 Prolene) to close the defect.<sup>9</sup>

The placement of vessel loops around the vena cava above and below the injury is also helpful. It should be remembered that the vena cava has friable walls, which are easily torn, particularly at the points where tributaries enter.

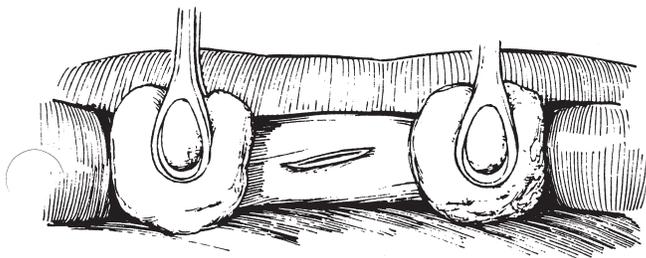


5-16

### Three-Finger Compression of Vena Cava

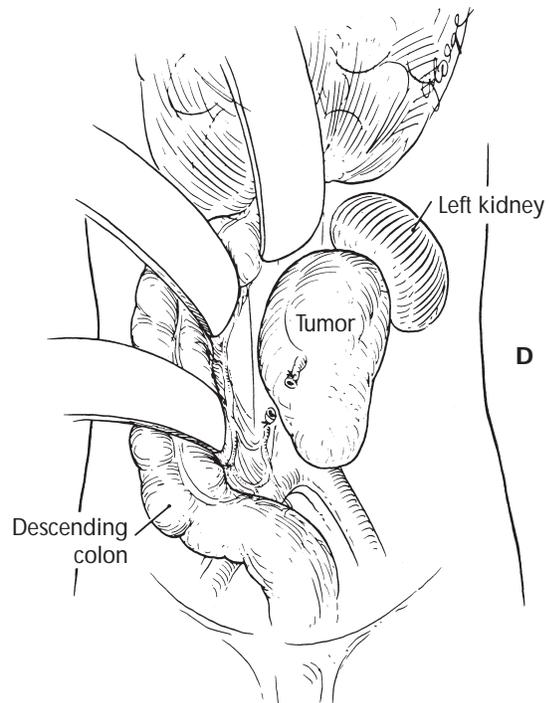
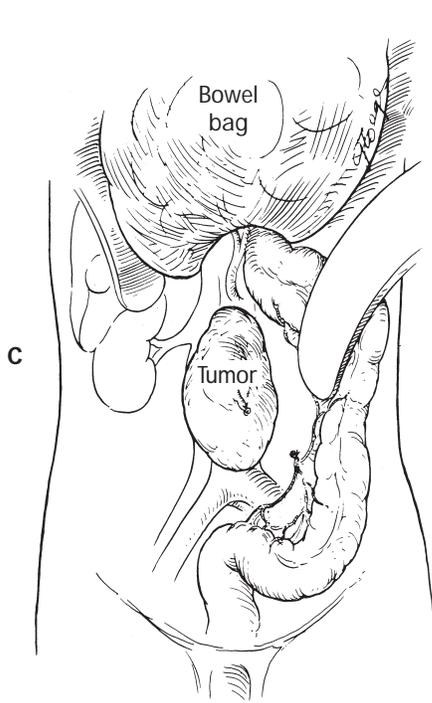
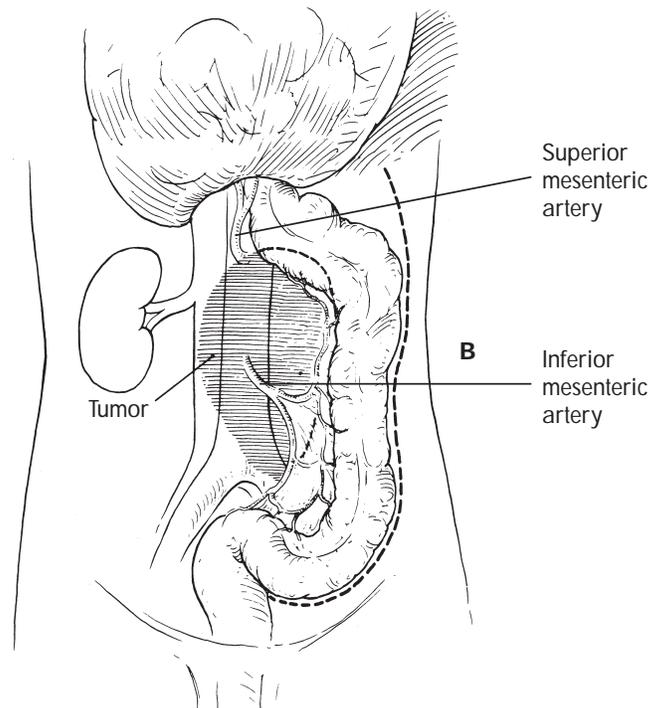
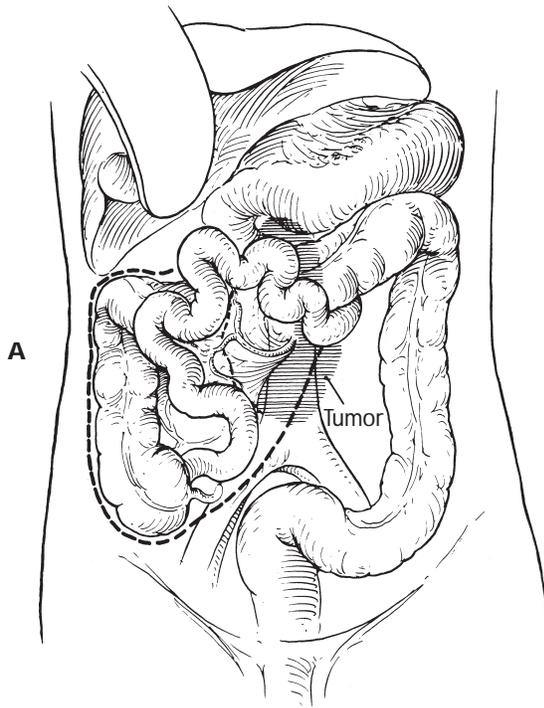


5-17



From Hinman F Jr: *Atlas of urologic surgery*, Philadelphia, 1989, WB Saunders.

5-18



From Skinner DG: *J Urol* 117:605, 1977.

### EXPOSURE OF AND SURGERY FOR BULKY RESIDUAL DISEASE

FIG. 5-19. To obtain maximal exposure, the surgeon must carry the initial peritoneal incision in the right posterior parietal peritoneum along the line of Toldt all the way up into the foramen of Winslow (to the region of the bile duct) and around the mesenteric root with division of the ligament of Treitz (**A**). Complete mobilization of the small bowel, ascending colon, duodenum, and part of the pancreas must be achieved.<sup>3,8</sup>

After the peritoneal attachments to the colon and small bowel mesentery have been incised, the intraabdominal contents are placed in a bowel bag and placed on the anterior chest wall, thus exposing the entire retroperitoneum (**B**). The surgeon must avoid placing excessive tension on the superior mesenteric pedicle.

For exposure of left-sided tumors, the spleen and transverse and descending colon are mobilized (**C**). For extensive tumors the right colon and small bowel are mobilized, placed in a bowel bag, and reflected onto the chest wall.

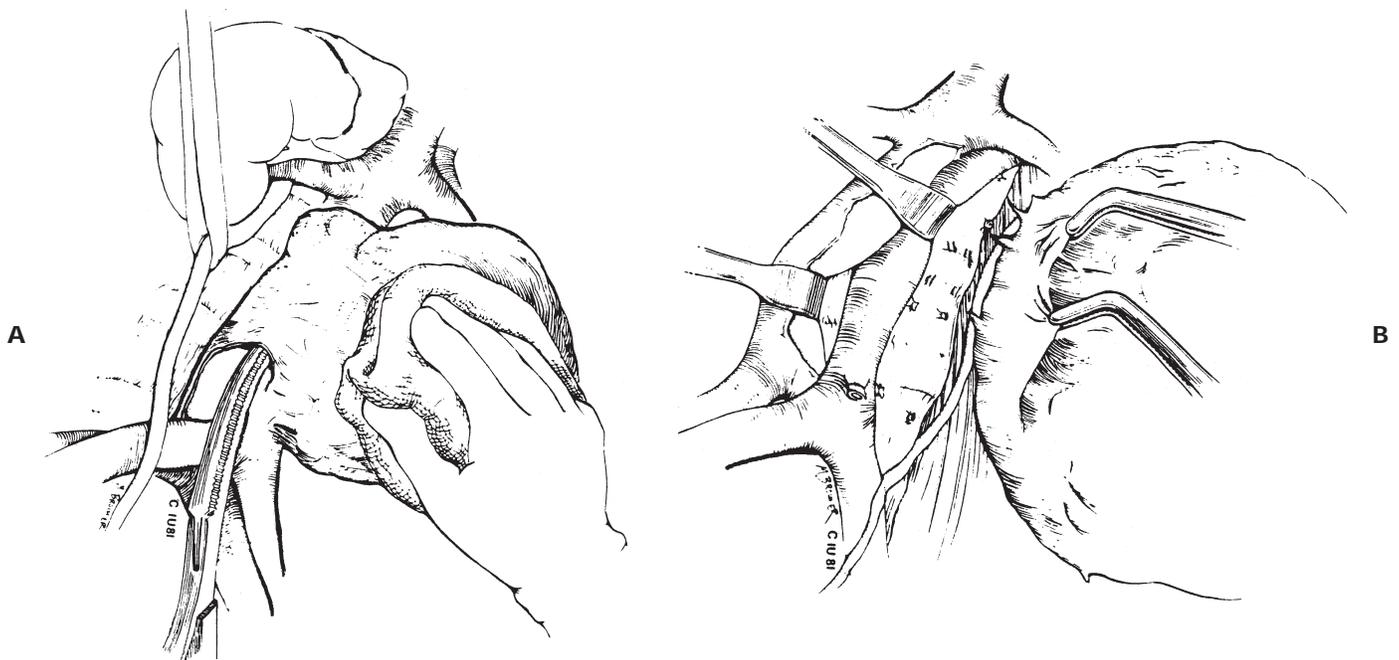
A left parietal peritoneal inci-

sion may be necessary to obtain the best exposure for a bulky mass extending to the left side (**D**). In this case, ligation of the inferior mesenteric artery is necessary to allow the mobilization of the descending colon. As stated earlier, the surgeon must take care to protect the superior mesenteric artery.

FIG. 5-20. Because 10% of debulking procedures may include ipsilateral nephrectomy, the surgeon should start the dissection from the contralateral ureter to ensure preservation of the remaining functioning kidney and ureter unit.

After chemotherapy, there is usually a dense fibrosis of the lymphatic tissues surrounding the great vessels. The surgeon must first define a dissection plane between the vessels and the tumor. Dissection in the subadventitial plane below the fibrous capsule of the tumor is the best approach (**A**).

Once a clear separation is started between the great vessels and the mass, the surgeon can use medial traction with right-angle clamps and gradually dissect the mass from the retroperitoneum (**B**).



From Donohue JP: *Testis tumors*, Baltimore, 1983, Williams & Wilkins.

**SUPRAHILAR NODAL DISEASE**

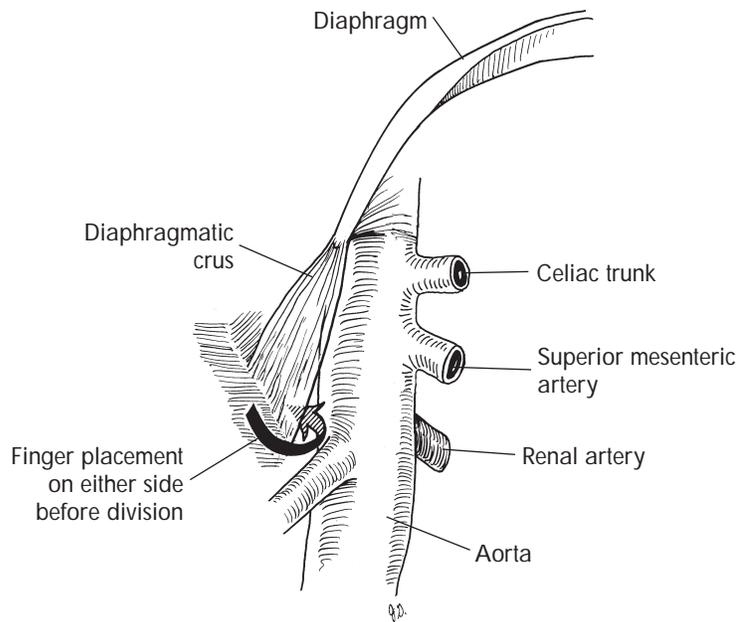
If suprahililar nodal involvement is anticipated from preoperative radiologic studies, the surgeon should be prepared to extend the midline incision and create a thoracoabdominal incision. In addition, the patient should be positioned at a 45-degree angle at the chest level as for a thoracoabdominal radical nephrectomy to obtain the best exposure of the high retroperitoneum with mobilization of the liver (see pp. 2-3).

FIGS. 5-21 AND 5-22. In general, nodal involvement occurs behind

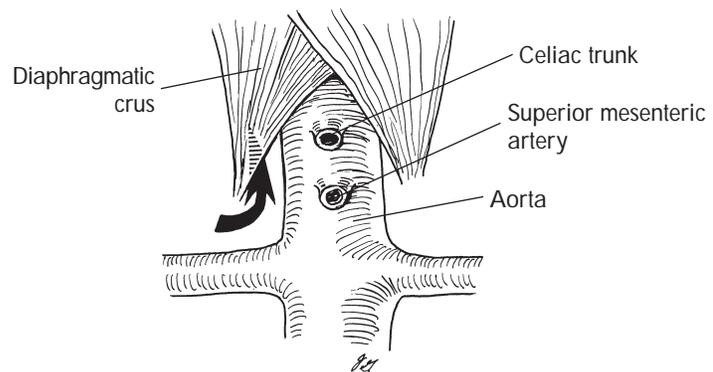
the crus of the diaphragm and above. The crura can easily be palpated as two leaves on either side of the aorta and can be divided for improved exposure.<sup>5,10</sup> This maneuver is blind, guided by only the surgeon's finger palpation of the diaphragmatic crus.

To learn this maneuver, the urologist should assist a thoracic surgeon with cases involving aortic aneurysm repair.

Residual higher masses should be approached directly from above in the pleural cavity.



5-21



5-22

**KEY  
POINTS**

- An incision is made lateral to the right colon extending from the foramen of Winslow, around the cecum, and up the mesenteric root to the ligament of Treitz.
- The inferior mesenteric vein is divided.
- The bowel is packed into a bowel bag and is reflected cephalad on the chest.
- With the pancreas reflected cephalad, the superior mesenteric artery is located by palpation and the Harrington retractor is placed over the region of the reflected pancreas.
- For a template nerve-sparing procedure, a large marking stitch is placed over the inferior mesenteric artery and other marking stitches are inserted to define template borders.
- The split-and-roll maneuver is performed.
- A multiple specimen analysis on the schematic diagram is prepared.
- Diaphragmatic crus division is performed for suprahilar node dissection.
- Bulky disease dissection is performed with preservation of the functioning contralateral renal unit.

**POTENTIAL  
PROBLEMS**

- *Poor exposure:* Check the incision to the foramen of Winslow and around to the ligament of Treitz → divide the ligament of Treitz → divide the inferior mesenteric vein
- *Vena cava tear:* Use a three-finger maneuver → apply compression with sponge sticks above and below the tear → control the vessel above and below the tear with vessel loops → perform double-arm stitch (Prolene 4-0) for closure
- *Injury of inferior mesenteric artery:* Proceed with surgery
- *Injury of lumbar artery above renal pedicle unilaterally:* Preserve the other side and all other lumbar arteries above the pedicles
- *Difficult lymphadenopathy in suprahilar area:* Divide diaphragmatic crura bilaterally
- *Area at inferior margin near inferior mesenteric artery shows positive biopsy:* Perform a full-node dissection and disregard the nerve-sparing template

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