The development of laparoscopic aortic surgery has led us to develop new approaches to the abdominal aorta.1,2 Transperitoneal approaches are not always possible and can be difficult, as is the case with open surgery. In these difficult cases, a left retroperitoneal laparoscopic (retroperitoneoscopic) approach (LRPA) is necessary. We describe the LRPA we used for total laparoscopic aortoiliac occlusive disease (AIOD) and abdominal aortic aneurysm (AAA) repairs.

**Surgical Technique**

The patient is under general anesthesia and placed in a dorsal decubitus position with an inflatable pillow (Pelvic-Tilt®, O.R. Comfort, LLC, Glen Ridge, New Jersey) behind his left flank, which gives a 30° rotation of the abdomen. The surgeon stands on the patient’s left side and the video monitor is viewed distally on the right side. The port used to introduce the 45° endoscope (Storz-France SA, Paris, France) is positioned using an open technique after retroperitoneal blunt dissection. It is positioned halfway between the costal margin and the anterosuperior iliac spine. Through this port, a retropneumoperitoneum of up to 14 mmHg is created. After insufflation, the dissection is started using the endoscope. The psoas muscle is the first anatomical landmark. The left kidney is identified. Two operator ports are placed in the left flank, between the iliac crest and the rib cage. Two 10 mm-ports are inserted in the left iliac fossa for assistant instrumentation and retractor (Fig. 1(A) and (B)). Dissection is conducted after incision of the left retrorenal fascia. The kidney is freed at its lower pole and retracted distally and medially. The left common iliac artery is visualized. The infrarenal aorta is then dissected proximally until the left renal artery. The venous reno-azygo-lumbar trunk is sectioned to avoid effraction of the left renal vein and provide exposure of the juxtarenal aorta. Peritoneal sac and left kidney are maintained with a retractor (Endoretract II, USSC, Autosuture Company, Elancourt, France). The anterior aspect of the right common iliac artery is dissected over 3–5 cm, as necessary. As in conventional surgery, ligation of an occluded inferior mesenteric artery can expand the exposure of the right common iliac artery. After achieving the dissection, the pillow is deflated, which allows a conventional approach to the femoral arteries if needed.

The patient is then taken back to right rotation. The vascular prosthesis is introduced in the abdomen through a port. Laparoscopic clamps (Storz-France SA, Paris, France) are positioned after a bolus of heparin administered intravenously. The proximal clamp is introduced through a sixth port placed above the left 12th rib. A distal clamp is positioned through a seventh port placed in the left iliac fossa. For AAA repair, right iliac clamping can be performed with detachable clamp or with an additional clamp introduced 3 cm below the umbilicus, which stabilizes the peritoneal sac into position.
Discussion

LRPA is similar to the retroperitoneoscopic approach used for lumbar sympathectomy. This approach offers advantages concerning the control of viscera and avoids intraabdominal adhesions. In thin patients, LRPA provides stable aortic exposure. In obese patients, LRPA is challenging but remains feasible. The difficulties of LRPA include the reduced working space and the loss of exposure in cases of accidental pneumoperitoneum. Working space is reduced both internally and externally. Internally, the aortic approach and anastomoses are technically demanding and can involve working in an area blinded by the peritoneal sac. Control of the right side of the aorta and dissection above the left renal vein are difficult.

Pneumoperitoneum due to an accidental tearing of the peritoneal sac, or created by diffusion, also can reduce the working space. Moreover, in cases of bleeding when vigorous suction is necessary, the retropneumoperitoneum is evacuated with immediate loss of visualization. Externally, placement of operating ports is limited to between the iliac crest and the rib cage. Other ports are placed in a small area with frequent crowding of instruments.

In our experience, LRPA was used when a laparoscopic transperitoneal approach was contra-indicated.
This was the case in six patients with a very hostile abdomen (Fig. 2(A)). Three other patients had contra-indications for pneumoperitoneum because of severe chronic obstructive pulmonary disease (two cases) (Fig. 2(B)) and cardiac insufficiency (one case).

References


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