SHORT REPORT

Total Laparoscopic Aortic Surgery: Transperitoneal Left Retrorenal Approach

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The primary difficulties with laparoscopic infrarenal aortic surgery are the exposure of the abdominal aorta and the performance of laparoscopic anastomoses.1 With training in videoscopic sutures, performance of laparoscopic anastomoses is possible. Sutureless anastomotic devices or Robot-assisted sutures are also promising techniques for the performance of laparoscopic anastomoses.2–4 Stable exposure of the abdominal aorta remains essential to perform total laparoscopic aortic repair. Laparoscopic transperitoneal left retrocolic approach5 allows a stable and reproducible aortic exposure during the performance of laparoscopic repair for abdominal aortic aneurysm (AAA) and aorto-iliac occlusive disease (AIOD). However, the left retrocolic approach is not always possible or could be difficult. In these cases, we use a transperitoneal left retrorenal approach.

Technique

As with the transperitoneal left retrocolic approach, the patient is placed in a dorsal decubitus position with an inflatable pillow (Pelvic-Tilt®, O.R. Comfort, LLC, Glen Ridge, New Jersey) placed behind the left flank, which gives a 50–60° rotation of the abdomen. A maximal right rotation of the operating table (ALM, Orléans, France) allows a 70–80° abdominal slope.

The video monitor is viewed distally on the left side of the patient and the surgeon is facing the patient’s abdomen.

Pneumoperitoneum is insufflated with the use of a Veress needle or with an open-technique. The 45 or 30° endoscope (Storz-France SA, Paris, France) is positioned through a 10 mm-trocar (Storz-France SA, Paris, France) on the anterior axillary line 3 cm below the costal margin. The position of the other trocars is shown in Fig. 1. Left retrorenal dissection is conducted cranially and medially from the psoas muscle after incision of the retrorenal fascia. If needed, a complete right medial visceral rotation is performed. Due to the right lateral decubitus, the small bowel, the left mesocolon, the left kidney and the spleen drop into the right part of the abdomen. Exposure can be maintained with a retractor introduced through the sub-xyphoid port. The venous renal-azygo-lumbar trunk is sectioned to provide complete retraction of the kidney and dissection of the juxtarenal aorta. Dissection of the infrarenal aorta is then conducted from the left iliac until the left renal artery.

After achieving the dissection, the operating table is rotated on the left, which allows a conventional approach to the femoral arteries if needed. The operating table is then taken back to its maximal right rotation. The vascular prosthesis is introduced in the abdomen through one of the trocars.

The proximal clamp (Storz-France SA, Paris, France) is introduced through the sub-xyphoid trocar and stabilizes the left kidney into position. Distal
celioscopic clamps stabilize the left mesocolon (Fig. 2(B)). For suprarenal clamping, left kidney and viscera are maintained with a retractor introduced through the sub-xyphoid port and proximal clamp is introduced through an additional port placed in the left flank. (Fig. 2(C)). This exposure allows total laparoscopic aortic reconstructions for AAA and AIOD.

Discussion

The laparoscopic transperitoneal left retrorenal approach of the abdominal aorta allows a stable and reproducible aortic exposure. The operative field remains free from intrusion of intraabdominal organs, which are dropped in the right part of the abdomen. Operator, facing the patient’s abdomen, is not bothered by the orientation of the surgical instruments.5 Dissection can be continued above the renal arteries with the use of a complete right mediovisceral rotation. In our experience of laparoscopic aortic surgery, the transperitoneal left retrorenal approach is indicated when a tranperitoneal left retrocolic approach is not possible. This is the case when the dissection in line of the Told fascia is difficult or impossible, especially for very thin patients or patients with previous left colonic or kidney surgery. It is also useful when suprarenal clamping is needed. By comparison with a left videoendoscopic retroperitoneal approach, the transperitoneal left retrorenal approach allows a larger working space, both externally for the placement of trocars and internally with the dome-shaped cavity due to the pneumoperitoneum.6

References


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Fig. 2. (A) Transverse section showing the abdominal sloping. Arrow is showing the orientation of the surgical instruments after the left retrorenal dissection. (B) Picture showing aortic exposure through a left retrorenal approach after positioning of infrarenal laparoscopic clamps. (C) Picture showing the positioning of suprarenal laparoscopic clamp through an additional port introduced in the left flank with a retractor maintaining the viscera in the right part of the abdomen.
Fig. 2 (continued)