SHORT REPORT

Total Laparoscopic Aortic Surgery: Transperitoneal Direct Approach

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Objective. We describe the laparoscopic transperitoneal direct approach to the abdominal aorta.

Operative technique. The patient is placed in the right lateral decubitus position, which allows dropping of the small bowel into right side of the abdomen. Anatomical exposure of the abdominal aorta follows the same steps as in open surgery.

Discussion. Laparoscopic transperitoneal direct approach allows a reproducible exposure of the abdominal aorta. This technique was useful when retrocolic and/or retrorenal approaches were not possible because of previous left nephrectomy.

Keywords: Laparoscopy; Aortic surgery.

Introduction

Like in open aortic surgery, laparoscopy needs knowledge of different approaches to the abdominal aorta in order to be suitable for different patients and aortic lesions. We previously described transperitoneal left retrocolic and retrorenal approaches for standard cases. 1, 2 For a few patients, we used retroperitoneoscopic approaches. 3 Here we describe the fourth approach of this panel, namely the laparoscopic transperitoneal direct approach of the abdominal aorta (LTDA) and discuss main advantages and drawbacks of this technique.

Operative Technique

Basic operating room set-up and surgeon placement were the same as described for laparoscopic transperitoneal retrocolic and retrorenal approaches. 1, 2 The main new technical point is the positioning of the patient in the right lateral decubitus position during the laparoscopic step of the procedure.

Pneumoperitoneum is insufflated up to 14 mmHg through a Veress needle. A 45-degree endoscope (Karl Storz Endoscopie France SA) was positioned on the left anterior axillary line, 3 cm below costal margin. Two 10-mm trocars were placed at the supraumbilical and left paramedian level, for operator instruments. A 10-mm trocar was placed under the xyphoid for proximal aortic clamp. Another 10-mm trocar was positioned 6 cm below the navel for distal aortic clamp. A 10-mm trocar was placed in the left lower abdomen for assistant instrumentation. With the right lateral decubitus position, the small bowel drops to the right side of the abdomen. After abdominal exploration, the transverse mesocolon was elevated with a stitch pulled out through the left subcostal abdominal wall. A longitudinal incision of the retroperitoneum overlying the aortic anterior wall was made, just to the left of the mesentery. This incision was conducted down to the iliac arteries. Another stitch was placed on the posterior peritoneum, near the duodenum, and pulled out through the right abdominal wall. If needed, an additional port was used to maintain the small bowel with a retractor (Endoretract II, USSC, Autosuture Company, Elancourt, France) introduced.
in the left flank or in the pelvis, on the right paramedian line. With such manoeuvres, the exposure was stable (Fig. 1). The aortic periadventitial plane was freed, and circumferential aortic dissection was obtained up to the left renal vein. After achieving aortoiliac dissection, the pillow was deflated and the operating table rotated to the left, which enabled conventional approaches to the femoral arteries. The patient was then taken back to a right lateral decubitus position and aortoiliac reconstruction was performed as previously described (Fig. 2).1

Currently, LTDA has been useful in two patients. The first patient was operated on for an abdominal aortic aneurysm and retrocolic and retrorenal approaches were not possible because of previous left nephrectomy. The second patient was very thin and a limited aortic endarterectomy was performed.

**Discussion**

Stable exposure is probably the main technical point of laparoscopic aortic surgery. Initially, we described the transperitoneal retrocolic aortic approach, which was used in standard cases.1 Now, we prefer to use a transperitoneal left retrorenal approach, especially in thin patients or those with previous left colonic surgery or when suprarenal clamping is necessary.2

In patients with severe chronic obstructive pulmonary disease or hostile abdomen, we use a left retroperitoneoscopic approach.3

A transperitoneal direct approach to the abdominal aorta was described by Alimi.4,5 In his technique, the patient was placed slightly tilted to the right and operator stood on the left side, with a net was used to maintain the small bowel out of sight.4 With this set-up, an additional Trendelenburg position was needed for aortic exposure. With our technique, placement of the patient in right lateral decubitus position allows to drop the small bowel in the right side of the abdomen. This avoids the need for sophisticated techniques to maintain viscera out of the operative field. Frontal approach of instruments allows dissection of both sides of the aorta. Theoretical advantages of the LTDA are (1) familiar exposure and anatomical landmarks for vascular surgeons, (2) limited dissection planes and (3) avoidance of ureteral dissection. However, main drawbacks of this approach are (1) the lack of stable exposure due to the falling of bowel loops near the operative field, especially in obese patients and in those with small abdominal cavities, (2) the difficulties for graft covering, especially in thin patients and (3) limited possibilities for suprarenal clamping. Use of a net such as described by Alimi et al.4,5 could be an interesting tool, combined with the right lateral decubitus position, and could provide a stable exposure but we have not yet tried this possibility.

**References**


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