Laparoscopic-Assisted Colectomy and Lymphadenectomy Without Peritoneal Insufflation for Sigmoid Colon Cancer Patients

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PURPOSE: A new method for laparoscopic-assisted sigmoid colectomy and lymphadenectomy is presented. The purpose of this method is to avoid complications and restrictions associated with pneumoperitoneum. METHODS: Abdominal wall is lifted up with Kirschner wires, which are placed in the middle and left lower abdomen; then a minilaparotomy, which can be created because air-tightness is not necessary, is extended at the beginning of the operation to later remove the resected specimen. Two laparoscopic instruments are inserted through the right lower abdomen. Through the minilaparotomy, the surgeon can operate with conventional instruments. RESULTS: Operative time can be shortened, and surgical manipulations such as ligations and sutures are far easier than and cosmetic results are similar to those of laparoscopic surgery under pneumoperitoneum. CONCLUSION: We believe that this technique is a safe, time-saving, and cost-beneficial technique for sigmoid colectomy, and by changing the location of the minilaparotomy, this method can also be applied to other types of gastrointestinal surgery. [Key words: Laparoscopic surgery; Colon cancer; Surgical technique; Peritoneal insufflation]


TECHNIQUE

Laparoscopically assisted surgery by the abdominal wall-lift method is indicated for sigmoid colon cancer patients without distant or peritoneal metastasis. The patient is placed in the lithotomy position under general anesthesia. The surgeon stands on the left side, and the assistant and laparoscopist stands on the right side. A 1-cm long incision is made 5 cm cranial from the umbilicus to introduce the laparoscope. Two Kirschner wires are inserted subcutaneously at the middle and lower abdomen. The first wire is placed 4 to 5 cm below the umbilicus, and the second wire is placed in the left lower abdomen. Next, two wires are connected with a specially designed metal bar (Mizuho Ika Industries, Tokyo, Japan) to lift the abdominal wall (Fig. 1). First, the abdominal cavity is

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observed with a laparoscope, and then two 1-cm incisions are made in the right lower abdomen to introduce the laparoscopic instruments, which are manipulated by the assistant; after that a 5-cm long transrectal incision (minilaparotomy) is made in the left lower abdomen. The operation is performed with conventional surgical instruments through the minilaparotomy and through the left lower abdomen with laparoscopic instruments (Fig. 2). The surgeon can proceed in accordance with a direct view via the minilaparotomy, assisted by the view of the operative field on a video monitor. The assistant mainly watches the video monitor. The sigmoid colon is grasped with a laparoscopic grasper and retracted toward the right side. The sigmoid colon is dissected from the retroperitoneum, with identification and protection of the left ureter and spermatic (or ovarian) vessels. At the front of the aorta, fibers of the hypogastric nerve are identified, and its branches to the colon are cut, which protects the main fibers to avoid postoperative sexual dysfunction. Dissection is extended to the lower border of the duodenum cranially and at least 10 cm from the tumor caudally. After mobilization of the sigmoid colon, the tumor can usually be palpated with the surgeon’s finger. After marking the distant cut line with stitches, the sigmoid colon is retracted toward the left side, and dissection from the right side of the sigmoid colon is performed. Vessels are ligated directly with the fingers through the minilaparotomy or, if that is impossible, with a specially designed knot pusher. The distal sigmoid colon is cut with a linear stapler. The inferior mesenteric artery (high ligation) or superior rectal artery (low ligation) is doubly tied at its origin. The proximal colon is cut extracorporeally. Anastomosis is performed using the double-stapling method. The anvil of a circular stapler is introduced into the proximal colon, returned into the peritoneum, and attached with the stapler, which is introduced transanally. After the stapler is fired, doughnuts are examined, and the colon is insufflated with air to confirm tightness of the anastomosis. A drain is usually introduced near the anastomosis. Wounds are closed in two layers.

**DISCUSSION**

PI is usually used in laparoscopic surgery to ensure visualization of the operative field. In addition to its