

Laparoscopic anterior resection of rectal cancer with lymph node dissection around the inferior mesenteric artery with preservation of the left colic artery (LAR-LND-PLCA)

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Background: Laparoscopic anterior resection of rectal cancer with lymph node dissection around the inferior mesenteric artery (IMA) with preservation of the left colic artery (LAR-LND-PLCA) is a highly difficult operation. According to our rich experiences of laparoscopy surgical techniques recent years, we can proficiently master the surgical techniques and difficulties of LAR-LND-PLCA base on the anatomy of blood vessels and the interfacial space.

Methods: A 59-year-old patient who was diagnosed as rectal cancer underwent LAR-LND-PLCA. Combined with this case, we share the surgical technology of LAR-LND-PLCA base on our experience.

Results: The length of operation was 120 min with bleeding of about 50 mL. The patient recovered well postoperation and discharged from hospital on the 7th day.

Conclusions: LAR-LND-PLCA is effective and safe for the rectal cancer. Because it is too difficult, so it must be done in the rich experienced hospital.

Keywords: Rectal cancer; laparoscopy; preservation of the left colic artery

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Introduction

Colorectal carcinoma is the second most commonly carcinoma in females and the third in males. In 2012 there are about 1.4 million new cases and 693,900 deaths (1). And approximately one third of all colorectal carcinoma are rectal cancer.

The anatomy of rectum is complex, and we need a good understanding of the anatomy of the rectum, good psychological quality, excellent surgical technique and the operation team with the tacit understanding to complete the laparoscopic anterior resection of rectal cancer with lymph node dissection around the inferior mesenteric artery (IMA) with preservation of the left colic artery (LAR-LND-PLCA). Here (*Figure 1*), we share the LAR-LND-PLCA

surgical skills by a case of rectal cancer.

Methods

Surgical indications

LAR-LND-PLCA is suitable for the cancerous lesion located within 12 cm of the anal verge by rigid proctoscopy.

The contraindications of LAR-LND-PLCA are as follows: patients with severe cardiopulmonary insufficiency, T4b, obstruction or tumor >6 cm in size.

In the video, the patient is a 59-year-old man diagnosed to be moderately differentiated rectal cancer after CRT, and preoperative tumor staging was ycT3N1M0 by MR (*Figure 2*).



Figure 1 LAR-LND-PLCA (2). LAR-LND-PLCA, laparoscopic anterior resection of rectal cancer with lymph node dissection around the inferior mesenteric artery with preservation of the left colic artery. Available online: <http://www.asvide.com/articles/1203>



Figure 2 Abdominal MRI scan.

Surgical position

After anesthesia, the patient is placed in lithotomy position and Trendelenburg position. In the operation room, there are two monitors placed right above the head and between

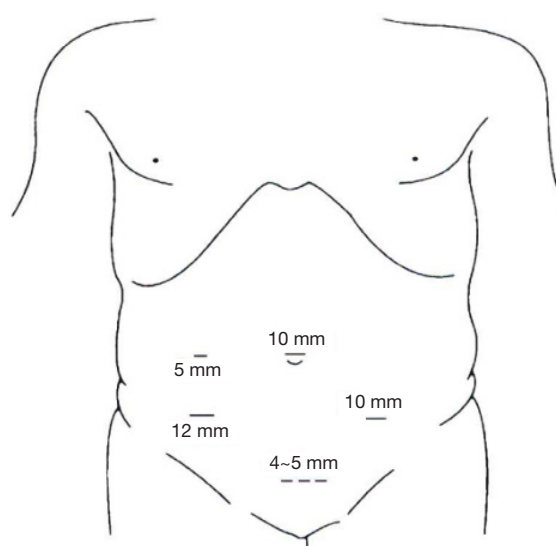


Figure 3 Trocars position.

the patient's legs. The surgeon stands on the right side of the patient. The first assistant stands on the left side of the patient. The second assistant stands on the left side of the surgeon.

Surgical procedures

In this operation, we need five trocars, of which two 12-mm and three 5-mm trocars. Above of the navel we puncture into 12 mm trocar and put in 30 degree laparoscopy. Pneumoperitoneum was established with carbon dioxide (CO₂) and the intra-abdominal pressure was maintained at a constant 12 to 15 mmHg. Other trocars were placed in position to see *Figure 3*. The first step is laparoscopic exploration to determine whether there was distant metastasis or spread.

And then we performed a central way to open the right side of the rectum ditch and separated the left Toldt's fascia.

At the same time, we should dissect the lymph nodes along IMA, vein and their branch and preserved the left colic artery. After branching the left colic artery of IMA, we ligated the IMA and IMV (*Figures 4,5*).

Then we can free the interspaces around the rectum and cut rectum according to the TME principle.

We extended the right side abdomen 12 mm trocars hole to about 5 cm. Through this incision, we took out the rectal cancer specimens and cut the colon in the cancer proximal 10 cm, then made an end-to-end anastomosis through the

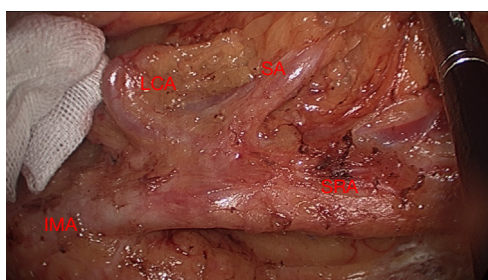


Figure 4 The branch of IMA. IMA, inferior mesenteric artery.

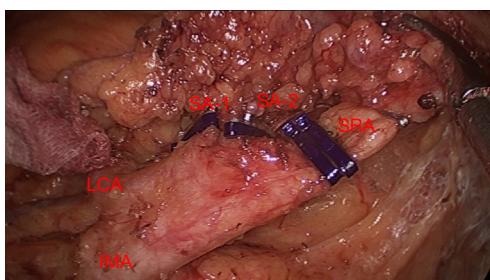


Figure 5 Ligating the IMA. IMA, inferior mesenteric artery.



Figure 6 Pathological specimens of rectal cancer.

anus using the anastomosis staplers.

At last, we made prophylactic ileostomy and suture the trocar holes and the incision.

Results

Operation time was 120 minutes, and the amount of bleeding was 50 mL. The postoperative pathological results showed that the poorly-differentiated adenocarcinoma with



Figure 7 Pathological specimens of rectal cancer.

ypT2N1aM0 (IIIA) stage among which 1/14 lymph node-positive (*Figures 6, 7*). The patient recovered well without complications and discharged from hospital 7 days after surgery.

Discussion

Some studies shows that laparoscopy is associated with the same short-term and long-term outcomes with comparing the open operations (3,4). Some scholars reported that LAR had the advantages of less bleeding, faster recovery and shorter hospital stay in the short-term endpoints (5,6). And locoregional recurrence and disease-free and overall survival are the same between laparoscopic-assisted and open operation (3,4,7,8). So LAR may be considered based on some principles in NCCN Guidelines for Rectal Cancer Version 2.2016.

Curative resection of rectal cancer included “high tie” and “low tie” of the IMA. “Low tie” included preservation of the LCA and lymph nodes dissection over the root of IMA (*Figure 8*). But it was controversial whether a high or low ligation of the IMA was superior. Some experts believed that there were no significant differences in the complication rate, operative time, the amount of blood loss, the number of days and OS and RFS rates between “low tie” and “high tie” with LND (9). But some scholars thought high tie may increase anastomotic leakage, because it reduced intestinal blood supply (10).

LAR-LND-PLCA LAR is a very difficult surgery and need skilled surgical techniques. So if it is difficult to deal with the problems in the laparoscopic surgery, please consult a rich experienced surgeon or change to open surgery.

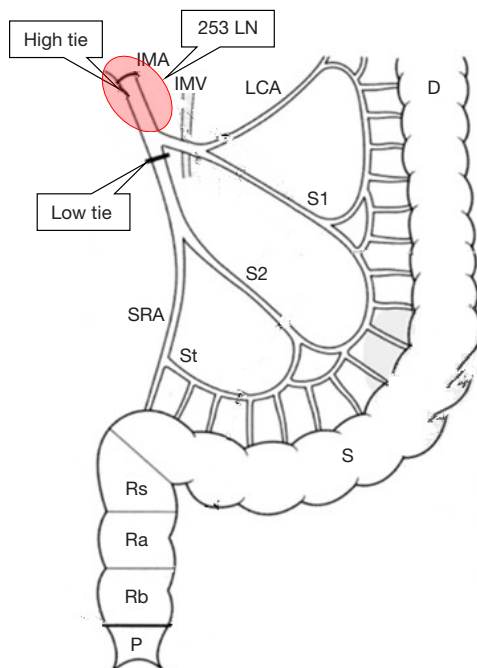


Figure 8 “High tie” and “low tie”.

Conclusions

LAR-LND-PLCA is effective and safe for the rectal cancer. Because it is too difficult, so it must be done in the rich experienced hospital.

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Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/ales.2016.10.09>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). Institutional ethical approval was waived. Written informed consent was obtained from the patient for publication of this manuscript and any accompanying

images.

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