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Case Report

Laparoscopy sigmoidectomy- an intracorporeal anastomosis for minimally invasive approach to sigmoid surgery in our center: a case report

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ABSTRACT

Rectosigmoid cancer is the 3rd high prevalence in the world and Indonesia. Surgical management is performed by resection with margins on the proximal and distal sides of the tumor. Improving optimal quality of life by minimizing complications including anastomotic leak, post-operative abscess, surgical site infection as well as decreasing time to discharge and quicker recovery. Minimally invasive ileocolic and colorectal anastomoses may be performed using intracorporeal or extracorporeal techniques. Intracorporeal laparoscopic is reported to be superior as it minimizes bleeding and serosal injuries leading to less postoperative complication of ileus and incisional hernia. Reported a case of laparoscopic sigmoidectomy with resection intracorporeal anterior anastomosis in a 68-year-old male patient with sigmoid cancer. Three trochanter port 12 mm was used subumbilical, 2 cm above anterior superior iliac spine and 5 cm under right mid clavicle line. Counter traction was performed, descending colon was pulled medially opening the plane caudally to the promontorium of the sacrum and medial to distal dissection was performed. The mesentery of the descending colon and retroperitoneum are opened, the anterior surface of Gerota's fascia along Toldt white line to the spleen flexure. Resection for sigmoid was performed 10 cm from proximal and 5 cm from distal sigmoid tumor. Anastomosis colon descendent and rectum using endo GIA 60 mm stappled and suture the defect using V Loc 3.0, identified leaks test was negative. The specimen was extracted out using Pfannenstiel incision. Management of laparoscopic sigmoidectomy using intracorporeal anastomosis for rectosigmoid carcinoma was effective. The patient was discharged from the hospital on the 3rd day. Evaluation was performed until 2 weeks, complications during follow-up were not found, and clinical improvement was reported.

Keywords: Sigmoid cancer, Intracorporeal anastomosis, Laparoscopic sigmoidectomy

INTRODUCTION

Sigmoid cancer is a part of colorectal cancer, one of the malignancies in the colon and rectum that initially occurs in the intestinal epithelial mucosa so that it can cause necrosis and ulcers. Colorectal cancer is the third most common cancer in the world with a presentation of 11.2% or 1,849,518 cases of the total number of cancer patients worldwide and the second cancer with a death rate of 9.2% or 880,792 in 2018. Within 5 years there were 1,021,005 cases in Asia with 43,324 new cases each year. In Indonesia, rectosigmoid cancer with a prevalence from 2013 to 2018 occurred 32,069 cases with 14,112 new cases in 2018.[1] The trend of CRC is expected to increase across different populations in the world, both in the West, including the United States, Canada, and Australia, and in Eastern populations, such as China, and Korea.[2] In Indonesia, 34,189 new cases of CRC were estimated in

2020, ranking the fourth most prevalent cancer incidence in the country. More than 30% of rectal cancers in Indonesia are found in patients aged 40 years or younger. The probable diagnosis is usually based on clinical data, which mainly comprise anemia, low digestive tract bleeding, abdominal pain, and weight loss.[3,4]

Anterior resection is the standard surgical therapy in recto-sigmoid cancer with anal verdge >10 cm. 5 year surgical experience survival is between 27-42% of this cancer. Laparoscopic techniques were adopted by general surgeons in the 1980s with subsequent adaptation to colorectal surgery in 1991. Rectal resection using laparoscopic technique allows for improved quality of postoperative recovery with faster return of bowel function, lower analgesia requirements and shorter length of hospitalization.[5] Minimizing infectious complications which include anastomotic leaks, postoperative abscesses and surgical site infections is essential, but reduced time to discharge and faster recovery are also key outcomes of laparoscopic anterior resection. Minimally invasive ileocolic and colorectal anastomoses can be performed using intracorporeal or extracorporeal techniques. Intracorporeal laparoscopy is reported to be superior as it minimizes bleeding and serosal injury leading to fewer complications of ileus and incisional hernia after surgery.[6]

CASE REPORT

Laparoscopic anterior resection was performed on a 68-year-old, male patient. 6 months before admission to the hospital, patient came with complaints of frequent liquid stools accompanied by blood and positive fecal blood occult results. The complaint was followed by pain when going to defecate. The patient did not complain of difficulty in defecation. Colonoscopy was performed with the results of a lumpy and friable mass with the scope entering at 17 cm from the anal verge. The patient's laboratory examination showed a hemoglobin level of 10.2 g/dl and tumor markers within normal limits: carcinoembryonic antigen of 4.8.

Figure 1: Identification intralumen of sigmoid tumor using colonoscopy.

Colonoscopy revealed a large villous tumor in the sigmoid. The tumor had a cauliflower shape with the tip protruding laterally from the base of the tumor and the edges of the tumor appeared fragile. Biopsy of the tumor showed adenocarcinoma in sigmoid.

Operating methods and procedures

The patient was supine on the operating table. After induction of general anesthesia, insertion of nasogastric tube and Foley catheter, the legs are placed in stirrups. The arm is tucked at the patient's side and a beanbag is placed. The abdomen is prepared with antiseptic solution and routinely draped. The main monitor is placed on the left side of the patient. The lead operating surgeon stands on the right side of the patient with the assistant standing on the left side of the patient and moving to the right side once the port is inserted.

Three trochanter port 12 mm was used subumbilical, 2 cm above anterior superior iliac spine and 5 cm under left mid clavicle line. The subumbilical primary optical port using modified Hasson approach ensured entry of the port into the peritoneal cavity, purge string sutures were placed around the subumbilical fascial defect. The abdomen was filled with CO_2 to a pressure of 12 mmHg. Telescope was inserted into the abdomen and assessment of abdominal cavity condition, mass of sigmoid rectum was identified as mobile.

Figure 2: Identification inralumen of sigmoid using laparoscopic.

Counter traction was performed, descendent colon was pulled medially using an atraumatic bowel clamp at the right lower quadrant port. Identify inferior mesenteric artery, high ligation was performed. Electro-surgery was used to open the peritoneum along this line, opening the plane of the inferior mesenteric artery, and caudally to the promontorium of the sacrum. Lateral dissection was performed, the mesentery of the descending colon and retroperitoneum are opened, the anterior surface of Gerota's fascia along Toldt white line to the spleen flexure.

The patient was returned to the Trendelenburg position, and the small bowel was directed in the cranial direction. Atraumatic bowel clamps inserted through the left side port were used to remove the rectosigmoid colon, posterior dissection behind the mesorectum to the pelvic floor.

Figure 3: Ligation of inferior mesenteric artery.

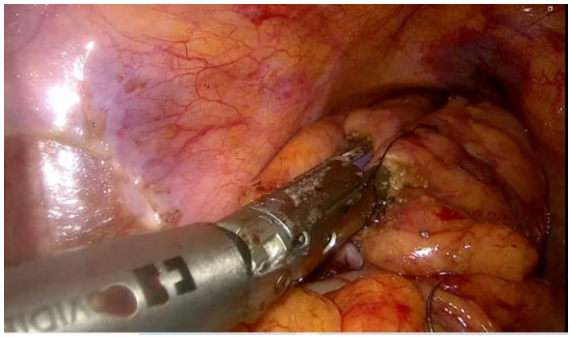

Figure 4: Anastomosis side to side colorectal.

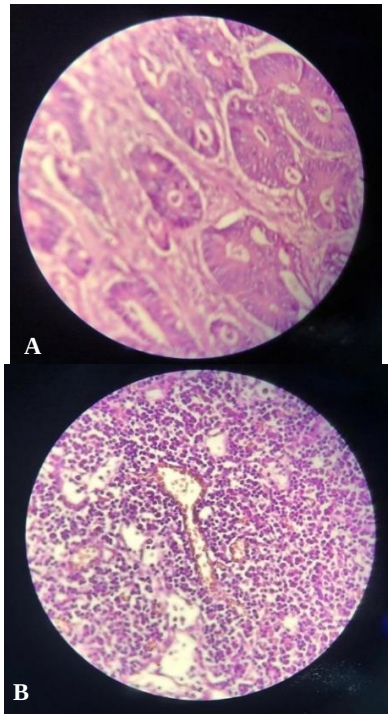

Figure 5: (A) Histopathology of the recto-sigmoid tumor with a microscope magnification of 40x shows tubular infiltration into the tunica serosa. (B) No tumor was found in lymph nodes.

Anterior resection for sigmoid was performed 10 cm from proximal and 5 cm from distal sigmoid tumor using endo GIA 60 mm stappled. Lateral dissection was continued on both sides of the rectum and extended anterior to the rectum, posterior to Denonvillier's fascia. Intracorporeal anastomosis side to side using a double-stapling technique with a circular stappler Endo GIA 60 mm and suturing the defect using Loc 3.0. The rectal tube was inserted using clear fluid inserted from the rectum and identified leaks test was negative. The specimen was extracted out using short Pfannenstiel incision, performed a 4 cm incision at the umbilical port site to extract the specimen.

The operative time was 194 minutes, and the estimated blood loss was 30 ml. The tumor measured 7 × 5 × 2 cm. Histological examination of the tumor showed well differentiated tubular adenocarcinoma without regional lymph node metastasis. Almost the entire tumor was intramucosal, with focal invasion of the subserous layer (stage 2; pT3, pN0, pM0). Our patient had an uneventful postoperative course. She had no fecal incontinence or constipation. After laparoscopy anterior resection and sigmoidectomy, an intracorporeal anastomosis anterior resection surgery follow-up was carried out up to 1 months postoperatively, there were no complications or recurrences of rectal carcinoma.

DISCUSSION

Anterior resection is performed in the management of rectosigmoid cancer. During this procedure the cancer is removed along with a portion of the sigmoid colon and rectum and the lymph nodes around the affected area. The two healthy ends of the colon and rectum are then sutured or stapled together to form a connection called an anastomosis. Laparoscopic anterior resection is a minimally invasive procedure with quick recovery and short hospitalization compared to the laparotomy approach. Systemic complications in laparoscopic anterior resection are around 2%-3% compared to 1% in conservative surgery.[6] The study on postoperative complications of anterior resection conducted by COST showed no significant difference between the two techniques indicating that both methods are safe and feasible. The randomized controlled trial-CLASICC study, which included 484 cases of laparoscopic colorectal surgery and 253 cases of conservative surgery.[7]

Anastomotic leakage is a major complication in laparoscopic LAR. The complications may be associated with Size and location of tumor, pathological staging and preoperative nutrition were significant factors associated with LAR complications, while gender, age and pathological type showed no relevance. Studi dari zhu dkk pada 132 consecutive patients yang menjalani laparoscopic LAR. Complications occurred during the operation in 7 patients (5.3%), within 30 postoperative days in 24 patients (18.2%), and within 3 mo in 2 patients (1.5%). The most significant complications were anastomotic leakage (9.1%) and anastomotic hemorrhage (5.3%).[8] In this case there were no complications during surgery or postoperatively. Lipska et al, 2006 performed a risk factor analysis for 98 laparoscopic LAR cases and concluded that tumors located within 6 cm of the anal

margin were a significant risk factor for surgical complications (p=0.01).[10] This reminds us that some modified techniques that can help relieve regional tension can be used as an alternative when performing some critical anastomoses during surgery.[11]

Other complications that may occur during surgery are ureteral and bladder injuries. This can occur in both colon surgery and rectal surgery. Exposure and identification of both sides of the abdominal cavity when separating the bowel and bladder aims to avoid unnecessary cuts (especially near the lateral or retro-peritoneum). In the event of an injury to the ureter, an evaluation of the severity is made first before choosing the appropriate method to repair it.[12] In most conditions, side to side anastomosis of the injured ureter with pigtail ureteral catheterization can be performed. When performing anterior dissection of the inferior border of the rectum, any manipulation (especially when using a harmonic scalpel) may result in a small bladder perforation (3-5 mm) and the use of a urethral catheter for 7-10 days is sufficient for wound healing.[9] Whereas in relatively large or irregular lesions, absorbable sutures are required and the urethral catheter is maintained for 4-10 days.[8]

Factors that can affect the occurrence of surgical complications including tumors larger than 3 cm in diameter, less than 6 cm proximal to the anal verge, pathological stage III related to tumor location, tumor size and pathological stage, are independent risk factors for surgical complications of colorectal cancer resection.[13] Anastomosis leakage is one of the complications of anterior resection. Insufficient blood supply, excessive tension, and difficult anastomosis are the causes of anastomosis leakage in conservative methods. Patients with larger tumor size based on TNM stage usually have worsening systemic physical status, intestinal edema, or pelvic adhesions due to invasion of a large tumor mass. insufficient blood supply around the anastomosis site results from the mesentery resection process.[14,15] Selection of a more proximal anastomosis at the lower border of the tumor to avoid tension is an appropriate choice. Development of laparoscopic techniques, the use of good anastomotic devices and the demand for better quality of life, more patients will receive laparoscopic for colorectal resection.

CONCLUSION

One of the treatment options for sigmoid cancer is laparoscopic anterior resection with intracorporeal anastomosis. The choice of one-stage or two-stage depends on several factors and must be carefully observed before surgery. One-stage procedures have a higher risk of anastomosis leakage but have the advantage of lower comorbidities. In this case, Anterior Resection was chosen based on the location of the tumor in the sigmoid and the size of the tumor.

Management of laparoscopy sigmoidectomy using intracorporeal anastomosis for rectosigmoid carcinoma was effective. The patient was discharged from the hospital on the 3rd day. Evaluation was performed until 4 weeks, complications during follow-up were not found, and clinical improvement was reported. In the follow-up of this patient, there were no complications or recurrences.

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REFERENCES

1. Morgan E, Arnold M, Gini A, Lorenzoni V, Cabasag CJ, Laversanne M, et al. Global burden of colorectal cancer in 2020 and 2040: Incidence and mortality estimates from GLOBOCAN. Gut. 2023;72:338–44.
2. Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Pineros M, et al. Indonesia. In: Global Cancer Observatory: Cancer Today; 2020.
3. Puspitaningtyas H, Hutajulu SH, Fachiroh J, Anggorowati N, Sanjaya GY, Lazuardi L, Sripan P. Diverging likelihood of colon and rectal cancer in Yogyakarta, Indonesia: A cross sectional study. PLoS One. 2024;19(3):e0301191.
4. Staib L, Link KH, Blatz A, Beger HG. Surgery of colorectal cancer: surgical morbidity and five and ten year results in 2400 patients monoinstitutional experience. World J Surg. 2002;26:59-66.
5. Law WL, Chu KW. Anterior resection for rectal cancer with mesorectal excision: a prospective evaluation of 622 patients. Ann Surg. 2004;240(2):260-8.
6. Brown RF, Cleary RK. Intracorporeal anastomosis versus extracorporeal anastomosis for minimally invasive colectomy. J Gastrointest Oncol. 2020;11(3):500-7.
7. Martijn P, Eva H, Miguel C, Alois F, Antonio L, Wim H, et al. Laparoscopic versus open surgery for rectal cancer (COLOR II): short-term outcomes of a randomised, phase 3 trial. The lancet oncology. 2013;14:10.
8. Zhu QL, Feng B, Lu AG, Wang ML, Hu WG, Li JW, et al. Laparoscopic low anterior resection for rectal carcinoma: complications and management in 132 consecutive patients. World J Gastroenterol. 2010;16(36):4605-10.
9. Lee WS, Yun SH, Roh YN, Yun HR, Lee WY, Cho YB, et al. Risk factors and clinical outcome for anastomotic leakage after total mesorectal excision for rectal cancer. World J Surg. 2008;32:1124-9.
10. Zhu QL, Feng B, Lu AG, Wang ML, Hu WG, Li JW, et al. Laparoscopic low anterior resection for rectal carcinoma: complications and management in 132 consecutive patients. World J Gastroenterol. 2010;16(36):4605-10.
11. Dayal S, Battersby N, Cecil T. Evolution of surgical treatment for rectal cancer: a review. J Gastrointest Surg. 2017;21:1166-73.

12. Lipska MA, Bissett IP, Parry BR, Merrie AE. Anastomotic leakage after lower gastrointestinal anastomosis: men are at a higher risk. ANZ J Surg. 2006;76:579-85.
13. Ferrara M, Kann BR. Urological Injuries during Colorectal Surgery. Clin Colon Rectal Surg. 2019;32(3):196-203.
14. Varela C, Kim NK. Surgical Treatment of Low-Lying Rectal Cancer: Updates. Ann Coloproctol. 2021;37(6):395-424.
15. Sripathi S, Khan MI, Patel N, Meda RT, Nuguru SP, Rachakonda S. Factors Contributing to Anastomotic Leakage Following Colorectal Surgery: Why, When, and Who Leaks? Cureus. 2022;14(10):e29964.

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