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Endoscopic evaluation of clinical colorectal anastomotic leakage

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ABSTRACT

Background: Anastomotic leakage (AL) is a major complication after anterior resection. However, its therapeutic strategies and technical risk factors have not been well established. Therefore, we endoscopically evaluated anastomotic regions after laparoscopic colorectal anastomosis using a double-stapling technique (DST) for determination of treatment and investigation of technical factors.

Methods: In total, 191 consecutive patients underwent laparoscopic anterior resection with a DST from September 2008–January 2013. Anastomotic regions were endoscopically evaluated in patients suspected to have AL after surgery.

Results: Anastomotic dehiscence was observed in 19 patients, and AL was diagnosed in 18 (9.3%). Of the 19 patients, 12 were treated by creation of an intestinal stoma and 7 were treated conservatively based on their clinical status and endoscopic findings. Twenty-three dehiscences were observed among 19 anastomotic regions; all 23 were observed on the circular stapler anastomosis lines. Of these 23 dehiscences, 13 (56.5%) were located at the point at which the anastomosis lines of the circular and linear staplers overlapped, and 10 (43.5%) were located on the circumferential aspect between the overlapping points.

Conclusions: Endoscopic evaluation of anastomotic regions is safe and useful for the determination of therapeutic strategies. The DST anastomotic technique itself may be closely related to the development of AL.

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1. Introduction

Anastomotic leakage (AL) is a major problem following laparoscopic surgery in patients with rectal cancer. This complication contributes not only to postoperative

morbidity and mortality but to local recurrence and poor prognosis [1–11]. The introduction of circular staplers in the 1970s and the double-stapling technique (DST) in the 1980s have resulted in a relatively safe method of end-to-end low colorectal anastomosis [12–15], reducing the rate of AL

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Table 1 – Characteristics of patients with colorectal anastomoses with DST.

Factors	Patients with anastomotic dehiscences	Other	P
Number of patients	19	172	NS
Age in years (range [mean])	40–80 (60.2)	32–88 (64.7)	NS
Sex (female : male)	2 : 17	63 : 109	NS
Body mass index (kg/m ²)	23.7 ± 2.9	22.9 ± 3.3	NS
Tumor location, UR/MR/LR	6/5/8	96/45/31	NS
Previous laparotomy, n (%)	2 (10.5)	42 (24.4)	NS
Previous radiotherapy, n (%)	1 (5.3)	8 (4.7)	NS
Previous chemotherapy, n (%)	1 (5.3)	2 (1.2)	NS
Operation time (min)	284.5 ± 198.0	203.1 ± 34.4	NS
Blood loss (g)	164.7 ± 146.2	129.4 ± 246.7	NS
Diameter of circular stapler in mm (25–29/31–33)	5/14	61/75	NS
Stage (0/I/II/IIIa/IIIb/IV)	0/3/7/3/2/4	3/40/64/29/15/21	NS

DS = distal sigmoid colon; LR = lower rectum; MR = middle rectum; NS = not significant; UR = upper rectum.

compared with hand-sewn anastomoses [15–17]. Nevertheless, the rate of AL after laparoscopic surgery has been found to range from approximately 5%–19%, which is higher than that observed after other gastrointestinal anastomosis techniques [1–8].

Factors associated with AL include patient-, surgery-, and instrument-associated factors. The most important patient-associated factors include older age, male sex, smoking, diabetes, obesity, larger tumor size, lower tumor level, and preoperative radiation and chemotherapy. Surgery-associated factors include perioperative complications such as total mesorectal excision, incomplete anastomosis, excessive tension on the anastomosis, blood circulation disorders, and bleeding in an anastomotic region. Instrument-associated factors in laparoscopic surgery include the number of linear staples and the size of circular staples [18–20].

Comparatively, little is known, however, about the effects of technical factors of the DST itself [21]. Therefore, we endoscopically evaluated anastomotic regions to determine the characteristics that can be used for the diagnosis of AL, determination of the therapeutic strategies for AL, and investigation of technical factors after laparoscopic intracorporeal colorectal anastomosis using a DST.

2. Patients and methods

2.1. Patients

We retrospectively evaluated a total of 191 consecutive patients who underwent laparoscopic rectal anterior resection with a DST for rectal cancer from September 2006–December 2012 at our institutions. No prophylactic covering stoma was created in any patients. AL occurred in 18 (9.3%) of these 191 patients. The anastomotic regions were examined in 41 patients suspected to have postoperative AL.

Eight of the 41 patients were strongly suspected to have AL based on severe clinical findings (clinical findings consistent with panperitonitis, and/or computed tomography [CT] evidence of fluid collection containing gas, and/or <100 mL/d of stool-like discharge from the drain). All eight patients' anastomosis sites were endoscopically examined and confirmed to exhibit AL; subsequent therapeutic ileostomy or colostomy was performed 2–7 d postoperatively. Additional endoscopic examinations were performed 4–14 d, postoperatively.

Of the remaining 33 patients, those exhibiting any deviation from the normal postoperative course, especially patients with fever, abdominal pain, or an increased white blood cell count, underwent endoscopic examination usually on postoperative day 4, which was 1 d before the scheduled start of an oral diet.

2.2. Anastomosis with DST

Patients with middle and lower rectal cancers underwent total mesorectal excision. Rectal transection was performed

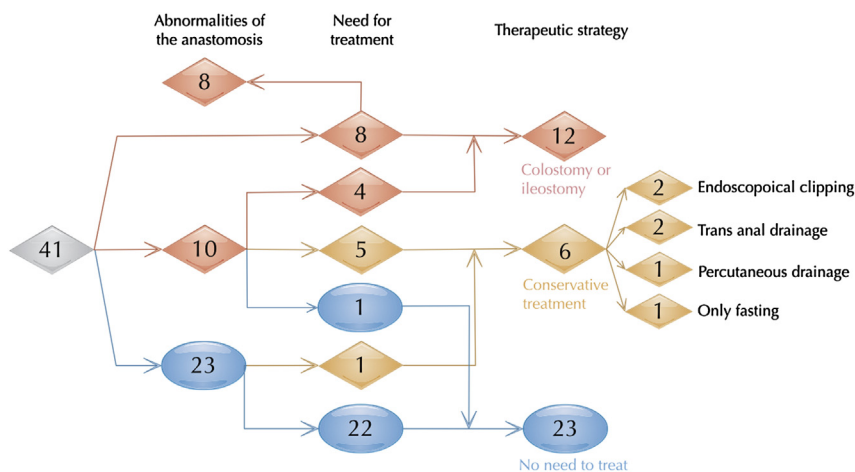


Fig. 1 – Flow chart of all 41 endoscopically evaluated patients.

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