Side-to-Side Anastomosis In Left Hemicolecctomy, Why and When: A Single-Center Experience

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ABSTRACT

BACKGROUND: Laparoscopic colectomy represents a safe, effective and well-established procedure for both benign and malignant colic disease. Transanal anastomosis (TA) with a circular stapler is the most commonly performed anastomotic technique in laparoscopic left hemicolectomy (LLH). We report our experience with side-to-side anastomosis (STSA) and side-to-end anastomosis (STEA) in selected patients with both emergency and elective LLH.

METHODS: A systematic review of the PubMed database was performed on recent studies that compared different anastomotic techniques after LLH. We collected internal data from June 2014 to July 2018 and compared our experience with the literature. The primary outcome was the anastomotic complication rate.

RESULTS: During the observation period, 158 patients underwent left hemicolectomy (LH). One-hundred-nineteen patients had malignant disease; 36 underwent surgery for complicated diverticular disease, one had
a large strangulated incisional hernia, one had a sigmoid volvulus, and one had a sigmoid localization of endometriosis. Thirty open left hemicolecystomies were performed. In 128 cases, a minimally invasive approach was used. Since conversion to open was necessary in 10 of these cases, 118 were totally LLH. STSA was performed in 64 cases; seven in an emergency setting and 57 in elective procedures. The overall anastomotic leak rate was 3.1% (2/64) and no anastomotic leak was reported in the emergency group (0/7). TA was performed in 15 cases, 93% in an elective setting (14/15), and the anastomotic leak rate was 13.3% (2/15). In 20 cases, we performed elective STEA and no anastomotic leak was recorded. In 19 cases, it was impossible to perform anastomosis and we decided to create a definitive colostomy.

CONCLUSION: Consistent with the literature data, our experience shows that, in selected cases, STSA and STEA are both safe and effective, with a lower anastomotic complication rate than TA.
In the case of disease located in the rectum, we position four trocars as previously described. The technique partially corresponds to the above-described LIMP technique with a crucial difference: inferior mesenteric artery ligation and section at its origin. Nerve-sparing isolation of the holy plane and preparation of Denovilliers’ fascia are carried out.

We perform a standardized side-to-side isoperistaltic mechanical intracorporeal anastomosis whenever possible. The antimesenteric sides of cranial and caudal stumps are approximated. On the same sides, colotomy is performed with a monopolar hook device. A laparoscopic stapler is placed and the anastomosis is created. Subsequently, a double continuous suture in PDS 3.0 is used to close the residual opening. Suture is performed by juxtaposing the two edges with ‘out-in and in-out’ full-thickness stitches. The first layer is always carried out from the anterior wall to the posterior corner of the anastomosis and the stitches are about 2 mm apart from each other. The second layer involves exclusively serosa. In this way, the specimen is isolated intracorporeally, thus requiring less colic mobilization. Consequently, the surgeon can choose the site of the extraction mini-laparotomy. When no previous scar is available, we usually adopt a mini-Pfannenstiel incision, which has the lowest rates of infection, post-incisional hernia, pain and ileus. An abdominal wall protector is always used during specimen extraction.

## RESULTS

Between June 2014 and July 2018, 158 patients underwent left hemicolectomy (LH) for both malignant (119 patients, 75.3%) and benign (39 patients, 24.6%) disease. Benign disease included 36 cases of diverticulitis, one large obstructed incisional hernia, one sigmoid volvulus, and one sigmoid endometriosis. Thirty open procedures were performed because the patients were considered to be unfit for a laparoscopic approach (very elderly patients with several cardio-pulmonary comorbidities). Ten emergency procedures were converted from a laparoscopic to laparotomic approach because of severe peritonitis. One-hundred-eighteen patients (74.6%) underwent totally LH. Ninety-five patients underwent elective LH. Twenty-three LH were performed in an emergency setting, and a Hartmann procedure was used in 19 of these. STSA was performed in 64 patients (7 emergency, 57 elective), 20 were STEA (all elective) and 15 TA (1 emergency, 14 elective). In three procedures, LH was associated with additional procedures (liver wedge resection for metastasis, total colectomy, istero-anneumectomy). The median follow-up was 21.5 months (range: 1-46 months).

Primary Outcome: The overall anastomotic leak rate in LH was 3.3% (4/118); 3.1% (2/64) in the STSA group and 13.3% in the TA group (2/15). There were no anastomotic leaks in the STEA group. Anastomotic failure was evaluated using clinical examination, blood tests and CT scans. Postoperative intervention (Clavien–Dindo 3b) was required in one patient who underwent a further explorative laparoscopy with anastomosis redo and lateral protective ileostomy. One patient needed radiological drainage of an intraabdominal abscess (Clavien-Dindo 3a). Two other patients underwent antibiotic therapy and parenteral nutrition for one week with complete resolution by CT scan.

## DISCUSSION

Since the beginning of the 1980s, Knight-Griffen transanal anastomosis (KGA) with a double-stapled technique has represented the gold standard for both open and laparoscopic LH.

The “double-stapled technique” (so-called because of the use of a circular stapler to transect a linear stapled line of the colonic-rectal stump) replaced manual or mechanical side-to-side and manual end-to-end anastomoses, and changed the approach to low colorectal anastomosis to allow an even “lower” anastomosis compared with a hand-sewn anastomotic technique (which is often very demanding or even impossible for low and ultra-low rectal resections). With the advent and spread of laparoscopy for sigmoid cancer, this anastomotic technique has been widely used due to its convenience and quick execution. However, according to our institution experience, the KGA technique (along with its technical variations such as side-to-end anastomosis, j-pouch anastomosis, etc.) remains the major option for rectal cancer.

For a laparoscopic KGA anastomosis, adequate colonic mobilization is required to ensure a tension-free anastomosis, for specimen extraction, for resection and for insertion of the anvil. This process is sometimes complex, especially in obese patients with bulky mesenteric fat and a thick abdominal wall. Therefore, the KGA technique may be associated with excessive mesenteric traction, increased risk of bleeding and a longer incision line with a higher risk of infection, post-operative pain and post-operative incisional hernia. This approach often forces the surgeon to perform the minilaparotomy incision through the left rectus muscle. Moreover, the technique entails the overlapping of two suture lines and the inevitable formation of two “dog ears”, which represent points of anastomotic weakness.

We also have to consider the difficulties that are sometimes associated with the transanal introduction of a circular stapler and potential traumatic damage to the sphincters, especially in the case of a long distal stump. These difficulties could make the KGA technique particularly challenging to perform during laparoscopy. Finally, anastomotic stricture is widely described as a potential insidious complication that is specifically associated with the KGA technique.12,13,15,16

## CONCLUSION

According to the results of our institution experience, KGA should not represent the only anastomotic option considered during LH; a stapled STSA can overcome the difficulties related to the KGA technique. Our data, even though preliminary and from a small sample, show that STSA has anastomotic leak rates comparable to those reported in the literature and can be performed safely in selected cases.12

## AUTHORS’ DISCLOSURES

The authors have no conflicts of interest to declare.