Short- and Mid-Term Outcomes after Endoscopic Transanal or Laparoscopic Transabdominal Total Mesorectal Excision for Low Rectal Cancer: A Single Institutional Case-Control Study

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BACKGROUND: Transabdominal laparoscopic proctectomy (LAP) for rectal cancer was associated with postoperative recovery improvement. Early studies showed favorable short-term results of endoscopic transanal proctectomy (ETAP), with low conversion rates to open procedures. We aimed to compare efficacy, morbidity, and functional outcomes of ETAP to standard LAP for low rectal cancer.

STUDY DESIGN: From 2008 to 2013, 72 consecutive patients received proctectomy and coloanal manual anastomosis for low rectal adenocarcinoma. Thirty-four patients had transanal endoscopic proctectomy, and 38 patients underwent the standard laparoscopic procedure.

RESULTS: When compared with the LAP group, the ETAP group demonstrated a lower conversion rate to open procedures (23.7% vs 2.9%, respectively; $p = 0.015$), shorter in-hospital stays (9 vs 8 days, respectively; $p = 0.04$), and a lower readmission rate (13.2% vs 0%; $p = 0.03$). Overall postoperative morbidity rates for the LAP and the ETAP groups (36.8% vs 32.4%, respectively; $p = 0.69$) and functional results (Kirwan score 1/2, 73.7% vs 73.5%, respectively; $p = 0.85$) were comparable; additionally, we found similar oncologic quality criteria (R1 resection 10.5% vs 5.9%, respectively; $p = 0.68$; grade 3 mesorectal integrity 52.6% vs 55.9%, respectively; $p = 0.66$). Disease-free survival of 24 months (Kaplan-Meier estimation) was comparable in the 2 groups: 86% in the ETAP group vs 88% in the LAP group; $p = 0.91$. At the date of last follow-up, 91.2% of ETAP patients and 92.1% of LAP patients were free of stoma.

CONCLUSIONS: The endoscopic transanal approach could facilitate mesorectal excision and improve short-term outcomes without impairing the oncologic quality of the resection or mid-term functional and oncologic results. (J Am Coll Surg 2017;224:917–925. © 2017 Published by Elsevier Inc. on behalf of the American College of Surgeons.)

The transanal endoscopic approach could facilitate a new era in minimally invasive colorectal surgery. In 2003, early results of the laparoscopic approach to rectal cancer were reported.[1] Laparoscopy has been associated with a clear progression in the management of rectal cancer patients, with significant improvement in postoperative measures, including pain, first bowel movements, and hospital stays.[2] However, there are still some limitations to its applications, especially in difficult cases. These situations may be indicative of either conversion to an open procedure or positive resection margins.[3,4] Moreover, there is no high level of evidence of the transanal endoscopic approach regarding both urologic and sexual function safety.[5] The arguments to assess retrograde mesorectal excision by a transanal endoscopic route are therefore quite obvious. An initial "bottom-up" approach

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Abbreviations and Acronyms
CRM = circumferential resection margin
ETAP = endoscopic transanal proctectomy
LAP = laparoscopic proctectomy

provides direct access to the lower pelvis.[6-8] Endoscopic dissection is performed while the patient is in a supine position without pneumoperitoneum or need for pelvic retractors. Finally, the Natural Orifice Translumenal Endoscopic Surgery (NOTES) concept can be further developed by using combined single-port access through the temporary stoma site.[9] All of these parameters could contribute to reduced surgical trauma and morbidity. Several studies, mostly provided by expert centers, have already been published, with promising results in terms of postoperative outcomes.[10-15]

However, the technical modalities of this innovative approach await meticulous verification of its innocuous nature for several reasons. First, this approach is initiated from the rectal lumen to the perirectal space that is limited medially by the fascia recti; although it is recommended to close the rectal lumen before proceeding with dissection, there is at least a theoretical risk of tumor cell dissemination as well as bacterial contamination.[16] Therefore, all oncologic parameters, especially local recurrence rates, have to be assessed and compared, as do the operative field sepsis and anastomotic complication rates. Second, a specific device is inserted in the anal canal, and based on the type of device, the diameter is 35 to 45 mm. This device is kept in place for the entire endoscopic transanal dissection, requiring a deep curare administration. Although some data in the literature showed the safety of these devices when applied to the transanal endoscopic microsurgery procedure, the duration of transanal endoscopic mesorectal excision is significantly longer (60 to 90 minutes) and awaits prospective assessments of sphincter function. We therefore aimed to compare endoscopic transanal mesorectal excision with the "standard" transabdominal laparoscopic approach, with the aim of assessing the oncologic safety and surgical security of the transanal approach and then confirming its potential advantages for short- and mid-term outcomes.

METHODS

Patients

From January 2008 to December 2013, we evaluated all consecutive patients admitted for resectable low rectal cancer requiring conservative resection with manual colo-anal anastomosis and planned for a laparoscopic approach. Pre-therapeutic evaluations systematically included chest, abdominal, and pelvic CT scans, serum carcinoembryonic antigen (CEA) measurements, endorectal ultrasounds, and rectal MRI. Patients suitable for mechanical anastomosis with T4 tumors requiring an extended resection, or patients with nonresectable metastases or evidence of peritoneal carcinosis were excluded from this study.

Allocation of the treatment arm was not randomized. Endoscopic transanal mesorectal excision (endoscopic transanal proctectomy [ETAP] group) was performed from June 2011 to the end of the study; the standard laparoscopic transabdominal approach (laparoscopic proctectomy [LAP] group) was performed from January 2008 to June 2011.

Inclusion in the study did not have an impact on oncologic strategy; a patient routinely received preoperative chemoradiation (CRT) consisting of 45 to 50 Gy in 25 fractions combined with capecitabine if his or her tumor was classified as T3/T4 and/or N1 on MRI and/or endorectal ultrasound, or if predictable circumferential resection margin (CRM) on MRI was null. Therefore, some T2 ultralow tumors received preoperative chemoradiation.

Operative technique

Two colorectal surgeons (BL and CdC) with extensive laparoscopic colorectal experience performed all study procedures. The operative technique was standardized for all patients.

For the experimental ETAP group, endo-anal conventional dissection in the lithotomy position was conducted up to the circular exposure of the fascia recti. Exposure was ensured by a Lone Star Retractor (CooperSurgical). Next, the endo-anal disposable device (Gelpoint Path, Applied Medical or SILS port, Covidien) was inserted, and the endoscopic mesorectal excision was performed close to the fascia recti, beginning posteriorly, then laterally, and ending at the anterior opening of the Douglas pouch. Endoscopic transanal mesorectal excision was considered complete if posterior dissection led up to the vertical part of the rectum, if the Douglas pouch was opened, and if lateral nervous plexuses were identified. Finally, a simplified laparoscopic approach was used. When feasible, a single port approach (Abdominal Gelpoint, Applied Medical) in the ileostomy site was performed, allowing inferior mesenteric vessel ligation and colonic mobilization before the colo-anal anastomosis. The specimen could be extracted either via the transanal natural orifice or through the abdominal wound. For the control LAP group, a multiport transabdominal dissection without a primary transanal dissection