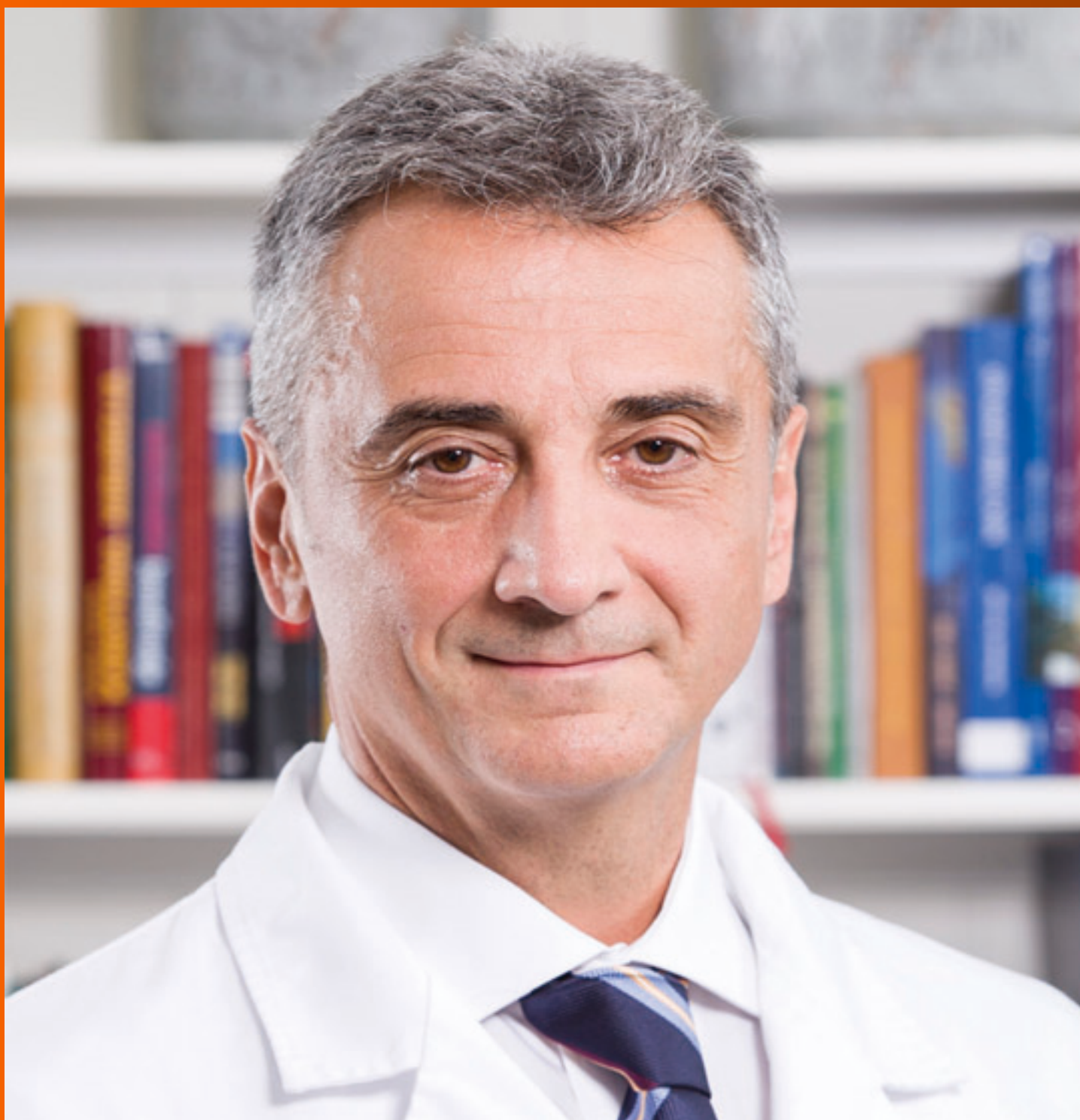


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Novel technique for anastomotic salvage using transanal minimally invasive surgery: A case report

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Abstract

BACKGROUND

Anastomotic leak (AL) after low anterior resection (LAR) can be a highly morbid complication. The incidence of AL ranges from 5% to 20% depending on patient characteristics and the distance of the anastomosis from the anal verge. Low anastomoses and leaks pose technical challenges for endoscopic treatment. The aim of this report was to describe the use of a commercially available laparoscopic energy device through a transanal minimally invasive surgery (TAMIS) port for the management of a symptomatic leak not requiring relaparotomy (grade B) after a LAR with diverting loop ileostomy.

CASE SUMMARY

A TAMIS GelPOINT Path port was inserted into the anus to access the distal rectum. Pneumorectum was achieved with AirSeal insufflation and a 30 degree laparoscope was introduced through a trocar. A LigaSure™ Retractable L-Hook device was then used to perform a septotomy of the chronic sinus tract identified posterior to the coloproctostomy. The procedure was then repeated twice in three weeks intervals with ultimate resolution of the chronic leak cavity. Several months after serial TAMIS septotomies, barium enema demonstrated a patent anastomosis with no evidence of persistent leak or stricture. The patient subsequently underwent ileostomy reversal and has had no significant post-operative issues.

CONCLUSION

TAMIS septotomy with the LigaSure™ Retractable L-Hook is a feasible and

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effective, minimally invasive salvage technique for the treatment of grade B ALs. Larger studies are needed to assess the generalizability and long-term results of this technique.

Key words: Transanal minimally invasive surgery; Ligasure hook; Anastomotic leak; Low anterior resection; Septotomy; Case report

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Core tip: Anastomotic leaks (ALs) after low anterior resection for the treatment of rectal cancer are highly morbid complications and often pose a technical challenge for its treatment. We report a case of a transanal minimally invasive septotomy of a chronic sinus secondary to an AL, with the use of the Ligasure retractable L-Hook device. This safe and effective technique may help avoid re-operations which are associated with higher mortality and higher permanent stoma rates.

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INTRODUCTION

Colorectal cancer remains the third most common cause of cancer related deaths in the United States among men and women. The American Cancer Society estimates there to be over 43000 new patients diagnosed with rectal cancer yearly^[1]. Mortality associated with this pathology is proportionally related to the staging of the disease prior to surgical treatment.

Over the past decades, significant advancements have been made in the management of rectal cancer in efforts to improve locoregional control. Among these, universal adoption of neoadjuvant therapy has been as important as the improvements in surgical techniques to control local spread of cancer and recurrence rates. After the introduction of restorative anterior resection by Dixon in 1948, boosted by the advent of surgical staplers and total mesorectal excision (TME) during proctectomy, there was an increase in the proportion of low anterior resection (LAR) over abdominoperineal resection (APR) for the treatment of rectal cancer^[2-6]. However, the improved oncologic and functional outcomes resulted in higher leak rates associated with colorectal and coloanal anastomoses^[7,8].

LAR for colorectal cancer has a reported morbidity of 20% with anastomotic leak (AL) being among the most dreaded complications. Multivariate analysis and logistic regression models evaluating risk factors for AL after LAR demonstrate that the lower the anterior resection, the more likely an AL will occur^[9,10]. Reported rates of AL range between 5% to 20%^[11-14]. This variation is in part attributed to the lack of a universally accepted nomenclature and classification of ALs. In 2010, the International Study Group of Rectal Cancer proposed a definition and severity grading system for AL after anterior resection of the rectum^[15]. The proposed grading system constituted three groups based on the severity of the AL: Grade A represents an AL identified on imaging not requiring therapeutic interventions. Grade B is a leak requiring interventions such as administration of antibiotics, transanal lavage and/or radiologic assisted placement of a pelvic drain, but not re-laparotomy. And lastly, grade C is a leak requiring re-laparotomy.

Within the options for management of grade B ALs, endoscopic interventions are often used to diagnose and treat the underlying pathology. The ability to treat the AL with minimally invasive techniques is paramount as re-operation is associated with higher mortality rates and higher rates of a permanent stoma^[14,16,17].

The purpose of this study was to describe the utility of a commercially available laparoscopic energy device, LigaSure™ Retractable L-Hook (Medtronic, Minneapolis, MN), through transanal minimally invasive surgery (TAMIS) as a novel technique for the management of a grade B AL after LAR.

CASE PRESENTATION

Chief complaints

A 69-year-old hispanic male initially presented with abdominal pain, weight loss, and hematochezia.

History of present illness

Patient was seen in gastroenterology clinic after 6-month having experienced lower abdominal pain, malaise, unintentional weight loss and loose bowel movement with occasional blood in the stool. Patient denied any similar symptoms prior to that time.

History of past illness

Past medical history was positive for benign essential hypertension.

Personal and family history

Personal and family history were negative for colorectal cancer, inflammatory bowel disease or other gastrointestinal diseases.

Physical examination upon admission

On physical examination, abdomen was soft, non-tender, with no palpable masses. Digital rectal examination revealed a palpable circumferential mass at approximately 7 cm from anal verge.

Laboratory examinations

Routine blood tests including complete blood count, comprehensive metabolic panel and urinalysis were all within normal limits, except hypochromic microcytic anemia with a hemoglobin of 7.4 g/dL and carcinoembryonic antigen was elevated to 4.1 ng/dL (normal range 0.0-3.0 ng/dL)

Imaging examinations

Patient underwent a diagnostic colonoscopy which revealed a near-obstructing, circumferential, ulcerated rectal mass at 7 cm from anal verge (Figure 1). Magnetic resonance imaging of the pelvis was consistent with extramural invasion of the tumor into the muscularis propria with mesorectal nodal involvement.

FINAL DIAGNOSIS

Biopsy performed during colonoscopy revealed an invasive, moderately differentiated adenocarcinoma of the rectum (T3N1).

TREATMENT

The patient underwent neoadjuvant chemotherapy with 5-Fluorouracil in combination with radiation therapy. Ten weeks after completion of neoadjuvant therapy, he was taken to the operating room for a robotic assisted laparoscopic LAR with TME, stapled coloproctostomy and diverting loop ileostomy. Post-operative course was complicated by a grade B AL with presacral abscess (Figure 2) requiring intravenous antibiotic therapy and percutaneous drainage by interventional radiology. The drain was kept in place for 2 wk and was ultimately removed when output was minimal. The patient recovered uneventfully and plans were made for subsequent ileostomy takedown.

Pre-operative workup for ileostomy takedown including a barium contrast enema (Figure 3) revealed a posterior sinus tract which was confirmed on flexible sigmoidoscopy (Figure 4). In order to prevent future sinus tract drainage and abscess formation, the decision was made to surgically intervene prior to ileostomy reversal. Endoscopic management was not considered given that the staple line and sinus tract location (posterolateral) were 4 cm from the anal verge. Visualization was suboptimal without pneumorectum. Therefore, the decision was made to proceed with a TAMIS approach.

Patient was brought to the operating room, placed under general anesthesia and transitioned into high lithotomy position. A GelPOINT Path® TAMIS port (Applied Medical, Rancho Santa Margarita, CA, United States) was inserted into the anus and secured to the skin with 2-0 silk sutures. Three trocars were placed through the TAMIS port. Pneumorectum was achieved with AirSeal® (Conmed, Utica, NY) insufflation and a 30 degree laparoscope was introduced through the trocar. The chronic sinus tract was identified just posterior to the coloproctostomy at 4 cm from

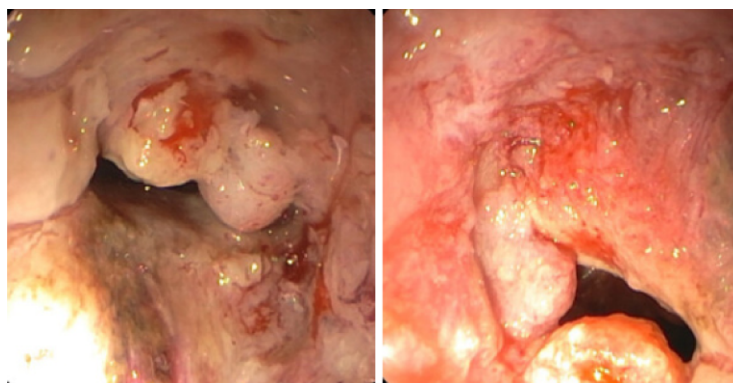


Figure 1 Rectal mass on colonoscopy.

the anal verge. The LigaSure™ Retractable L-Hook device was used to perform partial septotomies to create a wide opening of the mucosal bridge present between the sinus tract and the lumen (Figure 5). The cavity was then bluntly cleared of granulation and fibrotic tissue. The procedure was sequentially repeated twice, under general anesthesia, in three weeks intervals until the sinus tract was completely opened.

OUTCOME AND FOLLOW-UP

After three total septotomy treatments over the course of 9 wk, the sinus tract completely resolved. Post intervention barium contrast enema revealed resolution of the sinus tract and leak (Figure 6). The patient ultimately underwent ileostomy takedown without complications and was doing well at the 6 mo post-operative visit, having 2-3 bowel movements per day with no continence issues.

DISCUSSION

With the advent of emerging techniques for the treatment of rectal cancer in past decades, significant advances have been made in improving oncologic and functional outcomes^[6]. LAR has been coined as the standard of care in selected cases which were previously treated with APR, often preventing the need for a permanent stoma. Unfortunately, this led to the emergence of new challenges inherent to the LAR technique including ALs which can be difficult complications to manage.

Minimally invasive septotomies have been endorsed for the treatment of chronic sinus tracts not only after colorectal interventions but also after foregut procedures including sleeve gastrectomies and roux-en-y gastric bypass for weight loss complicated with staple line leaks^[18-21]. During this intervention the septum separating an abscess cavity and the true lumen is divided resulting in a larger communication of both lumens (true lumen and abscess lumen). By these means, internal drainage is favored through a path of low resistance with redirection of the leak flow from the abscess cavity towards the true lumen, resulting in contraction and scarring of the chronic leak/abscess cavity.

Minimally invasive management of AL after low and ultralow anterior resections has the benefit of minimizing the risk of temporary and permanent stomas^[13]. Specifically, endoscopic therapies such as fibrin glue application, endoscopic stenting, endoluminal vacuum drainage and clipping have all been described as options to manage varying grades of ALs^[22,23]. However, these techniques tend to be less effective for chronic leaks and are limited by several factors including the distance from the anal verge, size of the defect, or ability to traverse the anastomosis.

In cases where endoscopic means are incapable of managing the leak, TAMIS via rectal insufflation can be effective^[24,25]. This provides an alternate route to access to the distal rectum with use of conventional laparoscopic instruments^[26].

In this report, we describe a minimally invasive technique using a commercially available transanal port and energy device to induce insufflation within the rectum and complete sequential septotomies of a chronic draining sinus tract of the rectum after a LAR. When compared to other energy sources such as bovie and harmonic scalpel, the LigaSure L-Hook offers advantages such as less thermal spread, additional reach and better control due to the retractable technology, and ability to get

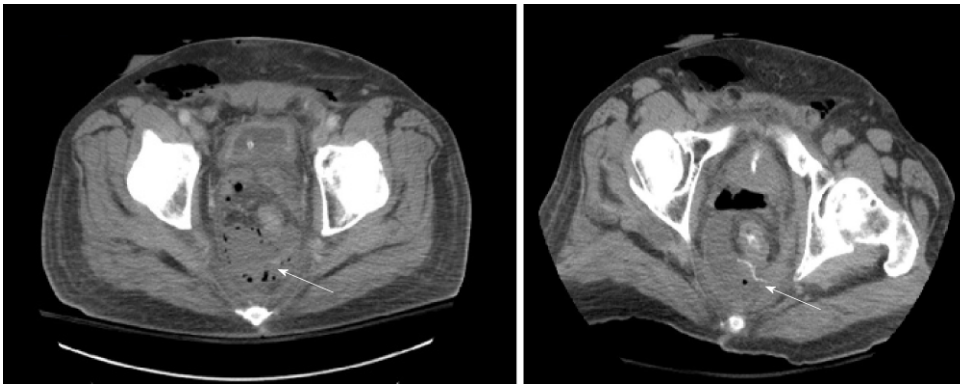


Figure 2 Presacral abscess with evidence of posterior leak of rectal contrast.

into tight spaces. Although the concept of endoscopic enlargement and eventual obliteration of a sinus tract after a colorectal leak has been reported in the literature, to our knowledge, this is the first report of the use of the LigaSure™ Retractable L-Hook device during this technique^[24,27,28].

No consensus exists for the management of ALs and the determination must be individualized for each patient. Minimally invasive techniques are safe and effective at managing symptomatic, small, contained leaks. However, few studies have compared effectiveness among different modalities and even fewer studies have looked at long term results after these are performed.

CONCLUSION

The treatment of grade B ALs after LAR for rectal cancer can be challenging. TAMIS septotomy with the LigaSure™ Retractable L-Hook device is a feasible and effective technique for the treatment of select grade B ALs. Larger studies with longer follow up are needed to assess the generalizability and long-term results of this technique.



Figure 3 Posterior sinus tract evidence in barium contrast enema.

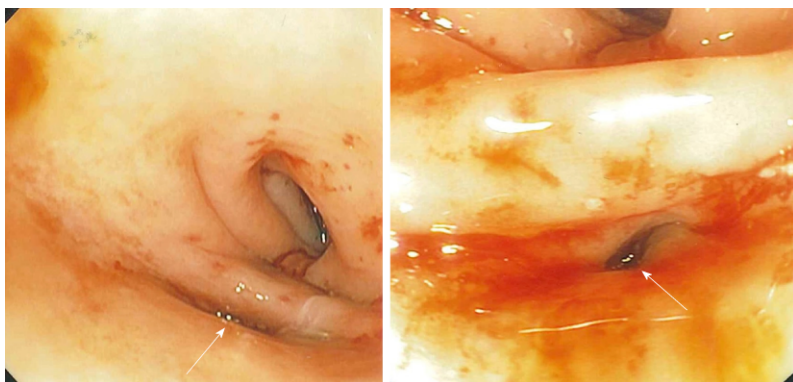


Figure 4 Posterior sinus tract at the healed staple line on flexible sigmoidoscopy.

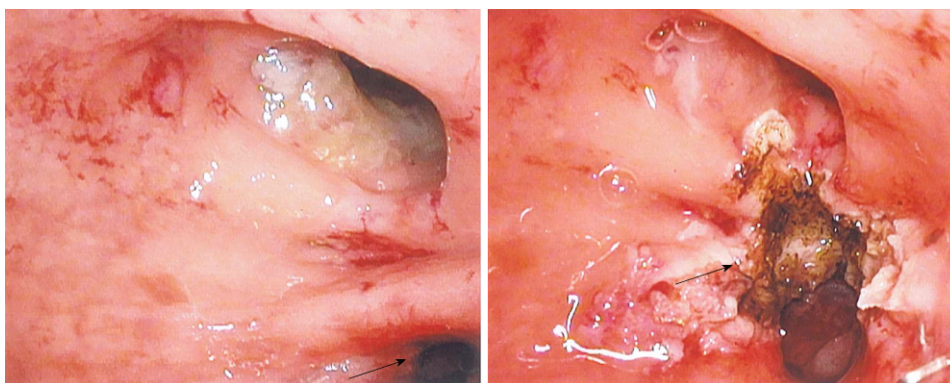


Figure 5 Rectal lumen and posterior sinus tract and sinus tract after septotomy. A: Rectal lumen and posterior sinus tract; B: Sinus tract after septotomy.



Figure 6 Absence of posterior sinus tract in post-operative barium contrast enema.

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