

Laparoscopic and natural orifice transluminal restorative proctocolectomy: no abdominal incision for specimen extraction or ileostomy

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Abstract

The aim of this study was to demonstrate the feasibility of laparoscopic restorative proctocolectomy (LRPC) without additional abdominal incisions. Two sisters with familial adenomatous polyposis were enrolled. The colon and rectum were mobilized entirely through the five abdominal trocars. The terminal ileum and distal rectum were transected with endoscopic staplers. The entire colorectal specimen was extracted transanally. A circular stapler anvil was introduced transanally. The J-pouch was created intracorporeally. The rectal stump was re-closed and a pouch-anal anastomosis was created using a circular stapler. We used a transanal tube for decompression of the pouch instead of a diverting ileostomy. The patients were discharged on the 10th and 12th days uneventfully. Both were doing well with their pouches after 18.5 and 12.1 months of follow-up. With the help of transanal specimen extraction and transanal tube decompression, additional abdominal incisions can be avoided following LRPC.

Key words: laparoscopic restorative proctocolectomy, natural orifice surgery, natural orifice transendoluminal surgery, natural orifice specimen extraction, ileostomy.

Introduction

Laparoscopic-assisted, hand-assisted and total laparoscopic restorative proctocolectomy (LRPC) have all been described in the management of familial adenomatous polyposis (FAP) and ulcerative colitis [1, 2]. Despite the satisfactory results following these procedures, an abdominal wall incision (a mini-laparotomy) was always required to retrieve the specimen or for the other interventions. In addition, an ileostomy was usually necessary.

Natural orifice specimen extraction (NOSE) eliminates the need for abdominal wall incision for specimen extraction and minimizes the risk of wound complications. It provides fewer incisional hernias, faster recovery and less postoperative pain [3–5].

On the other hand, avoiding an ileostomy in selected cases by using a transanal decompression tube during LRPC is a known procedure [6].

Here, we combined both advanced techniques, and aimed to demonstrate the feasibility of the LRPC without any abdominal incisions. To the best of our knowledge, these were the first human cases of LRPC with transanal specimen extraction without ileostomy. Thus, the procedure was registered at www.researchregistry.com (#301).

Case reports

Two sisters, aged 41 and 32 years, suffered from FAP and were advised to undergo LRPC. Their medical histories and physical examinations were not

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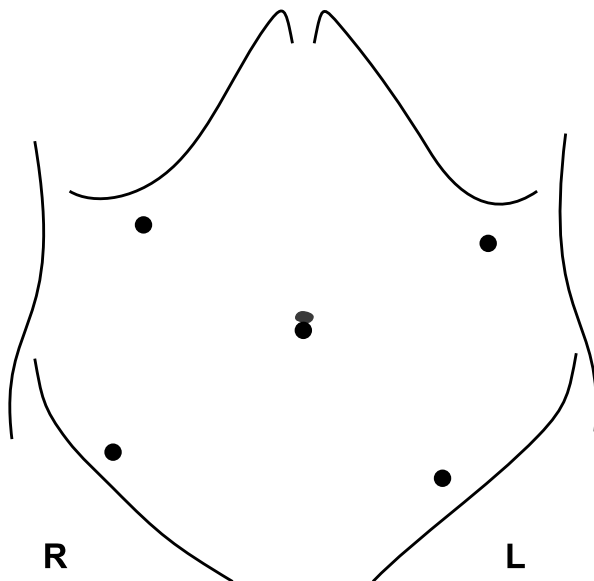


Figure 1. Trocar sites

significant. They had two brothers, and both had a history of open restorative proctocolectomies for FAP. The American Society of Anesthesiologists (ASA) scores of the sisters were I and their biochemical parameters were within normal ranges. The details of this new technique were explained to both women and the appropriate consent was obtained. Prophylactic intravenous antibiotics were given one hour prior to the operation, and antithrombotic prophylaxis was administered via low-molecular-weight heparin and elastic stockings. Both patients underwent bowel preparation the day before surgery. A nasogastric tube, a urinary catheter, and a central venous catheter were inserted before the procedure.

Procedure

Two monitors were used on the right and left sides of the patients. The patients were placed in a semilithotomy position. Pneumoperitoneum was created using a Veress needle through the umbilicus, and five trocars were positioned (Figure 1). The procedure was initiated via the mobilization of the rectosigmoid towards the descending colon. The inferior mesenteric vessels were ligated, and were divided using a 10 mm LigaSure vessel-sealing system (ForceTriad, Covidien, Boulder, CO, USA). The middle colic vessels were divided, and the splenic flexure and transverse colon were mobilized. The ascending colon and hepatic flexure were mobilized, and the distal ileum was transected using an endoscopic 60 mm linear stapler (Endo GIA, Covidien, Mansfield, MA, USA). A medial to lateral approach was used for the mesenteric dissections. Lastly, the rectum was transected using an endoscopic 60 mm linear stapler 2–3 cm proximal to the anal canal. The specimen was completely free in the abdomen. Following transanal lavage with povidone-iodine and normal saline, the rectal stump was opened using Endo shears and electrocautery (Photo 1). The anal canal was dilated up to two fingers (Photo 2), and the specimen was extracted transanally using an ovary clamp (Photos 3 and 4). Then a 15 cm length J-pouch to the terminal ileum was fashioned intracorporeally (Photo 5). The anvil of a 31 mm circular stapler (Autosuture, Tyco Healthcare Group LP, Norwalk, Connecticut) was introduced into the abdomen transanally (Photo 6), inserted into the pouch and secured with intracorporeal purse-string sutures (Photo 7). The opened rectal stump was closed us-

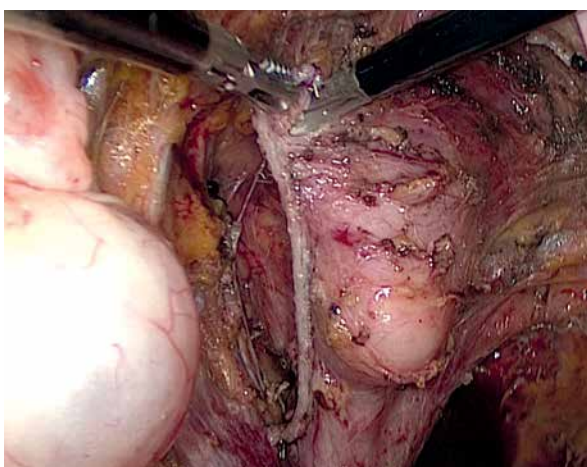


Photo 1. Opening the rectal stump

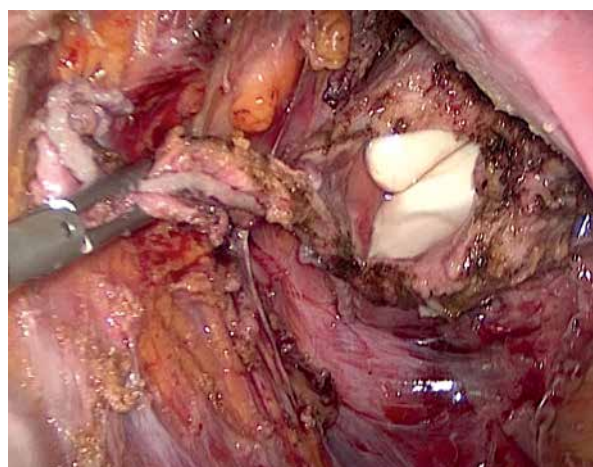


Photo 2. Dilatation of the anal canal

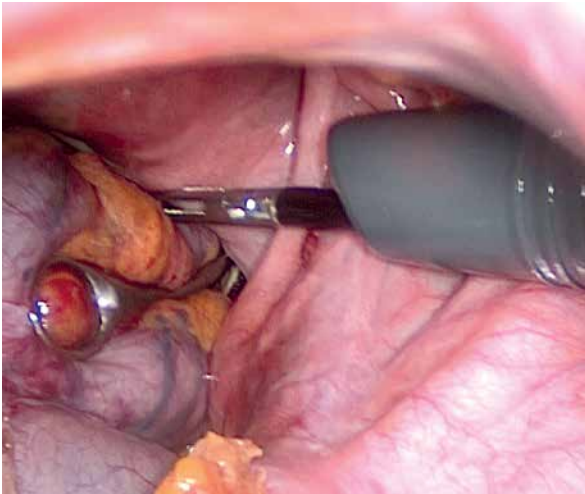


Photo 3. Removing the total proctocolectomy material using an ovary clamp



Photo 4. Extraction of the specimen through the anus

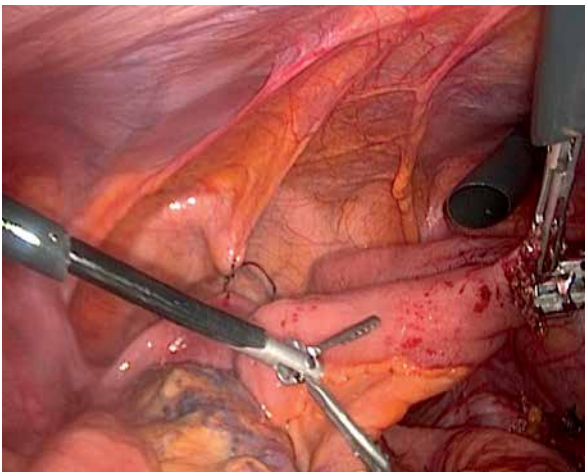


Photo 5. Creation of the J-pouch intracorporeally

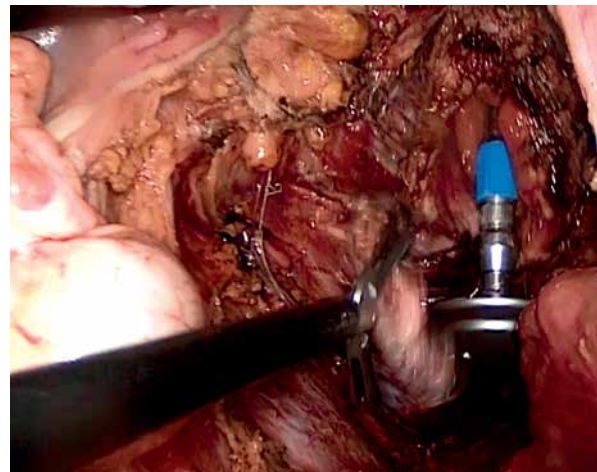


Photo 6. Pushed in stapler anvil through the anus

ing a laparoscopic stapler (Photo 8). Finally, the head of the circular stapler was passed through the anus (Photo 9) and a circular anastomosis was created (Photo 10). We did not perform a diverting ileostomy, but preferred a transanal tube (28 mm Pezzer tube) to decompress the pouch.

Results

The operations took 420 and 510 min with approximately 100 and 300 ml of blood loss. Neither additional port placement nor extension of the trocar site was required. All the procedures were completed entirely through the five (5–12 mm) abdominal trocars. The pouch-anal anastomoses were created 4 cm away from the anal verge. There were no intra-

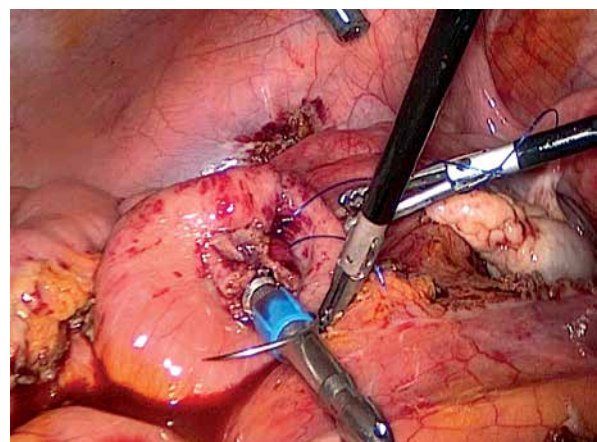


Photo 7. Intracorporeal purse-string suture around the anvil in the pouch

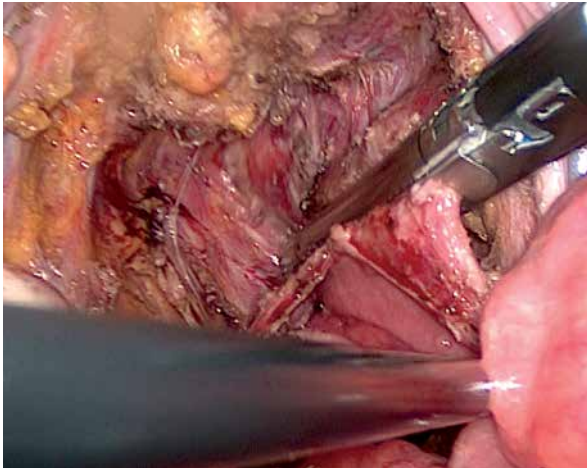


Photo 8. Re-closing the distal stump

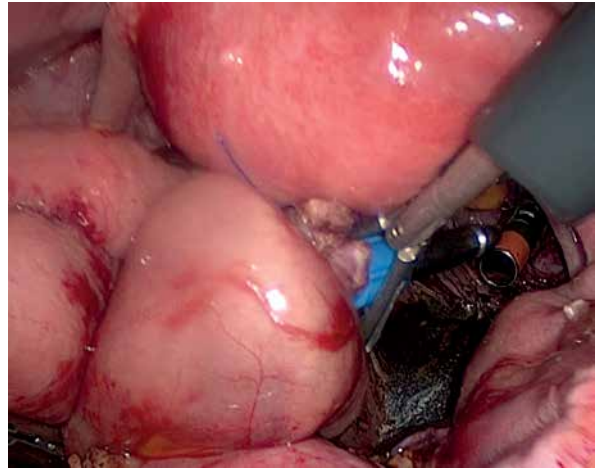


Photo 9. Alignment of the shaft and the anvil of the circular stapler

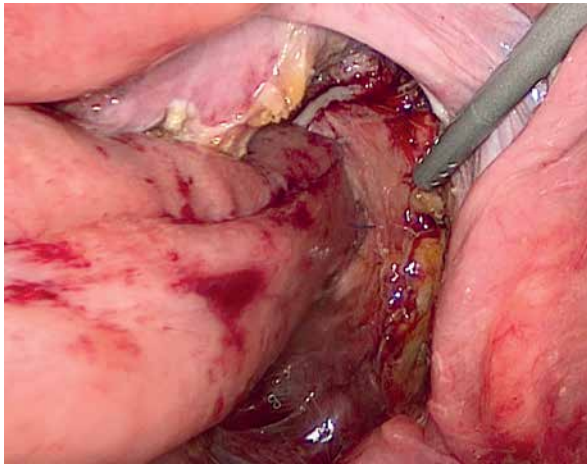


Photo 10. Pouch anal anastomosis



Photo 11. Abdominal view of the patient 9 months after the operation

operative or early postoperative complications, and the passage of flatus and feces from the transanal tube of each patient occurred on the third day after the operation. The transanal tubes were irrigated using 10 ml saline four times a day to prevent clogging. Total parenteral nutrition was performed for 7 days. A liquid diet was introduced on the seventh postoperative day and was increased gradually. After the enteral diet was tolerated, the transanal tubes were removed on the ninth and eighth postoperative days. Postoperative courses were uneventful, and the patients were discharged on the 10th and 12th postoperative days. Histopathologic examinations revealed FAP without malignancy. During the follow-up, the first patient suffered from an intra-abdominal abscess after 3 months and required abscess drainage. Both patients were doing well with

their pouches after 18.5 and 12.1 month follow-ups (Photo 11). They had good anal continence without soiling, even at night. On their last visit, the patients had a mean of 6 and 7 defecations per day, respectively.

Discussion

Transanal specimen extraction has been previously described for left or right-sided colon resec-

tions [7, 8], total colectomies [9] and rectal resections [10]. To the best of our knowledge, transanal specimen extraction for a total proctocolectomy has not been described previously. In general, the potential advantages of natural orifice surgery are lower risks of incision-related complications such as wound infections, postoperative pain and incisional hernias, as well as better cosmesis. Omitting the ileostomy increases the advantages of natural orifice surgery. Choosing the natural orifice extraction site for colorectal specimens is a matter of debate, and there are two options: the vagina and the anus. Transvaginal extraction of the proctocolectomy specimen has been described by Palanivelu *et al.* [11], with the conclusion that the transanal route can cause damage to the internal anal sphincter in cases of hand-sewn anastomosis. We agree that there can be overstretching on the anal sphincter during a hand-sewn anastomosis. However, we preferred the double stapling technique to the hand-sewn anastomosis. It has been shown to be a safe and effective method for pouch-anal anastomosis with good anal sphincter functions [12]. Transvaginal extraction is limited to female patients, and the transanal extraction of a colorectal specimen avoids any additional trauma to any innocent organ [9, 13]. We believe that the transvaginal route can be a good alternative for right-sided colonic resections [14, 15]. Lastly, transvaginal extraction of the specimen is not always suitable for patients of childbearing age, teenagers or virgins. Our second patient was a virgin, and she refused transvaginal access. Cultural sensitivity regarding the use of the vagina for surgical specimen extraction in virgins can be a problem, particularly in Third World countries, but also in the most promiscuous cultures.

Restorative proctocolectomy was first described using a diverting ileostomy due to the risk of anastomotic leakage and pelvic sepsis. Over the course of time, surgeons learnt that routine use of a diverting ileostomy was not necessary. A diverting stoma was justified when there were certain risk factors, such as steroid use and hand-sewn pouch anal anastomosis, but there have been no universally accepted criteria. Recently, a five-point predictive nomogram for the omission of an ileostomy during pouch surgery was suggested by the Cleveland Clinic [6]. They found five significant criteria to be associated with ileostomy omission: stapled anastomosis, no preoperative corticosteroid use, familial adenomatous pol-

yposis diagnosis, female gender, and age at surgery less than 26 years. With high scores, the omission of proximal diversion had no significant effect on postoperative adverse events. Both of our patients had high points (45–50; the maximum score for the nomogram is 54) for the nomogram, and had a good chance of stoma-free surgery. We relied on the nomogram and omitted the ileostomies in both cases; however, we placed a transient transanal tube to decompress the pouch lumen in both cases. Transanal tube decompression was not a proven method, and thus we could not suggest it as an alternative to a diverting ileostomy, but we believed that it provided low pressure in the pouch in the early postoperative period. Total parenteral nutrition and nil per os for 1 week prolonged the length of hospital stay as expected, and the patients were discharged on days 10 and 12.

Conclusions

Laparoscopic restorative proctocolectomy without ileostomy and transanal specimen extraction is a promising technique for some selected patients. It has all the advantages of minimally invasive surgery; moreover, it avoids any kind of mini-laparotomy, including the stoma. Transanal extraction of the colorectal specimen provides natural orifice surgery for both genders.

Conflict of interest

The authors declare no conflict of interest.

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