



# Early experience with simultaneous double equipe laparoscopic proctectomy and J-pouch reconstruction with trans anal mini-invasive approach for ulcerative colitis

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**Background:** Ileal pouch-anal anastomosis (IPAA) is the standard treatment for ulcerative colitis (UC). The advantages of laparoscopic minimally invasive surgery have been widely described for different abdominal procedures. The aim of the study was to evaluate short terms outcomes of simultaneous double equipe laparoscopic proctectomy and J-pouch reconstruction with trans anal (ta) mini-invasive approach IPAA in patients with UC.

**Methods:** Twelve consecutive patients with UC who underwent simultaneous laparoscopic proctectomy and ta-IPAA between January 2018 and December 2019 were analyzed. All patients were included in the enhanced recovery after surgery (ERAS) program and scheduled for a two or three-staged IPAA according to the general conditions. The ta-IPAA was performed with a laparoscopic abdominal approach combined with a ta proctectomy performed by two teams who worked simultaneously.

**Results:** The cohort consisted of 9 males and 3 females, with a median age of 46 years (range, 19–65 years). Indications to surgery were refractory to corticosteroids in 9 patients and/or diagnosis of extensive dysplasia-associated lesion and mass in 4 patients. The median body mass index (BMI) was 23.1 kg/m<sup>2</sup> (range, 18.0–32.0 kg/m<sup>2</sup>). The median illness time was 5.1 years. Disease extension was mainly grade 2 (4 patients) or 3 (6 patients) according to Montreal classification. All patients received preoperatively corticosteroids therapy whilst 4 patients were treated with biologic drugs. The median surgical time was 271 min (range, 150–435 min). No conversion to open surgery occurred. The 28-mm circular stapler was the most common used for the double purse-string anastomosis (6 patients). The median estimated blood loss was 70 mL (0–200 mL). Mortality was nil. Median comprehensive complication index was 8.5 (range, 0–33.7). Overall morbidity was 33.3% (4 patients). Two patients developed major complications, one of them required re-intervention for anastomosis leakage treated with placement of ta stiches and the other one developed abdominal bleeding treated conservatively. Median hospital stay was 7.8 days (range, 5.0–18.0 days).

**Conclusions:** Our preliminary results confirmed the safety and efficacy of simultaneous double equipe laparoscopic proctectomy and J-pouch reconstruction with ta mini-invasive approach in patients with UC.

**Keywords:** Ulcerative colitis (UC); laparoscopy; ileal pouch-anal anastomosis (IPAA); mini-invasive approach; laparoscopic proctectomy

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## Introduction

The *optimal treatment strategy* for ulcerative colitis (UC) is still a challenge. In the last years have been many improvements in both surgical and gastroenterological fields (1). The medical treatment of UC patients has been improved, resulting in postponed surgery (2). However, a significant proportion of patients require surgery with a cumulative risk that increases with the years of illness up to 15% (3). Those patients require a proctocolectomy with an ileal pouch anal anastomosis performed generally with a staged procedure. However, it is still debated what is the best surgical approach (4).

The laparoscopic trans-abdominal approach has multiple advantages in terms of short-term outcomes and fertility (5) in female patients and it has become the approach of choice especially in high-volume centers (6). The trans-anal (ta) approach, originally introduced for the rectum oncological disease, has been extended to the surgical treatment of UC (7). This approach seems to be particularly suitable in the treatment of UC, perhaps even more than in the oncological setting. It provides a magnified view of the distal rectum that allows to decide in advance the exact line of transection of the rectal cuff (8). The double equipe approach also called “Cecil approach” was firstly introduced by Lacy and colleagues and used for the transanal total mesorectal excision (ta-TME) in rectal cancer (9). Several studies demonstrated the usefulness of this approach in terms of reducing operating times. The abdominal team provides a retraction of the rectal stump that facilitate the transanal dissection and allows a synchronous dissection (7). Since January 2018, we started adopting Cecil approach during surgery for UC patients. The aim of the study was to evaluate short-term outcomes of minimally invasive ta approach IPAA in patients with UC. We present the following article in accordance with the STROBE reporting checklist (available at <https://ls.amegroups.com/article/view/10.21037/ls-2020-01/rc>).

## Methods

This monocentric study includes consecutive patients with endoscopic evidence and histological diagnosis of UC who underwent a primary ta ileal pouch anal anastomosis (ta-IPAA) between January 2018 and December 2019. All procedures were performed by two surgeons with a consolidated experience in laparoscopic colorectal surgery and ta-TME. Endpoint

of the study was the evaluation of the postoperative 90 days morbidity and mortality ranked according to the comprehensive complication index (CCI) (10) and based on the Clavien-Dindo score (11). Other data analyzed were conversion rate, median surgical time, anastomotic leak rate, postoperative bleeding requiring blood transfusion, postoperative ileus and the median postoperative stay. Data collected by a dedicated prospectively maintained database were retrospectively analysed. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by ethics board of A.O.U. Città della salute e della scienza di Torino, A.O. Ordine Mauriziano di Torino, A.S.L. Città di Torino (research registry 4930) and informed consent was taken from all the patients.

### Statistical analysis

The study is descriptive for a cohort of patients undergoing surgery and does not include statistical analyzes. All patients were informed and signed a consent and data entered in a prospective database.

### Surgical technique (Video 1)

In cases of poor general conditions, severe non-responsive pathology and sparing rectum dysplasia-associated lesion or mass (DALM) a three-stage procedure were performed. In particular, a sub total colectomy with end-ileostomy was performed as first step. In patients affected by an extensive rectal DALM an elective laparoscopic proctocolectomy with mini-invasive ta-TME (two stage procedure) was performed.

For the proctectomy, the patient was placed in Lloyd Davies position. The abdominal team began the procedure with the detachment of the ileostomy and the placement of an Alexis O-Ring® (Applied Medical, Rancho Santa Margarita, California, USA) through the ileostomy site. Other two trocars were placed in the surgical incisions already made during the first surgical phase. Mesoileum was full mobilized up to the duodenal plane. In cases of mucous fistula, the rectal stump was detached from the anterior wall by a linear cutter stapler. Rectal stump was isolated and a close rectal dissection of the mesorectum was performed, preserving the rectal vessels and the urogenital structures. In order to optimize the dissection an advanced bipolar device was used. When the first team began the isolation of the rectal stump, the second team started with the ta time.



**Video 1** Laparoscopic proctectomy and J-pouch reconstruction with trans anal mini-invasive approach for ulcerative colitis.

The Lone Star<sup>®</sup> self-retaining retractor (Cooper Surgical<sup>®</sup>, USA) was paced around the anus. Then the Gel POINT<sup>®</sup> Path (Applied Medical<sup>®</sup>, USA) was inserted, providing the insufflation by the Air Seal<sup>®</sup> System. A purse string suture in the distal rectum was completed and, after inducing the pneumo-rectum at 12 mmHg, a rectotomy 4 cm above the dentate line was performed. The dissection continued close to the rectal wall, following first the posterior plane than the anterior one, without dissecting the Denonvilliers' fascia and finally the lateral planes. A vessel sealing device was used during this surgical time to reduce the bleeding due to mesorectal inflammation. The two teams proceed synchronously to the transection until they reached the peritoneal cavity, generally anteriorly. The transection ended with the completion of the circumferential section, easily carried out by means of traction and counter-traction movements conducted by one or the other team. A suprapubic Pfannestiel incision was performed and the residual subcutaneous rectal stump was removed if present. An abdominal wall retractor Alexis O-Ring<sup>®</sup> (Applied Medical, Rancho Santa Margarita, California, USA) was placed and the surgical specimen removed. A J-pouch with a length of about 15 cm was fashioned using a laparoscopic linear stapler through the Pfannestiel incision. The anvil of a circular stapler was inserted in the distal edge of the pouch and secured with a purse-string. Another purse-string was applied on the rectal stump and a plastic tube was passed through it. The pneumoperitoneum was re-induced and the abdominal team, on the guide of the tube, checked the stapler closure under direct vision. An air leak test of the tightness of the anastomosis was performed. At the end, a lateral ileostomy on the right side of the abdomen was placed. A silicone drain was placed in the pelvis. All patients underwent an outpatient follow-up 10 days after surgery and then 1 and 3 months after discharge.

## Definitions

Morbidity included all postoperative complications ranked according to the CCI (10) and based on the Clavien-Dindo classification (11). Complications of grade III or higher were defined as major morbidity. Postoperative mortality was defined as death within 90 days after surgery. Extension and severity of UC was classified according to Montreal classification (12). The UC stage was evaluated according to the endoscopic Mayo score (13).

## Results

Between January 2018 and December 2019 twelve patients fulfilled the inclusion criteria. Patient's characteristics were summarized in the *Table 1*. Indications to surgery were refractory to corticosteroids (in 9 patients) and/or diagnosis of extensive DALM in 4 patients. The median illness time was 5.1 years. Disease *extension* was mainly grade 2 (4 patients) and 3 (6 patients) according to Montreal classification with different grades of severity (grade 1: 4 patients, grade 2: 3 patients and grade 3: 5 patients). Preoperative endoscopic exploration found UC stage grade 2–3 in 9 out 12 patients according to the Mayo score. Four patients had undergone previous surgery.

Surgical data were reported in *Table 2*. Median surgical time was 271 minutes (range, 150–435 minutes). The procedures were uneventful with no conversion to open surgery. The pouch was created through the Pfannestiel incision in all the cases. *Table 3* shows postoperative outcomes. Mortality was nil. Major complications occurred in two cases. The first one was an IPAA partial failure (Clavien-Dindo 3B; CCI 33.7) treated in seventh postoperative day with a transanal placement of stiches. The subsequent postoperative course was uneventful and the patient discharged in 18 p.o. days. The second patient presented a bleeding in fourth postoperative day with severe anemization treated with blood transfusion and endoscopic evaluation. A pouchoscopy under sedation revealed the presence of a clot adhering to the suture, without evidence of active bleeding. A rettosigmoidoscopy performed before discharge did not reveal any dehiscence or alterations of the pouch. This patient was readmitted twenty-nine days after discharge because of a severe anastomotic rhyme stenosis requiring endoscopic dilatation under sedation. No further stenosis recurrence occurred. Two patient had minor complications (Clavien-Dindo 2): in one case fever and pneumonia treated with antibiotics; in the other

**Table 1** Patient characteristics

Characteristics	Study cohort (N=12), N [%]
Male	9 [75]
Age (years)	46 [19–65]
Illness time (years)	5.3 [1.0–21.0]
Male	6.1 [1.0–21.0]
Female	3.0 [1.0–4.0]
Body mass index (kg/m <sup>2</sup> )	23.1 [18.0–32.0]
Male	23.8 [18.0–32.0]
Female	21.0 [20.6–21.7]
Smoke	3 [25]
ASA score <sup>‡</sup>	
1	2 [17]
2	9 [75]
3	1 [8]
Montreal classification—extension	
E1	2 [17]
E2	4 [33]
E3	6 [50]
Montreal classification—severity	
S1	4 [33]
S2	3 [25]
S3	5 [42]
Endoscopic Mayo score	
1	3 [25]
2	3 [25]
3	6 [50]
Number of fecal discharges	9 [2–20]
Steroids therapy	12 [100]
Steroid suspension before surgery (months)	3 [0–10]
Azathioprine therapy	6 [50]
Therapy with biologics:	9 [75]
Infliximab	6 [67]
Adalimumab	2 [22]
Golimumab	1 [11]
First line therapy (months)	11.3 [2.0–42.0]

**Table 1** (continued)**Table 1** (continued)

Characteristics	Study cohort (N=12), N [%]
Second line therapy (months)	4 [1–10]
Indications to surgery*	
Nonresponsive to therapy	9
Colic DALM	2
Rectal DALM	2

Continuous data are expressed as median and range. <sup>‡</sup>, ASA as physical status classification system according to the American Society of Anesthesiologists; \*, more than one reason for patient is possible. DALM, dysplasia-associated lesion or mass.

**Table 2** Surgical data

Variable	Study cohort (N=12), N (%)
Setting	
Elective	6 [50]
Urgence	6 [50]
Toxic Megacolon	1 [8]
Three stage procedure	10 [83]
Duration of procedures	271 [150–435]
Type of rectal dissection	
TME	2 [17]
CRD	10 [43]
Circular stapler diameters	
28 mm	6 [50]
29 mm	2 [17]
31 mm	4 [33]
Estimated blood loss (mL)	70 [0–200]

Continuous data are expressed as median and range. TME, total mesorectal excision; CRD, close to rectum dissection.

case a peri-stomal infection treated with advanced wound care and oral antibiotics therapy. The median length of hospital stay was 7.8 days (range, 5–18 days). Histological examination showed moderate/grave dysplasia in patients with extensive DALM and confirmed the diagnosis of UC in all the patients. Of this cohort of patients, eight closed the temporary ileostomy with a median length of stay of 8 days and without major complications. The other four patients are in the waiting list for stoma closure.

**Table 3** Postoperative data

Variable	Study cohort (N=12), N (%)
Length of stay (days)	7.8 [5.0–18.0]
Morbidity <sup>§</sup>	
Classification	
I	0
II	2 [17]
IIIa	1 [8]
IIIb	1 [8]
IV	0
CCI	8.5 [0–33.7]
Morbidity	
Anastomotic leak	1
Bleeding	1
Stoma related	1
Pulmonary complication	1
Readmission	1 [8]
Mortality	0

Continuous data are expressed as median and range. <sup>§</sup>, according to Clavien-Dindo classification. CCI, comprehensive complication index.

## Discussion

Our preliminary experience confirmed the effectiveness and safety of simultaneous double equipe laparoscopic proctectomy and J-pouch reconstruction with a mini-invasive approach in patients with UC. Only two patients developed postoperative complications that required proactive treatments and only one developed an anastomotic leak. These results are in line with the current literature data that provide an IPAA leak rate ranging from 2.3% to 26.7% (14).

The laparoscopic approach in colorectal surgery offers undoubted advantages, widely described in the literature (15). Some of the most striking consist in a more rapid postoperative recovery, a rapid restoration of intestinal canalization, a significant reduction in postoperative pain and hospital stay (16). In addition, some studies in women describe an improvement in fertility with a reduction in the time necessary for conception (6), as well as a better cosmetic result.

In our opinion the double equipe strategy represents

the key point of this demanding procedure, nonetheless it requires a significant learning curve for both surgeons and operating room team. Finally, it requires additional room staff and a great deal of harmony between the abdominal and transanal equipe (14).

In our experience, the transanal approach seems to be even more useful than in TATME to cope with inframesorectal resection of the distal portion of the rectum, otherwise not easily visible and often blindly sectioned. It allows to obtain a magnified view of the most distal rectal portion and a creation of a tailored cuff, especially in narrow pelvis and in obese and male patients. In fact, it permits to perform a full thickness rectotomy exactly where planned and to leave a short rectal cuff, which according to international guidelines must not exceed 2 cm. Moreover, the rectotomy performed transanally allows a much easier bottom-to-up approach and a real close rectal dissection, resulting in lesser nerve damage, fewer urogenital complications, and reduction of dead perirectal space, with possibly lower leak rate.

Furthermore, the benefits of this approach also concern the anal ileo-pouch anastomosis. In fact, it guarantees a single stapling, double purse-string anastomosis. The potential advantages are the absence of dog years and staple line crossing with a more controllable height of anastomosis suture (17).

Despite numerous experiences are reported so far, we still have no evidence that demonstrates a clear superiority of this approach with respect to the pure transabdominal technique. However, it is increasingly evident that the combined technique, performed in a high-volume reference center and by expert surgeons is safe and reproducible. Further experiences will be necessary to confirm the advantages of this technique.

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