



Case report

Redo surgery after low anterior resection for chronic pelvic sinus and anastomotic disruption. Could pull-through procedure with delayed anastomosis be a feasible alternative? Case reports and narrative review

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ABSTRACT

Introduction: A considerable step forward in low rectal cancer resection has been done in the last decades. Maintaining total mesorectal excision as the gold standard treatment, new techniques such as Trans-Anal Mini-Invasive Surgery (TAMIS) and Trans-Anal Total Mesorectal Excision (TATME), which have been added to improve skills in laparoscopic and robotic surgery, currently represent the advancement of this procedure. Despite improvements in surgical techniques, complications after low anterior resection for rectal cancer still remain a challenge. Drainage and colostomy are the main treatments used to overcome the problem caused by anastomosis failure, and most patients will never be restored. Different techniques of redo surgery could be proposed to deal complex cases, although remaining high risk procedures.

Case presentation: We present two clinical cases with a late complication of the colorectal anastomosis: one with a late leakage of low colorectal anastomoses, treated with Hartman procedure, that developed a pelvic chronic sinus; the another one with complete anastomotic disruption after massive suture bleeding; both treated with delayed pull-through anastomosis, according to Turnbull-Cutait technique. We also made a review of relative literature, in order to back our therapeutic iters.

Discussion: Both the procedures were carried out satisfactorily, with restoration of intestinal continuity and good anastomotic result. It allows the resolutions of the chronic sepsis caused by the pelvic sinus and maintenance of intestinal continuity with a good Wexner incontinence score. Literary review demonstrated that this procedure still remains undervalued and not widely exploited.

Conclusion: Delayed pull-through coloanal anastomosis could be considered as a valid option, in order to preserve intestinal continuity in septic or complicated low colorectal anastomosis.

1. Introduction

Colorectal neoplasms represent one of the most frequent cancers encountered and require multimodal treatment, in order to perform surgery with oncological rigour. Mesorectal excision, together with the advancement of technology and the possibility to perform laparoscopic or robotic surgery, have allowed a considerable step forward in the understanding and execution of the surgical treatment of rectal cancer. New techniques have been approached, such as the TATME anal extraction [1], the TAMIS technique [2] and the attempt to perform anastomoses with direct vision of the rectal stump [3]; however, despite these advances, it is estimated that 19% of stomas that were created in the first procedure will never be restored [4].

Regardless of the type of anastomotic technique performed, complications remain an issue to deal with in the post-surgical phase. In the Nederland cross sectional study [5] the diagnosis of leakage occurs in 13,4% within 30 days, and in 20% beyond 30 days after surgery, and half of them will never healed. The authors conclude that the persistence of presacral sinus remains an unsolved problem, that requires more attention. The severity classifications of these complications do not allow us to solve some of the problems that the surgeon has to deal with on a daily basis, especially when they are associated with severe sepsis. Treatment can range from the simple placement of drains, in order to evacuate an infected collection, to the positioning of prostheses to cover fistulas [6], to the insertion of suction drains, to re-intervention, such as disassembly of the anastomosis and creation of a terminal colostomy [7]

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and/or intersphincteric completion proctectomy with minimally invasive approach [8]. Unfortunately, a large majority of colostomy patients will never be restored. Debating this topic, we present two cases with diagnosis of rectal cancer, who underwent neo-adjuvant radio-chemotherapy and subsequent low rectal resection with protective ileostomy, developing a late and complicated anastomotic leakage, both treated with a delayed pull-through anastomotic procedure, as described by Turnbull-Cutait (Fig. 1). Furthermore, we conducted a review of literature, in order to support our treatment choices.

2. Case presentation

First case: a 64-year-old woman with cT2N1 rectal cancer, which had been pre-operatively treated with 5Fu + Radiotherapy 50.4 Gy. Subsequent open low anterior resection with protective ileostomy was done, demonstrating a regression of the lesion with a ypT1N0 and free margin of resection. Three months later, after colonoscopy and rectal enema, the patient underwent ileostomy closure. Postoperative course was complicated by pulmonary embolism (even if on course of prophylactic low molecular weight heparin) and colorectal fistula, which caused a diffuse peritonitis. As a consequence of persistent peritonitis and subsequent Multi Organ Failure, a series of surgical procedures was performed. Initially, a colostomy with open abdomen technique was performed; closure of the superior abdomen was done, and 25 days after ileostomy closure, an ileal perforation occurred. Double ileostomy with only skin closure was necessary. The subsequent clinical course was marked by a persistent septic status with infection of the hypogastric and pelvic region, which fistulized to the skin in the lower portion of the abdomen. Despite daily medications, specifically washing and drainage through the fistula and abdominal Vacuum therapy skin fistulization persist Transanal medications with Endo- SPONGE (B.Braun Medical B. V. Melsunge, Germany) had been started. This resulted in disappearance of abdominal fistulisation and reduction of both sinus secretions; however, as soon as the treatment was interrupted, the abscess immediately reappeared, with recurrent sepsis. Several attempts were done to interrupt Endoscopy treatment with immediately recurrence of the presacral sinus. For this reason, the Endosponge treatment had been continued until the patient felt better, reaching a fairly good performance status and remain without sepsis. Once the appropriate conditions were got for an intervention, it was proposed the option for abdominoperineal resection without evidence of sinus healing or redo surgery. After discussion, she underwent a delayed coloanal anastomosis, using pull-through technique, and unification of the two previous ileostomies in the right inferior quadrant. The hand-sewn anastomosis was done 14 day after the pull-through procedure. The patient had a long postoperative course that require recovery of a good performance status, and 2 months later, a colonoscopy confirmed a good anastomotic

result. Even if the presacral sinus and septic status had been solved, the patient refused ileostomy closure.

Second case: a 54-year-old man with cT3N+ rectal cancer, which had been treated with 5Fu + Radiotherapy 45 Gy, followed by low anterior resection with protective ileostomy. Postoperative course was uneventful and histology demonstrated a ypT3N0 rectal cancer with negative margin. At day 33, the patient was re-admitted for massive rectal bleeding. Angiography was carried out with embolization of a low rectal artery and subsequent colonoscopy revealed a complete disruption of the anastomosis, with a large cavity in the presacral space. The persistence of bleeding required emergency laparotomy with Mikulitz packing of the pelvis and open abdomen management. Two days after the procedure, the patient underwent second-look surgery, to ensure the absence of bleeding and to perform first step of delayed pull-through coloanal anastomosis. After 8 days, an hand-sewn coloanal anastomosis was made with good results. The postoperative course was uneventful and colonoscopy showed regular anastomotic healing. After 8 months since ileostomy closure the Wexner score for incontinence showed 7/20 score.

In both patients wide mobilization of the left colon was achieved, ensuring its extraction through the anus. In the first case, following two previous procedures that had required multiple resection of the left colon, the entire colostomy (skin excluded) was used to pull out the colon; scarification of the chronic sinus was also performed over the rectal stump, where the Endo- SPONGE (B.Braun Medical B.V. Melsunge, Germany) had been inserted (Fig. 2). In the first case, 11 cm of colon were left outside the anus, while about 9 cm in the second one. Mucosectomy of the rectal stump above the dentate line was performed after infiltration with adrenaline 1:10.000. After extraction, four absorbable stitches were placed between the muscular layer of the colon and the anal channel. The colon stump was wrapped with vaseline gauzes. In the first case (Fig. 3A-B-C), the stump became ischemic until 2 cm from the dentate line but, once resected at the anal level, it appeared to be well vascularized. In the second one (Fig. 4A-B-C), the resection was done 1,5 cm over the dentate line. A hand-sewn coloanal anastomosis with 8 absorbable stitches was made in both cases after 10 and 14 days from colonic extraction respectively. A colonoscopy performed a couple of months after the procedure showed regular anastomosis in both patients (Fig. 5A-B).

The work has been reported in line with both SCARE and PROCESS Guidelines [9,10].

3. Discussion

Low colorectal and coloanal anastomosis still represent a challenge in colorectal surgery, with an incidence of leakage for low anastomosis reaching 30% [11]. Late complications also occur, with an incidence of late readmissions of about 16%, of which 10% due to anastomotic leakage [12], even though those patients may be treated conservatively and stoma reversal could be safely performed [13].

When re-intervention is necessary, morbidity and mortality rates are very high: 34% and 12% respectively and, in one third of cases, mortality is directly related to leakage [14]. If severe complications after low colorectal anastomosis occur, colostomy seems to be the only life saving option, but most patients will never be restored, remaining with a definitive colostomy. Redo surgery remains a challenge, even in experienced centers, and restoration of intestinal continuity represents an option in selected fit and motivated patients, with success rate of 68%; while in chronic presacral sinus intersphincteric proctectomy with terminal colostomy might be a possible solution [8].

Turnbull-Cutait abdominoperineal pull-through procedure [15,16] was described as first choice treatment in colorectal surgery, especially in patients with mid-rectal cancer and in children with Hirschsprung's disease, until the advent of the stapling technique, and now remains an obsolete treatment, useful as second choice option in re-operated and irradiated pelvis, in chronic infection and also when a covering stoma is

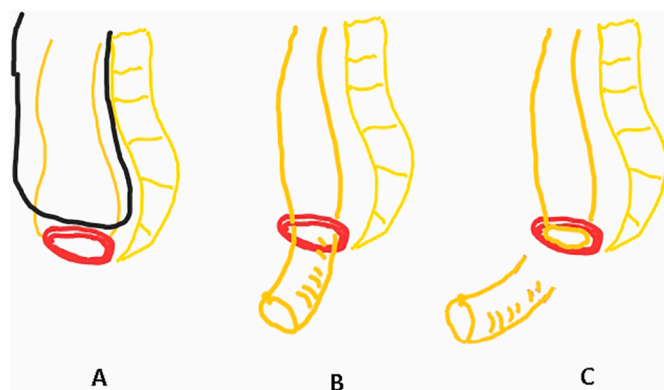


Fig. 1. Turnbull-Cutait classic procedure. A) Low anterior resection B) extraction of mobilized colon through the anus left in place for 10–14 days. C) resection of external portion of the colon and hand-sewn coloanal anastomosis.

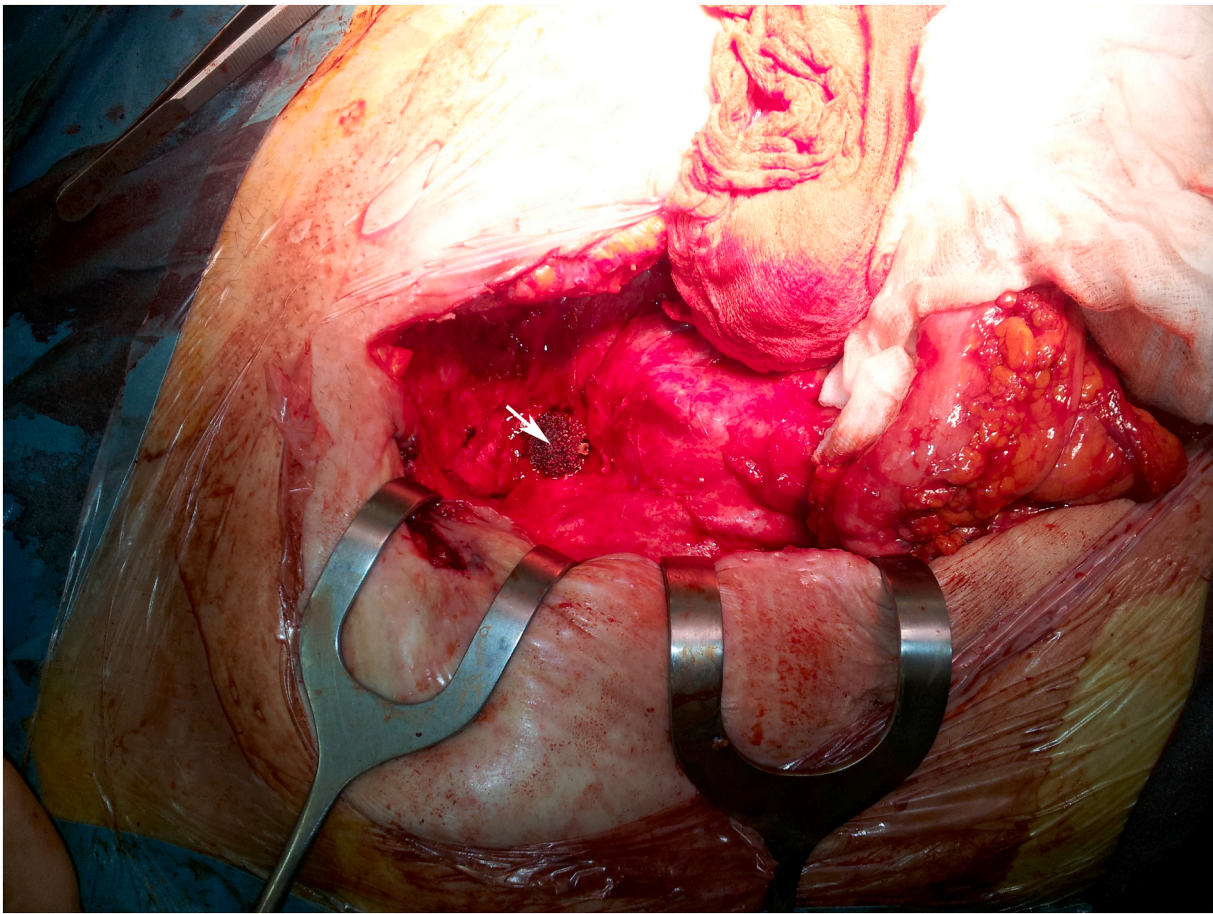


Fig. 2. Intraoperative pelvic sinus First Case: (White arrow internal portion of Endosponge inserted by the anus).

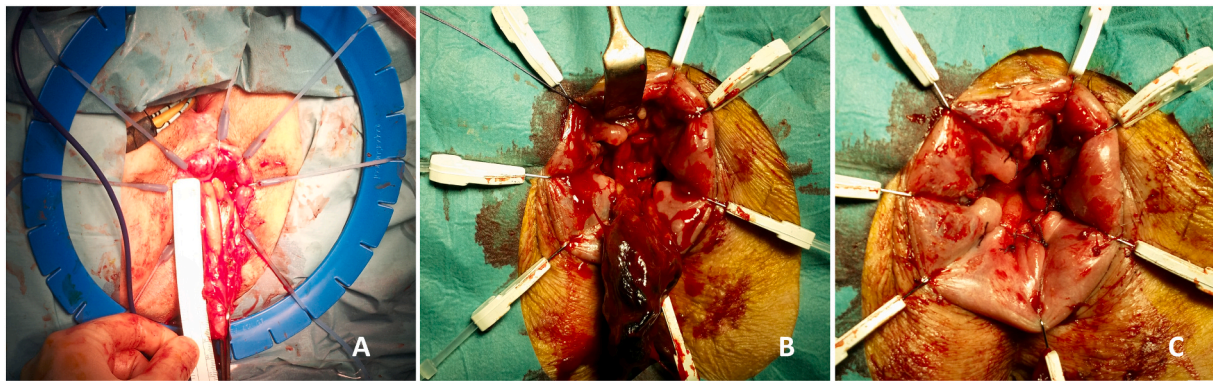


Fig. 3. First Case (A) Colonic extraction from the anus; (B) Section of extracted colon partially necrotic; (C) Coloanal anastomosis.

refused or dangerous [17–20]. This is a two-stage technique, including a first step which contemplates low anterior resection, with extraction from the anus of a variable segment of colon, generally about 8–10 cm, that is left in place without suturing; the second step consists in resection of the exteriorized colon and hand-sewn coloanal anastomosis, which are performed after 8–10 days [21]. Occasionally, the distal part of the exteriorized colon could become necrotic in some portions but, as described in our first case, this does not compromise results. More delayed anastomosis are described in complicated cases with sepsis, until 96 days from the first surgery [22]. Recently, modification of the technique have been described, with purpose of preventing stump ischemia through short stump [23] and high anastomosis (SHIP) [24], or by using of indocyanine green [25].

We used this technique to treat two different surgical situations: in the first case, to heal persistent sinus and sepsis which were probably caused by an ex-vacuum mechanism, by filling the cavity abscess; in the second case, to allow the use of a short rectal stump for a new coloanal anastomosis, avoiding a chronic pelvic fibrosis that could compromise a future restoration of the intestinal continuity.

The technique described by Turnbull and Cutait [15,16] decreases the incidence of leakage from 32% to 2%; moreover, in a recent series, it seems to be useful with 5% of anastomotic leakage versus 0% in two trials [15,26], and also in a systematic review, with an incidence of 0–7% and good functional result, similar to direct anastomosis [27]. Functional outcome seems to be encouraging, with good quality of life, especially if this intervention is used as rescue procedure [28],

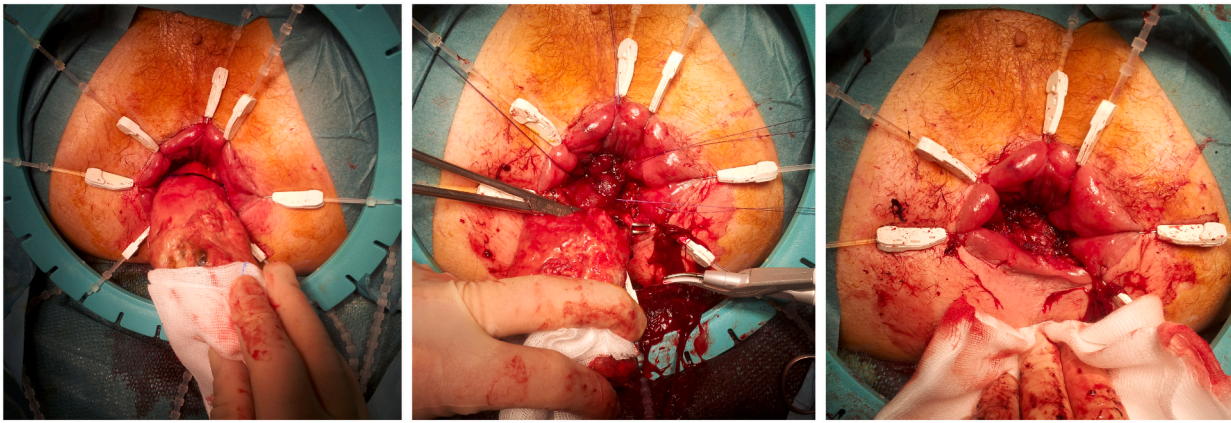


Fig. 4. Second Case (A) Level of resection of extracted colon; (B) Initial coloanal anastomosis; (C) Final coloanal anastomosis.

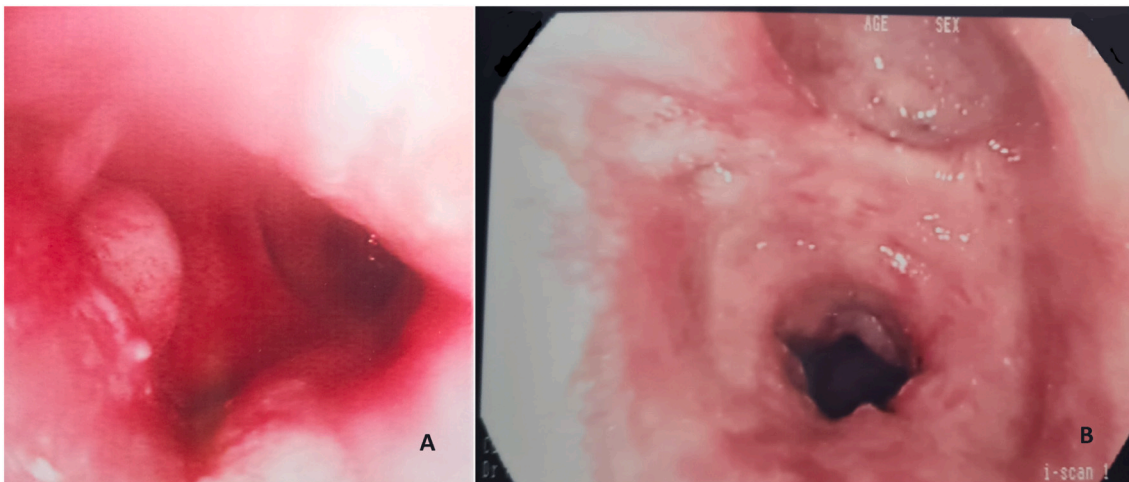


Fig. 5. Coloanal Anastomosis (A) First Case (B) Second Case.

demonstrating no low anterior resection syndrome (LARS) in 41% of cases, minor LARS in 41% and major LARS in 18% respectively [22], that could be considered acceptable in comparison to LARS after first intervention of total mesorectal excision, in the range of 62.21% perfect fit, 31.94% moderate fit and 5.85% no fit [29]. Other authors did not observe a significant difference in the mean Wexner score between delayed coloanal anastomosis (DCA) and immediate anastomosis (10.6 v. 12.2; $p = 0.09$) [24], whereas good success with DCA without faecal diversion in elective settings, as treatment of choice for rectal cancer, was reported [30]. Pull-through technique could also be performed months to years after permanent proctectomy in selected patients, with results comparable to first rectal reconstruction [31].

4. Results

Two-stage pull-through technique could be chosen as first-choice procedure, considering similar rates of short term complications and comparable 1-year oncological and functional outcomes, compared to conventional coloanal anastomosis technique, also avoiding the presence of diverting ileostomy [17,20,32,33]. Furthermore, no significant difference in terms of early post-operative morbidity (frequency of any morbidity, presence of grade 3b morbidity and Comprehensive Complication Index score), has been reported between Turnbull-Cutait technique and standard one-stage coloanal anastomosis [18,19,34].

Moreover, the advantages presented by Turnbull-Cutait technique make this procedure the most frequent option in complex cases, as rectourinary and rectovaginal fistulas [35,36].

Stand on these literature data, delayed pull-through coloanal anastomosis could be taken into consideration both as first-choice surgical treatment in patients with rectal cancer and as anastomotic salvage procedure in patients with severe complications [37].

5. Conclusions

As demonstrated in our experience, the pull-through procedure with delayed coloanal anastomosis, despite being an obsolete intervention, could be considered as a valid option for the preservation of intestinal continuity, especially after low anterior resection complications such as anastomotic disruption and chronic sacral sinus. More literature data are needed to demonstrate acceptable functional results.

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Ethical approval

N/a.

Consent

Written informed consent for publication of this case report and accompanying images was obtained from the second patient; a copy of the written consent is available for review by the Editor-in-Chief of this journal on request. Otherwise, first patient has died 3 years after the procedure.

Research registration

N/a.

Guarantor

Banchini Filippo.

CRedit authorship contribution statement

Banchini Filippo and Patrizio Capelli performed the interventions. Banchini Filippo conceptualization, methodology, validation, investigation, writing—original draft preparation, writing—review and editing, visualization, supervision, and final revision. Luzietti Enrico performed the writing—review and editing and final revision. Palmieri Gerardo was involved in the supervision and final revision. Conti Luigi was involved in the supervision and final revision. Capelli Patrizio was involved in the supervision and final revision.

Declaration of competing interest

The Authors declare that they have no conflict of interest.

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