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Scarless Two-Stage Delayed Coloanal Anastomosis: A Technique Description

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Abstract

Introduction In current clinical practice, immediate coloanal anastomosis (ICA) remains the standard technique for restoring the gastrointestinal tract following coloproctectomy for low rectal cancer. This anastomosis still requires a temporary diverting stoma to decrease the postoperative morbidity, which remains significantly high. As an alternative, some authors have proposed a two-stage delayed coloanal anastomosis (TS-DCA). This article reports on the surgical technique of TS-DCA.

Methods The case described is of a 53-year-old woman, without any particular history, in whom colonoscopy motivated by rectal bleeding revealed an adenocarcinoma of the low rectum. Magnetic resonance imaging showed a tumor $\sim$ 1 cm above the puborectalis muscle, graded cT3N + . The extension workup was negative. Seven weeks after chemoradiotherapy, a coloproctectomy with total mesorectal excision (TME) was performed. A TS-DCA was chosen to restore the digestive tract.

Conclusion Two-stage delayed coloanal anastomosis is a safe and effective alternative for restoring the digestive tract after proctectomy for low rectal cancer. Recent data seem to show a clear advantage of this technique in terms of morbidity.

Keywords
- delayed coloanal anastomosis
- Baulieux technique
- proctectomy
- total mesorectal excision
- diverting stoma
- Turnbull and Cutait procedure

Introduction

Immediate coloanal anastomosis (ICA) with diverting ileostomy remains the standard after coloproctectomy with total mesorectal excision (TME) for low rectal cancer. However, this approach is associated with a significant morbidity, mainly represented by anastomotic leaks and pelvic abscess.[1] In addition, there are specific complications related to the ileostomy itself, including postoperative renal failure and bowel obstruction.[2] Moreover, ileostomy seems to significantly alter the patients' quality of life as well as their self-perception[3,4]; without forgetting the complications inherent to its closure.[5] To overcome the drawbacks of ICA, some authors have suggested a two-stage delayed coloanal anastomosis (TS-DCA) as an alternative, in which the anastomosis is performed several days after proctectomy and externalization of the proximal colon through the anus. This paper describes the TS-DCA technique performed at the department of oncologic surgery of the Clinique Debussy (CPMC, Algiers).

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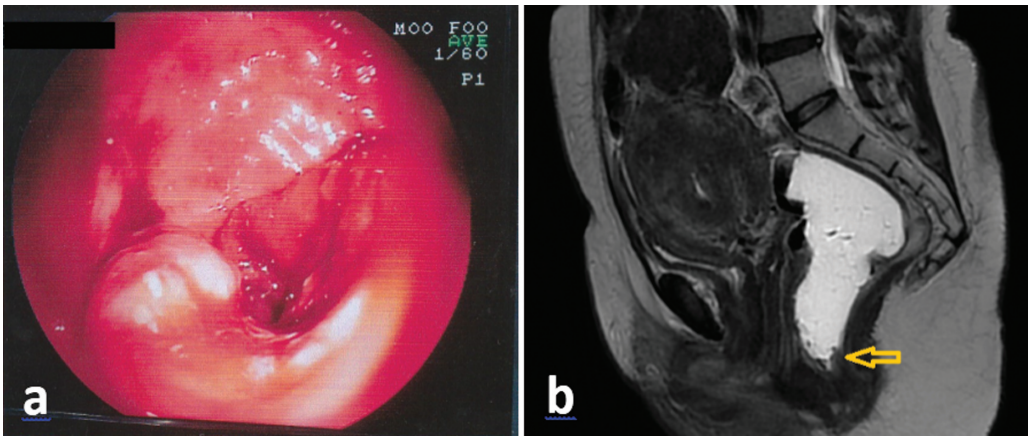

Fig. 1 (**a**) Rectal tumor endoscopic view. (**b**) Magnetic resonance imaging view of the tumor.

Patient Selection

The patient was a 53-year-old female, with a 2.5 × 1.5-cm rectal adenocarcinoma at ∼ 4 cm from the anal verge (►**Fig. 1**). Following chemoradiotherapy, a proctectomy with TME was planned. The reestablishment of the digestive tract was done via a TS-DCA.

Material and Methods

The patient's informed consent was obtained after a full discussion of the benefits, risks, and alternatives of the TS-DCA. The patient was prescribed a metronidazole-based antibiotic prophylaxis for 5 days prior to surgery and a mechanical bowel preparation the day before surgery. Here, the patient was positioned in the Lloyd-Davis position (►**Fig. 2**). For this case, we chose a first transanal approach (►**Fig. 3**).

The surgeon, placed between the patient's legs and using a Lone Star retractor, performed a Vicryl (Ethicon, Inc., Raritan, NJ, USA) 0 purse-string passing at least 1 cm from the lower edge of the tumor. A circumferential incision was made at the level of the dentate line and then continued to the presacral

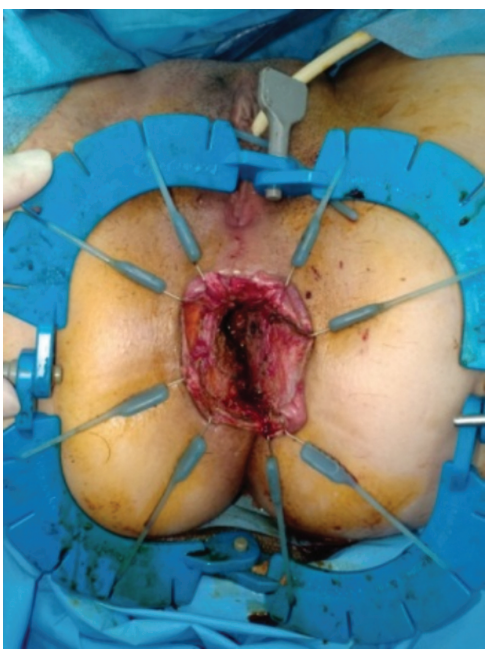

Fig. 3 First transanal approach with mucosectomy.

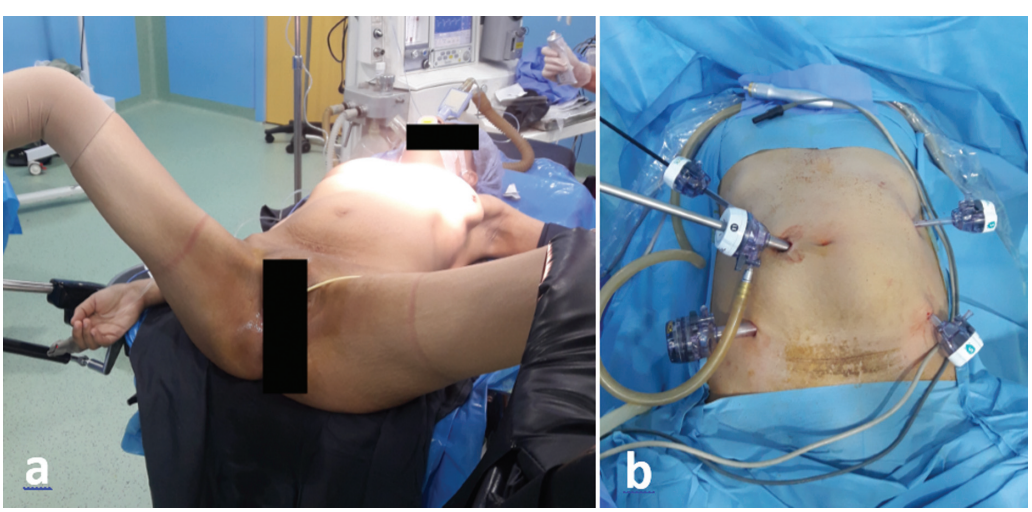

Fig. 2 (**a**) Patient positioning. (**b**) Port placement.

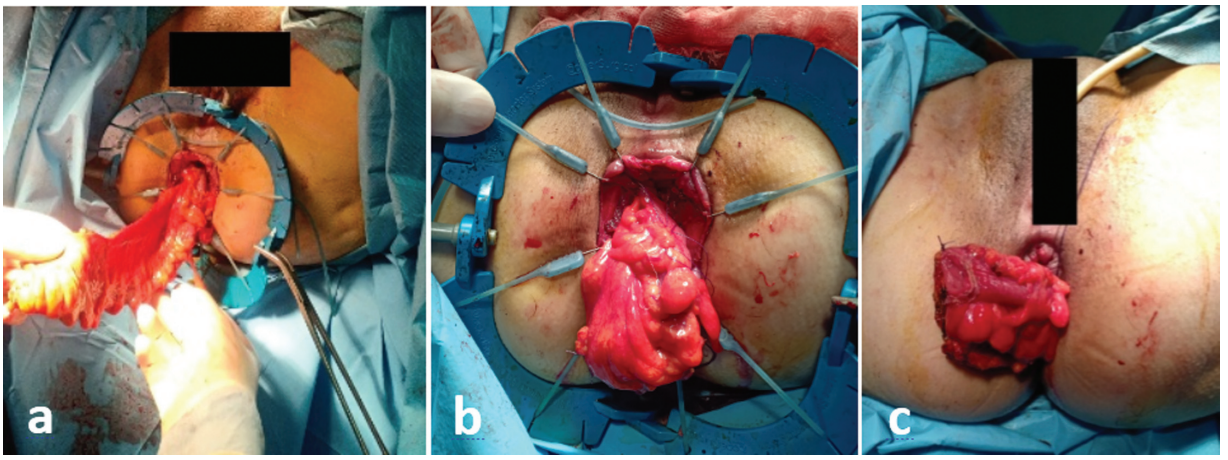

Fig. 4 (**a**) Aspect of the pulled-through colon. (**b**) and (**c**) The pulled-through colonic stump stitched to the skin.

plane, completing a partial intersphincteric resection. For practical reasons, the posterolateral sides were dissected first; the anterior side along the Denonvilliers' fascia was left for last. The dissection was carried out as far as the exposure allowed, this would greatly facilitate the abdominal TME and avoid a repeated digital rectal exam. A mucosectomy concluded this step. The coloproctectomy has been performed by laparoscopic approach after mobilization of the splenic flexure and ligation of the inferior mesenteric artery at 1 cm from its origin. The inferior mesenteric vein was sectioned below the pancreas. The TME was conducted up to down toward the pelvic floor, joining the transanal dissection plane. Using a Babcock forceps, the specimen was grasped and then pulled through the anus, taking care to avoid twisting the mesocolon (►**Fig. 4**). After resection, the mesorectum was inspected to ensure its quality, and the specimen was opened to assess the distal resection margin (►**Fig. 5**).

A sigmoidal stump of ~ 10 cm was left outside and fixed to the skin. Two or even three Vicryl 000 stitches were used to anchor the colonic wall to the sphincter on the anterior hemicircumference, and also as a landmark for the subsequent section (►**Fig. 4**). The pulled-through colonic stump was checked daily to ensure its viability. Also, a fat dressing was applied. On the 7th postoperative day, the patient was taken back to the surgery room, under locoregional anesthesia, for the second stage of the procedure. The colonic stump was sectioned around the entire circumference 2 to 3 mm from the previously placed stiches. The adhesions should not be mobilized. A coloanal anastomosis was made with interrupted sutures of Vicryl 000, joining the colonic, full-thickness, to the sphincter (►**Fig. 6**). The postoperative course was

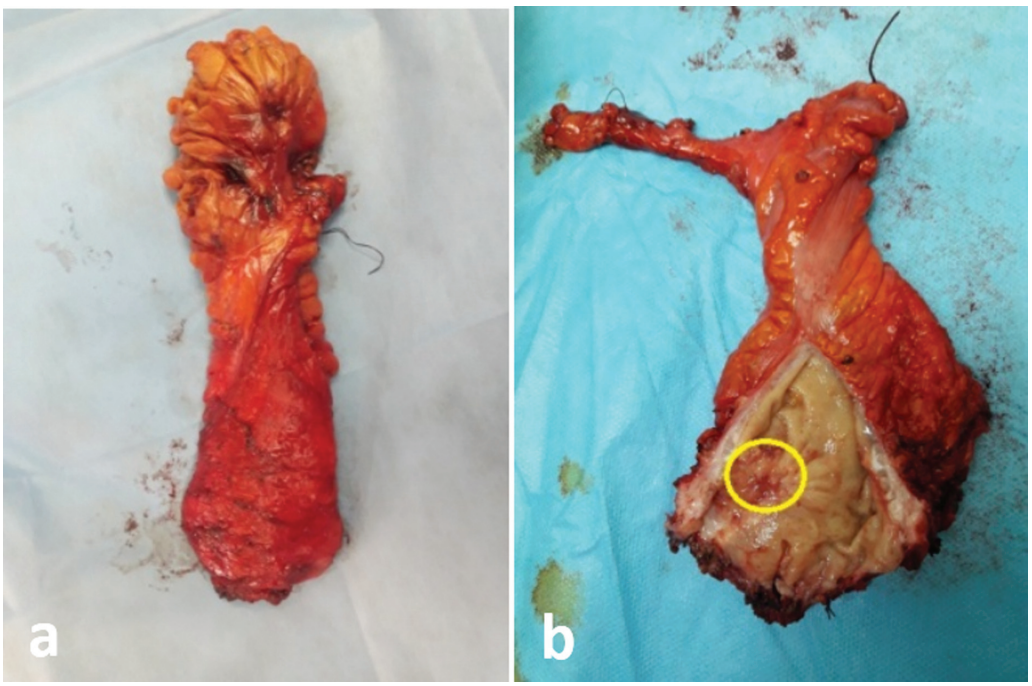

Fig. 5 (**a**) Appearance of the mesorectum. (**b**) Distal resection margin.

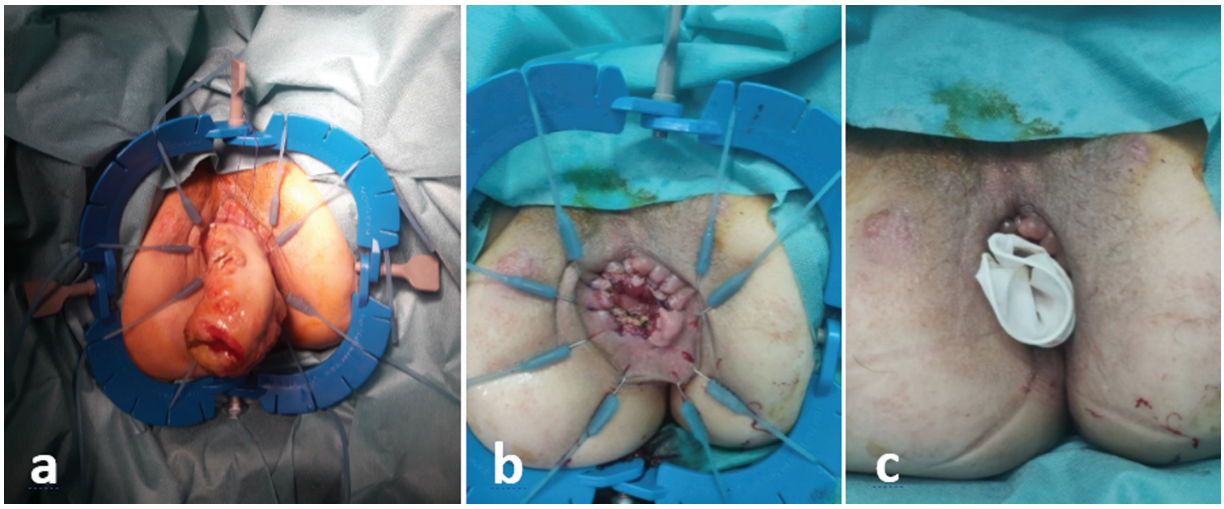

Fig. 6 (**a**) Aspect of the pulled-through colon at the 7th POD. (**b**) The delayed coloanal anastomosis. (**c**) Final look.

uneventful, and the patient was discharged on the 5th postoperative day. Pathologic analysis revealed a poorly differentiated adenocarcinoma ypT3N1bM0 Lv1 Pn1 R0 TRG 3.

Discussion

The delayed character of the TS-DCA seems to significantly decrease the morbidity of coloanal anastomosis.[6] Three main hypotheses are put forward to explain these facts:

1. Postoperatively, the colon, pulled down transanally and free of any attachment, does not undergo any traction due to the lifting of the pelvic floor after curarization effects have disappeared.

2. During the interval and before the DCA is made, adhesions are created, which join the lowered colon to the anal canal over the whole circumference, thus reducing the risk of fistulas.

3. Daily inspection of the stump allows an early diagnosis of possible necrosis by vascular occlusion of the Riolan arch; the surgeon will be able to rectify this during the second stage by resecting the necrotic segment and descending a healthy one.

Before reaching its current level of maturity, TS-DCA went through several phases. In 1932, Babcock was the first to describe the "*transanal pull-through procedure*.[7] It is in fact a proctectomy with a double abdominal and transanal approach preserving the external sphincter. The mobilized colon was pulled ~ 50 cm outside the anus, and, 2 to 3 weeks later, the prolapsed stump was cut. Black, in 1952, modified the technique making it more conservative toward the internal sphincter.[8] In 1961, Turnbull and Cutait independently described a two-stage technique for the treatment of mid-rectal cancer and Hirschsprung disease.[9,10] The first stage consisted of resecting the rectum, with the remaining rectal stump turned over and pulled out of the anus, through which the colon was lowered. In the second stage, the excess colon is resected, and the colorectal anastomosis is performed extracorporeally and then reintegrated into the pelvis without a protective ileostomy. In 1972, Parks described the hand-sewn coloanal anastomosis after mucosectomy.[11,12] More recently, Baulieux proposed an approach combining the Babcock technique with Parks direct coloanal anastomosis.[13] For many years, the concept of TS-DCA had to face a lot of skepticism and reluctance regarding the necessity of externalizing a colonic stump because of the functional consequences, the constraints related to the daily care of the stump for a somewhat prolonged period of time, and, finally, the difficulty to perform a delayed anastomosis.[14] In addition, the lack of data has largely contributed to limit the development of this technique. Furthermore, the introduction and diffusion of surgical stapling devices has considerably limited the indication to Hirschsprung disease and to coloanal anastomosis salvage in case of leaks.[15–17] However, in the last few years, there has been a renewed interest in TS-DCA due to the favorable findings of recent studies.[18–20]

Conclusion

Two-stage delayed coloanal anastomosis is a safe and effective alternative for restoring the digestive tract after proctectomy for low rectal cancer. Recent data seem to show a clear advantage of this technique in terms of morbidity.

Author Contributions

H. B.: Drafting the article and revising it critically for important intellectual content as well as final approval of the version to be submitted.

H. O., N. D., S. L., A. E., C. C., A. A., A. A., and **A. D.:** Revising the article critically for important intellectual content and final approval of the version to be submitted.

Conflict of Interests

The authors have no conflict of interests to declare.

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