v. 5, n. 8, 2025

International Journal of Health Science

Acceptance date: 30/01/2025

PULL-THROUGH SURGERY AS A THERAPEUTIC OPTION FOR INTESTINAL RECONSTRUCTION AFTER RECTOVAGINAL FISTULA

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Abstract: Intestinal transit reconstruction (ITR) is a significant challenge in the practice of proctologic surgeons aiming to restore patients' quality of life. These include variable anatomy, previous pathological conditions such as a short remaining rectal stump, fibrosis, as well as complications inherent to the procedure such as fistulas, stenosis, dehiscence and intestinal dysfunction. It is estimated that 30 to 60% of patients undergoing derivative ostomies, due to surgical complications, are candidates for RTI. The morbidity rates of RTI surgery after Hartmann's procedure vary between 10% and 50% and mortality rates are up to 28%. *Pull-through* surgery has emerged as a therapeutic option for hostile pelvises where the remaining intestine is pulled through the rectum and anastomosed with the anal canal. CASE REPORT: A 60-year-old female patient diagnosed with adenocarcinoma of the mid-rectum was followed up at the HCA's Coloproctology department, with the lesion staged and surgical resection indicated. She underwent rectosigmoidectomy in 2022 with primary anastomosis. On the 5th day after surgery, she developed a complication, dehiscence of the anastomosis and rectovaginal fistula. She was re-operated on at the same time and underwent a terminal colostomy, closure of the rectum (Hartmann) and vaginal raphe. After 17 months, she underwent intestinal transit reconstruction (ITR) using the *Pull--Through* technique due to the impossibility of dissociating the rectum from the vagina. The patient remained hospitalized for 30 days, evolving with abdominal distension, nausea, difficulty evacuating and inappetence. Dilation of the anal stump was necessary on D15 post-operatively. She evolved without surgical complications and with sphincter preservation. *Pull-through* surgery has emerged as an exceptional therapeutic option when primary colorectal anastomosis is not feasible. The *Pull-Through* technique is effective in selected

cases of RTI in patients with a remaining rectal stump that is difficult to dissect due to a previous fistula with the vaginal canal.

Keywords: Restorative Proctocolectomy, Intestinal Fistula, Rectovaginal Fistula, Colostomy

INTRODUCTION

Reconstruction of intestinal transit in patients with previous recto-vaginal fistula is a major technical challenge in Coloproctology, especially when it comes to complex surgical complications such as difficult access to the remaining stump. Recto-vaginal fistula consists of an abnormal communication between the rectum and the vagina, which can be caused by a number of factors, including surgical trauma, inflammatory bowel disease, neoplasms, post-partum complications or radiation. When this condition is diagnosed, it can significantly complicate subsequent surgical treatment, especially when looking for a definitive solution to restore intestinal transit. The presence of a rectovaginal fistula can alter the anatomy of the pelvic region, making surgical access and definitive treatment difficult. Complicating factors include scarring and previous adhesions, as well as altered anatomy, making it impossible to mobilize the colon and rectum and access the remaining stump, which can be limited or distorted, making abdominal anastomosis difficult. Repeat infections due to communication between the intestinal and vaginal tracts can increase the risk of local surgical infection, impairing healing. When mobilization of the remaining stump is difficult to locate or compromised due to a previous fistula, it makes surgery complex and can make primary anastomosis impossible, even leading to stenosis or recurrence of the fistula. Depending on the location of the fistula and the previous treatment, the anal sphincter may be compromised, and its preservation is crucial in order to avoid fecal incontinence. The complexity of treating these conditions requires the surgeon to have a thorough understanding of the altered anatomy and the appropriate techniques. *Pull--through* endorectal colonic lowering surgery has emerged as a viable solution when conventional options are not suitable, although it requires careful analysis of the risks and specific conditions of each patient. *Pull-through* surgery has emerged as a therapeutic option for hostile pelvises where the remaining intestine is pulled through the rectum and fixed in the perineal region. This is a unique case report on the reconstruction of the intestinal transit in a patient with a fistula between the colorectal anastomosis and the vagina, which occurred after rectosigmoidectomy due to rectal neoplasia. The patient required a surgical re-approach using the Hartmann technique. In view of the difficulties encountered in dissecting the remaining short rectal stump and the vagina, the technique of lowering the endorectal colon was chosen as a therapeutic alternative, with the aim of expanding the surgical options available for re-establishing colonic transit in complex cases such as the one presented.

CASE REPORT

A 60-year-old female patient diagnosed with a neoplasm in the upper and middle rectum was being followed up at the HCA's Coloproctology department. The staging of the lesion indicated the need for surgical resection. In 2022, she underwent rectosigmoidectomy with primary anastomosis. On the 5th postoperative day, the patient presented complications, with dehiscence of the anastomosis and formation of a rectovaginal fistula. She underwent immediate reoperation, with terminal colostomy, closure of the rectum (Hartmann's procedure) and vaginal raphe. After 17 months, the viability of the rectal stump and the closure of the vaginal fistula were assessed

and the fistula was completely closed. Given the difficulty in dissociating the rectum from the vagina, we opted for intestinal transit reconstruction (ITR) using the *Pull-Through* technique. During hospitalization, the patient remained in hospital for 30 days, presenting with abdominal distension, nausea, difficulty evacuating and inappetence, with low intestinal subocclusion, requiring manipulation with a rectal probe for relief. On the 20th day of hospitalization, after retraction and maturation of the perineal colonic stump in the anal canal, rectal stump dilation was performed under anesthesia. The patient progressed well, with no surgical complications and preservation of the anal sphincter. After 30 days in hospital, the patient was discharged, with subsequent outpatient follow-up.

DISCUSSION

Pull-through surgery is a surgical technique used to reconstruct intestinal transit in complex cases such as previous fistulas and difficult access to the remaining rectal stump. The surgical technique consists of mobilizing the remaining portion of the colon and resecting the diseased segment, followed by transposition of the colon where it is "pulled" (hence the name *pull-through*) through the rectum, where it will be fixed to the perineum to re-establish intestinal transit. The surgery is indicated for patients with chronic congenital constipation such as Hirschsprung's disease and other pathologies that require surgical treatment with sphincter preservation. In 1939, Babcock modified Hochenegg's procedure and proposed a two-stage transanal colonic surgery, known as the *pull-through* technique, which, however, did not receive much attention at the time. In 1945, Bacon reproposed and popularized this approach, which came to be called the Bacon operation. However, due to the excision of the levator ani and internal sphincter, post-operative anal function was compromised and complications were numerous. In 1952, Black modified the technique, keeping the levator ani and internal sphincter, which resulted in a significant improvement in anal function and a reduction in the incidence of infections. During the healing process, anastomotic union occurred. In 1961, the Turnbull-Cutait late coloanal anastomosis was introduced, also a *pull-through* procedure. Studies suggest that the anastomotic dehiscence rate of this technique is significantly lower, possibly due to the formation of adhesions between the wall of the anal canal, the colonic serosa and the pelvic tissues. Although post-operative complications are relatively rare, the clinical results can be serious, with complications such as perianastomotic abscess, anastomotic stenosis, colonic ischemia and necrosis of the exteriorized colonic segment. In addition, this technique eliminates the need for a diverting ileostomy, although recovery of sphincter function is not optimal, requiring pelvic physiotherapy during outpatient follow-up. The *pull-through* technique has been consolidated as an effective and advantageous alternative in the treatment of rectovaginal fistulas, especially in situations where other surgical options present a high risk of complications or are not viable. This approach offers a number of advantages, both from a technical and functional point of view, as well as a significant positive impact on patients' quality of life. One of the main advantages of the *pull-through* technique is the preservation of anatomy and anal function, especially as it does not compromise the internal anal sphincter and levator ani, which are fundamental structures for maintaining postoperative fecal continence. In contrast to other techniques, which can result in permanent damage to the anal musculature and consequent loss of sphincter function, *pull-through* allows continuity of intestinal transit to be restored without negatively affecting these essential func-

tions. Another substantial advantage of the *pull-through* technique is the reduced risk of anastomotic complications, such as dehiscence and infection. Studies have shown that coloanal anastomosis performed by *pull-through* has significantly lower dehiscence rates when compared to conventional techniques, such as primary anastomosis. This benefit can be attributed to the gradual traction of the colon and the creation of a more robust and secure anastomotic junction between the colonic segments, especially when the procedure is performed in two stages. In addition, the formation of adhesions during the second stage contributes to the stabilization of the anastomosis area, which further reduces the risk of complications. The *pull-through* technique also eliminates the need for a permanent or temporary protective ileostomy, a common procedure in other surgical approaches to intestinal transit reconstruction. The creation of an ileostomy can lead to additional complications, such as infections, prolapses or hernias, as well as significantly altering the patient's quality of life due to the need for ongoing care of the ostomy. With the *pull-through*, the continuation of colonic transit through the anastomosis and the preservation of anal function allow the patient to recover an intestinal function closer to normal, without the need for an ileostomy, promoting a faster and less complex recovery. The *pull-through* technique is also associated with a lower incidence of anastomotic stenosis and colonic ischemia. *Pull--through* anastomoses are more likely to heal properly, allowing the formation of a stronger anastomotic junction that is less prone to stenosis. Careful management of blood flow during surgery, combined with the preservation of pelvic structures, also contributes to the prevention of ischemia, a complication that can compromise the viability of the colonic segment and lead to necrosis. In terms of quality of life, *pull-through* offers considerable benefits compared to other surgical techniques for intestinal transit reconstruction. The preservation of anal function, faster recovery of intestinal transit and elimination of the need for a stoma contribute to a more efficient functional recovery, allowing patients to resume their daily activities more quickly and with less physical and emotional impact. The reduction in post-operative complications, such as infections and obstructions, also results in a shorter hospital stay and a smoother recovery. The *pull-through* technique stands out for its versatility in complex situations, especially in cases of rectovaginal fistulas, where dissociation of the rectum and vagina is difficult or impossible. The transanal approach allows the surgeon greater precision in the management of pelvic structures, facilitating the reconstruction of intestinal transit even in altered or challenging anatomical conditions. In many cases, the *pull-through* technique can be adapted to deal with the particularities of each patient, offering an effective solution where other approaches might not be feasible. *Pull--through* surgery, especially in its application to intestinal transit reconstruction in complex cases such as rectovaginal fistulas, involves rigorous post-operative care, with particular attention to the exteriorized anal stump. The adequacy of the post-operative approach is fundamental to guaranteeing the success of the surgery, minimizing complications and promoting an efficient functional recovery. Specific care of the exteriorized anal stump during the healing process is crucial, as the area is susceptible to complications such as infections, stenosis and difficulties with the final anastomosis. In the first few days after surgery, the exteriorized anal stump should be closely monitored for viability. The healing of the colonic stump in the anal canal can be impaired by factors such as ischemia, infection or excessive tension in the area. To avoid these complications, it is essential to ensure that

blood flow to the stump is adequate and that there are no signs of necrosis or compromise of the anastomosis. The use of rectal relief probes can be useful to reduce pressure on the anal stump, allowing adequate time for healing. Daily visual inspection of the stump is necessary to detect signs of infection, such as erythema, purulent discharge or an increase in local temperature. If any of these signs are observed, an immediate infection control protocol should be initiated, including the administration of antibiotics and, in some cases, surgical drainage if necessary. It is important to avoid excessive manipulation of the exteriorized anal stump to prevent the formation of adhesions or trauma. The stump should be protected with suitable sterile dressings, keeping the area clean and dry. The use of dressings with antimicrobial properties can be considered to reduce the risk of infection. In addition, pressure on the anal stump area can be minimized by positioning the patient properly, avoiding excessive compression on the pelvic region during recovery. In some cases, the exteriorized anal stump can be temporarily covered with a stoma bag to ensure additional protection against infection and to allow monitoring of healing. This is particularly important in patients at high risk of complications, such as those with immunosuppression or a history of previous anastomotic complications. The post-operative diet is another important factor in the care of the exteriorized anal stump. Initially, the patient should be kept on an absolute fast, with oral feeding being introduced gradually, according to clinical tolerance. The early start of a liquid diet and progression to more solid diets should be carefully monitored to avoid excessive abdominal distension or constipation, which can compromise the integrity of the stump. In many cases, the introduction of mild laxatives or stool softening agents is recommended to avoid constipation, which could result in excessive pressure on the anastomosis. In many cases, the exteriorized anal stump can undergo a process of retraction or stenosis during the initial healing phase. To avoid this complication, gradual dilation of the anal stump can be carried out under medical supervision in the second stage of surgery. Dilation should be carried out carefully, using suitable anal dilators, to avoid additional injuries or perforations. The dilation process should be gradual and carefully monitored, always respecting the patient's anatomical limits and avoiding excessive trauma. Dilation can also help improve the functionality of the anal stump, ensuring that the final anastomosis is wide enough to allow normal evacuation. In addition, dilation can facilitate the recovery of sphincter function, promoting a more efficient recovery of fecal continence after the reconstruction of intestinal transit. Outpatient follow-up is essential to monitor the healing of the exteriorized anal stump and identify any signs of complication early on. Regular consultations with the surgeon should be carried out, usually at intervals of 1 to 2 weeks in the early post-operative phases, to assess the progress of healing and the integrity of the anastomosis. During these follow-ups, complementary tests can be carried out, such as digital inspection of the anal canal or imaging tests, to assess the progress of healing and detect possible complications, such as anastomotic stenosis or persistent infection. Although immediate complications can be well managed with the care described, long-term follow-up is necessary to prevent chronic complications, such as persistent anal stump stenosis, fecal incontinence or anal sphincter dysfunction. Continuous assessment of anal function and intestinal transit should be carried out to ensure that the patient is able to return to a satisfactory functional pattern free of complications.

CONCLUSION

Pull-through surgery has established itself as an effective therapeutic option, particularly in cases where primary colorectal anastomosis is not feasible. Its application in intestinal transit reconstruction (ITR) has proved particularly beneficial for patients with a remaining rectal stump that is difficult to dissect, especially after previous rectovaginal fistulas. The versatility and functional advantages of this technique make it a robust solution in the treatment of rectovaginal fistulas, providing substantial improvements in clinical outcomes and patients' quality of life. With lower rates of serious complications and a significant positive impact on post-operative recovery, *pull-through* is positioned as a safe and effective approach, especially in complex intestinal reconstruction scenarios. Its adoption could represent a breakthrough in the treatment of rectovaginal fistulas, offering patients superior clinical results and satisfactory long-term functional recovery. In addition, the *pull-through* technique stands out as an excellent option for patients with rectovaginal fistulas and difficulties in accessing the remaining rectal stump, as it allows for the reconstruction of intestinal transit while preserving anal sphincter function, which is fundamental for fecal continence. Although the technique presents challenges, especially in cases with significant anatomical alterations, it allows many patients to avoid the need for permanent colostomies and resume their daily activities with greater functionality. The choice of surgical approach should always be individualized, taking into account the experience of the surgical team and the particularities of each case.

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