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Case Report

SURGICAL TREATMENT OF PARACOLOSTOMY HERNIAS AFTER ABDOMINOPERINEAL RESECTION

V. Ignatov^{* 1}, K. Ivanov¹, N. Kolev¹, T. Temelkov¹, I. Minev¹, N. Pirovski², A. Tonev¹, G. Ivanov¹

¹Department of General and Operative Surgery, St. Marina University Hospital, Prof. P. Stoyanov Medical University of Varna, ²Department of Anatomy, MF, Tracian University, Stara Zagora, Bulgaria

ABSTRACT

Background: Paracolostomy hernia is a frequent complication of intestinal stoma. Its correction can be made through relocation of the colostomy or by keeping it in place and performing abdominal wall reinforcement through direct suturing with or without a mesh.

Method: Results of surgical treatment of paracolostomy hernias were analysed in 21 patients who underwent surgery, with or without mesh, in our hospital during the past 7 years. All patients had terminal colostomies after abdominoperineal resection of the rectum for adenocarcinoma.

Results: In 15 (71%) patients, hernia correction was made by maintaining the colostomy in place, in 2 of them (10%) without reinforcement, and in the other 13 (62%) through reinforcement of the aponeurosis with mesh. In the 6 (28%) other patients, hernia correction was accomplished by relocation of the colostomy. The mean follow-up period was 28 months. Recurrence was observed in 2 (10%) patients after a median of 16 months post-correction.

Conclusion: Paracolostomy hernia remains a surgical challenge due to its high recurrence rate. Primary repair using a mesh may be preferable since muscle-aponeurotic weakness is frequently observed.

Key Words: intestinal stoma, hernia, colostomy, surgical treatment

INTRODUCTION

Surgical treatment of oncologic diseases of the colon and rectum may eventually involve a stoma Construction of a stoma is frequently considered a surgical procedure of secondary importance, although development of complications paracolostomy such as herniation is regarded as an almost inevitable outcome of colostomy formation. As result, complications of stomas are frequently reported, occasionally requiring early or late surgical correction (1-3). Paracolostomy hernias are quite frequent complications and can be observed in up to one third of patients who are bearers of definitive colostomies (2-6). A paracolostomy hernia may avoid intestinal irrigation and adequate fixation of collecting bags, causing pain, discomfort, and damage to body image that is already altered by the presence of the colostomy; its presence represents the additional potential risk of incarceration and stenosis of the bowel (1, 2 4, 7). Paracolostomy hernias may occur because of technical failure during stoma construction, such as incorrect positioning or excessively wide opening of the fascia; however, they can also be associated with tissue weakness, progressive increase of intra-abdominal pressure, obesity, suture dehiscence, or defective scarring secondary to infection (1, 2, 8). Despite its significant prevalence, there is persistent controversy in the literature regarding the best surgical option for the correction of a paracolostomy hernia. Many techniques are described all of which aim at obtaining a lower recurrence rate, and less morbidity and mortality. Among the surgical alternatives, the colostomy can be changed from its original location (to the same or to the opposite side of the abdomen), or correction of the hernia can be accomplished with or without the placement of mesh (2, 5, 8, 9). The aim of this study is to report our

^{*} Correspondence to: V. Ignatov, Department of General and Operative Surgery, St. Marina University Hospital, Prof. P. Stoyanov Medical University of Varna, BG-9002 Varna, 1, Hristo Smirnenski Street, Bulgaria; E-mail: teraton@abv.bg

results with surgical treatment of paracolostomy hernias in our institution through different techniques and using mesh when indicated, as well as to correlate recurrence findings to the operative technique.

MATERIAL AND METHODS

Results of surgical treatment of paracolostomy hernias were retrospectively analysed in 21 patients undergoing corrective surgery at the Department of General and Operative Surgery, St. Marina University Hospital, over the past 7 years. The median age was 54.2 years; 15 (71%) patients were women. All of the patients had end colostomies after abdominoperineal resection of the rectum. All patients underwent complete mechanical intestinal preparation. Systemic antibiotic prophylaxis was used in all cases. All operations were conducted under general anaesthesia. The procedure began with mobilization of the stoma after incision of the mucocutaneous iunction. followed bv resection of a cutaneous fusiform patch. The hernial sac was identified, dissected, and separated from the subcutaneous cellular tissue, and the fascial layer exposed. Opening of the hernial sac was usually required for mobilization of the appropriate extent of colonic segment to be used for a new colostomy. In patients undergoing local correction of the hernia, the defect of the fascial layer was corrected by simple stitches of nonabsorbable synthetic thread, avoiding tension. Complete closure of the skin and maturation of the colostomy was routinely employed. In cases where a wide fascial defect was identified and a significant weakness of neighbouring muscle-fascial layers was observed, mesh was used. In these patients, after appropriate dissection of the hernial sac and mobilization of the bowel loop to be exposed, the muscle-fascial layer was closed without tension by direct suture using

nonabsorbable stitches; the aim was to reduce the fascial defect to a size measuring between approximately 3.0 and 3.5 cm. After that, mesh previously cut in a round shape to a size large enough to cover all local muscleaponeurotic weakness, 0.5 cm larger than the bowel loop, was applied and fixed by simple stitches in an upper fascial position. Closing of the skin incision and maturation of the colostomy were routinely performed. In patients with a hernia associated to an inadequate placement of the stoma, resiting of the stoma was accomplished using the following method: the abdomen was opened through the previous laparotomy incision; the stoma and hernial sac were adequately mobilized, as already described; the fascia was repaired; the new stoma was carefully constructed according to well established principles of intestinal stoma construction. These include adequate vascular supply, no tension, meticulous attention to delivering the bowel through the rectus muscle and away from scars and bony protuberances, and immediate maturation.

RESULTS

Thirteen patients (62%) underwent hernia correction using mesh without relocation of the colostomy. In 3 patients (14.5%), hernia correction was accomplished by changing the colostomy site to a neighbouring area on the same side of the abdomen after fascial repair without using a mesh. In 3 patients (14.5%), the colostomy site was changed to the other side of the abdomen after fascial repair, as already mentioned. In 2 patients (10%), hernia correction was accomplished without using any mesh (Table 1). There were just two cases of intra-operative complication, which consisted of inadvertent lesion of the small bowel loop adhered to the hernia, which was repaired with no further complications.

Technique	n	%
Local repair of paracolostomy hernia	15	71
- correction with mesh	13	61
- correction without mesh	2	10
Relocation of the stoma without mesh	6	29
- same side of the abdomen	3	14.5
- other side of the abdomen	3	14.5
TOTAL	21	100

Table 1. Distribution of patients according to surgical technique

After a mean follow-up of 28 months, recurrence was observed in 2 (10%) patients (average of 16 months after the initial correction). None of the patients had body mass index greater than 30 kg/m2, and infection did not occur in the postoperative

period of the first operation. One patient who initially underwent correction using mesh developed recurrence after 2 years. A new operation with relocation of the colostomy to the other side of the abdomen was performed. The other patient who underwent stoma relocation on the same side of the abdomen presented recurrence of the hernia after 8 months; he also underwent surgery to and relocate the colostomy to the other side of the abdomen (**Table 2**).

Table 2. Surgical technique for primary repair of paracolostomy hernia, recurrence rate, and surgical technique used for second repair

Surgical technique for first repair	n	Recurrence (n)	Recurrence (%)	Surgical technique for second repair
Mesh	13	1	7.6	Stoma relocation
Stoma relocation	6	1	16	New relocation
Local tissue repair	2	0	0	
TOTAL	21	2	10	

DISCUSSION

Parastomal and ventral hernias are not infrequent complications after bowel surgery (10-12). The incidence of paraileostomy hernia has been reported to range between 0.8 and 28 percent (13). Paracolostomy hernias have been reported to develop in 5 to 58 percent of patients (14). The incidence of hernia in a laparotomy incision has been reported to range between 0.5 and 15 percent in clean, uncomplicated cases (15-18). The risk of developing a hernia at any site is believed to be even higher when surgery is performed in the setting of a contaminated frank wound operative field, seroma, infection, preoperative radiation therapy, steroid therapy, and various comorbid conditions (malnutrition, diabetes, obesity, ulcerative colitis, Crohn's disease, and cancer) (12, 16). Technical factors (3, 4), such as fascial opening larger than 2.5 cm, positioning of the stomas close to inguinal areas or lateral to the rectus muscle and not through rectus muscle, no closure of suture dehiscence of the mesenteric opening, and absence of an extraperitoneal route of the bowel loop, also act as predisposing conditions for the development of paracolostomy hernias (19). Paracolostomy hernias are associated with the impossibility of irrigating the stoma, pain, risk of entrapment or of loop strangulation, and difficulty in fixation of the collecting appliance, providing discomfort due to the deformity of body image that is already compromised by the presence of the colostomy (2,4,7). Although the main determining factors of the aetiology of paracolostomic hernias are related to surgical technique such as the correct positioning of the conduit and the creation of a fascial gap that allows only the bowel loop to be brought out, controversies persist regarding this

matter. Londono-Schimmer, contrary to the opinion of several other authors, reported that that routing the bowel through the rectus muscle did not reduce the risk of development of paracolostomy hernias in 203 patients with colostomies (3, 5, 8, 20). In the same series, the formation of the stoma through an extraperitoneal route reduced the occurrence of paracolostomy hernias when compared with the group in which transperitoneal routing was employed (3.6% vs 23.6%), supporting what Goligher and Thorlakson had previously proposed (1, 7). Despite these controversies, it is probable that the early appearance of a paracolostomic hernia during the postoperative follow-up period results from the formation of an excessively large fascial gap and is, therefore, due to technical failure. Meanwhile, the formation of the hernia years after surgery is commonly related to progressive dilatation of the aponeurotic gap, associated or not with general weakness of neighbouring tissues. Because of painful symptoms, difficultly in use of collecting appliances, and body image deformity, the need for surgical repair is quite obvious. Before proceeding to any correction, the surgeon must analyse whether the stoma site is correct, whether the fascial size is adequate. and evaluate the degree of weakness of the Although abdominal wall. there are controversial points, it is logical to suppose that if the colostomy site is correct and the fascial flaw is not excessively wide, an attempt at local repair by suture (with or without mesh) represents an appropriate therapeutic option. Several advantages can be obtained by maintaining the colostomy in the same site. Because the procedure is limited to the area of the stoma, without extra incisions, postoperative recovery is less painful; this is particularly important in patients with Crohn's disease who may be undergoing new surgical

interventions. Reinforcement of the fascia may be obtained using a mesh with the aim of obtaining a lower recurrence rate. The use of a variety of materials (synthetic material, such as polypropylene and polytetrafluorethylene; or biological material, such as bovine pericardium) has increased over the last years (20-23). The use of mesh is believed to permit a reduction in the tension developed on fascial sutures placed for repair of hernias, especially where there is significant separation or loss of fascia. For this reason, mesh is believed to be particularly useful in the repair of recurrent hernias. Use of mesh has been reported to be associated with a recurrence rate of 3 to 17 percent in the repair of such "difficult" hernias (24-26). Application of the mesh is technically simple. Although there was an initial fear regarding the placement of a synthetic material in a contaminated area, many reports have shown the safety (without septic complication) associated with the use of such mesh (19, 23, 24). Out of fear of infectious complications, some authors advocate the placement of a mesh in a lower fascial plane through the peritoneum through the old midline incision (22, 27, 31) or, more recently, laparoscopically (32-39). These approaches are claimed to be aseptic, and the operation can be performed in an otherwise potentially contaminated field. We could not agree more with the advantages of working in an aseptic field; however, if the surgeon does not dissect the hernial sac and does not correct the fascial flaw, we believe the risk of recurrence with extrusion of the mesh is higher. Additionally, as Stelzner et al (40) pointed out, there is a closer contact between bowel and mesh that may lead to fibrosis, erosion, and even eventual perforation, particularly when using a prosthetic mesh. Laparoscopic paracolostomy hernia repair is a minimally invasive procedure that has been adopted over the last years. Although this kind of procedure is attractive because of the short operating time, reduced length of stay, less pain and less ileus, recurrence may be high since the hernial sac is not dissected nor is the defect repaired (41). However, there are no studies analysing a large number of patients or having a considerable follow-up period. The potential disadvantages of a synthetic mesh are as follows:

- 1) it has rough edges that can erode into the bowel;
- 2) it may be difficult to position the mesh so that a sharp edge is not juxtaposed to bowel;
- 3) it is a semi-rigid material, which can

cause local discomfort;

4) a circle cut in rigid mesh has the tendency to enlarge over time, creating a high risk for recurrence (42, 29, 43).

Experimental studies have additionally shown that prosthetic mesh tends to enlarge over time (42, 44). Aiming to avoid this kind of complication, based on favourable past experience regarding the use of mesh may damage surrounding tissues more frequently due to its sharp cutting edges and relatively wide pores, (29, 43) as well as previous experimental studies that have shown that prosthetic mesh tends to enlarge over time (42, 44). Although often clinically evident, hernia recurrence at any site may be subtle. Confirmation of recurrence by CT or ultrasound may be required, particularly in the obese patient. Clinical recurrence determination alone is likely to underestimate true recurrence rates. Recurrence after simple repair of a ventral hernia has been reported to be 10 to 55 percent (46). In situations of incorrect positioning of the stoma associated or not with accentuated fascial and muscle weaknesses, as already mentioned, the stoma site must be changed (8). In our series, this technical procedure led to 1 (5%) recurrence. Therefore, attempting stoma relocation without laparotomy, although attractive, may be related to a higher risk of a new hernia. This conclusion, however, may not be obtained by the analysis of our data due to a reduced number of cases. In our sample population, we did not observe any case of rejection or infection. When changing the colostomy site, there is a risk of a hernia developing in the old colostomy site, which may be avoided by using mesh for fascial reinforcement (9, 21, 22). Repair with mesh should not allow new hernias when it is technically well performed, since the mesh adds strength to the abdominal wall. In our series, reinforcement of the old colostomy site was performed by simple suture. It was also possible to verify that although hernias are a common complication of permanent stomas, they have been observed in only a few cases (21 cases after 7 years) in our experience. The authors attribute this result to the strict application of technical principles established for the construction of intestinal stomas (45).

CONCLUSION

Evaluation of fascial opening, stoma location, and associated tissue weakness, although subjective, remain sound surgical principles adequately repairing paracolostomy for

hernias, although there may be not only one correct approach for each case. Based on the results of this study, we submit for discussion an algorithm for the surgical management of paracolostomy hernias when reconstruction of intestinal tract is not foreseen or cannot be accomplished.

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