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Introductory Chapter: Role of Colostomy in the Colorectal Pathologies

Vincenzo Neri

1. Introduction

Gastrointestinal stomas can be performed during the surgical treatment of various colorectal diseases. The therapeutic indications of colostomy are the decompression in the treatment of intestinal obstruction or the need of definitive or temporary exclusion of intestinal transit.

2. Functional and anatomical characteristics of colostomy

The first subdivision is between temporary and definitive colostomy; this distinction is based on the therapeutic perspective. Following anatomical criterion, the stomas can be divided as terminal and parietal. The parietal colostomies encompass cecostomy and loop colostomy. They are usually temporary, and fecal diversion is often partial; their site can be right iliac fossa (cecostomy) or left iliac fossa (sigmoidostomy) and right paraumbilical site (transverse colonostomy). Loop colostomy can be stabilized by a stick. Cecostomy usually is completed by the self-retained catheter fixed by the purse-string suture. Technical simplicity and rapid accomplishment are the characteristics of cecostomy. In the past, the parietal colostomies, as transverse colostomy, have been employed with the aim to prevent the leakage or dehiscence of the colorectal anastomosis, but now this role has been denied. In summary cecostomy may be indicated as a means of gas decompression in colonic obstruction, and transverse colostomy can instead ensure fecal diversion which is generally partial. End colostomy allows total fecal diversion. This can be employed in case of resection of diseased segment of the colon, and the immediate, contextual anastomosis is judged to be uncertain and not indicated. End colostomy is recommended rather than loop colostomy as permanent ostomy. In some conditions, such as Hartmann's procedure, there is also the distal end of the colon that can be treated as mucus fistula.

3. Indications for colostomy

The purpose of colostomy should be evaluated based on some reflections: clinical frame, functional aim, and temporal perspective of the procedure. The indications for colostomy can occur in the elective or urgent clinical conditions. The elective situation provides the bowel preparation; the patients may be submitted to the surgical procedure in the best general conditions. It will be also possible to

choose the correct site on the abdominal wall of ostomy. Some clinical conditions that require elective temporary colostomy are the treatment of rectovaginal and rectovesical fistula and inflammatory perineal disease; temporary colostomy usually is required for the protection of insecure low colorectal anastomosis. More frequently colostomy in the emergent clinical conditions is performed. In the first line are the traumatic lesions of the colon such as penetrating injuries, sometimes inserted in the very complex abdominal trauma. Obstruction of the large bowel and colonic perforation are in some cases indication for emergency colostomy. The functional purpose of colostomy is the fecal diversion or anal substitution. The therapeutic indications that require fecal diversion are numerous: discharge of intestinal obstruction is the more frequent clinical condition that can be treated with ostomy, to prevent possible contamination from rectal lesions or the management of rectal disease as high rectal fistula, rectovaginal fistula, etc. The temporal perspective of colostomy allows the distinction between the temporary and permanent one. First of all, permanent colostomy is indicated if the location of malignancy requires the abdominal perineal resection. Severe anatomical damage of the anal sphincter occurs in the complex ischiorectal abscess, Fournier's gangrene, lymphogranuloma venereum, and other severe inflammatory diseases that involve the perineum. Temporary colostomy has numerous indications as reported above.

4. General considerations of surgical techniques

The most important considerations concern the kind and the site of pathological involvement of the colon, the presence of possible complications, the anatomical mobility of each colonic segments, and the problems related to the closure of temporary colostomy. Colostomy is usually performed on the mobile sections of the colon: cecum or transverse or sigmoid colon. The site of the colostomy on the abdominal wall should be not close to bone saliences as costal edge of the torax, anterior superior iliac spine because the difficult to put on the colostomy appliance. Generally transverse colostomy is placed between the umbilicus and VIII rib and sigmoid colostomy between the umbilicus and anterior superior iliac spine. It is always preferable that the specific skin incision is made for colostomy; it is not recommended that colostomy passes through laparotomy. The position of colostomy along the colon is significant, because proximal ostomy, as cecostomy, causes hydroelectrolytic loss and irritation and ulceration of the skin around; but the pathologies affect this choice.

5. Colostomy morbidity

There are specific complications of colostomy that can be subdivided as early and late. The early complications occur during the immediate postoperative phase and encompass ostomy necrosis, retraction, peristomal infection, wound breaking open, skin irritation, blockage of colostomy, and intestinal obstruction [1]. The late complications include ostomy stenosis, prolapse mucous or total, parastomal hernia, poor stoma siting, and mucocutaneous separation. The global incidence of colostomy complications shows a wide range from 6 to 59% [2]. This wide variation should be due to the confusing definition of ostomy complications; and some of these would be out the medical competence but linked to the difficult adaptation of the patient to new condition. However also other studies recently reported in the literature confirmed the high incidence and the wide variation of ostomy morbidity with the range between 10 and 82% [3]. There are in this section various risk factors. The operation-related risks as

the emergency conditions play the remarkable role rather than elective indications of the procedure and the patient-related risk as the age, obesity and general conditions. Finally there are the disease-specific risk: ulcerative rectocolitis, Crohn disease, and ischemic colitis have more frequent colostomy complications. Alteration of vascular supply is a fearsome complication which can occur within 48–72 hours from the surgery. The vascular damage may be localized to the external, superficial section of the stoma or concerns the deep portion below the abdominal wall. The incidence of the superficial necrosis ranges between 2 and 20%; less frequent is the deep necrosis with the incidence of 0.37–3% [4]. The vascular damage is due to the excessive traction, torsion of the colic stump, or its excessive trimming of the epiploic fat and the mesentery. Very important in the prevention of the ischemic colostomy complication is the correct mobilization of the colonic segment which has to reach easily the skin site of the stoma. The superficial vascular compromise can be controlled and followed awaiting the resolution; if the ischemic evidence extends deeper, it is mandatory for the surgical revision to perform new colostomy. The stoma retraction generally is due to incomplete mobilization of the colon. The retraction is more frequent among the stoma complications; its incidence ranges between 30 and 40% [5]. This complication can occur early, in most cases for incorrect skin fixation, in particular in the obese patients; in this case, the dehiscence of mucocutaneous junction with site contamination is feared. It is also possible that the retraction develops late in the postoperative period, because of the patient's mobilization and deambulation. In some cases local revision can be attempted, but the success of this maneuver is unlikely because the retraction is usually due to incomplete colonic mobilization. Therefore the correction of colostomy retraction requires the new surgical procedure. Stoma stenosis can develop at the skin or fascial level; it is frequently caused by mucocutaneous dehiscence, peristomal contaminations, and suppurations with fibrosis. Fascial level stenosis may cause intestinal obstruction that should be treated by surgical procedure; the incomplete and superficial stenosis can be treated with conservative therapy and dilation procedures. Stomal prolapse is often a late complication, The incidence shows a wide range from 2 to 20% [6]. The prolapse can develop as simple mucosal prolapse or as a complete prolapse of all colonic wall. Loop colostomies are more frequently subject to complication than the end stomas. The causes of the prolapse are the excessive mobilization of the colon without the fixation of the mesentery and colon at fascial edge and finally can be also involved in the increase of the intra-abdominal pressure. Sometimes the stomal prolapse is voluminous and reducible. This is not a surgical emergency, but repeated reduction maneuvers are not recommended, and the complete surgical treatment should be performed. Parastomal hernia, incisional hernia, is unusual in the early postoperative period but becomes more frequently late, reaching the incidence of 15–40% [7]. The risk factors for the development of parastomal hernia are the large opening performed in the abdominal wall and the thin thickness of the abdominal wall. Such as for other abdominal wall hernias, all actions that increase the intra-abdominal pressure are important. In the parastomal hernia, it is possible that the common complications of hernias, as strangulation, irreducibility, and incarceration, require urgent surgical treatment. The therapeutic approach includes local primary repair, mesh repair, and relocation of the stoma. The simple repair of the parietal defect is followed by high recurrence rates which oscillate between 46% and 100%. These results are discouraging. The relocation of the stoma is usually performed in association with the parietal defect repair. This procedure provides better results, but the recurrence rates remains rather high (20–40%) [8]. The mesh repair of parastomal hernia with the stoma relocation, employing numerous technical details, has produced better results, reducing the incidence of recurrence to an acceptable level: 7–17% [9]. After some debatable suggestions to prevent parastomal hernia, as reduction of the size of trephination, passage of the colon through

the rectus abdominis, and extraperitoneal passage of the colon, there is the current proposal of the use of prophylactic mesh added into primary operation to prevent parastomal hernia [10].

6. Colostomy closure

The technique of colostomy closure is dependent on the type of colostomy which was employed: loop, end, or minor modifications of these are the methods. The pathology and clinical situations encountered usually recommend which type of colostomy should be performed. Closure of loop colostomy can be a simple procedure but, in some cases, can be rather difficult based on the degree of inflammation, the presence of fibrosis, or scarring. The contentious technical features about loop closure encompass simple closure as alternative of resection and anastomosis, intra- versus extraperitoneal closure, and finally the use of peritoneal drainage. Closure of an end colostomy with Hartmann's procedure can be commonly more difficult than simple colostomy closure and sometimes may occur the postoperative complications. Closure of end colostomy and mucous fistula has been traditionally performed with a laparotomy, dissection, and release of both ostomies and end-to-end anastomosis.

Author details

Vincenzo Neri
University of Foggia, Italy

*Address all correspondence to: vincenzo.neri@unifg.it

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