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Abstract

Despite the great advances in medical management of inflammatory bowel disease, an estimated 50–74 % of Crohn's patients require surgery 10 years after the diagnosis. Of these, many will require repeat surgery, and the specialist coloproctologist may develop a reputation for the super-specialized surgical treatment of these complicated patients. This chapter discusses the epidemiological and clinical risk factors associated with the need for reoperative surgery and the surgical options available along with their reported outcomes and complications.

Keywords

Resection • Crohn's disease (CD) • Colon • Ileocolonic disease • Proctocolectomy • Complications • Bowel-sparing • Ileostomy • Colectomy • Low Hartmann's procedure

Introduction

Crohn's disease (CD) may affect any part or multiple segments of the gastrointestinal tract. Farmer et al. [1], in a study of 615 new patients consecutively diagnosed with CD, found that 40.9 % had ileocolonic disease, 28.6 % had disease limited to the small bowel, and 30.4 % had disease involving only the colon or anorectal area. About 25 % of patients with CD limited to the colon and rectum have relative rectal or rectosigmoid sparing, but of patients with disease limited to the colon, only 25 % have inflammation affecting the entire

colon. In the remaining 75 %, any area of the colon may be affected, with the distal colon affected most often [2].

Although there have been great advances in the medical treatment of patients with CD, surgery is still frequently indicated for complications of the disease. However, because of its nature, surgery is performed with the intent to alleviate symptoms rather than to cure the disease. An estimated 50–74 % of Crohn's patients require surgery 10 years after the diagnosis [3–5]. Various factors have been considered to be associated with an increased risk for initial surgical intervention. The anatomic site of the disease is a major factor. An increased risk of surgery was found in patients with ileocolic or ileal disease compared with patients with colonic and rectal disease [6]. An increased probability of undergoing surgery also has been demonstrated in patients with ileocolonic disease compared with patients with disease confined to other anatomical sites. The lowest probability for surgery actually was found in patients with colorectal disease [1, 3]. Other proposed factors for incipient surgery include stricturing or penetrating clinical phenotypes, perianal disease, and age younger than 40 years at the time of diagnosis [1, 3, 7, 8].

One of the greatest challenges in managing patients with CD is the high frequency of recurrent disease after surgery. Of the patients who had undergone an intestinal resection, up

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to 50 % will experience recurrence at 10 years [9, 10]. The precise cause of recurrence remains undetermined. In cases of recurrence that have failed to respond to medical therapy, additional surgical procedures may be needed, and after primary resection between 9.5 and 43 % of patients may require reoperation at 5 years [9, 11]. Several prognostic factors have been investigated as potentially influencing the recurrence and reoperation rates, namely, smoking habits, age at disease onset, anatomic site and extent of involvement, extraintestinal manifestations, indication for surgery, anastomotic technique, operation involving stricturoplasty, postoperative complications, and type of medical treatment [3, 12–15].

Reoperation for recurrence of CD is, however, a complex issue. When compared with the first operation, it is associated with higher rates of intraoperative and postoperative complications including small-bowel injury and abdominal abscess as well as a longer hospital stay. The proposed causes for these findings are adhesions, complex preoperative medical therapy, and disease severity [16, 17]. Brouquet et al. [17] observed an overall morbidity rate of 38 %. The rate of associated procedures during operation was high (23 %), as was the rate of small-bowel injury (5 %).

Surgical Treatment for CD of the Colon and Rectum

Colorectal CD is on the increase worldwide and carries substantial morbidity: half of patients will undergo surgical resection within the first 10 years. The indications for surgery for CD of the colon and rectum are usually due to complications, including colonic bleeding, stricture, obstruction, dysplasia or frank cancer, debilitating perianal disease, and failure of medical therapy to control colitic symptoms, and results either in repeated hospital admissions or adversely affected health-related quality of life. In children, effects of repeated hospital admissions on schooling as well as the debilitating effects of growth retardation with steroid dependence or the side effects of other steroid-sparing medications also need to be taken into account [18]. Although bowel-sparing techniques are the standard of care for treatment of CD of the small bowel, the extent of resection in Crohn's colitis is still a matter of debate. Several different surgical approaches are available for the treatment of patients with colorectal involvement. The operative procedure is determined by the location and duration of the disease, the extent of the involved segment, the indication for surgery, the urgency of intervention, the presence of complications, the age and general condition of the patient, and the expected functional outcome reflecting rectal compliance and fecal continence.

Surgical options fall into three main categories: (1) one-stage large-bowel resection with immediate restoration of

intestinal continuity; (2) staged large-bowel resection with construction of an ileostomy with or without restoration of intestinal continuity; and (3) large-bowel resection with sphincter ablation, abdominoperineal proctectomy, and permanent ileostomy or colostomy. Large-bowel resection may include segmental colectomy, subtotal colectomy, total abdominal colectomy, and proctocolectomy. In patients with rectal-sparing segmental resection or total abdominal colectomy with an ileorectal anastomosis (IRA) have been used. Both have a considerable risk of recurrence in the rectum or small bowel, which may then require reoperation. Of patients with colorectal CD undergoing surgery, a considerable percentage will eventually receive an ileostomy. Lapidus et al. [19] found that the absolute cumulative risk of needing a permanent ileostomy was 16, 25, and 38 % at 5, 10, and 25 years after diagnosis, respectively.

Ileostomy Alone

Ileostomy usually is applied as a first step of a staged procedure for fecal diversion to control pelvic sepsis in patients destined to undergo proctocolectomy; it acts as protection for patients who receive simultaneous reconstructive procedures, such as IRA or restorative proctocolectomy (ileal pouch anal anastomosis [IPAA]), or during colon resection with the intention of reanastomosis of the ileum to the remaining part of the colon or rectum at a later date. In many cases, an ileostomy will alleviate distal disease including severe perianal disease. This topic is covered elsewhere in this section of the book Chap. 22; factors leading to a permanent ileostomy are beyond the scope of this chapter [20].

Abdominal Colectomy and Ileostomy

Abdominal colectomy with a Hartmann's pouch or mucous fistula and an ileostomy may be the first operation in a staged procedure. It is performed for emergency conditions (toxic fulminating disease, perforation) as well as for patients with extensive colitis for whom a subsequent proctocolectomy is planned but who either are too debilitated to withstand such a major procedure, have significant perianal sepsis, or have an uncertain diagnosis. The 10-year recurrence rates vary between 13 and 35 % in different studies and are the same after abdominal colectomy or proctocolectomy [21]. However, some patients will never have an IRA after colectomy and are left with an end ileostomy because of the severity of rectal or perianal disease. Lock et al. [22] found that 45 % of patients with a retained rectum after colectomy and ileostomy may actually subsequently undergo proctectomy for persistent severe proctitis or perianal disease.

Segmental Colectomy with Colocolonic Anastomosis

There has been much controversy about the role of segmental colectomy in Crohn's colitis. Until recently, total abdominal colectomy with IRA was the standard surgical procedure; however, segmental colectomy has assumed an ever-increasing role in the management of selected group of patients, of whom about 10 % will have short-segment disease (10–20 cm) with a normal remainder of the colon and rectum. Various articles have demonstrated that the risk of early recurrence in the remaining large bowel, and reoperation after segmental colectomy is increased when compared with subtotal colectomy and ileosigmoid or total colectomy with IRA. Prabhakar et al. [23] reported that after 14 years of follow-up, 59 % of patients that had undergone a segmental colectomy developed recurrent disease, which was mostly colorectal, and 44 % of those patients required either repeat surgery or prolonged medical therapy. In this respect, Andersson et al. [24] reported an overall 10-year re-resection rate after subtotal colectomy when compared with segmental colectomy in 41 and 55 % of cases, respectively. Although colorectal recurrences occur more often with segmental colectomy, there are no differences with respect to stoma formation when segmental and abdominal colectomies were compared [25, 26].

Subtotal or Total Abdominal Colectomy and Ileosigmoid/Rectal Anastomosis

Total abdominal colectomy and IRA or subtotal colectomy with ileosigmoid anastomosis have been effective in restoring chronically ill patients with Crohn's colitis to good health. The operation is particularly valuable and is the only sphincter-saving operation in young patients with extensive Crohn's colitis in whom IPAA is contraindicated because of a high risk of recurrence in or proximal to the ileal pouch. Other advantages of the procedure include minimal sexual and bladder dysfunction caused by pelvic dissection, the avoidance of perineal wound healing problems, and the avoidance of a permanent stoma. To minimize the failure rate, patient selection is important. Spared distensible distal sigmoid colon or rectum, minimal perianal involvement, and acceptable sphincter function are essential to the success of this approach. Subtotal colectomy (i.e., preservation of the sigmoid colon) with an ileosigmoid anastomosis is preferred whenever the sigmoid colon is spared because of functional advantages. Because colorectal recurrences are more common after segmental resection than after total abdominal colectomy, colectomy with IRA is advocated by several authors even when the colonic inflammation is limited to a few segments [21, 27, 28]. Approximately 40 % of patients

have a satisfactory outcome without the need for further surgery over 10 years of follow-up. Ambrose et al. [29] reported that the cumulative recurrence rate at 10 years was 64 % and the cumulative reoperation rate was 48 % in these patients. A more recent study by Cattani et al. [30] reported a cumulative recurrence rate after IRA of 58 % at 5 years and 83 % at 10 years. Despite a high rate of clinical recurrence, rectal preservation was achieved in 86 % of patients at 10 years.

Total Proctocolectomy and Ileostomy

Avoidance of a stoma with preservation of anal function and optimization of quality of life are of paramount importance from the patient's point of view. Because CD is a disease in patients of younger age, restoration of bowel continuity is either planned as part of a staged procedure or performed primarily by means of segmental resection, abdominal colectomy, and IRA or restorative proctocolectomy. Conventional proctocolectomy with an end ileostomy is reserved for those patients with extensive colonic disease, especially when significant rectal and anal involvement exists. It may be performed in one session or as a staged procedure that includes ileostomy with or without colectomy, or as a Hartmann's pouch/mucous fistula followed by completion proctectomy.

Total proctocolectomy and ileostomy offer the lowest of recurrence and reoperation rate for Crohn's colitis. The recurrence rate of 10–25 % compares favorably with the 50 % recurrence rate for all other surgical options [21]. However, it commits patients to a permanent ileostomy. A number of complications are associated with proctectomy. These include sexual dysfunction (particularly impotence and ejaculatory dysfunction in men), incomplete perineal wound healing, and the immediate complications specific to the pelvic and perineal portion of the operation. Perineal wound healing has been the subject of many reports. Employing a perimuscular or intersphincteric excision has resulted in a dramatic decrease in these complications [31]: about 60–90 % of perineal wounds will heal within 6 months [32].

Restorative Proctocolectomy (IPAA)

Historically, IPAA has been considered a contraindication in patients with CD because of poor outcomes. Several studies have been published that outline the poor outcomes associated with an IPAA in CD patients [33–37]. Brown et al. [36] reported that pouch complications were significantly more common in patients with CD (64 %) compared with patients with ulcerative colitis (UC) (22 %). After a mean follow-up of nearly 7 years, 56 % of CD patients had their pouch

excised or defunctioned, compared with 6 % of UC patients. CD in the pouch has been associated with refractory pouchitis, peripouch abscess, fistula formation, pouch strictures, and ultimate pouch failure. In a meta-analysis of ten articles comprising 3,103 patients with inflammatory bowel disease, Reese et al. [37] studied the effect of CD on outcomes after restorative proctocolectomy. Ileal pouch failure, pelvic sepsis, pouch-related fistula, and anastomotic strictures were significantly more frequent in patients with CD than those without CD. With regard to functional outcome, pouch inflammation, urgency, and incontinence occurred more commonly in Crohn's patients.

However, Panis et al. [38] demonstrated that preselected populations of CD patients may have a good outcome with an IPAA. After 5 years of follow-up, there has been no significant difference in pouch functioning between CD and UC patients undergoing the IAA procedure. These results were replicated by Regimbeau et al. [39], who demonstrated pouch failure rates of only 10 % in properly selected patients. Currently, performing an IPAA in patients with CD remains extremely controversial, and it usually is conducted in patients with a misdiagnosis of UC. If surgeons were to undertake an IPAA in the presence of CD, prerequisite conditions would include isolated colorectal disease, no small-bowel involvement, no previous perianal disease, and good sphincter function [38, 40]. It is important to point out that several studies have shown that the improvement in quality of life of patients after proctocolectomy and ileostomy is comparable to that in patients after IPAA [41, 42]—an issue that should be discussed with the patient in detail preoperatively.

Reoperation for Crohn's Colitis

Recurrence of CD after intestinal resection seems to be part of the natural history of the disease. The rate of recurrence may be reduced by the administration of immunomodulatory therapy with azathioprine/6 mercaptopurine or infliximab [43, 44]. Despite the progress in the medical prevention of recurrence after primary resection, clinical relapse still occurs in nearly 50 % of patients within 5 years [3], and this number might be expected to increase with longer follow-up. The risk for second resection is 25–45 % within 10 years [10, 45]. Many attempts have been made to define the risk factors for recurrence after primary surgery for isolated Crohn's colitis. Smoking is the most widely recognized risk factor for first intestinal resection [13]. Furthermore, several studies have concluded that CD patients who smoke are more likely to require surgical treatment for recurrence [46, 47]. Most studies have indicated that gender has no impact on the recurrence rate [48, 49], whereas some reports have shown that women had a significantly increased risk of recurrence compared with men [3, 50]. Several studies have investigated

whether anatomic extent predicts recurrence, and the majority have shown that the risk of recurrent disease is lower in Crohn's colitis than in ileocolic or isolated ileal disease [1, 3, 51–53], so that the presence of ileal disease at the time of colectomy has an impact on recurrence [22]. An increased risk also was found in patients with perianal fistula compared with patients without fistulous disease [24, 50, 54]. In this regard, Polle et al. [50] reported that two-thirds of patients with a history of perianal disease had a stoma compared with 20 % of patients with no such history. A few reports have found an increased rate of recurrence in young patients [32, 55]. Furthermore, patients with extraintestinal manifestations probably have an increased risk of recurrence as well as a lower chance of rectal preservation [30].

As mentioned earlier, the type of operation has a major impact on recurrence and reoperation rates. One concern is of earlier or higher recurrence rates after segmental colectomy when compared with total colectomy. Few studies that addressed this issue reported that segmental resection is associated with an increased risk for recurrence and re-resection [23, 28], whereas others have reported a similar risk [24, 56–58]. A meta-analysis by Tekkis et al. [57] showed that there was no significant difference in recurrence rates between total colectomy with IRA and segmental colectomy, although this study was somewhat flawed in its assessment of an eclectic group of patients who were not randomized for disease extent. They noted that the time to recurrence was shorter in the segmental colectomy group by 4.4 years. In a prospective study, Fichera et al. [28] reported on 179 patients with CD who were operated on for primary colonic disease. Overall there were 31 patients (24.4 %) with surgical Crohn's recurrences during follow-up: 38.8 % in the segmental colectomy group, 22.9 % in the total abdominal colectomy group, and 9.3 % in the total proctocolectomy group; the segmental colectomy patients had a significantly shorter time to first recurrence than total proctocolectomy patients. After adjusting for the extent of disease, the segmental colectomy group had a significantly greater risk of surgical recurrence than the total proctocolectomy group. Moreover, patients having total proctocolectomy were significantly less likely to be still taking medications 1 year after the index operation than patients who had total abdominal colectomy or segmental colectomy. Sites of recurrence may include the colon, rectum, and small bowel. The second concern is the presence of an anastomosis that promotes recurrent inflammation. The number of anastomoses is an equally important prognostic indicator for symptomatic recurrence after surgical treatment.

Various studies have indicated low recurrence rates of about 30 % after proctocolectomy with an ileostomy [20, 59], but increased rates of 50–70 % after total abdominal or segmental colonic resection with primary anastomosis have been reported by others in nonrandomized studies [22, 23, 60–62]. A population-based study by Bernell and colleagues [54]

showed that the lowest 10-year cumulative probability of symptomatic recurrence (24 %) was found after subtotal colectomy and ileostomy, followed by proctocolectomy and ileostomy, with an equivalent rate of 37 % overall. In comparison, after segmental colectomy and total colectomy with IRA, patients had recurrence rates of 47 and 58 %, respectively. The formation of a diverting ileostomy should be considered in every patient before reoperation because reoperation for recurrent CD is associated with higher rates of ileostomy construction when compared with primary resection [45]. Preoperative counseling with a stoma therapist and marking of the stoma site should, of course, be routinely performed.

Reoperation After segmental Colectomy

Surgery for CD has been guided by the appreciation of the need to confine surgical intervention to clinically significant lesions with the use of minimal resection when possible. In this context, although controversial, segmental colectomy may be performed as discussed. The safety of the procedure with respect to the risk of complications has been shown in several studies [56, 57]. The indications for second surgery include symptomatic fistula, bleeding, stricture, anastomotic recurrence, abscess, and refractory disease. Although it is possible to undertake another limited resection of the colon (with preservation of gastrointestinal continuity at the time of the second operation), the recommended options effectively include completion proctocolectomy with a permanent ileostomy, total colectomy with IRA, or restorative proctocolectomy. Ileal pouch rectal anastomosis is also a possible alternative to a permanent ileostomy when a short rectal stump that appears normal remains after a partial or total colectomy [62]. The rectum is transected through macroscopically normal bowel as determined by intraoperative assessment, including the external appearance of the rectum and via intraoperative rectoscopy. An ileal J pouch is created as for an IPAA, although it is usually made shorter. The pouch is anastomosed to the rectal stump using a circular stapler or a hand-sewn anastomosis. These patients obtain an acceptable functional outcome and quality of life comparable with that achieved after a straight IRA, although functional symptoms can develop from the retained rectal stump if it is too long [63].

Reoperation After Total Colectomy and IRA

Recurrent disease after colectomy and IRA usually occurs in the rectum or in the perianal region rather than in the small bowel or the anastomosis. As a consequence, most patients

will end up having a completion proctectomy with an end ileostomy. Only a small number of patients will eventually have restoration of the gastrointestinal tract by an IPAA [51]. Recent reports have suggested that more than 75 % of the patients undergoing an IRA will maintain a functional anastomosis at 10 years, making it a viable option in patients with relative rectal sparing [30, 54, 64]. Cattani et al. [30] reported an 86 % probability of rectal preservation at 5 and 10 years after IRA, despite high clinical recurrence rates of 58 and 83 % at 5 and 10 years, respectively; recurrent disease does not inevitably necessitate repeat surgery. Earlier reports have shown that 25–60 % of patients with a retained rectum may subsequently undergo proctectomy with an ileostomy for severe proctitis or perianal disease [22].

Completion Proctectomy with Perimuscular Dissection and Intersphincteric Resection

A completion proctectomy with a permanent end ileostomy is indicated usually because of progressive severe anorectal disease and complications such as rectovaginal fistula, rectal fibrosis, and aggressive perianal sepsis. For many years the pelvic and perianal dissection of the rectum in CD was the same as the dissection for rectal cancer, with a wide abdominoperineal dissection of the perirectal tissues and sphincters. However, the morbidity of unhealed perineal wounds and disruption of urinary and sexual function caused by this wide removal of tissue and disruption in lymphatics has prompted a more conservative dissection. Since the late 1970s, a perimuscular and intersphincteric excision of the rectum has been performed, with superior results [65] and lower rates of complications [66]. Lee and Dowling [67] first published a technique of perimuscular dissection in 1972, and Lyttle and Parks [68] described intersphincteric proctectomy in 1977. Since then, intersphincteric proctectomy along with perimuscular dissection for inflammatory bowel disease have been well described [31, 65, 66, 69]. Dissection is performed in the intersphincteric plane (between the internal and external sphincters), which minimizes the size of the perineal wound and decreases the incidence of unhealed perineal wounds. The external sphincter and levators are left intact and can be used for a secure closure. In patients with widespread perianal disease, debridement, curettage, and unroofing of affected areas in the perianal skin are undertaken at the time of proctectomy. A successful intersphincteric proctectomy also involves controlling other technical factors that may contribute to poor wound healing postoperatively. Meticulous hemostasis, the use of closed suction drainage, removal of all islands of rectal mucosa, and avoidance of fecal contamination are all important intraoperative technical factors in a successful healing outcome.

Low Hartmann's Procedure

One problem of proctectomy in the presence of perineal sepsis is that lack of healing of the perineal wound or a fistulating perineum are common complications and may create more severe symptoms than were present before surgery. The incidence of unhealed perineal wound 6–12 months after proctectomy ranges from 12 to 80 % [70, 71]. It is for this reason that a low Hartmann's procedure (i.e., full rectal mobilization with closure of the lower rectum or the upper anal canal and removal of the rectum with preservation of the sphincters) is recommended. Because only a short cuff of rectum is retained, no abdominal dissection is necessary and perineal intersphincteric approach could be employed, if needed, at a later stage. After a low Hartmann's procedure, the rectal stump becomes atrophic and anoperineal disease regresses, thereby permitting subsequent perineal proctectomy in less inflamed tissues. Sher et al. [71] reported on 25 patients with severe anorectal CD and perineal fistulas, necessitating excisional surgery, who underwent a low Hartmann's procedure in lieu of a standard proctectomy. Sixty percent had a completely healed perineum and required no further surgical therapy. Although perineal disease persisted in the other ten patients, their perineum were much improved compared with initial presentation. They subsequently underwent perineal proctectomies, although three patients still had an unhealed perineum at the time of the report. Overall, 88 % had a completely healed perineum at a mean follow-up period of 69.1 months.

The benefits of a low Hartmann's procedure (as described) are debatable. A percentage of patients with perianal CD who undergo diversion develop symptomatic disease in the excluded rectal stump, requiring further surgery. Similarly, although the amount of tissue left behind after a low Hartmann's is much less, the remaining anal canal can continue to be a source of morbidity due to discharge, hematoma, and sepsis [72–74].

IPAA

As mentioned previously, although CD is a relative contraindication to IPAA [32, 35, 75], some authors believe that IPAA may be considered in selected patients with CD with no ileal and no anal or perianal involvement [37, 38]. The complication rate of IPAA performed in patients with CD and the failure rates are nearly three times that of patients who have an IPAA performed for UC [32, 35, 36, 76]; CD has a more chronic relapsing course, often leading to small-bowel strictures and fistulas. Mylonakis et al. [76] reported that the outcome of IPAA at a mean follow-up of 10.2 years was pouch excision in 47.8 % and a proximal stoma in 4.3 % of cases. However, the functional outcome of patients in

whom the pouch was retained was similar to that of patients with a successful IRA. The exact role of IPAA in the surgical treatment of CD patients remains undefined.

We believe that proctocolectomy and ileostomy should remain the standard procedure for patients with Crohn's colitis involving the colon and rectum. If a patient with CD is offered an IPAA, careful counseling to outline the risks of poor functional outcomes and pouch failure is mandatory.

Reoperation After IPAA

The surgical options for reoperation in patients who develop recurrent complicated CD after previous reconstructive surgery are rather limited. Recurrent disease usually occurs as an inflammation in the ileoanal pouch, in the ileal loop proximal to the pouch, or as fistulizing disease outside the pouch in the perianal region. When medical treatment fails, a number of surgical procedures are available. Salvage procedures can be divided broadly into local transperineal repairs, abdominal restorative operations, or combined abdominoperineal restorative operations. Symptomatic strictures of the pouch inlet or outlet may be treated by endoscopic-guided balloon dilatation [77]. Pouch stricturoplasty is an option for patients with a long fibrotic stricture [78]. Patients with medically refractory fistulas can be treated with seton drainage or by other surgical techniques typically used for non-CD fistula repairs. However, the salvage rate in CD patients is only 30–35 % as opposed to 70–75 % in UC patients [79–81]. Ultimately, if these procedures fail, reoperation is required. These patients can be treated surgically in two ways: a diverting ileostomy performed above an indefinitely defunctioned pouch or an ileal pouch excision with a permanent ileostomy.

IPAA Excision

There is a potentially significant morbidity in pelvic pouch excision, including loss of critical small-bowel length, pelvic nerve injury, and a high rate of postoperative perineal suppuration with frequent chronic sinus formation [79, 82]. Persistent perineal sinuses may cause considerable morbidity and be difficult to manage. Karoui et al. [82] reported 68 patients who had undergone pouch excision in this setting. The overall morbidity rate was 62.3 %, and 53.7 % of patients were readmitted for a late complication. The risk of readmission from the time of pouch excision was 38 and 58 % at 1 and 5 years, respectively, and surgical treatment was required during most of the readmissions. For these patients, a persistent perineal sinus was the most common late complication, with the perineal wound remaining unhealed at 6 months in 40 % and at 12 months in a recalcitrant 10 %. Seven percent

of the men complained of impotence, and another patient suffered from short-bowel syndrome and required permanent parenteral nutrition.

Indefinite Diversion

Because the morbidity after pouch excision is considerable, it can serve as an argument for leaving the pouch in place and performing only an ileostomy, which is a smaller operation with fewer short- and long-term complications. Bengtsson et al. [83] studied 13 patients with indefinitely diverted pouches who were followed for 10 years; 85 % had no complaints regarding the pouch and there were no cases of subsequent dysplasia or cancer.

Conclusion

Recurrence in CD remains a major problem; high rates of surgical re-interventions are seen regardless of which operative strategy is used. Reoperation for CD recurrence is demanding and complex. It is associated with a higher morbidity rate, longer hospital stay, and higher stoma rate than the primary resection. By virtue of its nature, colonic CD is a frequently relapsing condition with a high need for reoperative surgery, particularly when segmental colectomy is performed initially and when there is coincident or subsequent refractory perianal disease. Meta-analyses would suggest (despite their limitations) a greater role for subtotal as opposed to segmental colectomy in such patients. The place for IPAA in patients with known CD would seem limited, with a high incidence of peri- and postoperative complications, and subsequent surgery more simply incorporates long-term diversion than it does pouch excision. Proctocolectomy still has a place, but it is tempered by a high incidence of poorly healed perineal sinuses, which necessitates consideration in selected cases for an ultralow Hartmann's procedure (not without its inherent morbidity) and a more routine use of intersphincteric proctectomy, lessening the size of the perineal wound. The presence of coincident small-bowel disease, smoking, and young age are all more likely to predict the use of a permanent ileostomy in patients undergoing reoperative surgery either for postoperative complications after the index operation or for medically resistant recurrent disease.

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