Indications and contraindications to reconstructive surgery in ulcerative colitis

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D JOHNSTON. Indications and contraindications to reconstructive surgery in ulcerative colitis. *Can J Gastroenterol* 1995;9(1):33-38. Surgical treatment is often needed for patients with ulcerative colitis because of toxic dilation, intractability or risk of cancer. Precise diagnosis is vital to exclude Crohn's disease and infective colitis, although patients with 'indeterminate' colitis often do well after reconstructive surgery. Restorative proctocolectomy, in which the anal sphincter is preserved and a pelvic ileal reservoir is used as a substitute for the rectum, is the standard surgical procedure, supplanting panproctocolectomy with ileostomy. Ileorectal anastomosis should also be considered, but is only suitable for patients with relative rectal sparing, and meticulous sigmoidoscopic follow-up is essential. For toxic dilation, colectomy with ileostomy and mucous fistula is recommended, proctectomy and reconstruction being deferred until the patient is fitter. For most patients, the entire colon and rectum are removed and a pelvic ileal reservoir is anastomosed to the anus. Many types of reservoir have been proposed, but randomized trials are few, and it seems that the J pouch is as good as the S or W pouches, and technically is simpler. The operative mortality of restorative proctocolectomy worldwide has been about 1%, thanks largely to the routine use of a temporary defunctioning ileostomy. A one-stage procedure without ileostomy is permissible if the patient is relatively fit and the surgeon is in attendance for 10 days after operation, but omission of the ileostomy certainly increases the risk to life and the postoperative morbidity, and should thus not be done in debilitated patients or in those on high dose steroids. Resection of the mucosal lining of the anal canal above the dentate line ('mucosal proctectomy') was formerly routine, but leads to diminished sphincter pressure and sensation, such that preservation of the entire motor and sensory sphincteric complex is now advocated by many authors. Omission of mucosal stripping renders the procedure technically simpler and quicker, and is associated with better sphincter function, with less fecal leakage. However, a small rim of inflamed mucosa may then be left above the anal transitional zone which theoretically could lead to risk of recurrent inflammation or even predispose to malignant change. (*Pour résumé, voir page 34*)

Key Words: Anal sphincter, Continence, Ileal reservoir, Restorative proctocolectomy, Ulcerative colitis

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PATIENTS WHO PRESENT FOR SURGICAL treatment – either because of failure of medical treatment with steroids and/or azathioprine, or the occurrence of complications such as fulminating colitis, toxic dilation, hemorrhage, perforation or malignant or premalignant change – do not represent a homogeneous group. Most are elective cases, a few are operated upon as emergencies, while a substantial minority requires urgent operation. Some are young, some are old, some are relatively fit, others are debilitated and undernourished, while yet others have serious associated disease of other organ systems. Hence strategies of treatment must take into account not only the extent and severity of the colitis, but also the physical state of the patient, the degree of urgency of the operative procedure and finally the experience and training of the surgeon who operates.

Colitis in children tends to have a worse prognosis than colitis in adults because with the former's long life expectancy there is a greater risk of carcinoma, while the debilitating effects of the disease process interfere with education and social relationships, and impair growth and sexual development. For these reasons, surgical treatment is required in a greater proportion of children than adults, and the decision to operate should not be delayed too long, lest the child be stunted and his or her education and social life impaired.

Indications et contre-indications de la chirurgie reconstructive dans la colite ulcéreuse

RÉSUMÉ : La chirurgie est souvent nécessaire chez les patients qui souffrent de colite ulcéreuse, à cause d'une dilatation toxique, de l'échec d'un traitement médicamenteux ou de la présence d'une néoplasie. La précision du diagnostic est vitale si l'on veut écarter la maladie de Crohn et la colite infectieuse, bien que les patients atteints de colite indéterminée évoluent souvent bien après une chirurgie de reconstruction. La proctocolectomie de restauration, dans laquelle le sphincter anal est préservé et un réservoir iléal est utilisé en remplacement du rectum, est la norme chirurgicale habituelle, qui supprime la panproctocolectomie avec iléostomie. L'anastomose iléorectale doit aussi être envisagée, mais ne convient qu'aux patients dont le rectum est relative épargné, et un suivi méticuleux par sigmoïdoscopie est essentiel. Dans les cas de dilatation toxique, la colectomie avec iléostomie et fistule muqueuse est recommandée, la proctectomie et la reconstruction sont alors retardées jusqu'à ce que l'état du patient se soit amélioré. Chez la plupart des patients, on procède à une ablation complète du côlon et du rectum et un réservoir iléal pelvien est anastomosé à l'anus. Différents types de réservoirs ont été proposés, mais les essais randomisés sont rares et il semble que le réservoir en J soit aussi acceptable que le réservoir en S ou en W et qu'il soit plus simple sur le plan technique. La mortalité liée à la chirurgie pour proctocolectomie de restauration à l'échelle mondiale est d'environ 1 %, surtout grâce au recours habituel à une iléostomie temporaire. La technique en une seule étape sans iléostomie est faisable si le patient est relativement bien et que le chirurgien est disponible dix jours durant après la chirurgie, mais l'omission de l'iléostomie accroît assurément le risque de mortalité et de morbidité post-opératoires et ne devrait de ce fait pas être recommandée chez des patients affaiblis ou qui prennent de fortes doses de corticostéroïdes. La résection de la paroi muqueuse du canal anal au-dessus de ligne anocutaneée (proctectomie muqueuse) se faisait auparavant de routine, mais entraîne une pression et une sensation diminuées au niveau de l'anus, de sorte que de nombreux auteurs jugent désormais préférable de préserver le complexe sensorio-moteur. En ne dégageant pas la muqueuse, on simplifie et on abrège l'intervention qui est ainsi associée à un meilleur fonctionnement du sphincter et à une incontinence fécale diminuée. Cela comporte toutefois un risque qu'il reste un mince rebord de muqueuse enflammée au-dessus de la zone de transition, ce qui pourrait entraîner une récurrence de l'inflammation ou même prédisposer le sujet à une néoplasie.

DIAGNOSIS

Infective causes of colitis must be excluded, leaving three main categories of disease: ulcerative colitis, Crohn's disease and colitis of an indeterminate nature. Crohn's disease should be excluded by normal clinical methods, supplemented by standard investigations such as colonoscopy with biopsies, air contrast barium enema and small bowel meal. History of anal disease, patchy distribution of the disease in the colon and, of course, involvement of the small intestine all suggest Crohn's disease.

Reconstructive surgery is contraindicated in patients with Crohn's disease (vide infra), although the distinction between Crohn's disease

and ulcerative colitis can on occasion be very difficult, and every large series of restorative proctocolectomies (ostensibly for ulcerative colitis) includes a few patients who eventually turn out to have Crohn's disease. In cases of particular diagnostic difficulty, when Crohn's disease is suspected but the small bowel seems to be completely normal on standard investigations, it may be prudent to remove the colon initially, leaving the rectum and establishing an ileostomy, so that an experienced pathologist may make a verdict on the large operative specimen rather than merely on biopsies. Whereas patients with Crohn's disease tend to fare badly after restorative proctocolectomy, patients with indeterminate coli-

tis tend to do well. Hence the correct philosophy is to preserve the anal sphincter unless there is good evidence that the patient has Crohn's disease according to the opinion of an experienced pathologist.

OPERATIVE PROCEDURE FOR ULCERATIVE COLITIS AND INDETERMINATE COLITIS

Until about 10 years ago, the standard operation for ulcerative colitis and indeterminate colitis was pan proctocolectomy and ileostomy. Today, however, the standard operative procedure is restorative proctocolectomy with a pelvic ileal reservoir anastomosed to the anal sphincter. Another possibility is colectomy with ileorectal anastomosis.

The anal sphincter is nearly always healthy in patients with ulcerative colitis, although its mucosal lining may be inflamed in the upper third or so of the high pressure zone. Because it is now accepted that a healthy anal sphincter is capable of providing excellent continence after removal of the entire rectum and colon, the burden of proof rests with those who advocate ablation of the sphincter rather than with those who would preserve it. That is, in accordance with the well known principle, *primum non nocere*, the prevailing philosophy must be that the sphincter should be preserved, while more aggressive approaches that remove the sphincter should be regarded as unnecessary, unjustifiable and, in future, difficult to justify in law.

In the University Department of Surgery at Leeds General Infirmary, in Leeds, United Kingdom, a systematic attempt has been made since 1977 to preserve the anal sphincter when operating for ulcerative colitis. Since 1980, very few primary panproctocolectomies with permanent ileostomy have been performed, although a few patients have ended up with a permanent stoma when the attempt at reconstruction to the anal sphincter failed. Ileorectal anastomosis is not generally used in Leeds because most patients seem to have severe disease in the rectum and because of the risk of cancer after ileorectal anastomosis. Thus the vast

majority of patients have been treated by sphincter-saving restorative proctocolectomy, combined in most patients with a temporary malfunctioning ileostomy.

Panproctocolectomy followed by the construction of a continent Kock (1) ileal reservoir has not been used by the author and colleagues in the past 15 years. In a small series in the 1970s, the author's group was impressed by the complexity of the procedure and deterred by the eventual death of a patient who succumbed to a series of postoperative complications. Patients with a conventional Brooke ileostomy who have undergone panproctocolectomy and who insist on being considered for the Kock pouch should be referred to one of the few centres where more than 50 such procedure have already been done.

PREOPERATIVE COUNSELLING

Before operation, sufficient time needs to be spent with the patient by the physician, surgeon, stomatherapist and, ideally, a patient who has already undergone the recommended operative procedure. The pros and cons of panproctocolectomy and ileostomy, ileorectal anastomosis and restorative proctocolectomy should be discussed fully, and the patient given ample time to reflect on what has been said and an opportunity to ask further questions at a subsequent meeting. Parents and relatives should be brought into these discussions as appropriate; this is particularly important in the case of children.

As stated above, the bias should be towards preservation of the anal sphincter. The advantages of restorative proctocolectomy in terms of preservation of continence, avoidance of a stoma and perineal wound, and the better quality of life that may be expected should be explained in detail.

At the same time, it is important not to paint too optimistic a picture. For example, it must be stated that, as with any operative procedure, there is a slight risk of death (although the risk is less than that of continued colitis and its treatment), that postoperative complications are quite common, that diar-

rhea and perianal excoriation tend to be troublesome for a few weeks after closure of the defunctioning ileostomy and that, in the long term, while the results are very good, they are by no means perfect; the procedure fails in 5 to 10% of patients, who then have to have a permanent ileostomy.

The patient should be told that the average bowel frequency is four or five times during the day and perhaps once at night, but it is important to add that there is a considerable range of frequency of defecation, from two to 10 times a day. This discouraging information should be tempered, however, by adding that frequent bowel action, if it should occur, tends to be more under the patient's control (tending to occur in the morning and after the evening meal) than the bowel frequency of colitis, and that urgent defecation – one of the worst features of colitis – is either absent or much improved after operation.

The possibility of attacks of clinical pouchitis should be discussed. The need for a temporary defunctioning ileostomy should be explained, and in patients who present in a debilitated state or as emergencies, the operation may have to be done in three stages, beginning with colectomy, ileostomy and construction of a mucous fistula.

IS THE ANAL SPHINCTER ADEQUATE?

After surgical removal of the entire colon and rectum, the patient's continence and quality of life depend crucially on the anal sphincter. Adequacy of the sphincter should therefore be evaluated carefully by means of history, examination and, if necessary, laboratory tests. The history is the most important method of evaluation. If a patient has severe colitis, with its frequency of defecation and urgency, yet remains continent, he or she will be continent after restorative proctocolectomy with a pelvic ileal reservoir. One should enquire carefully about common causes of sphincteric weakness, such as previous abscess or fistula, previous anal surgery or obstetric injury. Digital rectal examination will give fur-

ther information about the strength of the sphincter, and if any doubt remains, anorectal function tests should be carried out to provide information on maximum resting anal pressure and maximum squeeze pressure. At the same time, evaluation of maximum tolerated volume and compliance of the rectum should be done because if ileorectal anastomosis is contemplated, it is important that the rectum should not be an unyielding fibrous tube, and the minimum maximum tolerated volume should be approximately 150 mL.

CONTRAINDICATIONS TO RESTORATIVE PROCTOCOLECTOMY

Inadequacy of the anal sphincter: Inadequacy of the anal sphincter is a major contraindication. However, debilitated patients who have been ill for a long time with ulcerative colitis tend to have low serum potassium levels, low serum albumin and weak muscles. In these circumstances, removal of the colon and establishment of an ileostomy may effect a remarkable improvement in the patient's general condition and the anal sphincter may regain its normal power.

Diagnosis: The diagnosis should be ulcerative colitis or indeterminate colitis; Crohn's disease is a contraindication.

Previous small bowel resection: Previous small bowel resection should usually be regarded as a contraindication to reconstructive surgery because, anatomically, it may be difficult to construct an ileal reservoir and bring it down to the anal sphincter, while physiologically the effluent may be excessively profuse, liquid and corrosive.

Urgent or emergency operations: Urgent or emergency operations in toxic or debilitated patients also represent a contraindication to reconstructive surgery. The correct policy is to remove the entire colon, establish an end-ileostomy and bring out the upper end of the rectum as a mucous fistula. Reconstructive surgery can then be performed when the patient is restored to good health.

Carcinoma or severe dysplasia of the colon or rectum: Carcinoma or severe

dysplasia of the colon or rectum complicating colitis is often referred to as a contraindication to restorative surgery but, in practice, is seldom a factor in the decision-making. It is vital to assess the colon and rectum properly and to look for the presence of dysplasia and carcinoma. However, unless the carcinoma is located in the lower third of the rectum there seems to be no good reason to rule out the possibility of reconstructive surgery because most patients with rectal carcinoma are treated by sphincter-saving low anterior resection rather than abdominoperineal excision of the rectum. If the patient has liver secondaries associated with colorectal carcinoma, the surgical approach should be as conservative as possible so that the quality of life in the patient's remaining days may be as tolerable as possible. In view of the current lively debate about the desirability of ablating the mucosal lining of the anal sphincter above the dentate line, several biopsies should be taken from the anal transitional zone and the mucosa immediately above it, because if moderate to severe epithelial dysplasia is present there, end-to-end pouch-anal anastomosis without mucosectomy is contraindicated – the correct procedure is then either mucosal stripping with endo-anal pouch-anal anastomosis or, if the dysplasia is particularly severe and alarming, panproctectomy and ileostomy.

INDICATIONS AND CONTRA-INDICATIONS FOR ILEO-RECTAL ANASTOMOSIS (2-4)

The main disadvantage of ileorectal anastomosis is that it does not cure the disease (either in the large bowel or in its extracolonic manifestations), and that it exposes the patient to a steadily increasing risk of developing rectal carcinoma. Despite annual sigmoidoscopic surveillance, the onset of such a carcinoma is difficult to detect because the rectal mucosa may be obscured by fluid feces and because the entire rectal mucosa may be somewhat inflamed and abnormal-looking. Furthermore, the surveillance program is often faulty and patients may be lost to follow-up. For such reasons, cancers that develop tend to have a poor prognosis. The actual

magnitude of the risk of cancer is much debated. It depends to some extent on how carefully patients have been selected for ileorectal anastomosis, on the duration of follow-up and on the assiduity with which the presence of cancer is sought. The incidences of cancer in the remaining rectum vary from 0 to more than 20%, the average figure being about 5%. On follow-up of more than 20 years, about 20% of patients will have developed cancer.

Ileorectal anastomosis is contraindicated if the rectum is severely affected by ulcerative colitis and particularly if it is shrunken, fibrous and noncompliant or strictured. Obviously, if the rectum is the seat of carcinoma or severe dysplasia, it must be removed.

Nevertheless, despite the fact that colitis is usually at its most severe in the rectum, it appears that a minority of patients with ulcerative colitis, perhaps 10 to 20% of all those who require surgical treatment, are suitable for colectomy with ileorectal anastomosis. The indications for ileorectal anastomosis are that the anus be healthy and the rectum not be severely affected by disease. A short history of colitis is also desirable because the risk of cancer should then be relatively low for at least 10 years after ileorectal anastomosis. The procedure may also be indicated in elderly patients whose life expectancy is fairly short and in whom considerations of cancer risk are therefore less important than short term considerations about quality of life.

Paradoxically, however, ileorectal anastomosis is also worth considering in children, in whom life expectancy should be long and the risk of cancer therefore high, because ileorectal anastomosis is a simpler operation than the pelvic pouch procedure, postoperative morbidity tends to be less and return to school tends to be quicker. In addition, provided the disease process is relatively mild in the rectum, the quality of life after ileorectal anastomosis may be somewhat better than the quality of life after the pelvic pouch procedure because bowel frequency may be more predictable and the risk of autonomic nerve damage in the pelvis is negligible. Therefore, in children and adolescents

with colitis, it may be worth considering ileorectal anastomosis for five to 20 years, after which the rectum may be excised and an ileal pouch constructed with pouch-anal anastomosis. The major proviso, however, is that the parents must understand that there is a risk of cancer and the need for regular sigmoidoscopic surveillance of the rectum.

RESTORATIVE PROCTOCOLECTOMY WITH PELVIC ILEAL RESERVOIR (5-14)

Restorative proctocolectomy with pelvic ileal reservoir is the operation of choice for most patients with ulcerative colitis. The worldwide experience over the past 15 years shows that it is very safe, with an operative mortality of less than 1%. Postoperative complications are still common, affecting approximately 40 to 50% of all patients. The most frequent complications are pelvic sepsis, with or without anastomotic dehiscence, small bowel obstruction, fistula to the vagina or elsewhere, and stricture at the pouch-anal anastomosis. Even in elective cases, most surgeons still prefer to perform a temporary defunctioning ileostomy, which is closed two to three months later when the patient has recovered from the major operation. Nevertheless, several studies in carefully selected patients in major centres have shown that one-stage restorative proctocolectomy yields good results, with operative mortality and postoperative morbidity that are little different from the mortality and morbidity of the two-stage procedure. The experience in Leeds (10) mirrors the results of these trials, but it must be noted that when an ileostomy has been omitted the septic complications, although no greater in incidence, are much more dangerous in severity. For example, in a series of 50 one-stage procedures, three patients developed life-threatening peritonitis, and the need for emergency reoperation was greater than among 50 closely matched patients who underwent the two-stage procedure. For these reasons, the one-stage procedure must only be used in relatively 'fit' patients under strictly controlled conditions in specialized

centres, the technical aspects of the operation should be shown to be perfect (intact 'doughnuts', airtight suture lines) and the surgeon who performs the operation should see the patient daily for 10 days after operation and be 'on call'. The very low operative mortality of the two-stage restorative proctocolectomy has been a shining achievement which should not be tarnished by ill-judged attempts to perform the operation in one stage in the majority of patients. Admittedly, such a policy will be successful in most patients, and it is unlikely that in any one centre the operative mortality will rise statistically significantly, but operative mortality is likely higher when the ileostomy is omitted, and the author believes that a move to the one-stage procedure will increase operative mortality by 1 to 2%, an avoidable tragedy. Furthermore, about 40% of the patients treated by restorative proctocolectomy are young women, and fecal leakage from the pelvic pouch or from the pouch-anal anastomosis is likely to give rise to pelvic peritonitis which could endanger their prospects of having children. In either sex, such leakage may lead to fibrosis and rigidity of the pelvic contents, which could impair anorectal function in the long term.

Restorative proctocolectomy in older patients: It used to be thought that sphincter-saving surgery was contraindicated in most patients older than 55 years because their anal sphincters tended to be weaker than those of younger people and the functional result tended to be worse. However, these views have had to be modified in recent years because most major centres are now reporting good results in older patients. Many of these patients have had colitis for many years and their anal sphincters may have undergone 'work hypertrophy'.

It is particularly important in older patients to preserve the full power of the anal sphincter and, in the author's opinion, this is best done by leaving the sphincter completely undisturbed. That is, mucosal stripping should be avoided and the pelvic reservoir should be stapled end-to-end to the top of the

anal high pressure zone, 1 to 2 cm above the dentate line.

END-TO-END POUCH-ANAL ANASTOMOSIS COMPARED WITH MUCOSECTOMY AND ENDO-ANAL ANASTOMOSIS

While there is general agreement that most patients should be treated by some form of reconstructive surgery, there is lively disagreement about the best method of performing the reconstruction, and some disagreement too about which pelvic reservoir should be used. At the author's institution, the Fonkalsrud, J, S and W pouches have been used for the past 15 years, and a prospective trial of large pouches versus small pouches and of the J, Utsunomiya pouch versus the W, Nicholls pouch is underway. While the results of the author and co-workers with the quadruplicated W pouch are similar to those described by Nicholls and Pezim (11), both the author's group and Keighley et al (12) found, to their surprise, that a J pouch constructed from an equal length of ileum to that used in the W pouch yields similar results to those of the W reservoir.

END-TO-END OR MUCOSECTOMY AND ENDO-ANAL ANASTOMOSIS?

The method by which the pouch should be anastomosed to the anal sphincter is of great interest. Advocates of mucosectomy with endo-anal anastomosis at the dentate line stress the importance of ablating all inflammatory bowel disease in the mucosa even within the anal high pressure zone, and claim to have achieved clinical results as good as those obtained when the entire sphincter is preserved. They also tend to emphasize the theoretical long term danger of leaving some rectal type mucosa in the upper anal canal (13,14). In contrast, workers in Leeds (15) and others, such as Martin et al (16), were impressed by how the endo-anal procedure reduced resting pressure in the anal canal and how, in patients who sustained a particularly large fall in resting anal pressure, minor leakage of feces occurred, as early reports from the

Mayo clinic made clear. The incidence of such leakage after mucosectomy and endo-anal anastomosis is about 50% in the first postoperative year and tends to be worse at night.

Since the mid-1980s, the author and colleagues have therefore preferred to leave the anal high pressure zone intact, without stripping the mucosa above the dentate line, and have performed reconstruction by the double-stapling technique (15). In practice this has been associated with higher anal pressures, less leakage and better fine discrimination, such that patients are more likely to be able to release gas or wind without having to sit on a toilet. Besides, there is little doubt that avoidance of mucosectomy and hand-sewn endo-anal anastomosis renders the procedure technically more convenient.

One technical difficulty associated with the end-to-end procedure, however, is the difficulty that the abdominal operator experiences in knowing exactly where to transect the bowel. In certain cases, such as thickset males with a narrow pelvis, it is expedient to mobilize the rectum and upper anus from the abdominal aspect and then to evert the anorectal stump (17), as in the Soave operation in children. From the perineal aspect, the operator can then see exactly where to transect the bowel, about 1 cm above the dentate line, after which the closed anal stump is returned to its proper place and alimentary continuity restored by means of the circular stapling device.

It has been suggested that preservation of a centimetre or two of mucosa above the dentate line may be associated with an increased incidence of fistulation to vagina or elsewhere, but this has not been the author's experience, nor have patients so treated experienced greater urgency or frequency of defecation than those treated by endo-anal anastomosis. It should also be noted that the only cases of carcinoma after reconstructive surgery so far reported have been in patients who have undergone mucosal stripping, the performance of which does not guarantee that all at-risk mucosa has been removed.

Thus, the argument continues, and the final verdict on the question of whether the anal mucosa should be stripped will depend on long term clinical end-points, such as the respective incidences of carcinoma and the quality of life experienced by patients after end-to-end or endo-anal pouch-anal anastomosis.

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