RESTORATIVE PROCTOCOLECTOMY WITH AN ILEAL RESERVOIR

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INTRODUCTION

Panproctocolectomy with a permanent incontinent ileostomy has become the gold standard in the surgical management of ulcerative colitis, and is often necessary in the treatment of polyposis coli. The advantage of this technique is that it completely removes all intestinal disease in one stage, with a low operative mortality, and eliminates the possibility of malignant change. Many patients, however, regard the acquisition of a stoma for the remainder of their lives as a major disadvantage. This latter factor may cause patients to delay surgery beyond the optimum time, and dissuade polyposis families from undergoing screening evaluation.

DEVELOPMENT OF THE ILEAL RESERVOIR

Total colectomy and proctectomy, but with preservation of the anal canal and sphincters, followed by direct ileo-anal anastomosis, was advocated by Ravitch and Sabiston in 1947.[1,2] By this means, all the diseased area was removed, and intestinal continuity was restored without the need for a stoma. The procedure fell into disrepute because of frequent stools and faecal incontinence. In 1977, Martin[3] described an operation in children, where the entire colon was removed; the mucosa stripped from the rectal muscular sleeve and an anastomosis effected between the terminal ileum and anal canal. It was thought that the retention of the muscular wall of the rectum would preserve rectal sensation, and improve the functional results. The decreased volume and compliance of the distal bowel, however, resulted in poor continence and a high stool frequency (mean 8 per day). The operation was not widely applied.

The first restorative proctocolectomy with ileal reservoir was performed by Sir Alan Parks in 1976, and a small series reported two years later.[4] The interposition of an ileal reservoir between the small bowel and the anal canal was intended to abolish the direct propulsive action of the bowel, and to act as as a storage mechanism.

RESERVOIR DESIGNS AND OPERATIVE TECHNIQUE

Following a total abdominal colectomy, the original operative procedure involved transecting the rectum at the level of the sacral promontory, and stripping the mucosa from that level to the dentate line, by an abdominal, endo-anal or eversion technique. The preservation of a long rectal muscular sleeve, however, involved a tedious dissection and was often complicated by the development of a 'sleeve abscess' and pelvic sepsis. The operation has therefore been modified, and the rectum is now transected as low as possible, at the level of the pubo rectalis. Transection at that level may leave a small cuff of transitional epithelium above the dentate line. Whether it is absolutely necessary to remove this ring of mucosa is still the cause of some debate, but many surgeons now consider it unnecessary. The reservoir is anastomosed to the ano-rectal cuff, either by suturing or by means of stapling instruments, using an anal approach.

Parks and Nicholls[4] originally described a 3-limb ileal reservoir, the S pouch. The terminal 50 cms. of ileum is folded twice to give three segments of bowel, the proximal two being 15 cms. long and the distal segment 20 cms. long. A 5 cm. length projected beyond the reservoir and was used for the anastomosis. Several other reservoir designs were later developed. Utsunomiya et al [5] described the 2-loop J reservoir, using a 40 cm. length of terminal ileum with one fold and anastomosing together the two 20 cm. lengths of ileum. Nicholls et al [6] developed the 4-limb reservoir, where 50 cms. of terminal ileum is folded into four loops, each 12 cms. long and arranged in a W configuration. A further method, the lateral ileal reservoir, was described by Fonkalsrud[7].

The completion of the anastomosis between the ileal reservoir and the anal canal can be difficult because of tension on the ileal mesentery. Various methods can be used to reduce this tension, including complete division of the root of the mesentery as far as the duodenum, strategic division of the ileal vessels or of the ileo-colic artery.

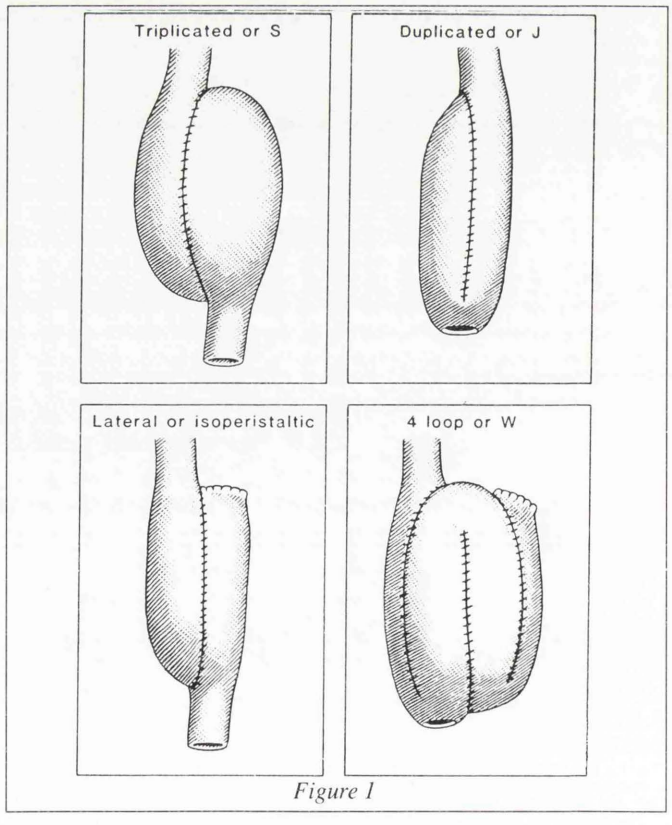

Figure 1

REPORTED RESULTS

There is now a very extensive world literature on this subject and I have chosen some representative reports. Parks et

al [8], reporting their early experience with the S reservoir, found that all 21 patients were completely continent during the day, but one patient was incontinent at night. The average frequency of bowel action was four per 24 hours; but approximately half the patients needed to perform self-catheterisation of the reservoir in order to defaecate. Two patients required anti-diarrhoeal medication. It was subsequently shown that the need for self-catheterisation was largely due to the length of the anastomotic spout in the S reservoir, and that if this was shortened, the problem was largely eliminated.

Becker and Raymond [9] reported their experience with 100 patients who underwent a J reservoir. Mean stool frequency ranged from 7.5 per day at one month to 5.4 at 24 months. No patient was incontinent during the day, but at one year, 25% had nocturnal leakage. Nicholls and Pezim [6] compared the S, J and W reservoirs in 104 patients. Frequency of defaecation was significantly greater with the J design, and was associated with a higher incidence of night evacuation. All patients with J or W reservoirs defaecated spontaneously, while only 41% of patients with the S reservoir did so (previously discussed). The same unit [10] reported 51 patients with the W reservoir who had a mean stool frequency of 3.3 per day (range 1 to 8), with night evacuation in 14%. Fonkalsrud[11] is the only surgeon with extensive experience of the lateral ileal reservoir and claims a significantly lower morbidity compared to other reservoir procedures.

The W reservoir has a larger capacity and is more compliant than the S or J reservoirs, consequently the frequency of defaecation is less. However, in a multivariate analysis of factors affecting pouch function, Keighley [12] demonstrated that pelvic sepsis, post operative fistula and endo-anal mucosectomy had a deleterious effect. The above factors were more important in determining function than pouch design.

COMPLICATIONS

Restorative proctocolectomy, despite its magnitude, is a relatively safe operation, with an operative mortality of 0.3%. Morbidity, however, can be considerable.

Anastomotic leakage is usually due to one of the following factors: tension on the suture line, ischaemic necrosis or sepsis. For these reasons, a protecting loop ileostomy is usually placed proximal to the reservoir at the time of its anastomosis to the anal canal. The ileostomy is then closed six weeks later, when satisfactory healing has occurred.

Complications related to the temporary defunctioning ileostomy may also occur e.g. stomal retraction, high ileostomy output with dehydration, and parastomal hernia. Some surgeons now avoid a temporary diverting ileostomy in selected patients.

Intestinal obstruction is one of the most frequent problems after this operation. Incidences of 19 to 22% have been reported, and half of these will require surgical intervention for relief of the obstruction. The obstruction may be due to adhesions, internal hernia, reservoir angulation, outlet problems or may be related to the temporary ileostomy.

Pelvic abscess may occur, an incidence of approximately 11% has been reported. Sleeve abscess is now much less common with the short rectal stump.

Anal anastomotic stricture may occur in 8 to 14% of cases. Such strictures usually respond to dilatation.

'Pouchitis' is a well-recognised complication, and occurs in 14-27% of cases. It usually presents with an increased liquid stool output, low grade fever, weakness and malaise. It is much more common in ulcerative colitic patients than those with polyposis coli. It is thought that it is due to stasis of faeces in the reservoir (pouch) with overgrowth of anaerobic organisms. The condition usually responds to treatment with metronidazole, but may recur.

Restorative proctocolectomy is contra-indicated in Crohn's disease, as a very high incidence of complications can be expected.

The preservation of normal sexual function is important in treating such a young age group, and it is encouraging that there have been few reports of impotence. Retrograde ejaculation, however, due to damage to the hypogastric nerves may occur, if dissection is not kept close to the rectum.

CONCLUSION

Restorative proctocolectomy is no longer an experimental procedure, and can be recommended to suitable patients, who are highly motivated to avoid an ileostomy. The inherent difficulties of the technique must be explained to the patient, who should also receive a clear idea of what sort of results can be expected. The operation should only be performed by surgeons who have been trained in the various techniques involved.

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