

A Method and the Results of Loop Colostomy

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A technique of loop colostomy which avoids a sutured skin wound, employs a deep tension suture with retained polythene sleeve as a bridge, and permits routine use of standard terminal colostomy appliances is described. The clinical results in 51 patients are reported and the advantages of this method of construction discussed. All patients were able to use standard, terminal colostomy appliances routinely from the time of construction. There were no immediate postoperative complications. Delayed complications occurred in 5 (10 per cent) patients. Intraoperative closure was performed in 43 patients and was complicated by 1 (2.3 per cent) transient fecal leak and 4 (9.3 per cent) wound infections. The absence of a sutured skin wound, the small bridge size, and the circular shape of the stoma facilitate use of accurately fitting, standard terminal colostomy appliances rather than the usual loop colostomy apparatus. This results in an improved skin seal, reduced fecal leakage, easier nursing and stoma care, and better patient morale. [Key words: Colostomy; Colon; Surgical technique]

A LOOP COLOSTOMY is usually constructed as a temporary measure to defunction the distal large bowel. Often it is performed as an emergency procedure in patients with complicated disease affecting the left side of the large intestine. It may also be carried out electively as part of the staged treatment of neoplastic or diverticular disease, at the time of large-bowel resection to allow a distal anastomosis to heal or to permit operations on the anal canal or rectum to be carried out in the absence of feces. The indications and ideal criteria for the construction of loop colostomies have been well documented previously.¹⁻³

The ideal time to close a loop colostomy is a matter of some controversy. Several authors have reported an increased incidence of complications when closure is performed within one to three months of construction.⁴⁻⁶ Thus, the majority of patients are required to manage their temporary stomas at least for several months and, in many cases, for much longer periods of time if the not uncommon problem of delayed distal healing is encountered. It is therefore important that the operation itself is

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free from complications and the colostomy effective, easily managed, reasonably acceptable to both patient and relatives, and as inoffensive as possible.^{2,7}

A large number of variations in technique have been described.⁸⁻¹² A frequently used method¹³ is to draw out, through an abdominal wall wound, a loop of large bowel which is held in place on the skin surface by a plastic or glass rod. The wound is then closed around the bowel and the skin sutured. Some surgeons delay opening the colostomy for 48 hours to allow the wound to seal completely, but usually it is opened immediately and sutured to the edges of the skin. A large appliance of the temporary loop colostomy variety is required to accommodate the stoma and bridge.

A method of construction employing an alternative bridging technique has been in use at St. Mark's Hospital for a number of years. This method avoids a sutured skin wound, employs a small bridge which does not interfere with the appliance seal, and permits the routine use of standard terminal colostomy appliances. We feel this technique is an improvement which, in large measure, fulfills the ideal criteria of construction. This paper describes the method in detail and presents the clinical results in a small group of patients.

Technique

Before the operation, the most suitable site for the stoma is marked out on the patient's abdomen in the usual way by drawing a circle in indelible ink. The position is checked with the patient wearing a standard terminal colostomy appliance, clothed and unclothed, in the lying and standing positions.

The method is illustrated in Figures 1-3. A skin incision, approximately 3 to 4 cm long, is made at the previously marked site. The wound is deepened through subcutaneous fat, superficial fascia, and deep fascia, either anterior rectus sheath or external oblique aponeurosis. The exposed underlying muscle is then divided or

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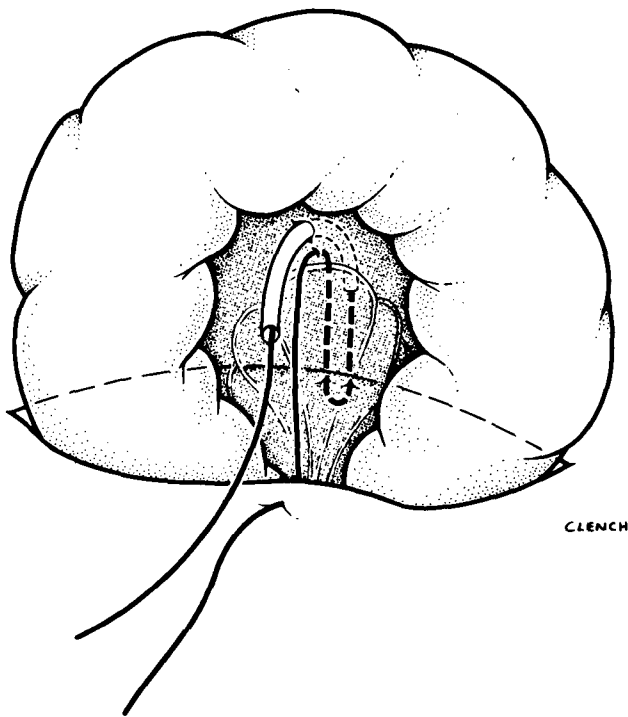


FIG. 1. Deep tension suture inserted through skin and transfixing mesocolon. The polythene sleeve is threaded onto the superficial limb of the suture.

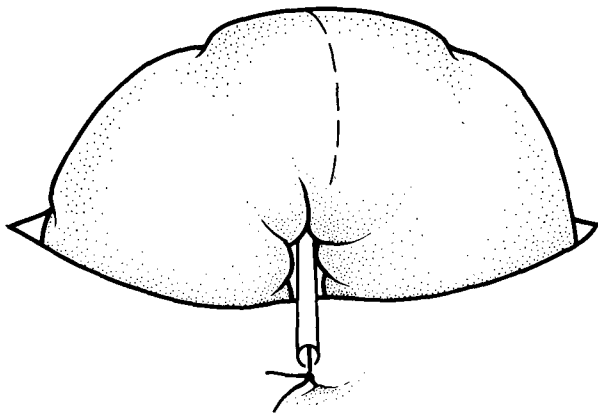


FIG. 2. Colostomy bridge in place without tension or bulging. Transverse colostomy incision.

split transversely and the peritoneum opened longitudinally in the line of the intestine. The selected loop of large bowel is cleansed and mobilized sufficiently to allow it to be drawn through the wound onto the skin surface without tension. After closure of the lateral space, the loop is held in place using a deep tension suture of No. 1 nylon with the protective polythene tubing retained as a supporting bridge. The suture is inserted through the edges of the skin and transfixes the mesocolon to lie across the wound at right angles to the loop of intestine. Care is taken to cut the polythene sleeve to a size comparable with

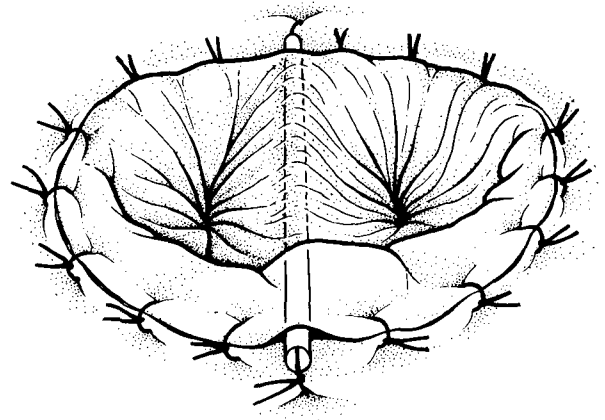


FIG. 3. Primary mucocutaneous suture. Note the completeness of this, the circular shape of the stoma and the small unobstructing bridge.

the diameter of the bowel; it is then threaded into the more superficial limb of the tension suture, so that it supports the deep aspect of the loop of bowel evenly. The suture is tied to ensure that the polythene tubing lies across the wound without tension or bulging. The bowel is opened transversely, and immediate mucocutaneous suture carried out with chromic catgut around the whole circumference of the stoma. No skin sutures are required, the size of the skin incision having been chosen to provide a neat fit around the loop of bowel. A standard terminal colostomy appliance is fitted immediately at the conclusion of the procedure. Removal of the tension suture and polythene bridge is carried out on the 7th to 10th postoperative day without undue difficulty. The final appearance of the stoma is shown in Figure 4.

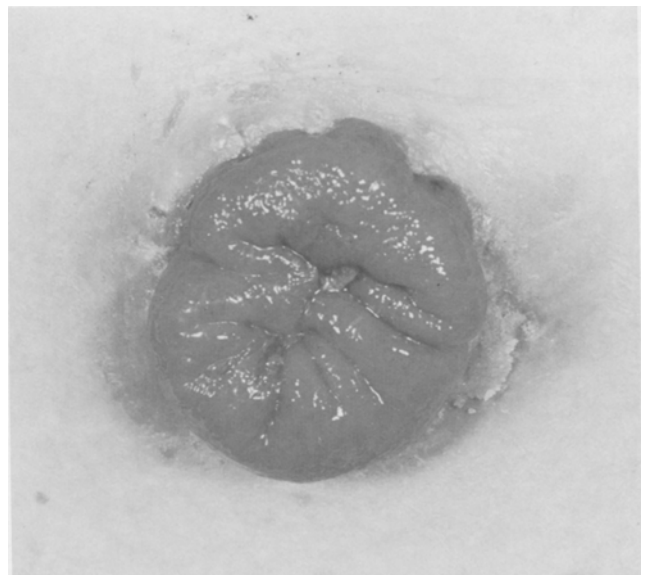


FIG. 4. The appearance 10 days after construction following removal of the bridge and deep tension suture.

Patients

Fifty-one patients, 33 females and 18 males, aged 4 to 67 years (mean, 37 years), who had undergone this type of loop colostomy, are reported. All required proximal fecal diversion to allow anal sphincter muscle repairs, 42 for traumatic division and nine for imperforate anus, to heal in the absence of feces. Forty-six of the 51 colostomies were constructed at the time of sphincter repair. The remaining 5 were carried out before the repair; two for severe anorectal trauma, two at the time of drainage of anorectal abscesses and one during colonic resection. The site of the stoma was the left iliac fossa in 44 and the right or left upper quadrants in seven patients.

Results

The clinical outcome of construction of these colostomies was completely uneventful in 46 (90 per cent) of the 51 patients. There were no immediate postoperative complications. Delayed complications occurred in five patients including two colostomy prolapses, two paracolostomy hernias and one stoma care problem due to leakage along a skin fold. One of the prolapses was a single episode of ileocecal intussusception through a right transverse colostomy in a four-year-old boy with imperforate anus; this was reduced under anesthesia. The other was a recurrent sigmoid colostomy prolapse.

Forty-three patients underwent intraperitoneal closure from 1 to 12 months (mean, 3.6 months) after construction in the trauma group, and from 2 to 24 months (mean, 6.6 months) afterward in the patients with imperforate anus ($P > 0.05$). In the latter group, closure was performed from two to three months (mean, 2.7 months) after construction in the males and from 3 to 24 months (mean, 8.8 months) afterward in the females ($P < 0.05$, Wilcoxon's rank sum test). Closure was uncomplicated in 38 (88 per cent) of the 43 patients; five, all in the trauma group, developed complications in the immediate postoperative period. One (2.3 per cent) transient fecal leak settled spontaneously without delay in hospital discharge and four (9.3 per cent) patients developed wound infections, with prolonged hospital stay evident in only one. Three (7 per cent) patients were found to have incisional hernias at follow-up; none of these had wound infections postoperatively.

Discussion

The purpose of this paper is to draw attention to a simple method of construction of a loop colostomy which we have found to have useful technical and stoma care advantages.

The overall complication rate following construction was 10 per cent, which compares favorably with series employing more conventional bridging techniques.^{14,15} The incidence of prolapse in our patients was surprisingly low, considering that most of the stomas were sited in the sigmoid colon; this complication has been found to be three times more frequent in the sigmoid colon than the transverse colon.¹⁴ This may be due to the small size of the wound in our method and the avoidance of wound sutures. It is interesting that in the patients with imperforate anus, the time to closure differed between sexes. The most likely explanation for this is that, in females, healing of the muscle repair was slower; this may be related to the presence of rectovaginal fistulas associated with imperforate anus in these patients. The outcome following closure of these loop colostomies compares well with a previous series reported from this hospital.⁵ As in that series, it is likely that the incidence of incisional hernia in our patients has been underestimated, since a proportion were followed up elsewhere.

The avoidance of a sutured skin wound eliminates a number of potentially troublesome problems associated with loop colostomy construction. Postoperative wound infection is less likely and was not encountered in our patients. On theoretical grounds, therefore, the incidence of paracolostomy hernia should be reduced. Moreover, in this method, an appliance is fitted to uninjured skin rather than to a freshly sutured skin wound. This results in a much improved seal between skin and appliance and a reduced incidence of skin excoriation in the early postoperative period.

The use of a deep tension suture and polythene sleeve as a colostomy bridge has several advantages. The size of the bridge allows a smaller appliance than normal to be used, does not interfere with the skin seal, and facilitates changing of the appliance. Immediate mucocutaneous suture, almost universally advocated to provide immediate fecal diversion,¹⁶⁻¹⁸ is more complete, owing to the small size of the bridge. This is important in the prevention of stomal stenosis and in the establishment and maintenance of total fecal diversion for the duration of the stoma.³ Contrary to previous experience with this type of bridge¹⁹ all our patients obtained adequate clinical fecal diversion throughout the course of their surgical treatment. The importance of total fecal diversion in this context is uncertain, since most loop colostomies are constructed as part of staged surgical treatment; therefore, prolonged total diversion may be unnecessary.³ It has been suggested that the presence of a loop colostomy compromises the blood supply to the distal colon;²⁰ this may be a local effect of the bridge on the integrity of the marginal artery. The small size of the bridge in this method makes such vascular damage unlikely—an important consideration

if resection and anastomosis has been performed or is to be carried out later.

The technique also offers benefits in stoma care. The incidence of fecal leakage after loop colostomy is largely dependent on the quality of the seal between skin and appliance. With this method, there is no sutured skin wound or large obstructing colostomy bridge to interfere with the seal. Furthermore, standard terminal colostomy appliances contrast markedly with those specifically designed for loop colostomies in the quality of seal which can be obtained. Because of the small bridge and circular shape of the stoma obtained in this method, accurately fitting standard terminal colostomy appliances may be used routinely right from the start. This is more satisfactory and comfortable than the usual loop colostomy apparatus which is, of necessity, large and tends to be cumbersome, poorly fitting, and difficult to change.¹⁹ These factors combine to provide a nearly perfect skin seal; as a result, fecal leakage is reduced to a minimum. This contributes considerably to nursing care, especially in the early postoperative period, and helps maintain patient morale which is often low following the creation of a colostomy, albeit a temporary one.

Although obstruction was not present in this series, the method may be used equally well in the obstructed or unobstructed bowel. In obstruction, when there is proximal dilatation, a larger wound and a correspondingly larger appliance is required to accommodate the increased size of the intestine. Nevertheless, the circular shape and small bridge again permit the use of standard appliances with all the above noted advantages. These assume even greater significance when the loop colostomy has been constructed as an emergency, since the patient has had no time to become adjusted to the prospect of living with a stoma.

The study shows that this method of loop colostomy construction offers benefits for patient, nursing staff, and surgeon alike. Whatever may be said about colostomies, patients do not like them; anything which helps to reduce the offense and indignity is surely of value.

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