



Original article

Defunctioning loop ileostomy and stapled side-to-side closure has low morbidity

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Introduction: Low pelvic anastomoses are associated with a high leak rate. Therefore, defunctioning loop ileostomies are being increasingly fashioned to protect against the consequences of a leak. However, the reported complication rates of such stoma creation and closure is between 5.7–69%.

Aims: To determine the outcome associated with construction and side-to-side closure of loop ileostomies in one specialist unit.

Patients and Methods: Data were obtained from a computer audit and case note analysis.

Results: Between 1994 and 1998, 71 patients (41 M, 30 F) with a median age of 51 years (range 19–88 years) had a loop ileostomy constructed for: (i) 26 ileoanal pouches; (ii) 36 left colonic and rectal resections; and (iii) 9 for other reasons. Side-to-side stoma closure was achieved using a GIA linear stapler through a parastomal incision. The median hospital stay following stoma creation was 12 days (range 7–63 days) and stoma closure was 7 days (range 6–16 days). The median time to closure was 140 days (range 10–790 days). There were no ileostomy-related deaths. There were 10 (13.8%) ileostomy-related complications, 4 following creation and 6 following closure.

Conclusions: Loop ileostomy is easy to create and close and is associated with a low morbidity. Therefore, we recommend a defunctioning ileostomy as a procedure of choice for temporary faecal diversion for complex colorectal surgery.

Key words: Loop ileostomy – Anterior resection – Ileal pouch anal anastomosis – Restorative proctocolectomy – Faecal diversion

Low pelvic anastomoses, *i.e.* ≤ 6 cm from the anal verge, are associated with a high leak rate (10–30%), anastomotic sinuses, pelvic abscesses, perianal fistulas, pouch fistulas and stenosis.^{1–6} The morbidity and

mortality associated with these complications is substantial.^{1–3} Temporary defunctioning stoma in the form of loop ileostomy, therefore, can be used for the diversion of proximal faecal stream to protect these

high risk anastomoses. However, the creation and closure of these stomas carry a high morbidity (5.7–69%).^{7–16} We report the outcome associated with the construction and closure of temporary loop ileostomies performed in the division of coloproctology at our institution.

Patients and Methods

Data were obtained from a computer audit together with case note analysis and out-patient follow-up. Between 1994–1998, 71 patients (41 males, 30 females) had loop ileostomies constructed, the indications of which are outlined in Table 1. The median age of these patients was 51 years (range 19–88 years) and the mean ASA score was 1 (range 1–3).

Loop ileostomy was created using the most distal part of the ileum which was brought out through the anterior abdominal wall at a pre-marked site in the right iliac fossa. The ileostomy was supported over a rod, which was removed after 5–7 days. All patients had a contrast study (a water-soluble enema or a pouchogram) prior to reversal which was achieved under antibiotic cover and without bowel preparation. The median time to closure was 140 days (range 10–790 days). The ileostomy was closed with a side-to-side stapled anastomosis as described by us previously.¹⁷ The median hospital stay following stoma creation was 12 days (range 7–63 days),

Table 1 Indications of loop ileostomy

Procedure	Number (%)
Anterior resection	36 (50.7)
Ileoanal pouch for UC	25 (35.2)
Pouch vaginal fistula	3 (4.2)
Ileoanal pouch for FAP	2 (2.8)
Reversal of Hartman's	2 (2.8)
Colo-vaginal fistula	1 (1.4)
Pseudo-obstruction	1 (1.4)
Mega-rectum	1 (1.4)
Total	71

Table 2 Complications of loop ileostomy

Indications	Creation/closure	Complications	Outcome
Ileal pouch anal anastomosis	After creation	Intestinal obstruction	Laparotomy and division of adhesions
Ileal pouch anal anastomosis	After closure	Intestinal obstruction secondary to incisional hernia	Surgical repair of incisional hernia
Ileal pouch anal anastomosis	After closure	Incisional hernia at the ileostomy site	Surgical repair of incisional hernia
Ileal pouch anal anastomosis	After creation	High stoma output: acute renal failure	Conservative management
Ileal pouch anal anastomosis	After creation	High stoma output	Conservative management
Ileal pouch anal anastomosis	After creation	High stoma output	Conservative management
Anterior resection	After closure	Wound infection	Antibiotics
Anterior resection	After closure	Intestinal obstruction	Conservative management
Anterior resection	After closure	Wound infection	Antibiotics
Anterior resection	After closure	Prolonged ileus	Conservative management

and following stoma closure was 7 days (range 6–16 days). The mean duration of surgery for ileostomy closure was 63 min (range 30–115 min). Patients returned to liquid and solid diet on average 1.6 days (range 1–4 days) and 2.5 days (2–7 days), respectively.

Results

Sixty seven patients had reversal of loop ileostomies. In 4 patients, the reversal was not achieved because one patient chose to keep the stoma whereas the other three died of unrelated causes which included massive upper gastrointestinal bleeding, myocardial infarction, and cerebrovascular accident after 1, 2, and 6 months, respectively. There were no ileostomy-related deaths and 10 patients (13.2%) developed ileostomy related complications which are outlined in Table 2.

Discussion

In recent years, sphincter-sparing low anterior resections and ileal pouch anal anastomosis in conjunction with mechanical anastomotic devices have revolutionized the surgical treatment of low rectal tumours, chronic ulcerative colitis and familial adenomatous polyposis. However, the increasing use of these complex distal anastomoses has led to increasing number of complications.^{1,2,4,6} A number of authors,^{1,2,4,6} therefore, have suggested the creation of loop ileostomy for proximal faecal diversion to protect these ultra low anastomoses. Wong *et al.*¹⁸ reported a 67% pelvis sepsis rate in their patients who underwent restorative proctocolectomies without covering ileostomies. Tjandra *et al.*¹⁹ showed that the anastomotic leakage rate was significantly higher following exclusion of temporary diversion in patients undergoing restorative proctocolectomy compared to the group who had routine diverting ileostomy (14% versus

4%). Furthermore, they showed a high re-laparotomy rate for sepsis in the former group as well. Metcalf *et al.*⁶ similarly showed higher incidence of pouch-anal anastomotic complications in those patients who had incomplete faecal diversion compared to those with complete diversion (44% versus 14%). Rullier *et al.*,¹ using univariate analysis in 272 patients undergoing rectal resection, found stoma as one of the five variables to be associated with the risk of anastomotic leakage. They also demonstrated that the risk of re-operation was twice as high for patients without a stoma than for those with a stoma. Other authors²⁰ similarly have shown higher rate of anastomotic complications on omission of diverting ileostomy following pouch procedures. The routine use of loop ileostomy according to these authors, therefore, significantly reduces the morbidity. However, three retrospective studies and one randomized trial²¹⁻²⁴ comparing patients with or without ileostomy following restorative proctocolectomy have shown either no benefit or an increased incidence of complications and hospital stay for the group of patients with loop ileostomy. Unfortunately, because of small number of patients in the randomized trial and retrospective nature of other trials, it is extremely difficult to draw meaningful conclusions.

A number of recent reports have analysed the morbidity of loop ileostomy creation and closure. The complication rate of its creation varies between 5.7–69%.⁷⁻¹⁶ The commonest complication associated with loop ileostomy which requires surgical intervention is intestinal obstruction, the incidence of which varies between 2.5–23% of patients.^{7,23} A number of risk factors have been implicated in its pathogenesis which include the techniques of closure (stapled *versus* hand sewn anastomosis), type of ileostomy (loop *versus* Brooks), type of disease (ulcerative colitis *versus* Crohn's) and closure of lateral space, all of which have yielded conflicting results.^{6,11,16,25-27} In our series, intestinal obstruction was observed in only 3 (4.2%) patients. This may well be due to the fact that our technique of stapled side-to-side anastomosis¹⁷ produced a large bore lumen which minimizes the intraluminal causes of obstruction such as faecal impaction. Furthermore, as all our patients underwent a contrast study (a water-soluble enema or a pouchogram) prior to reversal, this virtually eliminated any unforeseen cause of bowel obstruction prior to closure.

Peritonitis and faecal fistula occurs in 1–7% of patients following closure of loop ileostomy,^{6,25} which may be secondary to occult enteric tears or anastomotic leaks.⁹ In our series, these two complications were not observed, which may be secondary to gentle handling of the tissue, meticulous surgical techniques and reinforcement of mechanical anastomosis with an extra layer of hand sewn sutures.

The incidence of wound infection in our series following closure of ileostomy was only 2.8% (2 patients). This is far less than reported by some of the contemporary series, between 7–14%.^{7,12,27} Wexner *et al.*⁹ have advised leaving the stoma skin sites open because if the wound infection develops it can drain spontaneously. This approach reduced the wound infection rate in their series to 1.2%. Our approach, however, was to primarily close the stoma skin site in all the patients under antibiotic cover which did not lead to increased incidence of wound infection. Furthermore, this approach led to early patient discharge, a better cosmetic result, and avoidance of long-term district nursing care.

There were only two incisional hernias noted in our series, one at the stoma site and the other over the midline incision. The low incidence of incisional hernia (2.8%) compares favourably with other series.^{9,16,25} Other complications such as stomal prolapse, stomal retraction, stomal necrosis, stomal bleeding and peristomal irritation/dermatitis were not observed in our series.

Conclusions

This study has demonstrated that the construction and closure of temporary loop ileostomy is safe and effective with very low morbidity and no mortality. The morbidity in the majority of cases is minor and acceptable when compared to the dreadful complications seen with anastomotic breakdown in the absence of a defunctioning loop ileostomy, which can even lead to the death of the patient. In view of our favourable experience, we continue to advocate the use of temporary loop ileostomy as a safe alternative for temporary faecal diversion for all the complex colorectal procedures to protect high risk pelvic anastomoses.

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