OUTCOME OF ILEOSTOMY CLOSURE: AN AUDIT IN SURGICAL WARD 2, JPMC, KARACHI

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ABSTRACT
Objective: *Use of ileostomy is an effective method to protect pelvic anastomosis. It is also used as a damage control measure in neglected peritonitis. A second operation is required to close the stoma with potential complications. Rate of complications associated with ileostomy closure has been reported to be associated with primary pathology and general condition of the patient.*
Study Design: *It is retrospective study.*
Setting & Duration: *Department of Surgery, Ward 2, Jinnah Postgraduate Medical Centre, Karachi from January 2001 till 2006.*
Methodology: *Our aim of the study is to identify the risk factors associated with ileostomy takedown in surgical pratice. We studied a group of 66 patients who underwent ileostomy closure to determine the risk factors associated with complications of ileostomy closure, elective procedures are considered. All stoma related complications were recorded.*
Results: *Overall complication rate was 17%. Post taken down complication occurred in 17 patients, 10 patients developed wound infections, anastomotic leak in 2 patients, intestinal obstruction in 2 patients and 3 developed paralytic ileus. Conversion to laparotomy occurred in 7-8% because of difficulty in assessing 5% of the patients, all of the patients were treated conservatively and there was no need of surgery but they did require a long hospital stay.*
Conclusion: *It is concluded that ileostomy taken down is associated with low rates of serious complications; ileostomies should be done when required.*

KEYWORDS: *Ileostomy Closure, Stoma Anastomotic Leak*

INTRODUCTION

Anastomotic leakage is a serious postoperative complication following colorectal surgery.[1-3] Low pelvic anastomosis within 6cm from the anal verge, is associated with a high leakage rate of 10-30%.[4,5] These have driven surgeons to develop protective measures to diminish the severity of related consequences.[3,6-8] The construction of a loop ileostomy is an effective method to protect the pelvic anastomosis.[9] Ileostomy is a life saving procedure in malnourished patients.[10] The construction of an intestinal stoma is as important as any other aspect of surgery.[11] Men report less impact on quality of life than women.[12] Early diagnosis and primary exteriorization of the perforation as temporary ileostomy can decrease morbidity and mortality considerably.[13] Defunctioning stoma is beneficial for high risk patients who are unfit for a second abdominal procedure required to control a suture leakage.[14]

It is now generally accepted that a proximal intestinal stoma does not reduce the incidence of anastomotic leakage of distal colonic anastomosis, but it does facilitate clinical management of the detrimental effects once leakage occurs. The increase in sphincter saving colorectal surgery over the last 2-3 decades[15] has led to an increase in the construction of temporary loop ileostomies.[15] This defunctions the distal bowel after low colorectal/coloanal anastomosis after construction of a pelvic reservoir and other miscellaneous indications.[15,16] A multitude of factors influencing the complications of stoma closure, such as the surgeon's experience, periope-

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rative treatment, timing of the operation, and the surgical technique were identified.[17]

Small bowel obstruction is one of the most common complications after closure of loop ileostomy. The reported incidence of small bowel obstruction ranges from 0% to 15%. In most patients, the treatment was conservative and the obstruction resolved without reoperation. In patients who were reoperated on, the common causes of obstruction were mostly intraperitoneal adhesions.[18] The overall morbidity associated with the reversal of loop ileostomy varies between different authors and ranges between 10.8 and 69%.[19] This morbidity has an effect on patient's health, postoperative hospital stay and in hospital costs.[20]

METHODOLOGY

The aim of this study is to evaluate the complications associated with ileostomy take down. A total number of 66 consecutive patients who underwent closure of a loop and end ileostomy between the years 2001 to 2007 at Surgical Ward-2, Jinnah Postgraduate Medical Centre, Karachi were consecutively included in this retrospective non-randomized study. Data was obtained from patient's proforma, which collected all information regarding patient details, operative indications, type of procedure performed and postoperative morbidity and mortality. The latter was divided into early (within 30 days of the procedure) or late (after 30 days) postoperative morbidity and mortality.

Techniques for Closure of the Ileostomy

Prior to closure of the ileostomy, which is between 6 to 8 weeks of construction, the distal anastomosis is checked with a water soluble contrast. All patients were offered a clear liquid diet the night before surgery. Prophylactic antibiotics (Co-amaxiclave 1gmI/V and Metronidazole 50mg I/V) were administered during anaesthesia induction. The choice between stapled or manual anastomosis was at the surgeon's discretion. Consent was taken from all patients for laparotomy if required.

Table I. Indication for Ileostomy

Indications	No. (%)
Abdominal Tuberculosis	28(42.4)
Protection of ileal pouch-anal anastomosis	12(18.1)
Traumatic ileal perforation	10(15.1)
Protection of pelvic anastomosis	9(13.6)
Perforation secondary to enteric fever	7(10.6)

A circumstomal elliptical incision was made and the stoma was mobilized from surrounding fascial and peritoneal adhesions. Three techniques were used for closure of the loop ileostomy based upon the surgeon's preference, closure of the enterotomy with 3/0 vicryl, single layer interrupted sutures, resection of the thickened free edges and hand sewn end to end anastomosis with single layer interrupted 3/0 vicryl sutures, minimal resection of the borders and side to side stapled anastomosis using a proximate 75mm reloadable linear cutter followed by stapled closure of the ends with the same stapler. Muscle gap closed with vicryl 0 interrupted stitches. All skin incisions were primarily closed with interrupted proline 2/0 suture material and aseptic dressing done.

Definitions

1. Early postoperative obstruction was defined as clinical and radiological evidence of obstruction, which required readmission to hospital within the first 30 postoperative days.

2. Prolonged postoperative ileus was defined as the inability to tolerate oral intake a minimum of 5 days postoperatively together with a need for nasogastric decompression and an absence of bowel sounds.

3. Anastomosis leak was considered when there was evidence of generalized peritonitis, enterocutaneous fistula or radiographic evidence of a leak.

Statistical Analysis

All statistics were calculated using the statistical package for the Social Science (SPSS) version 10 for windows. Descriptive statistics were computed for continuous variables. Results were shown in the form of frequency and percentages where required.

RESULTS

Overall 66 patients (36 females and 30 males) were eligible for the study. Mean age was 35 (range from

Table II. Complications of Ileostomy Closure

Complications	No.	(%)
Wound Infection	10	41.6
Anastomotic Leak	2	8.3
Intestinal Obstruction	4	16.6
Paralytic Ileus	4	16.6
Enterocutaneous Fistula	2	8.3
Incisional Hernia	2	8.3

12-60 years). Primary disease requiring protective loop ileostomy was abdominal tuberculosis 28(42.4%), rectal cancer for protection of ileal pouch anal anastomosis were 12(18.1%), traumatic ileal perforation requiring ileostomy 10(15.1%) and perforation resulting in peritonitis secondary to enteric fever were 7(10.6%) and protection of pelvic anastomosis 9(13.6%).

These patients had their stoma closure after an interval determined by the surgeon and patient's choice. Mean interval between creation of ileostomy and closure was 14 weeks range. Mean hospital stay was one week 7 days. Mean operation time for ileostomy closure was 90 minutes range (40-200 minutes). Ileostomy closure was performed by manual anastomosis in 60 patients and by staple anastomosis in 6 patients.

Postoperative complications were experienced in 24 patients after ileostomy closure, leading to an overall morbidity rate of 36.36%. 10(41.6%) patients developed wound infection, which were managed by simple drainage and oral antibiotics, 4(16.6%) patients developed intestinal obstruction while 2(8.3%) required relaparotomy and 2(8.3%) managed by gastric decompression, bowel rest, and intravenous hydration, 4(16.6%) patients remained in paralytic ileus postoperatively which were also managed conservatively, 2(8.3%) patients developed anastomotic leak which were also managed conservatively, 2(8.3%) patients developed enterocutaneous fistula and was successfully managed by antibiotics, bowel rest and total parental nutrition, 2(8.3%) developed incisional hernia which required mesh repair of the hernia. Interestingly, primary disease requiring protective loop ileostomy was significantly associated with over all morbidity rates.

DISCUSSION

Diverting stomas are commonly performed during ileoanal, ileocolic and coloanal anastomosis as well as peritonitis resulting from tuberculosis and Crohn's disease. Since the first report of this procedure by Turnbull and Weakley in 1966[21], loop Ileostomies gained increased popularity because of its technical simplicity, lack of odour, liquid discharge, decrease rates of parastomal hernia and prolapsed[3,22] and offers excellent fecal diversion. Besides these advantages, another factor that attracted surgeons to the use of protective loop ileostomies as opposed to protective colostomies was the expected decreased rates of morbidity and mortality associated with the second operation from stoma take down.[3,9]

Nevertheless ileostomy closure is not by any means a morbidity free procedure. Reported overall complication rate of ileostomy closure range between 10% to 17%, and may reach upto 30% when performed for diversion of ileoanal pouches.[6,22] Several factors have been associated with increased risk of postoperative complications developing after ileostomy closure, such as the interval between primary surgery and closure, the use of bowel preparation, antibiotic prophylaxis and technical strategies stapled and handsewn suture techniques.[23,24]

The interval between primary surgery and ileostomy closure has been considered a possible risk factor for complication development. Possible explanations for this association include complete recovery by the patients after the initial procedure usually a major operation, which may take up to two to three months.[23] Also longer intervals may avoid the period of hypervascularization of adhesions, which progressively become less firm. Finally, longer time interval leads to increased vascularization and decreased edema of the stoma border. On the other hand, poor patient acceptance and compliance with ileostomy associated with cost burden of stoma care are arguments favouring early stoma closure as opposed to late closure.[23]

In our series, patients who developed post-operative complications had significantly shorter interval periods between primary operation and ileostomy closure (9.9 Vs 15.6 weeks). The benefit of ileostomy may be counter balanced by the complication rates associated with the stoma closure with longer hospital stay and costs. Although they are rarely severe, these complications are frequently managed conservatively and are associated with minimal mortality.

Complications after ileostomy closure were also frequent. Wound infection was the most frequent complication (41.6%) and was higher than that reported by other authors which were 1.3%[19] where skin incision left open versus 2.8%[5], 3% and 14.2%[25] in those who had primary closure of skin incision. All patients in our study underwent primary closure of the skin incision with proline 2/0 interrupted suture after ileostomy closure. This may have been a contributing factor to the high rate of wound infection though the results reported in the literature on this subject are contradictory. How ever, the majority of wound infections were minor and settled by drainage of the infection through a small opening in the wound and a course of broad-spectrum antibiotics and on the whole they did not markedly prolong hospital stay and had led to a better cosmetic result than if they had been left open.

Our anastomosis leak rate was similar to the 0-7% leak rate described in the literature.[19,22,25] However, we found no significant differences in the number of leaks between technique of ileostomy closure and is in accor-

dance with the results described by other authors.[24-26]

The most common complication was intestinal obstruction and paralytic ileus 16.6%. The incidence of this postoperative problem varies between different series depending on various techniques, a fact which is contrary to that reported by some.[24,25] They found a low rate of obstruction in patients with a stapled anastomosis but no differences in hospital stay, readmission and re-operation rate between the two groups.[24,26] In our patients the number of stapled anastomosis are few therefore it is not possible to comment as to which method is superior, however stapled anastomosis saves time.

The late complication was an incisional hernia at the stoma site in 2(8.3%) patients. It was reported between 0-2.8% by different authors.[5] This may have been due to the high rate of wound infection as it is true in our series.

CONCLUSION

In acute surgical patients, abdominal tuberculosis resulting in obstruction and peritonitis was the commonest indication for ileostomy. Although, rate of postoperative complications following ileostomy closure is upto 30% but it is consistent with the rate given in literature. Majority of our patients developed wound infection of minor grade and were managed conservatively, resulting in prolonged hospitalization. Some of our patients developed intestinal obstruction, paralytic ileus and anastomotic leakage and most of them settled conservatively, but there was no mortality.

The time interval from the construction of ileostomy to closure of ileostomy is crucial as most of our patients were suffering from tuberculosis which required increased duration between primary operation and reversal of ileostomy, in order to gain optimum health. Leakage of low colorectal and coloanal anastomosis after total mesorectal excision in patients with mid and low rectal cancer is a dreaded complication. The incidence of leakage increases when the anastomosis is within 6cm of the anal verge, attaining a rate of upto 15%.

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