

A Prospective Analysis of Intestinal Stomal Site Complications and the Various Peri Operative Factors Influencing Their Incidence

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Abstract

Original Research Article

Intestinal stomas, once formed are a long term fecal diversion which inadvertently leads to a lifestyle change for the patient. They are associated with a large spectrum of complications which must be managed promptly and appropriately. In this study, 50 patients who underwent a stoma formation procedure between October 2017 to September 2018 were analyzed for their pre-operative parameters like pulse, blood pressure and biochemical parameters were noted. They were followed up for three months and each complication that occurred was noted. Most common stoma formed was loop ileostomy. Stomal site complications occurred more frequently in patients who had a higher post-operative stay, ileostomy formation, and other post-operative complications. Deranged biochemical parameters especially low Serum albumin levels were associated with higher incidence of stomal site complications. Most common complication was skin excoriation. Pre-operative planning, proper stoma positioning, good surgical procedure and altering the possible risk factors leading to stoma complications can go a long way in helping a stoma patient. They can be predicted by pre-operative evaluation and type of surgery and minimized by stabilizing the patient and improving his biochemical status before surgery.

Keywords: intestinal stomas, ileostomy, colostomy, complications.

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INTRODUCTION

An intestinal stoma is an opening of the intestinal tract onto the abdominal wall, constructed surgically or appearing inadvertently. A colostomy is a connection of the colon to the skin of the abdominal wall. Ileostomy involves exteriorization of the ileum on the abdominal skin. In rare instances, the proximal small bowel may be exteriorized as a jejunostomy. A urinary conduit involves a stoma on the abdominal wall that serves to convey urine to an appliance placed on the skin.

Due to increasing incidence of tumors and inflammatory diseases of the large intestine and rectum as well as increasing number of injuries due to traffic accidents and bullet wounds, the number of ileostomies and colostomies has not decreased for the last thirty years, despite dynamic development of surgical methods, including stapler methods. Wider application of reconstruction methods associated with creation of ileoanal reservoirs and low anterior resection of the rectum also contribute to the increasing number of ileostomies and colostomies [1].

An intestinal stoma is of constant concern to anyone who has one and a well-constructed intestinal stoma can reduce the physical and psychological stress on its bearer. Creation of an intestinal stoma requires good judgment and surgical skill. However complicated or difficult the intra-abdominal part of the operation that necessitated the stoma, it is the quality and function of the stoma that determines a significant part of the long term quality of life [2].

Complications associated with stomas are frequent and run the gamut from the technical, mechanical, physiological and psychological aspect. The impact of these complications ranges from simple inconvenience to life-threatening situations. Today, despite modest advancement in surgical techniques and enterostomal therapy, stoma complication rates remain very high. The rate of intestinal stoma-specific complications in the literature varies quite widely, depending on the methodology of the study, the length of follow-up and definition of complication. Stoma surgery is a life-saving procedure and great care must be taken when creating an intestinal stoma to maximize

the satisfactory outcome and minimize the likelihood of developing a complication. Involvement of a professional stoma therapist has been shown to decrease the chances of stoma complications. It is the team approach where the involvement of doctors, a stoma therapist and patient education is of paramount importance. But even after the best of treatment, a few complications are inevitable and present in the form of early or late complications or stomal or peristomal skin-related complications [3].

Complications analyzed

On the basis of time of onset

Early Complications (within 30 days) [4, 5]

- Retraction
- Ischemic necrosis
- Mucocutaneous detachment
- Wound infection abscess
- Excoriation
- Contact dermatitis
- Transient edema /obstruction

Late Complications (after 30 days) [4, 5]

- Prolapse
- Stenosis
- Parastomal hernia
- Fistula formation

MATERIALS AND METHODS

Study design: Prospective hospital based study

Study duration: October 2017 to September 2018

Study place: Dept. of Surgery, S.P. Medical College and P.B.M Hospital, Bikaner

Study population: Patients of age group 15 years and above and both sex who underwent surgery for intestinal stoma formation over a period of one year.

Sample size: 50 patients reporting to the Surgery dept. within study duration and eligible as per inclusion criteria.

Sampling method: Convenience sampling

Consent and ethics: Written informed consent was taken from each subject and institutional ethical clearance will be taken.

Inclusion criteria: All patient undergoing surgery with intestinal stoma formation in both elective and emergency operative procedures.

Exclusion criteria

1. Co morbidities like diabetes mellitus
2. Patients undergoing chemotherapy/ radiotherapy
3. Patients on immunosuppressants
4. Immunocompromised patients

5. Cases of urinary conduits.

Parameters studied

- Rates of each complication
- Relation of complications with perioperative factors including (1) emergency or routine surgery (2) peritoneal contamination (3) preoperative biochemical parameters (4) hematologic parameters (5) vitals on admission

Follow up period: 3 months

Procedure of data collection

After taking informed consent by each subject, details of each case were recorded including history, clinical examination and investigations done based on a fixed proforma. Patients' details including vitals at the time of admission, emergency or routine surgery, procedure performed, and type of stoma created were documented. After that, all pre and post-operative complications faced by the patient during a period of 3 months were recorded.

Investigations done

- Haemoglobin
- Total leucocyte count
- Renal function tests
- Serum electrolytes
- Serum albumin

Data analysis

To collect required information, a pre structured pre tested proforma was used. For data analysis Microsoft excel and statistical software SPSS were used and data will be analyzed with the help of frequencies, figures, proportions, measures of central tendency and appropriate statistical test were used wherever required with p value <0.05 being taken significant.

RESULTS

Out of 50 a total of 24 cases had stomal site complications and 3 patients died during the follow up period. Most common early complication was skin excoriation (30%), followed by transient edema or obstruction which occurred in (16%), contact dermatitis and mucocutaneous detachment (6%). retraction wound abscess occurred in 1 patient each (2%). None of the patients had ischemic necrosis [Table 1].

Two of 50 patients had an enterocutaneous fistula formation (4%). One patient (2%) had prolapse of colostomy. None of the patients had stenosis or parastomal hernia formation [Table 2].

Mean age of patients was 42.48 ± 2.28 years. 31 patients were male and 19 female. Statistically significant factors associated with stomal site complications were long post-operative hospital stay (p

value -0.0111) and post-operative complications like respiratory distress sepsis wound infection and wound dehiscence (p value-0.01524). Biochemical parameters that were analyzed were hemoglobin, total leukocyte count, renal function tests, serum electrolytes and serum albumin levels. Overall deranged biochemical factors had a significant effect on incidence of complications (p value -0.00121).

Low albumin level exclusively was also a significant risk factor for stomal site complications (p

value - 0.0011). [Table 3]. Complication rate was significantly high in ileostomy patients as compared to colostomy patients (p value - 0.0297). Insignificant parameters: sex, age, peritoneal contamination, type of surgery, tachycardia (≥ 100), shock (SBP <90).

Most common complication was skin excoriation. Complications requiring operative management were fistula formation and one patient with severe skin excoriation.

Table-1: Early Stomal site complications

Early complications	No of cases
Retraction	1 (2%)
Ischaemic necrosis	0
Mucocutaneous detachment	3 (6%)
Wound INF/abscess	1 (2%)
Skin excoriation	15 (30%)
Contact dermatitis	3 (6%)
Transient edema or obstruction	8 (16%)

Table-2: Late stomal site complications

Early complications	No of cases
Stenosis	0
Prolapse	1(2%)
Fistula	2(4%)
Parastomal hernia	0

Table-3: Parameters Associated With Incidence of Complications

Parameter assessed	Value	Total Cases	Complications	Chi square	P value
Post op stay	<9 days	26	8(30.77%)	6.4431	0.0111
	≥ 9 days	24	16(66.67%)		
Post op complications	Absent	37	14(37.84%)	5.8878	0.01524
	Present	13	10(76.92%)		
Biochemical	Normal	20	4(20%)	10.4701	0.00121
	Deranged	30	20(66.67%)		
Serum albumin	Normal	38	14(36.84%)	6.4618	0.0011
	Decreased	12	10(83.33%)		

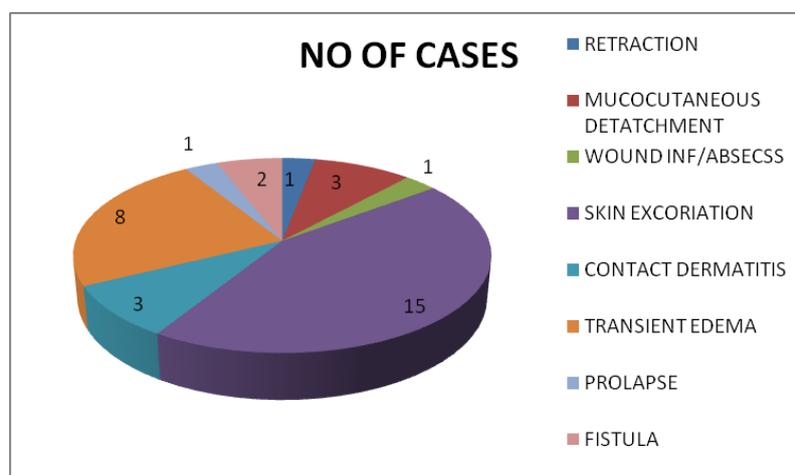


Chart-1: Distribution of complications

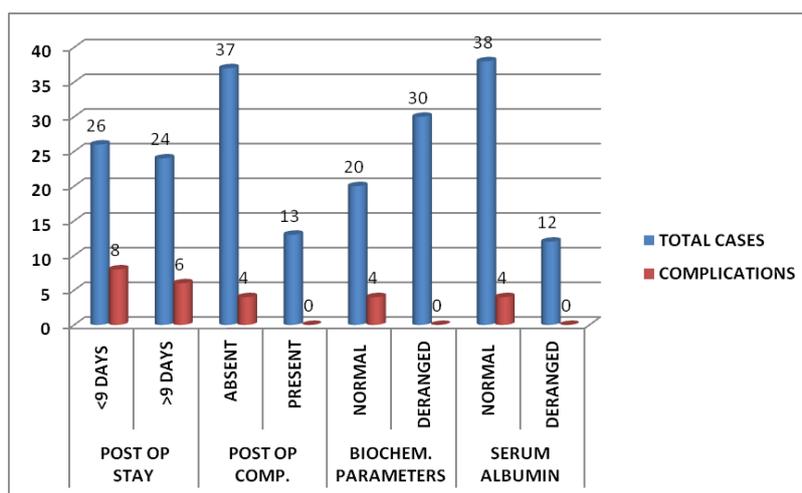


Chart-2: Individual parameter comparison

DISCUSSION

Our study was a prospective hospital based study which was conducted over a period of one year and evaluated 50 patients undergoing stoma formation. Our follow up period was 3 months. These patients were assessed for incidence of complications, type of complications, possible risk factors for complications and their management and outcome.

The overall complication rate in our study was 48%. Robertson *et al.* [6] reported stoma related complications rate between 10 and 70%, which may be because of varying lengths of follow up. They studied altogether 408 stoma patients who were followed up for the first 10 postoperative days, 318 for 3 months, 199 for 6 months, 114 for 1 year and 51 for 2 years. Our complication rate was close to studies of Stothert *et al.* [7]. Saghir *et al.* [8] had a complication rate of 67.9% in a retrospective study which analysed patient's upto three years. Umit Koc *et al.* [9] had a low complication rate of 28.4% as the follow up period was only 30 days.

Stoma related complications have a high incidence and a major economic, social as well as psychological effect on the patient's life. The overall incidence of complications increases over time after surgery.

The complication rate was slightly higher in males but it was statistically non-significant. Similar results were observed by Umit Koc *et al.* [9] and Saghir *et al.* [8]. The complication rate in males in our study was possibly higher as most males form rural background presenting to our hospital have some or other addiction histories e.g. smoking which predispose them to general respiratory complications and also possibly stomal site infections.

The mean age in our study was 42.48 years. It was considerably lower than most studies conducted out of India [8-11]. In comparison, it was similar to the Indian study by Ashraf *et al.* study where it was 43.85

years [12] and other Indian studies. The mean was lower in Indian studies possibly as India is a tropical country with ileal perforation due to typhoid and tuberculosis being a common cause of stoma formation [13], whereas most common cause for stoma creation in other countries is carcinoma [11].

The loop ileostomy was the most common type of stoma formed in our study made in a total of 30 patients. It was most frequently made for ileal perforation due to enteric fever. Ahmad *et al.* [13] and Arghya *et al.* [14], both Indian studies had similar finding with loop ileostomy constituting 64% in both the studies made for ileal perforation. Jonkers *et al.* [16] had only 12% loop ileostomies and loop colostomy as the most common stoma. Harris *et al.* [11] had end colostomy as the most commonly created stoma likely because most common indications for surgery was carcinoma in these patients.

All previous studies concluded that stomal complications were higher in emergency procedures as compared to elective procedures [11, 15]. In our study although the difference was clinically significant, it was not statistically significant. The urgent nature of the operative procedure limits bowel preparation, improvement of biochemical parameters and nutrition. This may be responsible for a slightly higher incidence of complications both stoma sites related and others.

Stomal site complications had a significant association with other post-operative complications signifying that similar factors were responsible for both type of complications.

Biochemical factors had a significant effect on the incidence of stomal site complications. A low hemoglobin level may delay healing, a high total leucocyte count maybe indicative of infection, deranged electrolytes can cause paralytic ileus and abdominal distention and low serum albumin levels can be associated with poor nutrition and delayed wound

healing. Low serum albumin levels have significant association with complications. Arghya Basu *et al.* [14] also showed that serum albumin levels affect the complication rate of intestinal stomas.

The most common early complication was skin excoriation due to leakage of stomal content. Its incidence was high occurring in about 30% of patients. Skin excoriation can occur due to faulty bag application techniques as well as poor quality bags. Being a government institute most of our patients were poor, uneducated with a rural background and they had difficulty in affording good quality bags as well as learning proper bag application. This resulted in high incidence of excoriation. Excoriation was a common complication in most other studies with an incidence varying from 15.5% to 66% [8, 10, 12, 14]. It may not be a life threatening complication but is very distressing to the patient causing burning and pain with difficulty in proper application of stomal bags which again leads to more excoriation.

The mortality rate in our study was 6%. It was similar to most studies. All three patients who died were operated in emergency. Although one patient had stomal site complications, none of these patients appeared to have died due to stoma related problems. In contrast, Harris *et al.* [11] and Stothert *et al.* [7] postulated the association between complication occurrence and death, with a significantly higher number of deaths seen following stoma-specific complications.

Stoma complications might not lead to deaths of patients but the patients undergoing stoma formations in emergency are usually sick patients with deranged biochemical parameters and poor bowel preparation which can predispose them to a high mortality as well as morbidity. Hence, there might be an association between stomal complications and mortality despite it not being a direct cause of mortality.

CONCLUSION

Although significant advancements have been made in stoma formation techniques the morbidity associated with stomas is still high. Complications of stomas result in both psychological and physical discomfort to the patient resulting in disruption of normal life and in some cases hospitalization. Certain pre-operative factors like serum albumin levels, biochemical parameters and their careful management can significantly reduce the morbidity associated with stomas. Post operatively, a shorter hospital stay and prevention of general post-operative complications can be beneficial in preventing stomal complications also. There is a need to further evaluate the risk factors for these complications and create guidelines that can help reduce the incidence of stomal site complications.

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