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Original Research Article

A clinico-observational study of intestinal stoma and their complications

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ABSTRACT

Background: The present study is designed to study the indications of intestinal stoma formation, type of stoma formation, complications of intestinal stoma made in patients under emergency or elective setting and postoperative care of the intestinal stomas.
Methods: The study was carried out in Department of surgery at J. L. N. Medical College, Ajmer from January 2016 to September 2017. In this study only >12 years age patient were included. The data were collected prospectively and analysed.
Results: It was observed that most patients were operated in emergency (90%) as compare to elective (10%) setting for the formation of intestinal stomas. The stoma was formed more in male (58%) as compared to female (42%). There were two peak age group 31-45 year and 45-60 years in which more stoma formation occur. The common indications for stoma were found to be ileal perforation with gangrenous ileum. The common stoma formed was ileostomy (64%) in compared to colostomy (34%). The loop stomas were formed in compared to end stoma and temporary stoma (84%) more formed compared to permanent stoma (16%). The most common complications were found to be skin excoriation (64%) as compared to other complications.
Conclusions: Despite increasing surgical expertise, complications of intestinal stomas still occur frequently in all setups and result in high morbidity. Meticulous skin care with regular follow-up, early detection of complications with their timely management along with education and counselling can decrease morbidity.

Keywords: Complications, Colostomy, Ileostomy, Intestinal stoma, Stoma care

INTRODUCTION

The word "stoma" is originated from Greek word which means mouth or opening.[1] An intestinal stoma is an opening of the intestinal tract onto the abdominal wall, constructed surgically or appearing inadvertently. Intestinal stomas are created to make possible for patient to live near normal life in spite the pathology present. Intestinal Stoma can be temporary or permanent, loop or end depending on pathology and need for construction. Intestinal Stoma can be psychologically and emotionally upsetting for the patient and it is the duty of surgeon to counsel patient regarding need for intestinal stoma creation, possible intestinal stoma complication and intestinal stoma care.

The major indications for emergency and elective intestinal stoma creation are intestinal obstruction or perforation with peritonitis.[2] Obstruction is most often due to primary cancer of the distal colon or rectum, complicated diverticular disease (stricture or abscess), or trauma of the intestine with perforation and faecal spillage. Elective Indication for colostomy creation is most commonly due to low rectal cancers, which require

an Abdomino-perineal resection to remove the tumour. Other indications for an elective colostomy include protection of a low colorectal or colo-anal anastomosis, recto-vaginal fistula, incontinence, radiation proctitis, and peri anal sepsis.[3] Indications for emergent ileostomy creation are generally due to conditions requiring small bowel or proximal colon resection, in which the integrity of a primary anastomosis would be compromised.[3] This may be due to a diffuse bowel injury (long standing peritonitis or obstruction, radiation, Crohn's disease) creating friable tissue that cannot hold a suture. Other emergent indications for an ileostomy are haemorrhage, ischemia, perforation or sepsis.

The intestinal stomas are of different type such as temporary, permanent, loop or end intestinal stoma. There are different complications of intestinal stoma like skin excoriation, parastomal hernia, stoma necrosis, stoma prolapsed, stoma retraction, mucocutaneous separation, abscess formation, high stoma output, bowel obstruction.

These above complication lead to postoperative morbidity and mortality. Each type of intestinal stoma is associated with a particular spectrum of complications, but some problems are common for all. Appropriate preoperative assessment and adherence to accepted construction techniques will usually avoid intestinal stoma complications. So improved preoperative assessment and counselling and longer follow up by the stoma department would be helpful in the management of patients with intestinal stomas and would probably contribute to improvement in the quality of life of these patients. The aim of our study is to evaluate various types of stoma and their indications, their complications, involved factors and ways to reduce complications in Indian setup.

METHODS

This is a prospective observational study conducted at Department of Surgery of J.L.N Medical College and Hospital Ajmer. A study of fifty cases of intestinal stoma was carried out between Jan 2016 and September 2017. The required information was gathered from case papers of patients admitted and operated in this hospital, over the mentioned time period.

The cases studied were categorized according to

- Age and sex of patient undergoing the procedure.
- The primary pathology or indication for stoma formation.
- The setting in which the procedure was performed i.e. emergency or elective.
- Type of stoma and nature of stoma.
- Complications were categorised as intra-operative, post-operative and complications of stoma (only up closure of stoma).

Exclusion criteria

Patients below the age of 12 years are not studied in this study, as we have a separate paediatric surgery department in our hospital.

Follow up

Follow up of the patients will be done at 4 week, 8 week, 12 week, and 24 week either by phone or by interview.

Statistical method

Descriptive analysis has been carried out in the study. Significance was analysed by using Chi-square test. The statistical software used was SPSS 22.0 version.

RESULTS

A total of 50 patients were included in the study. Two peaks in age distribution were found in our study in which stoma commonly formed. First in age group 31-45 in patients and second in age group 46-60 yrs. Stomas were commonly performed in ileum due to perforation of ileum and mesenteric ischemia with risk factor association like malnutrition, diabetes mellitus and other medical co morbidities. Other indications being sigmoid carcinoma/ Perforation/obstruction and rectal carcinoma (Table 1).

Table 1: Indications of stoma formation.

Indication	No. of patients	Percentage (%)
Mesenteric ischemia	15	30
Ileal perforation	11	22
Carcinoma of colon	10	20
Colon perforation	8	16
Tubo ovarian mass	2	4
Sigmoid volvulus	2	4
Foecal fistula	1	2
Ileal stricture	1	2

Table 2: Type of stoma complications found.

Complication occurred	No. of patients	Percentage (%)
Wound infection	7	14
Wound dehiscence	4	8
Skin excoriation	32	64
Stoma retraction	2	4
Diarrhoea	2	4
High output stoma	3	6
Blockage of stoma	1	2
Stoma prolapse	2	4
Stoma necrosis	1	2
Paracolostomy hernia	0	0

In this study we found 58% of patients undergone stoma surgery was males rest 42% were females. Stoma surgery was done mostly in emergency setting (90%) as compared to planned surgery (20%). The most common stoma constructed was ileostomy (41 out of 50), with loop ileostomy being the most common subtype of ileostomy performed (26 out of 41 ileostomies). End ileostomy was done in 5 patients and double barrel ileostomy in 10 patients. Colostomy was done in 9 patients, out of which 6 were loop colostomies, 2 end colostomies and 1 double barrel colostomy. Most common stoma constructed was ileostomy-loop/end/double barrel (82%). The most common stoma site was right lower abdomen (84%), followed by left iliac fossa (13%), right upper quadrant (2%) and left upper quadrant 1%.

Total 40 out of 50 patients developed complications related to stoma. This makes 80% as incidence rate of stoma related complications. Results suggest that skin excoriation (64%) is most common complication seen, followed by surgical site infection (14%), wound dehiscence (8%), diarrhoea (4%) and stoma retraction (4%). (Table 2) (Patients lost to follow up were not included in study).

DISCUSSION

This prospective study was conducted in J.L.N. Medical College and Hospital Ajmer on 50 patients undergoing stoma formation. In this study two peaks in age distribution were found, first in age group 31-45 in patients and second in age group 46-60 yrs. This is similar to literature given by Jayarajah et al, in 2016 according to him 46 year was the mean age in which intestinal stoma were formed. According to him common indications of stoma formation were rectal and anal malignancy (28.8%) and inflammatory bowel disease (12.3%) and these diseases are common in 3rd to 5th decades.[4] Stomas were commonly performed in patients with diseases of ileum like perforation with mesenteric ischemia, with risk factor association like malnutrition, Diabetes Mellitus and other medical comorbidities. Other indications being sigmoid carcinoma/ perforation/ obstruction and rectal carcinoma. These indications are commoner in older age group. Incidence of large bowel tumour and mesenteric ischemia increases with age. Similarly incidence of ulcerative colitis is maximum in age group 20-40 yrs. sigmoid volvulus occurs equally in young and middle age. Tubercular obstruction and bowel stricture as indication of stoma surgery have fewer incidences.

In this study we found 58% of patients who had undergone stoma surgery were male's rest 42% were females. This study is similar to study done by Jayarajah et al, in 2016 who found that 56.2% were male and 43.8% of female who had undergo stoma formations.[4] Stab injury and road traffic accidents causing large bowel perforation, leading to stoma surgery are more common in males. Colorectal cancer is commoner in males which is a leading cause for stoma surgery.

Ostomy surgery was done mostly in emergency setting (90%) as compared to planned surgery (20%). This study is different from study of Egbeare et al, which had 70% patient's stoma formation done in elective setting, because in our hospital maximum patients reported late after development of complications like perforation of gut and septicaemia.[5] Patients having colorectal carcinoma presented late in emergency, after development of complication. Patients having mesenteric ischemia or necrotizing colitis also presented in emergency as acute abdomen.

Results show that temporary stomas were performed more commonly. Permanent stomas were performed in few cases when there was no chance of restoration of intestinal continuity in future. Most common site of stoma in present study occurred to be in right lower quadrant, which was selected for ileostomy. Left lower quadrant was chosen for both ileostomy and colostomy in view of various indications.

Table 3: Incidence of stoma related complications from different studies.

Study	Year	No. of patients	%
Duchesne et al[6]	2002	164	25
Arumugam et al[7]	2003	97	50
Mahjoubi et al[8]	2005	330	69
Robertson et al[9]	2005	408	23.5
Harris et al[5]	2005	320	25
Jayarajah et al[4]	2016	192	34.2
Present study	2015-17	50	80

Indications for ileostomy in left lower quadrant where-enteric perforation, mesenteric ischemia, and post hysterectomy fecal fistula. Indications for colostomy in where left lower quadrant sigmoid volvulus, sigmoid perforation, sigmoid and recto-sigmoid mass, anal carcinoma and rectal injury in RTA. Total 40 out of 50 patients developed complications related to stoma. This makes 80% as incidence rate of stoma related complications. In present study we found 80% incidence of stoma complication which is different from other above study example in Jayarajah et al, (34.2%), Harris et a,l (25%), Duchesne et al, (25%), Arumugam et al (50%), Mahjoubi et al, (69%), Robertson et al, (23.5%) because in present study maximum cases were operated in emergency which are more prone for development of complications like wound infection, faecal peritonitis, wound abscess etc. and maximum patients were within septicaemia which also contributing factor for development of complications (Table 3).[4-9]

Results suggests that skin excoriation (64%) is most common complication seen, followed by surgical site

infection (14%), wound dehiscence (8%), diarrhoea (4%), stoma retraction (4%), high output stoma (6%), stoma prolapse (4%) and stoma necrosis (2%). The above common complications were seen comparable with similar studies (Table 4).[10-12]

Table 4: Incidence of each complication related to stoma.

Complication occurred	In present study (%)	Jayarajah et al[4]	Harris et al[5]
Wound infection	14	Not included	3.4%
Wound dehiscence	8	Not included	Not included
Skin excoriation	64	15.1%	Not included
Stoma retraction	4	1.4%	8%
Diarrhoea	4	Not included	Not included
High output stoma	6	Not included	Not included
Blockage of stoma	2	1.4%	1%
Stoma prolapsed	4	16.4%	13%
Stoma necrosis	2	Not included	3.8%
Para colostomy hernia	0	9.6%	9.5%
Death	8	-	47%

Peristomal skin excoriation (PSE)

in present study the skin excoriation (64%) was found to be most common complication and this result was different from study by Jayrajah et al, who had found skin excoriation (15.1%).[4] PSE is the most common complication encountered in stoma patients, with a reported higher incidence in patients with ileostomy. This observation is in agreed with consensus through the literature.[13] It is suggested that it is common because small intestine output is frequent and more irritant due to its caustic nature and also unplanned poor locations of the stoma so ostomy appliance could not be properly fit and leakage occurred.[14]

Another factors which responsible for these complications was patients had difficulty in learning the methods of care of stoma and how to apply the stoma appliance and was unavailability of stoma therapist in our setup. The degree of irritation ranges from that of a mild peristomal dermatitis to full thickness skin necrosis and ulceration. Even though our study shows no association in gender, a similarly retrospective study on skin problem of stormy did not show an association b/w skin excoriation and gender.[13]

Parastomal hernia and bowel obstruction

In present study the parastomal hernia complication were not found while compared to the reported incidence in Jayarajah et a1 was 9.6% as because the follow up period of present study was only up to closer of stoma in case of ileostomy and colostomy and these complications occurs after years.[4] In present study bowel obstruction was found 4% and this was due to post operative adhesions.

Stoma retraction

The reported incidence in present study was found (4%) which was different from studied by Harris et al who had found (8%) stoma retraction as stoma complication in end stoma.[5] The cause was mainly due to short mesentery remained and dragging traction on stoma lead to retraction (Table 4).

Stoma prolapsed

In present study found 4% stoma prolapsed as stoma complication. This was found more in colostomy mainly in end type. The reason being is due to increase intra abdominal pressure transmission to constipated gut. A review of literature of over 50 years showed significantly higher incidence of prolapsed in loop colostomy compared to loop ileostomy (Table 4).[15]

We encountered 8% mortality among 50 patient studied related to stoma complication. This was different from Harris et al, study who found 47% mortality in 345 patients for 8 years follow up.[5] The difference was due to long follow up in his study and most patients were of colon malignancy in which end stoma was created and malignancy was also a cause of death with contributory factor by stoma related complications (Table 4).

In majority of studies it has been shown that the influence of stoma therapist had a positive effect on the outcome which included complications due to surgery as well. [6] Increase in the rate of complications give addition economic burden to both patient and the health sector. Furthermore, reduction of complications has a positive effect on the quality of life of the patient. Therefore, incorporating a special stoma therapist may be an effective preventive measure to reduce the complications rates in developing country like India where the resource are limited.

Most of the patients were discharged 2-3 weeks postoperatively. Patients discharged before 2 weeks had either undergone planned surgery or had an uneventful postoperative period. Patients discharged in 2-3 week period had fewer postoperative complications or slower recovery due to associated preoperatively morbidity. Patients discharged after 3 weeks had complications like wound infection, wound dehiscence, skin excoriation etc, and were operated for indications like faecal fistula, ulcerative colitis and sigmoid carcinoma in aged patient

with associated co-morbidity. Expert management of complications with appropriate nutritional support (parenteral or alimentary), heralded recovery with shortening of convalescence period.

Most stomas were closed after 6 weeks and latest after 10 weeks (patients lost to follow up are not included in this study). Most of the stoma closure was done after 8-10 weeks and none of them had any complication on follow up. Stoma closures done before 6-8 weeks period are associated with increased chances of complication.

CONCLUSION

Most common local complication was peristomal skin irritation which is caused by chemical dermatitis due to exposure to the stoma effluent because of leakage from appliance. Unavailability of suitable stoma appliance in rural setup and due to cost factor causes, unavailability of stoma care nurse and illiteracy among patients increases morbidity. Meticulous skin care is mandatory with regular follow up of these patients to provide opportunity to enquire and manage such problems. A team approach involving the surgeon, ostomy staff nurse, and ostomates is essential in this type of surgery. However considering such a small number of study cases over a limited period of time in a single institution, results of such a study cannot be generalised.

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