International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

A Prospective Observational Study to Assess the Post Operative Complications of Loop Enterostomies in Cases of Perforation Peritonitis

Hariraj N, Rajan B Somani

Abstract: ***Introduction: A common surgical technique called an enterostomy creates an external interface between the distal end of the small or large intestine and the abdominal wall. A temporary loop enterostomy is justified in order to provide de - functioning in the event of possibly fatal anastomotic complications with a clear mortality risk. Fecal diversion using a transient stoma can lessen the symptoms of anastomotic leak and the frequency of procedures linked to leaks. Stomas usually carry a lot of morbidities starting from mental trauma affecting the patient to physical morbidities like skin excoriations, obstruction, prolapse, retraction, ulceration of stoma and rare parastomal hernias and to study the risk factors associated with this development. Aim: To assess the post operative complications associated with loop enterostomies in cases of perforation peritonitis. Primary Objectives: To assess the types and rate of occurrence of complications in loop enterostomies in cases of perforation peritonitis. Secondary Objectives: To assess the association of complications with risk factors like diabetes, overweight, previous abdominal surgeries. Methodology: 50 patients who underwent loop enterostomies for perforation peritonitis were assessed in prospective observational study during a period of 9 months from september 2021 to June 2022. Only loop enterostomies and perforation peritonitis cases from both sexes were included and End enterostomies were excluded. Variables included were age, gender, overweight (BMI), skin excoriations, obstruction of stoma, ulcerations of stoma, retractions of stoma, prolapse of stoma, parastomal hernia and haemorrhage. Result: The most common post operative complications associated with loop enterostomies done in cases of perforation peritonitis were skin excoriations (50%), ulceration of stoma (10%), retraction of stoma (6%), prolapse (4%), parastomal hernias (4%), haemorrhage (4%), and necrosis (2%) of stoma. Diabetes was found to be a risk factor for the development of post operative complications like necrosis ulceration and retraction of stoma. Obesity was found to be a risk factor for the development of necrosis and retraction of stoma. Conclusion: In this study, skin excoriation was discovered to be the main problem.50% of patients had peristomal skin issues, and incorrect siting and postoperative care are likely to blame. Since patients who appear late are typically in shock when they do, it is frequently impossible to label the stoma site in an emergency situation when the patient is both standing and seated. In these circumstances, it can be challenging to assess the waistline and skin folds in patients with high BMI. Obesity was found out to be a major risk factor in the development of retraction and necrosis of stoma The probable reasons for retraction in patients with obesity are a thickened fatty mesentery making mobilization of the bowel loop more difficult and traction is exerted on the bowel wall and further causing compression and necrosis of stoma. Diabetes was also a risk factor for the development of post operative complications like retraction necrosis and ulceration of stoma.***

Keywords: Loop Enterostomies, Perforation Peritonitis, BMI, Skin Excoriation, Prolapse, Necrosis, Ulceration, Prolapse, Parastomal Hernias, Hemorrhage.

1. Introduction

A stoma is an opening in the front abdominal wall that has been surgically made. To safeguard the anastomosis or relieve the obstruction, stomas are designed to direct excrement away from the distal bowel loops.

Stomas are classified temporary stoma or permanent stoma based on the need (1). Multiple difficulties arise during stoma construction. The majority of these complications are mild and can be treated with appropriate care, while serious complications necessitate surgical intervention and result in high morbidity and mortality rates.

Indications for ileostomy are:
Perforation with peritonitis Intestinal obstruction due to benign or malignant disease, Ulcerative colitis or Crohn's disease Mesenteric ischemia.

Indications for colostomy are:
Colonic growth colorectal malignancies Peritonitis due to perforation Anorectal malformations High anal fistula Multiple Factors are responsible for different type of complications. They are patient's presentation, timing of surgery, preoperative education, location of stoma, co morbidities, and quality of life.

Complications of Enterostomies (2)

Hemorrhage, Skin reactions around the stoma (Excoriations, Erosion), Necrosis, Prolapse, Retraction, Parastomal hernia, stenosis of stomal orifice,, fluid and electrolyte imbalance, diarrhoea. Findings from this study will help us understand the frequency of post - operative problems and how they relate to risk factors like diabetes, obesity, and prior abdominal surgery.

2. Aim and Objectives

Aim
To assess the post - operative complications assosciated with loop enterostomies in cases of perforation peritonitis.

Objectives
- **Primary:** to assess the types and frequency of post - operative complications in loop enterostomies, created in emergency for perforation peritonitis
- **Secondary**: to assess the association of complications with risk factors like diabetes, obesity, previous abdominal surgeries.

3. Materials and Methodology

This study was carried out at Sir T Hospital and Govt Medical College, Bhavnagar - 364001, Gujarat, India between September 2021 to June 2022. In this prospective observational study 50 cases (patients) undergone emergency exploratory laparatomy with loop enterostomies done for perforation peritonitis were taken. Informed and written consent was obtained from all the participants of the study. . The data was collected prospectively. All the cases were observed for a period of 2 months after operation and the data related to post operative complications was recorded. and at the time of admission patients BMI Blood sugar and history of any previous surgery was also obtained.

Inclusion Criteria:
- All loop enterostomies
- All perforation perforation cases All age groups Both sexes

Exclusion Criteria:
- End enterostomies

Procedure in Short:
After the approval of ethical committee, informed written consent of patients undergoing loop enterostomy for perforation peritonitis will be taken and patients will be enrolled according to the inclusion/exclusion criteria for data collection.

A prospective observational study will be carry out in Sir T hospital Bhavnagar

The recruited patients will be observed for post operative complications from the date of operation of the stoma to next 8 weeks during which most of the complications develop.

Pre operatively patients are assessed for presence of diabetes from history and also patients RBS is checked to identify any altered blood sugar level.

Patients are also asked about the history of any previous abdominal surgeries like previous appendicectomy laparotomy hernia repairs cholecystectomy etc

Patients BMI is also measured preoperatively to assess Obesity.

During the first week patient will be observed daily in the ward for complications like haemorhage, necrosis of stoma. From 7th day retraction, excoriations and ulcerations are looked for. After 2 weeks if patient is discharged then will be follow up twice weekly in opd to see any complications like obsruction, parastomal hernias and any local site infections.

Independant Variables

Age Sex
Diabetes Mellitus Obesity Previous surgical history

Dependant Variables
Post operative complications

Operative Techniques Loop Ileostomy
In order to lessen the effects of a distal anastomotic leakage, a diverting ileostomy is utilised. In low anterior resection for rectal cancer, temporary ileostomy is favoured to temporary colostomy. .
- The most distal portion of the terminal ileum without tension is selected, which is 20 to 30 cm proximal to the ileocaecal valve was selected for loop ileostomy.
- An abdominal wall opening is created as previously mentioned.
- The opening should be larger than that of end ileostomy to accommodate both loops of bowel.
- Distal end is marked with a suture to prevent maturation of the incorrect segment.
- The ileal loop is passed 4 to 5 cm beyond the abdominal skin Ileum is transected along approximately 80% of its circumference with preservation of mesentery soft catheter or ryles tube is passed through a small window made in the mesentery of the ileum
- Semi lunar incision is made in the mesenteric border of the distal limb at skin level, extending around most of the circumference of the ileum.
- The distal end is matured with simple sutures between terminal bowel and dermis.
- On the proximal side, several sutures take bites of the serosa of the emerging ileum at skin level. The loop of ileum can also be secured to the stoma site with a novel 'suture bridge' technique.
- The loop stoma should protrude adequately, with its functional end proximal limb is grasped with Babcock forceps

Loop Colostomy
- Selection of the loop colostomy site is necessary. For the left colon, use the left iliac fossa; for the transverse colon, use the right upper quadrant. Length of colon should be sufficient to reach stoma site. In case of disparity mobilization should be done.
- Peritoneal reflection should be removed to provide sufficient length.
- While dissection care should be taken to take care marginal vessels
- Hole in the anterior abdominal wall made, usually bigger than end colostomy
- Bowel loops brought out of hole.
- A window made in the mesentery and s supporting colostomy rod (68) or catheter is passed.
- Care should be taken to maintain the orientation of the colon.
- Transverse incision is made across the loop.
- Edges of the colon are everted and sutured to the skin edge of the hole with interrupted absorbable sutures

Expected Complications
Hemorrhages from stoma Necrosis of stoma.

Skin excoriation due to contact with effluent substances Retraction of stoma Ulceration of stoma

Obstruction of stoma: which could be mechanical like strictures adhesions, food bolus or stenosis, or non mechanical like crohns disease and short bowel syndrome Prolapse of stoma Parastomal hernias.

Tools

All data was entered in Microsoft Excel spreadsheet. Numerical data was reported as mean + SD and range. Categorical variables were reported as number and percentages. For all the statistical tests, a p value of less than 0.05 was taken to indicate significant difference.

4. Result and Discussion

A prospective observational study was conducted on 50 patients who had underwent loop enterostomies for perforation peritonitis to assess the rate of occurrence of post operative complications and risk factors associated with its development.

Statistics

Mean age of males

Descriptive Statistics

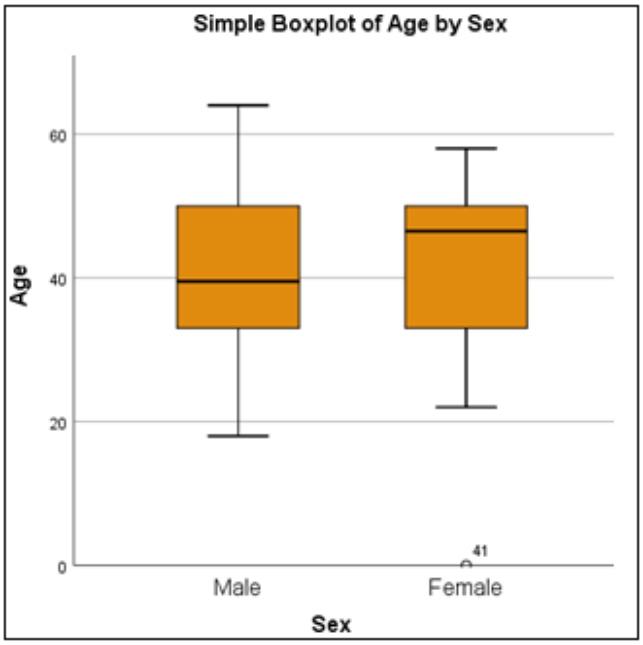
		N	Minimum	Maximum	Mean	Std. Deviation
Age	36	18	64	39.94	11.444	
Valid N (listwise)	36					

36 patients were male with a mean age of 39.94 and a standard deviation of 11.44

Mean age female

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Age	14	0	58	41.21	15.258
Valid N (listwise)	14				

14 patients were females with a mean age of 41.21 and standard deviation of 15.258



Descriptive

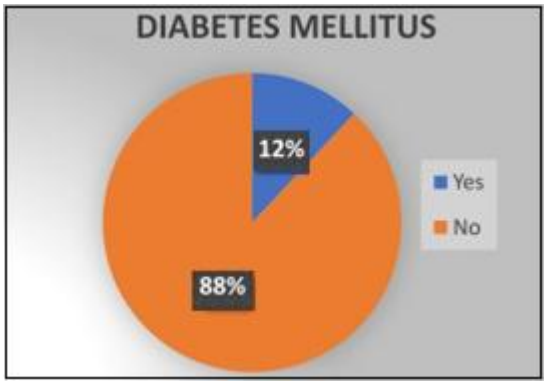
Gender			
		Frequency	Percent
Valid	Male	36	72.0
	Female	14	28.0
	Total	50	100.0

72% of patients were male and 28% were females

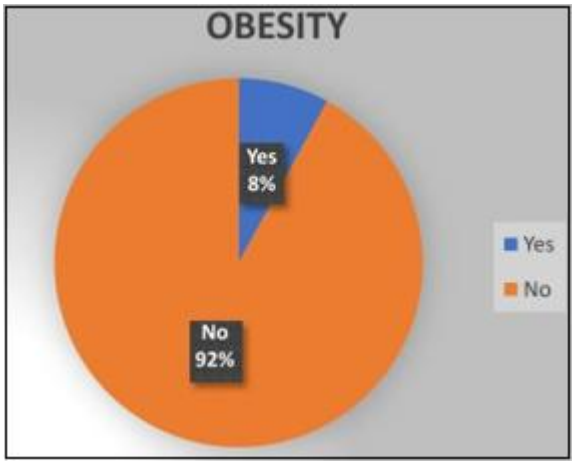
Age recorded			
		Frequency	Percent
Valid	less than 20 years	3	6.0
	20 - 40 years	24	48.0
	40 - 60 years	21	42.0
	more than 60 years	2	4.0
	Total	50	100.0

Maximum patients were in the age group of 20 - 40 (48%)

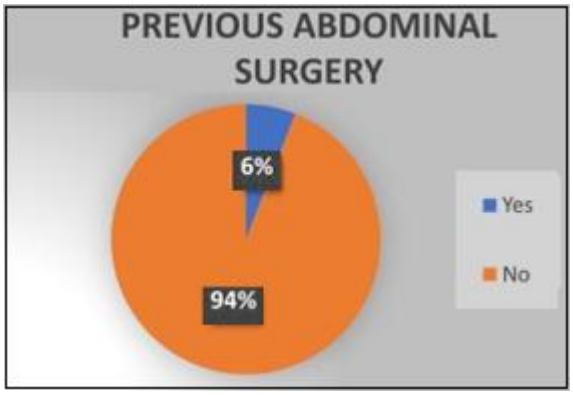
Risk factors



6 patients were diabetic and 44 patients were non diabetic.

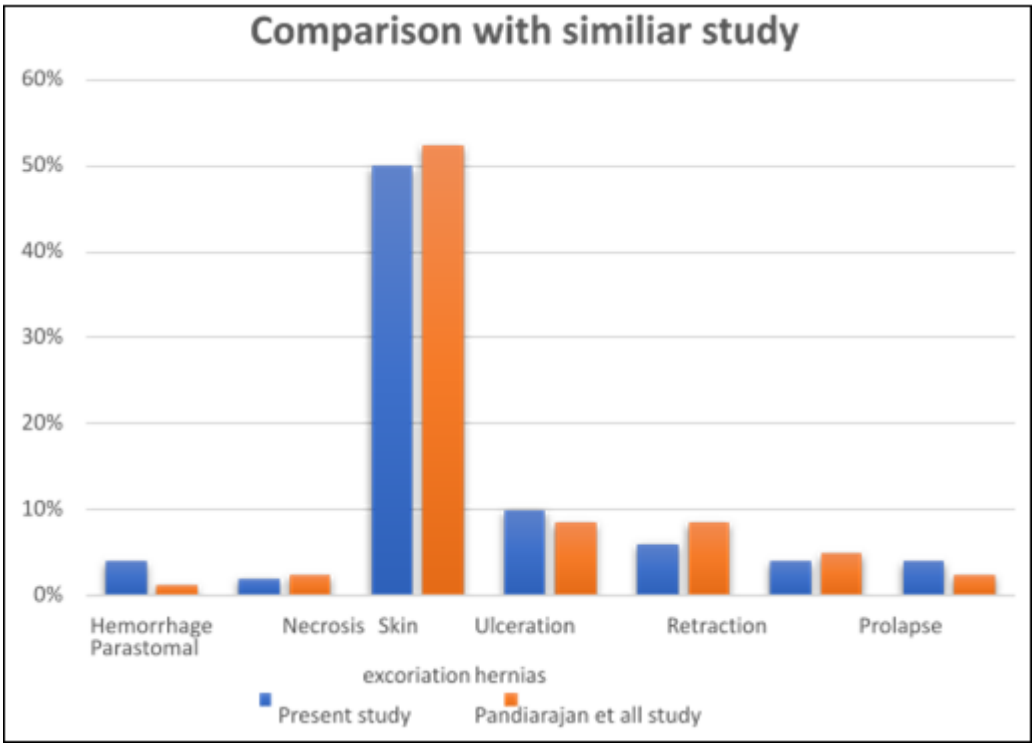


4 patients were obese and 46 patients were non obese.

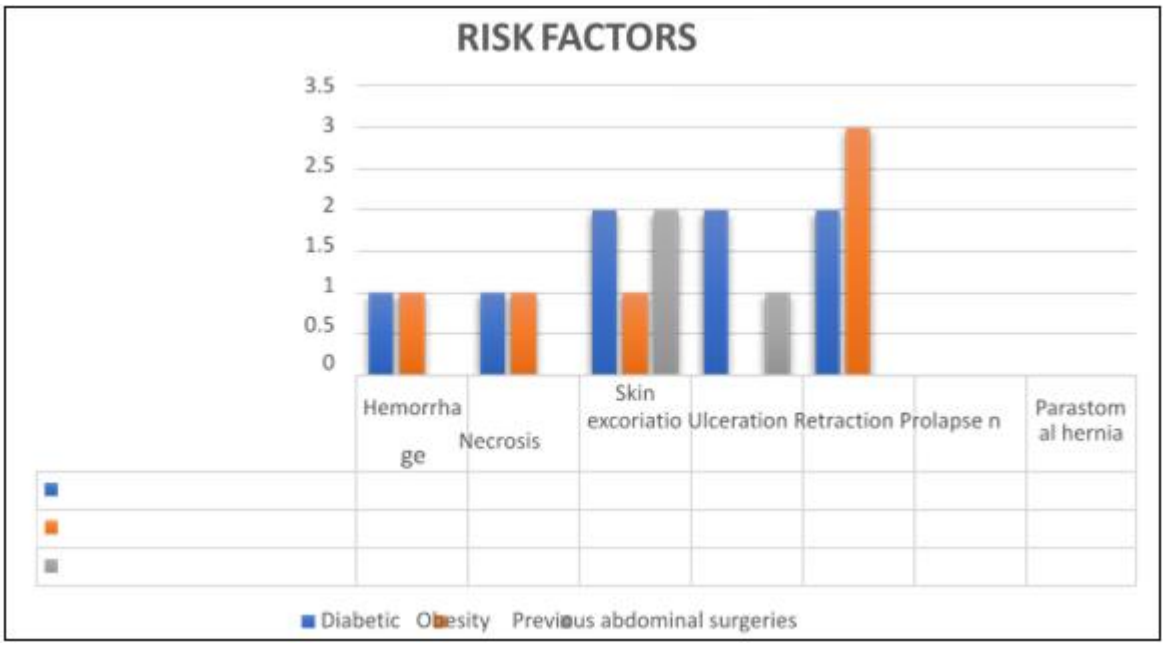


3 patients gives history of previous abdominal surgeries.

Complications	Frequency	Percentage	Pandirajan study et all
Hemorrhage	2	4%	1.2%
Necrosis	1	2%	2.4%
Skin excoriations	25	50%	52.4%
Ulceration	5	10%	8.5%
Retraction	3	6%	8.5%
Prolapse	2	4%	4.9%
Parastomal hernias	2	4%	2.4%
Total	50	100	100



In the present study, the incidence of Skin excoriation was 50% followed by Ulceration of stoma (10%), Retraction of stoma (6%), Parastomal hernia (4%), Prolapse (4%), Hemorrhage (4%), Necrosis (2%)



In Pandirajan et all study, Skin excoriation was 52.4%, Ulceration of stoma (8.5%), Retraction of stoma (8.5%), Parastomal hernia (2.4%), Prolapse (4.9%), Hemorrhage (1.2%), Necrosis (2.4%)

Diabetic	1	1	2	2	2	0	0
Obesity	1	1	1	0	3	0	0
Previous abdominal surgeries	0	0	2	1	0	0	0

Complications	Male	Female	Fischer exact/ chi square	p – value
Haemorrhage	2	0	0.810	0.368
Necrosis	1	0	0.397	0.529
Skin excoriations	17	8	0.397	0.529
Ulceration of stoma	4	1	0.176	0.675
Retraction of stoma	3	0	1.241	0.265
Prolapse of stoma	2	0	0.810	0.368
Parastomal hernias	2	0	0.810	0.368

In this study, 72% were male patients and 28% were female patients.

This shows that compared to the females, male patients underwent more stoma surgery.

All 50 patients were analyzed for association of stomal complications and gender of the patient.

2 male patients had developed hemorrhage from stoma as a complication with zero females patients, statistically no significant association was found between development of hemorrhage and gender difference.

1 male patient developed stoma necrosis but no female had necrosis, statistically there was no significant assosiation present between development of necrosis and gender difference.

17 male patients and 8 female patients developed skin excoriation. statistically no significant assosiation was found between skin excoriation and gender difference with p value >0.05.

4 male patients and 1 female patients developed ulceration of stoma, statistically no significant association was found between ulceration and gende difference.

3 male patients and 0 female patients developed retraction of stoma, statistically no significant association was found between retraction of stoma and gender difference.

2 male patients and 0 female patients developed prolapse of stoma, statistically no significant association was found between development of prolapse of stoma and gender difference

2 male patients and 0 female patients developed parastomal hernias, statistically no significant association was found between development of parastomal hernias and gender difference.

NB: sample size of this study was smaller so no significant association was found, if it was done on a bigger group result may be different

DM			
		Frequency	Percent
Valid	No	44	88.0
	Yes	6	12.0
	Total	50	100.0

Complications	DM +	DM -	Fischer exact/ chi square	p – value
Haemorrhage	1	1	2.849	0.091
Necrosis	1	0	7.483	0.006
Skin excoriations	2	23	0.758	0.384
Ulceration of stoma	2	3	4.125	0.042
Retraction of stoma	2	1	9.032	0.003
Prolapse of stoma	0	2	0.284	0.594
Parastomal hernias	0	2	0.284	0.594

In the study, 6 patients were diabetic and 44 were non diabetic

Statistically it was found out that there is significant association is present between diabetes and development of necrosis, ulceration and retraction of stoma with p value < 0.05

NB sample size was smaller, with a larger sample size result may be different.

Obesity			
		Frequency	Percent
Valid	No	46	92.0
	Yes	4	8.0
	Total	50	100.0

Complications	Obesity +	Obesity -	Fischer exact/ Chi square	p – value
Haemorrhage	1	1	4.993	0.025
Necrosis	1	0	11.735	0.001
Skin excoriations	1	24	1.087	0.297
Ulceration of stoma	0	5	0.483	0.487
Retraction of stoma	3	0	36.702	0.000
Prolapse of stoma	0	2	0.181	0.670
Parastomal hernias	0	2	0.181	0.670

4 patients were obese patients and 46 patients were non obese.

There was statistically significant association present between obesity and post operative complications like necrosis and retraction of stoma with a p value < 0.05.

NB: if study was conducted on a larger group it may give a different result.

Previous Surgery			
		Frequency	Percent
Valid	No	47	94.0
	Yes	3	6.0
	Total	50	100.0

Complications	Previous Sx+	Previous Sx-	Fischer exact/ chi square	p – value
Haemorrhage	0	2	0.133	0.715
Necrosis	0	1	0.065	0.799
Skin excoriations	2	23	0.355	0.552
Ulceration of stoma	1	4	1.931	0.165
Retraction of stoma	0	3	0.204	0.652
Prolapse of stoma	0	2	0.133	0.715
Parastomal hernias	0	2	0.133	0.715

3 patients gave history of previous abdominal surgeries

No significant association was proven between development of post operative complications and previous abdominal surgeries statistically.

5. Discussion

A Prospective observational study was carried out in patients who had underwent loop enterostomies for perforation peritonitis.50 patents in all were included in our study. From September 2021 to June 2022, this study was carried out at Sir T Hospital in Bhavnagar.

This study was undertaken for following reasons.

1) To identify the various complications encountered that occur after the construction of loop enterostomies in cases of perforation peritonitis.
2) To assess the various risk factors associated with the development of post - operative stomal complications.

Age:

Our study included 50 patients who underwent loop enterostomies for perforation peritonitis The maximum number of patients were in the group of 20 - 40 (n=24)

Gender:

In this study, 72% were male patients and 28% were female patients.

This shows that compared to the female group, male patients underwent more stoma surgery.

The association between stomal problems and patient gender was examined in all 50 patients. It demonstrates that there is no significant association between the patient's gender and stomal complications (p > 0.05). Therefore, there is no significant association between patient gender and stomal complications.

Out of 50 patients 2 male and 0 female patient developed hemorrhage from stoma as a complication, by fischer exact study there was no significant association was found between development of hemorrhage and gender difference.

1 male patient developed stoma necrosis but no female had necrosis, statistically there was no significant association was present between development of necrosis and gender difference.

17 male patients and 8 female patients developed skin excoriation. Statistically no significant association was found between skin excoriation and gender difference.

4 male patients and 1 female patients developed ulceration of stoma, statistically no significant association was found between ulceration and gende difference.
3 male patients and 0 female patients developed retraction of stoma, statistically no significant association was found between retraction of stoma and gender difference.

2 male patients and 0 female patients developed prolapse of stoma, statistically no significant association was found between development of prolapse of stoma and gender difference

2 male patients and 0 female patients developed parastomal hernias, statistically no significant association was found between development of parastomal hernias and gender difference.

NB: sample size of this study was smaller so no significant association was found, if it was done on a bigger group result may be different

In Pandiarajan et al (40) study 52% patients developed skin excoriation as a common post operative coplication with 8 % patients developing wound infection as a post comlocation

In Ahmad et all s (41) study it was found that 36% patient developed skin excoriation

In Akheel MA al faham ett (42) all study skin excoriation was found in 32 % and 30% patients developed strictures

In Ambreen muneer et all (43) study skin excoriation was found in 17.64% and 5.8% patients developed wound infections

Diabetes mellitus:

In the study, 6 patients were diabetic and 44 were non diabetic

Hemorrhage from stoma was seen in one patient with diabetic and one non diabetic patient. Statistically no significant association was found between diabetes as a risk factor for the development of hemorrhage.

Stomal necrosis was seen in one patient with diabetic and non diabetic patient not reported this complication, by fischer exact test significant association was found between diabetis as a risk factor for stomal necrosis

Out of 25 patients who developed skin excoriation 2 were and 23 were non diabetic, no significant association was found between diabetis as a risk factor for developing skin excoriation.

5 patients who developed ulceration of stoma, 2 were diabetic and 3 were non diabetic, there was significant association was present statistically between diabetes as a risk factor for developing ulceration

Of the 3 patients who developed retraction of stoma 2 were found to be diabetic. Significant association was present statistically between retraction and diabetis as a risk factor

Obesity:

After calculating BMI, 4 patients were obese and 46 patients were non obese.

Of the of 2 patients who developed hemorrhage one was obese. there was no significant association present between obesity as a risk factor for developing stomal hemorrhage

Necrosis was seen only in one patient who was also obese hence significant association is present between obesity as a risk factor for developing necrosis. in a bigger sample size this result may be different and patient also had diabetes.

25 patients who developed skin excoriation only one patient had obesity hence statistically there is no significant association between skin excoriation and obesity as a risk factor.

Of the 3 patients who developed retraction of stoma all had obesity, statistically there was significant association between development of retraction of stoma and obesity

History of previous abdominal surgeries:

3 patients gave history of previous abdominal surgeries

No significant association was proven between development of post operative complications and previous abdominal surgeries as a risk factor with a p value (>0.05).

6. Conclusion

Skin excoriation was found to be the common complication in this study. The incidence of Skin excoriation problems was 50% followed by Ulceration of stoma (10%), Retraction of stoma (6%), Parastomal hernia (4%), Prolapse (4%), Hemorrhage (4%), Necrosis (2%)

In emergency situations when patient presents with perforation, As patients who appear late are typically in shock at the time of presentation, it is generally hard to label the stoma site in both the standing and sitting positions. this can lead to improper siting of stoma and patients usually will end up with skin problems like excoriations.

Obesity was found out to be a major risk factor in the development of retraction and necrosis of stoma. Because thickened fatty mesentery in obese patients make mobilization of bowel loop more difficult and traction is exerted on the bowel wall leading to retraction of stoma and also further compression and necrosis of stoma.

Presence of diabetes was found to be a risk factor for the development of post operative complications like retraction necrosis and ulceration of stoma.

History of previous abdominal surgeries, gender difference and age of the patient is not a risk factor for the development of post operative complications.

This study however has its own limitations, owing to small sample size and less duration of follow up

References

[1] Vermeulen J, Gosselink MP, Busschbach JJV, Lange JF. Avoiding or reversing Hartmann's procedure provides improved quality of life after perforated diverticulitis. J Gastrointest Surg Off J Soc Surg Aliment Tract.2010 Apr; 14 (4): 651 - 7.
[2] Shabbir J, Britton DC. Stoma complications: a literature overview. Colorectal Dis Off J Assoc Coloproctology G B Irel.2010 Oct; 12 (10): 958 - 64.
[3] Dinnick T. The origins and evolution of colostomy. Br J Surg.1934 Jul; 22 (85): 142 - 54.104
[4] Doughty DB. History of Ostomy Surgery: J Wound Ostomy Continence Nurs.2008 Jan; 35 (1): 34 - 8.
[5] Slaney null. Bryan nicholas brooke. BMJ.1998 Nov 28; 317 (7171): 1529
[6] A portrait: Bryan Brooke. Gut.1991 Mar; 32 (3): 233.
[7] Cesaretti IU. [New technologies and techniques in the

care of stomas]. Rev Bras Enferm.1996 Jun; 49 (2): 183 - 92.
[8] Monks GH. V. Studies in the Surgical Anatomy of the Small Intestine and Its Mesentery. Ann Surg.1905; 42 (4): 543
[9] Lohsiriwat V, Wiangphoem N, Lohsiriwat S. The length of small bowel in Thai patients. J Med Assoc Thail Chotmaihet Thangphaet.2014 May; 97 (5): 525 - 9.
[10] Ellis H. Anatomy of the small intestine (jejunum and ileum). Surg Oxf.2011 Aug; 29 (8): 355 - 7.
[11] Baker ML, Williams RN, Nightingale JMD. Causes and management of ahigh - output stoma. Colorectal Dis Off J Assoc Coloproctology G B Irel.2011Feb; 13 (2): 191 - 7.
[12] Beck - Kaltenbach N, Voigt K, Rumstadt B. Renal impairment caused bytemporary loop ileostomy. Int J Colorectal Dis.2011 May 1; 26 (5): 623 - 6.
[13] Kye B - H, Kim H - J, Kim J - G, Cho H - M. The nutritional impact of diverting stoma - related complications in elderly rectal cancer patients. Int J Colorectal Dis.2013 Oct; 28 (10): 1393 - 400.
[14] Phatak UR, Kao LS, You YN, Rodriguez - Bigas MA, Skibber JM, Feig BW, etal. Impact of ileostomy - related complications on the multidisciplinary treatment of rectal cancer. Ann Surg Oncol.2014 Feb; 21 (2): 507 - 12.
[15] Hill GL, Mair WS, Goligher JC. Impairment of “ileostomy adaptation” in patients after ileal resection. Gut.1974 Dec; 15 (12): 982 - 7.