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Postoperative Paralytic Ileus After Stoma Closure-Impact on Patient Recovery

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ABSTRACT

Postoperative ileus (POI) is a significant complication after loop ileostomy closure given both its frequency and impact on the patient. The purpose of this study was to develop and externally validate a prediction model for POI after loop ileostomy closure. The model was developed and validated according to the TRIPOD checklist for prediction model development and validation. The development cohort included consecutive patients who underwent loop ileostomy closure in NSCB Medical college and hospital in Jabalpur, Candidate variables considered for inclusion in the model were chosen a priori based on subject knowledge. The final prediction model, which modelled the 14-day cumulative incidence of POI using logistic regression, was selected using the highest area under the receiver operating characteristic curve (AUC) criterion. The development cohort included 100 patients, in whom the incidence of POI was 7%. The final model included ten variables patient age, sex BMI comorbidities, indication for stoma creation effect of chemotherapy, stoma reversal time, hemoglobin level protein status hospital stay Potassium level serum creatinine leucocytes count platelets count. The model demonstrated good calibration. The validation cohort consisted of 100 patients, and the incidence of POI was 7%. On external validation, the model maintained good discrimination and calibration. A prediction model was developed for POI after loop ileostomy closure and included 14 variables. The model maintained good performance on external validation.

INTRODUCTION

Loop ileostomies are the most common surgical method of fecal diversion in colorectal surgery and are performed in approximately two-thirds of rectal cancer resections[1]. Given the relatively short operating time and low risk of severe postoperative complications, loop ileostomy closure is often regarded as a minor procedure. With the implementation of enhanced recovery protocols (ERPs), many patients are being discharged by postoperative day 1 or 2[2,3].

Same-day discharge after loop ileostomy closure has also been explored recently and deemed feasible in highly selected patients. However, loop ileostomy closure is still associated with considerable morbidity, limiting the widespread application of early discharge protocols.

Loop ileostomies are used currently in surgical practice to reduce the consequences of distal anastomotic failure following colorectal resection. It is often assumed that reversal of it, is a simple and safe procedure. However, many studies have demonstrated high morbidity rates following loop ileostomy closure. The most common post-operative complications included small bowel obstruction and wound sepsis[4].

Among widespread application of early discharge protocols. Among all complications, postoperative ileus (POI) is one of the most clinically significant. Large studies have reported an incidence of POI ranging from 13-20%.

MATERIALS AND METHODS

This prospective observational single center analysis "postoperative paralytic ileus after stoma closure-impact on patient recovery" done in department of general surgery N.S.C.B. Medical college and hospital between November 2019 to September 2022. The objective of this study was to develop and externally validate a prediction model for POI after loop ileostomy closure, in order to support physicians in clinical decision-making and preoperative risk assessment. This is a Prospective observational single center analysis.

All patient admitted in NSCB MCH, Jabalpur in Department of Surgery For stoma closure cases from September 2019-August 2021 was included. To obtain a homogenous group and to minimize confounders, only patients undergoing stoma closure following an open approach were included.

Patients who underwent a planned laparotomy with a concomitant procedure at the time of loop ileostomy closure, those who left the operating room with a nasogastric tube (NGT) in place, and patients whose index operation was a total proctocolectomy were excluded. Ileostomy closures were all performed using a handsewn technique and by trained surgeons. Routine use of ERPs after loop ileostomy closure was introduced (Fig. 1-3).

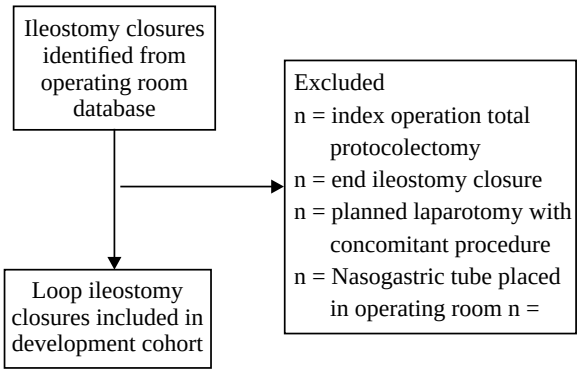

Fig. 1: laparotomy closure identified from operating room database

Fig. 2: Postoperative paralytic ileus after stoma closure

Fig. 3: Complications of stoma closure

Preoperative data: following parameters was collected during the preoperative period to correlate with the postoperative outcome:

- **Clinical parameter:** Vital signs, BMI, Dietary preference, Immune system, wound status, stoma reversal time
- **Hematological characteristics:** Haemoglobine, leucocytes count, platelets
- Total protein and albumin status
- Creatinine and urea in the blood
- Serum electrolytes

Timing of closure: Early closure will improve the quality of life of the patient, reduce ileostomy related morbidity and still protect a distal anastomosis. It is usually performed three months after the primary operation, to allow for wound healing and the development of any complications, so that they can be dealt with appropriately prior to considering closure. In our setting 3 months is the usual time frame within which ileostomies are closed. Early closure done in high output ileostomy which causes dehydration and repeated admissions to correct the same. Prior to closure distal cologram done to see any obstruction and leak at efferent limb

Operative procedure: Ileostomy closure techniques are quite standard and include a simple hand sewn anastomosis. After optimization, patients were taken for surgery under antibiotic cover. After proper painting and draping patient curvilinear/eye shaped incision will be given around stoma and bowel loops freed from subcutaneous tissue. Resection and anastomosis of bowel segment was done. "The freshened edges of the enterotomy are closed using absorbable sutures such as vicryl -2/0 in a continuous or interrupted manner". Wound closure was done over a suction drain and fixation of drain done with silk 1 cutting suture, and skin closed with purse-string suture technique by nylon 2-0.

Post operative course: All the patients were examined for stoma closure site on 1st POD, 3rd POD, 5th pod, 7th POD, 10^{h} pod 12th pod for nausea/vomiting, urinary retention, diarrhoea, DVT, paralytic ileus, bowel obstruction, wound infection, peritonitis due to anastomotic leak, intra-abdominal abscess, enterocutaneous fistula, bleeding, if there is any SSI of pus discharge present it was sent for pus culture and sensitivity and antibiotics were changed according to need.

RESULTS

Table 1 study shows that female cases are 33% and male cases are 67%. Out of the total cases, 7% developed paralytic ileus in which 57% of the total females while only 43% of the total male patients developed paralytic ileus. Females are approximately 3 times more prone for paralytic ileus.

In Table 2, patients mean (DS) age of cases is 34.17±13.82 year. Maximum cases of stoma closure ranges between 10-30 years. Mean (SD) age of incidence of paralytic ileus is 21.23±12.75 years. Age ranges between 10-30 years are more prone for paralytic ileus.

In Table 3, there is 30% were chronic alcoholics, 8% were chronic smokers, 18% were chronic tobacco users, some have mixed addiction and 66.7% had no significant addict history.

Table 4, out of these cases 16.7% of the chronic alcoholic, 15.0% of the chronic smokers and 3.5% with no significant personal history developed paralytic ileus. About 18% were chronic tobacco users but no any tobacco chewers patients developed paralytic ileus.

In Table 5, out of the total cases, 72% had average built while 28% were underweight. There is 2.27% of the cases with average built developed paralytic ileus. 17.85% the underweight cases developed paralytic cases. Out of the total cases, 83% were without comorbidities and 17% were with comorbidities. Based

Table 1: Gender distribution

Gender	Total cases (%)	Paralytic Ileus
Female	33 (100%)	4 (12.1%)
Male	67 (100%)	3 (4.47%)
Total	100 (100%)	7 (7%)

Table 2: Age distribution

Age groups	----------Frequency----------		----------Paralytic Ileus ----------	
10-20 years	21 (100%)	M=9 (64.2%)	3 (14.3%)	M=1 (33.3%)
		F=5 (35.7%)		F=2 (66.7%)
21-30 years	32 (100%)	M=12 (75%)	3 (9.4%)	M=1 (33.3%)
		F=4 (25%)		F=2 (66.7%)
31-40 years	21 (100%)	M=11 (84.6%)	1 (4.7%)	M=1 (100%)
		F=2 (15.4)		F=0 (0%)
41-50 years	16 1100%)	M=7 (63.6%)	0 (0.0%)	M=0 (0%)
		F=4 (24.4%)		F=0 (0%)
51-60 years	6 (100%)	M=1 (33.3%)	0 (0.0%)	M=0 (0%)
		F=2 (66.7%)		F=0 (0%)
61-70 years	4 (100%)	M=1 (33.3%)	0 (0.0%)	M=0 (0%)
		F=2 (66.7%)		F=0 (0%)
Total	100 (100.0%)	60(100%)	7 (7%)	4 (6.7%)
Mean (SD)	34.17±13.82	21.23±12.75		

on the immune status of the patient, 0% of the without comorbidities cases developed paralytic ileus while all the patient with paralytic ileus has some comorbidities.

In Table 6, out of the total cases, 96% cases had right sided stoma while only 4% had left-sided stoma. Based on this, 7.3% of the cases with right sided stoma developed paralytic ileus. None of the cases with left sided stoma developed paralytic ileus.

In Table 7, out of the total cases studied, 53% of the cases were operated for obstruction, 47% cases for perforation and percentage of cases operated for cancer. Based on this, 9.4% cases operated for obstruction and 4.25% of the cases operated for perforation developed paralytic ileus.

In Table 8, all the patient who has cancer, taken chemotherapy. About 13% cases are cancer patient. Out of those who developed paralytic ileus, all cases are benign disease. No any cancer patient developed paralytic ileus. All cancer patient has taken chemo/radiotherapy.

Out of the total cases, 94% did not develop post op nausea and vomiting, 4% developed nausea/vomiting on post op day 2 and 2% on 5th post op day. Out of the total cases, 2% cases developed post-op diarrhoea at 10th Pod, and 98% did not develop post-op diarrhoea. Out of the total cases, 72% did not have post op urinary retention, 21% developed on 1st post op day and 7% developed urinary retention on 2nd post op day.

In Table 9, out of the total cases 7% patients developed paralytic ileus at 3rd pod.

In Table 10, 17% of the total cases studied developed wound infection, 11% on 5th and 7th pod, 4% on 7th and 10th pod and 2% on 10th pod developed wound infection while 83% did not develop wound infection at all.

In Table 11, 42.5% paralytic ileus developed patients, leads to death. About 4% total cases developed paralytic ileus. Main Causes of death are:

- Paralytic ileus, hypokalemia, sepsis
- Paralytic ileus, sepsis, obstruction, wound Infection
- Paralytic ileus, obstruction, hypokalemia, sepsis

In Table 12, Patients who are stayed more, have more chances of developing paralytic ileus while who stayed less, have less chances of developing paralytic ileus. Maximum patients discharged at 7th and 8th pod.

In Table 13, Mostly stoma reversal done in 3-6 months after stoma formation. Mean time interval for stoma reversal = 5.82±6.32 months. Reversal time ranges from 1.5-6 months. More duration between stoma formation to stoma reversal leads to more chances of paralytic ileus.

Table 3: Personal history

Personal history	Frequency	Paralytic ileus
Chronic alcohol	30 (100%)	5 (16.7%)
Chronic smokers	8(100%)	1 (15%)
Chronic tobacco chewing	18 (100%)	0 (0%)
No addiction	57 (100%)	2 (3.50%)
Total	100 (100.0%)	(7%)

Table 4: General condition

General condition	Frequency	Paralytic ileus
Average (BMI≥18.5)	72 (100%)	2 (2.27%)
Underweight (BMI≤18.5)	28 (100%)	5 (17.85%)
Total	100 (100.0%)	(7%)

Table 5: Comorbidities

Immune status	N (%)	Paralytic Ileus (%)
Without comorbidities	83 (100%)	0 (0%)
With comorbidities	17 (100%)	7 (3%)
Diabetes	4 (100%)	2 (50%)
Hypertension	5 (100%)	0 (0%)
HbsAg	1 (100%)	1 (100%)
Typhoid	3 (100%)	0 (0%)
Tuberculosis	9 (100%)	5 (55.5%)
Total	100 (100%)	(7%)

Table 6: Sites of stoma

Site	N (%)	Paralytic Ileus (%)
Left	4 (100%)	0 (0%)
Right	96 (100%)	7 (7.3%)
Total	100 (100%)	(7%)

Table 7: Indication

Indication	Total cases (%)	Paralytic ileus (%)
Obstruction	53 (100%)	5 (9.4%)
Perforation	47 (100%)	2 (4.25%)
Total	100 (100%)	4 (7%)

Table 8: Benign or malignant

Benign/malignant	N (%)	Paralytic Ileus (%)
Cancer	13 (13%)	0 (0%)
Benign	87 (87%)	7 (7%)
Total	100 (100%)	7 (7%)

Table 9: Complication=paralytic ilieus

Paralytic Ileus	Frequency	Percentage
No	93	93
Yes-3rd POD	7	7
Total	100	100

Table 10 Complication: wound infection

Wound infection	Frequency
No	83
5th and 7th pod	11
7th and 10th pod	4
10th pod	2
Total	100

Table 11: Outcomes

Outcome	N (%)	Death
Paralytic ileus	7 (100%)	3 (42.8%)
No paralytic ileus	93 (100%)	2 (2.1%)
Total	100 (100%)	(4%)

Table 12: Hospital stay

Hospital stay	Total	Paralytic ileus
7th day	40 (40%)	0 (0%)
8th day	37 (37%)	2 (5.4%)
9th day	15 (15%)	0 (0%)
10^{th} day	3 (3%)	3 (100%)
≥10 day	5 (5%)	2 (40%)
Total	100 (100%)	(7%)

Table 13: Timing of stoma reversal

Timing of stoma reversal	Cases (%)	Paralytic Ileus (%)
≤ 3 months	35 (35%)	2 (5.7%)
3-6 months	42 (42%)	2 (4.7%)
6-9 months	10 (10%)	3 (30%)
≥ 9 months	13 (13%)	0 (0%)
Total	100 (100%)	7 (7%)

Table 14a: Comparison between investigations of preop and 1st POD, 3rd POD

Investigation	Preop	Day 1	Day 3	p-value®	p-value®®	p-value®®®
Hb	11.6±1.56	11.32±1.45	11.32±1.45	0.047	0.006	0.045
TLC	8092±2946	8387±4209	8478±4351	0.979	0.010	0.098
Platele TS	2.62±1.04	2.77±1.01	2.77±1.01	0.039	0.782	0.782
Total protein	5.47±0.56	5.11±0.33	5.11±0.33	0.202	0.439	0.039
S. Albumin	3.09±0.40	3.08±0.28	3.09±0.30	0.975	0.927	0.000
S. creatinine	1.11±0.34	1.05±0.38	1.05±0.26	0.012	0.301	0.004
Sodium	135±4.5	136±4.9	135±4.9	0.008	0.778	0.425
Potassium	3.7±0.72	3.56±0.80	3.56±0.81	0.043	0.015	0.285

Table 14b: Summary chart of study

Parameter	Paralytic ileus	Total	p-value
Demography			
Age			
≤30y	6	53	0.534
30-60y	1	43	
≥60y	0	4	
Sex (M:F)	¾	67/33	0.014
BMI ≤18.5/≥18.5	5/2	28/72	0.014
Comorbidity			
Alcohol intake	5	30	0.174
Smoking	1	8	
Tobacco chewer	0	18	0.174
Hypertension	0	5	
DM	2	4	
Tuberculosis	5	9	
HBSAG	1	1	
Typhoid	0	3	
Adjuvant chemotherapy	0	13	0.289
Indication			0.274
Obstruction	5	53	
Perforation	2	47	
Hospital stay			0
≤9 DAYS	2	92	
≥9 DAYS	5	8	
Stoma reversal			
Time			
≤3 months	2	35	0.030
3-6 months	2	42	
6-9 months	3	10	
≥9 months	0	13	

DISCUSSIONS

This study was conducted in department of surgery, N.S.C.B. Medical college, Jabalpur. This is prospective study on 100 consecutive patients admitting for restoration of intestinal continuity between November 2019 and September 2022. Data included are:

- Patient age[1]
- Sex[2]
- BMI[3]
- Comorbidities[4]
- Indication for stoma creation
- Effect of chemotherapy
- Stoma reversal time[5]
- Hemoglobin level[6]
- Protein status[7]
- Hospital stay[8]
- Potassium level[9]
- Serum creatinine[10]
- Leucocytes count[11]
- Platelets count with relation of post stoma closure paralytic ileus[12]

Also observe the complications and mortality of stoma closure.

Female instances account for 33% of cases in our study, whereas male cases account for 67% for stoma closure. Similar study analysis by Fok *et al*.[10] includes individuals who had an elective stoma closure between 2015 and 2017. In which 58 (64.4%) males and 42% females. Another Similar study done by Rubio-Perez *et al*.[7] conducted a retrospective review of 93 patients who had had elective ileostomy closure, of which 58% were male. Another similar study of Goret *et al*.[13] conducted a similar study with 168 individuals 118 (70.1%) of whom were male.

Out of the total females, 12.1% developed paralytic ileus while only 4.47% of males developed paralytic ileus. Females are approx. 2.5 times more prone for paralytic ileus in our study. Males have less chances of paralytic ileus because majority of males are tobacco chewers.

The average (SD) age of the cases in our study was 34.17±13.82 years. The majority of instances are discovered between the ages of 10 and 30. Rubio-Perez *et al*.[7] conducted a similar study retrospectively study in which the patients were on average 60.3 years old.

The mean (SD) age of paralytic ileus occurrence is 21.23±12.75 years. Paralytic ileus is more common in early aged 10-30. Our study found that early age group have more chances for paralytic ileus because in our study more cases of tuberculosis and typhoid etiology. While previous studies found that more cases of paralytic ileus have old age group because mostly cases are cancer patients.

According to our study, the incidence of paralytic ileus after stoma closure is 7%, with patients in the early age groups being more susceptible for paralytic ileus. Similar study done by Krebs *et al*.[6] conducted a retrospective cohort analysis of data for 260 patients with diverting stoma closure between 2003 and 2015, Postoperative ileus was the most prevalent complication (10%). Similar study done by Garfinkle *et al*.[14] conducted a similar investigation. POI was estimated to be 8.0% in a pooled analysis. Rubio-Perez *et al*.[7] conducted a similar study. A retrospective study was conducted on 93 individuals who had had elective ileostomy closure. In 13% of instances, paralytic ileus was the most common complication. A study by Chapuis *et al*.[8] indicated that prolonged ileus was detected in 14% of cases. In a retrospective analysis conducted by D'Haeninck *et al*.[15] Paralytic ileus was a surgical complication in 11.2% of cases.

In our study 30% were chronic alcoholics, 8% were chronic smokers, 18% were chronic tobacco chewers and 57% had no addiction. Out of these cases 16.7% of the chronic alcoholic, 15% of the chronic bidi smokers and 3.5% with no significant addiction developed paralytic ileus. No any tobacco user developed paralytic ileus. A similar study done by Lambrichts *et al*.[16] to assess nicotine chewing gum for the prevention of Postoperative ileus after colorectal surgery: In both groups, six patients developed PPOI. Time to primary endpoint (4.50 [3.00-7.25] vs. 3.50 days [3.00-4.25], p = 0.398) and length of stay (5.50 [4.00-8.50] vs. 4.50 days [4.00-6.00], p = 0.738) did not differ significantly between normal and nicotine gum.

In our study out of the total cases, 72% had average built while 28% were underweight [BMI≤18.5]. Basis on general condition of the patient, 2.27% of the cases with average built developed paralytic ileus while 17.85% of the underweight cases developed paralytic cases.

In our study out of the total cases, 90% had mixed diet while 10.0% were vegetarians. Based on the type of diet, paralytic ileus developed among 3.3% of cases with mixed diet and 40% of cases with vegetarian diet.

In our study out of the total cases, 68.3% were immunocompetent and 31.7% were immunocompromised. Basis on the immune status of the patient, 2.4% of the immunocompetent cases developed paralytic ileus while 15.8% of the immunocompromised cases developed paralytic ileus.

In our study out of the total studied cases, 87% cases were diagnosed with benign lesions while only 13% were diagnosed with cancer. Based on the diagnosis of the patient, 8% of the cases with benign lesions developed paralytic ileus. None of the cases with malignancy developed paralytic. Similar study done by Baik *et al*.[17], all patients who had a loop ileostomy closure at Inje University Busan Paik Hospital between 2008 and 2017 were tracked down Loop ileostomy closure was performed on 354 individuals. Chemotherapy had no effect on the outcome in this study.

In our study out of the total cases, 96% cases had right sided stoma while only 4% had left sided stoma. Basis on the site of stoma, 7.3% of the cases with right sided stoma and None of the cases with left sided stoma developed paralytic ileus.

Out of the total cases studied, 53% of the cases were operated for obstruction and 47% for perforation. Based on the indication of surgery, 9.4% cases operated for obstruction developed paralytic ileus and 4.25% of the cases operated for perforation developed paralytic ileus while none of the cases developed paralytic ileus of cancer patients.

In our study out of the total cases, 1% were HBsAg positive, 9% had history of tuberculosis and 3% had history of typhoid. 4% are diabetic, 5% are hypertensive. Out of these, all HBsAg positive patient, 16.7% tuberculosis patient, 50% of diabetic patient developed paralytic ileus.

None of the cases with history of typhoid, trauma, and hypertension developed paralytic ileus.

In our study, 13% cases are cancer patient, all cancer patients received 6 cycles of adjuvant chemotherapy. There was no paralytic ileus in any of the cases that received adjuvant treatment. So found that adjuvant chemotherapy has no effect on paralytic ileus. Baik *et al*.[17] conducted a study All patients who had a loop ileostomy closure at Inje University Busan Paik Hospital between 2008 and 2017 were tracked down. Loop ileostomy closure was performed on 354 individuals. Chemotherapy had no effect on the outcome in this study.

Patients who stayed 40% for 7days, 37% for 8 days, 15% for 9days, 3% for 10 days and 5% for more than 10 days. Out of which cases developed paralytic ileus in 5.4% 8th day, and remaining all case who stayed ≥10 days of cases, according to our study. So found that more hospital -stay related to more chances of paralytic ileus. Similar study done by Mengual-Ballester *et al*.[18] conducted a study, The average length of stay for a patient was 7.54 (2-23) days. Similar study done by Waterland *et al*.[19] conducted a retrospective investigation on patients who had a dysfunctioning ileostomy after anterior

Table 15: Mortality rates after stoma closure

Studies	Years	Mortality rate (%)
Faunø *et al*.[9]	August 2012	0.50
Mengual-Ballester *et al*.[18]	July 2012	1.12
Krebs *et al*.[6]	August 2019	1.80
Rubio-Perez *et al*.[7]	September 2014	1.00
Goret *et al*.[13]	2019	2.90
D'Haeninck *et al*.[15]	2011	0.50

Table 16: Complications of stoma closure

Studies	Years	Bowel obstruction (%)	Wound infection (%)	Diarrhea (%)
Faunø *et al*.[9]	August 2012	-	3.1	-
Fok *et al*.[15]	2021	-	1	-
El-Hussuna *et al*.[12]	2012	3	5	-
Mengual-Ballester *et al*.[18]	2012	32.2	6	6
Baik and Bae *et al*.[17]	2021	4.8	11.6	-
Krebs *et al*.[6]	2019	-	5	-
Rubio-Perez *et al*.[7]	-	13	-	
D'Haeninck *et al*.[15]	2011	4.1	4.6	-

rectal cancer excision. The median time it took to reverse the condition was 6 months (range 1-42). Adjuvant chemotherapy (22, 35%), medical sickness (14, 22%), anastomotic leak (9, 14%) and others (4, 7%) were the reasons for delayed reversal in 63 individuals. Delay in reverse was linked to a higher likelihood of problems and a longer hospital stay after reversal ($p<0.05$), according to a univariate analysis.

Stoma reversal was typically done in our study between 3-6 months of stoma development. Stoma reversal takes an average of 5.82-6.32 months. The time it takes to reverse the condition varies between 1.5 and 36 months. More time between the creation and the reversal of the stoma results in more chances of paralytic ileus. Similar study by Fok *et al*.[10], patients who had an elective stoma closure between 2015 and 2017 were included in this retrospective cohort analysis. The average time it took for a stoma to close was 15 months. Rubio-Perez *et al*.[7] conducted a similar study retrospectively, who had had elective ileostomy closure, The average time for stoma reversal was 10.3 months. Waterland *et al*.[19] conducted a retrospective investigation on patients who had a dysfunctioning ileostomy after anterior rectal cancer excision. A total of 177 cases were investigated. The median time it took to reverse the condition was 6 months.

In our study found that 43% of paralytic ileus developed patients, and 2.1% non-paralytic patient leads to death, 7% total cases developed paralytic ileus. While all discharged patients not developed paralytic ileus.

Many studied done to find out mortality rates after stoma closure in which showed in Table 15. In our study mortality rate after stoma closure was 5%.

Many studied done for assess complications of stoma closure which showed in Table 16.

Complications:

- Nausea/vomiting: 6%
- Diarrhoea: 2%
- Urinary retention: 28%
- Wound infection: 17%
- Death

Paralytic case:

- Non paralytic case: 40%
- Paralytic ileus: 7%

In addition, Low platelets count, raised leucocytes count, less haemoglobine value, less serum protein level, less serum albumin, raised urea level, raised creatinine level, less potassium level was found to be associated with the development of paralytic ileus both preoperatively and postoperatively in our study. Similar study conducted by Baik *et al*.[17], all patients who underwent loop ileostomy closure at Inje University Busan Paik Hospital between 2008 and 2017 were identified. Loop ileostomy closure was performed on 354 individuals. Closure technique or chemotherapy had no effect on the outcome but low serum albumin 3.5 g dL^{-1} and a longer interval between ileostomy closure were independent contributing factors for ileostomy closure morbidities.

In our study all patients skin closed with purse string suture technique.

In our study all patients anastomosed with handsewn technique. no any patient anastomosed with stapled technique.

CONCLUSION

This prospective observational single center study was conducted in department of surgery, N.S.C.B. Medical college, Jabalpur in 100 consecutive patients admitting for restoration of intestinal continuity between November 2019 and September 2022. A prediction model was developed for POI after loop ileostomy closure and included 14 variables. The model maintained good performance on external validation. From the present study we concluded that early age, female sex, low BMI, with comorbidity [DM, HBsAg, tuberculosis etc.], obstruction patient with less HB, less albumin/total protein, low platelets count, low potassium level, raised leucocytes count, raised creatinine level with late stoma reversal interval, long hospital stays strongly associated with post stoma

closure paralytic ileus development while chronic tobacco chewers protective for it. Study have also found that hypertension, typhoid etiology, trauma history and post-chemotherapy have no any effect in post stoma closure paralytic ileus. Mortality rates are 5% after stoma closure. Major complications are paralytic ileus (7%), bowel obstruction (7%), wound infection (17%), diarrhoea (2%), nausea/vomiting (6%), urinary retention (28%) are found. About 3% cases go to prolonged paralytic ileus which goes to death.

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