ORIGINAL ARTICLE

Association of Risk Factors for the Mortality and Morbidity of Stoma Closure

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ABSTRACT

Background: Anastomal leakage is a main surgical difficulty and requires stoma closure.

Objective: To find associated risks for mortality and morbidity of stoma closure.

Study Design: Retrospective cohort study

Place and Duration of Study: Department of Surgery Ward 2, Jinnah Sindh Medical University/Jinnah Postgraduate Medical Centre Karachi from 1st July 2020 to 30th June 2021.

Methodology: One hundred and twenty patients undergone rectal carcinoma surgeries were enrolled. The complications were graded by Clavien-Dindo classification system. The stoma closure was done by two different methods; the anterior wall technique or resection with anastomosis. Time duration of surgery, scoring by American Society of Anaesthesiologists was done and clinical and demographic information documented.

Results: There were 62.5% males while 37.5% females and mean age was 65.5±8.5 years range between 31 to 72 years. Vascular blood supply affected leaking anastomaly. No significant effect of stoma type or closing technique was seen. However the time of stoma (p=0.044) and ASA score closure was a main risk for causing complications and increasing morbidity or mortality chances.

Conclusion: Time of closure, American Society of Anaesthesiologists score as well as vascular supply are risk factors for morbidity or mortality in stoma closure.

Keywords: Surgical stoma closure, Risk factors, Morbidity, Mortality

INTRODUCTION

Leakage from anastoma is a major important surgical difficulty post rectal surgery.¹ Due to increase morbidity and mortality chances this is a highly important issue which needs emergent attention for life saving. Clinically featured leakages are noticed in 3-30% of carcinoma cases where lower-anterior surgery has been performed.² The rate of death associated with anastomatic leaking is around 6-22%.³

The factors which enhance its risks are several but unfortunately not well explored. Neo-adjuvant therapies, age of patients, length of operation, gender male, comorbidities, height of anastoma, peripheral coronary disease with reduced vascular supply could be risk factors. In order to prevent from severe consequences of leaking anastoma proper timely action is mandatory. Stoma closure by diverting enter-ostomy is an established surgical procedure. The similar process has been suggested by "working group for colon/rectal carcinoma" who proposed use of this process in carcinoma patients especially those in declined health conditions has shown promising results.⁴ However there has been critical questioning regarding this procedure as stoma closure is a very difficult procedure and cannot be handled by young surgeons.⁵⁻⁷

An increased risk of morbidity and mortality is associated with it. Reviews have reported 17% post-operative morbidity with a risk of 7.2-7.6% of bowel obstruction after surgery. The risk of leaking anastoma or perforation of bowel is around 1.4-2% and 1.2% respectively.⁵⁻⁸ Therefore the opted type for stoma closure is dependent on surgeon's choice with 3 various ways including anterior-wall technique, resection requiring end to end, anastomosis, hand stitched/stapled, or it can be latero lateral-anastomosis. The present study was designed to assess the risk factors associated with morbidity and mortality during stoma closure.

PATIENTS AND METHODS

This retrospective cohort study was conducted at Department of Surgery Ward 2, Jinnah Sindh Medical University/Jinnah Postgraduate Medical Centre Karachi from 1st July 2020 to 30th June 2021 and comprised 120 patients. Diverting ileostomy or

colostomy patients were included. During primary surgical operation surgeon opted the best suited procedure for stoma closure. Patients with rectal carcinoma operation having divertingstoma were enrolled as study cases. Gastro-grafin enema or else colonoscopy were performed on all patients before stoma closure. A routine pre-operation of distal as well as proximal bowel with complete cease of oral intake prior (25 hours before) to operation was performed. Antibiotic were started before surgery as a single shot. Data regarding gender, age, American Society of Anaesthesiologists (ASA) score and post-operated complications was documented at initial as well as stoma closure surgery. The two opted techniques were anterior wall technique with intact mesenteric side of bowel while closing entero-stomy transversely. A double layer procedure was adapted. Other opted technique was resection with anastomosis with resecting bowel and had stitching. The complications recorded were further classified by Clavien-Dindo classification (CDC) with additional data of surgical site infection recorded. ¹⁰ Data was statistically analyzed by SPSS-24.0 using t test and chi square. P value less than 0.05 was considered significant.

RESULTS

There were 75 (62.5%) males while 46 (37.5%) of females. The mean age was 65.5 ± 8.5 years. The ASA scoring showed highest frequency of ASA score 2 followed by 1 (Table 1)

There were total 57 lleostomy and 63 colostomy with 40 such participants who had anterior wall sutures performed while on 80 patients resection with anastomosis was conducted. There were more colostomy 52.5% cases than ileostomy 47.5%. Similarly more resection with anastomosis 66.6% was performed than anterior wall sutures 33.3% (Table 2). The Clavein-Dindo Classification (CDC) showed that 0-2 CDC score were highest inpatients than other scoring (Fig 1).

A complete analysis of overall complications and severe complications was recorded for analyzing the effect of various factors on rate of complication. It was seen that no significant effect of stoma type or closing technique was noticed nor did age negatively influenced stoma closure. However the time of stoma and ASA score closure was a main risk for causing complications and increasing morbidity or mortality chances (Table 3). Table 1: Clinical features of patients (n=120)

Variable	No.	%
Age (years)	65.5±8.5	
Gender		
Male	75	62.5
Female	45	37.5
ASA scoring		
1	35	29.2
2	68	56.6
3	16	13.4
4	1	0.8
Time to closure (31-912 days)	249	

Table2: Stoma type and closure technique adapted

Variable	Anterior Wall Sutures	Resection With anastomosis	Total
lleostomy	4 (7%)	53 (92.9%)	57 (47.5)
Colostomy	36 (7.1%)	27 (42.8%)	63 (52.5)
Total	40 (33.3%)	80 (66.6%)	120 (100%)

Table 3: The effect of various factors of rate of complication

Type of closure	sutures n=40	anastomosis n=80	P value
Overall complications	3(7.5%)	14 (17.5%)	>0.05
Critical complications	1(2.5%)	4 (5%)	>0.05
Age	<64 years	>64 years	
Overall complications	4 (10%)	11 (13.8%)	>0.05
Critical complications	1 (2.5%)	5 (6.25%)	>0.05
Status of ASA	ASA 1 & 2	ASA 3 & 4	
Overall complications	7(17.5%)	62(2.5%)	<0.05
Critical complications	3(7.5%)	1 (1.3%)	>0.05
Stoma Type	lleostomy	Colostomy	
Overall complications	5(12.5%)	10(2.5%)	>0.05
Critical complications	2(5%)	3(3.75%)	>0.05
Time of closure	<245 days	>245 days	
Overall complications	3(7.5%)	14(17.5%)	0.044
Critical complications	1 (2.5%)	4 (5%)	> 0.05



Clavien-Dindo Classification

Fig. 1: Clavein-Dindo classification among patients

DISCUSSION

There has been evidence that diverting stoma in rectal carcinoma surgery can be a promising procedure to reduce mortality and morbidity. A study recommended this procedure as lifesaving surgical technique. It assists in decreasing sepsis which could be seen due to leaking of anostoma.¹¹⁻¹² Controlling the leakages rate post-surgery can avoid requirement for stoma closure.¹³ The mean age of patients recruited in this study was 65.5 years. Studies have shown age related complication risk in stoma closure. However current study could not find any strong association of age with life threatening risk building during stoma closure.¹⁴

The male gender has also been associated as a risk factor for increasing morbidity and mortality in patients. In current study there were more males than females. It clearly predicts there higher frequency of rectal carcinoma in males than females which also comes for stoma closure surgeries. A multi-regression study stated that male sex and operating times are two main risk factors for increasing morbidity/mortality in stoma closure patients.¹⁵ The time of surgery was documented as crucial in the present study findings as well as in other literature.^{15,16} Late closure of stoma has been related with stoma complications prolapse, hernia, peristomal fistula or dermatitis and retraction.¹⁷ The ASA score is also an important factor in causing increased risk of mortality in stoma closure patients. The anastomal leakage can be due to vascular inadequate supply which consequently makes sufficient vascular supply as a factor predicting risk and morbidity in patients.¹⁸⁻²¹

CONCLUSION

Time of closure, ASA score and vascular supply are risk factors for morbidity or mortality in stoma closure.

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