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Comparison of frequency of complications in loop versus divided colostomy in patients with high variety anorectal malformation

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KEYWORDS

Anorectal malformation
Divided colostomy
Loop colostomy

ABSTRACT

Background: The objective of this study was to compare frequency of stoma related complications of loop versus divided sigmoid colostomy for the management of high variety anorectal malformations.

Methodology: This RCT was conducted in the department of Pediatrics Surgery Department of the Children's Hospital and the Institute of Child Health Lahore, for the period of one year from 1st May 2016 to 1st June 2017. One hundred and twenty patients (Sixty patients in each group) of anorectal malformation meeting inclusion criteria were taken in this study. Patients were divided into two groups randomly using lottery method; loop sigmoid colostomy in Group-A and divided sigmoid colostomy in Group-B. After surgeries patients were followed weekly up till 8 weeks. Stoma related complications (as per operational definition) were noted.

Results: The mean age in group -A and group-B were 3.34 ± 1.12 days and 3.36 ± 0.97 days, respectively. In group - A there were 52(86.67%) male and 8(13.33%) females, and in group-B there were 45(75%) male and 15(25%) female patients. In group-A 22(36.66%) patients had complications [3(5.00%) patients had retraction, 8(13.33%) had prolapse, 4(6.67%) had stoma obstruction, parastomal hernia were seen in 4(6.67%), stoma necrosis were seen in 3 (5.00%)] and in group-B, 16(26.66%) patients had different complications [1(1.67%) patients had retraction, 3(5.00%) had prolapse, 5(8.33%) had stoma obstruction, parastomal hernia were seen in 2(3.3%), stoma necrosis were seen 5(8.33%)]. The complications in group-A were higher when compared to group-B, but (p-value = 0.650) were not significant statistically except for stoma prolapse.

Conclusion: Though complication rate in both techniques is not statistically different but frequency of stoma prolapse is more in loop colostomy group. Therefore, divide colostomy should be opted as preferred technique.

INTRODUCTION

Colostomy formation in newborns with anorectal malformations (ARM) is lifesaving, though a trend of primary procedures is in vogue in certain types of ARM.[1] Various types of colostomy formation have been in use at various pediatric surgery centers. The common types of colostomy used for staged correction of high variety ARM, especially in male neonates, are divided colostomy and loop colostomy. Both have their benefits and drawbacks and optimal technique is still debatable.[2,3] Main difference in both techniques is attributed to the associated complications. Therefore, this study was conducted to identify frequency of types of complications in both techniques.

MATERIALS AND METHODS

This Randomized control trial (unregistered) was conducted at the Pediatrics Surgery Department of the Children's Hospital and the Institute of Child Health Lahore from 1st May 2016 to 1st June 2017, after approval of synopsis from IRB and UHS, with 8 weeks follow up. The neonates with ARM who needed a stoma as first stage of staged correction of ARM, were divide in two groups randomly using a lottery method. The patients randomized to group A were operated by sigmoid loop colostomy whereas those in group B undergone divided sigmoid colostomy.

Basic demographics (age and sex) and clinical history (type of anorectal malformation) was obtained after

taking informed consent form legal guardians. For loop sigmoid colostomy (group-A), the stoma was brought out as a loop, and the loop is prevented from retraction by using a skin bridge passed under the mesenteric border. For divided sigmoid colostomy (group-B), a small V shaped gap is made in mesentery, preserving the marginal artery; bowel is divided and fixed to the peritoneum and fascia. The two separate ends were brought on the surface. Proximal stoma was placed in lateral part and upper part of incision and distal stoma in medial and lower part of the incision. These patients were followed weekly up till 8 weeks. Stoma related complications were noted. All the data were collected and analyzed with SPSS V.20.

RESULTS

The mean age in group –A and group-B were 3.34 ± 1.12 days and 3.36 ± 0.97 days, respectively. In group – A there were 52(86.67%) male and 8(13.33%) females, and in group-B there were 45(75%) male and 15(25%) female patients. Overall, there was a male preponderance with 97/120 (81%) male neonates and rest were females. Despite randomization group B contains more female subjects compared to group A. Gestation age was comparable in both groups. Regarding frequency of types of complications, stoma retraction, stoma obstruction, parastomal hernia, stoma necrosis, and overall complications were not significantly different in both groups (Table 1). Only stoma prolapse was statistically more in sigmoid loop colostomy group (Table 1). Effect modifiers (gender, gestational age, and age at presentation) did not have any significant confounding effect on the stoma complications.

DISCUSSION

Colostomy formation for ARM is one of the commonly performed surgical intervention in all over the world. Two popular methods of colostomy formations being used in cases of anorectal anomalies are divided colostomy and loop colostomy at the level of descending or sigmoid colon.[1-5] Every technique has its own merits and demerits. Common complications of colostomy formation in case of anorectal anomalies are mucosal prolapse, colostomy stenosis, mucosal bleeding, anemia, parastomal herniation or evisceration, stoma retraction, urinary tract infection, and distal fecal impaction.[1-7]

Oda et al.[8] compared complications of loop vs divided stoma in patients with ARM and found significantly more complications in loop colostomy group [31.5% in loop colostomy and 15.5%, in divided colostomy ($p=0.031$). Of many stoma related complications, on multivariate analysis, only stoma prolapse was found significantly different. Similarly, in this study, only

stoma prolapse was only stoma related complication which was statistically more in loop colostomy. Stoma prolapse is most common in transverse loop colostomy followed by sigmoid loop colostomy. The continuation of the mesenteric side of colon is presumed to be the main reason of transmitting reverse peristalsis generated in the distal unused colon, thus leading to prolapse. Recurrent stoma prolapse not amenable to other measures is usually dealt with forming a divided stoma. Thus, it is predictable that primary divide stoma must have a less chance of getting stoma prolapse.

Divided stoma is preferred in patients with ARM. Pena advised to narrow down the lumen of distal stoma before anchoring it the abdominal wall. This further prevents incidence of stoma prolapse in these children.[1,2] The narrowed lumen of distal stoma is sufficient to admit a catheter for performing a distal colostogram, later during the management. The other theoretical benefit that a divided stoma can provide is less chances of urinary tract infections (UTI). As we know majority of patient with high variety ARM especially in male babies, there is a fistula of rectum with urinary tract. Divided stoma prevents fecal spillage from proximal stoma to the distal stoma thus can potentially avoid the chances of UTI. A meta-analysis evaluated twenty-six studies with 3866 neonates with ARM in which 2241 patients had loop colostomies and 1994 divided colostomies. Meta-analysis demonstrated no significant difference in the incidence of UTIs, (OR: 2.55 [0.76, 8.58], $p=0.12$), while loop colostomies had a significantly higher prolapse rate.[9] Therefore, stoma prolapse is the only significantly more complication in loop colostomies that at times need another operation for revision thus increasing the morbidity and treatment costs. Similarly, in our study, all the stoma related complications were comparable in both techniques, but stoma prolapse was significantly more in loop stoma group.

CONCLUSION

In our study frequency of types of stoma related complications was more in loop colostomy group, though statistically insignificant. Stoma prolapse was significantly less in the divided group. So, based on these findings, a divided stoma should be preferred in neonates with ARM.

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Table 1: Comparison of both groups

		Loop sigmoid Colostomy (Group A)	Divided sigmoid Colostomy (Group B)	Total	P-value
Gender	Male	52 (86.67%)	45 (75%)	97 (80.83%)	
	Female	8 (13.33%)	15 (25%)	23 (19.17%)	
	Total	60 (100%)	60 (100%)	120 (100%)	
Gestational age	Preterm	19 (31.67%)	22 (36.67%)	41 (34.17%)	
	Term	41 (68.33%)	38 (63.33%)	79 (65.83%)	
	Total	60 (100%)	60 (100%)	120 (100%)	
Retraction	No	57 (95%)	59 (98.33%)	67 (96.67%)	
	Yes	3 (5%)	1 (1.67%)	4 (3.33%)	
	Total	60 (100%)	60 (100%)	120 (100%)	0.750
Prolapse	No	52 (86.67%)	57 (95%)	109 (90.83%)	
	Yes	8 (13.33%)	3 (5%)	11 (9.17%)	
	Total	60 (100%)	60 (100%)	120 (100%)	0.010
Stoma Obstruction	No	56 (93.33%)	55 (91.67%)	111(92.50%)	
	Yes	4 (6.67%)	5 (8.33%)	9 (7.50%)	
	Total	60 (100%)	60 (100%)	120 (100%)	0.197
Parastomal hernia	No	56 (93.33%)	58 (96.67%)	114 (95%)	
	Yes	4 (6.67%)	2 (3.33%)	6 (5%)	
	Total	60 (100%)	60 (100%)	120 (100%)	0.190
Stoma necrosis	No	57 (95%)	55 (91.67%)	112 (93.33%)	
	Yes	3 (5%)	5 (8.33%)	8 (6.67%)	
	Total	60 (100%)	60 (100%)	120 (100%)	0.079
Complications	No	38 (63.33%)	44 (73.33%)	82 (68.33%)	
	Yes	22 (36.66%)	16 (26.66%)	38 (31.66%)	
	Total	60 (100%)	60 (100%)	120 (100%)	0.431

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