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ORIGINAL ARTICLE

Are the Loop Colostomies Safe in Management of High Anorectal Malformations ?

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ABSTRACT

Background: Colostomy is generally component of the neonatal population's management

of high anorectal malformation (ARM). **OBJECTIVES:** To evaluate the outcome of loop colostomies in management of high ARM patients and compare it with Devine's colostomies outcome. **DESIGN:** A case control retrospective prospective study. **SETTING:** pediatric surgery department, Zagazig university hospital. **PATIENTS AND METHODS:** All patients who were managed with colostomy for high ARM and had definitive repair during the period of January 2017 to January 2019. Outcomes relative to the type of the colostomy were compared. **RESULTS:** There were 30 patients managed for high ARM with colostomy as staged procedures, 17 males and 13 females. Patients had a colostomy at a median age of 2 days and were closed at a median of 9 months. Presence of fistula was in 18 patients. There were 15 loop and 15 divided colostomies. Operative time for loop colostomy creation was shorter than with divided colostomy (35 minutes vs 60 minutes, $P=0.04$). Operative time for loop colostomy closure was shorter than with divided colostomy (47 minutes vs 79 minutes, $P=0.032$).

There was no differences in complications of creation of loop and divided colostomies, There was differences in complications of closure ($p= 0.033$).

CONCLUSIONS: Loop colostomy has a shorter operating time of formation and closure and comparatively less complications compared to the separated colostomy. Our information suggest that loop colostomy may be more beneficial for high ARM patients than Devin's colostomy.

Keywords: simple loop colostomy, high anorectal malformation, with divided colostomy, the neonatal population.

INTRODUCTION

Anorectal malformations (ARM) make up a broad range of illnesses involving the distal rectum and anus as well as the urinary and genital systems. In a staged operation, high-type ARM is managed, and colostomy is generally the first. One of the variables prompting some pediatric surgeons to advocate main repair of ARM was colostomy complications. (¹) Colostomy is already conducted in neonates with high type ARM as part of staged management. (¹)

The colostomy is a life-saving procedure in newborns with high ARM. Indeed, the procedure may be followed by complications, particularly in resource limited settings. (²)

Defuncion colostomy may be performed as part of staged management in children with ARM to relieve obstruction, avoid urinary tract faecal contamination in those with rectourinary fistula, as well as prevent perineal wound faecal contamination after the definitive surgery. (³)

The favorite colostomy in management of high ARM is a descending colostomy, i.e.

made from the descending part of the colon placed in the lower-left quadrant of the abdomen, with simple loop stoma, because of it is easy to create and close, low rate of complications and its cosmetic advantage .⁽⁴⁾

Our research compared the result of simple loop and defunction colostomy in ARM patient' management.

PATIENTS AND METHODS

This prospective retrospective randomized study was done at The Pediatric Surgery Department, Zagazig University Hospital .This study was carried out on 30 patients with high ARM, during the period of study January 2017 – January 2019.

Demographic data were collected including gestational age, sex, birth weight, age of first presentation, consanguinity, associated congenital anomalies and type of fistulae. Operative data were collected including operative time and intra-operative complications, early post-operative complications , time of discharge and hospital stay, Complications associated with stoma including prolapse, retraction, parastomal hernia, urinary tract infection, exoriation of the skin, complications after PSARP, and complications after closure of colostomy including wound infection, leak, bowel obstruction and ugly scars. Written informed consent was obtained from all participants and the study was approved by the research ethical committee of Faculty of Medicine, Zagazig University. The work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Statistical analysis: The collected data was analyzed using SPSS (IBM, USA) software statistical computer package version 25. For quantitative data, the range, mean and standard deviation were calculated and the comparison between the two groups was done by unpaired student t-test. For qualitative

data, frequency and percentage were calculated and the comparison between the two groups was done using Chi-square test (X^2) or Fisher's Exact Test. The level of significance was adopted at **P value < 0.05**.

RESULTS

Over (24) months study period (30) patient were operated for management of high anorectal malformations in three stages: colostomy creation, definitive surgery (PASRP) and closure of colostomy.

The patients were divided into two group: **group A** prospective group of 15 patients, which were loop colostomy created in 1st stage of management, **group B** retrospective group of 15 patients, which were divided colostomy created in 1st stage of management. The total Females were (13) and total males were (17), the study is performed in neonatal and infantile ages, gestational age, sex, birth weight were described in (**table 1**). Associated anomalies were in 12 cases (5 loop and 7 divided), fistulae presence was in 18 cases (10 loop and 8 divided) (**table 2**). The colostomy was created at a median of 2 days and closed at a median of 9 months, Loop colostomies had a shorter operating time compared to Devine's colostomies, the average operating time for loop colostomy was 35 minutes and 60 minutes for Devine's colostomies respectively, (**P= 0.04, Table 3, figure 1**). Stoma related complications occurred in 17 patients 9 in loop group and 8 in divided group. There was no difference between both groups in development of stoma related complications (**table 4**). Loop colostomies had a shorter operating time compared to separated colostomies, average operating time for loop was 47 minutes and 79 minutes for separated colostomies. (**P= 0.032**). Divided colostomies were more liable to develop post closure complications *as wound infections and ugly scars* than loop colostomy (**table 4, figures 2,3, p= 0.033**)

Table (1): the descriptive data of the studied groups with high anorectal anomalies

	Group A (Loop)	Group B (Divided)	Test of Sig.	P value
Gestational age				
Mean±SD	39.13± 1.08	37.6± 0.762	T = - 0.76	0.508
Full term(37wks-42wks)	15 (100%)	15 (100%)		
Sex				
Male	8 (53%)	9 (60%)	X ² = 0.119	0.7298
Female	7 (47%)	6 (40%)		
Birth weight (gm)				
Mean±SD	3046±399	3320±479	T = 0.276	0.784
Average birth weight	15 (100%)	15 (100%)		

Table (2): associated congenital anomalies, fistulae presence and Stoma creation operative time in the studied groups

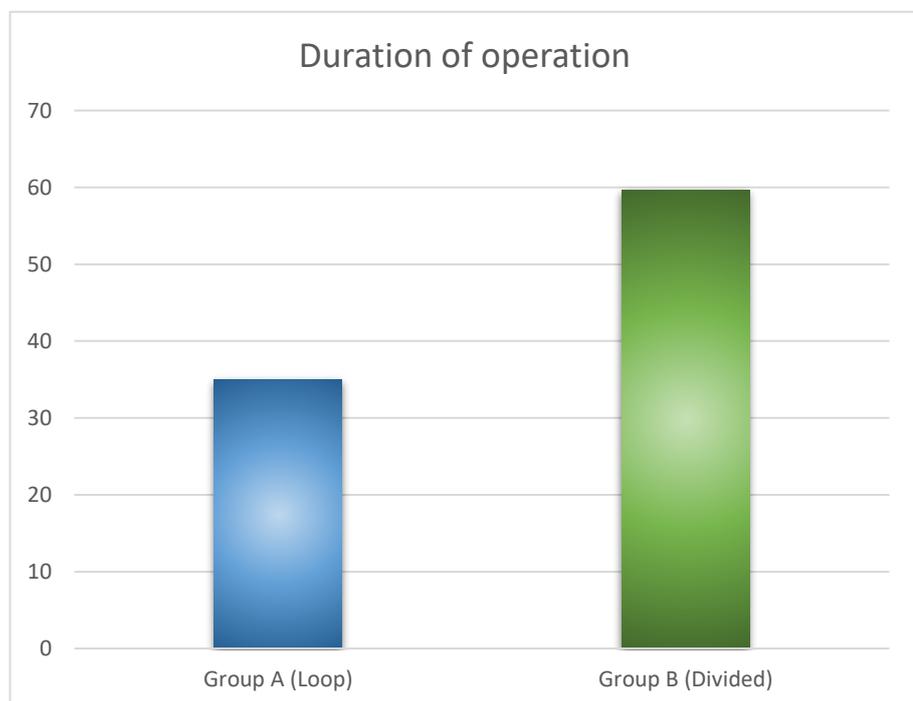
Associated anomolies		
Group A (Loop)	Group B (Divided)	P value
5 (33.3%)	7 (46.7%)	0.603
Fistulae presence		
Group A (Loop)	Group B (Divided)	P value
10 (66.7%)	8 (53.3%)	0.547

Table (3): Stoma creation operative time and stoma related complications in the studied groups

Stoma creation operative time				
	Group A (Loop)	Group B (Divided)		
Mean±SD	35±6.28	60±9.77		
Range	30-55	40-70		
T test (unpaired)	-3.7729			
P value	0.04			
Stoma related complications				
	Group A (Loop)	Group B (Divided)	X ²	P value
Retraction	0	0	-----	-----
Prolapse	5 (33.3%)	4 (26.7%)	4.497	0.339
Parastomal Hernia	3 (20%)	5 (33.3%)	2.596	0.27
Urinary Tract Infection	6 (40%)	5 (33.3%)	5.862	0.1011
Excoriation	9 (60%)	7 (46.7%)	2.596	0.31

Table (4) : Duration of operation(closure of colostomy) , post closure complications

Stoma closure operative time			
	Group A (Loop)	Group B (Divided)	
Mean±SD	47±7.432	79.67±13.425	
Range (minutes)	45-70	60-100	
T test (unpaired)	-5.889		
P value	0.032		
Complications post closure of colostomy			
	Group A (Loop)	Group B (Divided)	P value
Wound infection	2 (13.3%)	6 (40%)	0.033
Leakage managed conservative	----	1 (6.7%)	1
Leakage managed surgical (re do)	----	----	----
Obsruction	----	----	----
Ugly scar	1 (6.7%)	6 (40%)	0.0324

**Figure (1):** Operative time of colostomy creation in studied groups

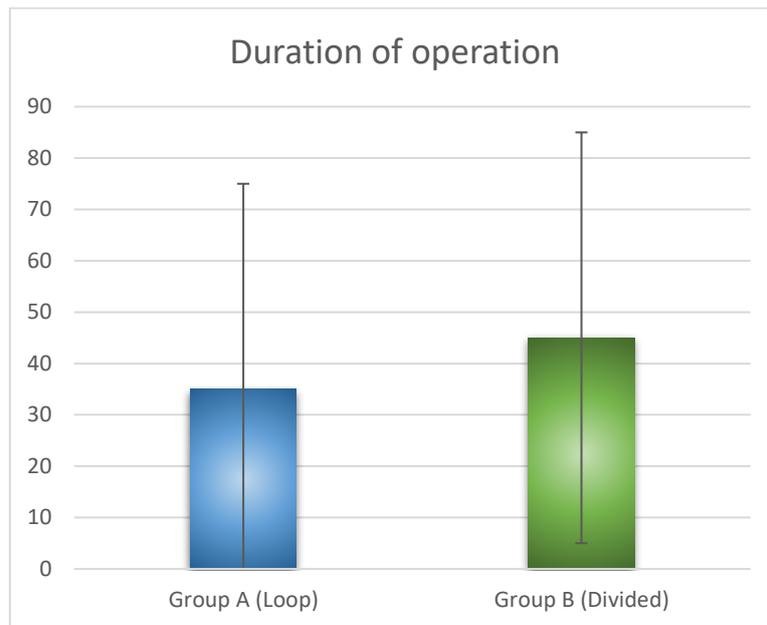


Figure (2): Operative time of colostomy closure in studied groups

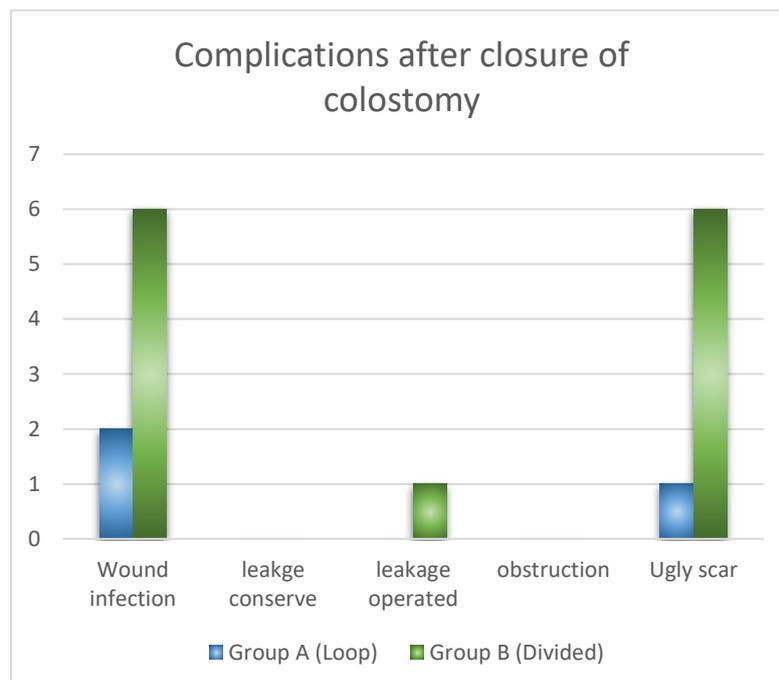


Figure (3): Complications post colostomy closure in studied groups

DISCUSSION

In a staged fashion, high-type ARM is operated , and colostomy is generally the first operation. One of the variables prompting some pediatric surgeons to advocate main repair of ARM was the complications of colostomies.

It has been proposed that defunctioning sigmoid colostomy with skin bridge separated

the proximal stoma from the distal mucous fistula enables the colostomy bag to be installed on the proximal opening , which protects against urinary and genital tract infection, megarectum, and wound infections. Separated sigmoid colostomy can lead to better radiological finding and a reduced the incidence of prolapsed ⁽⁵⁾. On the other hand, Because of a small incision, the loop

colostomy has better cosmetic outcomes and is simpler in creation and closure.

A recent research showed a higher incidence of prolapse in loop colostomy than separated colostomy, but in other problems such as urinary tract infection or megarectum there was no distinction between the two groups⁽⁶⁾. Indeed,

Our results showed no differences between the loop and divided colostomies in stoma related complications ($p= 0.349$).

In a recent research, loop colostomy was within shorter operative time in creation and closure and relatively less complications compared to the separated colostomy⁽⁷⁾ This goes hand in hand with our results which revealed that loop colostomy took significantly shorter time to create and closure and gives less complications post closure when compared to the divided colostomies which take longer operative time in closure and more complications rate (as wound infections and ugly scars).

No statistical differences were met in age, sex, associated anomalies, type of fistula, stoma related complications hospital stay and time of discharge.

CONCLUSION

Compared to the divided colostomy, the loop colostomy has a smaller operating time and comparatively less problems. Our findings suggest that simple loop colostomy may be more beneficial for high ARM patients than separated colostomy. Despite being deemed easy, colostomy continues a sensitive operation requiring excellent surgical abilities and postoperative care to

avoid complications. In addition, early definitive repair and therefore early colostomy closure can minimize morbidity.

Declaration of interest

The authors report no conflicts of interest. The authors along are responsible for the content and writing of the paper.

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None declared

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