

**MORBIDITY AND MORTALITY OF COLOSTOMY IN CHILDREN**<sup>1</sup>\*Dr. Iqra Fatima, <sup>2</sup>Muhammad Astaghees Tayyab and <sup>3</sup>Dr. Ahmed Muaz<sup>1</sup>PMDC # 87582-P.<sup>2</sup>PMDC # 87644-P.<sup>3</sup>PMDC # 78212-P.

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**ABSTRACT****Background:** Colostomy is a common procedure in children and may be attended by many complications.**Objective:** To determine the various causes, various types of colostomies, outcome (morbidity and mortality) of colostomy in pediatrics. **Patients and method:** This prospective study was conducted in the Department of Pediatric Surgery of Lahore Children Hospital over a period of 2 years (between May 2015 and April 2017) and included all the children (age limit of 0 days to 12 years) presented and managed by creation of colostomy.**Results:** There were 88 children, their mean age was 9.96 months (Range: 1 day to 7.8 years). The male to female ratio was 3.6:1. The indications for colostomy were congenital anomaly (94.3%). Complications after colostomy formation were encountered in 31.8% patients and the commonest complication was stenosis (11.4%). It was neither related to the age nor to the primary indication for the colostomy  $p>0.05$ , but it was related to operator experience, the observed inter-operator difference was statistically significant,  $p=0.041$ . **Conclusion:** A significant number of colostomies in children is constructed largely due to Hirschsprung's disease.**KEYWORDS:** Hirschsprung's disease.**INTRODUCTION**

The first successful deliberate colostomy operation was in 1793, when Duret formed an iliac colostomy for imperforate anus in a 3-day-old child. The patient lived for 45 years after the operation.<sup>[1]</sup>

Since then colostomies have been performed successfully, and the stoma formation has been available as a surgical option in the treatment of complicated gastrointestinal diseases.<sup>[2-5]</sup>

A colostomy is a surgically fashioned colo-cutaneous fistula for the diversion of faeces and flatus away from distal pathology or a surgical site, or, at times, as a permanent new anus. Indications for childhood colostomies differ from those in older persons. Although permanent colostomies are rarely indicated in childhood, common congenital colonic and anorectal conditions as well as a few acquired ones often need temporary colostomy as a lifesaving procedure in children.<sup>[6]</sup>

There are different surgical options for colostomy depending on the site of obstruction such as transverse loop/divided or sigmoid loop/divided colostomy. These approaches have advantages and disadvantages.<sup>[7]</sup>

A variety of complications, some of which with high incidence, have been reported. Even with careful technique, there is marked morbidity and mortality associated with formation of colostomy.<sup>[8]</sup>

Keeping in view the importance of colostomy in pediatric age group and the high incidence of complications associated with it, a study was conducted to explore our experience with colostomy in a teaching hospital.

**PATIENTS AND METHOD**

All pediatric patients who underwent colostomy procedure between May 2015 and April 2017 were enrolled in this Cohort study prospectively after acceptance of the pre-given informed consent by their parents. The patients were analyzed for their ages, gender, colostomy indications, colostomy types, operator, complications and mortality. The data were analyzed using SPSS program. Numerical data was expressed as percentage, and mean  $\pm$  standard deviation. The original diagnoses of the patients were; congenital anomaly in 83 (94.3%) that included: Hirschsprung's disease in 46 deviation and compared between groups using Chi square test. The confidence level was set at 95% CI and.

**RESULTS**

The study included 88 child, their mean age was 9.96 p values less than 0.05 were statistically considered

months (Sixty-nine male, and 19 female) with male to significant. female ratio of 3.6:1. Their age distribution shown in table 1.

**Table 1: Age group of study patients (n=88).**

Age group	Gender				Total	
	Male		Female			
	No.	Percent	No.	Percent	No.	Percent
< 1/12	26	29.5.6	12	13.6	38	43.2
1/12-1 year	19	21.6	5	5.7	24	27.3
> 1 - 5 years	19	21.6	—	—	19	21.6
> 5 years	5	5.7	2	2.3	7	8.0
<b>Total</b>	<b>69</b>	<b>78.4</b>	<b>19</b>	<b>21.6</b>	<b>88</b>	<b>100.0</b>

(52.3%), anorectal malformation in 37 (42.1%), and others in 5 (5.7%) that included: bowel ischemia in 2 (2.3%), severe perineal trauma 1 (1.1%), rectal inflammation in 1 (1.1%), and descending colon tumor in 1 (1.1%).

Associated co-morbid conditions that included urogenital malformation, congenital heart disease, hypospadias, Down's syndrome and Cleft lip & palate were encountered in 9 (10.2%) of patients with congenital anomaly.

In 68 (77.3%) of cases the operation was performed by resident on training, and 75 (85.2%) was carried out at emergency set.

Sigmoid colostomy was performed in 90.9%. Types of colostomy were loop, divided, double barrel and end colostomies in 49 (55.7%), 37 (42%), 1 (1.1%) and 1 (1.1%) respectively. It was properly fashioned in 85 patients (96.6%), while it was improper in site and in size in 2 (2.2%), and 1 (1.1%) of cases respectively, this was not affected by the operator as the observed difference was not significant, p=0.15 (Table 2).

**Table 2: Fashioning colostomy by operator.**

Operator	Site								Total	
	Proper		Improper site		Improper type		Improper both site & type			
	No.	%	No.	%	No.	%	No.	%	No.	%
Pediatric surgeon	11	12.5	—	—	—	—	—	—	11	12.5
General surgeon	8	9.1	—	—	—	—	1	1.1	9	10.2
Registrar	66	75	1	1.1	1	1.1	—	—	68	77.3
<b>Total</b>	<b>85</b>	<b>96.6</b>	<b>1</b>	<b>1.1</b>	<b>1</b>	<b>1.1</b>	<b>1</b>	<b>1.1</b>	<b>88</b>	<b>100.0</b>

**P= 0.15**

Mean hospital stay was  $5.6 \pm 3.8$  days. Follow-up was complete in this group of 88 patients and involved monthly visits for the first 6 months, visits every 3 months for the remaining 6 months, and then yearly visits. Follow up was up to two years or till closure of colostomy following definitive procedure, during which 28 patients (31.8%) developed complications following colostomy procedure. The complications of colostomy formation observed were stenosis (11.4%), skin excoriation (4.5%), obstruction (4.5%), stoma prolapse (2.3%), para-stomal hernia (2.3%), ischemia (2.3%), abscess (2.3%), and others (2.3%). Mean postoperative time of development of these complications was  $20.8 \pm 59.1$  days.

Majority of these complications were observed in patients whom their primary diagnosis and indication for creation of colostomy was congenital anomalies (89.2%), table 3 shows the incidence of complications depend on the primary diagnoses.

**Table 3: Indication of colostomy.**

Indications for colostomy	Frequency	%
Anorectal malformation	14	50
Hirschsprung's disease	11	39.2
Bowel ischemia	1	3.6
Severe perineal trauma	1	3.6
Rectal inflammation	1	3.6
Descending colon tumor	0	—
Others	0	—

Development of complications neither related to the age nor to the primary indication for the colostomy p=0.3 and p=0.7 respectively. Whereas it was related to operator experience; 20/28 (71.4%) of those were encountered in stomas set by registrars, 5/28 (17.9%) in operation carried out by a general surgeons and 3/28 (10.7%) in that performed by a pediatric surgeons, the observed difference was statistically significant, p=0.041 (Table 4).

**Table 4: The rate of surgical complications according to the experience of the operator.**

Surgical complication	Operator						Total	
	Pediatric surgeon		General surgeon		Registrar			
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
No complication	8	9.1	4	4.5	48	54.5	60	68.2
Ischemia	—	—	—	—	2	2.3	2	2.3
Skin irritation	1	1.1	1	1.1	2	2.3	4	—
Abscess	—	—	—	—	2	2.3	2	2.3
Obstruction	—	—	—	—	4	4.5	4	4.5
Stenosis	1	1.1	3	3.4	6	6.8	10	11.4
Parastomal hernia	—	—	—	—	2	2.3	2	2.3
Prolapse	—	—	1	1.1	1	1.1	2	2.3
Other	1	1.1	—	—	1	1.1	2	2.3
<b>Total</b>	<b>11</b>	<b>12.5</b>	<b>9</b>	<b>10.2</b>	<b>68</b>	<b>77.3</b>	<b>88</b>	<b>100.0</b>

**P= 0.04**

Mortality was observed in 7 (8%) cases. The cause of mortality in majority was development of pneumonia and sepsis.

## DISCUSSION

The mean age of 9.96 month at colostomy formation in this study indicate that most of our patients presented late for treatment. The reason for this delay in presentation may be the lack of pediatric surgeons in our sub-region. The late presentation may also be related to the preference of parents for traditional methods of treatment and their recourse to hospitals when their expectations are not met. It follows therefore that a public health enlightenment program may help to achieve early handling and management of such health problem.<sup>[9]</sup>

When performing colostomy, some basic concepts should be taken into account, such as: location, which should be far from the surgical incision; prior demarcation; hole size, whose extension should be close to two to three fingers (around 5 cm); proper bowel mobilization, free of tension and with good blood circulation.<sup>[10]</sup> In this study 96.6% of stoma was properly fashioned.

Some authors advocate that performing de-functioning stoma technique rather than the loop technique can minimize complications from colostomy.<sup>[11,12]</sup> Other studies observed no significant difference in morbidity between de-functioning and loop colostomy.<sup>[8,13]</sup> Although a colostomy has remained an important option in the care of many childhood conditions, its attendant morbidity and mortality have been the subject of many studies.<sup>[6]</sup> Clearly in our set routinely uses the loop colostomy as this method has been associated with ease of fashioning and closure as supported in earlier reports.<sup>[14]</sup> In spite that it is not free of problems, the loop colostomy has been acclaimed as ideal for most temporary indications which, luckily, are quite common in childhood.<sup>[6,15,16]</sup>

Variety of complications has been reported in the literature.<sup>[7]</sup> The overall complication rate of 31.8%

following colostomy formation in this study is similar to the 25.2 to 74% morbidity reported in earlier studies.<sup>[6,7,11, 15,17-20]</sup>

In the current study the rate of colostomy complications was common (89.2%) in patients treated because of congenital anomalies, this finding supporting others who advocated that the rate of colostomy complications occurring during the treatment of congenital anomalies may be high despite the surgical advances.<sup>[21]</sup>

The literature indicates stomal stenosis rates between 0.7 and 6.3%.<sup>[15,18,20]</sup> In our study, the rate of stomal stenosis was found as 11.4%, is higher than that reported in the literature. We have the opinion that stomal stenosis or obstruction could be related to the surgical technique. All stenosis cases were operated in the training period of the registrars.

## CONCLUSION

Unlike adults, colostomy in pediatrics in majority of the cases is due to congenital anomalies. Formation of colostomy in children should not be considered as a minor procedure. In our experience colostomy formation is associated with appreciable morbidity and mortality.

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