

# AUDIT OF COLOSTOMY AMONG PEDIATRIC PATIENTS IN SHEIKH ZAYED HOSPITAL, RAHIM YAR KHAN

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## ABSTRACT

**Background:** Colostomy is a commonly performed surgical procedure, for management of various congenital & acquired anomalies. **Objective:** The main objective of this study was, to evaluate the indications, types and complications of colostomy in pediatric surgical patients. **Setting:** Department of Pediatric Surgery, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan. **Duration** 1<sup>st</sup> January 2011 to 31<sup>st</sup> December 2011. **Patients and Methods:** A total of 82 neonates, infants and children who underwent creation of colostomy during this period for various congenital and acquired disorders of colon, rectum and anus were included in this descriptive study. The patients who were operated upon previously or operated elsewhere and referred due to stoma complication were excluded from the study. Data was collected on a comprehensive performa which included patients' demographics, medical history, indications and complications of intestinal stoma. Data was entered and analyzed in SPSS version 15. **Results:** Out of eighty two patients, 57 (69.52%) were male and 25 (30.48%) were females. 34 (41.46%) cases were neonates. Common indications for colostomy were, Anorectal malformations 34 (41.46%), hirschsprung disease 22 (26.83%), blunt trauma abdomen 5 (6.10%), rectovaginal fistula and fire arm injury 4 (4.87%) each. Sigmoid loop colostomy with skin bridge was made in 33 (40.24%) and sigmoid loop colostomy without skin bridge in 31(37.80%). Transverse colostomy was made in 10 (12.19%), ascending colostomy in 4 (4.87%), cecostomy in 2 (2.43%) and end colostomy in 2 (2.43%). In 22 patients (26.83%) associated anomalies were found in this series. The common stomal complications were parastomal skin excoriation 18 (21.95%), colostomy prolapse 13 (15.85%), bleeding from stoma 13 (15.85%), dehydration 12 (14.63%), infection 11 (13.41%) electrolyte imbalance 7 (8.53%) and adhesion obstruction 7 (8.53%). Mortality rate after colostomy was 6 (7.32%). **Conclusion:** Morbidity after stoma formation is very high even in experienced hands. Pediatric patients have high frequency of complications/problems after intestinal stoma formation. Colostomy is the most commonly performed procedure due to anorectal malformation and Hirschsprungs disease. Parastomal excoriation, stomal prolapse and bleeding from stoma are the main complications.

**Key Words:** Intestinal stoma, Loop colostomy, Hirschsprung disease, Indications, Complications

## INTRODUCTION

Colostomy is created when a portion of the large gut is removed or bypassed and remaining portion of the functioning large intestine (colon) is brought through the abdominal wall, creating a stoma. Colostomy is frequently employed in the management of children with congenital/acquired conditions of the colon or anorectum. In developed countries, primary pull through operations are increasingly performed to treat Hirschsprungs disease (HD) and anorectal malformation.<sup>1</sup> Stomas of gastrointestinal tract represent one of the most commonly performed surgical procedures in the practice of pediatric surgery. The wide variety of congenital anomalies and functional disorders of intestinal tract encountered by the pediatric surgeon has led to development of different varieties of intestinal stoma at different level. Colostomy plays a vital role in the

management of children with many congenital and acquired colorectal and anal disorders.<sup>2,3</sup> The basic purpose of performing the colostomy is simply to divert the fecal stream till the definitive procedure is performed. Care must be exercised to select the appropriate site for colostomy. Constructional classification of colostomy is based on how the stoma is created and is of two major types: loop colostomy and divided colostomy. Loop colostomy is an opening made on the antimesenteric border of the colon with out completely dividing it. The stoma may be looped over a rod/tube to prevent retraction. Because some enteric material still enters the distal bowel, it is in essence a non defunctioning stoma.<sup>3,1</sup> In divided colostomy the bowel is completely divided and there is no continuity between the stoma. The most common variations of divided colostomy are the double barrel colostomy, devine colostomy and end colostomy. The objective of this study was to evaluate the indications, types and complications of intestinal colostomy in pediatric surgical patients in Sheikh Zayed Medical College/Hospital, Rahim Yar Khan.

## PATIENTS AND METHODS

This cross sectional, descriptive study was carried out in Pediatric Surgical Department Sheikh Zayed

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Medical College/Hospital, Rahim Yar Khan, which is a tertiary care hospital. This study was conducted from 1<sup>st</sup> January to 31<sup>st</sup> December 2011. A total of 82 neonate, infants and children underwent creation of colostomy during this period for various congenital and acquired disorders of colon, rectum and anus were selected by non probability convenience sampling. All neonates, infants and children up to 12 years of age, the patients who required large intestine stoma (colostomy) formation as a part of their management were included in the study, whereas, children more than 12 years of age. The patients who were operated upon previously or operated elsewhere and referred due to stoma complication were excluded from study. A predesigned proforma was used for collection of information including age, sex, associated anomalies, types of lesion, indication of stoma, type of stoma, site of stoma and its complications.

All the data was entered and then analyzed by SPSS version 15. All patients were followed for three months. Early complications like bleeding from stoma, stoma necrosis, stoma retraction, infection or parastomal evisceration were noted and managed accordingly. Late complications like stomal prolapse, stomal stenosis, parastomal evisceration, parastomal excoriation, dehydration, electrolyte imbalance, adhesion obstruction and fecal impaction were recorded and managed accordingly. Re operation due to major complication and any mortality was also noted. The data was entered and analyzed in SPSS 15.

## RESULTS

A total of eighty two patients, with 57 (69.51%) male were included in study. Male to female ratio was 2.33:1. Thirty four (41.46%) patients were neonate, 27 (32.92 %) children fall between 1 month to 5 year of age and 21 (25.60%) children were between 5 to 12 years.

The most common indication for colostomy formation was anorectal malformation (imperforate anus of high variety) 34 (41.46%) in which sigmoid colostomy was performed. The second commonest reason for stoma formation was hirschsprungs disease 22 (26.83%). Other indications for stoma formation were blunt trauma abdomen 5 (6.10%), rectovaginal fistula and fire arm injury 4 (4.87%) each, adhesion obstruction and common cloacae 3 (3.65%). (Table I)

**Table I: Indications of Colostomy (N=82)**

Indications	Number	Percentage
Imperforate anus high variety	34	41.46
Hirschsprungs disease	22	26.83
Blunt trauma abdomen	05	6.10
Rectovaginal fistula	04	4.87
Fire arm injury	04	4.87
Adhesion obstruction	03	3.65
Common cloacae	03	3.65
Perineal trauma due to road traffic accidents	02	2.44
Intussusceptions	02	2.44
Mass abdomen	02	2.44
Sacroccocygeal Teratoma (huge)	01	1.22

**Table II: Colostomy Complications**

Complications	Number	Percentage
<b>Early</b>		
Bleeding from stoma	13	15.85
Dehydration	12	14.63
Infection	11	13.41
Para stomal evisceration	04	4.88
Burst abdomen	03	3.65
Stoma retraction	03	3.65
Stoma necrosis	02	2.44
<b>Late</b>		
Parastomal skin excoriation	18	21.95
Stoma prolapse	13	15.85
Electrolyte imbalance	07	8.53
Adhesion obstruction	07	8.53
Stoma stenosis	05	6.10
Fecal impaction	03	3.65
Polyp formation	01	1.22
Metabolic acidosis	01	1.22
Death	06	7.32

Different types of colostomies were constructed according to the primary disease and surgeon's preference. The most common variety was double barrel sigmoid colostomy 33 (40.24%) and loop sigmoid colostomy 31(37.80%). Transverse colostomy was created in 10(12.19%), ascending colostomy in 4 (4.8%), end colostomy in 2 (2.43%) and cecostomy 2 (2.43%) children. Out of 82 patients, 22 patients have associated anomalies; cardiovascular anomalies in 5 patients, down syndrome in 4, meningomyelocele in 3, umbilical polyp in 3, Telipes equinoverus in 2, trachea-esophageal fistula in 2, hypospadias in 2 and cleft lip with palate in one patient. All patients were followed for early and late complications of colostomy. Parastomal excoriation was the most common (21%)

complication, followed by bleeding from stomas and prolapse 15.81% each. Other complications were; dehydration 14%, infection 13%, electrolyte imbalance 8% and adhesion 8% (Table II). All patients were investigated for associated anomalies. Cardiovascular disorder was most commonly seen with anorectal malformation in 6.09% and Down syndrome was seen with Hirschsprungs disease in 4.88%.

## DISCUSSION

The colostomy is usually performed as an emergency procedure in the neonatal and pediatric age group. In children colostomy may be required as a crucial part of treatment of congenital anomalies of the large bowel. Colostomy formation and subsequent closure are important surgical procedures in the management of Hirschsprung disease, high and intermediate anorectal malformations and neonatal necrotizing enterocolitis.<sup>4</sup> Out of total eighty two patients operated for colostomy, 57 (69.51%) were male. This is probably due to the rapid healthcare seeking attitude for males in our society. The incidence of Hirschsprungs disease is almost four times more common in males as compared to females.<sup>5</sup> In another study, out of 182 children for colostomy for large bowel anomalies, 133 (73.1%) were male and 49 (26.9%) were females.<sup>6</sup> In our study, thirty four children (47.57%) undergoing for colostomy were neonates and mostly were operated due to anorectal malformation. Sixteen (19.51%) children fall between 1 month to 1 years of age and reason for colostomy in this age group was mainly due to Hirschsprungs disease. Eleven cases (13.41%) were 1 to 5 years of age. In a study, mean age for colostomy formation was 15.5 days (range 3-75 days) and mean age for Hirschsprungs was 4.6 year (range 8 days to 15 year). The most common indication for colostomy in our study was imperforate anus of high variety where 34 (41.46%) children under went stoma formation. The second most common cause for colostomy was Hirschsprungs disease, where 22 (26.83 %) children were operated for large bowel stoma. In another study, 48.68% children were operated for imperforate anus and 44.94% children were operated for Hirschsprung disease. Similarly in a study conducted at Childrens Hospital Karachi, colostomy was performed due to anorectal

malformation in 71 (58.68%) and Hirschsprungs disease in 41 (33.88%) children.<sup>8</sup> Another study conducted by Ekenze, colostomy was performed due to Hirschsprung disease in 106 (58.24%) and anorectal malformation in 76(41.76%).<sup>6</sup> Similarly in another study conducted by Ameh, indication of colostomy was anorectal malformation in 28 (49.12%) and Hirschsprung disease in 29 (50.88%).<sup>9</sup>

Indication	Our Study	Saleem et al <sup>7</sup>	Sheikh MA <sup>8</sup>	Ekenze SO <sup>6</sup>	Ameh EA <sup>9</sup>
Imperforate anus	34 (41.46 %)	130 (48.68 %)	71 (58.68 %)	76 (41.76 %)	28 (49.12 %)
Hirschsprungs disease	22 (26.83 %)	120 (44.94 %)	41 (33.88 %)	106 (58.24 %)	29 (50.88 %)

Other causes of colostomy formation in our study were blunt trauma abdomen 5 (6.10%), Rectovaginal fistula 4 (4.87%), Fire arm injury 4(4.87%), Adhesion obstruction 3 (3.65%), Common cloaca 3 (3.65%), Intussusceptions 2 (2.44%), Mass abdomen 2 (2.44%) and Perineal trauma 2 (2.44%). The most common indication for colostomy in this series was anorectal malformation (Imperforate anus) and Hirschsprungs disease. For both these indications care must be exercised to select appropriate site and type for stoma formation. In case of imperforate anus the segment of colon to be used for colostomy should be carefully examined and sufficient length of colon must be left distal to stoma so that subsequent definitive procedure (Posterior Sagittal Ano Recto Plasty) can be performed with out tension. Choosing the level of colostomy in case of Hirschsprungs Disease demand special facilities. The ideal position for a colostomy in this disease is the most distal normally ganglionic gut, 3 to 4 cm proximal to the transitional zone identified by frozen section histopathology.<sup>10</sup> In our study, sigmoid colostomy with skin bridge was performed in 33 (40.24%), sigmoid loop colostomy without skin bridge in 31(37.80%), transverse colostomy in 10 (12.19%), ascending colostomy in 4 (4.87 %), end colostomy in 2 (2.43%) and cecostomy in 2 (2.43%) children. In a study, the site of colostomy was sigmoid colon in 32%, transverse colon 8.75%, and descending colon 12.5 %. Loop colostomy with skin bridge was the special modification which we made in order to reduce stoma complications more over it will act as a true defunctioning stoma. Associated anomalies were also recorded and total 22 (26.83%) anomalies were identified. In our study, all patients were followed for early and late complications. Parastomal skin excoriation was the most common complication in our study. It usually occurs due to



continuous wetting of the surrounding skin, enzymatic digestion of the macerated tissue, allergic reaction to effluent and bacterial or fungal growth to exposed tissue. Total 18 children (21.95%) suffered from skin excoriation. Out of these, 11 were with anorectal malformation, 5 cases of Hirschsprungs disease, one perineal trauma and one common cloaca. The reported incidence of skin excoriation in other series is 21.98%<sup>6</sup> and 16.85%.<sup>7</sup> Stoma prolapse is a common, often frightening and distressing complication to the child and family. Stomal prolapse was seen in 13(15.85%) children. Out of thirteen, 7 cases were of Hirschsprungs disease where loop colostomy was performed without skin bridge. Four cases of anorectal malformation were prolapsed. In our study, prolapse was more common in loop colostomies especially in those cases where skin bridge was not made. Prolapse usually occurs when a loose stoma is created after shrinkage of dilated bowel especially in Hirschsprungs disease. The reported incidence of stomal prolapse in other series is 6.8%<sup>10</sup>, 20.32%<sup>6</sup>, 17.98%<sup>7</sup> and 33%.<sup>12</sup> Prolapse can be prevented by careful circumferential application of interrupted suture between colon and abdominal wall fascia. Another technique for temporary control of prolapsed stoma, described by Gauderer<sup>13</sup>, involves the placement of "U" stitch.<sup>13</sup> Bleeding from stoma was noted in 13 (15.85%) cases. Bleeding usually occurs from the mucosa or stoma edge. It was more common in neonates. In most of the cases pressure with a gauze pad was sufficient to control bleeding. However, in two cases fresh blood transfusion and vitamin K injection solved the problem. Dehydration was noted in 12 (14.63%) cases. This was due to decreased intake and excessive loss of fluid from colostomy fistula especially proximal type. All these patients were admitted and IV fluid was started. Infection of the stoma site was seen in 11 (13.41%) cases. Broad spectrum antibiotic was started and one case of intussusception was re-operated due to burst abdomen.

Mortality was seen in 6 (7.32%) patients. Three patients operated for high variety imperforate anus were expired. One due to septicemia, one due to severe cardiac defect and one child was re-operated due to colostomy necrosis and ultimately expired. One patient with HD associated with

downs syndrome could not survive. One transverse colostomy child due to Fire arm injury, expired as there was shattered spleen and pancreatic injury. Another mortality was due to massively enlarged right Willms tumour in which debulking done along with ascending colostomy. Mortality in other series was (3.3%),<sup>8</sup> 11.5% and 5.3%.<sup>17</sup>

Over all morbidity and mortality after colostomy formation is very high. The complication rate is higher in emergency operations in children and elderly.<sup>14</sup> In this series loop colostomies without skin bridge have high rate of complications as compared to loop colostomies with skin bridge, especially prolapse of stoma was commonly seen with loop colostomies. According to Pena<sup>15</sup> most colostomy complications are preventable using separated stomas in descending colon. Another study conducted by Cheung MT<sup>10</sup> on 322 stoma patients concludes that the creation of an abdominal stoma should not be regarded as a minor surgical procedure and certain stomas such as loop transverse colostomy should be avoided where ever possible. It is very important create a skin bridge between the proximal and distal loop in order to avoid prolapse and retraction. The skin bridge loop colostomy is complication free and well tolerated by patients in a series published by C S Milner.<sup>18</sup>

## CONCLUSION

Stoma creation is a major undertaking, associated with considerable morbidity and mortality. It is most commonly performed for the purpose of temporary stool diversion in anorectal malformations and Hirschsprungs disease in children. Parastomal excoriation, stomal prolapse, bleeding from stoma and dehydration are the common complications of colostomy. Careful surgical technique minimizes complications and promotes good ostomy function. Colostomy operations should not be underrated or relegated to the lowest member of the surgical team.

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