

## Colostomy in Children: Indications and Complications

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### ABSTRACT

**Objective:** To determine the indication and frequency of complications occurring with construction of colostomy in children.

**Methodology:** This descriptive study was conducted at Paediatric Surgery department of PMC Hospital and at Mumtaz Medical Center (Pvt.) Nawab Shah, from April 2008 to December 2009. All patients who required colostomy as the part of management were included in this study. The patients who were operated upon previously or elsewhere and were referred after having colostomy, were excluded. In all patients loop colostomy was performed. Complications after colostomy construction were noted on a proforma.

**Results:** Thirty-seven colostomies were created in 36 patients. Sigmoid loop colostomies were 51.35%, Right and left transverse colostomies in 24.32% each. All patients were operated due to congenital anomalies. Twenty-eight patients had anorectal malformation and 8 Hirschsprung's disease. Common Complications related to stoma were excoriation of skin 58.82% and prolapse of stoma (50%). Anaemia due to chronic blood loss was seen in 53.33% of patients. Transverse loop colostomy had higher number of complications / problems as compared with sigmoid loop colostomy. Five (13.88%) patients died (Three because of septicaemiae, one because of high grade fever at home, and one died on 2<sup>nd</sup> of PSARP, the cause could not be ascertained.

**Conclusion:** Construction of colostomy in paediatric patients carries high frequency of complications and requires careful technique. A sigmoid loop colostomy is an ideal as it has minimal complications. Stoma care clinic and enterostomal therapist can be helpful in educating families for stoma care and to decrease the incidence of complications.

**KEY WORDS:** Colostomy, Complications, Children.

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## INTRODUCTION

Bowel Stomas play vital role in the management of variety of congenital and acquired gastrointestinal conditions in paediatric population.<sup>1</sup> Colostomy is a commonly constructed intestinal stoma in infants and children<sup>2</sup> and among its major indication are anorectal malformations.<sup>3,4</sup> and Hirschsprung's disease.<sup>5</sup> The basic purpose of performing this procedure is diversion of faecal matter till the definitive procedure is performed.<sup>6</sup>

Contrary to adults, colostomy in children is a temporary procedure carried out for benign conditions. In developed countries, primary pull-through operations are increasingly being performed to treat Hirschsprung's disease and anorectal malformations.<sup>7-9</sup> This is not so in developing countries of Asia and Africa, and colostomy has continued to be life

saving and routine procedure in the management of children with these anomalies.<sup>1-3,10</sup> Since colostomy in children is usually performed for the treatment of non-malignant conditions and is temporary, there is tendency to relegate colostomy-related procedures to minor importance. However, serious complications may result from improper technique and follow-up.<sup>4,10,11</sup> Even with careful technique, there is marked morbidity and mortality associated with formation of colostomy.<sup>10-13</sup>

This study was conducted to determine the indication and frequency of complications/problems occurring with construction of colostomy in children.

### METHODOLOGY

This prospective descriptive study was conducted at department of Paediatric surgery of Peoples Medical College Hospital Nawab Shah and Mumtaz Medical Center (pvt), from April 2008 to December 2009. All the patients requiring a colostomy were included. Patients operated elsewhere and referred for definitive surgery or with complications of colostomy, were excluded.

In each case, a detailed history and physical examination followed by relevant investigations were carried. In all cases loop colostomy, sigmoid or transverse, was performed. Sigmoid colostomy was usually performed, except in conditions where lesion was high or preference of operating surgeon. In majority of cases of ARM (16/28) sigmoid loop colostomy was done. Right and left transverse colostomy was created in those cases of ARM who were sick, had huge distention of abdomen due to late presentation or those who had high anomaly. In cases of HD colostomy site was chosen on contrast enema finding as well as visual finding of dilated colon. We do not have facility of frozen section Histology. Colon was brought out as loop, and loop was prevented from retraction by using an anchoring tube passed underneath the mesenteric border of bowel to be removed on the 7<sup>th</sup> postoperative day. After fixing loop with peritoneum and fascia, the loop was opened longitudinally with diathermy and edges stoma were stitched with skin.

Different types of complications/problems occurring were noted on a proforma. Colostomy care was explained to parents by the author.

### RESULTS

Thirty-six patients had 37 colostomies. One female patient developed leakage following ERPT and a redo stoma was made. There were 28 (77.77%) patients with anorectal malformations (one anal stenosis and two rectal atresia) and eight (22.85%) of

Hirschsprung's disease. Twenty-two were males and 14 females in both groups with male female ratio of 1.57:1. Ages at time of creation of colostomy ranged from one day to four years. Ages of patients with ARM ranged from one day to 15 months (mean 55.67 days). Twenty-one out of 28(75%) patients of ARM were under five days of age at the time of creation of colostomy. Six out of 28 patients of ARM who had colostomy at relatively older age (mean age 7 months & 11 days) were females having vestibular fistula. Ages of patients of Hirschsprung's disease at time of creation of colostomy ranged from six days to four years (mean 8.27 months). The four years old boy presented with residual Hirschsprung's disease. In 24/36 (66.66%) patients, including one patient who developed leakage following ERPT, colostomy was created in emergency. Table-I shows indication of colostomies in all patients. Most of the patients with anorectal malformation were operated in emergency because of obstruction whereas most patients of Hirschsprung's disease were operated electively.

In our series all patients had loop colostomies. There were 19/37 (51.35%) Sigmoid, 9/37 (24.32%) right transverse and 9/37 (24.32%) left transverse colostomies. Three patients expired on 2<sup>nd</sup> or 3<sup>rd</sup> day after creation of colostomy due to septicaemia, leaving 33 patients with 34 colostomies who were followed up.

Two patients had significant bleeding during surgery. In one patient brisk bleeding occurred due to accidental injury to inferior epigastric artery during creation of stoma. Bleeding stopped on thermo coagulation. In 2<sup>nd</sup> patient there was minimal bleeding from stoma edges at time of creation, however later he developed profuse bleeding & dressing was completely soaked. On removal of dressing some blood clots were seen and there was ooze from stoma edges. Bleeding stopped after cautery.

Occasional bleeding from the stoma due to local injuries was observed in almost all cases on followup. Usual cause of injury was, the cloth applied over stoma, rubbing of thigh against stoma by neonates, touching of prolapsed stoma with ground when baby crawled and scratching of stoma with their hands by older babies. Haemoglobin was available in 30 patients. Sixteen (53.33%) out of 30 patients developed anaemia during course of colostomy from chronic blood loss.

Complications directly related to stoma were seen in 23 patients. Some patients had two or more complications. Most common complication related to stoma was the excoriation of skin around stoma, which occurred in 20 (58.82%) out of 34 colostomies. In

Table-I: Indications of Colostomy.

Diagnosis	No. of patients
Anorectal Malformations	25 ( M-14, F11 with RVF)
Rectal Atresia	02 (M-2, F-0)
Anal Stenosis	01 (M 1 year old)
Hirschsprung's disease	08 (M-5, F-3)
Leakage following ERPT	01 (F)

80% cases excoriation occurred with transverse colostomies. Excoriative dermatitis ranged from simple hyperemia to deep excoriation. Seven out of 20 cases had simple hyperemia which resolved spontaneously. Next common problem was the prolapse, which occurred in 17 (50%) out of 34 colostomies. In majority (88.23%) of cases prolapse occurred with transverse colostomies. Other complications are shown in Table-II.

In this series five (13.88%) patients died. Three patients died within two days of creation of colostomy due to septicaemia. One patient died of high grade fever, reported by parents on phone, at age of about six months. Another patient died on next of PSARP following fits & fever at age of six months. All patients had imperforate anus. Four patients had sigmoid loop colostomy and one had left transverse loop.

## DISCUSSION

Colostomy is a life saving procedure for neonates with ARM and HD, simplifies the management of colorectal anomalies in others and decreases the risk of infection associated with final repair.<sup>1,4,9</sup> The colostomy is usually performed as emergency procedure in paediatric age group.<sup>3,12,14</sup> In this study the most common indication was anorectal malformation (77.77%) followed by Hirschsprung's disease (22.85%). This observation is similar to other studies,<sup>1-3,12,15</sup> but is at variance with the studies of Uba and chirdan<sup>10</sup> and Nour et al<sup>11</sup> where Hirschsprung's disease has been reported to be the most common indication. Creation of colostomy for acquired conditions, like trauma, tumour and labour complication has been reported in some series.<sup>1-3,10</sup> In our series we did not see any acquired condition and

colostomy was solely indicated for congenital anomalies. The reason could be that span of our study was short and number of patients was also small.

In our series, like Gauderer, high sigmoid loop colostomy was the preferred procedure.<sup>16</sup> Because transverse colostomy is one of fastest to create, in one study it was mainly used.<sup>2</sup> In series of Khan et al all the colostomies were of loop type, 90% were transverse and 10% pelvic position.<sup>12</sup> Saleem et al<sup>3</sup> earlier used to perform transverse loop colostomy but due to high incidence of complications transverse loop colostomies, they preferred to perform completely divided high sigmoid colostomy. In series of sheikh et al<sup>1</sup> 72% of patients had sigmoid colostomy. We performed transverse colostomy in patients who had high anomaly or in those who were unstable. All colostomies were of loop type.

New born babies have bleeding tendency due to vitamin K deficiency.<sup>12</sup> Osifo et al<sup>2</sup> have noted bleeding from stoma edge in 13 (28.3%) out of 46 patients that was controlled with pressure dressing. Two of these children had problematic bleeding due to diathesis. In our series only two (5.55%) patients had problematic bleeding. In one due to accidental injury to inferior epigatric artery, while in 2<sup>nd</sup> there was mild bleeding from edge of stoma at the time of creation but later on developed profuse bleeding from colonic bleeder. In both bleeding was controlled with thermo coagulation. In rest of our patients there was no or very minor and negligible bleeding from stoma during surgery.

Bleeding due to frictional injuries to exposed loop of colon has been reported to be common.<sup>12</sup> In our series almost all patients there was history of occasional, on and off bleeding from stoma from repeated trauma. Reason for this was that it is difficult to secure a stoma bag in babies due to small size and secondly the cost is too high. All the mothers in our study used common cloth for covering the colostomy. Thus stoma was predisposed to external trauma; cloth itself also caused frictional injury. In some patients a continual blood loss over a long period may result in profound anaemia. Sixteen (53.33%) out of 30 patients, in whom Hb% level was available,

Table-II: Complications / Problems of Colostomy.

Complication	Sigmoid colostomy	Left transverse colostomy	Right transverse colostomy	Total
Skin excoriation	4	8	8	20(58.82%)
Prolapse	2	7	8	17(50%)
Retraction	3	1	1	5(14.70%)
Stenosis	1	0	0	1(2.94%)
Incomplete diversion	1	0	0	1(2.94%)
Lateral stoma	3	0	0	3(8.82%)
Colostomy diarrhea	1	1	0	2(5.88%)

developed anaemia due to chronic blood loss. This observation is quite similar to Sheikh et al<sup>1</sup>, who have reported chronic blood loss varying from 39% to 75% in different groups with over all incidence of 51.2%. Saleem et al<sup>3</sup> reported 4.11% incidence of this complication while Chandramouli et al<sup>17</sup> reported 10.3%.

Excoriation of skin, occurred in 20 (58.82%) out of 34 colostomies. Eighty percent occurred with transverse colostomies. This incidence correlates with the incidence reported by Osifo OD et al<sup>2</sup> Sheikh et al<sup>1</sup> Uba et al<sup>10</sup>, but is quite high than Saleem et al<sup>3</sup> and Khan et al who have reported 16.85% and 14.4% of excoriation respectively.

Colostomy prolapse occurred in 17 (50%) colostomies. Fifteen (88.23%) of prolapse occurred with transverse colostomies. Sheikh et al<sup>1</sup> have reported 18.3% incidence of prolapse in anorectal malformation group and 46.3% in Hirschsprung's disease group. In their study prolapse of stoma was more common in transverse colostomies, as in our study, with statically significant difference ( $p < 0.001$ ). They have also quoted from literature the incidence of prolapse of 12% to 73%. Saleem et al<sup>3</sup> have reported 17.98% incidence of recurrent prolapse of stoma. Prolapse reported by other series is 20.7%<sup>10</sup>, 18.8%<sup>11</sup> and 32%<sup>12</sup>. In Nour et al's series 73% of prolapses occurred with loop transverse colostomy.<sup>11</sup> Prolapse with transverse colostomy is more common because of mobile nature of transverse colon. Different methods have been adopted to control the prolapse but none is satisfactory<sup>2</sup>. We managed all cases of prolapse conservatively.

Retraction of stoma was observed in 14.70% of patients. In one of them incomplete diversion of faeces was noted after PSARP. Other studies have reported incidence to be 8.35- 17%.<sup>1,12,15</sup> The results of our series are comparable with these studies but are at variance with Saleem et al<sup>3</sup> who have reported 1.87% incidence. Retraction was more common (60%) in sigmoid colostomies probably due to inadequate mobilization of bowel. Stenosis of stoma was seen in one (2.94%) colostomy that was also laterally placed. The reported incidence is 1.44% to 8.7%.<sup>1-3,10,11</sup>

Three colostomies (8.82%) were placed too laterally. One of them was stenosed. These colostomies were performed by one of resident. Sheikh et al<sup>1</sup> have reported too lateral/ medial stoma in two (4.8%) colostomies in anorectal malformation group of patients. No other reference could be found.

In this study five (13.88%) patients expired. Three expired in immediate post operative period due to septicaemia, while two patients expired later on at age of about six months due to other causes. Reported incidence of mortality was 3.3% to 16%.<sup>1,3,10-12</sup>

## CONCLUSION

The creation of colostomy should not be taken as minor surgical procedure and proper placement of stoma is vital to minimize complications. As stomal complications are more common with transverse colostomy, sigmoid loop colostomy should be performed in ARM and short segment HD. In babies adequate resuscitation before surgery and diligent post operative care is needed. A stoma care center can help in Family education and preventing complications of stomas.

## REFERENCES

1. Sheikh MA, Akhtar J, Ahmed S. Complications / problems of colostomy in infants and children. *J Coll Physicians Surg Pak* 2006;16(8):509-513.
2. Osifo OD, Osaigbovo EO, Obeta EC. Colostomy in children: Indications and common problems in Benin City, Ngeria. *Pak J Med Sci* 2008;24(2):199-203.
3. Saleem M, Saqi Z, Shaikh AH, Malik N, Imran A, Shaukat, et al. Complications of colostomy in infants and children. *Ann KE Med Coll* 1998;4(2):20-23.
4. Wilkins S, Pena A. The role of colostomy in the management of anorectal malformations. *Pediatr Surg Int* 1998;3:105-109.
5. Rogers J. Hirschsprung's disease: Diagnosis and management in children. *Br J Nurs* 2001;10:640-649.
6. Mollitt DL, Malngoni MA, Ballantive TVN, Grosfeld JL. Colostomy complications in children, an analysis of 146 cases. *Arch Surg* 1980;115:455-458.
7. So HB, Becker JM, Schwartz DL. Eighteen years' experience with neonatal Hirschsprung's disease treated by endorectal pull through without colostomy. *J Pediatr Surg* 1998;33:673-675.
8. Teitelbaum DH, Cilly RE, Sherman NJ. A decade of experience with the primary pull-through for Hirschsprung's disease in the newborn period: A multicenter analysis of outcomes. *Ann Surg* 2000;232:372-380.
9. Sowande OA, Adejuyigbe O, Ogundoyin O. Colostomy complications in infants and children. *Nigerian J Surg* 1999;6:19-22.
10. Uba AF, Chirden LB. Colostomy complications in children. *Annals of African Medicine* 2003;2(1):9-12.
11. Nour S, Stinger MD, Beck J. Colostomy complications in infants and children. *Ann R Coll Surg Engl* 1996;78:526-530.
12. Khan MNZ, Abbasi Z, Jan IA, Akhtar N, Shirazi H. Critical analysis of complications in 125 colostomies in children. *Specialist (Pak J Med Sci)* 1992;8(3):39-43.
13. Steinau G, Ruhl KM, Hornchen H, Schumpelick V. Enterostomy complication in infancy and childhood. *Langenbecks Arch Surg* 2001;386:346-349.
14. Mollit DL, Manangoni MA, Ballantine TVN, Grosfeld JL. Colostomy complications in children: An analysis of 146 cases. *Arch Surg* 1980;115:455-458.
15. Khan K, Khan MY, Waheed T. Management of colostomies in infancy. *J Postgrad Medical Inst* 2003;17(1):7-10
16. Gauderer MWL. Stomas of the Small and large Intestine. In: Grosfeld JL, O' Neill JA, Fonkalsrud EW, Coran AG eds: *Pediatric Surgery 6<sup>th</sup> Edition Philadelphia: Mosby Elsevier, Inc* 2006;2:1479-1492.
17. Chandramouli B, Srinivasan K, Jagdish S, Anthakrishnan N. Morbidity and mortality of colostomy and its closure in children. *J Pediatr Surg* 2004;39:596-599.