

Divided and Separated Sigmoid Colostomy in Anorectal Malformation : Six Years Experience at Dhaka Shishu Hospital

M D Hossain¹, M Shahjahan², M Saifullah³, K M N Ferdous⁴, M K Islam⁵

Abstract

Background : There are various surgical options for management of anorectal malformations (ARM). Colostomy is a common part of the management of high anorectal malformation in the pediatric population.

Objective : The aim of this study was to find out the most common complications after formation of divided sigmoid colostomy.

Methods : This prospective observational study was done in the Division of Pediatric Surgery, Bangladesh Institute of Child Health and Dhaka Shishu (Children) Hospital, Dhaka from January 2012 to December 2017. Divided and separated sigmoid colostomy was done on 116 patients admitted with ARM during this period. Follow up on 2nd, 4th and 8th week after operation was done and in each follow up patients were assessed clinically for wound infection, skin excoriation, prolapse of colostomy, retraction of colostomy and parastomal hernia. If colostomy complications were found then managed as per standard method.

Results : The mean age of patients was 2.43 ± 1.29 days and majority of the patients 66 (56.9%) were male. About half of the patients 50 (43.1%) had fistula and 21 (18.1%) patients had associated anomaly. Among 116 patients 51 (43.97%) developed complications after colostomy. The most common complication was skin excoriation found in 35 (30.2%) patients followed by wound infection in 8 (6.9%). Prolapse and retraction of colostomy was found only in 6 (5.17%) and 2 (1.7%) cases respectively. No patient developed parastomal hernia and there was no mortality.

Conclusion : Divided and separated sigmoid colostomy provided satisfactory outcome in the management of high anorectal malformation. Skin excoriation was the most common complication and few developed wound infection and prolapse of colostomy.

Key Words : Anorectal malformation, Divided sigmoid colostomy, Complications of colostomy

DOI: <http://dx.doi.org/10.3329/nimcj.v9i2.38914>

Northern International Medical College Journal Vol. 9 No. 2 January 2018, Page 311-314

¹Dr. Md. Delwar Hossain
MS (Pediatric surgery)
Registrar, Division of
Pediatric Neuro Surgery
Dhaka Shishu (Children) Hospital

²Dr. Md. Shahjahan
MS (Pediatric surgery)
Resident Medical Officer
Division of Pediatric Surgery

³Dr. Md. Saifullah
MS (Pediatric surgery)
Associate Professor
Division of Burn and
Reconstructive Surgery

⁴Dr. Kazi Md. Noor-ul Ferdous
MS (Pediatric surgery)
Assistant Professor
Division of Pediatric
Neonatal Surgery

⁵Prof. M Kabirul Islam
MS (Pediatric surgery)
Professor & Head, Division of
Pediatric Neonatal Surgery

2, 3, 4, 5
Bangladesh Institute of Child
Health (BICH), Dhaka Shishu
(Children) Hospital

Correspondence
Dr. Md. Delwar Hossain
Registrar, Division of
Pediatric Neuro Surgery
Dhaka Shishu (Children) Hospital
e-mail: delwarhossaindr.dsh@gmail.com

Introduction

Anorectal malformations comprises a wide spectrum of diseases, which can affect both boys and girls, and involve the distal anus and rectum as well as the urinary and genital tracts. They occur in approximately 1 in 5000 live births.^{1,2}

A number of specialized investigations may be needed at different stages of the management before definitive surgery. If the type of malformation will not allow safe or adequate passage of feces the baby will need a colostomy.³

Since the first diverting stoma performed for the treatment of imperforate anus in 1783, the site and the type of least troublesome stoma in the

surgical management of anorectal malformations (ARM) have been major subjects for discussions among pediatric surgeons.⁴

Many pediatric surgeons recommended a divided sigmoid colostomy in the left lower abdominal quadrant with a sufficient skin bridge between proximal stoma and distal mucous fistula that permits the appliance to be fitted on the proximal stoma allowing complete diversion of stool. They believe that complete stool diversion will prevent the development of megarectum, UTI and wound infection after anoplasty.⁴

Dhaka Shishu (Children) Hospital is the largest children hospital in Bangladesh. It is a 650 beds tertiary hospital for children. According to the recorded data (from January 2012 to December

2017) of surgical patients of this hospital, the incidence of ARM 3.5%. Among them about 53% patients under went colostomy.

This prospective study presents six years’ experience of common complications of divided sigmoid colostomy in ARM patients.

Materials and methods

This prospective observational study was done in the Division of Pediatric Surgery, Bangladesh Institute of Child Health and Dhaka Shishu (Children) Hospital, Dhaka from January 2012 to December 2017.

The study population was the patients of anorectal malformations (ARM) admitted at Dhaka Shishu Hospital who required colostomy. Study population were selected according to the following

inclusion criteria :

1. Age upto 7 days
2. Fistulous tract was not identified upto 24 hours of age
3. High and intermediate variety of ARM
4. Rectourinary fistula
5. Rectovestibular fistula.

Variety of ARM was diagnosed by an X-ray prone cross table lateral view with elevated buttock after 24 hours of birth for those patients where no fistulous tract was identified.

Patients’ with Pouch colon syndrome, VACTERL association, Intestinal perforation, Septicemia and DIC or other gross congenital anomalies were excluded from the study.

Prior surgery all relevant investigations were done and patient kept nothing per oral. Nasogastric suction was given 2 hourly with continuous drainage. Quarter strength normal saline with 10% dextrose in aqua was administered. All patients got Inj. Ceftazidime (50-100) mg/kg/ twice daily for 5 days, Inj. Metronidazole: 1.5 ml/kg/dose 8 hourly for 5 days, Inj. Amikacin: 15mg/kg/day in 3 divided dose for 5 days, Inj. Vitamin K: 2 mg once daily for 3 days.

After General anesthesia, proper painting with povidone iodine and draping was done. An oblique incision was made on left side of the lower abdomen. After opening of the peritoneum, divided and separated proximal sigmoid colostomy was done in three layers (Fig.-1).



Figure - 1: Divided sigmoid colostomy

All patients kept nothing per oral for 1st post operative day (POD) with intravenous fluid supplementation. Body temperature, abdominal distension, urination, condition of the stoma and wound were checked.

From 2nd-3rd POD breast milk was given along with intravenous fluid were infused according to the requirement. They were also advised to apply zinc oxide paste 40% around the stoma frequently and use stoma appliance. From 3rd -5th POD only breast milk were recommended. All the patients were discharged on 6th POD.

Then all the patients were advised to come for follow up on 2nd, 4th and 8th week after operation. In each follow up patients were assessed clinically for the wound infection, skin excoriation, prolapse of colostomy, retraction of colostomy and parastomal hernia. If colostomy complications were found, then managed as per standard method.

Data Analysis

The statistical analysis was conducted using SPSS (Statistical Package for Social Science) version 20 statistical software. The findings of the study were presented by frequency, percentage in tables and graphs. Means and standard deviations for continuous variables and frequency distributions for categorical variables were used to describe the characteristics of the total sample.

Results

The mean age of patients was 2.43±1.29 days ranged from 1 day to 7 days. The mean birth weight of patients was 2.79±0.25kg ranged from 2.2 kg to 3.1 kg (Table I).

Table-I: Age and birth weight of the participants (n=116)

Variable	Mean±SD
Age at colostomy (days)	2.43±1.29
Birth weight(kilogram)	2.79±0.25

Majority of the patients 66 (56.9%) were male. Most of the patients 105 (90.5%) were term babies. About half of the patients 50 (43.1%) had fistula and 21(18.1%) participants had associated a anomaly (Table II).

Table-II : Characteristics of the participants (n=116)

Characteristics	Frequency	Percentage
Male	66	56.9
Term baby	105	90.5
Presence of fistula	50	43.1
Presence of associated anomaly	21	18.1

Congenital urogenital malformation was found in 7 (33.3%) males and 5 (23.8%) females had cardiovascular defects (Fig.-2).

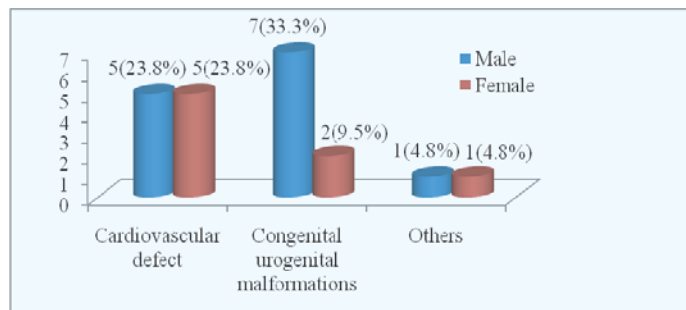


Figure-2 : Associated anomalies present in the participants (n=21)

The mean operation time was 42.08 ± 2.99 minutes. Among 116 patients 51 (43.97%) developed complications after colostomy. Skin excoriation (Fig.-3) developed in 35 (30.2%) participants, 08 (6.9%) patients developed wound infection (Fig.-4), 06 (5.17%) patients developed prolapse of colostomy and only 2 (1.7%) patients develop retraction of colostomy. No patient developed parastomal hernia (Table III). There was no mortality.

Table-III : Stoma related complication (n=116)

Type of complication	Frequency	Percentage
Skin excoriation	35	30.2
Wound infection	8	6.9
Prolapse	6	5.17
Retraction of colostomy	2	1.7
Parastomal hernia	0	0.0
Total number of patient	51	43.97



Fig 3. Skin excoriation



Fig 4. Wound infection

Complications of dividing colostomy

Discussion

Anorectal malformations are one of the most common congenital defects. Defects range from the very minor, which are easily treatable with an excellent functional prognosis, to those which are complex, difficult to manage, often associated with other anomalies and have a poor functional prognosis. The surgical approach for repairing these defects changed dramatically in 1980 with the introduction of the posterior

sagittal approach, which allowed surgeons to view the anatomy of these defects clearly, to repair them under direct vision, and to learn about the complex anatomic arrangement of the junction of rectum and genitourinary tract.¹

High-type ARM is managed in a staged fashion, and colostomy is usually the initial procedure.

Colostomy is traditionally performed as part of staged management in children with high type anorectal malformations. The level and the type of the colostomy in ARM have been a major topic for discussion among pediatric surgeons. It has been suggested that divided sigmoid colostomy with enough skin bridge between proximal stoma and distal mucous fistula allows the stoma bag to be fitted on the proximal stoma, which prevents the development of urinary tract infection, megarectum and wound infection. Divided sigmoid colostomy may result in better radiological studies and a lower incidence of prolapse.⁵

In Dhaka Shishu (Children) Hospital, many patients come for the treatment of ARM. For high and intermediate variety several types of colostomies are performed like loop colostomy, transverse colostomy, divided and separated sigmoid colostomy etc. Here the management of ARM with divided and separated sigmoid colostomy is discussed.

In this study we found that within this six years period, 116 patients underwent divided and separated sigmoid colostomy. The mean age of patients was found 2.43 ± 1.29 days which ranged from 1 day to 7 days. Most of the babies (90.5%) were termed babies where average weight of the patients was 2.79 ± 0.25 kg.

Levitt and Pena reported a slight male preponderance regarding ARM.² This fact was also found true in the current study where male preponderance (56.9%) existed. Among patients' 43.1% had fistula where male patients' had rectourinary fistula and female patients' had rectovestibular fistula. Levitt and Pena also reported that vestibular fistula is the most common finding in female patients and rectourinary fistula in male patients.²

Most babies (50% to 60%) with anorectal malformations have one or more abnormalities that affect other systems. Higher ARM abnormalities are associated with more malformations. Many are incidental findings, but others, such as cardiovascular defects, may be life threatening.² Bhargava et al. had conducted a research work in India to study the hospital incidence of anorectal malformations (ARM), frequency of various types of defects, their sex distribution and the spectrum of anomalies associated with ARM. One hundred consecutive children attending the pediatric surgery department were included in the study. Out of the 100 patients, 51 were males and 49 females. One out of every 6.62 admission was for ARM. Associated defects were urogenital, cardiovascular, gastrointestinal, genital

and limb defects.⁶ In the present study, among 116 patients, 21 (18.1%) patients had associated anomalies. Almost half of the patients (47.6%) had cardiovascular defects which include ASD, VSD and PDA. was seen. In 42.86% patients we found urogenital malformations like hydronephrosis, renal agenesis, undescended testis and hypospadias. Cleft lip and Talipesquinovarus were found in 2 patients.

Colostomy for patients with anorectal malformations decompresses an obstructed colon, avoids faecal contamination of the urinary tract, and protects a future perineal operation. The procedure is associated with several significant complications.⁵ In this study 51 (43.97%) patients developed complications after colostomy. The most common complication in this study was skin excoriation developed in 35 (30.2%) patients. It might be due to poor compliance of patients with colostomy appliance especially those from rural areas. Skin excoriation was the most common complication in Sheikh et al. study also.⁷ Sulaiman et al. found that wound sepsis was common complication following stoma formation.⁸ In our study after divided sigmoid colostomy 8 (6.9%) patients developed wound infection.

Retraction of colostomy is another complication of colostomy. In this study, two patients (1.7%) developed retraction of colostomy. Almosallam et al. conducted a retrospective study to evaluate whether the type of colostomy has an impact on outcome in patients with ARM where they found 2.04% developed retraction of colostomy.⁹ Oda et al. compared clinical outcome of loop and divided colostomies performed as part of the surgical management of ARM where they found 4.2% developed retraction of colostomy.⁴

Divided colostomy has a low risk of prolapse or retraction.¹⁰ Prolapse depends more on the level rather than the type of colostomy. A stoma in a mobile portion of the colon is more likely to prolapse than one in a fixed portion of the colon.⁹ Oda et al. found 2.8% patients had prolapse after divided colostomy.⁴ Six (5.17%) patients in the present study developed prolapse of colostomy, among which all developed on distal stoma site. Distal colostomy was done in mobile portion of sigmoid colon but it was done small and flat to prevent prolapse. In divided colostomy, proximal stoma was opened in proximal most sigmoid colon immediately distal to descending colon. Probably this was the cause of non-prolapse on proximal colostomy.

When a stoma is formed, for whatever reason, a potential site of weakness is created within the abdominal muscle due to the surgical dissection of muscle to externalize the bowel. For this, parastomal hernia is a frequent difficulty for patients with stomas.¹¹ But in this study no patient developed parastomal hernia. This might be due to the fact that patients for divided

colostomy were selected purposively and there were no major congenital anomaly other than ARM. This result is also consistent with other study where no patient developed parastomal hernia after divided colostomy.⁴

It is mentionable here that no mortality was seen in this study.

Conclusion

Divided and separated sigmoid colostomy had less complications and provided satisfactory outcome in the management of high anorectal malformation. Skin excoriation was the most common complication and few developed wound infection and prolapse of colostomy.

References

1. Pena A, Levitt MA. Anorectal malformations. *Orphanet Journal of Rare Diseases*. 2007; 2: 33.
2. Levitt MA, Pena A. Anorectal malformation. In: Coran AG, Adzick NS, Krummel TM, Laberge JM, Shamberger RC, Caldamone AA, editors. *Pediatric Surgery*. 7th edition: vol-2. Philadelphia: Elsevier; 2012:1289-1309.
3. England R. Trust Guideline for the Management of Anorectal Malformations in Neonates and Infants. Norfolk and Norwich University Hospitals. 2014. Available at: <http://www.nnuh.nhs.uk/publication/download/anorectal-malformations-in-neonates-and-infants-ca6039-v1-1> [Accessed 19 Sep. 2017].
4. Oda O, Davies D, Colapinto K, Gerstle J T. Loop versus divided colostomy for the management of anorectal malformations. *Journal of Pediatric Surgery*. 2014; 49: 87-90.
5. Pena A, Migotto-Krieger M and Levitt MA. Colostomy in anorectal malformations: a procedure with serious but preventable complications. *Journal of pediatric surgery*. 2006; 41 (4): 748-756.
6. Bhargava P, Mahajan J K, Kumar A. Anorectal malformations in children. *Journal of Indian Association of Pediatric Surgeons*. 2006; 11:136-9.
7. Sheikh MA, Akhtar J, Ahmed S. Complications and problems of colostomy in infant and children. *Journal of the college of physicians and surgeons. Pakistan: JCPS*. 2006; 16: 509-13.
8. Sulaiman TI, Zain AZ and Fadhi SZ. A Study of 100 Cases of Stomas Performed in Child's Central Teaching Hospital in Baghdad. *The Iraqi Postgraduate Medical Journal*. 2010; 9 (3): 300-305.
9. Almosallam OI, Aseeri A, Shanafey SA. Outcome of loop versus divided colostomy in the management of anorectal malformations. *Annals of Saudi Medicine*. 2016; 36(5): 352-355.
10. Curry J. Colostomy: formation and closure. In: Gearhart JP, Rink RC and Mouriquand PDE, editors. *Pediatric Urology*. 2th edition. Philadelphia: Elsevier; 2010: 615-627.
11. Thompson MJ. Parastomal hernia: incidence, prevention and treatment strategies. *British Journal of Nursing*, 2008; 17(2): S16-S20.