e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2023; 15 (12); 1662-1667

Original Research Article

Clinical Study and Management of Colostomies in Infancy and Childhood

Narendra Kumar[1], Sujoy Neogi[2], Simmi K. Ratan[3]

[1]Senior Resident (M.Ch.), Department of Pediatric Surgery, Maulana Azad Medical College and associated Lok Nayak Hospital, New Delhi

[2]Associate Professor, Department of Pediatric Surgery, Maulana Azad Medical College and associated Lok Nayak Hospital, New Delhi

[3]Director Professor & Head, Department of Pediatric Surgery, Maulana Azad Medical College and associated Lok Nayak Hospital, New Delhi

Received: 25-08-2023 / Revised: 28-09-2023 / Accepted: 30-10-2023

Corresponding author: Dr. Narendra Kumar

Conflict of interest: Nil

Abstract:

Background: The Greek word stoma, which means mouth or aperture, is where the word "stoma" originates. An intestinal stoma is a surgically made aperture that joins the front abdominal wall to a portion of the gastrointestinal system. Using different kinds of colostomies can save lives. This clinical study was conducted since, at our center, colostomies are frequently performed to treat a variety of diseases in the pediatric age group.

Methods: This study was conducted in the Department of Paediatric Surgery at Maulana Azad Medical College and associated Lok Nayak Hospital, New Delhi from November 2022 to April 2023. The patients aged day 1 to 12 years were admitted.

Results: Thirty-three pediatric colostomies were performed throughout the course of the six months study period. There were 16 (48.5%) girls and 17 (51.5%) males. When they had their colostomy, the majority of the patients were still in the newborn stage. Eleven (33.4%) patients had previously had a colostomy performed somewhere else, whereas 22 (66.6%) instances had the procedure done at our institution. Nine patients (27.3%) had transverse loop colostomies, while the majority of cases with colostomies were of the divided sigmoid form. Twelve individuals (36.36%) had significant post-colostomy problems that required medical treatment.

Conclusion: As a socio-psycho-biological unit, children suffer significant psychological distress from colostomy, as do their parents. Initial management and diagnosis depend on a thorough examination. Oftentimes, a correctly designed and indicated temporary stoma is necessary and life-saving.

Keywords: Colostomies, Anorectal malformations, Hirschsprung's disease, Loop colostomy.

Introduction

The Greek word stoma, which means mouth or aperture, is where the word "stoma" originates. [1] An intestinal stoma is a surgically made aperture that joins the front abdominal wall to a portion of the gastrointestinal system. Colostomies, a treatment used to alleviate intestinal obstruction, were first performed on children who had imperforate anus in the second half of the 18th century.

The use of stomas in children's large intestine and subsequently small intestine developed gradually, despite inconsistent early success. It seems sense that surgeons were hesitant to carry out these severe treatments because they carried a significant risk of consequences. [3,4]

When Littre saw a dead 6-day-old newborn with an imperforate anus and hypothesized that a colostomy would have saved his life, he first raised the concept of performing a colostomy. [5, 6]

In technical terms, there are two types of colostomies: loop colostomy, which includes delayed and defunct loop colostomies, and end colostomy, which includes intraperitoneal, extra-peritoneal, eversion, and trephine end colostomies. Colostomies may be performed primarily for diversion or decompression. Colostomies can be sigmoid, left transverse, or right transverse, depending on the site. [2,7]

A broad range of surgical and non-surgical pathologic disorders in newborns and children are managed with temporary and sometimes permanent stomas of the small and large intestine. More than half of stomas, aside from feeding access, occur in the neonatal period, and a further one-fourth occur in infants under one year of age. Oftentimes, an

effectively designed, medically suggested temporary stomas is necessary and life-saving. Hirschsprung's disease, high types of imperforate anus with complex pelvic deformities, colonic or anorectal injuries are among the usual indications for colostomies. [2,7] Using different kinds of colostomies can save lives.

Material and Methods

This clinical study was conducted in the Department of Pediatric Surgery at Maulana Azad Medical College and associated Lok Nayak Hospital, New Delhi from November 2022 to April 2023. Children between the ages of one and twelve were hospitalized. Patients who had colostomies performed outside of our institution and were later sent to us, as well as OPD or emergency room patients in need of one for various reasons, were also included in this study.

A comprehensive clinical examination, investigations, pre-operative work-up, and a detailed history were performed on every admitted patient in this study. The cases underwent surgical procedures, with the results tallied and the outcomes analyzed.

The sickness guided the creation of a colostomy. when a patient appeared at an emergency room with symptoms of an abrupt intestinal blockage. Prior to colostomy, pre-operative investigations, and resuscitation were performed.

During the postoperative period, antibiotics ranged from a single pre-operative dose to a course of one to five days; IV fluids were infused to correct dehydration and maintain adequate urine output until the patient's colostomy began to function or peristalsis returned; intermittent nasogastric suctioning was performed; oral feeding was started when the patient's colostomy functioned or peristalsis returned, or when nasogastric suction was negligible; the dressing was removed on the second or third day, and local antibiotic ointment was applied for five days.

Prior to discharging a colostomy patient, a thorough bowel cleanse was required. On the seventh- or tenth-day following surgery, the patients were typically discharged. After the main condition was treated, the patients were typically readmitted 3-6 months later. The colostomy closure was performed on an elective basis after 6-8 weeks of the treatment.

On an outpatient basis, follow-up was conducted, with particular attention paid to any surgical complications, colostomy care, upholding local hygiene, immunizations, and the child's growth.

The data collected was entered in MS Excel 2020. The data was analyzed by IBM SPSS version 22.0 (licensed). Proportions were calculated.

Results

33 colostomy cases that were performed throughout the course of the six-month research period were examined. There were 33 patients in all, 22 of whom had procedures done mostly in our hospital and 11 of whom had procedures done somewhere else.

Of the thirty-three patients that were part of the trial, seventeen (51.5%) were male and sixteen (48.5%) were female.

The mean age was highest in Hirschsprung's disease (6 months) and lowest in anorectal agenesis (2 days). The findings indicate that a large number of anomalies appeared within the first three days of life. Vestibular fistula appeared later, around six months after the stool solidified. With the exception of one patient who manifested on the seventh day following delivery, the average presentation period for Hirschsprung's illness is three to six months (Table 1). When they had colostomies, the majority of the patients were still in the early stages of infancy (Table 2).

Table 1: Average age at initial presentation

Pathological condition	Average age
Recto urethral fistula	3 days
Recto vesical fistula	2.2 days
Anorectal agenesis without fistula	2 days
Vestibular fistula	2.1 months
Cloacal anomaly	8.5 days
Hirschsprung’s disease	6 months

Table 2: Age distribution

Age	Number of patients N(%)
Early neonatal period (1-7 days)	14(42.4)
Neonatal period (1 week – 1 month)	3(9)
Post neonatal infant (1 month – 1 year)	11(33.3)
Children (>1 year)	4(12.1)

Anorectal abnormalities accounted for 40% of colostomies performed during the early neonatal period (ARM). Fifty percent of colostomies performed in the post-neonatal period were performed for Hirschsprung's disease.

Table 3: Clinical features in anorectal malformations

Type of ARM condition	Total N(%)	Clinical feature	No. of patients with clinical feature
Recto urethral fistula	5(15.5%)	No anal opening	5
		Passage of meconium per urethra	5
		Acute distension of abdomen	2
Recto vesical fistula	3(9%)	No anal opening	3
		Passage of meconium per urethra	3
Vestibular fistula	7(21.1%)	Passage of stool through vesibule	7
		Abdominal distension	2
Anorectal agenesis without fistula	3(9%)	No anal opening	3
		No Passage of meconium	3
		Acute distension of abdomen	3
Cloacal anomaly	4(12.1%)	Single anal opening	4
		Passage of urine, meconium through a single opening in the perineum	4

22 patients presented with clinical features representing ARM (66.7%) (Table 3).

Table 4: Clinical features in Hirschsprung's disease

Presenting clinical feature	Number of patients
Delayed passage of meconium	10
Constipation	11
Passage of hard beaded stool after enema	10
Failure to thrive	5
Abdominal distension	6
Fever	2
Diarrhoea	1

The main symptoms of Hirschsprung's illness, which included 11 (33.3%) cases, were constipation, delayed meconium passage, and hard stool passage following an enema. There was only one patient with diarrhea (Table 4).Eleven (33.4%) patients had previously had a colostomy performed somewhere else, whereas 22 (66.6%) cases had the procedure done at our institution.

Nine patients (27.3%) had transverse loop colostomies, while the majority of cases with colostomies were of the divided sigmoid form (Table 5).

Table 5: Type of colostomy

	No. of patients (N)	Percentage
Divided sigmoid colostomy	24	72.7%
Transverse loop colostomy	9	27.3%

Seven patients (21.1%) had an elective colostomy, while 26 patients (78.8%) had emergency surgery.

Twelve individuals (36.36%) had significant post-colostomy problems that required medical treatment. Nonetheless, no one passed away during the research time. There are three types of post-colostomy complications: immediate, early, and late. Seven patients (23.1%) had surgical site infections, which accounted for the majority of early complications, while seven patients (23.1%) had prolapse as the primary cause of late complications (Table 6).

Table 6: Post colostomy complications

		N (%)
Immediate	Bleeding	Nil
	Ischemia	Nil
Early	Postoperative sepsis	3(9.9)
	Ischemia	1(3.3)
	Small bowel herniation	Nil
	Wound infection	7(23.1)
	Intestinal obstruction	Nil
Late	Skin excoriation	14(46.2)
	Prolapse	7(23.1)
	Stenosis	2(6.6)
	Colocutaneous fistula	Nil

	Retraction	1(3.3)
	Wound hernia	1(3.3)
	Bleeding	1(3.3)
	Suture sinus	2(6.6)

Patients over three years old who were having their colostomy closed and definitive repair performed were evaluated functionally. A total of eighteen individuals in ARM could have their functional outcomes evaluated. Nine patients with Hirschsprung's disease had their functional outcomes evaluated (Table 7).

Table 7: Post colostomy closure bowel habitus

Disease type	Good continence (%)	Constipation (%)
Anorectal malformations	N = 15 (83.3%)	N = 3 (18.8%)
Hirschsprung's disease	N = 8 (88.8%)	N = 1 (11.1%)

Discussion

Colostomies were originally performed in the second half of the 18th century to cure intestinal obstruction; among the first patients to recover from this surgery were young patients with imperforate anus. [8] The use of stomas in the large intestine in children developed gradually, despite some early triumphs. The stomal construction methods that were created for adults at the turn of the century were changed and adapted for use with infants, especially newborns who had congenital intestinal blockage. [9, 10]

A children's colostomy is a significant disruption of their normalcy and often results in significant psychological trauma for both the child and parents. In contrast, the majority of intestinal stomas in children are transient. The standard course of treatment involves fixing the underlying issue and closing the diverting stoma afterward. While doctors are always looking for alternatives to intestinal exteriorization, sometimes there is no choice but to create a temporary stoma that is both life-saving and appropriately advised. [2]. Over the last few decades, enterostomal therapy has become a distinct specialty and now makes up a significant component of the surgical practice in pediatrics. [11]

Bishop of Philadelphia proposed a temporary abdominal colostomy in 1961 for a baby born with Hirschsprung's illness and an imperforate anus. [3].

Gauderer states that high forms of imperforate anus and complex pelvic deformity, Hirschsprung's disease, colonic atresia, colonic or anorectal trauma, and malignant disorders involving the large intestine and rectum are among the reasons of colostomy in infants. [2] When a male child was diagnosed with recto urethral bulbar fistula, recto urethral prostatic fistula, rectovesical fistula (bladder neck), imperforate anus without fistula, rectal atresia, or rectal stenosis, the world expert on anorectal malformations, Prof. Alberto Pena, recommended an emergency or elective colostomy prior to two weeks of definitive surgery. Vestibular fistula, vaginal fistula, imperforate anus without fistula, rectal atresia and stenosis, and persistent cloaca are the indicators in a female kid. He explained that the most prevalent type of fistula in female children is anovestibular, while rectourethral is seen in male children. [7]

With the exception of ultra-short Hirschsprung's disease (also known as anorectal achalasia), a diverting Loop colostomy is done in the ganglionated segment directly above the transition zone in cases of the disease. Anorectal myectomy is the recommended course of treatment for a patient with definitive ultra-short Hirschsprung's illness. To allow the protective stoma to remain in place following the pull through procedure, a previously diverted loop colostomy was positioned proximally in the right transverse colon. In the third step in a three-step process, it was then closed. However, a two-stage technique is currently the recommended method.[12]

Among our 33 colostomy patients, anorectal abnormalities (22 patients, 66.7%) and Hirschsprung's disease (11 patients, 33.3%) were the most common reasons for colostomy placement. The most common cause of anorectal anomalies in male children was rectourethral fistula (5 patients, 15.1%), which was followed by vesical fistula (3 patients, 9%). In female children, the most common cause was vestibular fistula (7 patients, 21.1%), which was followed by cloacal anomaly (4 patients, 12.1%), and in both cases, the patient (patient 11) had Hirschsprung's disease. The results bear some resemblance to those of Pena et al. and Teitelbaum et al. [7,12]

The majority of the ARMs in our series that required a colostomy appeared within the first week of birth, with a mean age of 2.8 days. The vestibular fistula typically manifests itself later, at approximately 2.1 months of age.

Hirschsprung's illness typically affects one full-term infant in a healthy group as an isolated condition. Over the course of the last few decades, the median age at which children are diagnosed with Hirschsprung's disease has gradually declined. Between the 1950s and 1960s, it was 3-6 months.[12] The mean age at presentation was 6 months for the 11 patients in our series.

Upon examining the presenting pattern at our hospital, we discovered that just 18.0% of patients arrived during the early neonatal period, even though nearly 42% of cases were diagnosed during this time. Conversely, 48.4% of the patients did not exhibit until after infancy, indicating that they were diagnosed at a younger age and hence presented later. This indicates that there may have been inadequacies in the referral services or those parents are not well informed about the implications of the sickness.

Pena (1996) suggested dividing loop colostomy with mucous fistula and outlined its benefits. It defunctionalizes only a small portion of the distal intestine, facilitating better absorption of water; it is complete by diverting; it permits decompression of urine that may pass from the urinary tract back into the rectum; it simplifies the distal intestine's preparation before the main repair; it facilitates distal colostograms more easily than with a more proximal colostomy; and its initial incidence is zero.[7]

He notably denounced loop colostomies due to the potential for feces to enter the distal stoma and induce megarectum, faecal impaction, and urinary tract infections. Following the primary repair, there is also a chance of contamination and infection.

Gauderer (1998) divided colostomies into three categories: sigmoid, left transverse, and right transverse.[2]. He recommended a high sigmoid loop colostomy for kids who had punctured anus. But recently, it has become a feasible alternative to separate the ends of the colon, especially in boys.

Less urinary tract pollution and a decreased incidence of prolapse, particularly in the distal limb, are benefits of separation. A lengthier incision, a higher risk of wound complications, and more difficulty putting a stoma device on small newborns are among the drawbacks.

The ideal location for a colostomy in children with Hirschsprung's disease is the dilated segment, which is located just proximal to the transition zone and contains normal ganglion cells, according to Gauderer and Teitelbaum et al. [2,12] The ease of fabrication and removal of a loop colostomy is typically the reason for its selection. During the final corrective procedure, this left quadrant stoma is removed because the majority of transition zones are located in the sigmoid colon. Since mucous cannot be adequately evacuated or rinsed away, the distal intestine should not be monitored if stoma separation is chosen, especially in cases with long segment Hirschsprung's illness.

22 colostomies (66.6%) have been conducted at our center in our series; 11 (33.3%) of the patients had colostomies performed outside and were then referred for definitive surgery. Of the 33 patients, 24 (72.7%) had divided sigmoid colostomies, while 9 (27.3%) had left transverse loop colostomies. In order to provide sufficient intestinal length for the final repair, we conducted left transverse loop colostomy on 4 female patients (12.1%) with cloacal abnormality and 1 male patient with anorectal agenesis without fistula.

Mollitt et al. examined 146 children's incidence of colostomy complications in 1980. [[4] The two main reasons for colostomy procedures were imperforate anus (46), and Hirschsprung's disease (70). In 120 patients (82%) a transverse loop colostomy was performed; in the other cases, a sigmoid loop colostomy was performed. One of the most common early complications, occurring in 24 individuals (18%), was sepsis. The most frequent late stomal consequence, skin excoriation, was noted in 48% of cases. 12% of cases had prolapse, and 6% had stenosis. In 24 cases (18%), colostomy revision was necessary; these cases were primarily caused by prolapse and appliance issues. Complications from sigmoid colostomies were noticeably less common. In sixteen cases (15%) there were major difficulties. No fatalities occurred as a result of colostomy closure. The frequency of problems matched the results published by Grant et al. and Mac Mohan et al. [13,14] The use of transverse colons as opposed to sigmoid colons and the policy of employing loops as opposed to divided stomas appeared to be associated with an increased risk of problems. It was discovered that age and underlying diagnosis were not significant variables.

The most frequent early complication in our group of 33 colostomies was postoperative sepsis, which affected 3 patients (9.9%) and resulted in infection in 7 patients (23.1%). Ischaemia affected 1 patient (3.3%), necessitating colostomy refashioning. Skin excoriation was observed in 14 patients (46.2%), and it was the most frequent late consequence, followed by prolapse in 7 patients (23.1%), with transverse loop colostomies being the most prevalent site of occurrence. The remaining post-operative problems included two cases of stenosis (6.6%), one case of retraction (3.3%), one case of wound hernia (3.3%), and two cases of suture sinus (6.6%). The lower result compared to Mottill et al and Mohan et al could be attributed to improved patient management, effective antibiotics, and a thorough understanding of colostomy care. [4,13]

As of right now, six patients are awaiting the definitive repair of their colostomy closure, while 27 colostomy closures have already been completed. Following colostomy closure, two patients (9%) experienced sepsis, while one patient (3.3%) experienced acute intestinal blockage. The outcome agrees with Mottill et al. [4]

An examination of the functional data revealed that 18.8% of ARM patients had constipation and 83.3% of cases had satisfactory continence. In patients with Hirschsprung's disease, 88.8% had satisfactory continence, while 11.1% had constipation. These findings align with those published by Teitelbaum et al, Puri, Pena, Rintala, and Lindhal et al. [12,15–17]

Conclusion

Rectourethral fistula in male children and vestibular fistula in female children are the most typical indications of colostomies.

The most prevalent reasons for using a sigmoid colostomy are its ease of installation, firmer stools, decreased prolapse risk, and normal growth and development. Although transverse loop colostomies have a high prolapse incidence, they provide a sufficient length of bowel for permanent healing.

The most frequent side effect was cutaneous excoriation. Following colostomy closure, functional outcomes are good. Initial management and diagnosis depend on a thorough examination.

A correctly designed, medically recommended temporary stoma is often necessary and life-saving.

References

1. Chave HS, Senapati A. Intestinal stomas and their complications. Surg Int. 2000; 24:162-8.
2. Gauderer MWL. Stomas of the small and large intestine. Pediatric Surgery. 1998; 2:1349-59.
3. Bishop HC. Colostomy in the new born: Indications, techniques, complications and care. Am Jr Surg. 1961; 101:642-8.
4. Mollitt DL, Malangoni MA, Ballantine TV, Grosfeld JL. Colostomy complications in children: An analysis of 146 cases. Arch Surg. 1980; 115(4):455-8.
5. Scharli WF. The history of colostomy in children: Progress Pediatr Surg. 1986; 20:188-98.
6. Sigmund EH. Divided loop colostomy that does not prolapsed. Am Jr Sum. 1984; 147:250-2.
7. Peña A, Levitt MA. Anorectal anomalies. Newborn Surg. 1996: 289-312.
8. Mackiegan JM, Cataldo PA. Intestinal stomas: Principles, techniques and management. St. Louis, 1993: 25-32.
9. Fonkalsrud EW. Special aspects of ostomies in infancy and childhood. CurrProbl Surg. 1975; 12:54.
10. Gauderer MWL, Stellato TA. Gastrectomies: Evaluation, techniques, indications and complications. Curr Probl Surg. 1986; 23:661.
11. Numanoglu A, Millar AJW, Brown, RA. Stomas in infants and children: Part I. Continuing Medical Education. 2005; 23(7): 359-60.
12. Teitelbaum DH, Coran AG. Hirschsprung's disease and related neurovascular disorder of the intestine. Pediatr Surg. 1998; 2:1381-424.
13. Mc Mahon RA, Cohen SJ, Eckstein. Colostomies in infancy and childhood. Arch Dis Child. 1963; 3(8):114-7.
14. Ah Al Salem, Grant C, Khawaja S. Colostomy complications in infants and children. Int Surg. 1992; 77(3):164-6.
15. Pena A. Anorectal malformations. Seminar Paediatr Surg. 1995; 4:35-47.
16. Rintala RJ, Lindahl H. Is normal bowel function possible after repair of intermediate and high anorectal malformations? J Paediatr Surg. 1995; 30:488-90.
17. Puri P. Hirschsprung's disease: Clinical Features. Berlin, Heidelberg: Springer; 1996: 370-371.