



Research Paper

Stoma In Children: Indications And Outcome in Jos University Teaching Hospital

AH SHITTA¹, ED DUNG¹, SD PETER¹, DJ SHILONG¹, L ANTHONY¹, UA ARUA¹, VI IMADE¹, ED WUYEP¹, GO ADARIKU¹, AI ASHOM¹, MW ISICHEI¹, FA UBA¹, LB CHIRDAN¹

¹(Department of Surgery, College of Health Sciences, University of Jos and Jos University Teaching Hospital, Nigeria.)

Abstract

Background: A stoma is a surgically created opening on the surface of the anterior abdominal wall to allow solid, liquid or air to exit the body. It is a life-saving procedure commonly performed in children. Despite its relevance, this procedure carries physiological, psychological, and social effects on the patient and caregiver. A thorough understanding of the indications, techniques, and outcomes is required for improved clinical practice, outcomes, and patients' quality of life. This study aimed to share our institutional experience with pediatric stomas, examining common indications, preferred stoma type and site, and associated outcomes and complications. This was a retrospective study, where we reviewed the clinical data from January 2011 to January 2025 of all patients aged 0-17 years who had stoma construction in our paediatric surgery unit. A total of 189 patient aged 0-17 years who had stomas were reviewed. There were 113 males and 76 females with the M:F ratio of 1.5: 1 and the mean age was 59.6 months. Stoma constructed were, 112 (59.3) colostomies, 70(37.0%) ileostomies 4(2.1%) suprapubic cystostomies 2(1.0%) jejunostomies and 1(0.5%) gastrostomy. Indications for stoma creation: Anorectal malformation 67(35.4%), Hirschsprung 28(14.8%), typhoid ileal perforation 39 (20.6%), enterocutaneous fistula 28(14.8%), urinary obstruction 4(2.1%), trauma 10(5.3%) neoplasm 6(3.2%), esophageal stricture1(0.53%). Reversal rate was 74.1% and Mortality was recorded in 15,7.9%. The shift from staged management of Hirschsprung's disease to single stage procedure has drastically reduced the need for colostomy in neonates and infants. A similar change in management protocol for anorectal malformation could further reduce the need for colostomy in our paediatric patients. There is also a need to provide portable water, improve sanitation and encourage personal hygiene to reduce the scourge of typhoid infection and its attendant complications necessitating siting ileostomy.

Keyword: Stoma, Children, indications, Outcomes, Jos University Teaching Hospital

Received 02 June., 2025; Revised 09 June., 2025; Accepted 11 June., 2025 © The author(s) 2025.

Published with open access at www.questjournals.org

I. INTRODUCTION:

A stoma is a surgically created opening on the surface of the anterior abdominal wall to allow solid, liquid or air (feces, urine or gas) to exit the body. It is a life-saving procedure commonly performed to bypass a part/whole of the intestinal or urinary system (1, 2) Stoma construction is therefore an essential skill in pediatric surgical practice which can be performed in both pediatric and adult patients. (1) Despite its relevance, this procedure carries physiological, psychological, and social effects on the patient and caregiver. A thorough understanding of the indications, techniques, and outcomes is required for improved clinical practice, clinical outcomes, and patients' quality of life with a stoma.(3)

Indications for stoma construction may be congenital or acquired and it can be performed as an emergency or elective procedure. Common congenital anomalies that require a stoma creation in children include Anorectal malformations (ARMs) and Hirschsprung's disease. Acquired conditions include trauma, neoplasm, inflammatory and infectious conditions. In the majority of patients, the stoma is created as a temporary procedure. Levitt and Peña (2007) emphasized the role of stomas as temporary solutions in staged reconstructions for complex congenital malformations. (4) Stoma can be sited in the stomach, small or large bowel or the urinary tract.

Stoma construction can be performed using a local anesthetic agent or under general anesthesia. The choice of anesthesia depends on the indication for the stoma, the type of stoma and the patient's clinical state. For most pediatric stoma constructions, general anesthesia remains the preferred choice in our institution due to its reliability in ensuring immobility and complete pain control. However, local anesthesia with sedation may be considered in specific cases, particularly when general anesthesia poses a higher risk. In our resource-limited settings, the decision is usually individualized, taking into consideration the child's specific medical needs.

A well-constructed stoma takes into consideration functionality for which it is created, convenient site for patient and ease of management of effluent. Despite ensuring this, stomas are not free of complications. These complications include skin excoriations, wound infection and dehiscence, stoma prolapse, retraction, stenosis and para stoma herniation just to mention but a few (5). In the developed nations the need for stoma creation is relatively reduced because definitive surgeries are carried out early, while in Africa, with the challenge of neonatal anaesthesia and where adequate neonatal supportive care is lacking, there is a tendency to delay definitive surgery and site a stoma for patient's safety(6),

Various reasons guide the choice of stoma site but the goal is to achieve a physiologically functional diversion that the caregiver can easily manage. This study aimed to share our institutional experience with pediatric stomas, examining common indications, preferred stoma type and site and associated outcomes and complications. Our findings aimed to inform clinical decision-making and improve the quality of pediatric surgical care.

II. METHODOLOGY

This was a retrospective study where we reviewed the clinical data from January 2011 to January 2025 of all patients aged 0-17years, who had stoma construction in our paediatric surgery unit.

Inclusion. All patients aged 0-17 years who had stoma construction in our unit and were followed up for at least one year or 4 months after reversal

Exclusion

Patient whose data were not complete or who were lost to follow up within the stipulated period of inclusion. Ethical clearance was obtained

Procedure

All stomas were created under general anaesthesia and were constructed either by the consultants or senior residents in the unit. The proximal stomas were constructed sprouting, while the distal stoma constructed flushed with the skin or as applicable. There were no appropriate collecting bags so improvised collecting bags were used as shown in figure 1.

Data analysis

Data was retrieved from hospital records of the patients and entered into excel spread sheet. Data included patient demographic (age, sex,), stoma type, site, indication for stoma, pre reversal complications, stoma duration before reversal, reversal rate and morbidity post reversal and mortality.

III. RESULTS

A total of 189 patient aged 0-17 years who had stomas were reviewed. There were 113 males and 76 females with the M:F ratio of 1.5: 1 and the mean age was 59.6 months. Stoma constructed were, 112 (59.3%) colostomies, 70(37.0%) ileostomies 4(2.1%) suprapubic cystostomies 2(1.0%) jejunostomies and 1(0.5%) gastrostomy. Indications for stoma creation: Anorectal malformation 67(35.4%), Hirschsprung 28(14.8%), typhoid ileal perforation 39(20.6%), enterocutaneous fistula 28(14.8%) urinary obstruction 4(2.1%), trauma 10(5.3%) neoplasm 6(3.2%), esophageal stricture 1(0.53%). (see table 1)

Outcome: Reversal (colostomy 85,75.9%, ileostomy 51,72.9%, suprapubic cystostomy 3,75% gastrostomy 1, (100%). Awaiting reversal 34 (colostomy 23,20.5% ileostomy 9,12.9% and suprapubic cystostomy 1,25%). Main Complications 47,24.9% (excoriation 19,40.4%, prolapse 15,31.9% stoma retraction 8,17.0% stenosis 5,10.6%). Mortality was recorded in 15,7.9%(colostomy 4,2.1% %, ileostomy 9,4.8 %, jejunostomy 2,1.1 %) patients.

Colostomy:112(59.3%) had colostomy, age ranged from 2 days to 17 years with mean age of 27.67 months. There were 69(61.9 %) males and 43(38.4% %) females with M:F ratio of 1.6:1. There were 108(92.9%) divided sigmoid and 4 (7,1% %) transverse loop stomas. Of the 112 stomas, 44,39.3% were in neonates, 23,20.5% infants, 26,23.2% toddlers, 15,13.4% school age (4-12years) and 5,4.5% teenagers (13-17 years). Indications included 67(59.8%) anorectal malformations, 28 (25%) Hirschsprung's disease, 5(4.5%) trauma, 5(4.5%) neoplasm and 7(6.2%) bowel perforations and adhesions

Ileostomy: 70 had ileostomy with generalized peritonitis for typhoid ileal perforation accounted for 39(55.7%) stomas, enterocutaneous fistula 25(35.7%), Hirschsprung's disease 2(2.9%), trauma 4(5.7%) and intussusception 1(1.4%)

Indications for suprapubic cystostomy were for bladder outlet obstruction in 3 patients and urinary diversion post urethral injury in 1 patient. Jejunostomy was indicated in 2 patients with jejunal atresia. One patient had gastrostomy for esophageal stricture.

Table 1 showing indications for stoma construction by age group

Age range	INDICATIONS									Total
	Anorectal malformations	Hirschsprung's disease	Intestinal atresia	Intussusception	Generalized peritonitis (typhoid intestinal perforation)	GI fistula	Trauma	Tumours	Bladder outlet obstruction	
≤28days	47 (24.9%)	1(0.5%)	2(1.1%)	-	-	-	-	-	-	50 (26.5%)
1-11 months	13 (6.9%)	8(4.2%)	1(0.5%)	3(1.6%)	-	-	1(0.5%)	-	2 (1.1%)	28 (14.8%)
1-3 yrs	7(3.7%)	13(6.9%)	-	1(0.5%)	1(0.5%)	-	3(1.6%)	3(1.6%)	1 (0.5%)	29 (15.3%)
4-12 yrs	-	4(2.1%)	-	-	27(14.3)	16(8.5%)	6(3.2%)	3 (1.6%)	1 (0.5%)	57 (30.2%)
13-17 yrs	-	2(1.1%)	-	-	11(5.8%)	12(6.3%)	-	-	-	25 (13.2%)
Total	67(35.4%)	28(14.8%)	3(1.6%)	4(2.1%)	39(20.6%)	28(14.8%)	10(5.3%)	6(3.2%)	4(2.1%)	189 (100%)

IV. DISCUSSION

In our study we found that the highest type of stoma construction was colostomy and it occurred mostly in neonates followed by infant and the commonest indication was anorectal malformation followed by Hirschsprung disease. A similar studies done in Enugu and Tanzania, reported similar findings with anorectal malformation as the commonest indication for colostomy in their centres(7, 6)

Uba et al(8) in their study on colostomy in children 14 years ago at the jos university teaching hospital, also reported that the highest number of colostomy was performed in neonates followed by infants, however, the commonest indication was Hirschsprung disease. This change in the commonest indication from Hirschsprung's disease to anorectal malformation could be explained by the change in approach to management of Hirschsprung's from a 3-stage procedure to a single stage procedure, thereby excluding the need for colostomy in Hirschsprung's disease. A similar study in Enugu also reported that the commonest indication for colostomy in children was Hirschsprung disease but was commonly done late(9)

In our study, Hirschsprung's was the 2 most common indication for colostomy and was the commonest indication for colostomy among infants and toddlers.

Uba et al in their study conducted in our institution reported that colostomy for Hirschsprung's disease was constructed more on neonates than toddlers (8).. In our study only those who presented late with complications needed a staged procedure for Hirschsprung's disease. The reason could be that most neonates most have had their single stage surgery earlier. There is a shift in the age range. whereas previous report found this indication in neonates, we found this indication more in infants and toddlers.

Ileostomy was the 2nd most common stoma created and commonest in school-age children for generalized peritonitis secondary to typhoid ileal perforations. A study in Pakistan also found typhoid intestinal perforation as the commonest indication for ileostomy (10). However, a different study found ileostomy as the commonest stoma created in children and necrotizing enterocolitis, as the commonest indication for the stoma creation (11)

Common complication in our study was skin excoriation in colostomy and distal loop prolapse in those with ileostomy. In a study by Soomro et al, found excoriation to be the commonest early complication and prolapse as the second most common complication encountered (12). Vogel et al found out that prolapse was the second commonest complication after high output, as a complication (11). However, Bafford et al found that prolapse was the commonest complication and occurred more on stomas sited on the sigmoid colon which was

in contrast to what we found (5). Following stoma reversal, we found that wound infection was the commonest complication and it occurred mostly in colostomy closure wounds.

Our excoriation rate has reduced so significantly compared to previous findings in our institution. This could be as a result of improved stoma care with our improvised stoma bag (see figure 1)

Mortality occurred only in patients who had ileostomy



Figure 1 showing our improvised colostomy and ileostomy bags

V. CONCLUSION

The shift from staged management of Hirschsprung's disease to single stage procedure has drastically reduced the need for colostomy in this group. A similar change in management protocol for anorectal malformation could further reduce the need for colostomy in our paediatric patients. There is also a need to provide portable water, improve sanitation and encourage personal hygiene to reduce the scourge of typhoid infection and its attendant complications necessitating siting ileostomy.

References

- [1]. Holschneider AM, Hutson JM, editors. Anorectal malformations in children: embryology, diagnosis, surgical treatment, follow-up. Springer Science & Business Media; 2006 Sep 22.
- [2]. Levitt MA, Peña A. Colostomy: Indications and Technique. *Semin Pediatr Surg*.
- [3]. Whitehead A, Cataldo PA. Technical considerations in stoma creation. *Clinics in colon and rectal surgery*. 2017 Jul;30(03):162-71.
- [4]. Rege SA et al. Optimal Stoma Placement in Pediatric Patients. *J Pediatr Surg*.
- [5]. Bafford AC, Irani JL. Management and complications of stomas. *Surgical Clinics*. 2013 Feb 1;93(1):145-66
- [6]. Massenga, A., Chibwae, A., Nuri, A. A., Bugimbi, M., Munisi, Y. K., Mfinanga, R., & Chalya, P. L. (2019). Indications for and complications of intestinal stomas in the children and adults at a tertiary care hospital in a resource-limited setting: a Tanzanian experience. *BMC gastroenterology*, 19(1), 157. <https://doi.org/10.1186/s12876-019-1070->
- [7]. Ezomike, U. O., Nwachukwu, I. E., Nwangwu, E. I., Chukwu, I. S., Aliozor, S. C., Nwankwo, E. P., & Ekenze, S. O. (2022). Childhood colostomies: patterns, indications and outcomes in a Nigerian University Teaching Hospital. *African health sciences*, 22(4), 205–211. <https://doi.org/10.4314/ahs.v22i4.25>
- [8]. Uba AF, Chirdan LB. Colostomy complications in children. *Annals of African medicine*. 2003;2(1):9-12
- [9]. Ekenze SO, Agugua-Obianyo NE, Amah CC. Colostomy for large bowel anomalies in children: a case controlled study. *International Journal of Surgery*. 2007 Aug 1;5(4):273-7.
- [10]. Khan A, Haris M, Rehman M, Khan MJ, Haris S. Early postoperative complications and surgical anatomy after ileostomy reversal among the population of Khyber Pakhtunkhwa, Pakistan. *Cureus*. 2021 Nov 17;13(11).
- [11]. Vogel I, Schattenkerk LD, Venema E, Pandey K, de Jong JR, Tanis PJ, Gorter R, van Heurn E, Musters GD, Derikx JP. Major stoma related morbidity in young children following stoma formation and closure: a retrospective cohort study. *Journal of pediatric surgery*. 2022 Oct 1;57(10):402-6.9.
- [12]. Soomro BA, Solangi RA, Siddiqui MA. Colostomy in Children: Indications and Complications. *Pakistan Journal of Medical Sciences*. 2010 Oct 1;26(4).

