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# Outcome of Colostomies in Children: A Review of 48 Cases at Nnamdi Azikiwe University Teaching Hospital Nnewi, Nigeria

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## Abstract

**Background:** Colostomies in children are common abdominal procedures in paediatric surgical practice and are often temporarily created for the purpose of diversion of faeces and flatus, hence would need to be closed when the primary pathology is sorted out.

**Aim:** To determine outcome of colostomies performed in children at NnamdiAzikiwe University Teaching Hospital Nnewi (NAUTH)and seek for modifications for improvement.

**Methodology:** This was a retrospective review of 48 children who had colostomies at NAUTH Nnewi over a 6- year period. Data were obtained and entered into an already prepared protocol sheet and analyzed using (IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.) Pearson Chi square test was used to test for associations between categorical variables. Statistical significance was inferred at p value of ≤0.05.

**Results:** A total of 48 children who had colostomies were evaluated. The age range was 1 day -10 years, median age was 2 days. There were 38 males (79.2%) and 10 females (20.8%). Anorectal malformations 33(62.5%) and Hirschsprung's disease 11(22.9%) were the most common indications. Both sigmoid and transverse defunctioning colostomies were performed in 23(47.9%) patients each while caecostomy and Hartman's operation were done in one (2.1%) patient each. There were complications in 17(35.4%) patients. Out of this, skin excoriations observed in 46.2% was the most common. Only 24(50%) of the patients went on to have their definitive surgeries. Seven (14.6%) were lost to follow-up while 10 mortalities occurred within the study period. The mean interval between creation of colostomy and definitive surgery was 10.72 months ±7.20 and duration of follow up was 1- 6 years.

**Conclusion:** Only a few of our patients who had colostomy progressed to access definitive treatment of their primary disease conditions. Perhaps carrying out more of single staged procedures where feasible and a review of the choice of colostomy informed by the pathology may help reduce the high morbidity and attrition associated with colostomies in children.

**Keywords:** Stomas, Anorectalmalformations, Hirschsprung's disease, Complications, Skin excoriations.

## Introduction

Colostomies are common in paediatric surgical practice and they are often created for the purpose of diverting faeces and flatus from distal pathologies in children with high anorectal malformations, Hirschsprung's disease, left colonic atresias, necrotizing entrocolities (NEC), complex pelvic malformations and left colonic traumas in children. Anorectal malformations and Hirschsprung's disease account for majority of the indications for colostomy in children [1-5]. Colostomies in children are largely temporary, so would be closed at a later date when the definitive treatment has been carried out [2,5]. This then requires close follow up of these children and timely take down of the stomas when they have served their purpose.

Despite the life- saving benefits of colostomy in children, it is fraught with high rate of complications [1-5]. The burden of the associated morbidity and mortality together with the cost and inconvenience of a three stage procedure in anorectal malformations and high default rate has informed some investigators' recommendations that a single stage procedure be carried out in children with high and intermediate anomalies without an initial colostomy in some carefully select group of patients [6-8].

Furthermore, colostomy constitutes a major disruption of the normal physiologic conduit of passage of stool and flatus [5]. This portends a substantial psychological impact on the older child and the parents with possible stigmatization. It becomes imperative that every colostomy in a child must be merited and subsequently managed properly both in the hospital and at home.

In this study, we aim to determine the fate of colostomies performed in children at Nnamdi Azikiwe University Teaching Hospital (NAUTH) Nnewi and to seek for modifications to

improve outcome.

## Patients and Methods

This is a retrospective review of the children who had colostomy in NAUTH, Nnewi over a period of six years, from July 2008 to June 2014. Data were extracted from the emergency rooms, theatres, and wards' records. Data on age, sex, indications for colostomy, type of colostomy, interval between creation and closure of colostomy, complications and outcome were entered into an already prepared protocol sheet and were analyzed using Statistical Package for Social Sciences (IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp). Statistical significance was inferred at p value of ≤0.05

## Results

A total of 48 children had colostomies within the study period of 6 years. The age range at the time of creation of stomas was 1 day -10 years, median age was 2 days. There were 38 males (79.2%) and 10 females (20.8%) with a male to female ratio of 3.8:1. The indications for colostomy were as shown in Table 1, Anorectal malformations 33(8.7%), Hirschsprung's disease 11(22.9%), left colonic atresia 2( 4.2%) cloacalexstrophy 1(2.1%) and necrotizing enterocolitis 1(2.1%).

The various types of colostomies performed are as shown in Table 2. The procedures were done as emergencies in 43(89.6%), urgent 3(6.3%) and elective in 2(4.2%). Consultants performed the procedures in 12(25%) and senior residents performed 36(75%). There were 26 complications in 17(35.4%) patients; the spectrum of complications is as shown in Table 3. Skin excoriations occurred in 12(25%) of the patients and constitute 46.2% of the complications. Complications were more common in transverse colostomies than those who had sigmoid colostomies ($p$=0.005). Only 24(50%) of the patients went on to have their definitive surgeries as all colostomies were done on temporary basis while 7(14.6%) of the children are still being followed up and are awaiting surgery. Seven (14.6%) were lost to follow-up. Ten (20.8%) mortalities occurred within the study period, causes of death are as shown in Table 4. Five (10.4%) mortalities occurred from complications of major congenital anomalies associated with anorectal malformations. No death was directly from colostomies. The interval between creation of colostomy and definitive surgery was 2 - 36months with a median interval of 10.72 months ±7.20. Duration of follow up was 1-6 years.

**Table 1:** Indications for Colostomy

| Indications | Frequency | Percentage |
|---|---|---|
| Anorectal malformations | 33 | 68.7 |
| Hirschsprung's disease | 11 | 22.9 |
| Colonic atresias | 2 | 4.2 |
| Cloacalexstrophy | 1 | 2.1 |
| Necrotizing enterocolitis | 1 | 2.1 |
| Total | 48 | 100 |

**Table 2:** Types of Colostomies performed

| Type of colostomy | Frequency | Percentage |
|---|---|---|
| Sigmoid defuntioning | 23 | 47.9 |
| Transverse defunctioning | 23 | 47.9 |
| Caecostomy | 1 | 2.1 |
| Hartman's Proceedure | 1 | 2.1 |
| Total | 48 | 100 |

**Table 3:** Complications of colostomies

| Complications | Frequency | Percentage |
|---|---|---|
| Skin excoriations | 12 | 46.2 |
| Stoma prolapse | 4 | 15.4 |
| Retraction | 1 | 3.8 |
| Stoma necrosis | 3 | 11.5 |
| Bleeding | 1 | 3.8 |
| Wound infection | 2 | 7.7 |
| Diarrhoea | 1 | 3.8 |
| Sepsis | 1 | 3.8 |
| stenosis | 1 | 3.8 |
| Total | 26 | 100 |

**Table 4:** Causes of death

| Cause of death | Frequency | Percentage (%) |
|---|---|---|
| Sepsis/ **cloacalexstrophy** | 1 | 10 |
| Aspiration Pneumonitis + **Oesophageal atresia** | 2 | 20 |
| sepsis | 2 | 20 |
| **Diaphragmatic** hernia/respiratory distress | 1 | 10 |
| Bronchopneumonia | 2 | 20 |
| Renal failure | 1 | 10 |
| Sepsis /Prune belly syndrome | 1 | 10 |

## Discussion

In this study, a total of 48 children had colostomies over a 6-year period, giving an average of 8 per year The age range of the children was 1day – 10 years with a median age of 2 days. This age distribution agrees with the findings by Osifo, et al [9] and Dode, et al [1]. The younger median age in our study is attributable to the younger age at presentation of children with anorectal malformations which constituted 68.7% of the indications. Consistent with findings from similar works in this domain, more males had colostomies than females in our survey with a ratio of 3.8: 1 [1,3,4,9]. This apparently is due to the higher incidence of ARM requiring colostomies and Hirschsprungs disease in males than females [10,11,12].

Besides a case of necrotizing enterocolitis (2.1%), all other conditions requiring colostomies were congenital anomalies of which ARM and Hirschsprung's disease at 68.7% and 22.9% respectively. This is similar to findings by several other investigators in which anorectal malformation was a more common indication than Hirschsprung's disease [1,2,9,13,14]. This however contrasts with the reports of Ekenze, et al [4] in the same region in Nigeria, Uba, et al [3] and Nour, et al [15] who despite having both ARM and Hirschprung's disease as the most common indications put together however discovered

that Hirschsprungs disease was a more common indication than anorectal malformation. We do not know the exact reasons for these regional variations however it may be a reflection of the variation in incidence of both conditions or as varied selection criteria for patients who would go for initial colostomy before the definitive pull through operation and those who would go for a single staged procedure for these anomalies.

Both sigmoid and transverse defunctioning colostomies were carried out equally on 23(47.9%) patients each. All the sigmoid colostomies were done for ARM but some ARM had transverse colostomies10(20.8?%), while all children who had HD in this study had transverse colostomies owing to lack of support facilities for levelling colostomies which is more ideal. The child with necrotizing enterocolitis with caecal perforation had caecostomy and one of the two children who had colonic atresias had Hartman's operation while the other had defunctioning sigmoid colostomy.

There were 26 complications in 17 patients (35.4%) and this is within the range of previous reports [1,2,3,4,15] and the spectrum of complications is as in Table 3. Skin excoriation 12(46.2%) was the most common complication observed amongst the patients and this is consistent with previous reports [1,3,4,9,14]. There might have even been a risk of underestimation of this rate given the retrospective nature of this study as highlighted by Nour et al [15] in their work. All the cases of skin excoriations resolved spontaneously on conservative care with Zinc Oxide pastes. Only 4(15.4%) cases of stoma prolapse were seen in this study as opposed to the findings by Nour, et al [15] where stoma prolapse constituted majority of their complications. Only one case of stoma prolapse had revision due to frequent bleeding on contacts while the others were taken care of at the definitive pull through operations. Second stoma revision was in a child with stoma necrosis. Other complications were managed conservatively. Complications were more common in transverse than in sigmoid colostomies ($p=0.005$) and this is consistent with findings by previous authors [2,3,13-16].

Definitive surgery and closure of colostomy was only achievable in 24 (50%) of the patients while 7 (14.6% ) are still awaiting surgery even though they are due for the surgeries, they are yet to be done due to financial constraints. Seven (14.6%) are already lost to follow-up. This scenario is quite worrisome and appears to be the trend in our environment as seen in the works by Sowande, et al [17] and Adeniran, et al [18]who had less than 50% of their patients completing their treatments up to the definitive pull-through and closure of colostomies. Poverty and the burden of multi-staged proceedures could explain this high default rate in developing countries [19]. Interestingly, parents of one of our patients who had stoma prolapse have taken the advantage of the child's illness to beg for money in public places even declining any committed charity aid towards definitive repair for 6 years now.

There were 10 (20.8%) mortalities in our survey. However, none was directly related to colostomy. Colostomy on its own does not cause much mortalities directly, majority of deaths in colostomised children either arise from a different co-morbidity, the primary condition or associated complex malformations [4,9,13,15]. Half of the mortalities in this study were as a result of complications from complex anomalies associated with ARM while the remaining 5 died from other causes as represented in Table 4.

The mean interval between colostomy and closure was 10.7months with a range of 2-36 months, quite similar to finding by Nasir, et al [19] in their study also from a developing world, but contrasts with the work by Patwardhan, et al [20] whose mean interval was 6 months. This variation could be as a result of poverty and paucity of man power and resources leading to a long waiting list [19].

Our challenges include poverty, poorly motivated parents, lack of stoma care therapists and unavailability of stoma bags. Perhaps reviewing our choice of stomas in favour of sigmoid colostomy for ARM and carrying out single staged procedures in some select patients will go a long way in ameliorating the complications.

## Conclusion

There is still high morbidity and attrition amongst children who had colostomy in our centreeven though mortalities are determined by the primary disease conditions. A review of choice of colostomy, multidisciplinary stoma team management and provision of NICU for those with complex abnormalities may improve the current scenario.

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