A Descriptive Study of Commonly Used Postoperative Approaches to Pediatric Stoma Care in a Developing Country

Lofty-John C. Anyanwu, MBBS, MHPM, FWACS, FMCS, FEBPS; Aminu Mohammad, MBBS, FWACS, FICS; and Tunde Oyebanji, MBBS

Abstract
Construction of an enterostomy is a common procedure in pediatric surgery. However, caring for the child with a stoma is challenging for parents in developing countries. Modern devices such as colostomy bags and accessories are expensive and not readily available. The purpose of this study was to describe methods of effluent collection and peristomal skin protection used by the mothers of colostomy patients. A prospective, descriptive study was conducted between January and December 2011 during the first three postoperative outpatient clinic visits among mothers of children who had a colostomy constructed in the authors’ hospital. The mothers of 44 children (27 males, 17 females, median age 3.3 months, range 2 days to 11 years) consented to participate. Demographic and clinical data were obtained from the records, and mothers were interviewed and asked to describe their preferred methods of colostomy effluent collection and peristomal skin protection. The stomas also were inspected at each clinic visit. Anorectal malformations were the most common indication for a colostomy (32, 72.73%), followed by Hirschsprung’s disease (11, 25%). Forty-two (42) patients had a divided sigmoid colostomy (95.45%); two patients had a right loop transverse colostomy (4.55%). Nine mothers alternated between two different collection methods. The diaper collection method was described most frequently (22 out of 53; 41.51%), followed by wraparound waistbands (19; 35.85%) and improvised colostomy bags (12; 22.64%). Peristomal skin excoriations were commonly seen within the first 3 weeks postsurgery and had mostly disappeared by the week 6 postoperative visit. Petrolatum jelly was the most commonly used barrier ointment. These locally available, acceptable, and affordable collection methods may be useful for children in other developing countries.

Keywords: descriptive study, stoma care, pediatrics, developing countries, colostomy

Potential Conflicts of Interest: none disclosed

A colostomy is an artificial colocutaneous fistula created to divert feces and flatus to the exterior. The French physician and anatomist Alexis Littre was the first to create a ventral colostomy in 1710 for a baby with imperforate anus; the first successful deliberate colostomy was performed by Duret in 1793 on a 3-day-old with an imperforate anus. Since then, this life-saving procedure has evolved and is used to divert fecal matter for bowel decompression under emergency conditions, as well as to protect distal bowel repairs in the management of various colonic and anorectal pathologies.

In children, the indications for colostomy are commonly benign and congenital and, as such, colostomies mostly serve as temporary measures before definitive treatment. The common indications for colostomies in children include necrotizing enterocolitis, Hirschsprung’s disease, anorectal malformations (ARMs), colonic atresias, pelvic tumors, Crohn’s disease, rectal perforations, severe perineal burns, and spina bifida with fecal incontinence.

The application of well-fitting colostomy bags helps prevent contact of the effluent with the skin and subsequent skin excoriation because of the enzyme content and pH level. Skin excoriation from colostomy effluent has been documented to be worse in those with a transverse colosto-
my, as compared with those with a sigmoid colostomy, due to the more liquid effluent from transverse colostomies. The use of skin barrier ointments helps protect peristomal skin by preventing fecal contact with the skin.\textsuperscript{5,7}

ARMs occur worldwide in one in every 4,000 to 5,000 births.\textsuperscript{5,8} The newborn with severe ARM is managed with an initial neonatal diverting colostomy, a temporary procedure to allow for bowel decompression and appropriate investigations before the definitive treatment.\textsuperscript{9-11} Another congenital anomaly for which a colostomy may be required in its management is Hirschsprung’s disease, seen in one in 5,000 newborns. Hirschsprung’s is characterized by the absence of ganglion cells in the distal bowel, resulting in a chronic intestinal obstruction.\textsuperscript{5,12} Operative treatment may involve an initial diverting colostomy for bowel decompression, followed by a colostomy takedown and removal of the aganglionic bowel segment and the establishment of a colo-anal anastomosis.\textsuperscript{13,14}

The authors’ hospital is a tertiary health center located in an urban setting in the North West region of Nigeria. This referral center for the community and surrounding areas covers a population of approximately 15 million people. The pediatric surgery unit has two full-time surgeons and one visiting pediatric surgeon. The unit performs between 40 and 60 colostomies per a year. Although nationwide colostomy statistics for children are not available, hospital-based reports from physicians of colostomies in children from the country exist.\textsuperscript{3,6} Data from the United Kingdom\textsuperscript{15} show 11,000 colostomies were created in persons of all ages in that country in 2006.

At the authors’ facility, a divided sigmoid colostomy is performed on all patients presenting with anorectal agenesis with or without a fistula to the lower tract, and also for the child presenting with a rectovestibular fistula after the first 6 months of age. The authors’ practice is to site the colostomy in the junction between the sigmoid colon and the descending colon using the first portion of the sigmoid colon immediately distal to the descending colon in order to leave a good length of distal colon for the definitive posterior sagittal anorectoplasty procedure.\textsuperscript{4} A divided sigmoid colostomy also is performed in cases of anorectal injury. For the child with a diagnosis of Hirschsprung’s disease seen beyond the neonatal period, the surgeons in the authors’ unit prefer to create a divided sigmoid colostomy if the pathology does not extend beyond the rectosigmoid. Children presenting within the neonatal period (ie, within the first 28 days of birth) with the disease are offered a right transverse loop colostomy if a total colonic aganglionosis is not suspected.\textsuperscript{5,6,16}

Because the majority (64.4%) of Nigeria’s population subsists on <$1 (US) per day\textsuperscript{17} and healthcare is largely funded by out-of-pocket payment (competing with the basic necessities of food, shelter, and clothing), standard colostomy bags are not affordable for most patients, nor are they readily available.\textsuperscript{2,3} Standard colostomy bags must be sourced from a city in the South West of the country at a cost of approximately $8 (US) per appliance, posing a financial challenge. The authors observed that some of the patients’ mothers improvised ways to collect their child’s colostomy effluent and decided to document and adopt these methods for teaching the mothers of patients who may require a colostomy. Because no wound and ostomy care nurse provides care, ward nurses provide instructions to the mothers of patients with a colostomy.

Commonly Used Methods for Colostomy Effluent Collection

The wraparound waistband. In this method, pieces of old cotton clothing, held in place by another wrapping of clothing material, are placed over the stoma to wick away the effluent (see Figure 1). The fabric used (atampa) is commonly worn by women in the locality.

The improvised colostomy bag. This device is made from commonly used food wrapper cellophane bags, held in place by adhesive tape (see Figure 2). For children who have allergic reaction to the adhesive tapes and also for mothers who cannot afford the extra cost of adhesive tapes, the cellophane bag can be held in place with a fenestrated piece of cloth (atampa) tied to the abdomen in the region of the colostomy (see Figure 3).

Diaper collection. This method is commonly used in infants with a sigmoid colostomy. Pieces of old cotton clothing are placed over the stoma to wick away the effluent, and the diaper is used to hold them in place (see Figure 4). Mothers also are taught to wash the peristomal skin with mild non-antiseptic soap, to rinse the area with plenty of water after each bowel movement, and to dry with a piece of soft cloth. After cleaning the area, a thick layer of bland petrolatum jelly is applied to the peristomal skin before the application of the adopted collection device.

Key Points

- For a variety of reasons, not all stoma patients have access to modern appliances.
- A study was conducted to describe colostomy effluent management methods developed by mothers of pediatric stoma patients in Nigeria.
- The mothers were interviewed and the stoma inspected during the first three postoperative outpatient follow-up visits.
- Petrolatum jelly for skin protection and diaper methods to collect effluent were most commonly used.
- Skin excoriation was generally temporary unless the child had diarrhea.

Ostomy Wound Management 2013;59(12):32–37
Petrolatum jelly is the barrier ointment used in the authors’ unit. Zinc oxide cream has been tried, but the available zinc oxide products did not adhere well to the skin, exposing it to the colostomy effluent. The authors also tried compounding their own inhouse zinc oxide cream by mixing the locally available zinc oxide powder (moju) with petrolatum jelly, but the result was a poorly adherent paste. Dixon had earlier reported that liquid stool seen in patients with diarrhea tends to wash off the protective barrier of zinc oxide, rendering it an ineffective protector of denuded skin.

Studies that describe improvised colostomy care in children in developing countries are rare. The purpose of this study was to describe the preferred methods of stoma care by the mothers of children with a colostomy who visited the authors’ outpatient clinic and to assess their adaptability for use by children in other regions of the authors’ country.

Methods

Patients and setting. A prospective, descriptive study was conducted between January and December 2011. The mothers of all children between the ages of 1 day and 12 years were invited to participate if their child had a colostomy performed in the authors’ unit and received follow-up care at the outpatient clinic. The study was conducted during the first three postoperative outpatient follow-up visits.

Procedure. Demographic and clinical data were abstracted from patients’ clinical records and included age, gender, reason for surgery, and stoma location. An unstructured interview was conducted on the first postoperative visit, which usually occurred between 2 and 3 weeks after the surgery. After agreeing to participate in the study, mothers were asked to describe methods used for colostomy effluent collection, the barrier ointment employed, and occurrence of any peristomal skin excoriation. The interviewer usually repeated the post-op instruction (ie, change the collection device after each bowel movement, clean the skin with mild soap and water, and apply a barrier ointment before the application of another collection device). Mothers’ compliance with care instructions was inferred from their responses. Responses to the open-ended questions were recorded by the interviewer. The interviews were conducted by the authors before or after the stoma assessment and evaluation during the clinic visit. The person who conducted the first interview also conducted the second and third clinic visit interviews, each 2 weeks apart.

Data collection and analysis. All data were entered and analyzed using the statistical package for the social sciences (SPSS) version 15.0 for windows (SPSS Inc, Chicago, IL). Descriptive statistics were used for clinical and demographic variables, and interview responses were summarized and tabulated.

Results

Forty-four (44) children, 27 boys (61.4%) and 17 girls (38.6%), ranging in age from 2 days to 11 years (median 3.3 months) were included in the study. The most common indications for a colostomy in the study were anorectal malformations (32, 72.73%) and Hirschsprung’s disease (11, 25%). One case of an anorectal injury required a colostomy (2.27%). Most of the patients had a divided sigmoid colostomy (42, 95.45%), and only two patients (4.55%) — neonates presenting with Hirschsprung’s disease — had a right loop transverse colostomy.

Effluent collection method. Nine mothers had adopted two different collection methods, resulting in 53 descriptions of collections methods. Of those, the diaper collection method was used most frequently (22, 41.51%). The wraparound waistband was used by 19 mothers (35.85%), and 12 (22.64%) used the improvised colostomy bag. The diaper collection method was most commonly used in neonates.

Barrier ointment. All respondents used petrolatum jelly.
as barrier ointment. Two mothers described using shea butter (man kadanya) when they could not afford petrolatum jelly. The mothers’ adherence to instruction was poor in the early weeks postsurgery. Some seemed to have not understood the initial instructions before discharge from the ward. Care improved with time as instructions were reiterated at clinic visits.

Skin excoriation. This commonly occurred in all patients and was seen in varying degrees between the first and second postoperative clinic visits. Although no objective scale was employed, the commonly observed lesions were erythema and superficial epidermal denudations. By the third postoperative visit, usually corresponding to between week 6 and 7 postsurgery, skin excoriation was only seen in children experiencing diarrhea/loose stools.

Discussion

The purpose of this study was to describe the preferred methods employed in the care of children with a colostomy in a Nigerian hospital. The results showed that 41.51% of the respondents used the diaper collection method, 35.85% used the wraparound waistband, and 22.64% used the improvised colostomy bag. The diaper collection method was used mostly by mothers of neonates and young infants, while the mothers of older children (31) used the other two methods.

There are few reports in the literature documenting alternative methods for stoma care in developing countries. Banu et al’s19 case series described the use of Betel leaf (Piper betle) for stoma care in Bangladeshi children. Banerjee and Haque20 had earlier published their experience with the use of Betel leaf for enterostomy management in a case series involving Indian children. Both studies reported this method as cheap and readily available and also highlighted that it was excellent in preventing skin excoriation of the peristomal area.19,20

The appliances used in the collection of colostomy effluent in the current study were mostly made of reusable old or worn out articles of clothing and other locally available items like cellophane bags used in wrapping food. A pack of 100 cellophane bags costs about $0.31 US compared to colostomy appliances, which cost approximately $8 US per bag.

Such stoma appliances, readily available in developed countries, are designed to attach around the stoma, collect the stomal output, and contain any odors while remaining skin friendly.15 However, various studies have shown that 60% to 73% of ostomates have peristomal skin complications.7,21,22 Peristomal skin can be damaged by various mechanisms that include traumatic pouch removal, resulting in epidermal stripping; peristomal skin alteration under ostomy wafers; tunneling of ostomy effluent under the barrier; sensitivity to ostomy products; and Candida infections.5,7,22,23 All current study patients had varying degrees of peristomal skin excoriation in the first 2 to 3 weeks following the creation of the stoma. However, this tended to disappear before postop week 6. The authors attributed this to better adherence to instructions as the mothers gained experience on how to manage the stoma. It was noted that diarrhea stools tended to worsen the skin excoriation, which supports the findings of Dixon18 regarding the perineal skin of patients with diarrhea.

A review of the literature reports that as many as 85% of people with a stoma experience leakage from their appliances at one time or the other. Liquid stool that seeps under the ostomy wafer may erode the barrier and allow undetected undermining by effluent, resulting in injury to the peristomal skin.23,5,7 Barrier ointments are believed to adhere to denuded skin and may be helpful in protecting the skin from caustic ostomy effluent.5,22,23 The skin of current study patients was routinely covered with petrolatum jelly, which is readily available and affordable as a barrier.
and in relevant cases, age appropriate. The alternative methods of colostomy effluent collection described in this study may be seen as less effective than commercially available ostomy appliances; however, they are considerably less expensive and readily available. The methods devised by these mothers may help other children in low-income countries like Nigeria.

References