ISSN (Print): 2663-9491 ISSN (Online): 2789-6897

Original Article

The Role of Using Betel Leaf in Pediatric Stoma Care in Bangladesh: A Prospective Study

DOI: dx.doi.org

Bipul Bhusan Das[1], Md. Sadruddin Al Masud[1], Md. Tawhidul Islam[1]

Received: 01 OCT 2022
Accepted: 10 OCT 2022
Published: 14 NOV 2022

Published by:
Sheikh Sayera Khatun Medical College, Gopalganj, Bangladesh

ABSTRACT

Introduction: *Construction of a stoma is a common procedure in pediatric surgical practice. For care of these stomas, commercially available devices such as ostomy bag, either disposable or of longer duration are usually used. These are expensive, particularly in countries like Bangladesh, and proper-sized ones are not always available. We have found an alternative for stoma care, betel leaf, which is suitable for Bangladeshis.* ***Objective:*** *The purpose of the study is to assess the role of using betel leaf inpediatric stoma care in Bangladesh.* ***Method and materials:*** *It is a prospective study conducted at the department of pediatric surgery, Dhaka Medical college and Hospital over a period of 24 months, January, 2014 to December, 2015, with a sample size of 60. Patients within 12 years having temporary loop colostomy or ileostomy in the pediatric surgery units of Dhaka Medical College & Hospital within the study period were considered as the study population.After construction of stoma, at first zinc oxide paste was applied on the Peristomal skin. A betel leaf with shiny, smooth surface outwards & rough surface inwards was put over the stoma with a hole made in the center according to the size of stoma. Another intact leaf covers the stomal opening. When bowel movement occurs, the overlying intact leaf was removed & the faecal matter was washed away from both. The leaves were reused after cleaning. Use of commercially available Ostomy bag (e.g., Convatec ostomy bag) with Adhesive paste (Stomahesive) will be applied on the Peristomal skin.* ***Results:*** *Of 60 pediatric patients, 20 had pelvic colostomy, 19 had transverse colostomy and 21 had ileostomy. Of 60 patients under stoma care Mild excoriation had seen 13.3% cases of betel leaf users. Out of 40% excoriation, 30% occurred in ileostomy (p value <0.0001, hence significant).* ***Conclusion:*** *No doubt, a commercial stoma appliance in the form of a well fitted stoma bag is need for proper care of a colostomy or ileostomy and the adjacent skin. But in underdeveloped country like Bangladesh, it is often beyond economic capability of parents to purchase stoma appliances regularly on a long-term basis. It is also not easily available in the small towns and rural areas of the country. In such a situation, the role of betel leaf are highly*

1. *Assistant Professor, Department of Pediatric Surgery, Dhaka Medical College & Hospital, Dhaka, Bangladesh*

important and it can be used as a cheap, easily available, satisfaction on care givers to take care of stoma, nonirritant and effective alternative of appliances to care of a stoma and Peristomal skin in pediatric patients.

Keywords: *Pediatric stoma, enterostoma, excoriation, colostomy, Sigmoid colostomy. Transverse colostomy, Ileostomy, betel leaf*

(The Insight 2022; 5(1): 216-224)

INTRUDUCTION

The word stoma originates from the Greek stomoun (to provide with an opening or mouth). Intestinal stomas, considered basic surgical procedures, have a long and colorful history. As a method of treating intestinal obstruction, colostomies date back to the latter part of the eighteenth century and some of the first survivors of this procedure were children with an imperforate anus [1].

Stoma care is one of the essential components in stoma management. For best possible stoma care, a comfortable device is needed to maintain skin integrity around the wound and also for easy handling. There are several commercially available devices for stoma care [2]. However, caring for low, very low, or extremely low birth weight infants with their tiny stomas and special needs can be challenging. The result of stoma care that is inappropriate for low gestational age infants, inconsistent among caregivers from shift to shift, and ineffective in containing effluent from the stoma or preventing stomal complications. An enterostoma in a child is a major disruption of normality and frequently leads to substantial psychological trauma for the child and the parents. However, most of the stomas in pediatric age group are temporary, and correction of the underlying problem very often leads to closure of the divertingopening [3].

Stomal complications include maceration, bleeding, ulceration, necrosis, prolapse, retraction or stenosis of the stoma. Peristomal complications include irritant or allergic contact dermatitis, folliculitis, mechanical damage, hyperplastic granulation, bacterial and candidal infection and parastomal hernia. Irritant contact dermatitis, occurring in 15.5%, is the most common peristomal complication [4]. The management of stomas in children follows the same basic principles as in adults, but indications differ and the techniques need modifications, particularly in early infancy for the management of congenital abnormalities. Most of them intended to be temporary stomas. But the psychological and social aspects of care must be tailored to meet the needs of every child.

The usage of betel leaf in various medical and surgical conditions is cited as far back as two thousand years. Betel leaf, known colloquially as Pan, is an attractive spice, fast-growing, perennial, dark green, glossy on one side and rough on other side, and heart-shaped with creeping stem branches [5]. They are harvested in different parts of Bangladesh, India, Myanmar, and

Indonesia. These leaves with betel nuts are traditionally chewed by Bangladeshis particularly in rural areas after meals.

Applying betel leaf over the forehead can give instant relief from headache. It is used for arresting unwanted foul smell secretions and oozing. Tying betel leaf with haldi (turmeric) on minor injuries helps to stop bleeding [5]. Applying the juice of leaves on wounds is a common rural practice. In our department, we use it only in the care of the stoma. Betel leaves contain a phenol called chavical, which has antiseptic properties (www.online-vitamins-guide.com/herbs/betel-leaves.htm .2007).

Betel leaf is cheap, costing only about US$0.15 per month. It is easier to handle, apply and remove from the stoma & people are very familiar with it. Sometimes its fragrancesubmerges the malodor of fecal matter. It can also be appropriately fitted on the stoma because betel leaves come in various sizes, whereas colostomy bags of appropriate sizes are not always available. The cut edge of the leaf does not curl or soften and does not cause any irritation to the stoma. It is very easy to rip or tear. In some parts of India, people also use betel leaf for care of colostomy in anorectal malformations.

Fig 1 A. Stoma care with betel leaf

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easy to rip or tear. In some parts of India, people also use betel leaf for care of colostomy in anorectal malformations.

Fig 1 B. Stoma care with betel leaf

A plant leaf has been recently suggested as an alternative [6]. A set betel leaves (Piper betel), one with a central hole equal to the stoma size, and the other placed over the exposed gut mucosa serves two purposes; (a) As a mechanical barrier prevents direct contact of effluent with the Peristomal skin and (b) The other leaf prevents contact and friction of the stomal mucosa with patients' clothing. A betel leaf has a smooth surface which has an apparent soothing effect on skin and delicate mucosa. The chemical or pharmacological components of the betel leaf that produce the job is yet to be discovered. Distal loop irrigation is easy removing the leaf over the stoma [7]

A good number of patients have to have colostomy or ileostomy as a part of a staged procedure during correction of complex surgical problems involving the gastrointestinal tract. Dressing of such enterostomy stomas with betel nut leaves (pan) is avery cheap and effective option, specially in developing country like india .

Aims of the Study

The purpose of the study is to assess the role of using betel leaf in pediatric stoma care in Bangladesh.

METHODS AND MATERIAL

Study design, sample and procedure

It is a prospective study conducted at the department of pediatric surgery, Dhaka Medical college and Hospital over a period of 24 months, January, 2014 toDecember, 2015 with a sample size of 60. Patients within 12 years having temporary loop colostomy or ileostomy inthe pediatric surgery units of Dhaka Medical College & Hospital within the study period were considered as the study population.Patients within 12 years having temporary loop colostomy or ileostomy and those had given consent were included in the study. Patients under the age of 12 years and with permanent colostomy or Patients with dividing colostomy were excluded.

Out of the study population the individual sample units were selected according to clinical judgement until desired sample size was attained. When a patient got admitted and had to done fecal diversion by temporary ileostomy orcolostomy at the study place guardians of the participants were informed about the study and informed consent was obtained.

Ethical consideration

Ethical clearance was taken from ethical review committee of Dhaka Medical College. All respondents were informed

about the objectives and procedures of the study and ensured of the confidentiality of the data.

Data collection tool

The principal investigator collected the data and the relevant investigations in the Department of Pediatric Surgery, Dhaka Medical College and Hospital. A Data sheet was filled up during data collection. In each case, information about the patient was collected in a prescribed questionnaire (appendix-II) after getting written consent from the parents or legal guardians in a preformed consent form (translated into Bangla - appendix-I). After admission each patient was thoroughly examined and relevant information's were noted.

After construction of stoma, at first zinc oxide paste was applied on the peristomal skin. A betel leaf with shiny, smooth surface outwards & rough surface inwards was put over the stoma with a hole made in the center according to the size of stoma. The hole could just snugly accommodate the stoma. Another intact leaf covers the stomal opening. When bowel movement occurs, the overlying intact leaf was removed & the faecal matter was washed away from both. The leaves were reused after cleaning. Children attended the pediatric surgery ward for follow up visits which was completed within the study period. Last follow up was recorded on November, 2015.

STATISTICAL ANALYSIS

Statistical analysis was performed using the Statistical Package for Social Science (SPSS) software, version 21 and expressed in tables with appropriate statistical test results. A descriptive analysis was performed for clinical features and results were presented as mean ± standard deviation, X^2-test for differences in proportion for categorical variables and unpaired Student's t-test for the differences in mean for continuous variables. All values were two sided and considered as statistically significant if $p < 0.05$.

RESULTS

Age range was 1 day to 4320 days in stoma bag group and 1 day to 3960 days in betel leaf group. Mean age stoma bag and betel leaf group was 1339.73±1470.19 days and 721.70±1227.64 days respectively. Significant age difference was seen between the groups as p value was <0.033 (Table1)

Table 1: Age distribution of the participant

Age	**Use of betel leaf**	**Use of Stoma bag**	**P value**
Day	1-4320	1-3869	**0.033**
Mean SD	(1339.73 ±1470.19)	(721.70 ±1227.64)	

Out of the total 60 patients, 41 were male (more than 50%) and 19 were female. Seventy six percent patients in betel leaf group were male. This difference in sex distribution between the study groups was statistically significant (P value -0.017). In stoma bag group male=60% and female=40%. (Table 2).

Table2: Sex distribution of the study groups

Gender	Stoma bag use		Betel leaf use		P value
	n	%	n	%	
Male	18	60	23	76.6	0.017
Female	12	40	7	23.3	

Qualitative assessment of the skin excoriation level was done in all patients to see depth of Peristomal skin excoriation 31.7% patients of study groups had healthy skin. Mild excoriation had seen 13.3% among the betel leaf user. Comparison was done by chi-square test and P value was 0.116 which was >0.05, hence not significant. (Table-3).

Table 3 Skin excoriation among the betel leaf user

Skin excoriation	Betel leaf user n (%)	P value
Healthy skin	19 (31.7)	0.116
Mild excoriation	8 (13.3%)	
Moderate excoriation	0	
Severe excoriation	0	

Qualitative assessment of the skin excoriation level was done in all patients to see depth of Peristomal skin excoriation in different type's enterostomas. P value was <0.0001, hence significant, more peristomal excoriation in ileostomy (Table 4).

Table 4: Types of Stoma

Type of stoma	n	Healthy skin	Mild excoriation	Moderate excoriation	Betel leaf use	P value
Sigmoid colostomy	20	18 (30%)	2 (3.33%)	0	13	**<0.0001**
Transverse colostomy	19	15 (25%)	(6.65%)	0	10	
Ileostomy	21	3 (5%)	15 (25%)	3 (5%)	7	

Qualitative assessment of care givers satisfaction score was done among all care givers. 31.7% care givers among the study groups were satisfied, 13.3% care givers of betel leaf user were strongly satisfied. 31.7% were moderately satisfied and 5% felt average using betel leaf. Chi-square test was done and p value was 0.002 and it was <0.05, hence significant. (Table5).

Table 5: Care givers satisfaction score among the study groups

	Care giver satisfaction score			P value
Stoma care	5	4	3	**0.002**
Betel leaf use	8 (13.3)	19 (31.7)	3 (5%)	

Fig 2: Stoma care with betel leaf with distal loop irrigation

DISCUSSION

Problems related to construction, care, and closure of stomas in the small and large intestines are numerous and common. They can lead to significant morbidity and occasional mortality.Analysis of pediatric series reveals complication rates that often reach and sometimes exceed 50% [8].

An enterostoma in a child is a major disruption of normality and frequently leads to substantial psychological trauma for the child and parents. However, most decompressing intestinal stomas in the pediatric age group are temporary and correction of the underlying problem often leads to closure of the diverting opening [9]. With the exception of feeding access, more than one half of the stomas are placed in the neonatal period and one fourth in children younger than one year of age [10].

In this study, the study group had neonate, infant and children, age range was 1 day to 3960 days with betel leaf. Significant age difference was seen as p value was <0.033.

There was significant difference regarding sex of the participants, 76% of the betel leaf group was male. This difference in sex distribution in the study group was statistically significant (P value -0.017). Proper care of an enterostoma begins with preoperative preparation whenever possible [11]. Parents, as well as older children, must be carefully taught and reassured before leaving the hospital and on subsequent follow-up visits. Ileostomies and proximal colon colostomies always require pouches. With the well-formed stools that result from sigmoid stomas, some parents of infants have used a skin barrier and diapers instead. A plant leaf has been recently suggested as an alternative [6].

Peristomal skin complications are the most common reason for ostomy patients visit an outpatient service. Prevention and management of Peristomal skin complications are critical care components of ostomy care. Identifying risk factors for the occurrence of peristomal skin complications and the clinical features can help optimum assessment and management approaches.

In this study 60% patientsof study groups had healthy skin. Mild excoriation had seen 13.3% cases among the betel leaf user. P value was 0.116 which was >0.05, hence not significant. This indicated that there was no significant difference of skin excoriation among the study group.

In this study all 3 moderate excoriation and 15 mild excoriations had in ileostomy cases which were 30% of all cases. 6.65% and 3.33% had mild excoriation in transverse colostomy and sigmoid colostomy respectively. Moreover, 60% of patients had no Peristomal skin excoriation. P value was <0.0001, hence significant, more peristomal excoriation in ileostomy.

Analysis of medical records of patients who underwent colostomy reveals two types of complications: stomal and peristomal. Stomal complications include maceration, bleeding, ulceration, necrosis, prolapse, retraction or stenosis of the stoma. Peristomal complications include irritant or allergic contact dermatitis, folliculitis, mechanical damage, hyperplastic granulation, bacterial and candidal infection and parastomal hernia. Irritant contact dermatitis, occurring in 15.5%, is the most common Peristomal complication [4]. Stomas used for evacuation of small intestine are associated with a higher morbidity than are colostomies because these stomas are compounded by fluid, electrolyte, and absorption losses, [12] Transverse colostomies are more prone to complications than are sigmoid stomas [13].

Several other factors have contributed to the safety, effectiveness, and ease of care of stomas in adults and children. Paramount among these is the advent of enterostomal therapy, which has evolved into a specialty in its own right [14].Enterostomal therapists are now an integral part of health care teams in most medical institutions. Major national and international ostomy associations [15] foster the dialogue among professionals and provide a wealth of information through traditional and web-based material including publications for parents, caregivers, and teenage patients [16]

Care givers satisfaction score was done among all care givers. 13.3% care givers of betel leaf user group were strongly satisfied.. 31.7% were moderately satisfied and 5% felt average using betel leaf. Chi-square test was done and p value was 0.002 and it was <0.05, hence significant.It indicated that there was significant difference of care givers satisfaction among the study groups. i e. Betel leaf using care givers are strongly satisfied.

In spite of substantial developments in recent years in the range and sophistication of commercially available stoma care products and devices, patients with a stoma still occasionally experience skin excoriation, leaking pouch, problems with malodor, allergy to adhesives, and difficulty in changing.

Betel leaf is cheap, costing only about US$0.15 per month. It is easier to handle, apply, and remove from the stoma because people are very familiar with it. Sometimes its fragrance submerges the malodor of fecal matter. It can also be appropriately fitted on the stoma because betel leaves come in various sizes, whereas colostomy bags

of appropriate sizes are not always available. The cut edge of the leaf does not curl or soften and does not cause any irritation to the stoma. It is very easy to rip or tear.

This study had certain limitations. It was conducted in a single institution, so the results may not be the true reflection of the whole population. The study period was short and sample size was also limited. Failure to attend on exact day of follow up, due to problem of transportation, remote areas from the center of study, follow-up could not be maintained in all cases.

CONCLUSION

No doubt, a commercial stoma appliance in the form of a well fitted stoma bag is need for proper care of a colostomy or ileostomy and the adjacent skin. But in underdeveloped country like Bangladesh, it is often beyond economic capability of parents to purchase stoma appliances regularly on a long-term basis. It is also not easily available in the small towns and rural areas of the country. In such a situation, the role of betel leaf are highly important and it can be used as a cheap, easily available, satisfaction on care givers to take care of stoma, nonirritant and effective alternative of appliances to care of a stoma and Peristomal skin in pediatric patients.

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