Betel Leaves as an Alternative Method of Enterostomy Management

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Aims

1. Assess the viability of betel leaf stoma care in terms of complication rates
2. Determine whether betel leaf stoma care is a practical alternative in LICs/LMICs

Introduction

Construction of an enterostomy is a common procedure in paediatric surgery, often used as a preliminary treatment in the surgical management of many congenital and acquired conditions of the gastrointestinal tract. Indications for construction of an enterostomy in children, most commonly conditions such as Hirschsprung's disease and anorectal malformations, are often benign or congenital in nature. Good stoma care requires a comfortable device that allows for easy collection of bowel contents whilst still protecting peristomal skin integrity. While commercially available stoma appliances have achieved this, they are too expensive for most in low-income-countries (LICs) and low-to-middle-income-countries (LMICs), and often unavailable in the required size.

Socioeconomic Impact

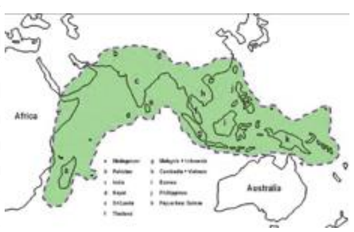
Patients often present in a delayed fashion in LICs/LMICs, resulting in many more ostomies than necessary. Insufficient access to surgery means patients must live with temporary ostomies for prolonged periods of time. These factors necessitate stoma formation in patients that may not have been necessary if they had been born in HICs. Therefore, the socioeconomic impact of ostomies is accentuated in these countries.

A study[1] noted 3 main consequences of ineffective stoma care facilities:

- Extensive time investment in order to maintain odour and hygiene - job/education opportunities had to be declined
- Extensive financial investment - caregivers sold livestock/household assets to finance care
- Stigma associated - skin excoriations[2] were a contributing factor to poor acceptance by caregivers; children often kept home from school; incidences of spouses leaving home due to the stigma attached.

Better, more accessible stoma care, such as the betel leaf alternative, may ease resources required from caregivers, lessening the negative impact ostomies have on a family.

This map[10] shows the regions of cultivation/consumption of betel leaves. *Piper betle*, is a type of leaf engrained in asian culture; in India and Sri Lanka, it is traditionally offered as a mark of respect. It is also used in cooking and as a wrapper when chewing tobacco. In Chinese folk medicine and Ayurvedic medicine, betel leaves are used for treatment of various disorders.



1. Comparison of Complication Rates

Current Stoma Care in LICs/LMICs

Due to an inability to access commercial disposable ostomy systems, caregivers in LICs/LMICs have to rely on their own skills to create a viable alternative; the alternatives include home-made devices using pieces of plastic, jar lids, plastic bags or cloth among other materials. Anyanwu et al[3] conducted a study in a tertiary health centre, serving 15 million people in Nigeria (LMIC), identifying a few common methods for colostomy effluent collection employed by caregivers in the absence of affordable/readily available stoma care equipment.

'The wraparound waistband': old cotton clothing held in place by another wrapping of clothing material

'Improvised colostomy bag': commonly made from used food wrapper cellophane bags, held in place by adhesive tape OR cloth tied around abdomen

'Diaper collection': old cotton clothing placed over stoma held in place by a diaper

Challenges of Stoma Care

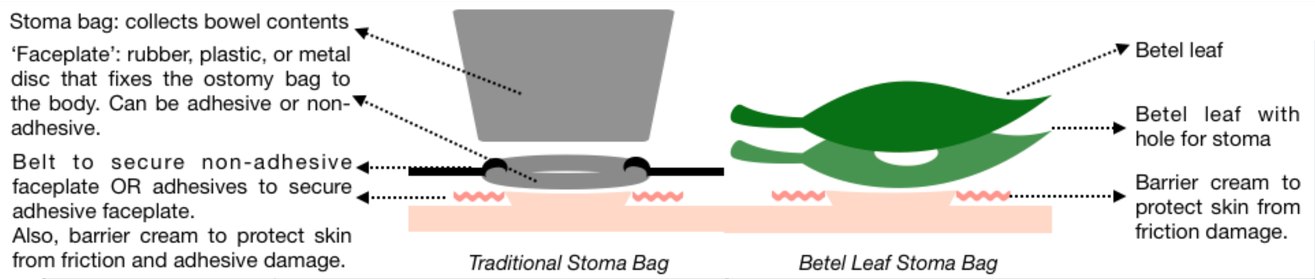
The major problem ostomy patients encounter is care of peristomal skin, with a reported incidence of peristomal skin excoriations ranging from 3-42% in the HIC setting. This can range from mild dermatitis to full thickness necrosis and ulceration; stoma neglect, improper placement or fit of the appliance can result in chemical dermatitis from skin exposure to stoma effluent. In studies conducted in India[4] and Pakistan[5], skin excoriations was found to be the most common stoma-related complication due to the non-availability of properly fitting colostomy bags. Following this, allergic reactions are the next most common complication of stoma appliances, occurring due to sensitivity to skin barriers, adhesives and tapes. Insult to the stomal mucosa can also occur.

The discussed complications occur as a result of the stoma bag, therefore, I have used these as parameters to compare different stoma appliances.

	Betel leaf alternative	Traditional Stoma	'Wraparound waistband'[3]	Improvised colostomy bag'[3]	Diaper collection method'[3]
Peristomal skin excoriations	Paper 1[6]: 2.6% Paper 2[7]: 20.93% Paper 3[8]: 3.22%	Paper 1: 40.65% Paper 2: 21.53%	100%	100%	100%
Allergic dermatitis of peristomal skin	Paper 1: 0% Paper 2: 0%	Paper 1: 18.75 Paper 2: 6.34 %	-	-	-
Mucosal Ulcerations	Paper 2: 8.13%	Paper 2: 7.69%	-	-	-

Through a literature search, I found 3 papers on the use of betel leaves in stoma care. The first 2 used the betel leaf stoma bag from day 1 post-surgery, though patients in paper 3 were only switched to betel leaf stoma care on day 5 or 6 post-surgery, and did not use a barrier cream. Paper 3 additionally did not have a traditional stoma care group as a control and excluded patients who had controlled skin excoriations. Shockingly, all currently employed alternative methods of stoma care had a 100% incidence rate for skin excoriations. Betel leaves proved to be equally good or better than traditional and alternative methods of stoma care in all 3 parameters. However, this is a small sample size and studies were geographically limited.

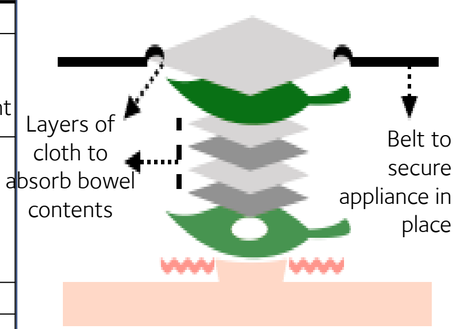
2. Comparison of Practicality



Cost per week	£8.13 - £49.44 for total care	£0.028 for 6 betel leaves[6]
Availability	•Come in specific sizes •Properly fitting stomas often unavailable in LIC/LMICs[4]	•Can be cut accordingly •Come in various sizes •Can be grown/embedded in culture so can be easily bought
Ease of use	•Caregiver needs training •Difficult to examine wound •Bags replaced when full	•Caregiver requires some training, but it is much more intuitive[6] •People are already familiar with the material[6] •Easy to examine wound •Must be frequently cleaned
Reusability	x	✓
Manoeuvrability	•Bowel fluid can be collected	•Stomas described in this poster cannot collect bowel fluid but the updated version (currently in use) can

Update

Since the referenced data was published, this type of stoma care has progressed[9]. The image below illustrates the current structure, solving the problem of collection of bowel fluid. Many users have also stitched cellophane bags to betel leaves to collect bowel contents.



1) Muzira, A., Kakembo, N., Kisa, P. et al. Pediatr Surg Int (2018) 34: 457.; **2)** Osifo, David & Osaigbovo, E.O. & Obeta, E.C.. (2008). Colostomy in children: Indications and common problems in Benin City, Nigeria. 24. 199-203.; **3)** Anyanwu, L.-J. C., Mohammad, A. and Oyebanji, T. (2013) 'A descriptive study of commonly used postoperative approaches to pediatric stoma care in a developing country.', *Ostomy/wound management*, 59(12), pp. 32–7; **4)** Chandramouli, B., Srinivasan, K., Jagdish, S., & Ananthakrishnan, N. (2004). Morbidity and mortality of colostomy and its closure in children. *Journal of Pediatric Surgery*, *39*(4), 596–599 ; **5)** Nasar GN. Indications & Complications of Colostomy in Children. APMC 2017;11(2):110-112. ; **6)** Banu, T., Talukder, R., Chowdhury, T. K., & Hoque, M. (2007). Betel leaf in stoma care. *Journal of Pediatric Surgery*, *42*(7), 1263–1265. ;**7)** Huq, M. A. U., Rahman, A. K. M. M., & Hossain, T. (2014). Use of Betel Leaves in Pediatric Stoma Care. *Journal of Paediatric Surgeons of Bangladesh*, *1*(2), 148–152.; **8)** Banerjee S., Haque J. (2001). An ingenious method of enterostomy management. *Journal of Indian Association of Paediatric Surgeons 2001 Jul-Sep; 6(3): 77-9;* **9)** Professor Tahmina Banu; **10)** SPAR Profiles for the Assessment of Genetic Diversity Between Male and Female Landraces of the Dioecious Betelvine Plant (Piper betle L.) - Scientific Figure on ResearchGate