

## A Plea for More Umbilical Stomas in Paediatric Surgical Practice

MV Vincent, SE Dundas Byles

### INTRODUCTION

Enterostomy formation is commonly performed in paediatric surgical practice. Many surgical procedures in infants and children benefit from a periumbilically sited incision and stoma formation should be no exception. Because of the superior cosmesis following closure of an umbilically-sited colostomy or ileostomy, ease of stoma care and economic benefits, periumbilically sited stomas are an attractive alternative for use in both neonates and children.

**Keywords:** Children, developing countries, periumbilical incisions, umbilical stomas

### CASE REPORT

A one-day old female neonate was referred to the paediatric surgical unit of the University Hospital of the West Indies after her newborn examination by the paediatrician at her local hospital revealed absence of an anal orifice. The baby had been born at term by normal spontaneous vaginal delivery to a 38-year old mother (G2 P1) whose antenatal history was uneventful. She weighed 3.22 kg at birth.

On surgical review, the neonate was active and pink with no dysmorphic features. Her abdomen was mildly distended, but soft and non-tender with no palpable masses. Perineal examination revealed well-formed buttocks with an anal dimple but no anal orifice. A rectovestibular fistula was noted through which extruded copious amounts of meconium and gas. She had no palpable vertebral or limb anomalies. Renal ultrasonography, cardiography and vertebral radiography were performed and excluded renal, cardiac and vertebral anomalies, respectively.

She remained well, tolerating breastfeeds and continued to decompress her bowel adequately through the fistula on the day of presentation. On Day 2 of life, a periumbilically sited stoma was performed. An infra-umbilical incision was made through which the contents of the peritoneal cavity were inspected. A urachal remnant was noted and divided, as were the medial umbilical ligaments.

The distal descending colon was mobilized and a loop colostomy was fashioned within the inferior umbilical skin crease. The proximal limb was sited superiorly to the distal limb. A fascial bridge was placed and the stoma matured using vicryl 3/0 sutures. Postoperative recovery was uneventful, the stoma became active within 24 hours and the baby was discharged home one week later. Prior to discharge, there was no evidence of peristomal skin excoriation or stomal prolapse.

At four months of age, the patient re-presented with a three day history of minimal passage of stool *via* the stoma. The mother reported that instead more stool was being passed perineally, *via* the rectovestibular fistula. On examination, the baby was noted to have stenosis of both the proximal and distal limbs of the colostomy. Both limbs were dilated up to a size nine Hegar dilator without anaesthesia and the baby was kept overnight for observations. Over the 24-hour observation period, she again began passing stool preferentially through the stoma and was thus discharged (Fig. 1).



Fig. 1: Umbilical stoma as seen on day of colostomy closure (age four months).

She remained well, experiencing no further stomal stenosis and was electively re-admitted at eight months of age for posterior sagittal anorectoplasty (PSARP). At the end of the procedure, a Hegar #10 dilator was used to dilate the proximal limb of her umbilical stoma.

From: Department of Surgery, Anaesthesia and Intensive Care (Paediatric Surgery), The University Hospital of the West Indies, Kingston 7, Jamaica.

Correspondence: Dr MV Vincent, Department of Surgery, Anaesthesia and Intensive Care, The University Hospital of the West Indies, Kingston 7, Jamaica. E-mail: michvincent@yahoo.com

The infant had a smooth postoperative recovery and was subsequently re-admitted electively at 18 months of age for closure of colostomy. The wound has since healed cosmetically (Fig. 2). Now two years of age, she is thriving



Fig. 2: Appearance of patient's abdomen 14 months after closure of periumbilically sited colostomy (age two years).

and doing well. She is presently on a bowel management regime for treatment of anorectal malformation-associated constipation. This involves dietary manipulation and use of laxatives.

## DISCUSSION

The first successful colostomy is said to have been performed by Duret in 1793 in a three-day old neonate with imperforate anus, who subsequently survived for 45 days (1). Today, stomas are surgical procedures frequently performed by paediatric surgeons, not only in the management of children with anorectal malformations (ARM) but also Hirschsprung's disease, trauma, necrotizing enterocolitis and inflammatory bowel disease (2–4).

The search for a more cosmetically appealing stoma may well be attributed to Raza (5), who in 1977 reported his experience with performing umbilical colostomies in 101 adult patients. The emphasis on superior cosmesis is also highly regarded in paediatric surgery. As a result, an increasing number of surgical procedures in children are now being performed *via* an umbilical incision. These include umbilical and peri-umbilical herniorrhaphy (6), pyloromyotomy for pyloric stenosis (7), obtaining colonic biopsies for Hirschsprung's disease (8), continent appendicostomy for bowel management in fecally incontinent children (9), continent conduit for managing urinary incontinence (10), transumbilical laparotomy for a wide range of surgical pathologies including jejunoileal atresias, intussusception and malrotation (11, 12) and a wide range of laparoscopic and laparoscopic-assisted procedures (13–15). The cosmetic

outcome is excellent, as its position lies within a natural skin crease.

Another major advantage of umbilical stomas in neonates and infants is the decreased cost of care if a colostomy has been formed. The effluent from a colostomy is usually of a consistency (pasty or semi-solid) not likely to be associated with significant peristomal excoriation. As a result, colostomy bags are not mandatory as a normally fitted diaper is usually adequate to collect effluent drainage. This is particularly relevant in developing countries like Jamaica where colostomy care can be economically challenging, particularly because of the cost of colostomy bags. The patient hereupon reported has never used colostomy bags, relying solely on her nappy/diaper to collect effluent drainage from the umbilical stoma. If an ileostomy has been formed, however, we recommend usage of colostomy bags with the usual protection of the peristomal skin, for example application of barrier creams or wafers.

As Raza (5) initially observed in adults, complication rates of umbilically sited stomas in children are also minimal, comparing favourably with stomas sited elsewhere (2, 16). The index patient, despite developing stomal stenosis, did not require surgical revision, with excellent response being obtained from stomal dilatation alone which did not require a general anaesthetic.

In an effort to decrease the risk of stomal prolapse which is one of the commonest complications of colostomy formation in the paediatric population (3, 17–19), we advocate adherence to the recommendation of using fixed portions of bowel when forming colostomies in neonates and infants using the periumbilical technique (3).

In summary, we recommend use of umbilical stomas in paediatric patients, particularly in neonates and infants, since they offer excellent cosmesis, minimal complications and are socio-economically advantageous.

## REFERENCES

1. Devlin HB. Colostomy – indications, management and complications. *Ann R Coll Surg Engl* 1973; **52**: 392–408.
2. Fitzgerald PG, Lau GYP, Cameron GS. Use of umbilical site for temporary ostomy: review of 47 cases. *J Pediatr Surg* 1989; **24**: 973.
3. Pena A, Migotto-Krieger M, Levitt MA. Colostomy in anorectal malformations: a procedure with serious but preventable complications. *J Pediatr Surg* 2006; **41**: 748–56.
4. Bischoff A, Levitt MA, Lawal TA, Pena A. Colostomy closure: how to avoid complications. *Pediatr Surg Int* 2010; **26**: 1087–92.
5. Raza SD, Portin BA, Bernhoft WH. Umbilical colostomy: a better intestinal stoma. *Dis Colon Rectum* 1977; **20**: 223–30.
6. Cone JB, Golladay ES. Purse-string skin closure of umbilical hernia repair. *J Pediatr Surg* 1983; **18**: 297.
7. Tan KC, Bianchi A. Circumumbilical incision for pyloromyotomy. *Br J Surg* 1986; **73**: 399.
8. Sauer CJE, Langer JC, Wales PW. The versatility of the umbilical incision in the management of Hirschsprung's disease. *J Pediatr Surg* 2005; **40**: 385–9.
9. Levitt MA, Soffer SZ, Pena A. Continent appendicostomy in the bowel management of fecally incontinent children. *J Pediatr Surg* 1997; **32**: 1630–3.

10. Mitrofanoff P. Trans-appendicular continent cystostomy in the management of the neurogenic bladder. *Chir Pediatr* 1980; **21**: 297–305.
11. Soutter AD, Askew AA. Transumbilical laparotomy in infants: a novel approach for a wide variety of surgical diseases. *J Pediatr Surg* 2003; **38**: 950–2.
12. Murphy FJ, Mahee A, Khalil B, Lall A, Morabito A, Bianchi A. Versatility of the circumumbilical incision in neonatal surgery. *Pediatr Surg Int* 2009; **25**: 145–7.
13. Zhou H, Sun N, Zhang X, Xie H, Ma L, Shen Z et al. Transumbilical laparoendoscopic single-site pyeloplasty in infants and children: initial experience and short-term outcome. *Pediatr Surg Int* 2012; **28**: 321–5.
14. St Peter SD. Single-site umbilical laparoscopic segmental small bowel resection. *Sem Pediatr Surg* 2011; **20**: 219–23.
15. Al-Zaiem MM. Assisted laparoscopic excision of huge abdominal cysts in newborns and infants using the umbilical laparoscopic port incision. *J Pediatr Surg* 2011; **46**: 1459–63.
16. Cameron GS, Lau GYP. The umbilicus as a site for temporary colostomy in infants. *J Pediatr Surg* 1982; **17**: 362–4.
17. Ein SH. Divided loop colostomy that does not prolapse. *Am J Surg* 1984; **147**: 250–2.
18. Nour S, Stringer MD, Beck J. Colostomy complications in infants and children. *Ann R Coll Surg Engl* 1996; **78**: 526–30.
19. Canil K, Fitzgerald P, Lau G, Cameron G, Walton M. Button-pxy fixation for repair of ileostomy and colostomy prolapse. *J Pediatr Surg* 1995; **30**: 1148–9.