Technical Innovation

Access this article online
Website: www.afrjpaedsurg.org
DOI: 10.4103/0189-6725.99412
Quick Response Code:

Colostomy in neonates under local anaesthesia: Indications, technique and outcome

Christopher Suiye Lukong, Basheer Abdullahi Jabo[1], Anita Yafeh Mfuh

ABSTRACT

Background: Colostomy is a resuscitative procedure in paediatric surgical practice. In critical patients, mortality may be high, if general anaesthesia is used. Local anaesthesia may be an alternative in this group of neonates. The aim of this article was to evaluate the indications, the technique and outcome of colostomy in neonates under local anaesthesia. **Materials and Methods:** A prospective analysis of 38 neonates who had colostomy under local anaesthesia, from July 2008 to September 2011, in our centre. **Results:** There were 34 boys and 4 girls. The median age was 4 days (range 2–11 days),and all presented in a critical state. The indication for colostomy was anorectal malformation 37 (97.4%) and colonic atresia 1 (2.6%). Colostomy: sigmoid 7 (18.4%), descending 29 (76.3%), transverse 2 (5.3%). The median duration of the procedure was 45 minutes (range 30–60 minutes). The hospital stay was 7–15 days (median 7 days) and cost of treatment 7000–7500 Naira (median 7500 Naira = $50). There were 5 (13.2%) early complications, namely, skin excoriation 2, superficial site infection 2, and bowel evisceration 1; mortality was 2 (5.3%). The late complications were stomal stenosis 1 (2.6%), colostomy diarrhoea 2 (5.3%), and parastomal hernia 2 (5.3%). 25 (65.7%) had colostomy takedown and 13 (34%) were yet to have colostomy takedown. Follow-up was for 1–2 years. None of the patients had a permanent colostomy. **Conclusion:** Colostomy in neonates under local anaesthesia is feasible, safe and cost-effective. The outcome is good and may be used when neonatal anaesthetic expertise and intensive care facilities are lacking.

Key words: Colostomy, local anaesthesia, mortality

Department of Surgery, Paediatric Surgery Unit, Usmanu Danfodiyo University Teaching Hospital, Sokoto, [1]Department of Nursing Sciences, Ahmadu Bello University, Zaria, Nigeria

Address for correspondence:
Dr Christopher Suiye Lukong,
Department of Surgery, Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria.
E-mail: lukongchris@yahoo.com

INTRODUCTION

Colostomy is a common procedure in paediatric surgery. It may be associated with morbidity and mortality.[1-5] Mortality may be increased in critically ill neonates, especially when general anaesthesia is used, among other causes. This is because in most instances these neonates are not suitable for general anaesthesia or may tolerate general anaesthesia poorly. In such instances it may be better to embark on local anaesthesia. This might reduce morbidity and mortality which may be associated with the adverse effects of general anaesthesia in neonates.

This article described the indications, the technique and the outcome of divided sigmoid colostomy in neonates under local anaesthesia.

MATERIALS AND METHODS

This was a prospective study of all the neonates who had colostomy under local anaesthesia from July 2008 to September 2011, in our centre. Data from a structured proforma of those who satisfied the selection criteria below were recruited and analysed. The results were recorded as shown below.

Selection criteria

Indications

1. Critically ill neonates
   These are neonates who presented at 48 hours or more after birth with features of intestinal obstruction, sepsis, respiratory difficulty and anterior abdominal wall edema.
2. Lack of neonatal anaesthetist
   Neonates who presented with intestinal obstruction, requiring colostomy, fit for general anaesthesia but had difficult or failed intubation. There is no neonatal anaesthetist in our centre.
3. Neonates requiring colostomy, but had associated conditions such severe cardiac anomalies or prematurity.

Exclusion criteria

Neonates who presented in good clinical state and had colostomy under general anaesthesia. These were few and may not statistically constitute a group for comparison and were therefore excluded from this study.

Technique of divided sigmoid colostomy

Preoperative preparation

The neonate is adequately resuscitated by decompressing the gastrointestinal tract, rehydration, administration of antibiotics and vitamin K. Tetanus toxoid is administered, if the mother never had tetanus immunization during the gestational period or the neonates were delivered at home or both.

These patients are kept warm, and informed consent for surgery was obtained from the parents.

Preoperative medications

Preoperative antibiotics are given parenterally, ceftriazone at 50 mg/kg stat and metronidazole at 7.5 mg/kg stat. Adequate analgesia is achieved with intravenous acetaminophen at 15 mg/kg stat, given intraoperatively, just before the local anaesthesia.

The local anaesthesitic agent used is 2% xylocaine with adrenaline at a dose of 7 mg/kg, drawn into a syringe and diluted four times to 0.25% concentration which is adequate for the neonate. Oxygen is administered using face mask at the rate of 3 L/min. No sedative is given.

Positioning

The patient is placed in supine position and trapped on the crucifix under a radiant heater [Figure 1]. The head was placed in lateral position with a wide bore nasogastric tube (size 10) *in situ* to decompress the stomach and reduce the risk of aspiration.

The operation site was cleaned and draped in sterile fashion. Xylocaine with adrenalin 0.25% was infiltrated on the incision site at the left iliac fossa for the procedure of divided sigmoid colostomy. The line of incision was marked midway between the umbilicus and the anterior superior iliac spine on the left iliac fossa region.

Procedure

Xylocaine with adrenalin was infiltrated along the premarked incisional line. A 3-cm transverse incision is made on the left iliac fossa following the premarked line. The incision is deepened through subcutaneous tissue and fascia to expose the muscle layer. The muscle layer is infiltrated with xylocaine and divided to gain access to the peritoneum. The peritoneum is divided to enter the abdominal cavity. At this point, caution must be employed to prevent small bowel evisceration. This will make identification of the sigmoid colon difficult, and the process of returning the bowel could be quite difficult. However, if bowel eviscerates, then allow the neonate to calm down and carefully return the small bowel. Do not return the small bowel forcefully because this may result in injury to the bowel.

At this stage, stay sutures are placed on the fascial layer at the mid aspect of the incision on both sides [Figure 2]. These stay sutures assist in retraction and are subsequently used to reconstitute the fascial bridge. The placement of the stay sutures at the mid aspect ensures equity in terms of space for the colostomy limbs when the fascial bridge is fashioned.

The sigmoid colon is identified, mobilized, brought out of the wound and divided immediately after displacing the marginal artery. After division of the colon, the effluent is then adequately sucked to prevent peritoneal contamination [Figure 3]. This step decompresses the intestine giving the neonate enough relief and relaxation for completion of the procedure. This decompression further creates space for examination of the bowel and other structures such as the urinary bladder. The divided ends of the sigmoid colon are held with Babcock tissue forceps or stay sutures to prevent them from falling back to the peritoneum. This may result in peritoneal contamination if this precaution is not employed.

The fascial bridge is then reconstituted using the stay sutures. Fasciocolonic sutures are applied on either limbs of the colostomy and tied. These will prevent parastomal herniation and bowel evisceration.

Colostomy is then matured on table using vicryl 4/0 sutures [Figure 4]. The distal stoma is thoroughly lavaged with normal saline. This will prevent faecal impaction and ectasia of the distal colon. The divided sigmoid colostomy is dressed with sufra tulle and gauze. The neonate is cleaned up and unstrapped from the crucifix.

Postoperative care

Immediate and regular inspection of the colostomy for reactionary haemorrhage and gangrene is commenced. Adequate fluid is administered to maintain volume and provide calorie. Analgesics, antibiotics and vitamin K are administered adequately and appropriately.

Colostomy care started preoperatively is continued



Figure 1: Patient positioned on crucifix



Figure 2: Stay sutures for retraction

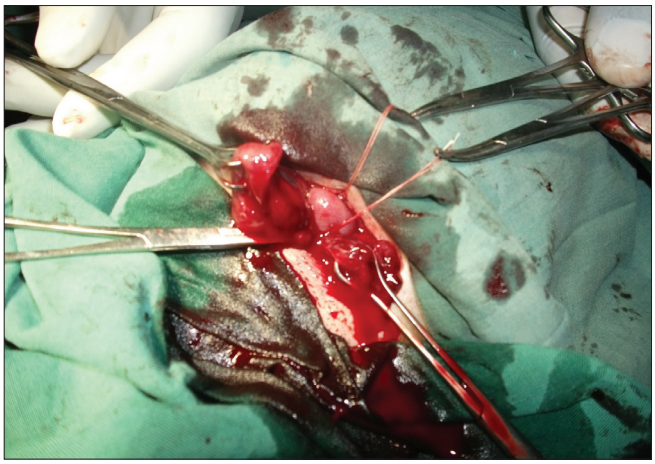


Figure 3: Enterostomy for marked decompression



Figure 4: Divided sigmoid colostomy

postoperatively. The mother is taught colostomy care. This is important, because she will have to continue the colostomy care at home.

Breast milk is commenced as soon as colostomy starts functioning, usually within 24–48 hours postoperatively. The patient is then discharged home on the seventh postoperative day. The necessary condition for discharge is that the mother must be able to effectively take care of the colostomy and recovery satisfactory as well. Follow-up is till the time of colostomy takedown usually within 1–2 years.

RESULTS

A total of 38 neonates were treated with this technique over a 3-year period, July 2008 to September 2011. There were 34 boys and 4 girls. The median age was 4 days (range 2–11 days), and all presented in a critical state. The indication for colostomy was anorectal malformation 37 (97.4%) and 1 (2.6%) colonic atresia. The clinical diagnosis of anorectal malformation was as follows: anorectal malformation with rectourinary fistula 24 (63.2%), anorectal malformation without fistula 12 (31.6%) and persistent cloaca 1 (2.6%). The various colostomies done were 7 (18.4%) sigmoid colostomy, 29 (76.3%) descending colostomy and 2 (5.3%) transverse colostomy.

The median duration for the procedure was 45 minutes (range 30–60 minutes). Hospital stay was 7–15 days (median 7 days). The median cost of the procedure was 7500 Naira ($50), range 7000–7500 Naira, under local anaesthesia (general anaesthesia attracts an additional cost of 7500 Naira ($50) for anaesthetic gases).The 5 (13.2%) early complications included skin excoriation 2, superficial surgical site infection 2 and bowel evisceration 1. The late complications were stomal stenosis 1 (2.6%), colostomy diarrhoea 2 (5.3%) and parastomal hernia 2 (5.3%). Mortality was 2 (5.3%), both due to overwhelming sepsis from bowel gangrene.

The follow-up was for 1–2 years during which period the colostomy would have been taken down. 25 (65.8%) patients had definitive surgery and subsequently colostomy takedown. 13 (34.2%) patients were yet to have colostomy takedown. There were no permanent colostomies and none of the remaining patients with colostomy had been lost to follow-up.

DISCUSSION

Colostomy is commonly done under general anaesthesia in ideal conditions and where facilities for intensive care are available. This is because mortality from this procedure could be high as a result of respiratory problems related to general anaesthesia or sepsis among other causes.[6,7] The stressful adverse events occurring in neonates following endotracheal intubation cannot be overemphasized.[8]

Mortality is particularly increased in critical patients especially when the procedure is done under general anaesthesia.[9] This was perhaps due to stress of general anaesthesia in an already vulnerable neonate. Local anaesthesia was therefore introduced to avert the problem above and would form the basis for discussion.

In this study, most of the patients presented late, in a critical state. The median age at presentation was 4 days. Only few presented early (2 days of age) fit for general anaesthesia but had difficult intubation. This group did not constitute a sufficient number for comparison and were therefore excluded from our study. There were no neonates with cardiac anomalies or prematurity.

All the neonates above satisfied our selection criteria and were recruited for colostomy under local anaesthesia. In this study the outcome was generally good with local anaesthesia. This was in concordance with a report by Chowdhary *et al.* in India,[9] where it was also noted that sick, small and septic babies did not appear to tolerate general anaesthesia. The mortality for these neonates was higher under general anaesthesia when compared with local anaesthesia. This study therefore alluded to the fact that in such patients a transverse colostomy under local anaesthesia may save life.[9] A large variety of local and regional anaesthetic techniques have been found to be advantageous in these vulnerable neonates.[10]

Most of the neonates in our series had anorectal malformation with only one with colonic atresia. Anorectal malformation is a common cause of neonatal intestinal obstruction, with concordance reports from other parts of Nigeria.[11-13]

The duration of the procedure was satisfactory and comparable to the procedure under general anaesthesia. The duration may even be shorter, under local anaesthesia, if one considers induction time and recovery time when general anaesthesia is employed.

The cost of the procedure with local anaesthesia was twice less when compared to the procedure with general anaesthesia. This is an advantage for a poor resource setting like ours where most patients have financial constraints. The hospital stay of 7 days was also comparable to the procedure under general anaesthesia.

There were 5 (13.2%) early complications and 5 (13.2%) late complications. The 2 (5.3%) with skin excoriation were due to poor colostomy care. In our centre, we lack colostomy bags and most times resort to improvise bags, which do not fit neatly. Surgical site infection occurred in 2 (5.3%) patients but resolved with wound care. There was 1 (2.6%) patient with bowel evisceration due to deep surgical site infection. This patient had bowel returned and the fascial dehiscence was repaired. Mortality was 2 (5.3%) and largely due to overwhelming sepsis from bowel gangrene. This study is not a comparative one, but similar reports from the subregion and elsewhere show better outcome in our study in terms of morbidity and mortality.[4,14,15]

It should be noted that a comparative study would be required in future for colostomy under local anaesthesia and general anaesthesia, for effective conclusions to be made. It is also important to note that the surgeon needs to be as gentle as possible when adopting this procedure in order to achieve the desired results.

CONCLUSION

Colostomy under local anaesthesia is a safe, cost-effective procedure in critical neonates. The outcome is good and may be employed in critical neonates or where neonatal anaesthetist and facilities for intensive care are lacking.

REFERENCES

1. Pena A, Migotte M, Levitt MA. Colostomy in anorectal malformation: A procedure with serious but preventable complications. J Pediatr Surg 2006;41:748-56.
2. Sheikh MA, Akhtar J, Ahmed S. Complications/procedures of colostomy in infants and children. J Coll Physicians Surg Pak 2006;16:509-13.
3. Chandramouli B, Srinivasan K, Jagdish S, Ananthakrishnan N. Morbidity and mortality of colostomy and its closure in children. J

Pediatr Surg 2004;39:596-9.
4. Uba AF, Chirdan LB. Colostomy complications in children. Ann Afr Med 2003;2:9-12.
5. Sowande OA, Adejuyigbe O, Ogundoyin OO. Colostomy complications in infants and children. Niger J Surg 1999;6:19-22.
6. Chirdan LB, Uba FA, Ameh EA, Mshelbwala PM. Colostomy for high Anorectal malformation: An evaluation of morbidity and mortality in a developing country. Pediatr Surg Int 2008;24:407-10.
7. Ekenze SO, Agugua-Obianyo NE, Amah CC. Colostomy for large bowel anomalies in children. A case controlled study. Int J Surg 2007;5:273-7.
8. Ventatesh V, Ponnusamy V, Anandaraj J, Chaudhary R, Malviya M, Clarke P, *et al*. Endotracheal intubation in a neonatal population remains associated with high risk of adverse events. Eur J Pediatr 2011;170:223-7.
9. Chowdhary SK, Chalapathi G, Narashima KL, Samajh R, Mahajan JK, Menon P, *et al*. An audit of neonatal colostomy for high anorectal malformation: The developing world perspective. Pediatr Surg Int 2004;20:111-3.
10. Lonngvist PA. Regional anaesthesia and analgesia in the neonate. Best Pract Res Clin Anaesthesiol 2010;24:309-21.
11. Momoh JT. Pattern of Intestinal Obstruction in Zaria, Northern Nigeria. East Afr Med J 1982;59:819-23.
12. Adejuyigbe O, Jeje NA, Owa J, Adeola BA. Neonatal intestinal obstruction in ile-ife, Nigeria. Niger Med J 1992;22:24-8.
13. Olumide F, Adedeji A, Adesola AO. Intestinal Obstruction in Nigerian Children. J Pediatr Surg 1976;11:195-204.
14. Cigdem MK, Onen A, Dinan H, Ozturk H, Otcu S. The mechanical complications of colostomy in infants and children: Analysis of 473 cases of a single center. Pediatr Surg Int 2006;22:671-6.
15. Osifo OD, Osaigbovo EO, Oberta EC. Colostomy in Children: Indications and common problems in Benin City, Nigeria. Pak J Med Sci 2008;24:199-203.

Cite this article as: Lukong CS, Jabo BA, Mfuh AY. Colostomy in neonates under local anaesthesia: Indications, technique and outcome. Afr J Paediatr Surg 2012;9:176-80.

Source of Support: Nil. **Conflict of Interest:** None declared.