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ONE-STAGE TREATMENT OF LEFT-SIDED LARGE BOWEL EMERGENCIES
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ABSTRACT

***Objective*: To evaluate the safety and benefits of left-sided colectomy and primary anastomosis without intraoperative colonic irrigation in the management of patients with colorectal emergencies.**
***Design*: Prospective descriptive analysis of patients with emergency left-sided colonic and rectal lesions requiring resection and primary anastomosis.**
***Setting*: A hospital based cohort over a five and a half year period at Jos University Teaching Hospital, Jos, Nigeria.**
***Subjects*: A total of 42 patients with left sided and rectal emergency lesions. Their ages ranged from 9-65 years with a mean of 43.1 years.**
***Intervention*: Twenty patients had sigmoid colectomy and primary colorectal anastomosis for sigmoid volvulus. Two patients with compound sigmoid volvulus had sigmoid colectomy as well as ileal resection and primary colorectal and ileoileal anastomosis. Transverse colectomy and primary colocolic anastomosis was carried out in six patients who had transverse colon tumour from gastric neoplasia. These six patients had in addition distal partial gastrectomy and gastrojejunal anastomosis to remove the primary gastric neoplasia. One patient had transverse colectomy and another four left hemicolectomy and primary colocolic anastomosis for trauma. Left colectomy and colocolic anastomosis was performed in three patients with left colon tumour while anterior resection and colorectal anastomosis for rectosigmoid cancer was carried out in six patients.**
***Main outcome measures*: Manual decompression of the colon is as good as antegrade colonic irrigation in the management of left-sided large bowel emergency conditions in selected patients when undertaken by dedicated experienced surgeons.**
***Results*: There was one clinical anastomostic leak presenting as enteric fistula on the sixth postoperative day. The discharge was bilious and occurred in a patient with gastric mesenchymal stromal tumour who had distal partial gastrectomy and gastrojejunal anastomosis. He had no features of generalised peritonitis nor residual intra-abdominal abscesses. The fistula was managed non-operatively. A 12% wound infection rate was recorded. All infections were superficial and healed with conservative measures. We had no mortality in our series. The hospital stay ranged from 6 to 21 days with a mean of 7.5 days.**
***Conclusion*: Manual decompression of the colon alone is as good as colonic irrigation in the management of left-sided large bowel emergencies. However, on-table antegrade colonic irrigation should be reserved for the loaded colon that may interfere with the use of a stapling instrument, when the resection margins are limited as in low anterior resections and when left-side colonic emergencies are undertaken by non-dedicated, less experienced surgeons.**

INTRODUCTION

Anastomotic leakage is the main complication after resection of the left colon in an emergency setting. It has been established that anastomotic dehiscence is caused by faecal load (1-4). There has been a trend towards one-stage primary resection and anastomosis (5-8). This is now widely regarded as a safe alternative to the traditional method of staged defunctioning colostomy and resection, even in the elderly (9-10). However, in all these reported series, on-table antegrade colonic lavage was performed to decompress and clean the proximal colon. While decompression

may be desirable (to decrease distension, facilitates abdominal closure and improve colonic blood supply), several reports have stressed that colonic lavage is unnecessary for ensuring the integrity of the anastomosis (11-14). Furthermore, on-table antegrade colonic lavage prolong the operating time, increases the risk of contamination and infection in the operating field and intraoperative hypothermia. In a retrospective review of the literature, it has been shown that the healing of anastomosis is conditioned by many local, systemic and technical factors rather than the faecal load (15-18). Consequently, there has been a change of attitude for us regarding the necessity of on-table antegrade colonic lavage before anastomosis in colorectal surgery.

In this study, we prospectively analysed outcomes of operations in terms of wound infection, anastomotic failure and postoperative mortality in a consecutive series of patients who underwent colorectal resection and primary anastomosis after manual decompression of the bowel only and report our experience with this method.

MATERIALS AND METHODS

Between January 2000 and May 2006, data were collected on consecutive series of patients who underwent emergency colorectal surgery without on-table antegrade colonic lavage in a general surgery unit in a tertiary referral health centre.

All patients admitted to the care of a surgeon who were found at surgery to have lesion necessitating resection and primary anastomosis of the colon and upper rectum were eligible for inclusion in the study. Prophylactic parenteral antibiotics (gentamycin 80mg, ampicillin 500mg and metronidazole 500mg) were given intravenously to all patients after induction of anaesthesia, with two further doses administered every eight hours in those with viable bowel after the procedure and for five days in those with infarcted bowel. Laparotomies were performed through a midline incision. The colon was mobilised and decompressed as described previously (12) after an initial exploration. The bowel was divided between non-crushing clamps just proximal to the lesion and the colonic contents were milked into a container after exteriorising the colon from the operating field. The bowel ends were cleansed with swabs soaked in aqueous chlorhexidine. Decompression was considered completed when the small intestine and proximal colon contain no further air or fluid to be milked out. In case of faecal spill and those having the procedure for colonic trauma, the abdominal or pelvic cavity was locally washed out with saline.

In patients with sigmoid volvulus, gaseous distension of the large bowel was relieved by foley catheter aspiration after manual untwisting of the torted sigmoid to relieve the obstruction. The large bowel was palpated after decompression for synchronous tumours and adenomas in patients with large bowel cancers. Anastomosis were made end-to-end with an inner continuous layer of 3/0 vicryl and an outer interrupted sero-muscular layer of 3/0 silk. In all the anastomosis, colonic ends were trimmed until there was free bleeding before such anastomoses were effected. Diverting ileostomies or colostomies were never used. Drains were not routinely used. The abdominal wall was closed in one layer with monofilament nylon I. The clinical course and postoperative complications were carefully documented. The endpoints of the study were wound infection, anastomotic leakage and death. Wound infection was defined as discharge of pus from the wound or a positive culture at any time. Anastomotic leakage was defined as a fistula from the abdominal wound, the drain tract or the vagina, or an intraperitoneal abscess or peritonitis along with an anastomotic dehiscence as seen by radiology, colonoscopy or laparotomy. No effort was made to screen for asymptomatic leakage. Mortality was defined as in-hospital death.

RESULTS

A total of 42 patients were prospectively studied and none was excluded from the analysis. Their ages ranged from 9 to 65 years (mean 43.1 years). There were 36 males and six females (Table 1). Sigmoid volvulus (n = 22) was the most common diagnosis, followed by colonic tumour (n = 9); secondary transverse colonic metastatic tumour from both adenocarcinoma and gastric mesenchymal stromal tumour (n = 6) and colonic trauma (n = 5) (Table 2). All obstructing colonic lesions with the exception of a nine year old boy with colonic polyp and gastric cancers were proven histologically to be adeno-carcinomas and gastric mesenchymal stromal tumours (Table 2). Procedures carried out in all the patients as well as the morbidity are indicated in Table 3.

Table 1

Age distribution in years

Age Range	Sex		
	Male	Female	Total
1 - 10	2	0	2
11 - 20	4	0	4
21 - 30	5	0	5
31 - 40	6	1	7
41 - 50	10	3	13
51 - 60	7	1	8
61 - 70	2	1	3
71 - 80	0	0	0
Total	36	6	42

Table 2

Indications for colonic resection and primary anastomosis

Disease	Number
Sigmoid volvulus	22
Colonic tumour	9 (8 adenocarcinoma, 1 polyp)
Secondary transverse colonic tumour from cancer of the stomach	6 (3 adnocarcinoma and 3 gastric mesenchymal stromal tumour
Colonic trauma	5

Table 3

Operative procedures, morbidity and mortality

Disease	Procedures performed	No. of patients	Wound infection	Anastomotic dehiscence	Deaths
Sigmoid volvulus	Single resection and primary anastomosis	20	2	0	0
	Double resection with primary ileoileal and colorectal anastomosis	2	0	0	0
Colonic tumour	Colectomy and primary anastomosis	9	2	0	0
Secondary colonic tumour anastomosis from gastric cancer	Transverse colectomy and primary colocolic and distal partial gastrectomy and gastrojejunal anastomosis	6	1	1	0
Colonic trauma	Transverse colonic and colocolic anastomosis	1	0	0	0
	Left hemi-colectomy and colorectal anastomosis	4	0	0	0
TOTAL		42	5	1	0

Hospital stay ranged from 6 days to 21 days with mean 7.5 days. One 43-year-old patient who had transverse colectomy and colocolic anastomosis; and distal partial gastrectomy and gastrojejunal anastomosis for gastric mesenchymal stromal tumour developed an enteric fistula. The discharge from the proximal end of the laparotomy wound noticed six days after the procedure was bilious. He had no features of peritonitis. Trans-abdominal ultrasonography revealed no intra-abdominal abscess. He was managed conservatively with good outcome. He was discharged after a total of 21 days. Superficial wound infection occurred in five patients (12%); none of these required further surgery. We had no mortality in our series.

DISCUSSION

The optimal management of emergency lesions of the left colon is still a controversial matter. Patients with left-sided colonic emergency lesions are treated traditionally by multi-stage procedures. This approach has disadvantages: multiple admissions, prolonged hospital stays and increased operative risks. Some patients do not get to complete the course of treatment and many temporary colostomies are never close (19). Furthermore, colostomy causes psychological problems and additional cost in terms of materials and frequent medical examinations.

The ideal treatment of emergency left-sided large bowel lesions is primary resection and anastomosis because it avoids a stoma and is associated with low postoperative mortality and morbidity (20). Subtotal colectomy by ileo-sigmoid and ileorectal anastomosis introduced in the eighties to overcome the problem associated with staged procedures has the additional advantages of relieving the obstruction, removing the dilated colon containing the lesion and synchronous lesion. However, this procedure suffers the disadvantage of increased bowel motion. The description of on-table antegrade colonic lavage in 1980 by Dudley and Radcliffe changed the attitude to colonic anastomosis and has been regarded as a safe alternative to multi-staged options even in the elderly. Intraoperative on-table antegrade colonic lavage reduces the amount of faeces brought into contact with the anastomosis and decompresses the colon, thus relieving the postoperative risk of anastomotic dehiscence. Decompression is beneficial in decreasing distension, facilitates abdominal closure and improves colonic blood supply. However, there is some evidence that complete cleaning of the colon of faecal matter is not necessary for ensuring anastomotic integrity (15-18). Furthermore, colonic lavage takes more time, is associated with more risk of spillage and contamination because it uses several litres of solution for irrigation and in a third world setting disposable drainage bag and anaesthetic scavenger tubes may not be readily available (13,22,23) Our experiences with the forty two cases has demonstrated that exclusion of bowel preparation during emergency surgery of the left colon was not associated with an increased anastomotic failure or wound infection rates. The wound infections did not vary much between the different procedures and pathologies. The bilious discharge from the proximal part of the laparotomy wound in the patient with gastric mesenchymal stromal tumour who had distal partial gastrectomy and gastrojejunal anastomosis resulted from either duodenal stump leakage or gastrojejunal anastomotic leak. This complication which is unrelated to colonic anastomosis healed with conservative management. Identification of synchronous colonic cancer (5%) and polyps in patients with unprepared bowel may pose challenges to a surgeon. Such polyps can be palpated and differentiated from local faeces by gently shifting stool aside. However, colonic irrigation may be necessary when intra-operative colonoscopy and careful palpation of colonic tumours are needed for the evaluation of tumour less than 2.0cm.

Our experience in this series of patients does not differ from the views expressed by others in the literature (12,13,20,22,23). Manual decompression of the proximal colon without irrigation is as safe as colonic irrigation in one-stage management of left-sided large bowel emergencies. Although the present study shows relatively few complications after colorectal surgery without colonic irrigation, we wish to state that a surgeon of the consultant cadre performed all operations. It is the view of the authors that a safe colorectal or colocolic anastomosis depends on good blood supply and meticulous techniques paying attention to details with respect to placement of sutures without tension; and not a well prepared colon. Since lavage is cumbersome, costly and time consuming and possibly increases the risk of spillage and contamination, colonic decompression without lavage and anastomosis for left-sided colonic emergencies is recommended.

On-table antegrade colonic lavage should, however, be reserved for the following: Colonic tumours (<2.0cm) that are difficult to palpate and may require intra-operative colonoscopy, when the loaded colon may interfere with the use of a stapling instrument, when resection margins are limited as in low anterior resections and when left-sided colonic emergencies are undertaken by non- dedicated less experienced surgeons.

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REFERENCES

1. Irving, T.T. and Goligher, J.C. Aetiology of disruption of intestinal anastomosis. *Br. J. Surg.* 1973; **60**: 461-464.
2. Smith, S.R.G., Conolly, J.C. and Gilmore, O.J.A. The effects of faecal loading on colonic anastomotic healing. *Br. J. Surg.* 1983; **70**: 49-50.
3. Ahrendt, G.M., Tantry, U.S. and Barbul, A. Intra-abdominal sepsis impairs colonic reparative collagen synthesis. *Am. J. Surg.* 1996; **171**: 102-107.
4. Hawley, P.J., Hunt, K.H. and Dunply, J.E. Aetiology of colonic anastomotic leaks. *Proc. Soc. Med.* 1970; **63**: 28-30.
5. Dudley, H.A.F., Radcliffe, A.G. and McGeehan, D. Intraoperative irrigation of the colon to permit primary anastomosis. *Br. J. Surg.* 1980; **67**: 80-81.
6. Murray, J.J., Schoetz, D.J., Jr. Coller, J.A. Roberts P.L. and Veidenheimer, M.C., Intraoperative colonic lavage and primary anastomosis in non-elective colon resection. *Dis. Colon. Rectum.* 1991; **34**: 527-531.
7. Allen-Mersh, T.G., Should primary anastomosis and on-table colonic lavage be standard treatment for left colon emergencies? *Ann R. Coll. Surg. Engl.* 1993; **75**: 195-198.
8. Sule, A.Z., Iya, D., Obekpa, P.O., *et al.* One-stage procedure in the management of acute sigmoid volvulus. J. *R. Coll. Surg. Edinb.* 1999; **44**:164-166.
9. Poon, R.T.P., Law, W.L., Chu, K.W. and Wong, J. Emergency resection and primary anastomosis for left-sided obstructing colorectal carcinoma in the elderly. *Br. J. Surg.* 1998; **85**: 1539-1542.
10. Naraynsingh, V. and Ariynanayagam, D.C. Obstructed left colon: one-stage surgery in a developing country. *J. R. Coll. Surg. Edinb.* 1990; **35**:360-361.
11. Santos, J.C.M., Batista, J., Sirimarco, M.T., *et al.* Prospective randomised trial of mechanical bowel preparation in patients undergoing elective colorectal surgery. *Br. J. Surg.* 1994; **81**: 1673-1676.
12. Dirk, V.G., Patrick, F.S.O., Leslie, A.N., *et al.* Complications after colorectal surgery without mechanical bowel preparation. *J. Am. Coll. Surg.* 2002; **194**: 40-47.
13. Utpal, De and Shibajyoti, G. Single-stage primary anastomosis without colonic lavage for left-sided colonic obstruction due to acute sigmoid volvulus: a prospective study of one hundred and ninety-seven cases. *ANZ. J. Surg.* 2003; **73**: 390-392.
14. Irving, A.D. and Scrimgeour, D. Mechanical bowel preparation for colonic resection and anastomosis. *Br. J. Surg.* 1987; **74**: 580-581.
15. Thornton, F.J. and Barbul, A. Healing in the gastro-intestinal tract. *Surg. Clin. North. Am.* 1997; **77**: 549-573.
16. Koruda, M.J. and Rolandelli, R.H. Experimental studies on the healing of colonic anastomosis. *J. Surg. Res.* 1990; **48**: 504-515.
17. Shadall, A., Lowndes, R., and Young, H.L. Colonic anastomotic healing and oxygen tension. *Br. J. Surg.* 1985; **72**: 606-609.
18. Erbil, Y., Calis, A., Berber, E. and Mercan, S. The effects of intraoperative colonic lavage with NG-intro-L-orginine methylester (L-NAME) on anastomotic healing in the presence of left-sided colonic obstruction in the rat. *Surg. Today.* 2000; **30**: 421-425.
19. Lamah, M., Mathur, P., McKeown, B., Blake, H. and Swift, R.I. The use of recto-sigmoid stents in the management of acute large bowel obstruction. *J. R. Coll. Surg. Edinb.* 1998; **43**: 318-321.
20. The Scotia Study Group. Single treatment for malignant left-sided colonic obstruction: A prospective randomized clinical trial comparing subtotal colectomy with segmental resection following intraoperative irrigation. *Br. J. Surg.* 1995; **82**: 1622-1627.
21. Torralba, J.A., Robles, R., Parrilla, P., *et al.* Subtotal colectomy versus intraoperative colonic irrigation in the management of obstructed left colon carcinoma. *Dis. Colon. Rectum.* 1998; **41**:18-22.
22. Patriti, A., Contine, A., Carbone, E., *et al.* One-stage resection without colonic lavage in emergency surgery of the left colon. *Colorectal Dis.* 2005; **7**: 332-338.
23. Naaeder, S.B. and Archampong, E.Q. One-stage resection of acute sigmoid. *Br. J. Surg.* 1995; **82**: 1635-1636.