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A Single Stage Resection and Primary Anastomosis without Colonic Lavage for Left-Sided Colonic Obstruction- Our Experience

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Abstract- *Introduction:* In the past century, colorectal surgeons considered a cleansed and empty bowel, a pre-requisite for a safe colonic and rectal resection and anastomosis. Also during this period, acute left colonic obstruction in an unprepared colon, could only be resected and primarily anastomosed if a proximal diverting colostomy was instituted. Tradition has held that an unprepared colon, poses an unacceptable high rate of failure of the anastomosis to heal. But recent evidence from Europe and other centres of the world have proven this surgical dogma to be incorrect.

The purpose of this study is to report our experience with a single-staged resection and primary anastomosis of acute left colonic obstruction, without bowel preparation or a diverting colostomy.

Methodology: A prospective study of a single-stage resection and primary anastomosis was done without mechanical bowel preparation or on-table colonic lavage or a proximal diverting colostomy for left colonic obstructions, on all consecutive patients that presented to the surgical unit of the Federal Medical Centre, Ido – Ekiti between January 2007 – December 2012.

Keywords: *left colonic obstruction, bowel preparation, single-stage resection and primary anastomosis.*

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Manual decompression of the colon was carried out, after resection intra-operatively. Post-operative abdominal infectious complications and extra-abdominal morbidity were looked out for and recorded prospectively.

Results: A total of forty-two (42) patients were included in the study. Twenty nine (29) of the patients were males, while thirteen (13) were females; with a male: female ratio (2.23:1).

Twenty-six (26) of the patients had left colonic and rectal tumours causing the obstruction, while in sixteen (16) patients, acute volvulus of the sigmoid colon accounted for the obstruction. No mortality was recorded in this study.

Conclusion: Single staged resection and primary anastomosis is a do-able, safe and reliable current treatment modality for surgical management of left colonic obstruction with a low morbidity.

Mechanical bowel preparation or on-table colonic lavage or proximal diverting colostomies are unnecessary with this technique.

Keywords: left colonic obstruction, bowel preparation, single-stage resection and primary anastomosis.

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I. Introduction

Since the first attempt at bowel surgery, a major aim had been to reduce the rate of post-operative infectious complications, especially anastomotic dehiscence[1]. In the first half of the 20th century, mortality from colon and rectal surgery often exceeded 20%, mainly attributed to sepsis.

Modern surgical techniques and improved peri-operative care have significantly lowered the mortality rates[1,2,3]. Infectious complications, however, is still a cause of morbidity, leading to increased costs, prolonged hospitalization and occasional mortality[3]. Efficient bowel preparation, mechanical bowel preparation (MBP)/ on – table lavage (OTL) or a diverting proximal colostomy, is considered to be a critical factor in preventing infectious complications and anastomotic dehiscenceafter colorectal surgery[3,4,5]. Since Plumley's[6] work on MBP of 1966 and Dudley et al[7,8] of On-table lavage in 1980, MBP and OTL have been accepted as a surgical dogma. Although bowel preparation may be desirable to decrease distension, facilitate abdominal closure and improve colonic blood supply, there is now some evidence that cleansing of the colon of faecal matter is not necessary to ensure anastomotic integrity [2,9,10,11,12].

The aim of this study is to evaluate the definitive one stage resection of the left colon and rectal obstructions (due to tumours/acute sigmoid volvulus) and primary anastomosis without colonic lavage or a diverting proximal colostomy.

II. Methodology

This is a prospective observational study of forty-two (42) consecutive patients, admitted into the Surgical Unit of the Federal Medical Centre (FMC) Ido – Ekiti, Ekiti State, South West Nigeria between January 2007 to December 2012 for acute Left Colonic Obstruction. The study was approved by the Ethical Review Committee of the hospital.

The left colonic obstruction was due, either to left colon and rectal tumours or acute sigmoid volvulus. Included patients' were aged 18 years or more, and had neither undergone MBP, On-table lavage nor a proximal

colostomy after resection and anastomosis. Exclusion criteria were Diabetics Mellitus, human immune-deficiency virus infection and any patient with severe co-morbdity that may hamper wound healing. The protocol also specified that any patient that may require a proximal diverting stoma would be excluded from the data analysis.

Informed consent was taken from every patient for inclusion in this study. The diagnostic protocol for every patient at presentation included clinical findings, plain abdominal x-ray, abdominal ultrasound, proctosigmoidoscopy and tissuebiopsy for histology; where applicable. Liver function test and chest x-rays were done to rule outviseral metastasis. All patients with sigmoid volvulus presented as emergencies with acute intestinal obstruction and abdominal distension ,their age ranged 65-85 years. In those patients whose obstructions were due to colonic tumours,18(69.23%) presented with chronic constipation alternating with diarrhoea, haematochezia and weight loss. Eight (30.77%) of them however presented as emergencies with complete obstruction as well as weight loss. The age of the patients with colonic tumour ranged between 22-70 years. All the patients were adequately resuscitated pre-operatively. They all had pre-operative broad spectrum antibiotics (metronidazole & ceftriaxone) and were continued post-operatively for about 5 days. Consultant surgeons performed all the operations.

Atlaparatomy, the left colonic/rectal tumours were assessed and resected. While the sigmoid volvulus was first untwisted to relieve the obstruction; gaseous distension of the bowel was relieved with a suction through a colostomy in the sigmoid colon. The colotomy was then closed and the sigmoid colon resected; as with the case of the colonic tumours, between two non-crushing clamps. The resected ends were isolated from the operating field, with the help of abdominal mops.

Careful manual decompression (milking) of the proximal and distal colons were carried out, at which stage the clamps were removed to allow the solid faces to be expelled. The clamps were re-applied and the bowel ends were cleansed with swabs soaked in normal saline. The two bowel ends were then anastomosed using a $^{2}/_{0}$vicryl as an inner layer and a silk $^{2}/_{0}$ as the outer layer. Both the proximal and distal colon/rectum were adequately mobilized to ensure a tension free anastomosis, which was manually done. No protecting stoma was instituted in any of the patients.

The peritoneum, after surgery were thoroughly lavaged with warm saline and peritoneal drains were routinely inserted.

The patients were closely monitored post-operatively for complications viz: wound infections, anastomotic leaks and intra abdominal abscesses.

Wound infection was defined as a wound draining purulent materials or erythema requiring re-initiation of antibiotic treatment. Anastomotic leakage was identified if faecal drainage was evident through a perianastomotic drain and abdominal abscess was defined as fluid collection demonstrated by abdominal ultrasound, in conjuction with elevated temperature or increased white blood cell counts. Tables were employed for data presentation. The results were analysed by arithmetic means and group percentages.

III. Results

A total of forty-two (42) patients were included in this study. There were twenty-nine 29, (69.0%) males and thirteen 13 (30.95%) females. Their ages ranged between 22 to 85 years.

The cause of the left colonic obstruction was due to tumours in twenty-six (61.90%) patients and sigmoid volvulus in sixteen (38.09%) patients. Table I.

Four patients (9.52%) were excluded from the study, three of them were elderly patients whose ages ranged between 68 and 82 years with poorly controlled diabetes mellitus and presented with sigmoid volvulus. The fourth was a 70 year old patient with low rectal tumour whose anastomosis was protected with a proximal colostomy.

Analysis of the post-operative outcome in this study is shown in Table II.

Post-operative abdominal infectious complications were documented in (4) patients 9.52% and anastomotic leakage occurred in one (1) patient 2.38%.

There was no clinical evidence of intra-abdominal abscess collection with faecal peritonitis.

All the wound infections were managed conservatively with antibiotics (ceftriaxone and metronidazole).

No mortality was recorded and the duration of hospital stay ranged from 10 days to 21 days. The long hospital stay was found in those patients' that had wound infections.

All the patients had a favourable outcome and were discharged to the surgical outpatient clinic where they were seen for about 6 – 8 weeks until lost to follow-up.

IV. Discussion

Although bowel preparation (MBP or On-table lavage) before left sided colorectal surgery has become routine, there is a paucity of scientific evidence to support this practice [2,12]. Traditionally, MBP was carried out on patients with partial left colonic obstruction that were to undergo surgery by using enemas in combination with oral laxatives to evacuate feaces from the colon. But more recently, powerful oral cathartics: sodium phosphate and polyethylene glycol have been discovered which provides superior cleansing when

compared to the traditional methods by inducing diarrhoea which cleanses the bowel of solid faeces. These are now being used pre-operatively by most surgeons in preparing their patients for colorectal surgeries. In complete obstruction however, OTL is the method of choice used to rid the proximal colon of solid faeces intraoperatively after resection; in which a catheter is inserted into the caecum through an appendiceal stump after an appendectomy. Normal saline is then rushed antegradely through the bowel, thus ridding the proximal colon of its faecal content. During this period also, the cut ends of the bowels are exteriorised to ensure less spillage and wound contamination. However, recent improvement in morbidity and mortality rates of bowel surgery resulting from advances in peri-operative care and routine use of antibiotic prophylaxis[13], in conjuction with recent experience with primary repair of colonic injuries by trauma surgeons from Europe and Asia[3,14], describing elective operations on the left colon done safely without pre- / intra-operative bowel lavage, have caused a re-consideration of the true value of cleansing the colon beforeanastomosis[2,9,10]. Also studies have shown that because the colonocytes receive their nutrition from intra luminal free fatty acids produced by fermentation from colonic bacteria, lavaging the colon, may actually be detrimental to the healing of a colonic anastomosis[14].

In this study, we recorded a post-operative infectious complications in 4 patients (9.52%) and a leaked anastomosis in one patient (2.38%). There was no intra-abdominal abscess collection and peritonitis.

All wound infections resolved with the re-commencement of antibiotics therapy. The leaked anastomosis was re-laparatomized, the dehisced portion repaired and the anastomosis was then protected with an ileostomy. The latter was closed after 8 weeks. This result is in keeping with other workers in the field; AaamerNaseer et al[9] recorded four (4) patients with superficial wound infection and one mortality, while working on 30 patients' with acute sigmoid volvulus in a local setting. Mumtaz Khan et al[10] also working from a local setting in Parkistan on 80 patients with acute sigmoid volvulus, recorded superficial wound infections in 16 (20%) patients, no anastomotic leakage and no mortality in their series. From our study, we may wish to emphasize that the critical risk factors in colonic dehiscence, after anastomosis is the solid faecal matter (SFM); which if carefully removed by simple manual decompression (milking) would render the anastomosis safe. This claim is further buttressed by the fact that all right colectomies with either ileo-colic or colo-colic anastomosis are not usually protected by proximal ileostomies, yet healing often occurs even though the anastomosis is bathed by watery faecal matter[14,21]. Naraynsinghet al[15] reported a prospective series of 58 unselected patient with left colonic anastomosis without a proximal diverting stoma. There was a case of anastomotic leakage andone mortality, unrelated to sepsis.

Till date, a number of authors have reported series of patients who under-went emergency left sided colon resection and anastomosis without intra-operative colonic lavage or a protecting proximal stoma and results are encouraging[11,16,17,18,19,20].

We therefore wish to state that simple manual decompression of the colon to expelthe SFM and exteriorizing the cut ends of the bowel while doing this, do prevent both faecal spillage into the peritoneum with its attendant peritonitis and wound contamination.

This currently favoured treatment modality is safe and effective. It could be adopted in local setting and in developing countries for its immense socio-economic benefits; as the financial burden involved in staged procedures are not only high, also colostomies are often not acceptable for socio-cultural reasons.

V. Conclusion

Resection and primary anastomosis of` left colonic obstruction can safely be performed without any form of bowel preparation or a diverting protecting colostomy. It has the merit of being a shorter and simpler procedure to perform without increasing the morbidity or mortality rates of the patients.

Table I (A & B) : Causes of the Left Colon Obstruction in the Study

A. Tumour of Left Colon and Rectum

AGE DISTRIBUTION (YRS)	MALE	FEMALE	PERCENTAGES
20-29	2	0	7.69%
30-39	3	1	15.38%
40-49	2	4	23.08%
50-59	5	3	30.77%
60-69	4	1	19.23%
>70	1	0	3.85%
TOTAL	17	9	100%

Male : Female = 1.8 : 1 Mean = 49.5

B. Acute Sigmoid Volvulus

Age Distribution(YRS)	Male	Female	Percentages
60-69	2	0	12.50%
70-79	7	2	56.25%
80-89	3	2	31.25%
TOTAL	12	4	100%

Male : Female = 3 : 1 Mean = 76.4

Table II : Analysis of Post-Operative Outcome

	Number of Patients	Percentages
Superficial wound infection	4	9.52%
Anastomotic leakage	1	2.38%
Intra abdominal abcess	0	-
Wound deliscence	0	-
Total of patients	42	

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