

Antegrade Intraoperative Colonic Lavage

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Summary

Emergency left-sided colonic resections have traditionally been dealt with by employing staged resections due to the dangers of an anastomosis in unprepared bowel. A small series of 6 patients with left-sided colonic obstruction is presented in which a single stage primary anastomosis was done after an antegrade intraoperative colonic lavage. There were no deaths, infective complications or anastomotic leaks. Major series in the last decade using intraoperative colonic lavage are reviewed as well, to confirm that the method is safe, effective and warrants wider usage locally.

Key words: Antegrade intraoperative colonic lavage, primary anastomosis, anastomotic leak.

Introduction

Emergency surgery for left-sided bowel obstruction is still fraught with mortality rates that range between 19% to 38%¹ and significant morbidity as well. Besides the fact that many of these patients are elderly and have intercurrent medical illnesses, one of the main reasons for this is the presence of faeces in unprepared bowel². This predisposes to anastomotic leakages which can be as high as 18% compared to 6% in non-obstructed colon³, and accounts for much of the morbidity and up to a third of all the deaths from carcinoma of the colon^{4,5}.

A staged procedure is thus the generally accepted approach to these patients, but is fraught with the many disadvantages that arise from multiple operations.

Antegrade intraoperative colonic lavage allows the surgeon to avoid a staged procedure. It was originally advocated by Muir⁶ and the first large-scale series was published by Radcliffe and Dudley⁷, in 1983, with low anastomotic leak rates of 3.1% and mean hospital stay of 12 days.

It was in response to this that the author embarked upon the single stage approach to acute large bowel obstruction using antegrade intraoperative colonic lavage.

Materials and Methods

From August 1989 to September 1990, the author prospectively treated 7 consecutive cases of obstructing large bowel tumours requiring emergency surgery, at the government surgical unit team M, at the Kuala Lumpur General Hospital.

Six patients presented with constipation, abdominal distention and radiological evidence of dilated large bowel. One patient had signs of peritonism due to a perforated obstructing sigmoid carcinoma. Six patients had antegrade intraoperative colonic lavage with primary anastomosis. One patient had disseminated squamous cell carcinoma of the lung as well and was deemed unfit and so a palliative Hartmanns procedure was done instead (Table I).

Surgical prophylaxis with cefoperazone and Memronidazole was used in all cases and continued till the fifth post-operative day. All the cases had a midline incision, the left colon was mobilised and the obstructing tumour and left colon was resected.

The technique of intraoperative colonic lavage utilised was similar to that described by Dudley and Radcliffe⁷, whereby the appendix stump was used. A 20F Foley catheter was inserted through an appendicostomy. A linen suture was tied around the base of the appendix stump to hold the catheter in place and the soft clamp over the caecum was removed and placed over the distal ileum to prevent retrograde irrigation.

The balloon of the Foley catheter was then inflated with 10 ml of water to prevent it from sudden dislodgement from the caecum. The distal bowel end was fitted over a sterile 2 cm anaesthetic tubing and secured with cloth tapes. The distal end of the tube was connected to a large plastic bag on the floor.

A 3 L saline bag was then connected to the 20F Foley catheter and was used to lavage the colon till clear effluent was seen. The colon was manually milked to facilitate the quick evacuation of solid faecal material out of the colon.

The anastomosis was handsewn with a single, full thickness layer of vicryl sutures in all cases except one, in which a stapled anastomosis was done. The irrigation catheter was then removed and the appendicular stump religated with 3.0 Chromic catgut.

All the cases had their peritoneal cavity thoroughly lavaged with warm saline before mass closure of wound. A tube drain to the vicinity of the anastomosis was used in all cases.

Results

There were no radiological investigations for anastomotic leaks in this series, as there were no patients post-operatively who developed persistent fever and abdominal tenderness to arouse any suspicion of a leak. There were 2 cases of major spillage while setting up the irrigation tube, but the peritoneal cavity was thoroughly lavaged and there were no infective complications in this series.

The amount of saline used ranged between 6-8 L and the operating time was increased by a mean of 60 mins (range 50 to 75 mins). There were no complications related to the anastomosis (Table I). One patient was treated for active pulmonary tuberculosis post-operatively, which delayed discharge. Two patients had troubling diarrhoea, which settled by the time of discharge. Mean hospitalisation was 14 days.

Table I
Characteristics of patients who underwent intraoperative colonic irrigation

No	Sex	Age	Site	Stage	Operation	Complications	Hospital stay (days)
1	M	81	Sigmoid	B	Sig colect	Nil	20
2	M	48	Decend	B	L hemi	Nil	10
3	M	58	Sigmoid	B	Sig colect	Nil	10
4	F	53	Splenic	B	L hemi	Nil	21
5	F	65	Sigmoid	B	Sig colect	Diarrhoea PTB	18
6	M	64	Rectal	B	Low ant	Diarrhoea	10
Mean		61.5					14.8

Discussion

Faecal loading has always been associated with increased risk of anastomotic leakage^{6,8} in emergency left colonic surgery. Experimental studies have reported poor anastomotic healing in unprepared bowel, which may be due to local sepsis which increases collagen lysis at the anastomosis⁹⁻¹⁰. A staged procedure has thus been advocated ever since Mikulicz reported mortality rates from 30% to 50% from primary resections for carcinoma of colon in 1903¹¹. The 3-stage procedure where a defunctioning colostomy is done first, followed by the resection and finally the closure of colostomy, enjoyed much popularity till the late 70s.

Primary resection was then thought to be associated with a better prognosis¹² as well as the obvious advantage of a reduced hospital stay. This gave rise to the most popular method of management currently, the 2-stage procedure, where a primary resection and anastomosis is done with a covering colostomy, which is closed at a later stage. Although the reason that resulted in this modification has not been borne out in recent multicentric trials³, nevertheless it continues to be widely adopted due to decrease hospitalisation and relative safety.

Nevertheless, a single-stage procedure without the nuisance of a stoma has always been thought of as the ideal and there are those that advocate subtotal colectomy with an ileorectal anastomosis, which is both safe and eliminates the risk occult of synchronous as well as future metachronous disease in the colon that is believed to have undergone a field change¹³⁻¹⁶. However, the troublesome diarrhoea from this loss of colon and the fact that metachronous disease occurs only in about 3% to 5% of cases, makes this a rather undesirable alternative.

Intraoperative colonic irrigation allows the best way to perform a single stage procedure safely with the intraoperative evacuation of the faecal load. There is also experimental evidence that intraoperative irrigation increases early anastomotic collagen content and healing¹⁷. There have been various ways suggested for the evacuation of the faecal load, for example using the retrograde rectal irrigation¹⁸, or the use of colonic

Table II
Intraoperative colonic irrigation in left-sided bowel surgery

Author	Year	Type	No	Leaks	Wnd inf	Deaths	Hsp
Radcliffe Dudley	1983	Em/EI*	64	2 (3.1%)	5 (7.8%)	2 (3.1%)	12
Koruth et al ¹²	1985	Em**	61	4 (6.6%)	2 (3.3%)	5 (8.2%)	13
Foster et al ¹⁷	1985	Em	15	2 (13.3%)	2 (13.3%)	2 (13.3%)	18
Thompson et al ²²	1986	Em/EI	126	6 (4.8%)	4 (3.2%)	5 (4.0%)	16
Pollock et al ²³	1987	Em	41	0	15 (36.0%)	7 (17.1%)	12
Kourtesis & Motson ²⁴	1988	Em	7	0	1 (14.2%)	0	16
Gramenga & Saccomani	1989	Em	27	0	0	1 (3.7%)	25
Meijer et al ²⁶	1989	Em	17	0	2 (11.7%)	1 (5.8%)	19
Danne P ²⁷	1991	Em/EI	50	1 (2.0%)	3 (6.0%)	3 (6.0%)	16
Total			408	15 (3.7%)	34 (8.3%)	27 (6.6%)	

*Elective.

**Emergency.

Hsp=Mean hospital stay (days).

decompressors¹⁹. However, the most popular to date is that of the antegrade colonic irrigation using either the appendix stump or an enterotomy²⁰.

There have been many series attesting to its safety (Table II). The major series over the last decade have been reviewed and the overall mortality was low at 6.6%. There were only 3.7% anastomotic leaks in this meta-analysis, as not all deaths were due to anastomotic leaks. Wound infections were also correspondingly low at 8.3%. The average hospital stay ranged between 12 to 25 days, which is shorter than most staged procedures.

Most of the series comprised of selected patients however, and the unfit patients were naturally excluded from this longer procedure in an effort to reduce mortality. The current series, although small, is in agreement with the literature and represents an encouraging initial experience.

The major problems with antegrade intraoperative colonic lavage are the time taken and the risk of spillage. There have been several modifications that address these problems²⁸⁻³², such as using the colotomy itself for draining into the collecting bowl, thus avoiding the problems of spillage when fixing the anaesthetic tubing. Other techniques to avoid spillage include the use of an endotracheal tube in the rectum to drain the effluent and the use of a special irrigating bag with a rimmed tube for ease of connection to the colon. The modifications of type of antegrade irrigation include irrigation through a long intestinal tube through the ileocaecal valve or a Varres type needle through the terminal ileum. A tube caecostomy for post-operative decompression, which was then removed, was advocated in the early series⁷, but was not employed here without any increase in morbidity.

The disadvantages of a staged procedure are obvious. In our local setting, intraoperative colonic irrigation with a single stage anastomosis represents a refreshingly simple advance in emergency left colonic surgery, as it reduces overall costs due to a shorter hospital stay, in an era of budget constraints and escalating technological costs. The large Muslim population in particular has much to gain in the omission of a colostomy which is thought to be an encumbrance to prayer.

Intraoperative colonic lavage has been applied to other situations in severe colonic haemorrhage, where it evacuates faecal material facilitating an intraoperative colonoscopy which can accurately pinpoint the source of bleeding³³⁻³⁴. It has also been used in colonic trauma to facilitate a primary repair without colostomy³⁵.

Intraoperative antegrade colonic lavage is a simple and safe procedure facilitating a primary anastomosis, without the need for a covering colostomy in left-sided bowel emergency. This markedly reduces hospital stay and will certainly be more acceptable to the patient than the traditional staged procedure.

Acknowledgement

We would like to thank Dato' Dr J.C. Mehta, Senior Consultant Surgeon, for his invaluable advice and help.

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ANTEGRADE INTRAOPERATIVE COLONIC LAVAGE

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