

Management of lower gastrointestinal bleeding after colorectal resection and stapled anastomosis

Maria-Angeles Martínez-Serrano • David Parés • Miguel Pera • Marta Pascual • Ricard Courtier • Maria Jose Gil Egea • Luis Grande

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Abstract Background Although limited haematochezia with the first bowel movement is frequent in patients undergoing colorectal resection, postoperative life-threatening lower gastrointestinal bleeding is very rare. The purpose of this study was to review our results in the management of this complication. **Methods** We analysed the cases of patients with severe lower gastrointestinal bleeding after colorectal surgery from 2000 to 2006 in our hospital. We studied the general characteristics, diagnostic data, therapeutic management and outcome. We also reviewed the published articles regarding this issue. **Results** This complication appeared in 7 (0.5%) of 1,389 colorectal procedures in the study period. In all the patients the anastomosis was stapled. In six of the seven patients bleeding resolved with conservative treatment including endoscopy. However, one patient required surgical treatment. There was no mortality and there were no anastomotic leaks in these seven patients. **Conclusion** Severe lower gastrointestinal bleeding after colorectal resection and stapled anastomosis is a rare complication. Only in unstable patients or failure of conservative measures is surgery indicated.

Key words Gastrointestinal bleeding · Colorectal surgery · Postoperative · Anastomosis complication

Introduction

Lower gastrointestinal bleeding (LGB) is a common clinical problem requiring a systematic diagnostic and therapeutic algorithm [1]. Proper management should include a diagnostic test to locate the origin and to plan the therapeutic strategy [2]. The first diagnostic tool is colonoscopy and afterwards in patients with negative endoscopy or massive bleeding, selective mesenteric angiography or scintigraphy are indicated [1–3].

Unfortunately, LGB originating in the anastomosis can occur in the postoperative course after colorectal resection [4]. Generally, its presentation is as a limited haematochezia with the first bowel movement, but severe bleeding can occur in about 1% of patients and diagnostic and therapeutic manoeuvres are challenging [5], particularly if we take into account the risk of anastomotic breakdown depending on its management.

We report here our experience in the management of postoperative LGB after colorectal surgery and stapled anastomosis, and report a review of the literature on the appropriate management of this complication.

Materials and methods

Inclusion criteria

We included in this retrospective study only patients from January 2000 to December 2006 who had persistent bleeding per rectum after colorectal anastomosis within the first 30 postoperative days and one or more of the following criteria: need for blood transfusion, haemodynamic instability or shock (defined as systolic blood pressure <90 mmHg or a reduction of >40 mmHg from

M.-A. Martínez-Serrano, D. Parés (✉) · M. Pera · M. Pascual · R. Courtier · M.J.G. Egea · L. Grande
Colorectal Surgery Unit,
Department of Surgery,
Hospital del Mar, Passeig Marítim 25–29, 08003, Barcelona Spain
Tel.: +34-93-2483207
Fax: +34-93-2483433
E-mail: Dpares@imas.imim.es

baseline despite adequate fluid resuscitation, along with the presence of perfusion abnormalities that could include oliguria, lactic acidosis or associated acute altered mental status), and finally the need for any emergency therapy such as endoscopy or surgery [6].

All patients received antegrade intestinal preparation (sodium phosphate and 1 g neomycin and 1 g erythromycin orally at 1.00 p.m. 2.00 p.m. and 11.00 p.m.) and standard deep vein thrombosis prophylaxis (low molecular weight heparin) from admission the day before surgery to hospital discharge. During the study period, our policy was to inspect the anastomosis for bleeding intraoperatively only in those in whom bleeding was detected during surgery.

In our unit we manage this complication using a standardized step-by-step protocol for postoperative gastrointestinal bleeding. After resuscitation and stabilization measures, we perform endoscopy and anastomosis washout plus haemostatic therapy if required. Only in those with persistent bleeding or unstable angiography is surgery indicated.

Variables analysed

A descriptive study was performed. Quantitative data are presented as medians and range, and categorical variables with absolute numbers or percentages.

The following variables were analysed:

1. Clinical data: age, gender, associated comorbidities (including previous anticoagulant or antiaggregant treatment), primary diagnosis and indication for primary surgery.
2. Surgical data: surgical technique and type of anastomosis.
3. LGB data: time from the primary surgical intervention to the appearance of complication, laboratory blood tests (haemoglobin, haematocrit, creatinine, urea, platelets and prothrombin time), type of treatment and finally the follow-up with special focus on morbidity (including anastomotic leak) and mortality.

The definition of anastomotic leakage proposed by the UK Surgical Infection Study Group (SISG) was applied [7]. The panel defined *anastomotic dehiscence* as the leakage of luminal content from a surgical anastomosis between two hollow viscera. The luminal contents may emerge through the wound or at the drain site, or may collect near the anastomosis, causing fever, abscess, septicaemia, metabolic disturbance, and/or multiple organ failure [7].

Literature review

An electronic search for relevant published articles in the English language was undertaken using the Medline

database via PubMed. The terms “lower gastrointestinal bleeding”, “postoperative”, “colorectal anastomosis”, or “complication” were searched as the main text items. Additional search strategies included the cited references of included studies.

A detailed review of the articles detailing reported series of postoperative haemorrhage requiring blood transfusions and/or emergency therapy following colorectal procedures and anastomosis was performed.

Results

Between January 2000 and December 2006, 1,389 colorectal surgical procedures (358 as emergency surgery) were carried out in our unit. The anastomosis was stapled in 1,242 of them (89.4%). In the overall series, seven patients (0.5%) showed postoperative LGB and met the inclusion criteria of the study.

Clinical data

The patient characteristics are shown in Table 1. The ages in the patients overall ranged between 42 and 88 years, with a median of 75 years. No patient had previous specific comorbidities, that could have increased the risk of haemorrhage such as coagulation diseases or specific medication (aspirin, warfarin, anticoagulation therapy). The primary diagnosis was colorectal cancer in five patients and diverticular disease in the remaining two patients.

Surgical data

All patients were operated upon electively and received an oral antegrade intestinal preparation the day before surgery. Two of the seven procedures were laparoscopic and in all procedures the anastomosis was stapled. An end-to-end colorectal anastomosis was performed in six patients (29 mm, Ethicon, USA) and a side-to-side stapled ileocolic anastomosis (75 mm, GIA Ethicon, USA) was performed in a patient with a right colectomy. None of these patients needed inspection of the anastomosis intraoperatively. A covering stoma was established in a patient who had an ultralow anterior resection of the rectum.

Lower gastrointestinal bleeding

The median time from primary surgery to LGB was 6.5 h and varied from 30 min to 9 days after surgery. LGB was

Table 1 Characteristics and management of seven patients with postoperative LGB

Patient	Age (years)	Gender	Diagnosis	Primary surgical technique	Time to postoperative haemorrhage	Treatment	Hospital stay (days)
1	81	F	Diverticular disease	Hartmann reversal	30 min	Medical support; anastomosis washout	7
2	88	F	Diverticular disease	Left colectomy	24 h	Transfusion; anastomosis washout	30
3	49	F	Sigmoid cancer	Sigmoidectomy ^a	3 h	Transfusion; anastomosis washout; surgery (reanastomosis)	7
4	75	F	Rectal cancer	Ultralow anterior resection	10 h	Transfusion; anastomosis washout	16
5	42	M	Sigmoid cancer	Sigmoidectomy ^a	3 h	Transfusion; anastomosis washout	6
6	56	M	Sigmoid cancer	Sigmoidectomy	11 h	Medical support; anastomosis washout	11
7	79	M	Right colon cancer	Right colectomy	9th day	Colonoscopy; anastomosis washout	30

^aLaparoscopic approach

associated with haemodynamic instability in two patients. Haemoglobin dropped from a median of 10.2 g/dl to 7.3 g/dl and haematocrit from 38.1% to 19.3% after LGB. The remaining laboratory data were unremarkable.

The therapeutic management of the patients is also shown in Table 1. Four patients needed packed red blood cell transfusion (one patient received 3 units and the remaining three patients 2 units) and the treatment was nonoperative in six of seven patients (85.7%). In the six patients with colorectal anastomosis (five with the anastomosis sited at the promontory and one with the anastomosis sited 4 cm above the dentate line), rectoscopy was performed to confirm the origin of the haemorrhage in the anastomosis and consequently colorectal washout with 2,000 to 5,000 ml of saline was performed. In five of these six patients, haemorrhage ceased with this manoeuvre but surgery was required in the remaining patient because of persistent bleeding and haemodynamic instability. Resection of the previous colorectal anastomosis and refashioning of the suture was successfully performed in this patient. In the patient in whom the primary surgery was right colectomy, a full colonoscopy was performed and haemostasis was achieved with saline instillation through the endoscope.

The median length of the hospital stay was 11 days and ranged from 6 to 30 days. In the overall series there were 34 anastomotic leaks (2.4%) but none of them in the seven patients treated for LGB.

Discussion

Some patients undergoing colorectal anastomosis show a limited haematochezia with the first bowel movement.

However, life-threatening postoperative LGB is a very rare complication [5]. In fact, this clinical emergency has been reported to occur after stapled colorectal anastomoses in approximately 1% of cases [1, 7]. In our experience the incidence was 0.5%, but in only one patient was a surgical approach needed because of persistent bleeding after conservative measures.

Although there are some reports of the importance of comorbidities in the outcome of LGB, as far we know, there is no information about their influence on colorectal anastomosis bleeding [2]. None of our patients had specific comorbidities or were taking medication associated with an increased risk of bleeding.

Although the time from the operation to the complication varied from 30 minutes to the ninth postoperative day, more than 85% had this complication in the first day. It is extremely rare for LGB to occur as much as 10 days after surgery as has been reported previously (Table 2). Our policy is to inspect the anastomosis for bleeding intraoperatively only in selected cases. Moreover, there is no clear information in the literature about the benefit of performing a systematic inspection of colorectal anastomosis to minimize the risk of postoperative bleeding. More studies regarding this issue are warranted.

All the patients in this series had a stapled anastomosis. However, it is difficult to draw any conclusion about the risks in comparison to the hand-sewn technique because nowadays nearly all anastomoses are performed mechanically even in right colectomy. Recently The Cochrane Group analysed data regarding the colorectal anastomosis technique and its complication rate [8]. The risk of anastomotic haemorrhage based on results in 662 patients was 2.7% higher with the stapled procedure in relation to the hand-sewn technique. Thus, the reviewers' conclusion was that there is no scientific evidence to

Table 2 Series reported from 1985 to 2007 of LGB after colorectal resection and anastomosis

Reference	n (%) ^a	Type of stapled anastomosis	Time to postoperative e haemorrhag	Treatment	Follow-up
[15]	1 (1.3)	Linear	ND	Blood transfusion	Death
[16]	1 (1.7)	Circular	ND	Nonoperative (blood transfusion and rectal packing)	Recovery
[17]	1 (ND)	Circular	<24 h	Surgical treatment	Recovery
[14]	7 (3.3)	Circular	5 patients <12 h; 1 patient 4th day; 1 patient 9th day	Nonoperative (blood transfusion and endoscopic coagulation ^b)	Anastomotic leak in two patients
[4]	1 (ND)	Linear	15th day	Nonoperative (blood transfusion and arteriography + vasopressin infusion)	Recovery
[5]	1 (ND)	Linear	3rd day	Nonoperative (blood transfusion and endoscopic coagulation)	Recovery
[18]	5 (0.5)	Circular	ND	Nonoperative (3 patients blood transfusion)	Recovery
[8]	10 (3.1)	ND	ND	ND	ND
[19]	7 (2.4)	Circular	ND	ND	Recovery
Present series	7 (0.5)	6 circular; 1 linear	6 patients 1st day; 1 patient 9th day	6 patients endoscopy and anastomosis washout; 1 patient surgical treatment	Recovery

ND, not documented

^aNumber (%) of patients reported with postoperative gastrointestinal bleeding

^bEndoscopic coagulation only in five of seven patients

demonstrate any increased risk of haemorrhage of the stapled over the hand-sewn technique in colorectal anastomosis [8].

To study the origin of the LGB and just before starting colorectal investigation, a nasogastric tube should be used to check for the presence of bile and/or blood. In fact, massive upper gastrointestinal bleeding can occasionally arise as LGB [1]. When anastomosis bleeding occurs, it is well known that nonoperative treatment is usually successful in almost all cases [4]. Different methods have been described which can be used equally to control postoperative haemorrhage from a colorectal anastomosis. However, each of these methods carries its own risks and potential secondary complications. The most challenging and troublesome is the theoretical increased risk of anastomosis leakage [5, 11].

There is a consensus that the first step in LGB evaluation should be resuscitation manoeuvres including fluid administration [1, 9]. Blood transfusion requirement is determined by the patient's age and the rate of bleeding and is also influenced by the presence of comorbid conditions [9]. In persistent gastrointestinal bleeding an invasive method should be used. Endoscopy is our preference as the first tool because it allows the location of the bleeding in the anastomosis to be established and saline irrigation to be performed immediately afterwards [5]. Why washout of the anastomosis using saline may be effective in bleeding control is still unknown. Theoretically, the presence of clot in the suture may be

responsible for the persistence of bleeding and therefore its removal could allow bleeding control. The same clinical scenario has been well studied in gastroduodenal ulcer bleeding [10]. Otherwise in patients with a low anterior resection of the rectum in whom the anastomosis can be visualized directly in the operating room, a haemostatic stitch or rectal packing could be very useful. In our series six of seven patients were successfully treated only with anastomosis saline irrigation. This therapy is preferably performed in the operating theatre and in some patients under general anaesthesia or sedation, particularly since surgery may be necessary in some patients. The effect of the type of liquid used in washout on the clinical results has been poorly studied [11].

The management of patients with an ileocolic anastomosis is the most challenging situation. The utility of colonoscopy to confirm the anastomotic bleeding has been suggested, and the safety of sclerotherapy, clips or electrocoagulation to stop the haemorrhage has been investigated [4, 5, 9, 12]. However, and depending on hospital policy or availability, angiographic localization and bleeding control using vasopressin or direct embolization could be a safe alternative as has been reported [13].

Surgical intervention should be considered in patients with haemodynamic instability despite aggressive resuscitation, or when severe bleeding persists [9]. There are some variables used in non-postoperative LGB that have been reported to define at admission those patients who

may require surgical treatment to solve the complication [13]. As LGB after stapled colorectal anastomosis is an uncommon complication, multicentre studies to determine which variables could predict the need for emergency surgery are warranted.

The risk of anastomosis leakage after one of these conservative methods to control bleeding is controversial. Theoretically, air insufflation and sclerotherapy in endoscopy or embolization in angiography could be considered as risk factors for anastomosis breakdown. Aurello et al. [14] reported two anastomotic leaks after endoscopic treatment of postoperative bleeding (Table 2). We used endoscopy and anastomosis washout, and none of our patients developed anastomotic dehiscence. However, it is very difficult to know if the beginning of the troublesome complication is the bleeding itself, its haemodynamic consequences or finally the treatment of the anastomosis.

In summary, in our experience LGB was a very rare complication after colorectal resection with stapled anastomosis. At its presentation, a conservative approach and endoscopy might be the first management. Only in unstable patients or failure of conservative measures is a surgical approach indicated.

Conflict of interest statement The Authors declare that they have no conflict of interest related to the publication of this article.

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