Introduction

Bleeding per rectum is one of the most common indications for acute admissions to the colorectal department of a hospital. It is an alarming symptom for the patient and is also one of the symptoms most associated by the lay person with colorectal cancer. The incidence of the different pathologies responsible for bleeding per rectum in Singapore may differ from the pattern seen in the West. Any difference in pattern has not been previously described in our local population.

A retrospective analysis of patients admitted to the Department of Colorectal Surgery from the Emergency Department for the complaint of bleeding per rectum at Singapore General Hospital was performed to study the aetiologies and outcomes of these patients, and to determine any differences in the frequencies of aetiologies when compared to the West.

Patients and methods

All patients admitted to the Department of Colorectal Surgery for acute bleeding per rectum from the Emergency Department over a 1-year period between 1 October 1995 and 30 September 1996 were identified from a prospectively accrued database. The following parameters were examined and recorded from...
the patients' case notes: age, gender, haemoglobin level on admission, blood transfusion volume, investigations performed to diagnose the source of bleeding (e.g. colonoscopy, radionuclide scan, angiography), diagnosis, treatment modalities, and outcome.

Results

There were 547 patients, 377 male and 170 female, with a mean age of 42 years (range, 15–97 years). The sites and causes of bleeding are illustrated in Table 1 and Figure 1.

Perianal causes of bleeding
Bedside proctoscopy was performed for all patients. This readily identified a source of bleeding from the anorectum in 87% (474/547) of patients. There were 339 males and 135 females, with a mean age of 40 years (range, 15–97 years). All patients were stable and bleeding was not severe. Their conditions were easily diagnosed and treated with good results.

In 94% (446/474) of patients with perianal bleeding, the bleeding was due to haemorrhoids. In 26% (116/446) of these patients, bleeding was from small first degree haemorrhoids; these patients were treated conservatively with stool softeners and high fibre diets, with or without subsequent injection or ligation therapy. The remaining 74% (330/446) of patients with haemorrhoids had larger second or third degree haemorrhoids complicated by bleeding or thrombosis; these patients underwent haemorrhoidectomy. Routine rigid sigmoidoscopy was performed under anaesthesia before surgery to exclude a more proximal cause of bleeding.

Fissure-in-ano was the cause of bleeding in 0.6% (3/474) of patients with perianal bleeding. All were treated conservatively with stool softeners and analgesics. In 5% (24/474), anal bleeding occurred as a complication following anorectal surgery. Nineteen patients bled following haemorrhoidectomy, while in another five patients, bleeding complicated lateral anal sphincterotomy. Eight of the 24 patients were given blood transfusions. Most patients stopped bleeding spontaneously and surgical intervention was required in only five patients.

An 80-year-old woman presented with bleeding from a huge fungating tumour at the anus with stenosis. She was unfit for surgery and was, thus, treated with radiotherapy. She eventually succumbed to metastatic disease.

Table 1. Causes of acute bleeding per rectum

<table>
<thead>
<tr>
<th>Cause</th>
<th>No. of patients</th>
<th>No. of patients with surgical treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perianal causes</td>
<td>(87%)</td>
<td></td>
</tr>
<tr>
<td>Haemorrhoids</td>
<td>446</td>
<td>330</td>
</tr>
<tr>
<td>Fissure-in-ano</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Carcinoma of anus</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Post-perianal surgery bleeding</td>
<td>24</td>
<td>5</td>
</tr>
<tr>
<td>Subtotal</td>
<td>474</td>
<td>335</td>
</tr>
<tr>
<td>Upper gastrointestinal causes</td>
<td>(1%)</td>
<td></td>
</tr>
<tr>
<td>Peptic ulcer disease</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Oesophageal varices</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Unknown source</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Subtotal</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Colorectal causes</td>
<td>(12%)</td>
<td></td>
</tr>
<tr>
<td>Diverticular disease</td>
<td>23</td>
<td>5</td>
</tr>
<tr>
<td>Colorectal carcinoma</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Adenoma(s)</td>
<td>13*</td>
<td>3</td>
</tr>
<tr>
<td>Infective colitis</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Radiation colitis</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Ischaemic colitis</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Solitary rectal ulcer syndrome</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Inflammatory bowel disease</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Post-polypectomy</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Subtotal</td>
<td>72*</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>547*</td>
<td>359</td>
</tr>
</tbody>
</table>

*Six patients with bleeding diverticular disease also had incidental adenoma. †Three underwent formalin application.6,7

Figure 1. Sites of bleeding in the gastrointestinal tract. ■ = upper gastrointestinal tract; ■■ = colon and rectum; ■■■ = perianal.
Colorectal causes of bleeding
Of the 547 patients, 66 (12%) were found to be bleeding from the colon and rectum. There were 35 males and 31 females, with a mean age of 70 years (range, 22–89 years). The majority of the patients were stable on admission. Of the 66 patients, nine (14%) had tachycardia defined as a pulse rate of more than 100 beats/minute and five (8%) had hypotension defined as a systolic blood pressure of less than 100 mmHg. They were resuscitated and stabilized with fluids and blood products. Only 28% required blood transfusions (1–3 units). Bleeding stopped spontaneously for most patients (94%) with colorectal bleeding. There was no mortality from haemorrhage.

Of the 66 patients, 90% underwent colonoscopy, of whom half underwent colonoscopy within 24 hours of admission. A positive diagnosis was almost always found. Angiography was not utilized in this group of patients. A technetium-99 tagged red blood cell scan was performed in only two patients with recurrent bleeding, but did not localize the source of bleeding. A barium enema was performed in one patient where colonoscopy was unsuccessful due to a sigmoid stricture from diverticular disease.

There were 23 patients bleeding from diverticular disease; only six underwent surgery. There were three total colectomies, two anterior resections, and one right hemicolectomy. Of the six procedures, three were performed on an emergency basis due to persistent bleeding. One patient bleeding from diverticular disease also had an early carcinoma of the colon detected incidentally, and a curative resection was performed.

Eight patients had resections for malignant disease of the colorectum while four with known unresectable cancers were treated conservatively. Seven patients were bleeding from colonic polyps: four patients underwent endoscopic polypectomies, one underwent transanal excision, one underwent subtotal colectomy, and one underwent total proctocolectomy for familial polyposis coli. Five patients were bleeding from radiation proctitis and they were treated successfully with formalin application.6,7

Patients who were less than 50 years old made up 70% (385/547) of the total number of patients admitted, while those aged 50 years and above made up the remainder (30%, 162/547). Of the 162 patients who were 50 years old or above, 6.8% had colorectal cancer, while only 0.3% of the 385 patients less than 50 years of age had colorectal cancer.8

Upper gastrointestinal causes of bleeding
There were seven patients with massive upper gastrointestinal bleeding who were admitted for suspected lower gastrointestinal bleeding where fresh melaena was probably mistaken for haematochezia. All of these patients required fluid resuscitation and blood transfusions. Oesophagogastroscopy was performed in all and they were subsequently managed in the general surgical department. Five patients had chronic peptic ulcer disease, of whom two patients had endoscopic injection therapy. A third patient experienced rebleeding after endoscopic therapy and required an emergency laparotomy. The remainder were treated conservatively with proton-pump inhibitors. Two patients with Helicobacter pylori infections also had “triple therapy”. One patient who bled from oesophageal varices was treated with injection sclerotherapy.

Extensive investigations, including endoscopy, angiography and radionuclide scans, failed to localize the source of bleeding in one young female patient. As she improved with conservative treatment and did not bleed again, a final definitive diagnosis was not pursued.

Discussion
Bleeding per rectum is an alarming symptom that may cause a patient to seek urgent medical attention. In the 1920s, most causes of lower gastrointestinal bleeding were thought to be from colonic neoplasms. It was not until the 1950s that physicians recognized that diverticulosis was an important cause of intestinal bleeding.2 For patients who are worried about malignancy, bleeding can cause significant anxiety until a diagnosis is reached. It is this same anxiety that urges patients to present to the Emergency Department for urgent medical attention.

Controversy still surrounds the diagnosis and management of lower gastrointestinal bleeding, especially regarding the optimal strategy for evaluating rectal bleeding in a young person. Although there are many reports on lower gastrointestinal bleeding, most are composed of small numbers from single institutions, with a surprising lack of randomized controlled trials, which may reflect a referral, diagnostic and treatment bypass and which does not necessarily reflect the national scope of the problem. Most practices depend on local expertise and availability of diagnostic and therapeutic modalities rather than a systematic algorithm. The best method of management depends on whether bleeding persists, the severity of continued bleeding, transfusion requirements, and the specific origin of the bleeding.

The site and cause of bleeding is related to patient age. Diverticulosis and arteriovenous malformation have been...
found to be more common in the elderly, while perianal causes such as haemorrhoids and fissures occur in the younger age groups. The prevalence of neoplasms in patients with haematocyesia was also found to substantially increase with age.

Bedside proctoscopy is performed routinely as part of the physical examination after digital rectal examination and is accurate for the diagnosis of perianal pathologies. In our series of patients presenting with bleeding per rectum, the majority (87%) bled due to perianal conditions. Patients were generally younger, with a mean age of 40 years, and haemorrhoids were the commonest pathology. This is similar to the situation in the United States, where haemorrhoids were one of the four diseases that account for a vast majority of lower intestinal bleeding cases, the others being arteriovenous malformation, diverticulosis, and neoplasms.

In fact, the overall most common cause of rectal bleeding was haemorrhoids. Haemorrhoids were also found to be the most common cause of rectal bleeding in a Jordanian review of 701 patients.

Of our patients with haemorrhoids, 74% subsequently had surgery for complicated haemorrhoids, and they were monitored in the outpatient clinic. Colonoscopy was performed if their bleeding recurred, or if they had risk factors for colorectal malignancy, which included age above 50 years, changes in bowel habits, positive family history, persistent anaemia after resuscitation and stabilized sufficiently for an aetiology to be established. The most common cause was diverticular disease in which most patients stopped bleeding spontaneously. This was followed by the aetiologies of polyps and cancers. Bleeding was mild, as only 15% of patients had haemodynamic instability and one third required blood transfusion.

We are very satisfied with the use of colonoscopy as the initial diagnostic modality. The most obvious advantages of colonoscopy are its ability to establish a diagnosis at the level of the colon by direct observation of the mucosal surface, to identify the active bleeding and/or responsible lesion, as well as the ability for therapeutic interventions. Almost all patients were stabilized sufficiently before a gentle bowel preparation in which 1 L of polyethylene glycol was given in preparation for colonoscopy. Half of our patients underwent colonoscopy within 12 to 24 hours of hospital admission. A positive diagnosis was almost always found. The cathartic effect of blood in the colon combined with 1 L of polyethylene glycol was sufficient in preparing the colon for colonoscopy. In this group of patients, the use of radionuclide scanning and angiography was uncommon, and was not very useful in evaluating bleeding from the colon.

In our population, diverticular disease and neoplasms accounted for two thirds of large bowel pathologies and for the majority of patients who required surgery. Diverticular disease, a condition common in developed countries, was the most common colonic pathology in our study, and this was similar when compared to the West. The natural history of bleeding colonic diverticula was as expected: bleeding stopped spontaneously in the majority, with only a few cases requiring surgery. The majority of these patients were admitted to the hospital. Patients were older, with a mean age of 70 years. The majority of patients were resuscitated and stabilized sufficiently for an aetiology to be established. The most common cause was diverticular disease in which most patients stopped bleeding spontaneously. This was followed by the aetiologies of polyps and cancers. Bleeding was mild, as only 15% of patients had haemodynamic instability and one third required blood transfusion.

In our series of patients, upper gastrointestinal causes were responsible for 1% of patients admitted for bleeding per rectum. Reports of up to 26% of cases of severe rectal bleeding had aetiologies proximal to the ileocaecal valve. Although less common, this highlights the fact that an oesophagogastroduodenoscopy should be performed in patients with more severe bleeding, a history of peptic ulcer disease or oesophageal varices. As expected, these patients have massive bleeding, where transfusions and surgical requirements are higher.

Bleeding from the colon and rectum made up 12% of our cases admitted to the hospital. Patients were older, with a mean age of 70 years. The majority of patients were resuscitated and stabilized sufficiently for an aetiology to be established. The most common cause was diverticular disease in which most patients stopped bleeding spontaneously. This was followed by the aetiologies of polyps and cancers. Bleeding was mild, as only 15% of patients had haemodynamic instability and one third required blood transfusion.

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few patients requiring massive transfusion and subsequent surgery. Neoplasms accounted for one third of our cases, similar to the West. About half of them were benign. Cancer was not a frequent cause of fresh bleeding per rectum in our study. This was especially true of right-sided cancers, as they tended to present with anaemia and positive faecal occult blood testing.

Angiodysplasia in the elderly and inflammatory conditions were uncommon in our population, while they contributed to a significantly larger proportion of cases in the West. Table 2 lists the causes of bleeding from the lower gastrointestinal tract reported by other authors.

Conclusions

Bleeding per rectum is a common cause of acute admission to the colorectal department from the emergency department. Haemorrhoids were the most common cause of rectal bleeding among our patients. Because bleeding tended to be mild, they could have been treated conservatively and discharged as an outpatient from the emergency department. Colonoscopy should be performed to look for pathology in the colon or rectum. Massive bleeding from the colorectum was seldom encountered in our patients. They were stable and responded well to simple resuscitative measures. A diagnostic colonoscopy can be performed within 24 hours. Should the bleeding continue or recur within 24 hours, and especially when colonoscopy is unable to localize the site or source of bleeding, urgent angiography or radionuclide scanning is recommended to localize the site of bleeding prior to surgical intervention.

The leading causes of rectal bleeding among our patients were similar when compared with those of the West. Nonetheless, the West had more cases of angiodysplasia, arteriovenous malformations, and inflammatory bowel disease. In our local population, the most common cause of bleeding from the colon was diverticular disease, not cancer (35% vs 10%). This fact should help ease unnecessary anxiety or fear among patients presenting with bleeding per rectum in the emergency department. Our local experience will enable better understanding and management of our patients presenting with bleeding per rectum. Our recommended management algorithm is shown in Figure 2.

References

Figure 2. Algorithm for the management of acute bleeding per rectum. OGD = oesophagogastrroduodenoscopy.


