Today's Treatment

Diseases of the alimentary system

Haematemesis and melaena

P B COTTON, R C G RUSSELL

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Acute gastrointestinal haemorrhage remains a common cause of emergency hospital admission, with a mortality close to 10%, despite recent improvements in resuscitation, anaesthesia, and surgery.¹ In Britain, most patients bleed from peptic ulcers or from erosions of the stomach or oesophagus.² The range of potential sources is large, however, and includes varices, tumours, mucosal tears, vascular malformations, and foreign bodies. The outlook for an individual patient depends upon the source of the bleeding, age, and the presence of co-existing disease.³

We see few patients who bleed so copiously that on admission they need immediate surgery to prevent exsanguination. Most stop spontaneously, if only temporarily. This brief respite allows resuscitation, assessment, and the formation of a management plan, bearing in mind an overall chance of immediate rebleeding of around 20%. There is a delicate balance to be drawn between conservatism and aggression, in both diagnosis and treatment.

Assessment

In Britain, most bleeding patients are initially admitted to medical wards. This is logical, because of the high incidence of concomitant disease and its important effect on prognosis, but the admitting physician must be aware of the natural history of haemorrhage and of the dangers of a leisurely approach. Management by a combined medicosurgical gastrointestinal team is a rarely achieved ideal. In most hospitals patients will be handled by the general admitting medical and surgical teams, whose specialist interest may lie elsewhere. The advantage of a multidisciplinary approach to severely ill patients has been highlighted and enhanced by the development of intensive treatment units, and it is logical to admit all severe bleeders to them for two or three days. The analogy of myocardial infarction and coronary care units is quite close. There is a critical period of about 72 hours when close observation and quick co-operative decisions are essential. Many patients who bleed are young and should have a normal expectation of life after the episode, which cannot be said for the young patient with coronary disease.

When faced with a patient believed to have bled, there are four basic questions: (1) How much has the patient bled?

(2) Where has the blood come from? (3) What else is wrong with the patient, and how will he stand up to resuscitation, investigation, rebleeding, or surgery? and (4) What should be done?

BLOOD LOSS

While patients often overestimate the amount of blood lost, the doctors' common error is to underestimate it, because of the body's compensatory mechanisms. There is no routine place for blood volume measurement, but there is often an urgent need to replace volume as guided by careful sequential observation. Arbitrary definitions of a major bleed are always open to criticism, but anyone who needs volume replacement immediately on admission to hospital, or who has serious co-existent disease, is certainly at high risk.

At the other end of the scale some patients who claim to have vomited blood are mistaken or malingering, and not all black material is sanguine. Blood from the teeth or nasopharynx may be swallowed overnight and vomited in the morning, particularly by children. Consideration of these possibilities may sometimes prevent unnecessary investigation and even hospital admission.

SOURCE OF BLEEDING

More than 90% of patients presenting with haematemesis or melaena, or both, have a lesion proximal to the papilla of Vater. Nevertheless, some presenting with melaena alone have a more distal lesion, sometimes even in the colon. The clinical history and physical examination, though important, are poor guides to the precise origin. Since peptic ulcers are the most common source, inquiry about previous dyspepsia or ulcer disease should always be made. The answer, however, may be misleading. Twenty-five per cent of patients with chronic dyspepsia are not bleeding from ulcers, and 30% of those with bleeding ulcers deny previous dyspepsia.² Recent salicylate ingestion without previous dyspepsia is often taken to suggest acute gastric erosions, particularly in the presence of a negative barium meal result, but this assumption is quite wrong. Salicylate ingestion is so common that many patients with this history are equally likely to be bleeding from a chronic ulcer.

It is fortunate, because treatment is so unsatisfactory, that oesophageal varices are a rare cause of bleeding (about 3%). Here again the history may be misleading. It has been shown repeatedly that patients with known cirrhosis or known oesophageal varices may be bleeding from other sources (ulcers and erosions). Knowledge of a congenital or acquired coagulation problem is relevant to management but does not define the site of bleeding; the same is true for patients known to have telangiectasia or other arteriovenous malformations.

Two particular clinical histories are helpful in suggesting the source of bleeding. A small red haematemesis after repeated and forceful vomiting strongly suggests a Mallory-Weiss tear of the oesophago-gastric junction, although such a history may be present in only half the patients with this condition. Bleeding from severe oesophagitis is seen quite often in elderly patients who are confined to bed because

The Middlesex Hospital, London W1N 8AA

P B COTTON, MD, MRCP, consultant physician
R C G RUSSELL, MB, FRCS, consultant surgeon

of intercurrent illness or recent surgery. In retrospect most admit to a history of heartburn. Until bleeding oesophagitis is diagnosed the condition may even be aggravated by raising the foot of the bed in an attempt to maintain central perfusion—a procedure to be deprecated in any event. Most patients stop bleeding quickly once the diagnosis is determined and the correct posture maintained.

Endoscopy

Thus clinical history and examination rarely provide a precise diagnosis of the bleeding source. Until recently diagnostic attempts relied upon the barium meal examination, supplemented in a few centres by gastroscopy. Many patients came to laparotomy without a precise diagnosis, and some indeed to necropsy. This unsatisfactory state of affairs is currently changing with the spread of fiberoptic oesophagogastrroduodenoscopy.⁴ In experienced hands, upper gastrointestinal endoscopy is highly accurate in diagnosing both large and small lesions. In all hospitals with a good endoscopy service this has become the procedure of first choice in investigating bleeding patients, and most radiologists would agree that the barium meal examination is a second best.⁵ Urgent endoscopy is not universally available, however, and expert barium radiology is certainly much better than inexperienced endoscopy.

The correct timing for diagnostic investigation is a matter of judgment and availability. Emergency endoscopy within a few hours of admission is difficult to arrange, but delay beyond 48 hours is illogical, since many patients will already have rebled. In the average case we have compromised by examining patients within 12 to 18 hours. If major haemorrhage has occurred and early surgical intervention is being considered endoscopy is performed sooner, though here the likelihood of blood obscuring the endoscopic view is quite high and cannot always be overcome by gastric lavage. We have often found it appropriate to examine such patients in the anaesthetic room of the operating theatre, under a general anaesthetic, with the surgeon in attendance. This allows a good examination and comprehensive gastric lavage if necessary. At the very least, it enables the endoscopist to exclude a bleeding oesophageal lesion.

If endoscopy fails to define a bleeding lesion and haemorrhage persists urgent arteriography by an expert may be helpful.⁶ Vascular malformations are particularly well demonstrated by this technique, which also has potential therapeutic applications (intra-arterial infusion of adrenalin, of vasopressin, or embolism with clots) in certain contexts. A prior barium meal examination will render angiography impossible.

Most endoscopic series provide an overall positive diagnosis in 80-90%. Gastric and duodenal ulcers together provide around 50%, and acute mucosal lesions another 15-20%. One of the lesions of widespread fiberoptic endoscopy is that duodenal ulceration is rather less important as a bleeding source, and oesophagitis and Mallory-Weiss lesions rather more, than was previously thought.⁴ In all endoscopic series there is a substantial group (10-25%) of patients who are found to have more than one potential bleeding lesion. A patient with a duodenal ulcer may in fact bleed from acute erosions or a mucosal tear. Herein lies a major advantage of endoscopy over barium studies, since it is usually possible to tell at endoscopy where the blood is coming from. In a few patients the result of the examination is entirely negative and no blood is seen, which suggests that the source is distal to the ampulla of Vater and that further diagnostic steps should be considered such as sigmoidoscopy, arteriography, barium enema, or colonoscopy.

THE GENERAL STATE OF HEALTH

The clinical history and physical examination in a bleeding patient should lead to a comprehensive knowledge of the patient's health, both past and present. Concomitant renal or cardiopulmonary disease will greatly affect decisions about patient management and the eventual prognosis. A few patients present with bleeding as a terminal event of an incurable malignant disease.

The assessment of any patient with a major bleed should be as rigorous as that of a patient admitted to an intensive care unit with a myocardial infarction. Baseline haematology and chemistry are important, and a clotting screen will often be necessary. Chest radiography and an electrocardiogram shortly after admission may identify previously unsuspected risk factors and provide invaluable baselines, as may blood gas analyses.

Management plan

On the basis of the foregoing comprehensive assessment, it should be possible to formulate a plan of action, including the likelihood of surgical intervention. For a minor bleeding episode from an acute mucosal lesion patients may only need inpatient observation for a few days, along with oral alkalis. There is no indication for any dietary restriction. Management of a major bleeding episode is more complex.

Management of a major bleed⁷

Patients need careful observation, and the use of an intensive treatment area has already been recommended. Replacement by blood, or occasionally blood substitutes, remains of prime importance, but the speed of replacement and need for supportive medication such as digoxin or diuretics must be determined for each patient. Particularly in the elderly patient with associated disease, blind replacement of blood is no longer acceptable. Careful monitoring of the central venous pressure, hourly urine output, and changes in the electrocardiogram may all be necessary if full advantage is to be taken of the opportunities provided by an early diagnosis. Electrolyte abnormalities, hypoproteinaemia, coagulation deficiencies, vitamin deficiencies, and anoxia may all need correction. The objective of the resuscitation period should be to prepare the patient for a further bleed or surgery.

Unnecessary delay and unnecessary surgery are both dangerous. An early accurate diagnosis should define a path between these chasms. The "blind gastrectomy" should now have passed into the history of surgery. Nearly all surface mucosal lesions (oesophagitis, Mallory-Weiss syndrome, acute erosions) stop bleeding spontaneously. Oesophageal varices often rebleed but surgery carries a formidable risk. The surgeons' main contribution lies with patients bleeding from peptic ulcers or neoplasms.

Peptic ulcer—If a patient is bleeding from a peptic ulcer and has a long past history of ulceration, surgery is usually offered as soon as the resuscitation phase is complete. In the same patient with the same ulcer, but no previous history, there is a tendency to await a second bleed. While this appears logical, several series have shown that patients with no previous history are at greater risk,¹⁻³ presumably because of this tendency to delay surgery. It is often stated that rebleeding is more likely in the older age group. This may simply reflect the higher incidence of gastric to duodenal ulceration. It is also true, however, that the mortality of surgery increases with advancing age. Thus judgment in the individual case is a question of balancing risks. It is certainly true that the operative mortality rises with delay, and most authorities recommend early operation in the elderly bleeder once chronic ulceration is established. A bleeding anastomotic ulcer usually needs early surgery.

Gastric ulceration—For bleeding gastric ulceration most surgeons favour a Billroth I gastrectomy with excision of the ulcer. The correct procedure for a bleeding duodenal ulcer remains debatable. Best results are obtained by the surgeon performing the operation with which he is most familiar. Reports suggest that a Polya gastrectomy is more effective in preventing rebleeding but has a higher mortality than vagotomy and drainage. The trend is towards vagotomy with under-running of the bleeding vessel through the pyloroplasty. Whether the vagotomy is truncal or selective is a matter of individual experience. Proximal gastric vagotomy is not to be advocated in an emergency. Nevertheless, advocates of this technique may employ it on an early elective basis after conservative management of the bleeding episode if the latter has not been severe, and the main indication for surgery is the chronicity of ulceration.

Gastric neoplasm—In the rare patient who bleeds acutely from a gastric neoplasm, surgical delay will serve no purpose once the initial assessment has been carried out, excepting that the

patient's chance of short- and long-term survival after major resection will depend upon the availability of an appropriate surgeon.

Acute mucosal lesions—Despite the overall good prognosis for patients bleeding from acute mucosal lesions a few continue to bleed. Until recently surgery provided the only possible treatment. Most surgeons would perform a Billroth I gastrectomy with or without vagotomy, with a commitment to total gastrectomy if bleeding persisted. Radical surgery after days of intensive medical management and repeated blood transfusions carries a formidable mortality. It is for these patients that the new experimental acid-suppressing drugs such as cimetidine (see below) will have important application.

Hiatus hernia itself is not a cause of bleeding. Occasionally gastric ulcers occur at the level of the diaphragmatic hiatus, but in most cases bleeding results from acute reflux oesophagitis. This virtually always stops when alkalis are given and the patient is propped up. Surgical intervention may sometimes be appropriate after recovery from the bleeding episode.

Oesophageal varices—The patient with bleeding oesophageal varices poses a formidable problem⁸ with which few surgeons are experienced. The acute episode is usually managed medically with replacement of blood and clotting factors, intravenous or arterial infusions of vasopressin, and a Sengstaken-Blakemore tube, along with the usual measures to alleviate or prevent hepatic insufficiency. This type of regimen usually provides temporary control. Failure needs a more aggressive approach, either directly on the oesophagus or through a shunt procedure. Sclerosis of varices can be performed through an oesophagoscope or through transhepatic catheterisation of the coronary vein. The choice of a shunt procedure remains controversial, and will in any event depend upon a radiological assessment of the portal system. There has been recent enthusiasm for meso-caval shunting using a Dacron graft. The complexity of management of these patients is such that their best chance of survival lies in units with special interest and competence in the condition; if patients are to be referred to such a centre it should be done early, while the patient is still relatively fit.

Rare causes—There are many rare causes of haematemesis and melaena. The investigation and management of these patients is often prolonged and punctuated by negative investigations, even laparotomy. Careful angiography is sometimes diagnostic. When laparotomy is to be performed on a patient with recurrent undiagnosed bleeding, on-table transintestinal endoscopy should be considered; with the abdomen open, it is easy to thread a fiberoptic endoscope through the entire small intestine and obtain excellent views on withdrawal. The Zollinger-Ellison syndrome should not be forgotten as a cause of rebleeding, particularly after surgery. An urgent serum gastrin estimation may be diagnostic.

Postoperative management

Careful postoperative care in an intensive treatment area is vital. In the elderly group of patients after major surgery, the commonest problems are those of pulmonary embolism, cerebrovascular and coronary episodes, as well as respiratory problems. The maintenance of normal perfusion and oxygenation is often of critical importance, and planned intermittent positive pressure ventilation may be appropriate immediately postoperatively. The incidence of pulmonary embolism may be reduced by low-dose subcutaneous heparin starting immediately before operation. Accurate fluid replacement is essential, and early physiotherapy and avoidance of a nasogastric tube can do much to prevent chest complications. Parenteral nutrition may be necessary.

Experimental therapy

The management of certain patients with acute upper gastrointestinal bleeding may well be altered by developments that

are under evaluation. Gastric acid secretion may be virtually abolished by the experimental H² blocking agent cimetidine. This treatment may certainly help in the management of patients with bleeding mucosal erosions⁹ and in the Zollinger-Ellison syndrome. Its precise application in other bleeding patients is under trial.

The second development concerns the local treatment of bleeding lesions through fiberoptic endoscopes.¹⁰ Injection of sclerosants into varices has already been mentioned. Diathermy coagulation can be applied to erosions, angiomas, and small ulcers. A laser beam has been used for the same purpose. An endoscope has been produced with which it is possible to apply clips to bleeding vessels. These applications are experimental and are unlikely to find widespread application. Small lesions usually stop bleeding spontaneously, and large ones usually require surgery.

Assessment of results

It seems reasonable to hope that careful assessment, accurate diagnosis, urgent resuscitation, careful observation, and skilful selected surgery will result in benefit to individual patients. To prove any such benefit, or to assess the contribution of any single factor, is much more difficult.¹¹ It is often stated that the overall mortality of haematemesis and melaena has changed little over many years. Different series, however, contain a different spectrum of lesions; the age of patients and their load of concomitant disease may well be changing.¹² A static overall mortality may obscure improvements in one area, and indeed adverse trends in another. Now that it is possible to diagnose precisely in most cases, we can assess the efficacy of our treatment within each diagnostic category and institute trials of different therapeutic protocols. Only in this way will progress or failure become apparent.

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A middle-aged woman with rheumatoid arthritis has been taking prednisolone (4 mg daily) for 10 years. She wishes to go abroad. What are the hazards, if any, of her being immunised against smallpox, yellow fever, and typhoid?

Smallpox vaccination in a patient under steroid treatment carries considerable additional risk, particularly if it is a primary vaccination or one after many years. The vaccinal lesion usually fails to heal after about a week and shows a progressive inflammation and subsequently the danger of a generalised septicaemia. As the smallpox endemic zone is now confined to a small area of Ethiopia, vaccination in a patient with such a known contraindication is not justified. Although a live virus is also employed in yellow fever vaccine, there is little added risk for a patient on steroid treatment. As yellow fever has increased in the endemic zone she should be vaccinated. The use of typhoid vaccine in a patient with rheumatoid arthritis may be associated with a risk of recurrence of activity, as it is a well-known "provocative" vaccine. It would therefore be preferable to use 0.1 ml of the monovalent typhoid vaccine intradermally with a second dose given about a month later.