Current Practice

DISEASE OF THE DIGESTIVE SYSTEM

Surgical Treatment of Upper Alimentary Bleeding

H. L. DUTHIE,* M.D., CH.M., F.R.C.S.

The place of surgery in the management of patients with bleeding into the stomach or duodenum is largely governed by two aspects of the haemorrhage: the total volume of blood lost and the rate of bleeding.

Other factors which are of importance are the cause of the bleeding and the age of the patient. Severe bleeding is one of the most demanding emergencies, and the decision may need to be made rapidly and the operation performed with dispatch. Fortunately most upper alimentary bleeding settles with conservative management and in only a minority of cases does immediate operation have to be considered. However, in all cases the question of surgery to prevent recurrence of the bleeding ought to be considered.

Co-operation

The approach to the diagnosis and treatment of upper gastrointestinal haemorrhage should be co-operative between physician and surgeon. In most centres such cases are admitted to medical units, but in the others to surgical units. The locus of the patient does not matter: the joint consultation is all-important. This joint action is too well established throughout Britain to need much emphasis; the surgeon benefits from seeing patients who do not require surgical treatment, the physician benefits from having earlier recourse to surgical assistance, and, best of all, the patient benefits by having the appropriate treatment at the appropriate time.

* Professor of Surgery, University of Sheffield.

Indications for Surgery

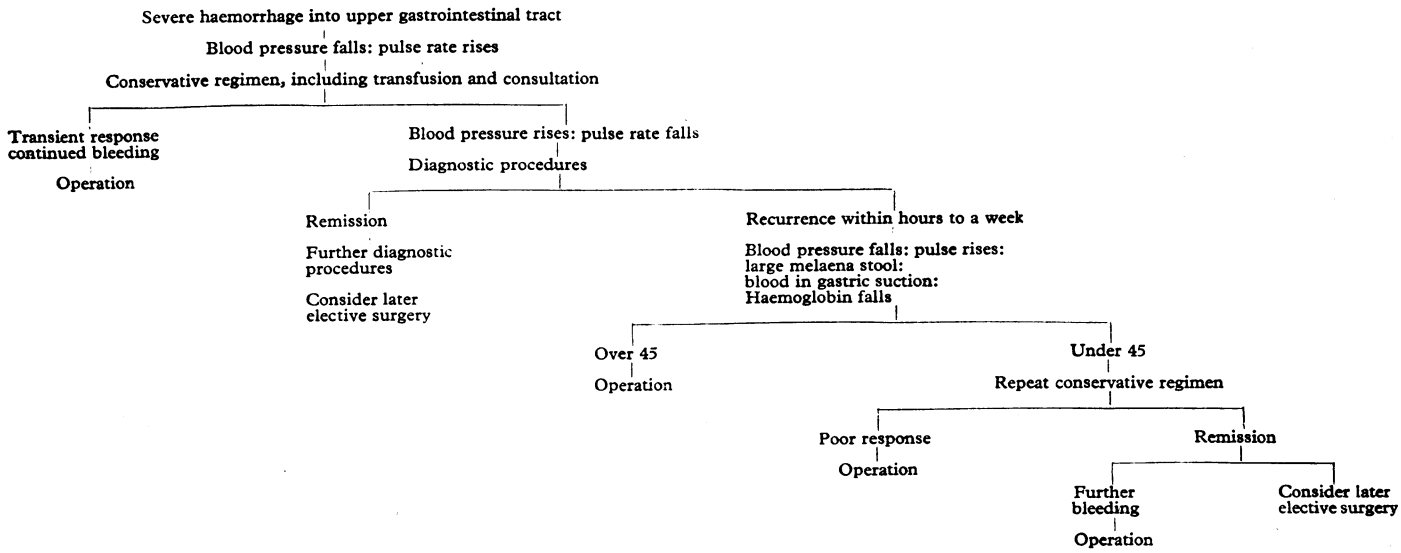
In the overall management of upper gastrointestinal bleeding the priorities may be stated as (1) life saving, (2) diagnosis, (3) definitive treatment. Surgical therapy may be called for in step one, when the endeavour is to accomplish all three objectives, or it may be left to stage three. Definitive treatment is to be preferred where it is compatible with the progress of the patient. The rapidity of the blood loss is the main factor indicating the correct time to operate (Table I).

Bleeding Threatening Life

When the bleeding threatens the life of the patient, despite adequate transfusion, operation must be done even though the diagnosis may not be known, provided that haemorrhagic disorders have been excluded. In some cases a preoperative diagnosis will have been established by a typical history of peptic ulcer, or of ingestion of aspirin, or of hepatic cirrhosis with portal hypertension, and in the last instance the physical examination will usually elicit signs of hepatic failure and the spleen will be palpable. A working diagnosis may be further buttressed by previous radiological findings. However, there may be no time to proceed to further diagnostic measures. Fortunately a bleed as demanding as this is uncommon and some time can usually be obtained for at least a radiographic study in the ward or for an endoscopic examination.

What does the surgeon do at operation? He first attempts to confirm or establish the source of the bleeding, then to stop

TABLE I.—*Place of Surgical Treatment in the Management of Bleeding from the Gastrointestinal Tract*



it, and finally to attempt to prevent its recurrence. Chronic duodenal ulceration is frequently detectable by inspection of the outside of the duodenum, but the duodenum may have to be opened to be quite sure of the presence of a small penetrating ulcer on the posterior wall. Gastric ulcers may be more difficult to detect and the stomach may have to be opened widely to locate the lesion, especially if it is an acute erosion. Another technique to assist in the location of the bleeding point at operation is to insert a sigmoidoscope through a small hole in the stomach. By inflating the stomach the mucosa may be examined, but the presence of blood and blood clot makes this difficult. I prefer opening the stomach and everting the lining, though blood clot may again make visualization tedious, and the mucosal folds must be carefully separated to make sure that a small lesion has not been overlooked. Portal hypertension is usually diagnosed preoperatively, but, if not, the presence of venous collaterals in the abdominal wall is indicated by the excessive bleeding encountered when making the incision. Once the abdominal cavity has been opened the enlarged spleen can be felt and the cirrhotic liver can be seen together with the distended intra-abdominal veins.

When the source of bleeding has been found it must be stopped at once by direct pressure, by oversewing, or by applying a clamp, and the transfusion allowed to continue for a few minutes to improve the patient's general condition before proceeding with the operation. The choice of procedure will be discussed later.

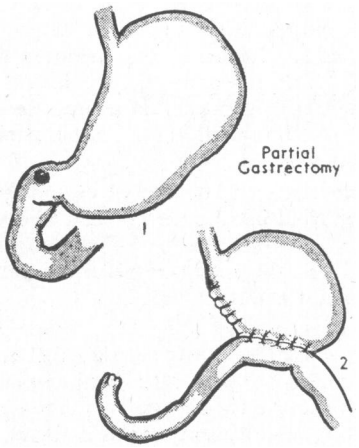


FIG. 1

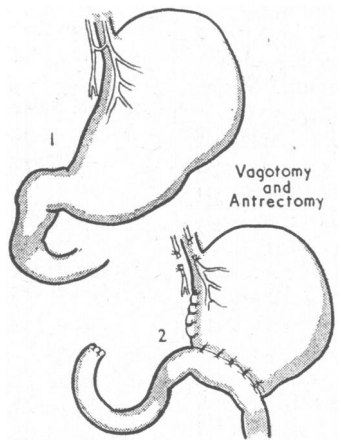


FIG. 2

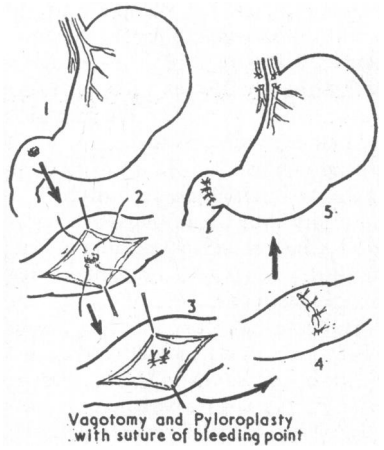


FIG. 3

Severe Bleeding—No Threat to Life with Transfusion

In this group the severity of the bleeding ranges from that in which the blood pressure can be maintained only with transfusion to the patient in whom the bleeding stops quickly and the transfusion replaces the lost volume. The value of time gained by transfusion is that the patient can get into a better condition to undergo surgery or to undergo investigation. History, physical examination, then immediate radiology, assessment of gastric acidity, and immediate gastroscopy combined can give a positive diagnosis in over four-fifths of patients. This is a great advantage to the surgeon, but no time must be lost attempting to make the diagnosis. If the patient's condition deteriorates, as seen by further fall in blood pressure, rise in pulse rate, and fresh blood in the gastric aspirate, immediate surgery is indicated. In this group recurrent haemorrhage is a frequent indication for operation, and usually after the diagnosis has been made.

Moderate Bleeding

When the amount of blood lost does not cause a decrease in blood pressure the problem is much less acute, and the indices of persistence of bleeding usually are the continued presence of occult blood in the stools and a consistently falling level of haemoglobin in the blood. The bleeding is then more an additional indication for surgery to treat the underlying cause rather than an absolute indication in itself.

Age

It is generally held that patients over the age of 45 to 50 should be considered more readily than younger patients for surgical treatment of bleeding, since vessels affected by the inevitable arteriosclerotic changes of age will be less likely to contract to assist in the arrest of the haemorrhage. However, in the case of the chronic duodenal ulcer this is hardly valid. No matter the age of the patient, the vessels in the base of the ulcer undergo periarteritis and become thickened. With this in mind, operation should not be postponed too long simply because the patient is in his twenties or thirties.

Cause of Bleeding

Both the indications for operation and the type of procedure will be influenced by the source of bleeding. The four most common causes in Britain are chronic peptic ulcer, acute ulceration, gastric cancer, and oesophageal varices.

Chronic Peptic Ulcer.—The bleeding is usually from a duodenal ulcer. Apart from the severity of the haemorrhage, the previous history of the patient will influence the decision to operate, especially if his symptoms are escaping from medical control. The general principle with this and any other cause of bleeding should be to treat surgically any patient who continues to bleed, either briskly—when an emergency procedure would be required—or more slowly over two or three days, when a more leisurely approach may be made. The other type of bleeding which leads to operation is recurrent bleeding—again the speed with which treatment is required depends upon the rate of the bleeding. This is assessed by the response of the pulse rate, which rises much earlier than blood pressure falls, the presence of fresh blood in the gastric aspirate (gastric intubation should be routine in these cases), and the clinical response to blood transfusion.

At this point it is well to mention another circumstance which occasionally has to be considered when the patient continues to bleed slowly but requires further transfusion of blood. If blood of the patient's group is in short supply, especially if of a rare group, a decision has to be made when three to four pints (units) are still available. If the bleeding seems to be stopped it may be safe to delay, but if any doubt exists this is a strong indication for operation while there is enough blood to cover it.

TABLE II.—*Operations for Upper Gastrointestinal Bleeding*

Procedure	Indications	Advantages	Drawbacks	Present Status
Partial gastrectomy	Duodenal ulcer. Gastric ulcer. Acute erosions. Gastric cancer	Removal of source of bleeding and reduced likelihood of rebleed	Severity of procedure. Still has some rebleeding. Small stomach symptoms	Most common procedure
Vagotomy with hemigastrectomy	Duodenal ulcer. Gastric ulcer. Acute erosions	Allows a larger gastric remnant	As above except fewer symptoms from small remnant. Post-vagotomy diarrhoea	Gaining popularity as a compromise between 1 and 3
Vagotomy and pyloroplasty with oversewing lesion	Duodenal ulcer. Gastric ulcer. Acute erosions	More minor operation. No loss of gastric reservoir	Risk of rebleed. Post-vagotomy diarrhoea	Used when lesion is small (1 cm. or less) but still to find favour with majority

Thus in general a patient with a long history of proved peptic ulcer disease will come to surgery earlier than when the diagnosis is in doubt or when an acute ulcer is suspected.

Choice of Surgical Procedure.—The aim of the operation (Table II) is to stop the bleeding and to prevent its recurrence. Unfortunately none of the procedures available can guarantee to do both in all cases, but all achieve both aims in the majority of patients. The reasons for any choice of a particular operative technique are always multiple and are compounded of the risks involved to life and in terms of later morbidity, together with the efficacy in fulfilling the aims. In the surgical treatment of chronic peptic ulceration until 10–20 years ago the favoured operation was partial gastrectomy. This is now being displaced by vagotomy and a drainage procedure. A similar trend has occurred when treating bleeding ulcers, but it has been much less marked. Most surgeons still prefer to resect the ulcer, and so partial gastrectomy is the commonest operation (Fig. 1). Some surgeons who are more impressed by the reported incidence of undesirable side-effects of gastric resection prefer to resect less of the stomach (hemigastrectomy or antrectomy) and to combine this with a vagotomy to avoid recurrent ulceration (Fig. 2). My own preference is to control the bleeding by local excision of the ulcer if it is gastric or anterior duodenal or to oversew the bleeding point if the ulcer is about 1 cm. in diameter or less ; then to attempt to prevent recurrence by performing a vagotomy and pyloroplasty (Fig. 3). It seems rational to denervate only the stomach and preserve the branches of the vagus to the liver, pancreas, and small bowel—a selective vagotomy. However, it takes longer to perform a selective vagotomy than to divide the main vagal trunks as they pass through the diaphragm, and in an emergency the latter procedure being more expeditious may on occasion be preferred.

Apart from the drawbacks of the "dumping" syndromes after gastrectomy and changes in bowel habit after vagotomy, the main untoward sequela of these operations when used in the treatment of haemorrhage is that they fail in 5% to 15% of cases—that is, bleeding recurs in these patients. The bleeding is usually more minor than the acute incident leading to the first operation. Opinions differ on the risks of this occurring with the various operations, but the general trend from the literature is shown in Table III. The further loss of blood

TABLE III.—*Incidence of Further Bleeding After Partial Gastrectomy or Vagotomy and Pyroplasty*

Operation for Bleeding Ulcer	Number	Further Bleeding
Partial gastrectomy	167	12 (7·2%)
Vagotomy and pyloroplasty	142	9 (6·3%)

may be from the original ulcer if it was not removed, from the region of the stoma, from undetected lesions, or from recurrent ulceration. Though the surgeon succeeds in securing a definitive cure in the majority of patients, this worrying minority remains.

Acute Ulceration.—Whether the acute ulcer is peptic in the stomach or duodenum, or due to aspirin ingestion in the stomach, or is due to repeated vomiting tearing the mucosa at the cardia, a much more conservative approach should be adopted. The aim should be to avoid surgery if this is at all reasonable, since the lesion in many cases is reversible. If the effects of the initial bleeding can be controlled until it stops the patient avoids an operation. In this group especially the use of gastric hypothermia seems to be most rational. The indications for operation are still persistent or recurrent bleeding, but the tendency is to postpone the operation longer than with the chronic ulcer patients. The choice of operation is the same as for chronic ulcer. There is a strong case for the use of vagotomy and a drainage procedure ; this avoids the possibility of having to remove almost all the stomach if widespread lesions have all to be resected.

Gastric Cancer.—Gastric cancer is not very commonly the basis of a large haemorrhage, and usually the decision to operate can be made at relative leisure. The resection of the growth is the only practicable procedure: this may be a palliative excision only, but it will serve to arrest the haemorrhage.

Oesophageal Varices.—Massive bleeding often arises from oesophageal varices. This is another condition in which efforts are made to do without acute surgical intervention, particularly since the postoperative mortality and morbidity are high. The death rate from bleeding oesophageal varices is the highest of these four common causes of bleeding from the upper gastrointestinal tract. Management of the condition will be discussed in a separate article in this series.

Summary

The surgeon's role in the acute management of bleeding from the upper alimentary canal is to act when bleeding threatens life by its persistence or its recurrence. He may be called upon to make the diagnosis at operation and to proceed to control the bleeding. More usually the bleeding is less catastrophic and more time is available ; the diagnosis has been made before operation and the control of the bleeding is the object of surgery. Partial gastrectomy is still the procedure most commonly performed for bleeding from gastric cancer or peptic ulceration, although direct control of the bleeding point along with vagotomy and pyloroplasty is also being used. Early joint consultation between physician and surgeon is the basis of sound management of upper gastrointestinal haemorrhage.