Gastrointestinal hemorrhage – surgical aspects

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Acute gastrointestinal bleeding is a frequent event, with an incidence of around 40-50 cases per 100,000 persons per year. These patients expose the clinician to substantial diagnostic and therapeutic challenges. Since the early seventies, emergency endoscopy has been widely used in the diagnosis and management of upper GI hemorrhage. Acid-suppressive drugs have become available and by the introduction of endoscopic intervention modalities in the eighties, the mortality rate from this severe clinical manifestation decreased slightly but is still centering around 10%. One of the main reasons for the persisting high mortality is probably the fact that the patients are at an advanced age and have concomitant complicating diseases. A quarter of the admitted patients are older than 80 years. Another factor might be the extensive use of NSAID and anticoagulants. Regarding lower GI hemorrhage, the therapeutic options and prognosis have been quite stable over the last decade but new technologies are emerging.

If endoscopy is performed within 24 hours of admission, the cause of bleeding is identified in more than 90%. However, in large epidemiological studies the percentages of undiagnosed patients vary widely between 0% and 25%. Gastroduodenal peptic ulcers account for about 40% of cases, where duodenal ulcers are most frequently seen, followed by hemorrhagic gastritis, variceal bleeding, esophagitis, duodenitis, Mallory-Weiss tears and malignancies (1%-5%). A meta-analysis showed that endoscopic therapy, including injection therapy, was effective in reducing the risk of rebleeding, need for emergency surgery and mortality in patients with active bleeding or non-bleeding visible vessels. Furthermore, the routine use of a second endoscopic treatment in case of rebleeding has been suggested, although a more widespread consensus and acceptance of this strategy has not been achieved. Rebleeding and requirement for emergency and urgent surgical intervention remains. For instance, recent trials have shown a rebleeding rate around 20%-25%, with 8%-15% need for urgent surgery. One trial has tried to assess whether elective endoscopic retreatment is better than early elective surgery after initial endoscopic hemostasis, but the issue is far from settled. Apparently, endoscopic reintervention has advantages over surgical intervention in terms of lower morbidity.

Surgical intervention

Depending on the timing of the operation, surgery for hemorrhage can be divided into three main groups: emergency surgery, elective early surgery, and delayed surgery. Emergency surgery carries a mortality rate between 10% and 20%, but if surgery is inappropriately delayed, mortality increases rapidly. Therefore patients who are likely to rebleed are the best candidates for early elective surgery after the initial bleeding has been stopped with endoscopic therapy.

Most surgical studies have been performed before effective endoscopic therapy became available, and it is therefore difficult to compare the different studies and strategies. Morris and co-workers prospectively compared early surgery with non-operative management in patients with bleeding ulcers, and stratified them by age and ulcer location. In age over 60, early surgery had a mortality of 7% compared to 43% for those with delayed surgery. However, the different types of surgery were not comparable in the two groups, and in those with delayed surgery more patients received gastric resection, which carries a higher procedure-related mortality. Overall mortality was 4% for early surgery and 15% for delayed surgical management. In patients with ulcers in the posterior wall of the duodenal bulb, with active bleeding or a visible vessel, early surgery may be recommended. Endoscopic hemostasis is difficult in these patients and recurrence of bleeding is often fulminant because of large side branches of the gastroduodenal artery being involved.

Gastric ulcers

Gastric ulcers more frequently require surgery due to uncontrolled bleeding, than duodenal ulcers. At the time of a laparotomy each gastric ulcer has to be excised, including in most instances a formal resection. The main reason for this strategy is that gastric ulcers always carry the potential of being malignant. Concomitant duodenal scarring and/or ulcers do not pose a significant problem in the days of Helicobacter pylori eradication therapies. Therefore only exceptionally should vagotomy procedures be added due to the associated morbidities.
Duodenal ulcers

For bleeding duodenal ulcers, extensive operations are almost never indicated, because many patients are *H. pylori*-infected and/or have the hemorrhage occurring as a consequence of NSAID usage. Therefore duodenal ulcer hemorrhage should mainly be treated by under-running the ulcer which, if correctly done, frequently elicits adequate hemostasis. If surgical acid suppression is required for any reason, a selective gastric vagotomy should be recommended due its lower morbidity and less frequent side effects.

Interventional radiology

Due to the high morbidity and mortality after surgical intervention, an increasing number of attempts have been taken to intervene radiologically to embolize relevant vessels in a situation where endoscopic interventions fail. Although the literature is still meager on the outcomes and how to best select cases and at which stage of the disease this intervention should be recommended, case-based reports demonstrate very promising results.

Variceal bleeding

In many institutions, operative porto-systemic shunts are no longer used as treatment for variceal bleeding. When the first-line options of non-selective beta blockade or endoscopic treatment fail to control bleeding, a transjugular intrahepatic portosystemic shunt (TIPS) is usually placed. The advantages of TIPS are that it is non-operative, it effectively decompresses the portal venous circulation in the short term, and early complications and procedure-related mortality are infrequent. However, late TIPS failure rates are high, with thrombosis or stenosis developing in approximately in 50% of patients within 1-2 years. Although TIPS revisions are successful in many patients, in most series, rebleeding rates after TIPS are considerably higher (10%-30%) than after surgically constructed shunts (<10%). When patent, TIPS is usually a non-selective shunt with encephalopathy rates in most trials similar to those seen after a porto-caval shunt.

Despite these disadvantages, TIPS is an excellent option for patients in whom endoscopic treatment is unsuccessful and who require relatively short-lasting portal decompression while on the waiting list for a liver transplant or whose anticipated survival is limited due to the underlying liver disease.

Long-term survival has been particularly impressive for patients undergoing surgery since the advent of liver transplantation, especially for those who are potential liver transplantation candidates and who can be salvaged by this procedure when hepatic failure develops.

Colonic hemorrhage

The diagnostic role of endoscopy is somewhat still debated. The outcome is usually reported as very positive, both regarding the level of the bleeding source as well as the nature of it. During endoscopy, the therapeutic option is always offered, but everyone who embarks on this should realize the demanding character of the mission both in terms of preparation of the lower GI tract as well as the level of expertise of the endoscopist.

In case of failure, interventional radiology seems to become more and more important and the option to embolize has increased without exposing the patient to an unacceptable risk of local bowel ischemia.

In case of surgical intervention, this should essentially always be total colectomy with ileo-rectal anastomosis. The reason behind such a strategy is that it is always very difficult to localize the bleeding lesion. In order not to expose the patient to an unacceptable risk of adding a second operation, most surgeons prefer this strategy as a rescue procedure.