# Upper gastrointestinal emergencies

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## Abstract

Upper gastrointestinal emergencies form the majority (in some centres 60−70%) of an unselected general surgical emergency take and non-specialist general surgeons need to have a thorough knowledge of the presentation and initial management of these conditions. Recent developments in the management of gallstone disease, pancreatitis and liver trauma in particular are covered in this article.

**Keywords** Abscess; biliary colic; gallstones; liver laceration; pancreatitis; ulcer

## Upper gastrointestinal tract bleeding

Acute bleeding from the upper gastrointestinal (GI) tract usually presents with haematemesis, but rapid blood loss from anywhere in the tract may present with rectal bleeding. The most common causes of upper GI bleeding are variceal bleeding and peptic ulceration. Variceal bleeding occurs as a result of portal hypertension, either from intrinsic liver disease such as cirrhosis or extra-hepatic portal vein occlusive disease and may be massive and sudden. Bleeding from peptic ulceration is usually the result of erosion of gastroduodenal artery or left gastric artery, depending on the location of the ulcer. Other rare causes include oesophagitis, gastritis or upper GI malignancy.

Investigation and rapid resuscitation as initial management should take place concurrently.[1] Large-bore venous access with a rapid crystalloid infusion to replace volume and high-flow oxygen therapy should be given. Proton pump inhibitors should be given as a continuous infusion over 72 hours before conversion to bolus form. Patients with suspected or known varices should be treated with terlipressin to lower portal pressures.[2]

The initial investigation of choice is gastroscopy, where varices can be banded, ulcers injected and bleeding vessels clipped. Combination therapy in controlling bleeding results in superior outcomes to monotherapy. Failure to control bleeding is an indication for laparotomy. There is a role for selective angio-embolization in upper GI tract bleeding, although the abundant collateral supply in this area can sometimes limit the effectiveness of this treatment. CT angiography can help to identify the source of bleeding although active blood loss must exceed around 0.5−1 ml/minute in order to be identified.

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Scoring systems, such as the Rockall score, which predict the risk of mortality and stratify patients by risk in order to identify those who can be managed as outpatients have been developed and are commonly used.[3]

## Upper gastrointestinal tract perforation

Oesophageal perforation is most commonly related to instrumentation (∼56%), but when spontaneous, usually results from forceful vomiting against a closed glottis, classically after a large meal and is then known by the eponymous term of Boerhaave's syndrome. The perforation is normally on the left side and presents with sudden onset of chest pain with shortness of breath after vomiting. A high index of clinical suspicion is necessary to diagnose this uncommon but potentially lethal problem. Mediastinal contamination ensues with mediastinitis, systemic sepsis and death if untreated.

Chest X-ray may reveal pneumomediastinum with a left pleural effusion but the investigation of choice is CT of the chest and upper abdomen with oral contrast which will reveal the site of perforation and any related collections. These collections must be drained promptly with broad spectrum antibiotic and anti-fungal cover. The patient must then be assessed for operative repair, oeesophagectomy or insertion of a covered stent by oesophago-gastroscopy. These decisions are best made by an experienced oesophago-gastric surgeon in a tertiary level unit.[4]

Gastric and duodenal perforation usually present as sudden onset of abdominal pain with progressive degrees of sepsis and systemic dysfunction, according to the length of time since the onset of symptoms. Gastric perforations may be due to ulcers or malignancy, whereas duodenal perforations are almost always due to ulcers. Chest X-ray will reveal pneumoperitoneum in 80% of cases whereas CT is 98% sensitive for free air. Sealed perforations may be demonstrated on CT by stranding and minimal fluid, without much in the way of free air. In stable patients without generalized signs, there is a role for conservative treatment of gastric and duodenal perforation with intravenous antibiotics, fluids and a period of fasting. The evidence however is conflicting and even older patients who are less fit may have better outcomes if offered early surgical repair.[5] Laparoscopic repair with an omental patch is a well-established technique. All gastric perforations should be assumed to be malignant until proven otherwise and must be biopsied.

## Gallstone disease

### Biliary colic

Perhaps the commonest condition presenting to an unselected general surgery 'take' is biliary colic. Gallstones are extremely common; although prevalence varies according to ethnicity and geography. Between 5 and 30% of any given population may harbour gallstones, and 15−25% of these individuals will become symptomatic in follow-up over 10−15 years.

Biliary colic occurs when gallstones cause upper abdominal pain, typically constant in nature and often radiating to the back or shoulder. The mechanism is thought to be intermittent obstruction of the cystic duct by one or more stones resulting in typical pain as the gallbladder contracts in response to cholecystokinin release from ingestion of fatty food. Other symptoms

include nausea and bloating. One must be careful about attributing pain to sonographically demonstrated gallstones when there are atypical features such as reflux, a history of peptic ulceration or pain which is not in the correct anatomical location, as symptoms will invariably persist after cholecystectomy.

Mandatory investigations include trans-abdominal ultrasound, not only to confirm the diagnosis but also to evaluate the diameter of the common bile duct. Liver function tests are usually normal. Any derangement in liver function tests or increase in the diameter of the common bile duct over the age-adjusted normal value (6 mm up to age 60 plus 1 mm per decade of life) should prompt magnetic resonance cholangiopancreatography (MRCP) evaluation of the duct for intra-ductal stones.

Immediate management includes symptomatic treatment with analgesics. Patients who are fit for surgery with uncomplicated biliary colic should be informed about the risks and benefits of cholecystectomy. It is the authors practice to offer cholecystectomy to these patients on the next available list. However, surgery during the inpatient stay often saves repeated admissions.

### Cholecystitis

These patients may present with sepsis, particularly if elderly or immuno-compromised and with upper abdominal pain. The cause is usually a gallstone which has impacted in the cystic duct or obstructed Hartmann's pouch and which has resulted in superimposed infection (usually with Gram-negative coliform bacteria) and inflammation of the gallbladder. Occasionally acalculous cholecystitis can be seen, most often in critically ill patients with co-morbidity on the intensive care unit. Trans-abdominal ultrasound scan will reveal a thickened gallbladder with peri-cholecystic fluid. Co-existing liver abscesses may also be seen. The management is identical — with supportive care in the first instance, broad spectrum antibiotics and intravenous fluids to correct the relative hypovolaemia of sepsis.

In uncomplicated cases, most patients can eat and drink after 24 hours of the onset of the attack and the usual course is for settling of the inflammation over 24—48 hours of treatment. The role of acute cholecystectomy for these patients is evolving and is well-established practice in many major hepatobiliary units.[6] There is no documented evidence of increased complication rates when carried out by suitably qualified surgeons. Patients with persisting sepsis despite antibiotic therapy should either undergo acute cholecystectomy or radiologically guided percutaneous transhepatic cholecystostomy.[7] The latter is a particularly useful technique in the patient who is unfit for surgery, although does not negate the need for cholecystectomy in the future.

### Choledocholithiasis

Patients with gallstones and either deranged liver function tests, a history of jaundice or a dilated bile duct on ultrasound should undergo MRCP to evaluate for intra-ductal stones and/or biliary stricture if there is no contraindication.[8] There is a higher risk of bile leak following cholecystectomy if there are undiagnosed ductal stones present.

Patients with ductal stones may develop cholangitis from superimposed infection of the obstructed duct. These individuals present classically with 'Charcot's triad' of right hypochondrial pain, jaundice and rigours. They are usually unwell and may

exhibit signs of septic shock. Immediate management is with high-flow oxygen, intravenous fluids and broad-spectrum antibiotics. Rapid imaging of the biliary tree is mandatory and will usually reveal a dilated bile duct on ultrasound, although these patients often undergo CT in the emergency department to rule out other intra-abdominal problems and this will also show dilated ducts. Patients with a dilated biliary system and septic shock must undergo prompt drainage of the biliary tree either via endoscopic retrograde cholangiopancreatography (ERCP) or placement of a percutaneous transhepatic drain. Refractory shock may require inotropic support in a critical care unit.

The treatment options for ductal stones without biliary stricture include either ductal clearance via ERCP followed by cholecystectomy or cholecystectomy and bile duct exploration, either as an open or, more appropriately where expertise permits, a laparoscopic procedure. Benign biliary strictures require a programme of ERCP intervention with repeated stenting and/or balloon dilatation. Unresponsive strictures require surgical biliary reconstruction with a Roux limb (Figure 1).

### Pancreatitis

Pancreatitis is one of the most common serious hepatobiliary emergencies in the UK and affects between 5 and 35 per 100,000 per year, meaning a busy hospital serving a typical population of 300,000 would expect to see one or two cases per week. Approximately 30% of cases are graded as 'severe', which means that they result in persistent organ dysfunction, with or without local complications. Patients with severe pancreatitis have a mortality rate that is three times that of mild uncomplicated pancreatitis and so it is crucial that these cases are identified early and managed appropriately.

### Aetiology

The most common causes in the UK are gallstones and alcohol ingestion. Other important, but less common causes include autoimmune pancreatitis, familial pancreatitis, hyperlipidaemia,
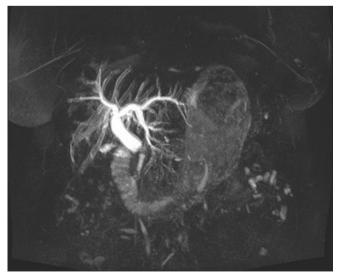


Figure 1 Reconstructed magnetic resonance cholangiopancreatography images showing a large distal common bile duct stone causing proximal obstruction to the intra- and extra-hepatic bile ducts.