

A

This man was hit by a bus. He complained of pain over the right chest.

Describe the chest X-Ray findings in picture A.

There is fluid level in the right thoracic cavity with right rib fractures 7th to 9th and subcutaneous emphysema.

What is this diagnosis?

Right haemothorax.

What is the initial management for this patient?

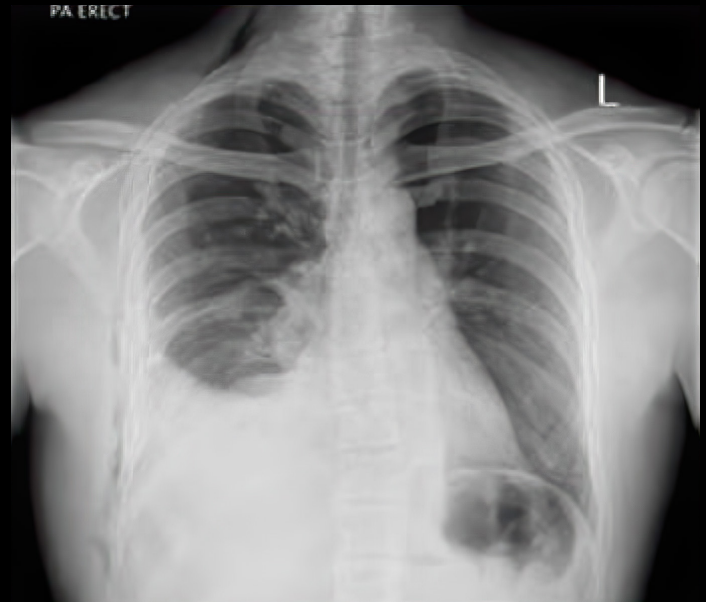
ABC: secure airway, maintain breathing (ventilation) and adequate circulation.

What is the subsequent management for this patient, based on picture B?

Chest tube insertion. It is inserted in the "safe area" of the chest. This is a triangular area, which is the thinnest region on the chest bordered by posterior border of the pectoralis, mid axillary line and nipple line.

What are the indications for surgical intervention?

Worsening haemothorax. This is evident from the haemodynamic and ventilatory instability of the patient and/or blood drainage from the chest tube (> 1.5 litres of blood on initial placement of the thoracostomy or persistent >200 mls/hour of blood for 4 hours).



B

A man fell off his motorcycle. He felt breathless and examination revealed central cyanosis and paradoxical movement of his right chest with crepitus.

What abnormalities are seen in the X-Ray?

Multiple rib fractures with flail segment, radio-hyperdensity due to pulmonary contusion and subcutaneous emphysema in the right chest.

What is the likely cause of the clinical findings and how does it affect lung ventilation?

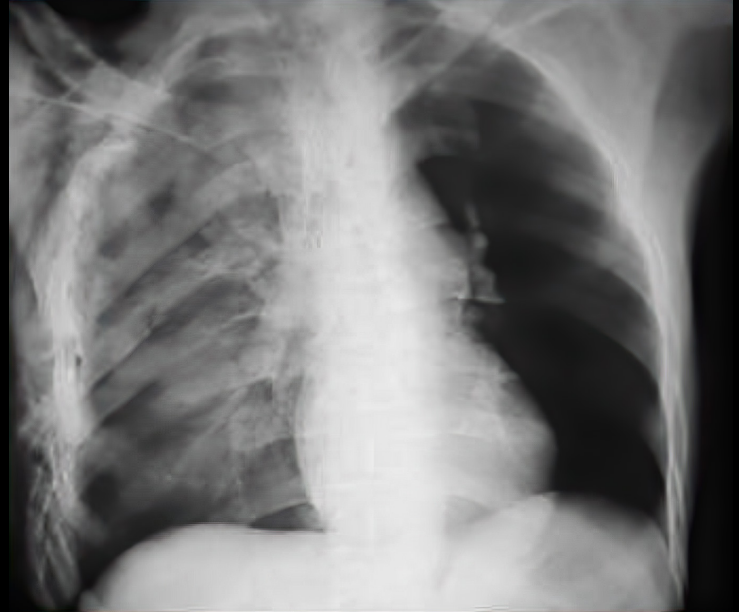
The paradoxical movement of the chest is highly suggestive of a right flail chest (two separate fractures in three or more consecutive ribs). In spontaneously breathing patients, the portion of the thoracic cage that has lost bony continuity retracts inward during inspiration.

What other injuries may occur with this type of chest trauma?

Pneumothorax and haemothorax.

How can we manage this injury?

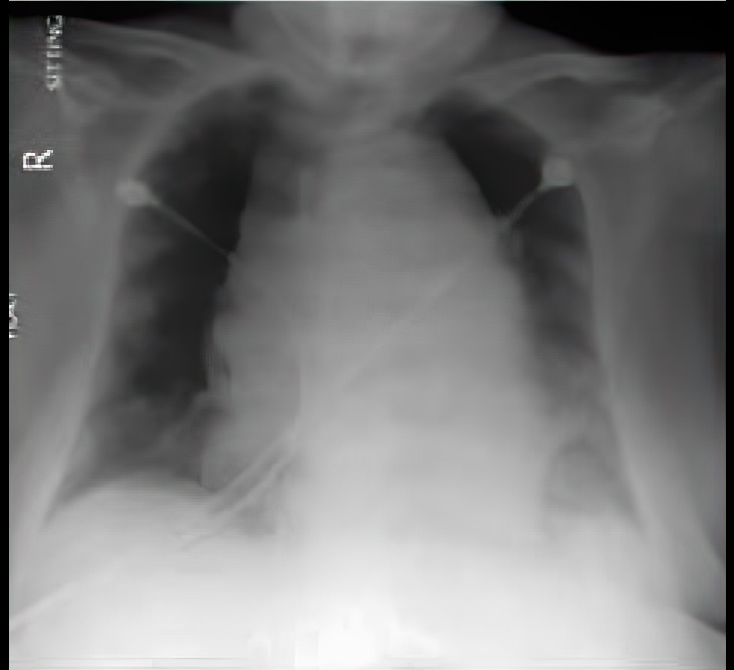
Adequate ventilation, humidified oxygen and adequate analgesia. Unstable fractures can be managed by internal splinting (internal pneumatic stabilization) or open reduction and internal fixation with prosthesis.



A man sustained acceleration-deceleration blunt chest trauma following a motorbike accident. The blood pressure readings in both arms were different.

What is the abnormality seen in the CXR and what does it suggest?

A widened mediastinum with right-sided displacement of the trachea. It is suggestive of blunt injury to the thoracic aorta. Up to 15% of patients may have a normal chest X-Ray. Abnormal signs include a left pleural effusion, depression of the left main bronchus, rightward displacement of the oesophagus (with a nasogastric tube), first rib fractures, apical cap and loss of the aorto-pulmonary window.



What is the most common initial presentation?

Shock. Most patients die at the scene of injury. 80% of patients with a torn thoracic aorta die of exsanguination before reaching the hospital.

What are the possible clinical signs?

They may have upper extremity hypertension, unequal upper extremity pulses and an expanding haematoma at the root of the neck.

How can we confirm the diagnosis?

A high index of suspicion is needed. It can be confirmed by a CT scan if the patient is stable.

A

A man was involved in a traffic accident. He had neck pain and was unable to move his lower limbs.

What do we look out for when examining the patient?

Inspect the neck for external trauma and palpate the spine for step-off. Perform a complete neurological examination of all the extremities.

What precautions should be taken?

Suspect a spinal injury and minimize additional spinal injury. This can be done by in-line cervical spine immobilization with a cervical collar and spinal board.

What abnormalities are seen in the X-Ray?

There is a fracture dislocation of the cervical spine at the C6-C7 level.

What other clinical findings could you expect in the patient?

- ◆ Spinal shock: flaccidity, areflexia, loss of anal sphincter tone and priapism.
- ◆ Neurogenic shock: hypotension, paradoxical bradycardia and flushed dry warm skin.
- ◆ Autonomic dysfunction: ileus, urinary retention and poikilothermia.

What is seen in picture B?

This halo external fixation of an unstable cervical spine fracture.



B

This patient was stabbed in the abdomen. His blood pressure was 90/60 mmHg and was tachycardic.

What is seen in the picture?

Evisceration of the small bowel.

How should this patient be managed?

Resuscitate the patient based on Advanced Trauma Life Support (ATLS) principles—ABC (Airway, Breathing and Circulation), and AMPLE (Allergies, Medication, Past Medical History, Last meal, and Events-description of the injury).

Is there a role for diagnostic peritoneal lavage (DPL)?

No.

Is there a role for focused abdominal sonography for trauma (FAST)?

No.

What is the definitive procedure for the patient?

Exploratory laparotomy. With this type of injury, we have to assume that there is other visceral organ damage and a careful and thorough examination of the intra-abdominal organs would be needed. The eviscerated part of the bowels needs to be returned to the abdominal cavity.



A 30-year-old motorcyclist was involved in a traffic accident. He had gross haematuria and was in haemodynamic shock.

A

What is seen in picture A?

Unstable open book fracture of the pelvis with separation of the left sacroiliac joint.

What could have caused the shock?

Trauma patients with displaced pelvic fractures have high incidence of other associated injuries. Pelvic fractures can cause shock by bleeding from exposed cancellous bone surfaces, pelvic veins and pelvic arteries.

What investigation may be done to confirm and treat the condition?

Selective catheter angiography can be done to identify and embolize the source of bleeding if it was from a major vessel.

Is there a role for mechanical stabilization?

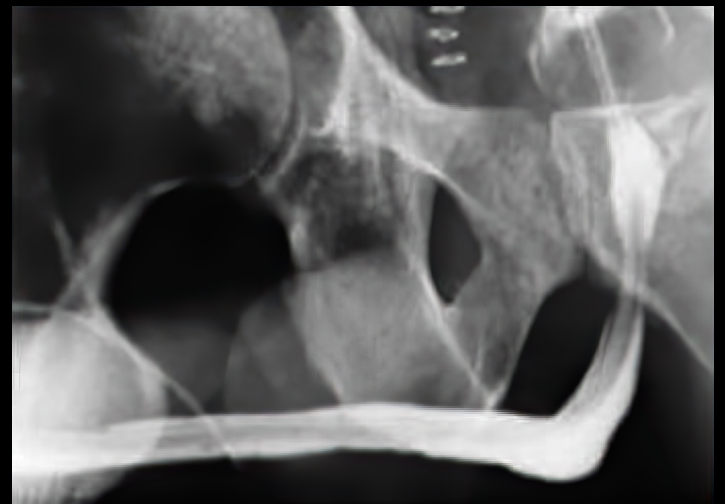
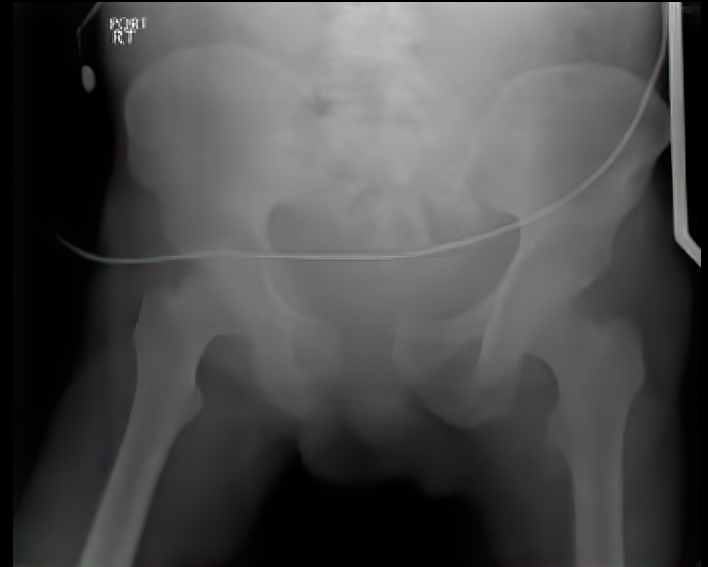
Open-book and vertical shear fractures with displacement may benefit from pelvic stabilization (external wrap or fixation). This decreases bleeding by decreasing the pelvic volume, providing a tamponade effect and opposing the fractures, thus promoting clot formation.

Can a urinary catheter be inserted?

Yes, unless it suggests urethral injury and blood is observed at the penile meatus.

Which radiological investigation was performed in picture B, and what can be seen?

Ascending urethrogram. An intact urethra.



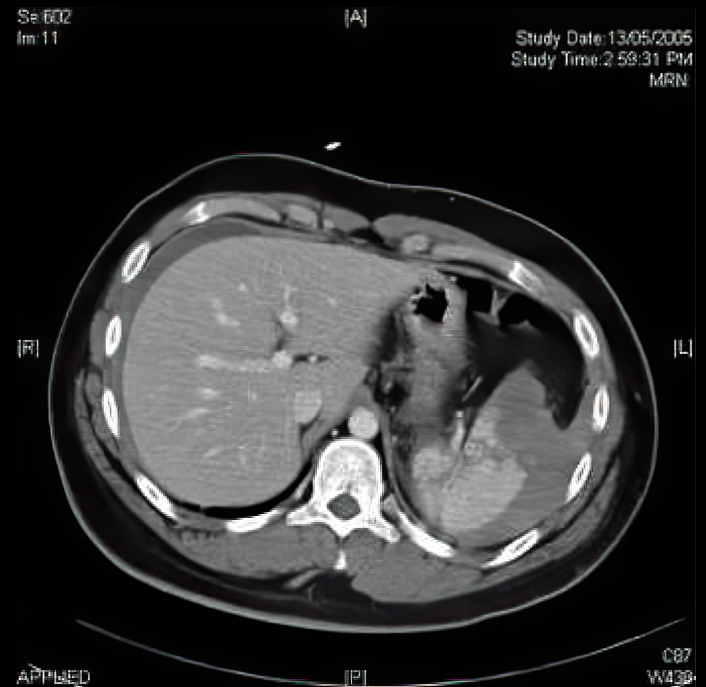
B

A

This man suffered fractures on the 9th, 10th and 11th rib on his left ribcage.

What is seen in picture A?

Based on this history, we have to strongly consider the possibility of a splenic injury. When the patient is haemodynamically stable, a scan may be used to evaluate intra-abdominal visceral injuries. The CT scan shows a splenic laceration with blood around it. Contrast leak into the abdomen suggests ongoing bleeding.



How might this patient have presented?

Hypovolaemic shock due to a haemoperitoneum, peritonitis from extravasated blood and Kehr's sign (referred shoulder-tip pain resulting from left diaphragmatic irritation).

When is emergency surgery indicated?

When there is haemodynamic instability; evidence of persisting bleeding or other intra-abdominal injuries, surgical intervention is necessary.

What is seen in picture B?

A shattered spleen (the most common solid organ damaged in blunt abdominal trauma).



What are the complications associated with the removal of the organ?

Overwhelming post-splenectomy infection (OPSI). Patients with splenectomy are advised to take lifelong oral antibiotic prophylaxis. Post-splenectomy patients may also develop thrombocytosis.

B

A

This man was resuscitated after being involved in a traffic accident. A urinary catheter was inserted.

What can be seen in picture A?

Urometer catheter bag showing gross haematuria.

Which organs are likely to have been injured?

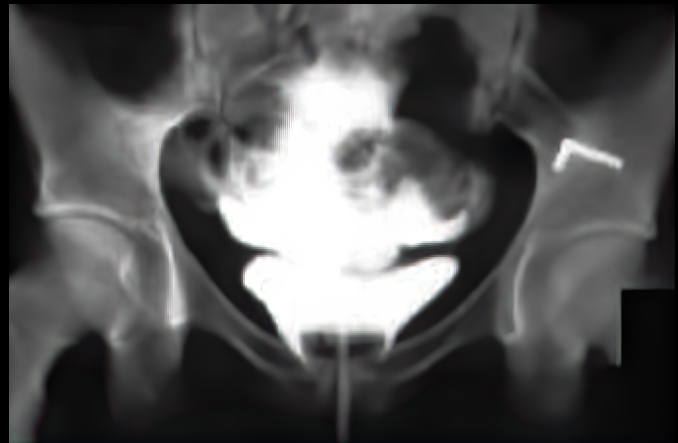
The kidneys, ureters, bladder or urethra are likely to have been injured.

When would you be wary of inserting a urinary catheter?

When there is a suspicion of urethral disruption—retention of urine, massive perineal swelling and blood in the urethral meatus.

Which radiological investigation was performed in picture B and what abnormality can be seen?

Ascending urethrogram/cystogram. There is extravasation of contrast into the peritoneal cavity, suggesting intraperitoneal bladder rupture.



B

A 27-year-old female motorcycle rider was involved in a road traffic accident.

Describe the injury sustained.

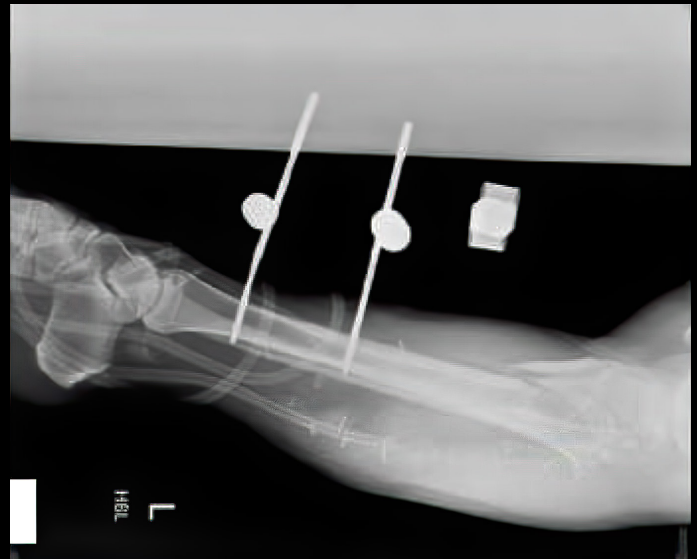
Comminuted fracture of her upper tibia. There is an associated soft tissue swelling.

What has been performed for the patient?

External fixation of the fracture. External fixation is usually used when internal fixation is contraindicated, often to treat open fractures, or as a temporary solution. A fasciotomy has also been performed, evident from the suction dressing over the medial aspect of the calf.

What complications are associated with this condition and its treatment?

Osteomyelitis, delayed union or non-union tibia, pin track infection/loosening, ankle stiffness and Compartment syndrome.



A patient was admitted to hospital with a Glasgow Coma Score of 5 following a road traffic accident.

What is the initial management of a brain-injured patient?

Initial management and resuscitation using ATLS principles as in any trauma situation. After that, neurological examination is needed. It includes checking for level of consciousness, eye pupil and motor examination. Also, look out for cervical spine injury.

What does the CT scan show?

Acute Subdural Hemorrhage (SDH).

What is the management if the patient is hypotensive?

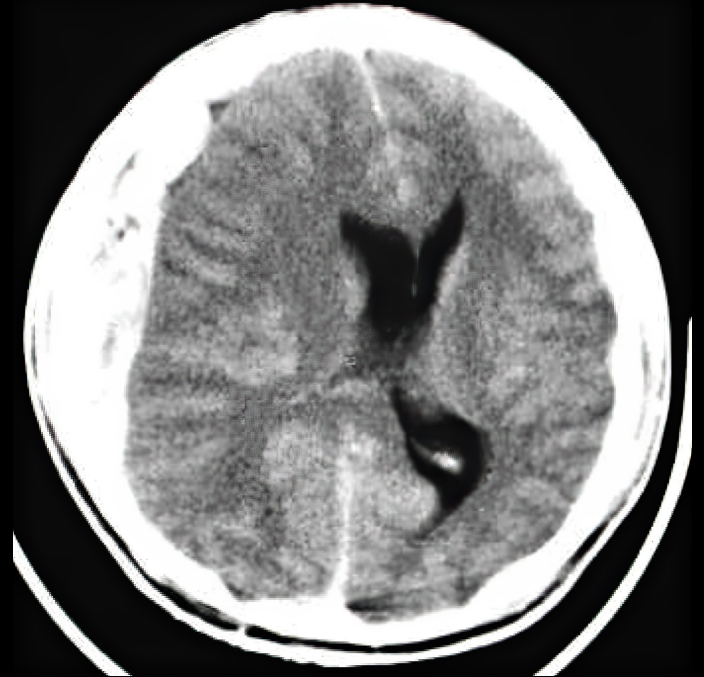
Hypotension in patients with head injury frequently accompanies other injuries. We need to rule out other sources of bleeding before assuming that the condition is simply due to brain injury.

What is the significance if this patient develops anisocoria (unequal pupils)?

It is a surgical emergency. There is stretching of the ipsilateral third nerve, indicative of raised intracranial pressure.

What is the surgical management?

Craniotomy and evacuation of the clot.



The patient is a 43-year-old man who had jaundice for 2 weeks.

Which part of the upper gastrointestinal tract is revealed in this endoscopic procedure?

The papilla in the second part of the duodenum.

Which diagnostic and therapeutic procedures have been performed?

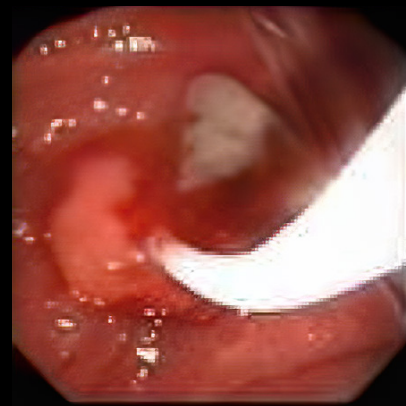
Endoscopic retrograde cholangiopancreatogram (ERCP), sphincterotomy of the papilla to facilitate removal of any biliary duct stones and the placement of stent to ensure drainage of the bile.

How would this patient present?

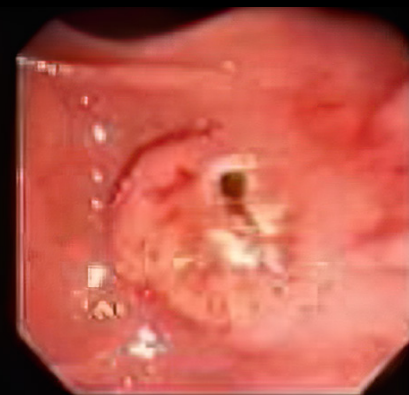
Jaundice, and signs and symptoms of pancreatitis or cholangitis.

What are the potential complications of performing this procedure?

Sphincterotomy of the papilla is associated with bleeding and perforation (commonly retroperitoneal). Pancreatic duct irritation during cannulation of the biliary tree can lead to pancreatitis. Patients are often given prophylactic antibiotics as the procedure may be associated with sepsis.



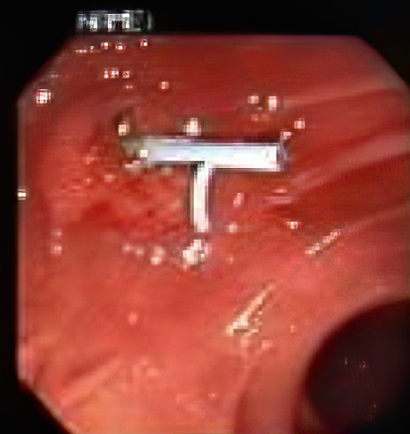
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This is an elderly lady with a long history of alcohol consumption.

What clinical sign does she have?

Jaundice as seen through the yellowing of the sclera. Bilirubin levels of above 50 $\mu\text{mol/L}$ are usually clinically detected.

How do we classify this condition?

- ◆ Pre-hepatic: caused by haemolytic anaemia.
- ◆ Hepatic: caused by hepatitis.
- ◆ Post-hepatic: obstructive/surgical jaundice caused by biliary obstruction.

Which blood investigations can be done to confirm the diagnosis?

In obstructive jaundice, there will be elevated serum conjugated bilirubin, increased alkaline phosphatase and gamma-glutamyl transferase, and increased conjugated bilirubin in the urine.

What complications may this patient encounter during surgery?

Coagulopathy (failure to absorb vitamin K from the gut affects the synthesis of clotting factors II, VII, IX and X), renal failure (hepato-renal syndrome), poor wound healing and increased susceptibility to infection.

How can we prevent these complications?

Administer intra-muscular vitamin K, adequate peri-operative hydration, additional peri-operative nutrition and appropriate coverage with broad-spectrum antibiotics.



This 56-year-old man presented with progressive jaundice.

What investigative procedure is this and what does it reveal?

The ERCP study shows a filling defect with shouldering in the middle portion of the common bile duct.

What is the most likely diagnosis?

Cholangiocarcinoma. The history of jaundice; being progressive, suggests malignant stricture. The lesion is in the middle of the bile duct.

Who are most commonly affected by this condition?

There is a slight male preponderance with a peak incidence in the sixth decade.

What are the risk factors?

They are common in the Far East where parasitic infections are endemic. It is associated with *Opisthorchis viverrini* infestation. Weak associations include bacterial-induced endogenous carcinogens derived from bile salts and ductal calculi.

How can this pathology be classified?

They are best classified according to their anatomical site of origin: intrahepatic, proximal (right and left) and its confluence (Klatskin) and distal (distal CBD and peri-ampullary).

How can we manage this patient?

Curative surgery provides the best prognosis. Post-operative adjuvant radiotherapy has been reported to provide survival benefit. Cholangiocarcinomas are generally unresponsive to chemotherapy.



This abdominal CT scan was performed for a 53-year-old lady who had severe abdominal pain.

What 2 abnormalities are revealed in this scan?

The contrast-enhanced CT shows gallstones and a pancreatic collection with no enhancement of normal pancreas.

What is your diagnosis?

Extensive pancreatic necrosis secondary to acute pancreatitis.

What is the pathophysiology?

The inflammation and oedema of the acute pancreatitis progressed with subsequent devitalization of the pancreatic and peri-pancreatic tissue.

What are her symptoms?

Severe abdominal pain radiating to the back. Abdominal examination may reveal diffuse abdominal tenderness with distension, and guarding and hypoactive bowel sounds. She may be febrile, tachycardic and dehydrated.

What is the most likely aetiological factor of this patient?

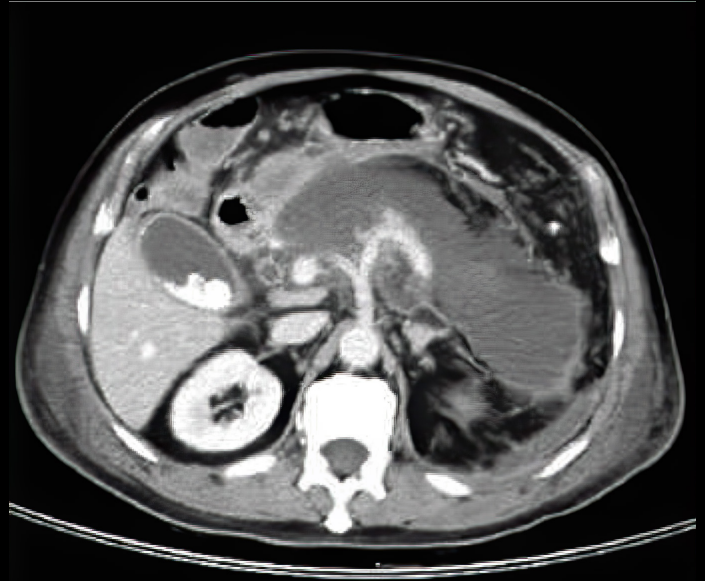
Gallstones.

What kind of blood investigation can confirm the diagnosis?

Serum amylase and lipase. Up to 30% of patients with pancreatitis have normal amylase levels ("burned-out" pancreas).

What is the prognosis of the patient's condition?

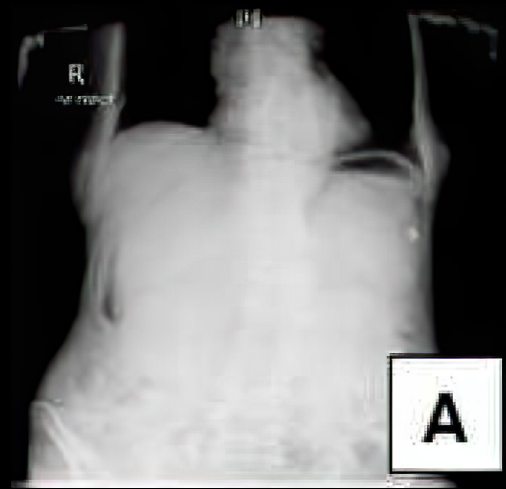
80% of patients with mild pancreatitis recover. Mortality is due to early multiple organ failure or sepsis from infected pancreatic necrosis.



This 46-year-old man had an episode of pancreatitis 3 months ago.

What can be seen in picture A?

Lack of bowel shadows and a generalized radio-dense appearance in the upper abdomen.



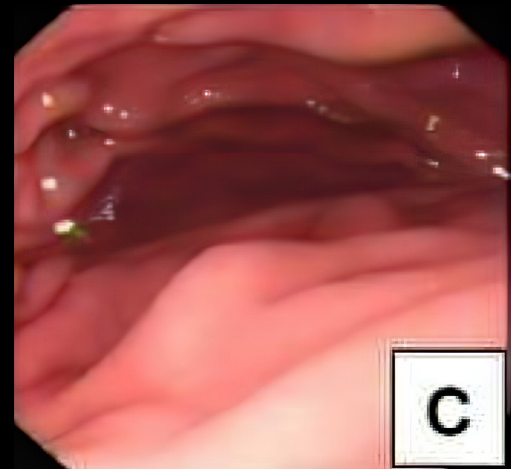
What can be seen in picture B?

The coronal CT of the abdomen shows a large homogenous mass in the abdomen.



What is shown in the gastroscopy in picture C?

The inability to distend the abdomen despite insufflation of air due to extrinsic compression by the mass.



What is the diagnosis?

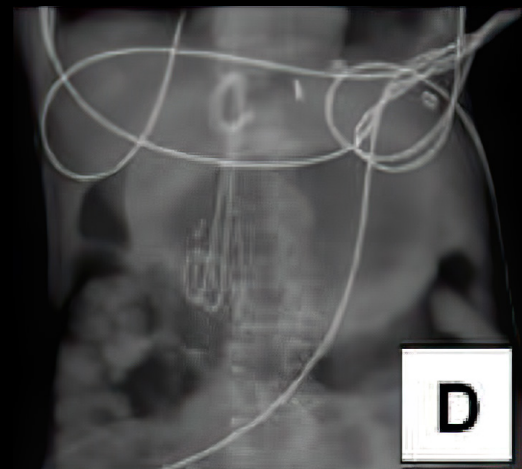
A pancreatic pseudocyst is a circumscribed collection of fluid rich in blood and necrotic tissue, typically located in the lesser sac of the abdomen. They occur 6 weeks after an episode of acute pancreatitis.

What kind of symptoms do you think the patient has?

Abdominal mass, early satiety, gastric outlet obstruction, abdominal discomfort and sepsis from secondary infection of the cyst.

What procedure is performed in picture D?

Endoscopic internal drainage into the stomach with 2 double pig-tail tubes. The cyst had decompressed significantly.



In what other way can this condition be managed?

Open or laparoscopic external or internal surgical drainage.

The patient is a 24-year-old man who had suffered a blunt injury to his abdomen.

What can be seen in picture A?

Injury to the pancreas. There is a full thickness laceration in the body of the pancreas.

Is this a common occurrence?

They are uncommon due to the position of the pancreas in the retroperitoneal area. It occurs in 2% of blunt and 10% of penetrating visceral injuries. During abdominal trauma, the pancreas is compressed against the vertebral column.

What investigation was performed in picture B and what does it indicate?

When there is a suspicion of a disruption of the pancreatic duct, an ERCP was performed to check its integrity.

What is the abnormality seen in picture B?

Leakage/extravasation of contrast indicates a disruption of the pancreatic duct.

What serum blood test may be useful in the diagnosis of this condition?

Up to 50% of patients who have sustained pancreatic injuries have an elevated serum amylase level.

What surgical options are available?

Ligation of the proximal pancreatic duct elements and preserve pancreatic tissue or a distal pancreatectomy.

A



B

A 50-year-old man presented with vague abdominal pain and weight loss.

What can be seen based on the endoscopy procedure?

A patulous papilla that resembles a "fish eye" with mucus extruding from the orifice.

What can be seen on the pancreatogram?

A segmentally dilated pancreatic duct without stricturing.

What is the diagnosis?

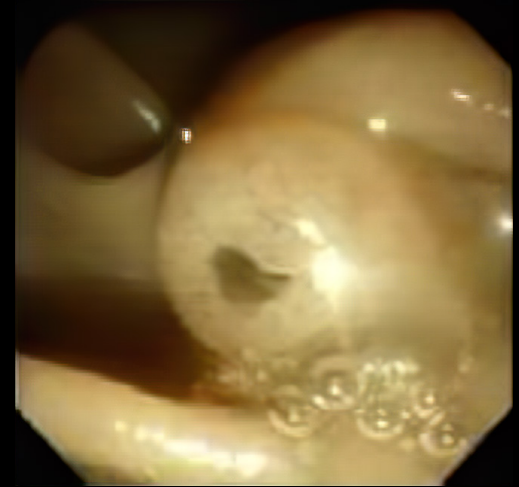
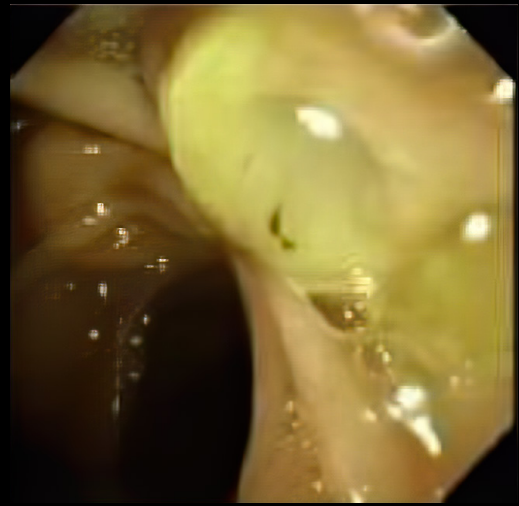
Intraductal papillary mucinous neoplasm (IPMN) of the pancreas.

What can be done at ERCP to further investigate this condition?

We can obtain cytology by aspiration of the duct contents or brushings. The cytology examination may reveal mucin and floating epithelial cells with varying degrees of atypia.

What is the management of this condition?

With a high index of suspicion that the neoplasm has malignant potential, curative surgical resection should be aimed for.



The patient presented with right-sided abdominal pain and fever.

What investigation was performed and what does it show?

Trans-abdominal ultrasound study of the hepato-biliary system. Stones in the gallbladder, An ultrasound detects 90% of gallstones.

Why is this mode of investigation the most sensitive way of detecting this pathology?

Gallstones are highly reflective and cast a distal acoustic shadow (as seen in the picture). The small and mobile gallstones may not be detected in CT or MRI scans. They have to be calcified to be seen in X-Rays.

How should the patient prepare himself for this investigation?

The patient has to fast for at least 6 hours so that the gallbladder is distended.

What other findings should we look for during the investigation?

Stones in the common bile duct, diameter of the CBD, thickness of the gallbladder and pericholecystic fluid.



A

The patient is a 40-year-old lady who had a cholecystectomy.

What can be seen in picture A?
A gangrenous gallbladder.

How could the patient have presented?
Biliary colic, cholecystitis, cholangitis and pancreatitis.

What can be seen in picture B?
Gallbladder with gallstones.

Which two approaches to cholecystectomies are available?

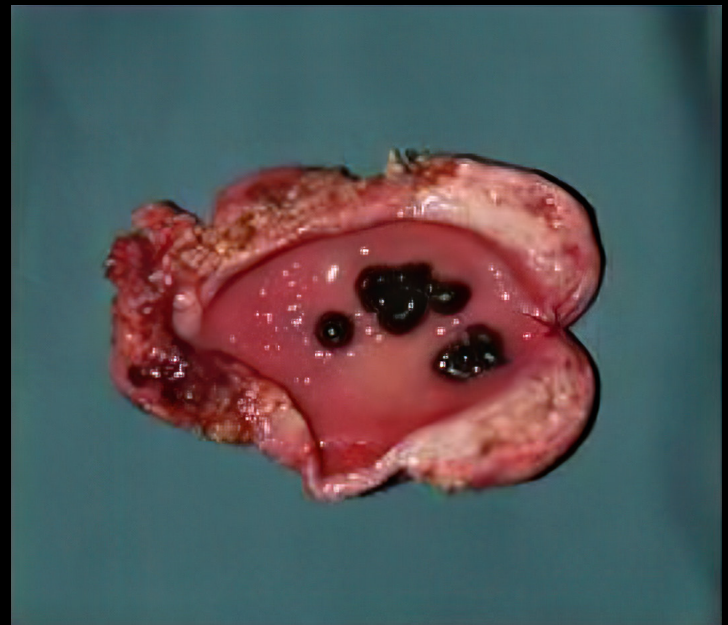
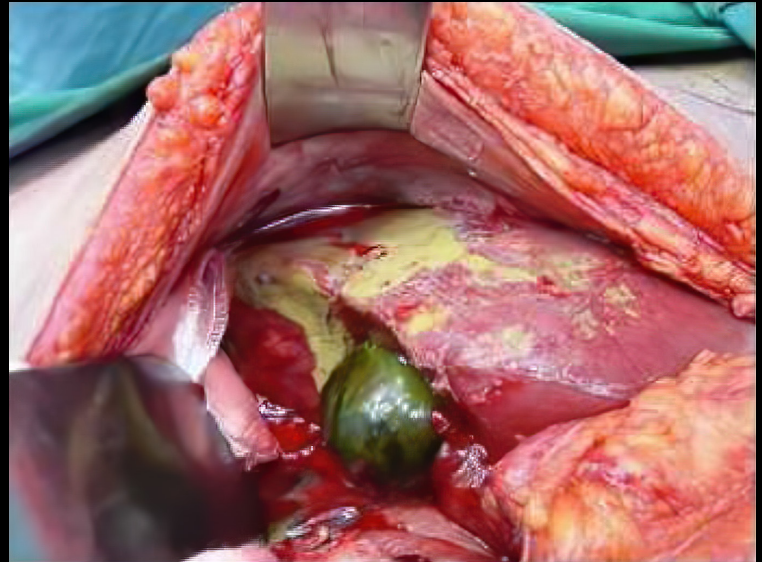
Laparoscopic or open method. The laparoscopic method is the most common method of cholecystectomy as it is safe and has all the advantages of a minimally invasive procedure.

What are the indications for an intra-operative cholangiogram?

Any suggestion of the concurrent presence of a ductal stone (jaundice, hyperbilirubinaemia, elevated alkaline phosphatase, choledocholithiasis on ultrasound) and defining the biliary ductal anatomy.

What are the complications associated with this surgery?

Leakage of bile from the cystic duct or gallbladder bed, injury to the common bile duct leading to a biliary stricture and jaundice due to retained stones in the biliary tree.



B

This lady had surgery for gallstone disease.

What surgery was performed on this patient?

Cholecystectomy, common bile duct exploration and closure of the duct over a T-Tube. Picture A shows the T-tube being deployed in the common bile duct, and picture B shows the surgical wound with the tube being externalized through the skin and draining bile in the bag.

What is the purpose of the tube drain?

When there is concern that a primary closure of common bile duct could lead to a stricture formation, a T-tube is used.

How long should the tube be kept there?

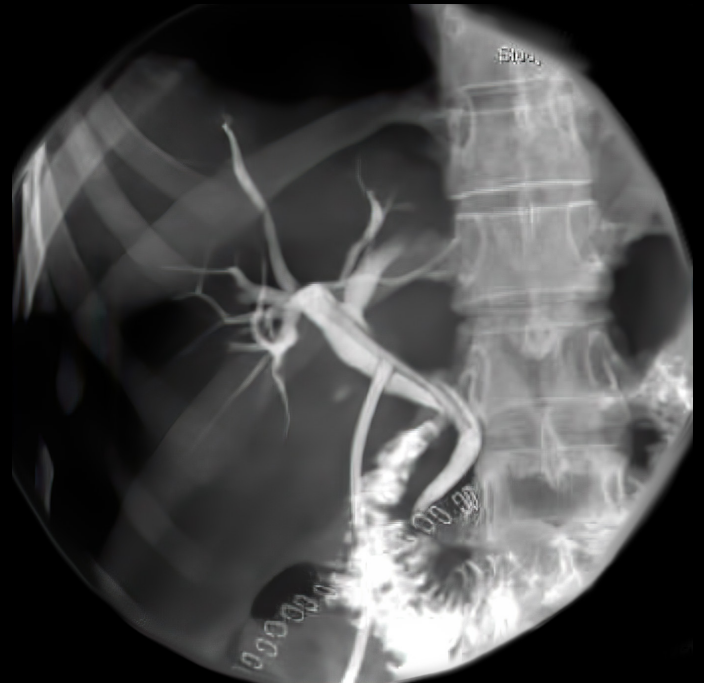
14 to 21 days. It allows for a tract between the biliary duct and skin to develop and for the oedema secondary to surgical biliary duct manipulation to resolve.

What procedure was performed prior to the removal of the tube in picture A?

A check cholangiogram through the T-tube to ensure no biliary obstruction and good flow of contrast from the proximal biliary tree into the duodenum. After removal of the tube, the tract biliary-cutaneous tract should close naturally.

What if some gallstones are retained?

With a T-tube in place, they can be extracted with a Dormia basket down the tube (Burhenne manoeuvre).



A

B

A

The patient is a 69-year-old lady who presented with loss of weight and obstructive jaundice.

What can be seen in picture A?

Jaundice, scratch marks due to accumulation of bile salts and a wound dressing on her right hypochondrium.

What else might she complain of?

Cholestatic jaundice would lead to tea-colored urine and pale stools.

What are the possible causes?

Causes for obstructive post-hepatic jaundice can be classified as:

Intraluminal: gallstones.

Luminal: cholangiocarcinoma, periampullary carcinoma.

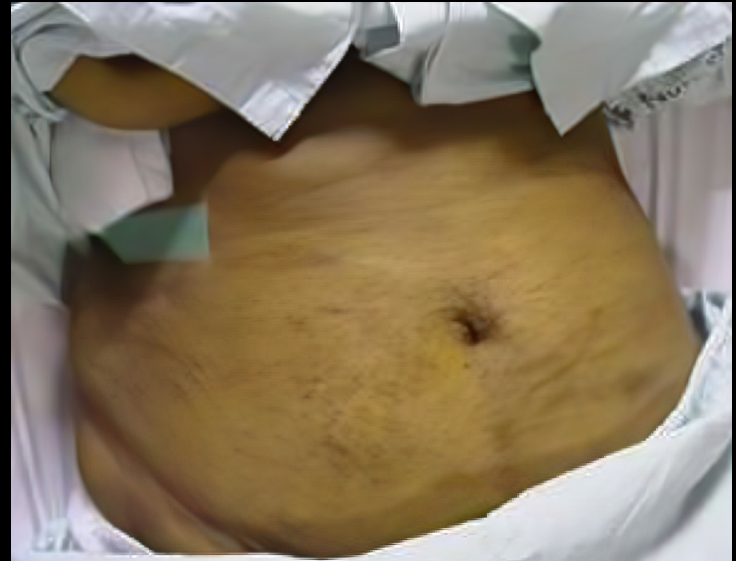
Extra-luminal: lymphadenopathy of the porta hepatis.

What procedure was performed on her (picture B) and what was its indication?

Percutaneous transhepatic cholangiogram (PTC) and drainage. Decompression of the biliary system may be indicated for symptom relief such as itchiness or complications such as hepato-renal syndrome, coagulopathy and cholangitis.

What alternative procedure can be performed?

Internal drainage via endoscopic method (ERCP).

C128
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B

The patient is a 40-year-old man who is a chronic alcoholic.

What is the lesion seen in the oesophagus through endoscopy in picture A?

Oesophageal varices.

What can be seen in picture B?

A distended abdomen with collateral venous development over the anterior abdominal wall. Other collaterals can occur via the superior haemorrhoidal to the hypogastric (rectal varices), portal vein to umbilical vein to superficial veins of abdominal wall (caput medusae) and mesenteric veins to the perilumbar veins.

What is their pathogenesis and what are the causes?

They are secondary to portal venous hypertension.

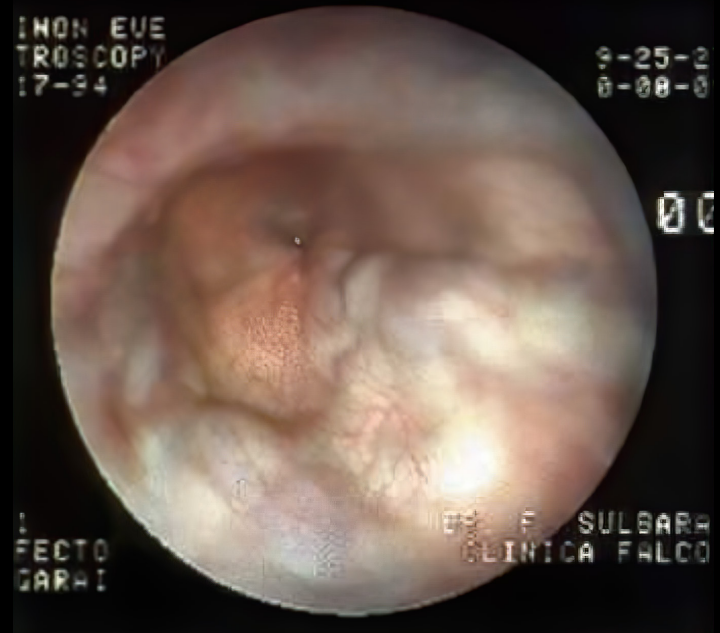
Causes include:

- ◆ Presinusoidal:
 - ▶ Extra-hepatic: portal vein or splenic vein thrombosis, congenital biliary atresia.
 - ▶ Intra-hepatic: primary biliary cirrhosis, schistosomiasis.
- ◆ Sinusoidal: Hepatic cirrhosis.
- ◆ Post sinusoidal: Budd-Chiari syndrome, IVC obstruction, right heart failure.

What other complications might develop?

Porto-systemic encephalopathy, ascites and spontaneous bacterial peritonitis, hypersplenism, portal hypertensive gastropathy and colopathy.

A



B

A

A 72-year-old female, presented with a 4-month history of loss of weight and appetite. She also suffered from jaundice for a week.

What do the pictures show?

A tumour in the head of the pancreas (picture A); dilated gallbladder, dilated common bile duct, and pancreatic duct (picture B); and dilated intra-hepatic ducts (picture C).

What is your diagnosis?

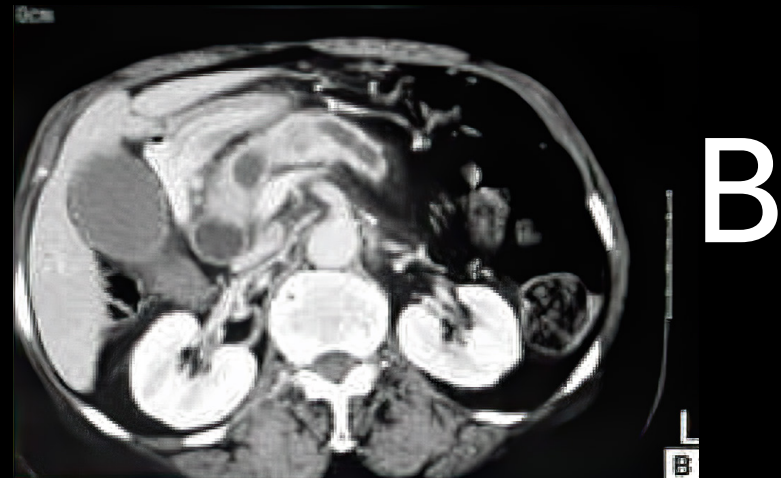
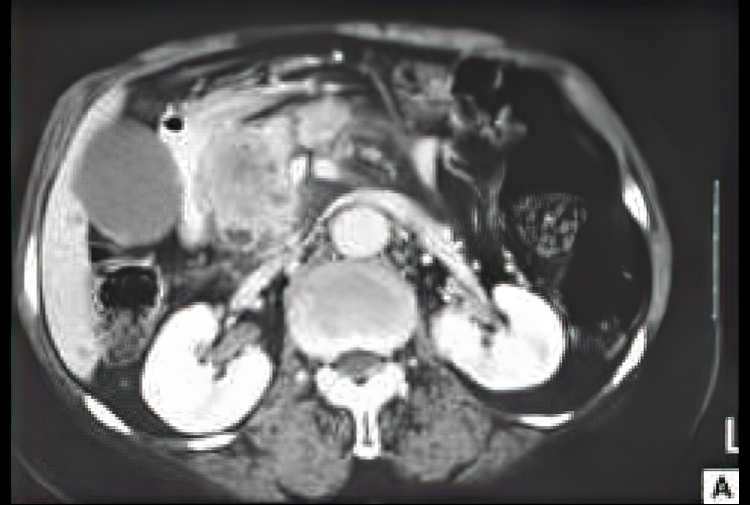
Carcinoma of the head of pancreas.

What organ may be palpable on abdominal examination?

A palpable non-tender gallbladder.

Which curative surgical procedure could you perform for this patient?

A whipple's procedure (pancreaticoduodenectomy). It is the removal of the gallbladder, distal common bile duct, duodenum and portion of the pancreas with reconstruction. When the tumour is deemed irresectable during intraoperative evaluation, the tumour is not removed and a bypass procedure is performed.



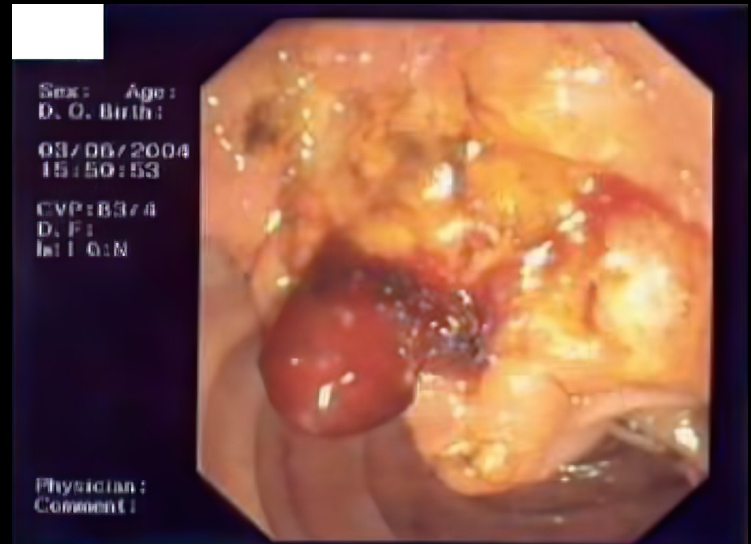
C

A

This is a 60-year-old male who underwent a Whipple's operation.

What does the pre-operative endoscopy in picture A reveal?

Gastroscopy and duodenoscopy. A mass lesion with ulceration at the duodenum.



What additional procedure may be performed to assist the investigation?

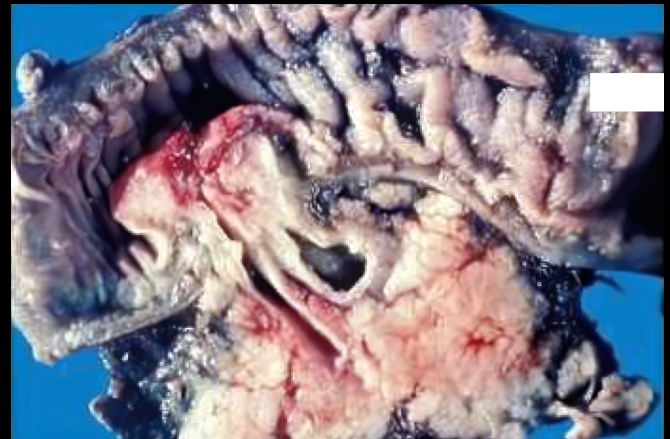
Biopsy for histology.

How do you think this patient presented?

Jaundice, pale stools (lack of stercobilin) and dark urine.

What can be seen in picture B?

The gross specimen shows a tumour in the periampullary region.



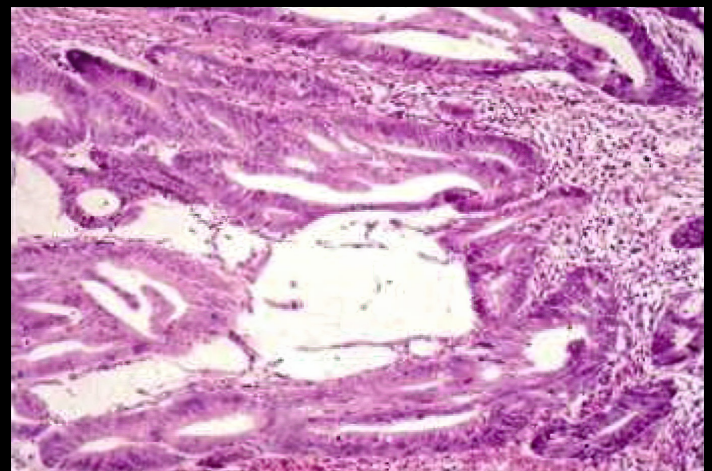
B

What is the histological cell type and where could the tumour have originated from?

The common bile duct, duodenal mucosa, pancreatic duct or ampulla of Vater.

What can be seen in picture C?

The histological specimen shows infiltrating abnormal glandular epithelium characteristic of adenocarcinoma.



C

This is a 45-year-old man who presented with fever and abdominal pain.

What can be seen in the CT scans?

Multiple hypodense lesions in both lobes of the liver.

What is the most likely diagnosis?

Hepatic Abscess.

What are possible routes of developing this condition?

Bile duct infection from ascending cholangitis, ascending pyelophlebitis from any inflammatory process within the abdomen, haematogenous spread from bacteraemia, direct extension from intra-abdominal suppuration and cryptogenic.

Name two common groups of causative organisms of this condition.

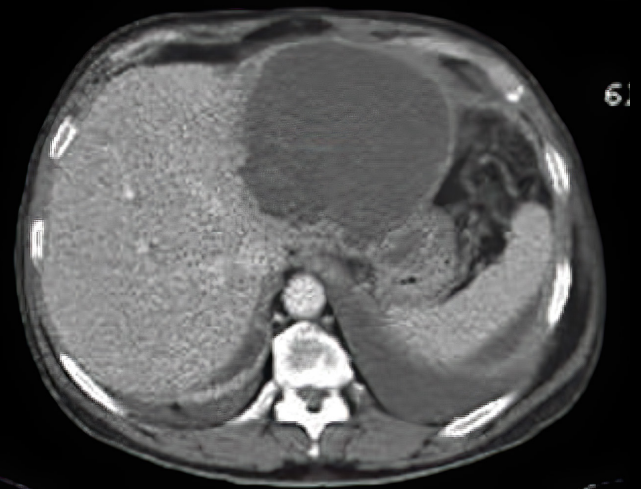
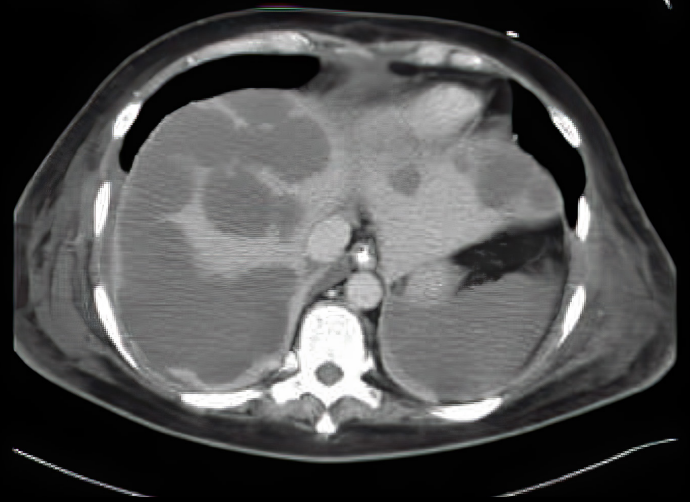
Pyogenic and amoebic.

Why are pain and tenderness often late presentations?

The position of the liver beneath the costal margin masks abdominal tenderness. These lesions often present as pyrexia of unknown origin.

How is this condition managed?

Initial management is usually non-surgical with administration of intravenous antibiotics. Closed percutaneous drainage under radiological guidance can be performed. Multiple abscesses usually respond better to open surgical drainage.



The patient presented with an alpha-fetoprotein (AFP) serum level of 300 ng/ml.

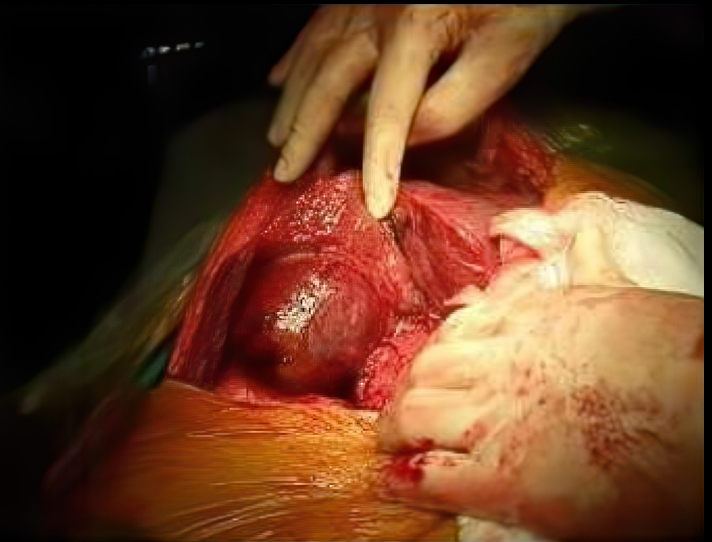
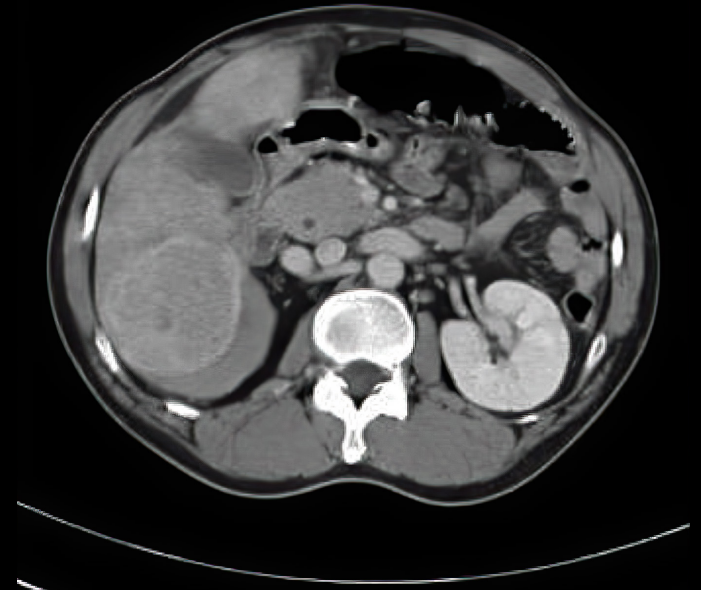
What is the most likely diagnosis?
Hepatocellular carcinoma (HCC).

What is a possible differential diagnosis?
Hepatic adenoma.

Where is the location of the lesion?
Based on the segments described by the French anatomist Couinaud, there are 8 segments, each considered a functional unit with its own hepatic artery, portal vein, bile duct and hepatic vein. This lesion is in segment 5 and 6.

Is it necessary to obtain pre-operative histological diagnosis?
It is contraindicated as it may cause seeding of malignant cells to the skin surface during percutaneous biopsies, thus "upstaging" the disease. Furthermore, bleeding can be a potential complication during the procedure as it is a vascular tumour.

How can the condition be surgically managed?
First, exclude metastatic disease. Second, ensure that there is adequate functional reserve liver tissue (these patients often have chronic liver disease). Excision of the cancer can be performed with a 1–2-cm margin of unaffected liver tissue.



A

This is a specimen taken from a 50-year-old man who is a hepatitis carrier. He underwent a hemihepatectomy.

What is the most likely diagnosis?

Hepatocellular carcinoma (HCC) with background cirrhosis.

How common is this condition?

It is the most common malignancy worldwide.

Which geographic areas have the highest incidence?

Sub-Saharan Africa and Far East Asia.

What are the likely etiological factors?

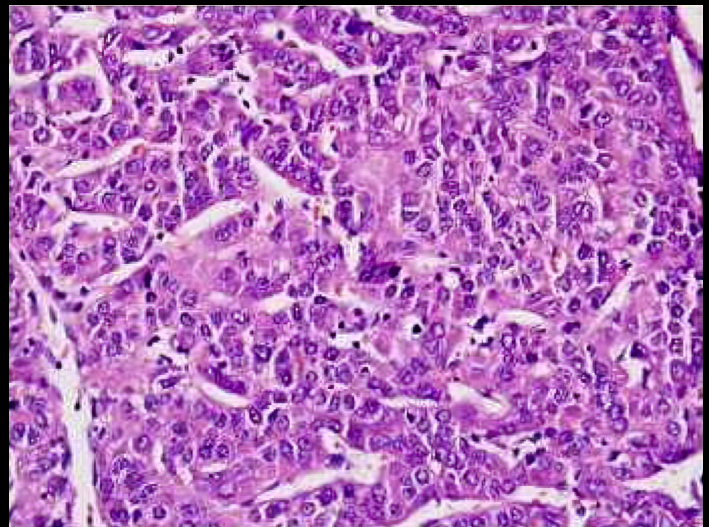
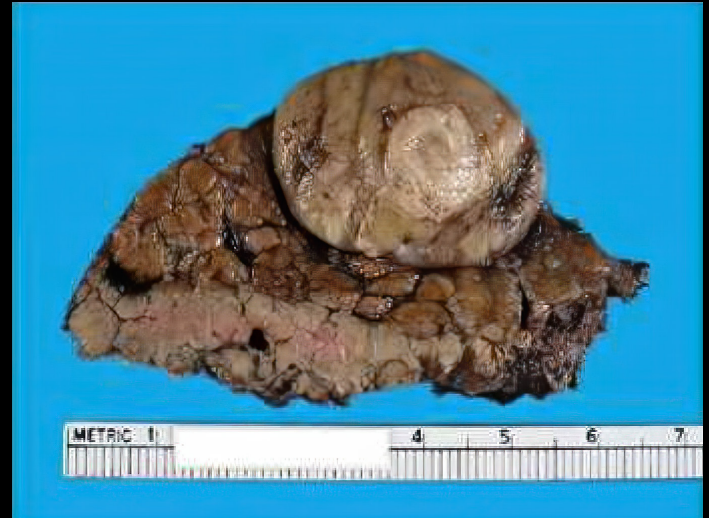
It develops in the background of cirrhosis (cirrhomimetic), in particular, the Hepatitis B or C virus, but can originate in non-cirrhotic hepatic parenchyma.

What macroscopic types are there?

Unifocal (large mass replacing part of the liver), multifocal (tumour nodules involving different parts of the liver) and diffuse infiltrative (tumours permeate and diffusely enlarge the liver).

What can be seen in the histological specimen?

Thickened trabeculae of neoplastic hepatocytes separated by sinusoids.



B

The 33-year-old lady presented with fever, jaundice and pain in the right hypochondrium.

What can be seen in picture A?

The intrahepatic biliary ducts are dilated.

How are her symptoms best described? What is the diagnosis?

The classic Charcot's triad, acute bacterial cholangitis, confusion and hypotension can occur in patients with suppurative cholangitis, producing Reynold's pentad.

Which group of organisms is involved?

Gram negative organisms (Escherichia Coli, Klebsiella, Pseudomonas, Enterobacter and Proteus).

What is the prognosis of this condition?

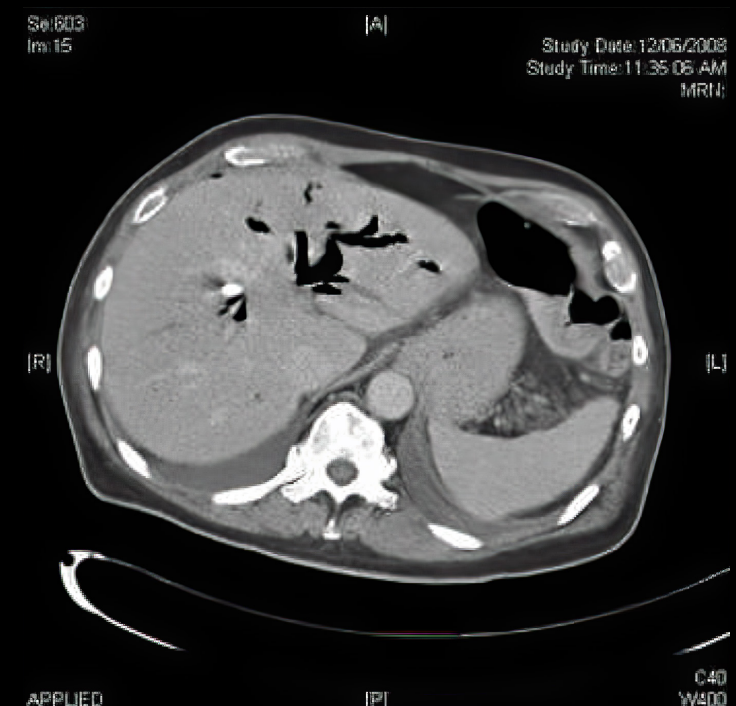
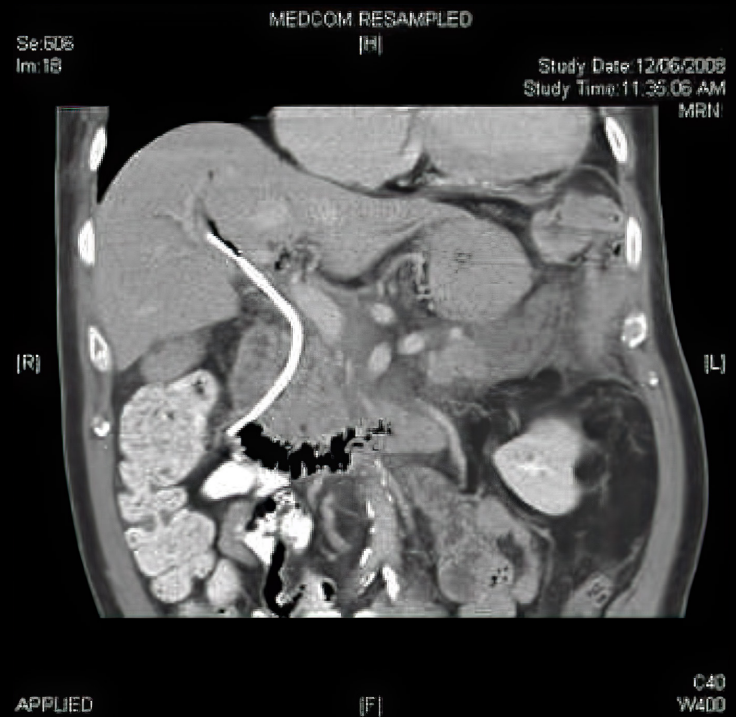
Mortality can occur in up to 10% of patients with severe cholangitis.

How should we manage this patient?

Prompt treatment involving rehydration, intravenous antibiotics and ductal drainage.

What procedure was performed in picture B?

The biliary tree was decompressed with an internal biliary stent.



This 35-year-old man underwent surgery after recurrent episodes of cholangitis.

What is seen in this patient?

A right rooftop incision and a stoma bag situated in the epigastrium.

What are the contents of the bag?

Bile (yellow stain).

What surgery has been performed?

Hepaticocutaneous jejunostomy.

What is the probable diagnosis?

Oriental cholangiohepatitis (OCH). It is a disease characterized by recurrent intrahepatic pigment stone formation, resulting in biliary obstruction with recurrent cholangitis, dilatation and stricturing of the biliary tree.

Why is the surgery necessary?

To facilitate the clearance of stones and infected bile with a choledochoscope at multiple sessions. It can also allow the dilation of intrahepatic strictures and fragmentation of stones.

What is the prognosis for the patient?

The most common causes of death in these patients are sepsis, liver failure and complications from cirrhosis.



A

This is a 36-year-old alcoholic who presented with vague abdominal pain radiating to the back.

What can be seen in picture A?

Colon cut-off sign. A dilated transverse colon overlying an inflamed pancreas.

What can be seen in picture B?

The CT scan shows acute pancreatitis with peripancreatic inflammation. The pancreas is still well-vascularized and the pancreatic duct is visualized.

How do we confirm the diagnosis?

Elevated serum amylase (>1000 U/ml).

How do we manage the condition?

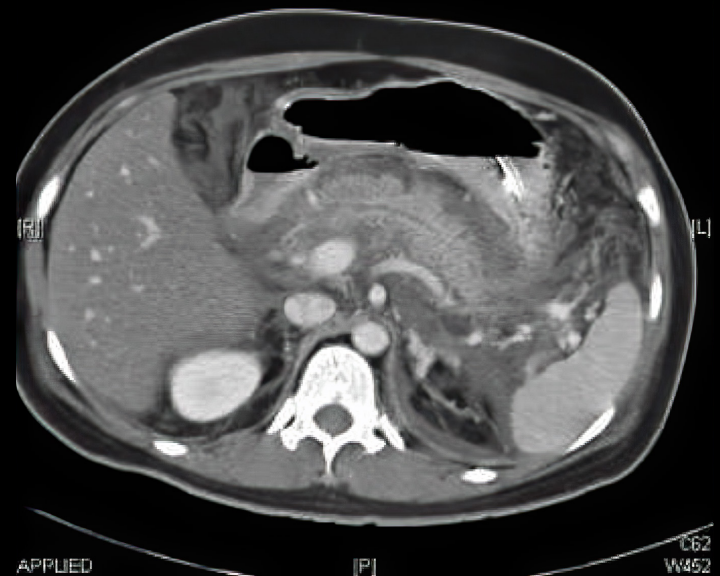
Volume resuscitation, analgesia, close monitoring and identify cause to prevent recurrence.

What scoring systems can be used to assess the condition's severity and prognosis?

Glasgow-Imrie, Ranson and APACHE II.

What are the potential complications?

- ◆ Early: necrotizing pancreatitis, which can lead to infected necrosis.
- ◆ Late: pseudocyst.



B

A

A 25-year-old gentleman complained of constipation and severe anal pain following defecation.

What are common causes of perianal pain?
 Anal fissure, anal fistula, perianal abscess and thrombosed haemorrhoids.

What are possible diagnoses, based on picture A?
 Perianal haematoma/thrombosed pile or a perianal abscess. The cause of a perianal haematoma is obscure, but what happens is thrombosis in a subcutaneous vein below the transitional zone. Perianal abscess result from infection of the anal glands in the crypts at the dentate line.

What is the treatment?
 It may resolve with symptomatic management, although during this time, they may rupture and ulcerate. If the pain is severe, the haematoma or abscess may be drained.

What procedure was performed in picture B?
 Deroofing of the haematoma with extrusion of the blood clot which is often described as "blackcurrant".



B

This is a 47-year-old man who complained of perianal pain and discharge.

What is the diagnosis?

Anal fistula. There is an external opening at the 1 o'clock position.

Define the condition.

An abnormal track lined by granulation tissue between the anal canal or rectum and the perianal skin. It can persist following drainage of a perianal abscess.

What underlying diseases is the condition associated with?

Crohn's Disease, ulcerative colitis or tuberculosis.

How can we classify this disease?

According to the position of the internal opening in relation to the external anal sphincter—i.e., low-level for an opening below and high-level for an opening above.

How can we manage them?

Low ones can be laid open (fistulotomy). High ones which pass above the anorectal ring or through the sphincter must not be laid open completely as incontinence is likely to result.

What procedures have been carried out for this patient?

Seton placement. Insertion of the seton will establish the site of internal opening on re-examination. It also acts as a wick to allow the acute reaction around the track to subside.



A 44-year-old woman complained of bright red rectal bleeding and painful defecation for 1 month.

What is the diagnosis?

Anal fissure—longitudinal tear in the mucosa of the anal canal (90% posterior and 10% anterior). 90% is caused by local trauma from passing hard stools and spasm of the internal anal sphincter.

What are the differential diagnoses?

Crohn's Disease, tuberculosis, anal cancer, fistula, cytomegalovirus, herpes simplex virus, chlamydia and syphilis.

How can we manage this condition conservatively?

90% of cases heal with conservative treatment. Patients are advised to avoid straining when defaecating, increase fiber in their diet, and use stool softeners and local anaesthetic agents. Doctors may also prescribe the use of agents which may promote relaxation of the internal anal sphincter. These include topical nifedipine ointment, topical nitrates calcium channel blockers and Botulinum toxin injection.

Which surgical procedure is appropriate if conservative treatment fails?

Lateral internal anal sphincterotomy. This is the partial division of the external sphincter through a small laterally placed stab incision.



A 35-year-old bus driver presented with pain and discharge in the lower back region.

What is evident in this patient?

Pilonidal sinus and evidence of previous surgery. These are blind-ending tracks containing hairs in the skin of the natal cleft.

What is its aetiology?

It is still not completely understood but it is thought to be an acquired condition. Buttock movement promoting hair migration into a sinus. It may present as an abscess or discharging sinus.

Who are commonly at risk?

Men in the second and third decades of life. It is also more common in those whose occupation involves prolonged sitting.

How do we treat this condition?

If uncomplicated, advice on good personal hygiene may be adequate. When infected, it is drained with healing by secondary intention. When quiescent, the sinus can be excised. Recurrence rate may be as high as 50%.



These equipment may be used in the outpatient surgical clinic.

What is on display in the picture?

Proctoscope, rubber band applicator and rubber bands.

What is it used for?

Diagnosing and ligating/banding haemorrhoids.

What is the pathology and how do we classify it?

Haemorrhoids are engorged vascular cushions found within the submucosa of the anal canal. They are found at constant positions within the anal canal (3, 7 and 11 o'clock). Classification can be made in four degrees, based on whether they prolapse through the anus and reducibility after that.

What is an alternative mode of treatment other than the one shown in the picture?

Injection sclerotherapy.

How can we prevent a recurrence of the condition?

Appropriate advice to prevent straining and constipation.



These patients presented with perianal discomfort.

What is the diagnosis?

Prolapsed haemorrhoids (3rd-degree piles are reducible and 4th-degree piles are irreducible).

What is the symptomatology?

Excruciating pain, bleeding and itch.

What are the predisposing factors?

Prolonged straining at defecation, constipation and pregnancy.

How would you manage this condition?

If they are reducible, advice on bowel regulation, having a high-fiber diet and avoidance of prolonged straining may be sufficient. If they are irreducible, surgical resection (haemorrhoidectomy) is needed.

What complications may arise after surgery?

- ◆ Early: Bleeding, infection and acute retention of urine due to post-operative pain.
- ◆ Late: Incontinence (injury to the sphincter complex) and anal stricture formation (excess amount of anal mucosa resected, leading to scarring).



This 72-year-old lady complained of a protruding mass at her anus following defecation.

What is seen here?

Rectal prolapse, which is a protrusion from the anus of the rectal mucosa (partial) or rectal wall (full thickness).

What other symptoms might this patient complain of?

Pain, bleeding, mucus discharge or incontinence.

What is the aetiology of this condition?

Rectal intussusception, poor sphincter tone, chronic straining and pelvic floor injury.

If conservative treatment fails, what is the surgical management option?

- ◆ In a fit patient, a trans-abdominal rectopexy +/- anterior resection may be considered (Wells, Ripstein's and Goldberg-Frykman procedure).
- ◆ In an elderly and unfit patient, a perineal proctectomy can be considered (Delormes, Thiersch or Altheimer).



This 45-year-old lady had previous abdominal surgery for intestinal obstruction.

What is seen in this patient?

Melanin spots on the lips.

What syndrome is this condition associated with?

Peutz-Jeghers Syndrome. This consists of familial intestinal hamartomatous polyps affecting the jejunum and melanosis of the oral mucus membranes and the lips, hands, perianal and umbilical areas.

How is it inherited?

Autosomal dominant.

What is the malignancy potential of this condition/syndrome?

There is an increase risk (10%) of malignancy in the gastrointestinal tract, pancreas and extra-intestinal organs.

What other abdominal complications may occur with this condition?

Haemorrhage into the jejunum or intestinal obstruction due to intussusception.

What is the recommended management in view of these possible complications?

All polyps larger than 2 cm should be removed in view of the risk of malignancy.



This 50-year-old man was investigated for a urinary infection.

What abnormality is seen in these radiological investigations?

Air in the bladder.

What is the condition?

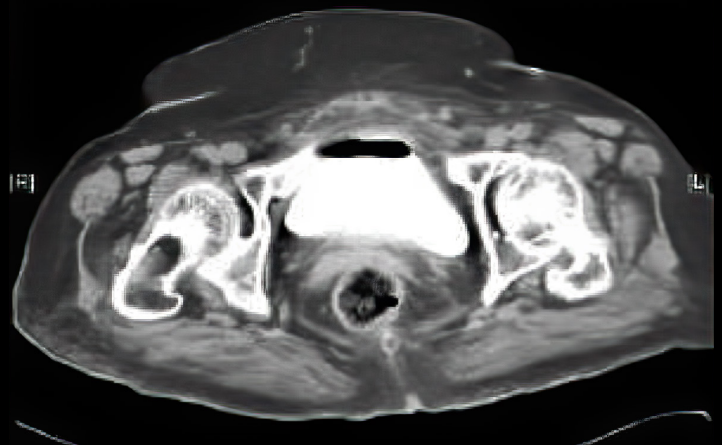
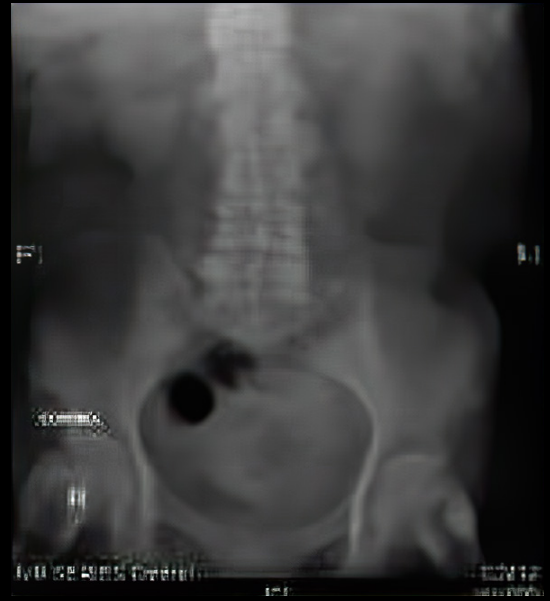
Colovesical fistula.

What are the possible causes of this anomaly?

Cancer (bladder or colon) or any inflammatory condition (inflammatory bowel disease, tuberculosis, post-radiation therapy or diverticulitis).

How may the patient present?

Recurrent urine infection, pneumaturia, dysuria or faecaluria.



This investigation was done in a 60-year old man for lower abdominal pain.

What is this radiological examination?

Double contrast barium enema.

Which pathological condition is depicted?

Diverticular disease (Diverticulosis). Common in patients aged 50 years and above with a male:female ratio of 1:1.5. Aetiology is due to a low-fiber diet, leading to increased intraluminal colonic pressure.

What is the pathogenesis?

Increased intraluminal pressure leads to false diverticula in which the mucosa and submucosa protrude through the muscularis propria. It occurs at the antimesenteric side where the arterioles penetrate the muscularis.

How may this patient present at the emergency department?

Haematochezia or peritonitis (diverticulitis, diverticular abscess or perforation).



This is a gross specimen of a resected colon from a 25-year-old patient.

What is the diagnosis?

Familial adenomatous polyposis (FAP). It is a general neoplastic disorder of the intestine whereby numerous (>100) polyps are found mainly in the large bowel.

What is its inheritance pattern?

Mendelian autosomal dominant. Males and females are equally affected.

Where is the gene located?

The Adenomatous Polyposis Coli (APC) tumour suppressor gene is on chromosome 5q21.

What are the chances of this patient developing colon cancer?

Carcinoma of the large bowel occurs between 10–20 years after the onset of polyposis. One or more cancers will be found in two-thirds of symptomatic patients.

What other tumors are associated with this condition?

Benign mesodermal tumours (desmoid tumours, osteomas) and epidermoid cysts (Gardner's syndrome).

What operation was performed for this patient?

Total colectomy with either end ileostomy, an ileal pouch anal anastomosis (IPAA) or rectal anastomosis.

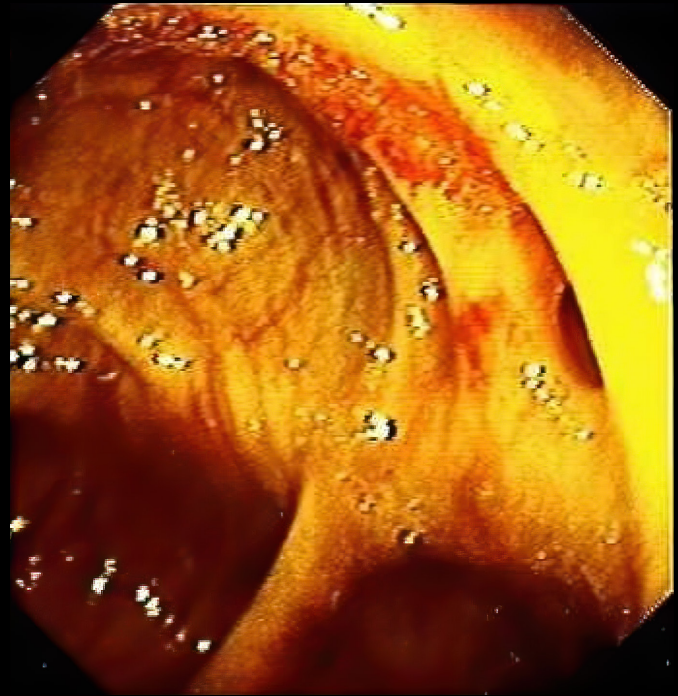


A

A 68-year-old man was admitted with massive per-rectal bleeding. After resuscitation, the patient underwent urgent colonoscopy.

What can be seen from the endoscopy in picture A?

Blood and diverticula in the colon. Bleeding diverticular disease.



What is their distribution in the colon?

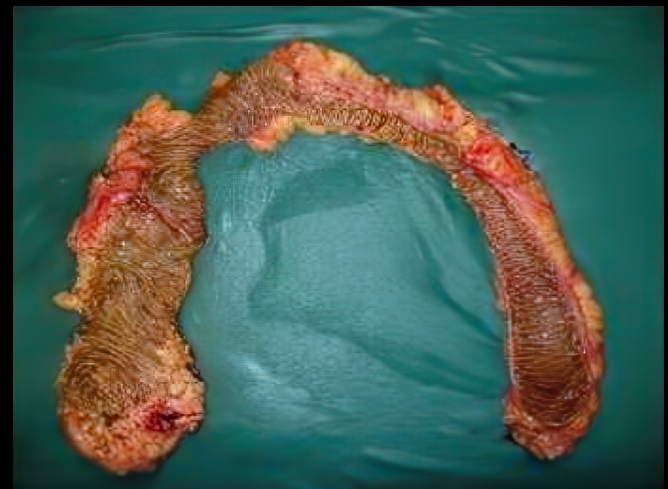
Diverticular disease is found in over 50% of patients over 60 years of age. In the West, there is a predominant left-sided preponderance. In the East, they tend to occur in the caecum and ascending colon.

What is another major cause of massive lower gastrointestinal hemorrhaging?

Angiodysplasia. It is a vascular malformation seen in the elderly. They occur in the ascending colon and caecum of elderly patients. They consist of dilated tortuous submucosal veins, and in severe cases, the mucosa is replaced by massive dilated deformed vessels.

How can we manage this patient?

With conservative management, 50% of diverticular bleeding will stop. If bleeding persists, consider laparotomy and segmental colectomy if the source of bleed is localized. If it is not localized, a total colectomy may be necessary.



B

Which surgical procedure was performed in picture B?

A total colectomy.

This 25-year-old female who presented with a distended abdomen, non-tender to palpation.

What can be seen intra-operatively in picture A?

Pockets of mucus in the peritoneal cavity (pseudomyxoma peritonei or "jelly belly").

What is the most likely cause?

Pseudomyxoma peritonei. It is an uncommon tumour known for its production of an abnormal amount of mucus in the abdominal cavity. It is associated with both mucinous and cystic tumours of the ovary and appendix. A thorough search for a primary tumour. If there isn't one, perform an appendectomy and/or oophorectomy (if there is any suggestion of an ovarian tumour).

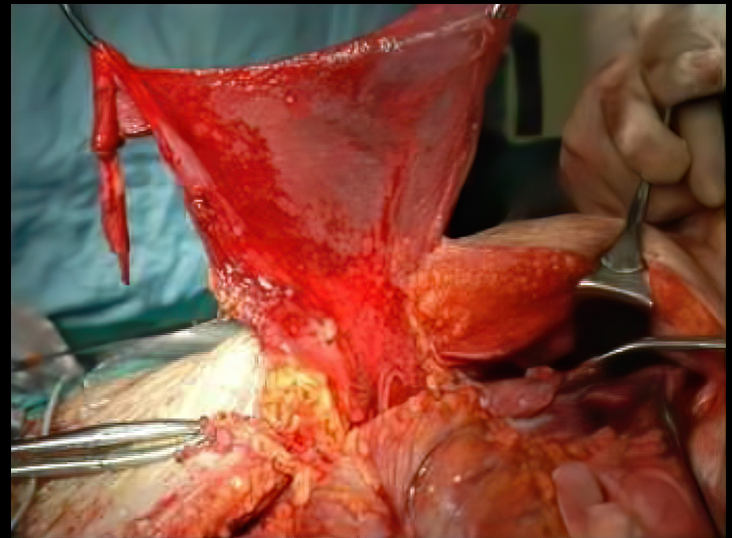
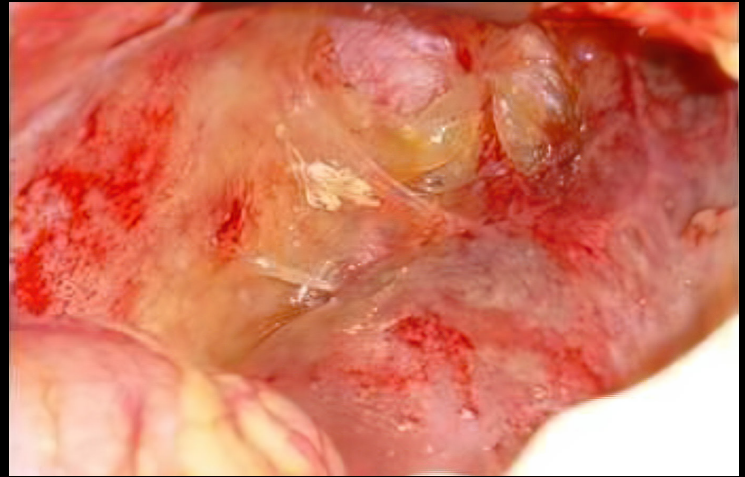
Which procedure was performed in picture B?

Radical resection of the parietal peritoneal surface.

What additional treatment can be carried out during surgery?

Intra-peritoneal chemotherapy.

A



B

A

This is a 60-year-old man who was sent to the emergency department.

What are the findings in picture A?

Dilated ascending and transverse colon.

How would the patient have presented?

Symptoms of intestinal obstruction. Abdominal distension and constipation.

How would you classify this obstruction (open or closed)?

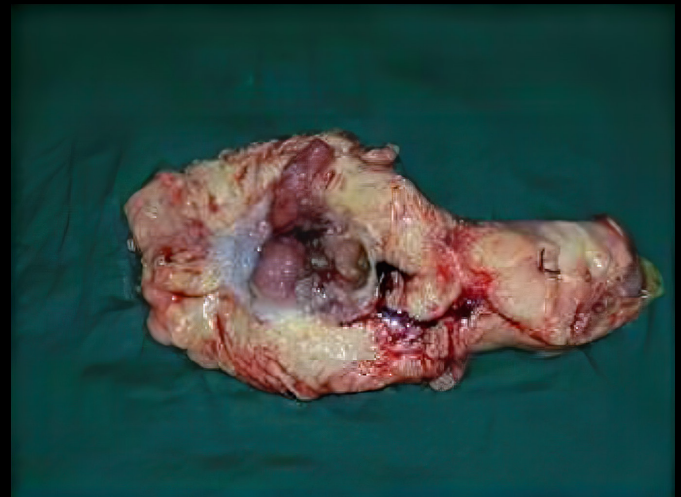
Closed-loop obstruction—A competent ileo-caecal valve allows ingress of luminal content into the loop (N.B. absence of dilated small bowel loops). Thus vomiting (especially faecal contents) may not be a feature.

If the obstruction is not relieved, which part of the gut is likely to perforate?

Increase in luminal pressure would be greatest in the caecum with subsequent impairment of the blood supply, resulting in caecal necrosis and perforation.

What is the most likely cause of the obstruction shown in picture B?

Carcinoma of the descending colon.



B

This 46-year-old man underwent a colectomy.

What is seen in the gross specimen?

A circumferential ulcerated polypoidal lesion.

How would he have presented?

Being circumferential, he probably presented as "napkin-ring" intestinal obstruction.

What is the most likely diagnosis?

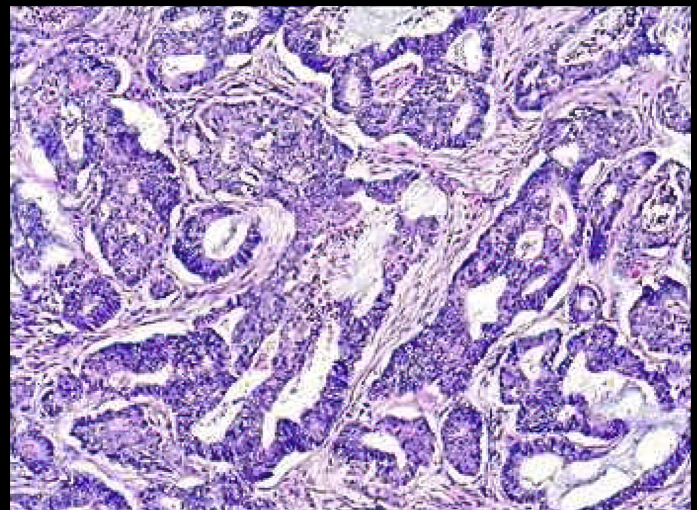
Colorectal cancer.

What is seen in the microscopic specimen?

Infiltrating neoplastic glandular structures within fibroblastic stroma.

What are the principal patterns of the inheritance of colorectal cancer?

- ◆ Sporadic: most common.
- ◆ Inherited:
 - ▶ FAP: (accounts for 2%) autosomal dominant.
 - ▶ HNPCC: (accounts for 5%) autosomal dominant.
 - ▶ Familial colorectal cancer: runs in families but no gene defect known.
 - ▶ Syndromes such as Lynch 2 and Li-Fraumeni.



This 45-year-old man had a neoplastic lesion 12 cm from the anal verge on endoscopy.

How would he have presented?

Per-rectal bleeding, tenesmus or intestinal obstruction.

What is the diagnosis and which staging systems are commonly used for this condition?

Adenocarcinoma of the colon/rectum. Dukes' and TNM (International Union against Cancer).

Where is the proposed development of this lesion?

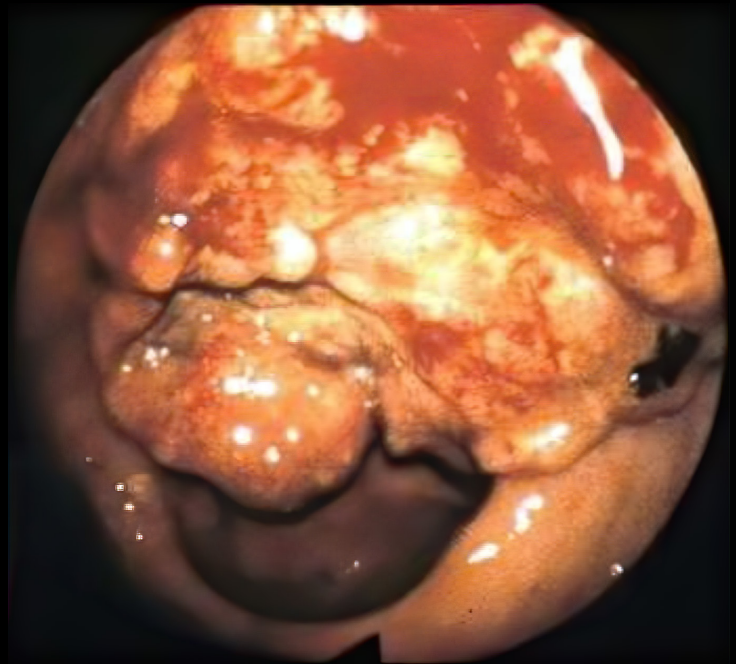
It is likely that all carcinomas start as benign adenomas, the so-called "adenoma carcinoma sequence," where there is an accumulation of about 5–10 stepwise mutations in tumour suppressor genes and oncogenes over a lifetime.

What are the common macroscopic varieties of the original lesion?

Annular, tubular, ulcerative and cauliflower.

What are some objectives in the surgical management of a low rectal lesion?

Radical excision of the rectum (including the mesorectum and associated lymph nodes) with preservation of continence by preserving the anal sphincter.



This 50-year-old man had undergone a radiological investigation.

What can be seen in this radiological film?

This is a double contrast barium enema showing an "apple core" lesion in the descending colon.

How may this patient have presented?

Change in bowel habit, per-rectal bleeding, and cramping abdominal pain.

How should this condition be managed?

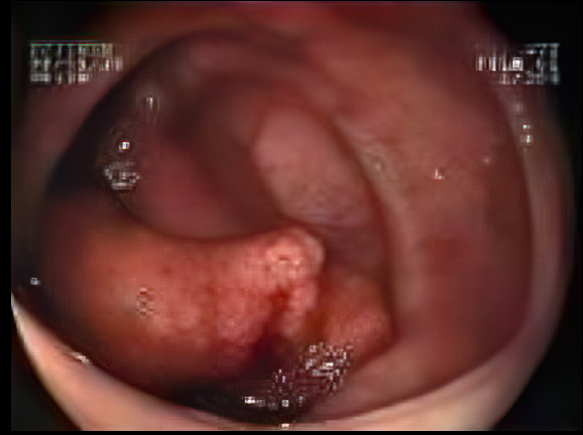
Colonoscopy with biopsy can confirm the diagnosis of cancer and stage the disease with a view to curative surgical resection (left hemicolectomy).

If the patient was unfit for surgery, what could be done to relieve the obstruction?

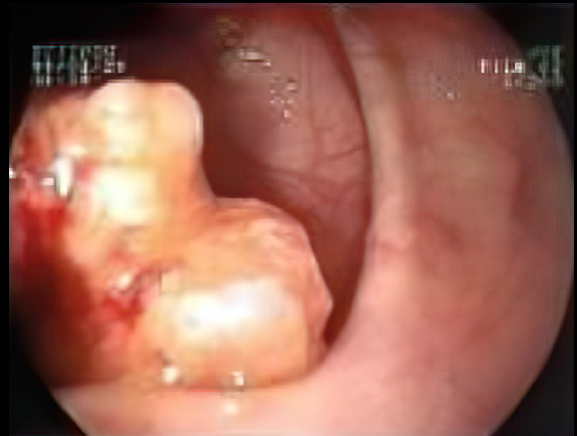
Endoluminal stenting. If there is impending caecal perforation, an emergency caecostomy may be performed.



This 44-year-old lady underwent colonoscopy for the investigation of iron deficiency anaemia. The caecum is displayed.

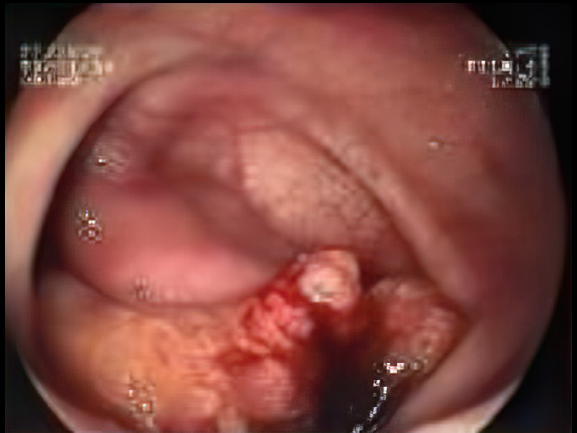


Describe the gross pathology seen.
An ulcerating polypoid lesion at the caecum.



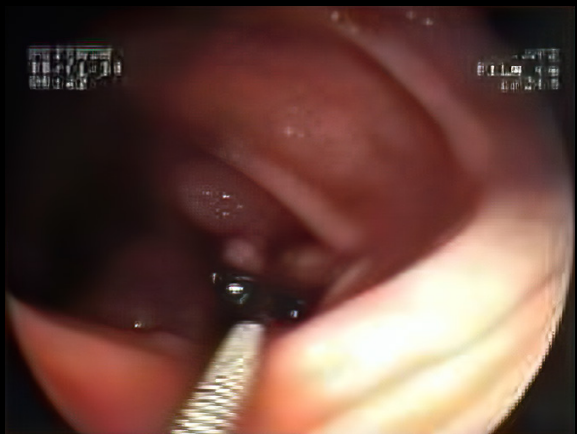
What was attempted during the colonoscopy?
Tissue biopsy of the lesion.

What is the most probable histology in this area?
Adenocarcinoma.



How would this patient have presented?
Abdominal mass, intestinal obstruction or intussusception.

Which surgical procedure would be recommended?
Right hemicolectomy with end-to-end ileo-colic anastomosis. General principles of oncological surgery include early ligation of the vascular pedicle, no-touch technique, and avoidance of contamination by bowel content.



A

A 62-year-old man was admitted to hospital for intestinal obstruction and emergency surgery was performed on him.

What procedure was carried out, based on picture A and why?

On table antegrade decompression on the small bowel. A Savage decompressor had been inserted into the small bowel.



What is an alternative procedure?

Retrograde milking to the contents into the stomach for aspiration via a wide-bore nasogastric tube.

What is the main physiological derangement of small bowel obstruction?

There is dehydration and electrolyte loss due to reduced oral intake, intestinal wall oedema leading to defective intestinal nutrient and fluid absorption, losses due to vomiting and sequestration into the small bowel. These patient will need adequate resuscitation and correction of fluid and electrolyte imbalance.

What surgical resection was performed on the patient, based on picture B?

Right hemicolectomy. The resection specimen includes the terminal ileum, caecum with appendix and ascending colon.



B

What is the most probable cause of the obstruction?

Cancer of the colon.

A 45-year-old man underwent sigmoidoscopy for profuse mucus discharge per rectum. A 2-cm lesion was seen in his rectum.

What is this lesion?

Villous adenoma. They are often very large and can occasionally fill the rectum.

What biochemical abnormality may be associated with this lesion?

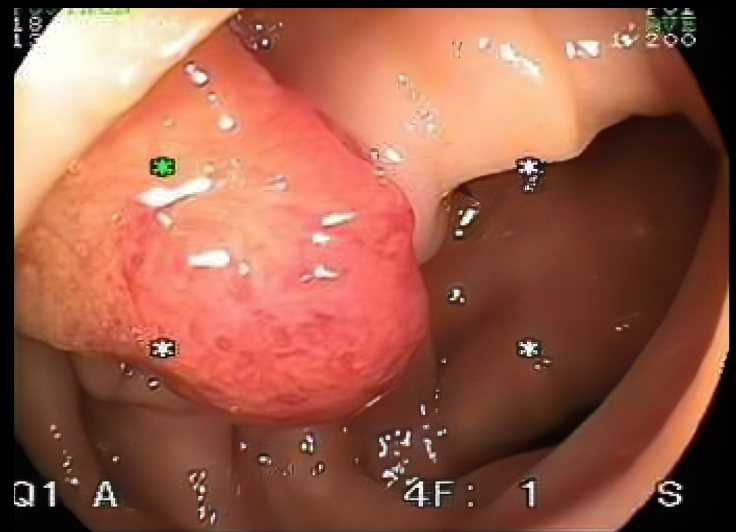
Hypokalaemia. Villous adenomas secrete mucous high in potassium content, which can cause electrolyte and fluid losses.

What is the risk of malignancy?

Proportional to the size. Lesions greater than 4 cm have up to 90% chance of malignancy.

What are the treatment options?

- ◆ Small (1–2 cm): endoscopic polypectomy.
- ◆ Medium (2–4 cm): trans-anal endoscopic microsurgery (TEM), full thickness local excision with suture closure of the defect.
- ◆ Large (>4 cm): resection of the rectum; either an ultra-low anterior resection or abdomino-perineal resection (APR).



This patient underwent surgery on the tongue.

What is seen in picture A?

The MRI reveals a mass lesion arising from the right aspect of the tongue.

What is seen in picture B?

Pre-operative tracheostomy for maintenance of airway during surgery and mandibulotomy to facilitate full exposure, revealing the carcinoma of the tongue.

What are the symptoms of his condition?

A hard ulcerated mass which bleeds easily. As the tumour grows, it infiltrates the tongue causing increasing pain, and speech and swallowing difficulty.

Which part of the tongue are these lesions more commonly found?

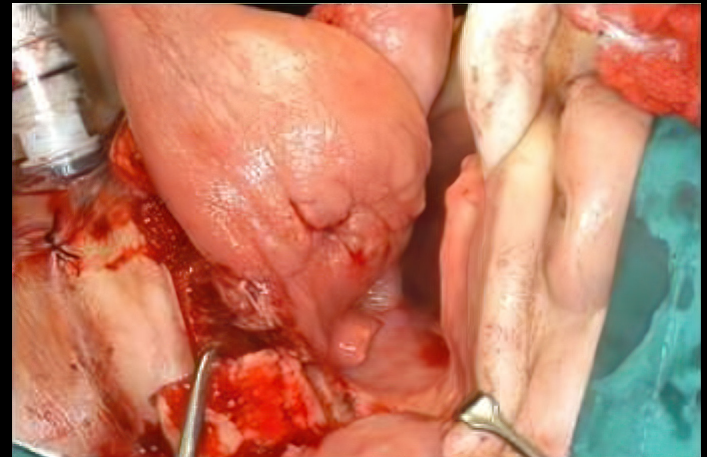
Most (50%) occur in the middle and lateral aspect of the tongue and lower lip. They do not occur commonly on the dorsum.

What is the etiology?

Smoking and alcohol ingestion. Human Papilloma Virus (HPV) is present in up to 15%. Chewing betel nuts and "lime" are important regional cultural influences in India and other parts of Asia.

What are the modes of treatment?

Surgery/radiotherapy or both for small lesions. Localized lesions can be treated surgically. Larger lesions require combination therapy. With treatment, the 5-year survival rate is 50%.



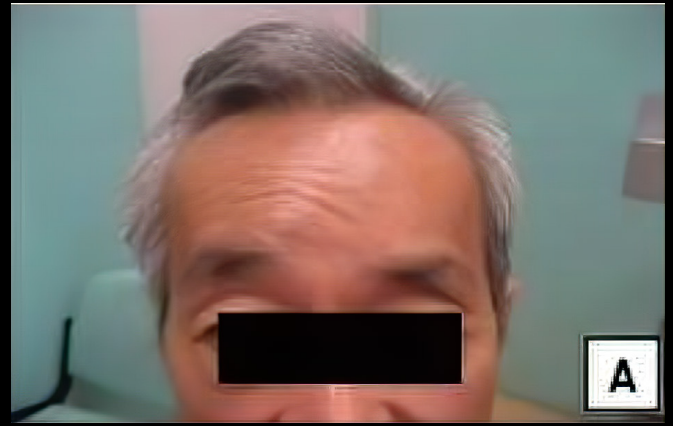
A

B

This gentleman had previous head and neck surgery

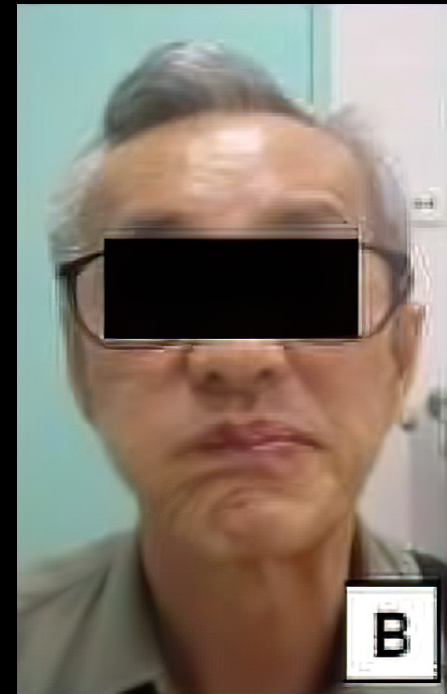
What clinical sign is evident in picture A?

Weakness of the left frontalis muscle due to palsy of the temporal branch of the facial nerve.



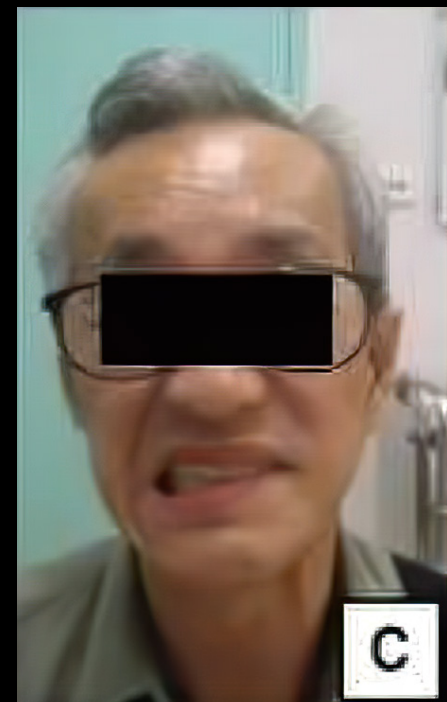
What clinical sign is evident in picture B?

Weakness of the left buccinator due to palsy of the buccal branch.



What clinical sign is evident in picture C?

Palsy of the mandibular branch.



What are the 2 other branches of the facial nerve?

Zygomatic and cervical.

Is this an upper motor neuron lesion?

No. The temporal branch palsy would be spared in an upper motor neuron lesion (bilateral corticobulbar supply).

This 70-year-old lady presented with a lump under her tongue.

Describe the lesion.

There is a 3 × 3 cm elevated fungating lesion arising from the dorsal surface of the left side of the tongue.

What tests would you carry out for diagnosis?

Incisional biopsy under local anaesthesia.

What are the possible differential diagnoses?

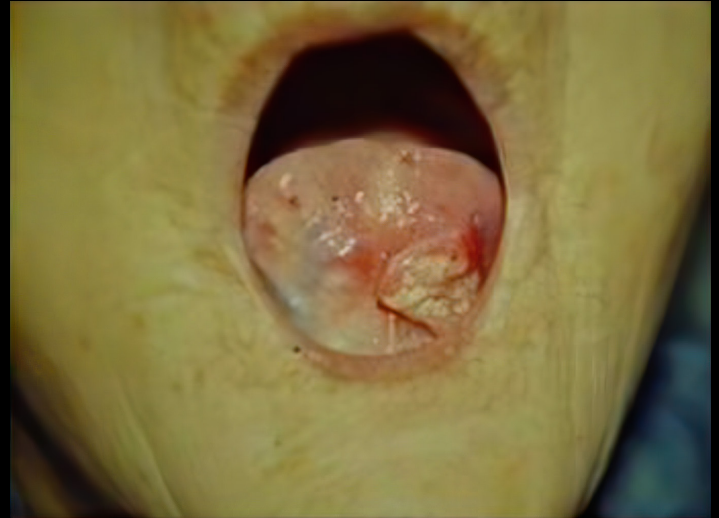
Squamous carcinoma or erythroplakia.

What other anatomical region should you examine?

Full examination of the neck to ascertain any cervical lymph node spread of the disease. Carcinoma of the tongue spreads early to the lymph nodes and up to 15% present with a "lump in the neck."

What investigation would be useful for further evaluation?

Magnetic resonance imaging (MRI) is better than CT scans for assessing soft tissue spread and the images are not degraded by metallic dental restorations.



This is a 55-year-old man, a chronic smoker, who had presented with a lump in the neck.

Describe the lesion seen on this man.

A well-circumscribed, smooth spherical mass arising at the angle of the left jaw. There is no overlying skin change. It appears to arise from the lower pole of the left parotid gland.

What is the most likely diagnosis?

Warthin's tumour (papillary cystadenoma lymphomatosum), classically a soft mass arising from the lower pole and up to 30% can be bilateral.

Who does it mostly affect?

Males, 50–70 years. Smokers have a greater risk (up to 8 times) of developing this tumour than the general population.

How should the lump be treated?

Superficial parotidectomy.



This 60-year-old lady had a lesion on the lateral surface of the tongue.

What is this condition called?

Leukoplakia.

Define the condition.

The World Health Organization (WHO) has defined it as "any white patch or plaque that cannot be characterized clinically or pathologically as any other disease".

What is the natural history of the condition?

There is potential for malignant change and the incidence increases with age of the lesion and patient.

What are the risk factors?

Tobacco smoking or chewing betel nuts or "lime". There is a weak association with alcohol.

How would you manage this condition?

Cessation of risk factors is critical as most cases will disappear with removal of them. Any suspicious lesions need histological examination. Regular follow-up is essential.



This man had a lump in his left neck which had been growing for the past 3 years.

What can be seen in picture A?

A multi-lobulated mass arising from the angle of the jaw lifting the ear lobe.

Which organ could this arise from?

Parotid gland.

What are the differential diagnoses of this swelling?

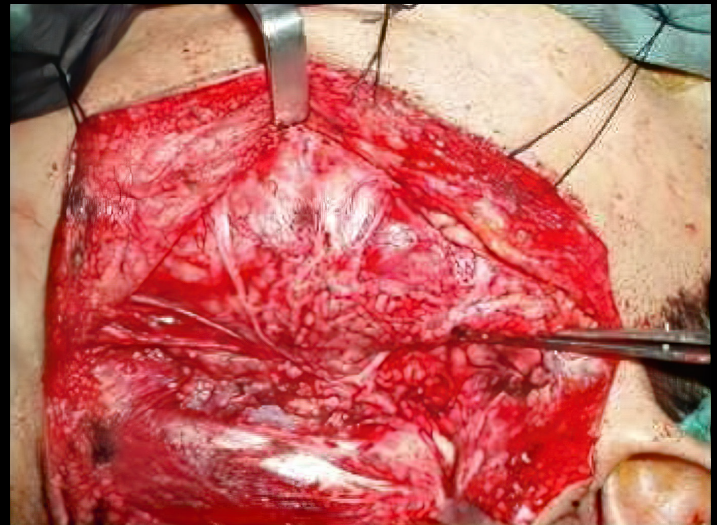
- ◆ **Benign:**
 - ▶ Pleomorphic adenoma.
 - ▶ Monomorphic adenoma.
- ◆ **Malignant:**
 - ▶ Low grade:
 - ▷ Acinic cell.
 - ▷ Adenoid cystic mucoepidermoid.
 - ▶ High grade:
 - ▷ Adenocarcinoma.
 - ▷ Mucoepidermoid.

What can be seen in picture B?

Superficial parotidectomy with preservation of the facial nerve.

What are the complications relating to the surgery?

Facial nerve injury, anaesthesia over the ear lobe and Frey's syndrome. Frey's syndrome is gustatory sweating of the face and auriculotemporal region due to the regeneration of post-ganglionic secretomotor parasympathetic fibers into the skin.



A

B

This Patient had previous treatment for oral cancer.

What can be seen in picture A?

Well-circumscribed masses in the left posterior triangle of the neck. Metastases to the cervical lymph nodes.

How may we confirm the diagnosis?

Fine needle aspiration and cytology (FNAC).

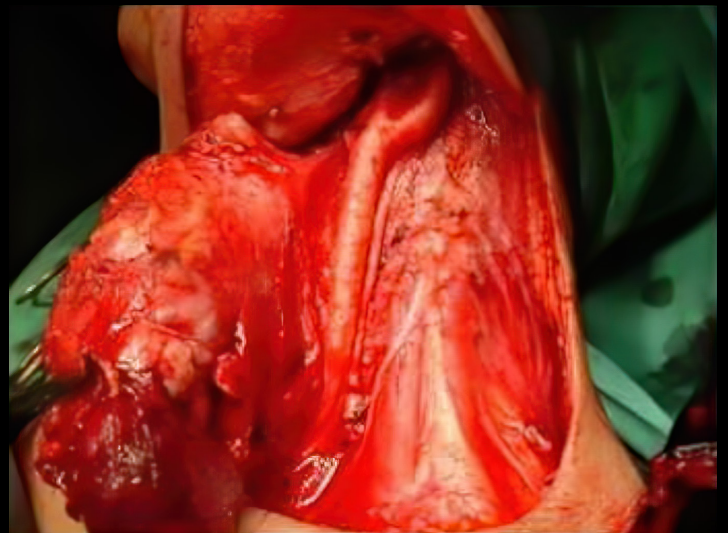
Which procedure was performed in picture B?

Radical neck dissection. It refers to the removal of all lymph node groups (level 1–5) extending from the inferior border of the mandible superiorly to the clavicle inferiorly, and from the lateral border of the sternohyoid muscle, hyoid bone and anterior belly of the digastric muscle medially to the anterior border of the trapezius laterally (take reference from the exposed carotid artery).

Which structures would be sacrificed in this procedure?

Sternocleidomastoid muscle, internal jugular vein and the spinal accessory nerve.

A



B

This is a 40-year-old man who presented with swelling in the right neck.

What anomaly can be seen in the CT scans?

There is a mass in the right side of the neck deep to the parotid gland and posterior to the mandible. There is fullness in the left nasopharyngeal region (fossa of Rosenmüller).

What is the diagnosis?

Nasopharyngeal carcinoma (NPC) with spread to the lymph nodes.

How else could this patient have presented?

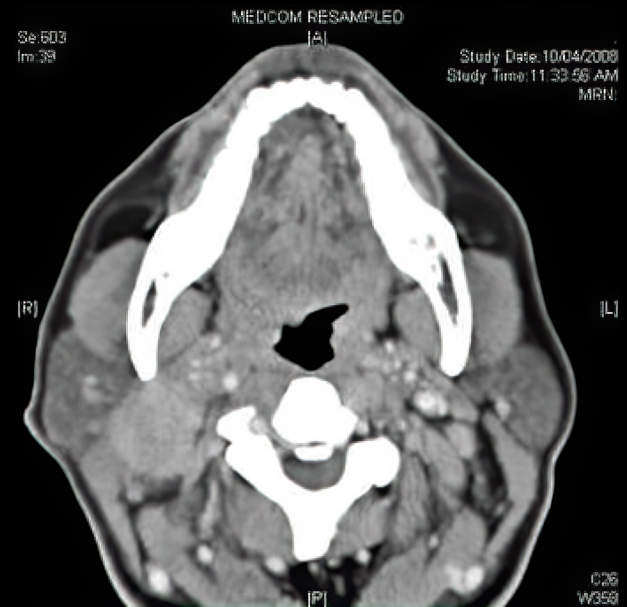
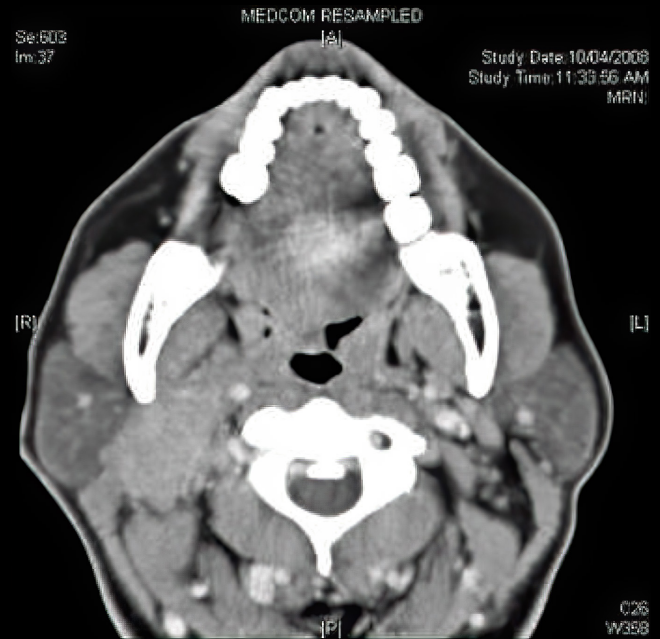
Epistaxis, Otitis media/hearing loss, nasal congestion and cervical lymphadenopathy.

What are the aetiological factors?

Epstein-Barr virus (EBV) and smoking. Dietary risk factors such as consumption of salted-cured fish high in nitrosamines may play a role in endemic areas of Asia.

How do we manage the condition?

Radiotherapy is the mainstay of treatment. Surgical treatment is not recommended due to the anatomical constraints in the nasopharynx. Combination therapy with chemotherapy seems to be beneficial for late-stage disease.



This is a 70-year-old man who presented with difficulty in breathing.

What can be seen, based on the picture of the patient?

- ◆ Mass arising from the right posterior triangle of the neck.
- ◆ Large swollen tongue.
- ◆ Tracheostomy tube.



What is the most likely diagnosis?

Carcinoma of the tongue that has spread to the cervical lymph nodes.

How might the patient have presented?

Upper airway obstruction necessitating the tracheostomy.

How should the patient be managed?

This cancer is in a late stage. The mainstay of treatment would be radiotherapy, ensuring that the airway is not compromised.



This is a 30-year old man who had an enlarged neck lymph node.

What abnormality can be seen in picture A?
A 3 × 3 cm well-circumscribed circular lesion in the middle third of his left neck.

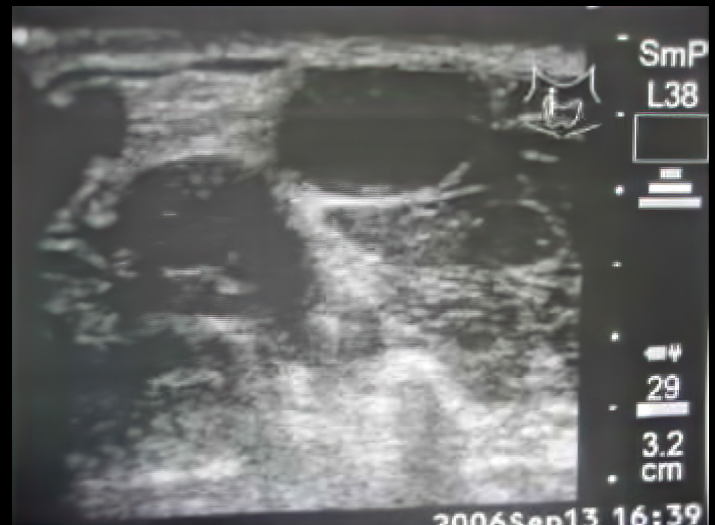
What clinical examination should be done?
A complete head and neck examination, including the oral cavity.

What kind of investigation was performed in picture B?
An ultrasound of the neck.

What other investigation should be done?
Fine needle aspiration of the lymph node.

If the investigation above revealed squamous cell carcinoma, what should be done?
Examination under anaesthesia (EUA) of the mouth, pharynx, larynx, oesophagus and tracheobronchial tree. If no lesion is seen, multiple blind biopsies of the nasopharynx, tonsils, base of tongue, and pyriform sinuses should be performed in the same sitting.

A



B

This is a 52-year-old lady who presented with cervical lymphadenopathy.

Where is the anatomical location of the enlarged lymph nodes?

The posterior triangle of the neck, level V.

Where are other levels of lymph nodes in the neck?

Level I: submental and submandibular.

Level II: upper third of the internal jugular vein (IJV).

Level III: middle third of IJV level.

Level IV: lower third of IJV.

Level VI: pre-tracheal.

What are the causes of cervical lymphadenopathy?

Infection: acute (infections of the aero-digestive tract, infectious mononucleosis, toxoplasmosis) and chronic (tuberculosis, sarcoidosis).

Malignancies

Primary: lymphoma.

Secondary: from the aero-digestive tract or epithelial tumours of the head neck (90% of cases are from the head and neck).



This is a 56-year-old man who presented with fever and tender swelling over the left side of the face. Pain on the left jaw was experienced with mastication.

What are the differential diagnoses?

Parotid or masseter abscess, parotid calculi, sialadenitis, mumps or part of a systemic problem—e.g., starvation, bulimia, liver cirrhosis, hypothyroidism.

What other clinical examination would you perform?

Intra-oral examination.

What investigations would you perform?

Plain X-Ray, ultrasound, sialogram, CT scan (this patient had a masseter abscess that was drained.)

What investigation is being performed in picture B?

A sialogram.

A



B

This patient presented with a neck mass on the right side.

What are the findings, based on these investigations?

Carotid body tumour (classic splaying of the carotid bifurcation with a blush that outlines the normal tumour vessels).

Where does the pathology arise from?

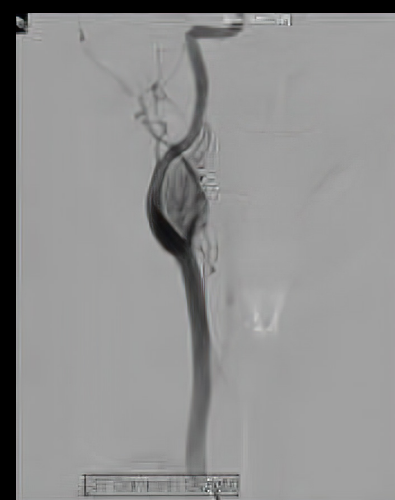
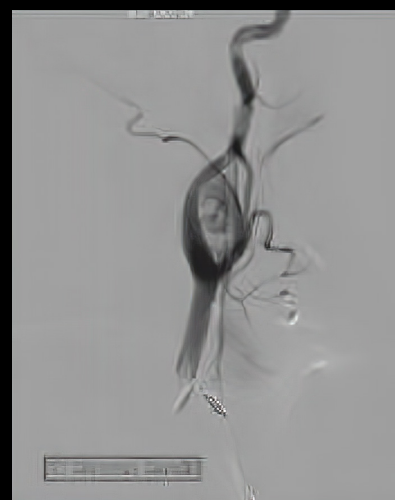
It is a rare tumour arising from the chemoreceptor cells on the medial side of the carotid body bulb.

Who are at risk?

High incidence rates for people who reside in high altitudes, those in the 5th decade of their life and those with a family history (10%).

How do they present?

Long history of slow-growing painless lump in the neck. The mass is firm, pulsatile and mobile side to side but not up and down.



This is a 60-year-old man who had previous surgery.

What can be seen in the pictures?

Exposure of an implant and the mandible.

What is the diagnosis?

Osteoradionecrosis.

What might it be caused by?

Non-vital bone secondary to radiation injury.

There is absence of reserve reparative capacity.

How else might he present?

Pain, swelling, trismus, malocclusion, oral cutaneous fistula and pathological fractures.

What are the options to manage the condition?

Medical therapy is mainly supportive. Hyperbaric Oxygen has been shown to be useful. Surgical options for closure of the wound include microvascular free tissue transfer.



The 56-year-old lady had a left breast lump that had increased in size over 6 months.

What is a "triple assessment"?

It is obtaining a diagnosis through the combined assessment of a breast lump from clinical, radiological and pathological examination.

Which investigations are being carried out in the pictures?

Bilateral mammogram and ultrasound.

Describe the features in the left breast.

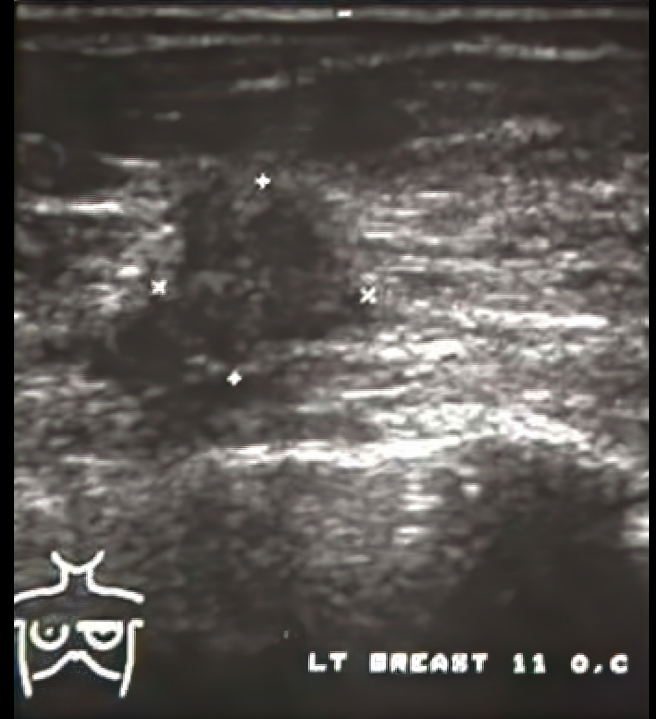
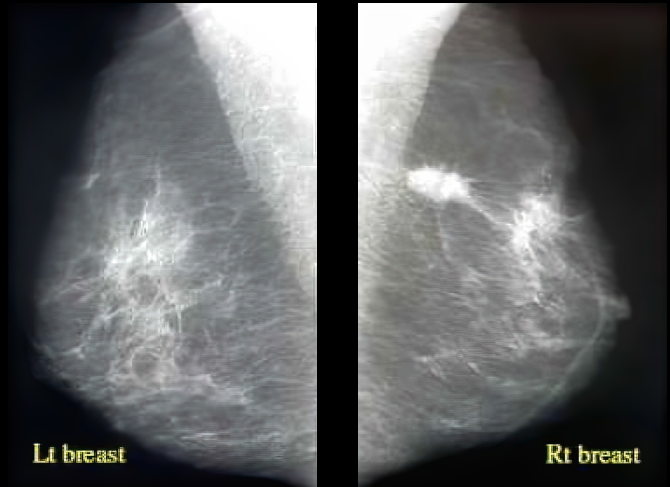
Distortion of the breast parenchyma with calcifications.

What procedures can you carry out in the clinic to further evaluate the breast lump?

Fine needle aspiration and cytology (FNAC) or core biopsy.

What is the management mode of this patient?

Confirmation of a cancer and stage the disease.



The 45-year-old woman presented with a mass in the left breast.

Describe the findings in picture A.

There is a large, lobulated ulcerating, inflamed mass in the left breast.

What are the possible differential diagnoses?

Breast carcinoma or abscess.

What are the important aspects of the patient's history?

The length of time since the onset of the lump (enlarging or reducing) and any associated tenderness or fever. Others include risk factors for breast cancer, the age at menarche, family history of breast cancer, number of children, age at childbirth and drug history (oral contraceptive pill/hormone replacement therapy).

Which is the best way to make a diagnosis?

Obtain a histological/cytological biopsy (this patient had a carcinoma).

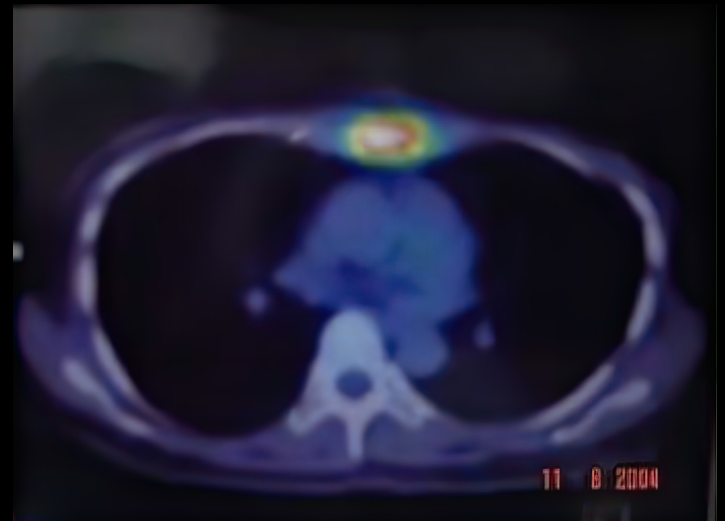
What investigations are done to stage the disease?

Chest X-Ray, liver ultrasound and bone scan.

What procedure has been performed in picture B and what can be seen?

Positron emission tomography (PET) showing metastatic spread to the sternum.

A



B

The 55-year-old lady had a mastectomy.

What can be seen in the macroscopic specimen?

The cut surface of a mastectomy specimen showing a large infiltrative solid tumour mass with involvement of the skin.

What can be seen in the histological specimen?

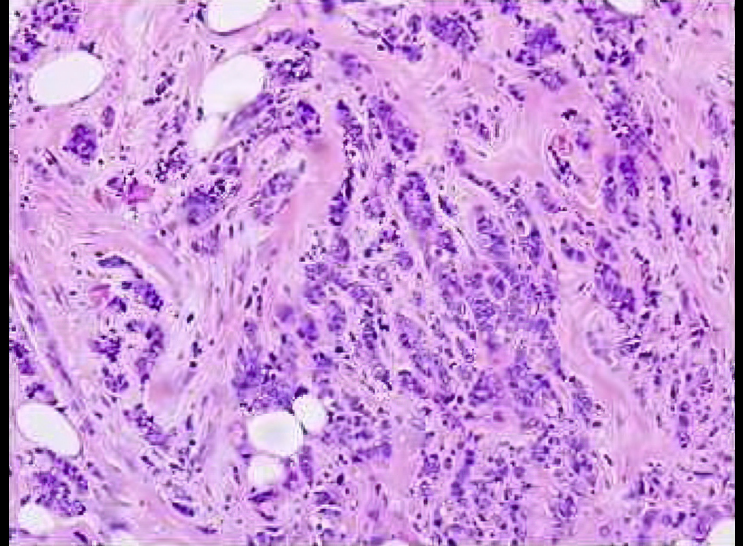
The tumour is composed of infiltrative malignant cells disposed in cord and nests, lying within fibroblastic stroma.

What are predictors of poor outcome?

Tumour size, histological type, tumour grade, nodal involvement, vascular invasion and multicentricity, tumour-involved excision margins.

What molecular markers are currently available and how do they influence prognosis?

Oestrogen and Progesterone receptors (ER and PR): ER/PR positive tumours have a good response rate to chemotherapy compared to ER/PR negative tumours. ERBB-2 (HER2) positivity a humanized anti-ERBB-2 monoclonal antibody trastuzumab (Herceptin) is effective in some patients with over-expression of ERBB-2



This 45-year-old lady had needle localization and excision of a breast lesion.

What can be seen in picture A?

The patient had areas of microcalcification (5B and 5C) in the breast tissue. This is radiological confirmation that the suspicious lesion has been excised.

What can be seen in picture B and what is the diagnosis?

Tumour cells are seen within ducts and confined to the basement membrane.
Ductal Carcinoma In Situ (DCIS).

What are the implications of the diagnosis?

It is a pre-invasive carcinomatous process. If left untreated, it often proceeds to invasive ductal carcinoma. There is a 25–50% risk of breast cancer in 10–15 years.

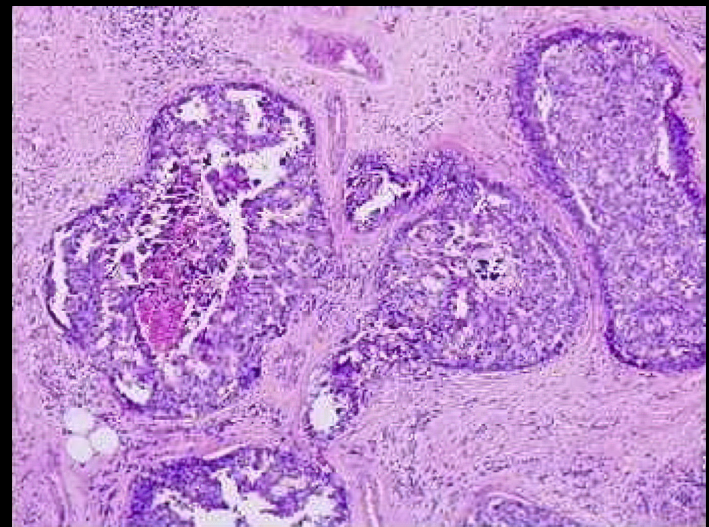
Who are most at risk and how does this condition present?

It affects patients predominantly between 40 to 60 years of age, and often presents as suspicious microcalcifications on mammography or with nipple discharge and/or mass.

How are patients with this condition managed?

Localized (<4 cm) lesions are treated by wide local excision +/- radiotherapy and tamoxifen. Wide spread/multifocal lesions are treated by mastectomy +/- tamoxifen.

A



B

A 25-year-old girl presented with a mobile breast lump that was excised.

What are the differential diagnoses of breast lumps for patients in this age group?

Fibroadenomas are common in young women. Breast cysts are common for women between 30 to 50 years of age. New lumps in women above 50 years of age should be investigated for a carcinoma until proven otherwise.

What is the probable diagnosis?

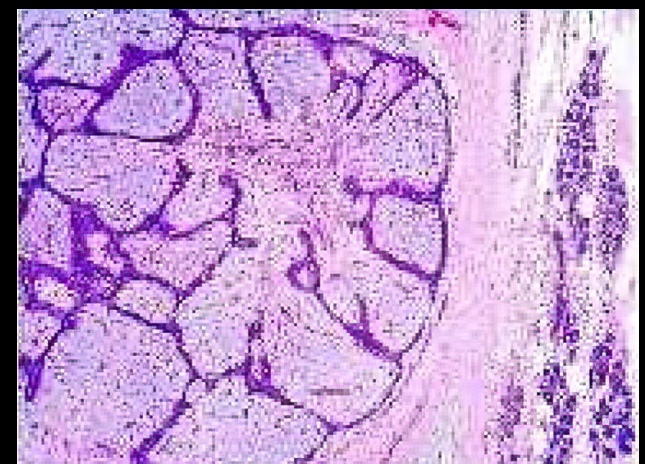
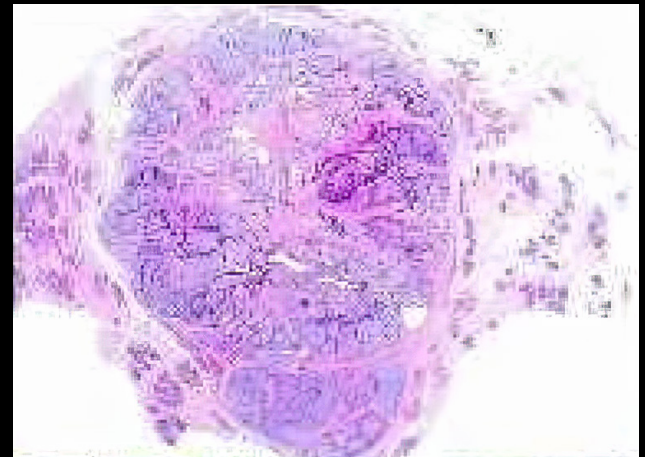
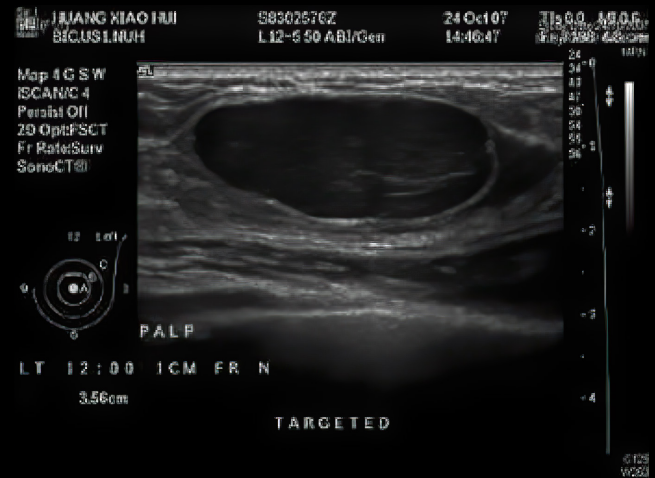
Fibroadenoma of the breast. It is the most common benign tumour of the female breast, developing most commonly during the reproductive periods of a woman.

How does it present?

A fibroadenoma presents as a well-circumscribed palpable mass, ovoid mammographic density or well-circumscribed smooth lesions on ultrasound imaging. It is often mobile and may disappear from between the fingers on palpation (hence the term "breast mouse").

What can be seen from the histology specimen?

A well-circumscribed biphasic lesion consisting of benign stroma and epithelium-lined cystic spaces.



A 40-year-old lady presented with “heaviness” and associated skin changes in her right breast.

Describe the abnormal physical signs that can be seen in the pictures.

Enlarged right breast with “peau d’orange” appearance of the right breast.

List two conditions that can give rise to the above appearance.

Breast carcinoma or abscess.

What is the pathogenesis?

It is due to cutaneous lymphatic oedema. The infiltrated skin is tethered to the sweat ducts and subsequently cannot swell, giving the appearance of tiny pits resembling that of orange peel.



A 40-year-old lady experienced pain in her left breast.

What abnormality can be seen in picture A?

There is an ulcerated lesion that involves the left nipple and has eroded into the left breast.

What is the most likely diagnosis?

Invasive breast carcinoma.

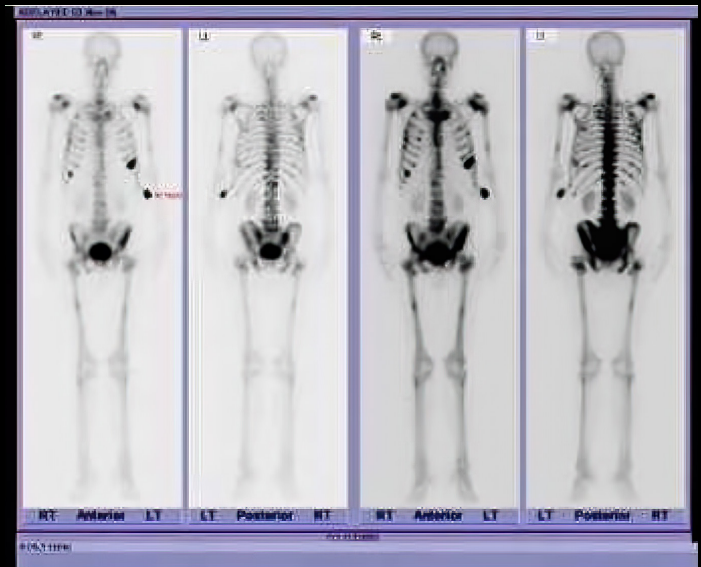
What can be seen from the bone scan in picture B?

Evidence of multiple bone metastases.

How can we manage the patient?

This patient has metastatic disease. She will require palliative systemic therapy to alleviate symptoms. Hormone manipulation is often the first-line treatment because of its minimal side effects. Local radiotherapy can be useful for painful bony deposits.

A



B

A 50-year-old lady presented with swelling and ulceration of her right breast for 2 years.

What is the most likely diagnosis and how would you confirm it?

It is most likely a breast carcinoma and a biopsy (FNA, core or wedge incision) can be done to confirm it.

What is the first-line treatment for this patient?

Neo-adjuvant therapy, chemotherapy or radiotherapy (the intention is to "shrink" the tumour to facilitate a less morbid toilet mastectomy as adequate skin closure is a concern).

What is the most useful receptor marker of this disease and what drug can be added if this receptor is present?

The cytosol of breast cancer cells may contain oestrogen (ER) and progesterone (PR) receptors. ER activity is present in 60% and represents a biochemical marker for the degree of differentiation and histological subtype. ER positive tumours have a better response to hormonal manipulation. Tamoxifen is a triphenylamine anti-oestrogen that blocks endogenous oestrogen. Approximately 30% of all breast cancers respond to tamoxifen. This rises to 60% if they are ER-positive.



A 35-year-old woman presented with a right nipple discharge for a duration of 1 month.

What other information about the discharge is important?

It is important to determine if the discharge is from a single or multiple ducts, and whether it is unilateral or bilateral.

What are the common causes of this kind of nipple discharge?

The most common cause is a physiological discharge that varies from clear to greenish brown. An intraductal papilloma presents as a unilateral blood-stained discharge. Other causes include ectasia, papillomatosis, and prolactinomas. An intraductal carcinoma must be ruled out.

Which kind of non-invasive investigations would you perform to help manage the condition?

Mammogram, ultrasound and smear of the discharge for cytology and culture.

If the investigations are not conclusive and the nipple discharge persists, what else can you do?

Microdochectomy/excision of duct system, duct lavage and cytological examination.



This lady had a procedure performed after routine breast screening.

Which procedure has been performed on this patient, based on the pictures?

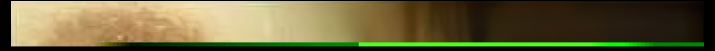
Radiological needle localization of a breast lesion that is diagnosed to be abnormal or suspicious, either on mammogram or ultrasound scans.

How may these lesions present?

They are generally asymptomatic and are diagnosed either during screening or during investigation for another unrelated problem.

What is done immediately after the excision of the breast tissue?

It is sent for radiological examination to confirm that the localized lesion has been completely removed.



This lady had surgery in her left axilla.

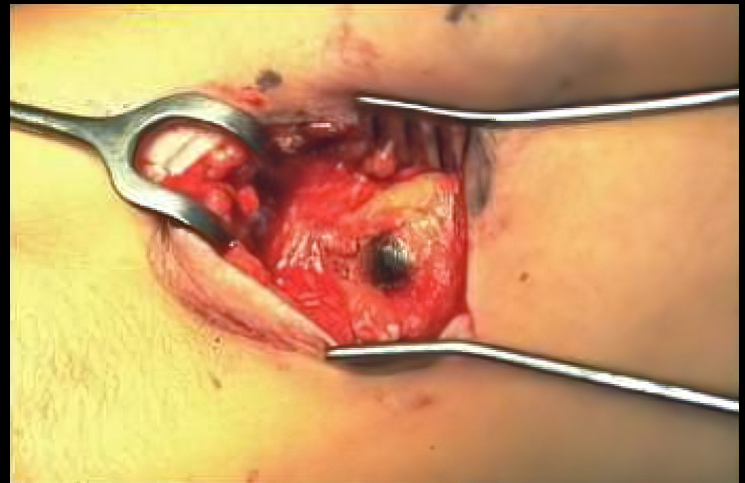
What kind of surgery was performed?
Sentinel lymph node biopsy.

What is the rationale for the surgery?
The sentinel lymph node is the first node that drains into the lymphatic basin. If it is not involved with a tumour, the remaining lymph nodes are assumed to be clear of disease.

Why is it important in breast surgery?
If there is no tumour spread to the node, an axillary clearance, which may be associated with upper limb lymphoedema, can be avoided.

How is it isolated?
Injected blue dye or technetium-labeled sulphur colloid injected either periareolar or into the tumour.

In what other pathologies is this mode of surgery used?
Management of penile carcinomas and malignant melanomas to determine the need for regional lymphadenectomy.



The 48-year-old lady recently noticed that her left breast looked different.

What abnormality can you observe?

Left nipple retraction.

What may be the cause?

It may be congenital where the nipple may evert at any time as the breast develops or changes, such as during pregnancy or when it undergoes involution. Other causes include carcinoma, mammary fistula, periductal fibrosis, duct ectasia, previous surgery, chronic abscess, Paget's disease.

What problems might the patient encounter?

Apart from the aesthetic concern, she might have difficulty breastfeeding and may have an increased risk of developing infections.

What diagnostic tests would you order for this patient?

Mammogram and ultrasound.



This 25-year-old lady was 3 months post-partum. She had undergone emergency breast surgery.

What abnormality can be seen in this patient?

An enlarged right breast that is red and inflamed.

What is the differential diagnosis?

Breast abscess, cellulitis, and inflammatory breast cancer.

Who are more susceptible to this condition?

The first group belongs to mothers who are breastfeeding. The second group belongs to patients who have a history of recent trauma—e.g., jogger's nipple. The painful swelling is usually accompanied by a dull ache but progresses to a throbbing pain.

How should the condition be managed?

Incision and drainage with a tissue biopsy (to exclude a carcinoma).



This is a 52-year-old Chinese lady who had surgery.

What surgery was performed?
Total right mastectomy.

What are the variations of this surgery?

Subcutaneous (all the breast tissue are removed except and nipple-areolar complex (NAC)), skin-sparing (all the breast tissue are removed except for overlying skin), total (all the breast tissue, overlying skin and NAC are removed) and radical (a total mastectomy with pectoralis muscle and axillary lymph nodes removed).



What are its indications?

- ◆ Therapeutic: carcinoma, widespread DCIS, subareolar tumour, large tumour relative to size, high risk of further disease (BRCA -1/-2 positive), previous irradiation, irradiation is contraindicated and patient preference.
- ◆ Prophylactic: strong family history of breast cancer.

What are the options for reconstruction?

All should be offered reconstruction; prosthetic or autologous; immediate or delayed to create a new breast mound.

This is an endoscopic view of the oesophagus.

What can be seen in picture A?

Narrowing/stricturing of the oesophagus.

How may this present clinically?

Dysphagia, regurgitation and vomiting.

What are the possible causes?

- ◆ Benign: long-standing reflux disease, anastomotic strictures and caustic agents.
- ◆ Malignant: carcinoma.

Which procedure was performed, based on pictures B and C?

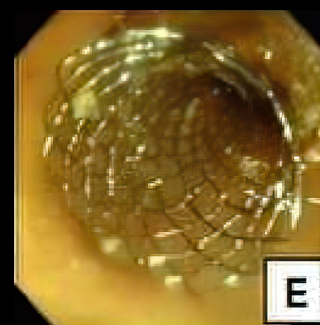
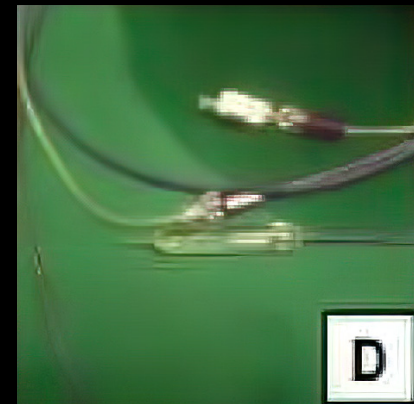
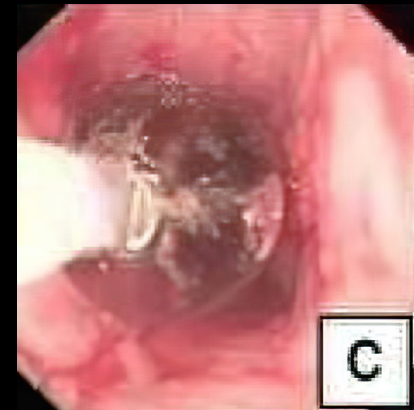
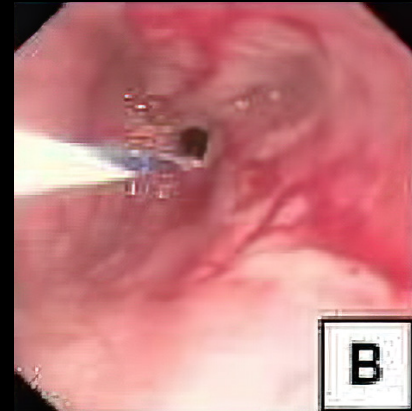
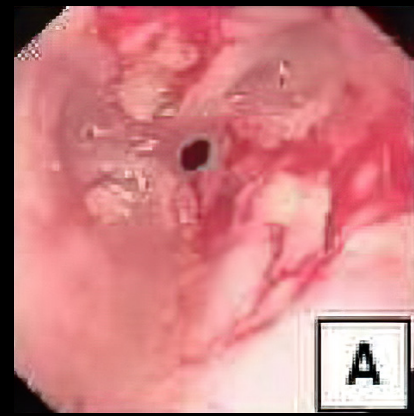
Insertion of a guide wire and subsequent balloon dilatation of the oesophagus.

What are the potential complications of the procedure?

- ◆ Early: bleeding and perforation.
- ◆ Late: re-narrowing.

What adjunctive procedure might be carried out in picture E so as to augment the previous procedure?

Insertion of a stent.



A 20-year-old man presented with worsening dysphagia, regurgitation and chest pain.

What investigation was performed?

Barium swallow.

What is the radiological appearance and diagnosis?

Dilatation of the proximal oesophagus with a beak-like tapering distally is highly suggestive of achalasia.

What is the definition of this disorder?

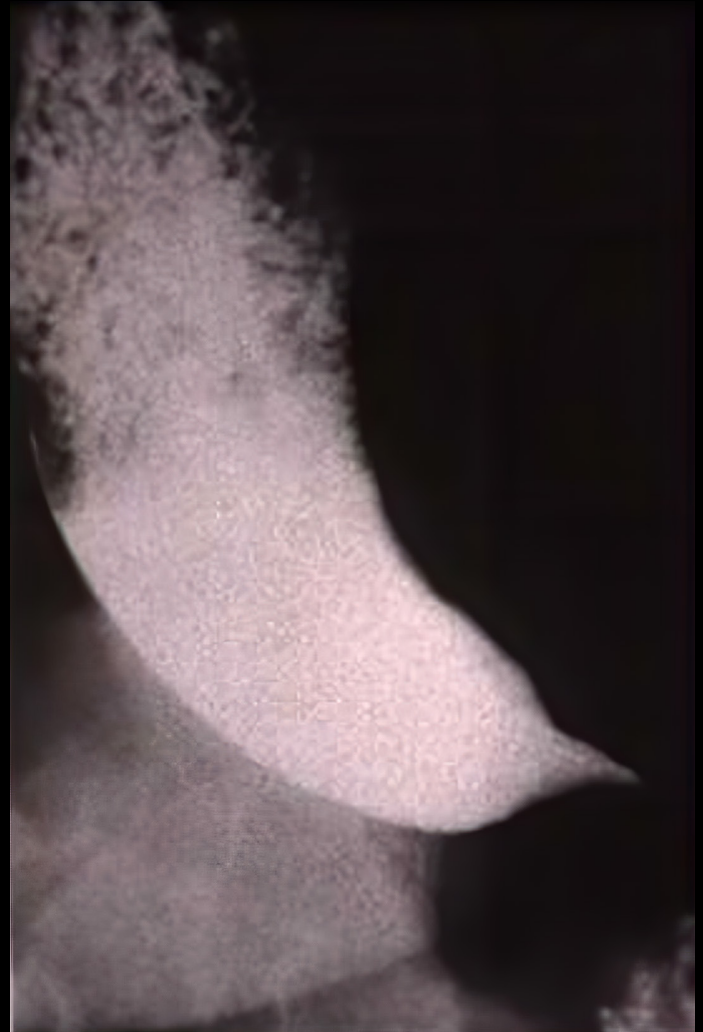
It is the most common primary oesophageal motility disorder caused by inflammation of the myenteric plexus, leading to fibrosis with decrease and loss of myenteric ganglion cells.

What other investigation can be done to confirm the disorder?

Manometric studies would reveal absence of peristaltic contractions and incomplete relaxation and abnormally high pressures of the lower oesophageal sphincter.

How may this condition be treated?

- ◆ Botulinum toxin injection provides temporary relief and symptomatic improvement.
- ◆ Pneumatic dilatation is more effective but is associated with recurrence with recurrence within 5 years. Surgical myotomy (Heller's cardiomyotomy) is considered after failure of the previous non-surgical treatments, younger patients and when there is other co-existing pathology requiring surgical intervention.



This is a specimen removed en bloc from a man who had a tumour in the stomach.

In the picture showing the gross specimen, which organ was resected with the stomach?
The spleen.

What can be seen in the microscopic picture?
Predominant spindle cell proliferation with absence of epithelial cells.

What kind of tumour is this and where do they originate from?

It is an uncommon tumour of the gastrointestinal tract. They arise from the mesenchymal layer from the Cajal cells (pacemaker cells of the gastrointestinal tract). 70% occur in the stomach, 20% in the small intestine, and, the rest, elsewhere in the gastrointestinal tract.

What is the diagnostic criterion?

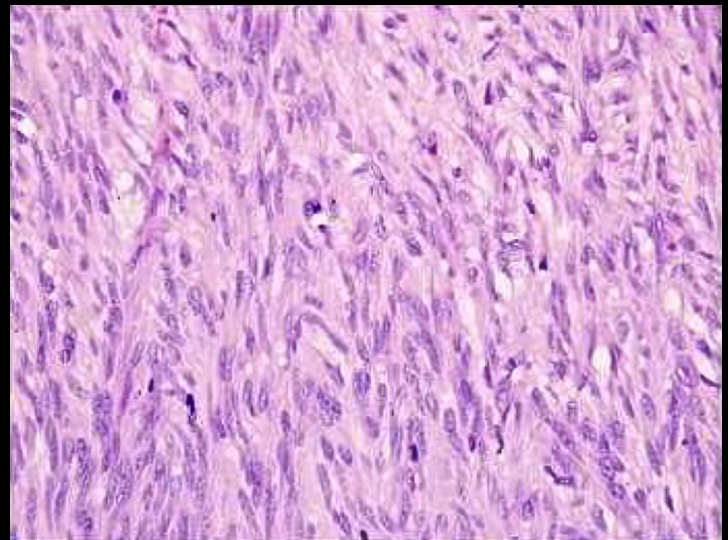
By histopathology with positive immunohistochemical staining for c-kit (CD117) (tyrosine kinase).

What determines its malignant potential?

The size of the tumour and mitotic rate of tumour cells.

What adjuvant treatment may be useful?

Tyrosine kinase inhibitors—e.g., Imatinib.



This scan is of a 45-year-old man who presented with vague upper abdominal discomfort.

What can be seen in picture A?

An air fluid level is seen in the posterior mediastinum on the chest X-Ray.

What investigation was carried in picture B and what does it show?

The barium swallow shows the upper part of the stomach herniating through a tear or weakness in the diaphragm.

What is the diagnosis and what types are there?

Hiatus hernia. The types include sliding (more common) and para-oesophageal.

What is the pathogenesis?

The distal esophagus is normally held in position by a fusion of the endothoracic and endoabdominal fascia at the diaphragmatic hiatus called the phreno-oesophageal membrane. Weakness of it allows the protrusion of the stomach.

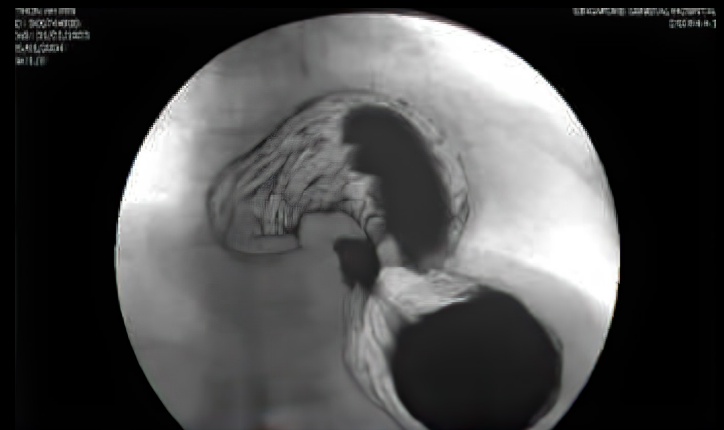
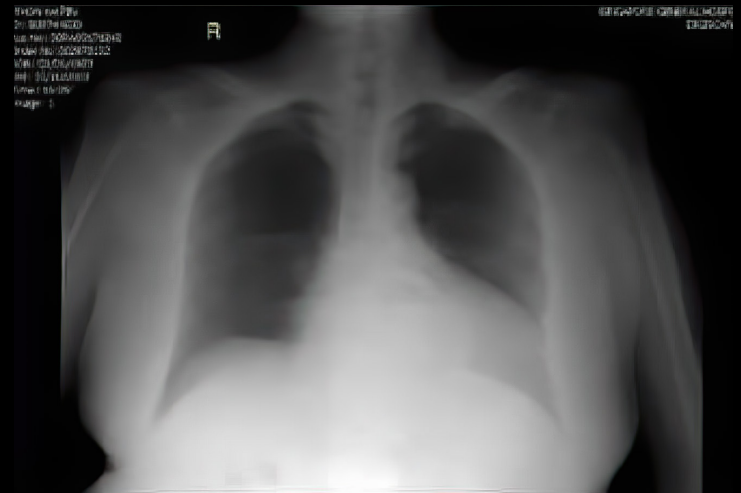
What symptoms would the patient complain of?

Gastro-oesophageal reflux, post-prandial pain, early satiety, breathlessness with meals and dysphagia.

What are the possible complications?

A herniated gastric pouch is susceptible to volvulus, obstruction, bleeding and infection.

A



B

This is a barium swallow study of a 70-year-old who presented with dysphagia.

What does the picture reveal?

Narrowing of the esophagus with shouldering.

What is the most likely diagnosis?

Carcinoma of the oesophagus. Most oesophageal carcinomas fall into one of two classes: squamous cell carcinomas; which are similar to head and neck cancers and associated with tobacco and alcohol consumption, and adenocarcinomas; which are associated with having a history of gastroesophageal reflux disease and Barrett's oesophagus.

Which kind of additional investigation would be useful?

Endoscopic ultrasound, CT thorax and liver ultrasound may be used to stage the disease.

What is the alternative to surgical treatment?

- ◆ Radiotherapy: super voltage external beam radiotherapy may be curative or palliative to relieve dysphagia.
- ◆ Brachytherapy may be another option.
- ◆ Chemotherapy: most regimes have 5-FU with or without leucovorin.
- ◆ Palliation to relieve dysphagia: re-canalization or intubation with a stent.



This man presented with progressive dysphagia and was initially treated with neoadjuvant chemo-radiotherapy.

Describe the abnormal endoscopic findings in picture A.

There is a ulcerated irregular mass arising from the oesophagus.

What is your diagnosis?

Carcinoma of the oesophagus.

What kind of investigation was performed in picture B? Why was it carried out?

Endoscopic ultrasound (EUS) helps to determine T stage of disease (depth of the Tumour growth) which influences choice of management between surgery and chemo-radiation.

What is the most likely histological type?

Squamous cell carcinoma (upper 2/3) and adenocarcinoma (lower 1/3).

What is neoadjuvant therapy and what are its advantages and disadvantages?

Treatment with chemotherapy and/or radiation to the primary lesion before surgery.
 Advantages: there is potential down-staging (to shrink the tumour), early treatment of micro-metastatic disease, treatment is better tolerated before surgical stress and verification of the tumours sensitivity to this particular therapy.
 Disadvantages: delay in the treatment of the primary lesion, selection for chemoresistant cell lines and potentially cause the tissue around the tumour to be inflamed or fibrosed.

A



B

This 50-year-old man presented with progressive dysphagia.

What can be seen in picture A?

A resected specimen of an oesophageal tumour with adequate macroscopic proximal and distal margins.

What is shown in picture B?

Radiological evidence of a gastric pull-up in the mediastinum.

What surgery did the patient undergo?

Ivor Lewis oesophagectomy with oesophago-gastric anastomosis in the right chest. Other causes of anastomosis include the neck or abdomen; depending on the site of the tumour; and the length of the oesophagus to be resected; for proximal and distal clearance.

Which other organ may be used as a conduit for the reconstruction of gastrointestinal continuity?

Free colon interposition.

What are the risks of this surgery?

This surgery is associated with high morbidity. Complications include haemorrhage, anastomotic leak, empyema, chyle leak, chest infection and anastomotic stricture.

A



B

An emergency gastroscopy was performed on this patient

What can be seen in picture A?

Oozing from an exposed vessel in the duodenum.

How would the patient have presented?

Haematemesis or melena and hypovolaemic shock.

What would have been subsequently done during the endoscopy shown in picture B?

Attempted haemostasis with endoclips. Other various methods include adrenaline injection and thermal coagulation.

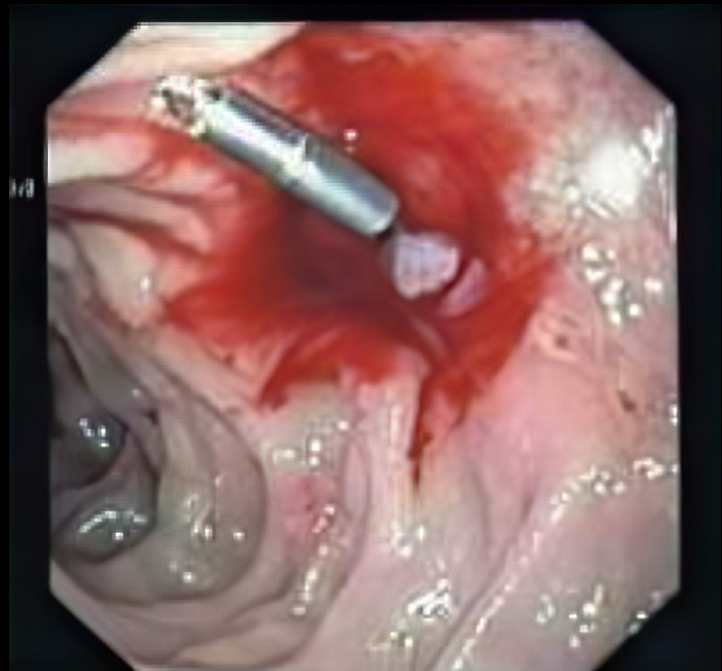
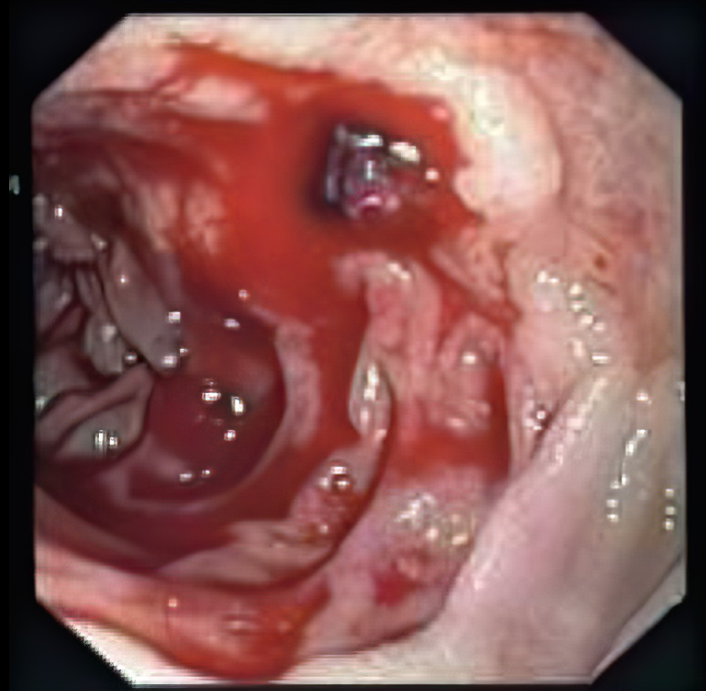
If bleeding is controlled, how would the patient be managed?

Start the patient on intravenous anti-acid therapy (with a proton pump inhibitor) and monitor closely for re-bleeding.

What should be done if bleeding continues?

Resuscitate and arrange for immediate surgery. This is often an under-running of the ulcer with the option of an acid reducing procedure (vagotomy).

A



B

The 60-year-old man had suffered a stroke.

What can be seen in this picture?

A gastrostomy tube.

How is the equipment inserted?

Percutaneous Endoscopic Gastrostomy (PEG) or open method.

Why would a patient need the equipment?

It is used for enteral feeding when per-oral feeding cannot be carried out due to a mechanical obstruction or a neurological cause affecting the swallowing mechanism.

What complications may develop during its usage?

Blockade or dislodgement of the tube, which requires a replacement.

What are the alternatives to the tube?

A nasogastric tube or a jejunostomy tube.



This obese 40-year-old man underwent surgery.

What can be seen in picture A and what kind of surgery was performed using the prosthesis in picture C?

The radiological study shows a contracted stomach with a gastric band across it. The prosthesis used is seen in picture C.

What are the indications for this procedure?

Patients with morbid obesity (elevated Body Mass Index) who have failed to lose weight with dietary modification and pharmacological treatment.

How is BMI calculated?

Body weight (in kg) divided by height (in meters) squared.

Name an alternative operative procedure as seen in the post-operative radiological study in picture B.

Another form of bariatric surgery is gastric bypass (malabsorptive) surgery.

What are the medical conditions associated with this body habitus?

Sleep apnea, coronary artery disease, pulmonary disease, diabetes, arthritis and so forth.



A 51-year-old man presented with a 6-month history of anorexia, pallor and weight loss.

What can be seen in the gross specimen and what surgical procedure had been performed?

There is a tumour in the lesser curve of the stomach. A total gastrectomy was performed.

What can be observed in the microscopic specimen?

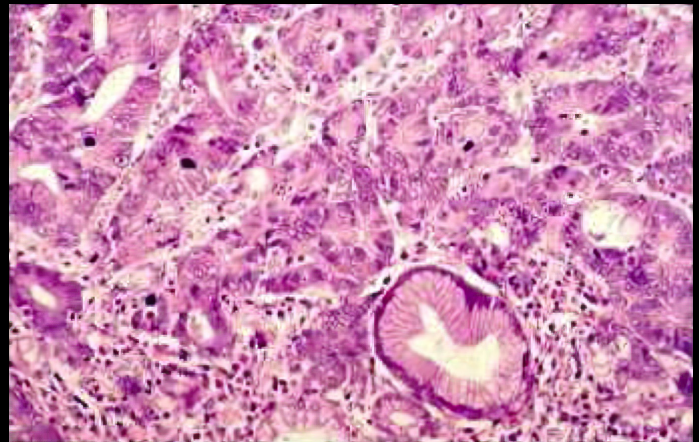
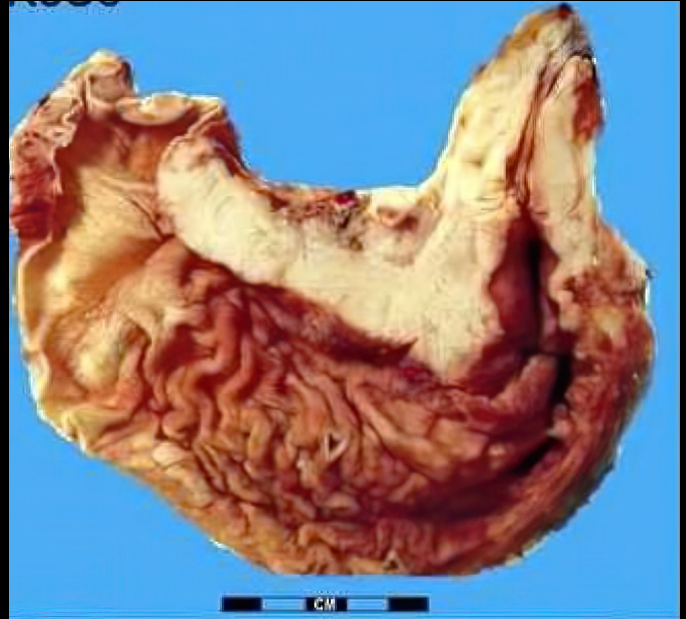
Normal columnar epithelium is replaced by poorly differentiated adenocarcinoma exhibiting an infiltrative growth pattern.

What are the two types of adenocarcinoma?

- ◆ Intestinal type: commoner, polypoid masses, has gland formation with intraglandular mucin, ulcerates and is associated with a better prognosis.
- ◆ Diffuse type: spreads through the wall, "leather bottle stomach", has no gland formation and instead forms signet-ring cells with intracellular mucin.

What are the aetiological factors of this pathological condition?

- ◆ Environment: diet (lack of fruit and vegetables), cigarette smoking.
- ◆ Host: infection by *Helicobacter Pylori*, leading to chronic gastritis, autoimmune gastritis, partial gastrectomy.
- ◆ Dysplasia is the final common pathway.



The 36-year-old man was a chronic heavy smoker and presented with early satiety.

What can be observed in these pictures?

A pre-pyloric gastric ulcer with evidence of gastric outlet obstruction (there should not be food debris after these patients have fasted for more than 6 hours).

What is characteristic of the vomiting relating to this pathology?

The vomiting is projectile and the vomitus is characterized by an absence of bile and the presence of partially digested food.

What might you find when examining the abdomen?

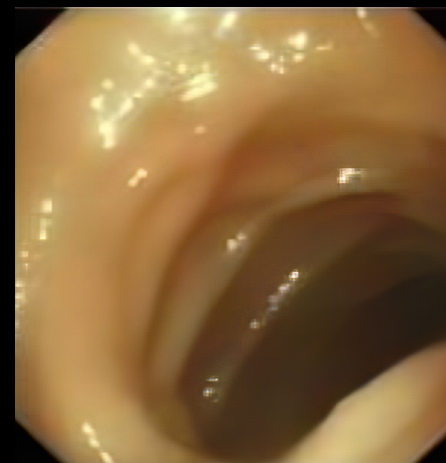
A mass arising in the upper abdomen. This "mass" is a distended stomach. If it is full of food, it will be a firm mass which is dull to percussion. If there is air and fluid, a succussion splash can be elicited.

What needs to be performed during endoscopy and how would the patient be managed?

A biopsy to exclude a cancer as a cause for the ulcer, check for urease activity and start acid suppression medication.

If the biopsy result is "active gastritis," what should be done next?

Repeat a gastroscopy to look for healing of the ulcer and repeat the biopsy if it remains the same.



This is a specimen of a 40-year-old man who presented with iron-deficiency anaemia.

What is the diagnosis?

Gastric cancer. It is the fourth most common cancer worldwide and the second most common cause of cancer death worldwide after lung cancer.

What are the possible histological types?

Adenocarcinoma (most common), lymphoma, gastrointestinal stromal tumours.

What surgery was performed?

D2 lymphadenectomy and gastrectomy (level 1 and 2 lymph nodes as seen by the omentectomy).

What is the clinical use of lymph node dissection?

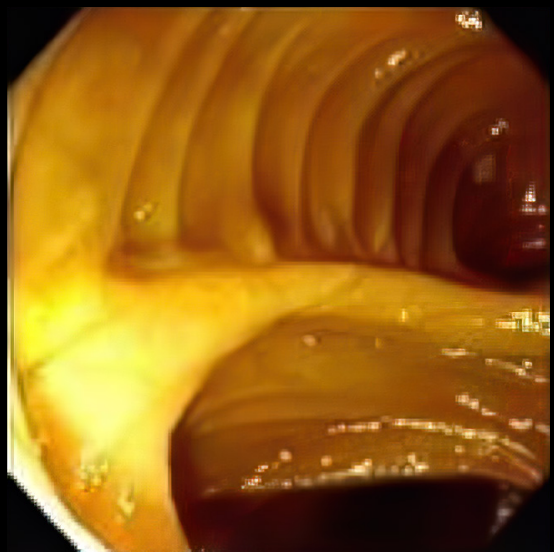
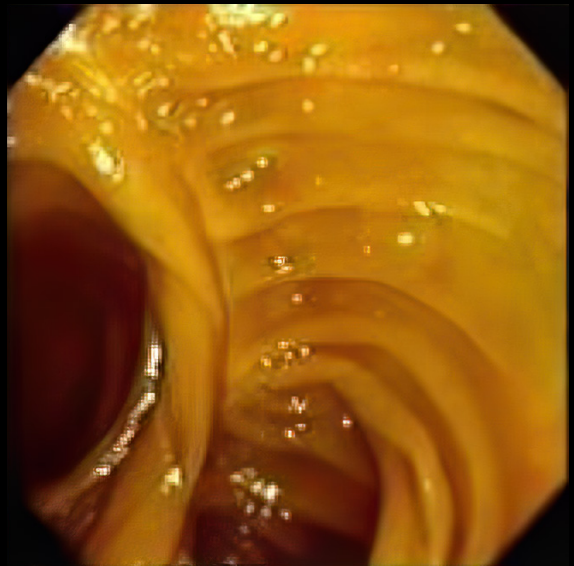
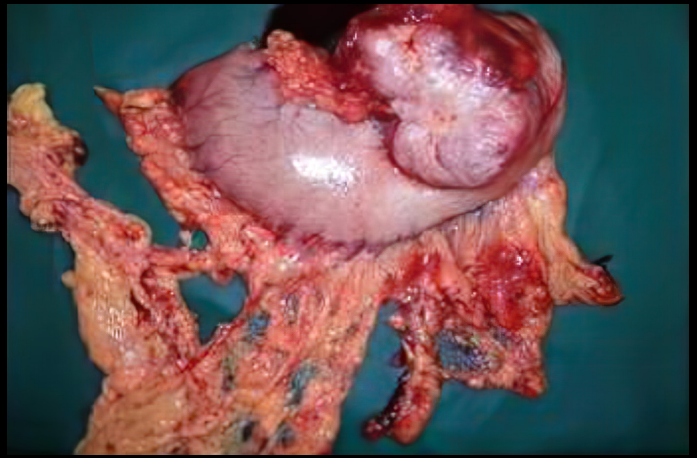
It provides better accuracy for staging and offer radical local clearance. Some studies have shown improved survival in patients with stage 2 and 3a disease.

What are the possible post-operative complications specific to the surgery?

Dumping syndrome; early and late, alkaline reflux gastritis, roux stasis syndrome, loop syndromes (efferent and afferent), post-vagotomy diarrhoea, nutritional deficiencies (iron, folate, vitamin B12 and calcium).

What can be seen in the endoscopic pictures?

The roux-loop anastomosis between the stomach and jejunum after the subtotal gastrectomy.



This is an endoscopic view of the lower oesophagus in 2 different patients.

What can be seen in picture A?

A normal gastro-oesophageal junction.

What can be seen in picture B and what is the diagnosis?

There are superficial mucosal erosions and ulcerations.

Reflux oesophagitis.

What symptoms might the patient in picture B have?

Heartburn, dysphagia and regurgitation.

The discomfort is often relieved by antacids.

The DeMeester scoring system is useful for assessing severity.

What is the pathogenesis?

The factors include: weakness of the lower oesophageal sphincter (LOS), short length of intra-abdominal segment of oesophagus, inappropriate LOS relaxations, delayed gastric emptying and hiatus hernia.

How should this condition be managed?

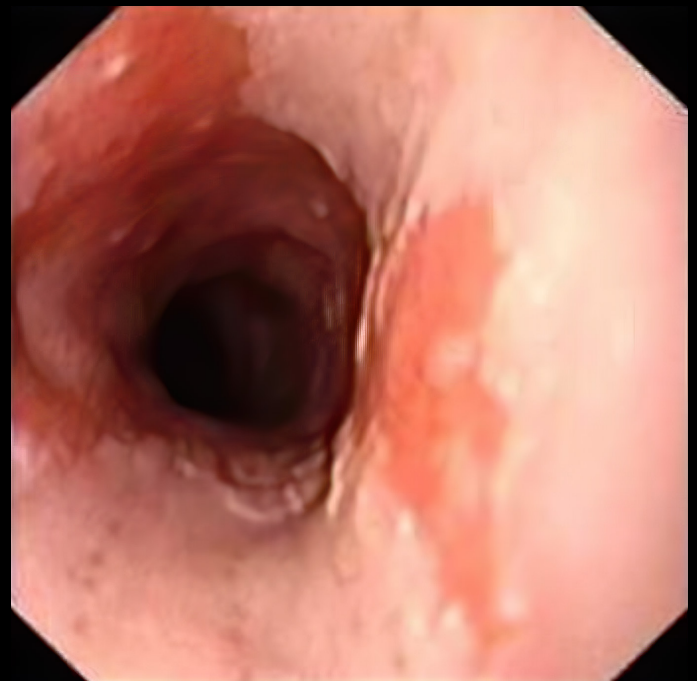
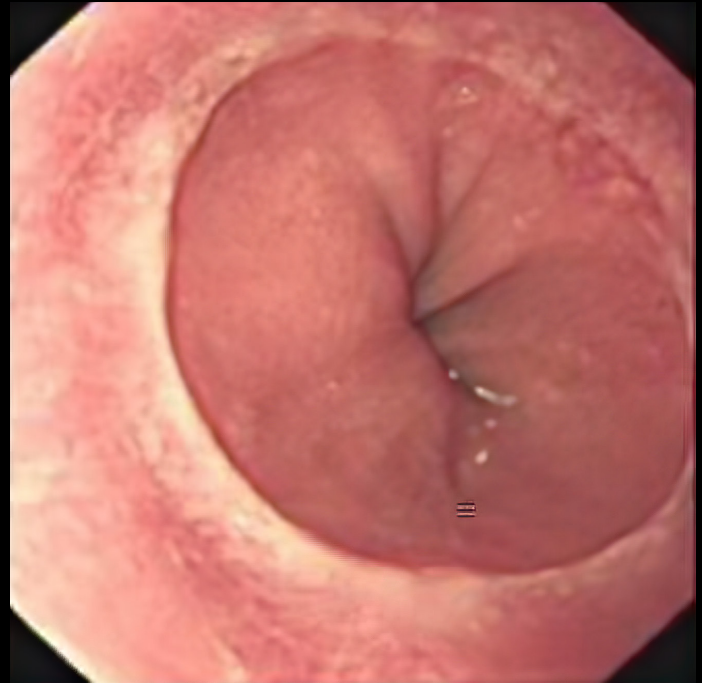
Conservative management includes the cessation of smoking and alcohol intake, avoidance of spicy food and heavy meals prior to bedtime, weight loss and elevating one's head when in bed. Medications include antacids, histamine-2-receptors antagonists and proton pump inhibitors (PPI).

What percentage of patients fail conservative therapy and how can they be managed?

10–15% will be referred for anti-reflux surgery.

It is a fundoplication procedure in which the gastric fundus is wrapped around the lower end of the oesophagus. It can be performed by laparoscopic or open surgery.

A



B

A 55-year-old male complained of left loin pain and fever. On examination, he was found to have a palpable left-sided abdominal mass.

What is the diagnosis?

Renal cell carcinoma (hypernephroma or Grawitz's tumour). It is the most common form of kidney cancer.

What is the most common histological cell type?

Seventy-five percent are adenocarcinoma and they arise from the proximal tubular cells.

How do they present?

A classic triad is often described. It includes haematuria with or without clot colic; occurring in 90% of patients, dragging discomfort in the loin and an abdominal mass.

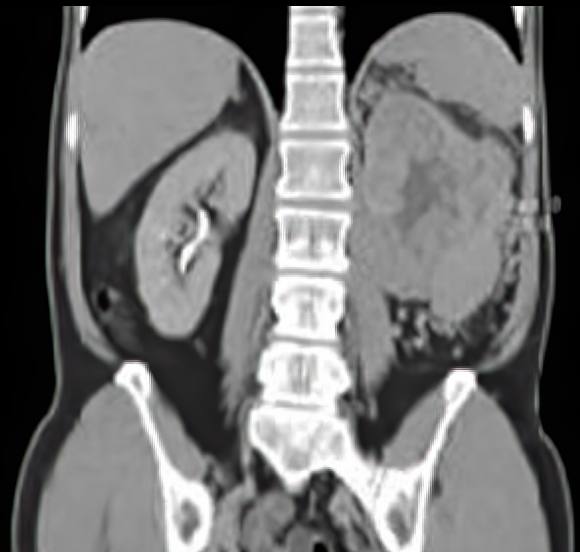
Other presentations include varicocele, persistent pyrexia or para-neoplastic syndromes.

What should you look out for during the CT scan?

Size of the mass, invasion into adjacent structures, presence of enlarged lymph nodes and involvement of the renal vein and inferior vena cava.

How can we manage this patient?

Radical surgery offers the best chance. The en bloc resection involves the removal of the kidney, upper ureters, renal vessels, adrenal glands and Gerota's fascia.



The 30-year-old man complained of a mass in his left scrotum.

What abnormality can be seen?

Left-sided varicocele.

What is the pathology?

Varicosities of the pampiniform plexus of veins, which drain the testicle. The majority (90%) of cases is left-sided and due to incompetence or absence of the valve at the termination of the left testicular vein before its insertion into the renal vein.

How may this condition present?

A dull ache in the scrotum or infertility.

What is the classical description of the condition upon examination in a standing position?

It feels like "a bag of worms."

How should the condition be managed?

Surgical intervention; ligation of the gonadal veins.

(Low tie): within the inguinal canal.

(High tie): retroperitoneal above the deep ring.

An alternative to surgery is radiological embolisation.

If this condition was of recent onset and the mass does not empty when in a supine position, what is your concern?

It may be due to venous occlusion by a renal or retroperitoneal tumour.



An intravenous urogram was performed on a 60-year-old man.

What are the two significant findings, based on the radiological investigation?

Filling defect in the right side of the bladder and delayed opacification of the right kidney.

What can be observed in the gross specimen?

There is a papillary tumour arising from mucosa of the resected bladder.

How does this condition present?

Painless haematuria (gross or microscopic) is the most common symptom.

Frequency, urgency and dysuria may also be present.

What surgery was performed?

A radical cystectomy with urinary diversion, either as a conduit or a continent reservoir.

What is an alternative to surgery?

Radical radiotherapy. It leaves the patient with a bladder and without appliance. This treatment is however associated with radiation cystitis and proctitis.

Other treatment options include topical chemotherapy and BCG therapy.



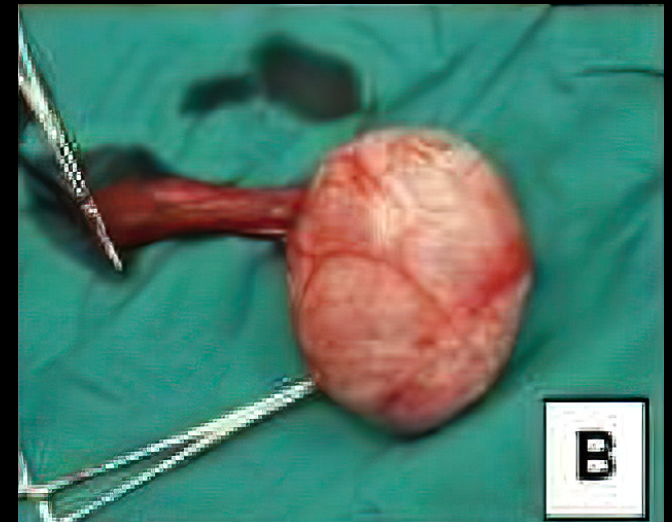
The 52-year-old man presented with increasing scrotal discomfort for 3 months.

What can be seen in picture A?
An enlarged left scrotal mass.



What surgical procedure was performed in picture B and what was the approach used?
Radical orchidectomy via the inguinal approach.

What is your diagnosis if the abnormality was found in a 20-year-old?
Seminoma (40% of tumours of the testis). Cut surface is typically homogenous and pink in colour.

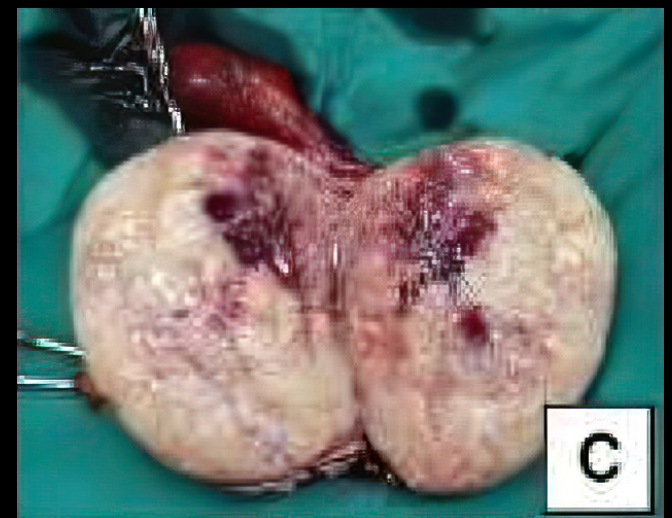


What is the lymphatic spread?
To the retro-peritoneal and intra-thoracic lymph nodes (not to the inguinal lymph nodes).

How are they staged?

- ◆ Stage 1: testis lesion, no nodal involvement.
- ◆ Stage 2: nodes below diaphragm.
- ◆ Stage 3: nodes above the diaphragm.
- ◆ Stage 4: pulmonary and hepatic metastases.

What is the prognosis?
No metastases: 5-year survival rate of 95% after orchidectomy and radiotherapy or chemotherapy.



This is a pathological specimen of the patient's lower urinary tract, including the bladder.

What is the pathology, based on the specimen?

Tri-lobar benign prostatic hypertrophy (BPH) with bladder calculus and wall hypertrophy

What investigations should be carried out?

Urinary symptom score, serum creatinine, urinalysis and culture, uroflowmetry and ultrasound scans of the bladder and kidneys.

What are the indications for treatment?

Acute or chronic retention leading to renal impairment, complications of bladder outflow obstruction (stone, infection and diverticular formation) and haemorrhaging.

What approaches can be used during surgery?

Trans-urethral (TURP), trans-vesical (TVP), retropubic (RPP) and through the perineum.



The 70-year-old man experienced pain and was unable to pass urine.

What is your finding, based on this picture?

A large mass in the lower abdomen.

A full bladder from urinary retention, which will be dull to percussion and tender to palpation, needs to be excluded before any further investigations are carried out.

How may the diagnosis be confirmed?

A trans-abdominal ultrasound can confirm a full bladder.

Catheterisation of the patient, either per-urethral or suprapubic yielding a high urine volume will be confirmation.

What are the possible causes?

Bladder outflow obstruction (stone or clot), urethral stricture, urethritis, phimosis, neurogenic, faecal impaction, post-operative pain or drugs (antihistamine, anticholinergic, tricyclic anti-depressants).



The 30-year-old man presented with haematuria.

What pathology can be seen, based on picture A? What procedure was attempted?

An enlarged left ureter.

A percutaneous nephrostomy (PCN) with an attempt to cannulate beyond the narrowing under radiological guidance.

What are its possible causes?

Causes of unilateral obstruction include luminal (sloughed papilla, stone or clots), mural (tumour and stricture), and extrinsic (retroperitoneal fibrosis).

What is the normal anatomical course of the structure?

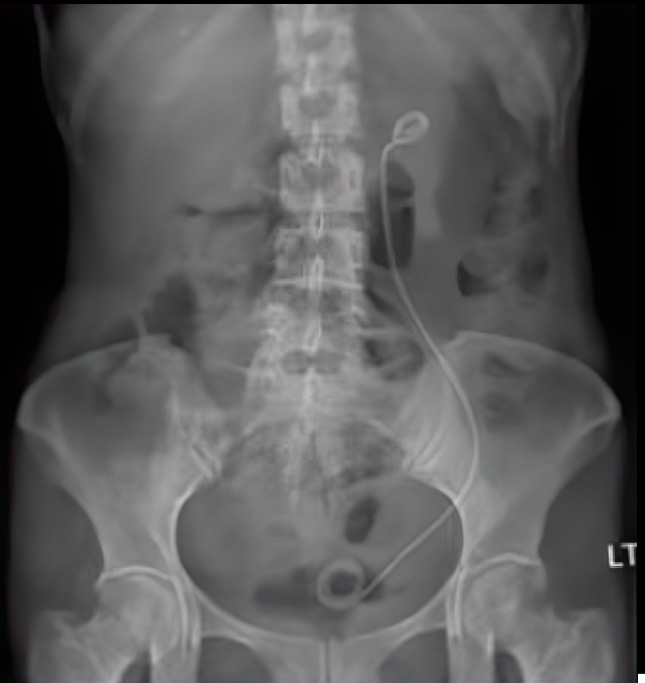
The ureter passes over the genito-femoral nerve and under the gonadal vessels, lateral to the inferior mesenteric vessels, deep to the left colic vessels, crosses the brim of pelvis, runs over the external iliac vessels and under the vas deferens (in males), turns medially at the level of the ischial spine and enters the bladder inferiolaterally.

What symptoms would the patient present?

Acute obstruction can present with pain but chronic obstruction may produce vague symptoms.

What can be seen in picture B?

A double-J ureteric stent in position across the narrowing.



The 6-week-old male infant presented with non-bilious projectile vomiting. A visible swelling can be seen on the body, moving from left to right.



What is the diagnosis and what is the definition?

Congenital pyloric stenosis.

It is defined as an idiopathic thickening and elongation of the pylorus that produces gastric outlet obstruction.

What radiological investigation has been done and what does it reveal?

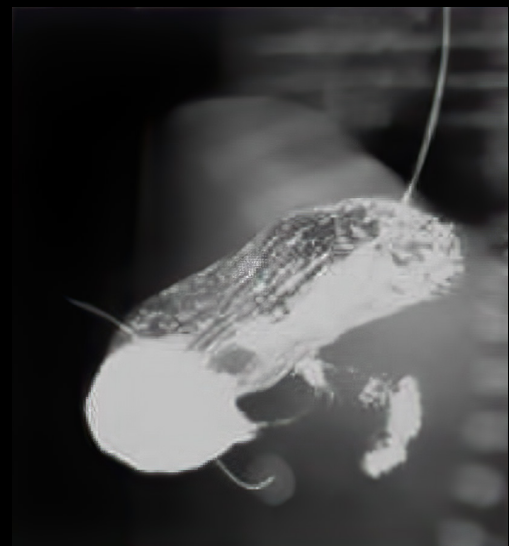
Barium meal.

It shows narrowing of the pylorus.



What other imaging procedures can be done to confirm the diagnosis?

An ultrasound can be performed to look for the pyloric diameter, wall width and pyloric channel length.



What biochemical abnormality is commonly associated with this condition?

Long-standing vomiting will result in hypokalaemic hypochloraemia metabolic alkalosis due to loss of gastric acid, leading to dehydration and electrolyte imbalance.

How can we manage this condition?

Fredet-Ramstedt pyloromyotomy.

This 1-year-old boy was born prematurely.

What abnormality can be seen?

A swelling in the left groin.

What is the diagnosis?

A left inguinal hernia. Inguinal hernias are the most common conditions requiring surgery in childhood.

How common is the condition and who are usually affected?

They are up to 8 times more common in boys and incidence is one in 50 live births. It is more common in premature babies.

What are the possible differential diagnoses?

Encysted hydrocoele of the cord, femoral hernia or undescended testis.

How would this condition be managed?

- ◆ Reducible: elective repair with high ligation of sac through a low abdominal incision.
- ◆ Incarcerated: most can be reduced with gentle direct pressure on the hernia followed by elective surgery.
- ◆ Strangulated: emergent surgery is indicated.



This is an X-Ray of a newborn baby.

What is the most obvious abnormality in the X-Ray?

A tube coiled in the oesophagus and gas in the intestines.

What other investigation can help confirm the diagnosis?

"Pouchogram" (contrast in the esophageal pouch).

What is the diagnosis and what other anomalies are associated with the condition?

Oesophageal atresia.

A tracheo-oesophageal fistula occurs in more than 90%.

Other birth defects may co-exist, commonly cardiac and occasionally in the anus, spinal column or kidneys. This is known as the VACTERL Syndrome (Vertebral column, Anorectal, Cardiac, Tracheal, Esophageal, Renal and Limbs).

What is the initial treatment?

Effort is directed toward minimising complications from aspiration (suction, upright posture and prophylactic antibiotics).

What is the definitive treatment?

Surgical correction via a thoracotomy, diversion of the fistula and end-to-end esophageal anastomosis.



The 3-year-old infant presented with an abdominal mass and haematuria.

What are the three most common causes of abdominal masses in infants?

Wilms' tumour (nephroblastoma), neuroblastomas, and liver tumour (hepatoblastoma) in order of frequency.

What is the diagnosis of this infant's condition?

Wilms' tumour.

Which features help distinguish this infant's tumour from other kinds of tumours?

It presents between 3–4 years of age, rarely extends across the midline, is smooth on palpation and does not have X-Ray calcifications.

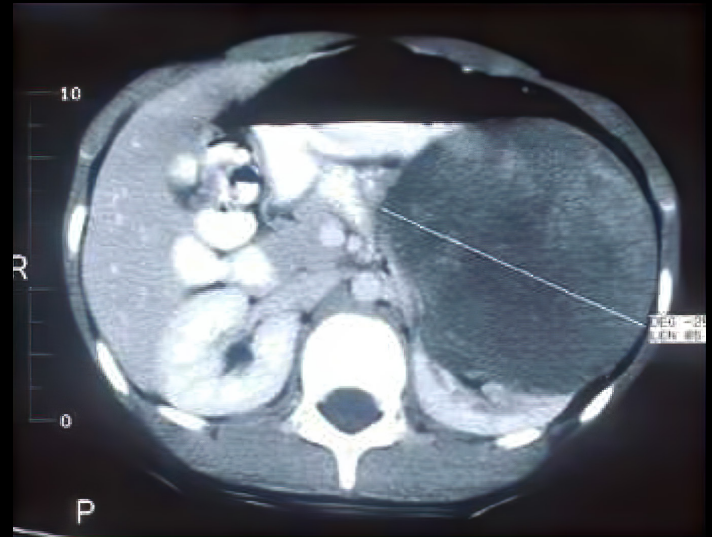
A neuroblastoma presents earlier, commonly extends across the midline, is knobby on surface palpation and has X-Ray calcifications.

What are the management options of this patient?

Radical surgery followed by chemotherapy provides the best chance of cure.

What are the best indicators of survival?

Stage and histologic subtypes; 85% of patients have favourable histology (FH); 15% have unfavourable histology (UH); overall survival is 85% for all stages.



This child was diagnosed with biliary atresia at birth.

What is this condition? How common is it?

Biliary atresia is a rare condition in newborn infants in which the extrahepatic biliary ducts are blocked or absent.

It occurs every one in 16,000 births.

What are the signs and symptoms?

Persistent jaundice, hepatomegaly, splenomegaly, ascitis, acholic stools, biliuria and other signs of portal hypertension. If unrecognised, the condition leads to liver failure but not kernicterus. The liver is still able to conjugate bilirubin and conjugated bilirubin is unable to cross the blood brain barrier.

What investigations should be carried out?

Ultrasound (rule out choledochal cyst and examine extrahepatic bile ducts), cholescintigraphy (HIDA) scan, cholangiogram and liver biopsy.

Name the definitive treatment for this child's current condition.

If the intrahepatic biliary tree is unaffected, a surgical reconstruction can be performed (Kasai hepatoportoenterostomy).

If atresia is complete, liver transplantation is the only option.



A day-old female neonate was found to be passing faeces from her introitus.

What is the clinical diagnosis?

Imperforate anus with a fistula to the vagina introitus.

What is the main factor that will determine how the infant's condition will be managed?

Whether the lesion is high or low with respect to the puborectalis sling. Low lesions are characterised by a fistula to the perineum somewhere along the midline raphe between the anus the midline meatus.

How can this condition be managed?

Colostomy before reconstruction is done for high lesions.

A pull-through procedure called posterior sagittal anorectoplasty is performed at a later date.

Low lesions can usually be managed with immediate anoplasty or dilatation and delayed repair.

A stoma is not necessary if primary repair is possible.

What are the associated anomalies?

VACTERAL association.

Cardiovascular anomalies occur in 15–20%.



This is a 2-year-old boy.

What is your diagnosis?

Cystic hygroma.

How did this condition develop?

At the 6th week of embryonic life, the primitive lymph sacs develop in the mesoblast, the principle pair being situated between the jugular and subclavian veins. Sequestration of a portion of the jugular lymph sacs accounts for the appearance.

What would you expect to find upon examination?

As a result of the intercommunication of its various compartments, the swelling is soft and partially compressible, visibly increasing in size when the patient coughs or cries. It is brilliantly translucent when illuminated.

How would you manage the condition?

Sclerosant agents have been attempted. Excision of all the lymphatic bearing tissues with meticulous conservative neck dissection is the mainstay of treatment.



This is an erect X-Ray of a newborn child with abdominal distension. He was suspected of having Hirschsprung's Disease.

Describe the two findings in the X-Ray.
Multiple fluid levels with distended bowel loops.

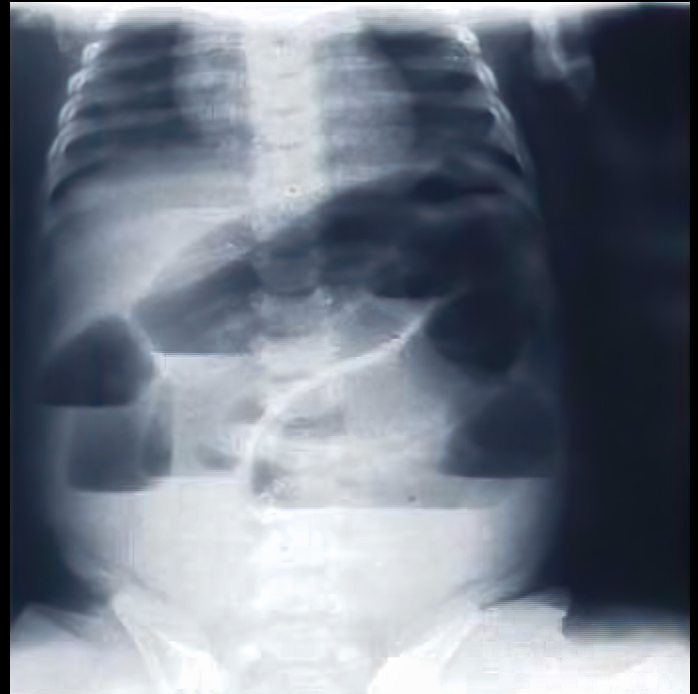
What is this disease called?
A congenital disorder characterised by a variable length of intestinal aganglionosis and presence of nerve hypertrophy of the hindgut.

How do older patients of this condition present?
They suffer chronic constipation, abdominal distension and failure to thrive.

How can we confirm diagnosis?
A rectal suction biopsy. A full thickness specimen will allow identification of the absence of ganglion cells in the Auerbach myenteric and the Meissner submucosal plexus.

What is the management?

- ◆ Initial colonic decompression to prevent enterocolitis.
- ◆ Unstable patients: diverting colostomy.
- ◆ Stable patients: reconstruction of intestinal continuity by bringing ganglionated bowel to within 1 cm of anal verge (Swenson, Duhamel and Soave procedures).



A 3-day-old neonate presented with bilious vomiting, abdominal distension and failure to pass meconium. The abdomen was distended with visible bowel loops.

What is the first pathology to exclude in this clinical scenario?

An imperforate anus.

What investigation should we perform next and why?

Obtain a plain radiograph.

The extent of gaseous distension of bowel loops suggests the level of obstruction.

Describe the findings of the X-Ray.

Dilated small bowel loops, unequal sizes of bowel loops, paucity of gas in rectum.

What are the possible differential diagnoses?

Hirschsprung's Disease, intestinal atresia, meconium ileus and malrotation.

Based on the intra-operative picture, what is your diagnosis? What is the treatment?

Intestinal atresia.

Resection and primary anastomosis.



A 2-year-old child had a 1-day history of abdominal pain, bilious vomiting, passing red current jelly per rectum, and a tender palpable mass in the right upper quadrant.

What was the radiological investigation performed?

Doppler ultrasound.

What is your diagnosis?

Intussusception.

Describe this pathological state.

It is the invagination of proximal bowel (intussusception) into the distal bowel (intussusception), swelling, vascular compromise and obstruction follow.

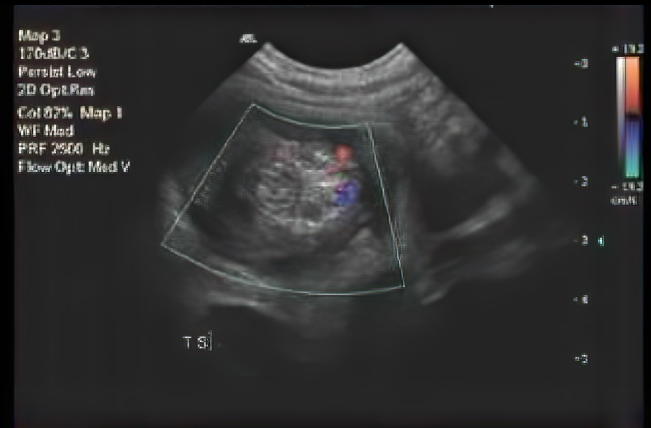
It develops mostly during the first 2 years of an infant and is believed to be due to lymphoid hyperplasia in the terminal ileum after a viral infection.

What is the treatment for this condition?

Controlled air enema reduction is successful in 90% of cases; otherwise an operative reduction is indicated.

What is the risk of recurrence?

5% from either mode of treatment.



A 12-year-old girl presented with a 1-day history of severe lower right-sided abdominal pain and vomiting. Menarche was at eleven. On examination, she was very tender in the right iliac fossa.

What are the possible differential diagnoses?

Appendicitis, mesenteric adenitis, ectopic pregnancy, volvulus of a malrotated gut and torsion of the ovaries.

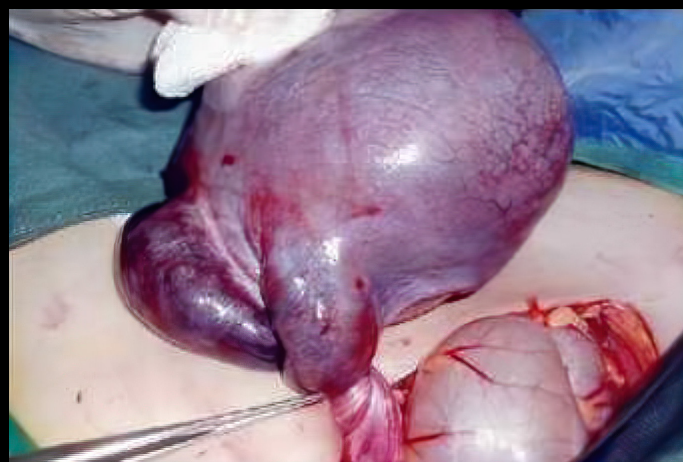
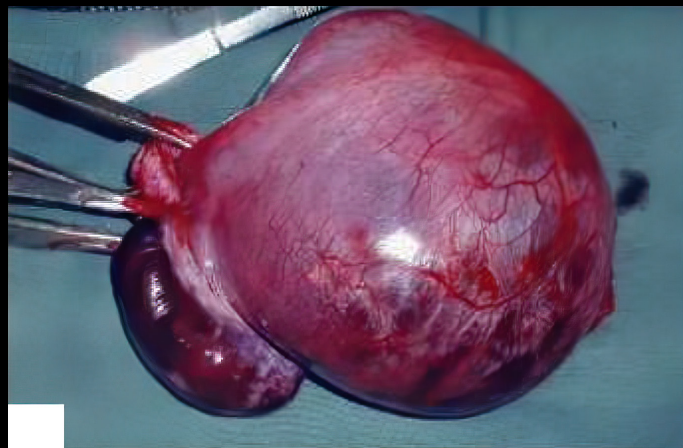
Appendicitis is the most common acute surgical emergency.

Which radiological investigations could be carried out to confirm your diagnoses?

Ultrasound and CT Scan.

Based on the intra-operative pictures, what is the most likely diagnosis?

Torsion of the ovary.



A 15-year-old boy complained of discomfort in the right hypochondrium.

What can be seen in the investigations and what is the diagnosis?

Cystic dilatation of the common bile duct. Note the non-dilated intrahepatic biliary ducts which would be present if it were a distal obstruction. Choledochal cyst.

What is this condition called?

Congenital dilations of the biliary tree. They can occur in any bile duct but more characteristically in the common hepatic and common bile duct.

How is it classified?

They can be classified into five types, as described by Todani based on the anatomical site of the cyst. This is a type 1, which is the most common whereby there is a fusiform/saccular dilatation of the CBD with normal intrahepatic ducts.

Which population group is most commonly affected?

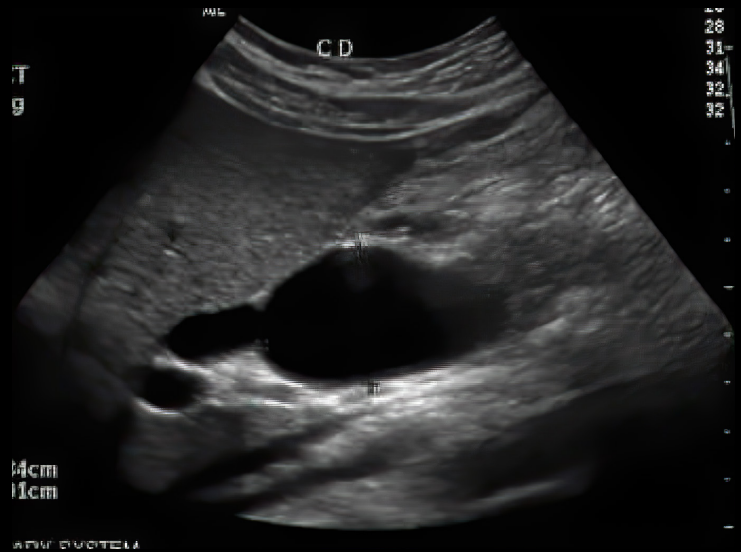
Women (3:1), Asian descent and 60% diagnosed before 10 years of age.

What does this condition predispose the patient to?

Jaundice, choledocholithiasis, cholangitis, portal hypertension and cholangiocarcinoma.

How should this condition be managed?

Surgical resection with biliary tree reconstruction.



This patient sustained an injury to the left forearm after a fall.

What is the diagnosis?

Monteggia fracture-dislocation; fracture proximal ulna and dislocated radial head.

What kind of nerve injury may be associated with this condition?

Radial nerve palsy or posterior interosseous nerve palsy.

What is the treatment?

Open reduction and internal fixation of ulna (plating) and reduction of radial head.

What functional disability can arise from inadequate reduction of the fracture?

Limitation of pronation and supination; limitation of forearm rotation and limitation of elbow movement.



A 7-year-old child injured his elbow following a fall. He complained of severe pain in the forearm 2 hours later.

What is the radiological diagnosis in picture A?

Displaced supracondylar fracture humerus.

What is the cause of the pain?

An arterial injury or compartment syndrome.

What complications may arise from this injury?

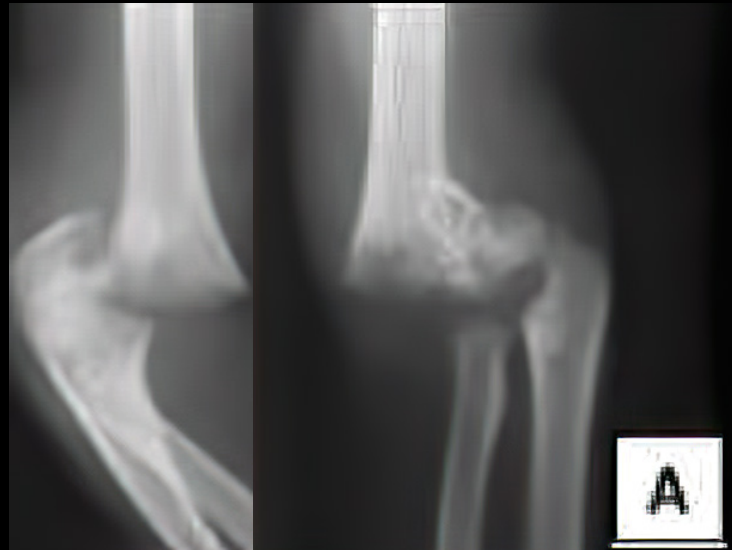
Volkmann's ischaemia (acute ischaemia of the muscles of the forearm), median nerve palsy, ulnar nerve palsy or brachial artery thrombosis.

How can we manage the injury?

- ◆ Non-displaced: conservative management with splinting.
- ◆ Displaced: percutaneous pinning and casting.
- ◆ Significant swelling and neurovascular compromise require urgent reduction and close observation.

What kind of complication of the condition can be seen in another child, shown in picture B?

Cubitus varus ("Gunstock deformity") due to inadequate treatment.



This patient presented with a painful shoulder after sustaining an injury when playing soccer.

What is the diagnosis?

Anterior dislocation of right shoulder.

Over 95% of shoulder dislocation cases are anterior.

Posterior dislocations are occasionally due to electrocution or seizure and may be caused by strength imbalance of the rotator cuff muscles.

Inferior dislocation is the least likely form, occurring in less than 1% of all shoulder dislocation cases.

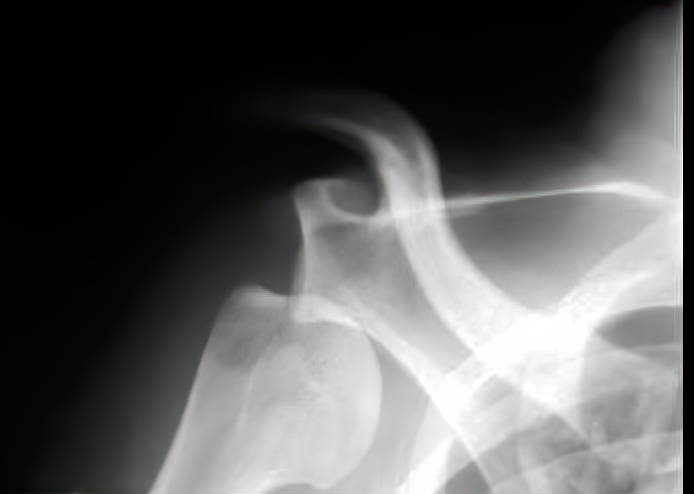
What pathologies or complications are associated with this injury?

Hill Sach's lesion; Bankart's lesion; lax capsule and nerve injury or vascular injury.

How would you manage this patient?

Manipulation and reduction (M and R) and splintage in an arm sling.

Kocher's method is a most popular method of reducing shoulder dislocation and should be done only under anaesthesia. Traction is applied on the arm and it is abducted. It is then externally rotated and then the arm is adducted, after which it is internally rotated.



A 65-year-old female slipped and fell at her home. She was unable to stand.

What is the diagnosis, based on picture A?
Fracture of the neck of the right femur.

How may this injury be classified?

Garden Classification:

- ◆ Type 1 is a stable fracture with impaction in valgus.
- ◆ Type 2 is complete but non-displaced.
- ◆ Type 3 is displaced (often rotated and angulated) with varus displacement but still has some contact between the two fragments.
- ◆ Type 4 is completely displaced and there is no contact between the fracture fragments.

Which underlying pathology is this injury most commonly associated with?
Osteoporosis.

What surgery was performed in picture B?
Moore's Hemiarthroplasty.

What can be seen in picture C and what complications may arise after the operation?
The prosthesis has dislocated.
Other complications include infection, loosening, and protusio acetabuli.



A



B



C

A 70-year-old female slipped at home and fell on the outstretched hand.

Describe the radiological features seen in the pictures.

Intra-articular fracture of distal radius with dorsal displacement and comminution (Colles' fracture).

It is named after Abraham Colles, an Irish surgeon who first described this in 1814 before the advent of X-Rays.

What complications are usually associated with this kind of injury?

Rupture of the Extensor Pollicis Longus (EPL), frozen shoulder, carpal tunnel syndrome, stiffness of the wrist, osteoarthritis and distal radio-ulnar joint instability.

How can we manage these fractures?

Treatment depends on the severity of the fracture.

- ◆ An undisplaced fracture may be treated with a cast alone. The cast is applied with the distal fragment in ulnar deviation.
- ◆ A fracture with mild angulation and displacement may require closed reduction.
- ◆ Significant angulation and deformity may require an open reduction and internal fixation or external fixation.



This man has persistent weakness of his right hand following a laceration over the volar aspect of the wrist 3 years ago.

Which clinical features are present?

A claw hand and wasting of the intrinsic muscles.

What is the pathophysiology?

Ulnar nerve injury.

What other non-traumatic causes may lead to this condition?

Brachial plexus abnormalities, thoracic outlet syndrome, Guyon's Tunnel Syndrome, infections, tumours, diabetes, hypothyroidism, rheumatism, and alcoholism.

What investigation can be done to confirm the diagnosis?

Nerve conduction test.

