INTRODUCTION

This subject is covered in Chapters 1 and 2.

The aim of these chapters is to emphasise the major features which separate life-threatening conditions from those which demand less immediate action. The major discriminant clinical features and their significance are shown, and the appropriate investigations indicated.

Almost any condition may reflect as abdominal pain, whether the offending organ is abdominal or not. The diagnosis is particularly difficult when the patient is a child or elderly person, and when the clinical picture is indistinct. Conditions which may provoke the symptom include myocardial infarction, lobar pneumonia, diabetic ketoacidosis, sickle cell disease and a variety of other rarer differential diagnoses outside the scope of this text.

Case history

A 40-year-old vagrant who is a regular attender at the local A & E department is brought into hospital with acute abdominal pain of 2 hours duration. He is a known alcoholic with previous admissions for head injuries and haematemesis. The patient is lying flat, unwilling to move and crying out in pain. The pain is constant, unremitting and severe and the patient has vomited twice with no haematemesis. There are no symptoms referable to the urinary tract.

On examination the patient is normotensive, in sinus rhythm 90 per minute and a pyrexial. He has a tense rigid abdomen, with tenderness on palpation and release. There are no bowel sounds and no organomegaly, distension or ascites. Rectal examination is normal.

1. What is the immediate differential diagnosis and what does the doctor do next?

The diagnosis of generalized peritonitis is made, due to pancreatitis or perforated duodenal ulcer. The patient is kept 'nil by mouth', and an intravenous fluid regime is started.

2. What is the major discriminant investigation, and what other investigations are important and why?

The casualty officer notes a mildly raised amylase and thereby excludes a diagnosis of pancreatitis. Normal FBC, WBC, liver function and glucose are noted. Blood gases are normal and an erect CXR reveals subdiaphragmatic gas.

3. What is the diagnosis and how is the patient further managed?

An urgent surgical referral is made and the duty surgical registrar arranges urgent laparotomy, at which a large perforated duodenal ulcer is oversewn.
1. THE ACUTE ABDOMEN

1. INITIAL ASSESSMENT

Alert and oriented
Normotensive

HAEMODYNAMICALLY
STABLE

Drowsiness, sweating, pallor
Tachycardia, hypotension
Low urine output
May be pyrexia

HYPOTENSIVE SHOCK
Due to sepsis or hypovolaemia
(cardiogenic shock excluded)

1. IMMEDIATE RESUSCITATION
   Oxygen by mask, i.v. access, urinary
   catheter, and nasogastric tube
2. I.V. VOLUME REPLACEMENT
   with colloid/crystalloid (not dextrose)
   titrated against blood pressure, CVP
   and urine output
3. FBC, U&E, G&S and cross-match
   Arterial blood gases
4. Adequate analgesia after
   management decisions made
5. Blood cultures and broad spectrum
   antibiotic cover if septic shock
   suspected

SUCCESSFUL
RESUSCITATION

Make working diagnosis and management plan
The correct pathological diagnosis is not necessary at this stage

CHARACTER OF PAIN

Periodic 'gripping' pain
poorly localized in abdomen

Patient doubled up
Abdomen may be tender,
but no true guarding or
rebound

COLIC

Pain made worse by
movement or coughing

Patient lies still
Abdominal guarding
Release/rebound tenderness
Absent bowel sounds

PERITONITIS/
PERITONEAL IRRITATION

'OTHERS'

SUCCESSFUL
RESUSCITATION

FAILURE OF
RESUSCITATION

Leaking/Ruptured
Abdominal Aortic
Aneurysm
Ruptured Ectopic
Pregnancy

IMMEDIATE LAPAROTOMY

LEAKING/ruptured
ABDOMINAL AORTIC
ANEURYSM
RUPTURED ECTOPIC
PREGNANCY
1. THE ACUTE ABDOMEN

1.2 PERITONITIS

GENERALIZED PERITONITIS
Continued resuscitation
Nil by mouth, intravenous fluids
(May pass nasogastric tube)

LOCALIZED PERITONITIS
LOCALIZED AREA OF PERITONEAL IRRITATION

SERUM AMYLASE PLUS ERECT CHEST X-RAY, ABDOMINAL X-RAY

Normal or slightly raised amylase
May be free gas on X-ray, best seen under the diaphragm

Suggests:

CAUSES

PERFORATED VISCUS
LAPAROTOMY

Majority of cases
Perforation in:
- Duodenal ulcer
- Gastric ulcer
- Gastric carcinoma
- Colonic diverticulum
- Inflamed appendix

Other causes
Mesenteric infarction
Perforation in:
- Ischaemic small bowel
- Sigmoid volvulus
- Caecal volvulus
- Gallbladder

Rarer causes
- Crohn's disease
- Perforated Meckel's diverticulum

ACUTE PANCREATITIS

Management aims:

1. Continued resuscitation. Risk factors include: PO2 < 8 kPa, WBC > 15 x 10^9/l, 
   urea > 16, calcium < 2, glucose > 10 mmol/l, albumin < 32 g/l, AST > 
   200 iu/l, LDH > 600 iu/l
2. Support cardiac, respiratory and renal function
   Maintain electrolyte balance and nutrition - this may involve inotropes,
   ventilation and parenteral fluids, electrolytes and feeding regimens
3. Establish cause in the stable patient
   ULTRASOUND SCAN

GALLSTONE
No evidence of gallstone

Majority of cases
Rarer differential diagnosis
- Toxic drugs
- Infective (mumps)
- Pancreas divisum

Idiopathic
Alcoholic

4. Operation usually for complications,
   (CT scan is investigation of choice)
   - Pseudocyst, abscess, necrosis
1. THE ACUTE ABDOMEN

1.3 LOCALIZED PERITONITIS

Gynaecological symptoms predominate
Consider clinical evidence for gynaecological
sepsis and investigate appropriately

Gastrointestinal symptoms predominate
Nausea, vomiting, ‘liver tenderness’
Diarrhoea, constipation

Right upper quadrant pain
referred to shoulder tip,
worse on inspiration
May be tender local mass

Central abdominal pain
moving to the right iliac fossa
May be tender local mass

Left iliac fossa pain
May be tender local mass

ULTRASOUND
Thickened gallbladder wall;
gallstones often seen

Routine blood tests and
plain X-rays unhelpful

ACUTE CHOLECYSTITIS
‘Nil by mouth’
Intravenous fluids
Antibiotics
(May pass nasogastric tube)

Immediate or delayed
operation after resolution

Resection
Failure to resolve or deterioration
(consider acalculous cholecystitis
in the ITU patient after burns,
sepsis, trauma)

Urgent cholecystectomy

Appendicectomy
By open incision
or laparoscopy

Clinical picture complicated
by gynaecological symptoms -
LAPAROSCOPY

ACUTE APPENDICITIS

Inflamed appendix
Septic fluid

ACUTE APPENDICITIS

Normal appendix

Likely causes:
- Perforated peptic ulcer
- Mesenteric adenitis
- Perforated caecal carcinoma
- Crohn’s disease

Gynaecological causes

Likely causes:
- Tubo-ovarian sepsis
- Ruptured ectopic pregnancy
- Ruptured ovarian cyst

ACUTE DIVERTICULITIS

‘Nil by mouth’
Intravenous fluids
Antibiotics
(May pass nasogastric tube)

Resolution
Failure to resolve or deterioration
suggests perforation
or abscess formation

Laparotomy
1. THE ACUTE ABDOMEN

Upper abdominal (foregut) colic and nausea
Intolerance to fatty food
May be previous history of gallstone disease

BILIARY COLIC

Central (midgut) or lower (hindgut) colicky pain
Vomiting/anorexia/constipation
Abdominal distension
Tympanic abdomen
Tinkling bowel sounds

INTESTINAL COLIC

Radiating loin to groin and testis
Urgency and frequency of micturition
Haematuria
May be previous history of stone disease

URETERIC COLIC

Central abdominal pain
Vomiting early, followed by constipation
Proximal obstruction - minimal distension
Distal obstruction - greater distension
Dilated small bowel on X-ray
Minimal gas distal to obstruction

LAPAROTOMY

Majority of cases
Adhesions - require lysis
Hernias - reduction & repair

Other common causes
Crohn's disease - resection
(often long obstructive history)
Intussusception - reduction
Obstructing bolus - enterotomy

Rarer differential diagnosis
Mesenteric vascular disease
- resection of ischaemic bowel
Gallstone ileus - enterotomy

In all cases the aims of laparotomy are to:
1. Decompress dilated bowel
2. Reduce/release the obstruction
3. Resect ischaemic bowel and allow primary anastomosis
1. THE ACUTE ABDOMEN

**LARGE BOWEL OBSTRUCTION**

- 'Nil by mouth'
  - Nasogastric tube
  - Intravenous fluids

**PLAIN X-RAY**

- Faecal shadow
- Dilated large bowel on X-ray
- Sigmoid volvulus

**CONSTIPATION**

- Faeces palpable on rectal examination, Barium enema normal

**RECTAL EXAMINATION, SIGMOIDOSCOPY & BIOPSY**

**DOUBLE-CONTRAST BARIUM ENEMA**

- Faeces palpable
- Diverticular stricture
- Diverticulum and diverticula
- Adenocarcinoma
- Benign fibrosis and chronic inflammation

**RADIOLOGY**

- Irregular structure, e.g. 'apple-core' lesion
- Diverticular stricture

**ENDOSCOPY**

- Polyloid, stenosing, ulcerated mass lesion
- Adenomas and cancers may be multiple

**BIOPSY**

- Adenocarcinoma
- Benign fibrosis and chronic inflammation

**COLONIC CARCINOMA**

**DIVERTICULAR STRUCTURE**

**SIGMOID VOLVULUS**

**NO OBSTRUCTING LESION**

- PSEUDO-OBSTRUCTION
  - May be general medical, pharmacological or metabolic causes

**OBSTRUCTING LESION**

**COLONOSCOPY & BIOPSY**

- Resolves: Volvulus untwists during sigmoidoscopy with the passage of flatus/faeces
- No resolution

**LAPAROTOMY**

On next available operating list, or immediately if signs of caecal tenderness occur - indicates peritoneal irritation and impending perforation

The aims of laparotomy are to:
1. Decompress dilated bowel
2. Resect malignant or non-viable bowel
3. Reconstruct by primary or staged anastomosis if possible
1. THE ACUTE ABDOMEN

1.6 BILIARY-COLIC

ULTRASOUND SCAN of liver and biliary tree

- Stones in gallbladder
  - Only 10% of these stones are opaque on X-ray
  - Liver enzymes may be normal
  - "Nil by mouth"
  - Intravenous fluids
  - Nasogastric tube
  - Analgesia

- No stones
  - Dilated bile ducts

- Normal
  - Myalgia, arthralgia
  - Fever
  - Tender right upper quadrant
  - Lymphadenopathy
  - Splenomegaly

- Jaundice - Fever - Rigors
  - CHARCOT'S TRIAD
  - Acute presentation of obstructed biliary tree disease complicated by infection
  - Liver enzymes elevated (alkaline phosphatase more than transaminases)
  - Clotting studies

- Liver enzymes elevated (transaminases greater than alkaline phosphatase)
  - Viral serology positive for infecting organism

GALLBLADDER STONES

- 'Nil by mouth'
- Intravenous fluids
- Nasogastric tube
- Analgesia

ASCENDING CHOLANGITIS, BILIARY TREE OBSTRUCTION

- Continue resuscitation
- Correct coagulation
- Blood cultures and broad spectrum antibiotic cover

- Resolution
- Elective decompression of biliary tree
- Elective cholecystectomy
- Acute cholecystectomy

- Failure to resolve or deterioration
- Consider empyema, mucocoele, fistula, perforation

VIRAL HEPATITIS

- Resuscitate and supportive care by physicians

- Resolution
- Failure to resolve or deterioration
- Emergency decompression of biliary tree

ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY OR OPEN DECOMPRESSION

- 3:2
1.7 URETERIC COLIC

URINE MICROSCOPY
(shows microscopic haematuria)

PLAIN ABDOMINAL FILM

Obvious stone, evidence of:
- infection (UTI/pyrexia, tender loin) and
- obstruction (stone > 0.5 cm, irregular
  shape, palpable kidney)

Urgent

Obvious ureteric stone
No obstruction and infection

Elective

NORMAL ABDOMINAL FILM

Elective

PLAIN ABDOMINAL FILM

Elective

INTRAVENOUS UROGRAPHY + ULTRASOUND SCAN

Obvious stone
90% of stones are radio-opaque

Clinical features of
stone disease
(See Ch. 17)

No stone
Filling defect or stenosis with
delayed excretion of contrast

No filling defect

PELVIC/URETERIC
CALCULUS

URETERIC STRicture

Evidence of infection AND obstruction
(hydronephrosis on USS/IVU)

Risk of irreversible renal damage
Continued resuscitation

URGENT PERCUTANEOUS NEPHROSTOMY
Correct obstructing pathology when patient stable

No evidence of
infection AND obstruction

Stone disease
Analgesia
Admit

Ureteric stricture
Endoscopic ureterostomy

TRANSITIONAL CELL CARCINOMA OF THE URETER
Sloughed renal papilla

Rarer differential diagnosis

PELVIC/URETERIC JUNCTION
OBSTRUCTION

Pyeloplasty

The management of stone disease is discussed in Chapter 17
1. THE ACUTE ABDOMEN

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**ECTOPIC PREGNANCY**
- History of amenorrhoea
- Positive pregnancy test

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**HYSTERECTION**
- Partial or complete resection of ovary

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**EROSION OF THE UTERINE WALL**

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**URETHERAL STRicture**

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**URINARy TRACT INFECTION**
- Symptoms resolve with antibiotic course
- Recurrent symptoms (despite treatment)
  - Male patients all investigated further

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**ABDOMINAL X-RAY**

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**CYSTOSCOPY + BIOPSY**
- Causes include:
  - Bladder cancer
  - Bladder stone
  - Chronic infection
  - Urethral stricture
  - See Section B

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**EXPANDING AORTIC ANEURYSM**

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**RETENTION OF URINE**

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**URINARY TRACT INFECTION**

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**SPECIAL CASE**
- Aged > 60 years
- Extreme pain in any region of the abdomen, extending to the back
- Palpable, expansile, tender abdominal mass
- Bruits over pulses

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**Differential diagnosis:**
- Myocardial infarction
- Lobar pneumonia
- Diabetic ketoacidosis
- Sickle cell disease
- Porphyria

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**SPECIAL CASE**
- Inability to pass urine
- Palpable bladder

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**Urinary frequency, 'burning' and 'stinging' on micturition**
- No retention

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**TORSION OF, OR HaeMORRAGE INTO, OVARIAN CYST**
- Partial or complete resection of ovary

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**ECTOPIC PREGNANCY**
- Remove at laparoscopy or laparotomy

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**Gynaecological symptoms predominate:**
- May be vaginal bleeding

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**History of painful or heavy periods, dyspareunia**
- Negative pregnancy test

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**History of amenorrhoea**
- Positive pregnancy test