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Abdominal Pain

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Introduction

Abdominal pain is a common presenting problem in primary care or A&E. Symptoms may be acute (an 'acute abdomen'), subacute or chronic. There are many possible causes - often it is not possible to reach a definite diagnosis in primary care. What is more important is to assess how ill the patient is, to identify any life-threatening problems or 'red flags' and to decide the next step in management - eg, whether to monitor, investigate or refer and how urgently.^[1]

This article gives an overview on assessment of patients with abdominal pain, lists possible causes (by region) and lastly, discusses causes of abdominal pain in particular groups (the elderly, immunocompromised and athletes).

Urgent or easily missed causes of acute abdominal pain

There are numerous causes of acute abdominal pain - this list points out some of the most urgent or the more easily missed causes to keep in mind:

Medical

- Myocardial infarction.
- Diabetic ketoacidosis.
- Lower lobe pneumonia.
- Sickle cell crisis.
- Hypercalcaemia.
- Hereditary angio-oedema.

Gynaecological/obstetric

- Ectopic pregnancy - may present with nonspecific symptoms - eg, syncope, urinary symptoms, diarrhoea or shoulder tip pain or without 'missed period'.
- Placental abruption, heavy vaginal bleeding and other pregnancy complications.
- Ovarian hyperstimulation syndrome (during assisted conception).^[2]

Surgical

- Aortic aneurysm and aortic dissection - may present with abdominal pain, back pain or renal colic.
- Bowel ischaemia (eg, mesenteric infarction or volvulus) - typically presents with pain out of proportion to the clinical signs.
- Generalised peritonitis.
- Acute bowel obstruction.
- Testicular torsion - pain may be referred to the abdomen.
- Urinary obstruction - an enlarged bladder can be missed if not percussed.
- Abscess (subphrenic, pelvic or psoas abscess) - pain and fever but may have few localising signs.

Assessment of patients with abdominal pain

- **How ill is the patient?**
 - **For acute abdominal pain:**^[1]
 - Use the 'ABCD' approach and always check - and document - vital signs.
 - Subtle changes in vital signs may indicate serious illness - eg, unexplained tachycardia can indicate a ruptured ectopic pregnancy.
 - If the patient is shocked, give intravenous fluids/colloid until the radial pulse is palpable and get senior help.
 - Give analgesia if needed: intravenous (IV) opiates may be given and do not affect clinical assessment; titrate small doses and monitor blood pressure.
 - Aim to identify urgent problems (see under 'Urgent or easily missed causes of acute abdominal pain', above).

Always consider ectopic pregnancy in any woman of childbearing age.

- **For subacute or chronic abdominal pain** - look for 'red flags' and other alerting features such as:
 - Age >60 years.
 - Relevant family history - ovarian or bowel cancer, familial polyposis coli.
 - History suggesting gastrointestinal (GI) bleed.
 - Unexplained weight loss (or poor growth in children).
 - Repeated consultations for the same problem; change in pattern of consultation ('beware the patient with thin notes').
 - Anaemia.
 - Masses or organomegaly.
- **History and examination ± initial investigations** (see 'History' and 'Examination' sections, below).
- **Decide initial management:**
 - Have a low threshold for admission/referral of young children, the elderly, the immunocompromised and those with learning difficulties - these groups are more likely to present late or without classical symptoms and signs and may deteriorate quickly.
 - Symptoms and signs may evolve over time - reassessment is an important tool.
 - If the patient is discharged, ensure they know when to seek further help.

History

- Location, nature and severity of pain:
 - Colicky (waves of pain): suggests obstructed viscus - eg, intestinal obstruction, renal colic, biliary colic.
 - Tearing pain: suggests aortic dissection or rupture.
 - Constant sharp pain, worse on movement or coughing: suggests peritonitis.
 - Constant dull ache: suggests inflammation - eg, appendicitis, diverticulitis.
 - The pattern of pain may change over time - eg, early appendicitis, mesenteric ischaemia or bowel strangulation may begin as colicky pain and then become constant as the condition progresses; pain may localise as the parietal peritoneum becomes involved.
- Any radiation or referred pain?
 - Aortic aneurysm, renal and pancreatic pain: may radiate to the back.
 - Renal colic: may radiate to the groin.
 - Diaphragmatic irritation: may cause shoulder tip pain.
 - Gallbladder pain: may radiate to the scapula.
- Onset of pain:
 - Very sudden onset suggests rupture or torsion of an organ (eg, ruptured aneurysm, ectopic pregnancy, torsion of testis or ovary).
- Other symptoms:
 - Systemic symptoms: fever, night sweats, weight loss.
 - Vomiting: may be due to severe pain (eg, testicular torsion), gastroenteritis or obstruction.
 - Bleeding: upper GI (haematemesis or melaena) or lower GI (rectal bleed).
 - Constipation or diarrhoea.
 - Vaginal bleeding or discharge: consider gynaecological/obstetric causes.
- Past medical history:
 - Note any similar episodes.
 - Note previous illness or surgery.
 - Note Medication/allergies/last meal.

Examination

See separate [Abdominal Examination](#) article.

Investigations

Initial investigations in primary care

- A urine pregnancy test should be offered to all women of childbearing age who have abdominal pain (to help rule out ectopic pregnancy).^[3] Serial human beta-chorionic gonadotrophin (beta-hCG) levels are no longer recommended; if the GP suspects ectopic pregnancy, the woman should be referred for urgent hospital assessment, even if the urine test is negative.^[4]
- Urinalysis ± microscopy and culture.
- Depending on the clinical scenario, consider:
 - Blood tests:
 - FBC (for occult bleeding).
 - Erythrocyte sedimentation rate (ESR)/C-reactive protein (CRP) - for inflammatory bowel disease.
 - Coeliac antibodies (anti-endomysial antibody or tissue transglutaminase test).
 - U&E, glucose, LFT, amylase, calcium.
 - ECG.
 - Ultrasound of the abdomen and pelvis.

Initial investigation in A&E

- Urine pregnancy test.
- Urinalysis ± microscopy and culture.
- Depending on the clinical scenario, consider:
 - ECG.
 - Blood tests:
 - FBC.
 - Group/crossmatch blood.
 - ESR/CRP
 - U&E, glucose, amylase, calcium.
 - Erect CXR (looking for air under the diaphragm).
 - Plain abdominal X-ray (or erect and supine abdominal X-rays if an obstruction is suspected) - may show up obstruction, volvulus, ischaemia, severe constipation.
 - Ultrasound or CT scans.

Further investigations

- Upper or lower GI endoscopy.
- Ultrasound or CT scans targeted at suspected pathology.
- Diagnostic laparoscopy.
- Laparotomy.

Aetiology

Causes of abdominal pain by regions^[5, 6, 7]

Diffuse pain or variable locations:

- **Surgical/gynaecological** - peritonitis, aortic aneurysm or dissection, intestinal obstruction, adhesions, ovarian cancer, ovarian hyperstimulation syndrome
- **Medical** - septicaemia, diabetic ketoacidosis, sickle cell crisis, hypercalcaemia, Hensch-Schönlein purpura, coeliac disease, Crohn's disease, ascites, constipation, porphyria, familial Mediterranean fever, hereditary angio-oedema.
- **Infections** - gastroenteritis, giardiasis, intestinal tuberculosis, typhoid fever, yersinial enterocolitis.
- **Toxins** - opiate withdrawal, methanol poisoning, heavy metal poisoning, black widow spider bite, scorpion sting.
- **Abdominal wall** - hernias, muscle strain or injury, shingles, spinal pain.
- **Others** - lactose intolerance, specific food allergy, abdominal migraine, somatisation, Münchhausen's syndrome, childhood abuse or sexual abuse,^[8] fictitious pain.

Right subcostal:

- Cardiac (see epigastric region).
- Lung - lower lobe pneumonia, pulmonary embolus, pleurisy.
- Liver - gallstones, cholecystitis, cholangitis, pre-eclampsia and HELLP syndrome (= Haemolysis, EL (elevated liver) enzymes, LP (low platelet) count), hepatitis, hepatic congestion, liver abscess/cyst.
- Duodenal ulcer.
- Retrocaecal appendicitis (rarely)

Epigastric:

- Cardiac - myocardial infarction, angina, pericarditis.
- Pre-eclampsia.
- Aortic aneurysm or dissection.
- Mesenteric ischaemia or infarction.
- Gastric - oesophagitis, gastritis, peptic ulcer, oesophageal or gastric cancer.
- Pancreas - pancreatitis, pancreatic cyst or tumour.

Left subcostal:

- Cardiac (see 'Epigastric' region).
- Lung - pneumonia, pleurisy, pulmonary embolus.
- Spleen - rupture, abscess, acute splenomegaly.
- Gastric (see 'Epigastric' region).

Right flank and loin:

- Aortic aneurysm or dissection.
- Renal - stones, pyelonephritis, tumours.
- Retrocaecal appendicitis.
- Diverticulitis.
- Ovarian pathology.
- Other problems - gallstones (rarely), retroperitoneal haemorrhage, mesenteric ischaemia.

Central abdomen:

- Appendicitis.
- Mesenteric adenitis.
- Meckel's diverticulitis.
- Small bowel - mesenteric ischaemia or infarction, small bowel obstruction, Crohn's disease.
- Pancreas (see 'Epigastric' region).
- Lymph nodes - lymphoma or metastases.

Left flank and loin:

- Aortic aneurysm or dissection.
- Renal - stones, pyelonephritis, tumours.
- Diverticulitis.
- Ovarian pathology.
- Other problems - pancreatitis (rarely), retroperitoneal haemorrhage, mesenteric ischaemia.

Right iliac fossa:

- Appendicitis.
- Mesenteric adenitis.
- Meckel's diverticulitis.
- Ectopic pregnancy and other gynaecological causes (see 'Left iliac fossa').
- Testicular torsion.
- Urinary tract - infection or stones.
- Colon (see 'Left iliac fossa').
- Hernia - inguinal or femoral.
- Caecal tumours.

Lower abdomen:

- Urinary tract - distended bladder, infection.
- Colon (see 'Left iliac fossa').
- Gynaecological (see 'Left iliac fossa').
- Obstetric - miscarriage, labour, placental abruption.

Left iliac fossa:

- Gynaecological - ectopic pregnancy, pelvic inflammatory disease, ovarian torsion, ovarian cyst or tumour, ovulation pain, endometriosis.
- Testicular torsion.
- Urinary tract - infection or stone.
- Colon - diverticulitis or diverticular disease, inflammatory bowel disease, large bowel obstruction or tumour, irritable bowel syndrome, constipation.
- Hernia - inguinal or femoral.
- Appendicitis in a patient with situs inversus (rare).

Abdominal pain in particular patient groups

Elderly patients^[9]

Presentation tends to be different from younger patients - it may lack classical symptoms and signs and it tends to present later.

Common causes of abdominal pain in the elderly are:

- Peptic ulcer disease.
- Cholecystitis.
- Acute pancreatitis.
- Mesenteric ischaemia/infarction.
- Aortic aneurysm.
- Bowel obstruction - small or large bowel.
- Diverticular disease/diverticulitis.
- Constipation.
- Urinary retention.
- Medical causes (see table 'Causes of abdominal pain by regions', above).

Immunocompromised patients^[10]

The classical signs of an acute abdomen may be absent in the immunocompromised patient.

Patients with the most severe immunocompromise are chemotherapy patients with neutropenia and HIV patients with CD4+ cell count <200/mm³. Mild-to-moderate immune deficiency occurs in those who are:

- Malnourished.
- Taking steroids.
- Elderly.
- Patients with diabetes.
- Patients with cancer.
- HIV-positive with CD4+ cell count >200/mm³.

Particular causes of abdominal pain in this group include:

- Gastritis - can be due to pathogens such as *Candida* spp., *Cryptosporidium* spp. and cytomegalovirus (CMV).
- Hepatic pathology - cholecystitis with atypical pathogens, AIDS-related cholangitis, liver abscess.
- Pseudomembranous colitis.
- Typhlitis (neutropenic enterocolitis) - fever and abdominal pain, particularly right iliac fossa pain.
- CMV colitis - a small-vessel vasculitis mainly affecting the colon; it affects AIDS and renal transplant patients.
- Abdominal tuberculosis - usually ileocaecal.
- Disseminated *Mycobacterium avium intracellulare* (MAI) - usually in AIDS patients, affecting the jejunum or small bowel; severe abdominal pain and systemic symptoms.
- Acute graft-versus-host disease - after bone marrow transplant.
- Bowel obstruction or intussusception - due to lymphoma or Kaposi's sarcoma.
- Side-effects of antiretrovirals, chemotherapy or other treatments.

Athletes

Abdominal pain during exertion is a common symptom among endurance sports athletes such as long-distance runners. There are many possible causes which may need careful evaluation. These are discussed in the literature.^[11]

Further reading & references

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