Acute Surgical Abdomen

Definition / Supporting Information

Acute surgical abdomen describes abdominal pain that may require immediate or urgent surgical intervention.

- Consider conditions most likely to cause complications if treatment is delayed:
  - Malrotation / midgut volvulus
  - Intussusception
  - Appendicitis
- Consider conditions that mimic an acute abdomen:
  - Pneumonia
  - Diabetic ketoacidosis

Keywords / also known as: abdominal pain, peritonitis, tenderness

Essential History

Evaluation should progress only after the ABCs (airway, breathing, and circulation) of resuscitation have been addressed.

Ask about:

- Nature, location, radiation, and timing of the pain
  - Intermittent / colicky
  - Recurrent or chronic abdominal pain
  - Associated with physical activity or eating
- Foreign body ingestion
- Presence of:
  - Vomiting (eg, bilious / projectile)
  - Constipation
  - Diarrhoea
  - Blood in stools (see Melaena / Bleeding Per Rectum)
- Symptoms of systemic illness
  - Fever
  - Headache
  - Sore throat
  - Myalgia
- Menstrual history
- Genitourinary tract symptoms

- Pre-existing conditions
  - Sickle cell disease
  - Cystic fibrosis
- Recent trauma or previous surgery
- Travel history

'Red Flag' Symptoms and Signs

Evaluation should progress only after the ABCs of resuscitation have been addressed.

Ask about:

- Bilious (green) vomiting
  - Suspect:
    - Malrotation
    - Volvulus
    - Bowel obstruction
- Episodes of sudden pain causing screaming followed by lethargy
  - Highly suggestive of intussusception
- Melaena, or fresh blood with stools
  - Redcurrant-jelly bloody stool may suggest intussusception
- Diffuse or periumbilical abdominal pain and / or localisation to the right lower quadrant
  - Consider appendicitis
    - Associated with anorexia (see Appetite Loss), nausea, or vomiting
- Polydipsia and / or polyuria
  - Suspect diabetic ketoacidosis
- Scrotal pain – the pain of torsion of the testis may radiate to the abdomen

Look for:

- Diffuse / right lower quadrant tenderness, guarding
  - Appendicitis
- Rigidity
  - Diffuse peritonitis
- Signs of pneumonia
  - Fever
  - Crepitations / reduced air entry on auscultation of lung fields
- Irreducible inguinal hernia
- Scrotal swelling
- Presence of a mass or abdominal distension
- Kussmaul breathing (shallow rapid breathing)

- Ketotic smell on breath

Differential Diagnosis / Conditions

- Surgical
  - Appendicitis
  - Intestinal obstruction
  - Peritonitis
    - Bacterial
    - Perforated viscus
  - Intussusception
  - Malrotation and volvulus
  - Obstructed inguinal hernia
  - Peptic ulcer
  - Cholecystitis
  - Biliary colic
  - Pancreatitis
  - Meckel's diverticulitis
- Gynaecological
  - Pelvic inflammatory disease
  - Endometriosis
  - Mittelschmerz (lower abdominal pain associated with ovulation)
  - Ovarian cyst (possibly ruptured) or ovarian torsion
  - Possible miscarriage
  - Ectopic pregnancy
- Urological
  - Pyelonephritis
  - Torsion of:
    - Testicle
    - Scrotal appendages
  - Hydronephrosis
  - Renal calculi
- Trauma
  - Rectus muscle tear
  - Haematoma
  - Injury to abdominal viscera
- Medical
  - Constipation
  - Gastroenteritis
    - Viral
    - Bacterial (eg, *Salmonella*, *Campylobacter*)

  - Colitis (eg, ulcerative colitis)
  - Mesenteric lymphadenitis
  - Pneumonia
  - Diabetic ketoacidosis
  - Sickle cell crisis
  - Hepatitis
  - Acute hepatomegaly / splenomegaly (eg, malaria, sickle cell disease)
  - Psoas abscess
  - Helminth infestation
  - Lead poisoning
  - Porphyria
  - Epilepsy
  - Migraine

Investigations

Evaluation should progress only after the ABCs of resuscitation have been addressed.

To be undertaken by non-specialist practitioners (eg, General Practitioner (GP) Team) where appropriate:

- Urinalysis
- Blood sugar
- Stool culture

Referral to specialist practitioner should be made once medical causes are excluded, before any other tests, including imaging studies, are requested.

To be undertaken by specialist practitioners (eg, Emergency Department / Paediatric / Paediatric Surgical Team(s)):

- Full blood count including differential
- Blood / serum biochemistry including:
  - Blood glucose estimation
  - Inflammatory markers eg, C-reactive protein
- Urinalysis
- These tests may not be decisive
  - When considering appendicitis, observation over 6–12 hours with serial examinations and a repeat leucocyte count may be diagnostic
- Chest X-ray (usually with the patient in a supine position)
  - May show pneumonia or free air as a ‘central bubble’
- Abdominal X-ray
  - Bowel obstruction
  - Localised ileus

  - Free air in the abdomen
  - Scoliosis
  - Impression of a mass
  - Appendicitis due to presence of a appendicolith
- Abdominal ultrasound
  - First-line investigation for possible intussusception
  - Ovarian disease
  - Appendicitis (operator-dependent)
- Upper gastrointestinal series
  - Volvulus
    - Surgical emergency – upper GI series must be performed urgently
  - Malrotation (with contrast)
- Computed tomography, as directed by the surgical team

Treatment Approach

To be undertaken by specialist practitioners (eg, Emergency Department / Paediatric Medical / Paediatric Surgical Team(s)):

Assess airway, breathing and circulation, and if compromised follow recognised resuscitation guidelines (eg, European Paediatric Life Support (EPLS) / Advanced Paediatric Life Support (APLS)).

For any patient with abdominal pain as any part of the chief symptom, no food or drink should be given (nil by mouth) until the diagnosis and disposition are decided.

- Fluid administration
  - In the presence of shock
    - A bolus of fluid as per advanced resuscitation guidelines (eg, EPLS / APLS)
  - Intravenous hydration at maintenance requirement plus replacement of losses
- Broad-spectrum antibiotics as directed by the surgical team
  - Amoxicillin or ampicillin
  - Gentamicin
  - Metronidazole
- Analgesics
  - Morphine as directed by surgical team
- Nasogastric tube
  - If a patient is vomiting or has marked abdominal distension

When to Refer

Refer (arrange emergency transfer) all patients with suspected acute surgical abdomen to specialist practitioners (eg, Emergency Department / Paediatric Surgical Team(s)).

Escalate care to Paediatric Surgical Team from Emergency Department for all patients with suspected acute surgical abdomen.

'Safety Netting' Advice

- Symptoms and signs of abdominal disease change with time
- The parents of any patient discharged or not referred must be given clear guidelines for return and medical review in the event of:
  - Persisting / worsening pain
  - Development of any red flag symptoms
  - Persisting parental / carer concern

Patient / Carer Information

Please note: whilst these resources have been developed to a high standard they may not be specific to children.

- Abdominal pain (Web page), Patient
- Appendicitis(Web page), Patient
- Stomach ache and abdominal pain (Web page), the NHS website

Resources

National Clinical Guidance

European Paediatric Life Support course, Resuscitation Council (UK).

Suggested Resources

Please note: these resources include links to external websites. These resources may not have national accreditation and therefore PCO UK cannot guarantee the accuracy of the content.

Abdominal Pain (Web page - requires log-in), Spotting the Sick Child

For parents (Web page), British Association of Paediatric Surgeons (BAPS).

Paediatric Acute Abdominal Pain Pathway (PDF), Royal College of Emergency Medicine.

Advanced Life Support Group. Advanced Paediatric Life Support: the practical approach. 5th ed. London: BMJ books; 2011.

Clinical Practice Guidelines: Abdominal Pain (Guideline), Royal Children's Hospital Melbourne.

Children and Infants with Acute Abdominal Pain – Acute Management (Guideline), New South Wales Health.

Morphine for pain (Web page), Medicines for Children

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