

# Surgical Snapshot: Management of Right Iliac Fossa Pain in Adults and Children

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## References

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# Surgical Snapshot: Management of Right Iliac Fossa Pain in Adults and Children

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**Abstract**

Right iliac fossa pain is one of the most common acute presentations to the general surgical department. The management of right iliac fossa pain amongst different ages and different genders can present a clinical conundrum to newly qualified doctors. We detail the common causes of right iliac fossa pain, the signs, symptoms and management options in different groups.

**What this paper adds:**

This paper seeks to summarise the differential diagnoses of acute right iliac fossa pain. This would aid diagnosis and potential management options for junior doctors encountering this presentation in their early career.

**Key Words**

Right Iliac Fossa Pain; Acute Appendicitis; Adults; Children.

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**Introduction**

Acute onset right iliac fossa pain, in all age groups, is a common presentation often referred to the general surgical team. Acute appendicitis is the most common indication for surgery and discerning this from other causes has long been a clinical challenge.

The diagnosis of acute appendicitis remains one guided by clinical acumen and enhanced by various diagnostic techniques; novel biochemical markers and scoring systems have been attempted to be

implemented with varying levels of success.

This clinical review aims to cover the salient points of the common differential diagnoses of right iliac fossa pain (Table 1). It will also look to give clinicians a useful insight into the management of each of these conditions.

**What are the common causes of acute right iliac fossa pain?**

*Table 1:* Common causes of acute right iliac fossa pain

Adults	Female	Paediatrics	Elderly
Ureteric colic	Mittelschmerz	Gastroenteritis	Diverticulitis
Perforated peptic ulcer	Pelvic Inflammatory Disease (PID)	Mesenteric adenitis	Intestinal obstruction
Testicular torsion	Ectopic pregnancy	Meckel's diverticulitis	Colon cancer
Pancreatitis	Torsion/ rupture of ovarian cyst	Intussusception	Mesenteric ischaemia
Rectus sheath haematoma	Endometriosis	Henoch-Schoenlein Purpura	Leaking abdominal aortic aneurysm
Crohn's ileitis	Retrograde menstruation	Lobar pneumonia	
Pyelonephritis			

### **Appendicitis**

Acute appendicitis is the most common cause of acute abdomen in the UK with a prevalence of 10%. It is an important presentation of right iliac fossa pain. The pathology is that of inflammation of the vermiform appendix, which is located below the terminal ileum. The base has a fixed position and is found from the confluence of the taenia coli which join to form the outer longitudinal muscle of the appendix (Williams et al 2008).

The pathophysiology of acute appendicitis is still not completely understood. The most common process is obstruction of the appendiceal lumen and subsequent infection of the wall due to translocation of gut bacteria. Causes of this obstruction include faecoliths, Crohn's disease, parasites, neoplasia and many more.

### **Right Iliac Fossa Pain in Specific Patient Groups:**

#### **Females**

Female patients are diagnostically challenging for appendicitis. Conditions such as pelvic inflammatory disease (PID), mittelschmerz (unilateral lower abdominal pain associated with ovulation), torsion/rupture of an ovarian cyst or haemorrhage and ectopic pregnancy are important differential diagnoses. A thorough history is essential including: menstrual cycle, dysmenorrhoea, vaginal discharge, hormonal contraception and pregnancies.

Ectopic pregnancy is a particularly important differential of right iliac fossa pain. Without accurate diagnosis and management this can become life-threatening. Ectopic pregnancy occurs when a fertilised egg implants outside the endometrial cavity, resulting in eventual death of the embryo. The classic triad of symptoms is: abdominal pain, amenorrhoea and vaginal bleeding. Unfortunately, many patients do not present this way and thus a high index of suspicion in females of child bearing age is required.

PID is an infectious and inflammatory disorder of the upper female genital tract (including the uterus, fallopian tubes and adjacent pelvic structures). It is caused by ascending infection from the vagina and cervix, and may spread to the abdomen. The classic presentation is a woman of child bearing age with multiple sexual partners and no/inconsistent contraception.

#### **Pregnancy**

Appendicitis is the most common extra-uterine cause of acute abdominal pain in pregnancy. Current obstetric teaching states that the caecum is pushed

to the right upper quadrant by the gravid uterus and therefore the classical signs and symptoms of appendicitis may be different in this population.

#### **Children**

Children present a challenging group to investigate as they are not always able to inform the clinician of their exact symptoms. The most common diseases in this age group that may mimic appendicitis are mesenteric adenitis or gastroenteritis. Appendicitis is a rare presentation below the age of three, as the base of the appendix is wider and funnel shaped and less likely to be obstructed. Above this age, children have an underdeveloped omentum, less able to limit the spread of purulent material from a perforated appendix. Therefore, they are unlikely to present with classical migratory pain and often present with frank peritonitis.

Mesenteric adenitis may present with cervical lymph nodes. The pain is colicky in nature and normally resolves within a few days. The symptoms of abdominal pain in this age group are normally preceded by a recent upper respiratory tract infection which raises the clinical suspicion of this diagnosis and is generally associated with normal inflammatory markers.

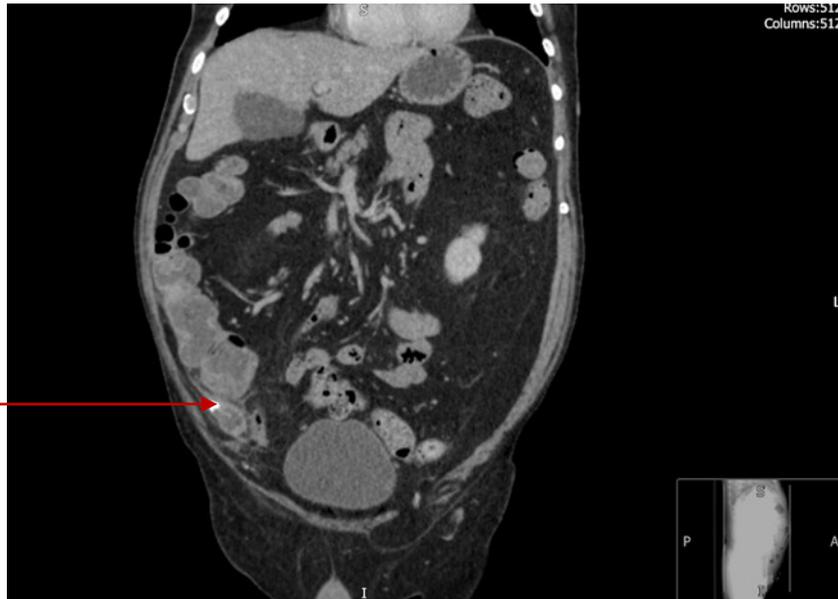
Meckel's diverticulitis may present with left sided or central abdominal pain, and is often difficult to distinguish clinically from acute appendicitis. In this age group, there may be symptoms of lower gastrointestinal bleeding: Meckel's diverticulum is a remnant of the vitelline duct, containing pluripotent cells which may contain heterotopic tissue. Most commonly, this is gastric mucosa which can lead to acid secretion, ulceration and bleeding of adjacent mucosa.

#### **Elderly**

Appendicitis has a bimodal distribution. In the elderly age group other important diagnoses to consider are: neoplasia, diverticulitis or bowel obstruction. In this age group (>50 years) computed tomography is a valuable tool to elucidate the cause of abdominal pain and avoid an exploratory laparotomy (Figure 1). The Royal College of Surgeons (RCS) and ASGBI (Association of Surgeons of Great Britain and Ireland) devised guidelines for the management of acute abdominal pain in those over the age of 50 to prevent harm through unnecessary surgical intervention.

Sigmoid diverticulosis/diverticulitis may mimic appendicitis especially in patients with a long sigmoid loop. Additionally, perforated or obstructed carcinoma of the caecum may present with identical

Appendicolith in proximal appendix, inflamed and fluid filled distal appendix. Acute uncomplicated appendicitis with no evidence of perforation or collection.



**Figure 1:** CT showing acute uncomplicated appendicitis in 70-year-old patient

**What are the symptoms of acute appendicitis?**

The clinical presentation of acute appendicitis is highly variable; this is due to positional variation of the appendix, degree of inflammation and age of the patient. The classical presentation of: anorexia, vomiting and migratory right iliac fossa pain, is found in approximately half of patients.

The classical presentation of central abdominal pain that migrates to the right iliac fossa reflects an inability to localise the pain until there is visceral

irritation. The appendix is part of the midgut and therefore produces this poorly localised pain (classically central abdomen); when there is local inflammation and irritation of the parietal peritoneum, pain is more constant and localised pain.

**What are the signs of acute appendicitis?**

The signs associated with acute appendicitis are low grade fever, localised abdominal tenderness and guarding (Table 2). Classically the patient is tender over McBurney’s point with rebound tenderness.

**Table 2:** Important signs of appendicitis

Important Signs
Low grade fever
Localised abdominal tenderness
Guarding

There may also be the presence of Rosving’s sign (palpation in the left iliac fossa produces pain in the right iliac fossa, as pressing on the left colon may distend the caecum). More rarely psoas sign may be present, which will cause the patient to lie with the hip flexed to alleviate the pain (the appendix lies on the psoas muscle and suggest a retrocaecal position). Finally, Obturator sign suggests pain due to an inflamed appendix pressing on obturator internus which is felt on passive internal rotation of a flexed right hip (Table 3).

**Table 3:** Eponymous signs related to appendicitis

Eponymous Sign	Clinical Picture
Rosving sign	Pain felt in the right iliac fossa on palpation of the left (attempt to distend the caecum by pushing the left colon)
Psoas sign	Pain felt on stretching iliopsoas by extending right hip (suggests retrocaecal appendix)
Obturator sign	Pain felt on internally rotating flexed right hip

### Variation in Appendiceal Anatomy

Specific positions of the appendix may also give differing signs (Figure 2).

#### Retrocaecal:

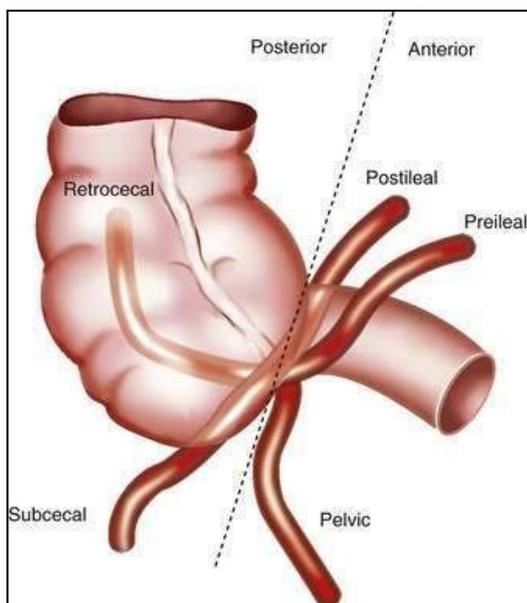
Due to overlying bowel gas it is difficult to exert pressure on the appendix and therefore patients will be less rigid and less tender on light palpation.

#### Pelvic:

Where the appendix is contact with the rectum or bladder respectively, it may present with diarrhoea or urinary symptoms.

#### Postileal:

This presents with more vague signs as the pain may not radiate and is ill defined due to the position.



**Figure 2:** Positions of the vermiform appendix (Buschard and Kjaeldgaard, 1973).

### How is appendicitis investigated?

Investigation of acute appendicitis is again age and

gender specific. In the younger age group, a period of watchful waiting may occur to avoid unnecessary surgical procedures, especially if there is any doubt. In female patients due to the variety of differential diagnoses ultrasonography (including transvaginal and transabdominal scans) is often utilised to elucidate the cause. Importantly blood and urine b hCG is a mandatory investigation on admission to rule out ectopic pregnancy.

In the elderly, the mainstay of investigation involves computed tomography to identify an alternative pathology, due to the increased chance of a neoplastic process.

In adults if there is any doubt then decision to operate may sometimes be delayed, if the patient is not in extremis. Often however, the risk of non-operative intervention versus negative appendicectomy is greater and therefore a decision to operate should be taken early to avoid an increased morbidity/ mortality to the patient.

Various scoring systems have been employed in the past and in some centres are still used. They are largely an aid to diagnosis; the diagnosis of acute appendicitis remains a clinical one aided by various biochemical and imaging modalities.

### How is appendicitis treated?

The mainstay of management of appendicitis is appendicectomy. Various studies have examined the use of antibiotics over operative management; these have been largely inconclusive with the only inference, that antibiotic management only may be best suited to those unfit for an operation (Wilms et al 2011). In cases of non-operative management there is a risk of recurrent appendicitis and there may be a role for interval appendicectomy, especially in patients who have developed an appendicular abscess/ mass.

The operation itself can be either laparoscopic or open. Open appendicectomy is sometimes reserved for those with CT diagnosed appendicitis and no alternative pathology, those who would not tolerate a raised intrabdominal pressure due to other morbidities and in the paediatric setting in a non-paediatric surgical centre. The current evidence suggests that laparoscopic appendicectomy is beneficial over open, in terms of reduced out of hospital complications, despite initial greater cost of this operative treatment (Sauerland et al 2010).

Regardless of the method of appendicectomy, patients benefit from a period of pre-operative fluid resuscitation and intravenous antibiotics (according to hospital protocol) to limit the incidence of wound infections.

### Summary

Acute appendicitis is a common presentation to UK hospitals and one with the greatest need for operative intervention. A thorough history, examination and supplementary investigations may aid in appropriate management. The differential diagnoses are important to be aware of to reduce

the number of negative appendicectomies.

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