

Perforated subhepatic appendicitis: Masquerading as a liver abscess

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Section: Abdominal imaging

Area of Interest: Abdomen

Procedure: Contrast agent-intravenous

Imaging Technique: CT

Special Focus: Abscess Inflammation Calcifications /
Calculi Case Type: Clinical Cases

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Patient: 18 years, female

Clinical History:

A 19-year-old lady presented with fever and right hypochondriac pain for 20 days. The patient was febrile, tachypnoeic and tachycardiac. Blood investigations revealed leukocytosis.

Imaging Findings:

The erect chest X-ray was normal.

Abdominal ultrasound revealed hypoechoic collection in subhepatic region anterolaterally, however, no focal lesions were noted within the liver. Diagnosis of sub-capsular liver abscess was made and computed tomography (CT) was performed for further evaluation.

Contrast-enhanced CT shows peripherally enhancing subhepatic sub-capsular hypodense (15 to 20 HU) collection with pockets of air, indenting on liver.

A well-defined peripherally enhancing tubular structure measuring 11 mm in transverse diameter, with a speck of calcification within is noted in right iliac fossa adjacent to the caecum, and communicating with the subcapsular collection (Fig. 1,2,3,4).

Based on these findings, perforated subhepatic appendicitis causing subcapsular liver abscess was suspected.

On surgery, a subhepatic perforated appendix with breach in liver capsule and large subcapsular abscess was noted. The subcapsular liver abscess was drained and appendectomy was performed.

Discussion:

Appendicitis usually presents as pain in right iliac fossa, fever, and vomiting, which constitutes Murphy's triad [1].

Appendix can be retro-caecal (65%), pelvic (31%), sub-caecal (2.2%), pre-ileal (1%) and post-ileal (0.4%).

Subhepatic and lateral pouch are rare locations.

Inflammation of the appendix in an uncommon location can lead to atypical presentations.

According to a study by Palanivelu et al, subhepatic appendicitis accounted for only 0.08% of all appendicitis cases

[2].

The caecum and appendix occupy a subhepatic position as the physiological umbilical hernia returns to the abdomen in the tenth week of intrauterine life. Descent of caecum to the right iliac fossa occurs in the eleventh week. Failure of this leads to subhepatic caecum and appendix [3]. Intestinal malrotation and adhesions can also lead to an abnormal location of the appendix.

Because of its location, subhepatic appendicitis can mimic liver abscess, acute cholecystitis, peptic ulcer disease and pyelonephritis. Diagnostic uncertainty due to atypical presentation leads to delayed diagnosis and increased adverse outcomes as sepsis, abscess formation, and perforation.

Although ultrasound is the first-line imaging tool; sub-hepatic appendiceal pathologies can be easily misdiagnosed as cholecystitis or liver abscess with ultrasound examination.

CT plays a vital role in identifying subhepatic appendicitis, with higher sensitivity, specificity and accuracy [4]. A thickened appendiceal wall (>3mm), a dilated appendix (>6mm), with peri-appendiceal fat standings suggest appendicitis. A calcified appendicolith and abscess formation can also be seen. Extra-luminal gas near appendix suggests perforation.

Caecal diverticulitis, tubo-ovarian abscesses, and infection with *Yersinia enterocolitica* can mimic appendicitis on CT. Visualisation of a normal appendix separately from the lesion can prevent confusion with these conditions [5].

Well localised abscesses can be managed with percutaneous drainage, large and poorly localised abscesses need surgical management.

Learning points:

1. Infrequent location of appendix in subhepatic appendicitis leads to atypical presentation and mimics liver abscess and cholecystitis.
2. Diagnostic uncertainty and delayed diagnosis cause a high incidence of adverse outcomes as perforation and abscess formation.
3. Awareness of various locations of the appendix, a high index of suspicion, and radiological imaging is needed for the early diagnosis and safe management.

Differential Diagnosis List: Perforated subhepatic appendicitis with subcapsular liver abscess., Liver abscess, Cholecystitis, Pyelonephritis

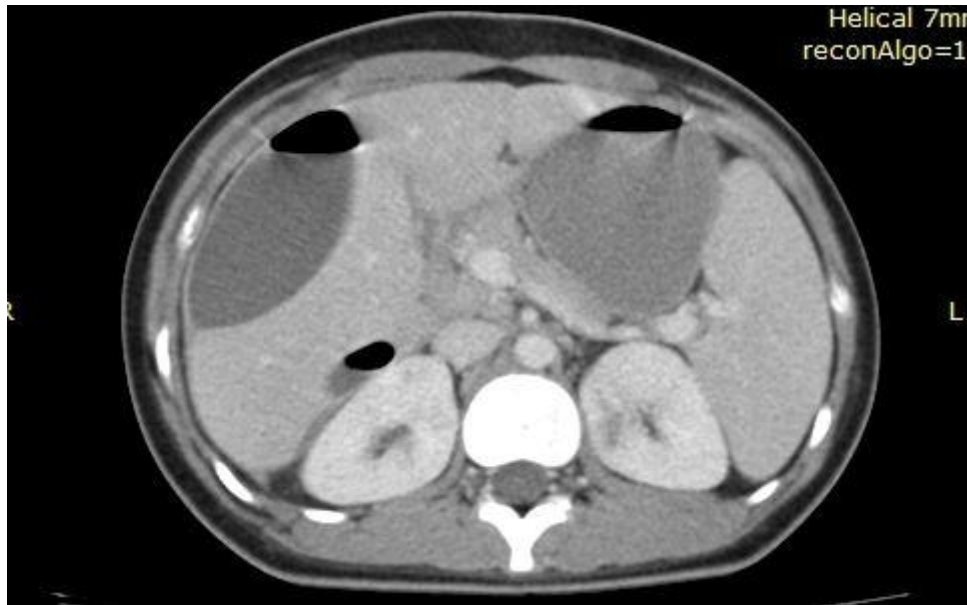
Final Diagnosis: Perforated subhepatic appendicitis with subcapsular liver abscess.

References:

- Singh S, Jha AK, Sharma N, Mishra TS (2014) A Case of Right Upper Abdominal Pain Misdiagnosed on Computerized Tomography. (PMID: [25977626](#))
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- Linder HH (1989) Embryology of gastrointestinal tract. Linder HH, editor. Clinical Anatomy. East Norwalk (CT): Appleton & Lange
- Chalazonitis AN, Tzovara I, Sammouti E et al (2008) CT in appendicitis. (PMID: [18306140](#))
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Figure 1

a



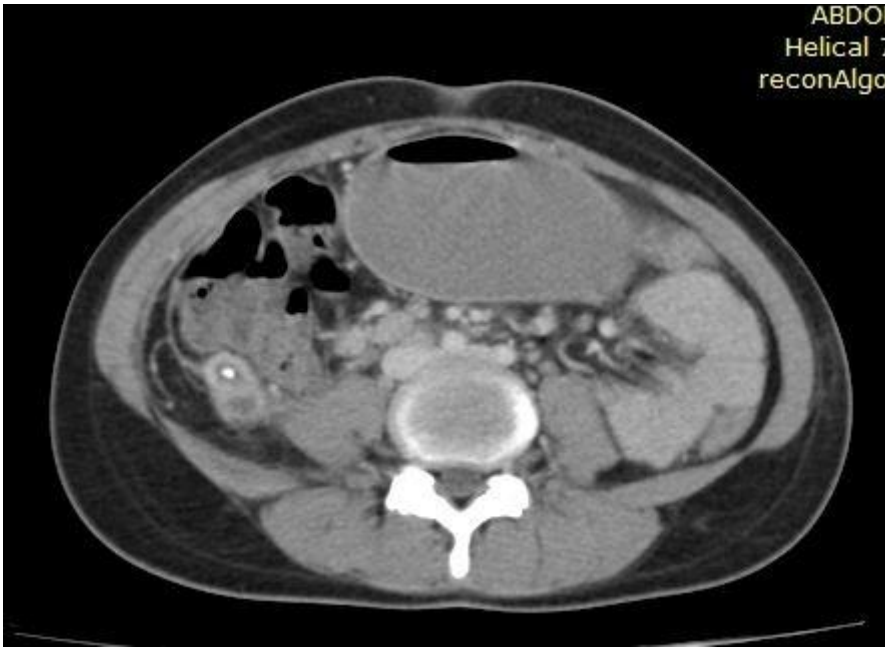
Description: Axial CECT image shows a subcapsular hypodense collections with pockets of air, indenting right lobe of liver along anterior and posterior surface. **Origin:** Dept of radiology, MMC-RI, Mysore,Karnataka,India

b



Description: Axial CECT image showing inflamed appendix in right iliac fossa. **Origin:** Dept of radiology, MMC-RI, Mysore,Karnataka,India

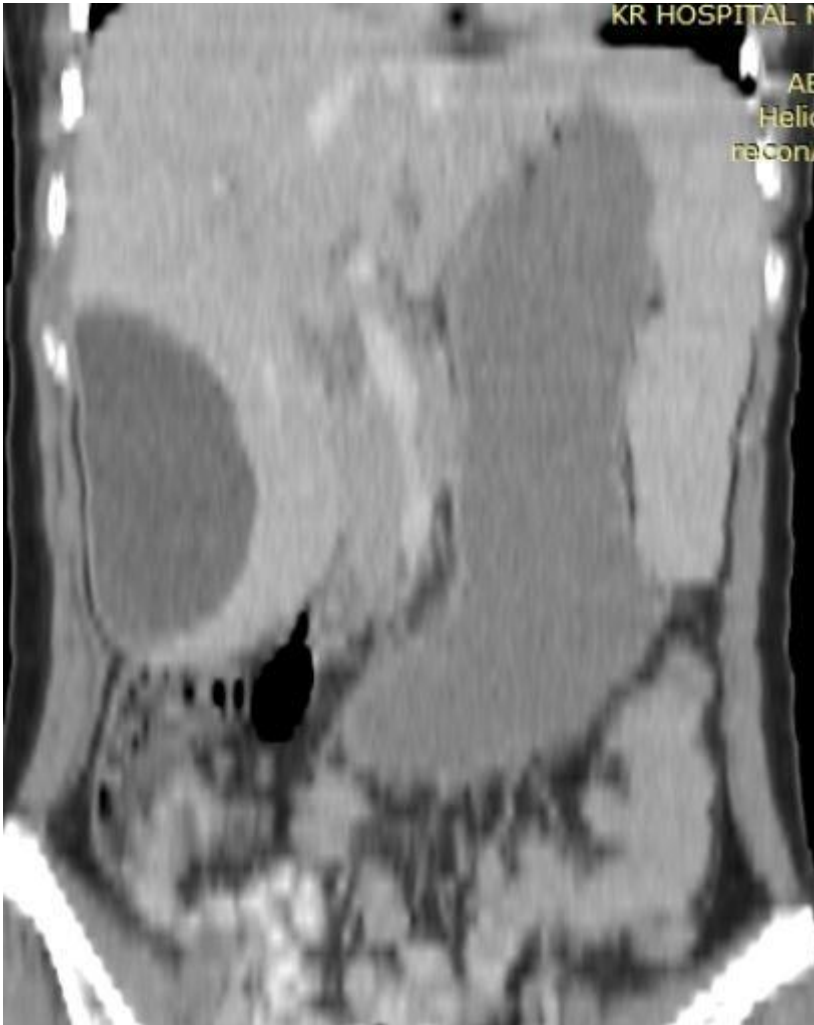
c



Description: Axial CECT image showing appendicolith within inflamed appendix. **Origin:** Dept of radiology, MMC-RI, Mysore, Karnataka, India

Figure 2

a



Description: Coronal reformatted CECT image showing subcapsular hypodense collection indenting right lobe of liver. **Origin:** Dept of Radiology, MMC-RI, Mysore,Karnataka,India

b



Description: Coronal reformatted CECT image demonstrating subhepatic appendix communicating with the subcapsular collection. **Origin:** Dept of Radiology, MMC-RI, Mysore, Karnataka, India