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Isolated Submucosal Lipomatosis of the Appendix: A Rare Incidental Finding on Contrast-Enhanced Computed Tomography

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Abstract: ***Appendiceal lipomatosis is an exceptionally rare benign condition characterised by fatty infiltration of the appendiceal wall. Its isolated submucosal variant- occurring without inflammation, luminal obstruction, or neoplasm- is among the least reported entities in radiological literature and is most often discovered incidentally. We present the case of a 50-year-old male investigated for left flank pain in whom contrast-enhanced computed tomography (CECT) of the abdomen incidentally demonstrated near-complete fat attenuation (−75 to −130 HU) along the entire length of a non-inflamed appendix, with no periappendiceal fat stranding or luminal dilatation, consistent with isolated submucosal lipomatosis of the appendix. Recognition of this entity on CT is important to distinguish it from acute appendicitis and appendiceal neoplasm and thereby avoid unnecessary surgical intervention. This report highlights its characteristic imaging features and differential diagnosis.***

Keywords: Appendiceal lipomatosis, Submucosal fatty infiltration, Computed tomography, Incidental appendiceal lesion, Differential diagnosis

1. Introduction

The appendix is a vestigial structure arising from the caecum that is implicated in a wide spectrum of disease, ranging from the ubiquitous acute appendicitis to rare primary neoplasms and non-neoplastic entities. Among the latter, lipomatous change of the appendix- whether as a discrete lipoma, lipomatous hypertrophy of the ileocaecal valve, or submucosal lipomatosis- represents an extremely uncommon and diagnostically challenging condition.

Appendiceal lipomatosis is characterised by fatty infiltration of the appendiceal wall, recognisable on computed tomography (CT) by its attenuation in the negative Hounsfield unit (HU) range. The isolated submucosal form, defined by the absence of luminal dilatation, obstruction, periappendiceal inflammation, or associated neoplasm, is exceptionally rare and is most often encountered incidentally on cross-sectional imaging performed for unrelated indications. [1, 2]

The clinical importance of this entity lies less in its own (generally negligible) morbidity than in its potential to mimic conditions such as acute appendicitis, appendiceal mucocele, or mucinous neoplasm, thereby prompting unwarranted surgery. Familiarity with its imaging appearance therefore allows confident, non-invasive characterisation. [3]

We report a case of isolated submucosal lipomatosis of the appendix detected incidentally on CECT of the abdomen in a 50-year-old male presenting with left flank pain, to highlight its imaging features and differential diagnosis.

2. Case Report

A 50-year-old male patient presented to the outpatient department with a 20-day history of left-sided flank pain. There was no associated fever, haematuria, nausea, vomiting, or altered bowel habit, and no history suggestive of right iliac fossa pain.

On examination:

- Soft, non-distended abdomen with mild left flank tenderness; no right iliac fossa tenderness and no palpable mass.
- Vital parameters within normal limits.

Investigations:

- Routine haematological and biochemical parameters were within normal limits, with no leucocytosis.
- In view of persistent flank pain, a contrast-enhanced CT (CECT) of the abdomen and pelvis was performed for further evaluation.

3. Imaging technique:

Serial axial sections of the whole abdomen and pelvis were obtained on a multi-detector CT scanner following administration of oral and intravenous iodinated contrast. Coronal and sagittal multiplanar reformats were generated and reviewed on a dedicated workstation using soft-tissue, lung, and bone windows.

4. Imaging Findings

Appendix: The appendix arose at the 2 o'clock position relative to the caecum and coursed inferiorly, measuring approximately 7.6 mm in maximum transverse dimension. The near-entire length of the appendiceal wall was replaced

by fat-attenuation material (average −75 to −130 HU), consistent with macroscopic fat. No oral contrast was seen within the lumen. Importantly, there was no periappendiceal fat stranding, free fluid, appendicolith, or luminal dilatation. A few subcentimetre, non-necrotic, enhancing lymph nodes were noted in the right iliac fossa, considered reactive. These features were most consistent with isolated submucosal lipomatosis of the appendix, an entirely incidental finding unrelated to the patient's presenting complaint.

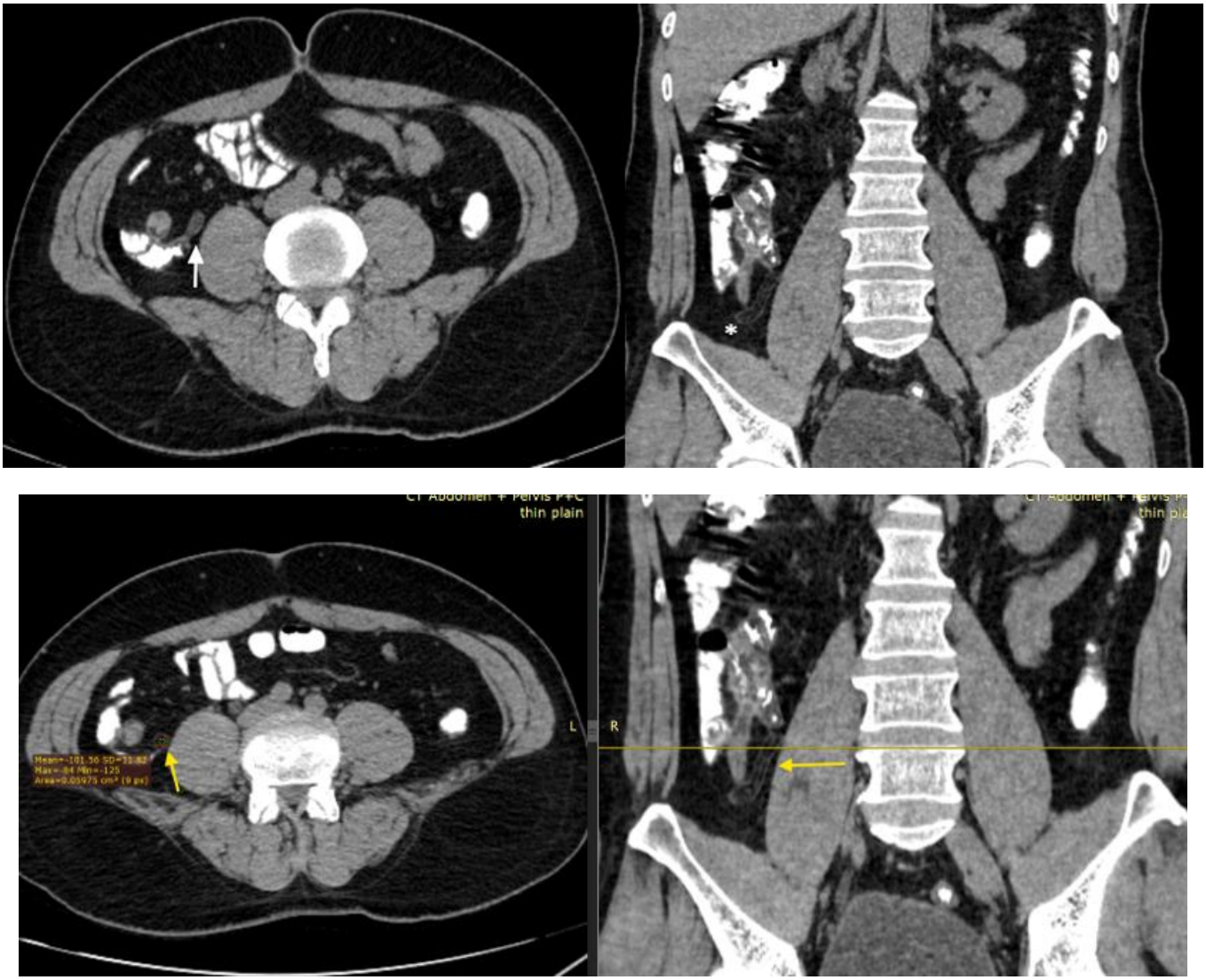

Figure 1: Axial CECT image at the level of the caecum showing the appendix (white arrow) with near-complete submucosal fat attenuation (−75 to −130 HU) (yellow arrowhead). No periappendiceal fat stranding or luminal dilatation is seen, consistent with isolated submucosal lipomatosis of the appendix.

5. Conclusion

Based on the above imaging features, the radiological diagnosis was isolated submucosal lipomatosis of the appendix. The radiological differentials considered and excluded were:

- Acute appendicitis
- Appendiceal mucocele / mucinous neoplasm
- Well-differentiated liposarcoma
- Appendiceal endometriosis
- Normal mesoappendiceal fat (extramural rather than intramural)

6. Discussion

Appendiceal lipomatosis is a rare, benign condition characterised by fatty infiltration of the appendiceal submucosa or wall. First described in surgical specimens, its recognition on cross-sectional imaging has been facilitated by CT, which precisely characterises macroscopic fat by its negative HU values.

The normal appendix measures up to about 6 mm in diameter on CT, although values up to 9 mm may be seen in asymptomatic individuals. In our case the appendix measured 7.6 mm, which- combined with the complete absence of periappendiceal inflammatory change- argues strongly against acute appendicitis. The key radiological hallmark was fat attenuation (−75 to −130 HU) throughout the near-entire appendiceal wall, a finding characteristic of lipomatous infiltration.

Lipomatous change of the gastrointestinal tract most commonly involves the ileocaecal valve, where lipomatous hypertrophy may occasionally cause intussusception or

obstruction; appendiceal involvement is considerably rarer. The literature consists largely of isolated case reports and small series, many identified retrospectively on histopathology after appendicectomy for presumed appendicitis or incidentally during imaging for unrelated complaints.

The principal imaging differentials for a fat-containing appendiceal lesion include appendiceal mucocele (luminal dilatation, mural calcification, absence of fat attenuation), well-differentiated liposarcoma (typically a large mass with thick septa and non-adipose components), appendiceal endometriosis (cyclical symptoms, no macroscopic fat), and normal mesoappendiceal fat (external to the wall rather than intramural). [5, 6] In our case, the intramural location of fat, absence of luminal dilatation, and lack of solid or enhancing components excluded these. An important pitfall is misdiagnosis as appendicitis on ultrasound, where echogenic submucosal fat may simulate inflammatory change; CT therefore offers superior tissue characterisation for this entity.

In summary, the key learning points are that isolated submucosal lipomatosis of the appendix is a benign entity best characterised on CT by intramural negative-HU attenuation without inflammation or solid components; that awareness of it prevents misdiagnosis as appendicitis or neoplasm and avoids unnecessary surgery; and that, when encountered incidentally, it can be confidently reported as benign with no further intervention required.

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