Case Report

Diagnostic Challenges in Atypical Pediatric Appendicitis Patients: A Case Report on the Discordance Between Imaging and Surgical Findings

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Abstract

Acute appendicitis is a frequent paediatric emergency, but atypical presentations and overlapping symptoms with other conditions, such as mesenteric adenitis, complicate the diagnosis. We present a case of an 8-year-old girl with right iliac fossa pain, vomiting, fever, and preceding upper respiratory symptoms. Despite the mild clinical findings, imaging suggested perforated appendicitis due to the presence of free pelvic fluid. Laparoscopic surgery, however, revealed a nonperforated, mildly inflamed appendix with minimal reactive fluid. Histopathology confirmed reactive appendicitis. This case highlights the importance of integrating clinical and imaging findings to avoid overestimating disease severity and unnecessary interventions.

Keywords: *appendicitis, paediatric emergency, ultrasonography, diagnostic imaging*

INTRODUCTION

Acute appendicitis is a common cause of abdominal pain in children. While classical signs include periumbilical pain shifting to the right lower quadrant, fever, and vomiting, many paediatric cases present atypically, creating diagnostic challenges. Differentiating appendicitis from conditions such as mesenteric adenitis is particularly difficult when imaging reveals free fluid.[1,2] Ultrasound is often the first-line imaging tool, but findings must be interpreted within the clinical context to avoid misdiagnosis and unnecessary procedures.[3,4] This report presents an 8-year-old girl with mild clinical signs but imaging suggestive of perforated appendicitis. Surgery revealed reactive appendicitis, reinforcing the importance of clinical-imaging integration.

CASE PRESENTATION

An 8-year-old previously healthy girl presented with a one-day history of right iliac fossa pain. The pain was described as dull and nonradiating, with a pain score of 3/10. She had experienced six episodes of nonbilious vomiting since symptom onset, low-grade fever, and decreased oral intake. She also reported a productive cough and clear nasal discharge, suggestive of a recent upper respiratory tract infection.

On examination, she was mildly ill but alert. Her vital signs were stable. Abdominal examination revealed mild right iliac fossa tenderness without rebound tenderness or involuntary guarding. The abdomen was soft, with no palpable masses or distention. Special tests for appendicitis (Rovsing's sign, the psoas sign, the obturator test, and the J-up test) were negative.

Initial laboratory investigations revealed leukocytosis (WBC 12.4 × 10^9/L; normal range: 3.4–10.1) and elevated CRP (54 mg/L). Urinalysis was unremarkable except for trace ketones. Abdominal and chest radiographs were nonspecific. A chest X-ray revealed no air under the diaphragm, and an abdominal X-ray revealed prominent bowel loops but no evidence of obstruction or dilated bowel segments.

Point-of-care ultrasound (POCUS) revealed free pelvic fluid. Formal ultrasound revealed a noncompressible, blind-ended structure in the right iliac fossa (0.8 cm diameter), periappendiceal fat stranding, minimal periappendiceal fluid, and significant interloop pelvic fluid (1.6 × 5.2 × 1.5 cm) without internal debris (Figures 1 & 2). However, no focal discontinuity of the

appendiceal wall was noted. No appendicolith or ovarian pathology was observed. These findings raised suspicion of perforated appendicitis.

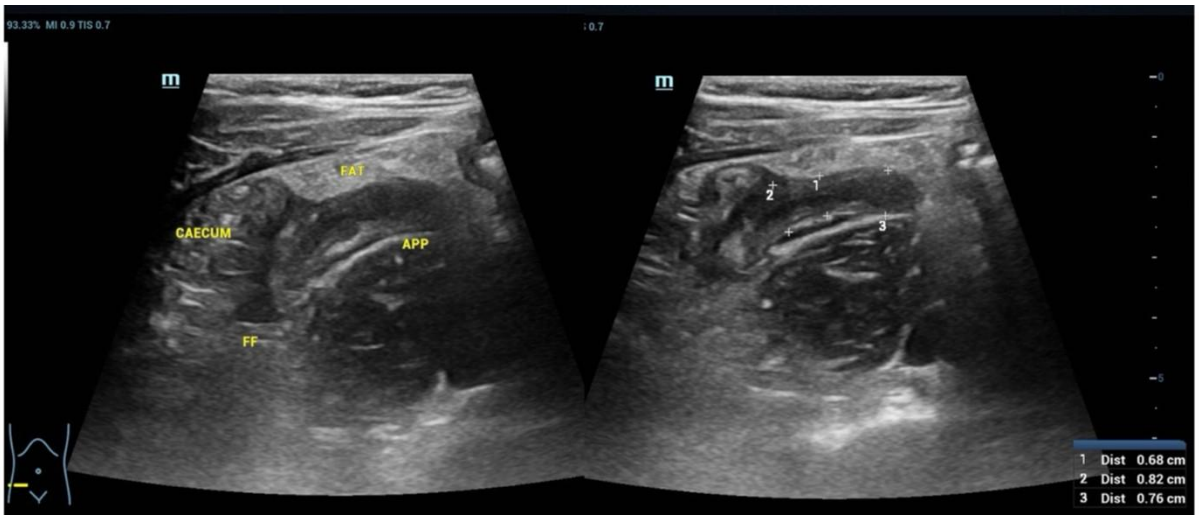

Figure 1: Formal ultrasound image of a dilated, noncompressible appendix (0.8 cm) with echogenic fat stranding and minimal peripendiceal fluid.

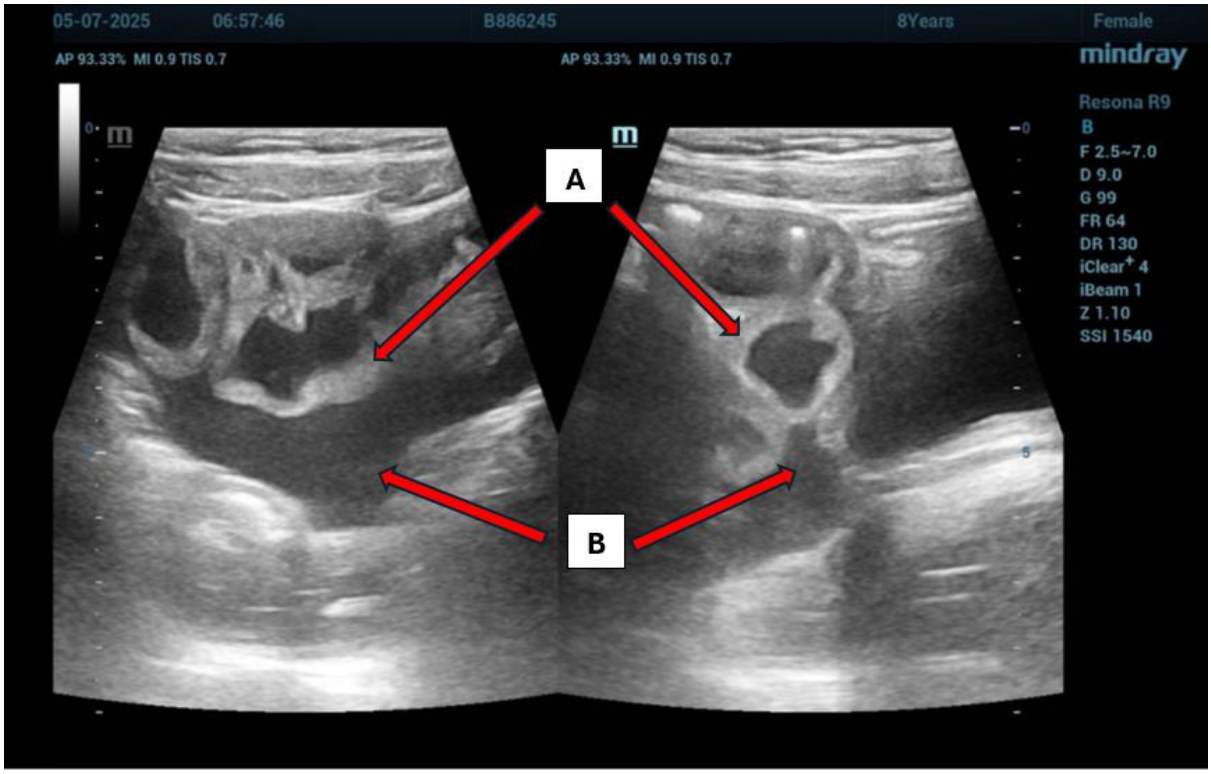

Figure 2: Formal ultrasound image showing interloop pelvic fluid (B) and thickened small bowel loops (A).

Emergency laparoscopic appendectomy was performed. Intraoperatively, the appendix was mildly inflamed but not perforated, with a healthy base and a small volume of clear reactive fluid in the pelvis (Figure 3). No pus, adhesions, or signs of peritonitis were observed. The right ovary and fallopian tube were normal. The postoperative period was uneventful. The patient was discharged on postoperative day 2 with oral antibiotics.

Histopathology revealed findings suggestive of focal mucosal ulceration with marked transmural neutrophilic infiltration involving the serosa and periappendicular fatty tissue, accompanied by acute inflammatory infiltrates.

Figure 3: Gross specimen of the excised appendix

DISCUSSION

This case illustrates the diagnostic challenges of paediatric appendicitis when the clinical and imaging findings are discordant. Although appendicitis is common in children, its atypical presentation complicates diagnosis.[1,5] Our patient had mild clinical signs, yet imaging suggested perforation due to pelvic fluid.

The chest and abdominal radiographs were nonspecific. POCUS, while valuable for bedside decision-making, is operator dependent. Formal ultrasound revealed a noncompressible appendix and a significant amount of pelvic fluid, raising concerns about perforation.[3,4,6] However, surgery revealed a nonperforated appendix and reactive fluid. This highlights that pelvic free fluid in children is not always pathological and may be reactive, physiological, or due to mesenteric adenitis, particularly during viral infections.[2,7]

Ultrasound remains the preferred initial imaging modality in children because of its safety, but it has limitations. Free fluid may also be present in benign conditions, such as those associated with gastroenteritis. Overreliance on imaging can lead to unnecessary surgery and increased costs.[8,9] The differentiation of appendicitis from mesenteric adenitis is complex. While symptoms such as vomiting and localised tenderness are more common in patients with appendicitis, overlaps exist.[2,7] Combining clinical scores, laboratory markers, and imaging improves diagnostic accuracy and reduces the number of negative appendectomies.[6,8,9] Laparoscopy played a key role in this case by confirming the diagnosis and preventing extended surgery. Minimally invasive surgery is supported in paediatric emergencies for accurate diagnosis and prompt management. [10]

CONCLUSION

This case underscores the importance of clinical judgement in paediatric patients with appendicitis. Imaging findings, particularly those in the pelvic fluid, should not be interpreted in isolation. Integrating clinical assessment and imaging and considering alternative diagnoses, such as mesenteric adenitis, can prevent unnecessary interventions and improve outcomes.

PATIENT CONSENT STATEMENT

Informed consent was obtained from the patient's parent for publication of this case and accompanying images.

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflicts of interest.

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