Radiology Case Reports 21 (2026) 3413–3418

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Case Report

Fruit pit mimicking gallstone ileus: A diagnostic pitfall on CT–Case report ☆,☆☆

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ARTICLE INFO

Article history:
Received 4 November 2025
Revised 28 April 2026
Accepted 29 April 2026

Keywords:
Small bowel obstruction
Intestinal occlusion
Gallstone ileus
Ingested foreign body

ABSTRACT

Small bowel obstruction due to ingested fruit pits is rare and often underrecognized. In exceptional cases, these foreign bodies may mimic the clinical and imaging features of gallstone ileus, a complication of cholelithiasis involving biliary-enteric fistula formation and gallstone migration into the intestinal lumen. Such presentations may lead to misdiagnosis and inappropriate management. This case highlights an uncommon but clinically relevant diagnostic pitfall: a pseudo-gallstone ileus caused by an impacted apricot pit in a patient with a prior ileocolic anastomosis. An Italian Caucasian 49-year-old woman presented with acute abdominal pain and vomiting. Her medical history included a remote ileocolic resection for intestinal ischemia. Physical examination revealed a diffusely tender abdomen without signs of peritonitis. Biochemical investigations showed mild hepatopancreatic enzyme elevation and a low-grade inflammatory response. Plain abdominal radiography demonstrated radiopaque intraluminal structures in the right iliac fossa and features of small bowel obstruction. Contrast-enhanced computed tomography confirmed mechanical obstruction above a prior ileocolic anastomosis, with three hyperdense intraluminal masses in the distal ileum and calcified gallstones in the gallbladder. Although no aerobilia or biliary-enteric fistula was detected, imaging raised suspicion of gallstone ileus. Colonoscopy revealed a stenotic ileocolic anastomosis and three hard, stone-like masses in the terminal ileum. Two were endoscopically mobilized into the colon; the third resisted lithotripsy. Magnetic resonance cholangiopancreatography showed no evidence of biliary-enteric fistula. On repeat endoscopy, after balloon dilation of the anastomosis, the remaining object was retrieved and identified as an apricot pit. Upon questioning, the patient recalled recent ingestion of stone fruits. The final diagnosis was mechanical small bowel obstruction from an impacted fruit pit mimicking gallstone ileus. The patient recovered fully and

Abbreviations: ALT, alanine aminotransferase; CRP, c-reactive protein; CT, computed tomography; GGT, gamma-glutamyl transferase; MRCP, magnetic resonance cholangiopancreatography; SBO, small bowel obstruction.

☆ Competing Interests: The authors have declared that no competing interests exist.

☆☆ Acknowledgments: The publication fees was funded by the University of Ferrara.

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https://doi.org/10.1016/j.radcr.2026.04.087

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was discharged with dietary recommendations. This case underscores the importance of considering alternative diagnoses when imaging suggests gallstone ileus, especially in the absence of a biliary-enteric fistula. Radiologists and clinicians should be aware that ingested fruit pits may resemble calcified biliary calculi on cross-sectional imaging. A high index of suspicion and multidisciplinary collaboration are essential to avoid misdiagnosis and unnecessary surgical intervention.

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Background

Small bowel obstruction (SBO) is a frequent cause of hospital admission and may result from a wide range of etiologies, including adhesions, hernias, neoplasms, and intraluminal foreign bodies. Foreign body ingestion is a common problem that often requires little intervention. Although foreign body ingestion is a relatively common event, the majority of ingested objects transit the gastrointestinal tract uneventfully, without the need for intervention. Successful spontaneous passage largely depends on factors such as the size, shape, and composition of the foreign body, as well as the absence of pre-existing anatomical or functional abnormalities of the bowel [1]. Although rarely considered in clinical practice, ingestion of fruit pits—such as those from peaches, apricots, or plums—can occasionally lead to mechanical obstruction, particularly in patients with underlying intestinal alterations such as surgical anastomoses or strictures [1,2].

In some cases, ingested pits may appear as radiopaque intraluminal masses and be misinterpreted as gallstones. When such findings are associated with small bowel obstruction and known gallbladder lithiasis, they may mimic the classic presentation of gallstone ileus, a rare condition caused by the passage of one or more gallstones into the intestinal lumen through a spontaneous biliary-enteric fistula [3–5].

This scenario may give rise to a diagnostic pitfall known as *pseudo-gallstone ileus*, in which an ingested fruit pit simulates the clinical and radiological features of true gallstone migration.

Radiologists may not be familiar with the appearance of fruit pits on cross-sectional imaging, and their density and morphology may closely resemble that of biliary calculi. This overlap is particularly relevant in patients with known cholelithiasis, where the presence of calcified gallstones can further bias the diagnostic interpretation [2].

We report a case of small bowel obstruction caused by an apricot pit impacted above a stenotic ileocolic anastomosis. The clinical and radiologic features initially oriented towards gallstone ileus, but no biliary-enteric fistula was identified. Endoscopic retrieval confirmed the presence of a foreign body. Radiologists' familiarity with the characteristic radiographic and cross-sectional imaging features of various foreign bodies is essential for guiding clinical decision-making. In cases where imaging findings are suggestive but not definitive for conditions such as gallstone ileus, radiologists should maintain a high index of suspicion for obstruction caused by ingested foreign bodies.

Case presentation

A 49-year-old Caucasian woman presented to the emergency department with acute-onset diffuse abdominal pain and a single episode of vomiting. Her medical history was significant for a self-reported prior ileocolic resection for intestinal ischemia performed approximately 18 years earlier at another institution, although no surgical documentation was available. She reported occasional episodes of abdominal discomfort in the previous days, but no regular medication use. Physical examination revealed a diffusely tender but non-peritonitic abdomen with reduced bowel sounds. The rectal ampulla was empty, although the patient reported recent passage of flatus.

Initial laboratory tests showed the following abnormalities: elevated alanine aminotransferase (ALT, 108 U/L; reference range 7-30), gamma-glutamyl transferase (GGT, 124 U/L; reference 5-36), pancreatic isoamylase (87 U/L; reference 13-53), and C-reactive protein (CRP, 1.00 mg/dL; reference 0.00-0.50). Total bilirubin was mildly elevated (1.02 mg/dL; reference 0.25-1.00), with a predominance of the indirect fraction.

Abdominal plain radiography performed on admission revealed three calcified formations in the right iliac fossa, the largest located within a dilated small bowel loop with an associated air-fluid level. Additional findings included multiple dilated small bowel loops with visible valvulae conniventes and multiple air-fluid levels. No free intraperitoneal air was detected. Multiple calcified biliary stones of smaller size were also visible in the projected area of the gallbladder, without radiographic evidence of aerobilia. These findings were consistent with mechanical small bowel obstruction (Fig. 1).

A contrast-enhanced abdominal CT scan (performed with and without intravenous contrast media) confirmed previous ileocolic resection and showed multiple distended and fluid-filled small bowel loops. In the dilated pre-anastomotic ileal loop, three hyperdense intraluminal formations were identified, the largest measuring approximately 3.5 cm in maximum diameter. Some small bowel loops in the right iliac fossa appeared mildly thickened, but with preserved contrast enhancement. Calcified gallstones were visualized within the gallbladder, without evidence of biliary tract dilatation, aerobilia, or biliary-enteric fistula (Fig. 2). These findings supported the diagnosis of mechanical small bowel obstruction.

Although not conclusive, the CT findings raised suspicion of gallstone ileus due to the presence of obstructive features, calcified gallstones within the gallbladder, and hyperdense intraluminal formations in the pre-anastomotic ileal loop, consistent with possible migrated biliary stones.

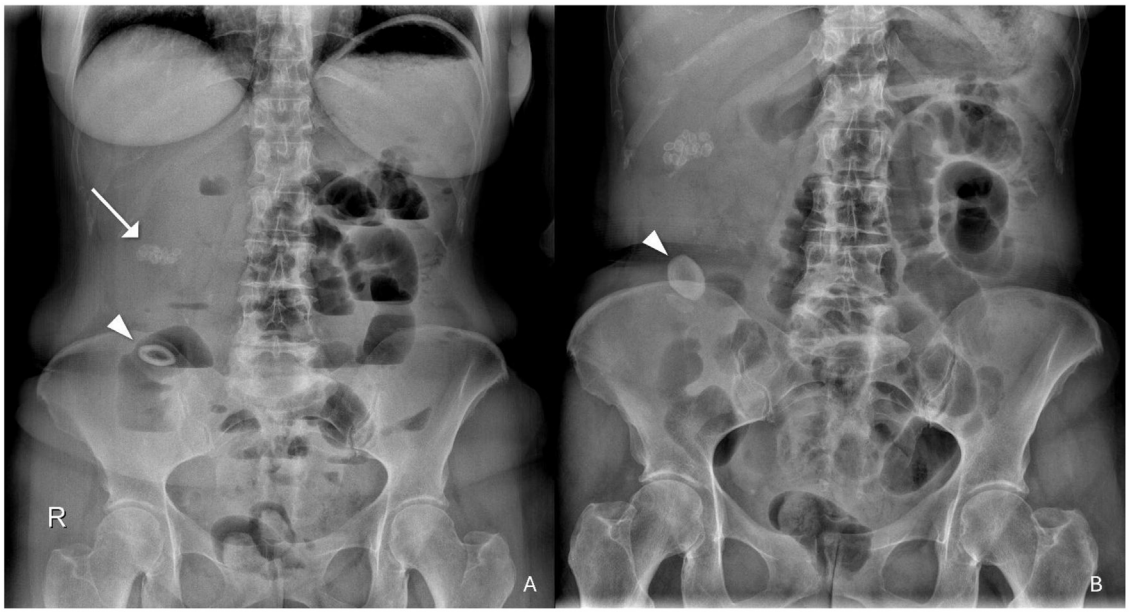


Fig. 1 – Upright (A) and supine (B) anterior-posterior projection abdominal radiographs showing multiple dilated small bowel loops with visible valvulae conniventes and air-fluid levels, consistent with small bowel occlusion. A cluster of calcified biliary stones is visible in the right upper quadrant (arrow). In the right iliac fossa, an ovoid-shaped, radiopaque intraluminal structure is evident within a distended small bowel loop (arrowhead).

A first colonoscopy was performed during hospitalization, revealing a subtotal stenosis at the ileocolic anastomosis, which was not passable with a standard endoscope. Balloon dilation up to 18 mm was performed, allowing access to the terminal ileum, where three hard, stone-like masses were observed. Two of them, measuring up to 2 cm, were retrieved and moved into the colon. However, a third, larger and harder one could not be mobilized across the anastomosis, and mechanical lithotripsy attempts failed. The procedure was suspended, and the endoscopic appearance was interpreted as consistent with gallstone ileus due to biliary stone impaction proximal to an anastomotic stricture.

Given the suspicion of gallstone ileus, the patient underwent magnetic resonance cholangiopancreatography (MRCP) to evaluate for the presence of a biliary-enteric fistula; no fistulous tract was identified.

A second colonoscopy was scheduled and performed after further bowel preparation. The anastomotic stricture was again dilated, and a foreign body measuring approximately 25 mm was successfully retrieved from the terminal ileum (Fig. 3). Upon direct inspection, the object was identified as an apricot pit.

The patient, upon explicit questioning by the medical team, reported having consumed fruits—specifically apricots and plums—in the days prior to admission, and acknowledged having inadvertently swallowed some of the pits.

The postoperative course was uneventful, and the patient was discharged in good condition a few days later. The final diagnosis was pseudo-gallstone ileus caused by an ingested apricot pit, impacted above a postsurgical anastomotic stricture.

Discussion and conclusions

This case illustrates a rare but clinically meaningful cause of mechanical small bowel obstruction: impaction of an ingested fruit pit mimicking gallstone ileus. The radiologic and endoscopic findings initially raised suspicion for biliary stone migration, particularly given the presence of cholelithiasis, obstructive features, and hyperdense intraluminal material. However, the absence of pneumobilia and biliary-enteric fistula prompted further evaluation, ultimately revealing an apricot pit impacted above a stenotic ileocolic anastomosis. This presentation underscores a critical diagnostic pitfall—namely, the potential for certain ingested foreign bodies to imitate classic features of gallstone ileus on cross-sectional imaging, leading to misdiagnosis and potentially unnecessary surgical intervention. From an educational standpoint, the case highlights the importance of integrating imaging findings with clinical history, endoscopic correlation, and a high index of suspicion for alternative diagnoses, especially in patients with predisposing factors such as prior surgery. The growing use of image-guided minimally invasive treatment strategies in abdominal disease reflects a broader trend toward less invasive, patient-tailored management strategies [6,7]. Indeed, this case benefited from a multidisciplinary, conservative approach supported by accurate imaging.

Small bowel obstruction (SBO) represents a common clinical condition and a frequent cause of acute abdominal pain, accounting for approximately 15% of all emergency hospital admissions for abdominal complaints [8]. It encompasses a wide spectrum of underlying etiologies, ranging from postop-

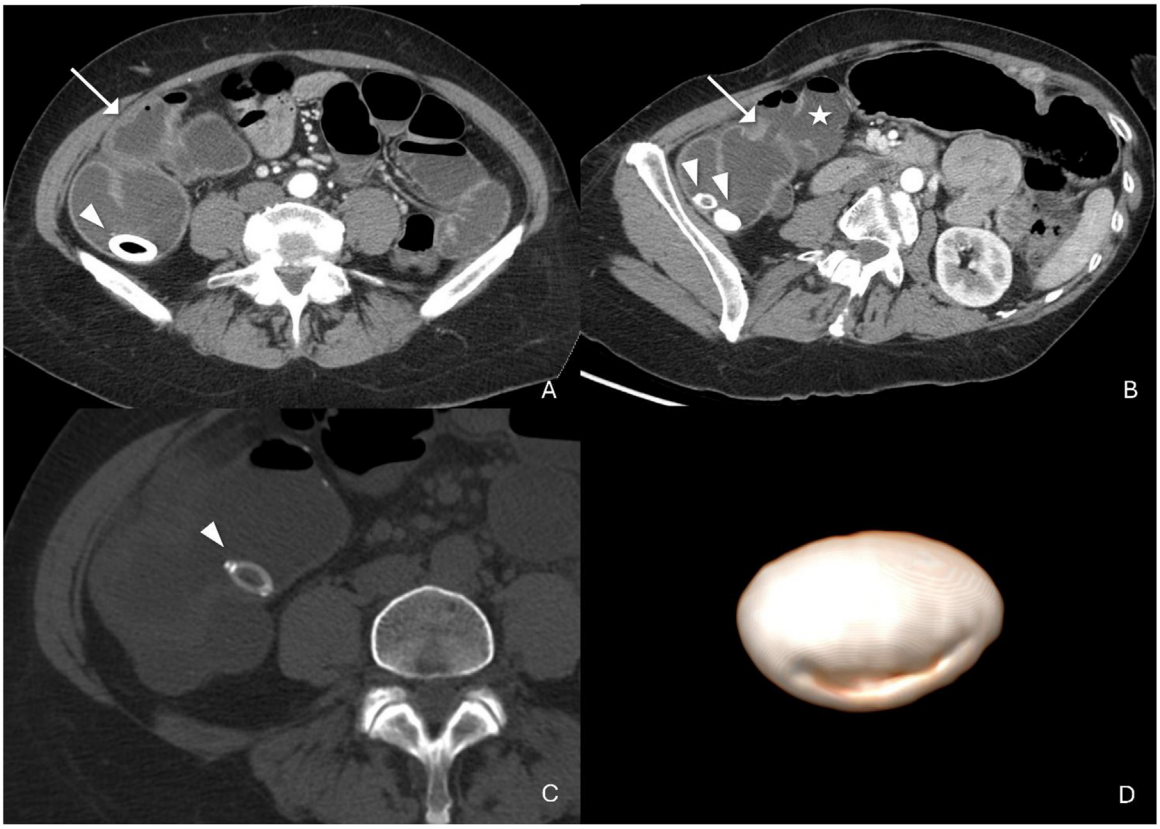


Fig. 2 – (A) Contrast-enhanced abdominal CT scan showing multiple dilated small bowel loops, some with slight mural thickening in the right iliac fossa (arrow). A radiopaque intraluminal structure is visible in the dilated preanastomotic ileal loop (arrowhead). (B) Oblique axial reformatted image displaying the stenotic ileocolic anastomosis (arrow), with two smaller hyperdense intraluminal structures identifiable within the adjacent ileal loop (arrowheads). The ascending colon is marked with a star. (C) Bone window setting highlighting the internal structure of one of the smaller intraluminal hyperdense formations. (D) Volume-rendering reconstruction depicting the largest of the aforementioned formations, with morphology suggestive of an apricot pit.

erative adhesions and hernias to neoplastic or inflammatory processes. Rapid and accurate diagnosis is essential to guide appropriate management and prevent complications such as bowel ischemia or perforation.

Among the less frequent causes of SBO is the ingestion of foreign bodies, a well-recognized but relatively uncommon event. While most ingested objects pass spontaneously without clinical consequence, complications such as impaction and obstruction may occur, particularly in predisposed individuals with intestinal strictures deriving from previous surgery or inflammatory bowel diseases [9]. Although more commonly observed in the pediatric population, foreign body ingestion in adults is typically associated with specific risk factors, including psychiatric disorders, or edentulism [2,7]. The diagnosis of intestinal obstruction due to ingested fruit pits is not always evident, particularly when a reliable and/or complete history is not available, as in the case we presented.

Only a limited number of cases describing ingested fruit pits or seeds mimicking gallstone ileus have been reported in the literature. Among these, a peach pit impaction has been documented as presenting with small bowel obstruction and CT features closely resembling an ectopic gallstone, including an ovoid intraluminal mass with a hyperdense rim and hypodense core, initially leading to a diagnosis of gallstone ileus [3]. Similarly, a durian seed has been reported to simulate gallstone ileus on CT, further illustrating this potential diagnostic pitfall [4]. Beyond these isolated reports, review articles have noted that hyperdense intraluminal foreign bodies may mimic ectopic gallstones on CT, particularly when calcified or when occurring in patients with known cholelithiasis; however, these observations are typically not supported by detailed—pathologic correlation or dedicated case descriptions [1,5,10,11].

As with many acute and potentially life-threatening conditions [7,12,13], computed tomography (CT) has become the modality of choice in the diagnostic evaluation of SBO, offering high sensitivity and specificity in identifying both the presence and level of obstruction, as well as its underlying cause and potential complications. In the context of foreign body ingestion, CT is particularly valuable for detecting radiolucent or atypical materials that may not be visible on conventional radiography, thereby enabling timely diagnosis and appropriate management [1].

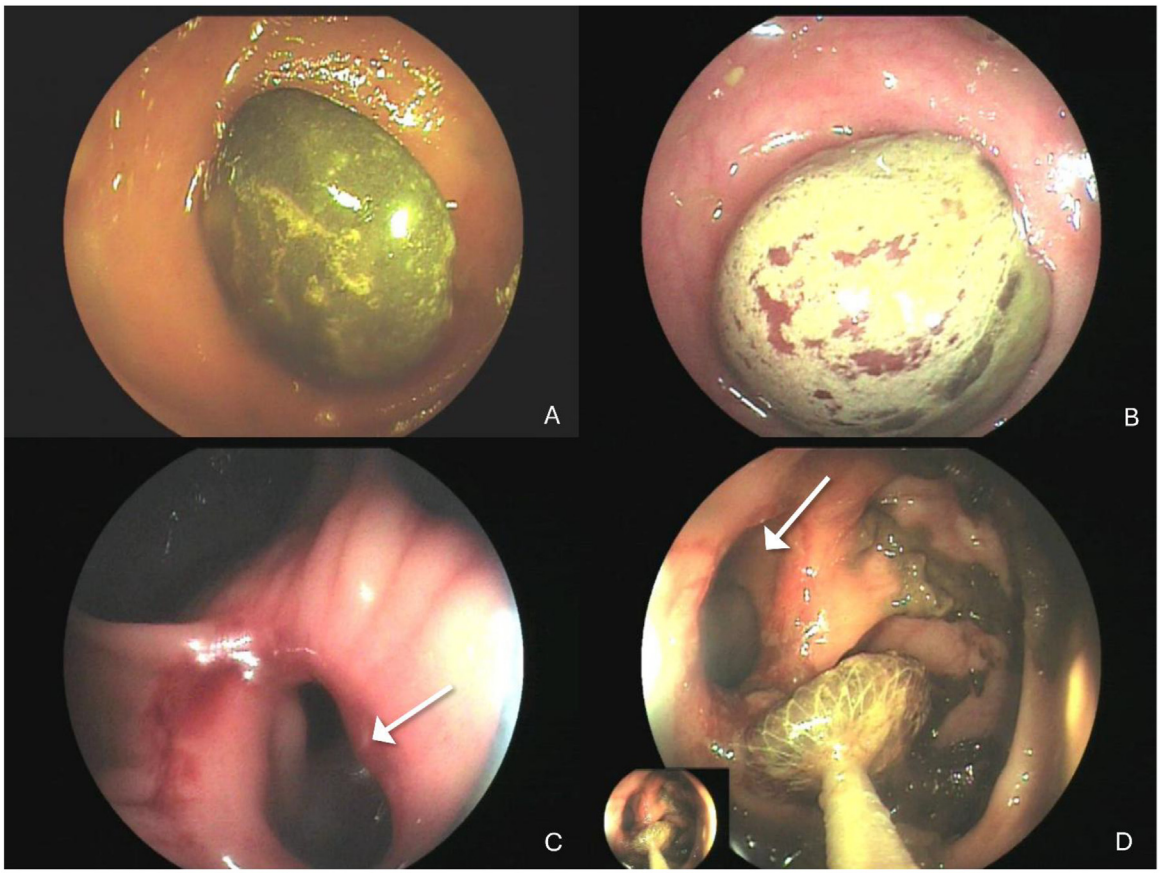


Fig. 3 – Endoscopic view showing the appearance of the largest (A) and of one of the two smaller (B) formations, both initially interpreted as biliary stones. Please note the aspect of the ileocolic anastomosis (arrow) after balloon dilatation (C), and the subsequent removal of the apricot pit using a basket (D).

Distinguishing true gallstone ileus from mimicking intraluminal obstructions can be particularly difficult when imaging reveals multiple calcified objects yet lacks key hallmarks such as pneumobilia or a visible biliary-enteric fistula [11]. In 1941, Rigler outlined his well-known triad of radiological signs for gallstone ileus on plain abdominal radiographs: pneumobilia (air within the biliary tree), evidence of small bowel obstruction, and ectopic radiopaque gallstones [14]. Although originally described on abdominal radiographs, today's radiologists are more likely to identify its counterpart on CT imaging. Nonetheless, the complete triad is observed in fewer than 50% of cases, as up to half of patients present with only two of the classic findings [5,10,15]. As Rigler's triad is frequently incomplete, reliance on partial findings may bias toward a diagnosis of gallstone ileus; therefore, alternative diagnoses must be actively considered, particularly in the absence of pneumobilia or a biliary-enteric fistula.

The CT appearance of ingested fruit pits varies considerably depending on the type of pit in question. For instance, peach stones have a characteristically deeply ridged surface, which facilitates their identification on CT [2,3]. In contrast, plum stones are smaller, with an oval or pointed morphology, and possess a smooth, more regular contour. Fruit stone morphology is readily apparent on modern multi-slice CT imaging, especially when reconstructed using bone-window settings or 3D volumetric techniques [16].

Apricot pits (*Prunus armeniaca*)—as in the present case—typically appear as ovoid to slightly almond-shaped hyperdense structures, measuring approximately 2-3 cm in length. On CT, they are characterized by a well-defined, hyperattenuating outer shell (corresponding to the lignified endocarp) with a relatively hypodense internal core, due to the softer seed tissue. Unlike peach stones, which display prominent surface ridging, apricot pits exhibit subtler longitudinal striations or shallow grooves along the outer contour, which may be visualized in high-resolution multiplanar or volume-rendered reconstructions (Fig. 2). In this context, although prospective differentiation remains challenging, the combination of careful assessment of morphology and internal structure, the absence of pneumobilia or a biliary-enteric fistula may raise suspicion for a foreign body rather than a migrated gallstone.

In conclusion, this case underscores the importance of considering alternative diagnoses when imaging suggests gallstone ileus, particularly in the absence of a demonstrable biliary-enteric fistula. Radiologists and clinicians should remain vigilant to the possibility that ingested fruit pits may mimic calcified biliary calculi on cross-sectional imaging,

especially in patients with predisposing anatomical alterations. Recognizing this potential pitfall is essential to avoid diagnostic errors and unnecessary surgical interventions. A thorough clinical history and multidisciplinary assessment are key to guiding appropriate management in such atypical presentations.

Data availability

All data generated or analyzed during this case report are included in this published article. Further details are available from the corresponding author upon reasonable request.

Author contributions

ACa conceived the study and was responsible for manuscript drafting and final revision. RB and NP contributed to clinical data collection and interpretation. ACo, FF, and MG reviewed the imaging studies and prepared the figures. All authors read and approved the final manuscript.

Patient consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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