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Case Report

Torsed wandering spleen as a cause of recurrent abdominal pain in a child[☆]

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ABSTRACT

Wandering spleen is an uncommon cause of acute abdomen in children. Diagnosis of this condition is challenging due to its non-specific symptoms, varying intensity and protracted history of presentation. Radiographs and ultrasound imaging provide rapid and reliable means to diagnose this condition without exposure to excessive radiation. We present a case of a torsed wandering spleen in a child with recurrent abdominal pain. We highlight the role of imaging in identifying salient radiographic and sonographic signs for diagnosis.

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Introduction

The spleen is part of the reticuloendothelial system and plays a major role in the body's defense system. In the vast majority of healthy individuals, it is found in the upper left abdominal quadrant and held in place by the gastrosplenic, splenorenal

and phrenicocolic ligaments. Wandering spleen is a condition where the supporting ligaments are abnormally lax, resulting in "wandering" and malpositioning elsewhere in the abdomen [1].

Wandering spleen is an uncommon cause of acute abdomen and only accounts for less than 0.25% of splenectomy cases [2]. There is a male predominance in the first year of life which is subsequently reversed when the child becomes a

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toddler [3]. In one case series which studied 130 children and adolescents diagnosed with wandering spleen, acute abdominal pain was the predominant presentation in 39% of patients above one year of age. On the other hand, patients younger than 1 year commonly present with an abdominal mass [4]. However, up to 50% of detected cases are asymptomatic [5].

We present a case of a torsed wandering spleen in a child with recurrent abdominal pain. We highlight the role of imaging in diagnosing this condition and its associated imaging findings.

Case summary

An 11-year-old girl presented to the emergency department complaining of intermittent left lower quadrant abdominal pain for 1 week. The pain was aggravated by movement and radiated to the back. There was associated low grade fever and abdominal distension during each painful episode, which can sometimes last for hours. The girl also experienced constipation 3 days prior to admission but denied having any urinary symptoms. There were similar episodes over the past year which prompted multiple visits to the local rural health clinic. She was diagnosed to have abdominal colic and was given symptomatic treatment. She was otherwise a healthy child and was active in school.

Upon assessment at the emergency department, she was alert and responsive, not jaundiced and not pale. She was normotensive but had a pulse of 130bpm with fever of 39.6°C. Her pain score was more than 8, requiring morphine infusion to alleviate the pain. On palpation, there was a hard, non-mobile left iliac fossa mass with localized tenderness. No overlying abdominal skin changes noted.

Abdominal radiograph demonstrated loss of the normal splenic shadow and left upper quadrant bowel dilatation. There was an ovoid opacity seen at the left iliac fossa suggestive of an abnormally located spleen (Fig. 1). Ultrasound abdomen demonstrated the absence of spleen in the left hypochondrium (Fig. 2) and confirmed the presence of an enlarged spleen in the left iliac fossa (Fig. 3). The spleen appeared diffusely hypoechoic with no internal Doppler signal demonstrated. Critically, whirlpool appearance at the splenic hilum was present with absence of Doppler signal indicating torsion (Fig. 3). Minimal intraabdominal free fluid was present.

The girl had leukocytosis and elevated serum C-reactive protein. Her renal and coagulation profiles were normal. Intravenous fluid boluses and broad-spectrum antibiotics were commenced.

An emergency laparotomy was arranged. Intra-operatively, the spleen was enlarged and it was occupying the left iliac fossa region. The spleen appeared non-viable, with tight torsion of the splenic hilum (twisted four times). The spleen was untwisted and after a period of warming, there were no signs of recovery. There was evidence of thrombosis of both splenic vein and artery; both were transfixated and divided and the spleen was subsequently removed.

Dense adhesions to the distal sigmoid colon were present and, proximal to it, the colon was dilated. Adhesiolysis was

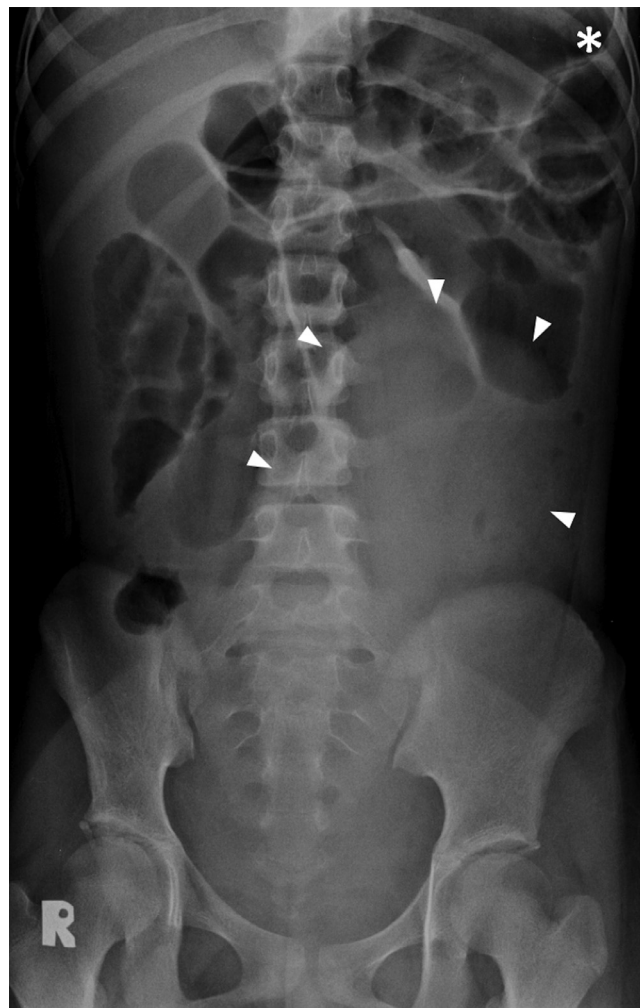


Fig. 1 – Bowel filled left upper quadrant (*) with oval opacity in the left iliac fossa (arrowheads) suggestive of an abnormally located spleen.

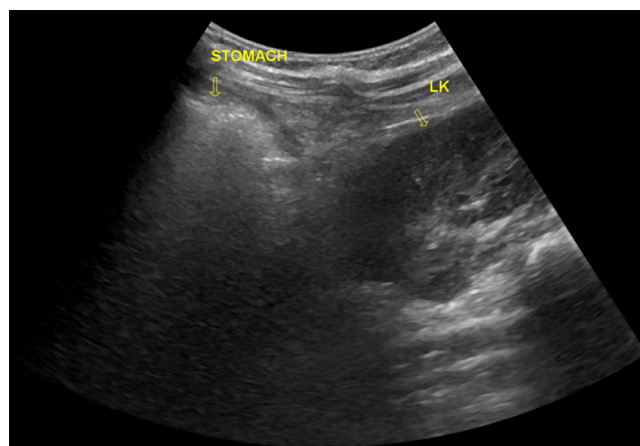


Fig. 2 – Absence of the spleen at the left upper quadrant between the stomach and the left kidney.

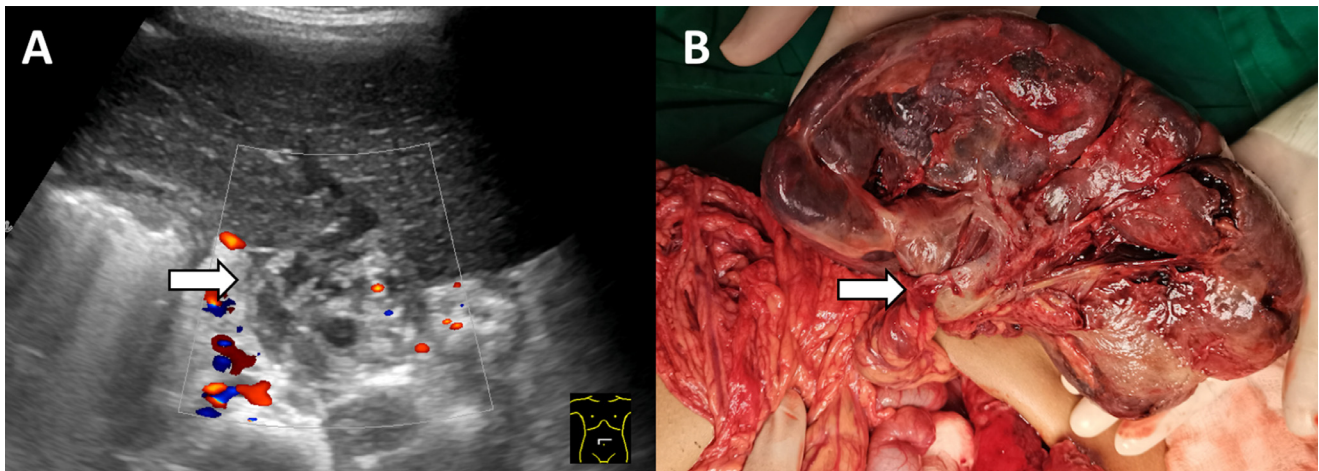


Fig. 3 – Ultrasound image of the splenic hilum demonstrating a whirlpool sign representing the twisted splenic vasculature (white arrow) - note the absence of Doppler signal within (A). Intraoperative photograph of the torsed spleen (B) showing the twisted splenic hilum (white arrow) with areas of necrosis.

performed. She was discharged well after 5 days, with a short course of oral aspirin.

Discussion

Wandering spleen is a rare cause of recurrent abdominal pain in children affecting boys more commonly than girls in a 6:1 ratio [6]. Clinically, patients usually present with non-specific symptoms of mild fever, constipation, and loss of appetite.

This condition is characterized by a malpositioned spleen, mainly due to the laxity of the supporting ligaments, which can be either acquired or congenital [7]. Acquired wandering spleen is normally caused by trauma damaging the suspensory splenic ligaments or pregnancy [8]. Conversely, abnormal development of the dorsal mesogastrum has been suggested as the cause of congenital wandering spleen [9,10]. Embryologically, mesodermal tissue condenses and fuses with the peritoneal lining at the abdominal wall forming the splenorenal ligament posteriorly and gastrosplenic ligament anteriorly. Incomplete fusion of the mesogastrum has been postulated to cause the laxity of the splenic hilum resulting in abnormal development of the splenorenal ligament. The resulting configuration has the spleen precariously supported by a single pedicle that is liable to torque. In the event of volvulus, splenic infarction inevitably ensues.

Imaging has been proven to be helpful in the diagnosis of wandering spleen. Abdominal radiography and ultrasound imaging are usually readily accessible and can ascertain an absent spleen in the left upper quadrant. Furthermore, Doppler interrogation of the splenic vasculature and parenchyma can give added information on the perfusion status of the spleen [11]. The whirlpool sign at the splenic pedicle with paucity of Doppler flow signal is specific for splenic torsion with acute infarction [12,13].

Contrasted CT scan is also another modality that can provide additional information on the stages of infarction [13].

Early infarcts can be diagnosed on CT imaging when rim enhancement of the splenic capsule or lack of fat stranding surrounding the twisted splenic pedicle are observed [13]. Chronic splenic infarction causes fibrotic contraction of the affected area accompanied by compensatory hypertrophy of the normal splenic parenchyma [14]. While some authors have advocated the use of contrasted CT scans as the modality of choice to diagnose the underlying cause of acute abdomen [3], we suggest that CT scans be used judiciously in children as it carries a heavy radiation burden [15].

If viable, the definitive treatment for wandering spleen is splenopexy. When possible, preserving the spleen would reduce the risk of postoperative sepsis [16,17]. Concomitant gastric volvulus has also been infrequently reported in cases of splenic torsion. This is mainly due to the similar pathophysiology of both conditions. Thus, some authors recommend prophylactic gastropexy in the same setting of splenopexy [7,18].

Conclusion

Torsed wandering spleen is an infrequent but treatable cause of recurrent acute abdominal pain in children. Early detection and high clinical suspicion can prevent the occurrence of splenic infarct and the need for splenectomy. Ultrasound and abdominal radiography are readily available imaging modalities that can help in the diagnosis of wandering spleen.

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Patient content

Consent has been obtained from the patient's parent for publication of this case report

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.radcr.2022.03.017.

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