CASE OF THE MONTH

Post-traumatic acute abdominal pain

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A 9-year-old female presented to the emergency department complaining of intense peri-umbilical pain with nausea and vomiting after a road accident. Physical examination revealed abdominal tenderness with a painful well-circumscribed mass in the lower abdomen. The haemodynamic state was stable. Ultrasonography showed a mobile hypoechoic mass with a moderate amount of free intraperitoneal fluid. An abdominal CT scan was performed. Axial images before and after intravenously administered contrast material are shown.

- What are the abnormalities seen in Figure 1?
- What do you notice in Figure 2?
- What is your diagnosis?

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Figure 1. Abdominal CT scans obtained before and after intravenously administered contrast material.

Figure 2. Abdominal CT scan with intravenously administered contrast material at a higher level.

Findings and diagnosis

Figure 1 shows the presence at the peri-umbilical region of an intraperitoneal mass, oblong, hypodense and not enhanced after injection of contrast, proven by the lack of significant change in the Hounsfield numbers in (b). This is the spleen and the lack of splenic enhancement is due to impairment of blood supply secondary to torsion. There is another round mass adjacent, which is composed of vascular structures surrounded by fat in a characteristic "whorled appearance".

In Figure 2, we note the absence of the spleen in its usual localisation with effusion at this site. These findings suggest torsion of a wandering spleen (WS). The patient subsequently underwent further surgery that confirmed the splenic torsion. A splenectomy was then performed.

Discussion

Wandering spleen is a rare entity, with a reported incidence less than 0.2% and accounts for only 2 per 1000 splenectomies [1]. Both congenital and acquired causes have been proposed to explain the hypermobility of the spleen. Some conditions including an enlargement or absence of a kidney, infectious mononucleosis, splenomegaly, Hodgkin's disease and Gaucher's disease have been incriminated. There are two peak ages of onset: childhood especially below one year, followed by the third decade of life, and it is more frequently seen in females of reproductive age. The most common presentation in children is acute abdominal pain. WS may also present with no specific symptoms such as occasional nausea, emesis or mild abdominal pain and sometimes it may be completely asymptomatic. Traumatic splenic rupture has been reported [2], but we could only find two paediatric cases of traumatic torsion on a PubMed [3] search.

Cross-sectional imaging with ultrasound or computed tomography (CT) confirms the absence of the spleen in its expected location and the presence of a homogeneous soft-tissue mass in an inferior position within the abdomen or pelvis. The hilum of the wandering spleen is often located anteriorly. CT has the advantage of evaluating the tail of the pancreas, as well as other normal or abnormal intra-abdominal structures.

Torsion of the pedicle leads to splenic ischaemia or even infarction. In splenic torsion, Doppler ultrasound demonstrates no flow within the spleen itself and a low diastolic velocity with an elevated resistive index in the proximal splenic artery [4]. CT demonstrates heterogeneous enhancement with lower attenuation [5].

Another useful CT finding is the characteristic whorled appearance of the twisted splenic pedicle that is created

by alternating bands of high-attenuation vessels and adjacent low-attenuation fat [6].

The advantage of magnetic resonance imaging (MRI) is its lack of ionising radiation, as well as its superior tissue characterisation. However, there are few reports describing MRI findings of torsion of a wandering spleen. Areas of infarction appear as well-defined wedge-shaped areas of hyperintensity on T_2 weighted image extending from the periphery towards the splenic hilum. A thick, enhancing pseudocapsule representing omental and peritoneal adhesions has been observed in cases with chronic torsion. MRI may also reveal the whorled appearance of the splenic vessels [7]. Arteriography allows definitive evaluation of the splenic vasculature.

Definitive treatment for wandering spleen is operative, since non-operative treatment is associated with a complication rate as high as 65%. Splenopexy is now the procedure of choice in children, as long as there is no evidence of infarction [8]; if the spleen appears infarcted, a splenectomy should be performed.

Conclusion

Torsion of a wandering spleen in blunt abdominal trauma is rare in children. It is a complication that must be considered in any acute abdomen. Imaging, especially ultrasound coupled with Doppler and CT scan, are essential for diagnosis. Specific signs are hypovascular areas of the splenic parenchyma and the characteristic whorled appearance of the twisted splenic pedicle.

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