Torsion of a fatty fringe of the falciform ligament, a rare cause of right hypochondrial pain

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Torsion of the colic epiploic fringe or the omentum is a rare but fully acknowledged cause of acute abdominal pain, recognised as much from the clinical as from the radiological point of view. The notion of intra-abdominal focal fat infarction (IFFI) has recently been proposed, in order to group these clinical entities together [1].

We report a case of torsion of the fatty fringe of the falciform ligament, which was confirmed surgically.

Observation

A 46-year-old female patient, a nursing auxiliary, consulted the emergency department for sudden onset hypochondrial pain which had developed over 3 days. The main features of her history were an appendectomy and episodes of severe renal colic.

Clinically, there was no fever or jaundice, but there was considerable guarding on abdominal palpation of the right hypochondrium.

Questioning did not reveal any particular trigger or any analgesic taken that might be the cause.

Initial laboratory results showed isolated elevation of gamma-GT at 98 IU/L. There was no inflammation or cytolysis.

Ultrasonography, initially requested because of suspected acute cholecystitis, and the initial abdomino-pelvic CT scan showed an acalculous gall bladder with thin walls. There was no dilatation of intra- or extra-hepatic bile ducts.

In view of the discordant radiological, clinical and laboratory picture, the patient was admitted for monitoring. Laboratory results were much the same except for a moderate increase in CRP to 56 mg/L. The clinical examination was similar.

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Radiological reassessment was undertaken. Another ultrasound examination, limited by the patient’s pain and again performed without using the superficial probe, contributed nothing. The CT scan performed revealed an oblong mass, of fatty density with a hyperdense crown and a linear hyperdense centre, located at the site of the falciform ligament, suggesting torsion of a fatty fringe of this ligament. There was also discrete perilesional infiltration (Fig. 1).

Given the persistent pain, the patient underwent laparoscopic exploration which confirmed the diagnosis (Fig. 2), so that the lesion could be ablated. On histological examination, it was found to be a rounded fragment of adipose tissue with ghosts of adipocytes and fibrous partitions with haemorrhagic suffusions and the presence of a few inflammatory elements on the surface indicating infarction of the epiploic fringe.

**Discussion**

The falciform ligament is a vestige of the ventral mesogastrium. It stretches sagittally from the superior surface of the liver to the inferior surface of the diaphragm and to the posterior surface of the anterior abdominal wall. The two layers forming it, which continue from the superior layer of the coronary ligament, are formed by reflection of the hepatic visceral peritoneum on the diaphragmatic peritoneum. In its lower part, it contains the round ligament, the paraumbilical veins and a variable quantity of fat [2,3].

The falciform ligament is hardly implicated at all in current pathology or, at least, little diagnosed. Iatrogenic internal hernia through the ligament is the condition principally found. Gangrene, most often related to acute necrotising pancreatitis, and tumours, benign or otherwise (lipomas and myxoid sarcomas particularly), have also been described in relation to it.

Torsion of a fatty fringe of the falciform ligament is a very rare cause of acute abdominal pain. To our knowledge, only two cases with radiological and surgical correlation have been published to date [4,5]. This condition is close to primary appendagitis, both clinically and radiologically.

The clinical picture and laboratory values are often non-specific and may point wrongly towards diagnosis of biliary colic or cholecystitis. The onset of pain is sudden; it is focal and elective (the patient can point to the site of his or her pain) [6]. In laboratory tests, moderate hyperleukocytosis and increase in CRP may be observed, but results are often normal.

Ultrasonography may cause the diagnosis to be suspected. Examination of the painful site with a superficial probe will find a hyperechoic, oval, non-compressible mass, surrounded by a peripheral hypoechoic halo, situated at the point of maximum pain [7]. However, the sensitivity of this technique is low, probably because of lack of knowledge of the condition. Above all, it enables us to eliminate differential diagnoses. Similarly, elective pain at a point with normal ultrasonography may possibly point to the diagnosis.

Diagnosis is mainly made as a result of the CT scan, as in our case, and this therefore appears to be the reference examination. Injection of a contrast agent is not necessary for this purpose. Localisation on the skin surface may be of help, as in our case (Fig. 1). In a painful period, an oval nodule of fatty density is found, limited peripherally by a hyperdense ring corresponding to the peritoneum [7,8]. The nodule occurs under the anterior abdominal wall at the site of the falciform ligament. At the centre of the inflamed epiploic appendage, there is well-defined, linear or round hyperdensity known as the ‘dot’ sign. This is caused by thrombosis of the vessels in the centre of the pathological fringe [7,9]. Fat infiltration is often found at the periphery of the epiploic appendage involved.

In view of the CT appearance, the other possible differential diagnosis could be appendagitis of the right colon. Connection to the falciform ligament can be shown perfectly with coronal and sagittal reconstructions (Fig. 3). As
Figure 3. Sagittal MPR. The fringe, the site of torsion (arrow head), is in contact with the falciform ligament, just below the umbilical vein (full arrow).

management of these two conditions is similar; the distinction is of minor importance. Treatment is basically conservative, since a spontaneous evolution is to be preferred. However, in our case, surgical exploration removed the diagnostic doubt.

Conclusion

Although very rare, radiologists should know of this IFFI of the falciform ligament, in order to avoid diagnostic error and optimise patient management.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

References