LETTER / Gastrointestinal imaging

Peritoneal splenosis mimicking peritoneal carcinomatosis: A case report

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Peritoneal splenosis occurs rarely [1] and is difficult to diagnose because it can mimic peritoneal conditions or solid organ tumours [1,2]. We report a case of diffuse peritoneal splenosis mimicking peritoneal carcinomatosis, diagnosis of which was confirmed through the laparoscopic ablation of a nodule which was examined histologically.

Observation

Mrs RJ, aged 65, was referred to us for exploration of abdominal lymphadenopathies found by ultrasound following abdominal pain. The patient was in a generally good condition, stage 1 on the WHO performance status scale. In her history, cancer of the cervix of the uterus had been found in 1995 (a FIGO classification grade IA, slightly invasive, intraepithelial malpighian carcinoma), treated by extended total hysterectomy with lymph node dissection, which proved negative, and splenectomy in August 1964 following a traffic accident.

An ultrasonography (US) in our department revealed oval lesions isoechoic with the liver. These lesions were intraperitoneal in the epigastric region, so that lymphadenopathy was suspected (Fig. 1). A thoraco-abdominopelvic CT found many isodense nodular formations near the liver; they were intraperitoneal, one centimetre in size with homogenous enhancement on the contrast-enhanced venous phase images. These nodules were unchanged in a second CT performed 4 months later to assess the progress of the lesions given the patient’s satisfactory clinical state (Fig. 2). In addition, an 18F-FDG PET CT found no metabolic hyperfixation indicating neoplastic recurrence or a high grade lymphoma (Fig. 3). The patient’s previous cancer history had

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Figure 1. Ultrasonography axial slices. Intraperitoneal, well circumscribed, oval, hypoechoic nodules.

Figure 2. Clearly delimited homogeneous nodules, anterior to the gastric antrum and in the right iliac fossa, isodense to the liver at unenhanced CT images and with intense and homogenous enhancement on the contrast enhancement CT images. a: CT: axial unenhanced CT image (December 2008); b: CT: axial contrast-enhanced portal phase CT image (December 2008); c: CT: axial contrast-enhanced portal phase CT images (April 2009).
led us to suspect peritoneal carcinomatosis and to recommend a biopsy. Laparoscopy was performed with excision of a nodule. Macroscopic examination showed a 3 g nodule, well delimited by a capsule, with the appearance of splenic parenchyma on sectioning. Under the microscope, the nodule was well circumscribed by a thin fibrous capsule delimiting splenic parenchyma composed of non-malignant red and white pulp. The patient’s history of post-traumatic splenectomy led to the diagnosis of peritoneal splenosis.

Discussion

Splenosis is the development of fragments of spleen in the organism. It is secondary to splenectomy usually after traumatic rupture [1–3]. The spleen fragments or splenules may develop anywhere in the abdominal cavity, the peritoneal cavity being the most common location. They can occur in the thorax if there is associated rupture of the diaphragm [4]. They are different entities from accessory or supernumerary spleens which are embryonic migration anomalies of the primitive splenic islands [1,4,5]. Peritoneal splenosis is usually discovered by chance during surgery, autopsy or imaging [2]. It is sometimes diagnosed when there are painful abdominal or pelvic symptoms secondary to infarction due to torsion, spontaneous rupture, digestive occlusion or a mass effect on adjacent structures [1,2,5,6]. With US, splenules appear hypoechoic relative to the hepatic parenchyma, uniform, clearly circumscribed, and with a reinforced posterior echo [2]. Recent work [4] has shown that the use of an ultrasound contrast agent makes differential diagnosis possible between splenosis implants and peritoneal metastases. Bertolotto et al. [4] showed that enhancement of splenosis nodules was intense with early wash-out, unlike peritoneal carcinomatosis nodules which show progressive enhancement without wash-out. Contrast-enhanced ultrasound is thus a valid alternative to other imaging methods, particularly CT, which is a source of irradiation.

In CT, these nodules are hypo- or isodense relative to the liver, and have similar enhancement kinetics to that of the spleen, with heterogeneity in the arterial phase and hypodensity in the venous phase [7–9]. In our observation, the arterial phase was not performed: it would have allowed better characterisation of the lesion.

In MRI, the splenosis nodules are hypointense in T1 and T2 and in T1 are heterogeneously enhanced early in the arterial phase after injection of gadolinium, becoming homogenous in the late phase [2]. In addition, MRI can confirm the diagnosis if a superparamagnetic contrast agent is injected. Roussel et al. [2] thus diagnosed splenosis in a patient with a lesion mimicking an exophytic hepatic tumour by injecting superparamagnetic contrast agent containing iron oxide (SPIO: SuperParamagnetic Iron Oxide).

Another imaging method which can confirm the diagnosis of splenosis is scintigraphy: Chagnaud et al. [1] diagnosed peritoneal splenosis when confronted with a right retroperitoneal mass using splenic scintigraphy selective for altered red blood cells labelled with technetium 99m, more sensitive than colloid hepatosplenic scintigraphy [1,2,5,9]. Due to the fact that uterine cancers can metastasise on the surface of the peritoneum and the patient’s history of cancer, we considered lymphadenopathies then peritoneal carcinomatosis, which is characterised by nodules, ascites and thickening of the peritoneal membranes [8,9]. CT is the examination of choice for evaluating peritoneal
carcinomatosis. It is often preceded by an ultrasound examination which can detect any intraperitoneal effusion. Given the good general condition of the patient and 15 years free of relapse after treatment of the tumour, peritoneal carcinomatosis was not a very likely diagnosis.

The other important differential diagnoses to consider were accessory spleens, polypsplenia, adenomegalies, endometriotic nodules and desmoid tumours [2,3,9,10]. Accessory spleens most often occur in the hilum of the spleen, the spleno-pancreatic ligament and gastrosplenic ligament [1,9]. They are smaller and fewer in number and in imaging have the same characteristics as the orthotopic spleen [9]. Polysplenia, often associated with other visceral abnormalities, particularly with an aygos continuation of the caudal vena cava, is characterised by a spleen divided into two to six splenules found in the left or right hypochondrium [9]. Adenomegalies occur along the vascular axes. Endometriosis nodules are looked for in a woman with chronic pelvic pain. They can occur anywhere in the abdominopelvic cavity but are usually found in the peritoneum and pelvic organs and are rarely as large [3].

Finally, a desmoid tumour or benign fibromatosis classically occurs after colectomy surgery. In imaging, the rather moderate enhancement of these well-defined homogeneous tissue lesions is variable [3]. When the diagnosis of peritoneal splenosis has not been considered, as was the case in our observation, diagnosis is confirmed by histological examination after biopsy or excision of a nodule.

**Conclusion**

Peritoneal splenosis is rare, particularly in the diffuse form. A history of post-traumatic splenectomy should bring it to mind when faced with any nodule or single or multiple intraperitoneal mass, even in a patient with a history of neoplasia. CT helps to characterise the lesion.

Contrast-enhanced ultrasound, MRI with injection of a superparamagnetic contrast agent and scintigraphy with technetium 99m labelled altered red blood cells can help confirm a diagnosis of peritoneal splenosis and avoid any invasive action.

**Disclosure of interest**

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

**References**


