Focal fatty infiltration in Segment IV of the liver mimicking peritoneal carcinomatosis on CT and MR imaging

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Summary Focal hepatic steatosis occurs often. If mistaken for liver metastasis, it can occasionally result in a decision against resection because of suspicion of locally advanced disease. Magnetic resonance imaging (MRI) often leads to the correct preoperative diagnosis, but if any doubt persists, surgery should not be precluded, even if the disease appears to be widespread, particularly since the classical age limitations for large magnitude operations have been steadily rolled back. The following 69-year-old patient, with peritoneal carcinomatosis from an appendiceal cancer and an atypical image in the liver corresponding to focal Segment IV steatosis, illustrates our message.

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CT scan often reveals pseudo-tumorous lesions and this constitutes a classical trap recognized for more than 20 years [1,2]. Most of these images are found in the posterior part of segment IV. Several hypotheses have been forwarded to explain the development of such lesions, including abnormalities of hepatic venous drainage leading to focal areas of steatosis or, conversely, focal “healthy” areas in a liver with extensive hepatosteatosis [3,4].

Recognition of these abnormalities is important because their presence could lead to an incorrect decision to refuse patients for surgery when such an image is falsely considered to be a sign of extended disease.

Current management of peritoneal carcinomatosis of appendicular origin calls for complete excision of carcinomatosis lesions in association with systemic and above all intraperitoneal chemotherapy. Today, hyperthermic intraperitoneal chemotherapy (HIPEC) is the standard therapy. When liver localizations are seen in association with
peritoneal metastases, the role of surgical excision with HIPEC is debatable.

A 69-year-old woman was referred to our unit for peritoneal carcinomatosis, synchronous with an as-yet unresected appendiceal carcinoma after diagnosis by laparoscopy. This patient had no major co-morbidities and underwent four sessions of induction FOLFOX chemotherapy. The initial thoraco-abdominal CT scan did not show any peri- or intrahepatic abnormalities, but a post-chemotherapy CT scan demonstrated a subcapsular focal abnormal image in Segment IV, suggestive of liver metastasis or a new localization of peritoneal carcinomatosis (Fig. 1). The liver MRI revealed a fatty lesion without any diffusion restriction, but the form of the lesion was truly quite atypical to be considered as focal steatosis (Fig. 2). Advanced hepatic metastasis would have contra-indicated surgery for peritoneal carcinomatosis.

Analysis of factors predictive of worsened morbidity and mortality was complex because of the patient’s age. Nonetheless, the current attitude for treatment of peritoneal carcinomatosis with cytoreductive surgery and HIPEC is not to refuse surgery for patients over 70 years old; this is

Figure 1. Abdominal CT scan after injection of contrast material: axial (A) and coronal (B) portal reconstruction phases: unique subcapsular hypodense lesion in segment IV, oblong and bilobed (arrow).

Figure 2. Liver MRI axial slices: the lesion presents a hypersignal on T1 (A) and the signal drops in the T1-weighted opposition phase sequence (B) which is suggestive of fatty tissue. The suspicious area enhances less than the peripheral parenchyma (C) but there is no diffusion restriction (D).
also the case for other complex oncologic surgeries, such as esophageal or gastric cardiac adenocarcinoma [5]. The decision taken in multidisciplinary reunion was to perform a laparotomy anticipating the possibility of immediate HIPEC. The laparotomy confirmed the diagnosis of limited carcinomatosis, with a carcinomatosis index of 14; the hepatic lesion consisted of focal fatty infiltration in Segment 4 (Fig. 3). Complete excision of carcinomatosis followed by HIPEC was performed. Follow-up at six months showed no evidence of progression of carcinomatosis.

Focal pseudo-tumorous hepatic abnormalities, particularly focal fatty infiltration, must be recognized in order to avoid refusal of surgery to operable patients. These lesions have been widely described in the radiological literature and several morphological and functional elements allow their recognition preoperatively and help avoid confusing them with authentic malignant lesions [6,7]. MRI with "in phase" and "opposition of phase" sequences is particularly helpful in making the correct diagnosis in this setting. However, this case reminds us that characterization based on imaging can be particularly difficult in certain settings, such as diffuse malignant disease.

Disclosure of interest

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

References