Unusual T2-hypointense liver lesion: solitary necrotic nodule

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Imaging Technique: Ultrasound
Case Type: Clinical Cases
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Patient: 37 years, female

Clinical History:

Incidental detection of focal liver lesion in a healthy Italian woman without any significant previous medical history, on her return from a year-long stay in the Caribbeans. Use of medications or toxic substances was excluded.

Imaging Findings:

Abdominal ultrasound detected, as the only abnormality, the presence of a solitary focal lesion in the right lobe of a normal liver: the lesion showed regular lobulated contour, hypoechoic structure with some thin internal echoic septations and absent intrasional colour Doppler signals. The initial clinical suspicion of an infectious lesion was contradicted since all laboratory tests (including liver enzymes and function, infectious and neoplastic markers) yielded normal results.

Further investigation with MRI confirmed a single lesion, characterised by low T1- and T2- signal intensity and non-restricted diffusion; no significant vascularisation was detectable during the dynamic contrast-enhanced acquisition save for few linear delayed enhancing structures corresponding to the echoic septa.

Histology of targeted liver biopsy specimen was reported as including mostly necrotic areas, surrounded by mixed fibrous-inflammatory tissue with histiocytes, plasma cells and fibroblastic reaction; no signs of neoplasia were detectable; peripherally, some liver parenchyma with normally structured trabeculae, residual vascular and biliary structures.

Discussion:

Detection of a T2-hypointense liver lesion is a rare occurrence, since the vast majority of benign and malignant focal abnormalities appear more or less hyperintense on T2-weighted sequences.

Low T2-signal intensity may be related to the presence of blood degradation products in different haemorrhagic lesions, to iron or copper deposition, or to a variable content in smooth muscle, fibrosis, mucin, calcification or necrosis.

When faced with a T2-hypointense liver lesion, the puzzled radiologist should consider these possibilities to narrow the differential diagnosis, often obtained through biopsy.

In our patient, histological findings of the liver lesion are consistent with a solitary necrotic nodule. After 6 months, the patient remains asymptomatic and the lesion is sonographically unchanged.

Solitary necrotic nodule (SNN) of the liver is a very rare, nonmalignant entity of unknown aetiology; an origin from
previous parasitic infection, trauma or sclerosing haemangioma has been hypothesised. Initially described in 1983, SNN is defined pathologically by a central necrotic core enclosed by a peripheral fibrotic capsule with elastic fibres and inflammatory cell including histiocytes and plasma cells. Most commonly diagnosed in adulthood, SNN are not associated with clinical symptoms and laboratory abnormalities, and usually represent an incidental finding on diagnostic imaging studies that may raise concern particularly in patients with history of primary cancer. These uncommon lesions are usually single, measuring 1 cm to 4 cm and located no more than 1 cm from the liver capsule, sometimes with a bilobed or lobulated shape that is unusual for malignancies. Hypoechoic at ultrasound and hypodense on unenhanced CT scans, at MRI most hepatic SNN appear with low signal intensity on both T1- and T2-weighted sequences, consistent with the presence of dehydrated, coagulative necrosis at histopathology. On dynamic contrast-enhanced studies, complete avascularity is the rule save for slight enhancement sometimes observed at the periphery and corresponding to the fibrous-inflammatory capsule. Radiologists should be aware of this uncommon entity, to avoid misinterpretation as a potentially malignant lesion such as abscess, metastasis or cholangiocarcinoma. The possibility of a SNN should be suggested with single, subcapsular or peripherally located avascular lesions, particularly if lobulated and/or T2-hypointense at MRI. As demonstrated by this case, percutaneous aspiration or biopsy is useful to exclude malignancy and may show cyto- or histological features consistent with SNN, thus avoiding unnecessary surgery. Since these lesions are not associated with potential complications, conservative treatment and clinical follow-up are recommended.

**Differential Diagnosis List:** Solitary necrotic nodule of the liver, Healed liver abscess, Inflammatory pseudotumour, Hepatic angiomyolipoma, Hepatic leiomyoma, Regenerative siderotic nodule, Haemorrhage, Siderotic hepatocellular carcinoma, Desmoplastic or mucin-containing metastasis, Cholangiocarcinoma

**Final Diagnosis:** Solitary necrotic nodule of the liver

**References:**


Figure 1

Description: Polylobulated hypoechoic lesion (approximately 3.5 maximum diameter) in the right liver lobe, with some thin echoic septa. Origin:
Description: Before intravenous contrast, the liver lesion appears hypointense on T1-weighted (a), conventional (b) and fat-suppressed T2-weighted (c) images, with lobulated contour, without restricted diffusion (d, b=600). Origin:
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Figure 3

**Description:** During dynamic gadolinium-enhanced acquisition (a-c) the lesion appears avascular save for thin, minimal septal enhancement increasing from the venous to the delayed phases. **Origin:**

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