Brucella liver abscess (brucelloma)

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Section: Abdominal imaging
Area of Interest: Abdomen Liver
Procedure: Diagnostic procedure
Imaging Technique: Ultrasound
Imaging Technique: CT
Special Focus: Abscess Calcifications / Calculi Case
Type: Clinical Cases
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Patient: 29 years, female

Clinical History:

A 29-year-old woman presented to our institution with abdominal pain in the right upper quadrant for the past month and associated fever for one week. Laboratory tests showed inflammation with C-reactive protein elevation to 231 mg/l and leukocyte count of 12 x 10^9/l. Liver function tests were normal.

Imaging Findings:

Abdominal ultrasound (US) was performed showing a 6 cm hypoechogenic liver lesion in the right subcapsular region with a central hyperechogenicity and posterior shadowing (Fig. 1a). A stone was seen in the gallbladder (not shown) without signs of acute inflammation. After intravenous injection of 100 mL of iodinated contrast media (iodine content: 300 mg/mL), computed tomography (CT) showed the lesion to be hypodense as referred to normal liver parenchyma (20-45 HU) in the portal venous phase, hypovascular, centred in the VIth liver segment with an extension into the VIIth liver segment (Fig. 1b). Corresponding to the central hyperechogenicity on the US, there was a 1 cm central rounded lamellar calcification inside the lesion. During US guided puncture (not shown), a greenish purulent fluid was aspirated, sent for cytopathologic and bacteriological examinations.

Discussion:

Brucellosis is a zoonosis transmitted to humans by the ingestion of infected foods (meat, unpasteurized dairy products), or direct contact with cattle, sheep, or pigs. It is endemic in rural areas of certain countries of the Mediterranean basin, the Middle East, Central and South America. The causative agents are Gram-negative aerobic bacteria of the Brucella genus, notably B. melitensis, B. abortus, and B. suis.

In Brucellosis, any organ system may be affected [1]. If 90% of infections show a subclinical course, brucellosis may cause undulant fever, weight loss, muscular pain, and arthralgia. Infection of the gastro-intestinal tract may present with abdominal pain. Liver involvement occurs in the form of diffuse acute hepatitis or more rarely in 1.7% of patients, as a focal abscess called brucelloma or necrotizing pseudotumoural granuloma [2, 3]. It is a caseous granulomatous and suppurative reaction to the germ, calcification appearing with chronicity [1, 2, 4]. Brucella liver abscess may be unifocal or multiple [3]. Laboratory workup of brucellosis includes serology with agglutination testing, and definitive proof by polymerase chain reaction. Culture may be based on blood samples in the septicemic phase, or biopsy however often negative [2, 4]. The role of imaging is crucial to confirm affected localizations, search for complications, and suggest a final diagnosis of brucellotic abscess which requires a treatment different from that of a classic pyogenic abscess.

Imaging findings of Brucella abscess are nonspecific except in cases where nodular calcifications are present, deemed to be specific if serology is simultaneously positive [3, 4]. Calcifications may readily be detected on
abdominal plain films. On ultrasound, they appear as a central hyperechogenicity, surrounded by a hypoechochogenic necrotic zone. A thick septated wall around the liquified portion of the abscess may be seen on CT, with a homogenous and hypodense appearance. T2-weighted magnetic resonance images show the abcess's central saccule to be hyperintense with septal peripheral gadolinium enhancement on T1-weighted images. Therapeutic approach for brucellosis is individual according to clinical signs, sepsis, or a more indolent disease course. Antibiotics combine doxycyclin, rifampicin, and gentamicin [1]. If a concretion is present in a hepatic abscess, antibiotic treatment in association with percutaneous abscess drainage is possible [2], other sources promote surgical removal of the calcification to prevent recidivant disease [3]. In conclusion, in suspected brucellosis, the diagnosis is based on a combination of clinical manifestation, exposure history, laboratory findings, and radiology. Central calcification in liver or spleen abscesses is considered a specific sign for the disease.

**Differential Diagnosis List:** Brucella liver abscess (brucelloma), Pyogenic liver abscess, Amoebic abscess, Tuberculoma, Hydatidosis, Lost gallstone

**Final Diagnosis:** Brucella liver abscess (brucelloma)

**References:**


Figure 1

a

Description: Ultrasound image with hypoechogenic subcapsular lesion in the right liver (arrow) containing a central hyperechogenic element with acoustic shadowing. Origin: Department of Radiology, Geneva University Hospital

b

Description: Contrast enhanced abdominal CT with hypoattenuating right liver lesion (arrow) containing a central calcification. Origin: Department of Radiology, Geneva University Hospital