Tuberculosis of the gall bladder: a case report
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Patient: 36 years, female

Clinical History:
A 36-year-old woman presented with recurrent pain in the right hypochondrium for the last 9 months.

Imaging Findings:
A 36-year-old woman presented with recurrent pain in the right hypochondrium for the last 9 months. No history of jaundice or fever was present. There was no significant medical history, especially regarding tuberculosis. Abdominal examination revealed hepatosplenomegaly with a firm palpable lump in the right hypochondrium. Murphy’s sign was positive. Her laboratory findings were within the normal range except for ESR (erythrocyte sedimentation rate) which was 69 mm. Ultrasonography revealed cholelithiasis with circumferential gallbladder wall thickening, more pronounced at the fundus. CT revealed an oedematous and thickened gallbladder wall. Asymmetric eccentric wall thickening was present near the fundus with a non-enhanced hypodense area seen within. MRI demonstrated similar findings. The mural nodule appeared markedly hypointense on the T2-w images. Pericholecystic fat-planes were indistinct. Based upon the imaging findings, especially the mural nodule, diagnostic possibility of Xanthogranulomatous cholecystitis was entertained. It was decided to remove the gall bladder surgically. Intra-operatively, multiple small nodules were seen along the liver surface especially along the gall-bladder fossa with associated pericholecystic omental adhesions. Gross examination of the resected gall bladder showed a growth like area, which on cross section was haemorrhagic and necrotic, and the mucosa velvety and bile stained. No sentinel lymph node was present in the specimen. Microscopic histopathologic examination showed non-caseating granuloma in the mucosa of the gall bladder with dense infiltration of lymphocytes. Section from the liver nodule showed non-cirrhotic periportal fibrosis and granulomas consistent with tuberculosis. Thus final diagnosis of gallbladder and peritoneal tuberculosis was made and anti-tuberculous treatment started, to which the patient responded.

Discussion:
In spite of abdominal tuberculosis being frequent in the developing world, tuberculous involvement of the gallbladder is quite rare. The normal gallbladder is supposed to be highly resistant to tuberculous infection owing to the high alkalinity of bile and presence of bile acids which hinder the growth of tuberculosis bacilli. The presence of cholelithiasis or cystic duct obstruction is considered to be essential for development of gallbladder tuberculosis (GBTB). The gallbladder may get infected by tuberculosis bacilli as a part of miliary tuberculosis (haematogenous spread), disseminated abdominal tuberculosis (contiguous or lymphatic spread) or through the entero-hepatic route. Literature describes four types of gallbladder tuberculosis: 1) as a part of miliary tuberculosis; 2) in association with severe abdominal tuberculosis; 3) isolated GBTB; and 4) involvement of gallbladder in anergic or immunodeficient states such as uraemia, cancer or AIDS. Gallbladder involvement with other intra-abdominal tuberculoses is the commonest variety.

The clinical symptoms are often vague and non-specific. These include pain in the right hypochondrium mimicking
acute or chronic cholecystitis, fever, anorexia, nausea, vomiting, diarrhoea, weight loss, jaundice and a palpable abdominal lump. Laboratory tests may show an elevated ESR and a positive tuberculin test. The diagnosis of gallbladder tuberculosis is often not suspected prior to surgery or biopsy. It has no pathognomonic diagnostic imaging features and mostly the diagnosis is retrospective, made after cholecystectomy. Review of literature reveals very few reports elucidating the imaging findings of GBTB. Ultrasonography, CT or MR imaging may demonstrate focal or circumferential gallbladder wall thickening, an intraluminal soft tissue mass or nodular mural lesions with or without loco-regional lymphadenopathy. However, none of these imaging features are specific for GBTB. The presence of tuberculous lesions in other abdominal organs (liver, spleen, peritoneum, lymph nodes) can be helpful clues for clinching the diagnosis. Mesenteric thickening and high-density ascites if present favour the diagnosis of GBTB. Based upon the imaging findings the closest differentials of GBTB include acute and chronic cholecystitis and gallbladder carcinoma. A pre-operative FNAC/ aspiration can help to confirm the diagnosis. The unusual finding which we encountered in our case was the unusually hypointense mural nodule, as seen on the T2-weighted MR images (Fig. 3). As generally seen in intracranial tuberculomas, this T2w-hypointensity may possibly reflect restricted mobile protons within high protein contents of organised caseation, cellular and collagenous contents, the presence of free radicals produced by macrophages during active phagocytosis, and/or highly immobile saturated fatty acids.

To conclude, a correct preoperative diagnosis of GBTB is uncommon. Due to non-specific imaging findings, it is often confused with gallbladder malignancy or chronic cholecystitis. In countries with a high prevalence of tuberculosis, the possibility GBTB should be included in the list of differentials. The presence of toxic tuberculous symptoms, elevated ESR, a positive tuberculin test, and presence of other intra-abdominal tuberculous lesions can serve as helpful corroborative findings.

**Differential Diagnosis List:** Tuberculosis of gall bladder

**Final Diagnosis:** Tuberculosis of gall bladder

**References:**

**Description:** The gallbladder wall appears thickened and oedematous. Eccentric smooth wall thickening is noted along the left medio-lateral wall with a poorly enhanced hypo-attenuating mural nodule within. **Origin:**
Description: T1-w MRI confirms the presence of a hypointense mural nodule within the thickened gall-bladder wall. Origin:
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**Description:** The mural nodule demonstrates abnormally hypointense signal of these T2-weighted images. **Origin:**
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**Figure 4**

**Description:** Coronal MRI shows circumferential thickening of the gall bladder. Associated hepatosplenomegaly can be appreciated. **Origin:**