

MRI findings in 1 case of primary gallbladder lymphoma

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Abstract

We describe a case of gallbladder extra-nodal marginal zone B-cell lymphoma of mucosa-associated lymphoid tissue (MALT-ML). MALT-ML is rare, and its clinical manifestations are lack of specificity. A few cases have been reported, and no characteristic imaging features have been described. We discussed the challenges of MRI in diagnosing MALT-ML of gallbladder, especially in differentiating it from gallbladder cancer. We found a “comb-like” sign in the inner wall of gallbladder on T2WI, which may be helpful in diagnosing gallbladder MALT-ML.

Keywords: gallbladder; non-Hodgkin lymphoma; MRI.

Clinical presentation

The patient is a 67 years old male, who suffered from inappetence and febleness for 1 month without obvious predisposing causes. He ran a fever intermittently, with a maximum temperature of about 38.6 °C. There was no definite abnormality on physical examination. Laboratory tests showed no abnormality in AFP, CA125, CA199, and other tumour markers, and no obvious signs of infection. The patient had no history of hepatitis B virus infection. Since the patient complained of loss of appetite, US, CT, and MRI were performed one after another to investigate the digestive system disease.

Imaging findings

On US, the lateral wall of the gall bladder was thickened with low echo and inadequate blood flow, and part of the inner wall protrudes into the gallbladder cavity. CT and MRI examinations were suggested to further determine the nature of the lesion and its relationship with the surrounding structures.

CT examination showed uneven thickening of the gallbladder wall with obvious enhancement at the delayed phase.

MRI examination revealed cirrhosis of the liver. The inner part of the right posterior wall of body and bottom part of gallbladder is thickened with a “comb tooth” like protrusion into the gallbladder cavity, and the outer wall of the gallbladder is smooth. The lesion is iso-intense on T1WI and T2WI, hyper-intense on DWI and hypo-intense on ADC images. Dynamic contrast enhanced MRI (DCE-MRI) showed significant enhancement at arterial phase and the enhancement was slightly reduced at delayed phase. (Figures 1 and 2).

Differential diagnosis

Gallbladder lymphoma often needs to be differentiated from gallbladder cancer, cholecystitis, and gallbladder adenomyosis. Although the patient has intermittent fever, laboratory

tests have not revealed bacterial or viral infection. Both US and CT examination revealed irregular thickening of the gallbladder wall, without specific signs to make a definitive diagnosis. Finally, high-resolution MRI was performed, and some special imaging features were found in this case of gallbladder lymphoma.

Clinical outcomes

The patient underwent laparoscopic cholecystectomy. The gross pathology showed muddy stones in the gallbladder cavity and multiple polypoid processes on the mucosa of the thickened gallbladder wall (Figures 2 and 3). Frozen pathological histology demonstrated obvious hyperplasia in gallbladder mucosa and lymphoid tissues in the muscular layer. Postoperative pathological immunohistochemical results were as follows: CK (mucosa+), CD20(+), CD21 (FDC network+), Ki-67(20%+), CD10(–), Bcl-2(+), Bcl-6(–), CycLinD1(–), CD5(–), and CD3(–). The postoperative pathologic diagnosis was extranodal marginal zone B-cell lymphoma of mucosa-associated lymphoid tissue (MALT-ML; Figure 4). No tumour was found at the surgically severed end of the neck of the gallbladder, and no lymph node metastasis was found around it. The patient recovered well without recurrence and metastasis within 1-year follow-up.

Discussion

As a rare non-Hodgkin lymphoma, MALT-ML belongs to low malignant extra-nodal B-cell lymphoma. It is most commonly occurs in mucous membranes and glandular epithelial tissues of organs other than lymph nodes, with about 50% occur in gastrointestinal tract,¹ and rarely in gallbladder. Its clinical manifestations lack specificity, they are often asymptomatic or only with symptoms of chronic cholecystitis and cholelithiasis in the early stage, and obstructive jaundice may appear in the late stage due to invasion of hepatoduodenal ligament and liver.²

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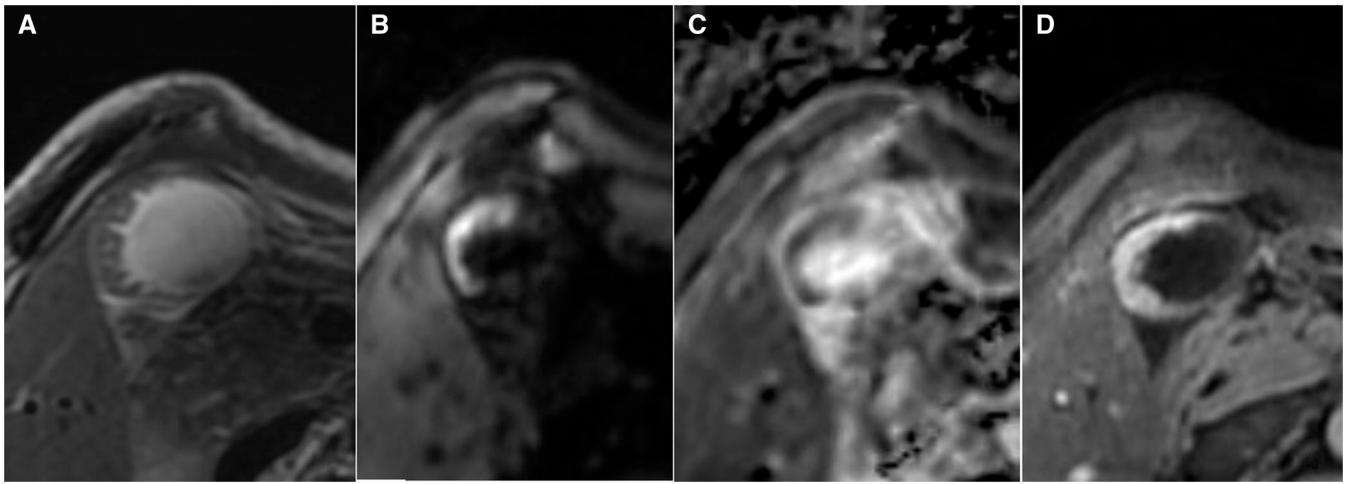


Figure 1. MRI images of the case. (A) Axial T2WI shows “comb-tooth” like thickening in the right posterior wall of the body and the bottom of gallbladder, with iso-signal intensity and clear edge. (B) The lesion was hyper-signal intensity on DWI. (C) The lesion was hypo-signal intensity on ADC map, with ADC values ranging from 1.1×10^{-3} to 1.7×10^{-3} mm^2/s . (D) Arterial phase of DCE-MRI shows obvious enhancement of the lesion.

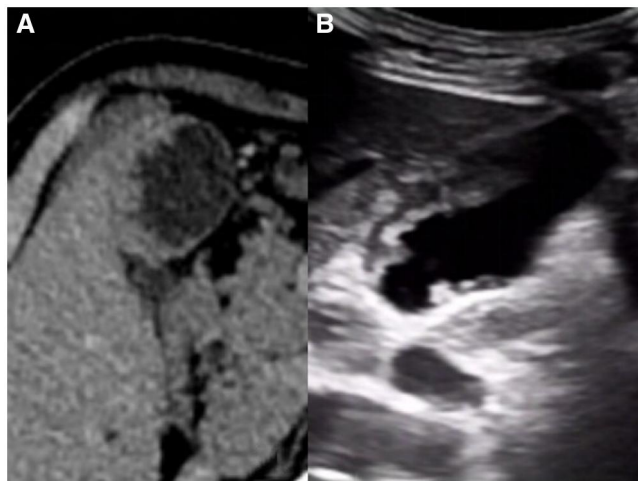


Figure 2. CT and US images of the case. (A) CT showed uneven thickening of the gallbladder wall with iso-density. Low-density fat tissue which separates the gallbladder wall from adjacent liver parenchyma was reserved. (B) US demonstrated the posterior wall of the gallbladder was not uniformly thickened with strong echo. The “comb—tooth” like appearance on both CT and US images was not so clear as on MRI images.

MALT-ML is often associated with infection and autoimmune diseases. For example, gastric MALT-ML is related to *Helicobacter pylori* infection,³ about 20% of ocular adnexal MALT-ML have a history of *Chlamydia psittaci* infection,⁴ and thyroid and salivary gland MALT-ML are related to Hashimoto's thyroiditis and Sjogren syndrome respectively.^{5,6} Normal gallbladder mucosa has few lymphocytes and no lymphoid follicles, but a few lymphocytes may exist between superficial columnar epithelium. Therefore, on the basis of chronic cholecystitis, there is a certain chance for patients to develop acquired MALT and evolve into MALT-ML.² In this situation, muddy stone and intermittent fever may occur, such as in our case. The patient had a background of liver cirrhosis and portal hypertension. Whether lymphatic reflux stasis secondary to portal hypertension is one of the causes of lymphatic hyperplasia in the gallbladder wall remains to be confirmed.



Figure 3. Gross specimen of the case. There are some polypoid bulges scattered on the mucosa of gallbladder.

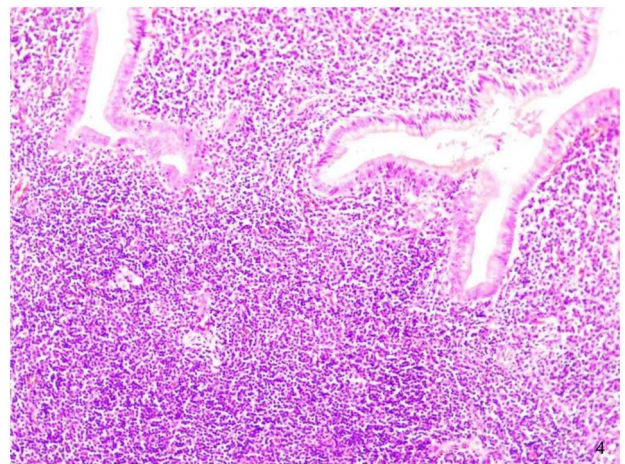


Figure 4. The histopathological image of the gallbladder (H&E 100 \times). There were abundant lymphocytes in the mucosa.

It was reported that the imaging features of gallbladder lymphoma were different according to its pathological classification. High-grade lymphomas, such as diffuse

large B-cell lymphoma, often formed solid and large masses in the gallbladder or had obvious and irregular thickening of gallbladder wall.^{7,8} While most low-grade lymphomas, such as MALT or follicular lymphomas, may show slight thickening of the gallbladder wall. It should be noted that the integrity of the gallbladder mucosa is a common feature of most low-grade lymphomas.⁷ In this case, atypical lymphoid cell hyperplasia is mainly distributed in the deep layer of the gallbladder, while the superficial layer of the mucosa and the muscular layer are slightly infiltrated, and the mucosal folds are still maintained. This may be the reason for the “comb-like” appearance of the lesion on T2WI.

It is hard to differentiate gallbladder MALT-ML from gallbladder carcinoma with US or CT.² Previous study has found that the signal intensity on T2WI of gallbladder lymphoma is lower and more uniform than that of gallbladder cancer.⁷ While the thickening of the gallbladder wall in gallbladder cancer is more uneven, and the tumor cells often infiltrate the whole layers and more easy to invade the adjacent liver parenchyma. With the uniform thickening of the gallbladder wall found in this case, it is also necessary to distinguish it from xanthogranulomatous cholecystitis and gallbladder adenomyosis. Xanthogranulomatous cholecystitis may present with characteristic features, such as unenhanced granulomatous nodules between the inner and outer gallbladder walls, which have reduced signal on the sequence of fat suppression; MRI of gallbladder adenomyosis often show single or multiple unenhanced Rokitanski-Aschoff sinus(es), which can be distinguished from gallbladder lymphoma.

Conclusion

In conclusion, the “comb-like” thickening of gallbladder wall on T2WI sequences shown in this case should rise the suspicion of gallbladder MALT-ML, and similar reports have not been reported in previous literature. This morphological feature may be related to the non-invasion of the gallbladder mucosa, but this theory needs to be confirmed by further studies.

Learning points

- MRI has advantages over other imaging method in diagnosing gallbladder MALT-ML
- The “comb-like” thickening of gallbladder wall may indicate the possibility of gallbladder MALT-ML.

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Conflicts of interest

No potential conflict of interest was reported by the authors.

Patient consent

Written informed consent was obtained from the patient for publication of this case report, including accompanying images.

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