

# Acalculous Hemorrhagic Cholecystitis with Chronic Intraluminal Hematoma: MRI Findings

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Acalculous hemorrhagic cholecystitis is a rare complication of acute cholecystitis and is associated with a high mortality rate. We present a case of acalculous hemorrhagic cholecystitis with hematoma in the gallbladder lumen, which was diagnosed using magnetic resonance imaging (MRI). The T1- & T2-weighted MRI revealed gallbladder distension with a hypointense intraluminal hematoma. The excellent tissue contrast provided by MRI is useful for detecting hematomas in the cases of hemorrhagic cholecystitis.

**Index words :** Gallbladder  
Acalculous cholecystitis  
Magnetic Resonance Imaging

## Introduction

Acalculous hemorrhagic cholecystitis is a rare complication of acute cholecystitis and is associated with a high mortality rate. Magnetic resonance imaging (MRI) is usually not performed for the diagnosis of acute cholecystitis, but it is a valuable imaging modality and affords excellent tissue contrast for the diagnosis of hemorrhagic cholecystitis and the detection of hematoma within the gallbladder lumen. To our knowledge, there are a few reports of the MRI findings in hemorrhagic cholecystitis (1-3). We report the MRI findings in a case of hemorrhagic cholecystitis with intraluminal hematoma.

## Case Report

A 40-year-old man who had been experiencing diffuse abdominal pain for 1 week presented to the emergency room. He had no history of abdominal trauma. Physical examination revealed tenderness and rebound tenderness at the right upper abdomen. The laboratory evaluations revealed a hemoglobin level of 8.9 g/dl and positive results for the fecal occult blood test.

Ultrasonography (US) revealed that a heterogeneously echogenic mass had filled the lumen of the gallbladder with diffuse wall thickening (Fig. 1). Sonographic Murphy's sign was positive. Precontrast computed tomography (CT) showed that the

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gallbladder was distended with diffuse wall thickening and was filled with a slightly hyperdense intraluminal mass (Fig. 2). This hyperdense intraluminal mass did not show any enhancement on the postcontrast CT images. There was no evidence of cholelithiasis on both US and CT images.

MRI (Signa 1.5T; GE, Milwaukee, WI, USA) revealed a slightly hypointense intraluminal mass on the precontrast T1-weighted gradient-echo LAVA (liver acquisition with volume acceleration) image (Fig. 3A). This intraluminal mass appeared as a region with low signal intensity on the spin-echo T2-weighted image (TR, 6316 msec; TE, 8 msec); we also observed linear dark signal intensity within the mass, thereby suggesting hemosiderin deposition in the hematoma (Fig. 3B). The intraluminal hematoma did not show any enhancement on the T1-weighted LAVA dynamic gadolinium-enhanced image (Fig. 3C). The contrast-enhanced T1-weighted image showed enhancement of the thickened gallbladder wall. The MR image did not show any evidence of cholelithiasis.

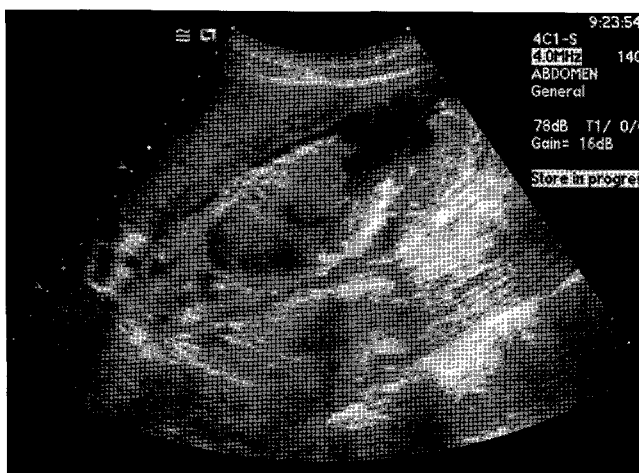
Laparoscopic cholecystectomy was performed, and the large hematoma and thrombus were found to fill the lumen of the gallbladder without showing cholelithiasis. The pathologic examination revealed broad mucosal ulceration and localized pus formation in the gallbladder wall. The pathological examination did not reveal any specific cause of hemorrhage such as a neoplasm or a vascular disease such as arteriovenous malformation. The postoperative period was

uneventful.

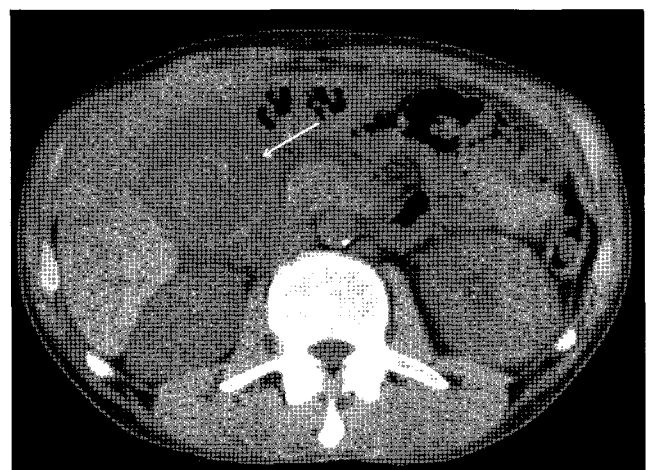
## Discussion

Hemorrhagic cholecystitis is a rare complication of acute cholecystitis and is most commonly associated with cholelithiasis. Acalculous hemorrhagic cholecystitis can occur uncommonly (4). In hemorrhagic cholecystitis, the hemorrhage is thought to result from local inflammations causing mucosal ulcerations or necrosis of the gallbladder (5). The causes of gallbladder hemorrhage without associated cholecystitis include trauma, vascular diseases, biliary neoplasms, parasites, ectopic gastric or pancreatic mucosa, drugs such as anticoagulants, pancreatic diseases such as pseudocyst, and hepatic abscess (4).

US and CT are useful imaging modalities for the diagnosis of acute cholecystitis. In US, an acute-stage of intraluminal hematoma shows homogeneous echogenicity and can be confused with a thick sludge. In contrast, the later-stage of hematoma shows heterogeneous echogenicity with liquefaction and lysis and can mimic gallbladder carcinoma (6). In this case, the intraluminal hematoma appeared as a heterogeneously echogenic mass, indicating a later-stage hematoma. However, we could not exclude the possibility of neoplasm on the basis of this sonographic finding. CT facilitated the differentiation between intraluminal hematoma and carcinoma of the gallbladder. The precontrast CT scan revealed



**Fig. 1.** Sonography shows a large heterogeneously echogenic mass within the gallbladder lumen with diffuse wall thickening.



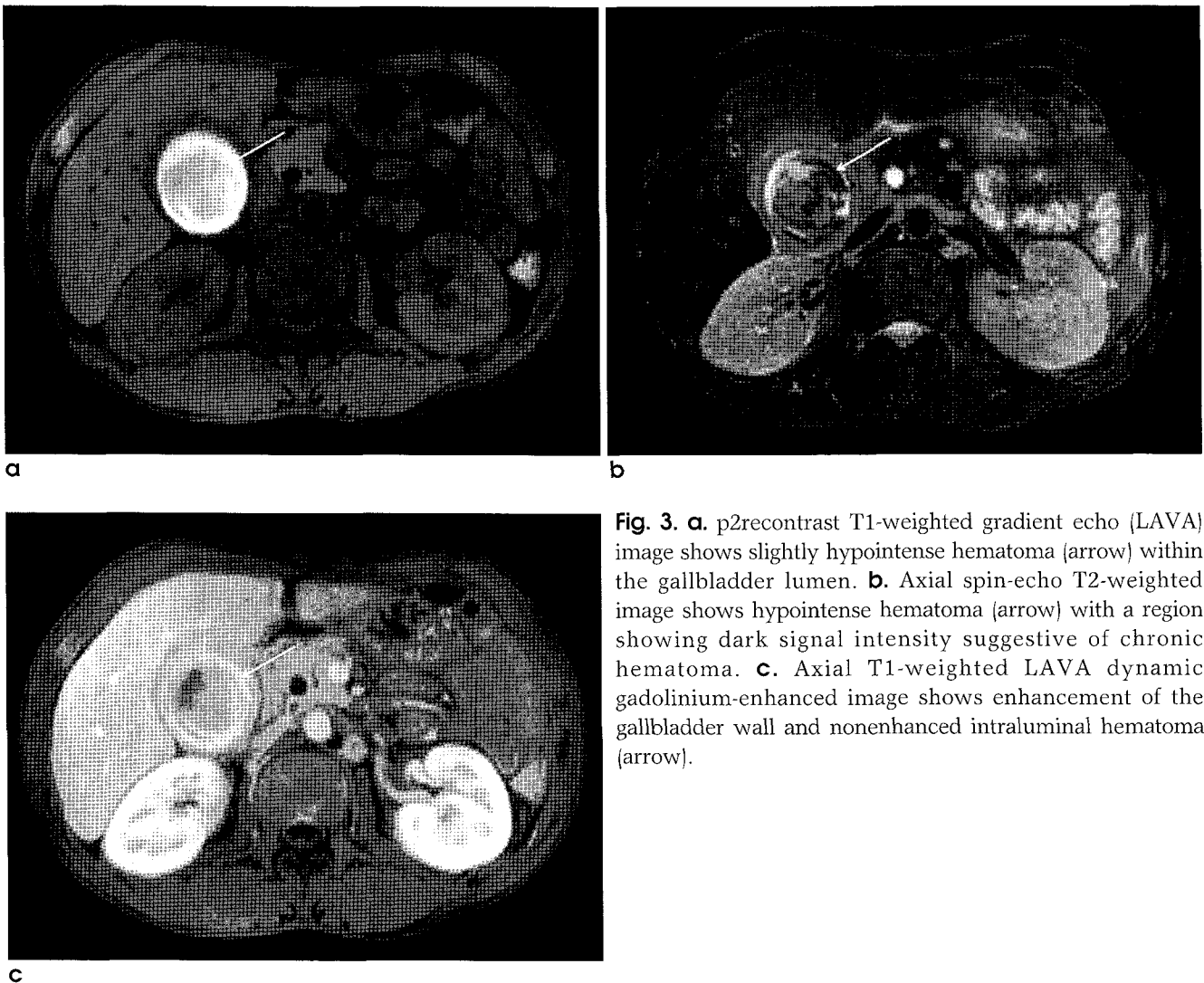
**Fig. 2.** The precontrast CT image shows a slightly hyperdense intraluminal mass (arrow) suggestive of hematoma and diffuse gallbladder wall thickening.

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hyperdense contents in the gallbladder lumen, thereby indicating intraluminal hematoma, and the postcontrast CT images did not show any enhancement of intraluminal hematoma. These CT findings of intraluminal hematoma are different from those for gallbladder carcinoma. MRI is usually not performed for the diagnosis of acute cholecystitis, but it is a valuable imaging modality that affords excellent tissue contrast for the diagnosis of complicated cholecystitis, especially in patients with decreased renal function (1-3). We performed MRI to rule out other specific causes of hemorrhage, such as neoplasm or vascular diseases such as arteriovenous malformation. In comparison with CT, MRI can provide a more detailed image of the bile duct, including better visualization of choledocholithiasis. In this case, MRI ruled out the possibility of neoplasm, vascular disease, or

choledocholithiasis. The appearance of the hemorrhage in MR images is related to the presence of blood-breakdown products from different stages of the pathological process. Subacute hemorrhage reveals high signal intensity on both T1- and T2-weighted image due to extracellular methemoglobin. Chronic hemorrhage presents dark signal intensity on T2-weighted image due to hemosiderin deposition (1, 2). The intraluminal hematoma revealed low and dark signal intensity on the T2-weighted image and the dark signal intensity within the hematoma indicated hemosiderin deposition in the chronic stage of the hemorrhage.

In summary, MRI can be used to diagnose hemorrhagic cholecystitis with excellent tissue contrast. MRI can detect late-stage of hematoma within the gallbladder lumen and can be used to rule out other



**Fig. 3.** **a.** p2recontrast T1-weighted gradient echo (LAVA) image shows slightly hypointense hematoma (arrow) within the gallbladder lumen. **b.** Axial spin-echo T2-weighted image shows hypointense hematoma (arrow) with a region showing dark signal intensity suggestive of chronic hematoma. **c.** Axial T1-weighted LAVA dynamic gadolinium-enhanced image shows enhancement of the gallbladder wall and nonenhanced intraluminal hematoma (arrow).

specific causes of hemorrhage, such as neoplasms or vascular diseases such as arteriovenous malformation.

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혈종을 동반한 무결석 출혈성 담낭염: 자기공명영상소견

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무결석 출혈성 담낭염은 높은 사망률을 보이는 급성 담낭염의 드문 합병증이다. 저자는 담낭의 내강에 혈종을 동반한 무결석 출혈성 담낭염의 자기공명영상소견을 보고하고자 한다. 자기공명영상에서 팽대된 담낭과 담낭 내강의 혈종이 관찰되었고, 혈종은 T1과 T2강조영상에서 담낭 내강의 저신호강도의 종괴로 보였다. 자기공명영상은 우수한 조직 대조성을 가지므로 출혈성 담낭염에서 담낭내강에 혈종을 검출하는데 유용하다.

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