

## MR findings of acute gangrenous cholecystitis

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### Purpose

To investigate whether MR imaging can be useful in the diagnosis of acute gangrenous cholecystitis.

### Introduction

Gangrenous cholecystitis is a severe advanced form of acute cholecystitis with a higher morbidity and mortality rate than uncomplicated acute cholecystitis. Because of the increased risk of perforation, early cholecystectomy should be performed. Clinical findings are often nonspecific and indistinguishable from those in patients with non-gangrenous cholecystitis. MR imaging can provide various contrasts which correspond to pathological changes such as hemorrhage and necrosis. The purpose of this study was to review MR findings of pathologically-proved gangrenous cholecystitis and investigate the possibility if MR imaging can be useful to diagnose gangrenous cholecystitis.

### Material and Methods

All MR imaging examinations were performed at 1.5T(Gyrosan Intera: Philips Medical Systems) between July 2003 and May 2006. MR image findings were retrospectively reviewed in seven patients with surgically and pathologically –proved gangrenous cholecystitis. MRI was performed prior to cholecystectomy including the following sequences: thick slab single-slice MR cholangiopancreatography(MRCP), multi-slice MRCP, Fat-suppressed T1-weighted, T1-weighted in-phase, Heavily T2-weighted, fat-suppressed T2-weighted, Diffusion-weighted (b value of 600 or 800 s/mm<sup>2</sup>), contrast-enhanced fat-suppressed T1-weighted imaging.

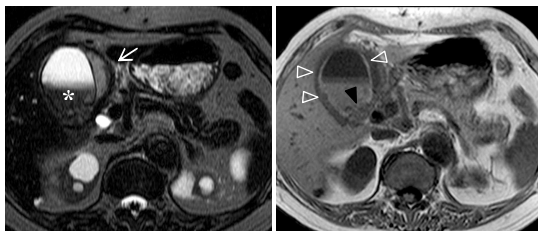
We investigated if the following findings were seen or not; irregular mucosal surface, absent or interrupted wall, lack of mural enhancement, hyperintense area in gallbladder wall on T1-weighted images, hyperintense area in gallbladder wall on diffusion-weighted images, pericholecystic inflammation and fluid collection, intraluminal debris on heavily T2-weighted images.

### Results

In gangrenous cholecystitis, the following findings were observed; irregular mucosal surface(7/7;100%), absent or interrupted wall (5/7;71%), lack of mural enhancement(2/2;100%), hyperintense area on T1-weighted images (6/7;86%), hyperintense area on diffusion-weighted images (6/6;100%), intraluminal debris on heavily T2-weighted images (4/7;57%), pericholecystic inflammation and fluid collection (5/7;71%). These findings correlated with necrosis, hemorrhage and pus in the gallbladder wall or lumen on intraoperative and pathological findings.

### Conclusion

MR imaging can detect hemorrhage, necrosis and pus in the gallbladder wall and lumen and help to accurately diagnose gangrenous cholecystitis. More studies are needed to establish the accuracy of MR imaging in the diagnosis of gangrenous cholecystitis.



A: Heavily T2WI

B: T1WI

### Fig 1

Heavily T2WI(A) showed pericholecystic abscess (↑) covered with omentum and intraluminal debris(\*). T1WI(B) showed slightly hyperintense mucosa (△) and focal defect(▲) in gallbladder wall.



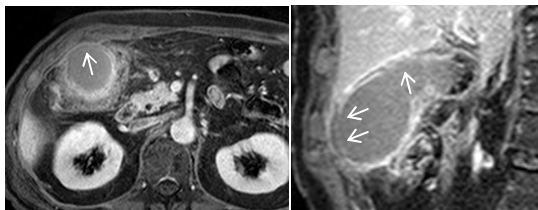
A: Fat-suppressed T2WI

B: Fat-suppressed T1WI

C: diffusion-WI

### Fig 2

FS-T1WI(B) and DWI(C) showed high signal intensity (↑) of the gallbladder wall, suggesting hemorrhagic necrosis. FS-T2WI(A) showed loculated fluid (△) adjacent to gallbladder. Intraoperative findings showed leaked bile covered with omentum,



Fat-suppressed T1WI

### Fig 3

Contrast-enhanced fat-suppressed T1WI showed interrupted mucosal enhancement (↑) due to necrosis.