

ULTRASOUND FINDINGS OF ACUTE AND CHRONIC CHOLECYSTITIS

Daranee PITANUPONGSA, M.D.¹

ABSTRACT

A retrospective study of ultrasound findings of patients who underwent cholecystectomy with histopathologically proven to be acute or chronic cholecystitis in Trang Hospital were studied from January 2005 to February 2008. There were 26 patients; acute cholecystitis 14 cases and chronic cholecystitis 12 cases. Gallstone were the most frequent sonographic findings of acute and chronic cholecystitis (93% and 83% respectively). Gallbladder distention and diffuse gallbladder wall thickening with anechoic zone were seen more frequent in acute cholecystitis but contracted gallbladder and diffuse gallbladder wall thickening without anechoic zone were seen more frequent in chronic cholecystitis. Complications of acute cholecystitis were found in 50% of cases. Localized thickening of the gallbladder wall that mimicked gallbladder carcinoma were found in 3 cases (25%) of chronic cholecystitis and additional CT scan of upper abdomen were performed in 2 cases. All of the patients with acute cholecystitis were diagnosed by ultrasonography and only 2 cases of the patient with chronic cholecystitis need CT for further investigation.

INTRODUCTION

The role of computed tomography (CT) in the evaluation of abdominal pain continue to be spreading. Acute cholecystitis is the most common cause of acute right upper quadrant abdominal pain. Ultrasound should be used as the initial imaging method to be employed. It is a relatively inexpensive, non-invasive, rapidly performable at the bedside without radiation hazard. The present study aimed to describe ultrasound findings of patients with acute or chronic cholecystitis diagnosed and treated at my hospital.

MATERIAL AND METHOD

The ultrasound findings of 26 patients who underwent cholecystectomy with histopathologically proven to be acute or chronic cholecystitis at Trang Hospital from January 2005 to February 2008, were reviewed, retrospectively.

Ultrasonographic examinations were performed with a realtime scanners (SSD 2200, Aloka), using 3.5 MHz convex transducer.

Ultrasound features, operative and histopathologic findings were analyzed.

RESULTS

I found acute cholecystitis (14 cases, 54%) more than chronic cholecystitis (12 cases, 46%). Two cases of chronic cholecystitis had subsequently acute exacerbation.

Acute cholecystitis were divided into two groups, with or without complications. Seven patients had acute uncomplicated cholecystitis and the other seven cases had complications; gangrenous cholecystitis 4 cases, emphysematous cholecystitis 2 cases and gallbladder perforation 1 case.

¹ Department of Radiology, Trang Hospital, Trang, Thailand.

All of the acute uncomplicated cholecystitis had gallstones and diffuse gallbladder wall thickening. Anechoic zone in the gallbladder wall thickening were shown in 6 cases. Gallbladder distention were identified in 3 cases and with pericholecystic fluid in 2 cases respectively (Fig.1, 2).

In acute cholecystitis with complications, gallstones were found in 6 cases. Five cases had gallbladder distention. Gangrenous cholecystitis had anechoic zone in the thickened gallbladder wall in 1 case, sloughing of gallbladder wall in 2 cases and intraluminal membrane in 1 case (Fig.3). Diffuse echogenicity in gallbladder lumen was seen in one case of gangrenous cholecystitis (Fig.4). Air collections within the lumen of gallbladder were detected in both cases of emphysematous cholecystitis (Fig.5A). These findings were confirmed at abdominal radiographs (Fig.5B). Only one case had gallbladder perforation by evidence of ill-defined gallbladder wall with complex pericholecystic fluid collection (Fig.6).

Pericholecystic fluid were seen in 2 cases of acute complicated cholecystitis. Ultrasound findings of acute cholecystitis were summarized in table 1.

Most of chronic cholecystitis (10 cases, 83%) had gallstones. The contracted gallbladder were seen in 9 cases. Diffuse gallbladder wall thickening were found in 7 cases but anechoic zone in the thickened gallbladder wall were found in only 2 cases of chronic cholecystitis with acute exacerbation (Fig.7, 8). One case had gallbladder distention. The localized thickening of gallbladder wall were identified in 3 cases. Additional CT scans of upper abdomen were performed in 2 cases. Focally ulcerated mucosa were demonstrated in both cases and muddy gallstone was found in one case (Fig.9, 10). The third case, no further investigation was performed. Mucus cyst was identified, histopathologically (Fig.11). Diffuse echogenicity in gallbladder lumen was seen in one case of chronic cholecystitis with acute exacerbation. Ultrasound findings of chronic cholecystitis were summarized in table 2.

Table 1 Ultrasound findings in acute cholecystitis (14 cases)

Findings	Number (%)	Acute uncomplicated cholecystitis case (n = 7)	Acute cholecystitis with complications case (n = 7)
1. Gallstones	13 (93%)	7	6
2. Gallbladder distention	8 (57%)	3	5
3. Diffuse gallbladder wall thickening (> 3 mm.)	8 (57%)	7	1
- Anechoic zone in the gallbladder wall		6	1
4. Pericholecystic fluid	4 (28.5%)	2	2
5. Sloughing of gallbladder wall	2 (14%)	0	2
6. Intraluminal membrane	1 (7%)	0	1
7. Ill-defined gallbladder wall with complex pericholecystic fluid collection	1 (7%)	0	1
8. Reflective echoes in the gallbladder fossa with associated reverberation artifact	2 (14%)	0	2
9. Diffuse echogenicity in gallbladder lumen	1 (7%)	0	1

Table 2 Ultrasound findings in chronic cholecystitis (12 cases)

Findings	Number (%)	Chronic Cholecystitis case (n = 10)	Chronic cholecystitis with acute exacerbation case (n = 2)
1. Gallstones	10 (83%)	8	2
2. Contracted gallbladder	9 (75%)	8	1
3. Gallbladder distention	1 (8%)	1	0
4. Diffuse gallbladder wall thickening (> 3 mm)	7 (58%)	5	2
-Anechoic zone in the gallbladder wall		0	2
5. Localized thickening of gallbladder wall	3 (25%)	3	0
6. Diffuse echogenicity in gallbladder lumen	1 (8%)	0	1

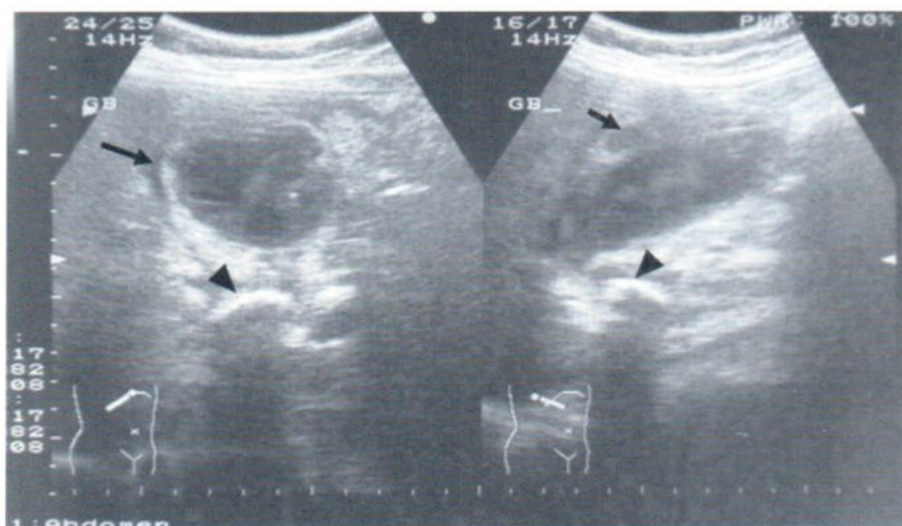


Fig.1 Acute uncomplicated cholecystitis. Ultrasound demonstrates a shadowing stone (arrowheads) impacted in the gallbladder neck. The gallbladder wall is thickened with anechoic zone in the wall (short arrow). Pericholecystic fluid (long arrow) is seen.



Fig.2 Acute uncomplicated cholecystitis. Ultrasound demonstrates distended gallbladder with thickened wall (arrow). There is a shadowing stone (arrowhead) in the gallbladder neck.

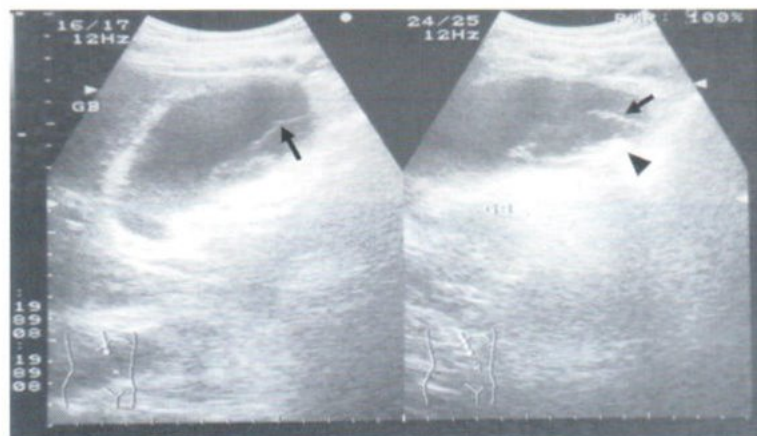


Fig.3 Gangrenous cholecystitis. Ultrasound demonstrates distended gallbladder with intraluminal membrane (arrows). Gallstones (arrowhead) are seen.

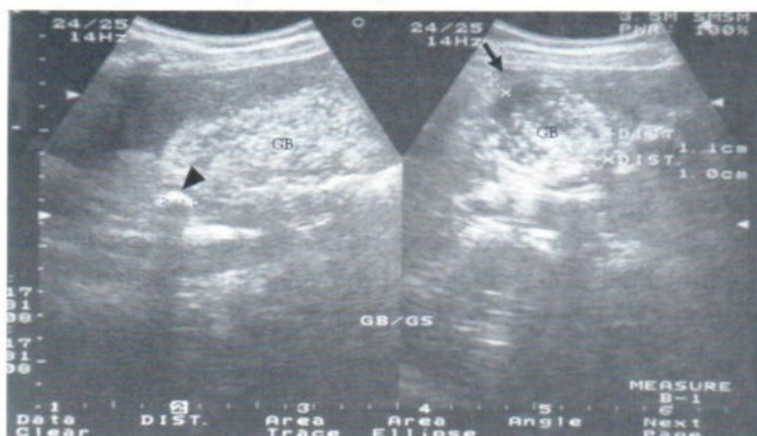
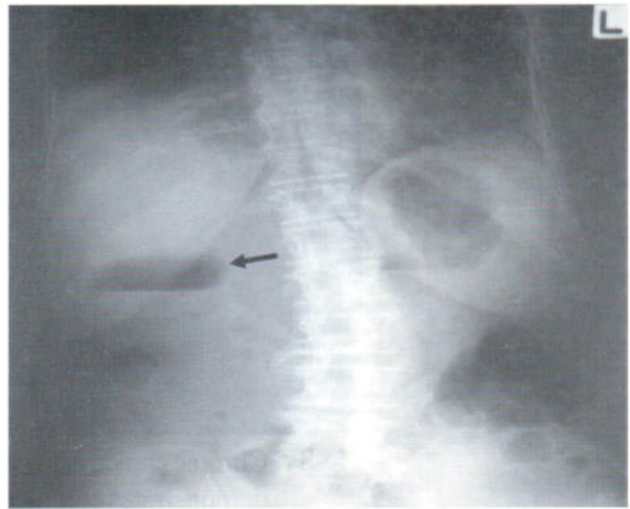


Fig.4 Gangrenous cholecystitis. Ultrasound demonstrates distended gallbladder with thickened wall (arrow) and diffuse echogenicity in the gallbladder lumen (GB). A shadowing gallstone (arrowhead) is seen.



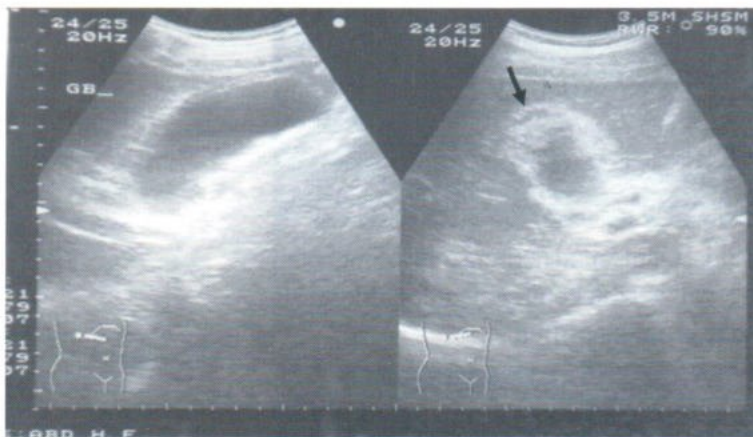
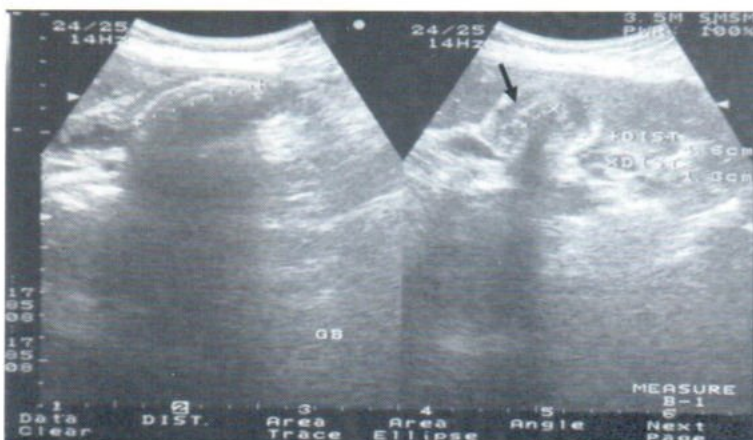
5A



5B

Fig.5 Emphysematous cholecystitis.

- A** Ultrasound demonstrates reflective echoes in the gallbladder fossa with associated reverberation artifact (arrow).
B Upright radiograph of the abdomen confirms air-fluid level in the gallbladder lumen (arrow).

**Fig.6** Gallbladder perforation. Ultrasound demonstrates ill-defined gallbladder wall with complex pericholecystic fluid collection (arrow).**Fig.7** Chronic cholecystitis. Ultrasound demonstrates stone in contracted gallbladder (+--+ ,x--x). Diffuse gallbladder wall thickening (arrow) is seen.

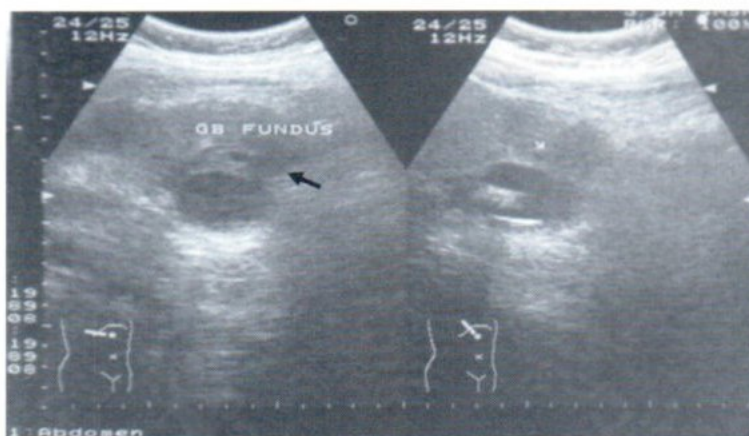


Fig.8 Chronic cholecystitis with acute exacerbation. Ultrasound demonstrates contracted gallbladder with gallstone. The gallbladder wall is thickened with anechoic zone in the wall (black arrow).

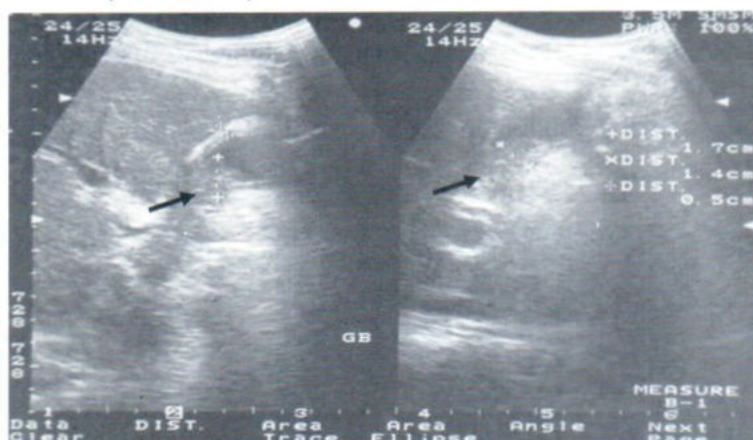


Fig.9 Chronic cholecystitis. Ultrasound demonstrates contracted gallbladder with localized thickening of gallbladder wall (arrows). Gallstone is not identified.



Fig.10 Chronic cholecystitis with muddy gallstone. Ultrasound demonstrates localized thickening of gallbladder wall (arrows) at fundus. This finding is confirmed in operation where there is muddy gallstone in the gallbladder.

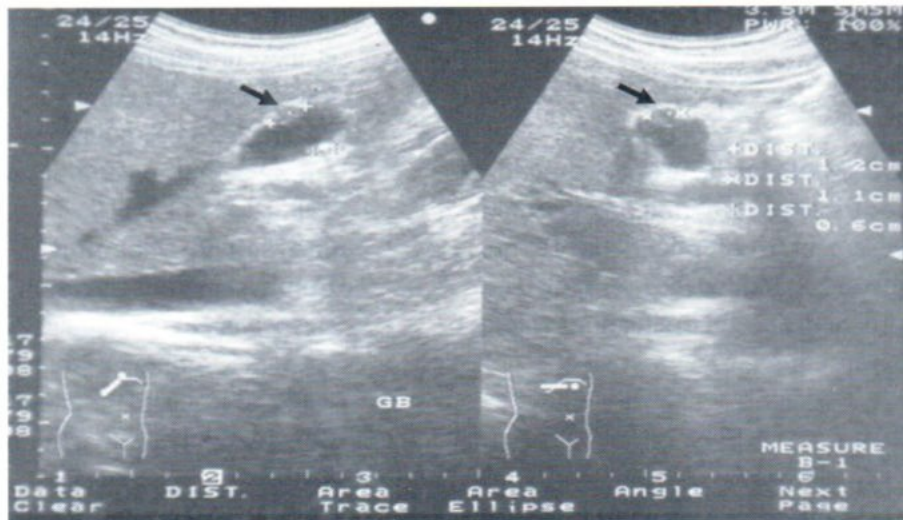


Fig.11 Chronic cholecystitis with mucus cyst. Ultrasound demonstrates contracted gallbladder with a hypoechoic nodule at anterior wall (arrows).

DISCUSSION

The role of CT in the evaluation of abdominal pain continues to be expanded. CT allows for more comprehensive evaluation of the abdomen and pelvis and can identify various inflammatory processes. But ultrasound should be the first imaging modality used when suspecting cholecystitis. It's non-invasive, fast, no radiation, easily tolerated by the patient and reliable in the hands of an experienced operator. Ultrasound is also superior to CT as the initial imaging investigation for assessment of biliary diseases causing acute right upper quadrant pain.¹

Ultrasound findings in acute uncomplicated cholecystitis are including gallstones, which often impacted in gallbladder neck or cystic duct, a positive sonographic Murphy's sign, gallbladder distention, wall thickening and pericholecystic fluid.²⁻⁴ In the present study, all cases had gallstones and wall thickening. Gallbladder distention and pericholecystic fluid were seen less than half of the cases. I saw gallbladder distention more often in acute cholecystitis with complications. Early detection of the complications reduces morbidity and mortality.⁵ In the present study, complications were detected in 50% of the cases, mostly having gallstones. Ultrasound findings of acute cholecystitis with complications in the present study

were not different from the previous reports; sloughing of gallbladder wall and intraluminal membrane in gangrenous cholecystitis, intraluminal gas in emphysematous cholecystitis and ill-defined gallbladder wall with complex pericholecystic fluid collection in gallbladder perforation.⁶⁻⁹ Abdominal radiographs were reviewed to confirm intraluminal/intramural air in emphysematous cholecystitis.

Sonographic features of chronic cholecystitis are gallstones and gallbladder wall thickening.¹⁰⁻¹¹ In the present study, most had gallstones and contracted lumen. Diffuse gallbladder wall thickening were seen half of the cases. Localized thickening of the gallbladder wall that mimicked gallbladder carcinoma were identified in 3 cases. Ultrasound findings in cases of chronic cholecystitis with acute exacerbation were similar to cases of acute cholecystitis. Both cases had gallstones and diffuse gallbladder wall thickening with anechoic zone. Diffuse echogenicity in gallbladder lumen which were seen in acute complicated cholecystitis was found in one case.

In the present study, all of acute cholecystitis were diagnosed by ultrasonography and only 2 cases (17%) of chronic cholecystitis need CT for more

information.

CONCLUSION

Ultrasound should be the primary imaging modality of choice for the evaluation of suspected cholecystitis. Assessment of complications of acute cholecystitis is valuable to reduce the morbidity and mortality. CT is particularly useful in situations where ultrasound findings are equivocal.

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