

ULTRASONOGRAFIC DIAGNOSIS OF GALLBLADDER PERFORATION: DEMONSTRATION OF PERFORE HOLE SIGN (A CASE REPORT)

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SUMMARY

Perforation of the gallbladder, perforation type and localisation can now be easily diagnosed in a noninvasive fashion due to advent of real-time ultrasonography (US). We report a case of Niemeier type 2 subacute gallbladder perforation with pericholecystic abscesses and present the US findings.

INTRODUCTION

A sharp decline in the incidence of gallbladder perforation has occurred over the past four decades, a result of earlier and better surgical intervention and the use of modern antibiotics (1). This complication, still seen in 6% -12 % of patients with acute cholecystitis, has a mortality rate of 8% -12% of patients with acute cholecystitis, has a mortality rate of 8% -24% (2,3). According to Niemeier's classification, there are three types of gallbladder perforation : type 1, acute free perforation into the peritoneal cavity; type 2, subacute perforation with pericholecystic abscess; and type 3, chronic perforation with cholecystoenteric fistula (4). Pericholecystic collections have a varied sonographic appearance ran-

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ging from anechoic to hyperechoic collections, and their internal characteristics seem to depend on the duration of the pericholecystic process.

CASE REPORT

A 21-year-old male patient presented with constipation, right upper quadrant abdominal pain, nausea and vomiting for 6 days before admission. On admission to our Research Hospital, his body temperature was 36.7C, pulse rate 80/min, respiration rate 18/min and blood pressure 110/70 mmHg. Physical examination revealed which were not icteric, and the liver and spleen were not palpable. The right upper quadrant was tender to palpation with mild muscle guarding and rebound tenderness. Intestinal sounds were decreased. The white blood cell count was 13,700/mm³ with 90% segmented. The hemoglobin level was 16.6g/dl, alkaline phosphatase activity 65IU/L, aspartate aminotransferase activity 92IU/L, total bilirubin 1.6mg/dl, total protein 7.9 mg%, and creatinin 0.6 mg/dl. The electrocardiogram, the chest and abdominal X-rays were normal.

This patient was scanned shortly after admission, with TOSHIBA SAL 77-B image scanner having 3.5-MHz convex and 7MHz Linear transducers in the Department of Radiology. Abdominal US was revealed an irregular, double-walled gallbladder with a hole on the peritoneal side. Stones in the gallbladder with acoustic shadows and pericholecystic abscesses were seen. Of these abscesses, the biggest one with dimensions of 3x3x2 cm in gallbladder bed was anechoic and related to the gallbladder via a hole on peritoneal side of the gallbladder (fig. 1).

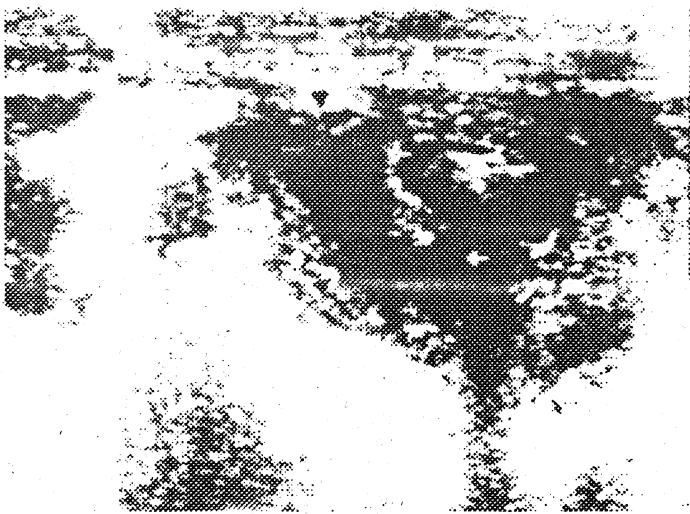
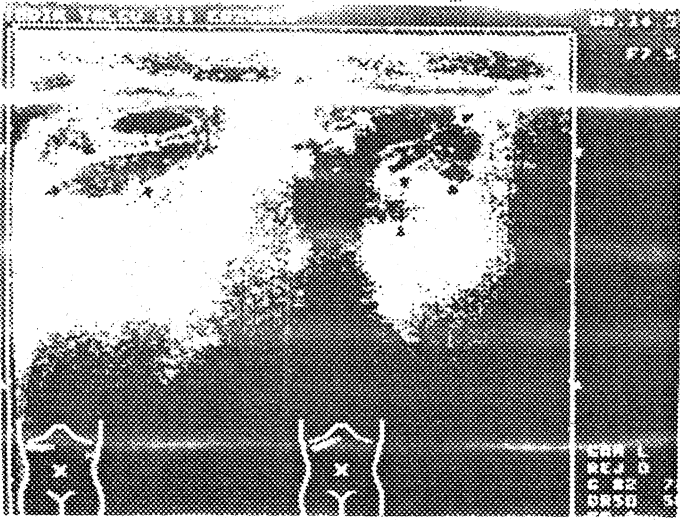


Figure 1: The fluid collection in gallbladder bed (arrowheads) and the hole in wall (arrows).

The other abscesses were located as follows: one with 3x1.5x1cm dimensions on peritoneal-side and two with 2x1.5x1.5 cm and 1.5x1x1cm dimensions on liver-side. All of them were hypoechoic (fig.2).



a

b

Figure 2a: Pericholecystic abscess in peritoneal side of gallbladder (arrows).
 2b: Pericholecystic abscesses in liver side of gallbladder (arrowheads).

In addition, intraperitoneal fluid and subdiaphragmatic and subhepatic fluid collections were demonstrated (fig. 3)

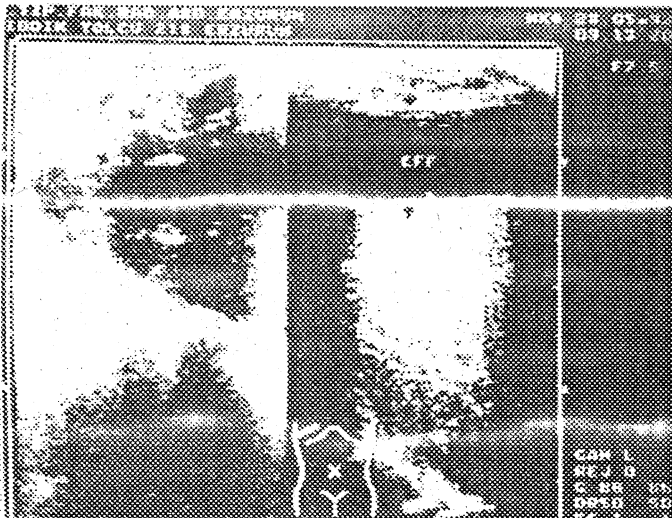


Figure 3: subhepatic fluid collection (arrows).

The patient was taken into operation in the following day due to prediagnosis of gallbladder perforation. At surgery, gallbladder was perforated from fundus, stones were found in the gallbladder which was surrounded by omentum and small intestine. Subdiaphragmatic and subhepatic fluid collections and 250-300 cc of intraperitoneal fluid were drained and cholecystectomy was performed. The patient discharged on the ninth postoperative day.

DISCUSSION

Gallbladder perforation may develop as early as 2 days after the onset of symptoms of acute cholecystitis or as late as several weeks. The site of gallbladder perforation is most frequently in the fundus, and may lead to peritonitis, pericholecystic abscess or fistular communication with adjacent viscera, depending on the rate and site of perforation (3,5-7). Pericholecystic abscesses are found mostly in gallbladder bed, intramural and rarely in liver. The differential diagnosis of acute cholecystitis and its complications can be made by laboratory findings and clinical examination (3,8). Perforation may rarely be diagnosed by conventional methods (5). Computerized tomography is very valuable method in diagnosis of gallbladder empyema and perforation. Ultrasonography of abdomen, being one of the examination of choice and useful in detection of gallbladder perforation preoperatively, may be also detected the earlier signs such as distension of gallbladder and edema of its walls (9). As previous studies reported, US findings of gallbladder perforations are nonspecific. Those findings are pericholecystic fluid collections, thickness of wall, gallbladder stones and densely intracholecystic echogenic debris and dilatation of bile ducts (1,2,10-12). Ultrasonographic "hole sign" is the most specific finding of perforation (9). Madrazo et al. (1) in a series of 13 cases, found that 8 cases had anechoic fluid collections, 5 had hyperechoic collections. The duration of symptom before US evaluation was lower than one week in 8 cases with anechoic collections, and two weeks in 3 patients with hyperechoic collections (1). However, in our case although this duration was one week, there were one anechoic abscess in gallbladder bed and several hypoechoic abscesses.

Specific and nonspecific US findings such as "hole sign", pericholecystic abscesses, wall thickness and gallstones, the preoperative diagnosis of gallbladder perforation were confirmed by surgery. Thus, it was concluded that abdominal US was a very reliable and useful method in preoperative diagnosis of the gallbladder perforation, and in determination of its type and localisation.

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