Ultrasound scan to detect acalculous cholecystopathy in immunocompromised hosts with unexplained fever

We found a significant prevalence of acalculous cholecystopathy in a group of patients with hematologic malignancies and unexplained fever. Ultrasound scan (US) detected a case of acute cholecystitis, two of gallbladder overdistension and biliary sludge, and one of striated gallbladder wall thickening. US proved effective in early identification of abdominal infection site.

Sir,

In immunocompromised hosts, biliary injury may be due directly to opportunistic infection or may be related to endotoxins released during bacterial sepsis. We investigated 55 unselected immunocompromised patients, suffering from hematologic malignancies and fever of unknown origin (FUO), using abdominal ultrasound (US) scan with the aim of defining the infection site. The US examination was carried out at patient’s bedside, within the first 2 days after the appearance of fever and subsequently, using portable Hitachi equipment with a 3.5 MHz probe. US gallbladder examination was used to monitor changes in diameters, wall thickening, formation of intraparietal abscess and perforation.

Of the 55 patients studied, four (7%) had a cholecystopathy in the absence of calculi and of bile duct obstruction or dilation: 1 case of acute cholecystitis complicated by empyema, 2 cases of gallbladder overdistension and biliary sludge, one of which with wall thickening, and 1 case of striated gallbladder wall thickening (Table 1). None of these four patients had received total parenteral nutrition or had a history of primary gallbladder disease; two (#1 and 3) had received antimicrobial prophylaxis because of a previous course of chemotherapy and had a central venous line inserted. All patients had high-grade fever, abdominal symptoms which did not require analgesics, mild alteration in liver function tests and negative microbiological examination. The diagnosis of cholecystopathy was defined by US scan in all cases. The main gallbladder findings were positive Murphy’s sign (all cases), wall thickening which was striated in two, overdistension, biliary sludge (three cases) and intraparietal abscess (one case) (Figure 1). Other US findings were hepatomegaly, splenomegaly and pleural effusions. In patient #1 computed tomography confirmed the US findings (Figure 1). This patient underwent emergency laparotomy and cholecystectomy; an empyema of gallbladder, without calculi, was found; Enterococcus faecalis grew from bile culture. Unfortunately, he died a few days later of cardiorespiratory failure. The other patients received conservative medical treatment including broad-spectrum antibiotics, granulocyte colony-stimulating factor (patients #2 and #3) and bowel rest; during this treatment US follow-up documented improvement of the gallbladder abnormalities.

Our survey confirms that cholecystopathy related to endotoxins may be a significant cause of fever in immunocompromised patients with FUO.

Table 1. Clinical, laboratory and ultrasound findings in immunocompromised patients with FUO and gallbladder abnormality.

<table>
<thead>
<tr>
<th>Pt.</th>
<th>Sex, age (years)</th>
<th>Basic disease</th>
<th>Immunologic status</th>
<th>Abdominal symptoms</th>
<th>Abnormal liver tests*</th>
<th>US gallbladder findings</th>
<th>Other US findings</th>
<th>Treatment</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 M, 71</td>
<td>AML M4</td>
<td>aplastic phase after induction chemotherapy*</td>
<td>fever, right pain, distension, vomiting</td>
<td>transaminases, ALP and γ-GT (x3); albumin 2.9 g/dL</td>
<td>overdistension (diame- ters: long. 11 cm; antero-posterior 4.1 cm)</td>
<td>striated wall thickening (10 mm), biliary sludge, positive Murphy’s sign, intraparietal abscess</td>
<td>hepatomegaly, moderate right pleural effusion</td>
<td>cholecystectomy</td>
<td>died of post-operative complications</td>
</tr>
<tr>
<td>2 F, 66</td>
<td>RAEB-T</td>
<td>neutropenia related to bone marrow hypofunction</td>
<td>fever, moderate right pain, distension</td>
<td>transaminases (x2); albumin 2.8 g/dL</td>
<td>overdistension (diame- ters: long. 10 cm; antero-posterior 4.5 cm), wall thickening (4 mm), biliary sludge, moderately positive Murphy’s sign</td>
<td>hepatomegaly, mild peritoneal effusion</td>
<td>ceftriaxone 2 g daily, recovery</td>
<td>amikacin 1 g daily, G-CSF 300 µg daily, bowel rest</td>
<td></td>
</tr>
<tr>
<td>3 F, 60</td>
<td>ALL L2</td>
<td>aplastic phase after salvage chemotherapy**</td>
<td>fever, moderate right pain, distension</td>
<td>albumin 3 g/dL</td>
<td>overdistension (diame- ters: long. 11 cm; antero-posterior 5 cm), wall thickening (4 mm), biliary sludge, moderately positive Murphy’s sign</td>
<td>hepatomegaly, mild peritoneal and right pleural effusion</td>
<td>meprednem 3 g daily, recovery</td>
<td>amikacin 1 g daily, teicoplanin 200 mg daily, G-CSF 300 µg daily, bowel rest</td>
<td></td>
</tr>
<tr>
<td>4 M, 72</td>
<td>WM</td>
<td>mild neutropenia</td>
<td>fever, moderate right pain, distension</td>
<td>transaminases (x2); albumin 2.8 g/dL</td>
<td>striated wall thickening (10 mm), moderately positive Murphy’s sign</td>
<td>hepatomegaly, splenomegaly, mild peritoneal effusion</td>
<td>ceftriaxone 2 g daily, recovery</td>
<td>bowel rest</td>
<td></td>
</tr>
</tbody>
</table>


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to infectious causes, even in the absence of calculi or bile duct abnormality, has a significant prevalence in a group of patients suffering from hematologic malignancies complicated by FUO. In these cases, as in other settings, abdominal US scan proved to be a valuable tool for rapid detection of the infection site, thus moving a number of patients from FUO to clinically documented infection and ultimately leading to more appropriate treatment. In our small series, one patient had gallbladder empyema; the others had a clinical syndrome characterized by high fever, moderate right abdominal pain, serositis and US findings strongly suspicious of gallbladder distress. We see US examination as the natural continuation and extension of the physician’s manual action, and a potentiation of his semeiotic sensitivity. It is a rapid, safe, effective and inexpensive diagnostic tool for detecting the site of infection in immunocompromised patients with FUO, with special attention to the gallbladder.

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Key words
Acute acalculous cholecystitis, gallbladder abnormality, ultrasound scan, immunocompromised hosts, FUO

Contributions and Acknowledgments
MP designed the study and performed the ultrasound examinations. CS, CC and AC were responsible for patient care and follow-up. BR was responsible for data interpretation and revising the paper.

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References

Fludarabine-containing regimen followed by autologous peripheral blood stem cell transplantation in unselected patients with acute myeloid leukemia: a single center experience

Fludarabine has been recently reported as ineffective in mobilizing peripheral blood stem cells (PBSC) in acute myeloid leukemia (AML) patients. We report herein on 27 AML patients, 9 of them being eligible for peripheral blood stem cell transplantation (PBSTC). Eight of the 9 successfully