Roentgenogram of the Month

Ultrasonic Evaluation of the Gallbladder in Sickle Cell Disease

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The gallbladder is frequently diseased in sickle cell anemia. The distinction between cholecystitis and the abdominal crisis of sickle cell disease is difficult to make. Ultrasonography permits a rapid evaluation of the gallbladder in sickle cell disease.

The prevalence of gallstones in sickle cell disease has been reported to range from 6 percent to 37 percent.[1] With the exception of infants and small children, cholecystograms have been urged for all patients who have sickle cell disease and abdominal pain. If gallstones are present or the gallbladder does not visualize, elective cholecystectomy after the patient is adequately prepared has been recommended.[2]

Ultrasound has been used to assess the gallbladder in cases of suspected cholelithiasis.[3] Recently, two patients were seen who demonstrate the efficacy of ultrasonic examination of the gallbladder in sickle cell disease.

Case Reports

Case 1

A 28-year-old black female with known sickle cell disease was admitted to Georgetown University Hospital in August 1977 with a one week history of abdominal pain. Past history included numerous episodes of sickle cell crisis treated elsewhere, as well as a leg ulcer and pulmonary infarction.

On physical examination the temperature was 101 F. The sclera were mildly icteric and there was right upper quadrant abdominal tenderness.

Laboratory data included an hematocrit of 21 percent and white blood cell count of 23,600/mm^3. Total bilirubin was 2.9 mg/100 ml (1.1 mg/100 ml indirect), with LDH 462 U, SGOT 39 U, and alkaline phosphatase 3.2 Bodansky units. Flat plate of the abdomen was unremarkable. Surgical consultation was obtained. Abdominal sonography revealed multiple stones in the gallbladder (Figure 1).

Symptoms improved over several days with the administration of intravenous fluids and antibiotics. Elective cholecystectomy was subsequently proposed, but the patient has thus far declined.

Case 2

A 21-year-old black female with known sickle cell anemia was admitted to the Georgetown University Surgery Division, DC General Hospital, in December 1977 with a two-day history of fever and right upper quadrant abdominal pain. Past history included two previous similar episodes and multiple episodes of pneumonia and suspected pulmonary infarction.

On physical examination the temperature was 101 F. The sclera were icteric and there was right upper quadrant abdominal tenderness with guarding. There were no abdominal masses.

Pertinent laboratory data included an hematocrit of 21 percent and white blood cell count of 20,900/mm^3. The total bilirubin was 3.2 mg/100 ml (2.6 mg/100 ml indirect), with LDH 460 U, SGOT 43 U, and alkaline phosphatase 3.2 Bodansky units. Flat plate of the abdomen was unremarkable. Abdominal sonography was consistent with cholelithiasis.

Intravenous fluids and antibiotics were administered. The fever, abdominal tenderness, and leukocytosis resolved over several days and the patient was discharged from the hospital. Elective cholecystectomy was planned, but recurrence of similar symptoms necessitated readmission in January 1978.

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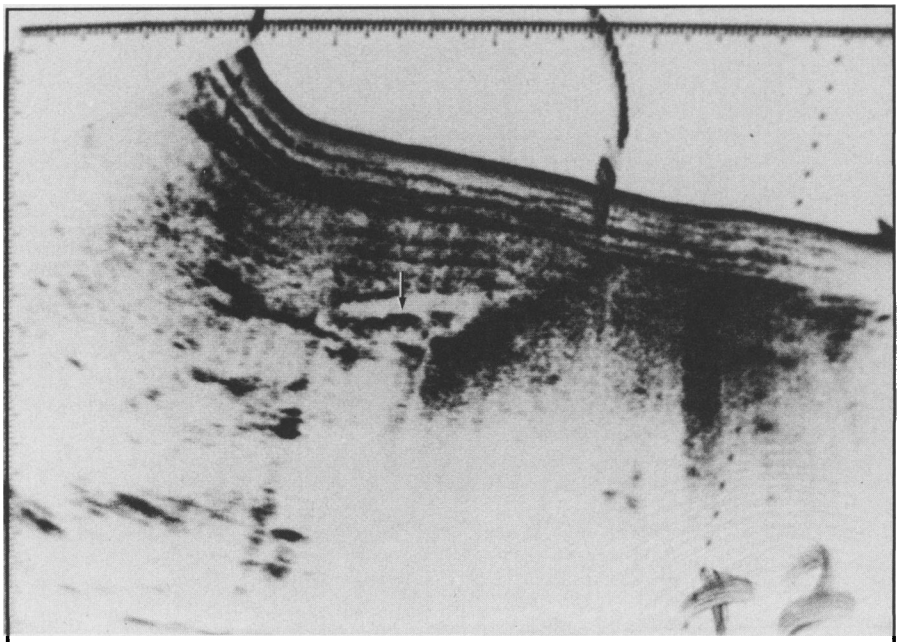

Figure 1. Longitudinal (sagittal) sonogram of the right upper quadrant of the abdomen 2 cm to the right of the midline with the patient supine. Multiple gallstones are visualized (arrow) within the sonolucent gallbladder

Intravenous fluids, antibiotics, and two units of packed red blood cells were administered preoperatively. At surgery, multiple gallstones were found within a chronically inflamed gallbladder. After cholecystectomy, an intraoperative cystic duct cholangiogram was within normal limits. The postoperative course was unremarkable and she was discharged on the seventh postoperative day. The patient remains asymptomatic.

Discussion

Demonstration of the gallbladder and the biliary tree by oral or intravenous contrast radiography is dependent on the function of the gallbladder and liver. Thus, if a patient is jaundiced, these methods are not reliable. Since the total bilirubin in patients with sickle cell disease averages about 3.0 mg/100 ml, another method of visualizing the biliary tree is often needed.[4]

Ultrasonography depends on the differences in the physical properties of the organs through which sound travels to produce images of the various objects studied. Gallstones are recognized with sonography by the presence of echoes within the normally echo-free bile in the gallbladder. The method is rapid, painless, noninvasive, and not function dependent. These attributes make it particularly suitable in the pediatric age group.[5]

If gallstones are documented, elective cholecystectomy is advised. There is no evidence that the surgical morbidity and mortality in properly prepared and controlled patients with sickle cell anemia is greater than in the general population.[2] Care must be taken to avoid changes in oxygen tension, pH, and osmolality which may precipitate sickling of erythrocytes.[6] Preoperative transfusions are given to correct the anemia and to decrease the proportion of circulating hemoglobin S.[7]

It is recommended that patients with sickle cell disease, and in particular those with abdominal pain, undergo cholecystosonography to establish the presence or absence of gallstones.

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