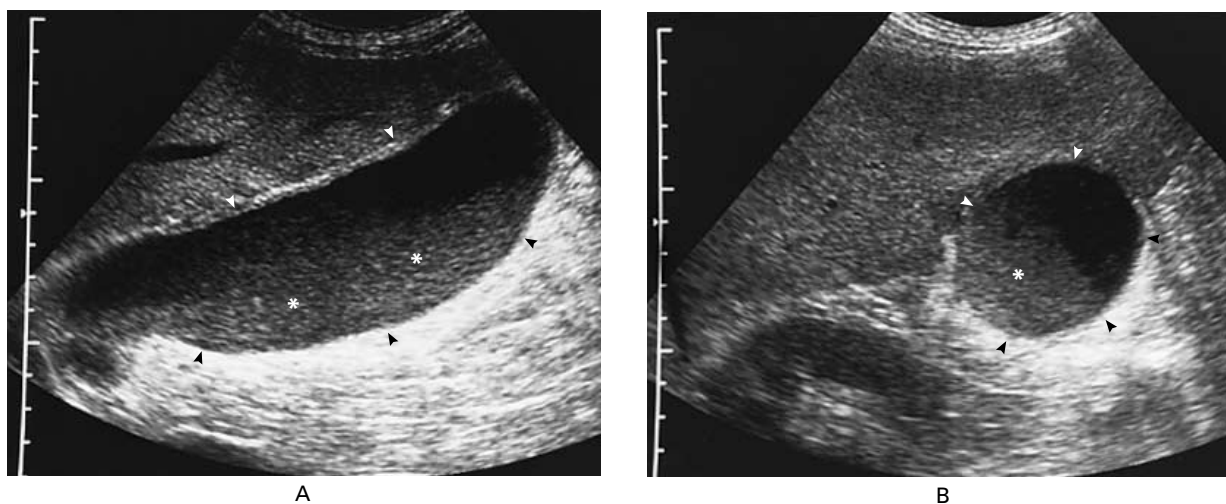




## Images in Clinical Medicine



### *Gallbladder Sludge*

A 54-year-old man underwent autologous peripheral stem-cell transplantation for acute myelogenous leukemia in second remission. Fifteen days later, right-upper-quadrant pain and jaundice occurred with the resumption of oral feeding after a prolonged period of total parenteral nutrition. The bilirubin level rose from 0.9 to 5.5 mg per deciliter (15.4 to 94.0  $\mu\text{mol}$  per liter), and the alkaline phosphatase level from 95 to 386 U per liter, while the aminotransferase and amylase levels remained normal. Ultrasonography revealed a distended gallbladder that was 16 cm long (arrowheads in Panel A) and 6 cm wide (arrowheads in Panel B) and was filled with echogenic sludge (indicated by the asterisks) that settled with gravity and did not produce a shadow. The common hepatic duct was slightly dilated, and the size of the intrahepatic biliary ducts was normal. The abdominal pain resolved spontaneously overnight, and the bilirubin level returned to normal over the next few days.

Biliary sludge consisting of calcium bilirubinate crystals commonly develops after bone marrow transplantation (in up to two thirds of recipients after 28 days) and total parenteral nutrition (in up to half the patients after 4 to 6 weeks). In these cases, it is caused mainly by hypomotility of the gallbladder, increased lithogenicity of bile, and possibly treatment with cyclosporine. Obstruction of the ducts by sludge may produce biliary colic, as was the case in this patient, or pancreatitis. These conditions usually develop on the resumption of oral feeding, as the gallbladder contracts and empties the sludge into the biliary tree.

ERIC Y. CHEN, M.D., PH.D.  
*University of Washington*  
*Seattle, WA 98195*

TOAN D. NGUYEN, M.D.  
*Veterans Affairs Puget Sound Health Care System*  
*Seattle, WA 98108*

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