

Enteroliths in a Meckel's Diverticulum Mimicking Gallstone Ileus

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Gallstone ileus is a form of mechanical obstruction of the small intestine caused by a large gallstone that has passed from the gallbladder to the intestine through a cholecystoenteral fistula.¹ This diagnosis is suspected in patients with gallstones and symptoms or signs of intermittent small-bowel obstruction.

Meckel's diverticulum, the most common malformation of the gastrointestinal tract, is found in about 2 percent of individuals.² Its rare clinical manifestations include intestinal obstruction, ulceration, hemorrhage, intussusception, and neoplasm. Such phenomena usually are not diagnosed preoperatively.³ Some 50 cases of enteroliths occurring in a Meckel's diverticulum have been reported.⁴ This unusual finding occurs most often in men and can present with lower abdominal pain, vomiting,⁵ rectal bleeding,⁶ anemia,⁷ or bowel obstruction.⁸ Radiographs may reveal laminated, faceted stones in the pelvis⁶⁻¹¹ or, rarely, in the upper right abdomen.^{12,13} The preoperative assessment of patients with enteroliths in a Meckel's diverticulum has often led errantly to such diagnoses as peritonitis, gastric ulcer, perforated appendix, incarcerated inguinal hernia, appendicitis, carcinoma, and cholelithiasis.

A patient recently presented with gallstones and abdominal pain and a presumptive diagnosis of gallstone ileus but, at surgery, was found to have enteroliths in a Meckel's diverticulum. Although there have been previous reports of patients with Meckel's stones who have had symptoms and radiographic findings compatible with cholelithiasis,^{12,13} this instance is the first patient whose preoperative evaluation led to the serious consideration of the diagnosis of gallstone ileus.

CASE REPORT

A 58-year-old male attorney was admitted to the hospital on March 5, 1984, with episodic, crampy mid-abdominal

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pain. The recurring symptoms had a duration of several hours, each time culminating in severe distress lasting 10 to 15 minutes. Progressive fatigue and episodic anorexia pursued. He denied fatty food intolerance, jaundice, vomiting, or a past history of gastrointestinal disease. The family history and other personal history were unremarkable.

On examination the patient was well nourished and in no acute distress. He was normotensive, afebrile, and nonicteric. The abdomen was mildly distended, and there was mild tenderness to deep palpation of the right upper quadrant. No rebound or guarding was elicited, nor were there masses noted. Rectal examination was negative, although some brown, guaiac-positive stool was recovered. The remainder of the physical examination was within normal limits.

Laboratory results included a hematocrit of 36 percent, a white blood count of $10 \times 10^3/\mu\text{L}$, and an erythrocyte sedimentation rate of 28 mm/h. Serum electrolytes, blood urea nitrogen, creatinine, glucose, calcium, albumin, and total protein levels were normal. The serum bilirubin level was 1.0 mg percent. The serum glutamic-oxaloacetic transaminase (SGOT) was 44 IU/L (normal range 6 to 33 IU/L), the lactate dehydrogenase 307 IU/L (normal range 100 to 225 IU/L), and the alkaline phosphatase was 116 IU/L (normal range 35 to 110 IU/L). Findings on chest roentgenogram and electrocardiogram were normal.

Multiple stones in the gallbladder were demonstrated on an abdominal ultrasound. Upper gastrointestinal endoscopy and barium enema revealed no intrinsic lesions; however, calcified densities in the right upper quadrant were noted on several films. A small-bowel follow-through revealed that these calcific densities resided in a cavity that communicated with the small intestine. Although the point of communication with the small intestine could not be determined with certainty, it was thought to be compatible with a cholecystoenteric fistula.

At laparotomy the gallbladder was found to contain multiple stones ranging in size from 0.5 to 2.0 cm. No cholecystoenteric fistula was found. Adherent to the superior aspect of the cecum was an inflamed Meckel's diverticulum, which apparently had been drawn into po-

sition in the right upper abdomen secondary to the peridiverticular inflammatory process. The diverticulum was found to contain several 2-cm kidney-shaped, smooth, black stones. The diverticulum and gallbladder were removed without complications. Histologic evaluation of the diverticulum showed no heterotropic mucosa, but superficial ulcerations as well as other signs of chronic and acute inflammation were found. The stones were analyzed and found to contain 50 percent cholesterol, 20 percent calcium oxylate, 15 percent proteinaceous tissue and mixed fatty acids, 10 percent calcium bilirubinate, and 5 percent bile pigment.

At the six-month follow-up the patient has continued to be asymptomatic with guaiac-negative stools and a normal hematocrit.

COMMENT

A middle-aged man developed episodic mid-abdominal pain, anemia, and guaiac-positive stools. He was found to have gallstones by ultrasound examination. Subsequently a small-bowel series demonstrated calculi within a right upper quadrant cavity that communicated with the small intestine. The diagnosis of gallstone ileus was entertained. A surgical exploration revealed both gallstones and an inflamed Meckel's diverticulum that contained multiple enteroliths. Diverticulitis and mucosal inflammation were thought to have caused the patient's pain and occult bleeding, as has been seen previously in other patients with Meckel's enteroliths.^{5,11} Although there was no evidence of cholecystitis or choledocholithiasis, the contribution of cholelithiasis to his symptoms could not be ruled out with certainty.

The episodic pain and the findings on a small-bowel series, taken together with the patient having known gallstones, suggested that the patient might have gallstone ileus. A factor arguing against the diagnosis of gallstone ileus was the uniformity of the radiopaque stones seen on the x-ray films of the abdomen.¹

The enteroliths recovered from the patient's Meckel's

diverticulum were similar in radiographic and gross appearance^{5,9} as well as in chemical content to those previously described.⁸

That this stone-bearing Meckel's diverticulum was unusually located in the right upper quadrant and that the ultrasound examination revealed gallstones led to an erroneous preoperative diagnosis of gallstone ileus. In retrospect, the uniform size of the calcific densities seen on x-ray examination should have suggested that they were not gallstones.

The diagnosis of Meckel's enteroliths should be considered strongly when uniform-shaped, laminated stones are seen on radiographs of the right upper abdomen even if gallstones can be demonstrated by ultrasound examination.

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