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Case Report

Barium Appendicitis 1 Month After a Barium Meal

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Because barium sulfate ($BaSO_4$) is not harmful to the mucosa, it is widely used for gastrointestinal imaging. Barium appendicitis is a very rare complication of barium meals and barium enema. We report a case of acute appendicitis associated with retained appendiceal barium. A 47-year-old man presented with right lower abdominal pain after upper gastrointestinal imaging was performed using barium 1 month earlier. The abdominal plain roentgenogram showed an area of retained barium in the right lower quadrant. Multiplanar reconstruction of computed tomography scans showed barium retention in the appendix. Emergency appendectomy was performed. A cross section of the specimen revealed the barium mass. Barium-associated appendicitis is a very rare clinical entity but we should be cautious of this uncommon disease when we encounter barium deposits in the appendix after barium examination. This report is significant because barium was identified both macroscopically and microscopically.

Key words: Appendicitis – Barium – Appendicolith

Because barium sulfate ($BaSO_4$) is not harmful to the intestinal mucosa, it is widely used for gastrointestinal imaging. Barium-associated appendicitis is a very rare complication of barium meals and barium enema. Here, we describe the case of a 47-year-old man who developed barium appendicitis after swallowing barium.

Case Report

A 47-year-old man presented to our emergency room complaining of right lower abdominal pain. He had undergone double-contrast barium examination of his stomach 1 month earlier as a periodic checkup for gastric cancer. The white blood cell count was 13,180/μL with 80% neutrophils and the C-reactive protein level was within normal limit. His body temperature was 37.2°C. Physical examination revealed slight tenderness at the McBurney's point without signs of peritoneal irritation. A plain radiographic study of the abdomen showed a radiopaque area in the right lower quadrant (Fig. 1). Computed tomography (CT) revealed barium retention near the cecum (Fig. 2). Multiplanar reconstruction of

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Fig. 1 Radiopaque objects in the right lower quadrant of the abdomen. Plain abdominal roentgenogram.

the CT images demonstrated barium impaction in the appendix and dilatation of its lumen (Fig. 3). Acute appendicitis was strongly suspected and emergency surgery was performed that revealed an inflamed appendix with palpable concretion. Neither ascites nor perforation was detected. Normograde appendectomy was performed. A cross section of the formalin-fixed specimen revealed a white substance within the lumen (Fig. 4). This finding was different from an ordinary appendicolith. Pathology confirmed the diagnosis of barium appendicitis (Fig. 5). The patient was discharged 7 days later.

Fig. 2 Barium retention near the cecum. CT scan.

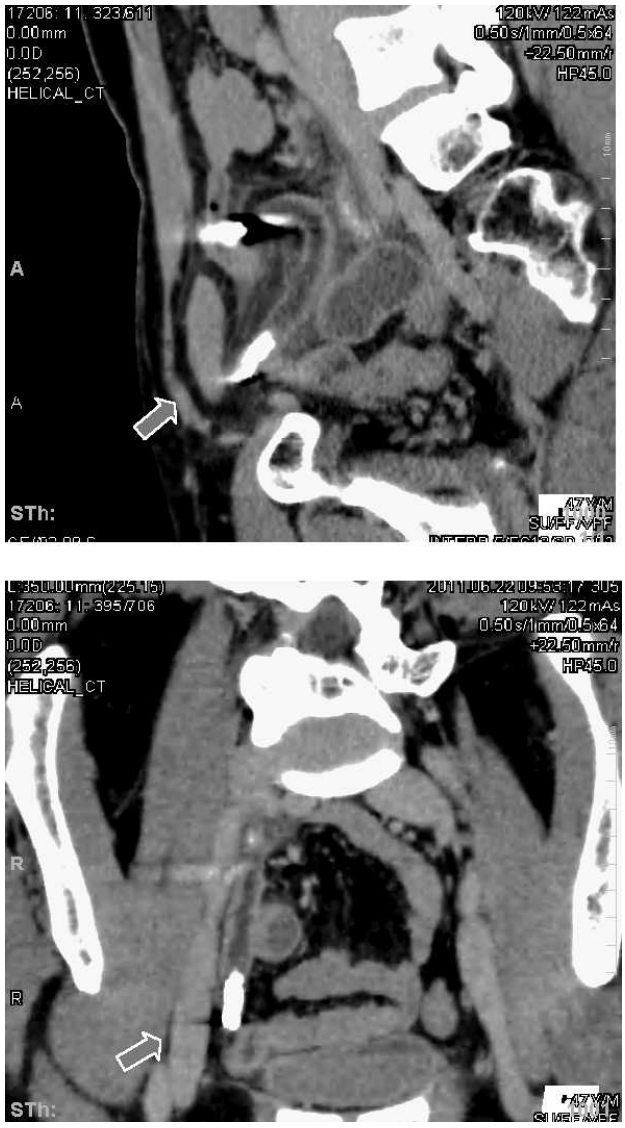

Fig. 3 Barium impaction in the appendix and dilatation of its lumen. Multiplanar reconstruction of computed tomography scans.

Discussion

In spite of pervasive use of barium for enteric radiographic studies, barium appendicitis is seldom seen. Less than 100 cases were reported in the literature after the first report by Gubler and Kukral[1] in 1954. Barium sulfate crystals are not soluble in intestinal juice and are not absorbed by the mucosa. Therefore, $BaSO_4$ is not considered to be irritating to the enteric mucosa. However, very rarely, $BaSO_4$ gives rise to acute appendicitis. The mechanism of its onset is the result of obstruction of the appendiceal lumen by barium as well as

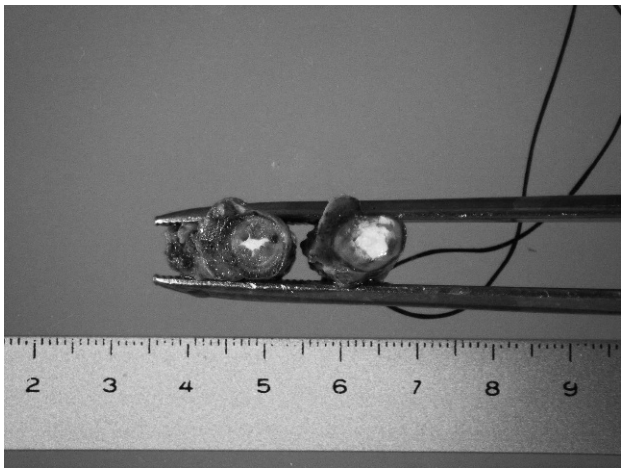

Fig. 4 Barium lump detected in a cross section. Formalin-fixed specimen.

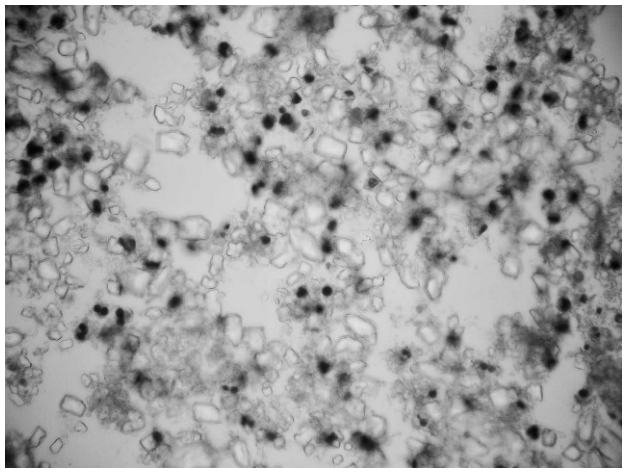

Fig. 5 Barium crystals and inflammatory cell infiltration. H&E stain.

ordinary fecaliths.[2] The appendix is filled in almost all subjects during barium study; however, the barium is usually excreted within 3 days.[3] The time span between barium study and onset ranges from a few hours to a few years.[4] Because barium appendicitis easily perforates, which results in barium peritonitis, barium appendicitis should be considered as a differential diagnosis in patients with barium retention in the appendix after barium imaging.[5] This case report is very significant because it consists of an imaging diagnosis, macroscopic detection of the barium mass in cross section, and microscopic detection of barium crystals by hematoxylin-eosin stain.

In conclusion, barium-associated appendicitis is a very rare clinical entity, but we should be cautious of this uncommon disease when we encounter barium deposits in the appendix vermiformis.

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