CASE REPORT
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A Case of Endoscopic Removal of a Giant Appendicolith Combined with Stump Appendicitis

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Stump appendicitis is an acute inflammation of the residual appendix and is a rare complication after appendectomy. The physician should be aware of the possibility of stump appendicitis in patients with right lower abdominal pain after appendectomy so that delayed diagnosis and treatment can be prevented. Stump appendicitis is usually treated by surgical resection, and endoscopic treatment has not been reported previously. A 48-year-old man who had undergone appendectomy 35 years earlier presented to the hospital because of right lower quadrant discomfort. A computed tomography scan showed a large stone in the residual appendix. Colonoscopic findings revealed a large, smooth, protruding lesion at the cecum with a stone inside the appendiceal orifice. Endoscopic removal after incision of the appendiceal orifice was performed successfully.

Key Words: Appendicolith; Stump appendicitis; Endoscopic removal

INTRODUCTION

Appendicitis is one of the most common causes of acute abdomen, and its diagnosis is relatively easy because most cases are identified on the basis of typical symptoms and physical examination. Appendicitis occurs when the appendiceal orifice is obstructed. This obstruction may occur because of hyperplasia of lymphatic tissues around the vermiform appendix, appendicoliths, inflammatory constriction, tumors, and foreign material. In most cases, an appendicolith is found incidentally in asymptomatic patients; sometimes, an appendicolith causes acute appendicitis by inducing inflammation and increases the risk of perforation or abscess.[1] Thus, once the symptom is experienced, the patient is usually treated surgically. The authors diagnosed stump appendicitis that was caused by an appendicolith embedded in the appendiceal orifice using abdominal computed tomography (CT) performed in a patient who had undergone appendectomy; the appendicolith was removed using colonoscopy. Thus, here we report the case.

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CASE REPORT

A 48-year-old man was referred to our hospital for further evaluation of a 2-cm, large, protruding lesion in the cecum found on colonoscopy performed at a nearby hospital. He had been experiencing right lower quadrant discomfort for 1 month. He had undergone surgery for acute appendicitis 35 years earlier. During his recent hospital visit, his vital signs were measured, including blood pressure 120/70 mm Hg, pulse rate 72 beats per minute, respiration 20 beats per minute, and body temperature 36.0°C. Physical examination revealed light tenderness in the right lower quadrant of the abdomen, but there was no rebound tenderness, palpated mass, or muscle guarding. The results of the blood test were normal, with white blood cell count 8,900/mm^3 (segmented neutrophil count, 76.7%), hemoglobin level 15.4 g/dL, platelet count 192,000/mm^3, total bilirubin level 1.5 mg/dL, and aspartate aminotransferase/alanine aminotransferase level 21/31 U/L. An abdominal CT scan showed that the appendix was thickened owing to the presence of a 2-cm appendicolith; therefore, stump appendicitis was diagnosed (Fig. 1). We

consulted the surgery department; they recommended biopsy and colonoscopy to identify the protruding lesion because the patient did not have typical signs of appendicitis, such as right lower quadrant pain, tenderness, and rebound tenderness. Therefore, we conducted a colonoscopy that revealed a 2×3-cm, large, protruding lesion covered by normal mucosa around the appendiceal orifice of the cecum. An embedded stone was visible through the appendiceal orifice. Because the orifice was too small for the stone to be removed, we made a 4-mm incision to widen the orifice by using an IT knife (KD-611L; Olympus, Tokyo, Japan). Next, with a snare, we grasped the lower part of the protruding lesion adjacent to the cecal wall. Then, as we strangulated the lower portion of the protruding lesion, a large stone (fecalith) with whitish pus gushed out of the orifice. During the procedure, complications such as perforation and bleeding were not noted (Fig. 2). An abdominal CT scan and a colonoscopy 2 months later did not show any sign of appendicolith recurrence. The patient has been under outpatient care and has had no symptoms for 2 years.

DISCUSSION

Acute appendicitis is one of the most common surgical emergencies worldwide, affecting approximately 7% of the general population in a lifetime. Some reports note that mild forms of acute appendicitis can be treated successfully with nonsurgical treatments. However, nonsurgical treatment has been associated with recurrence of acute appendicitis. Svensson et al.[2] showed that 73% of patients treated nonsurgically for suspected acute appendicitis did not require surgery, and that 17% experienced recurrence during the 1-year follow-up.

An appendicolith is the most common cause of appendicitis. It is formed by firm, dense stool (fecalith) and mineral deposits (calculi), and is usually smaller than 1 cm in diameter. A giant appendicolith (>2 cm) is rare, and only a few cases have been reported thus far. In this case, the appendicolith was 2.3 cm in size.[3]

Stump appendicitis, a complication of appendectomy, may occur when the residual appendix is kept long; that is, it is incompletely resected because of severe inflammation or when surgery is conducted without accurately confirming the appendiceal-cecal junction, and thus, secondary infection occurs. In previous case reports on stump appendicitis, the length of the residual part varied between 0.6 and 6.5 cm, and complete appendectomy was mentioned as an important factor for preventing stump appendicitis. The clinical pattern of stump appendicitis is not different from that of usual appendicitis. Because of the history of appendectomy, however, stump appendicitis is easily mistaken for another digestive disease, resulting in delayed diagnosis. Approximately 70% of stump appendicitis cases are detected after perforation. The disease is diagnosed more commonly using CT than using ultrasound. In some reports, laparoscopic surgery for acute appendicitis has been most likely implicated owing to the inability to amputate the appendix close to the cecal base. Nevertheless, most of the reported cases were treated using laparotomy, and therefore, the association between laparoscopic surgery and stump appendicitis has not been proved.[4,5] Our case also had a history of laparotomy. Our case showed an extremely rare clinical pattern, in which a giant appendicolith embedded in the residual appendix induced stump appendicitis.

Recently, colonoscopy has become commonly used for di-

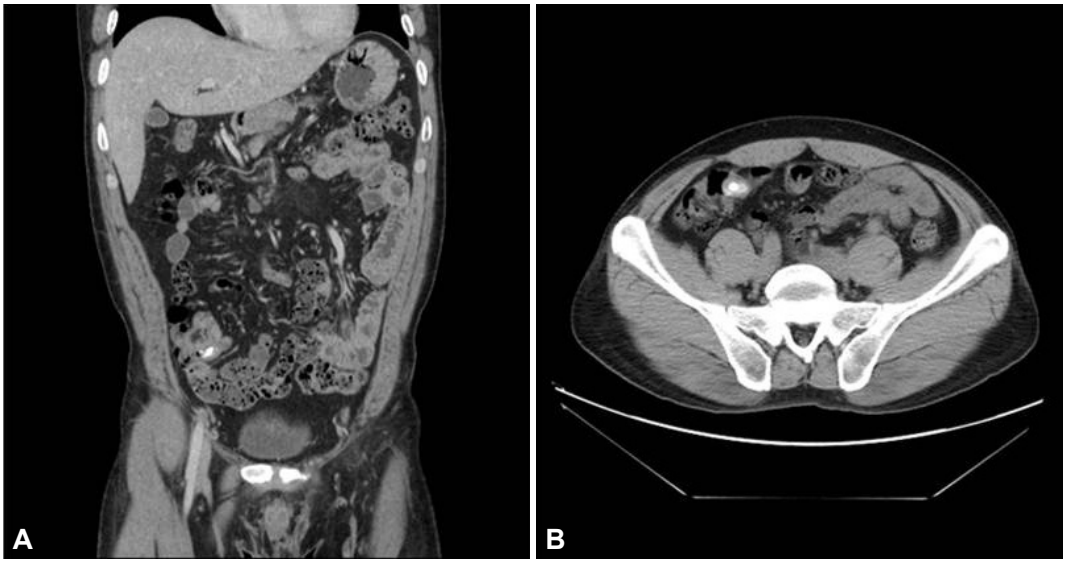

Fig. 1. Abdominal computed tomography showing stump appendicitis with residual stone. (A) Coronal view. (B) Axial view.

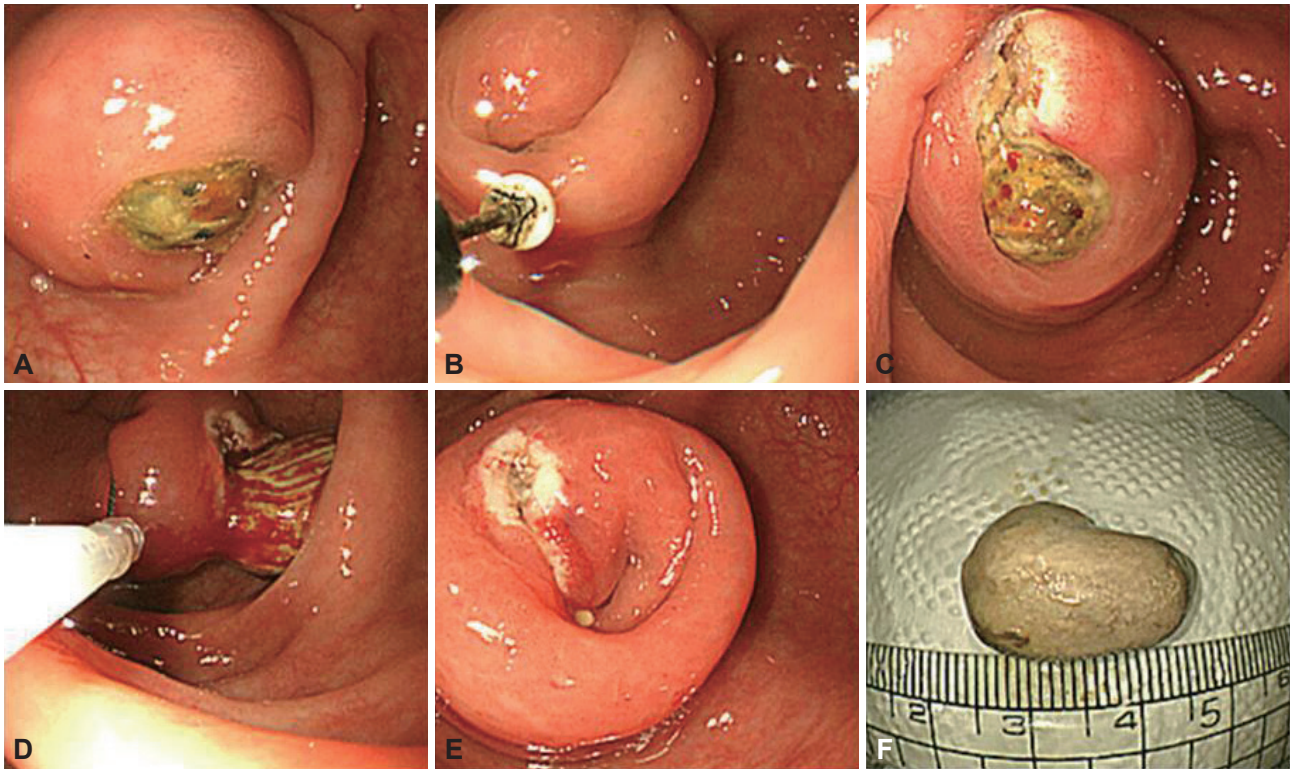

Fig. 2. (A) Colonoscopy showing a round, protruding mass covered with normal mucosa and an impacted stone at the appendiceal orifice. (B, C) An approximately 4-mm incision on the appendiceal orifice by using an IT knife. (D, E) Removal of the appendiceal stone using a snare. (F) View of the complete removal of the appendiceal stone.

agnosing patients with abdominal pain presenting to the hospital, and its findings occasionally show erythema or edema of the mucosa around the appendiceal orifice or the ileocecal region caused by acute appendicitis or abscess around the appendix. Sometimes, the spontaneous drainage of pus from an increased amount of colonic mucosa around the appendiceal orifice or the ileocecal region is observed. A few sporadic studies have indicated that the pus was drained by inserting a biliary stent into the appendiceal orifice or that the pus was sucked using a cap for endoscopic variceal ligation, but no case has reported nonsurgical treatment using endoscopy for the treatment of a giant stone-induced stump appendicitis.[6-8] In this case, we attempted to remove the appendicolith endoscopically because of the lesion's marked protrusion into the colonic lumen. The procedure was performed in two steps. First, we made an incision into the appendiceal orifice with an IT knife. Because the margin of the orifice was connected by the colonic wall, a wide incision can lead to complications such as perforation. Thus, minimal incision of the margin of the orifice was performed to the extent that the appendicolith could be removed. Second, we squeezed the lower part of the lesion with a snare so that the appendicolith could be removed by widening the appendiceal orifice.

In conclusion, we endoscopically treated stump appendicitis caused by a giant appendicolith. Although surgery has been the main method to treat appendicitis, endoscopic treatment is an option in selected cases of appendicolith-induced stump appendicitis.

Conflicts of Interest

The authors have no financial conflicts of interest.

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