



Case Report

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Acute Suppurative Appendicitis Following Screening Colonoscopy

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There has been a significant increase in the number of colonoscopies being performed worldwide. Moreover, post-colonoscopy appendicitis is a rare phenomenon, with limited clarity about its pathogenesis. Herein, we discuss the case of 41-year-old female patient, who underwent forceps biopsy polypectomy and cold snare polypectomy during a colonoscopy for a routine check-up. However, 6 h later she experienced episodes of lower abdominal pain and vomiting, subsequently diagnosed as acute appendicitis upon revisit. The patient afterwards underwent laparoscopic appendectomy in the general surgery department. There is a significant lack of knowledge regarding the mechanism of occurrence and predisposing factors associated with post-colonoscopy acute appendicitis; however, if a patient exhibits clear symptoms and a typical course of pain, active exploration for appendicitis can be considered, even shortly after undergoing colonoscopy.

Keywords: Appendicitis, Colonoscopy, Complications

Introduction

Worldwide there has been a rapid surge in colonoscopy, and is presently one of the most commonly performed procedures for diagnostic or therapeutic purposes. Frequently associated postoperative complications include bleeding and perforation; however, rare occurrences such as splenic injury, pneumomediastinum, pneumothorax, incarcerated hernia, ileus, and diverticulitis are scarcely described in previous reports [1]. Post-colonoscopy appendicitis being rarely reported, lacks in evidence establishing its mechanism, incidence rate, and prognostic model. This report presents a case of acute appendicitis following a routine colonoscopy screening, with the aim of providing relevant information about this rare complication.

Case report

A 41-year-old woman with no underlying medical condition visited the outpatient department complaining of abdominal pain in the periumbilical and left lower quadrant areas. Two days before her visit, she underwent the first colonoscopy of her life, for diagnostic purpose. The preparation and procedure were uneventful, resulting in a Boston Bowel Preparation Scale score of 9 with clear visualization of every segment of the colon, including the cecum, appendiceal orifice, and ileocecal regions. The cecal intubation time was 5 minutes. No specific pathological findings were observed in the cecum or the appendiceal orifice (Fig. 1). During colonoscopy, a 3 mm sessile polyp was removed via forceps biopsy polypectomy in the descending colon, and a 5 mm sessile polyp was re-

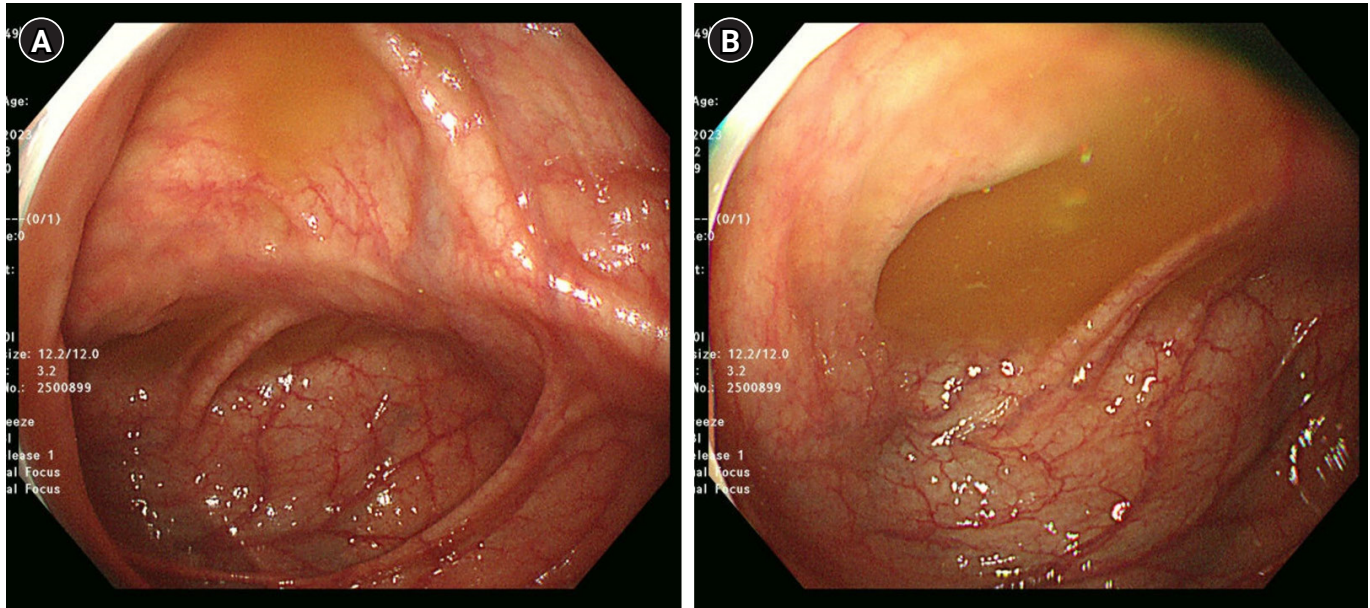


Fig. 1. Colonoscopy screening reveals nonspecific findings in the cecum (A) and appendiceal orifice (B), with no signs of inflammation.

moved via cold snare polypectomy in the sigmoid colon. The entire procedure, including the observation time for post-polypectomy bleeding, lasted for 14 minutes. The patient was stable without any discomfort after the procedure and was discharged. However, about 6 hours later, she experienced sudden periumbilical pain while consuming her first meal, which was a soft porridge diet. As the abdominal pain worsened and was frequently accompanied by vomiting, she visited different healthcare facilities where she received conservative treatment but without further evaluation. However, following her deteriorating condition, she eventually returned to the hospital where the first colonoscopy was performed. During this re-evaluation, her physical examination revealed not only left-sided tenderness but the lower abdomen bilaterally. The point-of-care ultrasonography conducted using a convex probe showed the most severe sonographic tenderness in the right lower quadrant, specifically in the ileocecal region, which was thought to be the transition point to the appendix (Fig. 2A). A post-colonoscopy acute appendicitis was suspected, and the patient was transferred to the emergency department. At the time, her vital sign measurements were as follows: body temperature of 38.6 °C, blood pressure at 130/70 mmHg, heart rate at 100 beats per minute, respiratory rate of 20 breaths per minute, and oxygen saturation at 97%. Laboratory result findings demonstrated white blood cell count 11,530 /mm³ (Neutrophil 91.3%), hemoglobin level 13.6 g/dL, platelet count 210,000 /mm³, blood urea nitrogen/creatinine 19/0.72 mg/dL,

total total protein/albumin 6.8/4.3 g/dL, alkaline phosphatase/aspartate aminotransferase/alanine aminotransferase 86/9/5 U/L, amylase 47 U/L, lipase 24 U/L, C-reactive protein 15.08 mg/dL (reference value 0.0-0.5 mg/dL), creatine phosphokinase 23.2 U/L, and prothrombin time of 14.6 seconds (international normalized ratio, 1.25).

Imaging studies revealed an ileus on radiography (Fig. 2B), acute appendicitis with suspected localized peritonitis, and no intraperitoneal free air on computed tomography (Fig. 2C, 2D). As a result, an emergency laparoscopic appendectomy was performed in conjunction with the general surgery department. During the surgery, perforated appendicitis with omental adhesion and pus collection in the pelvic cavity were observed (Fig. 3). The patient showed a rapid resolution of symptoms after surgery and was discharged in a stable condition on the 4th day of hospitalization. The final histopathological report of the resected specimens revealed a tubular adenoma with low-grade dysplasia in the excised polyps and acute suppurative appendicitis in the appendiceal tissue.

Discussion

Colonoscopy is a widely performed procedure for both diagnostic and therapeutic purposes, including the detection and removal of cancerous and precancerous polyps. As the number of colonoscopies performed worldwide continues to increase, concerns regarding complications and adverse events

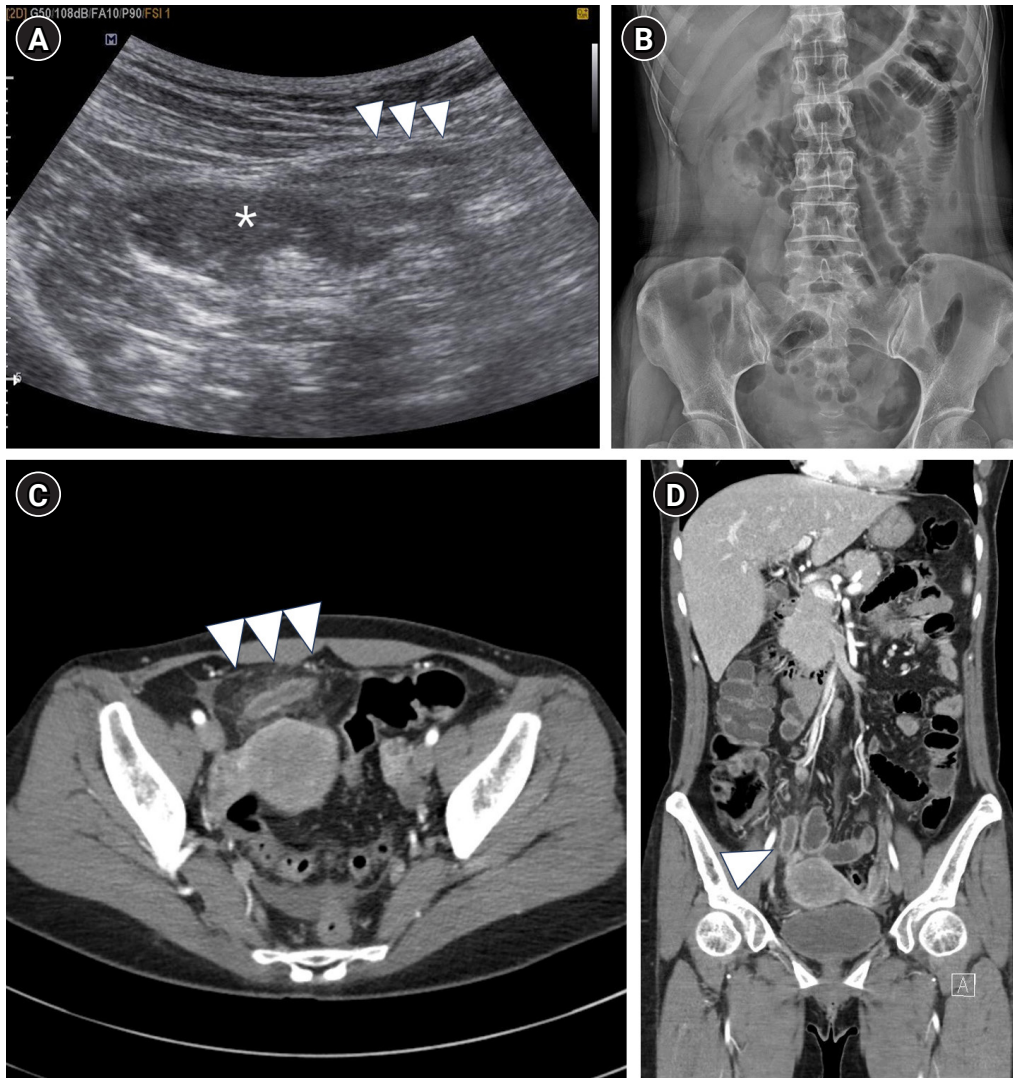


Fig. 2. (A) Point-of-care ultrasound indicates the most tender point on the inflamed appendix (asterisk, psoas muscle; arrowheads, appendix). (B) Abdominal X-ray of supine view demonstrates multiple loops of gas-filled small bowel centrally projected over the abdomen. The CT scan indicates acute appendicitis with suspected localized peritonitis and no intraperitoneal free air, as seen in the axial view (C; arrowheads) and coronal view (D; arrowhead).

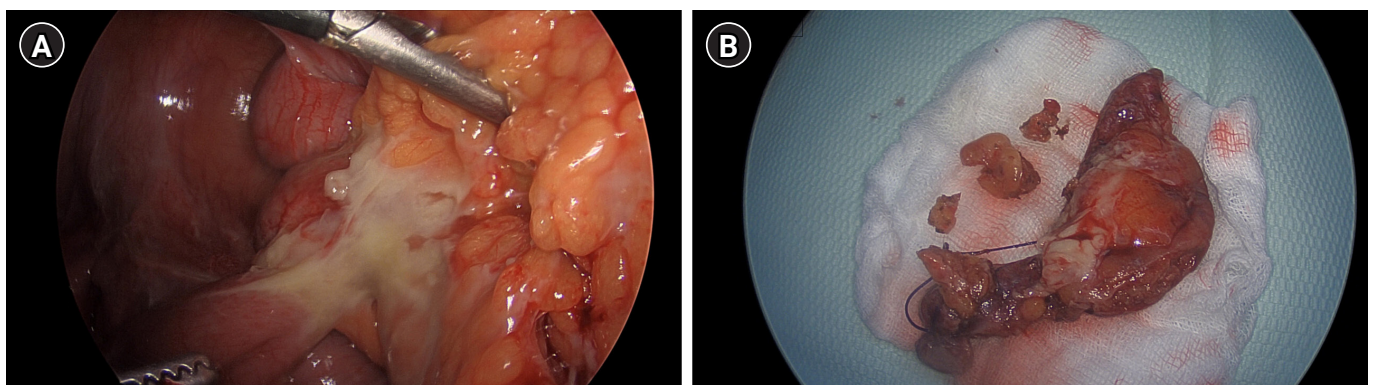


Fig. 3. During the operation, a perforated appendicitis with mesentery involvement is observed in the surgical field (A). The resected specimen displaying the pathology of acute suppurative appendicitis (B).

have also risen. A representative adverse event of colonoscopy is perforation, which occurs at a rate of 0.05% for all colonoscopies and increases to 0.08% for polypectomy procedures. Similarly, the rate of post-polypectomy bleeding is 0.26% for all colonoscopies and 0.98% for procedures involving polyp removal [2,3]. Appendicitis as a post-colonoscopy complication was first described in a 35-year-old male patient in 1988, and later reported as relatively rare in case studies mostly [4-6]. One study by Vender et al. [7] in 1995 conducted a review of 8,000 patients over a two-year period wherein 3 cases of appendicitis were reported, estimating an incidence rate of 0.038%, a commonly cited statistic in literature. In Shaw's literature review of post-colonoscopy appendicitis cases, symptoms of appendicitis were reported within a wide period, ranging from immediately after endoscopic examination to up to 10 days afterward. In Ng's study, approximately 85% of patients (45 of 53) experienced symptoms of appendicitis within 48 hours of undergoing endoscopy [8,9]. Since large multi-center prospective cohort studies are lacking, the occurrence and timing of appendicitis after colonoscopy are challenging to predict, and empirical antibiotic therapy may mask inflammation in some cases, making it a very rarely reported complication. Currently, there is no definitive standard for diagnosing post-colonoscopy acute appendicitis. Shaw et al. [8] proposed to define the term "post-colonoscopy appendicitis" for acute appendicitis occurring within 72 hours after colonoscopy. A retrospective study using veteran cohort data from 2009 to 2014 in the United States analyzing current procedural terminology codes compared the incidence rate of appendicitis between within 1 week and 1-51 weeks after colonoscopy. The authors found an incidence rate ratio of 4.5, suggesting a higher risk of appendicitis within the first week after colonoscopy. However, it has been pointed out that this finding does not establish a cause-and-effect relationship between colonoscopy and appendicitis, due to lack of evidence, and other factors such as ischemic changes due to bowel preparation of specific agents or changes in the microbiome during bowel preparation could also play a role [10]. Usual pathogenesis of appendicitis involves obstruction of the lumen by a fecalith, which increases intraluminal pressure, leading to ischemia and inflammation. According to Shaw et al. [8] and Ng et al. [9], hypotheses regarding the mechanism of appendicitis occurrence after colonoscopy have been proposed in previous reports and comprise the following: 1) insertion or spreading of fecalith during the procedure, resulting in blockage and/or inflammation; 2) traumatic injury to the appendix leading to swelling of the appendiceal lumen; 3) unintentional direct insertion into the ap-

pendiceal orifice; 4) barotrauma due to insufflation; and 5) worsening of the subclinical disease. In the present case, which fulfilled Shaw's criteria, the procedure time was not significantly longer than average, there was no mechanical damage to the appendiceal orifice during the manipulation, and the absence of a fecalith distinguishes it from previous reports.

Acute appendicitis immediately after colonoscopy is an extremely rare phenomenon, and it is still difficult to establish a causal link between a recent colonoscopy and appendicitis in such patients appendicitis. Although appendicitis is a possible complication of colonoscopy, routine prediction, such as inclusion in the consent form or prevention of appendicitis during colonoscopy, is not yet recommended [11-13]. However, in patients with post-colonoscopy abdominal pain with detectable signs and symptoms, exploration of acute appendicitis should be actively considered, along with the differential diagnosis of perforation and post-polypectomy syndrome. Prompt recognition of this condition through early intervention can lead to favorable outcomes.

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Ethics approval

The requirement to obtain informed consent was waived.

Conflict of interest

The authors have nothing to disclose.

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