

CASE REPORT

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Pyogenic Liver Abscess Caused by Endoscopic Submucosal Dissection for Early Colon Cancer

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Endoscopic submucosal dissection (ESD) is widely used for the treatment of colorectal neoplasia in patients who are candidates for endoscopic resection. In particular, pyogenic liver abscess (PLA), although rare, can occur. To our knowledge, there are no reports of PLA cases after ESD. Therefore, we report a rare case of PLA caused by ESD. A 76-year-old man was referred from a local clinic and admitted to our hospital for colonic ESD for a large polypoid mass. During colonoscopy, a 5-cm mass was seen in the cecum. ESD was performed. Four days after the procedure, he complained of myalgia and abdominal discomfort. Computed tomography revealed a 5.4-cm PLA in the medial segments of the liver. He was treated with antibiotics, and a percutaneous drainage catheter was inserted. Here, we report a very rare complication (PLA) after ESD. In conclusion, comprehensive awareness of the development of PLA is needed in ESD cases. **Clin Endosc 2019;52:620-623**

Key Words: Colonic neoplasm; Colonoscopy; Endoscopic submucosal dissection; Endoscopy; Liver abscess

INTRODUCTION

Endoscopic submucosal dissection (ESD) is widely used to treat colorectal neoplasia in patients who are candidates for endoscopic resection. Compared with surgery, ESD is a minimally invasive technique with the advantages of short duration of hospital stay and rapid recovery. According to the European Society of Gastrointestinal Endoscopy clinical guidelines, ESD is recommended to achieve *en-bloc* resection in cases of suspected superficial invasive adenocarcinoma.¹ Although ESD has various advantages, some adverse events can occur during or after ESD, the most common being perforation and bleeding. There was a report about the low rate of bacteremia associated with endoscopic resection.² There-

fore, post-ESD infection caused by the disruption of mucosal integrity is considered a causative mechanism leading to a rare complication.

We encountered a case of pyogenic liver abscess (PLA) that developed after ESD. In the literature, there have been two reports of PLA development after endoscopic mucosal resection.^{3,4} To our knowledge, there have been no reported cases after ESD. Here, we report an uncommon case of a PLA caused by ESD.

CASE REPORT

A 76-year-old man was referred from a local clinic and admitted to our hospital for colonic ESD for a large polypoid mass. His history included PLA 4 years prior and a cystectomy for a bladder tumor. He denied any other medical history. Initially, his vital signs, physical examination results, laboratory tests, and plain abdominal films were normal. During colonoscopy, a 5-cm mass was seen in the cecum (Fig. 1A). The mass was identified as a tubular adenoma and focal high-grade dysplasia on a preprocedural evaluation. ESD was performed using a J-type knife (FINEMEDIX Co., Dae-

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gu, Korea) connected to an electrosurgical unit (VIO 300D; ERBE, Tübingen, Germany). The injection material was 0.4% sodium hyaluronate solution (Endo-Mucoup; BMI Korea Co., Jeju, Korea). The total procedure time was 120 min. Because of massive bleeding that occurred during ESD, a piecemeal *en-bloc* resection was performed. No immediate complications were noted (Fig. 1B). Four days after the procedure, the patient complained of myalgia and abdominal discomfort. His blood pressure was 128/78 mm Hg, and his body temperature was 38.2°C. Palpation of the abdomen showed tenderness and mild rebound tenderness on the epigastric and right upper quadrant areas. Laboratory tests indicated a leukocyte count of 12,450/mL (normal range, 4,000–10,800/mL), hemoglobin level of 11.6 g/dL (normal range, 11–17 g/dL), aspartate aminotransferase level of 27 IU/L (normal range, <37 IU/L), alanine aminotransferase level of 33 IU/L (normal range,

<41 IU/L), total bilirubin level of 1.07 mg/dL (normal range, 0.3–1.2 mg/dL), alkaline phosphatase level of 120 U/L (normal range, 40–129 U/L), and C-reactive protein level of 19.2 mg/dL (normal range, <0.3 mg/dL). Computed tomography (CT) revealed a 5.4-cm, newly developed PLA in the right lobe of the liver, in contrast to the previous CT that was obtained 14 days before (Fig. 2A, B). After blood cultures were collected, antibiotics (third-generation cephalosporin and metronidazole) were administered. Next, a drainage catheter was placed with radiologic and ultrasonographic guidance (Fig. 3). From the drainage catheter, about 25 mL of turbid yellow pus was obtained. On microscopic examination, there were many leukocytes in pus. However, cultures from blood and pus were negative for bacterial growth. As the antimicrobial therapy continued, the patient's clinical symptoms resolved. The drainage catheter was removed, and he was discharged 2 weeks af-

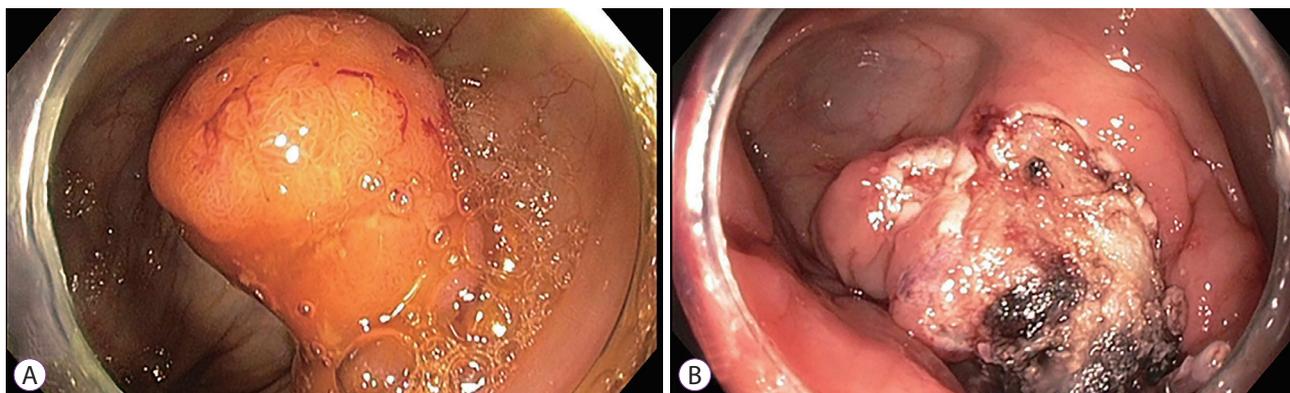


Fig. 1. (A) Colonoscopy image showing a 5-cm polypoid mass at the cecum. (B) The mass was removed by means of endoscopic submucosal dissection.

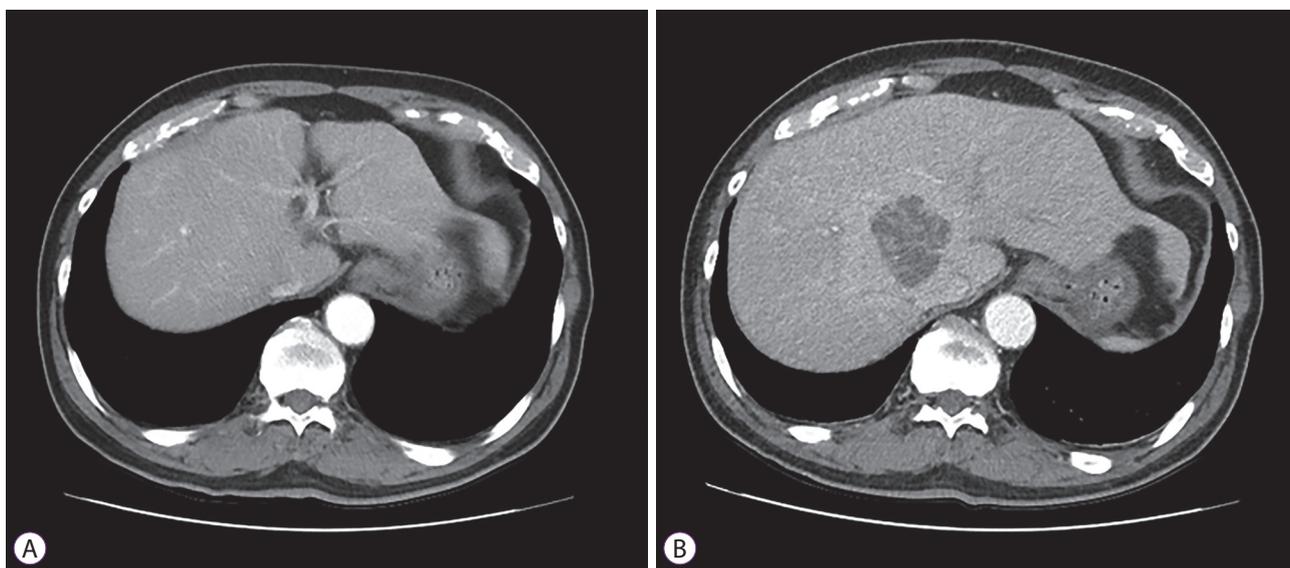


Fig. 2. (A) Computed tomography (CT) scan showing normal findings 14 days before endoscopic submucosal dissection. (B) CT with intravenous contrast revealed a 5.4-cm pyogenic liver abscess in the right lobe of the liver.

ter the procedure. Two months after discharge, serial CT scans showed complete resolution of the PLA (Fig. 4). The pathologic diagnosis of the ESD specimen was colon adenocarcinoma. However, as ESD was performed through piecemeal *en-bloc* resection, the pathologic report could not exclude submucosal invasion of the adenocarcinoma. Consequently, the patient underwent an additional surgery. The final pathologic report indicated no residual tumor at the endoscopic resection site. During follow-up, he complained of no PLA-related symptoms.

DISCUSSION

The liver can be affected by infectious pathogens gaining access to the organ via the transmission routes of the portal venous or hepatobiliary system. Therefore, the liver is the

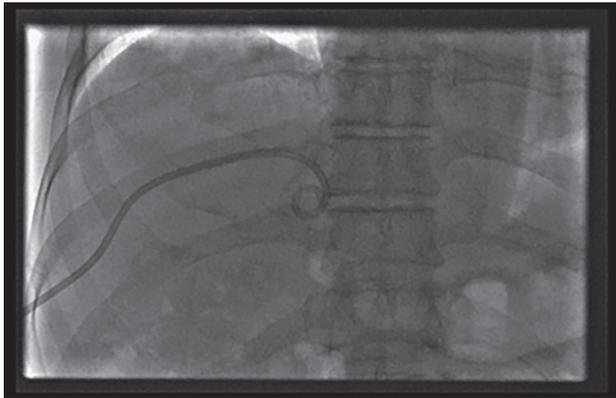


Fig. 3. The drainage catheter was placed with radiologic and ultrasonographic guidance.

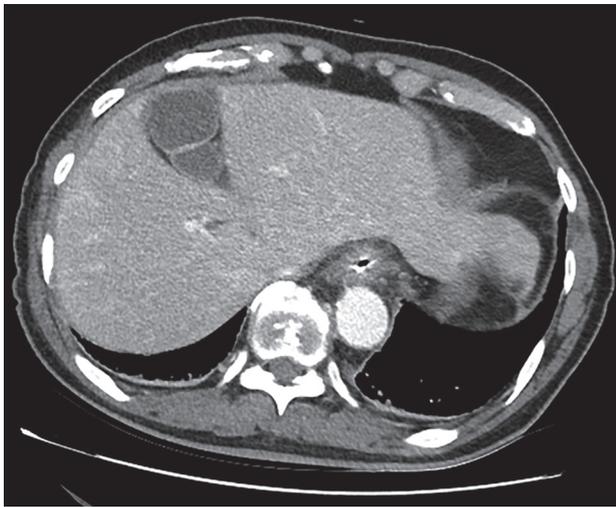


Fig. 4. Two months after discharge, serial computed tomography scan showed complete resolution of pyogenic liver abscess.

most common site of intra-abdominal abscess development. However, some cases of PLA do not have an exact cause. In the last decade, many investigators have suggested correlations between tumorous lesions of the gastrointestinal tract and PLA.^{5,6} Furthermore, many researchers have suggested that cryptogenic PLA is a first manifestation of colonic neoplasia.⁷⁻¹⁰ This may be due to the opening of a mucosal barrier defect, which becomes a route for infectious pathogens to move into the portal system connected to the liver. The hematogenous spread of infectious agents, such as *Klebsiella pneumoniae* and *Entamoeba histolytica*, to the liver is a crucial process in the development of liver abscesses without a definite cause. Advanced colorectal neoplasia that involves ulcers or erosive inflammation can cause an obvious disruption of the continuity of the mucosal barrier, resulting in PLA. In accordance with the previously mentioned phenomenon, there is another iatrogenic setting that may result in a mucosal barrier defect. During ESD, intentional mucosal or submucosal incisions and dissections are performed. Consequently, the damaged mucosal barrier of the colon can provide chances for infectious pathogens to access the liver. In a systematic review, about two-thirds of patients with PLA related to colorectal cancer presented abscess in the right liver¹¹ because the right lobe of the liver is larger than the left lobe and has a propensity to receive most of the portal venous flow.¹² Our patient also showed PLA in the right lobe of the liver. Therefore, we suppose that the PLA in our case developed through a similar mechanism.

ESD has been widely recognized as a first-line treatment option for large nonpedunculated colorectal adenomas and early adenocarcinomas in East Asia.¹³ Submucosal incisions with an electrocautery knife are made during ESD. Inevitably, the normal integrity of the colonic mucosal wall is disrupted. Infectious materials may move directly to the portal venous system through the exposed submucosa and vessels. Further, inflammatory changes usually occur during the course of mucosal healing. These can alter the integrity of the colonic wall and lead to the translocation of infectious pathogens. For example, inflammatory bowel disease, which includes ulcerative colitis (UC) and Crohn's disease (CD), is characterized by chronic inflammation of the intestinal wall. To date, many cases of PLA have been reported in patients with UC and CD.^{14,15} Thus, we postulate that direct exposure of the submucosa and the inflammatory healing process resulting from ESD can trigger PLA formation.

The clinical manifestations of patients with PLA are non-specific. Thus, patients may present with vague symptoms such as fever, chills, abdominal pain, and right upper quadrant discomfort. The laboratory features of PLA include hypoalbuminemia; leukocytosis; a high erythrocyte sedimentation

rate; and high levels of C-reactive protein, total bilirubin, and alanine aminotransferase. The most integral method of diagnosing PLA is a radiologic imaging study consisting of ultrasonography and CT. Ultrasonography reveals PLA as hypoechoic and solid nodules. PLA appears as isodense lesions on unenhanced CT or hypodense nodules after the injection of intravenous contrast.¹⁶ When the lesion is solitary and small (<3 cm), antibiotic monotherapy is recommended. However, if the lesion is multinodular and larger (>3 cm), additional percutaneous aspiration or drainage is needed. Surgical treatment is sometimes performed in cases of failed medical therapy and accompanying malignancy.¹⁷ The current case was managed using broad-spectrum antibiotics and percutaneous drainage because of the large size of the PLA.

In conclusion, we reported a very rare complication (PLA) after ESD. Cases of PLA can become serious. Therefore, optimal treatment for patients with PLA is needed. Like in our case, when a patient complains of myalgia and right upper quadrant pain after ESD, clinicians should be aware of the possibility of PLA as the underlying cause.

Conflicts of Interest

The authors have no financial conflicts of interest.

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