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# Esophageal Pyogenic Granuloma: Endosonographic Findings and Endoscopic Treatments

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Pyogenic granuloma is a benign inflammatory vascular lesion, mainly found in the skin and oral mucosa. A few cases of pyogenic granuloma in the gastrointestinal tract have been reported, and the esophagus was the main site in these cases. These patients were diagnosed with pyogenic granuloma after they underwent upper endoscopy and biopsy. Endoscopic resection is a favorable treatment option for esophageal pyogenic granuloma. Recently, we observed characteristic endosonographic findings in two cases with esophageal pyogenic granuloma, which were then treated successfully by endoscopic resection.

**Key Words:** Endosonography; Esophagus; Pyogenic granuloma

## INTRODUCTION

Pyogenic granuloma was first reported as botryomycosis humaine in 1897.<sup>1</sup> It is a benign inflammatory vascular lesion, mainly found in the skin and oral mucosa. Only a few cases of pyogenic granuloma in the gastrointestinal tract have been reported.<sup>2</sup> A pyogenic granuloma is usually seen as a protruding polypoid lesion and occasionally as a submucosal tumor-like lesion on endoscopy. Endosonographic findings for pyogenic granuloma have not yet been reported. In this study, we reported the endosonographic findings obtained and the treatment approaches used for two patients with esophageal pyogenic granuloma.

## CASE REPORTS

### Case 1

A 58-year-old man underwent upper endoscopy as part of

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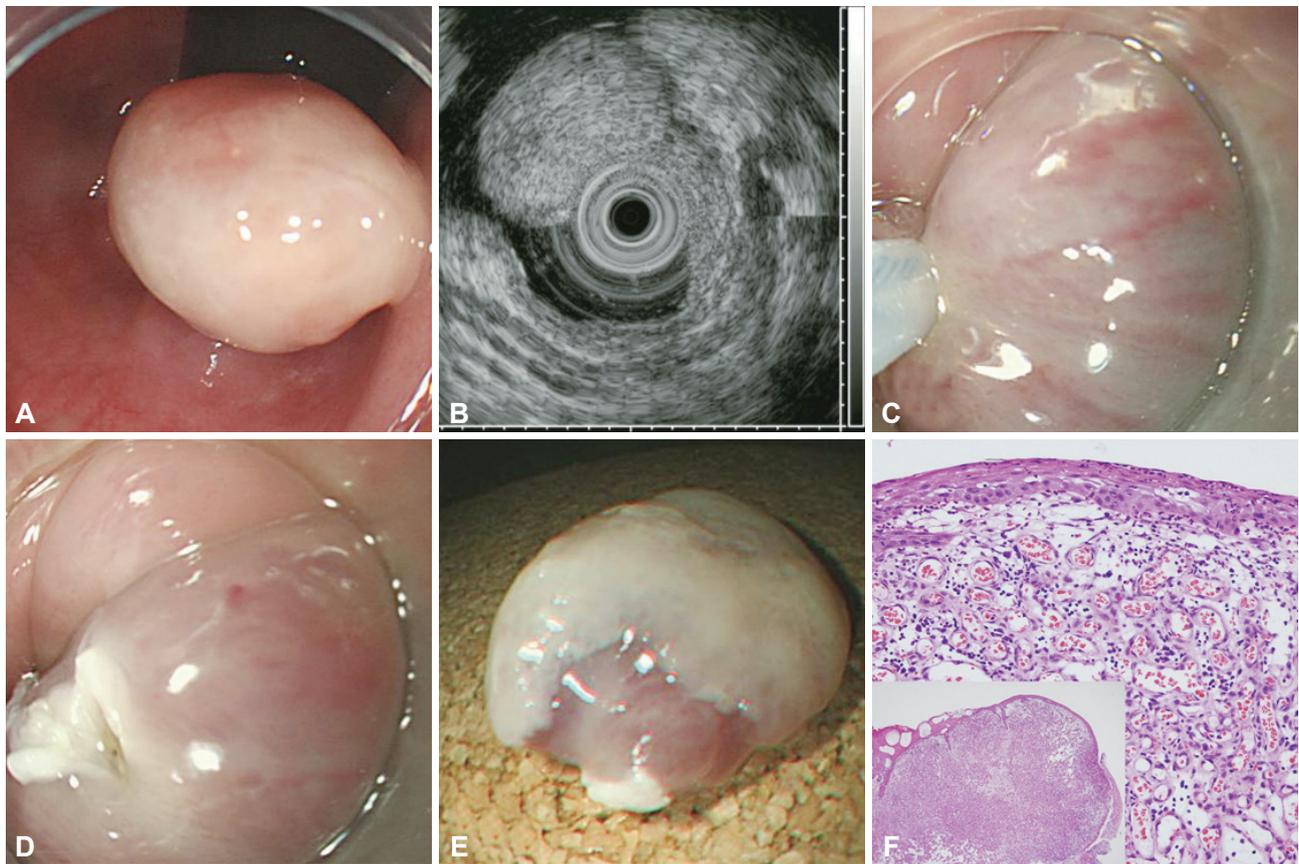
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a medical check-up. The endoscopic findings showed the presence of a polypoid lesion in the lower esophagus. The patient was asymptomatic, and physical examination showed unremarkable findings. The upper endoscopy showed a 1-cm polypoid mass that was located just above the esophagogastric junction (Fig. 1A). The mass had a smooth surface and was covered with white exudates; it did not exhibit cushion sign. Endoscopic ultrasonography (EUS) showed that the lesion was homogeneously hyperechogenic (Fig. 1B), had clear margins, and was located in the submucosa. Endoscopic and EUS findings suggested possibility of an inflammatory lesion such as inflammatory fibrinoid polyp. The patient wanted to remove the tumor strongly and then endoscopic resection was planned without biopsy. For endoscopic resection, a saline solution was injected to lift the lesion. Next, we performed endoscopic mucosal resection (EMR). The lesion was completely resected without complications (Fig. 1C-E). Histological examination showed edematous granulation tissue containing numerous capillaries with acute and chronic inflammatory cell infiltration (Fig. 1F). These histological findings were indicative of pyogenic granuloma. Recurrence was not observed during the follow-up endoscopy performed 6 months later.

### Case 2

A 54-year-old man visited our hospital because of the inci-



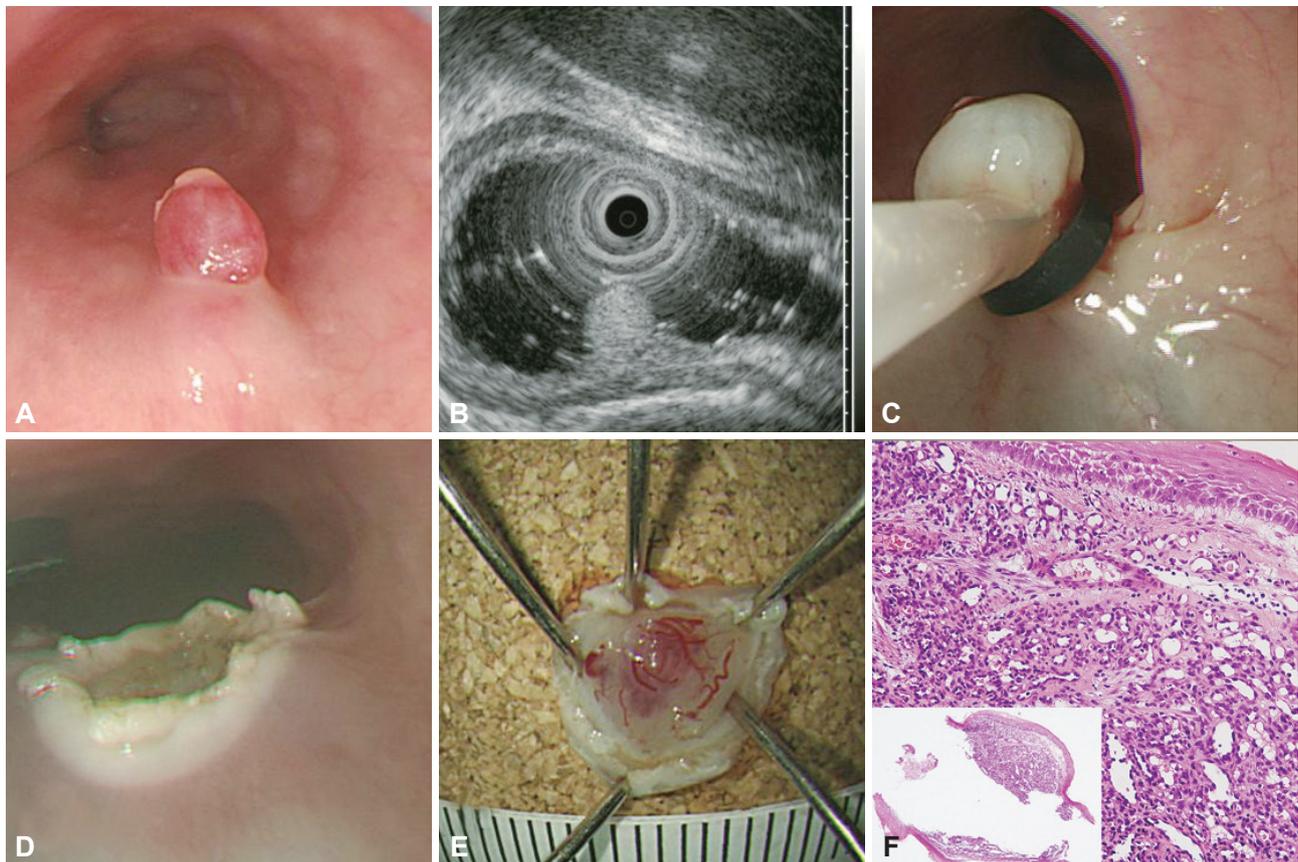
**Fig. 1.** (A) Endoscopy findings. A 1-cm polypoid lesion covered by exudates is observed just above the esophagogastric junction. (B) Endosonographic findings. A homogeneously hyperechoic lesion is seen in the submucosa. (C) Saline solution is injected to lift the lesion. (D) Complete removal of the lesion using a snare. (E) Resected specimen. (F) Histological findings. The resected polyp is composed of edematous granulated tissue containing numerous capillaries (H&E stain,  $\times 200$ ; Box, H&E stain,  $\times 40$ ).

dental detection of a polypoid lesion in the esophagus during a medical check-up. The patient was asymptomatic, and abnormalities were not found during his physical and laboratory examinations. The upper endoscopy showed a 0.5-cm reddish polypoid lesion located 30 cm from the incisor teeth (Fig. 2A). This lesion was covered by some exudates and did not exhibit the cushion sign. EUS showed that the lesion was homogeneously hyperechoic, had clear margins, and was located in the lamina propria (Fig. 2B). It was suspected as a pyogenic granuloma. After forceps biopsy, a moderate amount of bleeding occurred. The bleeding was stopped by epinephrine injection. The result of endoscopic biopsy revealed capillary hemangioma. EMR was performed using a ligation device (Fig. 2C-E). Histological analysis showed that the resected polyp was composed of abundant capillaries that were lined with endothelial cells (Fig. 2F); the polyp was infiltrated with acute and chronic inflammatory cells. The histological features were consistent with those of pyogenic granuloma. Recurrence was not observed during the follow-up endoscopy performed 6 months later.

## DISCUSSION

Pyogenic granuloma is a common lesion in the skin and oral mucosa, but rarely found in the alimentary tract.<sup>3</sup> Only 42 cases of pyogenic granuloma in the alimentary tract have been reported to date; the granuloma was located in the esophagus in 23 of these cases.<sup>2-6</sup> The incidence rate is the same regardless of the gender and age of the patient.<sup>4</sup> Currently, the etiologic factors suggested for pyogenic granuloma are infection, mechanical trauma, chemical irritation, pregnancy, and hormonal mechanisms that induce reactive inflammatory and abnormal vascular response.<sup>7,8</sup> However, the exact etiology is still unknown. Thirty percent of the patients with esophageal pyogenic granulomas are asymptomatic and the remainder experience diverse symptoms such as dysphagia, epigastric discomfort, and soreness.<sup>5</sup>

On endoscopic analysis, such granulomas are seen as protruding tumors or occasionally as submucosal tumor-like lesions. Their diameters are less than 20 mm, and they are pale pink to dark red in color.<sup>4</sup> The surface of these lesions were usually soft and were sometimes accompanied by exudates.



**Fig. 2.** (A) Endoscopy findings. A 0.5-cm pinkish polypoid lesion is seen 30 cm from the incisor teeth. (B) Endosonographic findings. A homogeneously hyperechoic lesion is seen in the lamina propria. (C) Band ligation was performed using a ligation device and then snare resection was done. (D) Complete resection of the lesion. (E) Resected specimen. (F) Histological findings. The resected polyp is composed of abundant capillaries that are lined with endothelial cells (H&E stain,  $\times 200$ ; Box, H&E stain,  $\times 40$ ).

Our patients had submucosal tumor-like lesions, and therefore, we performed EUS. EUS findings for pyogenic granuloma have not yet been reported. EUS showed that the patients had lesions that were homogeneously hyperechoic, had clear borders, and were located in the lamina propria or submucosa. It is thought that the hyperechogenicity reflects the proliferation of blood vessels in lesions like hemangiomas.<sup>9</sup> These EUS features would be helpful in the differential diagnosis of esophageal submucosal tumor-like lesions, such as gastrointestinal stromal tumor, leiomyoma, lipoma, granular tumor, and duplication cyst. In case 2, bleeding occurred by forceps biopsy and then epinephrine was injected to stop the bleeding. Since pyogenic granuloma is a highly vascular lesion, massive bleeding is expected after biopsy. Therefore, if there is a possibility of pyogenic granuloma in esophageal submucosal tumor-like lesions by the above mentioned EUS findings, we could avoid endoscopic biopsy for histological diagnosis.

EMR and endoscopic snare polypectomy are the most favorable treatment options for esophageal pyogenic granulomas.<sup>3,6</sup> In our patients, the lesions were completely resected

using traditional EMR or EMR with a ligation device. Recurrence of tumors that are resected by surgical or endoscopic methods is rare.

Pyogenic granuloma is histologically characterized by capillary hemangiomas with lobulated proliferation in the edematous stroma. The granuloma is consisted of numerous newly formed capillaries of variable sizes, with the infiltration of acute and chronic inflammatory cells.<sup>3</sup> Kaposi's sarcoma must be included in the differential diagnosis in such cases. Kaposi's sarcoma is suspected more often than pyogenic granuloma when a patient has immunosuppression due to conditions such as AIDS or transplantation; it is also suspected to a greater extent when spindle cells and eosinophilic globules are observed during histological analysis.<sup>10</sup>

In summary, esophageal pyogenic granuloma is a rare submucosal tumor-like polypoid lesion. On EUS, it appears as a homogeneously hyperechoic lesion that has clear borders and is located in the lamina propria or submucosa. These EUS features would be helpful in distinguishing pyogenic granuloma from other lesions. Endoscopic resection is an effective treatment for esophageal pyogenic granuloma.

**Conflicts of Interest** \_\_\_\_\_

The authors have no financial conflicts of interest.

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