

[ CASE REPORT ]

## Mediastinal Lymph Node Metastasis of Esophageal Cancer with Esophageal Stenosis Diagnosed via Transesophageal Endoscopic Ultrasound with Bronchoscope-guided Fine-needle Aspiration

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### Abstract:

An 80-year-old man underwent follow-up examinations after endoscopic submucosal dissection (ESD) for esophageal cancer. Computed tomography showed enlarged lymph nodes of the right recurrent nerve. The patient had esophageal stenosis due to repeated ESD for multiple esophageal tumors. The stenosis made the passage of an endoscopic ultrasound (EUS) scope through the esophagus difficult. Thus, an endobronchial ultrasound bronchoscope, which had a thinner diameter than that of the EUS scope, was used for transesophageal endoscopic ultrasound with bronchoscope-guided fine-needle aspiration. This technique led to the diagnosis of mediastinal lymph node metastasis of esophageal cancer.

**Key words:** endoscopic ultrasound with bronchoscope-guided fine-needle aspiration, endobronchial ultrasound, endoscopic submucosal dissection, esophageal cancer, mediastinal lymph node metastasis, esophageal stenosis

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### Introduction

Transesophageal endoscopic ultrasound with bronchoscope-guided fine-needle aspiration (EUS-B-FNA) using an endobronchial ultrasound (EBUS) bronchoscope is reportedly useful for diagnosing mediastinal lesions adjacent to the esophagus in lung cancer patients (1,2). The bronchoscope's thin diameter facilitates the passage of the endoscopic ultrasound (EUS) device through the esophagus in patients with esophageal stenosis. Esophageal stenosis is a common complication of endoscopic submucosal dissection (ESD) or radiation therapy for esophageal cancer.

To our knowledge, few reports have highlighted the usefulness of EUS-B-FNA in the field of gastrointestinal cancer. We herein report an 80-year-old esophageal cancer patient with esophageal stenosis due to repeated ESD. EUS-B-FNA was conducted, which led to the diagnosis of mediasti-

nal lymph node metastasis of the primary esophageal malignant tumor.

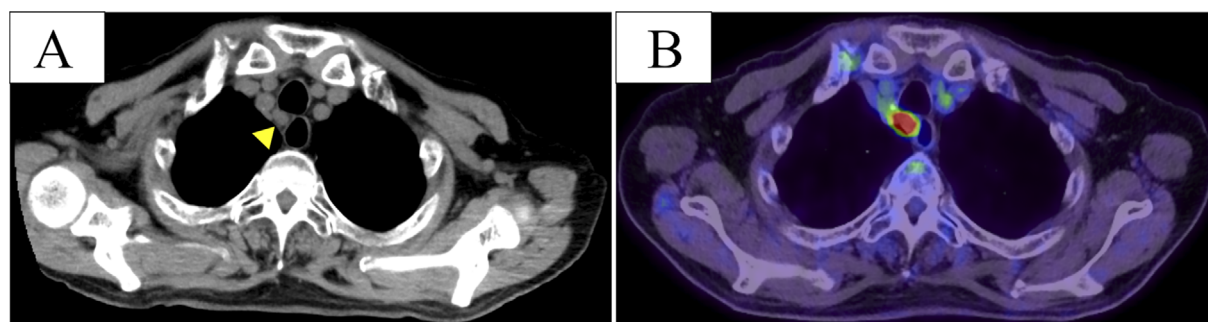
### Case Report

An 80-year-old man with a history of multiple primary esophageal malignant tumors, papillary thyroid cancer, and bladder cancer underwent follow-up examinations after ESD/endoscopic mucosal resection via a cap-fitted panendoscope (EMRC) for esophageal cancer. Computed tomography (CT) revealed enlarged lymph nodes of the right recurrent nerve (Fig. 1A). He underwent left lobectomy and D2 lymphadenectomy for papillary thyroid cancer at 76 years old, ESD/EMRC 4 times due to multiple esophageal malignant tumors between 76 and 79 years old, and transurethral resection and Bacille de Calmette et Guérin injection for bladder cancer at 78 years old. He was a former smoker with 110 pack years of smoking and a heavy alcoholic bev-

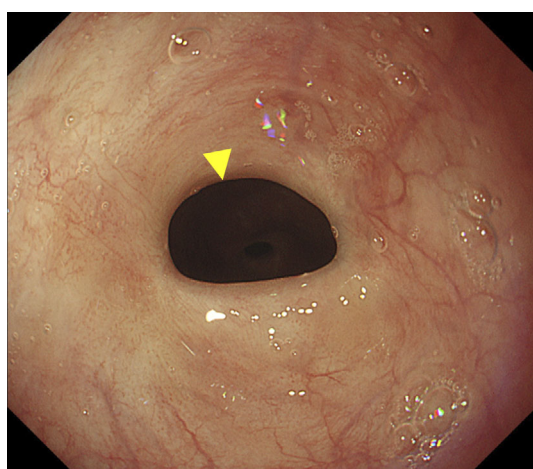
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**Figure 1.** Computed tomography (CT) shows enlarged lymph nodes in the right recurrent nerve (yellow arrowhead) (A). Fluorodeoxyglucose (FDG) positron emission tomography/CT shows the lymphadenopathies of the right recurrent nerve with the accumulation of FDG and a maximum standard uptake value of 20.56 (B).



**Figure 2.** Endoscopy results show multiple esophageal stenosis due to repeated endoscopic submucosal dissection/endoscopic mucosal resection via a cap-fitted panendoscope (yellow arrowhead).

erage drinker who consumed 2 L of whiskey within 5 days for 56 years.

His physical examination findings were unremarkable. However, he reported symptoms of esophageal transit obstruction when he ingested large chunks of food. His serum levels of squamous cell carcinoma antigen (1.0 ng/mL), cytokeratin-19 fragments (0.7 ng/mL), and thyroglobulin (1.23 ng/mL) were normal. A lung function test revealed an obstructive disorder; the forced expiratory volume 1 second (FEV1) and FEV1/forced vital capacity ratio were 1.61 L and 45.6%. Fluorodeoxyglucose positron emission tomography (FDG-PET)/CT showed that the enlarged lymph nodes of the right recurrent nerve accumulated FDG with a maximum standard uptake value of 20.56% (Fig. 1B). This uptake value was suggestive of malignancy. In addition, he had esophageal stenosis due to repeated ESD/EMRC for multiple esophageal malignant tumors (Fig. 2). Hence, the passage of a GIF TYPE Q260J (Olympus, Tokyo, Japan), with a diameter of 9.9 mm (Olympus) through the esophagus was difficult, and GIF-1200N (Olympus) or GIF-XP290N

(Olympus), with a diameter of 5.4 mm were used for follow-up endoscopy after ESD/EMRC.

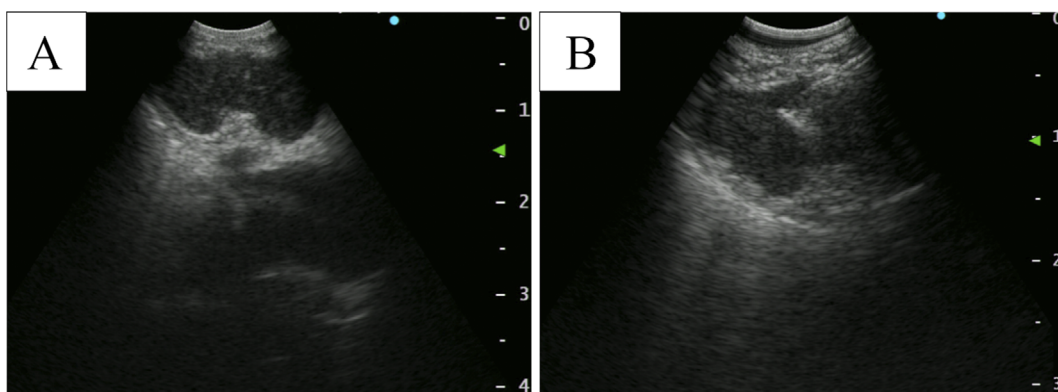
Since the lymphadenopathies of the right recurrent nerve were also adjacent to the esophagus at the superior mediastinum, we attempted to obtain a sample of tissues from the lymphadenopathies using EUS-FNA. However, the GF-UCT 260 (Olympus), with a diameter of 14.6 mm, could not be passed through the stenosed esophagus. We also considered performing EUS-FNA after balloon dilation of the stenosed esophagus. However, the risks of bleeding and perforation were high. We eventually decided to perform EUS-B-FNA using a BF TYPE UC260FW (Olympus), with a diameter of 6.9 mm, which was thinner than the GF-UCT260.

The enlarged lymph nodes of the right recurrent nerve were located on the right side of the anterior wall of the esophagus, about 20 cm from the incisor, which was located on the distal side of the esophageal stenosis. The diameter of the mass was 17.4×9.4 mm of which the interior was mildly heterogeneous, surrounded with several hypoechoic nodules, including a 3.8×3.3-mm nodule (Fig. 3A). Three specimens were obtained via needle aspiration using the Sonotip 22 G (Medi-Globe, Achenmühle, Germany) (Fig. 3B). The results of the rapid on-site cytological evaluation were positive. There was no esophageal mucosal injury or bleeding at the puncture site, as determined by pumping air and water through the suction port using a syringe. In total, 4 mg of midazolam and 35 mg of pethidine were used for sedation without episodes of oxygen desaturation.

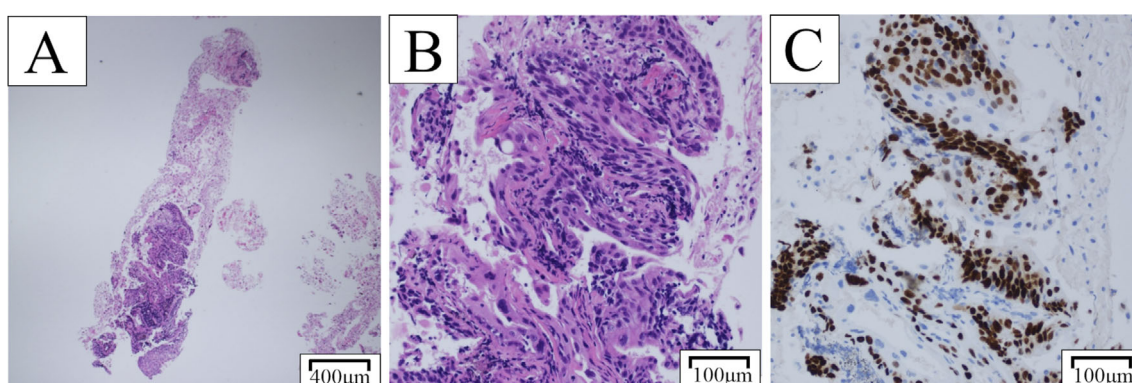
The histopathological examination results revealed that the patient had metastatic esophageal squamous cell carcinoma (Fig. 4). The recurrent esophageal cancer lesion was located in the lymph node of the right recurrent laryngeal nerve. The patient then underwent radiotherapy.

## Discussion

Esophageal stenosis is a complication of ESD, which is a treatment modality for esophageal cancer. In fact, esophageal stenosis accounts for 1.7% of all ESD cases in Japan (3). In this case, the patient had esophageal stenosis due



**Figure 3.** The length of the enlarged lymph node of the right recurrent nerve is 17.4×9.4 mm. Its interior is mildly heterogeneous (A). The enlarged lymph node was sampled by needle aspiration using the Sonotip 22 G (B).



**Figure 4.** The specimens obtained by EUS-B-FNA show clusters of cells with unequal sizes and irregularly-shaped nuclei (A, B). The results of immunostaining show that the cells are positive for p40 (C).

to repeated ESD/EMRC performed four times for multiple esophageal malignant tumors. We therefore had difficulty passing the EUS scope through the esophagus. EUS-FNA after endoscopic esophageal stricture dilation was considered. However, this technique was associated with an increased risk of bleeding and perforation. The incidences of bleeding when endoscopic esophageal stricture dilation was performed for esophageal stenosis associated with ESD was reported to be 0.8% per patient and 0.07% per procedure, while the incidences of perforation were 4.1% per patient and 0.37% per procedure (4). However, the EBUS bronchoscope had a thinner diameter than the EUS scope, so we were able to safely perform endoscopy without balloon dilation of the stenosed esophagus.

The histopathological findings for the patient following ESD/EMRC performed four times revealed T1a-epithelium (EP) or T1a-lamina propria mucosae (LPM) without lymphovascular invasion. The cumulative 5-year metastasis rate was reported to be 0.4% when the depth was T1a-EP/T1a-LPM (5). Since recurrence of early-stage esophageal cancer is very rare and our patient had a history of thyroid papillary cancer and bladder cancer, a reliable pathological diagnosis was considered necessary to identify mediastinal lym-

phadenopathies. The EBUS bronchoscope was inserted using a 19- to 25-G needle, which was the same size as that of the EUS scope. EUS-B-FNA is reportedly a practical and feasible method for obtaining tumor tissue to detect epidermal growth factor receptor mutations, echinoderm microtubule-associated protein-like 4, and the anaplastic lymphoma kinase fusion gene in lung cancer patients (6, 7). In the present case, a sufficient number of specimens for pathological and immunohistochemical examinations were obtained via needle aspiration using a 22-G needle, thereby suggesting that EUS-B-FNA might have a good diagnostic capability for mediastinal lesions adjacent to the esophagus.

EUS-B-FNA provides a high diagnostic yield for mediastinal lesions in lung cancer patients. It is equivalent to endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA), which is performed in lung cancer patients (8, 9). The sensitivities of EUS-B-FNA and EBUS-TBNA for diagnosing mediastinal lesions in patients with lung cancer are higher than those of each individual method (10). Although the target lesion was within the range approachable by both EUS-B-FNA and EBUS-TBNA in this case, EUS-B-FNA had several advantages over EBUS-TBNA. EUS-B-FNA requires fewer sedatives and lo-



cal anesthetics, has a shorter examination time, and involves fewer oxygen desaturation episodes than EBUS-TBNA in lung cancer patients. Furthermore, there was a case report of an enlarged lymph node in the superior mediastinum that could not be sampled by EBUS-TBNA due to the patient's strong cough reflex. However, when EUS-B-FNA was performed, samples were successfully obtained within the endoscopy session (11). In addition, EUS-B-FNA was performed in patients with poor respiratory conditions who were unable to undergo bronchoscopy (7, 12). Thus, EUS-B-FNA is an effective and safe method and should thus be more widely used for diagnosing mediastinal lesions adjacent to the esophagus.

A study compared the diagnostic accuracy of EUS-B-FNA and EUS-FNA for left adrenal metastasis of lung cancer (13). EUS-B-FNA may be less painful for patients than EUS-FNA because the scope diameter is thinner. Further comparative studies are warranted concerning the diagnostic accuracy, complications, and level of patient distress during the use of EUS-B-FNA and EUS-FNA for mediastinal lymph node lesions adjacent to the esophagus.

In conclusion, in patients with esophageal stenosis, passage of the EUS scope is difficult. However, in such patients, EUS-B-FNA using a thinner EBUS bronchoscope is useful, especially in the diagnosis of enlarged mediastinal lymph nodes adjacent to the esophagus.

**The authors state that they have no Conflict of Interest (COI).**

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