Esophageal Anthracosis with Tuberculous Lymphadenitis
Confirmed on Transesophageal Endoscopic Ultrasound-guided Fine-needle Aspiration

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Abstract

Esophageal anthracosis with tuberculous lymphadenitis is a very rare disease. Almost all reported cases are diagnosed using multiple endoscopic biopsies or thoracic esophagectomy. The present case report describes a case of esophageal anthracosis with tuberculous lymphadenitis that was diagnosed using transesophageal endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA) alone. After taking antituberculosis drugs, the patient’s chest pain was relieved and she recovered. The patient achieved an excellent outcome following the use of less invasive methods than mediastinoscopy. If no esophageal anthracotic lesions are found on the mucous membrane layer of the esophagus, transesophageal endoscopic ultrasound-guided fine-needle aspiration is a suitable approach for diagnosing esophageal anthracosis.

Key words: transesophageal endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA), esophageal anthracosis, tuberculous lymphadenitis, malignant melanoma

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Introduction

Anthracosis is a very common disease of the lungs. Extrapulmonary anthracosis that includes the esophagus is very rare. Previous studies have reported that making the differential diagnosis of esophageal anthracosis and malignant melanoma is difficult (1). We herein report a case of esophageal anthracosis that mimicked malignant melanoma in the endoscopic findings and radiographic images in a patient diagnosed with esophageal anthracosis on transesophageal endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA).

Case Report

A 75-year-old woman was referred to our hospital with a two-month history of anterior chest pain. She had also experienced a 6-kg weight loss during the same period. She did not smoke, and her medical history was unremarkable. She was a farmer with no history of occupational exposure to charcoal. The cardiovascular examination was normal. The endoscopic findings revealed a 20-mm, black-pigmented, depressed lesion located 24 cm from the upper incisors (Fig. 1). In addition, a papillary lesion was observed to be superimposed on the black lesion. Narrow band imaging (NBI) magnification endoscopy revealed intrapapillary capillary loop (IPCL) type II inflammatory changes (Fig. 2). In addition, a papillary lesion was observed to be superimposed on the black lesion. To rule out the possibility of malignant melanoma, multiple biopsy samples were obtained from the black lesion and papillary lesion. The histological examination revealed that the black lesion exhibited chronic inflammatory changes, while the papillary lesion was compatible with squamous papilloma. An immunohistochemical
The patient was diagnosed with tuberculous lymphadenitis. In Ziehl-Neelsen and auramine stains were positive, and the black anthracotic pigment-laden macrophages (Fig. 5A, B). The aspirated material revealed granulomas with necrosis and inflammation. In addition, the serological examination for QFT was positive.

EUS-FNA without surgical intervention. We prescribed the following three drugs as the first-line treatment regimen: isoniazid (INH), rifampin (RFP) and ethambutol (EB) for the first one month. The patient responded well, and we added pyrazinamide (PZA) to the above three drugs. Two months later, we prescribed only INH and RFP for the following three months. Six months after starting the treatment, we discontinued the antituberculosis drugs.

This case report indicates that patients can achieve excellent outcomes with minimally invasive methods, such as EUS-FNA without surgical intervention.
Figure 5.  A: Cytological smears and tissue obtained from the aspirated material demonstrated granulomas with necrosis and black anthracotic pigment-laden macrophages (Hematoxylin and Eosin staining ×160).  B: The black anthracotic pigment was not bleached.

Table.  A summarized Search Results for Case Reports of Esophageal Anthracosis between 1990 and 2013 through the Japana Centra Revuo Medicine and MEDLINE

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Age</th>
<th>Major complaint</th>
<th>Location</th>
<th>Pathology</th>
<th>Diagnosing</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vakharia</td>
<td>1990</td>
<td>68</td>
<td>Weakness of breath</td>
<td>Middle esophagus</td>
<td>Anthracotic pigment-laden macrophages</td>
<td>Endoscopic Biopsy</td>
<td>Observation</td>
</tr>
<tr>
<td>Uedo</td>
<td>2002</td>
<td>62</td>
<td>Discomfort of deglution Epigastric comfort, Obstructive feeling</td>
<td>Middle esophagus</td>
<td>Granulomas with coal pigments</td>
<td>Endoscopic Biopsy</td>
<td>Observation</td>
</tr>
<tr>
<td>Murata</td>
<td>2002</td>
<td>69</td>
<td>Epigastric comfort, Obstructive feeling</td>
<td>Middle esophagus</td>
<td>Histocytes with black pigments</td>
<td>Thoracic esophagectomy</td>
<td>Observation</td>
</tr>
<tr>
<td>Park</td>
<td>2006</td>
<td>68</td>
<td>No symptoms</td>
<td>Middle esophagus</td>
<td>Anthracotic pigment-laden macrophages</td>
<td>Endoscopic Biopsy</td>
<td>Antituberculous therapy</td>
</tr>
<tr>
<td>Choi</td>
<td>2010</td>
<td>74</td>
<td>Dysphagia</td>
<td>Middle esophagus</td>
<td>Granulomatous inflammation with anthracosis</td>
<td>Endoscopic Biopsy</td>
<td>Antituberculous therapy</td>
</tr>
<tr>
<td>Yang</td>
<td>2010</td>
<td>55</td>
<td>Blood-tinged sputum</td>
<td>Middle esophagus</td>
<td>Atypical cell with black pigmentation</td>
<td>Endoscopic Biopsy</td>
<td>Bronchoscopy</td>
</tr>
<tr>
<td>Nishiyama (present case)</td>
<td>2013</td>
<td>75</td>
<td>Anterical chest pain</td>
<td>Middle esophagus</td>
<td>Granuloma with anthracosis</td>
<td>EUS-FNA</td>
<td>Antituberculous therapy</td>
</tr>
</tbody>
</table>

Discussion

Esophageal anthracosis with tuberculous lymphadenitis is a very rare disease. In an autopsy series of 18,049 tubercular patients, esophageal involvement was found to be rare, with an incidence of only 0.14% (2). Anthracosis is a form of pneumoconiosis. The occurrence of pulmonary anthracosis has been well documented in cases of pneumoconiosis among adult coal workers and is caused by the deposition of coal dust in the lungs, as well as other environmental factors. Another possible mechanism underlying the development of esophageal anthracosis is inflammation due to direct contact between patients with paraesophageal lymphadenitis and tubercular infection (3). The differential diagnosis of black-pigmented esophageal lesions includes primarily malignant melanoma and anthracotic pigmentation, the treatments for which are significantly different (1, 4). Therefore, making the differential diagnosis between these two diseases is essential and plays an important role in the clinical setting. Endoscopically, most primary malignant melanomas of the esophagus present as bulky and polypoid lesions. In contrast, anthracotic lesions are pigmented and flat in the early stage of tuberculous lymphadenitis, progressing to ulceration with scarring in the later stages of the disease (5). A search for case reports of esophageal anthracosis between 1990 and 2013 using the Japana Centra Revuo Medicina and MEDLINE databases identified only seven reports, including the
The diagnostic modalities included endoscopic biopsies in five cases, thoracic esophagectomy in one case and EUS-FNA in one case (the present case). However, it is difficult to diagnose and differentiate between early stage esophageal anthracosis and malignant melanoma using biopsies alone because esophageal anthracotic lesions are not necessarily found on the mucous membrane of the esophagus. EUS is now a commonly employed modality in the diagnosis and management of suspected esophageal and mediastinal lesions. Previously published articles have reported the effectiveness of EUS-FNA for detecting malignant melanoma. However, there are no reports of dissemination via EUS-FNA to esophageal malignant melanoma (6).

Previous studies have also reported that, for mediastinal lymph nodes, EUS-FNA has an overall diagnostic yield of 93%, a sensitivity of 71%, a specificity of 100% and a positive predictive value of 100% and is a safe procedure, with complication rates below 1% (7, 8). The rate of acid-fast bacterial positivity is high in EUS-FNA lymph node samples compared with that observed in endoscopic biopsy samples of esophageal ulcers. For this reason, we were unable to make a differential diagnosis between esophageal anthracosis and malignant melanoma using an endoscopic biopsy alone in this case. The present case report indicates that EUS-FNA is suitable for diagnosing esophageal anthracosis with tuberculous lymphadenitis.

**Conclusion**

When esophageal anthracotic lesions are not visible on the mucous membrane of the esophagus in the early stages of the disease, it is difficult to obtain a specimen using multiple endoscopic biopsies. In such cases, EUS-guided FNA is a suitable and minimally invasive diagnostic approach that renders surgical intervention unnecessary.

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

**References**


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