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Squamous cell carcinoma in an esophageal diverticulum below the aortic arch

Akiyuki Wakita, Satoru Motoyama*, Yusuke Sato, Kei Yoshino, Tomohiko Sasaki, Hajime Saito, Yoshihiro Minamiya, Jun-ichi Ogawa

Department of Surgery, Akita University Graduate School of Medicine, 1-1-1 Hondo, Akita 010-8543, Japan

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ABSTRACT

INTRODUCTION: Esophageal diverticula frequently arise from pharyngoesophageal transition area, tracheal bifurcation and epiphrenic region. Carcinoma arising from esophageal diverticulum is rarely seen. We report a patient with a squamous cell carcinoma arising within an esophageal diverticulum below the aortic arch.

PRESENTATION OF CASE: A 70-year-old man was diagnosed to have a squamous cell carcinoma of the vocal cord with enlarged lymph nodes in the neck, as well as a squamous cell carcinoma arising within an esophageal diverticulum below the aortic arch. There have been no reported cases of esophageal cancer arising from a diverticulum below the aortic arch. Preoperative radiotherapy for the esophageal cancer and pharyngeal cancer was given, followed by surgery. The excised specimen of the esophageal diverticulum and its external appearance revealed that it lacked muscle fibers, with a type 0-IIa lesion arising from the diverticulum. Microscopic examination showed three lymph nodes at the superior mediastinum were positive for malignancy. Bilateral pleural dissemination was detected 7 months after esophagectomy.

DISCUSSION: Cancer arising from an esophageal diverticulum is mainly found at an advanced stage because of delayed diagnosis. The absence of muscularis propia may lead to early invasion. Thus, cancers within an esophageal diverticulum are considered to be at a more advanced stage than similar cancers arising elsewhere.

CONCLUSION: For detecting of cancer arising from an esophageal diverticulum, a high index of awareness is important. Delay in diagnosis makes surgical management difficult.

1. Introduction

Esophageal diverticula are rare. Common sites at which they are most likely to develop are pharyngoesophageal transition area, tracheal bifurcation and epiphrenic region. An association between esophageal cancer and diverticula has been reported. Furthermore, the anatomical features of diverticula make the cancer more likely to invade into the surrounding tissues and become metastatic. The following case report describes the occurrence of a squamous cell carcinoma arising within an esophageal diverticulum below the aortic arch. In this patient, there had been multiple lymph nodes metastasis. Pleural dissemination occurred soon after surgery.

2. Case report

A 70-year-old Japanese man was referred to us for further management after sputum cytology was found to be positive in class IIIa after admission into our hospital, and bronchial examination and computed tomography revealed a squamous cell carcinoma of the vocal cord with enlarged lymph nodes in the neck, as well as a tumor at the thoracic esophagus just below the aortic arch. Barium contrast esophagography revealed a diverticulum below the level of the aortic arch with a secular cavity with irregular wall arising from the left side of the esophagus. The finding suggested a mass projecting into the lumen (Fig. 1A). Esophagogastroscopy showed the presence of an elevated lesion 23 cm from the incisors, on the left of esophagus (Fig. 1B). Histological examination of a biopsy specimen showed moderately differentiated squamous cell carcinoma. ^{18}F-fluorodeoxy glucose positron emission tomography-computed tomography (PET-CT) identified a tumorous lesion within a diverculum with a maximum standardized uptake volume (SUV) of 5.0 (Fig. 1C). Diagnosis of laryngeal cancer with left internal deep cervical lymph node metastasis (T2N1M0) and a T1N2M0 upper thoracic esophageal squamous cell cancer were made.

This patient was treated with preoperative radiotherapy, 40 Gy to the esophageal cancer and 60 Gy to the pharyngeal cancer. The vocal cord tumor disappeared after radiation therapy. However, the left internal cervical lymph nodes remained. Radical cervical dissection was then carried out, and the larynx was preserved. For the thoracic esophageal cancer, esophagectomy through a right-thoracotomy, 3-field lymph node dissection, followed by reconstruction with a gastric tube through the posterior mediasternal route was carried out. The operative time was 9 hours. The blood loss was 787 ml.

* Corresponding author. Tel.: +81 18 884 6132; fax: +81 18 836 2615.
E-mail address: motoyama@doc.med.akita-u.ac.jp (S. Motoyama).

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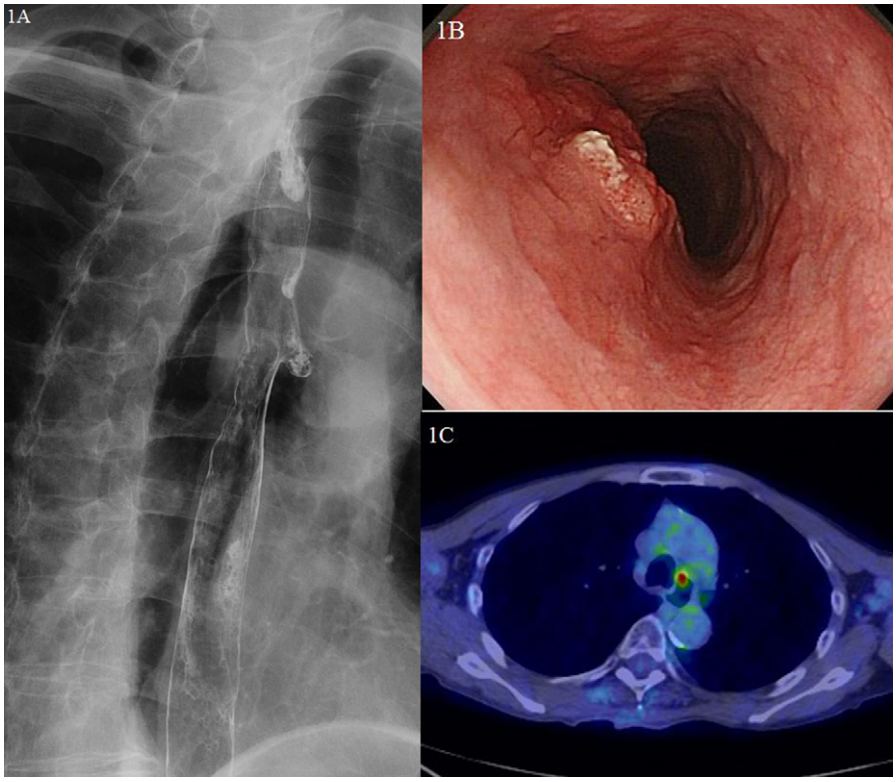

Fig. 1. (A) Barium swallow showing a diverticulum below the aortic arch and the irregular outline of the mucosa. (B) Esophagogastroscopy showing an elevated lesion in the left wall of the esophagus. (C) FDG-PET showing a tumor (SUVmax = 5.0) arising from the diverticulum.

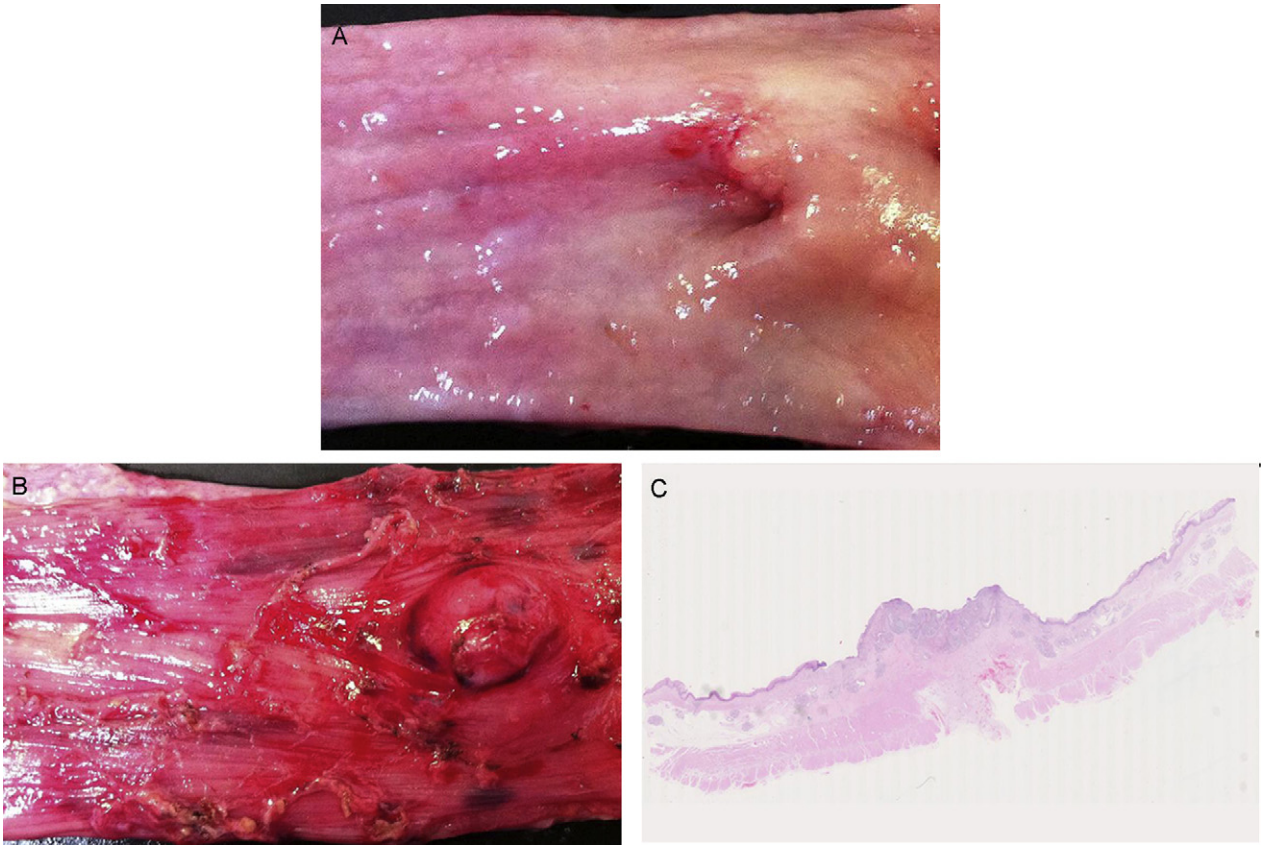

Fig. 2. (A and B) Type 0-IIa lesion (1.8 cm × 1.8 cm) arising from an esophageal diverticulum. (C) Histologic study showing the diverticulum to lack muscle fibers (arrows, hematoxylin and eosin × 3.2).

The specimen consisted of a segment of esophageal diverticulum measuring 2.0 cm in diameter. Examination of its external surface revealed that it lacked muscle fibers (Fig. 2A). Arising from the diverticulum was 1.8 cm × 1.8 cm type 0-IIa lesion (Fig. 2B). Histological examination showed an esophageal diverticulum containing a poorly differentiated squamous cell carcinoma which had extended into the wall of the esophagus (Fig. 2C). The sac contained squamous epithelium invading into the deep layer of submucosa. The mucosa at the site of the excision was free of cancer. Three lymph nodes at the superior mediastinum were positive for malignancy. Bilateral pleural dissemination was detected 7 months after esophagectomy. The patient is currently alive 10 months after surgery.

3. Discussion

There have been 70 cases of esophageal cancer with a diverticulum reported in the medical literature. The prevalences of cancer in a diverticulum are 0.3–7%, 1.8–4% and 0.3–3% for pharyngoesophageal, tracheal bifurcation and epiphrenic diverticula, respectively.[1,2] To the best of our knowledge, there have been no reported cases of esophageal cancer which arises from a diverticulum below the aortic arch.

The risk factors for development of cancer include a prolonged history of diverticulum with chronic irritation and inflammation within the pouches secondary to food retention.[3] The tumor is usually at an advanced stage at diagnosis because the majority of patients have symptoms related to the diverticulum, which conceal the symptom of the malignancy. Moreover, the absence of a muscularis propria may enable rapid invasion.[4,5] Indeed, in our case there was malignant involvement of three lymph nodes. Thus cancers arising within a diverticulum should be considered to be at a more advanced stage than similar cancers arising elsewhere.

4. Conclusion

Although long term survival has been reported,[6] the prognosis of these patients is generally poor. As a delay in diagnosis makes surgical management difficult, a high index of awareness is important to diagnose this condition.

Conflict of interest

None.

Funding

There was no financial and personal relationship with other people or organizations that could inappropriately influence this work.

Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contributions

Akiyuki Wakita and Satoru Motoyama contributed to study design, data collection and writing. Yusuke Sato, Kei Yoshino and Tomohiko Sasaki contributed to data collection. Hajime Saito and Yoshihiro Minamiya contributed to data analysis and other. Jun-ichi Ogawa contributed to study design and writing.

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