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# Surgical resection and chemoradiotherapy for metachronous pulmonary metastasis of basaloid squamous cell carcinoma of the oesophagus



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## ABSTRACT

**INTRODUCTION:** Basaloid squamous cell carcinoma of the oesophagus (BSCCE) is a relatively rare variant of oesophageal malignancy. There are no established treatment strategies for pulmonary metastases of BSCCE.

**PRESENTATION OF CASE:** A 72-year-old man underwent oesophagectomy and subsequently received a pathological diagnosis of stage IIIA (T3N1M0) BSCCE according to Union for International Cancer Control. One year and 5 months later, he underwent partial resection of the right lung because of metastasis of the BSCCE. One year and 6 months after the pulmonary resection, recurrence in the right lung was observed. The patient was treated with concurrent chemoradiotherapy using cisplatin and 5-fluorouracil, and the lesion completely disappeared. The patient is doing well without recurrence 5 years after chemoradiotherapy.

**DISCUSSION:** In our case, the recurrent lesion in the right lung was observed after the pulmonary resection. It is difficult to determine whether the recurrent lesion is solitary or multiple and whether it is a local or pleural metastasis. Therefore, surgical indication must be decided carefully. Systemic chemotherapy or radiotherapy is useful to treat BSCCE metastasis, however, appropriate, but which agents and their regimens are appropriate is not clear. Concurrent chemotherapy using cisplatin and 5-fluorouracil and radiotherapy for pulmonary BSCCE metastases may provide curative therapy and should be considered.

**CONCLUSION:** This report describes a case of recurrent pulmonary metastasis after pulmonary resection of BSCCE metastasis, successfully treated by concurrent chemotherapy and radiotherapy. Further studies are required to establish the indications and efficacy of these therapeutic approaches.

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## 1. Introduction

Basaloid squamous cell carcinoma (BSCC) was first described in 1986 by Wain et al. [1]. BSCC of the oesophagus (BSCCE) is an uncommon form of squamous cell carcinoma of the oesophagus (SCCE) and a relatively rare oesophageal malignancy. Previous reports indicate that the incidence of BSCCE varies between 0.068 and 11.3% [2,3]. In our institution, 1193 patients underwent

oesophagectomy from 1986 to 2013, 50 (4.2%) of whom were diagnosed with BSCCE following pathological examination of resected specimens. Treatment strategies for conventional SCCE are currently commonly used to treat BSCCE [4]. Treatment guidelines for BSCCE and metastatic lesions are not yet established because of the limited number of studies. Therefore, few reports discuss the treatment strategies for pulmonary metastasis of BSCCE. Here, we present the first case of a recurrent pulmonary metastasis of BSCCE after pulmonary resection successfully treated with concurrent chemoradiotherapy resulting in long-term recurrence-free survival. Furthermore, we conducted a literature review relevant to this case.

**Abbreviations:** BSCCE, basaloid squamous cell carcinoma of the oesophagus; CT, computed tomography; FDG-PET, <sup>18</sup>F-2-fluoro-2-deoxy-D-glucose positron emission tomography; SCCE, squamous cell carcinoma of the oesophagus; SUV<sub>max</sub>, maximum standardised uptake value.

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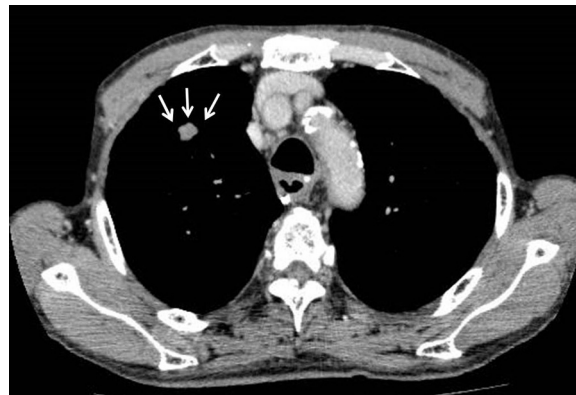
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**Fig. 1.** Oesophagogastroduodenoscopy findings A protruding-type tumour was detected in the middle third of the thoracic oesophagus. Pathological examination of biopsy specimens indicated squamous cell carcinoma.

**2. Presentation of case**

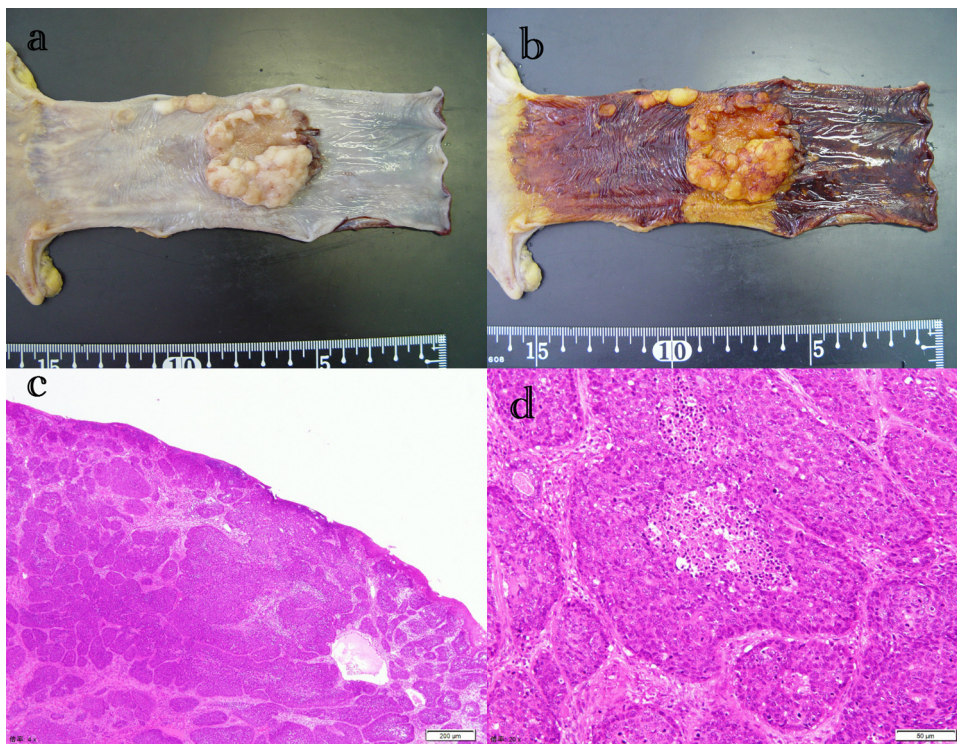
A 72-year-old man complaining of dysphagia was diagnosed with oesophageal cancer by oesophagogastroduodenoscopy and admitted to our hospital. A protruding-type tumor was observed in the middle third of the thoracic oesophagus. Pathological examination of biopsy specimens revealed SCCE (Fig. 1). Computed tomography (CT) demonstrated swelling of the left gastric artery lymph nodes without evidence of invasion into adjacent structures or metastasis to distant organs. Curative oesophagectomy with lymph node dissection was performed thoroscopically. Macroscopic analysis of the resected specimen revealed a 40 × 35 mm



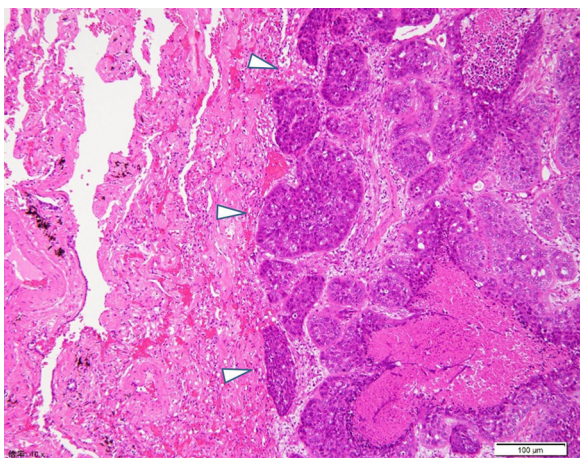
**Fig. 3.** Follow-up computed tomography showing a 10-mm nodule in the upper lobe of the right lung (arrows).

tumor in the middle third of the thoracic oesophagus, and three multiple lesions were detected on the anal side of the main tumor (Figs. 2a and b). The pathological diagnosis was BSCCE, and macroscopic evaluation revealed multiple lesions (Figs. 2c and d). Lymphatic invasion and venous invasion were also detected pathologically. Lymph node metastases were detected along the left recurrent laryngeal nerve and left gastric artery and diagnosed as pathological stage IIIA (T3N1M0) according to the seventh edition of Union for International Cancer Control. Postoperatively, an anastomotic leak was observed and successfully managed with conservative treatment.

Fourteen months later, a follow-up CT detected a 10-mm nodule in the upper lobe of the right lung (Fig. 3) with a maximum standardised uptake value (SUV<sub>max</sub>) of 2.0 on <sup>18</sup>F-2-fluoro-2-deoxy-D-glucose positron emission tomography (FDG-PET). Furthermore, SCC antigen levels were elevated at 2.3 ng/mL (nor-



**Fig. 2.** Macroscopic and pathological findings of resected oesophageal specimen (a) Macroscopic view of the resected specimen demonstrating a 40 × 35 mm pedunculated and ulcerated protruding lesion situated in the middle third of the thoracic oesophagus. (b) Three skip lesions were observed on the anal side of the main tumour. An area that was not stained by iodine was identified. (c and d) Pathological examination revealed infiltrating cancer cells with characteristic oesophageal basal cell morphology, round to oval nuclei and a high nuclear-to-cytoplasmic ratio forming nests and cord-like arrangements.



**Fig. 4.** Microscopic view of BSCCE lesion in resected pulmonary tissue (arrowheads) The pulmonary lesion was pathologically diagnosed as a metastasis derived from the BSCCE.

mal range, 0.00–1.50 ng/mL); therefore, the lesion was diagnosed as a BSCCE metastasis. No other metastases were found on systemic examination. Thoracoscopic partial resection of the upper lobe of the right lung was performed. The pulmonary lesion was pathologically diagnosed as a metastasis derived from the BSCCE (Fig. 4), and there was no cancer in the surgical margin. Eighteen months after the second surgery, CT revealed a tumor in the right pulmonary apex (Fig. 5a) with a  $SUV_{max}$  of 12.2 on FDG-PET. These results suggested that the BSCCE had metastasised again. Although, it was difficult to determine whether the lung tumor was a local recurrence or a pleural lung metastasis of BSCCE, it was considered to be another pleural lung metastasis on the basis of previous operative findings and the surgical specimen.

Surgical resection was considered challenging because the lesion was in close proximity to the right subclavian artery and vein. Therefore, the patient was treated with intravenous cisplatin, 70 mg/m<sup>2</sup>/day on days 1 and 29 and was continuously treated with intravenous 5-fluorouracil, 700 mg/m<sup>2</sup>/day from days 1 to 4 and 29 to 32. In addition, concurrent radiotherapy of 60 Gy (30 fractions of 2 Gy, 5 days/week) was administered. Diagnostic imaging revealed that the metastatic lesion disappeared completely (Fig. 5b). The patient is doing well without any sign of recurrence 5 years after chemoradiotherapy.

### 3. Discussion

BSCCE is a relatively rare oesophageal malignancy. Previous reports indicate that the incidence of BSCCE varies between 0.068 and 11.3% [2,3]. In general, the prognosis of BSCCE has been

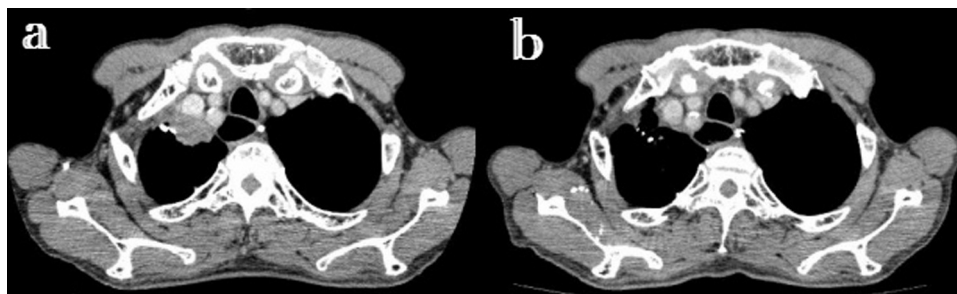
reported to be worse than that of SCCE because of high proliferative activity and a high incidence of distant metastases [5,6].

Oesophageal cancer patients with haematogenous recurrence have a poorer prognosis than patients with locoregional recurrence [7]. Outcomes following pulmonary metastasectomy for oesophageal cancer metastases are unclear; therefore, it is controversial whether surgery is an effective treatment for metastatic oesophageal cancer. Ichikawa et al. reported acceptable outcomes following operative intervention for metachronous pulmonary metastasis from oesophageal carcinoma (including SCC and adenocarcinoma) with predicted 1-, 3-, and 5- year overall survival rates after pulmonary metastasectomy of 73.9%, 43.5%, and 43.5%, respectively, and a median survival time of 28.7 months [8]. Shiono et al. reported that pulmonary metastasectomy for oesophageal cancer (including SCC, adenocarcinoma and carcinosarcoma) should be considered in selected patients with a disease-free interval of >12 months [9]. The prognosis of patients treated non-operatively for pulmonary metastasis is also unclear as data on the benefit of surgical resection of BSCCE pulmonary metastases is currently lacking.

To the best of our knowledge, three successful cases of resected pulmonary BSCCE metastases without involvement of distant organs have been reported [4,10,11]. Surgical intervention may be considered in patients likely to tolerate operative therapy with solitary metachronous pulmonary BSCCE metastases.

In our case, a recurrent lesion in the right lung was observed after the pulmonary resection for metachronous pulmonary BSCCE metastasis. It is difficult to determine whether the recurrent lesion in the lung is solitary or multiple and whether it is a local recurrence or pleural metastasis of BSCCE. Pulmonary metastasis is often detected as multiple lesions or in combination with extrapulmonary metastases. The utility of surgical intervention for BSCCE metastases remains controversial; further studies are required to assess the biology of metastatic lesions and the efficacy of pulmonary metastasectomy.

At present, treatment regimens for BSCCE are usually similar to those employed for typical SCCE [4], for one reason, because of the difficulty in pre-treatment diagnosis [12]. Cisplatin and 5-fluorouracil chemotherapy is concurrently used with conventional radiotherapy protocols developed for advanced or recurrent SCCE [13]. There have been previous reports about use of chemotherapy and radiotherapy in the treatment of BCSSE metastasis. Nishimura et al. reported that hepatic BSCCE metastases were successfully treated by regional chemotherapy via the hepatic artery using 5-fluorouracil [3]. Shibata et al. reported that splenic and paraclavicular lymph node BSCCE metastasis was successfully treated by systemic chemotherapy using 5-fluorouracil and cisplatin [14]. Harada et al. achieved a complete response in patients with metachronous endobronchial BSCCE metastasis using chemoradiotherapy comprising docetaxel, cisplatin, 5-fluorouracil and 60 Gy of irradiation [15]. In a retrospective analysis of 142 cases of BSCCE,



**Fig. 5.** Computed tomography (CT) imaging of the recurrent lesion (a) Tumour in the right pulmonary apex. (b) CT scan performed 5 years following completion of chemoradiotherapy demonstrating disappearance of the metastatic lesion with no evidence of recurrence.

Zhang et al. reported the frequency of locoregional recurrence to be significantly higher in patients who did not receive radiotherapy than that in patients receiving radiotherapy [16]. However, there are few reports regarding successful chemotherapy or radiotherapy for pulmonary metastasis of BSCCE. Here, we presented a case successfully treated with concurrent chemoradiotherapy for recurrent pulmonary metastasis of BSCCE. The combination of cisplatin and 5-fluorouracil may have utility in patients with pulmonary BSCCE metastasis. Chemotherapy using cisplatin and 5-fluorouracil with concurrent radiotherapy may provide improved prognosis and should be considered for the treatment of BSCCE lung metastasis. Further studies are required in the future to establish the indications and efficacy of this therapeutic approach.

#### 4. Conclusion

We presented a case of recurrent pulmonary metastasis after resection of pulmonary metastasis of BSCCE successfully treated with concurrent chemoradiotherapy resulting in 5 years of recurrence-free survival. Concurrent chemotherapy using cisplatin and 5-fluorouracil and radiotherapy for pulmonary BSCCE metastases may provide improved prognosis or curative therapy and should be considered for the treatment of this disease.

#### Consent

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.

#### Conflict of interest

None.

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This work was not supported by any fund.

#### Ethical approval

This work does not require a deliberation by the ethics committee.

#### Authors contribution

Hirota Ishida and Toru Nakano are the main authors of this article; Toru Nakano, Tadashi Sakurai, Yusuke Taniyama, and Takashi Kamei were attending doctors and performed clinical treatment including surgical operation; Fumiyoshi Fujishima and Hironobu Sasano are responsible for pathological analysis; Chiaki Sato, Toshiaki Fukutomi, Kuroudo Kamiya, Yohei Ozawa, Hironobu

Sasano, and Noriaki Ohuchi reviewed the manuscript; all authors have read and approved the final manuscript.

#### Guarantor

Toru Nakano and Noriaki Ohuchi accept full responsibility for the work and had controlled the decision to publish.

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