

So-called Carcinosarcoma of the Esophagus: Report of a Case

Ichiro Akagi, Masao Miyashita, Hiroshi Makino,
Tsutomu Nomura, Keiichi Ohkawa and Takashi Tajiri

Surgery for Organ Function and Biological Regulation, Graduate School of Medicine, Nippon Medical School

Abstract

The carcinosarcoma of the esophagus is a rare malignant neoplasm consisting of both carcinomatous and sarcomatous components. A case of so-called carcinosarcoma of the esophagus is described herein. A 69-year-old man presented with dysphagia and was admitted to our hospital. Imaging studies revealed a localized ulcerative tumor in the middle intrathoracic esophagus without any invasion or metastasis. The patient was initially thought to have squamous cell carcinoma and underwent subtotal esophagectomy with lymphadenectomy. Final diagnosis of the tumor was so-called carcinosarcoma of the esophagus. The patient had an uneventful postoperative course and showed no evidence of recurrence or metastasis in the 4-year postoperative period.

(J Nippon Med Sch 2008; 75: 171–174)

Key words: carcinosarcoma, esophagus, operation

Introduction

Carcinosarcoma of the esophagus is a rare malignant neoplasm consisting of both carcinomatous and sarcomatous components. Esophageal carcinosarcoma comprises approximately 1% to 2% of all esophageal neoplasms¹, and the metaplastic concept has been the mainstream view for the pathogenesis of these tumors. With the accumulation of reported cases of esophageal carcinosarcoma, it has become clear that most of these tumors show polypoid morphology. Because of its accelerated intraluminal growth, esophageal carcinosarcoma often presents at an early stage. Ultimately, the treatment is similar to that of esophageal carcinoma, requiring esophagectomy for resectable lesions. We present a case of esophageal carcinosarcoma forming a localized ulcerative tumor in a 69-year-old man along

with clinical, light microscopic, and immunohistochemical features.

Case Report

A 69-year-old man was admitted to our hospital with dysphagia and anorexia. He had a history of chronic alcoholism and alcoholic hepatitis. He had stopped drinking alcohol, after which the alcoholic hepatitis resolved. A barium swallow esophagogram showed a protruding lesion at the anterior side of the middle esophagus, measuring 1.6 cm in diameter (**Fig. 1**). Endoscopic examination revealed a localized ulcerative tumor 27 cm from the incisors (**Fig. 2A, 2B**). Multiple biopsies of the tumor revealed it to be squamous cell carcinoma (SCC). Computed tomography showed no marked extraluminal extension and no swelling of the lymph nodes. The patient underwent subtotal esophagectomy with lymphadenectomy through a left-sided thoracotomy

Correspondence to Ichiro Akagi, MD, Department of Surgery for Organ Function and Biological Regulation, Nippon Medical School, 1-1-5 Sendagi, Bunkyo-ku, Tokyo 113-8603, Japan
E-mail: ichiro@nms.ac.jp
Journal Website (<http://www.nms.ac.jp/jnms/>)



Fig. 1 Barium swallow esophagogram showed an ulceration in the lesion protruding at the posterior side of the middle esophagus measuring 2.0 cm in diameter (**arrows**).

and was discharged 1 month after surgery without any postoperative problems. He showed no evidence of recurrence or metastasis in a 4-year postoperative period.

On macroscopic examination, the resected tumor, measuring $16 \times 11 \times 5$ mm, was located in the thoracic esophagus. The surface of the tumor was ulcerated and necrotic (**Fig. 3**). Microscopic examination revealed two tumor components, both SCC and a second population of spindle-shaped cells with numerous mitoses (**Fig. 4**). A gradual transition between the sarcomatous and carcinomatous elements was evident (**Fig. 4**). On immunohistochemical studies, the SCC cells were positive for cytokeratin (**Fig. 5A**). In contrast, the spindle-shaped tumor cells were immunoreactive for vimentin (**Fig. 5B**) and negative for epithelial markers or other mesenchymal markers.

Discussion

Composite malignant tumors with both carcinomatous and sarcomatous components are known as carcinosarcomas. In Japan, esophageal carcinosarcoma reportedly accounts for 0.5% to 2.8% of all esophageal tumors¹². Like SCC of the esophagus, carcinosarcoma occurs most often in middle-aged and elderly men with a history of smoking or drinking or both³. The present patient had been a heavy drinker and had alcoholic hepatitis. According to the Japanese Society for Esophageal Disease, three major theories have been proposed for the pathogenesis of carcinosarcomas. The first theory is that the spindle cell component is a reaction to the carcinoma⁴. The second theory, known as the collision theory, proposes that two individual stem cells may independently and simultaneously undergo malignant transformation and are actually separate tumors that have collided (true carcinosarcoma)⁴. The third theory is that individual elements are derived from a single common ancestor cell (so-called carcinosarcoma)⁴.

In most cases, it has been suggested that the sarcomatous element of esophageal carcinosarcoma generally results from differentiation of SCC cells into mesenchymal tumor cells. This suggestion is based on the facts that most carcinosarcomas contain a transitional zone with both carcinomatous and sarcomatous components⁵ and that identical genetic alterations are observed in both components^{6,7}. With the accumulation of reported cases of esophageal carcinosarcoma, it has become clear that most of these tumors show polypoid morphology. However, a localized ulcerative tumor, which is extremely rare, was detected in our case. For conventional microscopic diagnosis, the presence of a transitional zone or genuine sarcomatous components or both is a key feature. In the present case, a transitional zone was observed and was confined within extremely narrow limits. Thus, the present case was diagnosed as a so-called carcinosarcoma of the esophagus. The application of immunohistochemical antiepithelial markers (cytokeratin) would be of help for verifying the presence or absence of an epithelial component in this tumor with sarcoma/carcinosarcoma

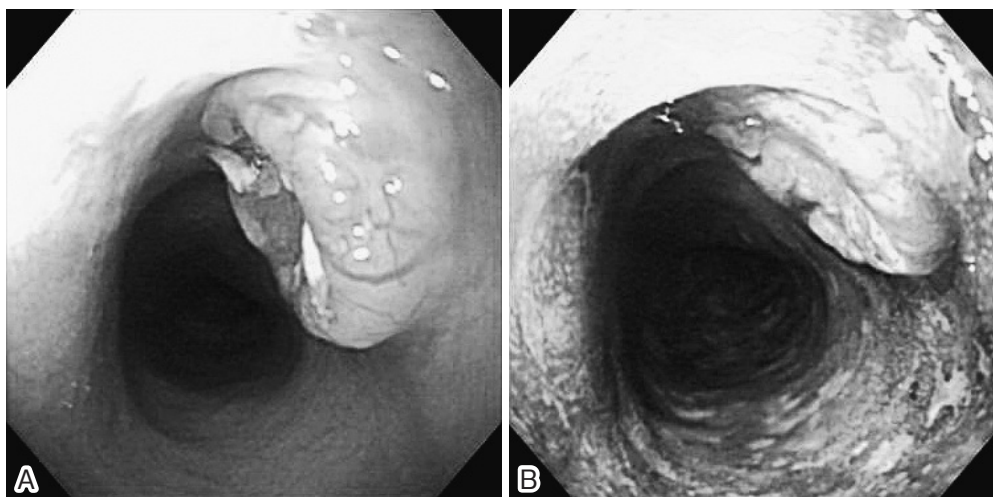


Fig. 2 Endoscopic examination revealed a localized ulcerative tumor 27 cm from the incisors (A). The tumor was not stained with Lugol's solution (B).

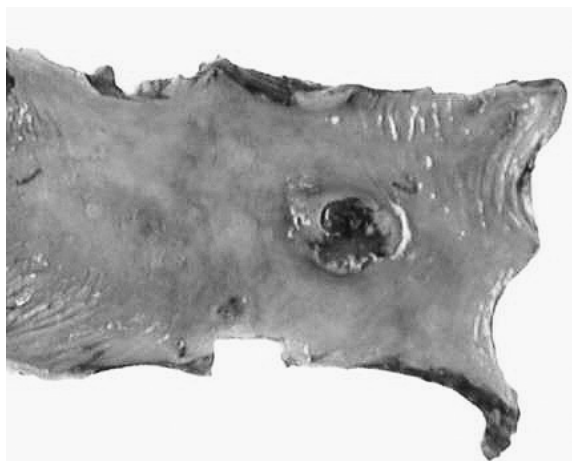


Fig. 3 Macroscopic examination showed that the resected tumor, measuring $16 \times 11 \times 5$ mm, was located in the thoracic esophagus. The surface of the tumor was ulcerated and necrotic.

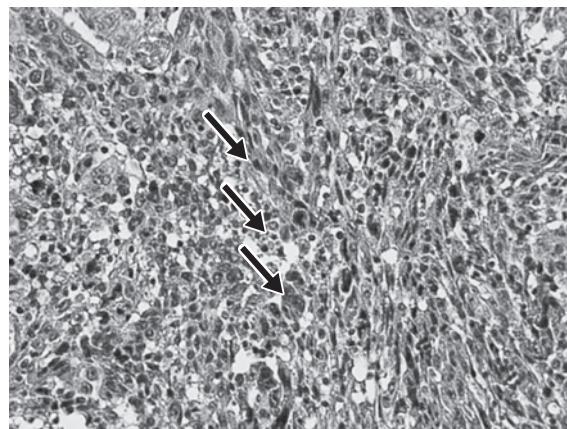


Fig. 4 Histological examination revealed two tumor components, both SCC and a second population of spindle-shaped cells with numerous mitoses. A gradual transition between the sarcomatous and carcinomatous elements is evident (**arrows**).

components⁸. Moreover, vimentin immunoreactivity is necessarily indicative of a mesenchymal origin of spindle cells, even if the sarcomatoid elements seem to be involved in the process of differentiation from carcinomatous to sarcomatous cells⁹. In the present case, the SCC cells were positive for cytokeratin, whereas the spindle-shaped tumor cells were immunoreactive for vimentin.

Esophageal carcinosarcomas have been treated according to the protocols used for other esophageal cancers. Treatment of esophageal carcinosarcoma does not differ from that of other malignant esophageal lesions. Surgical resection should be

considered for all lesions in patients who can tolerate an operation. The indications for resectability are the same for esophageal SCC or adenocarcinoma. Additionally, the role of concomitant radiation and chemotherapy for re-irradiation of residual microscopic disease and local control must also be considered, given the unpredictable course of this tumor.

The rapid growth of this tumor was previously reported by Sasajima et al.¹⁰. The patient was followed up by means of serial esophagograms because the patient initially refused treatment. They estimated the doubling time to be 2.2 months,

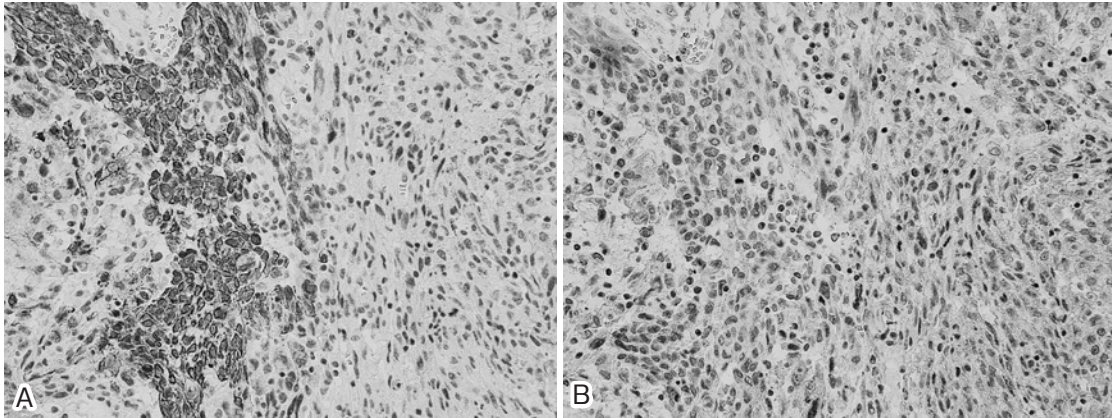


Fig. 5 On immunohistochemical examination, the SCC cells were positive for cytokeratin (A). In contrast, the spindle-shaped tumor cells were immunoreactive for vimentin (B).

whereas other investigators have reported that esophageal carcinomas have doubling times at least twice as long (5 months). This rapid growth may account for the earlier diagnosis of carcinosarcoma. Because the intraluminal component of this tumor is often larger than that of typical carcinomas at the same stage, symptoms occur much earlier in its course. Although the earlier appearance of symptoms allows earlier diagnosis and treatment, esophageal carcinosarcomas do not necessarily have a better prognosis. It has been reported that the 3-year survival rate is better than that for esophageal SCCs (63% vs 28%), whereas there is no significant difference in the 5-year survival rates (27% vs 22%)¹. Esophageal carcinosarcomas may become symptomatic earlier than do SCCs, but the earlier diagnosis is not associated with a better long-term prognosis because of their rapid growth.

In esophageal carcinosarcomas, the volume of the sarcomatous component is generally predominant. These sarcomatous cells might be more resistant to standard chemo- and/or radiotherapy than SCC cells. To date, there have been no studies of the efficacy of chemotherapy or radiotherapy against recurrent carcinosarcoma. Therefore, another strategy for the treatment of carcinosarcoma is required, especially against tumor cells exhibiting sarcomatous features.

In summary, the esophageal carcinosarcoma is a rare disease entity. Just as for typical SCCs, early detection and treatment by means of surgical resection are needed to produce significant long-

term survival.

References

1. Iyomasa S, Kato H, Tachimori Y, Watanabe H, Yamaguchi H, Itabashi M: Carcinosarcoma of the esophagus: a twenty-case study. *Jpn J Clin Oncol* 1990; 20: 99-106.
2. Hatch GF 3rd, Wertheimer-Hatch L, Hatch KF, et al: Tumors of the esophagus. *World J Surg* 2000; 24: 401-411.
3. Kimura H, Konishi K, Kawamura T, et al: Esophageal sarcomas: report of three cases. *Dig Surg* 1999; 163: 244-247.
4. Madan AK, Long AE, Weldon CB, Jaffe BM: Esophageal carcinosarcoma. *J Gastrointest Surg* 2001; 54: 414-417.
5. Wang ZY, Itabashi M, Hirota T, Watanabe H, Kato H: Immunohistochemical study of the histogenesis of esophageal carcinosarcoma. *Jpn J Clin Oncol* 1992; 22: 377-386.
6. Kashiwabara K, Sano T, Oyama T, et al: A case of esophageal sarcomatoid carcinoma with molecular evidence of a monoclonal origin. *Pathol Res Pract* 2001; 197: 41-46.
7. Matsumoto T, Fujii H, Arakawa A, et al: Loss of heterozygosity analysis shows monoclonal evolution with frequent genetic progression and divergence in esophageal carcinosarcoma. *Hum Pathol* 2004; 35: 322-327.
8. Iacone C, Barreca M: Carcinosarcoma and pseudosarcoma of the esophagus: two names, one disease—comprehensive review of the literature. *World J Surg* 1999; 23: 153-157.
9. Ohtaka M, Kumasaka T, Nobukawa B, et al: Carcinosarcoma of the esophagus characterized by myoepithelial and ductal differentiations. *Pathol Int* 2002; 52: 657-663.
10. Sasajima K, Taniguchi Y, Morino K, et al: Rapid growth of a pseudosarcoma of the esophagus. *J Clin Gastroenterol* 1988; 10: 533-536.

(Received, February 7, 2008)

(Accepted, February 29, 2008)