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CLINICAL IMAGE

Cerebellar metastasis with the cavity of both components of lung adenosquamous cell carcinoma

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A 72-year-old woman with no history of smoking presented to our hospital with dizziness for the past 3 weeks. Nine years earlier, she had hemoptysis, and a large tumor in the left lung was revealed by chest computed tomography (FIGURE 1A). The patient underwent a lobectomy of the left lower lung and mediastinal lymph node dissection. The resected tumor consisted of the components of adenocarcinoma as well as squamous cell carcinoma, each comprising more than 10% of the tumor. The final pathological diagnosis was lung adenosquamous cell carcinoma, and the tumor was staged as pT3bN1M1a according to the TNM classification.

The 2 components of the surgically resected tumor were precisely separated by manual microdissection under microscope to avoid contamination of each sample by different components. An epidermal growth factor receptor (EGFR) exon 19 deletion, but not the T790M mutation, was identified in both components. Thereafter, the patient developed several small cavitary metastases (<10 mm in size) in both lungs (FIGURE 1B). She was administered EGFR-tyrosine kinase inhibitors and cytotoxic chemotherapies (gefitinib for 23 months; 4 cycles of carboplatin, pemetrexed, and bevacizumab; 15 cycles of pemetrexed and bevacizumab for 15 months; afatinib for 13 months; and 17 cycles of docetaxel and bevacizumab for 15 months),

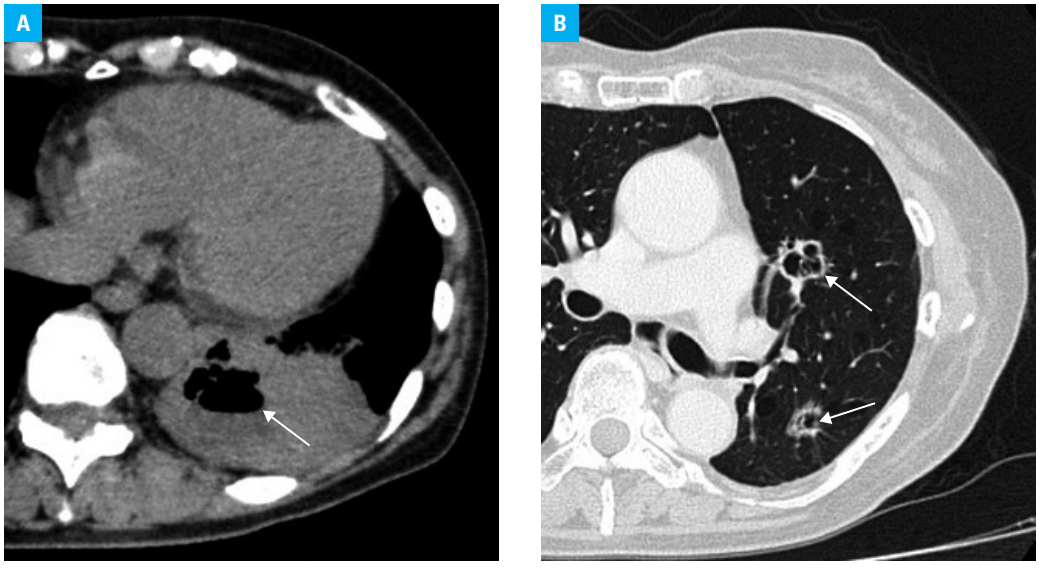

FIGURE 1 **A** – primary adenosquamous cell carcinoma with cavity (arrow) (axial contrast-enhanced chest computed tomography [CT] at the mediastinal window at the superior segment of the lower lobe of the left lung); **B** – pulmonary metastases with cavities (arrows) in the left upper lobe of the lung at the time of recurrence (axial CT at the lung window at the level of the lower lobe)

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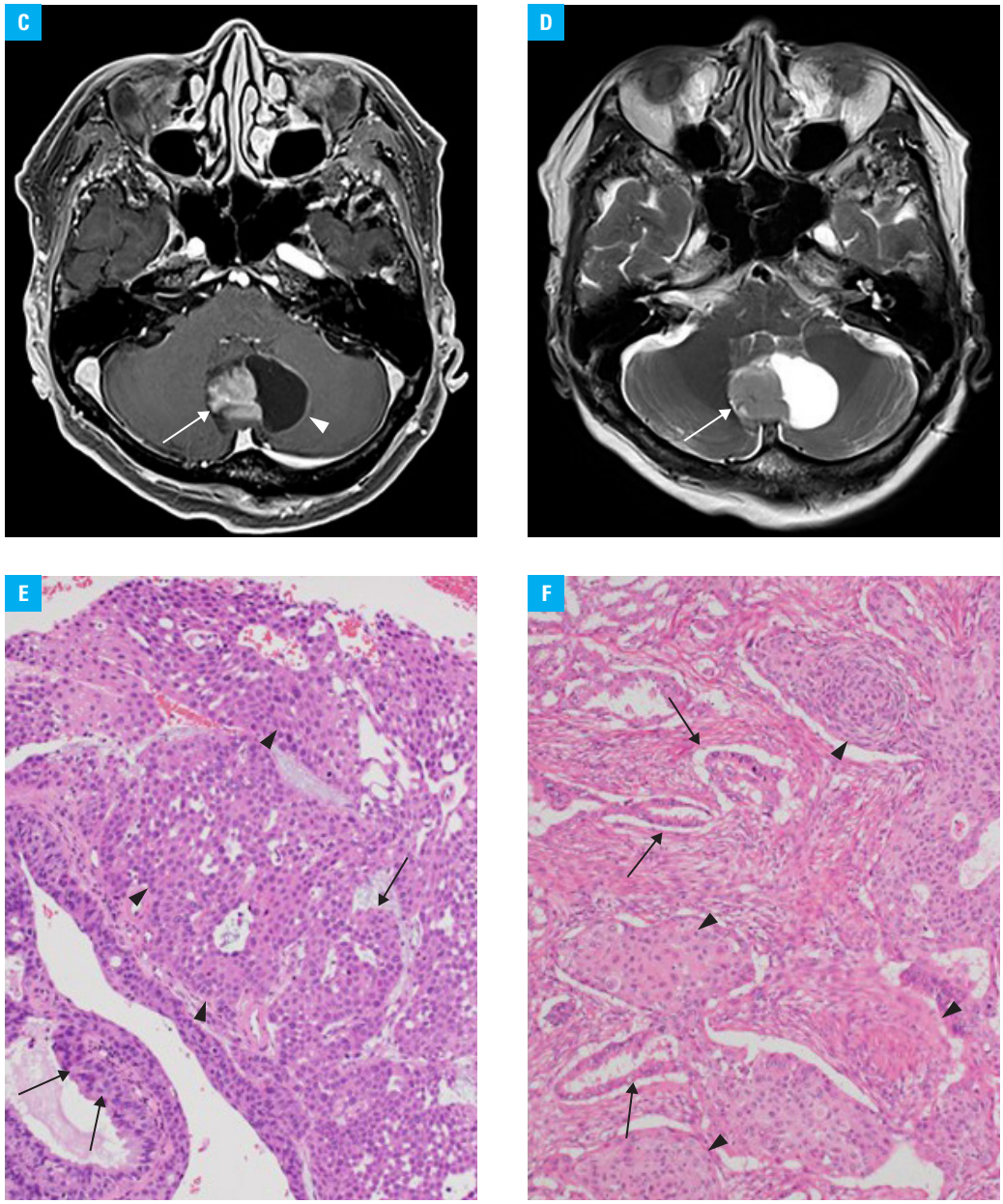

FIGURE 1
C – an enhanced solid mass (arrow) accompanying a cystic mass (arrowhead) in the cerebellar vermis (gadolinium-enhanced T1-weighted magnetic resonance imaging [MRI]); **D** – solid mass (arrow) with iso- to high-signal with no marked peritumoral edema (T2-weighted MRI);
E – cerebellar metastatic lesion (hematoxylin and eosin staining, × 200);
F – primary lung lesion (hematoxylin and eosin staining, × 200);
E, **F** – the tumor consisted of the components of adenocarcinoma (arrows) as well as squamous cell carcinoma (arrowheads).

and partial response of lung metastatic lesions was obtained with each treatment. However, 3 months after the termination of the last chemotherapy, the patient developed dizziness that lasted 3 weeks. Brain magnetic resonance imaging on admission showed an enhanced solid mass accompanying cavity lesion in the cerebellar vermis (FIGURE 1C and 1D). Excision of the metastatic lesion in a single surgical field was assessed as feasible, and metastectomy was performed with complete resection of the metastatic lesion. The resected tumor of the cerebellum exhibited adenocarcinomatous and squamous cell carcinomatous components. These pathological findings of the cerebellar tumor were found to be identical with those of the surgically resected specimen of the primary lesion (FIGURE 1E and 1F). An EGFR exon 19 deletion was identified, but the T790M mutation was not found. The patient received additional irradiation to the cerebellum. She has been administered a combination therapy of erlotinib and bevacizumab for 8 months, and her clinical condition is good.

Pulmonary adenosquamous carcinoma can form cavities.[1,2] To our best knowledge, however, there has been no report on the formation of cavities in brain metastatic lesions in patients with pulmonary adenosquamous carcinoma. In our case, cavities found in the primary lesion and lung metastatic sites were also observed in brain metastatic lesions. As the features of the primary tumor may be preserved at the metastatic sites, cavities in brain metastases may occur in patients with adenosquamous cell carcinoma of the lung. In malignant tumors with 2 or more components, only one component often metastasizes.[3,4] Adenosquamous carcinoma of the lung is a morphologically mixed type of tumor, including 2 cell components, adenocarcinoma and squamous cell carcinoma, in varying proportions, each representing 10% or more of the entire tumor.[5] In our patient, the 2 components of adenocarcinoma and squamous cell carcinoma were confirmed pathologically. The history of the patient may support the concept that

tumor stem cells are involved in metastases. To the best of our knowledge, no such findings have been reported so far in patients with lung cancer.

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