CASE REPORT

Pulmonary collision tumor: Metastatic adenoid cystic carcinoma and lung adenocarcinoma

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Summary We report an extraordinary case of collision tumor consisting of a lung adenocarcinoma and a metastatic adenoid cystic carcinoma in a 56 year-old man. He was diagnosed with a pulmonary nodule 11 years after treatment of an adenoid cystic carcinoma of the right maxillary sinus. A non-small cell carcinoma was observed when a transbronchial biopsy was performed. The other component of the nodule was only diagnosed with pathological examination of the resection specimen.

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Introduction

Collision tumors are a rare condition in which two histologically different malignant neoplasms, originating from two separate primary sites, intermix with one another.
The occurrence of multiple malignancies in the same anatomical site in organs such as the thyroid, breast and lymph nodes has been previously described. In the lung, single cases of bronchogenic carcinoma have been unexpectedly found when pulmonary resection was performed for metastatic lung cancer. Nevertheless, the occurrence of synchronous colliding tumors remains an extremely uncommon condition with a very limited number of cases having been published in the literature. ACC is a rare form of malignant neoplasm that usually originates within the major and minor salivary glands of the head and neck. Clinically, this tumor presents insidiously and is generally advanced when diagnosed. ACC seldom metastasizes to regional lymph nodes. Nevertheless, a distant spread to the lungs and bones occurs frequently. The distant metastasis can cause death as long as 10–20 years after initial treatment. In our case, as described in the literature, metastasis appeared in the lung 11 years after treatment. Nevertheless we did not suspect the existence of an ACC metastasis inside the nodule because there were no local recurrences during the follow-up period and we found a positive transbronchial biopsy for non-small cell carcinoma.

Immunohistochemical study was important for the final diagnosis; part of the nodule was negative for TTF-1 and positive for C-kit, which is a transmembrane type III receptor tyrosine kinase that has recently been reported to be expressed in ACC. C-kit is activated by binding of its ligand, stem cell factor. Binding of stem cell factor initiates a phosphorylation cascade that ultimately leads to activation of various transcription factors that regulate apoptosis,
cell differentiation and proliferation. Kit protein expression is important in the development of normal human tissues and in many human neoplasms including mastocytosis, gastrointestinal stromal cell tumors, melanoma, breast cancer, gynecologic cancers, thyroid neoplasms, etc.\textsuperscript{10,11} Recently, Kit expression has been identified in several types of salivary gland tumors. In these tumors, kit expression has been most extensively documented in adenoid cystic carcinomas with an expression frequency ranging from 67 to 100\textsuperscript{12}.

If we consider the origin of ACC, we must distinguish metastatic ACC from primary ACC of the lung. Pulmonary ACC is a malignant tumor arising in the tracheobronchial glands...
Metastatic adenoid cystic carcinoma and lung adenocarcinoma distributed in the airway submucosa, with a similar morphology to ACC arising in the salivary glands. Because of the site of origin, pulmonary ACC is more common in the central bronchi than in the segmental bronchi. Reports of ACC originating in the peripheral lung are rare. In addition, in cases of occurrence in the periphery, lung metastases from a salivary gland tumor must be ruled out. In our case, the characteristics we observed gave us the final diagnosis of a metastatic ACC. These characteristics were: (1) The obvious difference in the histological pattern between the two tumors. Moreover, we did observe no histological admixture or an intermediate cell population zone between both tumors. (2) The different immunohistochemical expression of both tumors for C-kit and TTF-1. (3) The existence of another subpleural nodule in the right lower lobe. (4) The oncology history of the patient. In conclusion metastasis in ACC can manifest itself very late, and thus, long-term follow-up and a high index of suspicion is necessary to diagnose them early. This was observed in the present case. We would like to emphasize the role of detailed histopathologic analysis and the use of immunohistochemistry in better identifying lung neoplasms.

Conflict of interest
The authors declare that they have no conflict of interest.

References