AMERICAN JOURNAL OF MEDICAL CASE REPORTS

ISSN 2374-216X

A lung mucoepidermoid carcinoma with multiple brain metastases: A rare case report

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Abstract

Mucoepidermoid carcinoma (MEC) of the lung is a tumor of low malignant potential arising from the submukozal bronchial glands. MEC is a rare tumor of the lung accounting for only 0.1% to 0.2% all pulmoner cancer. A 60-year-old male patient who was presented with haemoptysis and dyspnea had a mass lesion in the right hilar on the chest X-ray. The patient had 1 pack-year smoking history. Computerized tomography of the chest showed right hilar mass, and mediastinal lymph node biyopsy was performed. Histopathological diagnosis was mucoepidermoid carcinoma. For staging, abdomen tomography and brain magnetic resonans imaging (MRI) was applied. Multipl brain metastases determined on the MRI and palliative radiotherapy was planned. The patient died on the 8th day treatment. Pulmonary patient with brain metastases in advanced stage of our MEC is presented because it is a rare tumor.

Keywords

lungs; mucoepidermoid; radiotherapy

Introduction

Mucoepidermoid carcinomas (MECs) are rare tumors originating from the bronchial glands which account for 0.1 to 0.2% of all lung tumors [1]. Such as adenoid cystic carcinomas, MECs are malignancies originating from the minor salivary glands and peri-maxillary region, particularly from the parotid and submandibular glands. Pulmonary MECs often originate from the proximal bronchi [2]. Pulmonary MECs typically manifest with signs of bronchial obstruction and atelectasis, such as cough, hemoptysis, wheezing, and post-obstructive pneumonia [3].

It has two histological subtypes as low- and high-grades. Low-grade MECs develop in younger ages and have a better prognosis, while high-grade disease is mostly seen in older patients and usually result in death. Based on a molecular perspective, MECs are characterized by repetitive t(11;19)(q21;p13) translocations producing CRTC1-MAML2 fusion protein [4]. This protein acts as a transcription factor on the cell-growth regulation pathway. Herein, we present a rare case of lung cancer accompanied by brain metastasis and discuss prognosis in the light of literature data.

Case Report

A 60-year-old male patient was admitted to our hospital with complaints of hemoptysis and

dyspnea for about four months. A plain chest X-ray showed a perihilar mass on the right side. His medical and family history was non-specific, except a smoking history of one pack/day for the past 45 years. Thoracic computed tomography (CT) imaging showed a mass lesion of 7x5 cm extending from the right hilar region towards the paracardiac region (Figure 1). Bronchoscopy revealed a mass causing almost full obstruction of the right upper lobe entry. A biopsy sample was unable to be obtained, as the patient had active bleeding. Instead, a lavage sample was obtained. However, since the lavage and scrub biopsy cytologies were found to be suspicious for malignancy, the patient was taken into mediastinoscopy and a lymph node biopsy was obtained. Microscopic examination of the biopsy material obtained from the mediastinal lymph node showed focal necrosis areas in the fibrotic stroma in lymph node parenchyma, and neoplastic infiltration with a solid component consisting of squamous-type cells and a glandular component consisting of mucin-rich goblet cells (Figure 2). Immunohistochemical staining of the tumor cells did not show staining with TTF-1 or cytokeratin-20, while cytokeratin-7 staining result was positive. These histomorphological and immunohistochemical findings were suggestive of a metastatic MEC.

Cranial and abdominal CT scans were obtained for staging. Since the cranial CT imaging showed a mass of 1-cm in the right frontal region, cranial magnetic resonance imaging (MRI) was performed. It showed multiple metastases involving vasogenic areas of edema in the right cerebellar hemisphere, bilateral occipital and right temporal regions. The patient was, then, scheduled for palliative total brain radiotherapy and anti-edema therapy (Figure 3). Using the tomotherapy device, 10 fractions of radiotherapy at a fractional dose of 300 cGy was planned to be given to the brain by the intensity-modulated radiotherapy (IMRT) technique. His overall status deteriorated and dyspnea worsened on Day 8 following radiotherapy. Although he was intubated, he died two days later.

Discussion

Mucoepidermoid carcinomas are the most commonly seen tumors of the salivary glands. These tumors originating from the bronchial glands were first defined by Smetana in 1952 [5]. For histological grading of the lung cancers, the World Health Organization classifies MECs under the main group of malignant epithelial tumors and under a sub-group of salivary gland tumors [6]. Mucoepidermoid carcinomas of the tracheobronchial system are rare, slow-growing tumors with an unknown etiology, which account 0.1 to 0.2% of all lung malignancies [1]. The tumor is usually placed in the main lobe or in the segmental bronchi, and grows in the lumen as a polypoid mass. While low-grade variant usually covers the bronchial wall, high-grade variant frequently shows parenchymal invasion [7]. Smoking is not a major risk factor. While there is no well-defined age of onset, 50nearly half of the cases are below the age of 30 years, and between-gender differences are also unclear, although some authors reported an increased incidence in men [8]. Signs and symptoms of this tumor are associated with bronchial irritation and obstruction, and patients may present with cough, hemoptysis, wheezing, and post-obstructive pneumonia. Of all patients, 25% may be asymptomatic, and these cases can be confused with foreign body aspiration or asthma.

Histologically, they are classified as low- and high-grade MECs. Low-grade tumors usually consist of a cystic component, they do not frequently show microscopic invasion to the pulmonary parenchyma, and regional lymph node metastasis is rare. High-grade tumors, on the other hand, usually consist of a solid component. They are characterized by atypia, mitotic activity and necrosis [9]. Regional lymph node

involvement is common. It is difficult to differentiate high-grade MECs from adenosquamous carcinomas. However, adenosquamous carcinomas mostly originate from the lung parenchyma, they show marked keratinization, and they are usually immunohistochemically TTF-1 positive in the tumor cells [10]. A mixture of mucin-containing cells and lack of keratinization are different features of High grade MEC [11]. On the other hand, MECs are not associated with keratinization, and they are TTF-1 negative; however, they often show positivity for cytokeratin 7. In a small series of Shilo et al showed that all mucoepidermoid carcinomas of the bronchus were negative for TTF-1 and CK20,but positive for CK7 [12]. In our case, immunohistochemical analysis did not suggest TTF-1 staining in the tumor cells, while cytokeratin 7 staining was positive.

Standard treatment of a pulmonary MEC is based on surgery including lobectomy, sleeve resection, local resection, and segmental resection [13]. In the absence of lymph node or distant organ metastasis, R0 resection is usually sufficient for the treatment of low-grade MECs. Adjuvant radiotherapy and chemotherapy are mostly recommended for very high-grade MECs, when resections cannot be R0, surgery is not feasible, or the patient has metastatic disease.

Histological grade, age, stage, and R0 resection are the most important prognostic factors [14]. Following complete surgical resection, five-year survival rate is 80% for low-grade and 31% for high-grade MECs. In a series of Heitmiller et al. including 18 patients with low-and high-grade disease, survival was followed in patients with low-grade MECs, and no recurrence was reported over a period of 4.7 years. However, all patients in the high-grade group died within 16 months. Previous studies also showed that high-grade MECs are more common among older individuals with a poorer prognosis [15].

Recurrence is more common in high-grade MECs and the rates of metastasis can be high. Metastasis occurs through hematogenous and lymphatic pathways in MEC cases. The most common sites of metastasis include regional lymph nodes (48%), bone (25%), distant lymph nodes (18%) and adrenal glands, brain and skin (14%) [16].

Conclusion

Standard treatment of pulmonary MECs is based on surgery. There is no study supporting the use of adjuvant radiotherapy, chemotherapy, and targeted therapies. In the presence of metastatic disease, palliative radiotherapy can be given.

In conclusion, in the light of the current literature, our case was presented due to its rarity.

Figures

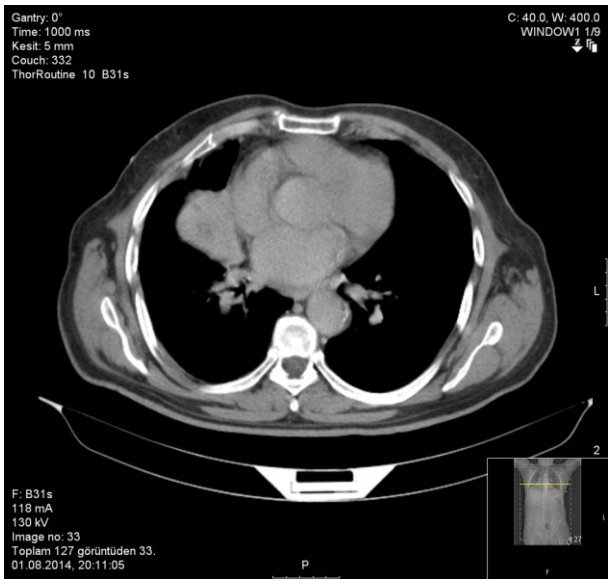

Figure 1: A thoracic computed tomography scan showing a mass in the right hilar region in the axial section.

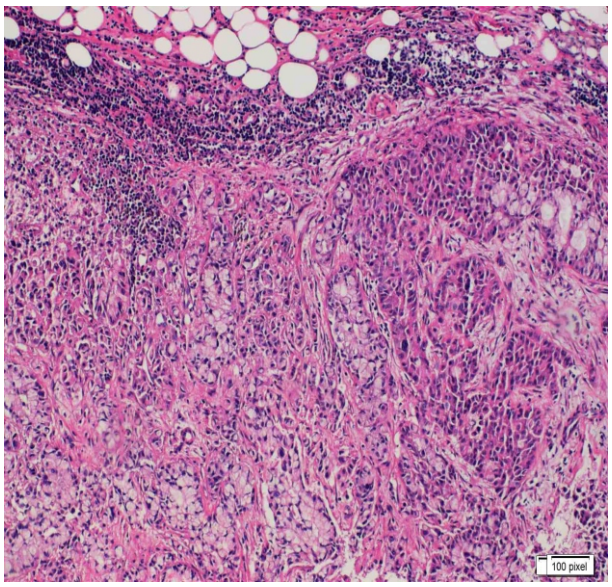

Figure 2: Solid islands consisting of squamous cells and glandular component including mucin-rich goblet cells (H&E,X100).

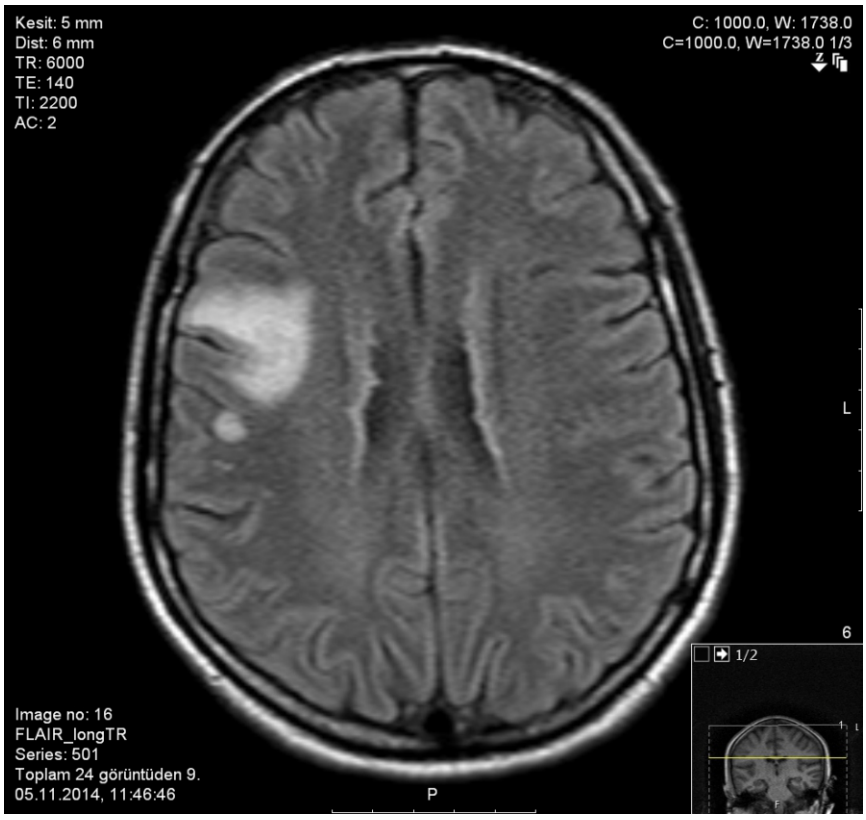

Figure 3: A cranial magnetic resonance imaging showing a mass in the right hemisphere.

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