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Adenoid cystic carcinoma of the lung — a case report

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ABSTRACT

Adenoid cystic carcinoma (ACC) is a malignant neoplasm that frequently originates from the salivary glands of the head and neck. The majority of pulmonary adenoid cystic carcinomas develop centrally in the trachea. Primary ACC of the lung arising from the bronchial glands is a rare disease and accounts for only 0.09–0.2% of all primary lung neoplasms. Although their growth rate is often indolent, they sometimes show aggressive biologic behaviour. Local invasion with perineural infiltrations, and lymph node and hematogenous metastases have been reported for some of these neoplasms. Treatment options for advanced disease are limited. We herein report a case of a 56-year-old male patient with adenoid cystic carcinoma of the lung, who received conventional chemotherapy and endobronchial irradiation. This review focuses on the role of palliative treatment in the management of metastatic ACC.

Key words: adenoid cystic carcinoma, lung, chemotherapy

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Case report

In July 2016, a 56-year-old man diagnosed with adenoid cystic carcinoma (ACC) of the left lung with an initial clinical stage of cT3N2M0 was admitted to the Department of Lung and Thoracic Cancers, The Maria Skłodowska-Curie Institute — Oncology Centre in Warsaw. Previously, in another centre, the patient received six cycles of chemotherapy according to the PN regimen (cisplatin and vinorelbine) — treatment was completed in May 2016. On admission, the patient was in good general condition (category 1 — according to the World Health Organisation classification), but had reported shortness of breath and haemoptysis since about two weeks previously. No significant abnormalities were found in the laboratory tests. Physical examination of pulmonary fields revealed impaired percussion sound on the left side and weakening of respiratory murmur on the same side. Chest computed tomography (CT) showed complete atelectasis of the left lung with left main bronchus amputation and the presence of a lymph node package under tracheal bifurcation of size 30 × 17 mm as well as lesions in the right lung and left

kidney (largest 34 × 33 mm). The patient was qualified to high dose rate (HDR) endobronchial brachytherapy using the iridium isotope Iridium-192. A total of 20 Gy in four fractions at weekly intervals was given to the affected bronchial sections. The treatment was completed in August 2016. After 15 months, the disease progressed. Four chemotherapy cycles were used according to the carboplatin/paclitaxel regimen, and the disease was stabilised. In December 2018, a CT scan showed a new lesion in the 6/7 liver segment and numerous metastatic changes in both kidneys. The patient received four cycles of chemotherapy according to the PE scheme (cisplatin and etoposide) and achieved disease stabilisation. Treatment was complicated by grade 2 hearing impairment (CTCAE version 5.0). The last control visit took place in July 2019; the disease is still stabilised.

Discussion

Primary ACC of the lung arising from the bronchial glands is a rare disease and accounts for only 0.09–0.2%

of all primary lung neoplasms [1]. Although their growth rate is often indolent, they sometimes show aggressive biologic behaviour. Local invasion with perineural infiltrations, and lymph node and hematogenous metastases have been reported for some of these neoplasms [2]. Among 34 patients observed in the Beijing centre, 21 (61.8%) primary lesions were located in the trachea or main bronchus, 11 (32.3%) tumours were below the lobular bronchi, and only 2 (5.9%) were in the pulmonary parenchyma [3]. The relatively low incidence of ACC in peripheral parts of the lung is probably closely related to the distribution of glandular cells [4]. Occurrence of glands gradually decreases with the degree of bronchial branching and accounts for only 11.3% in 6th order bronchi, and then decreases close to zero [4]. ACC localised outside the trachea should be distinguished from primary and metastatic lung tumours. In comparison with other primary lung cancer, ACC tends to occur in younger patients and with equal frequency in men and women [3]. Smoking does not appear to be an aetiological factor for ACC. Often, the first symptom of the disease is cough, but in many patients the disease is detected by an incidentally performed imaging test. However, demographic data, clinical presentation, and radiological picture of changes are often diverse and free from any characteristics. Histopathological examination remains the only diagnostic tool that differentiates ACC from other lung neoplasms. The morphological picture is characteristic — there are two types of cells: ductal cells with scant cytoplasm and angulated hyperchromatic nucleus, stained with cytokeratin (CK7); and myoepithelial cells of basaloid appearance stained with myoepithelial markers (p63, SMA, calponin) — this biphasic character emphasised by immunohistochemistry is crucial in differential diagnosis. The cells form cribriform, tubular, and solid structures. The percentage of solid pattern determines the degree of histological differentiation. Cancer typically extensively infiltrates along the nerve trunk. In doubtful cases, it is possible to perform immunohistochemical staining with the MYB antibody — a positive reaction indicates MYB gene translocation characteristic for ACC, which can be confirmed by fluorescence hybridisation in situ (FISH) [5, 6]. Usually, ACC of the lung grows slowly; however, in some cases there is a more aggressive course with a tendency of local infiltration and, less frequently, lymph node involvement. In addition, after various periods of disease-free time local or systemic relapses can occur [2]. Among the large group of patients treated at the Mayo Clinic in 1972–2002 distant metastases were observed in 40.5% [7]. In 15 ACC patients the tumour metastasised mainly to the lungs, brain, chest wall, and liver [7]. Initially advanced disease is described very rarely. In the previously cited study, inoperable patients constituted 23% (8), of whom five were diagnosed with

clinical stage IIIB and three with stage IV at baseline [3]. In the next two studies, patients with stage IV accounted for 8.3% (1) and 10% (3), respectively [5, 8].

The treatment of choice is radical surgery, if feasible. Palliative treatment, on the other hand, includes chemotherapy, radiotherapy, prosthesis, and other palliative surgery. Several studies have demonstrated the benefit of radiation therapy in terms of controlling the primary tumour and ensuring a good palliative effect in up to 75% of patients treated [9]. Resolution of haemoptysis and reduction of dyspnoea were reported in 72.2% and 56.3% of irradiated patients, respectively [9]. Brachytherapy appears to be an effective and safe method of palliative ACC treatment [10, 11]. One of the papers describes the use of endotracheal and endobronchial irradiation in a young woman diagnosed with ACC. There was a reduction of discomfort and improved respiratory function confirmed in lung function tests, and the response to treatment continued for almost a year [10]. ACC is considered as a cancer with low sensitivity to chemotherapy. There are few data in the literature regarding systemic treatment of this group of patients. Among the previously mentioned patients in stage IV, attempts were made to use chemotherapy [3]. The first patient received a regimen including gemcitabine (1250 mg/m² on days 1 and 8) and cisplatin (75 mg/m² on day 1), but the disease progressed after two treatment cycles due to enlargement of the primary lesion and mediastinal lymph nodes. The second patient received vinorelbine (25 mg/m² on days 1 and 8) and cisplatin (75 mg/m² on days 1–3), achieving symptom relief and disease stabilisation in imaging tests. One patient received erlotinib, but after three months of treatment the disease progressed within the mediastinal lymph nodes. Systemic treatment was also used among patients with disease disseminated during the follow-up period [3]. Data on treatment regimens are presented in Table 1. In the study described, among the presented patients receiving palliative chemotherapy, only one showed sensitivity to treatment with paclitaxel and cisplatin. Another study described the efficacy of a combination of carboplatin and paclitaxel, and another

Table 1. Combination chemotherapy in advanced ACC of the lung [3]

Chemotherapy regimen	Treatment line
paclitaxel 175 mg/m ² , day 1; cisplatin 75 mg/m ² , days 1–3	1
gemcitabine 1250 mg/m ² , days 1 and 8; cisplatin 75 mg/m ² , days 1–3	1
vinorelbine 25 mg/m ² , days 1 and 8; cisplatin 75 mg/m ² , days 1–3	1
paclitaxel 175 mg/m ² , day 1; cisplatin 75 mg/m ² , day 1	2
pemetrexed 500 mg/m ² , day 1	2

case that was sensitive to uracil-tegafur and cisplatin in combination with radiation therapy [4, 12].

The presented patient received systemic treatment three times — in each case doublet chemotherapy with a platinum derivative. After each treatment patient obtained clinical benefit and disease stabilisation was found on imaging tests. The use of endobronchial irradiation resulted in the relief of symptoms and disease control for over a year. The treatment was well tolerated.

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