Case report - Pulmonary

Multiple early bronchioloalveolar carcinomas in both lungs

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Abstract

We treated a 49-year-old woman with synchronous multiple bronchioloalveolar carcinomas (BAC). Multiple bilateral ‘ground-glass’ opacities were detected by computed tomography (CT). We performed partial lung resection, and the pathologic diagnosis was atypical adenomatous hyperplasia. Two and one-half years later, a lesion showed enlargement, and was resected along with some others. The histopathologic diagnosis was multiple early BAC. High-resolution CT is likely to detect increasing numbers of similar cases.

Keywords: Multiple lung carcinomas; Synchronous tumors; Bronchioloalveolar carcinoma in situ; Ground glass opacity

1. Introduction

Recent technical advances such as high-resolution computed tomography have increased the frequency of detection of small peripheral adenocarcinomas of the lung. Among these, bronchioloalveolar carcinoma (BAC) without active fibroblastic proliferation is considered a localized neoplasm that can be cured surgically [1]. On the other hand, multiple atypical adenomatous hyperplasias (AAH) associated with adenocarcinoma have been reported by several authors [2]; Miller et al. [3] proposed an adenoma-carcinoma sequence in which advanced adenocarcinoma with AAH was a late stage. Multiple small localized BAC may represent a distinct form of adenocarcinoma, and this case may be an example.

2. Case report

A 49-year-old woman showed numerous bilateral ‘ground-glass’ opacities(GGO) upon screening by computed tomography (CT) of the lungs. Thoracoscopic partial resection of the left lower lobe was performed. Macroscopically the tumor from the resected specimen was 5 mm in diameter. The pathologic diagnosis was atypical adenomatous hyperplasia (AAH). Chest CT repeated 2.5 years later showed enlargement of a lesion in the right upper lobe. The patient was admitted for surgery. She had never smoked. On physical examination, breath sounds were normal. No superficial lymph nodes were palpable. Laboratory data, respiratory function test and blood gas parameters were within normal limits. Concentrations of α-fetoprotein, carcinoembryonic antigen, squamous cell carcinoma antigen, sialyl stage-specific embryonic antigen-1 and cytokeratin 19 fragment were normal. No lesion was demonstrated in a chest radiograph. Chest CT obtained 5-mm collimation showed numerous GGO in both lungs (Fig. 1A). No lymph node metastasis was detected. High-resolution CT scan (resolution 0.35 mm) obtained with 1-mm collimation in the right lung revealed 14 lesions more than 5 mm in diameter and numerous less than 5 mm. The lesion in the right upper lobe appeared to have enlarged up to 10 mm in diameter (Fig. 1B,C).

2.1. Surgical procedure

We resected the lesion showing enlargement and several other lesions readily approached from the surface of the lung as follows. The patient was placed in the left lateral position and three ports was inserted, two through the fourth intercostal space and one through the sixth intercostal space. The enlarged lesion was easy to resect thoracoscopically, as were other superficially located lesions. In all, three portions of the right lung were resected in this operation.
2.2. Histopathologic examination

The resected specimens were sliced at 5-mm-thick intervals. There were 19 lesions in the resected specimens and the greatest diameter of the tumors was 0.2–1.1 cm (mean, 0.4 cm) Microscopically, atypical cells showed a pattern of growth by replacement of alveolar lining cells. No fibrotic foci were present. The individual cells resembled Clara cells and type II pneumocytes, with the lesions corresponding to adenocarcinoma of Noguchi subtype A (Fig. 2A,B). The histopathologic diagnosis was multiple BAC. As lesions were multiple and bilateral, the patient has been managed by serial follow-up evaluation.

3. Discussion

BAC, considered a subtype of adenocarcinoma, accounts for 1–9% of lung cancers. Prognosis in BAC originally was
thought to be poor, but several authors [1,4] demonstrated a good outcome for localized neoplasms. The histopathologic characteristic of such early BAC, though controversial, is that atypical cells replace alveolar lining cells with no active fibroblastic proliferation. These lesions, designated adenocarcinoma subtype A and B by Noguchi, show no lymph node metastasis; vascular and pleural invasion are absent. These two types are considered BAC in situ. In recent years in Japan, high-resolution CT and other advances have made detection of such early BAC more common. Jang et al. [5] reported localized GGO on high-resolution CT as a sign of early BAC. On the other hand, the differential diagnosis of early BAC from AAH often can be difficult by CT as well as by histopathologic examination [1]. In our case, the tumor resected at the first operation was misdiagnosed as AAH.

AAH is classified as a premalignant lesion [6], and Koga et al. suggested that AAH is associated with lung adenocarcinoma, especially in cases of BAC [7]. Furthermore, in recent years, multiple AAH lesions have been associated with adenocarcinoma, particularly multiple adenocarcinomas [2,8]. Taking such a background into consideration, multiple early BAC may be more frequent than is recognized. Such lesions would be detected preoperatively as multiple GGO by CT. Some authors have reported multiple BAC in recent years. Okubo et al. [9] reported 14 of 119 resected BAC (12%) to be multiple. Kodama et al. [8] described eight of 104 resected small adenocarcinomas (7.7%) as multiple, with seven of these being BAC. However, few authors have documented the occurrence of numerous early BAC without coexisting advanced carcinoma in both lungs.

Martini and Melamed [10] have outlined criteria for defining multiple primary lung cancers. Although all the resected lesions in our case were histologically similar and some lesions coexisted in the same lobe, all tumors were carcinoma in situ. Radiologically and intraoperatively, our case was thought to represent multiple early primary lung carcinomas.

To preserve pulmonary function, curative yet limited operation has been recommended for multiple lung carcinomas, but the numerous lesions in our case could not all be resected. Prognosis in early multiple lung carcinomas is not clear, and careful ongoing follow-up will be needed.

References