Bronchioloalveolar Carcinoma Mimicking DILD: A Case Report

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Bronchioloalveolar carcinoma is a disease with an insidious onset and various radiologic manifestations. A solitary peripheral pulmonary nodule, multiple nodules and lobar or diffuse consolidation are the common radiological findings. We report here on a case of bronchioloalveolar carcinoma mimicking DILD (diffuse interstitial lung disease) in a 60 year-old male that manifested as multiple peripheral consolidations, ground-glass opacities, subpleural lines, pleural thickening and interlobular septal thickening on CT.

Index words: Lung
Computed tomography (CT)
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Bronchioloalveolar carcinoma (BAC) can demonstrate many different radiologic appearances. The common radiologic appearances are those of a solitary peripheral pulmonary nodule, multiple nodules and lobar or diffuse consolidation [1]. The unusual radiologic appearances include diffuse disease with minimal or no radiologic signs, expansive pulmonary consolidation without air bronchograms, lobar atelectasis and cavitation [1].

To the best of our knowledge, there are only rare case reports of bronchioloalveolar carcinoma mimicking diffuse interstitial lung disease [1-3]. We report here on a case of bronchioloalveolar carcinoma that presented as multiple peripheral consolidations with pleural tails, ground-glass opacities and interstitial thickening that mimicked diffuse interstitial lung disease.

Case Report

A 60-year-old male presented with dyspnea, cough and chills that he had experienced for over one month. He had a smoking history of 30 pack years. He was treated for pulmonary infection at a local clinic, but there was no significant improvement of his symptoms. Right flank pain on inspiration developed and the coughing was aggravated at night, especially when he spoke or was lying down.

The initial chest radiography showed diffusely distributed multiple peripheral patchy consolidations and reticular opacities in both lungs (Fig. 1). Computed tomography (CT) revealed multiple patchy consolidations with pleural tails and ground-glass opacities in both lungs; this was mainly seen in the peripheral portions. The ground-glass opacities were variable sized triangular or rectangular shapes that represented secondary pulmonary lobule involvement. The subpleural lines and pleural thickening were quite prominent. Multiple small nodules around the consolidations, mild interlobular septal thickening, a small amount of fluid collection...
at the right major fissure and enlarged precarinal lymph nodes were the associated findings [Fig. 2].

Four days later, the symptoms had persisted and the follow up chest radiography showed mild aggravation with increased opacity in the right lower lung and mildly increased right pleural effusion, so he was admitted for further evaluation. On the next day, bronchoscopy was performed and the cytologic examination of bronchoalveolar lavage (BAL) fluid revealed no evidence of malignancy with one percent neutrophils, two percent eosinophils and 87% macrophages. On the fourth day of admission, open lung biopsy was done at the posterior basal segment of the left lung; this intervention revealed that the lung was covered with diffuse whitish materials and small hard plaque about 0.5 cm in diameter that were attached to the diaphragm. Multifocal pleural adhesions were also noted. The pathology report revealed it was well-to-poorly differentiated multifocal adenocarcinoma with the mucinous-type features of bronchioloalveolar carcinoma showing infiltration into the abortive glands in the vascular wall [Fig. 3]. The margin of biopsy specimen was positive with tumor cells. The patient underwent PET (positron emission tomography)-CT scan using 2-(F-18)-fluoro-2-deoxy-D-glucose (FDG) for the metastasis work up. The scan showed multiple nodular lesions with mildly increased FDG uptake in the right upper and bilateral lower lung fields, and also in the lateral and posterior subpleural areas. An associated mild to moderate amount of bilateral pleural effusion with increased FDG uptake and a mildly increased FDG uptake in the precarinal lymph nodes were also noted. There was a focal area of increased uptake in the first thoracic vertebral body and it suggested bone metastasis. He was then transferred to the oncology department for chemotherapy.

Although the patient was treated with chemotherapy, including Iressa® (Gefitinib), the serial follow-up chest radiography showed the disease had progressed with increased peripheral reticular nodular opacities and increased bilateral pleural effusion [Fig. 4]. CT scanning also showed generally progressed disease with increased pleural effusion, more aggravated consolidations, ground-glass opacities and interstitial thickening in both lungs, and progressed mediastinal lymphadenopathy was also noted.

Discussion

Bronchioloalveolar carcinoma remains one of the most enigmatic and controversial lung cancers and it has a broad spectrum of radiographic appearances (3, 4). It is a disease with an insidious onset and various radiographic manifestations. BAC can be defined as a well-differentiated, peripheral, primary lung neoplasm that arises beyond the recognizable bronchus, and it has a tendency to spread locally into the peripheral air spaces by using the alveolar septa as a stroma [3, 4]. The tumor can spread to other areas of the lung via aerogenous and lymphogenous routes (3). The physician has to make sure there is no other bronchogenic carcinoma present and no adenocarcinoma involving another organ because metastatic adenocarcinoma from another organ cannot always be reliably differentiated from tumors that have developed from lung tissue [3]. Hill (3) retrospectively reviewed the radiographic patterns of 136 patients with bronchioloalveolar carcinoma. The lesions fell into one of three categories: a localized nodule less than 4 cm in diameter, a mass or a localized area of consolidation, or diffuse nodules or areas of consolidation. Lesion growth is characterized by a variable latency period, with some localized lesions remaining dormant or growing slowly over a period of years, and other diffuse or multicentric forms progress rapidly and aggressively.

Fig. 1. A 60-year-old male patient with dyspnea. The chest radiography shows diffusely distributed multiple peripheral patchy consolidations and reticular opacities in both lungs.
Aquino et al. (6) compared consolidated BAC with consolidated infectious pneumonia; this revealed that coexisting nodules and a peripheral distribution of consolidation were more often seen on CT scans of consolidated BAC. The consolidated form of BAC accounts for approximately 30% of all the BAC tumors and it corre-

Fig. 2. Computed tomography (CT) reveals multiple patchy consolidations with pleural tails and ground-glass opacities in both lungs with a peripheral predominance at the level of the aortic arch (A), the level of the right lower bronchus (B), and the level of the diaphragm (C). Associated subpleural lines, pleural thickening and multiple small nodules are noted in both lungs.

Fig. 3. A. (H & E, ×15) Open lung biopsy shows the normal alveolar structure (thick arrow) and tumor cells (thin arrow) in the same section.
B. (H & E, ×200) Mucin containing tall columnar cells line the alveolar walls. The nuclei show atypia and they are displaced to the basement membrane by the mucin vacuoles.
sponds to a mucinous histologic subtype (6). Certain findings such as multiple cysts, cavities or bubble-like radiolucencies, an air bronchogram, bulging of the interlobar fissure, the CT angiogram sign and uniform, low attenuation of the pulmonary consolidation on CT may help to identify pulmonary consolidation as BAC. The five-year survival rate of patients with the consolidated form of BAC is 26% (6, 7). The natural course of the disease is bronchogenic dissemination throughout the lung and ultimately death by respiratory failure (6).

Ground-glass opacity is a finding seen on high resolution CT, and it is defined as hazy increased attenuation of the lung with preservation of the bronchial and vascular margins. It is caused by the combined effects of diminished intra-alveolar air and increased cellular density with alveolar cuboidal cell hyperplasia, thickening of the alveolar septa and partial filling of the terminal air spaces. Although ground-glass opacity is a nonspecific finding, BAC must be considered in the differential diagnosis when the size of this ground-glass opacity is larger than 1 cm (8).

We experienced a case of the rapidly progressing multifocal consolidated type of BAC, and it was was confused with DILD on chest radiography and CT. On chest CT, diffusely distributed multiple patchy ground-glass opacities and patchy consolidations with pleural tails were predominant in the peripheral portion of both lungs. Associated multiple small nodules, interlobular septal thickening, subpleural lines, pleural thickening and several enlarged precardinal lymph nodes were also noted. The lesion was confirmed by wedge biopsy of the lung as being adenocarcinoma with a feature of the mucinous type of bronchioalveolar carcinoma. The PET-CT scan showed increased uptakes in the lung lesions and multiple metastases that included pleura and bone. The lesions were confused with diffuse interstitial lung disease because they presented with multiple consolidations, ground-glass opacities, subpleural lines and interstitial thickening; these findings were predominantly observed in the peripheral portion of both lungs.

If there is no response or there is progression of the consolidation in the lung disease in spite of antibiotics treatment, the possibility of the consolidated type or DILD-mimicking BAC might be considered and cytologic evaluation could be recommended.

References


**Fig. 4.** Four months later from the initial chest radiogram, the disease has progressed with increased peripheral reticular nodular opacities and increased bilateral pleural effusion.
원판 확장성 저하

1. 원판 중앙 혹은 원판의 주변부가 요동의 굴절부에 위치한 경우
2. 원판의 주변부가 요동의 굴절부에 위치한 경우
3. 원판 중앙 혹은 원판의 주변부가 요동의 미굴절부에 위치한 경우

원판 확장성 저하는 원판의 전방 혹은 후방의 음극선의 굴절부 혹은 미굴절부에 주로 위치하고 있다. 원판의 음극선의 굴절부 혹은 미굴절부는 정상적인 경우 60°가 되어야 하며

CT로는 원판 중앙 또는 주변부가 요동의 굴절부 혹은 미굴절부에 위치한 경우, 원판의 주변부가 요동의 미굴절부에 위치한 경우, 원판의 주변부가 요동의 미굴절부에 위치한 경우를 확인할 수 있으며 10% 정도의 원판 확장성 저하를 나타내는 경우도 있다.