CT Characteristics of Peripheral Organizing Pneumonia

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Diagnostic dilemma of persistent mass-forming parenchymal opacity in the lung periphery occurs occasionally in the realm of diagnostic radiology. Until recently, literature on the role of computed tomography in peripheral organizing pneumonia, which is difficult to differentiate from malignancy, has little been published. We experienced one case of pathologically proven organizing pneumonia diagnosed preoperatively by chest CT.

When it comes to solitary peripheral mass density in the lung, we think that CT can be proved useful in the diagnosis of benign organizing pneumonia by showing regular and smoothly corrugate margin, peripheral contrast enhancement with inner low density, and air-trapping by intervening normal lung parenchyma.

Introduction

The application of computed tomography (CT) in the evaluation of focal lung disorders has not actively evolved at the same pace as other pulmonary diseases including mediastinum. The value and findings of chest CT in assessing mass-forming peripheral organizing pneumonia which is often difficult to differentiate from alveolar cell carcinoma, solitary pulmonary infarct and so on have not been fully clarified yet. We have observed some helpful CT findings of surgically proven organizing pneumonia located in the lung periphery, so we wish to present radiologic findings with emphasis on the differential diagnosis of solitary peripheral mass-forming density in the lung.
Case Report

A 33-year-old man was referred to our hospital because of flu-like symptoms for two weeks despite empiric antibiotics coverage. There was a decreased breathing sound on right lower lung field with inspiratory rale at admission. Laboratory data was not specific. Plain chest radiographs showed elliptical opacity along right retrocardiac space abutting thoracic spine with rather fluffy margin (Fig. 1-A, B). Owing to persistent mass-forming lesion, we performed chest CT which revealed craggy-surfaced ovoid soft tissue density with contrast enhancement peripherally and internal low density, and a few CT air-bronchograms by intervening normal lung tissues (Fig. 1-C, D). On the 30th day following admission, right lower lobectomy was performed to eliminate the mass lesion which was shown 6 cm-sized relatively firm soft tissue mass in the posteromedial segment of right lower lobe adhered to the parietal pleura. Pathologic cut surface showed yellowish tan necrotic focus in the lung specimen and its final diagnosis was organizing pneumonia with fibrosis (Fig. 1-E).

Discussion

To date, the role of CT in the evaluation of patients with air-space disease has gone minimally explored. This is primarily because of the ease with which air-space disease is diagnosed from plain chest radiographs (1). According to Generaux (2), CT has little role to play during the acute phase of the pneumonias apart from its valuable assistance in identifying some of the complications (cavity formation, bronchopleural fistula, empyema). Overall consideration of inflammatory disorders is beyond the scope of this report, we would like to focus our interest on the CT features of peripheral mass-forming organizing pneumonia which used to be found by us after its acute stage.

The term of organizing pneumonia seems to be less distinct from the standpoint of its underlying pathologic morphology. Recently there has been several articles reinvestigate bronchiolitis obliterans organizing pneumonia (BOOP) because it has a favorable prognosis and good response to steroid therapy (3-5). McLoud et al. said that localized lesion with bronchiolitis obliterans is usually referred to as “focal organizing pneumonia” and its detailed description of CT feature is rare, but the appearance is that of an irregular sublobar area of air-space consolidation (6). We think our case is not quite dissimilar to that of localized BOOP, although the pathologic pattern of bronchial obstruction is not prominent.

Differential diagnoses include unifocal alveolar cell carcinoma, single pulmonary infarct, rounded atelectasis and subpleural tuberculoma. Relatively uncommon unifocal alveolar cell carcinoma is indistinguishable on the basis of CT features, although frequent association with hilar or mediastinal lymphadenopathy will favor the malignancy (6). We think smooth undulated surface and surrounding contrast enhancement pattern and air-densities by normal parenchyma are helpful aspects of organizing pneumatic process on chest CT. Pulmonary thromboembolism with pleural—based area of consolidation may mimic inflammation but often multiple. Pulmonary embolus can be determined by radionuclide perfusion scan when there is only one area of parenchymal density on the plain radiograph (7). Rounded atelectasis as a benign form of peripheral lung collapse may be differentiated by the characteristic pleural deformity with acute angle, curvilinear entrapment of vessels and bronchi and some other CT signs (7). Subpleural tuberculoma tends to be sharply circumscribed and there may be small satellite lesions in the vicinity of a somewhat large granuloma with frequent parenchymal infiltration and calcification (7).
Plain chest radiographs show elongated mass shadow at posteromedial segment of right lower lobe.

CT scan demonstrates scalloped-margined soft tissue density with inner low density after contrast enhancement (INSET with arrows). See multiple air-containing spaces surrounding the density (Open arrows).

Photomicrograph of the resected lung reveals patchy air-space fibrosis (arrows) with interstitial infiltration of the chronic inflammatory cells. Alveolar walls are hypercellular and thickened (H-E, x 100).

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Fig. 1.
In summary, CT features of rather smoothly corrugate margin, peripheral contrast enhancement with inner low density, surrounding air-densities and absent lymphadenopathy in the case of peripheral mass-forming opacity favor the diagnosis of organizing pneumonia although not specific. Appropriate clinical setting and temporal change are also helpful in the diagnosis.

REFERENCES

7. Doyle TC, Lawler GA: CT features of rounded atelectasis of the lung. AJR 143:225-228, 1984