Intrapulmonary lipoma: a case report and literature review

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Background: **Intrapulmonary lipoma is extemely rare in children. So far, all reported pulmonary lipomas were from adult patients.**

Methods: **We present herein a case of intrapulmonary lipoma in a child and a review of the related literature.**

Results: **A 13-month-old boy was hospitalized because of cough and fever. Chest CT showed patchy infiltration and round-shape, hypodense homogeneous lesions located in the lung. After 19 days of antibiotic treatment, his clinic symptoms disappeared, but the round lesions remained without any change. One month and one year later, he was examined by chest MRI with technique of fat suppression. The child was diagnosed as having an intrapulmonary lipoma without biopsy.**

Conclusions: **Intrapulmonary lipoma is rare in children. Chest CT and MRI are very important for the correct diagnosis of intrapulmonary lipoma.**

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Key words: **chest imaging;**
diagnosis;
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Introduction

Lipoma is the most common form of benign tumors originating from soft tissue. However, intrapulmonary lipoma is rare. We found only nine case reports of intrapulmonary lipoma in the medical literature over a 90-year period,[1-5] and all 9 patients were adults aged from 44 to 71 years (8 males and 1 female). Herein, we present a case report of a child with peripheral intrapulmonary lipoma.

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Case report

A 13-month-old boy was initially hospitalized in our department with the complaint of ten-day cough and a three-day low-grade fever. The patient had been delivered at a 27-week gestation and required a tracheal intubation for breathing assistance. He was later diagnosed with bronchopulmonary dysplasia. His mother was healthy when she was pregnant.

Physical examination revealed a temperature of 37.6 °C and a respiratory rate of 32 breaths/min. His heart rate was 120 beats/min, and body weight was 7.5 kg. The patient showed delayed growth and malnutrition. The retraction sign of three fossae was positive. There were small and middle bubble sounds over the lungs. No other abnormalities were noted.

Laboratory tests revealed white blood cell count 5.31×10^9/L, neutrophils percentage 72.3%, C-reactive protein 2.1 mg/L (normal value <8 mg/L), erythrocyte sedimentation rate 2 mm/h, procalcitonin >0.5 ng/mL, and anti-streptolysin O <250 U/L. Tuberculosis antibody and tuberculin protein derivative test were negative. No pathogens were cultured from sputum or blood. Glucan (1-3)-B-D test (G test) was 184.9 pg/mL (normal value <10 pg/mL). The result of arterial blood gas analysis was normal.

Chest radiograph showed bilateral dot-like and patchy infiltration. Chest CT revealed bilateral multiple patchy infiltratrates, and four well-defined, rounded homogeneous/hypodense lesions with a CT value of -172 Hu in the lower lobe of the right lung and near mediastinum.

The patient was diagnosed as having bronchopneumonia and treated with intravenous cefmenoxime at a dose of 0.25 g, twice a day for four days. His fever, cough and rale did not improve. The antibiotic was changed to meropenem, at a dose of 80 mg three times a day. After 2 days, the patient's body temperature became normal and the cough improved. After 5 days of treatment, the rale disappeared. Another chest CT performed after 14 days of treatment with meropenem showed that the patches had resolved, but no change was found in the round lesions. In view of the possible fungus infection in the lungs due to existing bronchopulmonary dysplasia, long-term treatment with antibiotics, and a positive G test, the patient was treated with fluconazole

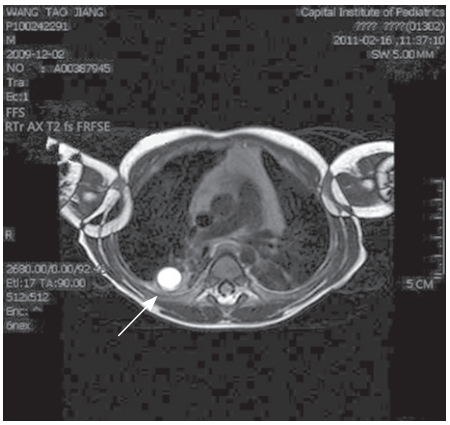

Fig. Chest MRI showing a round lesion in the lower lobe of the right lung (arrow). T2 weighted MRI images with fat suppression revealed a high signal.

for 14 days. MRI one year and one month later revealed that the lesions were still there. The round lesions were identified as intrapulmonary lipoma by T2 weighted MRI images with fat suppression (Fig.). Finally, the child was diagnosed as having intrapulmonary lipoma without biopsy.

Discussion

The first case of lipoma in the lower respiratory tract was reported by Rokitansky in 1854.[1] Pulmonary lipoma is divided into endobronchial lipoma and peripheral intralpulmonary lipoma, and the former form constitutes approximately 80%. Endobronchial lipoma usually located in submucousal layer of the bronchial walls is thought to be derived from the fatty tissue in the walls. The number of peripheral pulmonary lipoma accounts for 20% of the number of pulmonary lipoma, mainly located in the upper lobe of the right lung, with a diameter of one to seven centimeters. The fatty content in the bronchial walls decreases with the progressive branching of the bronchi and are not seen in bronchioli smaller than one millimeter diameter. This may be the part of the reasons why peripheral intrapulmonary lipoma is extremely rare.

Lipoma is commonly seen in people aged 20 to 85 years, with the highest rate in the fifties and sixties. The majority of lipoma patients are male. Usually, patients with peripheral intrapulmonary lipoma are asymptomatic owing to lesion location, and lesions are often found by chance in routine thorax radiographic examination. Endobronchial lipoma may cause blockage of the airway, result in atelectasis or purulent lesion, and show relevant symptoms. The images of thorax radiography for peripheral intrapulmomary lipoma often reveal a single lesion, which provides no evidence to exclude malignancy because of the high incidence rate in 50- to 60-year-old people. Chest CT with the value of -50 to -150 Hu and a well-defined homogeneous hypodense mass may suggest the diagnosis of lipoma.[3,6] Although intrapulmonary lipoma is a benign tumor, it is difficult to diagnose clinically and easy to misdiagnose as a malignancy. The final diagnosis is often dependent on histopathology. Eight of nine cases reported in the literature required a lung biopsy[1] to make a correct diagnosis. Another case was diagnosed through the new CT images and the review of old CT films performed 12 years before, thus ruling out the possibility of malignancy.

So far all reported pulmonary lipomas are from adult patients at age of 20 to 85 years, and the absence of a report in children may be related to the less fatty content in the bronchial walls in children. The patient we described here was a 13-month-old child. He was prematurely born and had been subjected to intubation and ventilation for a long period after birth, which may affect the development of the lungs. But the pathogenesis of intrapulmomary lipoma is not clear.

Initially, the patient was diagnosed mainly through the exclusion of infection and the assessment of chest CT findings (well-defined, homogeneous/hypodense lesions; no calcification, CT value of fat density). The definitive diagnosis was made after MRI and follow-up. With the development of MRI techniques, it is possible to distinguish different compositions in the lesions. Furthermore, fat suppression technique of MRI can clarify the nature of the lesion, avoiding the need of intervention such as pulmonary biopsy.

In conclusion, intrapulmonary lipoma can also be found in children. Those lesions with well-defined, round, homogeneous and hypodense features and CT value of fat density (-50 to -150 Hu) should be considered as lipomas. Chest CT and MRI can help to make a differential diagnosis.

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