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Case Report

Left upper lobe atelectasis due to plastic bronchitis

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Plastic bronchitis is a rare condition in children, characterized by expectoration of branching bronchial casts. It can cause atelectasis in the lung. Herein we reported a 4.5-year-old boy with left upper lobe atelectasis due to plastic bronchitis. Although his chest X-ray is specific for left upper left atelectasis, thoracic computerized tomography had been performed and was compatible with obliterated left upper lobe bronchus. Typical radiological appearance of the left upper lobe atelectasis is not well known by clinicians which results unnecessary further examinations such as computerized tomography which exposes high dose radiation. We want to emphasize the long-term side effects of radiation and avoid unnecessary examinations in children.

Key words: atelectasis, children, plastic bronchitis, radiation.

Plastic bronchitis is a rare and uncommon condition in children, characterized by expectoration of branching bronchial casts that partially or completely block the bronchial lumen[1]. It is usually associated with congenital heart disease but other conditions such as pulmonary lymphatic anomalies, pulmonary influenza A infection, toxic inhalation, acute chest syndrome in sickle cell anemia, cystic fibrosis, bronchiectasis, bacterial pneumonia were reported as possible causes of plastic bronchitis[2]. Due to obstruction of airways with casts, life–threatening respiratory distress can occur. We described a 4.5-year-old boy with upper lobe atelectasis due to plastic bronchitis.

Case Report

A 4.5-year-old boy, treated for pneumonia 1 month ago, presented to pediatric pulmonology department. Although his cough resolved and acute phase reactants decreased to the normal level following the treatment he received for pneumonia, there was no improvement on chest X-ray associated with decreased respiratory sounds in the left upper lobe. He did not have any chronic diseases other than atopic dermatitis. At presentation left upper lobe atelectasis was noted on chest X-ray (Fig. 1); thoracic computerized tomography (CT) performed prior to presentation to our department showed dense secretions obliterating the left upper lobe bronchus. Atelectasis due to infection was the preliminary diagnosis, and chest physiotherapy and mucolytic treatment were initiated. Ten days after presentation he coughed up a dense, mucoid, light-colored bronchial cast (Fig. 2), and subsequent chest X-ray one month after presentation showed that his atelectasis was resolved.

Informed consent was received from the family.

Discussion

Plastic bronchitis is the development of thick, obstructing mucoid/gelatinous casts in the tracheobronchial airway[3]. It is rare in childhood, but has been reported in patients with congenital heart disease, asthma, cystic fibrosis, bronchopulmonary aspergillosis[3,4]. There are two types of disease. Type I plastic bronchitis is associated with respiratory diseases with fibrin, inflammatory cells and eosinophils, Type II is mainly associated with congenital heart disease and casts are consisted by mucus and little or rare cellular infiltrate[3,5]. Our case had atopic dermatitis and also pneumonia in a close time. Both of them could be the cause of plastic bronchitis in this patient. We could not perform pathological examination of the cast because the

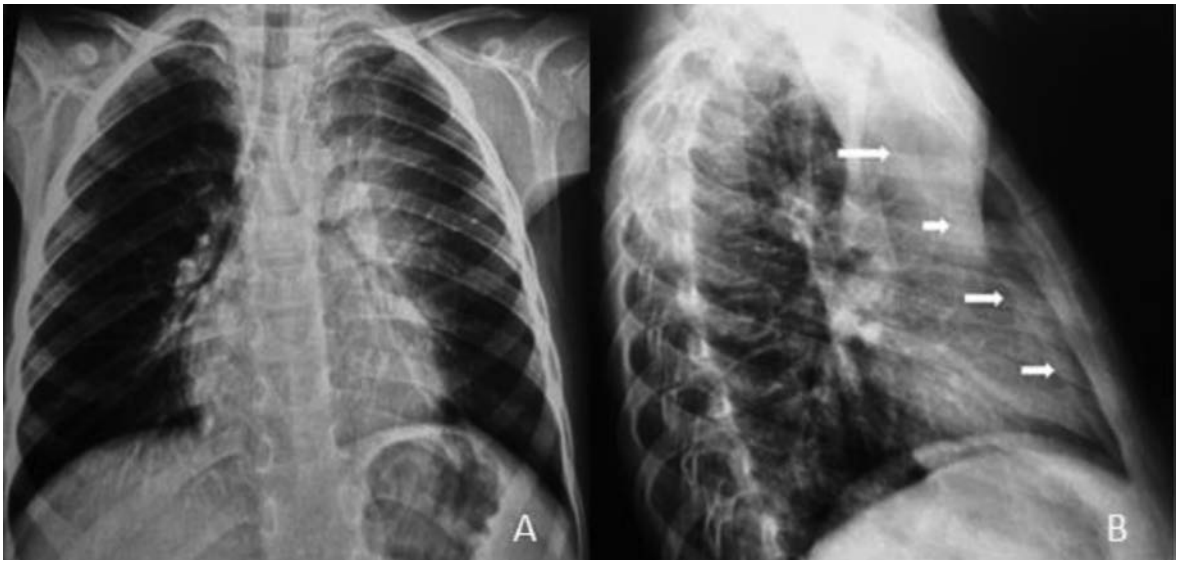

Fig. 1. A) Collapse of the left upper lobe (consolidation), reduced left lung volume, shift of the left hilum to superior and lateral, left diaphragm elevation, compensatory hyperinflation in the healthy lung; B) Collapsed left upper lobe (relative increase in density in the region between the line denoted by arrows and the sternum).

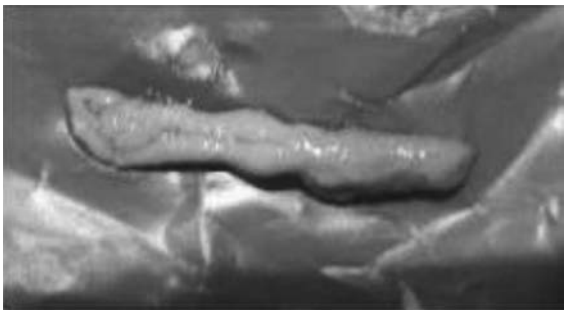

Fig. 2. Expectorated bronchial cast.

parents threw away it, but it could be useful for patients. In some patients, plastic bronchitis causes atelectasis. If the patient is well and exhibits clinical and laboratory improvement following treatment, plastic bronchitis can resolve with chest physiotherapy and mucolytic therapy, as in the presented patient. Moreover, bronchoscopy can be performed when necessary.

Atelectasis is a non-ventilated lung parenchyma that can occur by several causes in children. One of them is intraluminal obstruction that may be due to mucus plugs, granulomas, foreign bodies and rarely plastic bronchitis. Both anterior-posterior and lateral chest X-rays are sufficient to document the presence, extent, and distribution of the atelectasis. If there is a suspicion about external compression of airways or a mass on chest X-ray, tomography could be performed for definitive diagnosis. However, many clinicians are unfamiliar with the typical radiological appearance of left upper lobe atelectasis, which results unnecessary further evaluation. Children are generally more sensitive than adults to radiotherapy for 25% of cancer types, including leukemia, and cancers of the thyroid, skin, breast, and brain. Although radiation dose of a plain film is 0.02 mSv, it is 8.0 mSv in thorax tomography in children[6]. Studies have reported the long-term negative effects on health of multiple CT examinations in children, especially an increased risk of leukemia and solid cancers[7]. In our patient, because of recent pneumonia history, mucus plug was thought to be the cause of intraluminal obstruction. In this situation bronchoscopy could be the diagnostic and therapeutic option. We decided to perform bronchoscopy for him if we could not resolve atelectasis by mucolytic treatment and chest physiotherapy. But he expectorated plastic bronchitis before the date of bronchoscopy. Examinations that use high-dose radiation, such as tomography, should not be performed unnecessarily, especially in children.

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