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(CASE REPORT)

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Multiple bullae in asthmatic patients

Desdiani Desdiani *

Department of Pulmonology and Respiratory Medicine, Faculty of Medicine, Sultan Ageng Tirtayasa University, Serang, Banten, Indonesia

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Abstract

Emphysema bullae are often found in patients with chronic obstructive pulmonary disease and if the size of the bulla fulfills > 30% of the hemithorax, it can be called a giant bullae. A giant bullae can be similar to a pneumothorax, requiring a CT scan of the chest to avoid misdiagnosis and unnecessary procedures. The difference between a bulla and a pneumothorax obtained from imaging results is that if the lung collapses towards the ipsilateral hilum it is called a pneumothorax, while the bulla will appear to surround or wrap around the lung. Asthma is a disease characterized by chronic inflammation and bronchoconstriction. In acute asthma attacks or exacerbations, bronchoconstriction causes severe bilateral lung parenchymal inflation.We present a case of a 32-years-old male with multiple bullae, a complete history of tuberculosis treatment and suffering from asthma since childhood but not controlled. In this case, the likelihood of **Multiple bullae in asthmatic patients**, needs to be a concern, as well as the importance of evaluation and strict follow-up to reduce shortness of breath and improve the patient's quality of life.

Keywords: Multiple bullae; Asthma; Shortness of breath; Tuberculosis

1. Introduction

Bulla is considered emphysematous spaces in the lungs with a diameter > 1 cm.[1] In 1937, Burke described bulla as idiopathic, a clinical syndrome distinct from severe progressive breathlessness, which can lead to respiratory failure.[2] According to Roberts et al based on radiological examination results, emphysematous bullae were found in one or both upper lobes, occupying at least one-third of the hemithorax and suppressing the surrounding normal lung parenchyma.[3] Stern et al described the findings on chest CT scan of an emphysematous bullae consisting of many large bullae 1 to 20 cm in diameter.

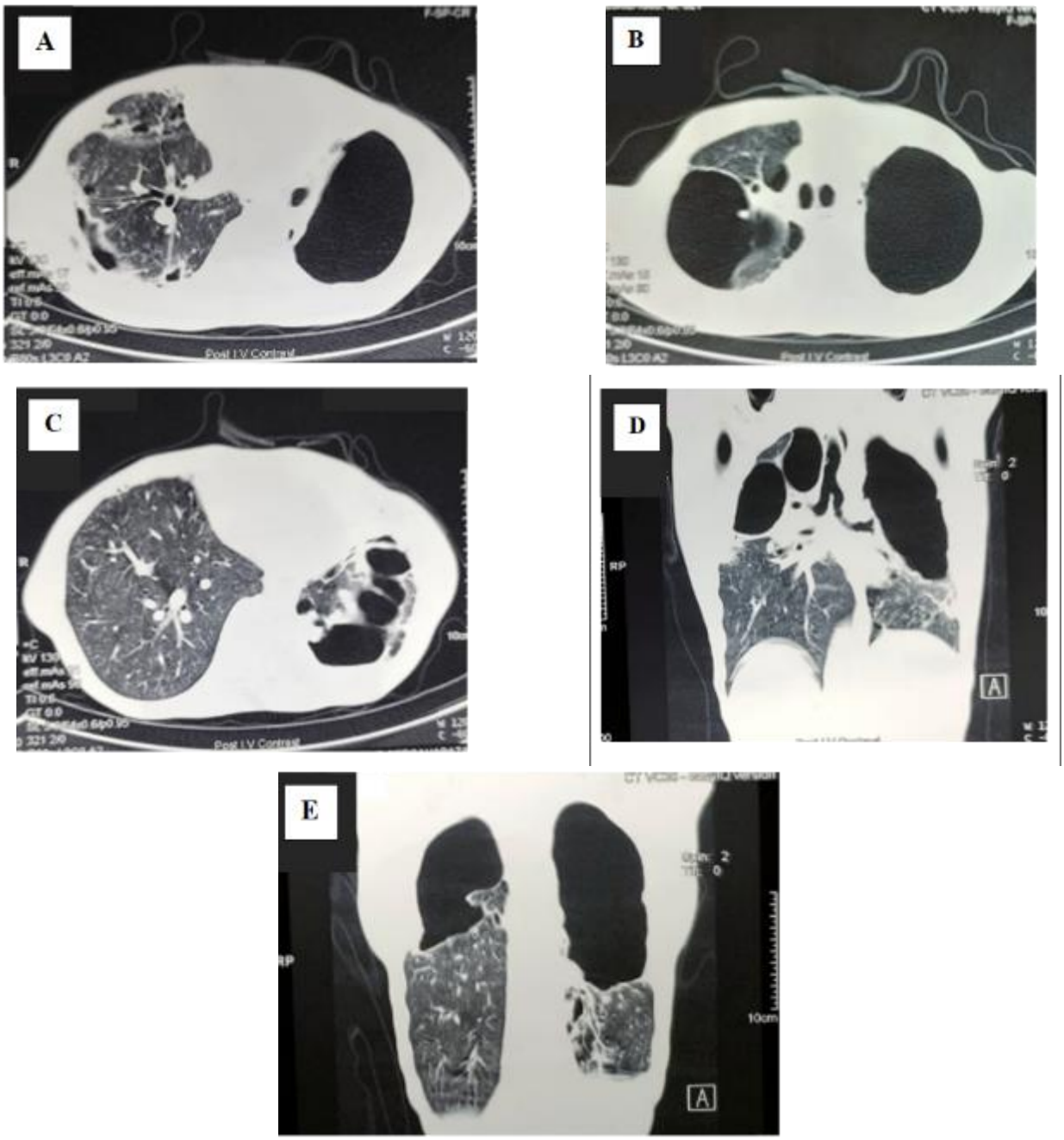
Radiological picture of a bulla appearing as an avascular radiolucency with a thin curved wall. The wall is usually less than 1 mm thickness and often invisible, making detection of bulla was difficult and often confused with a pneumothorax. Chest CT scanning is more sensitive than chest X-ray for detecting an accurate assessment of the bulla's number, size, and position, especially when the bulla are not clearly visible.[4] Patients who qualify for surgery have bulla that occupy a quarter or more of one hemithorax.

Asthma is characterized by chronic inflammatory bronchoconstriction. In acute asthma attacks or exacerbations, bronchoconstriction causes severe bilateral overinflation of the lung parenchyma. Manifestations on chest x-ray and chest CT scan are increased lung volumes, flattened diaphragms, and sometimes decreased diameter of the cardiac silhouette. Sequelae of overinflation may be the only changes seen on chest radiographs. Pneumopericardium or pneumomediastinum can be caused by excessive forced coughing. Chest CT scan may show bronchial wall thickening and irregularity, due to remodeling. Expiratory scan may reveal air trapping and mosaic attenuation. In both acute asthma attacks and exacerbations, the clinical picture is quite different from the imaging appearance.

* Corresponding author: Desdiani Desdiani.

2. Case

A 32-years-old male was admitted to the emergency unit of the hospital with shortness of breath, coughing, no weight loss, no fever and sometimes feeling pain in the right or left chest. The patient worked as an employee in a finance office, has never smoked and has a history of asthma since childhood but is not controlled, often brought by his mother to the emergency department. Since the last 6 months, his shortness of breath has gotten worse, not affected by activity and not affected by time.



Figures A-E Chest CT scan showing multiple bullae on both lung fields, a giant bulla on the left side was seen. Red arrows indicate double wall signs

Continuous shortness of breath throughout the day and will be worse if strenuous activities. This patient also admitted that he had tuberculosis, had finished treatment about 5 years ago and was declared cured. The results of radiological examinations several years ago, the patient admitted that he did not save any more. The results of a thoracic CT scan at this time showed multiple bullae and giant bullae in both lung fields.[Figure A-E] Laboratory results showed leukocytes 15,800 cells/μ and an eosinophil count of 6%. The patient has no other comorbidities such as hypertension, diabetes

mellitus, immune disorders or other chronic diseases. The therapy given was simple oxygen mask 7 litres/minute, ceftriaxone injection, methylprednisolone injection, combination of albuterol and ipratropium, and budesonide inhalation and other symptomatic medications. After being treated for 5 days, the patient's condition improved and is currently undergoing outpatient treatment for several months and regularly uses medicine containing budesonide and formoterol. In this case, it appears that the role of drugs containing anti-inflammatory and anticholinergic can help patients who experience multiple bullae and provide clinical improvement and improve quality of life.

3. Discussion

A bulla is an air-filled space in the subpleural or visceral layer of the lung. Bulla can be unilateral or bilateral, solitary or multiple. The size of the bulla is several millimeters to several centimeters, bulla always have a thin wall (≤ 1 mm). The radiographic appearance of a bulla is a round latency focus in the subpleural, thin-walled area usually better seen on a CT scan of the chest than on a chest-ray. The presence of the wall is important in differentiating bulla from centrilobular emphysema. Although bulla are commonly seen at the lung apex of patients with spontaneous pneumothorax, there is no definite relationship between their occurrence, number, size and the development of a pneumothorax. Pneumothorax is the most important entity in the differential diagnosis of bulla.[5]

Pulmonary bullae are usually found in COPD patients, but there have been cases of bulla seen in asthmatic patients. A study reported on young patients who had asthma on controlled medication. No wheezing was found and albuterol administration did not reduce shortness of breath. After radiological examination, a giant bullae was found in the lower lobe of the lung.[6] In this case, multiple bullae were found with a history of uncontrolled asthma. Currently, the patient's condition has finally improved and is stable after routine control and using inhaled budesonide and formoterol fumarate.

CT findings of bulla include many large bullae, measuring 1 to 20 cm in diameter, usually 2-8 cm. Radiological examination shows the bulla looks like avascular radiolucent areas with thin curvilinear walls. The bulla wall thickness is usually less than 1 mm, so that it can be difficult to detect and sometimes misdiagnosed as a pneumothorax. Thoracic CT scan examination is more sensitive and accurate than chest x-ray to detect bulla, number, size and location of bulla, especially if they are not clearly visible on chest x-ray. Patients who qualify for surgery are patients with giant bullae that occupy a quarter or more of one hemithorax.[7] In this case, the appearance of multiple bullae in both lung fields with varying sizes.

4. Conclusion

We present a case of a 32-years-old male with multiple bullae, completed history of tuberculosis treatment and suffered from asthma since childhood but not controlled. In this case, the likelihood of multiple bullae in asthmatic patients, need to be a concerned, as well as the importance of evaluation and strict follow-up to reduce shortness of breath and improve the patient's quality of life. Surgery is recommended to patients when shortness of breath gets worse and meetthe requirements for surgery, if the giant bulla occupies a quarter or more of one hemithorax.

Compliance with ethical standards

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Disclosure of conflict of interest

None to declare.

Statement of informed consent

Written informed consent for the publication of this study was obtained from the patient's family. A copy of the consent form is available upon request.

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