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Case Report

Giant Bullae as a Great Mimicker of Pneumothorax in a Symptomatic Young Adult Individual Seen on CXR and CT Chest

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Abstract

Giant pulmonary bulla (Vanishing Lung Syndrome) is a rare condition which is usually associated with male gender and smoking habits. Sometimes such patients may present with symptoms like chest pain while other patients may become asymptomatic.

In this report we describe a patient with a giant pulmonary bulla occupying the whole right upper lobe inferiorly compressing the middle lobe and lower lobe with transmediastinal herniation at the level of the anterior junctional zone as per CT Chest, who had history of occasional attacks of lower right chest pain.

Having diagnosed the patient in our facility, he was referred to another facility for possible bullectomy.

Keywords: *Giant Bullae; Pneumothorax; CXR and CT Chest*

Case Report

A 34-year-old African man presented to the respiratory clinic for right lower chest pain that had bothered him for 4 months.

A diagnosis of pneumothorax was made 2023, based on chest radiograph. There was no history of any severe respiratory infection in childhood, and he had generally been in good health all his life. He was a never smoker, and denied any exposure to environmental tobacco smoke or biomass fuel.

He worked as a businessman, which was the only job he had ever held. He did not any exposure to biological or industrial dusts, gases or fumes. He led a sedentary lifestyle, and had never taken any recreational drugs. There was no family history of respiratory illnesses.

He remained well until 2023 February when he began to experience right lower chest pain. This was not associated with exertional dyspnoea, orthopnoea, paroxysmal nocturnal dyspnoea or lower limb swelling.

He denied any significant cough, hemoptysis or wheezing.

He did not have constitutional symptoms such as fever, night sweats, anorexia or weight loss.

He also did not have any skin or joint complaints. A chest radiograph revealed increased lucency in the upper half of the right hemithorax.

This was followed by a chest computed tomography (CT) scan that revealed a large air filled cystic structure occupying the half of the right lung volume compressing the middle and lower lobes inferiorly with associated congested bronchovascular markings. and transmediastinal herniation to the left side through anterior junctional line.

Blood investigations including auto-immune markers like ANA and ANCA were done and turned negative.

Spirometry showed normal lung function.

Furthermore, radiological investigations which were done were: CXR and CT chest.

Below are the two radiological investigations performed to the patient: CXR and CT chest.

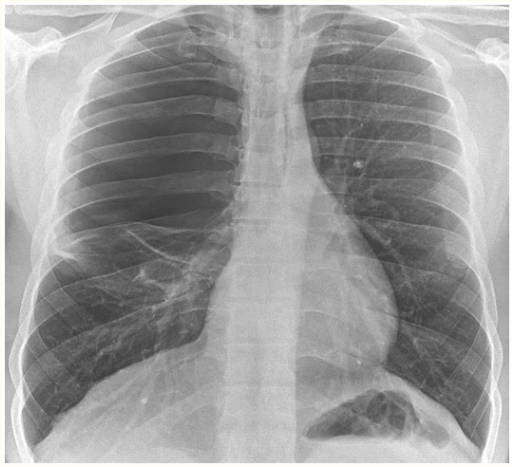

Figure 1

CXR PA view shows:

- The right upper zone show an area of hyperlucency.
- There is no bronchovascular markings seen.
- There is no pleural line observed.

Features are suggestive of: Pneumothorax/ddx; right upper giant bullae.

A chest computed tomography (CT) scan that revealed a large air filled cystic structure occupying the half of the right lung volume compressing the middle and lower lobes inferiorly with associated mild congested bronchovascular markings. and transmediastinal herniation to the left side through anterior junctional line.

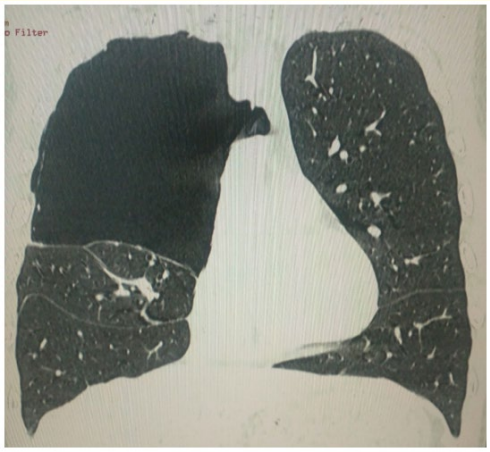

Figure 2

Discussion

Giant bullous emphysema, as described by Burke in 1937 [4], is a distinct clinical syndrome without any known cause characterized by progressive dyspnea and extensive, asymmetric predominantly upper lobe bullous emphysema which ultimately progresses to respiratory failure. Radiologically, giant bullous emphysema is defined as the presence of giant bulla in one or both upper lobes, occupying at least one-third of the hemithorax and compressing the adjacent normal lung [5].

Radiologically, bulla appear as radiolucent avascular area with thin curvilinear walls which are usually less than 1 mm in thickness and thus may not be visible sometimes on a chest X-ray which makes it difficult to detect and leads to misdiagnosis as a pneumothorax. The wall of the bullae when visible may sometimes be misinterpreted as a pleural line and can be confused with pneumothorax on a chest X-ray [6].

The size, distribution, and locations of bullae on high-resolution CT are predominantly subpleural or intraparenchyma. Moreover, it is important to note that two adjacent bullae in a CT can produce what is known as a false or apparent double wall sign, mimicking a pneumothorax. It can be avoided by viewing closely multiple images that show the absence of air in the pleural space and that the bulla wall is not parallel to the chest wall or parietal pleura [6].

To differentiate between a pneumothorax and a giant bulla, the double wall sign is used, which is seen on a CT of the thorax when there is air on both sides of the bulla wall parallel to the chest wall. The absence of this sign rules out pneumothorax; hence, careful viewing can prevent further mishaps and iatrogenic injuries [6].

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Pneumothorax is a serious complication in patients with an already compromised lung function and in those with a prior respiratory disease history which requires immediate placement of an ICT.

Therefore, distinguishing carefully between bullae and pneumothorax is important to avoid iatrogenic pneumothorax or bronchopleural fistulae in patients with bullous disease.

Large bullae presenting without symptoms are usually treated conservatively or managed with bronchoscopy with the placement of bronchial valves or lung volume reduction coils. The indications of bullectomy are scarce. Bullae usually progress gradually, but there are some cases that report the spontaneous resolution of giant bullae. Bullectomy, however, is the mainstay of treatment for tension bullae. Patients with non-functioning bullae which compress normal tissue and occupy space in the chest cavity benefit the most from surgical procedures. Giant bullae can be removed surgically in case of an increasing size of bullae, pneumothorax, respiratory distress, hemoptysis, and infection in bullae. A better post-surgical result and prognosis are obtained in patients without underlying lung disease [9].

Conclusion

The case shows the importance of distinguishing between giant bullae, tension bulla, and pneumothorax, especially before intervention. Chest X-rays sometimes can be difficult in differentiating these entities. A CT of the thorax is more helpful, especially if there is the presence of a double wall sign. Close viewing of CT images can be helpful in differentiating the double wall sign from the apparent double wall sign. The correct diagnosis can prevent iatrogenic mishaps and determine the care plan and management accordingly.

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