Radiology Forum

A Large Bulla Simulating Diaphragmatic Eventration

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CLINICAL SUMMARY

A 50-year-old male who was a heavy smoker, presented with complaints of gradually progressive exertional dyspnoea and cough with minimal sputum production for the last seven years. There was no history of chest or abdominal pain, fever, wheezing or vomiting. He also denied any history of trauma. On examination, the patient was comfortable; vital signs and oxygen saturation on pulse oximetry were normal. There was no cyanosis, peripheral oedema or clubbing. On respiratory system examination, vesicular breath sounds with prolonged expiration all over the chest and reduced intensity in the left infrascapular region were evident. Rest of the systemic examination was unremarkable.

INVESTIGATIONS

The haemogram, renal and liver biochemical tests were within the normal range. Chest radiograph (postero-anterior view) (Figure 1) revealed a large hyperlucent area in the left lower zone devoid of any vascular markings, with a smooth and convex upper border of less than 2mm thickness, and a nearly horizontal inferior margin. Its upper border reached almost halfway up the hemithorax, extending from the mediastinum to the lateral chest wall. There was a slight shift of the lower mediastinum to the right. Spirometry showed severe airflow limitation [forced expiratory volume in the first second (FEV_1) to forced vital capacity (FVC) ratio 37%; FEV_1% predicted 26%]; there was a non-significant increase after inhalation of salbutamol.

Based on the radiographic appearances, a differential diagnosis of diaphragmatic eventration, paralysis, diaphragmatic hernia, left lower lobe bulla, loculated hydropneumothorax, gastric volvulus and a lung abscess were considered. Ultrasound examination of the chest did not reveal any fluid in the left pleural cavity and the hemidiaphragm was in the normal position. The sniff test showed a normal

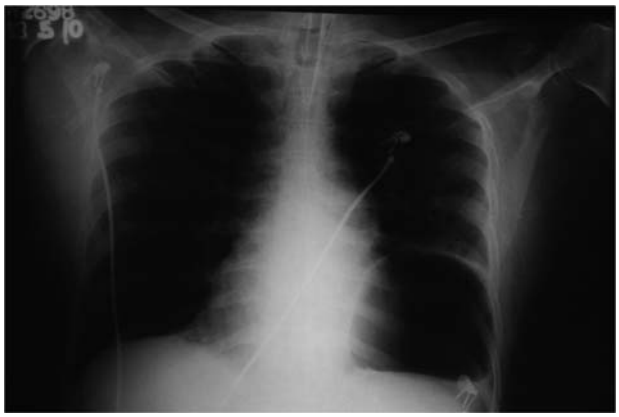

Figure 1. Chest radiograph (postero-anterior view) showing a large hyperlucent area without any vascular markings with a smooth, thin and convex upper border reaching almost halfway up the hemithorax.

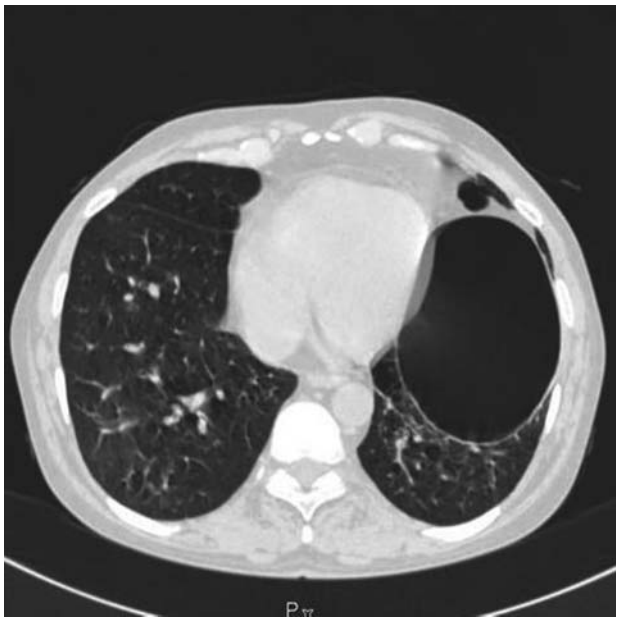

Figure 2. Computed tomography of the chest (lung window) showing a large bulla in the left lower lobe.

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diaphragmatic motion. Computed tomography (CT) of the chest (Figure 2) revealed a large bulla, well within the confines of the left lower lobe, with sharp and thin margins along with widespread centrilobular emphysema. The left hemidiaphragm was identified intact, just below the bulla.

DIAGNOSIS

Chronic obstructive pulmonary disease (COPD) with a large left lower lobe bulla.

DISCUSSION

The differential diagnosis for the radiographic appearance of a hyperlucent shadow in the left lower zone with a curved upper border reaching halfway up the chest giving the appearance of an elevated diaphragm included diaphragmatic eventration or paralysis, diaphragmatic hernia, left lower lobe bulla, loculated pneumothorax and a lung abscess and a gastric volvulus. A diaphragmatic eventration is most often congential due to an incomplete muscularisation of the diaphragm resulting in a hypoplastic and attenuated structure with little or no ability to contract. Congenital eventration usually manifests at birth with severe cardio-respiratory symptoms.[1] Acquired eventration is a condition of paralysis of the diaphragm, most often unilateral, and can occur secondary to trauma, head and neck surgeries, neuromuscular disease and neoplastic infiltration of the phrenic nerve. Chronic paralysis leads to muscular atrophy.[2,3] When the eventration is complete, it is associated with the presence of abdominal contents in the thoracic cavity making it difficult to distinguish from a diaphragmatic hernia. A wide sub-diaphragmatic space provides potential space for the abdominal viscera such as stomach to rotate on their axis resulting in volvulus. The distended stomach may give the appearance of a hyperlucent area in the left lower zone.[4] The clinical picture, absent sniff test and normal motion of the diaphragm ruled out eventration and paralysis as the possible causes in the present case. Diaphragmatic hernias may be congenital or acquired, the latter often arising out of trauma or raised intra-abdominal pressures, and may present as an emergency in the neonate or may be asymptomatic.[5] However, no diaphragmatic defect was detected on the CT of the thorax.

Although the somewhat horizontal lower border of the lucent shadow raised the possibility of a fluid level, a lung abscess was ruled out clinically because of the absence of characteristic features of fever, copious foul-smelling sputum and CT of the chest. A gastric volvulus usually presents as an acute abdominal emergency and was thus clinically ruled out. Rarely, gastric volvulus can present as a chronic condition. However, CT of the chest ruled out this possibility as well as a loculated hydropneumo-thorax. Finally, the CT appearance confirmed a large left lower lobe bulla.

The patient was treated for COPD and an option for a surgical removal of the bulla was discussed with the patient. But, the patient did not give consent for undergoing surgical intervention. Subsequent chest radiographs on several occasions have revealed no change in the size of the bulla.

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