

Giant Bulla or Tension Pneumothorax- Diagnostic Dilemma in Emergency: A Case Series

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Abstract: A single giant bulla or multiple emphysematous bullae that coalesce to form a giant bulla can give the impression of tension pneumothorax on chest radiography. We hereby report a series of two rare cases presenting with increased dyspnea having large hyperlucent area on right side with mediastinum shift to the left on chest X-ray. This radiologic pattern was consistent with tension pneumothorax; however, the clinical scenario was not keeping with this diagnosis (absence of shock, jugular venous pressure elevation or muffled heart sounds). Computed Tomography of the chest was done subsequently which revealed a giant emphysematous bulla on right side in both the cases. The relatively stable vitals of the patients at the time of presentation provided us the opportunity to do Computed tomography of Thorax and prevent the undesirous complications of putting intercostals tube in a Bulla. Both the patients were evaluated for surgical intervention as bullectomy is the treatment of choice for giant bulla and referred for cardiothoracic surgery.

Keywords: Giant Bulla, Tension Pneumothorax, Emphysema, Dyspnea, Smoking, Computed Tomography.

INTRODUCTION

A Bulla is an air containing space greater than 1 cm within the lung parenchyma that arises from destruction, dilatation and confluence of airspaces distal to terminal bronchioles. It occurs in several clinical contexts namely[1]. Bullous Emphysema particularly paraseptal variety; 2. So called Vanishing Lung Syndrome where parenchyma is rapidly replaced by multiple bullae and 3. In otherwise normal lungs (Bullous Lung Disease)[1].

Giant Bullae, Tension Pneumothorax and Atypical (clustered) Pneumothorax can produce similar signs and radiological appearances, therefore should be differentiated in detail when chest radiography presents with large lucent areas with mediastinal shift so as to prevent misdiagnosis and wrong treatment that may be life threatening[2]. Here we present a case report of 2 patients with Giant Bulla mimicking Tension Pneumothorax on chest roentgenogram. In our case the stable vitals of the patients provided us ample time to confirm our diagnosis by doing Computed Tomography Thorax and proceed for the correct management accordingly. So one must be vigilant regarding clinical history, physical examination and radiology for true

diagnosis especially in acute presentation of the patients in emergency department.

CASE REPORT

CASE 1

A 76 years old male smoker with a background of chronic obstructive airways disease was admitted with a gradually progressive breathlessness since 3 years, MMRC (Modified Medical Research Council) grade III dyspnea since last 3 days associated with a productive cough. Patient was chronic smoker having smoking history of 50 pack years. There was no history of any past medical illness. He reported no allergies. Physical examination revealed an elderly male alert and oriented, with respiratory distress. Vitals were stable. Chest examination reveals barrel shaped chest with accessory muscles of respiration in use. Trachea was centrally placed. Vocal fremitus was decreased on right with hyper resonant note on same side. Chest auscultation showed decreased air entry on right side with bilateral expiratory wheeze. On cardiac examination apex beat was shifted laterally. Rest of the examinations were unremarkable. Chest X ray showed hypertranslucent right lung with shift of mediastinum to the left simulating tension pneumothorax (Figure 1). A Computed Tomography chest was subsequently

performed. This revealed multiple sub pleural bullae in bilateral upper lobes and a large emphysematous bulla (9.2x9.4x18cm) involving the right lower lobe with a shift of the mediastinum to the left (Figure 2). FEV1

was 41% of predicted, DLCO 32% of predicted, RV/TLC 184% of predicted, and due to severe impairment of pulmonary functions and diseased underlying lung, patient was managed conservatively.

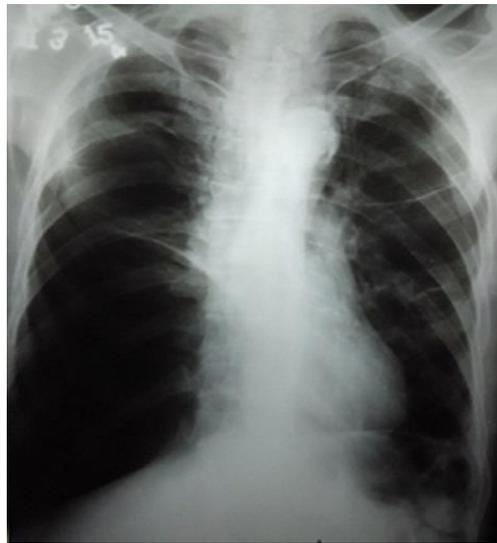


Fig 1: Chest Radiography showing hyper transradiancy with absence of vascular markings on right lower lobe with mediastinal shift to left side



Fig 2: CT Thorax showing bilateral bullous lung disease with giant bullae on right lower lobe (in sagittal section)

CASE 2

A 43 years old non smoker male presented with gradually progressive breathlessness since 5 years initially with MMRC grade II dyspnea and now grade III dyspnea since last 15 days associated with right sided chest pain. Respiratory system examination showed tracheal shift to left side with hyper resonant note and decreased air entry in all the areas on the right side. Apex beat was also shifted to left. Other system examinations were unremarkable. On Chest X ray a large hyper luscent area was present on right hemi

thorax with left side mediastinal shift (Figure 3). Chest CT revealed large emphysematous bulla (19.1 x16.3 x 25.2 cm) in right lung with underlying lung collapse suggesting giant bullous emphysema. Paraseptal emphysematous changes were also noted in left upper lobe (Figure 4). Alpha 1 antitrypsin level was within normal limits. Pulmonary function tests showed FEV1 24% of predicted, DLCO 50% of predicted, RV/TLC 277 % of predicted. The patient was counselled for bullectomy and referred to cardiothoracic surgeon to delineate plans for surgery at a appropriate time.



Fig 3: Chest radiography showing large hyperlucent area over the entire right hemi thorax.

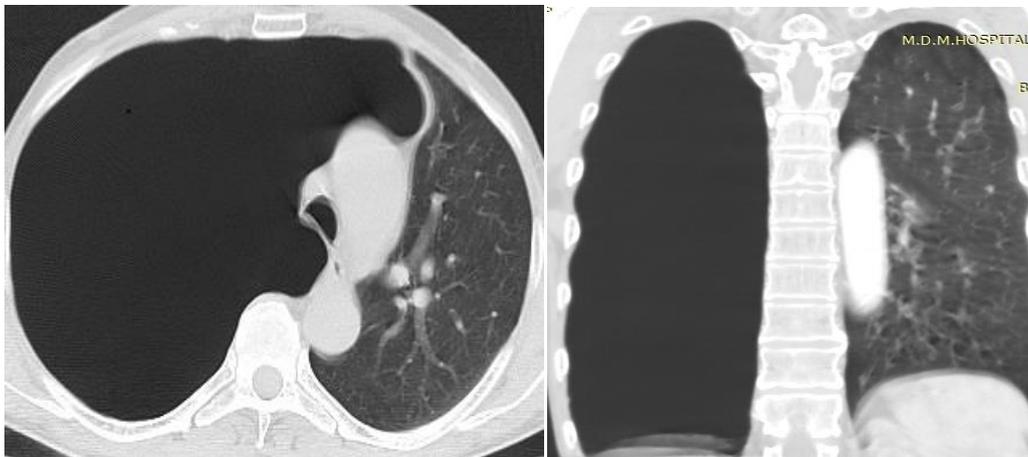


Fig 4: Computed Tomography of chest demonstrate a giant bulla involving complete right lung with compressive atelectasis of underlying lung and mediastinal shift to left.

DISCUSSION

The Bullous disease is reserved for multiple bullae in lungs that are otherwise normal [1]. It was originally reported by Burke in 1937, who coined it as Vanishing Lung Syndrome[3].

This entity is different in etiology and pathogenesis from that of the bullae occurring in conjunction with underlying chronic obstructive pulmonary disease[1].

The various genetic and acquired conditions that are associated with development of bullous Emphysema are smoking, intravenous drug abusers, α -1 antitrypsin deficiency, vanishing lung syndrome, genetic disorders like Ehler Danlos and Marfan syndrome[4,5,6].

Giant Bulla refers to the enlargement of one or more bullae to such a degree that they fill more than one-third of the hemithorax[7].

Giant bullae can gradually progress into tension bullae due to check valve mechanism of air trapping which has a growing mass effect on underlying lung parenchyma as well as mediastinum compromising lung ventilation and gaseous exchange[2].

Infrequently Giant bullae may reach a size sufficient to simulate tension pneumothorax which is even more compounded by the clinical presentation of Tension Pneumothorax. In such scenario CT scans are the gold standard to distinguish giant bullae from pneumothorax [9]. On CT scan, bullae appear as avascular areas with curvilinear boundaries [10]. Without visualization of the outer wall of the bullae, a large airspace in the chest could be pneumothorax or bullae. Double wall sign is a valuable sign that help to distinguish a pneumothorax from adjacent giant bullae[9].

At times the patient condition doesn't allow us to go for CT chest and immediate intervention is required. But whenever time permits especially when

vitals are relatively preserved (as in our cases) one should try to go for CT thorax. The above decision should not be based on patient's or physician's anxiety, it should be based on objective clinical assessment of the patient. Time taken to get CT done and availability of in-house CT scan may be the other factors influencing one's decision of CT or Intercostals tube drainage. Moreover, timely done CT thorax will prevent unintentional placement of the chest tube into the giant bulla which can cause iatrogenic pneumothorax, hem thorax, shock or death as mentioned by Mac Duff *et al.*; [8].

Patients having giant bulla compressing adjacent normal lung tissue carry better surgical outcomes than those with underlying emphysematous lung [7].

Clearly further studies on the clinical parameters associated with better outcomes with "Immediate Intercostals Drainage" or "First CT approach" may shed more light on the protocol and help to distinguish uncomplicated bullous lung disease from that of pneumothorax.

CONCLUSION

Giant bulla may mimic tension pneumothorax, so the decision whether to take informed calculated risk of intercostal drainage or to go for Computed tomography Thorax should be carefully evaluated. We believe if patient is not in shock and one can auscultate cardiac sounds, CT Thorax could be more safer than going for Intercostal drainage blindly. The management of two conditions are very different, and misdiagnosis may be catastrophic.

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