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CASE REPORT

DRAMATIC AND EARLY COMPLETE RESOLUTION OF LOBAR COLLAPSE IN YOUNG PATIENT OF BRONCHIAL ASTHMA: A CASE REPORT FROM RADIOLOGIST PERSPECTIVE

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ABSTRACT

To A 30 year old female with known history of bronchial asthma since five years presented to emergency department with acute shortness of breath and left sided pleuritic chest pain since one day. Imaging with initial chest x-ray reveal left lower lobe lung collapse with ipsilateral tracheo-mediastinal shift. On CT scan complete cutoff of the left lower lobe bronchus was seen. With conservative management including inhaled bronchodilators and intravenous corticosteroids and physiotherapy treatment; dramatic and complete resolution of lobar collapse seen within period of 4 days without any residual changes. Such dramatic changes have never been perceived in our radiology experience and literature review, which we report as interesting case.

Key words: Asthma, Complete resolution, Early, Lobar collapse

INTRODUCTION

Atelectasis is a well-known complication of asthma. It is usually segmental or lobar and is more common in children than in adults. The middle lobe is most frequently involved. Massive collapse of lung involving more than one lobe is uncommon; however collapse of an entire lung has been reported very rarely.[1,2]

Lobar atelectasis is caused by a variety of mechanisms including resorption atelectasis, which is due to airway obstruction, passive atelectasis which results from hypoventilation, compressive atelectasis due to abdominal distension and adhesive atelectasis because of increased surface tension. Lobar collapse is relatively common and occurs following obstruction of a bronchus. Mucus plugs cause more often left lower lobe collapse and foreign bodies more often right lower lobe collapse.[3]

CASE REPORT

A 30 year old female presented to emergency department with acute shortness of breath worsening since one day, cough and left sided pleuritic chest pain. She was a known asthmatic since five years, however, non-compliant with her medications. She was afebrile, her respiratory rates were 22 per minutes, PaO2 of 7.5 kpa, heart rate 88 per minutes. Her initial evaluation with chest x-ray revealed signs of collapse in left lower lobe with elevated left hemidiaphragm and tracheo-mediastinal shift towards same side. On plain x-ray there was abrupt cut off of left lower lobe bronchus. **(Figure 1)**

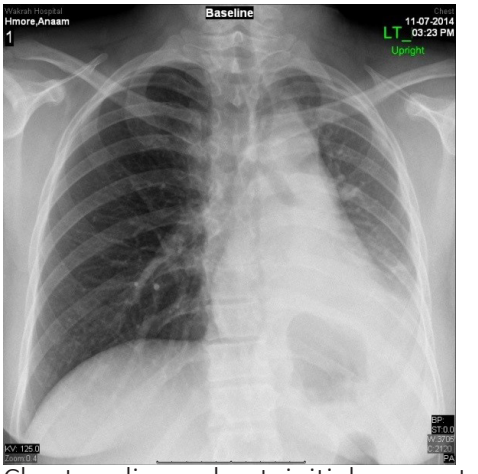

Figure 1: Chest radiograph at initial presentation; show collapse of left lower lung parenchyma with signs of volume loss. Note the abrupt cut off of left bronchus.

Figure 2: Contrast CT of chest show complete collapse of left lower lobe, confirmations of chest X ray findings.

With clinical suspicion in afebrile patient of acute shortness of breath pulmonary embolism was suspected and she underwent CT pulmonary angiography. The CT findings were negative for pulmonary thromboembolism. There was abrupt cut off of left lower lobe bronchus with lobar collapse of left lower lobe. Signs of collapse in CT scan were bronchovascular crowding, elevated left hemidiaphragm, and ipsilateral tracheo-mediastinal shift with compensatory overinflation of rest of the lungs. Mosiac attenuation with prominent bronchi represented chronic small airway disease. **(Figure 2)** Rest of the lung parenchyma was normal.

The patient was treated empirical intravenous antibiotics, the sputum culture revealed no organisms. She was on nebulization with bronchodilators, intravenous corticosteroids and regular physiotherapy. Later bronchoscopy was planned which was delayed. But in the morning when bronchoscopy was planned, she had chest x-ray done. This to the surprise revealed normal lung parenchyma bilaterally. **(Figure 3)** For confirmation of the findings low dose non-contrast CT of chest was done which show normal bilateral lung parenchyma. No residual atelectasis, ground glass opacities or consolidation were seen. Even bilateral lung parenchyma was completely normal with no signs of diaphragmatic elevation or mediastinal shift as seen in previous images. **(Figure 4)** The cause of the acute lung collapse probably is expected to be the mucous plug which subsequently was cleared with conservative management.

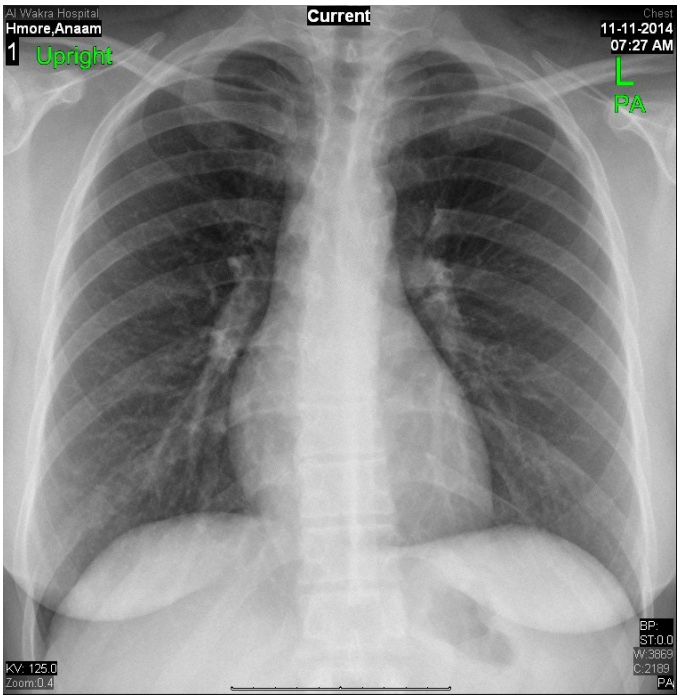

Figure 3: Chest radiograph in less than 4 days after initial presentation show complete resolution of the findings.

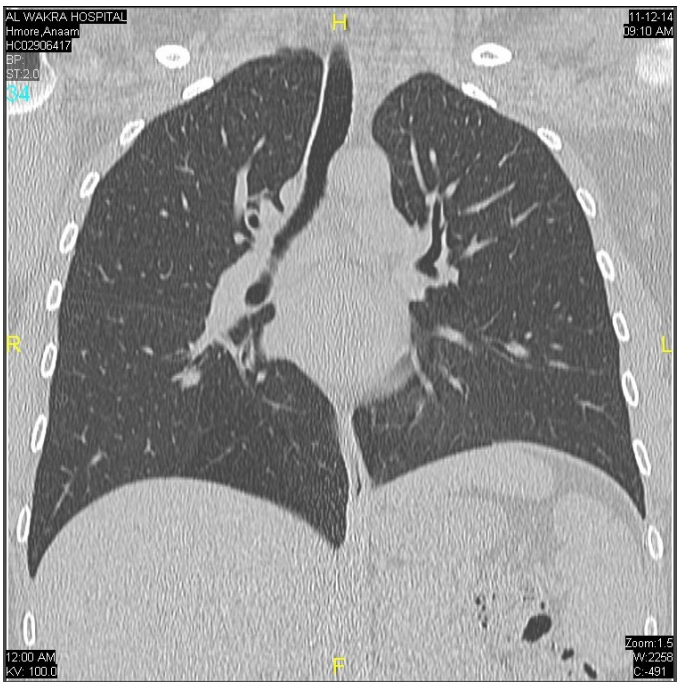

Figure 4: Low done non contrast CT chest done show no trace of any lung pathology and complete resolution of the pathology.

DISCUSSION

These dramatic changes were observed within 90 hours of conservative treatment, which is less than 4 days of admission. Such a dramatic and complete reversal of findings was never encountered in our department or individual experiences. Referring to various literatures also we could not find such interesting and dramatic reversal of the lobar collapse findings, to surprise happening in conservative management. Generally the lung collapse is expected to improve gradually with remaining atelectasis or consolidation. This kind of dramatic and complete treatment within 4 days with only conservative treatment is rarely reported.

There are some literatures that discuss about accelerated treatment with bronchoscopic removal of the impacted mucus. But in our case bronchoscopy was not performed and managed conservatively. However, evidence-based studies on the management of lobar atelectasis are lacking. Chest physiotherapy, inhaled and intravenous corticosteroids, nebulized DNase and fibreoptic bronchoscopy are useful in patients with mucous plugging of the airways. In passive and adhesive atelectasis, positive end-expiratory pressure is helpful adjunct to treatment.[4]

Fibreoptic bronchoscopy can aspirate secretions, and has been used in the management of proximal airway obstruction, and has been found to resolve atelectasis successfully in 26 of 35 (74%) paediatric intensive care patients.[5] However in a small randomized control trial, fibreoptic bronchoscopy did not improve the rate of resolution of volume loss in comparison with chest physiotherapy, and in contrast, it may have adverse effects on intracranial pressure.[6]In patients with acute bronchoconstriction, a bronchodilator increases airway diameter and hence improves secretion clearance, but there are no published studies evaluating its use in the management of atelectasis in asthmatic or non-asthmatic patients. In infants and children with bronchiolitis, nebulised adrenaline (epinephrine) is beneficial to decrease airway mucosal edema and hence increase airway diameter which may be more beneficial than bronchodilators.[7]

Treatment and prognosis are clearly dependent on the cause of collapse. If the cause is a mucus plug or foreign body which is diagnosed early and if removed promptly, re-expansion of the lung is early and return to normal function is expected with resolution of symptoms and no long term consequences.

CONCLUSION

Thus we report this interesting case report of dramatic, complete and early resolution of the lobar lung collapse in known case of bronchial asthma. To the best of our knowledge, reviewing literature and individual experience, such early resolution of pathology have ever been reported.

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