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SPONTANEOUS PNEUMOTHORAX IN PATIENT WITH CHRONIC EXPOSURE TO PORCELAIN DUST

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ABSTRACT
Porcelain is a ceramic material with wide number of applications. Chronic exposure to porcelain dust which contains crystalline silica dust can cause silicosis, a preventable occupational disease. This is a rare case report of a patient who was working in a manufacturing sector of electrical insulators made up of porcelain since 35 years. Patient presented with history of gradual onset of difficulty in breathing since 15 days associated with occasional cough. CXR showed left sided pneumothorax with passive collapse of left upper lobe with mediastinal shift to right side. Patient was managed with Intercostal drainage placed at left 4th intercostal space. Lung expanded over 48 hours where he was shifted to ward on 3rd day after removal of tube and later discharged home on 5th day. This case report mainly highlights about a rare case of spontaneous pneumothorax in patient who exposed to long term porcelain dust which contains silica.

INTRODUCTION

Porcelain dust contains silica which is known to cause silicosis. Pneumothorax is a rare feature of porcelain exposure. Pneumothorax is a case of life threatening medical emergency. Delay in diagnosis or appropriate intervention can lead to increased morbidity and mortality. This case report highlights about a rare case of spontaneous pneumothorax in patient who was exposed to porcelain for long time.

CASE REPORT

This is a case report of 64years old male, a worker in porcelain factory since 35 years, presented with history of gradual onset of difficulty in breathing since 15 days and aggravated since 1 day, associated with occasional cough. On initial evaluation in the emergency department (ER), patient found to be conscious and oriented. Vitals such as heart rate-94beats per minute, Blood pressure-130/90mmhg, oxygen saturation-90% on room air increased to 100% with 6 liters of oxygen through face mask. On auscultation, decreased breath sounds over the left half of the chest with hyper resonant note on percussion. Chest x-ray was done which showed left sided pneumothorax (Figure-1). CT chest revealed left sided pneumothorax with passive collapse of left upper lobe, lingual and apical segment of left lower lobe with mediastinal shift to right side (Figure-2 and 3). Complete blood picture such as Hb 14.7gm/dl, total leucocyte count 6200 cells/cu mm, platelets 2.7 lakhs/cu mm, serum electrolytes, LFT, RFT. PT, INR and APTT all were normal. 2D echo was normal, Pleural fluid was sent for analysis which showed WBC - 407, glucose-10, LDH-73, protein-0.29, gram stain shows, acid fast bacilli and cytology were negative. Diagnosed as spontaneous hydro-pneumothorax secondary to chronic exposure to porcelain. Immediately after written and informed consent, under strict aseptic precautions 24G Intercostal drainage tube was inserted in the left 4th intercostal space along the anterior axillary line. He was treated with intravenous fluids, Nebulization, DVT and gastric ulcer prophylaxis. Lung expanded over 48 hours (Figure-4) where he was shifted to ward on 3rd day after removal of tube and later discharged home on 5th day.

Fig 1.

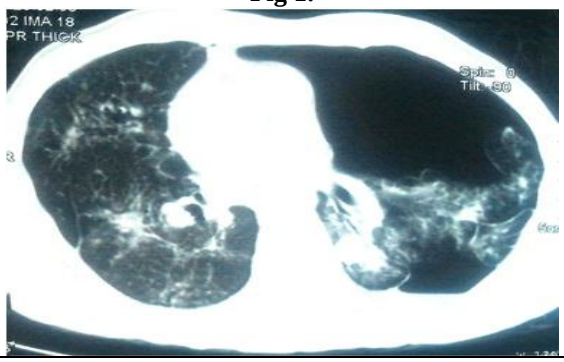


Fig 2.

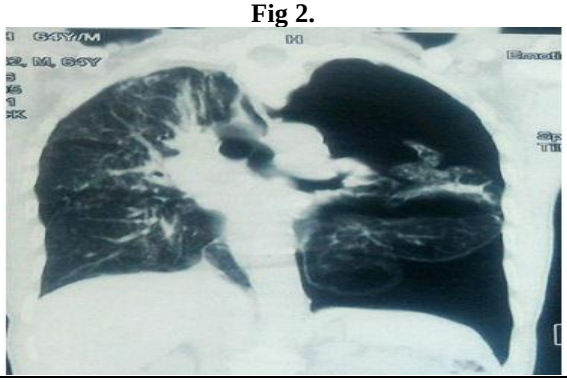


Fig 3.

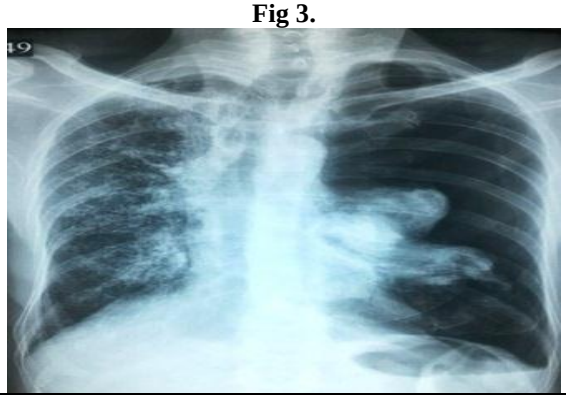
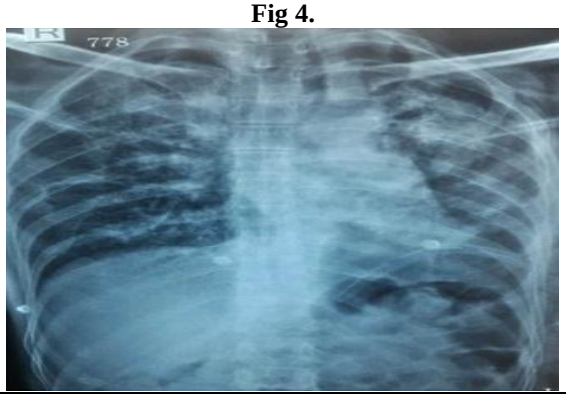


Fig 4.



DISCUSSION

Porcelain is a ceramic material formed by heating kaolin (China clay) which is a clay mineral containing layered silicate [1]. It is well known for its features of low permeability, elasticity and high resistance to thermal shock. Porcelain has wide number of applications such as pottery, electric insulating material (due to its insulator property at high voltages), tiles or panels for buildings, bathroom fittings and casings of bathroom. Our patient was working in a manufacturing sector of electrical insulators for 35 years which consists of porcelain as its primary agent. The working environment was filled with fine particles of porcelain.

Chronic exposure to porcelain dust which contains silica results in silicosis which is a preventable occupational lung disease [2]. The lung disease depends upon the duration of exposure to silica dust, such as simple silicosis (6 months to 2 years exposure) and silico proteinosis to progressive massive fibrosis (more than 20years). The main reason for lung fibrosis is due to activation of macrophages which in turn release chemotactic and fibrogenic factors. Clinical features include chronic cough, difficulty in breathing, fever, pleuritic chest pain and fatigue. Our patient had only acute history of difficulty in breathing and occasional cough. Silicosis may be associated with autoimmune disease such as rheumatoid arthritis, lupus and progressive systemic sclerosis [3].The diagnosis is made based on history of exposure, chest x-ray (nodular or reticular patterns in the upper lobe) and pulmonary function tests (restrictive/obstructive pattern, reduced FEV1, diffusing capacity, total lung capacity and lung compliance) [4]. Our patient had nodular opacity mainly upper lobes and pneumothorax which is a rare presentation). The differential diagnosis includes fungal infection, miliary tuberculosis, sarcoidosis or idiopathic pulmonary fibrosis. Treatment is mainly targeted to decrease inflammatory response to silica in the lungs with steroids [5] or sometimes whole lung lavage [6]. Mortality which was around 1000 deaths annually during 1920s and 1930s [7], has reduced significantly to 165 in 2004 [8]. The risk of developing silicosis depends upon the lifetime exposure of workers to the crystalline silica. Silicosis prevention has been advised in three different stages such as primary, secondary and tertiary prevention. In primary prevention workers have been advised to regarding using personal protection measures and monitoring of fraction of respirable dust. Secondary prevention mainly deals with cessation of smoking and monitoring of tuberculosis infection. Treatment of respiratory failure and airflow limitation is the tertiary prevention. This case report mainly highlights about a rare case of spontaneous pneumothorax in patient who was exposed to long term porcelain dust.

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DECLARATION OF INTEREST

None declared.

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