

CASE REPORT

Pulmonary Talco-silicosis in a Balloon Making Industry Worker

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Abstract:

We report a case of a thirty eight year old lady, working in balloon making industry. She was referred to us in view of incidental chest X-ray changes found during preoperative pulmonary evaluation. She was asymptomatic from respiratory point of view. Chest X-ray was suggestive of bilateral reticulonodular opacities. HRCT thorax revealed interstitial lung disease. Spirometry was suggestive of restrictive abnormality. Subsequently the powder which patient used to instill in balloon before inflating was brought for analysis which revealed 32.73% silica. Hence diagnosis of talco-silicosis was made, in the absence of any other cause for lung involvement.

Keywords: Talcosis, Silicosis, Balloon Maker

Introduction:

Pulmonary talcosis is pulmonary disorder caused by talc inhalation. It is a type of pneumoconiosis. Talc is a mineral widely used in ceramic, paper, plastic rubber, paint and cosmetic industries. Four distinct forms of pulmonary disease caused by talc have been defined; 1) Talcosis 2) Talcosilicosis 3) Talcoasbestosis are associated with inhalation of talc, and the fourth form is result of intravenous administration of talc seen in intravenous drug users who inject medication intended for oral use. We describe a case of occupational talco-silicosis.

Case Report:

A thirty eight years old woman was referred to our department in view of chest X-ray changes on preoperative evaluation. She was recently

diagnosed to have acoustic neuroma and surgery was planned for the same. On enquiry, she gave history of exertional breathlessness since last 3 months, however denied any other respiratory symptoms. She was working in the balloon making industry since thirty years. Her job involved instilling talc powder in the balloons as lubricant before inflating them which lead to unrecognised accidental talc inhalation. Her respiratory system examination revealed bibasilar crepitations. Hematological and biochemical blood investigations and arterial blood gas analysis were normal. Chest X-ray showed bilateral reticulonodular opacities (Fig.1). High Resolution Computed Tomography (HRCT) of thorax revealed ill defined lesions with a centrilobular distribution pattern throughout the lung parenchyma bilaterally, with confluence into areas of apparent ground glass attenuation, no septal thickening or honeycombing (Fig. 2). Spirometry was suggestive of restrictive abnormality with FVC 1.79 liters (56% predicted). Chemical analysis of powder (Fig. 3) used as lubricant in balloons was done; its nature was talc powder and had 32.73% silica content. Hence she was diagnosed as a case of pulmonary talco-silicosis. She underwent an uneventful acoustic neuroma surgery and was subsequently discharged with advice to avoid further occupational exposure to talc.



Fig.1: Chest X ray showing Bilateral Reticulonodular Opacities



Fig. 2: HRCT Thorax showing Bilateral Reticulonodular Opacities and Interstitial Septal Thickening



Fig. 3: Photograph of the Powder Used During Balloon Making

Discussion:

Thorel reported the first case of talc pneumoconiosis in 1896 [1]. Following this there have been several written reports of talcosis; however, the presentation and course of disease can be varied. Pure talc is a phyllosilicate ($Mg_3Si_4O_{10}(OH)_2$) used in the cosmetic and pharmaceutical industries. Talc, or hydrated magnesium silicate, is formed during the breakdown and weathering of serpentine, tremolite, and anthrophyllite rock [2]. The fibrogenic properties of talc are attributed to these impurities, especially anthrophyllite and tremolite, which are members of the asbestos group of minerals. Talc pneumoconiosis has been described in several occupations, including talc mining and milling; manufacture of rubber cable and tires, accumulator plates, cosmetics, soaps, paints, and textiles; and sailing, since sailors dust life rafts with talc. Pulmonary disease due to talc is almost exclusively encountered secondary to occupational exposure or intravenous drug abuse. Talcosis or talc pneumoconiosis is one of the rarer forms of silicate induced lung disease. It has been described in workers exposed to talc during its production or its industrial use. Very often, the history of exposure is not recognised by the patient. However, talcosis can also be caused due to the use of cosmetic talcum powder. High-purity talc is used in cosmetic and pharmaceutical industries and there is no conclusive evidence that cosmetic talc, when used as intended, presents a health hazard [3]. Four different forms of pulmonary disease are identified. The first form, talcosilicosis, is caused by talc mined with high-silica-content mineral. Findings in this form are identical with those of silicosis. Talcoasbestosis closely resembles asbestosis and is produced by crystalline talc, generally inhaled with asbestos fibers. Pathologic and radiographic abnormalities

are virtually identical with those of asbestosis, including calcifications and malignant tumor formation. The third form, talcosis, caused by inhalation of pure talc, may include acute or chronic bronchitis as well as interstitial inflammation; radiographically, it appears as interstitial reticulations or small, irregular nodules, typical of small-airway obstruction. The fourth form, due to intravenous administration of talc, is usually associated with abuse of oral medications and production of vascular granulomas manifested by consolidations, large nodules, and masses [4].

Radiographic findings may include generalised haziness, nodulation and reticulation. However, the apices and costophrenic sulci are generally spared in talcosis. As in other forms of pneumoconiosis, nodule confluence results in large opacities that resemble those in progressive massive fibrosis. In some patients, hilar lymphadenopathy develops. HRCT findings in patients with talco-silicosis caused by inhaled particulates include small centrilobular and subpleural nodules and heterogeneous conglomerate masses with internal foci of high attenuation that are consistent with talc deposition

[5]. The characteristic histopathologic finding of the lung biopsy specimen is same as that of silicosis as silica content of talc causes talcosis i.e., silicotic nodule mostly located near the respiratory bronchiole. The nodule is composed of refractile particles of silica surrounded by whorled collagen in concentric layers, with macrophages, lymphocytes, and fibroblasts in the periphery. Emphysematous blebs surround the silicotic nodule, especially in the subpleural area. Birefringent crystals of silica in the center of a silicotic nodule may be identified by polarized light microscopy. For definitive identification, scanning electron microscopy combined with x-ray spectroscopy may be needed [6]. A simpler diagnostic approach involves chemical analysis of the powder/dust to which the patient has been exposed to in clinico-radiological correlation and absence of other differentials diagnosis. The powder analysis identifies the contaminant in talc obviating the need for an invasive lung biopsy. Our patient had relatively good health, and diagnosis of talco-silicosis was made on the basis of radiology and powder analysis, avoiding invasive procedure like lung biopsy.

References

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