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Case Report

Pathology Section

Pulmonary Talc Granulomatosis- An Uncommon Finding at Autopsy

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ABSTRACT

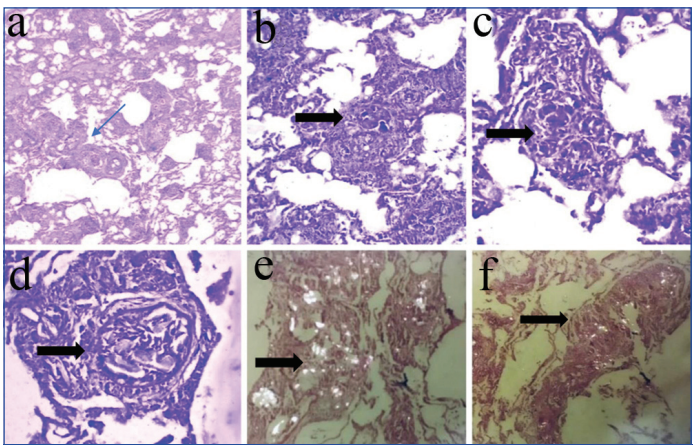
Talc is chemically hydrous magnesium silicate and used as lubricant of consumer goods, as well as, in various oral prescribed medications due to its diluting nature. Pulmonary disease secondary to occupational exposure of talc have been named as talcosilicosis and talcoasbestosis, inhalational exposure results in talcosis whereas, talc granulomatosis found intravenous drug abusers who inject tablets intended for oral use. Herein, The authors present the case of a 25-year-old deceased male whose heart and pieces of lung, liver and kidney were received for histopathological examination sections from heart, liver, kidney were histologically unremarkable. Microsections from lung tissue revealed multiple non caseating epithelioid cells granuloma with foreign body type giant cells mainly in perivascular area. Under polarised light, crystalline needle shaped foreign bodies seen mainly in the centre of granuloma. Final diagnosis of talc granulomatosis was given. Because, pulmonary talcosis has a very low incidence, the diagnosis can be a challenge therefore, it is essential to suspect this entity in all cases of granulomatous inflammation of lung to prevent misdiagnosis.

Keywords: Epithelioid granuloma, Polarised light, Talcosilicosis

CASE REPORT

A 25-year-old male whose postmortem viscera along with relevant details were received in the Department of Pathology. Organs including heart, piece of lung, liver and kidney were received fixed in 10% formalin for histopathological examination. Postmortem papers revealed no significant history of illness before death and history of any intravenous (i.v.) ous drug abuse or such exposures could not be ruled out so exact aetiology could not be commented upon. Neither any relevant investigations like past chest radiographs/Computed tomography (CT) scans of the deceased could be retrieved from postmortem papers.

Piece of lung, weighed 62 gm and measured 11x5.5x2.5 cm and grossly external surfaces were unremarkable. Haematoxylin and Eosin (H&E) stained microsections from lung tissue revealed numerous non caseating granulomas consisting of epithelioid cells, few lymphocytes and many foreign body type giant cells. These granulomas were concentrated in perivascular area seen [Table/Fig-1a-d]. Ziehl-Neelsen staining for acid fast bacilli and special stains like Periodic acid-Schiff (PAS), as well as, methenamine silver for fungal aetiology were non contributory. Under polarised light, talc like bright white crystals seen in the granulomas [Table/Fig-1e,f]. Remaining all organs submitted for histopathological examination was grossly and microscopically unremarkable. Final diagnosis of talc granulomatosis was given.



[Table/Fig-1]: Microsections examined from lung tissue show perivascular epithelioid cell granuloma with numerous foreign body giant cells (H&E stain 2X, 10X, 20X, 40X); (e&f) Microsections examined under polarised light show collection of bright white polarisable crystals which are diffuse but mainly centred around vessels.

DISCUSSION

Talc is a mineral with chemical formula for hydrous magnesium silicate and commercially used in combination with other constituents in various industries, pharmaceuticals and cosmetics [1]. Pure talc has lubricating quality due to microscopic shape in the form of plates or sheets [2]. Pulmonary talc granulomatosis is uncommon condition, first described in the 1960s [3,4]. Inhaled talc pneumoconiosis was first described in 1896 by Thorel C [5]. Pulmonary talc granulomas develop mainly in those, who inject oral tablets thus accounting for approximately 5% of drug abusers [3]. Methylphenidate (Ritalin), methadone, tripelennamine (Pyribenzamine), propoxyphene (Darvon), phenmetrazine (Preludin) and amphetamines are six different talc containing medications which have been reported to be associated with talc granulomas in drug abusers [3].

The pathogenesis of talc granulomatosis is not well described in literature however, talc being larger in size (>10 micron) is filtered by pulmonary bed vasculature. The reaction to talc is variable and only few talc particles that embolise results in an initial inflammatory arteritis followed by collection of neutrophils around that particle [3]. Later on, foreign body granuloma comprising of epithelioid cells and foreign-body giant cells develops resulting from a delayed hypersensitivity reaction after migration of particles to the pulmonary interstitial tissue and surrounding perivascular area [3,6].

The finding of foreign material crystals which are needle shaped or plate like and are birefringent under polarising light which are located perivascularly or intravascularly in the lungs is characteristic of intravascular talcosis due to intravenous injection of illegal drugs [3]. Foreign-body granulomatous reactions have also been mentioned in various organs, such as liver, spleen, retina, kidney, skin, pancreas, lymph nodes and bone marrow [7].

The most important and close differential of intravascular talcosis is talc pneumoconiosis which occurs as a result of

S. No.	Author/place	Age/gender	Year	Clinical diagnosis	H/o drug abuse	Histopathological examination
1.	Present case study Sonepat, Haryana, India	25/M	2023	No significant history found in postmortem papers	Drug history could not be ruled out	Multinucleate foreign body giant cells in perivascular area in lung sections which under polarised light showed bright white talc like crystals.
2.	Jasuja S et al., [3] California, USA	64/M	2017	Cough	No (Tobacco abuse and exposure to copious amounts of baby powder)	Foreign-body giant cell reaction with intracellular round to oval polarisable material in transbronchial biopsy
3.	Jaumally BA et al., [11] New Orleans	62/F	2019	Exacerbation of Chronic Obstructive Pulmonary Disease (COPD)	Yes (Tobacco smoker and early cocaine user)	Multinucleate foreign body giant cells and fibrosis, compatible with talc granulomatosis
4.	Krimsky WS and Dhand S [6] Cambridge, USA	53/M	2008	Radiologic imaging was mimicking malignancy	Yes (chronic smoker and heroine drug abuser)	Talc granulomatosis
5.	Siddiqui MF et al., [10] Arkansas	34/M	2013	Acute respiratory failure and seizures	No	Talc granulomatosis on biopsy
6.	Medford ARL et al., [12] UK	44/F	2005	Poorly controlled asthma	No	Talc granulomatosis on biopsy
7.	Low SU and Nichol A [13] UK	33/F	2006	Colitis with hypothyroidism	Yes (multiple drug intake)	Foreign body perivascular granuloma and needle shaped crystal on polarised light
8.	Weiner J et al., [14] New York	28/M	2012	Crohn's disease and pulomary hypertension	Yes (oral medications)	Multiple perivascular granulomas with birefringent crystals in lung, brain and heart
9.	Iqbal A et al., [15] New Delhi, India	38/F	2008	Sarcoidosis	No history of occupational exposure to talc or intravenous drug abuse	Transbronchial biopsy revealed numerous foreign body giant cells with birefringent particles and non -caseating granulomas, with predominance of macrophages
10.	Altraja A et al., [16] Estonia	24/M	2014	HIV and hepatitis C mimicking miliary tuberculosis	Yes (heroine, amphetamines) and chronic smoker	Perivascular foreign body granuloma with talc like material on electron microscopy

[Table/Fig-2]: List of reported cases of talc granulomatosis from published literature [3,6,10-16].

inhalation of microscopic dust [8]. As granuloma is a non specific histopathological finding alone, so multidisciplinary approach in the form of precise clinical details, laboratory testing, pulmonary function testing, radiological imaging, histopathological findings helped in arriving a conclusive diagnosis of granulomatous lung diseases. Various differential diagnosis for granulomatous lesions of lungs includes infectious causes such as mycobacteria and fungi and non infectious causes like sarcoidosis, necrotising sarcoid granulomatosis, hypersensitivity pneumonitis, hot tub lung, berylliosis, granulomatosis with polyangiitis, eosinophilic granulomatosis with polyangiitis, rheumatoid nodules, talc granulomatosis, Langerhans cell histiocytosis and broncho-centric granulomatosis [9].

Clinical presentation of talc granuloma can be in the form of dyspnoea, cough with expectoration, fever and weight loss. It can elicit inflammatory pneumonitis with alveolitis which can lead to irreversible pulmonary fibrosis. Various complications like respiratory failure and cor pulmonale can occur in long standing cases. High resolution computed tomography shows presence of enlarged lymph nodes, interstitial fibrosis, multiple diffuse nodular opacities and ground glass opacities however, confirmation needs to be done by histopathological examination [8].

Clinical, radiological and histopathological correlation could help in arriving the accurate diagnosis. Detailed clinical history, including occupational or remote exposures, spirometry tests, correlation with chest X-ray or CT scan and finally a lung biopsy could help in establishing the diagnosis of talcosis [11]. There are no defined treatment guidelines for pulmonary talc granulomatosis [12]. Till date, only few cases have been reported in literature [Table/Fig-2] [3,6,10-16].

It is emphasised that history is mandatory along with radiological correlation and biopsy play pivotal role to reach the final diagnosis of this rare entity. In all cases of multiple non caseating granulomatous inflammation of lung, a differential diagnosis of talc granulomatosis should always be kept.

CONCLUSION(S)

Talc granulomatosis in healthy adults is unusual condition, and its diagnosis can be challenging as the clinical picture and radiologic changes can mimic other common causes of granuloma like tuberculosis or fungal. Diagnosis of pulmonary talcosis may be challenging due to its rarity, unavailability of history of drug abuse, histopathological finding mimicking other granulomatous lung disease and lack of suspicion. Accurate history as well as biopsy are utmost importance and should always be investigated to reduce the mortality and morbidity.

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