

Clinical Note

Pain-driven suicide due to pleural plaques associated with asbestos exposure

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Asbestos is a nonflammable substance, which does not dissolve in water, and is resistant to friction and stretching, heat and acid. It has been in use for centuries, with increasing utilization in industrial production in the last 100 years. Asbestosis is defined as an occupational disease, leading to chronic problems upon the reaching of the dust, present in environments where asbestos is widely used, up to the alveoli. The size of the fibers (aerodynamic diameter), carries major importance in terms of whether the dust reaches the lung alveoli. The particles with a height/width ratio of 3/1 are called fibers. Among the most widely known diseases associated with fibers, is lung fibrosis (asbestosis) caused by asbestos fibers and lung cancer.¹

It has been mentioned that there are numerous asbestos warehouses and cases of asbestosis in Eskisehir in central western Turkey.² According to the information provided by the subject's family, this case involves an individual male, born in 1936 in Eskisehir where he lived in a sun-dried brick house in Eskisehir-Mihalliç until 1958 when he started his military service. After becoming a non-commissioned army officer (Sergeant), he worked for 25 years (20 years at the Eskisehir Air Force Hospital and 5-6 years at the Merzifon Air Force Hospital) as a medical equipment technician, repairing medical equipment. Until his retirement in 1984, he had a habit of smoking more than one pack of cigarettes a day for 25 years. An inspection of his file at the Dokuz Eylül University Hospital indicates the following: In March 2003, he sought medical attention at the Emergency Unit of the Dokuz Eylül Hospital, in the town of Izmir, complaining of fever and hypertension. The physical examination and investigations did not indicate any pathology, and the psychiatric consultation yielded an "anxiety" diagnosis. In April, he applied to the Respiratory Diseases polyclinic where a PA lung graphic established nodular densities, the largest of which was located in the central left zone. Shortly afterwards, a chest tomography was taken with a pre-diagnosis of asbestosis or mesothelioma, which indicated bilaterally distributed calcified benign pleural plaques (asbestosis). Abdominal and cranial tomographies did not indicate any pathology; he did not agree to undergo bronchoscopy. He then applied to

the General Surgery unit, complaining of an occasional swelling in the anus that could be manually felt for a period of 6 months. Consequently, he was diagnosed with a small hiatal hernia and erythematous gastritis and a sample taken from a non-branched polyp in the colon was diagnosed as "tubular adenoma." He then applied to the Internal Diseases Department, complaining of loss of appetite, constipation, indigestion, dyspepsia, dysphagia and weight loss, 7 kg over a period of 3 months. He complained of an increase in coughing, and was referred to the Chest Diseases Department. He refused to undergo a bronchoscopy as his symptoms had not worsened, his phlegm was minor and he had an acute fear of malignity. The bronchoscopy that he subsequently underwent a few days later, showed clear hyperemia, edema and fragility in the anthracotic pigment areas in the medial wall of the main bronchus of the right lung, and the mucus in the distal segment of the posterior segment of the upper lobe. The bronchial tissue of the biopsy material taken from the area indicated alveolar macrophage in the BAL (70%) and lymphocyte (30%). Shortly afterwards, he went to the emergency service complaining of sore throat, fever and bloody sputum. It was noted that his oral intake was damaged, that he was not able to swallow solid food, had fever reaching 38°C and suffered from night sweats and coughing; he was diagnosed with upper respiratory tract infection.

In the psychiatric consultation, it had been recorded that he was being monitored for "coherence deficiency with anxiety symptoms" and he had been using antidepressants and anxiolytic drugs (Cipram 1 x 1 and Xanax 0.5 gm 3 x 1) for 2 months, there had been a minimal decrease in his complaints of depression, his appetite had decreased and he thought he had lung cancer and feared death. It was recorded that despite the fact that his physician had told him this was not an important pathology, he had not been convinced, his medicines were prescribed and he was summoned for a control one month later. It was reported by his family that he thought "he had dirty blood circulating inside him, his lungs were rotting, he would be arrested for not submitting his hospital file, he was searched by the police officer," that a couple of days before his suicide he had pointed to his chest, saying "I wish I were dead, so that I could be saved," he could not sleep at night, he constantly listened to himself and had pain, and had left a "suicide note" before his death.

In July 2003, it was determined that he had died in the bathroom of his house, as a consequence of injuries by a cutting and piercing instrument, and evidence had been collected in the place of the incident

by the inspection teams. In the autopsy performed, it was determined that there were 11 blows of a cutting and piercing instrument in 4 structures on the left side of the chest, that all of the cuts described had been targeted in the body cavities, therefore causing death, and that his death had been due to internal and external bleeding caused by injuries by a cutting and piercing instrument. It was reported that the angle of the injuries was narrow, that the injuries by a cutting and piercing instrument had entered into the body cavities, but had not cut any organ or big vein, other than the stomach, thus, the death occurred slowly within a long timeframe and it was possible and probable for this to have been performed by himself.

Upon opening the chest cavity, it was observed that there were diffused white, hard polypoid structures with smooth surfaced pedicles of 0.5-11.5 cm in the parietal pleura in the pericard and diaphragms on both hemithoraxes, with the left one being more evident, the fibrotic nodules had caused retraction in the surrounding tissues (**Figure 1**). The histopathological evaluation of the widespread nodules revealed dense, almost acellular hyaline tissue showing minimal vascularity and nonspecific inflammatory exudates with focal calcifications. The microscopical picture was found to be consistent with 'benign pleural plaques'. It has not been determined that he had been exposed to asbestos in his working life, and it has been presumed that his asbestos exposure has been local and that he was exposed to asbestos in the house where he lived. It has been reported that he sought medical advice with respiratory difficulties and complaints about pain upon the manifestation of the relevant picture for a period of 20-40 years under asbestos exposure, and that asbestos was detected



Figure 1 - The white fibrotic nodules had caused retraction in the surrounding tissues.

with radiological analysis. It has been reported by his family, that he may have been exposed to asbestos until he started working, and during the period he worked, and that this picture had manifested for a long time. It has been reported that in cases related with asbestos, genetic propensity would be possible and that smoking was a severe predisposing factor.^{1,2} He had a history of smoking more than one pack a day over a period of 25 years until 20 years ago.

The prevalence of lung cancer in persons working in places where asbestos is used is 10-15 times more than the general population. Lung diseases occurring in relation with dust are frequently encountered in persons who smoke and have a genetic propensity (lack of alpha-1 antitrypsin enzyme). Furthermore, the amount of dust in the environment (concentration) and the exposure time to dust are also important. The disease is mostly observed in persons who have been working in dusty environments for 10 years or longer. The minimum period of dust exposure for the occurrence of the disease has been determined as 3 years.¹⁻³

Malign mesothelioma was indicated to be caused by different types of asbestos in the soil in many regions of Turkey and also utilized in the internal and external paintings of buildings, thus, constantly present in the breathing environment and by microfibers. There is tremolite, called white soil in the Southeastern region of Turkey, in Çermik and the surrounding areas, crocidolite called blue asbestos, which is a type of amphibole, amosite called brown asbestos and serpentine type chrysotile, called white asbestos in the provinces of Yozgat, Konya, Çankırı, Eskisehir, Tokat, Elazığ, Sivas Çorum, Kütahya, Malatya, Ankara, Diyarbakır, Niğde and İzmir.² The diseases caused by asbestos, and the mortality rate is not known due to the inability to obtain sound data with regard to asbestos. It has been determined that there have been 3922 deaths caused by asbestos between 1979-1992 in the US. The use of asbestos is being banned or limited all over the world, due to its cancerous characteristics. It is reported that in countries of rapid and non-inspected industrialization, this problem reaches much more severe degrees. The fact that asbestos leads to diseases or death, brings forth the forensic medicine aspect of the matter. It is necessary for employers or the state to assume responsibilities and form a causality relation.⁴

This patient had been diagnosed with widespread benign pleural plaques. The association between long-term asbestos exposure and benign parenchymal and pleural lung diseases are well documented in the literature. These are mainly pleural plaques, round atelectasis and nodular or uniform pleural thickening.

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Studies showed that pleural plaques were always bilateral and less than 1 cm thick, with calcifications in most cases.⁵ These reports suggested that pleural plaques were the reliable sign of asbestos exposure, although the prevalence of asbestos bodies was around 20%. Our case had been exposed to asbestosis, and the microscopic findings were consistent with the literature, despite asbestos bodies not able to be shown. The diffusion of the lesions observed in the autopsy and fibrotic tractions are lesions, which have caused the pain that he had been complaining about. It has been reported that the pain may be very severe in some cases. Although pain has not been so severe as to induce to suicide, the symptoms detected, and the complaints in the psychiatric analysis of the patient have played a role in the process inducing to his suicide. It has been claimed that causes such as disease, facilitates suicides in cases of suicide observed in advanced ages. This had been mentioned in the suicide notes of this patient.

In the studies conducted in Turkey, it has been reported that suicides caused by a cutting and piercing instrument are not common, and that usually the chest and the abdominal areas are targeted.⁶ It has been noteworthy that the injuries caused by a cutting and piercing instrument on the subject were localized on the left side of the chest and the abdominal area, concentrating mostly on the area of diffused mesothelioma. Taking into account the suicide note, the type of death, the location where the death occurred, and the prevalence of the lesions, the probability of a suicide has prevailed, and the inspection conducted in the location of the event verified this judgment.

Although asbestos exposure results in a severe public health problem in developing countries, a causality link needs to be detected for proving the justness of the concerned parties in the lawsuits filed. The crucial step in solving the issue is to conduct detailed forensic evaluation.

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