

## Acquired nasopharyngeal obstruction and "Metsovo lung"\*

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### SUMMARY

*Acquired nasopharyngeal obstruction is a rare lesion today. Formerly it was the result of infections, but today it is more commonly seen as an unusual complication of surgical trauma. This article reports the first case, as we know it from the international literature, of nasopharyngeal obstruction which cannot be attributed to the already known causes and which occurred in a woman with "Metsovo lung" (i.e., occupational exposure to the asbestos-containing mineral tremolite). The ascertainment in the future of other cases like this will confirm the correlation between nasopharyngeal stenosis and Metsovo lung for which we have not any doubts.*

*Key words: nasopharyngeal stenosis, Metsovo lung, asbestos exposure*

### INTRODUCTION

Acquired nasopharyngeal stenosis is characterized by obliteration of the normal communication between the naso- and oropharynx, resulting from fusion of the soft palate and the tonsillar pillars to the posterior pharyngeal wall. The symptoms vary from mild complaints of having difficulty to blow one's nose or clearing pharyngeal secretions to complete nasal obstruction (Katsantonis et al., 1987). Acquired nasopharyngeal stenosis, and more so, complete obstruction are rare today. The incidence of this appearance was higher in the pre-antibiotic era in the early parts of the 20th century. The most common causes of nasopharyngeal stenosis were various infections such as syphilis, tuberculosis, rhinoscleroma, and diphtheria.

Rarely, as it is mentioned to recent literature, nasopharyngeal stenosis can occur in Wegener's disease (Stell, 1987). It can also be secondary to chemical causes such as dye ingestion, or the application of chemicals to the opening of the Eustachian tube orifice in order to eliminate obstructive lymphoid hyperplasia (Cotton, 1985). During the last years surgical trauma is the most common cause of nasopharyngeal stenosis. This article reports the first case, as we know it from the international literature, of nasopharyngeal obstruction which cannot be attributed to the aforementioned causes and which occurred in a woman with occupational exposure to tremolite.

Asbestos is a broad term for a group of naturally occurring hydrated silicates that crystallize in a fibrous form. There are two main types of asbestos: 1) serpentine type (containing curved fibres); and 2) amphibole type (with straight fibres). The

commonest amphiboles are crocidolite, amosite, anthophyllite, tremolite, and actinolite.

Asbestos is resistant to heat, acids and friction, and has therefore been used extensively in different industries. Today its main use is asbest-cement, mainly for water pipes. In practice, only chrysotile asbestos is used commercially. Exposure to asbestos fibres can occur in any phase of exploitation, from mining to the final product, provided that the fibre is easily released and inhaled. Only inhaled asbestos is considered a health hazard. Occupational exposure to asbestos has been associated with asbestosis, lung cancer, malignant mesothelioma of the pleura and peritoneum, and benign changes in the pleura (pleural plaques, pleural effusion, et cetera).

Tremolite has been shown to be one of the most potent carcinogenic forms of asbestos. We have previously reported on the exposure of inhabitants of Metsovo in North-western Greece to tremolite, because of the use of materials for household white-wash during the previous years (Constantopoulos et al., 1985, 1987a, b; Langer et al., 1987). The majority of the inhabitants have pleural calcifications which formerly were considered to be due to tuberculosis. In addition, they appear to have high incidence of malignant mesothelioma which as it is known is attributed usually to exposure to tremolite (Constantopoulos et al., 1987a). The above combination, calcified pleural plaques and malignant pleural mesothelioma, has been named "Metsovo lung" from the name of the village where it was first noticed. Since then, seven more men with occupational asbestos exposure have been discovered in Greece (Constantopoulos et al., 1991).



## CASE REPORT

A 66-year-old woman from Metsovo was transferred to the ENT Clinic by the Pulmonary Section of the Internal Medicine Department of the University Hospital of Ioannina for further investigation, because obstruction of nasopharynx was observed during fibre-optic bronchoscopy from the nose. The patient was admitted to the Pulmonary Section of the Internal Medicine Department from the out-patient ward of the Hospital which she visited for complaints of dyspnoea. During her hospitalization in the Pulmonary Section the patient was submitted to the following examinations.

Thorax roentgenograms revealed bilaterally extensive calcified pleural plaques (Figure 1). CT scan confirmed these findings and, in addition, revealed a round atelectasis on the left upper

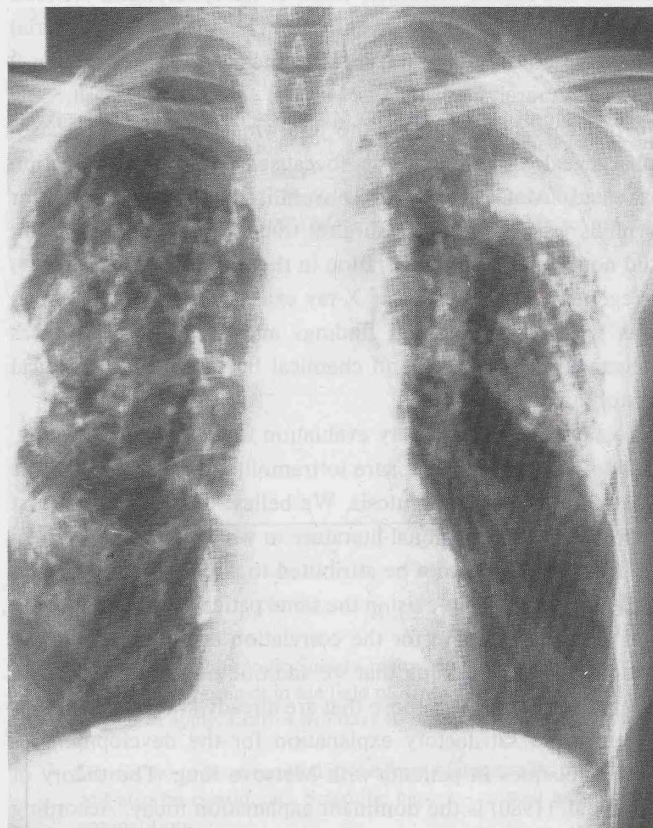


Figure 1. Chest roentgenogram of the patient showing extensive pleural calcifications.

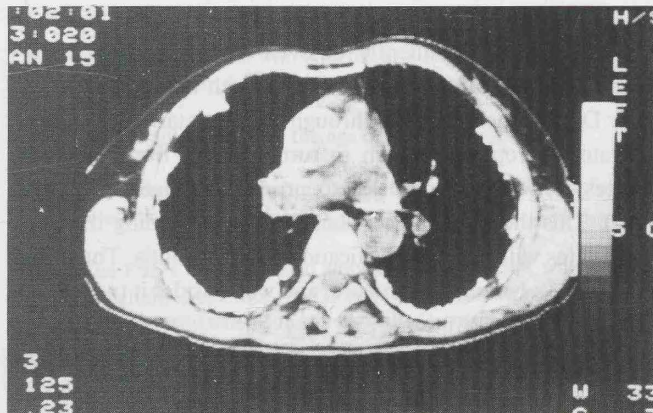


Figure 2. Chest axial CT-scan of the patient showing extensive pleural calcifications.

lung field. The round atelectasis appeared as a round opacity forming a comet's tail sign (Figure 2). Both findings are typical of asbestos exposure (Hanke et al., 1980). Fibre-optic bronchoscopy was negative for active lung disease. Cytology of bronchial washings was negative for malignancy. Sputum examination was negative for acid-fast bacilli, and the Mantoux test was also negative.

ENT clinical examination showed a bilateral atrophic drumhead with retraction of the tympanic membrane and serous effusion in the middle ear. In the nose, bilateral mucous secretions in the floor of the nasal cavities were observed. The nasal turbinates had a normal size and appearance. No septal deviation could be observed. The middle nasal meatus was free of secretions. The nasopharynx was obstructed because of symphysis of the soft palate and posterior pillars with the posterior wall of pharynx; as a consequence, the uvula was smaller and outlined with great difficulty. The hypopharynx and larynx were normal. The movement of vocal cords was normal.

In addition the patient during her hospitalization in the ENT Department was submitted to ophthalmological, gynaecological, urological and dermatological examinations, which did not reveal pathological findings.

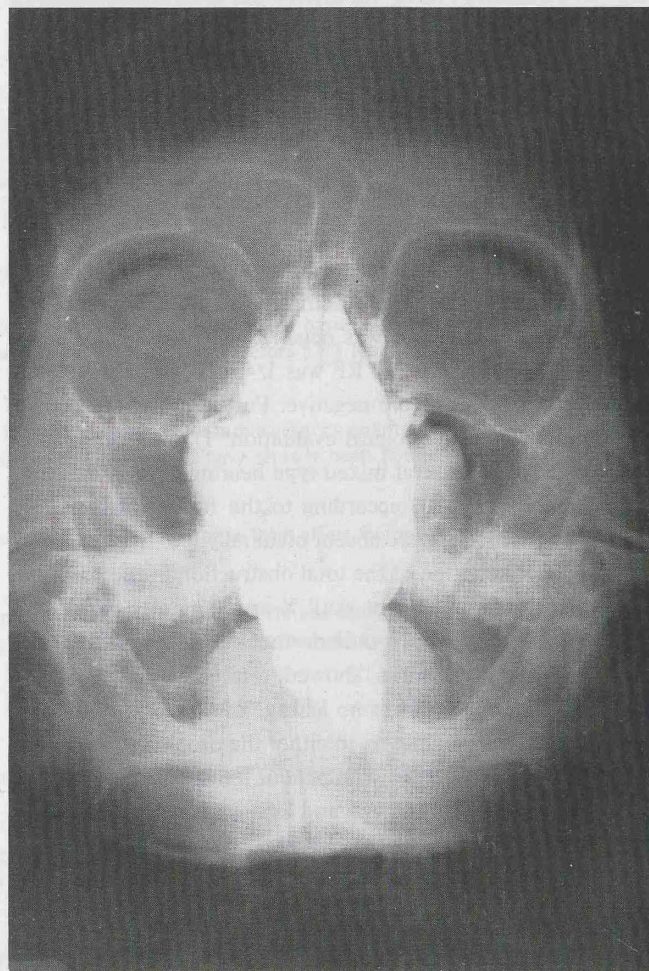


Figure 3. Skull roentgenogram, anteroposterior view, after the administration of radiopaque substance in the nasal cavities, showing the nasopharyngeal obstruction.



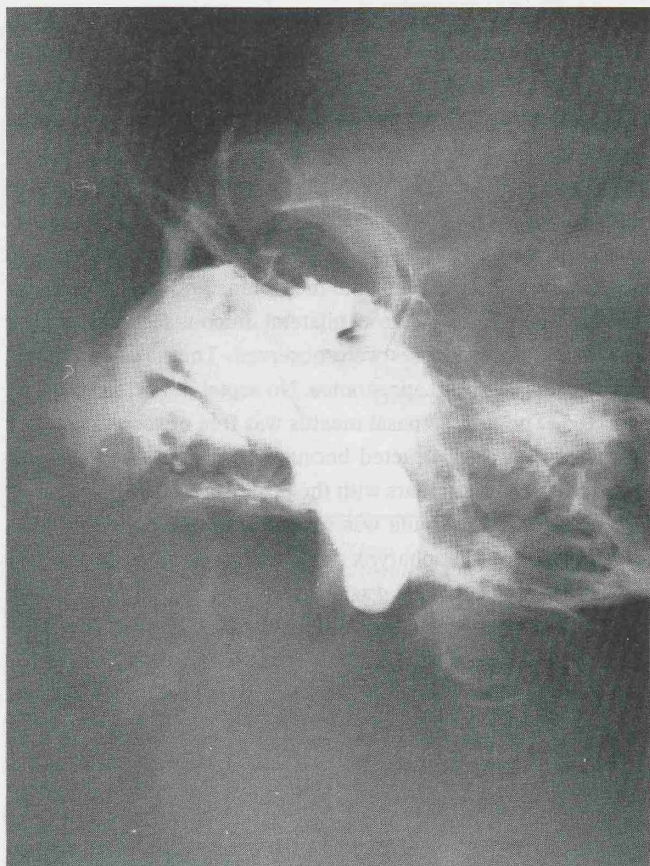


Figure 4. Skull roentgenogram, lateral view, after the administration of radiopaque substance in the nasal cavities, showing the nasopharyngeal obstruction.

Upon radiological evaluation, 1) Schuller's view revealed reduced pneumatization of the mastoid and mild opacity of air cells bilateral; Water's view revealed well-developed paranasal sinuses without pathological findings.

The RPR test for syphilis was negative. The serological study showed: CRP was negative; RF was 1/40; C3 was 111; C4 was 49; ANA and ANCA were negative. Furthermore, the patient was submitted to audiological evaluation: 1) pure-tone audiometry revealed a bilateral mixed-type hearing loss; 2) the tympanograms were type B according to the Jerger classification. The acoustic reflexes were absent bilaterally.

For the documentation of the total obstruction of the nasopharynx, the patient underwent skull X-rays (anteroposterior and lateral views) with contrast-enhancement, locally applied to the nasal cavities. Both views showed total obstruction of the nasopharynx, and there was no leakage of the radiopaque substance from the nasopharynx to either the oropharynx or hypopharynx (Figures 3 and 4). The patient refused to be subjected to biopsy and surgical therapy and left our Department voluntarily.

#### Medical history

The patient reported pulmonary tuberculosis 10 years ago, for which she had been hospitalized for a period of one month in a Chest Hospital. Following her discharge from this hospital she was subjected to therapy with ethambutol and isoniazid for a

period of 18 months. Simultaneously with her hospitalization in the Chest Hospital, the patient presented the first symptoms of nasal obstruction, probably due to the development of the nasopharyngeal stenosis. At the same time the first symptoms from the dysfunction of the Eustachian tube with hearing loss bilaterally were established. Because of hearing loss she had been hospitalized in an ENT Department. The patient did not report surgical operation in the oral cavity, neither applications of chemicals in the site of nasopharynx or oropharynx. At last she did not report having suffered from diphtheria.

#### DISCUSSION

As we mentioned previously, nowadays the most frequent cause of nasopharyngeal stenosis or obstruction is surgical trauma. In the recent literature, cases of nasopharyngeal stenosis due to infections (such as syphilis, tuberculosis, and diphtheria) or due to immunological disorders (such as Wegener's disease) have been rarely reported.

In our case, we excluded the following causes of the nasopharyngeal: 1) tuberculosis (because pulmonary evaluation revealed "Metsovo lung"); 2) syphilis (RPR examination for syphilis was negative); 3) surgical trauma, because the patient did not report surgical operation in the oro- or nasopharynx; 4) Wegener's disease, because X-ray examination (Water's view) was without pathological findings and the ANCA test was negative; 5) diphtheria and chemical burns from the medical history.

In contrast, the pulmonary evaluation revealed Metsovo lung, due to occupational exposure to tremolite, which formerly was considered to be tuberculosis. We believe that this is the first report in the international literature in which a nasopharyngeal obstruction that cannot be attributed to already known causes, and Metsovo lung co-exist in the same patient. However, we are not absolutely certain for the correlation of both pathological conditions, but we think that we add one more cause of nasopharyngeal stenosis to those that are already known.

There is no satisfactory explanation for the development of pleural plaques in patients with Metsovo lung. The theory of Hillerdal (1980) is the dominant explanation today. According to it, part of the asbestos fibres reaches alveoli and then the pulmonary interstitium. A fraction of the fibres enters perilobar lymph vessels via the lymphocytic route and wedge at the perisplachnic pleura. Some fibres perch it and fall inside the pleural cavity. They are subsequently removed via openings ("stomata") of the pleura in direct communication with the lymphatic system. During their passage through the parietal pleura, fibres activate macrophages which in turn produce fibrogenic substances, activating fibroblasts to produce collagen (Hillerdal, 1980). This theory is in accordance with our finding that only Metsovites with pleural calcifications had alveolitis. The alveolitis was of a lymphocytic nature, and we consider it to be a sign of macrophage activation.

With regard to occurrence of scars in the nasopharynx we surmise that the asbestos fibres that reach the nasal cavity are transferred by the action of ciliated stratified or pseudostratified columnar epithelium of the nasal cavity into the nasopharynx.



There, the fibres are coming in contact with the lymphoid tissues of the pharynx and Waldeyer's ring. The activation of macrophages of the lymphoid tissues in the area of Waldeyer's ring produces fibrogenic substances, activating fibroblasts to produce collagen. This is a possible mechanism for the development of nasopharyngeal stenosis. The ascertainment in the future of other cases like this will confirm the correlation between nasopharyngeal stenosis and Metsovo lung, for which we do not have doubts.

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## SOCIETY NEWS

## CALL FOR PAPERS

## RESEARCH PRIZES 1996 of the EUROPEAN RHINOLOGIC SOCIETY

The European Rhinologic Society biennial awards two Research Prizes; one prize is awarded for original basic research, and the second for an original clinical research in the field of Rhinology. In 1996, again, these prizes will be awarded, and therefore ENT Residents and Fellows are kindly requested to apply. Entries will have to meet the following conditions:

- Entries are to be submitted in the form of a scientific paper. Papers that have been accepted for publication by an international scientific journal will also be considered. Scientific papers - as well as supplements and Ph.D.-theses - that have already been published are excluded from competition.
- The research paper submitted is either the result of individual research activities or resulting from a team effort. In the latter case the first author will be considered as the nominee.
- Each applicant is allowed one entry. The author indicates whether the paper is a basic research or a clinical study. (We define clinical research as studies that deal with patients or normal subjects in a clinical set-up, whereas basic research refers to studies performed with either animals or tissues taken from patients or normal subjects.)
- Only candidates below the age of 40 years can apply.
- The Executive Committee of the European Rhinologic Society, supported by a number of invited expert referees, will act as the jury and will select both prize winners.
- The Prizes, each of which amounts to ECU 1,500, will be awarded during the Opening Ceremony of the forthcoming ERS Congress at Ghent (Belgium), September 7-13, 1996. The prize winners will be invited to attend the congress, free of charge. The prize-winning entries will be given priority when submitted to the journal *Rhinology*.

Applications, together with five copies of the submitted papers, should be directed before April 1, 1996, to the Chief Editor of the journal *Rhinology*, Prof. Dr. E.H. Huizing at the following address: Department of Otorhinolaryngology, University Hospital Utrecht, P.O. Box 85.500, NL-3508 GA Utrecht, The Netherlands.