

Pleural Plaques: A Review of Diagnostic Issues and Possible Nonasbestos Factors

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ABSTRACT. The authors reviewed nonasbestos etiologies and diagnostic issues related to pleural plaques. Through searches of PUBMED and DIALOG using the term *pleural plaques*, they identified 125 articles. The authors found additional references by reviewing citations of these 125 articles. Exposure to nonasbestos agents (eg, erionite, silicates, manmade fibers) was cited as a possible factor in plaque development, although this association was based on limited data; empyema, tuberculosis, rib fractures, and hemothorax also were cited as potential etiologies. Rib companion shadows, fat, intercostal vessels, and muscles can appear as plaques; thus, radiographic diagnosis requires careful evaluation. Chest x-rays show large false negative and varying false positive rates. The terms *calcification* and *thickening* often were used as synonymous with plaques; however, these terms have different meanings. The authors concluded that plaques may be associated with nonasbestos exposures and certain medical conditions. Without a thorough exposure/medical history, plaque reports can be misleading.

KEYWORDS: medical and environmental factors, pathology, pleural plaques, radiologic diagnosis

Pleural plaques are firm, dense, fibrotic lesions, usually located on the parietal pleura, that generally cause no symptoms or physiological impairments.¹ Linked to asbestos, they have become an accepted marker for asbestos exposure. Jacob and Bohlig, writing in 1955, are credited as the first authors to report an association between pleural plaques and asbestos.^{2,3} Numerous reports in the 1960s and 1970s supported the association of pleural plaques and asbestos exposure,^{4,5} such that by 1976, Becklake⁵ concluded that the association between pleural plaques and asbestos exposure had been confirmed whether exposure was occupational or nonoccupational. This association is now accepted medical opinion, reinforced by authors of medical textbooks. For example, in the most recent edition (2005) of *Harrison's Principles of Internal Medicine*, Spiezer notes, "Past (asbestos) exposure is specifically indicated by pleural plaques."⁶ (p 1522)

Estimates of the prevalence of pleural plaques in the general population are reported in the literature. In 8 surveys among populations without any known exposure to fibrogenic dusts, occurrence of pleural calcifications ranged from 0.02% to 6.6% (see Table 1). In 1995, using a stratified population sample thought to be representative of the Finnish population aged 30 years or older, Zitting¹⁰ estimated the total age-adjusted prevalence of bilateral plaques of the parietal pleura as 7.0% in men and 1.9% in women, and for unilateral and bilateral plaques combined, prevalence of 12.8% for men and 3.4% for women. Rous and Studeny¹⁶ reported 6.6% prevalence in a study of the rural population in Czechoslovakia. When evaluating workers exposed to asbestos, the occurrence of pleural plaques is higher. For example, Boraschi et al¹⁷ reported that the occurrence of pleural plaques, as estimated by 4 other research groups, was 14% to 62% in workers heavily exposed to asbestos,

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