

Radiological Diagnosis

Diagnosis of the case presented in the previous edition

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TALCOSIS SECONDARY TO INTRAVENOUS DRUG USE



CASE
42-YEAR-OLD FEMALE
SEVERE PROGRESSIVE DYSPNEA
ILLICIT DRUG USER

High-resolution computed tomography (HRCT)

Exam performed using a 16-slice multidetector scanner taking 1.0-mm thick slices and using multiplanar reconstruction. The axial and coronal images show micronodules presenting a fine granular pattern, together with attenuated areas of ground-glass pattern, predominantly in the upper lobes. Note also the areas of lesser attenuation, predominantly in the lower lobes, and the sparsely distributed linear opacities. The coronal reconstruction shows increased lung volume and more clearly, the predominant distribution of the granular pattern in the upper lobes and of the areas of lesser attenuation in the lower lobes.

COMMENTS

Patients who are illicit drug users may present pulmonary complications such as pneumonia, septal embolism, cardiogenic pulmonary edema, pulmonary hemorrhage, aspiration pneumonia, emphysema and talc-induced lung disease.

Talcosis secondary to intravenous injection of talc (magnesium silicate) is seen almost exclusively in drug users who inject intravenously preparations intended for oral use. These patients typically

present progressive dyspnea and symptoms that mimic chronic obstructive pulmonary disease. Talc is used as a lubricant in various oral medications. The most commonly injected oral medications are pentazocine, meperidine, heroin, cocaine, amphetamine and methylphenidate (Ritalin). When triturated, dissolved in water and used intravenously, innumerable talc particles form embolisms in the pulmonary arterioles and by the capillaries, resulting in occlusion and possibly even pulmonary hypertension. Via the pulmonary circulation, these particles can also affect other organs such as the liver, bone marrow, lymph nodes, skin and eyes. Migration of talc particles into the pulmonary interstice provokes a granulomatous reaction, forming small granulomas composed of multinucleate giant cells surrounded by fibrous tissue. Talc crystals are birefringent and can be identified under polarized light.

Radiographic findings include diffuse micronodules and conglomerate masses similar to the massive progressive fibrosis found in the silicosis and pneumoconiosis seen in coal miners. In the high-resolution computed tomography images, the principal findings consist of randomly distributed nodules of less than 1.0 mm in

diameter (fine granular pattern), perihilar conglomerate masses, attenuated areas of ground-glass pattern and panacinar emphysema in the lower lobes. The first manifestation of talcosis may be diffuse micronodules, which coalesce and increase in size as the disease progresses. In the advanced stages, perihilar conglomerate masses that, due to the accumulation of talc, typically present considerable attenuation are identified in high-resolution computed tomography scans. Panacinar emphysema – similar to that found in patients with alpha-1 antitrypsin deficiency – is more common in patients who are methylphenidate users. The mechanism by which panacinar emphysema develops in such patients remains unclear.

Micronodules or a diffuse granular pattern, together with highly attenuated perihilar conglomerate masses or panacinar emphysema seen in high-resolution computed tomography imaging, is highly suggestive of talcosis secondary to the intravenous injection of medications intended for oral use.

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