

Answer to this month's Radiological Conference

Answer:

b) Coccidioidomycosis

Radiological findings

Frontal chest radiograph taken following admission showed multiple ill-defined soft tissue density nodules with size ranging from 5 mm to 1 cm. Some of the nodules coalesced to form larger consolidation in the right lower lobe. There was no definite zonal predominance. The right hilum was prominent, suggestive of hilar adenopathy.

No pleural effusion or calcified lung nodule was seen.

Figure 2: Frontal view of the chest identical to figure 1 with addition of arrows pointing to the soft tissue nodules



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Discussion

Coccidioidomycosis

Coccidioidomycosis is caused by the inhalation of the fungus spores of *Coccidioides immitis*, which is found in desert soil. The disease occurs mainly in semiarid regions in the southwest desert of USA (San Joaquin Valley, central southern Arizona, Western Texas, southern New Mexico) and northern Mexico, where it is endemic. The infection usually affects adults and is usually mild and self-limiting, although occasionally it can be severe and prolonged.

The standard laboratory diagnostic tests are precipitin and complement fixation tests. The most definitive diagnosis is made by identification or culture of the organism in body fluid or tissues, but the success rate varies greatly.

The disease can be classified as primary coccidioidomycosis and persistent pulmonary coccidioidomycosis. The symptoms of primary coccidioidomycosis are usually non-specific, and resemble a mild virus infection; sometimes a severe pneumonia is seen. In symptomatic patients, the chest radiograph may show patchy infiltrates mainly in the lower lobes. Most of the lesions resolve spontaneously within one or two months without therapy. Hilar and mediastinal lymphadenopathy and pleural effusion are sometimes seen.

Most patients with primary coccidioidomycosis recover within 3 weeks. Those patients with symptoms or radiographic abnormalities persisting after 6 to 8 weeks are considered to have persistent coccidioidomycosis. The most common complaint is haemoptysis. Patients with persistent and extensive pneumonia are often very sick. The radiographic findings of persistent pulmonary coccidioidomycosis are coccidioidal nodules, persistent coccidioidal pneumonia, and miliary coccidioidomycosis. The coccidioidal nodules tend to cavitate rapidly, and the cavities typically have very thin walls. The thin-walled cavity is the classic lesion of coccidioidomycosis, but it occurs in only 10% to 15% of cases. Miliary nodulation has an appearance similar to that of miliary tuberculosis, with the size of the nodules ranging from 5mm to 1cm in diameter. Associated mediastinal lymph node enlargement is common.

Sarcoidosis

Sarcoidosis can produce multiple nodular shadows in the lung that may resemble metastases or lymphoma. The

nodules are distributed primarily along the lymphatics in the peribronchovascular bundles emanating from the hila in an axial distribution. Uniformity in size with a slightly ill-defined edge, as well as accompanying hilar and mediastinal lymphadenopathy adenopathy are important clues for the diagnosis of sarcoidosis.

Pulmonary metastases

Metastases are usually round and well margined, although metastases with irregular margins and poorly defined edges are occasionally encountered. The larger and the more variable in size the nodules are, the more likely they are to be neoplastic. Usually, both lungs are affected by metastases, and the lung bases are more frequently involved than the apices. More than 80% to 90% of the metastatic nodules are located in the periphery, and most of them lie in close proximity to the pleura.

Pulmonary arteriovenous malformations

Multiple pulmonary arteriovenous malformations can usually be diagnosed with certainty by noting the large feeding arteries and draining veins on radiographs. They are very rare and are usually part of the Osler-Weber-Rendu syndrome. Roughly 30% of the arteriovenous malformations are multiple, and occur mostly in the lower lobes. Dynamic contrast-enhanced CT scans are

recommended for the identification of the size, number, and architecture of pulmonary arteriovenous malformations.

Silicosis

Silicosis is a fibrotic disease of the lungs caused by inhalation of dust containing free crystalline silica or silicon dioxide. Silica dust may be encountered in almost any mining, quarrying, or tunnelling operation. Occupational history can usually give a hint for this diagnosis. Classical radiographic findings consist of multiple nodules ranging from 1 to 10 mm in diameter. Larger nodules often predominate and typically involving upper lung zones. Sometimes, the nodules can calcify. Enlargement of hilar or mediastinal lymph nodes is common and may precede the appearance of diffuse nodularity. Calcification of the periphery of lymph nodes, eggshell calcification may occur and has a characteristic appearance. ■

Further readings

1. Dähnert W. *Radiology Review Manual*. 3rd ed. Baltimore: Williams and Wilkins, 1996;355.
2. Chapman S, Nakielny R. *Aids to Radiological Differential Diagnosis*. 3rd ed. London: WB Saunders, 1995;133-134.
3. McLoud TC. *Thoracic Radiology-The Requisites*. 1st ed. St. Louis: Mosby; 125, 334-336.
4. Armstrong P, Wilson AG, Dee P, et al. *Imaging of Diseases of the Chest*. 2nd ed. St. Louis: Mosby;202-204.