Lesson 6: Perilymphatic Pulmonary Nodules: Definition, Differential Diagnosis, and Demonstration of the “Pipe-Cleaner” Sign

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Question 6-1. This question refers to the pulmonary nodules in sarcoidosis, which represent noncaseating granulomas (D). So (D) is the correct answer.

Question 6-2. This question represents a clinical vignette in which a 60-year-old man, who has worked as a stonecutter for the past 20 years, presents with slowly progressive dyspnea. Initial chest radiographs reveal reticulonodular interstitial abnormalities. Multiple pulmonary nodules were discovered on a subsequent chest CT. Both the clinical presentation and radiographic findings suggest the diagnosis of classic (chronic) silicosis. In classic silicosis, the pulmonary nodules predominate in the upper lobes, posteriorly (B). So (B) is the correct answer.

Question 6-3. This question highlights another clinical vignette in which a 36-year-old asymptomatic female physician without significant medical history undergoes a preemployment chest radiograph, which is abnormal. Subsequent chest CT reveals subpleural nodules and architectural distortion in the upper lobes. Both the clinical presentation and radiographic findings suggest pulmonary sarcoidosis (D). The predominant locations of perilymphatic pulmonary nodules in pulmonary sarcoidosis are subpleural and peribronchovascular. Architectural distortion is a less common feature of pulmonary sarcoidosis but generally involves the upper lobes bilaterally. So (D) is the most likely diagnosis, and (D) is the correct answer.

Question 6-4. This question is illustrated by an axial CT image (Figure 9) of a 50-year-old man with a history of lung adenocarcinoma. The chest findings reveal unilateral thickening of the peribronchovascular interstitium and interlobular septae on the right. These CT findings are unchanged over the past 4 weeks. This case represents a differential diagnostic challenge for the radiologist. Stability of the CT findings over the past 4 weeks and the unilateral nature of disease make pulmonary edema (A), PCP pneumonia (C), and viral pneumonia (E) unlikely diagnoses. Furthermore, the extent of peribronchovascular interstitial thickening would be unusual for PCP pneumonia. Likewise, pulmonary sarcoidosis (B) almost invariably is a bilateral process. However, pulmonary lymphangitic carcinomatosis is characterized on chest CT by smooth and/or nodular thickening of the peribronchovascular interstitium and interlobular septae. Therefore, pulmonary lymphangitic carcinomatosis (D) is the most likely diagnosis given unilateral disease, persistence of disease over 4 weeks, and a history of lung adenocarcinoma. So (D) is the correct answer.

Question 6-5. This question draws attention to the various anatomic locations of pulmonary lymphatics, which include the pleura (A), interlobular septae (C), centrilobular interstitium (D), and peribronchovascular interstitium (E), but not alveolar sacs (B). So (A), (C), (D), and (E) are true, but (B) is false and the exception; and (B) is the correct answer.
Question 6-6. This question emphasizes the differential diagnosis of the chest CT findings of nodular septal thickening and thickening of the peribronchial interstitium in the left lung of a 60-year-old man with dyspnea. The right lung is normal. The CT findings of unilateral perilymphatic pulmonary disease in an older man with dyspnea suggest the diagnosis of pulmonary lymphangitic carcinomatosis (D). The other options in the differential diagnosis (i.e., sarcoidosis [A], acute silicosis [B], coal worker’s pneumoconiosis [C], and chronic silicosis [E]) usually present as bilateral disease. So (D) is the most likely diagnosis, and (D) is the correct answer.

Question 6-7. This question alludes to the cause of the “pipe-cleaner” sign on chest CT, which is pulmonary nodules within bronchovascular lymphatics (A). The pipe-cleaner sign often is present in pulmonary sarcoidosis. So (A) is the correct answer.

Question 6-8. This question speaks to pulmonary diseases in which perilymphatic nodules predominate. These pulmonary diseases include silicosis (A), pulmonary lymphangitic carcinomatosis (B), sarcoidosis (C), and coal worker’s pneumoconiosis (D). Since (A), (B), (C), and (D) are true; (E), all of the above, is the correct answer.

Question 6-9. This question refers to a common cause of pulmonary lymphangitic carcinomatosis. Of the options provided, the most common is adenocarcinoma of the lung (E). Other malignancies causing pulmonary lymphangitic carcinomatosis include breast, gastrointestinal, prostate, and kidney. So (E) is the correct answer.

Question 6-10. This question concerns CT features of the chest associated with the perilymphatic pattern of pulmonary nodules, which include interlobular septal thickening (B), the pipe-cleaner sign (C), peribronchovascular thickening (D), and nodularity along interlobar fissures (E), but not sparing of pleural surfaces (A). So (B), (C), (D), and (E) are true, but (A) is false and the exception; and (A) is the correct answer.

Answer Key for Volume 36 # 6:
1. D
2. B
3. D
4. D
5. B
6. D
7. A
8. E
9. E
10. A