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Folded Lung Syndrome: A Case Report Demonstrating the Development of Round Atelectasis, an Atypical Image Finding

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Abstract

Introduction:

Rounded atelectasis is an uncommon benign condition characterized by localized lung collapse adjacent to areas of pleural thickening often clinically misinterpreted as a pulmonary neoplasm. Though most frequently associated with asbestos exposure, it can also be seen on the background of pleural diseases such as tuberculous pleuritis, empyema, hemothorax, and long-standing pleural effusions. The exact mechanism of action is not fully understood; however, several theories exist such as mass effect from surrounding fluid, inflammation of visceral pleura, and airway distortion creating localized atelectasis.

Rounded atelectasis typically appears as a solitary peripheral lesion in the lower posterior lobes; however multiple lesions may occasionally occur. On chest radiographs, it presents as a round or oval opacity measuring approximately 2.5–8 cm, associated with pleural thickening and volume loss. CT imaging demonstrates a pleura-adjacent soft-tissue mass containing a central air bronchogram. The characteristic “comet tail” sign, represents curved bronchi and vessels entering the lesion. The mass may also be associated with pleural effusion. The following case study demonstrates how lung pathology can contribute to the formation of this uncommon finding.

Case Description:
A 38-year-old male with a past medical history of substance and alcohol use disorders presents to the emergency room in Acute Hypoxic Respiratory Failure. On arrival, patient was ill-appearing and met criteria for sepsis. On initial investigation, blood cultures were positive for *Streptococcus pyogenes.* Early imaging was suggestive of lung abscess versus septic pulmonary emboli. Transthoracic echocardiogram was negative for valvular vegetations, lowering septic emboli secondary to infective endocarditis on the list of differentials. The patient was started on intravenous antibiotics, and a multi-disciplinary team was consulted including Pulmonology, Infectious Disease, and Cardiothoracic Surgery.

Serial imaging demonstrated persistent right-sided pleural effusion, loculated collections and rounded atelectasis with the characteristic comet tail. This rare finding was likely the result of inflammation and increasing loculated pleural fluid collections. The fibrotic changes associated with this finding may have even contributed to the incomplete lung expansion status post intrathoracic tube placement for fluid drainage. Due to the complex progression of illness, the patient underwent right thoracotomy with hemothorax evacuation and decortication. One interesting intra operative finding were two traumatic defects in the right lateral and posterior lower lobe adjacent to friable, necrotic lung parenchyma. There is a high probability these traumatic defects were the source of round atelectasis seen on imaging.

Conclusion

Rounded atelectasis is a benign finding of unknown etiology but is commonly associated with harsh irritant exposure (e.g. asbestos) or persistent intraparenchymal inflammatory processes. They can closely mimic pulmonary malignancy on imaging. Given this, recognition of characteristic radiologic features, particularly the comet tail sign and associated pleural thickening as seen in this case, can serve as distinguishing features and prevent unnecessary invasive diagnostic procedures. Biopsy should only be considered if the lesion lacks classic radiologic features or if malignancy cannot be confidently excluded.