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Imaging Tuberculosis and Pulmonary Infections: A Visual Atlas

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Commentary

Tuberculosis (TB) and other pulmonary infections continue to pose major global health challenges, particularly in developing regions where their prevalence remains high. Radiologic imaging plays a pivotal role in detecting, characterizing and monitoring these infections, providing crucial insights into disease progression and response to therapy. The visual interpretation of imaging findings, supported by clinical data, allows healthcare professionals to differentiate among infectious causes, assess disease severity and guide treatment strategies effectively.

Chest X-rays remain the first-line imaging tool for suspected pulmonary infections due to their wide availability and cost-effectiveness. In tuberculosis, typical findings include upper lobe infiltrates, cavitary lesions and fibrotic changes. However, in the early stages, TB may present as non-specific patchy opacities, which can mimic other infections. Computed Tomography (CT) offers superior sensitivity and specificity, revealing subtle lesions that may not be visible on radiographs. High-resolution CT (HRCT) can detect characteristic patterns such as tree-in-bud nodules, centrilobular opacities and bronchiectasis key visual indicators of active infection and endobronchial spread [1].

Magnetic Resonance Imaging (MRI) and Positron Emission Tomography (PET) are increasingly valuable in assessing complex or chronic infections. MRI provides superior soft-tissue contrast and can be particularly useful for evaluating chest wall or mediastinal extension of infection. PET imaging, using Fluorodeoxyglucose (FDG), helps distinguish between active infection and residual scarring, offering a functional dimension to anatomical assessment.

The integration of radiologic findings with clinical and microbiological data remains essential in achieving diagnostic precision. Symptoms such as fever, chronic cough and weight loss, when interpreted alongside imaging patterns, enable early and targeted therapeutic interventions. With advancements in digital imaging and artificial intelligence, radiologists can now analyze disease patterns more efficiently, aiding in early detection and monitoring treatment response.

In essence, imaging serves as a visual atlas for understanding the diverse manifestations of tuberculosis and other pulmonary infections. From chest radiographs to advanced CT and PET imaging, each modality contributes unique insights that enhance diagnostic confidence and patient care. As technology continues to evolve, imaging will remain at the forefront of combating infectious lung diseases through precision visualization and informed clinical decision-making [2].

Keywords: Tuberculosis imaging; Pulmonary infections; Radiologic diagnosis

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Conflict of Interest

None.

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