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Differentiation of persistent and transient subsolid nodules: does morphology help?

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Abstract:

Purpose: Current recommendations propose a three month follow-up CT scan to differentiate between persistent and transient subsolid lesions leading to a substantial number of short term follow-ups. Purpose of the study was to look for morphological features to differentiate persistent from transient lesions.

Methods and Materials: Transient and persistent subsolid nodules were randomly selected from the NELSON and DLCST screening trial. An experienced chest radiologist assessed a number of predefined morphological features. Likelihood of persistence was assessed using a continuous scale between 0-100. MANOVA statistics were used to assess the discriminating power of morphological features ($p < 0.05$ was considered significant), ROC analysis was applied to assess ability to differentiate persistent from transient lesions.

Results: A total of 122 nodules were assessed (median 9.7mm). Size distribution was equivalent for the two groups. The ROC area under the curve (AUC) for differentiating was 0.68 for all lesions and 0.82 for lesions > 10 mm. MANOVA revealed no significant discriminative features for all lesions, but yielded significance ($p = 0.02$) for lesions > 5 mm. Multiplicity ($p = 0.046$) and margin characteristics ($p = 0.006$) had significant discriminative power. Demarcation by interlobular septum was predictive for transient nodules (74% vs. 26%) while spiculation was predictive for persistence (100% vs. 0%).

Conclusion: There are morphological features with significant predictive power to differentiate persistent from transient subsolid nodules. They may be used in risk stratification models for subsolid nodules and serve as input for computerized classification systems.

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