

II. Anatomy and Physiology

A. Normal Anatomy and Physiology

1. Lower airway

LANDMARK ARTICLE:

Magnussen JS. Chicco P. Palmer AW. Van der Wall H. Vu DH.

Creation of a three-dimensional model of human segmental lung anatomy

AJR. American Journal of Roentgenology. 174(5):1333-6, 2000

OBJECTIVE: The investigation of pulmonary embolism using scintigraphic tomography requires a model of the internal architecture of the segments and subsegments in the human lung. Such a model has been developed by the segmentation and subsegmentation of an existing whole-body tissue-segmented phantom. **MATERIALS AND METHODS:** By using information from suitably windowed human axial CT scans, combined with the information gained from the injection of color-coded dyes into the segmental bronchi of human cadaveric lungs, the lobar and segmental boundaries were added to the existing phantom. Further refinements were added from reports in the literature regarding the predominant pattern of subsegmental bronchi in a series of human cadavers, enabling the creation of subsegmental boundaries. **RESULTS:** A digitized model of the segmental and subsegmental anatomy of the human lung was successfully created. External, or pleural, projections of the complex internal arrangement of the segments closely corresponded with the projections of the best available authorities on the subject. **CONCLUSION:** The model provides the opportunity to address several issues germane to scintigraphy and important for diagnosing pulmonary embolic disease. In particular, the model allows the manipulation of three-dimensional data sets to explore issues of importance to tomographic lung scanning.