Thin-section CT of the lung: does electrocardiographic triggering influence diagnosis?

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PURPOSE: To determine the impact of prospective electrocardiographic (ECG) triggering on image quality and diagnostic outcome of thin-section computed tomography (CT) of the lung. MATERIALS AND METHODS: Forty-five consecutive patients referred for thin-section CT of the lung were examined with prospectively ECG-triggered and nontriggered thin-section CT of the lung with a multi-detector row helical CT scanner. Subjective image quality criteria (image noise, motion artifacts, and diagnostic accessibility) were rated by three radiologists in consensus for the upper lobe, middle lobe and/or lingula, and lower lobe. Pathologic changes were assessed for the various lobes, and a diagnosis was assigned. The diagnoses were compared by two radiologists in consensus to determine the effects of CT technique on diagnostic outcome. Quantitative measurements were performed, including determination of image noise and signal-to-noise ratios in different anatomic regions. The Wilcoxon signed rank test and paired sign test (both with Bonferroni correction) were used for statistical analysis. RESULTS: Subjective assessment showed significant differences in motion artifact reduction in the middle lobe, lingula, and left lower lobe. The diagnostic assessibility of triggered CT was rated significantly higher only for the left lower lobe compared with nontriggered data acquisition. No differences in diagnostic outcome were determined between triggered and nontriggered techniques. Mean image noise in tracheal air was 68.2 +/- 17 (SD) for triggered CT versus 37.4 +/- 9 for nontriggered CT (P <.05). Mean signal-to-noise ratio in the upper versus lower lobes was 22.5 +/- 8 versus 25.4 +/- 10 for triggered and 35.6 +/- 9 versus 39.2 +/- 10 for nontriggered techniques (P <.05). CONCLUSION: Given the lack of improvement in diagnostic accuracy and the need for additional resources, ECG-triggered thin-section CT of the lung is not recommended for routine clinical practice.