AIM: The purpose of this study was to determine the feasibility of echocardiogram (ECG)-gated multi-slice CT angiography (MCTA) in patients with clinical suspicion of acute venous thromboembolism (VTE), to investigate the effect of ECG-gating on cardiac motion artefacts, and to determine the diagnostic reader agreement of ECG-gated MCTA in comparison with conventional MCTA.

MATERIALS AND METHODS: Forty-eight consecutive patients were prospectively enrolled and randomly underwent ECG-gated (n=25, group 1) or non-ECG-gated (n=23, group 2) eight-slice pulmonary MCTA. Image data were evaluated by three independent chest radiologists with respect to the presence or absence of emboli at different arterial levels (main, lobar, segmental, and subsegmental arteries), and with regard to cardiac motion artefacts. Statistical tests used to calculate inter-observer agreement were weighted kappa statistics, extended kappa statistics and confidence indices indicating three-reader agreement accuracy. RESULTS: Twenty-seven patients (56.3%) were diagnosed to have pulmonary embolism (13 from group 1, 14 from group 2). Cardiac motion artefacts were significantly more frequent in group 2 (70% in group 2 versus 13% in group 1, p=0.0001). The overall diagnostic agreement was excellent with both MCTA techniques (three-reader confidence index for all vascular territories: 0.76 and 0.84 for...
groups 1 and 2, respectively (extended kappa=0.69 and 0.78, respectively); three-reader confidence index for diagnosis of VTE: 0.94 and 0.85 for groups 1 and 2, respectively (extended kappa=0.91 and 0.73, respectively), weighted kappa=0.81-0.83 and 0.92-0.95 for groups 1 and 2, respectively, and did not differ significantly between the two groups. In addition there was no significant difference of inter-observer agreement in either group at any assessed pulmonary arterial level. CONCLUSION: ECG-gated pulmonary MCTA is feasible in patients with clinical suspicion of VTE. However, ECG-gated image acquisition did not influence the diagnostic reader agreement accuracy and inter-observer agreement of MCTA. Hence, it does not appear to be advantageous for the MCTA diagnosis of pulmonary embolism.