Titel des Beitrags: Validation of a low dose simulation technique for computed tomography images.

Abstract: Evaluation of a new software tool for generation of simulated low-dose computed tomography (CT) images from an original higher dose scan. Original CT scan data (100 mAs, 80 mAs, 60 mAs, 40 mAs, 20 mAs, 10 mAs; 100 kV) of a swine were acquired (approved by the regional governmental commission for animal protection). Simulations of CT acquisition with a lower dose (simulated 10-80 mAs) were calculated using a low-dose simulation algorithm. The simulations were compared to the originals of the same dose level with regard to density values and image noise. Four radiologists assessed the realistic visual appearance of the simulated images. Image characteristics of simulated low dose scans were similar to the originals. Mean overall discrepancy of image noise and CT values was -1.2% (range -9% to 3.2%) and -0.2% (range -8.2% to 3.2%), respectively, p>0.05. Confidence intervals of discrepancies ranged between 0.9-10.2 HU (noise) and 1.9-13.4 HU (CT values), without significant differences (p>0.05). Subjective observer evaluation of image appearance showed no visually detectable difference. Simulated low dose images showed excellent agreement with the originals concerning image noise, CT density...
values, and subjective assessment of the visual appearance of the simulated images. An authentic low-dose simulation opens up opportunity with regard to staff education, protocol optimization and introduction of new techniques.