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Abstract: To improve the detection of liver lesions in patients with hepatocellular carcinoma (HCC) via an iodine contrast enhancement tool. Thirty-two patients with clinically proven HCCs underwent imaging with a three-phase protocol on a 256-slice MDCT. The contrast enhancement in the reconstructed slices was improved via a post-processing tool. Mean image noise was measured in four different regions: liver lesion, healthy liver, subcutaneous fat and bone. For each image set the image noise and contrast-to-noise ratio (CNR) were assessed. For subjective image assessment, four experienced radiologists evaluated the diagnostic quality. While employing the post-processing algorithm, CNR between the liver lesion and healthy liver tissue improves significantly by a factor of 1.78 (CNRwithout vC = 2.30 ± 1.92/CNRwith vC = 4.11 ± 3.05) (P* = 0.01). All results could be achieved without a strengthening of artefacts; mean HU values of subcutaneous fat and bone did not significantly change. Subjective image analysis illustrated a significant improvement when employing post-processing for clinically relevant criteria such as diagnostic confidence. With post-processing we see a significantly improved detection of arterial uptake in hepatic lesions compared with non-processed data. The
Improvement in CNR was confirmed by subjective image assessment for small lesions and for lesions with limited uptake. Enhancement with iodine-based contrast agents is an essential part of CT. A new post-processing tool significantly improves the diagnostics of hepatocellular carcinoma. It also improves detection of small lesions with limited iodine uptake.