

Cardiovascular imaging (radiology, ultrasound, nuclear medicine, CT, MRI)

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DIAGNOSTIC ACCURACY OF 128-SLICE DUAL-SOURCE CT USING HIGH-PITCH SPIRAL MODE IN ASSESSMENT OF CORONARY ARTERY STENT IMAGING COMPARISON WITH INVASIVE CORONARY ANGIOGRAPHY

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¹Yang Xia, ²Chen Yundai. ¹Chinese PLA General Hospital; ²Chinese PLA General Hospital

Objectives To investigate the diagnostic accuracy of 128-slice dual-source CT (DSCT) using high-pitch spiral mode in assessment of coronary stent imaging comparison with invasive coronary angiography (CA).

Methods We conducted a prospective study on patients with previous stent implantation who was scheduled for coronary angiography, received 128-slice dual-source CT using three CT protocols (high-pitch spiral (HPS), sequential (SEQ), low-pitch spiral (LPS)). Two reviewers scored coronary stent image quality, evaluated lumen blinded to the result of CA and calculated the radiation dose.

Results One hundreds and sixty-five patients with total 256 stents were evaluated. There were no significant differences in image quality scores between three groups. Image quality was not influenced by age, body mass index or heart rate in any groups, but heart rate variability and an impact on the image quality of SEQ and HPS group. Per-stent based sensitivity, specificity, and positive and negative predictive value in assessment of stent restenosis were 100%, 97.1%, 83.3%, 100%, respectively in the HPS CT angiography groups, 92.3%, 95.9%, 80%, 98.6%, respectively in the SEQ groups and 93.3%, 97.3%, 87.5%, 98.6%, respectively in the LPS groups. The mean effective dose in three groups were 1.0 ± 0.5 mSv (HPS), 3.0 ± 1.4 mSv (SEQ) and 13.0 ± 5.4 mSv (LPS), respectively. The effective dose in HPS group is significant less than SEQ and LPS group ($p < 0.01$). Besides, the DSCT mean effective dose of in HPS groups was a weak less than invasive CA (1.50 ± 0.8 mSv).

Conclusions As a gold standard of CA, 128-slice DSCT using HPS mode has a similar performance in assessing coronary stent patency comparison with SEQ and LPS mode, but a lower effective dose in selected patients with regular heart rates ≤ 70 bpm.