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宝石CT不同扫描及重建方式对冠状动脉支架图像质量的影响:体模实验研究

Impact of scanning and reconstruction mode of HDCT on image quality of coronary artery stent: An experimental study

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中文摘要:

目的 探讨不同扫描及重建方式对冠状动脉支架图像质量的影响。方法 对6支不同类型及直径的冠状动脉支架,分批注入6种不同浓度碘对比剂(在120 kVp条件下的CT值:A组,138 HU组,186 HU;C组,205 HU;D组,250 HU;E组,374 HU;F组,414 HU),将其置于水箱中,利用GE Discovery CT750 HDCT机采用不同方式扫描及重建:单扇区扫描标准重建,单扇区扫描细节重建,高描标准重建,高清扫描高清重建。采用4级评分法对图像质量进行主观评分。结果 高清扫描高清重建时,各浓度组支架均显示清晰。两两比较,A~E组高清扫描高清重建方式与其他扫描重式组间差异均有统计学意义(P均<0.05);F组单扇区扫描细节重建方式与高清扫描高清重建方式图像质量评分差异无统计学意义(P>0.05)。高清扫描高清重建与其他两种扫描及重建方式图量评分比较差异均有统计学意义(P均<0.05)。单因素方差分析表明,高清模式下各浓度组间图像质量评分差异无统计学意义(P>0.05)。 结论 与其他扫描和重建方式比较,高清扫描高清重冠状动脉支架的显示较佳。但当管腔内对比剂浓度较高(CT值414 HU)时,其与单扇区扫描细节重建方式之间对支架的显示无明显差别。对比剂的CT值在138~414 HU之间时对高清模式支架无明显影响。

英文摘要:

Objective To assess the impact of different scanning and reconstruction modes on image quality of coronary artery stent. **Methods** Six micro-tubes with six stents varying in size were filled with contrast agent of different CT values (at 120 kVp, group A, 138 HU; group B, 186 HU; group C, 205 HU; group D, 250 HU; group E, 374 HU; group F, 414 HU) and put into a water tank. CT scan was performed with Discovery CT750 HD scanner. There were four types of scanning and reconstruction mode: Segment scan with standard reconstruction, segment scan with detail reconstruction, h resolution scan with standard reconstruction, high-resolution scan with high-resolution reconstruction. The image quality was evaluated with 4-point scale. **Results** The stents were clear when high-resolution scan with high-resolution reconstruction in all groups. Among group A-E, there were significant differences between high-resolution scanning with high-resolution reconstruction and other (all P<0.05). For group F, the difference between segment scan with detail reconstruction and high-resolution scan with high-resolution reconstruction was not significant statistically (P>0.05). Differe between high-resolution scan with high-resolution reconstruction and other types were statistically significant (all P<0.05). *One-Way ANOVA* showed no significant difference among all groups using h resolution scan mode (P>0.05). **Conclusion** Although high-resolution scan with high-resolution reconstruction of HDCT can provide good image quality, segment scan with detail reconstruction is comparable to high-resolution scan with high-resolution reconstruction for image quality of stent when CT values is 414 HU. There is no influence in evaluating stent when CT value is from 138 to 41 HU.