

黄克敏,冯彦林,温广华,梁伟棠,李林,冯叶霞.不同采集角度对SPECT心肌灌注显像左心室下后壁图像的影响[J].中国医学影像技术,2014,30(8):1238-1242

不同采集角度对SPECT心肌灌注显像左心室下后壁图像的影响

Impact of different acquisition arcs on inferior-posterior wall of left ventricle in myocardial perfusion SPECT

投稿时间: 2014-04-03 最后修改时间: 2014-06-27

DOI:

中文关键词: [心脏](#) [体层摄影术](#) [发射型计算机](#) [单光子](#)

英文关键词: [Heart](#) [Tomography](#) [emission-computed](#) [single-photon](#)

基金项目:

作者	单位	E-mail
黄克敏	佛山市第一人民医院核医学科, 广东 佛山 528000	hkmin25@163.com
冯彦林	佛山市第一人民医院核医学科, 广东 佛山 528000	
温广华	佛山市第一人民医院核医学科, 广东 佛山 528000	
梁伟棠	佛山市第一人民医院核医学科, 广东 佛山 528000	
李林	佛山市第一人民医院核医学科, 广东 佛山 528000	
冯叶霞	佛山市第一人民医院核医学科, 广东 佛山 528000	

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中文摘要:

目的 探讨不同采集角度对SPECT心肌灌注显像左心室下后壁图像的影响。方法 接受 ^{99m}Tc -甲氧基异丁基异脒心肌灌注显像的患者52例,均接受 360° 采集成像。选择不同角度的相邻 80° 的原始数据进行图像重建(从 -180° 开始,每间隔 5° 进行一次图像重建,重建起始角度从 -180° 到 0° 共进行37次重建)。利用靶心图获得不同角度重建图像左心室各壁段的放射性计数百分比,比较不同角度重建时左心室各壁段放射性计数的变化,同时比较起始角度为 -135° 的重建范围[左后斜 45° ~右前斜 45° (LPO 45° -RAO 45°)]和起始角度为 -180° 的重建范围(后位~前位)左心室下后壁放射性计数的差异和图像差异,以及在不同性别和不同体质指数(BMI)受检者间的差异。结果 左心室各壁段的放射性计数在不同起始角度重建时出现明显变化,其中侧壁、下后壁和间壁放射性计数的最高点均出现在 -180° 重建时,前壁和心尖部分别出现在 -135° 和 -125° 重建时。下后壁、间壁和侧壁的放射性计数在 -135° 重建时明显低于 -180° 重建时($t=-10.322, -6.201, -4.033, P<0.001$),心尖部的放射性计数则高于 -180° 重建时($t=6.041, P<0.001$)。其中, -180° 重建与 -135° 重建时超重($24\text{ kg/m}^2\leq\text{BMI}<28\text{ kg/m}^2$)者的下后壁的放射性计数的平均差值明显高于BMI正常者(4.71 ± 2.15 vs $2.55\pm 2.43, t=3.227, P=0.002$)。与常规 -135° (LPO 45° -RAO 45°)的重建图像比较, -180° 重建(后位~前位)时左心室下后壁放射性分布出现不同程度改善,其中轻微改善者占30.77%(16/52),明显改善者占48.08%(25/52)。在超重者中出现下后壁放射性分布改善的受检者的比例明显高于BMI正常者[89.66%(26/29)和65.22%(15/23), $\chi^2=4.953, P=0.032$]。结论 改变重建起始角度能显著影响左心室各壁段的放射性计数,与起始角度为 -135° 的重建范围(LPO 45° -RAO 45°)比较, -180° 的重建范围(后位~前位)能明显改善左心室下后壁显示,尤其是对超重的受检者。

英文摘要:

To evaluate the effects of different acquisition arcs on inferior-posterior wall of left ventricle in myocardial perfusion SPECT. **Methods** Totally 52 patients underwent ^{99m}Tc -MIBI myocardial perfusion SPECT with 360° acquisition arcs. The 180° projection data that the start angle from -180° to 0° were reconstructed respectively. Counts of the left ventricle using myocardial Bull's-eye were measured and changes from different angle reconstruct data were analyzed. The image quality and counts of inferior-posterior wall from the -135° (left posterior oblique 45° to right anterior oblique 45° , LPO 45° -RAO 45°) and -180° (posterior to anterior) reconstruction data were compared, and the difference of sex and body mass index were analyzed. **Results** The counts of left ventricle were significantly altered when the reconstruction arcs was changed. The highest count of lateral, inferior-posterior and septal wall was related to -180° reconstruction arcs, and the anterior, apex wall was related to -135° and -125° reconstruction arcs respectively. The counts of inferior-posterior, septal and lateral wall were significantly lower ($t=-10.322, -6.201, -4.033, \text{all } P<0.001$) and apex wall was significantly higher ($t=6.041, P<0.001$) in -135° reconstruction arcs than that in -180° reconstruction arcs. The difference of counts in inferior-posterior wall between -180° and -135° reconstruction arcs were significantly higher in overweight cases than that in normal weight cases (4.71 ± 2.15 vs $2.55\pm 2.43, t=3.227, P=0.002$). The radioactivity distribution of inferior-posterior wall was improved in -180° reconstruction imaging than that in -135° reconstruction imaging, 16 cases (16/52, 30.77%) were improved slightly and 25 cases (25/52, 48.08%) were improved markedly, and the improved cases were significant higher in overweight than that in normal weight (89.66% [26/29] and 65.22% [15/23], $\chi^2=4.953, P=0.032$). **Conclusion** The counts of left ventricle could be changed significantly when the acquisition arcs were changed. The radioactivity distribution of inferior-posterior wall is significantly improved in -180° acquisition arcs (posterior to anterior) than that in -135° acquisition arcs (LPO 45° -RAO 45°), especially in overweight ($24\text{ kg/m}^2\leq\text{BMI}<28\text{ kg/m}^2$) cases.

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地址：北京市海淀区北四环西路21号大猷楼502室 邮政编码：100190 电话：010-82547901/2/3 传真：010-82547903

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