中国医学影像技术
CHINESE JOURNAL OF MEDICAL IMAGING TECHNOLOGY

郭娟,郭瑞强,陈金玲,曹省,胡波.对比三维斑点追踪技术和二维斑点追踪技术评价正常人左心室心肌应变[J].中国医学影像技术,2013,29(12):1960~1964

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Comparison on two-dimensional speckle tracking technology and three-dimensional speckle tracking technology in evaluation on left ventricular myocardial strains in healthy subjects

投稿时间： 2013-07-17 最后修改时间： 2013-09-19

DOI:

中文关键词：斑点追踪成像 心室功能,左 应变

英文关键词:Speckle tracking echocardiography Ventricular function, left Strain

基金项目：

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中文摘要：

目的 应用二维斑点追踪成像（2D-STE）与三维斑点追踪成像（3D-STE）技术评估正常人左心室心肌应变。方法 对34名正常人进行左心室心肌二维、三维图像采集，通过二维图像获取左心室心肌收缩末期17节段纵向应变（LS）、18节段环向应变（CS）及径向应变均（RS），通过三维图像获得面积应变（AS）、LS、RS及CS。结果 3D-STE与2D-STE的LS和CS均自基底段至心尖段逐渐增大，RS均逐渐减。与2D-STE相比，3D-STE测得的LS较小，CS较大（P均<0.05）。3D-STE所测的AS与LVEF相关性最强（r=-0.720，P<0.05）。3D-STE获取图像及脱机分析时间明显少于2D-STE（P均<0.05）。结论 3D-STE是更全面、省时、高效的应变测量方法。作为3D-STE的新型应变参数，AS能更全面地反映左心室收缩功能。

英文摘要：

Objective To assess left ventricular myocardial strains with two-dimensional speckle tracking echocardiography (2D-STE) and three-dimensional speckle echocardiography (3D-STE). **Methods** 2D-STE and 3D-STE were performed in 34 healthy subjects. Longitudinal strain (LS) was obtained in 17-segment, circumferential strain (CS) and radial strain (RS) were also obtained in 18-segment in left ventricular end-systolic through 2D-STE, while area strain (AS), LS, RS and CS were obtained with 3D-STE. **Results** LS and CS all progressively increased from base to apex, while RS decreased from base to apex in both 3D-STE and 2D-STE. LS obtained with 3D-STE was smaller than that with 2D-STE, and CS obtained with 3D-STE was higher than that with 2D-STE (P<0.05). Among all 3D-STE strain indexes, AS had the closest correlation with left ventricular ejection fraction (r=-0.720, P<0.05). The time taken for imaging and offline analysis using 3D-STE were significantly less than those using 2D-STE (P<0.05). **Conclusion** 3D-STE is a comprehensive and time efficient tool to evaluate regional wall strain. AS is a good index for evaluation of left ventricular systolic function.