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四维自动左心室定量分析技术评价左心室功能与几何形态改变的关系

Evaluation on relationship between left ventricular function and geometric shape with 4-dimensional auto left ventricular quantification

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中文关键词：超声心动描记术 四维自动左心室定量分析 心室功能 球形指数

英文关键词:Echocardiography Four dimensional auto left ventricular quantification Ventricular function Spherical index

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中文摘要:

目的 应用四维自动左心室定量分析工具（4D Auto LVQ）与二维超声心动图（2DE）对比分析左心室扩大者心室几何形态及收缩功能，探讨左心室几何形态改变与收缩功能的关系。方法 以左心室球形指数作为反映左心室几何构型变化的指标，应用2DE及RT-3DE测量39名健康志愿者（正常组）和60例左心室扩大患者（左心室扩大组）的左心室舒张末期容积（LVEDV）、左心室收缩末期容积（LVESV）、左心室射血分数（LVEF）及二维舒张末期球形指数$^{-1}$（SId^{-1}）和三维球形指数（SPI），并进行相关性分析。结果 与正常组比较，左心室扩大组LVEDV、LVESV及SPI增加，LVEF减小；2DE与RT-3DE所获得的LVEDV、LVESV、LVEF及球形指数值显著相关（P均<0.05）。左心室扩大组中，RT-3DE和2DE分别所测球形指数与LVEF呈负相关，球形指数与LVEDV、LVESV呈正相关（P<0.05），SPI与LVEF的相关性高于SId^{-1}与LVEF（r=-0.553 vs r=-0.457，P<0.05）。结论 应用4D Auto LVQ技术可较简捷、直观显示并测量左心室几何形态及收缩功能；球形指数与LVEF、LVEDV、LVESV显著相关。

英文摘要:

Objective To explore the relationship between left ventricular geometry and systolic function via comparative analysis of left ventricular morphologic parameters and systolic function in patients with left ventricular enlargement by using real-time three-dimensional echocardiograph (RT-3DE) 4-dimensional auto left ventricular quantification (4D Auto LVQ) technique. **Methods** Left ventricular morphologic parameter was taken as index of left ventricular sphericity. Thirty-nine healthy volunteers (normal group) and 60 patients with left ventricular enlargement (left ventricular enlargement group) underwent two- and RT-3DE for measurement and analysis of end-diastolic left ventricular volume (LVEDV), end-systolic left ventricular volume (LVESV), ejection fraction (LVEF), end-diastolic spherical index^{-1} (SId^{-1}) and spherical index (SPI). **Results** LVEDV, LVESV and SPI in the left ventricular enlargement group were higher than those in normal group, while LVEF in left ventricular enlargement group was lower than that in normal group. LVEDV, LVESV, LVEF and sphericity index measured by 2DE and RT-3DE were correlated in both two groups (P<0.05). Spherical index and LVEF measured by RT-3DE and 2DE were negatively correlated, while spherical index and LVEDV, LVESV measured by RT-3DE and 2DE were positively correlated (P<0.05), and the correlation between spherical index and LVEF measured by RT-3DE was higher than those measured by 2DE in left ventricular enlargement group (r=-0.553 vs r=-0.457, P<0.05). **Conclusion** The application of 4-dimensional automatic left ventricular quantification can simply and visually display and measure left ventricular geometry and systolic function. There is significant correlation between spherical index and LVEF, LVEDV, LVESV.