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双源CT半自动法左心室功能分析在不同心率(律)下的准确性

Veracity of semi-automatic left ventricular function analysis of dual source CT in patients with different heart rate (rhythm)

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中文摘要:

目的 探讨双源CT(DSCT)半自动Simpson和半自动3D法对不同心率(律)个体左心室功能分析的准确性及应用限度。方法 连续84例接受冠状动脉CT造影的患者,依据心率(律)分为3组(A组:心率≤75次/分,31例;B组:心率>75次/分,36例;C组:心律不齐,17例)。采用第二代DSCT前瞻性心电门控序列进行扫描(30%~80%R-R间期),分别用半自动Simpson法、手动矫正Simpson法和半自动3D法(以下分别简称第一、二、三种方法)测得左心室收缩末期容积(LVESV)、舒张末期容积(LVEDV)以及射血分数(LVEF),并以第二种方法结果为对照进行统计学分析。结果 A组:3种处理方法均顺利完成,左心室功能各测量数值差别均无统计学意义(P均>0.05)。B组:第一种方法失败2例,其余34例顺利完成;第一、第二种方法测量的LVEF值及第二、第三种方法测量的LVEDV值差别有统计学意义(P均<0.05);第三与第二种方法测得的LVEF的相关性明显高于第一与第二种方法。C组:第一种方法失败8例,其中3例第一、第三种方法均失败,同时用3种方法处理成功9例,成功率52.94%(9/17)。结论 DSCT半自动Simpson和半自动3D法左心室功能分析有一定的心率(律)适用范围;应依据心率(律)选择合理的计算方法,以保证计算的准确性。

英文摘要:

Objective To investigate the accuracy and application limit of left ventricular function evaluation with semi-automatic Simpson and semi-automatic 3D methods in dual source CT (DSCT) for patients with different heart rate (rhythm). **Methods** Eighty-four consecutive patients who underwent cardiac CT were divided into three groups (group A: heart rate≤75 bpm, n=31; group B: heart rate>75 bpm, n=36; group C: arrhythmias, n=17) according to heart rates(rhythm). Prospective ECG-trigger and sequential acquisition model (30%—80% R-R interval) were used in coronary arterial angiography with the second generation DSCT. Semi-automatic Simpson method (1st method), manual correction Simpson method (2nd method) and Semi-automatic 3D method (3rd method) were applied respectively to evaluate the left ventricular end systolic volume (LVESV), left ventricular end diastolic volume (LVEDV) and left ventricular ejection fraction (LVEF). Outcome of the 2nd method was regarded as standard of comparison in statistical analysis. **Results** Group A: All three methods were accomplished successfully, no statistical difference was found among the above parameters (all P>0.05). Group B: The 1st method failed in 2 cases, and the other 34 patients finished calculation successfully. Statistical differences of LVEF were found between 1st and 2nd method (P<0.05) , as well as of LVEDV between 2nd and 3rd method (P<0.05). The correlation of LVEF obtained with the 2nd and 3rd method was higher than that of the 1st and 2nd method. In group C, the 1st method failed in 8 cases and the 3rd method failed in 3 cases, while all three methods succeeded in 9 cases, and the success rate was 52.94% (9/17). **Conclusion** Semi-automatic Simpson and semi-automatic 3D method of DSCT have some applicable scope in left ventricular function analysis according to different heart rates (rhythm). Reasonable methods should be taken to guarantee the accuracy of evaluation.

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