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双源射频发射技术在3.0TMR心脏成像中的优势

Advantages of dual-source parallel radiofrequency transmission in 3.0T MR cardiac imaging

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中文摘要:

目的 评价双源射频发射技术在提高3.0TMR心脏局部射频场均匀性和心脏成像质量中的优势.方法 对14名健康成年志愿者行双源和单源射频发射左心室短轴位射频场均匀性和电影成TFE序列),其中双源电影成像采用不同TR/TE和FA分别得到3组图像.利用配对t检验评价射频场的均匀性,以单因素方差分析比较心室腔-室间隔信号对比度(CR)之间的差异.由2名医师对电影进行评分,采用Wilcoxon秩和检验比较评分差异.对评价者间的一致性采用Kappa检验.结果 双源射频发射技术显著改善了B1场的均匀性,提高了B-TFE序列心室腔-室间隔的CR($P<0.05$)短TR双源射频发射技术图像伪影明显减少($P<0.05$),评价者间的一致性均高度一致.结论 双源射频发射技术在3.0TMR心脏成像中有一定优势,可以提高射频场均匀性,增加血池-心肌CR,减少伪影.

英文摘要:

Objective To assess the advantages of dual-source parallel radiofrequency (RF) transmission in 3.0T MR cardiac imaging, esp. in increasing RF homogeneity and image quality. **Methods** With institutional review board approval and written informed consent, 14 healthy volunteers underwent cardiac imaging using 3.0T MR scanner equipped with dual-channel parallel RF transmission technique. B1 calibrations and balanced-turbo field echo (B-TFE) cine imaging of left ventricular short-axial plane were performed with conventional single-source and dual-source RF transmission, respectively, three groups acquisition were obtained with different TR/TE and FA B-TFE. A paired *t*-test was performed to compare RF homogeneity data. The contrast ratios (CR) were compared with one-way ANOVA. The artifacts were assessed by two doctors and then analyzed with non-parametric Wilcoxon signed rank test. Inter-observer agreement was evaluated with Kappa test. **Results** Dual-source transmission improved RF homogeneity and increased CR of short-axis B-TFE ventricular cine images significantly ($P<0.05$). Dual-source RF transmission with shorter TR significantly reduced the artifacts ($P<0.05$). Inter-observer agreement was highly consistent. **Conclusion** Dual-source parallel RF transmission has observable advantages in 3.0T cardiac MR imaging, which can improve the homogeneity of RF field, increase contrast between blood pool and myocardium and reduce artifacts.

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