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利用颅脑射频线圈进行大鼠磁共振成像

Radiofrequency coil in rat brain MR imaging

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中文摘要:

目的 研究3.0T磁共振成像系统中大鼠脑部射频线圈。方法 提出一种设计线圈结构的方案,采用高等于直径的鞍型线圈,研究直径为5 cm的大鼠脑部线圈减小电容和分布电容,可使线圈带宽减小,提高线圈品质的因素(Q)。将线圈与人体头部线圈和体部线圈分别对自制的模型利用同一序列进行扫描,对三组图像选择同一位置的图像,比较各线圈的信噪比(SNR)。观察图像的质量,应用大鼠颅脑模型分别进行轴位、矢状位和冠状位T1W FLAIR或T2W扫描。结果 线圈的SNR比现有的头部线圈高5倍以上。大鼠图像能很好地显示脑室结构,可清楚分辨脑部的灰质和白质。结论 利用所设计的线圈可获得具有很高SNR的图像,在大鼠脑部影像研究中取得了很好的效果。

英文摘要:

Objective To assess the value of radiofrequency coil in rat brain imaging with 3.0T MR system. **Methods** A kind of method that designed the coil structure was put forward. A saddle coil of cylinder high equal to the diameter was adopted, and the rat brain coil diameter was 5 cm. The capacitors and distributed capacitors were minimized and the coil bandwidth decreased, the coil quality factor (Q) raised as well. The coil with head coils and body coil were used to carry on scan to the self-made model respectively in same sequence, and the coils signal-to-noise ratio (SNR) of three groups images in same position slice were compared. The rat brain was carried on T1W FLAIR and T2W scan in three axes directions respectively to observe the imaging quality. **Results** The coil SNR was 5 times higher than that existing brain coil and could clearly distinguish grey matter from white matter, as well as the structure in the rat brain on T1WI and T2WI. **Conclusion** This coil has very high SNR and can obtain good results in the imaging researches of rat brain.

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