匀场辅助装置在臂丛神经成像中的应用

Application of the assistive device for shimming of MR imaging for brachial plexus

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中文摘要：

　　目的　探讨自制匀场辅助装置在3D Cube T2W序列正常臂丛神经成像中的应用价值。方法　采用相同参数对30名健康志愿者双侧臂丛神经进行2次斜冠状位3D Cube T2W序列扫描,第2次扫描时使用匀场辅助装置.测量神经、肌肉、背景噪声信号,并进行MIP、CPR等后处理和图像质量评级,计算神经SNR及对比噪声比(CNR)。结果　常规扫描图像常出现颈部低信号伪影、颈肩部脂肪抑制不均匀现象,神经根、斜角肌、胸锁关节和腋动脉水平臂丛神经成像质量分级分别为2.38 ± 0.64、2.45 ± 0.53、1.73 ± 0.66、1.95 ± 0.53。使用匀场辅助装置后,图像颈部伪影消除、颈肩部脂肪抑制效果明显改善,神经根、斜角肌、胸锁关节和腋动脉水平臂丛神经成像质量分级分别为3.95 ± 0.21、3.82 ± 0.39、3.38 ± 0.55、1.97 ± 0.41;其中神经根、斜角肌、胸锁关节水平臂丛神经成像质量分级高于常规扫描图像(P均<0.001)。常规扫描图像的SNR及CNR分别为13.14 ± 4.37、6.65 ± 2.96,使用匀场辅助装置后分别为15.10 ± 5.91、8.03 ± 3.63(P均<0.05)。结论　在3D Cube T2W序列臂丛神经成像中,应用匀场辅助装置可改善局部磁场均匀度,提高臂丛神经成像质量。

英文摘要：

　　Objective To explore the application value of the self-made assistive device for shimming on 3D Cube T2W sequence MR imaging for normal brachial plexus. **Methods** Thirty healthy volunteers underwent same MR scan twice with 3D Cube T2W sequence to obtain images of brachial plexus, and the assistive device was used in the second time. The signal of nerve, muscle and background noise was measured. Images were postprocessed with MIP and CPR, and then image quality was assessed. SNR and contrast-to-noise ratio (CNR) were calculated. **Results** Low signal artifact on neck and non-uniform fat suppression occurred on conventional images, and the image quality grade of brachial plexus at various anatomic levels (roots, interscalene area, costoclavicular space and axillary level) was 2.38 ± 0.64, 2.45 ± 0.53, 1.73 ± 0.66, 1.95 ± 0.53, respectively. Using the assistive device, the artifact on neck disappeared, and the effect of fat suppression was better than before. The image quality grade of various anatomic levels in brachial plexus was 3.95 ± 0.21, 3.82 ± 0.39, 3.38 ± 0.55, 1.97 ± 0.41, respectively, higher than conventional images in the level of roots, interscalene area, costoclavicular space (all $P<0.001$). SNR and CNR of conventional images were 13.14 ± 4.37 and 6.65 ± 2.96, respectively. Using the assistive device, SNR and CNR of images was 15.10 ± 5.91 and 8.03 ± 3.63, higher than those of conventional images (both $P<0.05$). **Conclusion** The assistive device for shimming can improve the uniformity of local magnetic field and image quality of brachial plexus on 3D Cube T2W sequence.

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