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Design and Optimization of 4-Channel SENSE Head Coil

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목적 : Recently, a major interesting method of fast MR imaging is sensitivity encoding (SENSE) using arrays of multiple receiver coils. In this study, we have designed and implemented a 4-channel head array coil and optimized the structure and arrangement of the coil to improve the performance.

대상 및 방법 : Sensitivity encoding (SENSE) scheme had been proposed to reduce scan time using a receiver coil array for multi-channel signal acquisition. In this technique the spatial sensitivity distributions of the receiver coils are used in order to reconstruct a full field-of-view (FOV) image from a set of reduced FOV images obtained using the set of coils.

결과 : We have designed and implemented a 4-channel SENSE head coil array to obtain MR images with a 3.0 T Medinus MRI system and MR images have been reconstructed by use of SENSE reconstruction algorithm. We implemented the SENSE reconstruction scheme using the sensitivity maps of the multiple coils. The isolations between the coil elements are minimized using low impedance preamplifiers with dedicated matching circuits, and g-factors are minimized by using the simulation results.

결론 : SENSE imaging with a 4-channel head coil enables us to reduce the scan time. SAR exposure has also been reduced by use of the developed coil and the SENSE scheme.

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