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Development of Sensitive RF Surface Coils for MR Microscopic Image

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목적 :

The purpose of this study is to develop the technique that we can obtain high resolution images in 1.5T and 3T by redesigned surface coils.

대상 및 방법 :

The basic components of a RF surface coil are R-L-C. The resonance frequency of a RF-pulse is expressed simply. So, the conductance of the coil can be driven from concept equations. A cross diode is necessary to decouple with a Tx coil and there is a variable capacitor for matching and tuning frequency.

결과 :

The Q-factor of our surface coil was measured about 170 and its impedance is about 85 when nothing loaded. When a object(poke skin) is loaded, Q-factor value has about 100 and its impedance is 50. So this coil can be used for a MR imaging in 1.5T (The resonance frequency of protons is 64.88(MHz) in 1.5T).

결론 :

The higher resolution, the better skin images can be obtained with this surface coil. In order to get images whose resolutions are high (the smaller FOV size and the more matrix number), the gradient field which is more than 40 (mT/m) is required. On the other hand, in order to improve the SNR of a surface coil, we are planning multi-turned surface coil.

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