The comparison of SENSE and SPACE RIP
in parallel imaging performance with regularization

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목적: SENSE and SPACE RIP are both parallel imaging techniques, but they have their own reconstruction processes. Consequently, this results in difference in reconstructed image quality. In this study, we compared the performance of SENSE and SPACE RIP in their reconstructed image quality.

대상 및 방법: Two-fold reduction data was acquired using 8-channel phased-array coil. In order to compare the performance of SENSE and SPACE RIP, the reduced data was reconstructed by using three methods, SENSE, SENSE with regularization, and SPACE RIP with regularization. Each reconstructed image from each reconstruction method was compared with the reference image, and numerical difference was calculated. This process was repeated for the other reduction factor, from 3 to 8.

결과: At low reduction factor, the reconstructed image quality from the three methods are almost same. But, at high reduction factor, the reconstructed image from the SPACE RIP with regularization shows the best quality.

결론: To resolve the pixel from the aliased pixel, matrix equation must be solved in parallel imaging. Since SENSE is based on pixel by pixel reconstruction, the matrix equation for each aliased pixel is well-posed. Consequently, the regularization does not have much impact on the reconstructed image quality and the reconstructed image quality degraded as the reduction factor increases. However, SPACE RIP is based on column by column reconstruction. Therefore the matrix equation tends to be ill-posed. For this reason, the SPACE RIP reconstruction works well only when regularization is used, but the reconstructed image quality is acceptable until the reduction factor reaches theoretically maximum value.