



KSMRM Educational Course 2

교육세션 2-4

## 최신 고속 MRI 영상기법

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Rapid imaging in MRI is essential for minimizing motion artifacts, improving patient comfort, and enabling dynamic and quantitative studies. The demand for faster image acquisition has driven the evolution of several acceleration techniques.

Early breakthroughs such as SENSE (Sensitivity Encoding) leveraged coil sensitivity maps to reduce scan time by undersampling k-space, while GRAPPA (Generalized Autocalibrating Partial Parallel Acquisition) provided robust reconstruction using autocalibration. Later, Compressed Sensing (CS) introduced the concept that images can be reconstructed from fewer measurements by exploiting image sparsity and iterative reconstruction algorithms, further pushing the limits of scan acceleration.

Most recently, Deep Learning-based reconstruction methods have emerged, enabling even greater speed and image quality improvements by learning complex data-driven mappings from undersampled data to fully sampled images. In this presentation, I will introduce the clinical importance of fast MRI acquisition and trace the chronological development from SENSE and GRAPPA, through compressed sensing, to the latest advances in deep learning reconstruction. Key principles, advantages, and limitations of each method will be addressed, highlighting how these innovations have shaped modern MRI practice within clinical and research settings.

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