Fast magnetization transfer saturation imaging

Fast Magnetization Transfer Saturation (FMTS) imaging is a magnetic resonance imaging (MRI) technique used to study the interaction between protons in different molecular environments within biological tissues. It utilizes magnetization transfer (MT) effects to enhance image contrast and provide additional information about tissue microstructure and composition.

In FMTS imaging, a radiofrequency (RF) pulse is applied at the frequency of the magnetization exchange between bound and free water protons. This pulse selectively saturates the magnetization of bound protons, which are typically associated with macromolecules such as proteins and lipids. Then, a fast imaging sequence, often based on gradient echo techniques, is employed to acquire images while the saturated magnetization is transferred to the free water protons. This results in enhanced contrast between tissues with different macromolecular content.

FMTS imaging has applications in various fields such as neuroimaging, musculoskeletal imaging, and oncology. It can provide insights into tissue composition, detect subtle changes in tissue microstructure, and improve the detection and characterization of pathological conditions. Additionally, FMTS imaging can be combined with other MRI techniques to further enhance its diagnostic capabilities.