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Presentation 50: Evaluation of magnetic susceptibility in cardiac tissues using magnetic resonance imaging

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Magnetic Resonance Imaging (MRI) obtained for diagnosis in Medicine contains the amplitude and phase of the signal, the former of which is normally used for anatomical identification of structures and their alteration in disease. The information is determined, among other variables, by the movement of the structures under analysis and influenced by their magnetic susceptibility, depending on the chemical components present. Cardiac pathologies can cause the deposition or accumulation of substances in the heart, such as blood and its degradation products or calcification of the valvular apparatus. These have a significantly different magnetic susceptibility to other cardiac tissues, inducing alterations and artifacts in the images, particularly in the phase component of the signal.

To isolate the effect of magnetic susceptibility in the case of cardiac applications, it is necessary to minimize the impact of movement by modifying the shape of the gradients in order to avoid phase accumulation due to movement and synchronizing acquisition with cardiac and respiratory cycles. Having acquired a series of T2*-sensitive images with different weightings, the signal still has to be analyzed in order to remove potential contamination due to the presence of fat before estimating the magnetic susceptibility map.

In this project, we intend to implement a protocol for acquiring and analyzing cardiac MRI images to assess magnetic susceptibility in the heart in order to identify blood deposition or calcification.

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