Latest Updates In Cardiovascular MRA

Sang Il Choi

Seoul National University Bundang Hospital, Korea

Coronary magnetic resonance angiography (CMRA) is a powerful noninvasive technique with high soft-tissue contrast for the visualization of the coronary anatomy without X-ray exposure. Due to the small dimensions and tortuous nature of the coronary arteries, a high spatial resolution and sufficient volumetric coverage have to be obtained. However, this necessitates scanning times that are typically much longer than one cardiac cycle. By collecting image data during multiple RR intervals, one can successfully acquire coronary MR angiograms. However, constant cardiac contraction and relaxation, as well as respiratory motion, adversely affect image quality. Therefore, sophisticated motion-compensation strategies are needed. Furthermore, a high contrast between the coronary arteries and the surrounding tissue is mandatory. In the present lecture, challenges and solutions of coronary imaging are discussed, and results obtained in both healthy and diseased states are reviewed. This includes preliminary data obtained with state-of-the-art techniques such as steady-state free precession (SSFP), whole-heart imaging, intravascular contrast agents, coronary vessel wall imaging, and high-field imaging. Simultaneously, the utility of cardiac multidetector computed tomography (MDCT) for the visualization of the coronary arteries is discussed..