Phase contrast cine magnetic resonance imaging

Phase contrast cine magnetic resonance imaging (MRI) combines the flow-dependent contrast of Phase contrast imaging with the ability of cardiac cine imaging to produce images throughout the cardiac cycle. Two pulse sequence types are used for sensitivity to flow in one direction, whereas four are needed for sensitivity in all directions. Several alternatives for synchronization of the data to the cardiac cycle exist. Retrospectively interpolated methods can image the entire cardiac cycle efficiently. Rapid interleaving of the various sequence types ensures immunity to motion misregistration. The technique produces images in which contrast is related to flow velocity as well as magnitude images such as those of conventional cine MRI. The data can be interpreted qualitatively to demonstrate the presence, magnitude, and direction of flow, and quantitatively to provide estimates of flow velocity, volume flow rate, and displaced volumes. Phase contrast cine MRI is helpful in the diagnosis of aortic dissections, in the study of flow distributions in large vessels such as pulmonary arteries, as well as in smaller vessels such as carotid and basilar arteries, and in the evaluation of complex anatomical variants. Future developments are expected to reduce imaging time and expand the quantitative applications [1)]

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Pelc NJ, Herfkens RJ, Shimakawa A, Enzmann DR. Phase contrast cine magnetic resonance imaging. Magn Reson Q. 1991 Oct;7(4):229-54. PMID: 1790111.