Summits in Clinical Cardiovascular MRI: Cardiac.

CASE BASED TEACHING SERIES: CONGENITAL HEART DISEASE

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The evaluation of congenital heart disease requires combined knowledge of sequential anatomy, surgical approaches and imaging techniques. A number of complications and sequelae should be recognized after surgical procedures. The initial evaluation of the anatomy using black-blood sequences, bright blood sequences and MR angiography is based on the sequential analysis of ventricles, valves, atria and large vessels. A number of anatomic abnormalities may occur in isolation (e.g. valvular lesions, bicuspid aortic valves) or as part of complex congenital heart disease with multiple features (e.g. transposition of the aorta with single vemntricle morphology). The basic information on anatomy is best initially evaluated by using the transverse image orientation. Sometimes special views and techniques may enhance the diagnostic value (e.g. views aligned to the long-axis of the vessel of interest). Gadolinium-based projection MR angiography may reveal tortuous and stenosed vessels to better advantage than the individual slices obtained with other techniques. MR flow mapping is indispensable for complete evaluation of valvular and large vessel physiology. MR flow mapping plays an important role for evaluating stenosed and particularly regurgitant valvular lesions (e.g. pulmonary regurgitation after Fallot surgery). Scar tissue can also be defined in a number of congenital heart diseases by using delayed gadolinium enhanced MRI (e.g. after Senning and Fallot repair). In this case presentation a number of usual and unusual congenital entities will be discussed.