

Summary

Cardiovascular magnetic resonance (CMR) imaging is a well-established noninvasive technique that does not employ potentially nephrotoxic contrast or ionizing radiation and allows for a comprehensive assessment of valvular heart disease.

The lack of ionizing radiation is particularly important for valvular disease. Patients who frequently undergo serial examinations over the course of the disease.

Echocardiography is still the procedure of choice for obtaining anatomic information regarding number of leaflets, valve thickness, and presence of vegetations in endocarditis. However, MR imaging is a more accurate and reproducible method of quantifying valvular regurgitation and stenosis non invasively without use of radiation.

Valvular imaging with Cardiovascular MR generally relies on three types of sequences: anatomic black-blood imaging, Cine MR (SSFP) imaging and assessment of blood flow with phase-contrast imaging

Black blood (Spin-echo) imaging allows the visualization of the valve morphology and the size and structure of the great vessels and the cardiac chambers.

Cine MRI sequences (SSFP) provides most of the morphologic as well as the functional information such as leaflet morphology, leaflet motion, valve area, severity of regurgitation and stenosis, ventricular size and function and the prosthetic valve motion.

Phase-contrast or velocity-encoded cine MRI is a highly attractive technique to visualize and to quantify flow, enabling to calculate blood flow velocities and volumes, such as ventricular stroke volumes, cardiac output and regurgitation flow in insufficient valves or high-velocity jet through stenotic valves.

In addition, the good interstudy reproducibility of measurements of cardiac dimensions, valvular regurgitation, and valvular stenosis with cine gradient-echo and VEC MR imaging suggests a role for this modality in assessing the effects of therapeutic intervention and monitoring regurgitant fraction in valvular regurgitation to help plan surgical intervention and prevent ventricular dysfunction.

With increasing cost-effectiveness and accessibility of MR imagers as well as the growing availability of new hardware, more advanced techniques, and faster imaging sequences, MR imaging will become a routine procedure for investigation and follow-up of patients with valvular heart disease.