Sub-aortic mitral impact lesion depicted by delayed enhancement cardiac magnetic resonance imaging

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A 65-year-old male was referred for assessment by cardiac magnetic resonance imaging (CMR) following a transthoracic echocardiogram which had demonstrated features of obstructive hypertrophic cardiomyopathy. The CMR confirmed asymmetric hypertrophy involving the basal septum and anterior wall with a maximum diastolic thickness of 2.5 cm and secondary systolic outflow tract obstruction. Two- (panel A) and four-chamber (Panel B) steady-state-free precession cine images demonstrate systolic anterior motion (SAM) of the anterior mitral leaflet and contact of the leaflet to the sub-aortic septal myocardium in both systole and diastole (Panel C). Four-chamber-delayed enhancement image after gadolinium at a equivalent level within the outflow tract (Panel D) shows a distinct area of linear enhancement in the sub-aortic septum corresponding to the contact point of the mitral leaflet, which we postulate is secondary to chronic repetitive trauma to the endocardium. Gadolinium is an extra-vascular, extra-cellular contrast medium, which accumulates in areas of fibrosis on delayed imaging due to altered wash in/wash out kinetics and increased volume of distribution. The septal mitral impact lesions secondary to SAM have been described as having areas of linear endocardial fibrosis, which mirror the shape of the anterior mitral leaflet and are associated with thickening of both the culprit leaflet and chordae. The resultant fibrosis and thickening is felt to be potentially contributory to worsening of outflow tract obstruction over time.

This case is an excellent illustration of the ability of CMR to visualize mitral impact lesions, previously only described on gross pathological specimens.