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Meeting abstract

1012 Cardiac surgery results in anterior translocation of the left ventricle in systole and tethering of the right ventricular free wall – an explanation for post-operative paradoxical septal motion

Subodh B Joshi*, Ali K Salah, Dorinna D Mendoza, Joseph Lindsay Jr, Steven A Goldstein and Anthon R Fuisz

Address: Washington Hospital Center, Washington, DC, USA
* Corresponding author

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Introduction

Abnormal (paradoxical) interventricular septal motion is commonly noted on echocardiography after cardiac surgery. Its mechanism has been debated. Cardiac magnetic resonance imaging (MRI) allows for accurate assessment of movement of the heart relative to the chest wall.

Purpose

To compare the motion of cardiac structures pre and post cardiac surgery.

Methods

Patients scheduled for coronary artery bypass surgery were prospectively enrolled to undergo cardiac MRI before and three months after surgery. On a mid left ventricular (LV) short axis cine image the positions of myocardial landmarks were ascertained relative to a stationary anterior reference point. Systolic wall thickening (SWT) in the mid septum was assessed on the same images. Viability images and echocardiography results were also reviewed.

Results

23 patients were identified, 19 male, mean age 64 years. Table 1 describes the motion of the structures indicated. A negative sign indicates posterior motion in systole and a positive sign an anterior movement. Scar in the inter-ventricular septum was identified in three patients. Paradoxical septal motion was noted in 7 of the 8 patients in whom post-operative echocardiograms were available.

Conclusion

After cardiac surgery the entire left ventricle moves anteriorly in systole. There is reduced motion of the right ventricular free wall suggestive of tethering to chest wall. This pattern of movement post-operatively occurs despite preserved septal wall thickening and improved global left and right ventricular function.

Table 1:

Motion in Systole, + Anterior, - Posterior			
	Pre CABG	Post CABG	P value
RV wall (mm)	-5.2	-2.3	0.002
Septum (mm)	-1.5	3.7	< 0.001
Mid LV cavity (mm)	-0.9	6.7	<0.001
Lateral LV wall (mm)	3.5	8.6	<0.001
Septal SWT (%)	54%	49%	0.56
LVEF (%)	50%	60%	<0.001
RVEF (%)	52%	60%	<0.001