

# Biventricular Reverse Remodeling and Relationship with Mitral Valve Prolapse After Transcatheter Closure of ASD Secundum, A 3D Echocardiographic Study

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## BACKGROUND:

Mitral Valve Prolapse (MVP) is the commonest anomaly of the Mitral Valve, several studies have shown prevalence of MVP in Atrial Septal Defect (ASD) especially secundum types (II). The aims of this study is to show the potential role of 3D echocardiography in improving the diagnosis of MVP and to depict the relationship between reverse remodeling of the right and left ventricles (RV and LV) and MVP after Transcatheter closure of ASD II. Methods: 60 patients underwent Transcatheter Closure of ASD II and completed follow up by 2D and 3D Echocardiography in Cairo University Children Hospital before the procedure and 24, 1 month and 6 months after the procedure. Results: 3D Echocardiography was more accurate than 2D Echocardiography in detecting MVP frequency in ASD II patients (75% vs. 50%). Maximum statistically significant reverse remodeling was detected by 3D Echocardiography 1 month after the procedure (RV: LV ratio by 3D Echocardiography  $1.9 \pm 0.03$  24 hours after the procedure vs.  $1.6 \pm 0.03$  1 months after the procedure, P Value  $< 0.01$ ) while 2D Echocardiography was delayed in detecting biventricular reverse Remodeling. 3D derived RV:LV ratio was accurate in detecting MVP status with a sensitivity of 88%. Conclusion: MVP in ASD II may be related to Biventricular remodeling, 3D Echocardiography is accurate in detection of reverse remodeling as well as MVP status in ASD II patients before and after device closure.

**Table:** Follow up of 2D and 3D derived RV: LV ratios after Transcatheter ASD II Closure.

	Before Closure	24 hours after transcatheter closure	1 month after transcatheter closure	6 months after transcatheter closure	P Value (1)	P Value (2)	P Value (3)
2D RV: LV ratio (Mean±SD)	2.8±0.06	2.7±0.05	2.6±0.05	2.2±0.04	NS	NS	<0.01
3D RV:LV ratio (Mean±SD)	2.2±0.05	1.9±0.03	1.6±0.03	1.5±0.02	0.04	<0.01	NS
Percentage of patients with MVP by 3D Echocardiography % (n)	75 (45)	75 (45)	45 (27)	40 (24)	NS	<0.01	NS

P Value (1): Comparison between before closure and 24 hours after Closure

P value (2): Comparison between 24 hours after closure and 1 month after closure P Value (3): Comparison between 1 month after closure and 6 months after closure

Abbreviations: ASD II: Ostium Secundum Atrial Septal Defect, LV: Left Ventricle, MVP: Mitral Valve Prolapse, n (number), RV: Right Ventricle, 2D: two- Dimensional, 3D: Three Dimensional

NB: P Value  $< 0.05$  was considered statistically significant

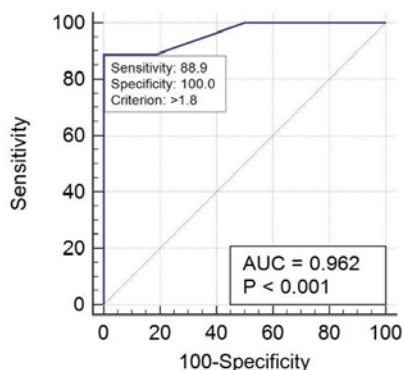


Figure: 3D Derived RV:LV ratio for prediction of negative outcome regarding MVP status 1 month after transcatheter ASD II closure