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Right ventricular volume off-loading following atrial septal defect closure or pulmonary valve replacement: impact on tricuspid regurgitation and mid-term remodeling

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Introduction: Cardiac surgery or catheter intervention is nowadays commonly performed to abolish volume loading of the right ventricle (RV) in adults with congenital heart disease (ACHD).

Purpose: Little is known, however, of their impact on the preexisting tricuspid regurgitation (TR) following such procedures (atrial septal defect [ASD] closure and pulmonary valve replacement [PVR]), which was the aim of our study.

Methods: Demographics, clinical and echocardiographic characteristics were analyzed from 162 consecutive patients undergoing such interventions between July 2005 and December 2014, who had at least mild preoperative TR.

Results: Mean age at intervention was 42±16 years (38.3% male); 101

patients underwent ASD closure, whereas 61 patients PVR. Only 11.1% receiving concomitant tricuspid valve surgery (repair). There was significant overall improvement in severity of TR, from 38 (23.5%) patients having moderate or severe TR preoperatively to only 11 (6.8%) and 20 (12.3%) at 6 and 12 months of follow-up, respectively (p<0.05) (Figure 1) (Table 1). Improvement in TR was observed in patients who did not have concomitant TV repair, from 15.3% to 6.9% and 11.8%, 6 and 12 months, respectively (p<0.05).

Conclusions: ASD closure or PVR are commonly associated with significant reduction of preoperative functional tricuspid regurgitation event amongst patients who did not undergo concomitant tricuspid valve surgery.

Echocardiographic data

	Echo 1 (baseline)	Echo 2 (6 months)	Echo 3 (12 months)	p-value [†]	[‡] Echo 1	[‡] Echo 2	[‡] Echo 3
TR grade (none = 1, mild = 2, moderate = 3, severe = 4)	2.3±0.6	1.6±0.6	1.7±0.8	<0.0001	A	B	B
End-diastolic tricuspid annulus diameter (cm)	4.3±0.6	3.6±0.6	3.5±0.5	<0.0001	A	B	B
Systolic tenting area (cm ²)	0.7±0.5	0.5±0.2	0.5±0.3	<0.0001	A	B	B
Coaptation distance (cm)	0.6±0.2	0.4±0.2	0.4±0.2	<0.0001	A	B	B
End-diastolic area (cm ²)	30.3±7.5	21.7±6.0	20.6±6.0	<0.0001	A	B	C
Fractional area change (%)	39.4±8.4	39.0±8.0	39.9±8.1	0.58	A	A	A
RV mid diameter (cm)	4.2±0.7	3.3±0.7	3.2±0.6	<0.0001	A	B	B
RVOT end-diastolic proximal diameter (cm)	4.4±0.6	3.8±0.6	3.6±0.5	<0.0001	A	B	C
TAPSE (cm)	2.1±0.6	1.4±0.5	1.4±0.4	<0.0001	A	B	B
Lateral TDi S (cm/s)	12.4±3.3	8.8±3.0	9.2±3.0	<0.0001	A	B	B
Systolic pulmonary artery pressure (mmHg)	42.4±13.4	34.8±10.1	35.1±11.6	<0.0001	A	B	B
LVEF (normal = 1, mild LV dysfunction = 2, moderate = 3, severe = 4)	1.0±0.2	1.0±0.2	1.0±0.2	0.80	A	A	A
RA area (cm ²)	26.1±9.6	19.5±6.6	19.2±6.7	<0.0001	A	B	B

[†]One-way ANOVA comparison. [‡]Tukey pairwise comparison between Echos 1, 2 and 3: means that do not share a letter are significantly different (i.e. p<0.05).

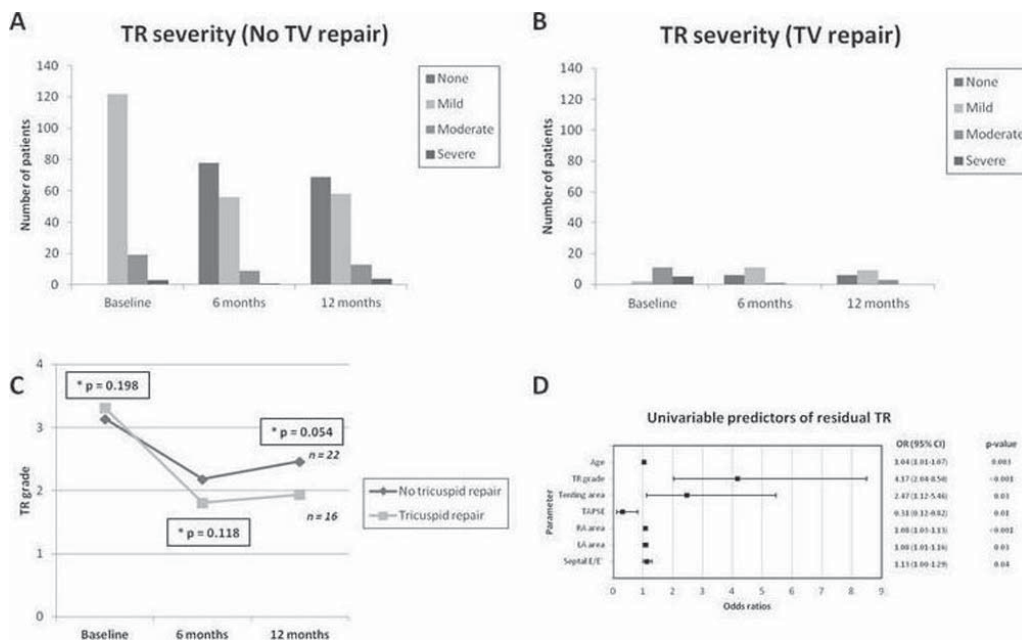


Figure 1