



ACC.14

TCT@ACC-12 | innovation in intervention

A519

JACC April 1, 2014

Volume 63, Issue 12



Congenital Heart Disease

REDUCTION OF ADVERSE VENTRICULAR INTERACTION AFTER TRANSCATHETER PULMONARY VALVE REPLACEMENT IN PATIENTS WITH RIGHT VENTRICULAR OUTFLOW TRACT OBSTRUCTION

Poster Contributions

Hall C

Saturday, March 29, 2014, 3:45 p.m.-4:30 p.m.

Session Title: Pediatric Interventional Cardiology

Abstract Category: 10. Congenital Heart Disease: Pediatric

Presentation Number: 1153-267

Authors: *Fatima Lunze, Babar Hasan, Kimberlee Gauvreau, David Brown, Steven Colan, Doff McElhinney, Boston Children's Hospital, Boston, MA, USA*

Background: Transcatheter pulmonary valve replacement (TPVR) for postoperative right ventricular outflow tract obstruction (RVOTO) improves biventricular function and exercise capacity over the short term, but the longer term effects on adverse ventricular interaction are unknown.

Methods: This study investigated changes in ventricular interaction and remodeling in 24 patients (17 tetralogy of Fallot) who underwent TPVR for predominant RVOTO (median age 18 yrs). Patients were evaluated with conventional and speckle tracking strain echocardiography and cardiopulmonary exercise, testing before TPVR, early post-TPVR (median 6 mo), and at mid-term follow-up (FU; median 2.5 yrs). Strain data were compared to healthy age- and heart rate-matched controls.

Results: The maximum RVOT gradient decreased from baseline to early post-TPVR (59 ± 24 to 25 ± 9 mmHg, $P < 0.001$), as did RV end-diastolic and end-systolic areas ($P = 0.017$ and $P = 0.014$, respectively). End-diastolic and end-systolic LV eccentricity (leftward shift of the interventricular septum) improved early after TPVR (1.37 ± 0.18 to 1.26 ± 0.20 , 1.33 ± 0.23 to 1.17 ± 0.19 , respectively; both $P = 0.001$), and end-diastolic septal shift improved further at mid-term FU (to 1.12 ± 0.13 , $P = 0.017$). LV longitudinal, circumferential, and radial strains were below normal at baseline ($-22 \pm 1\%$ vs. $-17 \pm 3\%$, $-29 \pm 3\%$ vs. $-24 \pm 4\%$, $-37 \pm 5\%$ vs. $-27 \pm 8\%$, respectively; all $P < 0.001$) and gradually recovered by mid-term (all $P \leq 0.004$). RV longitudinal strain was impaired at baseline ($-15 \pm 3\%$), but improved early post-TPVR (to $-17 \pm 3\%$, $P < 0.001$) and further at mid-term FU (to $-21 \pm 3\%$, $P < 0.001$), although it remained lower than in controls ($-29 \pm 2\%$, $P < 0.001$). Peak oxygen uptake improved early post-TPVR (from $69 \pm 16\%$ of predicted to $80 \pm 16\%$, $P = 0.006$), and further at mid-term FU (to $82 \pm 13\%$, $P = 0.018$ vs. early).

Conclusions: There was adverse ventricular interaction due to leftward septal shift associated with biventricular dysfunction at baseline. Relieving RVOTO with TPVR led to progressive improvement in biventricular function and reduced septal shift at early and mid-term FU. In patients with RVOTO, positive functional remodeling continues beyond the acute effects of TPVR.