Predictors and Outcomes of Right ventricular Outflow Tract Conduit Rupture during Percutaneous Pulmonary Valve Implantation: A Multicentric Study

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Background and Objectives: Conduit rupture is a complication encountered during percutaneous pulmonary valve implantation (PPVI). There is insignificant data on the risk factors for this potentially life threatening complication. We sought to evaluate the incidence, and predictors of conduit rupture during right ventricular outflow tract (RVOT) transcatheter treatment.

Methods: All consecutive patients who underwent transcatheater RVOT treatment from May 2008 to December 2011 were prospectively studied. Baseline demographics along with incidence, predictors and outcomes of conduit rupture with various transcatheter therapies were reviewed.

Results: Conduit rupture occurred in 9 out of 99 patients (9.09%). All conduit ruptures occurred universally during balloon dilatation of the RVOT. Significant risk factors included heavy calcification (p<0.05, OR=16 [1.87-357]), conduit type (homograft vs. others; p<0.05, OR=5.37 [1.1-27.39]) and conduit stenosis as the primary lesion (p<0.05). Other factors such as prolonged time interval between prior surgical RVOT repair and interventions, use of high-pressure balloons, balloon diameter, and overexpansion of conduit statistically failed to show any association. All patients were managed in the cardiac catheterization laboratory. None required surgery. There were no delayed complications during a mean follow up period of 2.3 ± 0.95 (SD) years. Conduit rupture had no impact on the mid-term outcomes.

Conclusions: Conduit rupture is a serious complication noted in a small proportion of patients undergoing transcatheter interventions on RVOT. Heavy calcification, homograft conduit and stenosis as primary lesion were significant predictors for conduit rupture. Immediate diagnosis with use of targeted interventional therapies should be attempted before proceeding with PPVI to avoid urgent surgical repair.