

Right Ventricular Outflow Reconstruction With Injectable Valve

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Introduction: Significant pulmonary regurgitation is a common problem after surgical or percutaneous treatment of congenital cardiac defects like Tetralogy of Fallot or Pulmonary Stenosis negatively affecting long-term prognosis and necessitating re-interventions.

The Biointegral no-react injectable pulmonic (NRIP) valve allows pulmonary valve replacement with or without cardiopulmonary bypass under direct control minimizing the impact of surgery on cardiac function. The aim of the works is to describe our multi institutional experience with the clinical use of this device.

Methods: Between January 2006 and January 2011, 21 symptomatic patients ,mean age 21.0 ± 12.5 (5.8-53.5), with severe pulmonary regurgitation and progressive right ventricular dysfunction after Tetralogy or similar pathology repair, received NRIP in 7 European different Institutions. All patients underwent magnetic resonance (MR) studies before and after the implant and trans-esophageal 2-D echocardiography during the surgical procedure and the follow up.

Results: Valve insertion, delivery, and placement were successful in all patients but one that required the repositioning of the same valve in cardiopulmonary by pass., Of these, 4 patients implanted the NRIP in cardiopulmonary by pass to allow repair of intracardiac defects. Early recovery was uneventful and all the patients were discharged home after a mean length of hospital stay of 6.3 ± 2.4 (2-12) days. Intraoperatively, transesophageal echocardiography was the unique tool to guide device positioning and verify early surgical results. In two patients echo documented a valve displacement after delivery and guided the repositioning (one in cardiopulmonary by-pass). In the immediate postoperative course serial echocardiographic examinations and MR studies documented right ventricle reverse remodeling and excluded later complications. The mean follow up was 2.8 yrs (2 months – 4 yrs).

Conclusions: The NRIP valve allows safe and easy pulmonary valve replacement without cardiopulmonary by pass in selected cases. Its mode of implantation offer less invasive approach with less blood loss and shorter hospital stays. Trans esophageal echocardiography plays an important role in the intraoperative management and the MR permit an adequate selection of the patients. Longer follow up is required to assess the valve performance.