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Pulmonary valve replacement after previous TOF repair in childhood

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Objectives. Patients born with Tetralogy of Fallot (TOF) being the most common form of cyanotic congenital heart disease frequently survive into adulthood. As pulmonary valve insufficiency is a well-known long-term complication after surgical TOF repair in childhood therapeutic strategies for these patients must be established. For a long while homograft or Contegra-graft implantation was the only therapeutical option but nowadays the implantations of biological prostheses in pulmonary position lead to convincing results, too. Implantation of these valves provides the opportunity to perform valve-in-valve procedures later on.

Material. From 2000 to 2014 in the Department of Cardiothoracic Surgery of the University of Muenster, 81 patients with previous TOF repair in childhood needed pulmonary valve replacement due to severe pulmonary insufficiency. Either homografts (n=46) or Contegra-grafts (n=17) were routinely used till in 2011 pulmonary valve replacement (PVR) with biological valve prostheses (n=18) was established. Perioperative data of these patients with PVR was analyzed retrospectively.

Results. 18 patients of either sex at a mean age of 29 [range 5-72] years were surgically treated for pulmonary insufficiency. The primary operation was performed at an average of 23 [range 5-48] years ago in childhood. Now either St. Jude Medical Trifecta™ (n=8) or Carpentier Edwards (CE) Perimount™ prostheses (n=10) were implanted. Mean size of the implanted biological prostheses was 23 [19-27] mm.

Postoperative echocardiography was used to exclude paravalvular leckages (n=0). A mild insufficiency of the pulmonary valve could be identified in 5 patients (28%) – the central jets based on the tissue valve design of the biological prostheses. Stenoses of the valves with a mean vmax of 2.2 [1.6-2.5] m/s did not lead to clinical symptoms or surgical interventions, respectively.

In-hospital-mortality was 1.2% (1 pt.). This patient, the oldest one of all (72 years) died 40 days after surgery due to a complicated ICU-stay with long-term ventilation and renal failure. All other patients were discharged home.

Conclusion. Pulmonary valve replacement using biological prostheses in patients with TOF repair in childhood is a safe and clinically reliable therapeutic option to treat severe pulmonary insufficiency properly.