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Outcomes after percutaneous vs. surgical pulmonary valve implantation – up to 12 years follow up of 481 patients from a single center

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Introduction. Percutaneous pulmonary valve implantation (PPVI) was introduced initially to expand the lifetime of a surgically implanted pulmonary valve by at least two years. Studies comparing PPVI and surgical pulmonary valve replacement (SPVR) in terms of survival and reinterventions at the long-term are missing.

Methods. The clinical information of all patients who were treated by PPVI and SPVR in our center between 12.2006 and 12.2018 was prospectively enrolled into a database. SPVR was only done in patients who were considered to be unsuitable for PPVI. We evaluated the patients' long term follow up data in means of survival and further valve replacement.

Results. The study comprised 481 patients. Percutaneous pulmonary valves were implanted in 265 patients and 216 patients were treated with SPVR. In the PPVI cohort, 242 (91%) received the Melody valve and 23 patients (9%) – the Sapien valve. The patients with SPVR were treated with biological valves: Homograft (n=139; 64%), Hancock (n=57; 26%), Contegra (n=13; 6%) and others (n=7; 3%). There were no significant differences in the age and weight of the patients from both groups. Median follow up was 4 years (range 6m – 12years). Seventeen patients died (3.5%), seven after PPVI, ten after SPVR (p=0.24). Estimated survival at 10 years after PPVI was 95%, which was comparable to that after SPVR – 94%, p=0.43. Estimated survival with the originally implanted valve at 10 years was 86% in the PPVI group vs. 72% in the SPVR group, (p=0.27). In the surviving patients, freedom from reinterventions on the valve because of infective endocarditis at 10 years was 95.7% for the PPVI cohort vs. 97.3% for the SPVR group, p=0.174.

Conclusion. Long-term survival and freedom from reinterventions because of degeneration or endocarditis after PPVI is comparable to that after SPVR. Percutaneous pulmonary valves show excellent longevity which extends to more than ten years. Thus, due to its less invasive approach, PPVI is the method of first choice whenever possible to treat pulmonary valve or conduit failure.