

P163. Growth Potential Of A Decellularized Xenogenic Heart Valve?

Pascal M. Dohmen¹; Francisco D. da Costa²; Sergio V. Lopes²; Felipe P. da Souza³; Ricardo Vilani³; Sergio Yoschi⁴; Wolfgang Konertz¹

¹*Dept. of Cardiovascular Surgery, Charité Hospital, Medical University Berlin, Berlin, Germany;* ²*Dept. of Cardiac Surgery, Santa Casa Hospital, Pontificia Universidade Catolica do Parana, Curitiba, Brazil;* ³*Dept. of Vetrinary Medicin, Pontificia Universidade Catolica do Parana, Curitiba, Brazil;* ⁴*Dept. of Pathology, Pontificia Universidade Catolica do Parana, Curitiba, Brazil*

OBJECTIVES: This study was performed to evaluate the growth potential of a decellularized heart valve, which would be of great interest for congenital cardiac surgery.

METHODS: In the juvenile sheep (age 12 ± 1 weeks) with a weight of 24.3 ± 4.4 kg, 17 mm diameter decellularized porcine valves were implanted. Transthoracic echocardiography was performed for hemodynamic valve surveillance. At explantation, valves were evaluated by gross examination for wall thickness or tissue abnormalities. Histology (hematoxylin and eosin, von Kossa, Sirius red, Weigert, Gomori staining, CD 31, CD 34 and CD68) was performed to evaluate tissue quality and remodeling and regeneration potential.

RESULTS: All animals showed fast recovery. The mean follow up at explantation was 9.0 ± 1.8 months. All sheep at least doubled their weight (54.3 ± 9.2 kg). Echocardiography showed no regurgitation, optimal leaflet coaptation and a flow velocity of 0.7 ± 0.1 m/s at the latest follow up. The valve diameter increased from 17.6 ± 0.5 mm to 27.5 ± 2.1 mm ($p < 0.018$). Gross examination showed a similar wall thickness of the implanted valve and native pulmonary wall, with smooth and pliable leaflets. Histology showed a monolayer of endothelial cells, fibroblast ingrowth and production of new collagen.

CONCLUSIONS: Thus, this decellularized xenogenic heart valves showed remodeling, regeneration and growth potential.