

Feasibility of Pulmonary Autograft (PGA) Operation
in Neonatal Swine

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In order to test the hypothesis that the pulmonic valve, when used to replace the aortic root as a pulmonary autograft, will remain a viable anatomical structure and will grow and develop normally along with the host, we performed aortic valve replacement with the pulmonary autograft in 15 neonatal piglets.

The weight of the donor was 9.3 ± 0.2 kg, the recipient 9.6 ± 0.3 kg. Measured diameter of pulmonic annulus were 14 ± 0.2 mm for autograft and 14.2 ± 0.2 mm for pulmonary artery homograft. Operation was performed under cardiopulmonary bypass with deep hypothermia (20°C) at low flow perfusion (70 ml/kg/min). The mean operation time was 227 ± 10 min., bypass time 152 ± 7.6 min. and aortic cross clamp time 73 ± 4.6 min. Among 15 cases, 6 (40 %) died early postoperatively and 9 piglets survived more than 12 hours. Of these, 7 could be extubated the endotracheal tube. One survived 12 days and died of pneumonia and the latest one survived in good condition and sacrificed at postoperative 6th week for cardiac catheterization and pathologic examination which revealed the viability and growing of the pulmonary autograft.

The postoperative care evolved with experience gained during the initial operations. Currently we are able to complete the operation with good preservation of cardiac function, and our postoperative care has evolved to the extent that we are now confident enough of having an acceptable percentage of long term survivors to undertake a definite study in this regard.