

O10-4

Pulmonary Artery Growth after Arterial Duct Stenting in Completely Duct-dependent Pulmonary Circulation

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INTRODUCTION. Significant and balanced pulmonary artery (PA) growth following arterial duct (AD) stenting has already been reported in literature. However, no data are so far available about the role of this percutaneous approach in promoting PA growth in the case of congenital heart disease (CHD) with completely duct-dependent pulmonary blood flow (CDD-PBF). Aim of this study was to evaluate the effect of AD stenting in this patho-physiologic setting.

METHODS. PA growth was evaluated as Nakata Index and McGoon Ratio as well as individual PA z-score changes in 49 patients submitted to neonatal AD stenting according to their patho-physiology [CDD-PBF (n=15) vs. multiple PBF sources (n=34)].

RESULTS. Control angiography was performed 7.2 ± 6.4 months (range 1-8, median 6) after AD stenting. In the whole population, significant and balanced PA growth was recorded (Nakata Index $+122\pm 117\%$; LPA z-score $+84\pm 52\%$; RPA z-score $+92\pm 53\%$ vs. pre-procedure, $p<0.0001$ for all comparisons). Percentage increase of global and branch vessel size was not significantly different in patients with CDD-PBF as compared to those with multiple PBF sources (Nakata Index 89 ± 90 vs. $144\pm 124\%$; LPA z-score 63 ± 40 vs. $89\pm 58\%$; RPA z-score 74 ± 35 vs. $100\pm 57\%$, $p=NS$ for all comparisons) as was final absolute PA size (Nakata Index 237 ± 90 vs. 289 ± 80 mm²/m², $p=NS$).

CONCLUSIONS. Percutaneous AD stenting was associated with significant and balanced PA growth in CHD with completely duct-dependent pulmonary circulation over a short-term follow-up. Thus, it may be considered as a valuable alternative to surgical palliation in this subset of patients.