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Pulmonary artery branches stenosis in patients with congenital heart disease: the result of combined surgical and interventional approaches

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Introduction: In this study we sought to evaluate our recent experience with surgical plasty of pulmonary artery (PA) branches both for native and acquired stenosis.
Methods: We review data relative to the postoperative course of patients who underwent surgical PA plasty between January 2004 and October 2011. Primary outcomes included the need for further surgical procedures or interventional maneuvers on the PA branches for residual stenosis.
Results: Thirty-three patients were included in the study. Median age at surgery was 0.99 years (range 0.02-3.45 years), with a median weight of 6.1 kg (range 3.72-13 kg).
There were 12 native and 21 acquired PA stenosis. The location of the PA stenosis was mainly at the PA origin (n=13, 38%) and at PA bifurcation (n=11, 33%). The PA plasty was defined as simple in 13 patients (38%) and as complex in the remaining 20 patients (62%), including multiple maneuvers of the PA branches. Median Follow-up time after surgery was 4 years (range 0.17-7.75 years). One patient died 3 days after bidirectional cavo-pulmonary anastomosis and complex PA plasty for low output syndrome and one patient died 22 months after bidirectional cavo-pulmonary anastomosis, tricuspid valve plasty and simple PA plasty for congestive heart failure.
Nineteen patients (19/32 patients, 59%) underwent 36 hemodynamic interventions of the PA branches for residual stenosis. A stent implantation of the PA branches was deemed necessary in 6 patients (6/32 patients, 19%) who underwent previous unsuccessful post-operative balloon dilation. Three patients, who required postoperative interventions, underwent additional surgical maneuvers on the PA branches 6 months, 3.6 years and 4.4 years after initial PA surgical plasty. Twelve of the 19 patients (63%) who required postoperative balloon dilation have been operated before the age of 6 months; the majority of the PA stenosis were acquired (13/19, 68%) and underwent a complex plasty (12/19, 63%).
Conclusions: Pulmonary artery branches stenosis represent a life-threatening situation always jeopardizing patient’s clinical status and outcome which often requires a prompt surgical or interventional resolution. A combined collaborative surgical followed by trans-catheter approaches is always needed particulary in cases of acquired PA stenosis who required complex surgical repair.