Pulmonary artery growth and interventions after bilateral branch pulmonary arterial banding

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Background – Bilateral branch pulmonary artery banding (bilatPAB) is used to control pulmonary blood flow in the hybrid palliation for ductus dependent lesions. The long-term impact on pulmonary artery growth and the need for interventions has not been assessed.

Methods - We performed a retrospective review of all newborns (2001-2012) undergoing bilatPAB at a single institution (n=46); these were compared to a random group of contemporaneous newborns undergoing the Norwood operation (n=48). Pulmonary arterial growth as determined by angiography prior to hemi-Fontan and Fontan operation and the need for pulmonary artery interventions (surgical arterioplasty, balloon angioplasty, or stent implantation) was assessed.

Results – Left and right pulmonary artery were banded to the same diameter in 34 (73.9%) of 46 patients; 7 patients required subsequent band adjustment. Bands were in place for a median of 79.5 days (1-229 days). Mean pulmonary artery branch diameter prior to hemi-Fontan was smaller in the bilatPAB group (RPA: 4.0 mm vs. 5.2 mm, p=0.03 and LPA: 3.7 mm vs. 4.1 mm, p=NS). There was a trend toward increased likelihood of lobar branch obliteration in the bilatPAB group (hazard ratio 2.8, 95%CI 0.5-15.2). Surgical and catheter interventions were more frequent in the bilatPAB group compared to the Norwood group (p=0.02; hazard ratio 1.9, 95%CI 0.8-4.2). The bilatPAB patients frequently required multiple interventions (9/46 vs. 2/48, p=0.02). Duration of banding, and the need for band adjustment did not appear to affect the likelihood of subsequent intervention.

Conclusions – Bilateral branch pulmonary artery banding appears to reduce pulmonary artery growth and carries the risk of lobar branch obliteration resulting in increased need for pulmonary artery interventions.