

Sternotomy As a Safe Alternative 'Access' for Transluminal Interventions In Low Birth Weight infants

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Background: transluminal interventions in low birth weight infants with CHD remain a therapeutic challenge: injury of the accessed vessels or risk for cardiac tear. We used sternotomy for hybrid direct cardiovascular access in 4 low birth weight infants as bail out stenting procedure.

Patients and methods: 4 patients: hybrid suite; sternotomy;

A/ 3 patients (1620, 2190 & 2630 g) with Fallot with PA and hypoplastic pulmonary trunk (2-3 mm).

Procedure : purse string on RV; 2 vascular clips as radio-opaque markers: one at the pulmonary valve , one at the puncture site. Double needle technique: one 21G needle as a reference for depth adjacent on the surface of the RVOT; 2nd 21 G needle used to puncture. Puncture in two motions: first perpendicular to the surface into the RV, second angulation of the needle towards and through the atretic outflow tract. 0.014" wire into the pulmonary arterial branch; needle exchanged for a 4 Fr short sheath; angiography by mini 1cc injections through side-arm. A 5/16 mm coronary stent deployed into the RVOT to obtain an "intracardiac Sano shunt".

B/ 1 patient (970 g) with critical aortic coarctation and open duct. Procedure: purse-string on the ascending aorta with vascular clip; 0.014" wire into the descending aorta; needle exchanged for a 4 Fr short sheath; angiograms through side-arm. A 3/8 mm coronary stent deployed into the aortic isthmus; arterial duct clipped.

Results:

Sternotomy well tolerated by all patients remaining hemodynamically very stable throughout procedure.

A. Fallot: adequate palliation with symmetrical antegrade flow (sats > 92%). After median 3 months an additional stent was necessary transvenously in all patients due to muscular infundibular stenosis. Two patients went to full repair at 5 months; one patient with multiple hilar stenoses requires additional transluminal procedures.

B. Coarctation: good aortic flow, stent resection and arch repair at 4 months. No associated morbidity.

Conclusion:

Medial sternotomy can be a safe alternative access for bail out transluminal cardiac interventions in low birth weight infants, allowing conventional repair at bigger weight. The technique with 2 identical needles and radio-opaque markers simplifies the hybrid procedures.