

Stenting ductus arteriosus via axillary artery vs femoral vein in infants

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Introduction: Stenting of the ductus arteriosus is necessary for maintain duct dependent circulation. The ductal morphology predicts not only the technical difficulty in stenting but also the risks of restenosis necessitating reintervention.

Aim & Objectives: To retrospectively review the outcomes of ductal stenting in children via different routes, present a technique of ductal stenting via axillary artery and compare it with femoral access.

Nineteen patients with duct-dependent pulmonary circulations through a vertical ductus arteriosus were treated with stent implantation. Those patients were retrospectively included in the study. In the first nine of these cases, stent delivery was done trans venously. In the latter ten cases, we favoured the axillary artery access to the transvenous approach for stenting the vertical ductus arteriosus. Wire-target technique was used to attain access to axillary artery.

Materials & Methods: Twenty-three patients with duct dependent circulation were treated with stent implantation. These patients were included in the study retrospectively. In 19 (82%) of these patients, duct stenting was done through the femoral venous route. In 4 (18%) of the cases the axillary artery was favoured to transvenous approach for ductal stenting.

To retrospectively review the outcome of stent placement in neonates with a vertical ductus, present a technique of ductal stenting via the axillary artery and compare it to ductal stenting via the femoral venous access. The Congenital Catheterization Research Collaborative (CCRC) reviewed multicentre data from infants who underwent PDA stenting via the CA or AA approach from 2008 to 2017, and compared outcomes to those of infants undergoing PDA stenting via the femoral artery (FA) approach. Post-procedure ultrasound (US) imaging was reviewed.

Results: PDA stenting was done four cases in which axillary approach was used. All the 4 cases received prostaglandin infusion. The median age at procedure time was 12 days (range: 4- 18 days) with a median

weight of 2.9 kg (range: 2.7-3.3kg). All the babies were term. 1 had pulmonary atresia intact septum, 1-complete AV canal defect with PA and unbalanced ventricles and 2 had TOF with PA. The median ductal diameter was 2.4 mm (range: 2.2-3.4mm) with median ductal length of 15 mm (range: 10-22 mm). The median procedure time was 78 minutes (range: 70-118minutes) with median fluoroscopic time of 32 minutes (range: 26-42 minutes). Fluoroscopic time was significantly shorter in those with axillary approach.

Forty-nine infants underwent PDA stenting from the CA (n = 43) or AA (n = 6) approach, compared with 55 infants who underwent PDA stenting from the FA approach. The PDA was the sole pulmonary blood flow (PBF) source in 61% of infants in the CA/AA cohort, compared with 33% of the FA cohort (p < .01). Ductal tortuosity for CA/AA cohort was Type I (straight) in 10 (20%), Type II (one turn) in 17 (35%), and Type III (multiple turns) in 22 (45%) infants and reflected a greater degree of tortuosity when compared to the FA cohort (p < .01). In 17 infants with CA/AA approach, the "flip technique" was used, and was associated with shorter procedure times for highly tortuous PDA (Type III) patients. Rates of procedural complications were similar across access sites. Most common complications were access site injury (thrombus or bleeding) and stent malposition. No complications were specifically related to the "flip technique."

Conclusion: The axillary arterial access is an effective approach to stent the arterial duct in new-borns with duct-dependent circulation. Compared with anterograde approach via the femoral vein, positioning the wire into the vertical duct via the axillary artery is much more feasible. This increases success rates as well as shortens the duration of procedure and reduces complications. Use of CA and AA approach for PDA stenting was found to be more commonly employed in sole source PBF and highly tortuous PDAs. Procedural modifications such as the "flip technique" may lead to shorter procedure times. CA and AA approaches are associated with a similar burden of procedural or late complications. Post-

procedural surveillance of the CA and AA is suggested,

given the incidence of vascular findings on US.