

## MP4-11

### **Additional Value of Three-Dimensional Rotational Angiography in the Diagnostic Evaluation and Percutaneous Treatment of Children With Univentricular Hearts**

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**Introduction:** Children with univentricular hearts undergo staged palliation to a Fontan circulation. In the interstages, detailed anatomical information is required to proceed. Anatomical information acquired by conventional 2D angiography (CA) is often difficult to interpret. Three-dimensional rotational angiography (3DRA) is a promising imaging technique that makes real time 3D images and is suitable for displaying cardiovascular anatomy. The aims of this study are to evaluate the diagnostic value, percutaneous treatment and additional value of 3DRA in children with univentricular hearts and to design a 3DRA image protocol.

**Methods:** A retrospective study was performed in which demographic data, clinical data and catheterization details (amount of contrast, radiation doses, interventions and complications) of both imaging techniques were collected. Image quality, interventional success and additional value of 3DRA were reviewed and scored. Data of the two techniques were compared to each other. Technical settings of all 3DRAs (rapid pacing, number and location of contrast injection, amount of contrast and contrast dilution) were collected.

**Results:** Between 2003 and 2014 128 patients underwent 186 CAs and 56 3DRAs. Image quality was good with both techniques, with better imaging of shunt and coronary arteries with 3DRA ( $p = 0.000$ ). More interventions were performed in the 3DRA versus CA group: 44/56 3DRAs compared to 84/186 CAs ( $p = 0.000$ ). Intervention success rate ( $p = 0.087$ ) and complication rates ( $p = 0.949$ ) were similar. Amount of contrast, number of angiographies and radiation used did not significantly differ. The additional value of 3DRA arises from the good imaging capacities and 3D reconstruction of cardiovascular anatomy, collaterals, stenosis, vessel-vessel and vessel-bronchi interactions.

**Conclusion:** 3DRA is superior to CA in displaying the shunt, coronary arteries, collaterals, stenoses, vessel-vessel and vessel-bronchi interactions in children with univentricular hearts, with comparable radiation dosages, amount of contrast used, intervention success rate and complication rate.