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Use of 3 dimensional rotational angiography in pediatric interventional cardiology.

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Introduction
3 dimensional rotational angiography (3DRA) has recently become available in the pediatric catheterisation laboratory. It provides 3 dimensional images of the heart and great vessels and may be used as roadmap during interventions. The aim of this study is to investigate the current use of 3DRA in pulmonary artery (PA) and coarctation (CoA) stenting.

Methods
We retrospectively reviewed our catheterisation database to obtain all percutaneous interventions performed in children <18 years of age during 2012 and 2013. 3DRA guided PA and CoA stent placements were selected. Patient diagnosis and intervention were noted and results of the intervention and additional value of 3DRA were evaluated.

Results:
During the study period 492 interventions were performed, 77 concerning 3DRA guided stent placement in PA (n=60) or CoA (n=17). Underlying diagnosis in patients with PA stenting were Tetralogy of Fallot (n=13), Pulmonary Atresia (n=11), Transposition of the Great Arteries (n=12), univentricular heart with shunt (n=1), Partial Cavo Pulmonary Connection (n=5), Total Cavo Pulmonary Connection (n=5), Alagille syndrome (n=4), Truncus Arteriosus/occult pulmonary artery (n=3), homograft stenosis post Ross-Kono procedure (n=4), Williams syndrome (n=1) and supravalvular and PA branch stenosis (n=1). PA interventions performed were Melody procedure (n=7), RPA or LPA stenting (n=35), RPA and LPA stenting (n=13), PA stenting (n=2) and MAPCA stenting (n=3). 3DRA provided excellent 3D information of the great arteries and was considered of great additional value in detecting PA branch stenosis in Glen/Fontan circulation and after arterial switch operation due to its ability to provide cranial angulations. 3DRA provided additional information on the surrounding anatomical structures (e.g. coronary arteries and aorta in case of PA stenting). In 4 additional patients a Melody procedure was aborted due to close proximity of the coronary arteries clearly revealed by 3DRA. Finally 3DRA provided accurate roadmaps for the intervention.

Conclusion
3DRA guided stent placement has become a routine procedure at our centre.
With 3DRA real time 3D anatomical information of the lesion and its surrounding structures is obtained and a roadmap to guide the intervention is provided. This leads to better understanding of the lesion and should lead to safer and more successful procedures.