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Significance of 3DRA in the cath lab for congenital heart disease

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Objectives: 3DRA seems to be advantageous in the cath lab for congenital heart disease. Beneath its use as a comprehensive diagnostic tool, it promises faster and safer intervention with reduced radiation and contrast dye consumption and additionally better results.
Methods: Assessment of our 4 years' experience with 3DRA and 3D guidance in our cath lab and review of literature.
Results: More than 360 cases with 3DRA (29% of all investigations, 74% interventions), median 1.8ml contrast/kg, 83 µGym², 12.4 kg [2.3-98]. 15% 3D-3D-fusion with MRI or MDCT images. Reduced fluoroscopy time in stenting aortic arch and percutaneous pulmonary valve replacement. Radiation dose lower than 0.7mSv (biological and physical measurement). Valuable measurement of vessels with a systematic error of 4% in 3D-reconstructions. Application protocols are available, promising reproducible results for most anatomic regions. 3DRA is more than a 3D-angiography; it provides a complete 3D-CT dataset with valuable extravascular anatomic information.
Conclusions: Nowadays, a major indication for cardiac catheterization is the need of intervention. 3DRA facilitates the procedures in complex cases. 3D-models and 3D-Guidance from 3DRA or implementation of MRI or MDCT reconstructions enable a clearly demonstrating anatomy, accelerating complex interventions and improving patients` safety, particularly for less experienced investigators. Further evolvement of the detectors will reduce radiation, further development of the soft- and hardware will facilitate implementation of MRI- and CT images or allow even implementation of (4D) echo. 3DRA emerges to a standard imaging tool in catheter based cardiac interventions in congenital heart disease.