

## Multimodality 3D-Imaging for 3D-Guidance of catheter-based interventions in congenital heart disease

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**Introduction:** Cardiac catheterization in congenital heart disease is a procedure in a 3D-space and limited by standard 2D-fluoroscopy. 3D-guidance is possible by three-dimensional rotational angiography (3D-RA): 3D-models from intra-procedural 3D-RA as well as 3D-reconstructions from former MRI- and MDCT-scans can be used. We evaluate possibility and significance of 3D-guidance.

**Methods:** Assessment of all cases with 3D-guidance in a 26 month period. Benefit for intervention and accuracy of 2D-3D registration were evaluated. Determination of fluoroscopy time, radiation-dose and used contrast dye.

**Results:** More than 90 cases at this time. Sufficient image fusion over 95%; 3D-guidance rated superior to 2D-guidance in over 94%; total dose-area product ( $\mu\text{Gym}^2$ ): 171.2 (range 38.6-1276.6), used contrast-medium:  $4.2 \pm 2.5$  ml/kg.

**Conclusions:** Benefit of 3D-guidance: vascular structures are always visible in any c-arm angulation and table position. Surrounding tissue can be displayed (e.g. coronaries by pulmonary valve implantation). This technique enables a safer and faster catheter-based intervention in congenital heart disease with reduced need of radiation dose and contrast dye.

