

# Interventional Pediatric Cardiology

## 3D Roadmap Coarctation



### HISTORY

A 12-year-old male with coarctation of the aorta. He was treated by the clinician with a stent implantation utilizing 3D Roadmap (3DRM).

### TECHNOLOGY

Canon Medical Systems' 3DRM allows clinicians to overlay 3D images on live 2D fluoro images on the Infinix™-i exam room monitor. The 3DRM image is acquired by iso-centering the anatomy that is of interest and then performing an injection of contrast media while the C-arm spins around the patient, collecting the 3D rotational angiography (3DRA) acquisition. Once the 3DRA acquisition has been acquired, it is immediately available for use as part of the 3DRM. The 3D

image is automatically updated with the movement of both the C-arm and the tabletop. The 3D image display changes according to the C-arm rotation angle, C-arm sliding angle, SID, field size, tabletop height, and tabletop panning of the Infinix-i system. This capability displays the vascular anatomy with every rotation and angulation of the C-arm. In this case study, 3DRM images were used by the clinician for overlay on the live 2D fluoro images during a pediatric cardiology interventional study to implant a covered stent in the proximal descending aorta.

### PROCEDURE

Access was gained in the patient's right femoral artery utilizing a micro puncture technique while a 5 Fr sheath was inserted in the right femoral artery. A 4 Fr pigtail catheter was then inserted through the sheath and advanced over

the guide wire, which was placed at the level of the ascending aorta proximal to the coarctation of the aorta. Next, a 3DRA acquisition was obtained with an injection of contrast material during the acquisition (Figure 1). Once completed, the 3D image was immediately available and ready to be utilized for 3DRM. Fusion of the 3D image with live fluoroscopy was then used to assist with the positioning and placement of the covered stent utilized for the intervention (Figure 2).

The clinician then utilized the 3DRM image to aid him in visualization and guide the placement of the delivery system of the covered stent above the coarctation of the aorta. Once the delivery system was in place, the clinician then deployed the covered stent by unsheathing it and displaying the 3DRM image on the live fluoro image (Figure 3). Finally, the physician then acquired a 2D digital angiography (2D DA) acquisition of the aorta to visualize improved flow without the descending aorta with no aortic wall injury (Figure 4).

## CONCLUSION

The 3DRA images combined with the 3D reconstruction provide additional views of vascular anatomy to aid clinicians in visualizing complex vascular anatomy. In this case, the fused 3DRM volume set was utilized by the clinician during the manipulation and positioning of the catheter. Lastly, 3DRM aided the clinician in the visualization of accurate stent positioning and stent placement.



Figure 1. 3D Acquisition of Aorta Coarctation

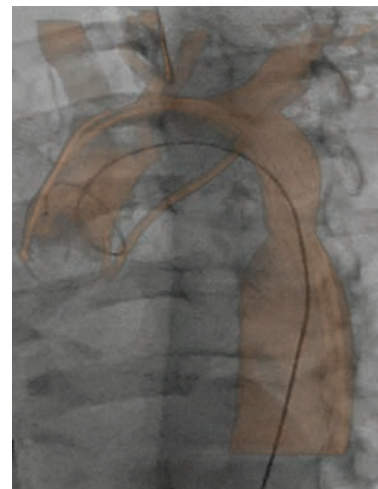


Figure 2. 3DRM Fusion of Aorta Coarctation

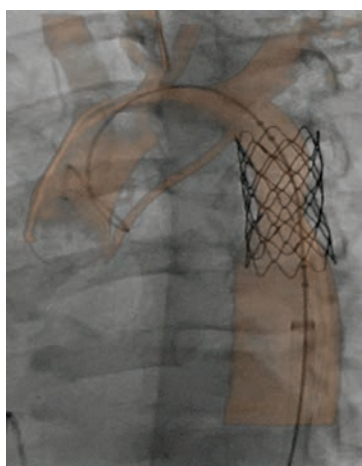


Figure 3. 3DRM Fusion of Aorta Coarctation Post Intervention

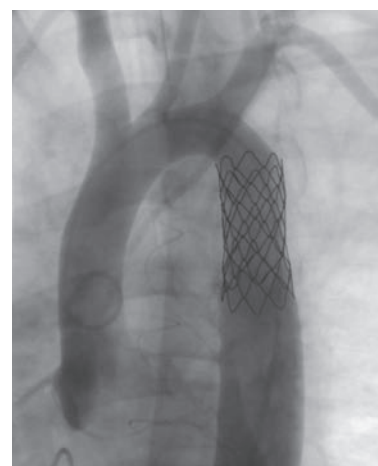


Figure 4. 2D DA Acquisition of Aorta Coarctation Post Intervention

*The clinical results described in this case study are the experience of the author. Results may vary due to clinical setting, patient presentation and other factors.*

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