

# Newborn with Complex Single Ventricle Hemodynamic Supported by *syngo* DynaCT

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## Patient History

Premature newborn, weighing 2.120 kg at birth at 36 weeks of gestation. When 3 weeks old, the child received a central AP shunt due to duct-dependent pulmonary perfusion. On the third postoperative day severe desaturation occurred.

## Diagnosis

Dextrocardia, congenitally corrected transposition of the great arteries (ccTGA), double outlet right ventricle (DORV) and severe subvalvular pulmonary obstruction, arterial duct open under prostaglandin.

## Treatment

With oxygen saturations around 45-50 the child was immediately heart-catheterized under stable hemodynamic conditions. Vascular access was initially transvenous to prevent arterial puncture if unnecessary. Conventional RV angiography did not deliver sufficient contrast in the region of the shunt and attempts to reach the ascending aorta with a loop in RV were not tolerated well.

Therefore *syngo* DynaCT – with venous access only – was used to visualize the shunt situation and morphology of the ventriculo-arterial connections. After total shunt occlusion had been identified, straight forward recanalization of the AP shunt was performed based on the 3D reconstruction by implanting a Skylor 2.5x10 mm coronary stent using femoral artery access.

## Comments

This is the first time that *syngo* DynaCT was used for a patient weighing less than 3 kg. *syngo* DynaCT was essential to understand the anatomical relationships between the LV, LVOT, PA, RPA and LPA as well as the acute AP shunt occlusion. The use of *syngo* DynaCT enabled us to visualize the complex biventricular anatomy in one run. The 3D reconstruction – positioned in the background of the fluoroscopy as a roadmap – allowed easy localization of the shunt ostium and RPA during recanalization and helped to minimize the amount of contrast fluid and radiation in this low-weight, dystrophic and critical newborn.

## Protocol

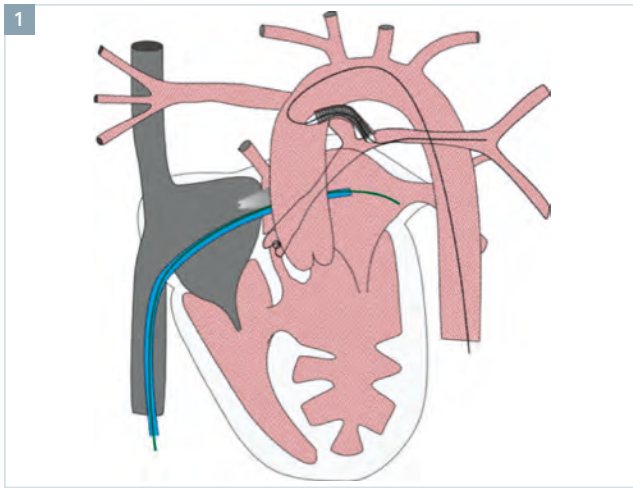
Own standard protocol for *syngo* DynaCT: pacing electrode 4 F (Bard) via 5 F venous long sheath (Cook) in left atrium, rapid pacing with 240 beats/min causing 40% drop of ABP, injection of 15 cc diluted contrast (60% contrast with 40% NaCl 0.9%) with 2.5 cc/sec through the long sheath; rotational angiography with 1 sec delay after start of the injector; zoom 42 cm, collimator used to optimize scan area; rotation at 0.8 degree/frame. Dose area product (*syngo* DynaCT run versus total amount): 106  $\mu\text{Gy}/\text{m}^2$  (637)  $\mu\text{Gy}/\text{m}^2$ .

Gregor Krings, MD, in an interventional procedure.

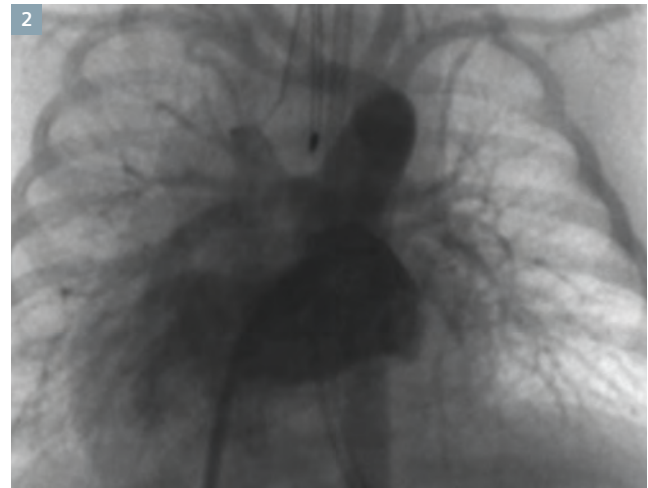


## Contact

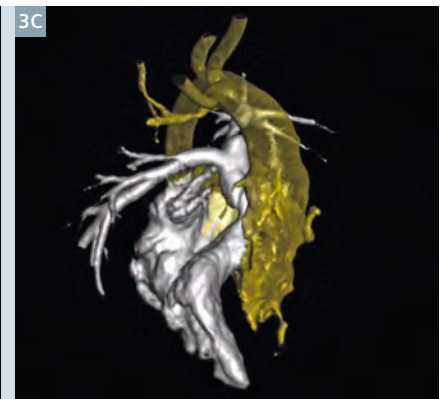
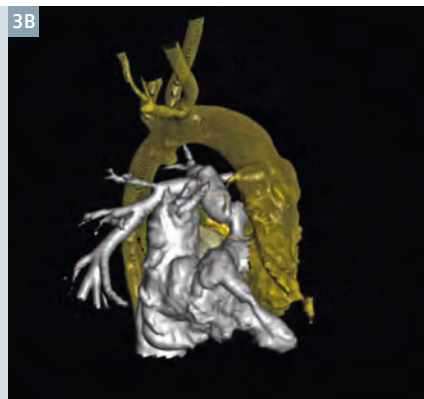
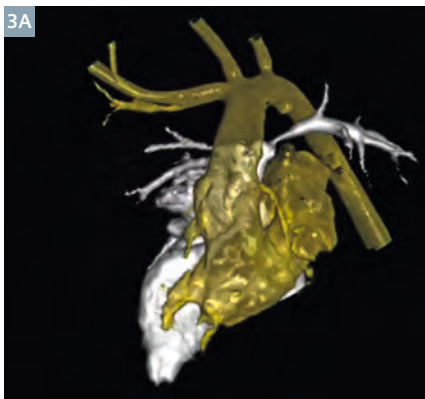
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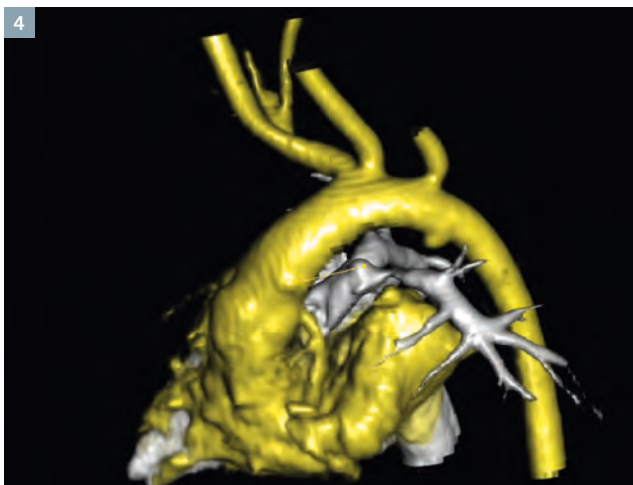
1 Scheme of morphology, syngo DynaCT setting (contrast injection in left atrium under left atrial rapid pacing) and intervention (retrograde AP shunt stenting).



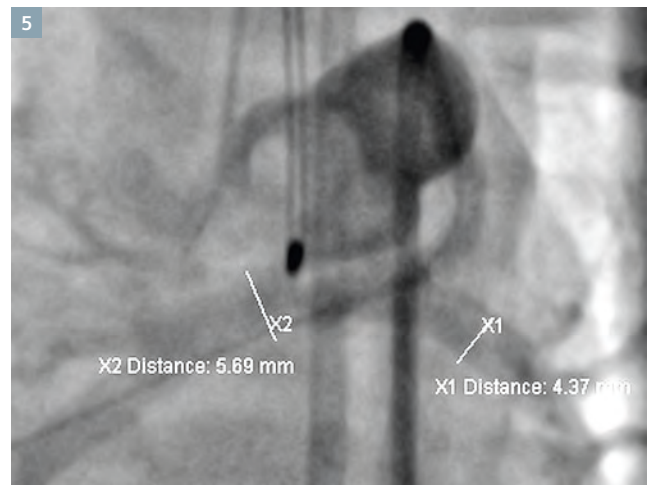
2 AP projection from rotational angiography.



3 Three projections of 3D reconstruction prior to intervention using syngo X workplace. Silver: LV-LVOT-PA-RPA/LPA connection, severe subpulmonary stenosis, LPA stenosis. Gold transparent: double outlet RV with Ao connection.



4 3D syngo DynaCT reconstruction (LAO projection): central AP shunt occlusion (shunt insertion at left side of ascending aorta, discontinuity with PA bifurcation), severe LPA stenosis.



5 Conventional AoAsc injection in AP projection showing successful shunt recanalization after stent implantation with unrestricted bilateral pulmonary artery perfusion.