

**The Added Value of ECG Gated CT for Complex Congenital Heart Disease in Infants.**

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**Background:**

Trans-thoracic echocardiography is limited in imaging congenital heart disease (CHD). ECG gated CT of the chest might help in the anatomic delineation of CHD in infants. The purpose of this study is to evaluate the added value of gated cardiac CT in infants with complex CHD.

**Methods:**

A total of 34 scans were performed in 29 children; mean age: 58 d (1-270); (18 males; 12 females); mean weight 3.5 Kg (1.8-8) mean heart rate (HR) 129 bpm (99-160). CHD malformations: Truncus Arteriosus (N= 8), Tetralogy of Fallot (N= 6), AV canal (N=2), transposition of great arteries (N=1) interrupted aortic arch (N=1), Aortic coarctation (N=2), Williams's syndrome (N=1) hypoplastic Lt heart (N=3), double outlet right ventricle (N=3), anomalous LAD from PA (N=1), pulmonary atresia (N=1).  
Scanners: 64 and 128 MDCT (Brilliance 64, ICT SP Philips); retrospective ECG gating; whole chest included. All patients were sedated to achieve full sedation. Respiration, saturation, blood pressure and HR were monitored. Non ionic contrast (Iomeron 350) was administered intravenously (2.5-3ml/Kg). Effective radiation dose was recorded per patient.

**Results:**

Good to excellent diagnostic quality was demonstrated in 22/34 of the scans. Catheter angiography was performed only in 7/34 (20%) of the cases. 31/34 (92%) scans added important information and helped plan further care accordingly. Average radiation exposure was calculated as 3.6 mSv.

**Conclusions:**

Imaging of CHD using ECG gated CT is non invasive, fast, feasible and of diagnostic quality. The related radiation exposure is relatively low. Important features for successful scanning include: sufficient contrast (3ml/Kg), adequate IV access and appropriate sedation. ECG gating, in spite of high HR, is a key factor for successful studies, in order to demonstrate CHD in detail. Important clinical information was added in 92% of the cases, thus contributing to the comprehensive assessment of complex CHD in very young children.