

**MP2-13**

**Coronary artery imaging in patients with Congenital Heart Disease: Improved image quality by the use of an intravascular contrast agent and specific MR sequence design**

*Dedieu N., Lossnitzer D., Makowski M., Wong J., Wiethoff A., Botnar R., Kiesewetter C., Razavi R., Schaeffter T., Greil G.  
Kings' College London*

**Aim:** In patients with congenital heart disease (CHD) imaging of coronary artery origin and course can be crucial for preoperative planning. In this study a novel intravascular contrast agent (gadofosveset trisodium-GdT) was injected and a standard commercially available T2-prepared steady-state-free-precession (SSFP) MR sequence and an inversion-recovery (IR) SSFP magnetic resonance (MR) sequence was used. Results were compared with a frequently used extravascular contrast agent (Gadopentetate dimeglumine-GdD) and a standard commercially available T2-prepared SSFP MR sequence.

**Material and Methods:** Ten patients with CHD (age range 22 to 40 years; mean 31 years) were scanned at a 1.5 T clinical MR scanner (Achieva, Philips Healthcare, Best, Netherlands) using a 32-element cardiac coil. An extravascular contrast agent was used first using a standard commercially available T2-prepared SSFP sequence. Within 72 hours patients were re-scanned using a novel intravascular contrast agent and IR SSFP additional to the standard T2-prepared SSFP MR sequence. Contrast-to-noise ratios (CNR) and image quality achieved by using the intravascular agent with an optimized scan protocol were compared to those achieved by using standard extravascular agent with a standard sequence .

Image quality was graded from 0 (non-diagnostic) to 4 (best image quality) for the left anterior descending (LAD), the left circumflex (LCx) and the right coronary artery system (RCA) using the extracellular (T2-prepared SSFP) and intracellular (T2-prepared SSFP and IR-SSFP) contrast agent. Data were analyzed using Soap Bubble Tool and Osirix.

**Results:** Mean image quality was calculated for each vessel and sequence design, as well as mean CNR for each of the sequence. GdT showed to be superior in imaging coronaries, not only in image quality based on grading, but also better CNR when combined with an IR SSFP sequence. (See Figure 1a to 1d)

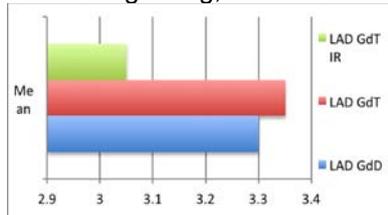


Fig 1a Mean image quality LAD

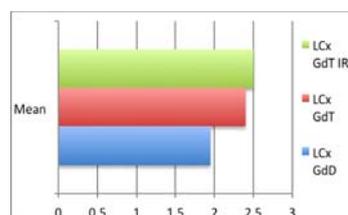


Fig 1b Mean image quality LCx

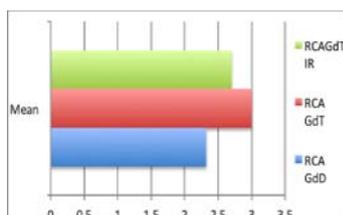


Fig 1c Mean image quality RCA

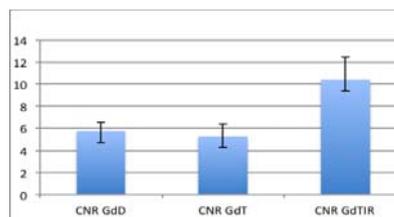


Fig 1d :Mean CNR with SD

For LAD and RCA GdT T2-prepared SSFP showed better diagnostic accuracy, whereas using GdT associated to an IR sequence LCx and CNR showed to be superior.

**Conclusion:** The combination of a novel intravascular contrast agent (GdT) and the addition of an adapted sequence design (IR SSFP) to the routine protocol provide superior imaging results compared to currently available contrast agents and sequence design.

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