

Poster presentation

## MRI scanning by remote control: experience in pediatric cardiovascular disease

Derek G Lohan\*, Reza Habibi, M Ines Boechat, Ihab Awad, Roya Saleh, Daniel B Ennis and J Paul Finn

Address: David Geffen School of Medicine at UCLA, Los Angeles, CA, USA

\* Corresponding author

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### Objectives

MRI scanning by remote control has recently been described, a technique that holds considerable promise in making expertise in cardiovascular imaging more widely available to centers where performance of such examinations may not otherwise be possible. We describe single-center experience in perhaps the most technically challenging population of all, pediatric patients, for a variety of cardiovascular conditions.

### Materials and methods

59 examinations were performed in 57 consecutive clinically-referred pediatric patients, scanned during a 32-month period on a single 1.5 Tesla MRI scanner (Magnetom Sonata, Siemens Medical Solutions). All examinations were performed using full anesthesia under the supervision of a pediatric anesthesiologist. The remote console was located ~ 0.5 miles from the MRI scanner. Examinations were tailored according to clinical indication, though contrast-enhanced MR angiography was performed in all cases. All examinations were evaluated in consensus by two experienced cardiovascular radiologists and scored according to image quality and present of artifact. MRI findings were validated, where possible, using comparative imaging or operative notes Figure 1.

### Results

Cine steady-state free precession (SSFP) acquisitions were designated scores in the 'excellent' range in 83% of series (94/113) and 'good' for the remaining 17% series (19/

113). 71% (80/113) of SSFP cine series showed no artifactual degradation, minimal artifact was detected in 28% (32/113), while in only 0.9% (1/113) was moderate artifact noted. With regard to contrast-enhanced MRA, 96.6% of studies were assigned a score in the 'excellent' range (57/59 cases), the remaining 2 studies receiving a score in the 'good' range. Of 1815 evaluative arterial segments, failure of visualization due to technical reasons occurred in only 7 segments (0.4%). 91 segments (5%) showed 'poor' segmental visualization, 243 segments (13.4%) were 'well-defined', while the remaining 1474 segments (81.2%) received an optimal score in the 'excellent' range. Detrimental artifact was noted in 35.6% studies (21/59) during CE-MRA, most commonly occurring as a result of cardiac motion. External validation of MRI findings was facilitated by the availability of 73 complementary imaging examinations and 26 open surgical procedures.

### Conclusion

Remotely controlled MRI scanning of pediatric patients as young as 1 day is feasible, producing high-quality examinations in the diagnostic range. This holds the potential to disseminate specialized technical and clinical expertise, regardless of geographic location.



**Figure 1**

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