

## Fetal Imaging with Multitransmit MR at 3.0T: Preliminary Findings

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**Purpose:** To demonstrate feasibility of fetal MR imaging at 3.0T with use of multitransmit technology. Newer techniques are needed for more accurate detection of fetal brain anomalies with the hope of enhanced prognostication. (1)

**Materials and Methods:** 3 cases of fetal anomalies were referred for MR imaging at 3.0T which was performed with and without multitransmit, and all cases had perinatal MR imaging after birth. Oblique axial, coronal, and sagittal single shot T2-weighted TSE images were obtained of the fetus with TR 2400-2500, TE 120, 6 NEX, SENSE XL Torso Coil, FOV 250mm, slice thickness 4mm, and sequence duration of less than 90 seconds. Total Scan time was less than 8 minutes in all cases.

**Results:** In all cases fetal MR diagnoses were confirmed on follow-up MR: Chiari II with myelomeningocele and cord tethered at lumbosacral junction, agenesis of corpus callosum with ventriculomegaly of atria exceeding 15mm, and twin gestation with one fetal demise and other fetus with severe hypoxic-ischemic damage. Multitransmit MR had superior image quality with less dielectric shading and improvements in signal to noise and contrast to noise. With multitransmit, sequence scan times were on average 33% faster, and total scan time was reduced by more than half in all cases. Average SAR in all three cases using multitransmit was less than 0.4W/kg.

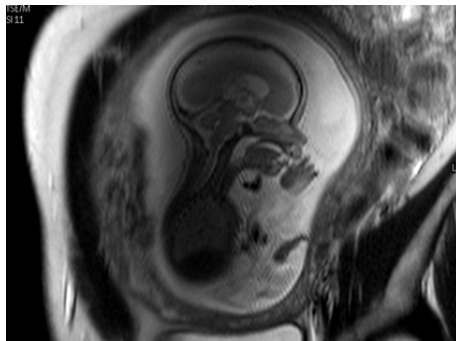


Figure 1: Dielectric shading obscures brain parenchyma.

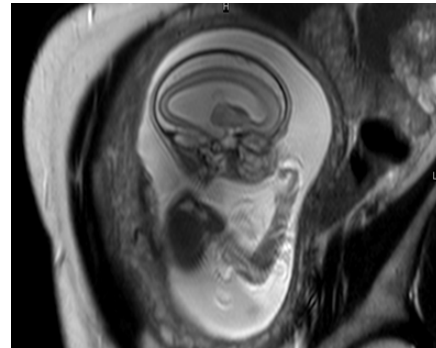


Figure 2: Improved visualization of ventriculomegaly.

**Conclusion:** Multitransmit MR at 3.0T allows for successful fetal MR imaging with less dielectric shading due to improvements in B1 inhomogeneity and less focal SAR hot spots improving safety. Improvements in signal to noise, contrast to noise, and reductions in scan time and duration were obtained.

### References:

<sup>1</sup>Gressens P, Dominique L. Fetal MRI: Obstetrical and Neurological Perspectives. *Pediatr Radiol* 2004; 34: 682-684.