

Assessing periventricular white matter lesions in a 37-week-old infant with neonatal encephalopathy

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Embrace[®] Neonatal MRI System

Redefining Neuro Imaging *Inside* the NICU

Patient History

Term infant born at 37 weeks gestation after decreased fetal movements were noted by the mother for two days. The infant had moderate encephalopathy at birth which was treated with therapeutic hypothermia for 72 hours and suffered from a complicated NICU course with multi-system organ failure, seizures and severe hypoglycemia. The infant was referred for MR on day of life 14 to assess the extent of brain injury.

Procedure

The “feed and wrap” technique was used to prepare the non-sedated infant for the MRI scan. The infant was then transported to the Embrace[®] Neonatal MRI system inside the NICU and placed in the temperature-controlled Embrace[®] patient bed. Heart rate and oxygen saturation were monitored throughout the scan with an MR-conditional wireless monitoring system and the infant's face was continuously observed through the color video monitor incorporated into the Embrace[®] system. Transit time to and from the Embrace[®] system was seven times faster compared to the off-unit MRI scanner*.

MR Protocols Used

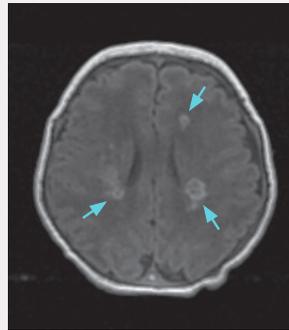
- Axial T1
- Axial T2
- Axial Diffusion-Weighted Imaging (DWI)
- Apparent Diffusion Coefficient (ADC)
- Coronal T2
- Sagittal T2
- Sagittal T1 3D GRE

MR Findings

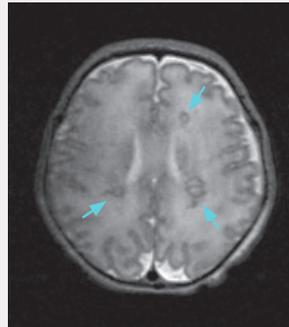
The MRI scan was completed at 14 days of life and showed bilateral punctate lesions in the centrum semiovale and periventricular white matter (blue arrows) as evidenced by hyperintense foci with hypointense centers on the T1-weighted images, complementary abnormal findings on the T2, and restricted diffusion on the DWI and ADC maps.

*Bin-Nun, A (2019, Feb). Global Brain Injury scores in Preterm Infants: Validation of a novel 1T Neonatal MRI vs Conventional 1.5T MRI. Podium Presentation at the 10th Annual Neonatal Brain Monitoring & Neuroprotection Conference, Tampa, FL.

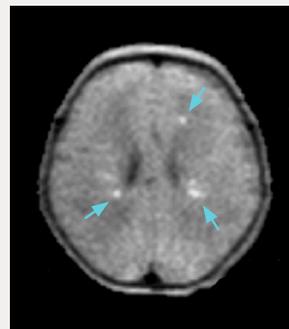
Embrace[®] System



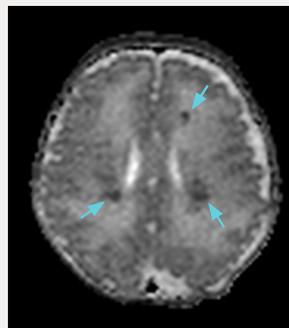
AX T1 SE
 TR/TE=600/10.4 ms
 voxel size=0.8 x 0.8 x 3.0 mm
 NSA=2, AT=2:37 min.



AX T2 FSE
 TR/TE=7291/161.1 ms
 voxel size=0.7 x 0.7 x 3.0 mm
 NSA=2, AT=2:25 min.

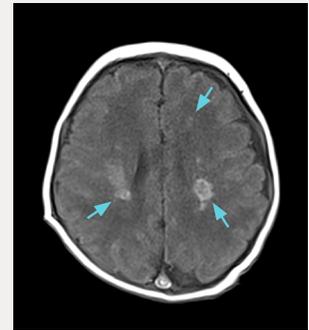


DWI
 TR/TE=13173/121.7 ms
 3-directions, b-value=700
 voxel size=1.5 x 1.5 x 3.0 mm
 NSA=3, AT=4:23 min.

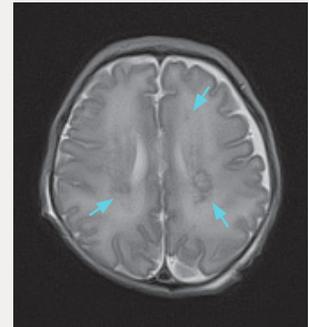


ADC

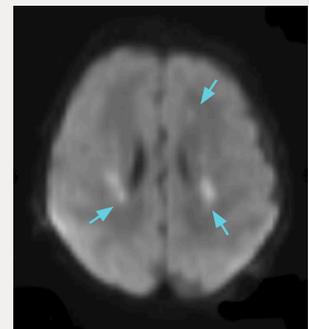
1.5T MRI System



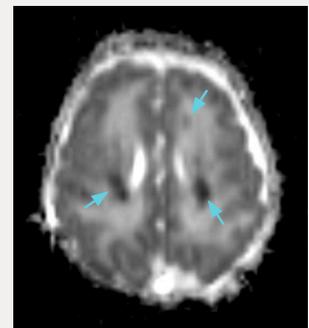
AX T1 SE
 TR/TE=415/11 ms
 voxel size=0.63 x 0.63 x 3.0 mm
 NSA=2, AT=2:40 min.



AX T2 FSE
 TR/TE=7450/150 ms
 voxel size=0.7 x 0.7 x 3.0 mm
 NSA=1, AT=1:30 min.



DWI
 TR/TE=5600/83 ms
 3-directions, b-value=700
 voxel size=1.7 x 1.7 x 3.0 mm
 NSA=7, AT=2:55 min.



ADC