

6. FETAL DIAGNOSIS AND IMAGING: MRI

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INTRODUCTION

- *First described in 1983*
 - Impractical due to long scan times
- *Fast Imaging techniques*
 - Fast T2 weighted sequences- **HASTE**
 - Fast Gradient Echo sequences- **FLASH**
 - Echo Planar Imaging
- *Advantages*
 - Superior contrast resolution
 - Large field of view
 - True multi-planar imaging

ROLE OF FETAL MRI AS ADJUNCT TO ULTRASOUND

- *Confirm diagnosis/offer alternative diagnosis*

Fetal MRI has been shown to lead to a significant change in diagnosis in 30-66% of cases referred because of an abnormality discovered on ultrasound.
- *Identify additional abnormalities*

In the central nervous system, Fetal MRI can provide additional information in 20-64% of cases
- *Patient counseling/pregnancy management*

May alter decision to terminate pregnancy or change timing/method of delivery.

INDICATIONS FOR FETAL MRI

- *Central nervous system abnormality*

All fetuses with a CNS abnormality should be screened with MRI

- ***Chest Mass***
 - Maybe helpful in distinguishing between
 - CDH
 - CCAM
 - Sequestration
 - Bronchogenic cyst
- ***Lung hypoplasia***
 - Various methods have been devised to evaluate for the presence or degree of hypoplasia. Limited by the inability to determine hypoplasia vs. atelectatic lung.
 - Volume calculation: Trace the visualized lung parenchyma on all images and multiple by the number of slices and the slice thickness. Can compare to predicted volume based on GA or weight. Can also calculate lung to head or lung to abdomen ratios
 - Signal intensity (SI): Usually calculated as a ratio of lung SI to liver SI or lung SI to amniotic fluid SI
- ***Renal or GU abnormality***
 - Determine number, size, and location of kidneys
- ***Large sacrococcygeal teratoma***
 - Determine position/extent of mass and its relationship to the pelvic organs
- ***Twin to twin transfusion syndrome***
 - Has been used pre-operative to map position of the placenta
- ***Problem solver***

FUTURE DIRECTIONS

- ***Fetal Cardiac MRI***
- ***MR Spectroscopy***
 - Amniotic fluid and/or lung parenchyma for lecithin
 - CNS for myelin