MRI in pregnancy for assessment of congenital anomalies of the chest, abdomen and pelvis

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Safety

It is not known whether adverse effects or safety issues are long-term adverse issues in women. There is no evidence for adverse effect or safety issues in women. May serve to better characterize the anomaly, establish a diagnosis, increase confidence in diagnosis, assess evolution of anomaly during gestation, predict survival, or guide prenatal management in: a) respiratory, cardiovascular, and gastrointestinal disorders; b) abdominal and pelvic masses; c) abdominal wall defects and bowel stenosis; d) bilateral urinary tract anomalies (particularly with inconclusive findings on ultrasound and oligohydramnios); e) congenital heart disease

Patient preparation and MRI sequences

2 hour fasting, oral disaccharide 30 minutes prior to study (optional in cases with severe polyhydramnios to limit fetal motion)
Performed at 1.5 Tesla. Single Shot Fast Spin Echo (SSFSE), Fast Imaging Employing Steady State Acquisition (FIESTA), Ultrafast Gradient Echo (UGFGE), SSFSE and FIESTA are fluid sensitive similar to T2-weighted sequences and T1GE is a T1-weighted sequence.

MRI signal intensities of normal organs

Bowel: High T2 signal fluid is seen in proximal small bowel. High T1 signal mucosa is seen in large bowel and distal small bowel. In 2nd and mostly large bowel in 3rd trimester
Liver: Liver parenchyma has intermediate T1 signal and low T2 signal
Kidneys: renal parenchyma has intermediate T2 signal

Chest anomalies

Fig. 1. Neuroradiologic anatomy. a, b) Coronal FIESTA images at 25 wk show left lateral chest wall mass (arrow a) in a monozygotic twin at 32 wk. c) Axial FIESTA image in 1 year old shows right thoracic cystic mass (arrow a) communicating with right pleural space. d) Conal CT in newborn shows right pleural mass (arrow a) communicating with right pleural space.

Fig. 2. CHEST ANOMALIES. a) Axial FIESTA image at 28 wk shows right thoracic cystic mass (arrow a) communicating with right pleural space. b) Axial FIESTA image in 1 year old shows right thoracic mass (arrow a) communicating with right pleural space. c) Sagittal FIESTA image in 1 year old shows right thoracic mass (arrow a) communicating with right pleural space. d) Conal CT in newborn shows right pleural mass (arrow a) communicating with right pleural space.

Abdominal and pelvic masses

Fig. 3. Abdominal and pelvic masses. a) Coronal FIESTA images at 20 wk show cystic mass (arrow a) communicating with right pleural space. b) Coronal FIESTA image in 1 year old shows right thoracic mass (arrow a) communicating with right pleural space. c) Sagittal FIESTA image in 1 year old shows right thoracic mass (arrow a) communicating with right pleural space. d) Conal CT in newborn shows right pleural mass (arrow a) communicating with right pleural space.

Gastrointestinal and abdominal wall anomalies

Fig. 4. GASTROINTESTINAL AND ABDOMINAL WALL ANOMALIES. a) Axial FIESTA image at 23 wk shows right thoracic cystic mass (arrow a) communicating with right pleural space. b) Axial FIESTA image in 1 year old shows right thoracic mass (arrow a) communicating with right pleural space. c) Sagittal FIESTA image in 1 year old shows right thoracic mass (arrow a) communicating with right pleural space. d) Conal CT in newborn shows right pleural mass (arrow a) communicating with right pleural space.

Genitourinary anomalies

Fig. 5. GENITOURINARY ANOMALIES. a) Axial FIESTA image at 23 wk shows right thoracic cystic mass (arrow a) communicating with right pleural space. b) Axial FIESTA image in 1 year old shows right thoracic mass (arrow a) communicating with right pleural space. c) Sagittal FIESTA image in 1 year old shows right thoracic mass (arrow a) communicating with right pleural space. d) Conal CT in newborn shows right pleural mass (arrow a) communicating with right pleural space.