

# Fetal MRI

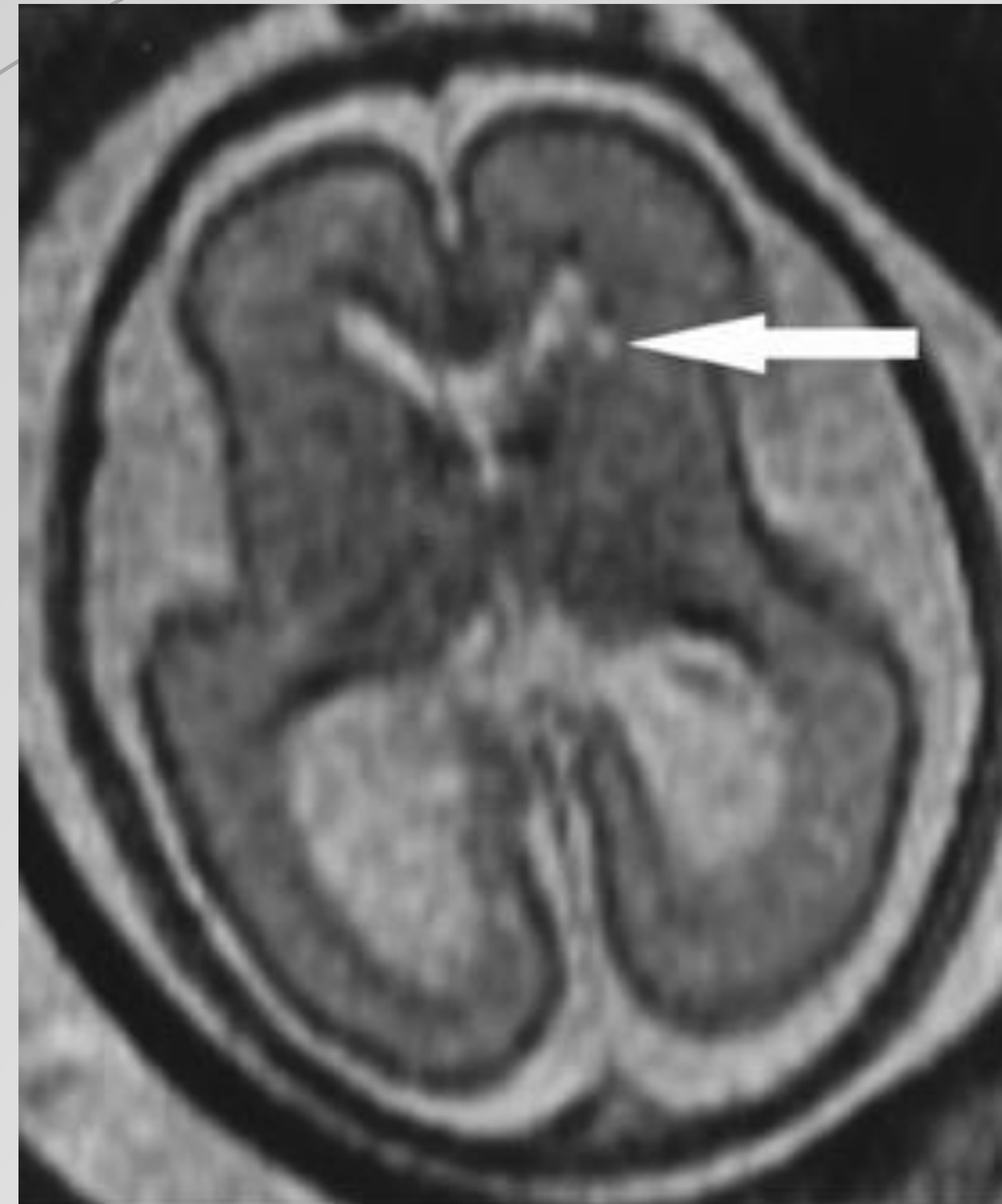
While ultrasound is, and has been, the primary technique for fetal visualization for several decades, fetal MRI is becoming more commonly used due to its many benefits over other modalities.

## Advantages

- Soft-tissue contrast resolution
- Capture and reconstruct images in any plane
- Large field of view
- Few limitations
  - Not affected by maternal obesity, fetal position, ossified skulls, etc.
- Nonionizing
- Noninvasive

## Disadvantages

- High cost
- Not recommended for pregnant women in their first trimester
  - Acoustic damage to fetus
    - MRI coils generate loud noises
  - Lower quality images
    - Sporadic fetal movement
    - Small fetal size



This axial image of a fetal brain shows mild ventriculomegaly (Coakley, et al., 2003)



This image shows a cystic mass in the anterior neck of the fetus (Saleem, 2013)

### References

Coakley, F. V., Glenn, O. A., Qayyum, A., Barkovich, A. J., Goldstein, R., & Filly, R. A. (2003). Fetal MRI: A Developing Technique for the Developing Patient. *Perspective*, 243-251.  
 Saleem, S. N. (2013). Fetal MRI: An approach to practice: A review. *Journal of Advanced Research*, 507-521.

## Abnormalities & Indications

### Brain

Ventriculomegaly – lateral ventricles of the fetus become dilated

### Thorax

Diaphragmatic hernia – abnormal opening in the diaphragm allowing organs from the belly to move into the chest cavity near the lungs

## Sequences

The sequences used must be very fast to reduce as much fetal motion as possible.

- Single-shot fast spin-echo (SSFSE) T2-weighted imaging
- T1-weighted imaging
  - Used to evaluate fat, calcifications, and hemorrhages
- Balanced steady-state free-precession (SSFP)
  - Demonstrates the heart and vessels