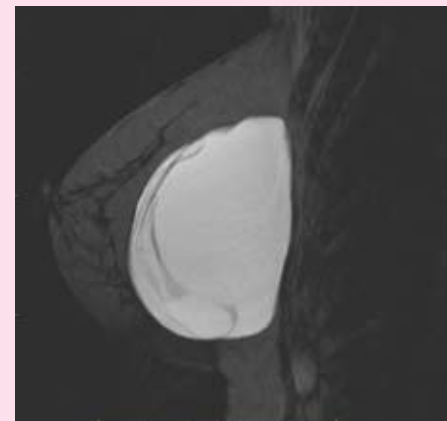




**FOCUS ON BREAST MRI INDICATIONS:
Patients with Breast Implants**

Today, more than one million American women have breast implants. Possible complications may include leakage, rupture, infection, fibrosis, and contraction. Although mammography traditionally has been used to detect extracapsular rupture, it is insensitive to small leaks and intracapsular ruptures. The accuracy of MRI for evaluation of breast implants has been proven to be superior to ultrasound, mammography, and CT, with an estimated sensitivity and specificity of 72-94% and 85-100% for MRI.¹ It is especially valuable with silicone implants.

The ability of MRI to detect carcinomas in women with breast implants is also extremely important. Mammography in women with implants is performed using modified compression imaging, which can increase the radiation dose and, in rare cases, may even rupture the implant. Even with these techniques, it is estimated that silicone implants obscure from 22 to 83 percent of breast tissue on mammography.¹ Because of its cross-sectional nature, MRI does not suffer from this limitation in patients with implants.



Sagittal inversion recovery water-saturated sequences shows a silicone implant with the "linguine sign" (arrow).

For more information on breast MRI, please go to:

• **Breast MRI Home Page**

http://www.proscan.com/fw/main/Breast_MRI-697.html

• **Breast MRI FAQ Page**

http://www.proscan.com/fw/main/Breast_MRI_FAQ-702.html

• **Education Courses**

http://www.proscan.com/fw/main/2008_Courses-743.html

• **Education Online Store**

<http://www.proscanshopping.com/>

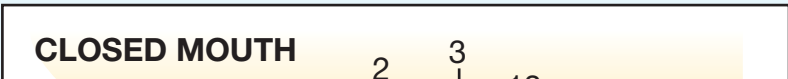


MRI Shows TMJ Involvement Common in Juvenile Arthritis

Researchers from the Children's Hospital of Philadelphia evaluated the temporomandibular joints (TMJ) of 32 children with the diagnosis of juvenile idiopathic arthritis (JIA) – formerly known as juvenile rheumatoid arthritis – using both MRI and ultrasound. MRI identified acute TMJ arthritis in 24 of these cases (75%), none of which were found on ultrasound. Of these patients, 71% were asymptomatic and 63% had normal physical exam findings of the TMJ. However, injection of steroids into the TMJ improved maximal incisal opening in 56%. Chronic TMJ arthrosis was found in 69% of the patients on MRI and 28% on ultrasound.² **Conclusion: Acute and chronic TMJ arthritis are both common in children with JIA and better detected on MRI than ultrasound.**

**The Temporomandibular Joint:
A REVIEW**

The temporomandibular joint, or TMJ, is defined as the articulation between the temporal



bone and the mandible.

• Osseous components

- The undersurface of the temporal bone forms the superior margin of the joint space
- This bone is divided into the:
 - articular eminence (12) anteriorly
 - mandibular fossa (13) posteriorly (located just anterior to the external auditory canal)
- The mandibular condyle (7) forms the inferior margin of the joint space

• Synovial compartments

- The upper synovial cavity (11) lies between the mandibular fossa of the temporal bone and the disc
- The lower synovial cavity (8) lies between the disc and the mandibular condyle. This extends into two recesses:
 - The anterior recess
 - The posterior recess, which extends inferiorly, deep to the posterior joint capsule attachment to the posterior condylar neck

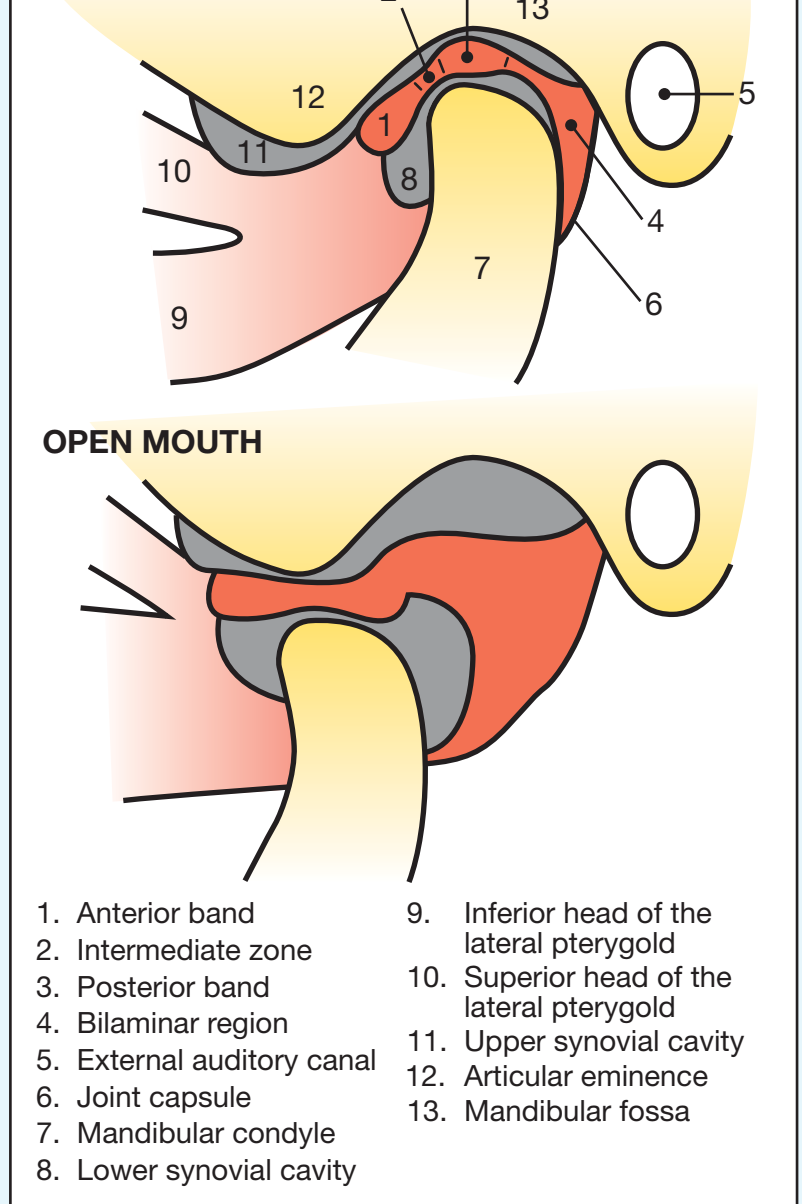
• Articular Disc

- The disc is shaped like a dumbbell, and is normally low on signal on both T1- and T2-weighted MR images
- Components:

- Anterior band (1): Connects to the lateral pterygoid muscle
- Intermediate zone (2): Between the anterior and posterior bands
- Posterior band (3): Larger bulbous portion
- Bilaminar zone (4)
 - Arises from posterior aspect of the posterior band
 - Has two layers (bilaminar):
 - Superior portion attaches to posterior mandibular fossa
 - inferior portion extends into inferior joint capsule, to insert on posterior aspect of mandibular condyle
 - The bilaminar zone can be distinguished from the rest of the disc on MRI by its more intermediate signal on T2-weighted images, compared to the dark signal of the disc

• Normal movement of the TMJ

- Open mouth
 - In the completely open-mouthed position, the mandibular condyle slides anteroinferiorly to align with the articular eminence
 - The disc also slides along with the condyle, stretching the posterior disc, bilaminar zone, and posterior capsule
 - On MRI, the disc will appear shaped like a bow-tie, located between the condylar eminence and mandibular condyle
- Closed mouth
 - The anterior band is located just inferior to the articular eminence of the temporal bone



- The junction between the posterior band of the disc and the bilaminar zone should be at about the 12 o'clock position relative to the mandibular condyle³

NEXT ISSUE: MORE ADVANCED IMAGING NEWS

SOURCES

1. Berg WA, Nguyen TK, Middleton MS, Soo, *et al.* "MR Imaging of Extracapsular Silicone from Breast Implants: Diagnostic Pitfalls." *Am. J. Roentgenol.* 2002; 178:465-472.
2. Weiss PF, Arabshahi B, Johnson A, *et al.* "High Prevalence of Temporomandibular Joint Arthritis at Disease Onset in Children with Juvenile Idiopathic Arthritis, as Detected by Magnetic Resonance Imaging But Not by Ultrasound." *Arthritis Rheum.* 2008; 58:1189-1196.
3. Harnsberger HR, Osborn AG, Ross JS, *et al.* (2006). *Diagnostic and Surgical Imaging Anatomy: Brain, Head & Neck, Spine.* Salt Lake City, UT: Amirsys.



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- *Contributing Editors:* Resham R. Mendi, M.D. (rrmendi@proscan.com) and Stephen J. Pomeranz, M.D. (spomeranz@proscan.com)
- *Editor:* Rod Willis (rwillis@proscan.com)
- *Designer:* Tom Anneken (tanneken@proscan.com)

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