

The Story of a Good Joint Gone Bad... Part One: The Normal TMJ

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To understand dysfunction, it's first helpful to understand general structures and function of the joint (below). Then on page 2, we'll start looking at the symptoms and treatment of degenerative joint disease in the TMJ, beginning with clicking.

Bony structures: The TMJ is a complex ball and socket joint: the condyle is the ball, the fossa of the temporal bone is the socket. Along the front of the fossa (the eminence) is where the joint surfaces are designed to interact. The eminence is heavy bone, which helps it withstand the loading that occurs when the condyle glides along the eminence during translation. The eminence is covered by a layer of fibrocartilage from the top of the fossa to the bottom of the eminence (see red line), as is the condylar head. The condylar head should face the eminence.

Some gooshy stuff: A fibrocartilaginous disc sits between the fossa and the condylar head. In front and behind the condylar head are synovial pouches (superiorly and inferiorly) which bathe the entire joint with synovial fluid. If the synoviums are sore on palpation they tell us the joint is getting pinched in the front or back. Superiorly and posteriorly in the joint are the nerve and vascular supply – especially important to the nutrition of the condylar head. Compression of the vascular supply can result in avascular necrosis and collapse of the condyle—this is severe DJD.



S = synoviums **E** = eminence
P = posterior nerves and arterial supply

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Musculature: The musculature of the TMJ works to open, close, and move the mandible side to side. It also provides the primary support for the mandible and TMJ. Think of it as holding the mandible gently upward, like a sling, maintaining the condylar head up against the disc located between the condyle and fossa. At rest, this upward lifting of the mandibular sling should apply just enough pressure to keep the condyle/disc/eminence relationship held together lightly in a stable state. Too much pressure in the sling (clenching) will cause the joint to break down.

Joint Arthrokinematics: The TMJ is composed of an upper and lower joint compartment. (See January newsletter.) During the first 25-30 mm of opening the condylar head should spin under the disc and little joint compression occurs. During the second half of oral opening (30-40 mm) the condyle/disc complex slides forward (translates) along the eminence, pulled forward by the pterygoid musculature. This is the loaded part of opening when condyle and disc are compressed against the eminence. The repetitive loading of early translation is one of the major factors in causing the joint to break down, as seen by MRI studies.

Details about our friend, the disc:

- From the side it is shaped like a bow tie (bi-concave), being fatter in the back and front and narrow in the center. This is where the condyle should fit. The wider posterior part keeps the condylar head from moving up and into the back of the fossa, protecting the nerves and arterial supply to the condylar head.

- It wraps around the condylar head with a 3-point attachment: from the sides by the medial and lateral collateral ligaments, and from behind by the posterior ligaments.

- The bi-concave shape helps stabilize the joint by keeping the two convex surfaces (eminence and condyle) from "rolling off" each other.

- It prevents direct contact between the condylar head and the eminence and the subsequent destruction of the fibrocartilaginous linings of the surface (chondromalacia). *This damage can occur before the patient reports any pain.*

See next page
for Part Two:
Tough Times for
the TMJ





At Jackson County Physical Therapy care for TMJ patients is offered :

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Q. What did they do for the Dentist of the Year?

A. They gave him a little plaque.



UPCOMING COURSE:

On Friday, May 21, 2010, Bill Esser, PT, MS, and Ted Bennion, DMD, MS, present "Evaluation and Treatment of Limited Opening and the Acute Close-Locked Temporomandibular Joint" at Inn of the Seventh Mountain in Bend, Oregon. Contact Mike Doden at 541-585-2531.

(Insiders are referring to this event as "Bill and Ted's Even-More-Excellent Adventure!")

Part Two: Tough Times for the TMJ Begin with Clicking

A temporomandibular joint presenting with joint noise is not uncommon (up to 50% of individuals report joint noise at some time). Unfortunately, it usually represents an incorrect condyle-disc-eminence association. This can occur secondary to direct trauma (a blow to the chin) or insidiously, secondary to microtrauma to the joint. Examples of microtrauma are the parafunctional behaviors such as clenching, early translation (see January newsletter), and nail biting. Significant malocclusion (such as a cross bite) can also affect the condyle-disc-eminence relationship. In the early stages of disc displacement—and in the absence of pain—the clinician may choose not to treat the condition. In our opinion, this represents a missed opportunity to address an anatomical and functional problem in its early stages. The classic presentation in our office includes years of clicking progressing to intermittent locking, finally reaching a close-locked condition. Ideally, it would be most beneficial to address joint problems before the patient reaches this stage where the disc becomes irreversibly deformed and condylar collapse and changes in bite occur.



An immediate first step: Address Compression - both active and passive!

Active compression — It always surprises us that patients do not know that even light contact of their teeth together during the day is clenching behavior. The PT, through proprioception exercises and teaching of correct tongue position on the palate, helps the patient establish a position of the teeth apart. Tongue position on the palate helps establish a freeway space between the teeth. Correct tongue position on the palate also markedly decreases EMG activity of the masseter and temporalis.

Years of clenching can also increase resting tone and irritability of the neck, head, and facial musculature. Facial muscles become tough like beef jerky. Electrical acupuncture and soft tissue techniques help to restore normal tissue states of the facial and neck muscles. Self-massage techniques become part of the home program.

Passive Compression — As the disc is displaced from between the condyle and the eminence, the condyle moves posterior and superior into the back of the joint. Compression of the nerves and arteries at the back of the joint = pain and a depletion of nourishment to the condylar head. The capsule surrounding the joint shrinks and puts the joint under constant passive compression. Initial physical therapy intervention involves gentle stretching (1mm at a time) in all three planes of movement to decompress the joint. It can take weeks of gentle stretching, in clinic and via home program, to restore normal capsule mobility and optimize the condyle-disc-eminence relationship.



Manual therapy techniques to restore joint space

Moral of the story: A clicking joint is a smoldering fire. Don't ignore it!

Next issue: More about parafunctioning, including posture...so sit up straight & wait for it!