Masticatory Anatomy
Quiz: Friday March 30, 2007
8 South 1:15 p.m.

Material included: lecture material & Okeson readings

• Feb 23: Interocclusal Records, CR-Clinical Method and Arc of Closure
• March 2: Masticatory Anatomy & Biology of Centric Relation
Masticatory Anatomy
The Muscles of Mastication

masseter
temporalis
lateral pterygoid
medial pterygoid
A. Temporalsis Muscle

**Origin:** temporal fossa & temporal fascia

**Insertion:** coronoid process & anterior of ramus
A. Temporalis Muscle

**Function:** Elevation and positioning of the mandible
B. Masseter Muscle

Origin: zygomatic arch

Insertion: lateral surface of ramus, coronoid process & angle of mandible
B. Masseter Muscle

**Function:** power with vertical elevation of the mandible; deep portion stabilizes the condyle in protrusive closure
C. Medial Pterygoid Muscle

**Origin:** medial surface of lateral pterygoid plate, pyramidal process of palatine bone & Mx tuberosity

**Insertion:** medial surface of ramus & angle of mandible
C. Medial Pterygoid Muscle

**Function:** elevation of the mandible, protrusion of the mandible and lateral movement of the mandible with unilateral activation
Pterygomasseteric Sling
D. Inferior Lateral Pterygoid Muscle

**Origin:** lateral surface of lateral pterygoid plate

**Insertion:** pterygoid fovea of condyle
D. Inferior Lateral Pterygoid Muscle

**Function:** protrusion, lateral movement and contributes to opening
E. Superior Lateral Pterygoid Muscle

**Origin:** infratemporal surface greater wing of the sphenoid bone

**Insertion:** pterygoid fovea of the condyle and variable to the disc
E. Superior Lateral Pterygoid Muscle

**Function:** active with the muscles of closure, especially aiding stabilization of the condyle during the power stroke.
Temporomandibular Joint Anatomy
“Craniomandibular Joint”: a diarthrodial or synovial lined joint
A compound joint: > 2 components

- Temporal Bone
- Mandibular Condyle
- Articular Disc
A. Temporal Bone

- Cranial component
- Mandibular fossa
- Articular eminence
- Articular surface from superior fossa to the anterior aspect of the eminence, thickest bone.
B. Mandibular Component: Condyle

- **Condylar dimensions:**
  A-P 8-10 mm
  M-L 15-20 mm
- **Articular surface:**
  anterior superior aspect
B. Mandibular Condyle

- Variation side to side in size and shape is common. Response to loading
- Lateral pole anterior to medial pole.
C. Articular Tissue

- **Origin**: modified periosteum of intramembranous bone, NOT endochondral origin. A consequence of 2 embryonic tissue masses growing towards each other, NOT a single tissue mass cleft to form a joint articulation.
C. Articular Tissue

• **Function:**
  1) load distribution
  2) synovial lubrication

• **Character:** NOT hyaline cartilage, but fibrous in nature
  1) avascular
  2) NOT innervated
  3) resistant to shear, tension forces
  4) increased remodeling potential
D. Articular Disc

- **Composition:** avascular connective tissue, collagenous
- **Shape:** biconcave in cross section with posterior band, intermediate zone and anterior band
- **Position:** posterior band edge at “12:00”
D. Articular Disc

[Diagram showing Articular Disc with labeled regions: Bilaminar Region, Post Band, Intermed. Zone, Ant. Bond, Ant. Extension, Capsular Ligament]
E. TM Joint Capsule

- **Function:**
  1) limit extreme ROM
  2) synovial lining
  3) confines synovial fluid
  4) joint proprioception
F. Mandibular Ligaments

Restrict and limit joint range of motion
A. Temporomandibular Ligament

- Lateral thickening of the TM jt capsule
- **Limits:** retrusion and inferior condylar distraction
B. Collateral Ligaments

• Medial and lateral
• **Limit:** medial and lateral movement of the disc relative to the condyle
C. Accessory Ligaments

- **Sphenomandibular Ligament**: nonfunctional vestige or remnant of Meckel’s cartilage.
- **Stylomandibular Ligament**: limits extreme jaw protrusion.
TM Joint Stability

- NOT ligaments
- Muscles pulling across joints
- Articular Disc Geometry
TM Joint Anatomy: sagittal

- **Lateral Pterygoid M**
  Superior head insertion-condyle & sometimes disc
  Inferior head insertion-condyle

- **Retrodisical tissues**
  1) Superior- elastic
  2) Inferior- “check ligament”
  3) Loose C.T.- venous compartment and innervated

- **Synovial tissues**
TM Joint Retrodiscal Tissue
TM Joint Innervation: V3

mandibular nerve

motor innervation to:
- temporalis
- masseter
- medial pterygoid
- lateral pterygoid

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TM Joint Functional Anatomy

Read pages in Okeson, pp. 22-26!
“…when both condyles are firmly seated in their most posterior positions in the glenoid fossae.”

McCollum BB, Stuart CE: A Research Report, 1955, pg 91
“From all that we know, the character of the condylar movements remains the same from day to day, from age to age, as long as the individual lives…”

McCollum BB, Stuart CE: A Research Report, 1955, pg 91
History of Centric Relation

“The most retruded relation of the mandible to the maxillae when the condyles are in the most unstrained position in the glenoid fossae from which lateral movement can be made, at any given degree of jaw separation.”

History of Centric Relation

“A maxillomandibular relationship in which the condyles articulate with the thinnest avascular portion of their respective discs with the complex in the anterior-superior position against the slopes of the articular eminences.”

History of Centric Relation

“This position is independent of tooth contact. This position is clinically discernible when the mandible is directed superiorly and anteriorly and restricted to a purely rotary movement about a transverse horizontal axis”


*Definition has remained essentially unchanged through the 8th Edition, 2005.
Jaw position with the condyles in their most superoanterior positions in the articular fossae, resting against the posterior slopes of the articular eminences, with the articular discs properly interposed.
Biology of Centric Relation

Muscloskeletal Stability: a stable position in which to load the joint, mm pull across jts seating condyle
Biology of Centric Relation

Clinical Evidence:
patients do well with IP coincidental with jaw position in CR (clinical experience)
Biology of Centric Relation

- **Clinically repeatable:** a reference position for restorative dental procedures

- ... but NOT immutable!
  (Celenza FV, JPD 1973)

- About 1 year? ... but highly variable