Chiropractic Treatment Options for TMJ Disorders

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The National Institute of Dental and Craniofacial Research reports that as many as 10 million people have TMJ disorders, often presenting with other conditions such as headaches, neck pain, chronic fatigue syndrome, fibromyalgia, IBS, and other systemic illnesses.

This 4 hour program will provide the doctor with practical information and techniques specific to TMJ Disorders that can be integrated into even a busy practice the following day. Advanced therapeutic applications and adjusting techniques will be highlighted.
• TMJ is a synovial joint

• Comprised of a biconcave disk compressed between the mandibular condyle and the mandibular fossa of the temporal bone
After ~ 25mm of pure rotation, the condyle "translates" out of the mandibular fossa and starts its journey over the articular eminence.
TMJ Articular Disc

- Biconcave -- allows for gliding to occur
- Fibrocartilage & viscoelastic
- Avascular and non-innervated
- Ligaments: Anterior, Posterior & Intermediate Bands
- Lateral Pterygoid is attached anteriorly
- Bilaminar Zone – posterior
- Retrodiscal tissue
Nerve Supply

- Mandibular nerve (CN V), the facial nerve (CN VII), C 1, C 2 and C 3
- Sensory innervation of the temporomandibular joint is derived from the **auriculotemporal** and **masseteric** branches of the mandibular branch of the trigeminal nerve (CN V).
  - Auriculotemporal nerve leaves the mandibular nerve behind the joint and ascends laterally & superiorly to wrap around the posterior region of the joint.
Proprioception of the TMJ

• Ruffini Endings
  • function as static mechanoreceptor – act to position the mandible

• Pacinian Corpuscles
  • dynamic mechanoreceptors which accelerate movement during reflexes.

• Golgi Tendon Organs
  • static mechanoreceptors for protection of ligaments around the temporomandibular joint.

• Free Nerve Endings
  • pain receptors for protection of the temporomandibular joint itself.
Ligaments of the TMJ

- Three functional ligaments support the TMJ:
  - Collateral Ligaments
  - Capsular Ligaments
  - Tempromandibular Ligament

- Two Accessory ligaments:
  - Sphenomandibular ligament
  - Stylomandibular ligament

- The ligaments act as passive restraining devices to limit the extent of movement of the mandible.
Collateral Discal ligaments

• Attach the medial and lateral borders of the articular disc to the poles of the condyle
• True ligaments composed of collagenous connective tissue fibers – they do not stretch
• Allow the disc to move passively with the condyle as it glides anteriorly and posteriorly on the articular surface of the condyle
• Responsible for hinging movement of TMJ
• Have vascular supply and are innervated – strain on these ligaments produce pain
Capsular Ligament

• The TMJ joint itself is surrounded by the capsular ligament
• Fibers are attached superiorly to the temporal bone along the borders of the joint surface of the mandibular fossa and articular eminence
Tempromandibular Ligament

- Outside lateral aspect of the capsular ligament is reinforced by the strong TM Ligament (aka lateral ligament)

- Triangular in shape. Attaches to the zygomatic process of the temporal bone and the articular tubercle. Apex is attached to the lateral side of the neck of the mandible
  - Two parts: Outer Oblique Portion (OOP) and Inner Horizontal Portion (IHP)

- Prevents the excessive retraction (posterior movement) of the mandible as when ligament is tight – the neck of the condyle cannot rotate

- As mouth if forced open wider, the condyle must move downward and forward across the articular eminence.
• To Clinically test....
  • Close mouth and applying mild posterior force to the chin/jaw, rotating until teeth are 20-25mm apart after which a resistance is felt when the jaw is opened wider.
  • This resistance is caused by the tightening of the TM Ligament
• The unique feature of the Tempromandibular ligament which limits rotational opening of the jaw is found only in humans
Accessory Ligaments

• Stylomandibular ligament:
  • Attaches to the styloid process and to the posterior border of the ramus.
  • Limits protrusion of mandible (relaxed when mandible is opened).

• Sphenomandibular ligament:
  • Extends between the spine of the sphenoid bone and the lingula of the mandible
  • Does not have any significant limiting effects on mandible.

• These ligaments limit the range of motion of the condyle and prevent it from coming in contact with the tympanic plate (behind) and from passing beyond the articular eminence (front)
Medial and Lateral Pterygoids

- Originate from the sphenoid bone
- Insert into the mandible
- Fibers of the Medial Pterygoid run superior/inferior--pulls the mandible upward (elevation)
- Fibers of the Lateral Pterygoid run horizontally---pulls the mandible forward (protrusion)
Medial Pterygoid Muscle

- Quadrilateral shape
- Two Heads:
  - 1. Superficial head
    - Originates at the maxillary tuberosity
  - 2. Deep head
    - Originates at the medial surface of the lateral pterygoid plate
- Originates from the pterygoid fossa and extends downward, backward and outward to insert along the medial surface of the mandibular angle
Medial Pterygoid Muscle

• Works with the massester muscle to form a muscular sling that supports the mandible at the mandibular angle

• ACTIONS:
  • Elevates the mandible (closes the mouth)
  • Assists in Protrusion of mandible
  • Side to side movements-grinding action (with opposite Lateral pterygoid)
Lateral Pterygoid Muscle

- Unlike the other three pairs of muscles, the fibers are oriented primarily horizontally

- Origin Two Heads:
  - Upper head (superior head) from infratemporal crest of greater wing of the sphenoid
  - Lower head (inferior head) from lateral surface of the lateral pterygoid plate

- Insertion:
  - Fovea in front head of the mandible (pterygoid fovea)

- ACTIONS:
  - Prime mover of the mandible (except closing of the jaw)
    - Protrusion
    - Depression of mandible (inferior head)
    - Side to side lateral movement
Action of Lateral Pterygoid
Jaw Movements

• Upper Compartment of the Joint:
  • Protrusion – Anterior movement
  • Retraction (aka Retrusion)- Posterior movement

• Lower Compartment of the Joint:
  • Depression – Lowering the jaw
  • Elevation-- Raising the Jaw

• Lateral Deviation – alternating retraction & protrusion
Muscles of Mastication

**ELEVATION**
Temporalis Muscle
(Masserter & Medial Pterygoid)

**PROTRUSION**
Lateral Pterygoid
Medial Pterygoid

**RETRACTION**
Posterior fibers of Temporalis muscle, deep Masseter

**DEPRESSION**
Gravity & Mylohyoid
Inferior belly of digastric

**LATERAL MOVEMENTS**
Medial Pterygoid
Lateral Pterygoid
<table>
<thead>
<tr>
<th>Muscles</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporalis</td>
<td>Elevates mandible</td>
</tr>
<tr>
<td>Masseter</td>
<td>Elevates mandible</td>
</tr>
<tr>
<td>Lateral pterygoid</td>
<td>Protrusion of mandible, depresses chin, lateral deviation of mandible</td>
</tr>
<tr>
<td>Medial pterygoid</td>
<td>Works with masseter to elevate mandible, aids in protrusion</td>
</tr>
<tr>
<td>Digastric, Stylohyoid</td>
<td></td>
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<tr>
<td>Mylohyoid</td>
<td>Depresses the mandible against resistance when infrahyoid muscles</td>
</tr>
<tr>
<td>Geniohyoid</td>
<td>stabilize or depress hyoid bone</td>
</tr>
<tr>
<td>Platysma</td>
<td>Depresses mandible against resistance</td>
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</tbody>
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Range of Motion

• Normal ROM of jaw opening is between 40-50mm
• Initial 25mm of opening is primarily achieved by the rotation which occurs in the bottom half of the joints between the mandibular condyle and the inferior surface of the disk
• Remaining 15-25 mm of motion is primarily through the anterior translation (forward gliding) motion that occurs between the superior surface of the disk and the temporal bone
• Opening the mouth:
  • Depression & protrusion

• Closing the mouth
  • Elevation & retraction:

• https://www.youtube.com/watch?time_continue=132&v=SC54MiJ5Xw
Animated muscles of mastication

https://www.youtube.com/watch?v=y9HdptyD76s
Normal vs. Abnormal Motion
**Temporomandibular joint**

**Normal Closed Position.**
Jawbone is separated from skull by a Soft disk that acts as a cushion when You chew, speak or swallow.

**Temporomandibular Joint**

**Normal Open Position.**
Disk stays in place when jaw is in use.

**Temporomandibular Joint**

**Abnormal. Disk Is Pulled**
Forward when jaw is in use, causing The bone structures to grind together.
• Hypermobility and/or excessive anterior translation of one or both TMJ’s is most common issue

• Excessive forward gliding (anterior translation) results in laxity of surrounding capsule and ligaments.

• Increased laxity/ over-stretching results in derangement and disk displacement in one or both jaw joints.

• Ultimately results in pain, functional loss, and arthritic changes
Resting Position vs. Close-Packed Position

- Resting position of the TMJ: --with the mouth slightly open, the lips together and the teeth not in contact.

- Closed-pack position of the TMJ: --the teeth are tightly clenched.
Cervical Involvement

Pinched Nerves Can Contribute To Teeth Grinding

- Splenius cervicis muscle
- Levator scapulae muscle
- Scalene muscles
- Digastric muscle
- Sternocleidomastoid muscle
- Sternal head
- Clavicular head
- Trapezius muscle
- Brachial plexus
- C1, C2, C3, C4, C5

Masseter muscle
Pinched Nerves Can Contribute To Teeth Grinding
Result and Conclusion: about 88.2% of patients, presented complaining of Temporomandibular disorder symptoms had neck pain concomitantly and a significant improvement in neck pain was noticed when treating the Temporomandibular joint (P=0.001).

The Temporomandibular joint symptoms were also significantly improved when neck is treated (P<0.001).

Moreover and interestingly, 100% of those who did not report pain in the Temporomandibular joints, but presented only with clicking, had reported pain in the neck at presentation. Clicking in one or both Temporomandibular was reported in 56.7% of patients presented with pain in both neck and the temporomandibular joint.
• The study concluded that disorders of Temporomandibular Joint and neck are significantly related to each other.

• Pathology in one can influence the pathology in the other same as treatment of each of them shows improvement of the other as well.
Jaw Dysfunction Is Associated with Neck Disability and Muscle Tenderness in Subjects with and without Chronic Temporomandibular Disorders

- A. Silveira, 1 I. C. Gadotti, 2 , * S. Armijo-Olivo, 3 D. A. Biasotto-Gonzalez, 4 and D. Magee 3

**Conclusion.** High levels of muscle tenderness in upper trapezius and temporalis muscles correlated with high levels of jaw and neck dysfunction. Moreover, high levels of neck disability correlated with high levels of jaw disability. These findings emphasize the importance of considering the neck and its structures when evaluating and treating patients with TMD.
Clinical Presentation

• Clicking, popping or cracking (CREPITIS) with opening or closing
• Pain in one or both TMJ
• Tinnitus
• Sensation of “full” or “clogged” ear(s)
• Lateral translation of jaw during opening and/or closing of mouth
• Jaw “locking” in open or closed positions
TMJ ROM
- General “rule of thumb” (fingers in this case)

• Patient should be able to place 3 fingers vertically between the incisor teeth
  • Indicates normal range of mandibular opening of ~35-50mm

• If unable to place even 2 fingers, then need to evaluate for cause
• Demonstration of how to perform a **TMJ** exam.
• [https://www.youtube.com/watch?v=CkgM8Rcm9ZE](https://www.youtube.com/watch?v=CkgM8Rcm9ZE)
Palpation of the TMJ
Adjustment Techniques

• Manual
• Pulse or Activator-type tool
• Internal/external
  • Palate
• Cervical adjustments
• Adjunctive treatments
Adjustment Techniques, cont.

• Hypo vs Hyper mobile joint
  often opposite side of pain
• Don’t forget to balance /equilibrate
• Cervical adjustments – upper cervical
• Light/laser therapy to help ease pain/inflammation
• Home instructions
Therapeutic Options

- Light /Laser Therapy
- Microcurrent
- Ultrasound
- Massage
- IFC
Treatment Protocols
Management of Temporomandibular Disorders with Low Level Laser Therapy.


PURPOSE:
To evaluate the efficacy of low level laser therapy (LLLT) in the treatment of temporomandibular disorders (TMD) in relation to pain intensity, tender points, joint sounds and jaw movements.

MATERIALS AND METHODS:
Twenty patients received 6 sessions of LLLT (3 times a week for 2 weeks) with semiconductive diode laser (gallium arsenide; 904 nm, 0.6 W, 60 s, 4 J/cm(2)). Pain intensity, number of tender points, joint sounds and active range of motion were assessed before and immediately after each session and after 1, 2 weeks, 1, 3 and 6 months.

RESULTS:
Statistically significant results were achieved in all study parameters.

CONCLUSION:
LLLT promoted satisfactory results in reducing the pain intensity, number of tender points, joint sounds and improvement in the range of jaw motion. Hence it is an effective and efficient treatment method for TMDs.
Home Exercises

1. **Part 1: Activate the Jia Che Point (ST6).**
   - With two fingers, apply firm pressure to the point where the bottom of the masseter meets the outside corner of the jaw.
   - Hold this pressure for 30 seconds while performing small circular motions with your fingertips.
   - Repeat this exercise for the other side of your jaw.

2. **Part 2: Activate the Masseter/Ear Pressure Points.**
   - On both sides of your face, find the small hollow spot in front of the small triangular part of the ear with your middle finger. Open and close your jaw a few times to feel that small hollow.
   - Place a finger on the small hollow, a second finger where the top of your ear meets your head, and the third finger where the bottom of your ear meets your head.
   - Press evenly with all three fingers towards your skull.
   - Hold the pressure for 5 to 10 seconds.

3. Do this exercise several times each day.
**Functional Opening of the Jaw** - In this exercise, you will be palpating and massaging the condylar head of your TMJ with your index finger. This exercise acts to increase circulation, jaw mobility, and motor/neuromuscular control. Restoration of this motor control is essential if you are suffering from a hyper-mobile joint.

Note: This exercise stimulates the Xia Guan (ST7) acupuncture point. This point is used to treat TMJ, facial pain, and upper jaw toothaches.

1. **Stimulate the Xia Guan point (ST7)**
   - Keep your tongue pressed against the hard palate of your mouth, with the tip just behind your front teeth. This position will give you feedback about your TMJ motion.
   - Place your forefingers by your ears as shown in image A.
   - Use your index fingers to locate the condylar head of your TMJ at the back of your mouth. It will feel like a small indentation when your mouth is open.

2. Keep your finger in this indentation and apply moderate pressure directly towards your skull.

3. Slowly open and close your jaw while limiting any jaw deviations, and always working within your pain-free zone.

4. Repeat this exercise for the recommended number of sets and repetitions.
Other Considerations

• Manage Stress
• Nutritional supplementation
  • Pain
  • Muscle relaxation
  • Stress adaptation
• Co-Management
Case Studies
Chiropractic Treatment of Temporomandibular Dysfunction: A Retrospective Case Series
Steven Pavia, DC,a Rebecca Fischer, DC,b and Richard Roy, DC, PhDc,*

• Published online 2015 Nov 11. doi: 10.1016/j.jcm.2015.08.005, PMCID: PMC4688559, PMID: 26793040

• Retrospective case series of 14 patients, including 13 adults and 1 child. The majority of these patients were undergoing chiropractic care for spine-related conditions when they presented with additional TMD signs and symptoms. They were evaluated and treated with Activator Methods International published protocols relative to the temporomandibular joint before the addition of treatment to the suprahyoid muscles.

• Conclusion:
• All patients selected for this case series showed a reduction of temporomandibular dysfunction symptoms.
Research

Chiropractic Treatment of Temporomandibular Dysfunction: A Retrospective Case Series.

Chiropractic treatment of temporomandibular disorders using the activator adjusting instrument: a prospective case series.

A collaborative approach between chiropractic and dentistry to address temporomandibular dysfunction: a case report.
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Chiropractic care of interstitial cystitis/painful bladder syndrome associated with pelvic lumbar spine dysfunction: a case series.
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The long-term effect of occlusal therapy on self-administered treatment outcomes of TMD.
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Nilsson IM.
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PMID: 12674926
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Cooper BC, Kleinberg I.
PMID: 17508632

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Saghafi D, Curl DD.
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Differences in initial symptom scores between myogenous TMD patients with high and low temporomandibular opening index.
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On surgical intervention in the temporomandibular joint.
Widmark G.
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Evaluation of the applicability of temporomandibular opening index in Turkish children with and without signs and symptoms of temporomandibular joint disorders.
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Oral health-related quality of life in patients with temporomandibular disorders.
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• Jump up↑ Functional Anatomy of the TMJ. Movements of the TMJ. Available from https://www.youtube.com/watch?v=SCS4MiHJ5Xw [last accessed 07/01/2018]