My Jaw Hurts! What do I do?

An Overview of Orofacial Pain and Temporomandibular Joint Disorders, Pain Mechanisms, and Diagnosis

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What types of conditions are orofacial pain disorders?
TEMPOROMANDIBULAR JOINT DISORDERS

MASTICATORY MUSCULOSKELETAL PAIN

CERVICAL MUSCULOSKELETAL PAIN

NEUROVASCULAR PAIN

NEUROPATHIC PAIN

SLEEP DISORDERS RELATED TO OROFACIAL PAIN

OROFACIAL DYSTONIAS

HEADACHES

INTRAORAL, INTRACRANIAL, EXTRACRANIAL, AND SYSTEMIC DISORDERS THAT CAUSE OROFACIAL PAIN
Course objectives

1) How to recognize and screen patients with orofacial pain and dysfunction, including temporomandibular joint disorders.

2) The underlying pain mechanisms and dysfunction of the orofacial structures.

3) How to make common orofacial pain diagnoses.

4) The relationships between orofacial pain disorders, headaches, and cervical pain.
Course Outline

1) Terminology and pain mechanisms
2) Internal derangements
3) Arthrogenous Disorders
4) Myogenous Disorders
What is oral health?

“Oral health is multi-faceted and includes the ability to speak, smile, smell, taste, touch, chew, swallow and convey a range of emotions through facial expressions with confidence and without pain, discomfort and disease of the craniofacial complex.”

Framework for the definition of oral health
Orofacial pain

UNDERSTAND FIRST, TREAT SECOND

Muscloskeletal

Neuropathic

Neurovascular
Definitions...

True or False...
Temporomandibular Disorder (TMD) is an appropriate diagnosis.

What are the common symptoms associated with "TMD"?

Common complaints: jaw pain, earache, headache, facial pain, bruxism
1) 57 yo female: “My ears hurt and feel full”

- Ear pain and fullness
- Ear ringing
- Headaches
- Jaw pain
- Ear fullness
- Facial pain

Prior consultations:
- ENT, Dentist, Endodontist, PCP
2) 80 yo female with a persistent toothache

1) #31 aching pain since the last 6 months
   - Sharp when biting down
2) Headache
3) Neck pain
4) Ear fullness and ringing
5) Facial pain
6) Tingling of the tip of the tongue

Prior consultations: Dentist, Endodontist, Periodontist, PCP
3) 65 yo female with severe pain on the upper right and lower right teeth

- Pain began 6 months prior to initial visit
- Poorly localized pain on the right side
- Feels sharp and achy
- Has severe pain on the TMJs and masticatory muscles
General symptoms of “TMD”
So what does this all mean?

- 1 in 6 patients visiting a general dentist experienced orofacial pain
- Dentoalveolar and musculoligamentous were the most prevalent types of pain

Costen syndrome

- Suggested changes in the dental condition caused ear symptoms
- His theories have now been disproved
- Initiated the dental community’s interest in understanding the orofacial system

Photo credit: Dr. Gaetano Meli TMJ Pain and Neuropathic Pain in Patients with Temporomandibular Joint Disorders http://slideplayer.com/slide/9878267/
Terminology and classification

1934: Costen Syndrome
1959: Temporomandibular dysfunction syndrome (Shore)
1969: Myofascial pain dysfunction syndrome (Laskin)
1971: Functional temporomandibular joint disturbances (Ramfjord and Ash)
1982: Temporomandibular disorders (Bell)

1988: IHS-11th category: headache of facial pain attributed to disorder of cranium, neck, eyes, ears, nose, sinuses, teeth, mouth, or other facial or cranial structures
1992: Research diagnostic criteria for TMD (Dworkin & LeResche)
1996: AAOP provided diagnostic criteria and subcategories
Temporomandibular Disorders

According to the RDC/TMD, temporomandibular disorders are classified into 3 categories: muscle disorders, disc displacements, and arthralgia/arthritis/arthrosis.

2014: Diagnostic Criteria for TMD

- 12 common diagnoses identified:
  - Arthralgia
  - Myalgia, local myalgia, myofascial pain, myofascial pain with referral
  - 4 disc displacement disorders
  - Degenerative joint disease
  - Subluxation
  - Headache attributed to TMD

Classification

- **ICD-10**: Medical classification list developed by the WHO
  - Diagnostic classification standard
  - [http://www.icd10data.com/](http://www.icd10data.com/)

- **SNOMED-CT**: Systematized Nomenclature of Medicine - Clinical Terms.
“Initially the dentist should select the least invasive and most reversible therapy that may ameliorate the patient's pain and/or functional impairment.”

“Before restorative and/or occlusal therapy is performed, the dentist should attempt to reduce, through the use of reversible modalities, the neuromuscular, myofascial and temporomandibular joint symptoms.”

1. In the last 30 days, how long did any pain last in your jaw or temple area on either side?
   a. No pain
   b. Pain comes and goes
   c. Pain is always present

2. In the last 30 days, have you had pain or stiffness in your jaw on awakening?
   a. No
   b. Yes

3. In the last 30 days, did the following activities change any pain (that is, make it better or make it worse) in your jaw or temple area on either side?

A. Chewing hard or tough food: a. No, b. Yes

B. Opening your mouth or moving your jaw forward or to the side: a. No, b. Yes

C. Jaw habits such as holding teeth together, clenching, grinding, or chewing gum: a. No, b. Yes

D. Other jaw activities such as talking, kissing or yawning: a. No, b. Yes
Screening Form

**Part A:**
- Current jaw muscle or joint pain, painful jaw popping, locking?
- Current persistent tooth pain after having multiple dental treatments?
- Current burning tongue/mouth syndrome, trigeminal neuralgia, trigeminal neuropathy?

**Part B:**
- Recent (within two years) history of pain in the jaw muscles and/or TMJs
- Any history of treatment for TMD (TMJ)
- Clenching/grinding of the teeth
- TMJ crepitation (grating noise) or popping
- Frequent unexplained headaches, migraines, and/or neck pain
- Ear pain, ear ringing, stuffiness in the ear
Part C:

- Palpate the masseter and anterior temporalis muscles.

- Palpate the lateral and dorsal condyles of the TMJs.
Part D

Range of Motion in mm (inter-incisal)

1) Comfortable opening _____mm

2) Maximum passive stretch (Doctor stretches the patient) __mm

Document the presence or absence of pain as well as the location
Always consider addressing the orofacial pain complaint if you:

- Checked any box in part A
- Found any palpation pain in part C of level 2 or 3
- Checked any box in part B AND had any palpation pain in part C of level 1, 2 or 3

Find any of the following in Part D

- Less than 30 mm comfort opening
- Less than 35 mm passive stretch
- Jaw pain with over 35 mm of any opening
Anatomy
Temporomandibular joint

- Formed by the mandibular condyle and the mandibular fossa of the temporal bone
- Ginglymoarthrodial joint

- Articular disc
  - Dense fibrous connective tissue
Temporomandibular Joint

- Retrodiscal tissue
- Superior and inferior cavities
- Synovial fluid
  - Metabolic requirements to tissue
  - Lubricates the joint
1. Collateral ligaments

2. Capsular ligaments

3. Temporomandibular ligament

4. Sphenomandibular ligament (accessory)

5. Styloglossus ligament (accessory)
Innervation and vascularization

- Trigeminal nerve, V3
  - Auriculotemporal nerve
  - Deep temporal nerve
  - Masseteric nerve
- Superficial temporal artery (posterior aspect)
- Middle meningeal artery (anterior aspect)
- Internal maxillary artery (inferior aspect)
- Inferior alveolar artery (condyle)
Muscles of Mastication

- Masseter
- Temporalis
- Medial Pterygoid
- Lateral Pterygoid
- Digastric
**Masseter**

- Superficial and deep portions
  - Elevation of mandible
  - Superficial portion aids in protrusion
Temporals: anterior, middle, and posterior

- Anterior: elevation of mandible
- Middle: elevation and retrusion of mandible
- Posterior: elevation and slight retrusion of mandible
Temporals

**Temporalis: anterior, middle, and posterior**
- Anterior: elevation of mandible
- Middle: elevation and retrusion of mandible
- Posterior: elevation and slight retrusion of mandible
Medial Pterygoid

**Medial pterygoid**
- Elevation and protrusion
- Mediotrusive movement with unilateral contraction
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Medial Pterygoid

Medial pterygoid
- Elevation and protrusion
- Mediotrusive movement with unilateral contraction
**Lateral Pterygoid**

**Lateral pterygoid: inferior and superior bellies**

- Inferior lateral pterygoid: opening and protrusion (simultaneous contraction); mediotrusive movement (unilateral contraction)

- Superior lateral pterygoid: elevation of mandible; stabilizes the condyle and disc during mandibular loading (unilateral chewing)
Digastric: Anterior and Posterior

Digastric: anterior and posterior bellies
- Depression of mandible
- Elevation of hyoid bone
Pain mechanisms
Terminology

- Afferent nerve fibers:
  - I: A-alpha
  - II: A-beta
  - III: A-delta
  - IV: C fibers

- Nociception
- Pain
- Suffering
- Pain behavior
Nociception

The Inflammatory “Soup”

Nociception
Transmission: 1<sup>st</sup> order neurons
Nociception

Transmission: 2nd order neurons
Nociception

Perception
Pain terminology continued

1. Peripheral Sensitization
2. Central Sensitization
Peripheral Sensitization

**Allodynia**

**Hyperalgesia**
Central Sensitization

Tissue Injury and/or prolonged noxious stimulation

Release of glutamate, aspartate, SP, CGRP

Activation of NMDA Receptors
Decreased Inhibition

Secondary hyperalgesia
Allodynia (A-beta fibers)
Expanded receptive fields

Chronic Pain States
Let’s recap
Thank you!