Orofacial Pain: Diagnosis & Management
Clarifying the issues

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An unpleasant sensory and emotional experience.
Associated with actual or potential tissue damage.
Described in terms of such damage.

UNC Pain Center – Primary Pain Complaints

<table>
<thead>
<tr>
<th>Body Region</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head, face, and neck</td>
<td>43%</td>
</tr>
<tr>
<td>Back, lower extremities</td>
<td>23%</td>
</tr>
<tr>
<td>Other</td>
<td>34%</td>
</tr>
</tbody>
</table>

Prevalence Rate of Facial Pain

Per 100,000

<table>
<thead>
<tr>
<th>Condition</th>
<th>Prevalence</th>
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</thead>
<tbody>
<tr>
<td>Toothache</td>
<td>12,361</td>
</tr>
<tr>
<td>Oral Ulcer</td>
<td>8,392</td>
</tr>
<tr>
<td>TM Joint</td>
<td>5,289</td>
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<tr>
<td>Face Pain</td>
<td>1,415</td>
</tr>
<tr>
<td>Burning Mouth</td>
<td>707</td>
</tr>
</tbody>
</table>

Lipton, Shipp, Larach-Robinson JADA 124:115, 1993

22% of population suffered from orofacial pain more than once in the previous 6 months.

Lipton, Shipp, Larach-Robinson JADA 124:115, 1993

Categories of Common Orofacial Pain Conditions

Somatic (nociceptive pain)
- local (oral/perioral) tissue injury / inflammation
Musculoskeletal
-TMD
Neuropathic orofacial pain
- neuralgias
- deafferentation
- dysesthesia
Headache
- migraine
- tension-type

Lipton, Shipp, Larach-Robinson JADA 124:115, 1993
**Chief concern**
- bitemporal headache (frequent)
- clicking and pain with jaw function
- severe throbbing headache (occasional)
- fatigue

**Should I treat this patient?**
What is/are the diagnosis(es)
How should I treat this patient?
What factors are important in this case?

**Patient Evaluation**

**Data collection**
- Chief concern(s)
- History of chief concern(s)
- Past medical/dental history
- Review of systems
- Physical examination
- Additional studies if indicated
- Differential diagnosis

**Acute Pain Characteristics**
- Protective mechanism
- Sudden onset
- Limited duration
- Patients usually show anxiety
- No persisting psychologic reactions
- Responds well to traditional therapy

**Quality**
*may suggest mechanism(s)*

**ORIGINS OF PAIN**

**Musculoskeletal** - dull, aching stiff, sore
- Myofascial pain
- Myalgia
- Tension-type headache
- Arthrosis/arthritis

**Vascular** - throbbing, pounding
- Migraine
- Temporal arteritis
- Inflammation
- Hypertension
ORIGINS OF PAIN

Neuropathic - sharp, burning, tingling, numb
- Neuralgia
- Neuropathy
- Entrapment
- Vascular compromise

Psychogenic - bizarre, vague, migrating
- Rare
- Somatoform disorder
- Must consider:
  - Fibromyalgia
  - Systemic disease

What We See
What We Don't See/Know!!!

The Many Faces of Pain
What We Don't See/Know!!!

Nociceptive versus Neuropathic Pain

<table>
<thead>
<tr>
<th>Nociceptive Pain</th>
<th>Mixed Pain</th>
<th>Neuropathic Pain</th>
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</thead>
<tbody>
<tr>
<td>Caused by activities in neural pathways in response to potentially tissue damaging stimuli</td>
<td>Caused by a combination of both primary injury or secondary effects</td>
<td>Initiated or caused by primary lesion or dysfunction in the nervous system</td>
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</tbody>
</table>

Paradigms in Pain Diagnosis and Management

Enhanced understanding of pain mechanisms and pathways has provided for targeting pathology on a case-specific basis.
Chronic Pain Characteristics

- Has no useful purpose
- Occurs after acute phase
- Not self-limiting; appears permanent
- Invariably accompanied by psychologic changes in behavior
- May be refractory to traditional forms of therapy

Chronic Pain in the United States

- 57% suffered from chronic or recurrent pain in last year
- Small variation between age groups
- 4 of 10 chronic pain sufferers reported significant life adjustments
- 76% impacted by pain

Research America! September 4, 2003

Orofacial Pain Diagnosis

“Shared neurologic circuitry of the head and neck make the etiology (true location) of pain difficult to diagnose.”


Differential Diagnosis

The systematic consideration of the patient’s signs and symptoms in order to distinguish one disease from another.
Differential Diagnosis

- Teeth
- Glandular
- Vascular
- Neurogenous
- Myogenous
- Arthrogenous
- Paranasal sinuses
- Otologic

Individualization of care:
- Investigate all possible facets to include:
  - etiology
  - perpetuation
  - recurrence
  - co-morbid conditions
NEOPLASM

- Neoplasms can be the cause of refractory chronic pain
- Mass in posterior fossa as a trigger for trigeminovascular system and upper cervical afferents resulting in secondary chronic headaches

Bigal ME, Rapoport AM, Camiel M. Cephalalgia 2002 Mar; 23(2): 124-8

EVALUATION STRATEGIES

“Investigate the Atypical and the Red Flags”

WORRISOME HEADACHE RED FLAGS “SNOOP”

- Systemic symptoms (fever, weight loss) or secondary risk factors (HIV, systemic cancer)
- Neurologic deficits lateralizing to side of pain or abnormal signs (confusion, impaired alertness, or consciousness)
- Onset: sudden, abrupt, or split-second
- Older: new onset and progressive headache, especially in middle-age >50 (giant cell arteritis)
- Previous headache history: first headache or different (change in attack frequency, severity, or clinical features)

Differential Diagnosis

- Teeth
- Glandular
- Vascular
- Neurogenous
- Myogenous
- Arthrogenous
- Paranasal sinuses
- Otologic
Patient: Betty

- 51 year old Caucasian female
- Medical history significant for:
  - left temporomandibular surgery X2
  - hypothyroidism

Patient: Betty

- Chief pain concern:
  - “I have pain in my jaw and throat when I eat. The pain radiates to my ear. It feels like a toothache.”

Patient: Betty

- Aggravating factors:
  - chewing and drinking
  - certain aromas
- Alleviating/relieving factors:
  - none identified

Major Salivary Glands

- Parotid gland
  - pure serous
- Submandibular gland
  - primarily serous
- Sublingual gland
  - primarily mucous

Interruption in Glandular Flow

- Viral infections
- Bacterial infections
- Sialolithiasis
- Neoplasms
- Trauma
Obstructions

- Mucous plug
- Stones
  - hydroxyapatite
  - trace magnesium carbonate
  - trace ammonia
  - organic matrix (amino acids / carbohydrates)

Sialolithiasis

- Most common obstruction
- Primarily affects submandibular gland

Sialolithiasis

Diagnosis

- History
  - pain with salivation
- Inspection
- Palpation

Diagnosis

- Imaging
  - occlusal
  - lateral jaw
  - panoramic
  - sialogram

Patient: Juan

- 28 year old Hispanic male
- Medical history:
  - unexplained intermittent facial swelling and lymphadenopathy
  - previously treated with Pen VK 500 mg
Patient: Juan

Chief pain concern(s):
- "pain on the right side of my face; headaches in the temples; clicking in my right jaw; face feels numb and tingles on the right side; throbbing when I eat"

Aggravating factors:
- eating
- opening wide
- yawning

Alleviating/relieving factors:
- antibiotics (Pen VK 500)
- analgesics (Ibuprofen) -- "takes the edge off"

Parotido-Masseteric Hypertrophy
Traumatic Occlusion Syndrome

Parotid swelling
- duct obstruction
- pain

Sialodochitis
- bacterial infection due to retrograde travel of organisms from the oral cavity

Traumatic occlusion
Parotido-Masseteric Hypertrophy Traumatic Occlusion Syndrome

**Treatment**
- Antibiotic therapy
- Analgesics
- Occlusal therapy
- Control parafunctional habits

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**Differential Diagnosis**
- Teeth
- Glandular
- Vascular
- Neurogenous
- Myogenous
- Arthrogenous
- Paranasal sinuses
- Otologic

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**Headache And Dental Pain**

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**Migraine: Demographics**
- 28 million Americans; 1/4 households
- Up to 90 % have family history
- One-year prevalence (one attack) - 12.6 %
  - 6% men
  - 15 - 18% women
- Increasing incidence ?
- Preventive therapy only used by 3 - 5 %

*In children the incidence in males is only slightly lower than in females*

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**Migraine Prevalence**

*Age and gender perspectives*

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**Differential Diagnosis of Headache**

- **Pulsating quality**
- **Moderate/severe pain intensity**
- **Aggravation by routine physical activity**

No Longer Just Neurovascular

No Longer Just Neurovascular

What Happens During a Migraine?

Migraine without aura

- HA attacks lasting 4 to 72 hours
- At least two of the following:
  - unilateral
  - pulsating quality
  - moderate to severe pain intensity
  - aggravation by physical activity
- Associated symptoms: nausea, vomiting, phonophobia, and/or photophobia
- Resolution with sleep

Migraine With Aura

- Migraine without aura criteria
- Plus at least three of the following
  - One or more fully reversible aura symptoms
  - At least one symptom develops gradually (>4 min) or two or more symptoms occur in succession
  - No single aura symptom lasts longer than 60 min
  - Headache follows aura within 60 min (may begin before or simultaneously with aura symptom(s)
- Secondary causes excluded
- At least two attacks

In some patients an aura may come before the headache
Visual Flashes (photopsia)
- Zigzag lines (teichopsia)
- Blurred / cloudy vision
- Tunnel vision

How Do Patients Describe the Impact of Migraine on Their Lives?
- “I can’t do anything. All I want to do is hide in a dark room.”
- “Any sound bothers me. I can’t even talk to my children.”
- “I can’t control the pain. I’ve tried [almost] everything.”
- “When I have a severe migraine headache, I am completely unable to function, unable to drive or to work.”

What Can Trigger a Migraine Attack?
- Stress/Relief of stress
- Hormonal Changes
  - Oral contraceptives
  - Menstruation
- Lack of or too much sleep
- Missed meals
- Certain foods, drinks and ingredients
  - For example, red wine, chocolate, and cheese
**Treatment:**
- Trigger avoidance
- Symptomatic control to abort attacks

**First line treatment:**
- NSAIDs
  - Ibuprofen, naproxen, ASA
  - Combination acetaminophen, asa, caffeine like Excedrin migraine
  - OTC antihistamine, anti-nausea

**Pharmacotherapy**

**Transnasal lidocaine 4% HCL (no vasoconstrictor)**
- Indications
  - Neuropathic pain
  - Migraine headache

**Second line treatment:**
- Triptans
  - Avoid in coronary artery disease
- Fioricet, fiorinal combination of butalbital
- Dihydroergotamines
  - Injection / Intranasally

**How to Help Prevent Migraine Attacks**

The goal of preventive therapy is to reduce the frequency, severity and/or duration of migraine attacks.
- Beta-blockers
- Tricyclic antidepressants
  - Elavil (amitriptyline)
- Anticonvulsants
  - Topamax (topiramate)
Non-Pharmacological Intervention

- Interest in Non-Pharmacological Intervention has increased in recent years
- NTI (nociceptive trigeminal inhibitor)
- Biofeedback
- Relaxation
- Behavioral intervention
- Barriers in dissemination and implementation exist


Beware of pitfalls of treatment

Biofeedback and Relaxation

- Combination of biofeedback and relaxation training is more effective than each therapy administered individually
- Also used in combination with medication therapy (biofeedback, relaxation, propranolol)


Patient: Bernadette

- 76 yr. old Caucasian female
- Medical history:
  - hypertension
  - osteoporosis
  - intermittent, migrating joint swelling
  - fatigue of recent onset
  - depressed mood
  - progressively worsening vision

Patient: Bernadette

- Chief pain concern(s):
  - "I have facial pain all over both sides of my face. I have severe pain upon..."
Patient: Bernadette

- Aggravating factors:
  - eating
  - talking
  - clenching
- Alleviating/relieving factors:
  - jaw rest
  - "eating in stages"

Temporal Arteritis

- Jaw claudication
- Craniofacial pain
  - dental pain
  - TM joint pain
  - otalgia
  - headache

Temporal Arteritis

- Visual symptoms
- Anorexia
- Anemia
- Low grade fever/malaise
- Neurologic deficits
- Systemic involvement
  - polymyalgia rheumatica

Temporal Arteritis

- Clinical
  - decreased pulse
  - fibrotic, tender artery
- Laboratory
  - Westergren erythrocyte sedimentation rate (> 50mm/hr)
  - Elevated C-reactive protein
Temporal Arteritis

**Diagnosis**

- Biopsy
  - usually the superficial temporal artery
  - 1.5 cm segment due to “skip” lesions

**Treatment**

- Glucocorticoid therapy
  - parenteral (in patients with visual symptoms)
  - oral
    - Prednisone 40-60 mg / day initially with gradual taper over 6-12 months

**The Key To Success...**

Because most patients with headache have normal neurologic and general physical examinations, when possible, a thorough history is CRUCIAL to determining the etiology.

**Differential Diagnosis**

- Teeth
- Glandular
- Vascular
- Neurogenous
- Myogenous
- Arthrogenous
- Paranasal sinuses
- Otologic
Neuropathic Pain

“Pain initiated or caused by a primary lesion or dysfunction in the nervous system”

International Association for the Study of Pain (IASP)

Common
-25-30% of Facial Pain Center patients
Under/misdiagnosed and undertreated
Interpatient variability regarding presentation and response to treatment
Complex pathophysiology
Practitioner doubt

Differential Diagnosis
Neuropathic Orofacial Pain

Physical Examination
Allodynia - pain from stimulus that does not normally cause pain
Hyperalgesia - increased response to a painful stimuli
Sympathetic hyperfunction - swelling, redness, sweating

Trigeminal Neuralgia

“Facial Pain II. A Prospective Survey of 1052 Patients with a View of: Character of Attacks, Onset, Course and Character of Pain”

Rasmussen P. Acta Neurochirurgica, 1990;107:121-128

Trigeminal Neuralgia

Atypical trigeminal neuralgia (ATN)
Characterized by brief pain paroxysms with interval pain or attacks of several minutes duration

Rasmussen P. Acta Neurochirurgica, 1990;107:121-128
Patient: Charles

Chief pain concern:
- “hurts when touched- electric like shock; almost constant aching”

Aggravating factors:
- touching area (occasionally)
- blowing nose, sneezing
- occasionally when smiling

Alleviating/relieving factors:
- Tegretol (200 mg bid)- several hours

Pre-trigeminal Neuralgia

Historical perspectives

“...avoid the useless and unnecessary extraction of entire rows of healthy teeth.”

Fothergill J. London. 1769;3:400-418
Pujol M. Paris: Theophile Barrois, 1787

“...prodromal sensations experienced in the upper or lower jaws at the onset of their illness.”


Teeth were extracted 10 years prior to pain onset.

No osseous pathology is evident radiographically.

The soft tissues overlying the area is of normal color and texture.
Pre-trigeminal Neuralgia

1. dull, aching pain (toothache/sinus-like pain)
2. spontaneous onset
3. no specific trigger zone
4. duration- minutes to hours
5. pain may spread

6. sporadic sharp, lancinating pain
7. triggered by chewing, drinking hot/cold liquids brushing teeth, yawning, talking
8. pain decreases with somatic blocks
9. precedes trigeminal neuralgia

Differential diagnostic considerations

• neoplasm
• atypical odontalgia
• lower half headache
• odontogenic pain

• sinusitis
• myofascial pain
• TM joint dysfunction
• osseous pathology

Neuropathic Facial Pain

Classification

Trigeminal Neuralgia
Type 2 (TN 2)

✓ Facial pain of spontaneous onset with greater than 50% presenting as a constant pain.

One of the most painful afflictions known to man
Dental Care - TN Connection

- TN may mimic dental pain
- Dental treatment may cause nerve irritation/damage
- Dental care may aggravate pre-existing trigeminal neuralgia

Trigeminal Neuralgia

<table>
<thead>
<tr>
<th>Started as or in direct conjunction with</th>
<th>TTN number</th>
<th>TTN per cent</th>
<th>ATN number</th>
<th>ATN per cent</th>
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<tbody>
<tr>
<td>Toothache</td>
<td>109</td>
<td>10</td>
<td>102</td>
<td>10</td>
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<tr>
<td>Dental Treatment</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>5</td>
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<td>Surgery of Oral Cavity</td>
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<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Fitting/Placement of Bridges or Dentures</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Dislocation of the jaw joint</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Facial trauma</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Sinusitis</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>22</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

Patient: Lavonne

- 56 year old Caucasian female
- Medical history significant for:
  - hairy cell leukemia (in remission)
  - low back pain (intermittent)
  - depressed mood secondary to pain
- Chief pain concern:
  - “lightning bolt-like pain in lower right jaw; feels like upper and lower teeth are misaligned; fairly constant burning”
Patient: Lavonne

- Aggravating factors:
  - chewing, yawning, and talking
  - cool/cold breeze on face
- Alleviating/relieving factors:
  - occlusal appliance therapy
  - Tegretol

Trigeminal Neuralgia

Sudden, unilateral, severe, brief, recurrent pain in the distribution of the trigeminal nerve.

Trigeminal Neuralgia

Characteristics

- sharp, agonizing, electric, shock-like stabs in skin or buccal mucosa
- triggered by light touch
- lasting a few seconds to 2 minutes

Trigeminal Neuralgia

Characteristics

- paroxysms occur at intervals to almost continuously
- pain free intervals of months or years, followed by recurrence
Trigeminal Neuralgia

1. Greater frequency in women.
2. Predilection for right side.
3. Mandibular and maxillary divisions most often affected.

4. Teeth and palate seldom the trigger zone.
5. Tongue is seldom painful.
7. Remission between attacks become shorter.
**Trigeminal Neuralgia**

*Primary Treatment Modalities*

- Pharmacotherapeutic
- Surgical

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**Pharmacotherapy**

*Adjuvant analgesics*

- Antidepressants
- Anticonvulsants
- GABA agonists
- Local anesthetics
- Neuroleptics
- Muscle relaxants
- Miscellaneous

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**Trigeminal Neuralgia**

*Proposed etiologies:*

- vascular compression of trigeminal ganglion
- traumatic or auto-immune demyelination (MS)
- central / peripheral neural injury
- intracranial mass (tumor, aneurysm, cyst)
- unknown

*Consider AGE and SYMPTOMS: idiopathic versus secondary*

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**Neuropathic Facial Pain**

*Classification*

Secondary Symptomatic Trigeminal Neuralgia (STN)

- Facial pain resulting from multiple sclerosis
**Trigeminal Neuralgia**

*Age of onset:*
- **Idiopathic / classic**
  - typically after age 30 (50-75 years)
- **Multiple sclerosis-related**
  - 20-40 years of age

**Secondary Trigeminal Neuralgia**

- *Multiple sclerosis* affects approximately 1:700 people, with an estimated US prevalence of 250,000-500,000.
  - ~1-2% of patients with MS develop TN (~ 10 new cases per year, and cumulative total of approximately 4,000-5,000 people).
- Only about 3% of patients with TN have MS.
- TN due to an *intracranial mass* such as a tumor or aneurysm (excluding vascular compression from cerebellar arteries) is rare, probably accounting for no more than 5% of cases.

**Multiple Sclerosis - Craniofacial Pain**

1. Pain may be first symptom.
2. Identical to trigeminal neuralgia.
4. Associated with leg weakness.
5. Sclerotic plaque in rootlets of V.

**Multiple Sclerosis - Craniofacial Pain**

- Herpes Zoster (shingles) is an acute infectious disease caused by herpes zoster virus.
- It primarily affects the posterior spinal root ganglion of the spinal nerves.
**Herpes Zoster: Incidence**

- Overall incidence of HZ: 131 per 100,000.
- No gender difference.
- Directly related to age; older > younger.
- More common and severe in immunosuppressed patients
  - lymphoma
  - chronic lymphocytic leukemia
  - radiation therapy
  - chemotherapy
  - lupus erythematosus

<table>
<thead>
<tr>
<th>Region</th>
<th>Cases (%)</th>
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<tr>
<td>Cranial</td>
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<tr>
<td>Cervical</td>
<td>12</td>
</tr>
<tr>
<td>Thoracic</td>
<td>55</td>
</tr>
<tr>
<td>Lumbar</td>
<td>14</td>
</tr>
<tr>
<td>Sacral</td>
<td>3</td>
</tr>
<tr>
<td>Generalized</td>
<td>1</td>
</tr>
<tr>
<td>All</td>
<td>100</td>
</tr>
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</table>

**Herpes Zoster of V**

1. Pain may appear before vesicles.
2. Ophthalmic division most often affected.
4. Pathologic changes in V ganglion and rootlets.
5. Chronic postherpetic pain rare but incurable.

**Herpes Zoster**

- May occur at any age
- Incidence highest in the 6th – 8th decade
- Recurs in 6% of cases
  - usually at the same site as the initial lesion

**Factors associated with reactivation**

- Immunosuppressive therapy
- Stress/anxiety
- Malignancy
- Local irradiation
- Trauma
Neuropathic Facial Pain

Classification

Post-Herpetic Neuralgia (PHN)

- Pain resulting from herpes zoster outbreak (shingles) along the trigeminal nerve

Herpes Zoster

Postherpetic neuralgia

Pain recurring or continuing at the site of shingles 1 or more months after the rash.

Herpes Zoster

Incidence:

- Age dependent
- 50-70% depending on population studied
- Dramatic increase after the age of 50

Herpes Zoster

Treatment:

- Antiviral agent
- Analgesic
- Corticosteroid???
- Local anesthetic
  - Peripheral
  - Sympathetic
  - Intravenous
- Topical agents
  - Capsaicin
  - Local anesthetic
  - Aspirin/chloroform
  - clonidine
- Tricyclic antidepressants
- Neruontin (gabapentin)

Herpes Zoster

Prevention

Oxman N, Levin M. J Infect Dis. Mar 1, 2008; 197(Suppl 2): S228-S236

Herpes Zoster

Prevention

Oxman N, Levin M. J Infect Dis. Mar 1, 2008; 197(Suppl 2): S228-S236
ANATOMIC SOURCES OF OROFACIAL PAIN

CORONOID HYPERTROPHY
- Limited range of motion (gradually developing)
- May be painless
- Most common in adolescent males
EAGLE’S SYNDROME
ELONGATED STYLOID PROCESS

Pain on swallowing
- Pain upon palpation of lateral pharyngeal wall
- Pain on turning head (associated dizziness?)

Surgical Removal Of Styloid Process

Temporomandibular Disorder
A collective term referring to a number of clinical problems involving the masticatory musculature, the temporomandibular joint(s) and associated structures or both.
Temporomandibular Disorder

Cardinal Signs/Symptoms

• Pain in the:
  – Temporomandibular joints
  – Masticatory muscles
  – Cervical region
• Limitation or disturbance of mandibular movements
• Temporomandibular joint sounds

TMD: Temporal Characteristics

• Pain may arise suddenly
• May progress over months or years
• Intermittent frequency and intensity

Too Much Disagreement

The Puzzle

TMD Epidemiology

No evidence that TM joint clicking must progress to locking and degeneration
No evidence that arthritic reactions must develop in joints that lock
Most degenerating joints tend to become non-painful with time (1-3 years)
As many as 16% may have long term pain
**TMD: Complex Interactions**

**PATHOGENESIS**

The cellular events and reactions and other pathologic mechanisms occurring in the development of disease.

**Temporomandibular Disorder**

Many things can light the fuse... many things can keep it burning!

**TMD: Etiologic Variables**

- Anatomy
- Parafunction
- Sleep Disorders
- Occlusion
- Stress
- Trauma
- Pain
- Coping
- Nutrition
- Gender
- Depression
- Posture

Pathofunction Balance Pathofunction

**Differential Diagnosis**

- Teeth
- Glandular
- Vascular
- Neurogenous
- Myogenous
- Arthrogenous
- Paranasal sinuses
- Otologic

**Patient: Marcus**

- 28 year old Caucasian male
- Medical history: non-contributory
Patient: Marcus

Chief pain concern:
“I have a toothache in my lower right molar area”

Radiographic and clinical findings (intraoral assessment) were non-contributory to determination of a diagnosis.

Patient: Marcus

Aggravating factors:
– chewing
– clenching

Alleviating/relieving factors:
– analgesics (NSAIDs, opioids)

Patient: Marcus

Chief pain concern:
“constant toothache, even where I don’t have teeth any more”

Myofascial Pain

*Diagnostic criteria*

- Regional dull, aching pain
- Presence of trigger points in muscles, tendons, or fascia
- Pain reduction with abolishment of trigger point
**Myofascial Pain**

**Clinical characteristics**

**Zone of reference**
- Constant dull ache
- Fluctuates with intensity
- Consistent referral pattern
- Local or distant trigger point
- Alleviation with trigger point abolishment

**Trigger points**
- Rope-like band of muscle
- Tenderness on palpation
- Palpation alters pain
- Consistent location

**Contributing factors**
- Nutritional
- Sleep disturbance
- Stress/anxiety
- Endocrinological
- Physical disorders
- Parafunctional habits
- Postural strains
- Disuse
**Myofascial Pain**

**Management considerations**

- Nutritional
  - Calcium 1200 mg/day
  - Magnesium 600 mg/day
  - B-100 complex
- Sleep disturbance
  - Sleep hygiene
  - Pharmacotherapy

**Myofascial Pain**

**Management considerations**

- Avoid increased bed rest
- Maintain range of motion/mobility
- Palliative care techniques
  - Ice massage
  - Heat
  - Ethyl chloride spray
  - Gentle stretching

**Myofascial Pain**

**Management considerations**

- Stress/anxiety
  - Relaxation techniques
  - Pharmacotherapy
  - Psychotherapy
- Muscle deficiency
  - Stretching/strengthening exercises
  - Physical therapy
  - Nutritional supplementation

**Myofascial Pain**

**Management considerations**

- Pharmacotherapy
  - NSAIDs
  - Muscle relaxants
  - Tricyclic antidepressants
  - Sleep aid medications
  - Local anesthetics (trigger point injections)
  - Transdermal preparations
Differential Diagnosis
- Teeth
- Glandular
- Vascular
- Neurogenous
- Myogenous
- Arthrogenous
- Paranasal sinuses
- Otologic

TM Joint Inflammatory Conditions

Capsulitis, Synovitis, Retrodiscitis
An inflammation of the synovial lining, capsular, or retrodiscal tissues of the temporomandibular joint that can be due to infection, an immunologic condition secondary to articular surface degeneration, or trauma.

Management Considerations:
- Patient education
- Restrict mandibular function
- Control parafunctional activity
- Pharmacotherapy
  - Analgesic/anti-inflammatory
  - Muscle relaxant (?)
- Stabilization orthotic
- Physical therapy
TM Joint: Normal Biomechanics

Disc Displacement With Reduction

Articular Disc Displacement With Reduction
Disc Displacement With Reduction

An abrupt alteration or interference of the disc-condyle structural relationship during mandibular translation with mouth opening or closing.

Disc Displacement With Reduction (Painful)

Management Considerations:
- Patient education
- Restrict mandibular function
- Pharmacotherapy
  - Analgesic/anti-inflammatory
  - Muscle relaxant (?)
- Stabilization orthotic

TM Joint: Affects of Reduced Loading

- Improved mesenchymal cell reprogramming
- Facilitation of pseudodisc formation
- Facilitation of condylar remodeling
- Reduction in amount of cellular debris
- Decreased synovial irritation

Moses
**Pseudodisc Hypothesis**

When subjected to constant repetitive compressive forces and loading, the retrodiscal tissue may transform into a disc-like tissue.

Scapino. OS,OM,OP 1983 (April):382-97  
Baustein, Scapino. Plas Recon Surg 1986 (December):756-64

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**Pseudodisc Hypothesis**

Many TM joints display an adaptive capacity to remodel themselves and continue to function without ideal disc position.

Westesson, Rohlin. OS,OM,OP 1984;4:17-22

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**Disc Displacement with Reduction (Painless)**

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**Sudden Onset Closed Lock with no prior history of clicking**

Anchored-disc phenomenon versus  
Acute Closed Lock  
(Disk displacement without reduction)
Arthroscopy: Diagnostic findings

- Normal findings
- Synovitis
- Disk displacement
- Fibrillation
- Adhesions
Degenerative Joint Disease

A chronic inflammatory or non-inflammatory disease resulting in joint deformity caused by degenerative changes in the articular cartilage, fibrous connective tissue, and/or the articular disc within the temporomandibular joint.

Macrotrauma

- Impact injury
- Extension-flexion injury
- Prolonged / excessive mouth opening
- Intubation

Degenerative temporomandibular joint disease is the result of maladaptation to increased joint loading.

Westesson, Rohlin 1984
Axelson, et al. 1992, 1993
Stegenga, et al. 1992
deBont, Stegenga 1993
TMD DJD: Trauma-Related

Macrotrauma

- 400 patients
- 25.5% reported an identifiable specific event

Microtrauma

- Bruxism
- Clenching
- Hyperextension
- Postural
- Musicians
- Other habitual repetitive behaviors

Cummulative Trauma Disorder

\[
\text{Repetition} + \text{Position} + \text{Force} + \text{Time} \rightarrow \text{TMD}
\]

Bruxing / Clenching

- Joint overloading
- Surface stickiness
- Fibrillation
- Degenerative changes

TM Joint Overloading

- Physiologic changes
  - Increased matrix degradation
  - Fibrocartilage breakdown
  - Synovial fluid alterations
  - Impaired function (frictional resistance)
  - Incoordination between TM joint components during movement
52 year old female

*Chief concern:* bilateral pre-auricular pain (severe) with swelling
**Clinical Findings**

- **TM joint**
  - Severe pain at lateral and medial aspects on palpation bilaterally
  - Severe pain on loading bilaterally
  - Maximum painless opening 15mm
  - Course crepitus
- **Masticatory musculature**
  - Generalized moderate pain on palpation

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**TM Joint Degenerative Joint Disease**

**Management considerations**

- Patient education
- Restricted function
- Pharmacotherapy
  - analgesic/anti-inflammatory
  - muscle relaxant
- Control parafunctional activities
- Occlusal orthosis therapy
- Physical therapy

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**Treatment**

**Pharmacotherapy**

a. NSAIDs
b. Muscle relaxants
c. Supportive

1) Glycoaminoglycan
   1200-1500 mg/d

2) Chondroitin Sulfate
   1500 mg/d

3) MSM

4) Antioxidants
   - Vitamin C (sustained release)
   - 1000 mg/d
   - Vitamin E
   - 400 I.U./d
   - Betacarotene
   - 2500 I.U./d (am)
### Internal Derangement and Osteoarthritis

<table>
<thead>
<tr>
<th>A. Toller (1973)</th>
<th>1. 130 DJD patients</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Years Observed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>51%</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>76%</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>87%</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>98%</td>
</tr>
</tbody>
</table>

#### TM Joint Degenerative Joint Disease

**Epidemiology - natural course?**

**30 year follow-up (n=99)**
- Disk displacement with reduction (at baseline)
  - 75% clicking ceased
  - 13% reported crepitus
- Disk displacement without reduction (at baseline)
  - 7% reported crepitus

**Clinical Outcomes**
- TM Joint Degenerative Joint Disease
  - Disk displacement with reduction
    - 75% clicking ceased
    - 13% reported crepitus
  - Disk displacement without reduction
    - 7% reported crepitus

**Epidemiology - natural course?**

**30 year follow-up (n=99)**
- Masticatory function
  - patients=controls
- Clicking and pain
  - decreased
- Most common complaint
  - fatigue of masticatory muscles


#### Differential Diagnosis

- Teeth
- Glandular
- Vascular
- Neurogenous
- Myogenous
- Arthrogenous
- Paranasal sinuses
- Otologic
Paranasal Sinuses

Headache and facial pain are commonly related to infection, inflammation, and/or obstruction of the outflow of the tracts of the paranasal sinuses.

Acute / Chronic Sinusitis: PAINFUL COMPLICATIONS

- Mucosal inflammation and thickening in cases of acute sinusitis
- Partial or complete obstruction of sinus ostia
- Pressure sensation
- Maxillary mucoceles
- Osteomyelitis

Acute / Chronic Sinusitis

<table>
<thead>
<tr>
<th>Sinus involved</th>
<th>Site(s) of referral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sphenoid sinus</td>
<td>Vertex, other parts of the cranium</td>
</tr>
<tr>
<td>Frontal sinus</td>
<td>Frontal region</td>
</tr>
<tr>
<td>Ethmoid sinus</td>
<td>Between the eyes</td>
</tr>
<tr>
<td>Maxillary sinus</td>
<td>Maxilla, dental structures</td>
</tr>
<tr>
<td>Pansinusitis</td>
<td>Pain may be coalescent, less localized, associated with frontal headaches, constant pressure</td>
</tr>
</tbody>
</table>

Mucosal Contact Headache

- Dull and aching
- Diffuse peri-/retro-ocular, supraorbital pain
- History of chronic maxillary sinusitis
- Allergy prone
- Associated with upper respiratory tract infection
- Impedance of normal mucosal activity
Differential Diagnosis
- Teeth
- Glandular
- Vascular
- Neurogenous
- Myogenous
- Arthrogenous
- Paranasal sinuses
- Otologic
Tinnitus: Differential Diagnosis

- Noise-induced
- Metabolic disease
- Endocrine disease
- Autoimmune disorders
- Structural abnormalities
- Medication-induced
- Occluso-muscle

Normal Tympanic Membrane

Otitis Media

Otitis Media Tympanic Membrane Perforation
Eustachian tube dysfunction

- Normal function
  - Dilatation
  - Primarily involves the tensor veli palatini
  - Swallowing causes momentary eustachian tube dilatation which equalizes pressure
  - Secondarily involves Levator veli palatini Salpingopharyngeus Superior constrictor

Tonic Tensor Tympani Phenomenon

- Hypertonia of medial pterygoid produces a concomitant reflex hypertonia of the tensor tympani muscle
- Tonic tensor tympani cannot initiate the reflex that increases the tonus of the tensor veli palatini muscle
- Failure of the eustachian tube to open during deglutition

Should I treat this patient?
What is/are the diagnosis(es)?
What factors are important in this case?
How should I treat this case?
The most important duties of the health care professional

- To cure sometimes
- To relieve often
- To comfort always

ABOVE ALL…

DO NO HARM!!!

Greater awareness does not come in a single blinding flash of enlightenment.

It comes slowly piece by piece, and each piece must be worked for by the patient effort of study and observation of everything, including ourselves.