Orofacial Pain: Diagnosis & Management
Clarifying the issues

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UNC Pain Center – *Primary Pain Complaints*

Body Region

- ***Head, face, and neck*** ***43%***
- *Back, lower extremities* *23%*
- *Other* *34%*

Prevalence Rate of Facial Pain

Per 100,000

45,711 Households Interviewed

Toothache	12,361
Oral Ulcer	8,392
TM Joint	5,289
Face Pain	1,415
Burning Mouth	707

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

Orofacial Pain

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

Chief concern

-bitemporal headache (frequent)
-clicking and pain with jaw function
-severe throbbing headache (occasional)
-fatigue

Key Questions

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

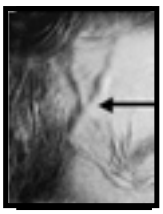
Musculoskeletal- dull, aching stiff, sore

- ➢ Myofascial pain
- ➢ Myalgia
- ➢ Tension-type headache
- ➢ Arthrosis/arthritis

ORIGINS OF PAIN

Vascular- throbbing, pounding

- ➢ Migraine
- ➢ Temporal arteritis
- ➢ Inflammation
- ➢ Hypertension



ORIGINS OF PAIN

Neuropathic- sharp, burning, tingling, numb

- Neuralgia
- Neuropathy
- Entrapment
- Vascular compromise

ORIGINS OF PAIN

Psychogenic- bizarre, vague, migrating

- Rare
- Somatoform disorder
- Must consider:
  - fibromyalgia
  - systemic disease

Nociceptive versus Neuropathic Pain

Nociceptive Pain	***Mixed Pain***	***Neuropathic Pain***
Caused by activities in neural pathways in response to potentially tissue damaging stimuli	Caused by a combination of both primary injury or secondary effects	Initiated or caused by primary lesion or dysfunction in the nervous system

Myofascial Pain
Degenerative Joint Disease
Tension Type Headache
Post-op Pain
Trigeminal Neuralgia
Trauma Induced Neuralgia
Phantom Pain
CRPS
PHN

Paradigms in Pain Diagnosis and Management

Enhanced understandi
of pain mec
pathwa
for targ **gy**
on a ca **ecific basis.**

Chronic Pain Characteristics

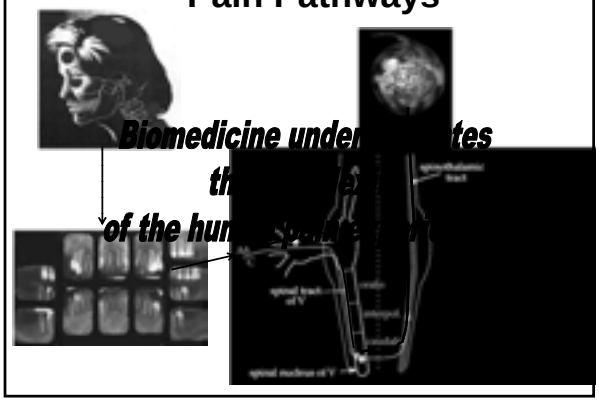
- Has no useful purpose
- Occurs after acute phase
- Not self-limiting; appears permanent
- Invariably accompanied by psychologic changes in behavior
- May be refractory to traditional forms of therapy

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

Pain Pathways



Orofacial Pain Diagnosis

Confounding factors

"Shared neurologic circuitry of the head and neck make the etiology (true location) of pain difficulty to diagnose."

Sessle BJ, et al. Pain 27:219-236,1986

Orofacial Pain: Complex Interactions

Differential Diagnosis

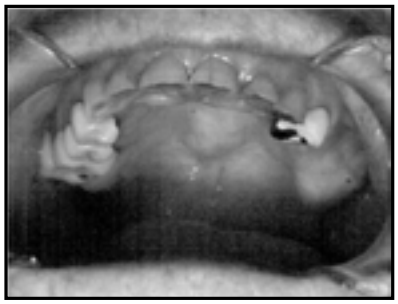
The systematic consideration of the patient's signs and symptoms in order to distinguish one disease from another.

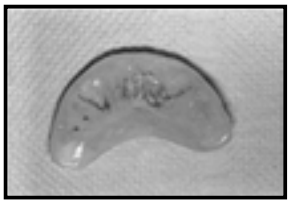
Differential Diagnosis

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

Individualization of care:

- Investigate all possible facets to include:
  - -etiology
  - -perpetuation
  - -recurrence
  - -co-morbid conditions

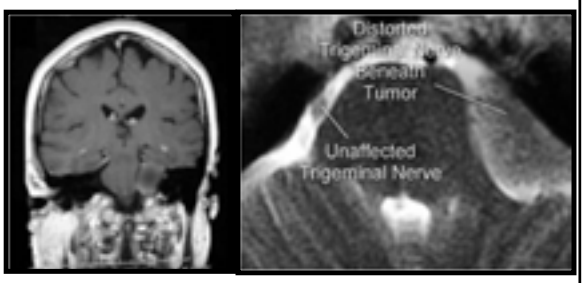




NEOPLASM

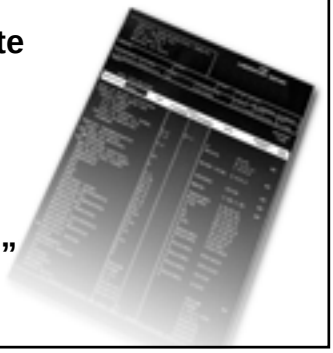
- Neoplasms can be the cause of refractory chronic pain
- Mass in posterior fossa as a trigger for trigeminovascular system and upper cervical afferents resulting in secondary chronic headaches

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



EVALUATION STRATEGIES

"Investigate the Atypical and the Red Flags"



WORRISOME HEADACHE RED FLAGS "SNOOP"

- **S**ystemic symptoms (fever, weight loss) or **S**econdary risk factors (HIV, systemic cancer)
- **N**eurologic deficits lateralizing to side of pain or abnormal signs (confusion, impaired alertness, or consciousness)
- **O**nset: sudden, abrupt, or split-second
- **O**lder: new onset and progressive headache, especially in middle-age >50 (giant cell arteritis)
- **P**revious headache history: first headache or different (change in attack frequency, severity, or clinical features)

Differential Diagnosis

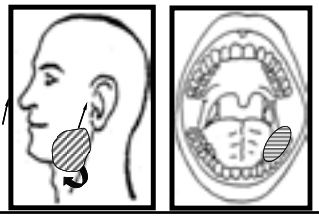
- Teeth
- Glandular
- Vascular
- Neurogenous
- Myogenous
- Arthrogenous
- Paranasal sinuses
- Otologic

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

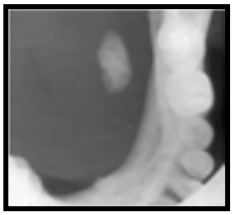
Diagnosis

- History
  - pain with salivation
- Inspection
- Palpation

Sialolithiasis

Diagnosis

- Imaging
  - occlusal
  - lateral jaw
  - panoramic
  - sialogram

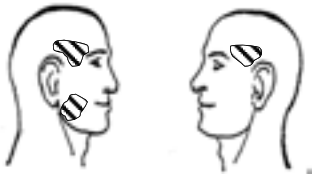


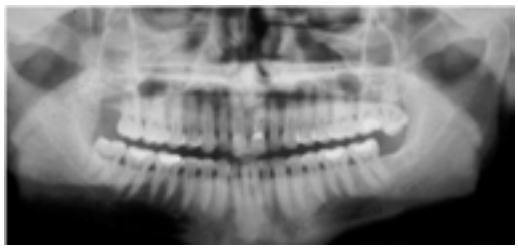
Patient: Juan

- 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"



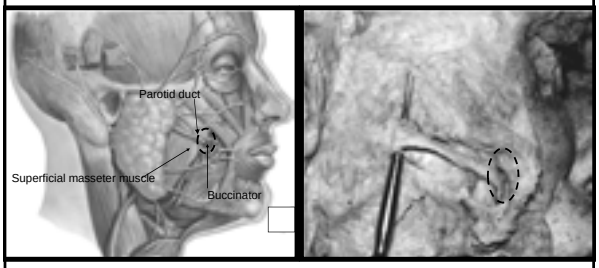


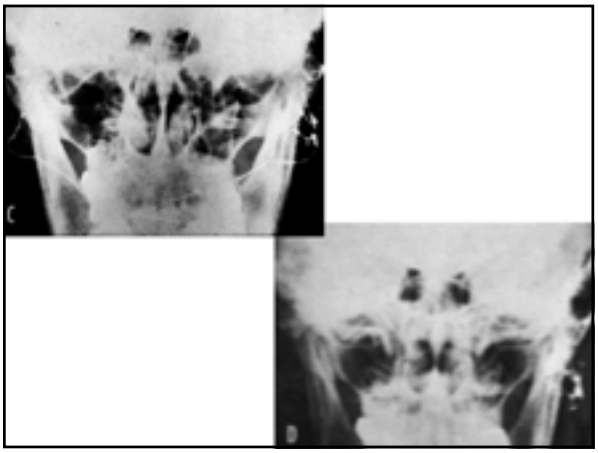
Patient: Juan

- 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
- Sialdochitis
  - bacterial infection due to retrograde travel of organisms from the oral cavity
- Traumatic occlusion





Parotido-Masseteric Hypertrophy Traumatic Occlusion Syndrome

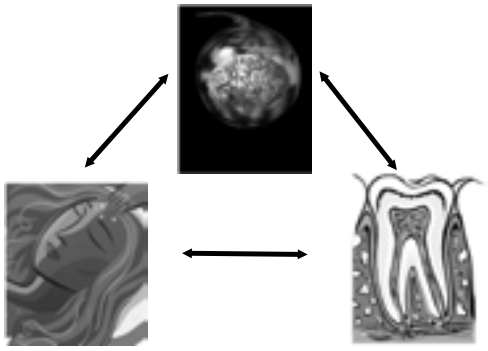
Treatment

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

Differential Diagnosis

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

Headache And Dental Pain



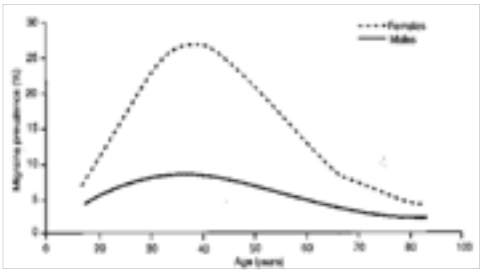
Migraine: Demographics

- 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

Migraine Prevalence

Age and gender perspectives



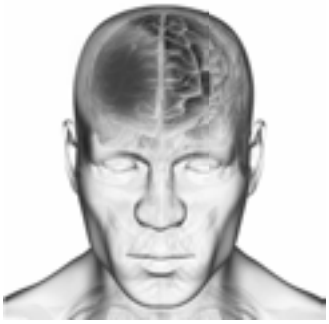
Differential Diagnosis of Headache

Migraine

Pulsating quality

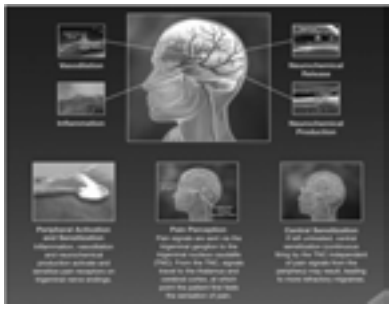
Moderate/severe pain intensity

Aggravation by routine physical activity



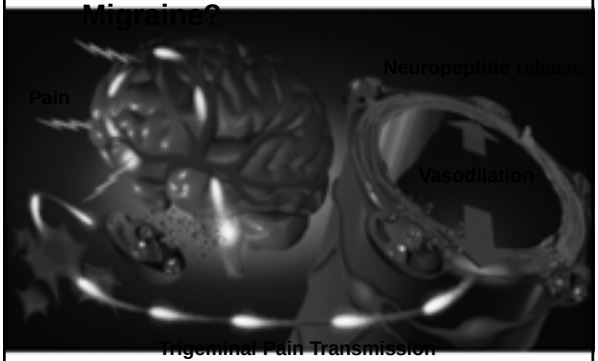
Headache Classification Subcommittee of the International Headache Society. *Cephalalgia.* 2004;24(suppl 1):9-160.

No Longer Just Neurovascular



Bolay H et al. *Nature Medicine*. 2001;8(2):136-142. Burstein R. *Pain*. 2001;89:107-110.
Cady RK and Biondi DM. *Postgraduate Medicine*. 2006; Suppl (April):5-13.
Hargreaves RJ, Shepheard SL. *Can J Neurol Sci*. 1999;26(suppl3):S12-19.
Silberstein SD. *Cephalalgia*. 2004;24(Suppl 2):2-7. Williamson DJ, Hargreaves RJ. *Microsc Res Tech*. 2001;53(3):167-78. Woolf CJ. *Ann Intern Med*. 2004;140:441-451.

What Happens During a Migraine?



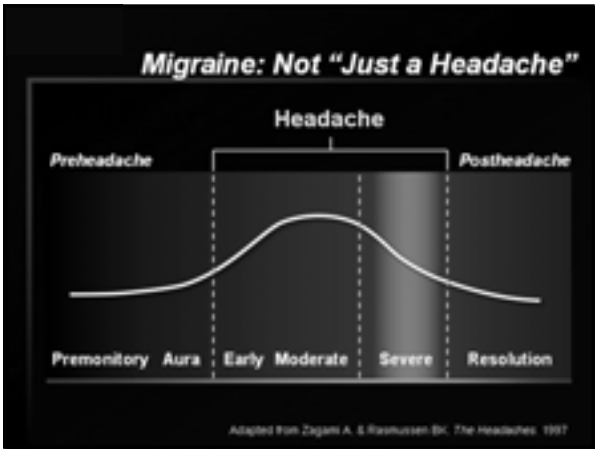
Migraine without aura

- ✓ 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

In some patients an aura may come before the headache

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

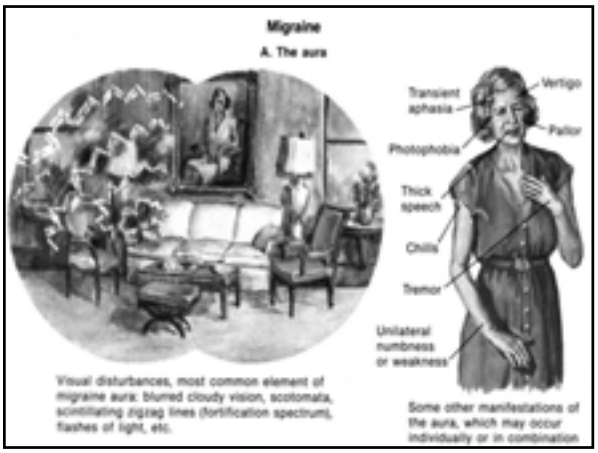


Premonitory Symptoms

Excitatory
- Irritability
- Elation
- Physical hyperactivity
- Yawning
- Food craving
- Photophobia/ phonophobia
- Increased bowel and/or bladder activity

Inhibitory
- Mental/physical slowing
- Poor concentration
- Word finding difficulty
- Weakness/fatigue
- Chill, anorexia, constipation, abdominal bloating

Adapted from Waelkens J. Cephalalgia 1985



Visual

- Flashes (photopsia)
- Zigzag lines (teichopsia)
- Blurred / cloudy vision
- Tunnel vision

Characteristic Migraine Features

- Frequent temporal association with menstrual cycle
- Characteristic triggers
- Paradoxical relationship to sleep – frequently occur during sleep or upon awakening but also abated by sleep
- Family history of migraine
- Reversible attack-related cognitive impairment
- Dizziness, vertigo

Adapted from Pryse-Phillips WEM et al. Can Med Assoc Journal 1997

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."**

Migraine Disability Assessment Study, September 2000. Language patients used to describe migraine as stated by physicians.
Durham C.F. et al. Headache 1998;38:427-435

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

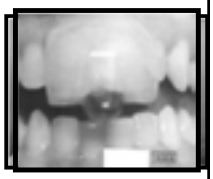
How to Help Prevent Migraine Attacks

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)

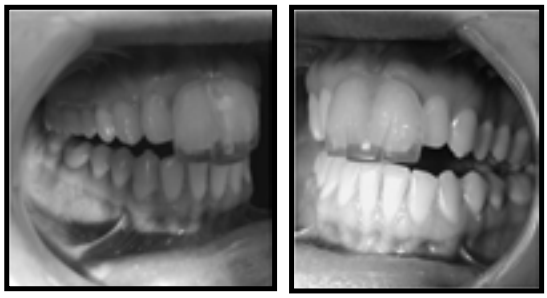
Non-Pharmacological Intervention

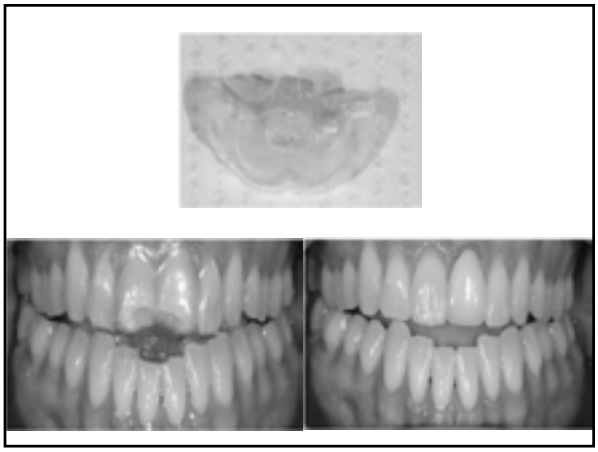
- Interest in Non-Pharmacological Intervention has increased in recent years
- NTI (nociceptive trigeminal inhibitor)
- Biofeedback
- Relaxation
- Behavioral intervention
- Barriers in dissemination and implementation exist



Smitherman TA, Penzien DB, Rains JCCurr Pain Headache Rep. 2007 Dec;11(6):471-7.

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)

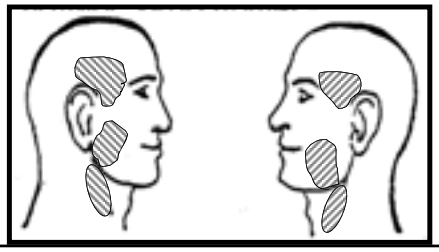
Holroyd KA and al. Enhancing the effectiveness of relaxation-thermal biofeedbackwith propranolol. J. Consult Clin Psychol. 1995;63 (2):327-330.

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

Characteristics

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

Temporal Arteritis

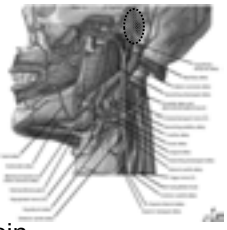
Characteristics

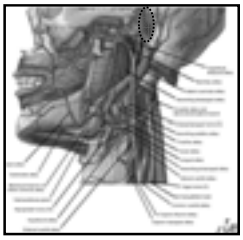
- Visual symptoms
- Anorexia
- Anemia
- Low grade fever/malaise
- Neurologic deficits
- Systemic involvement
  - polymyalgia rheumatica

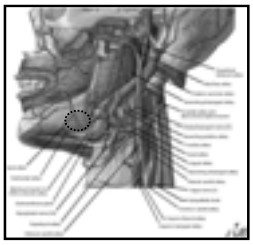
Temporal Arteritis

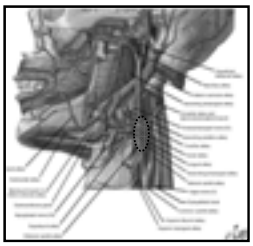
Diagnosis

- 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

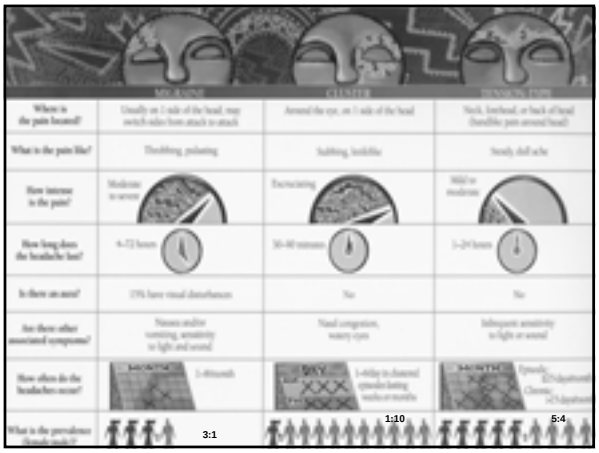
Temporal Arteritis

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

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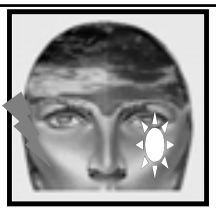


Neuropathic Pain

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

International Association for the Study of Pain (IASP)

Neuropathic Pain

Key issues and challenges

Common
- **-25-30% of Facial Pain Center patients**

Under/misdiagnosed and undertreated

Interpatient variability regarding presentation and response to treatment

Complex pathophysiology

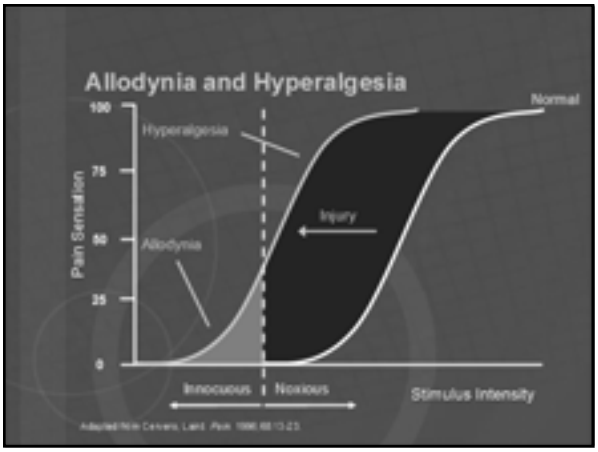
Practitioner doubt

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

Onset

"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

Onset

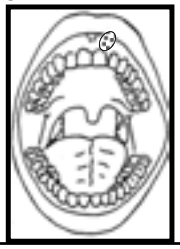
Atypical trigeminal neuralgia (ATN)

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"



Patient: Charles

- 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."

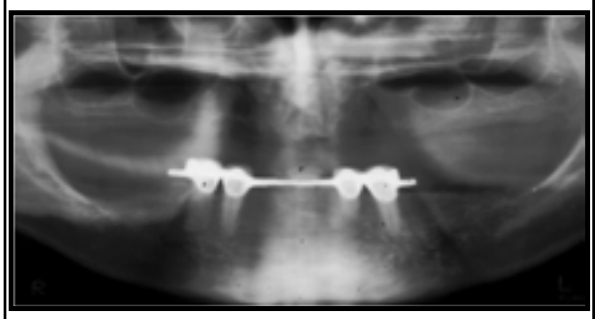
Fothergill J. London. 1769;3:400-418
Pujol M. Paris: Theophile Barrois, 1787

Pre-trigeminal Neuralgia

Historical perspectives

"…prodromal sensations experienced in the upper or lower jaws at the onset of their illness."

Symons C. Ann R Coll Surg Engl 1949;4:206-212
Mitchell PG. Br Dent J 1980;149:167-170



- 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

Pre-trigeminal Neuralgia

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

Pre-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

Classic Trigeminal Neuralgia
Type 1 (TN 1)

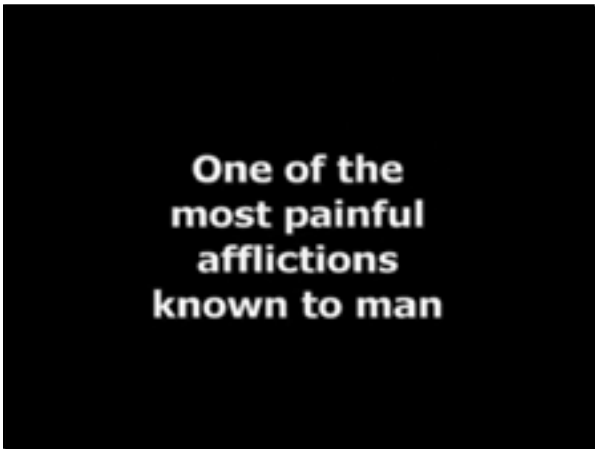
- ✓ Facial pain of spontaneous onset
- ✓ >50% limited to duration of an episode of pain (temporary pain)

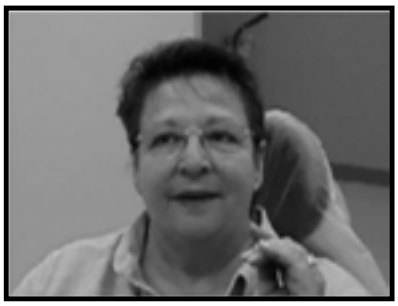
Neuropathic Facial Pain

Classification

Trigeminal Neuralgia
Type 2 (TN 2)

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





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 is often misdiagnosed

Trigeminal Neuralgia

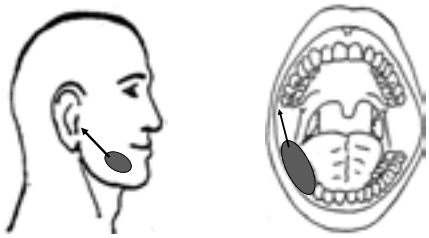
Started as or in direct conjunction with	TTN number	TTN per cent	ATN number	ATN per cent
	109		102	
Toothache	10	9	10	10
Dental Treatment	7	6	5	5
Surgery of Oral Cavity	1	1	1	1
Fitting/Placement of Bridges or Dentures	3	3	1	1
Dislocation of the jaw joint	1	1	0	0
Facial trauma	1	1	1	1
Sinusitis	1	1	2	2
	24	22	20	20

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

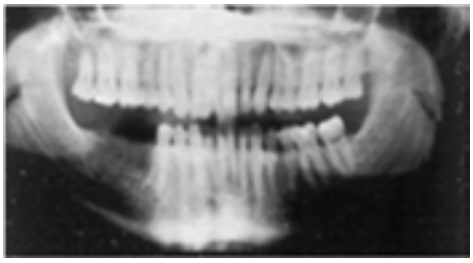
Patient: Lavonne

- 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

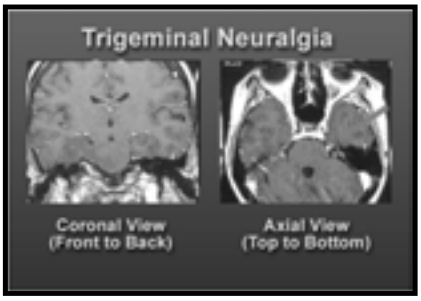
- paroxysms occur at intervals to almost continuously
- pain free intervals of months or years, followed by recurrence

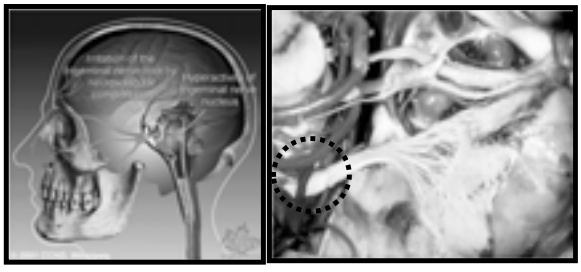
Trigeminal Neuralgia

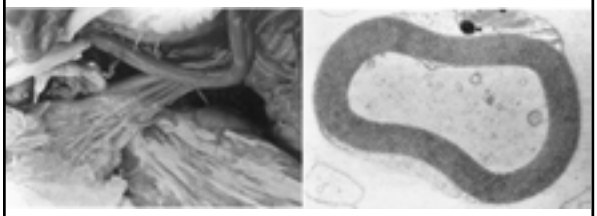
1. Greater frequency in women.
2. Predilection for right side.
3. Mandibular and maxillary divisions most often affected.

Trigeminal Neuralgia

4. Teeth and palate seldom the trigger zone.
5. Tongue is seldom painful.
6. Secondary radiation seldom skips a division.
7. Remission between attacks become shorter.







Trigeminal Neuralgia

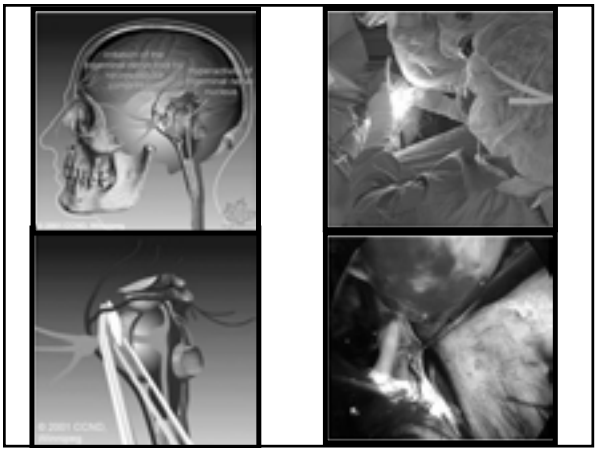
Primary Treatment Modalities

- Pharmacotherapeutic
- Surgical

Pharmacotherapy

Adjuvant analgesics

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



Trigeminal Neuralgia

<u>Proposed etiologies:</u>

- *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

137

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

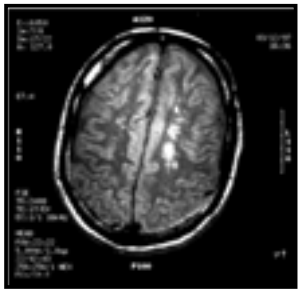
Secondary Trigeminal Neuralgia

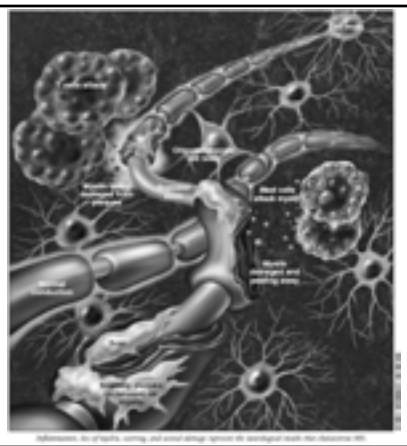
- *Multiple sclerosis* affects approximately 1:700 people, with an estimated US prevalence of 250,000-500,000.
  - ~1-2% of patients with MS develop TN (~ 10 new cases per year, and cumulative total of approximately 4,000-5,000 people).
- Only about 3% of patients with TN have MS.
- TN due to an *intracranial 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.
3. Begins between age 20 and 40.
4. Associated with leg weakness.
5. Sclerotic plaque in rootlets of V.

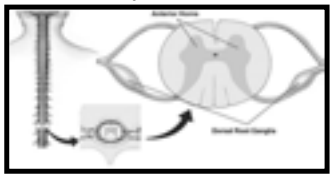
Multiple Sclerosis - Craniofacial Pain





Herpes Zoster

- 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*

Distribution of herpes zoster

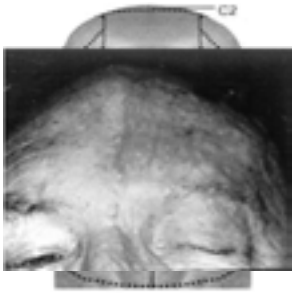
Region	Cases (%)
Cranial	***15***
Cervical	***12***
Thoracic	**55**
Lumbar	**14**
Sacral	**3**
Generalized	**1**
All	**100**

Herpes Zoster of V

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

Herpes Zoster

- Pain/dysesthesia preceeds vesicles by 24-72 hours.
- Evidenced in the distribution of the nerve affected.



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

Herpes Zoster

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

Postherpetic neuralgia

Incidence:

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

Herpes Zoster

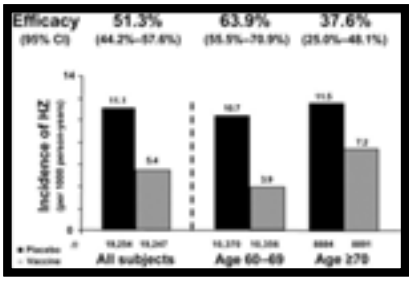
Postherpetic neuralgia

Treatment:

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

Herpes Zoster

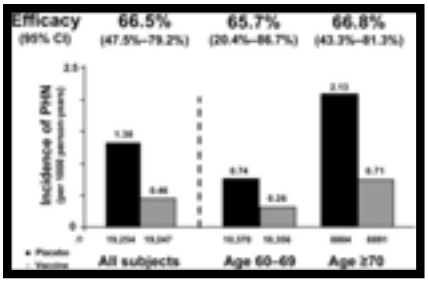
Prevention



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

Herpes Zoster

Prevention



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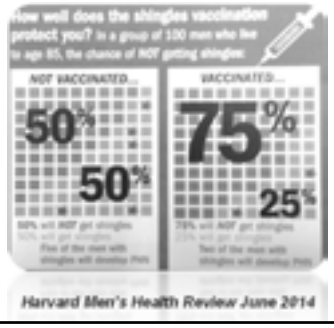
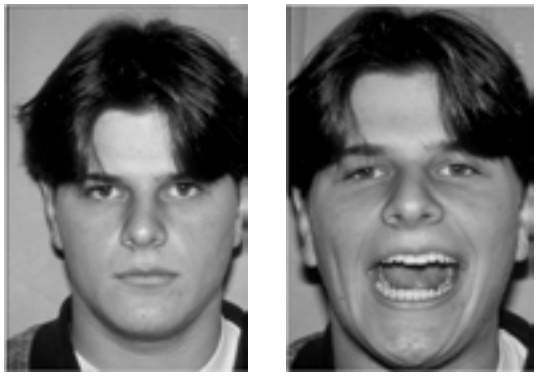
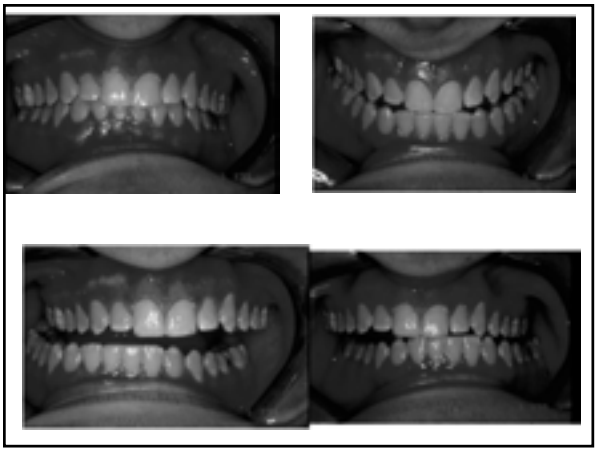
Herpes Zoster

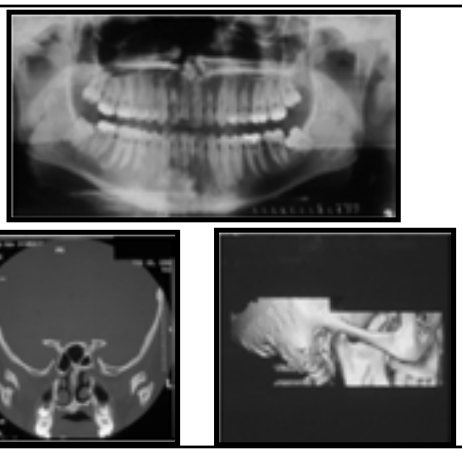
Prevention



ANATOMIC SOURCES OF OROFACIAL PAIN



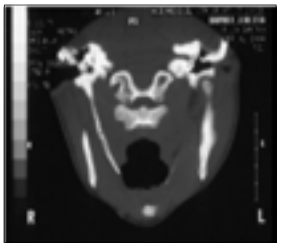




CORONOID HYPERTROPHY

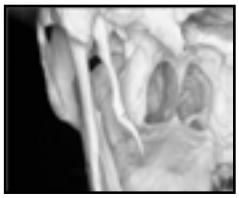
- Limited range of motion (gradually developing)
- May be painless
- Most common in adolescent males

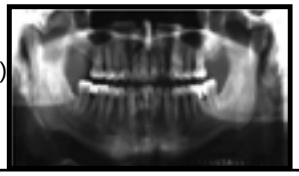
EAGLE'S SYNDROME
ELONGATED STYLOID PROCESS

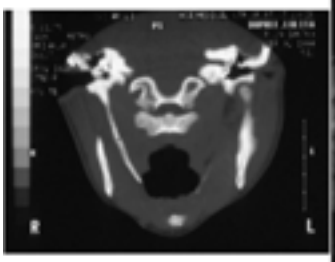


EAGLE'S SYNDROME

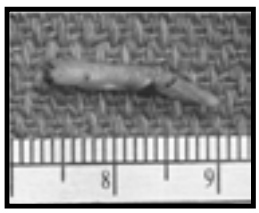
- Pain on swallowing
- Pain upon palpation of lateral pharyngeal wall
- Pain on turning head (associated dizziness?)







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 sou**

TMD: Temporal Characteristics

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

Too Much Disagreement

The Puzzle

TMD Epidemiology

NATURAL COURSE??

clicking → ***catching*** → ***locking*** → ***degeneration***

TMD Epidemiology

NATURAL COURSE

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

Homeostatic Balance

Pathofunction **Pathofunction**

Differential Diagnosis

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

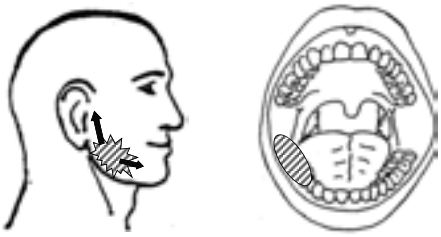
Patient: Marcus

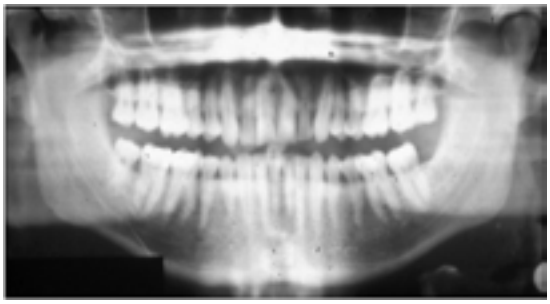
- 28 year old Caucasian male
- Medical history:
  - non-contributory

Patient: Marcus

Chief pain concern:

"I have a toothache in my lower right molar area"

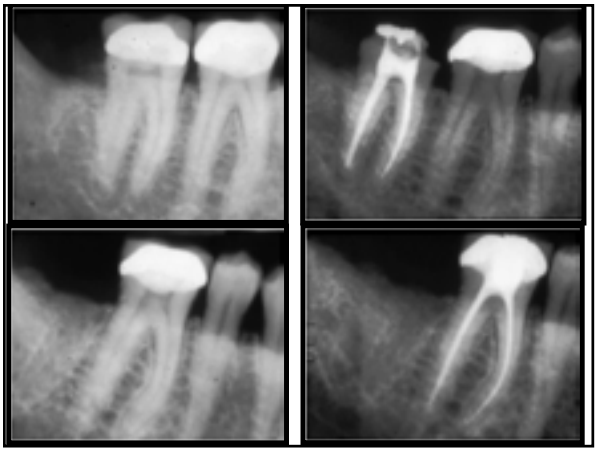




Radiographic and clinical findings (intraoral assessment) were non-contributory to determination of a diagnosis.

Patient: Marcus

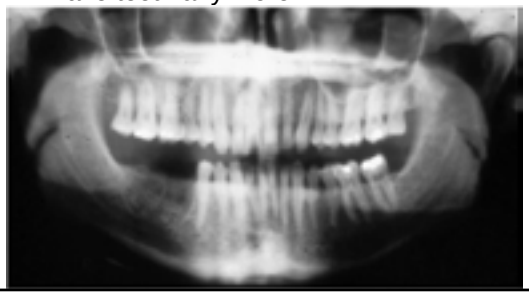
- Aggravating factors:
  - chewing
  - clenching
- Alleviating/relieving factors:
  - analgesics (NSAIDs, opioids)



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

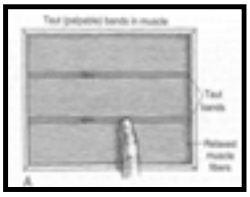
- Constant dull ache
- Fluctuates with intensity
- Consistent referral pattern
- Local or distant trigger point
- Alleviation with trigger point abolishment

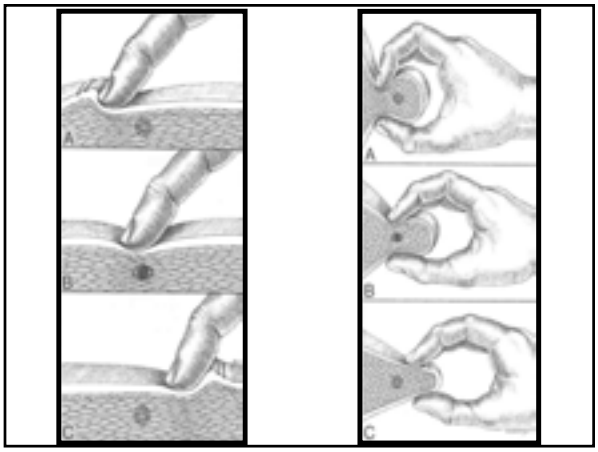
Myofascial Pain

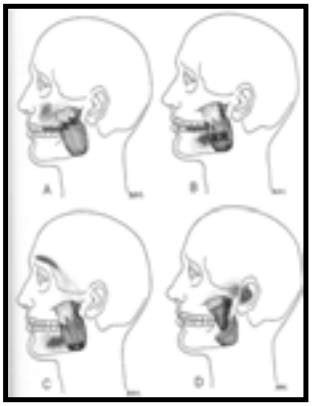
Clinical characteristics

Trigger points

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



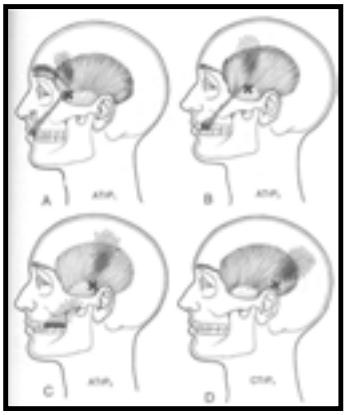


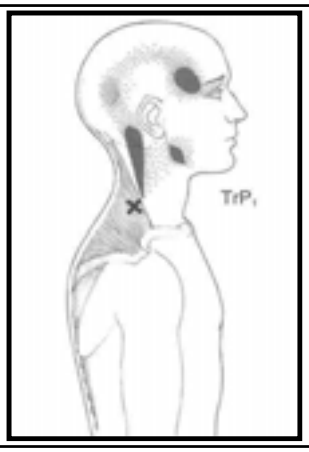


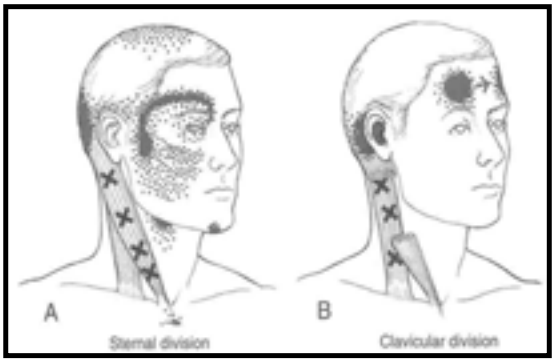
Myofascial Pain

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

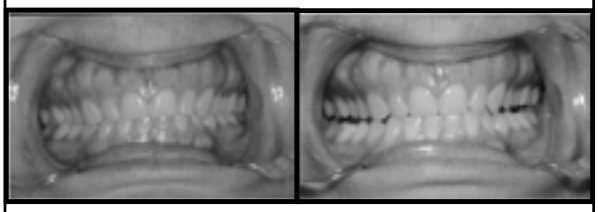
Management considerations

- Pharmacotherapy
  - NSAIDs
  - Muscle relaxants
  - Tricyclic antidepressants
  - Sleep aid medications
  - Local anesthetics (trigger point injections)
  - Transdermal preparations

Differential Diagnosis

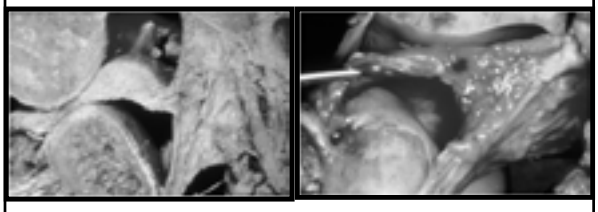
- Teeth
- Glandular
- Vascular
- Neurogenous
- Myogenous
- Arthrogenous
- Paranasal sinuses
- Otologic

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.

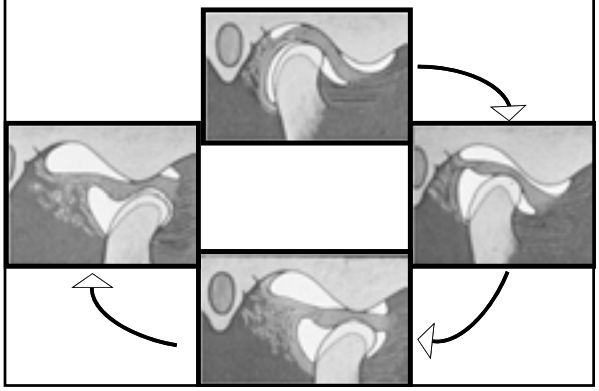


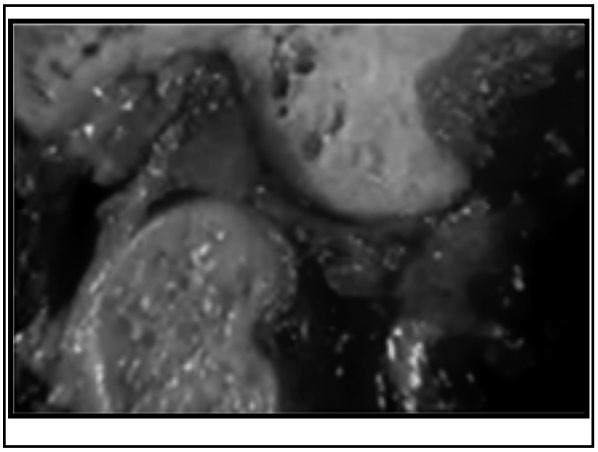
Capsulitis, Synovitis, Retrodiscitis

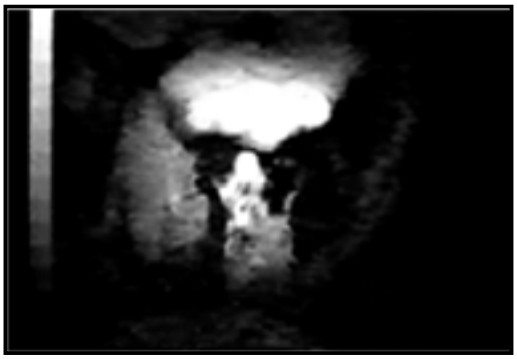
Management Considerations:

- Patient education
- Restrict mandibular function
- Control parafunctional activity
- Pharmacotherapy
  - Analgesic/anti-inflammatory
  - Muscle relaxant (?)
- Stabilization orthotic
- Physical therapy

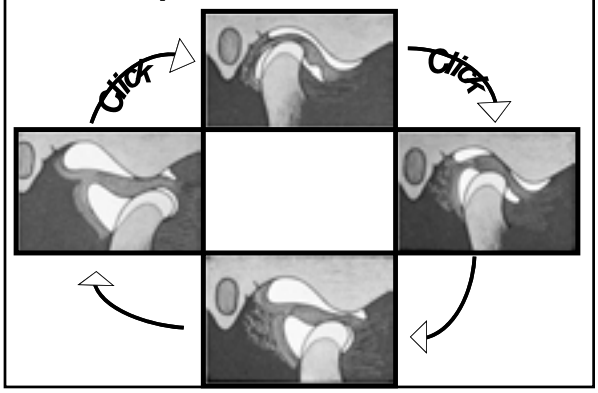
TM Joint: Normal Biomechanics



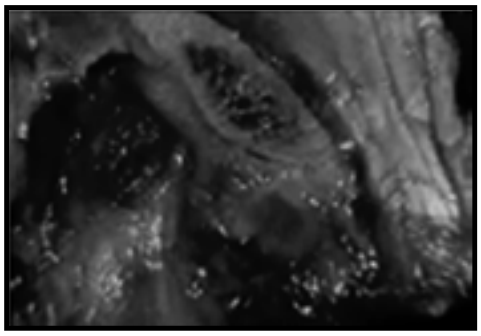




Disc Displacement With Reduction

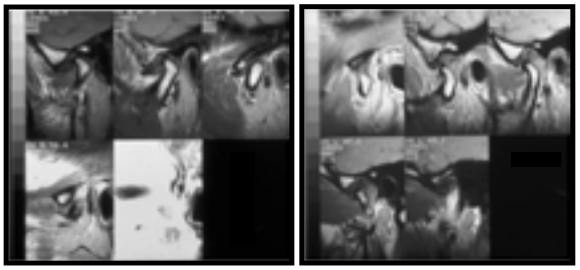


Articular Disc Displacement With Reduction



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.

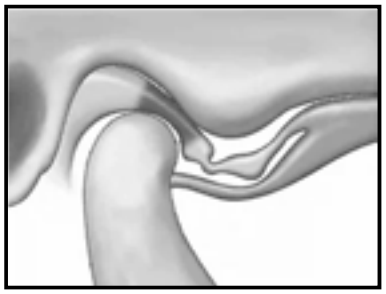
Scapino. OS,OM,OP 1983 (April):382-97
Baustein, Scapino. Plas Recon Surg 1986 (December):756-64

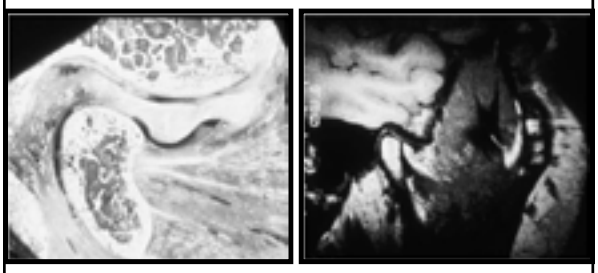
Pseudodisc Hypothesis

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

Solberg, Hansson. J Oral Rehab 1985, 12:303-321
Westesson, Rohlin. OS,OM,OP 1984;4:17-22

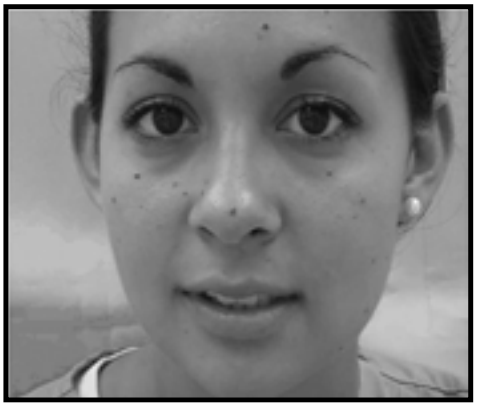
Disc Displacement with Reduction (Painless)

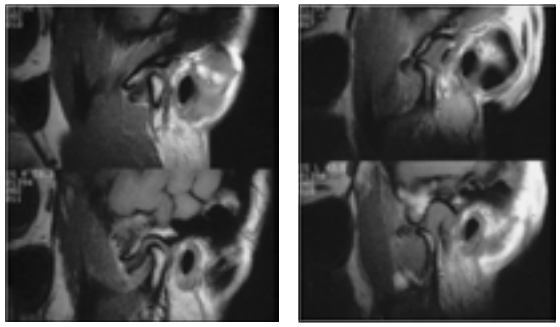




Sudden Onset Closed Lock
with no prior history of clicking

Anchored-disc phenomenon
versus
Acute Closed Lock
(Disk displacement without reduction)



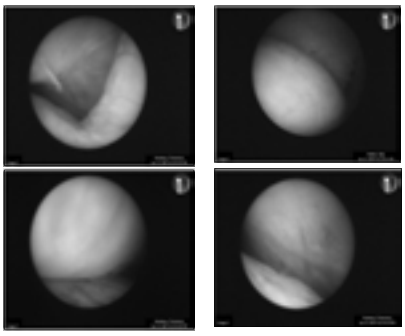


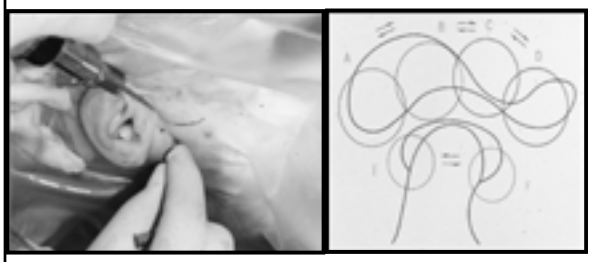
TM Joint Distraction

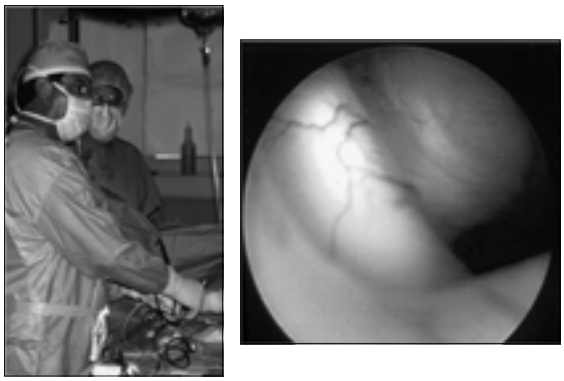
Arthrosimplicity-Outpatient Arthroscopy

1.1mm scope

Normal Anatomy







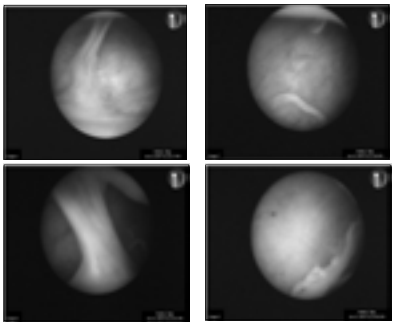
TMJ ARTHROSCOPY

Procedures

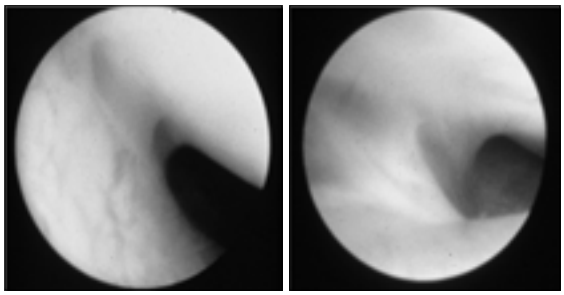
Arthroscopy: Diagnostic findings

a. Normal findings
b. Synovitis
c. Disk displacement
d. Fibrillation
e. Adhesions

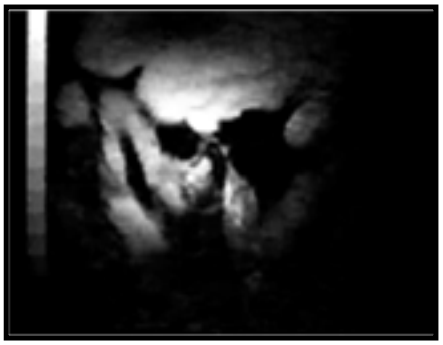
Adhesions

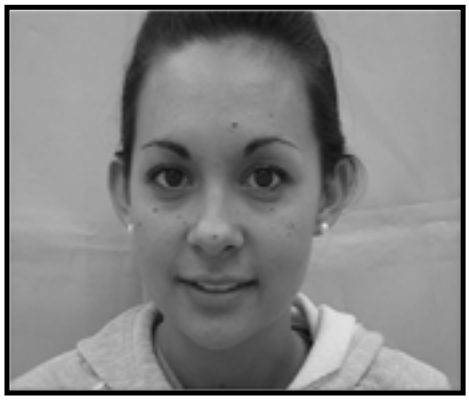


Adhesions



Adhesions Upper Joint Space





TMJ ARTHROSCOPY

Post-op Management

1. Aggressive ROM exercises
2. NSAIDs
3. Reduce joint loading
   a. Medications
   b. Occlusal orthosis

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.

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

Macrotrauma

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

TMD DJD: Trauma-Related

Macrotrauma

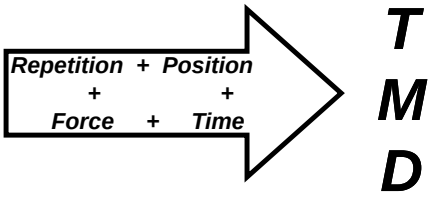
- 400 patients
- 25.5% reported an identifiable specific event

deBouver JA, Keersmakers K. J Oral Rehab 1996;23(2):91-96

Microtrauma

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

Cummulative Trauma Disorder



Bruxing / Clenching

↓

Joint overloading

↓

Surface stickiness

↓

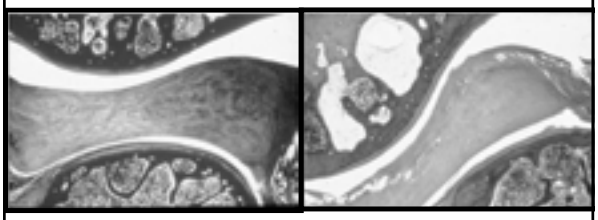
Fibrillation

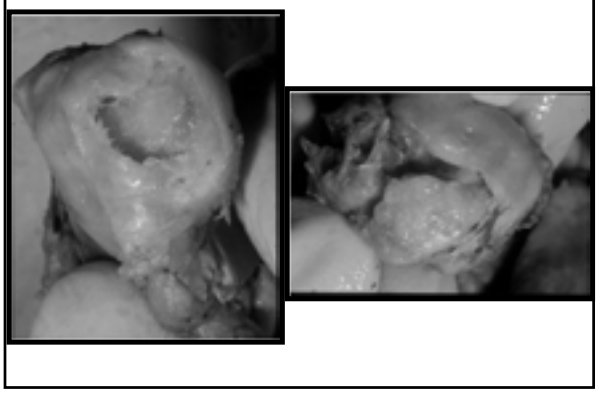
↓

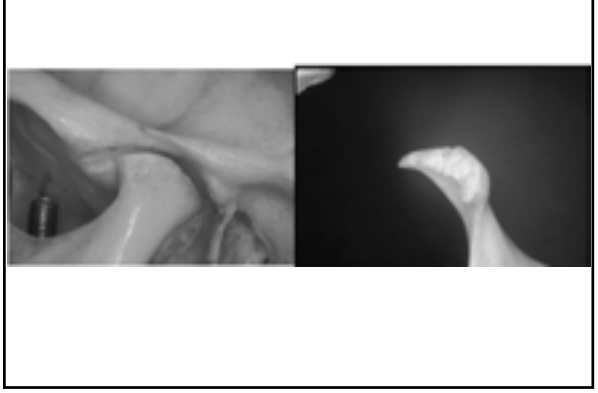
Degenerative changes

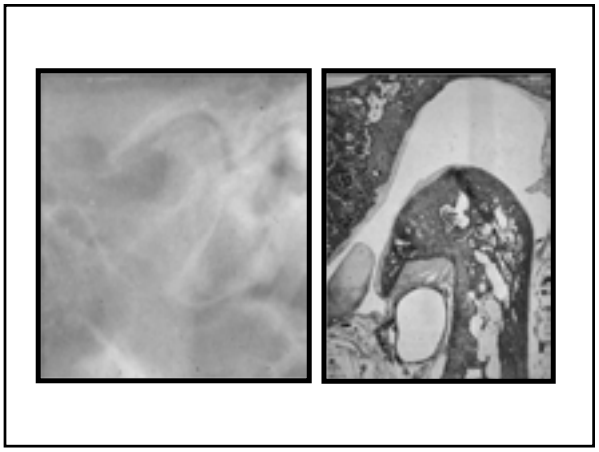
TM Joint Overloading

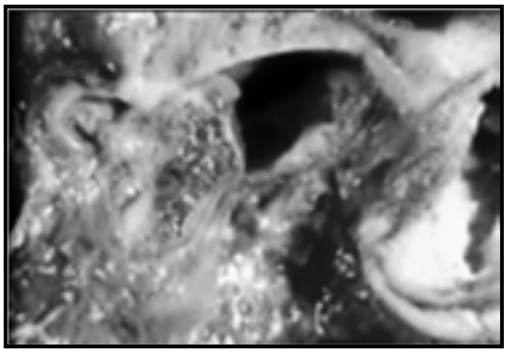
- Physiologic changes
  - Increased matrix degradation
  - Fibrocartilage breakdown
  - Synovial fluid alterations
  - Impaired function (⇧ frictional resistance)
  - Incoordination between TM joint components during movement

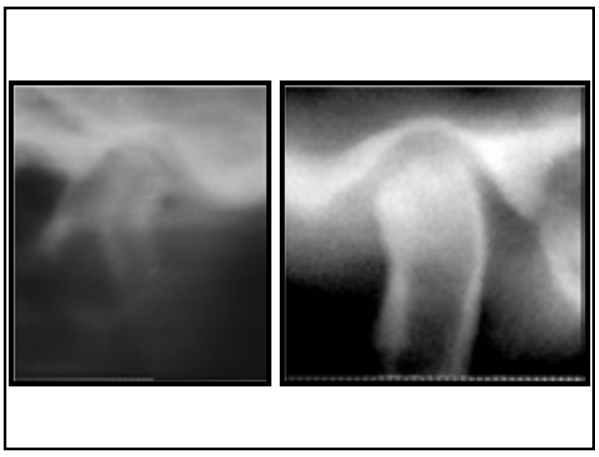






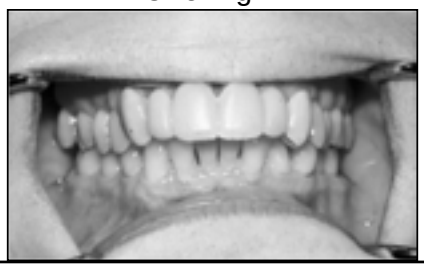






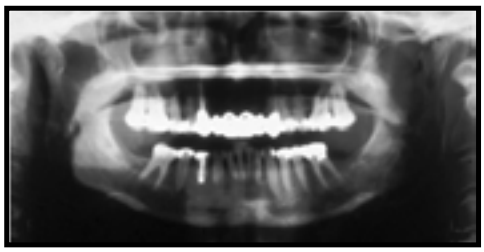
52 year old female

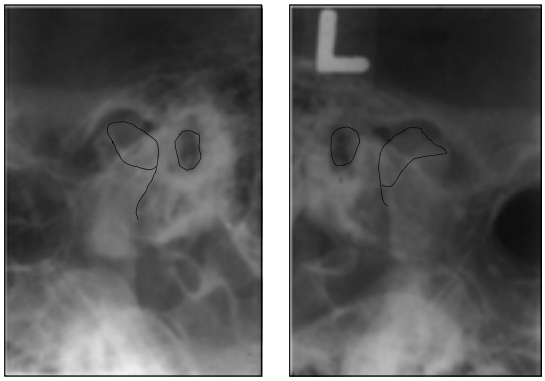
Chief concern: bilateral pre-auricular pain (severe) with swelling

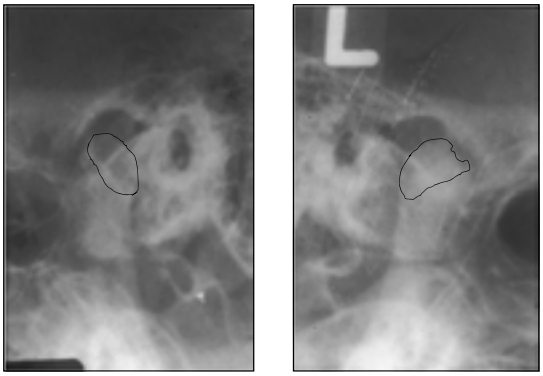


Clinical Findings

- 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







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

Degenerative Joint Disease

Treatment

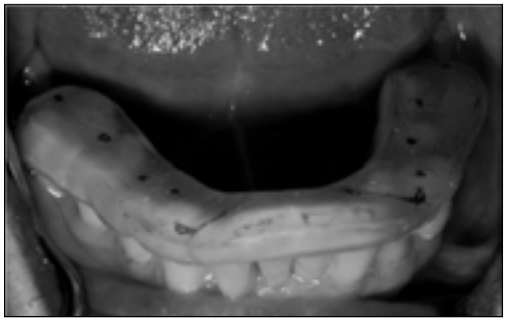
Pharmacotherapy

a. NSAIDs

b. Muscle relaxants

c. Supportive

1) Glygoaminoglycan 1200-1500 mg/d
1) 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

Outcomes

A. Toller (1973)
   1. 130 DJD patients
   2.

Years Observed	Improvement
1	51%
2	76%
3	87%
5	98%

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

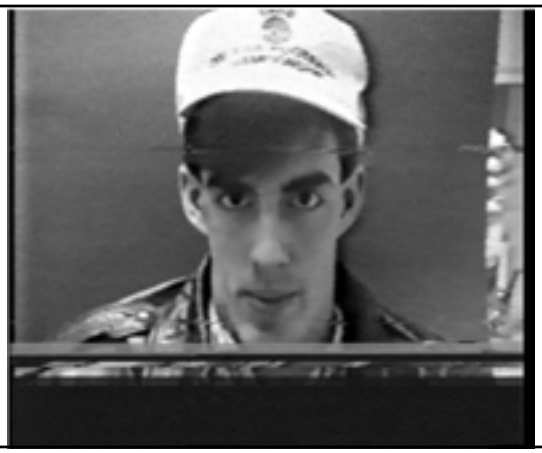
TM Joint Degenerative Joint Disease

Epidemiology- natural course?

30 year follow-up (n=99)

- Masticatory function
  - patients=controls
- Clicking and pain
  - decreased
- Most common complaint
  - fatigue of masticatory muscles

DeLeeuw R, et al. J Orofac Pain 1994;8:18-24



Differential Diagnosis

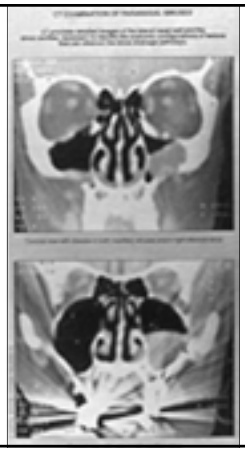
- Teeth
- Glandular
- Vascular
- Neurogenous
- Myogenous
- Arthrogenous
- Paranasal sinuses
- Otologic

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



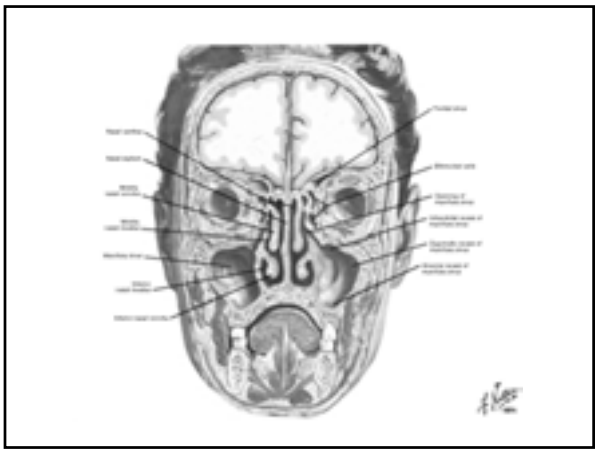
Acute / Chronic Sinusitis

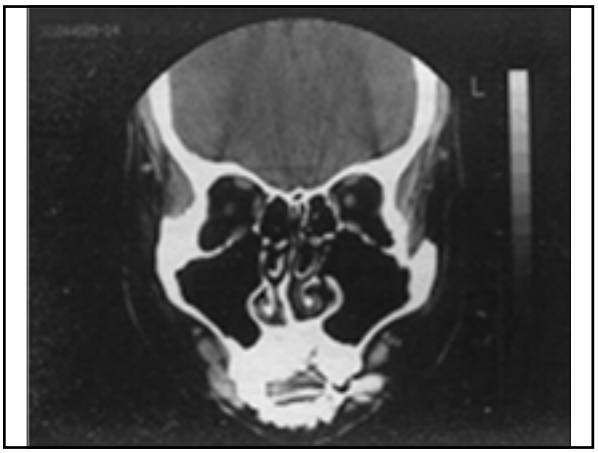
Sinus involved	***Site(s) of referral***
Sphenoid sinus	Vertex, other parts of the cranium
Frontal sinus	Frontal region
Ethmoid sinus	Between the eyes
Maxillary sinus	Maxilla, dental structures
Pansinusitis	Pain may be coalescent, less localized, associated with frontal headaches, constant pressure

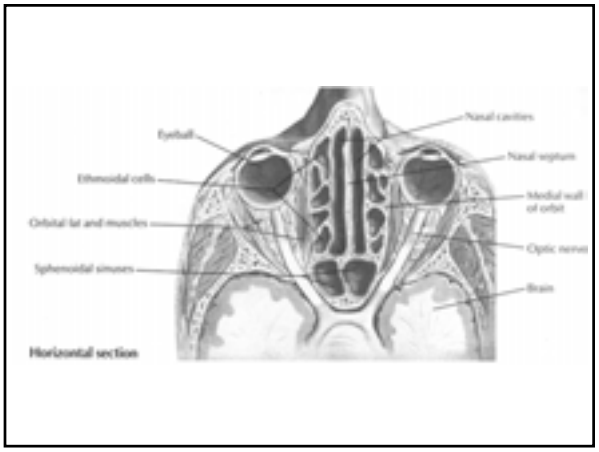
MUCOSAL CONTACT HEADACHE

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
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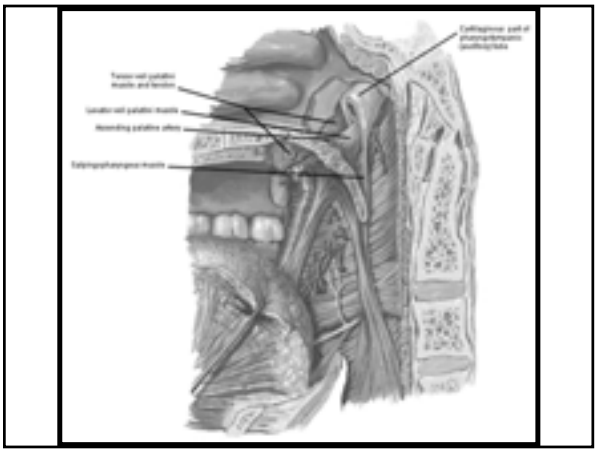
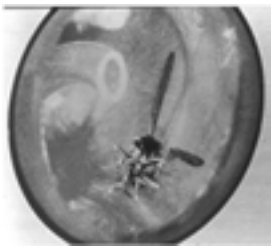
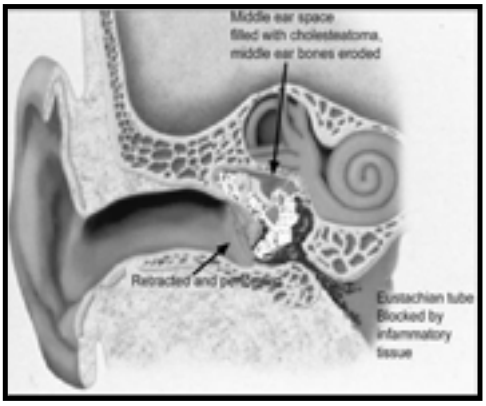


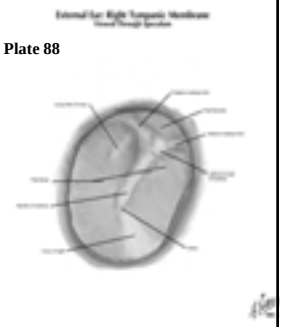
Tinnitus: Differential Diagnosis

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

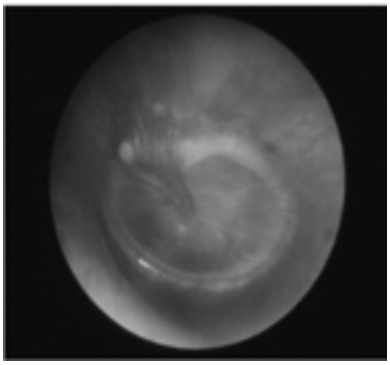




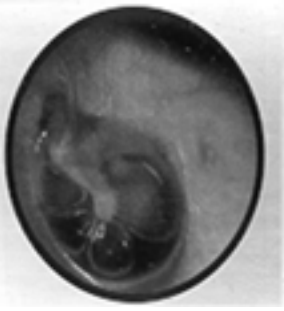
Normal Tympanic Membrane



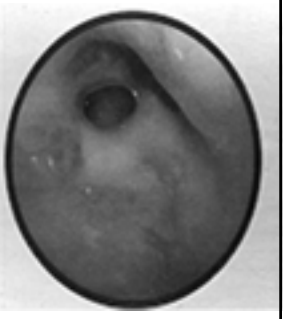
Otitis Media

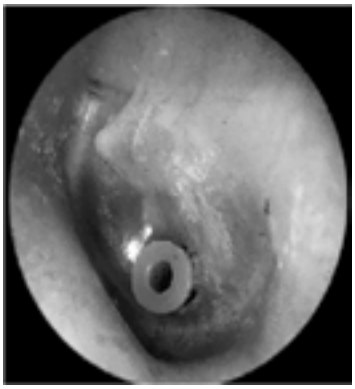


Otitis Media



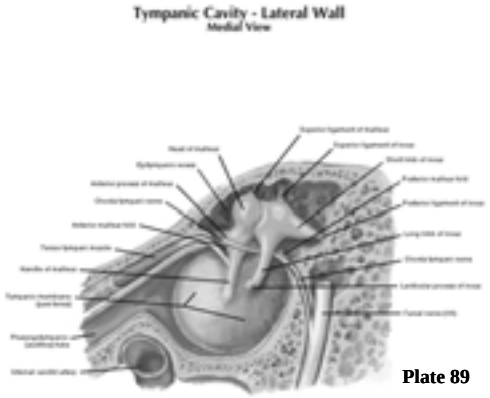
Tympanic Membrane Perforation





Eustachian tube dysfunction

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

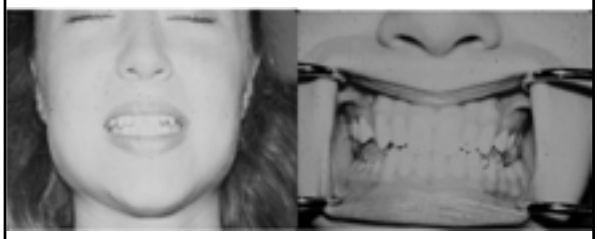


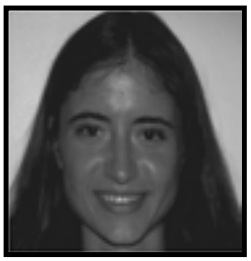
Tonic Tensor Tympani Phenomenon

- 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 tnsor veli palatini muscle
- Failure of the eustachian tube to open during deglutition

Key Questions

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





Diagnosis

Diagnosis

Diagnosis

The most important duties of the health care professional

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

[redacted]

The Future

- **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.**

Scott Peck
Road Less Traveled 285