

Arthrogenous disorders of the TMJ

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Which of the following represents an arthrogenous disorder?

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Pain in the
masseter
muscle

An electric
shock-like
pain
around
tooth #30

A
throbbing
pain
around the
left eye

Crepitus
and pain
around the
left TMJ

75 yo female presents with pain on the left side



Onset	<u>Review of Systems:</u>
Location	Frequent urination
Quality	Poor digestion
Frequency	Stomach gas
Associated	Heartburn problems
Severity	Insomnia
Ameliorating factors	Low energy
Exacerbating factors	Chronically tired
Associated symptoms	Osteoarthritis
	Poor circulation
	Wears glasses
	Cancer (skin cancer; both legs)
	Overweight

Arthritic disorders

- ▶ 1. Arthralgia/Capsulitis
- ▶ 2. Localized osteoarthritis
- ▶ 3. Polyarthritits
- ▶ 4. Synovial chondromatosis
- ▶ 5. Chronic pain associated with TMJ dysfunction and joint arthrosis
- ▶ 6. Idiopathic condylar resorption

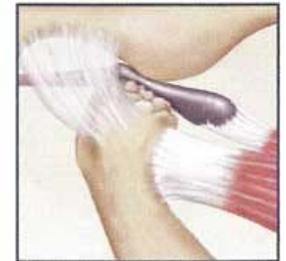
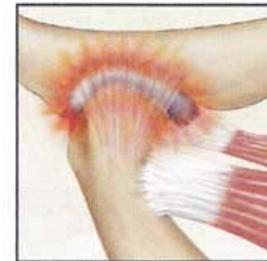
Arthralgia

- ▶ Painful joint without osseous changes
- ▶ Presence of joint tenderness to palpation
- ▶ Other terms: capsulitis, synovitis, retrodiscitis, joint effusion



Localized osteoarthritis

- ▶ Clinical features: arthralgia, crepitus
 - ▶ Often presents unilaterally
- ▶ Imaging findings: degenerative joint changes
 - ▶ Decreased joint space
 - ▶ Flattening of the articulating surfaces
 - ▶ Bony spurs
 - ▶ Sclerosis
 - ▶ Erosive bony lesions
- ▶ High suspicion in patients >50 years



Case: Musculoskeletal Exam

Palpations	
Rectus capitus R	3
Rectus capitus L	3
Upper trap R	3
Upper trap L	3
Lateral capsule R	3
Lateral capsule L	3
Dorsal capsule R	3
Dorsal capsule L	3
Superficial masseter R	3
Superficial masseter L	3
Temporalis Tendon R	3
Temporalis Tendon L	3

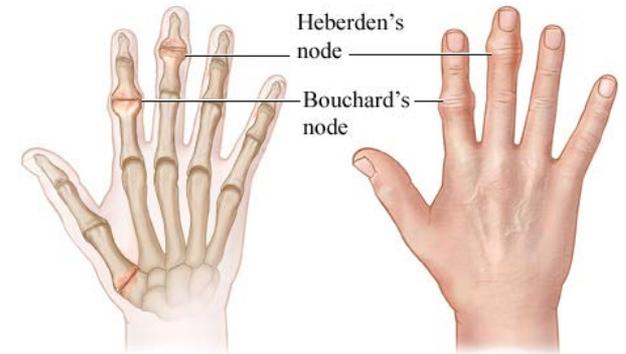
Case: Exam Findings

Range of Motion:

- ▶ Comfort Opening: 23 + 5 mm
- ▶ Passive Opening: 30mm (w/pain on L TMJ)
- ▶ Opening Path: straight
- ▶ RT lateral: 8mm (w/pain on L TMJ)
- ▶ LFT Laterotrusive: 10mm (w/pain on L TMJ)
- ▶ TMJ Noise Dysfunction: Crepitus on the left

Generalized osteoarthritis

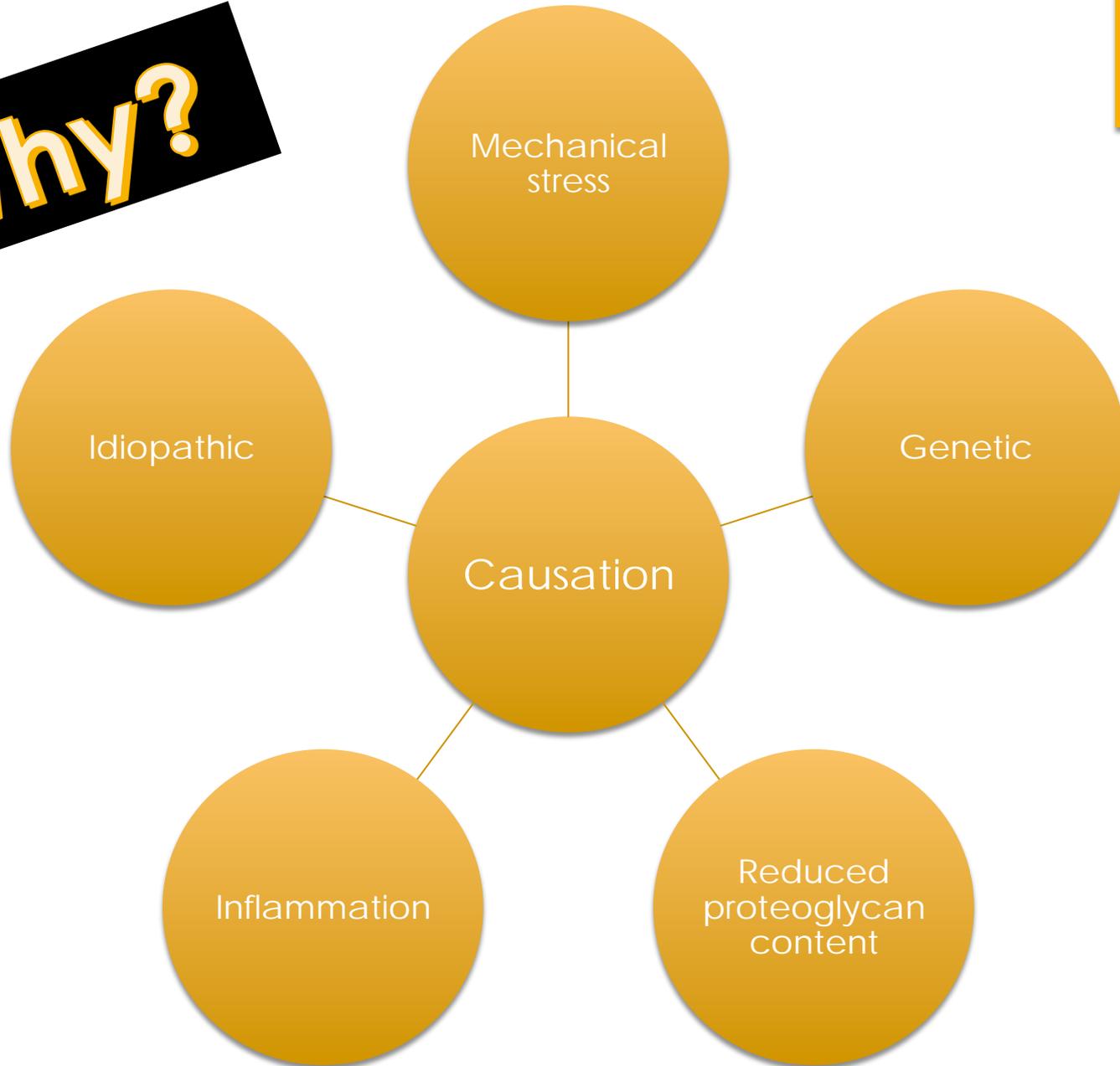
- ▶ Primary vs. Secondary
 - ▶ Primary: idiopathic, genetic
 - ▶ Secondary: osteoarthritic changes caused by other disorders
- ▶ Heberdon's nodes



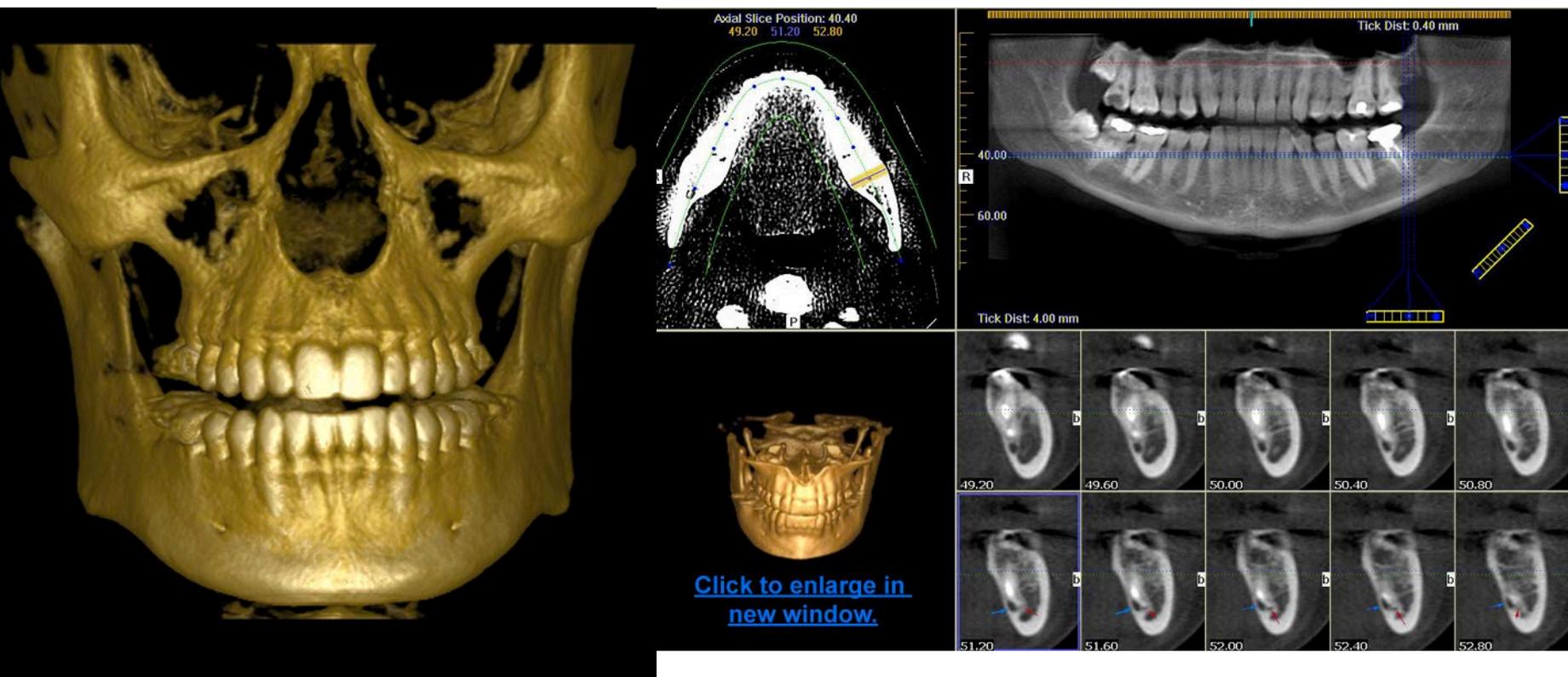
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Why?



Imaging Modalities



Osseous Component (CT/CBCT): What do we look for?

Condylar features

Articular surface flattening	Subcortical sclerosis
Subcortical cyst	Surface Erosion
Osteophyte	Loose joint body
Deviation in form	Bony ankylosis
Condylar hypoplasia	Condylar hyperplasia

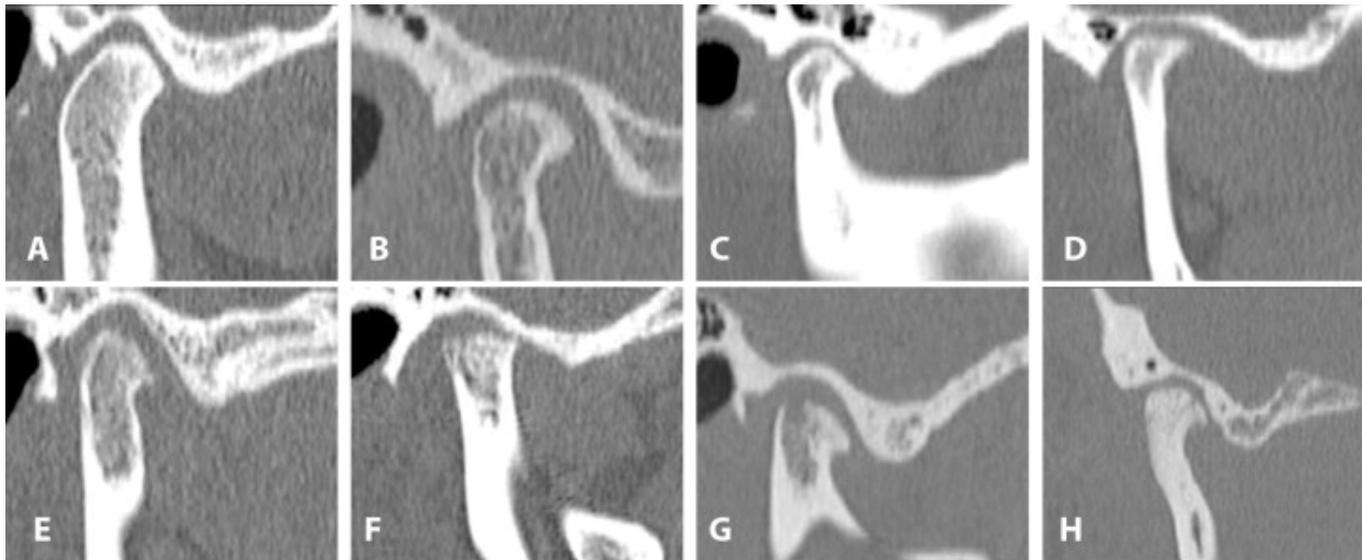
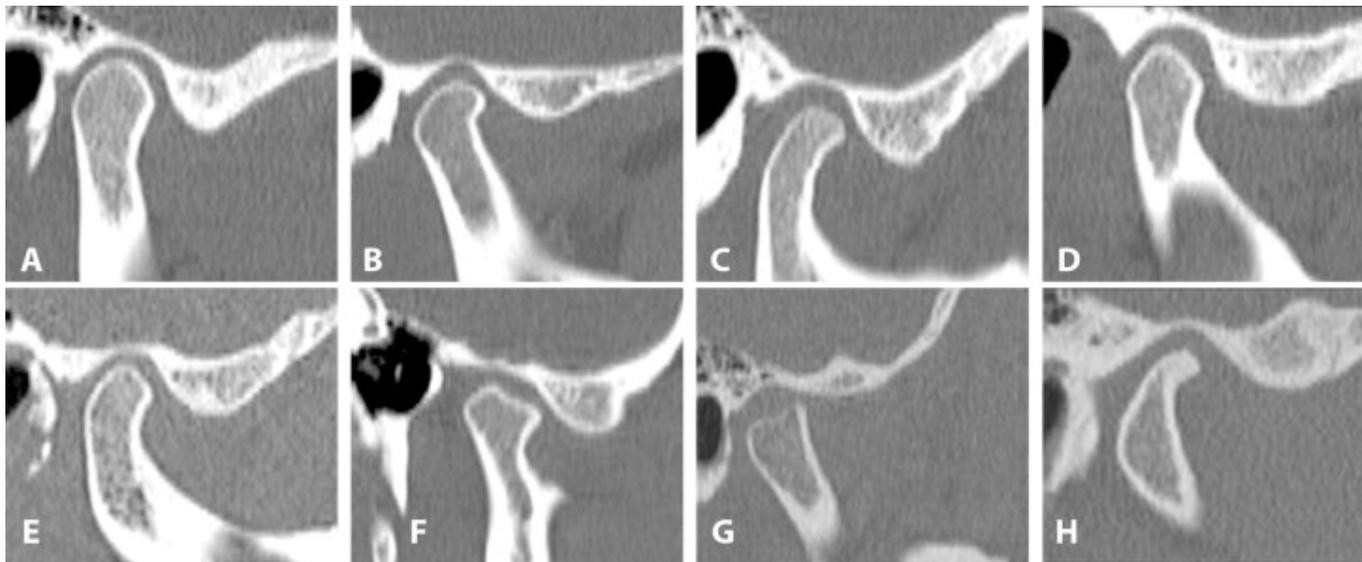
Condylar position

Concentric position with normal joint space
Concentric position with decreased joint space
Anterior position
Posterior position

Fossa/eminence features

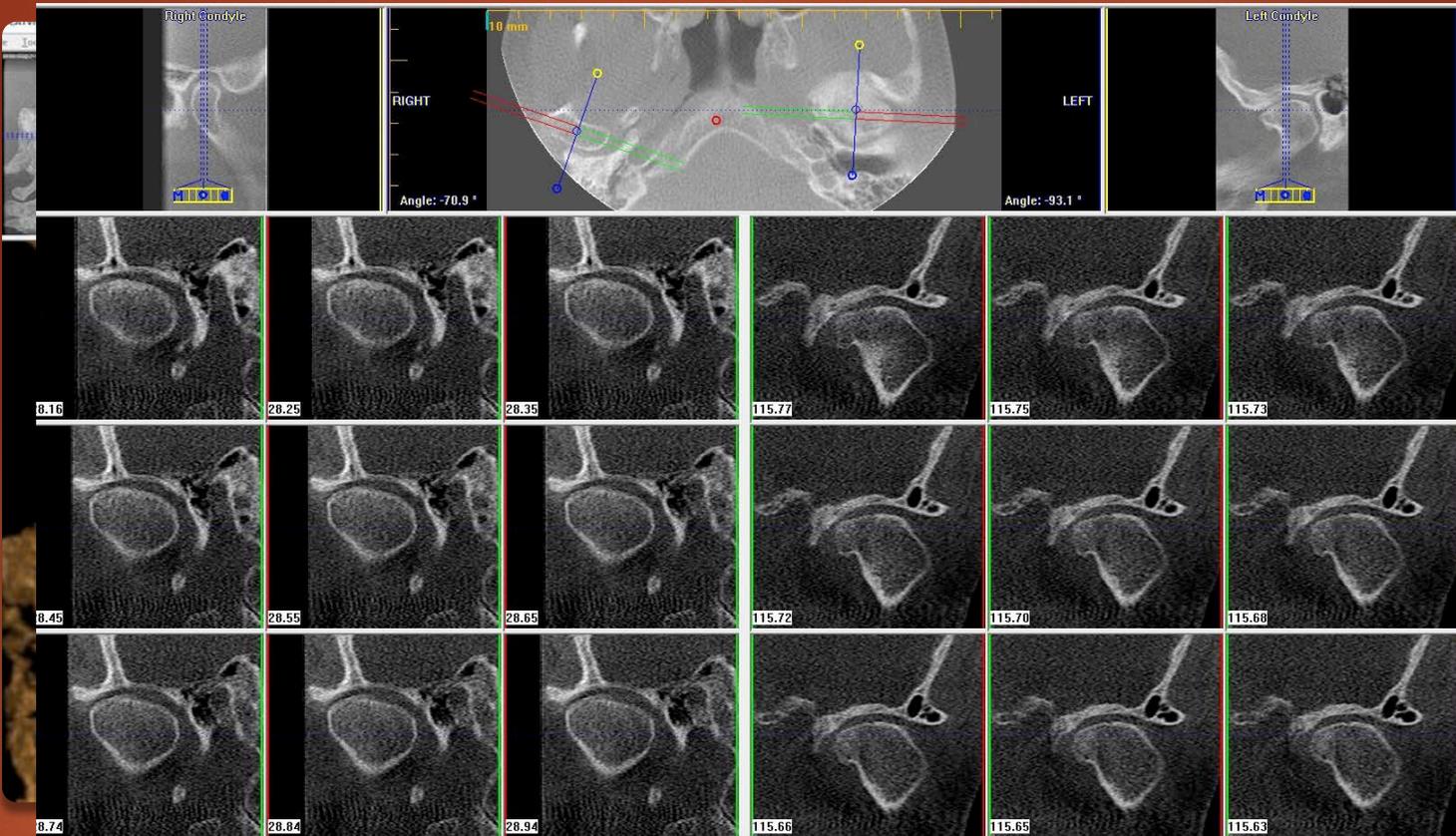
Articular surface flattening	Subcortical sclerosis
Surface erosion	

Ahmad M, Hollender L, Anderson Q et al. Research diagnostic criteria for temporomandibular disorders (RDC/TMD): development of image analysis criteria and examiner reliability for image analysis. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2009; 107(6):844-60.



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No Osteoarthritis	Indeterminate for Osteoarthritis	Osteoarthritis
Normal size of condylar head PLUS	Normal size of condylar head PLUS	Deformation from subcortical cyst, surface erosion, osteophyte, or generalized sclerosis
No subcortical sclerosis or articular surface flattening PLUS	Subcortical sclerosis with or without articular surface flattening OR	
No deformation from subcortical cyst, surface erosion, osteophyte, or generalized sclerosis	Articular surface flattening with or without subcortical sclerosis PLUS	
	No deformation from subcortical cyst, surface erosion, osteophyte, or generalized sclerosis	



Case: Imaging Findings

49 yo female with left-sided pain

▶ HPI:

- ▶ 14-year history of left-sided TMJ pain
- ▶ Prior treatments: multiple steroid joint injections, TMJ surgery
- ▶ Persistent pain
- ▶ Was told she had “arthritis” in the TMJ
- ▶ Hurts to even brush her hair on that side



Physical exam

- ▶ Range of motion:
 - ▶ Comfort: 22 mm
 - ▶ Passive: 39 mm, pain on left TMJ, soft-end feel
 - ▶ Lateral movements: R: 7 mm, L: 9 mm
 - ▶ Straight opening path
- ▶ Intraoral exam:
 - ▶ Generalized moderate dental attrition
- ▶ Occlusal exam:
 - ▶ Heavier contacts on the left posterior teeth
- ▶ Joint noises:
 - ▶ Crepitus, L TMJ
- ▶ Allodynia L TMJ area
- ▶ All palpations were severe

Trigeminal Nerve Exam

Intraoral

Light touch :
L V2 and V3:
reduced sensation

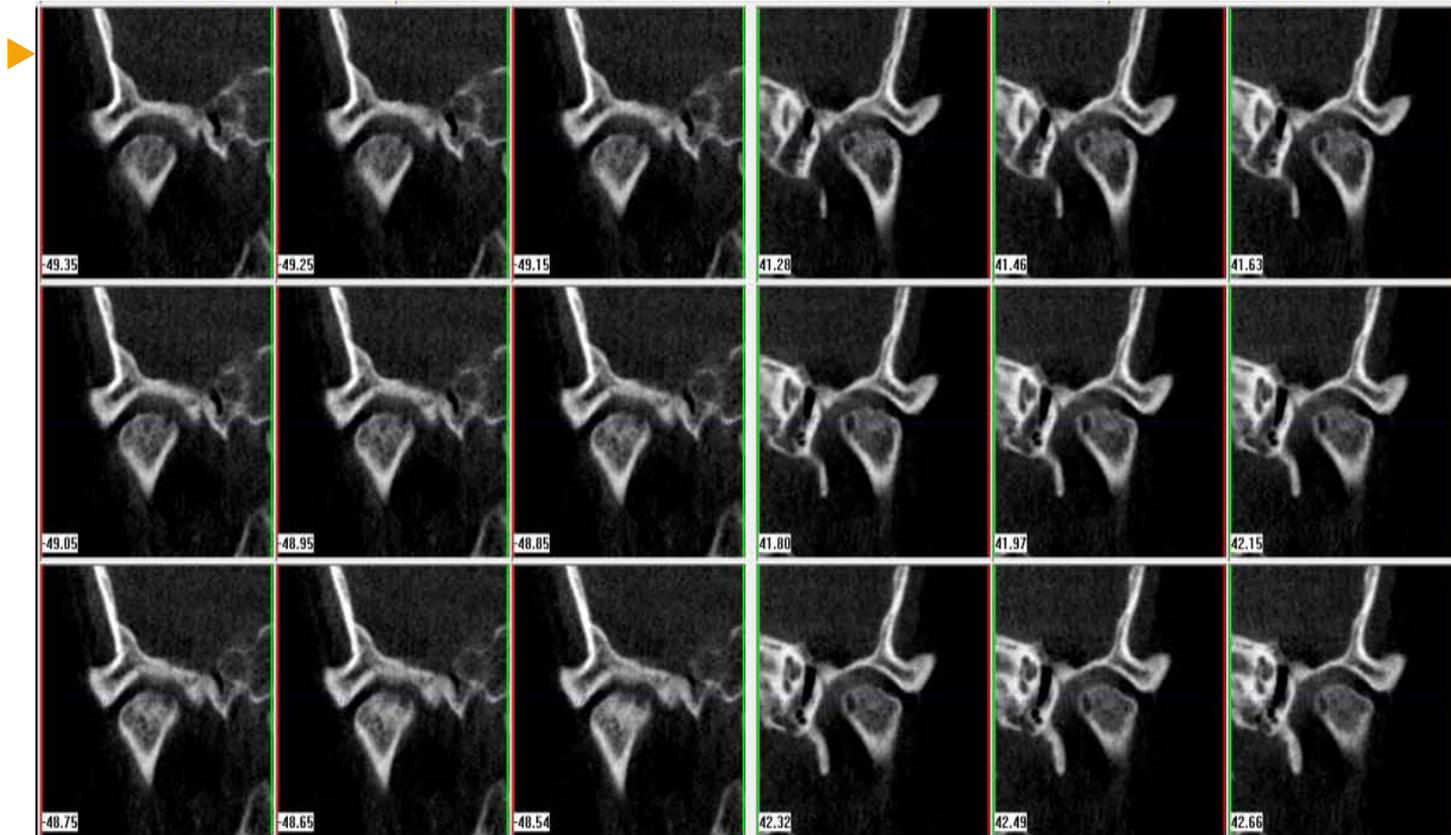
Pin Prick:
L V2 and V3:
reduced sensation

Extraoral

Light touch:
L V1 reduced
sensation
L V2: allodynia

Pin prick:
L V1: reduced
sensation
L V2: Hyperalgesia

Radiographic Exam



Diagnoses

- ▶ Arthralgia
- ▶ Degenerative joint disease
- ▶ Myofascial Pain
- ▶ Possible neuropathic component

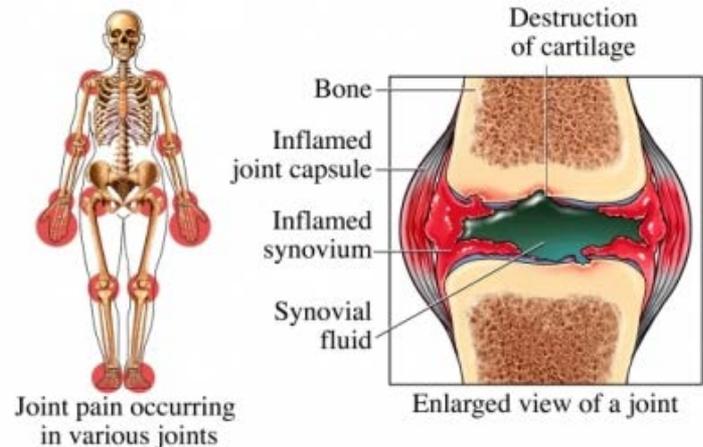
Any underlying etiology?

Polyjoint arthritis

- ▶ Manifests as swelling and disability in multiple body joints
- ▶ Various types: rheumatoid, osteoarthritis, psoriatic, lupus, gout, and pseudogout
- ▶ May have clear hematologic markers
- ▶ Polyjoint osteoarthritis is the most common of the rheumatic diseases

Rheumatoid arthritis (RA)

- ▶ Chronic, systemic, autoimmune and inflammatory disorder
- ▶ Joint inflammation, erosive properties, symmetric joint involvement
- ▶ Can affect other organ systems
- ▶ Serologic markers:
 - ▶ Rheumatoid factor
 - ▶ Erythrocyte sedimentation rate
 - ▶ Anti-CCP antibodies
- ▶ Genetic component



Rheumatoid arthritis and the TMJs

- ▶ The TMJ is one of the last joints affected by RA (generally)
- ▶ Affected in >50% of adults and children with RA
- ▶ Symptoms:
 - ▶ Dull, aching pain with function
 - ▶ Joint edema
 - ▶ Limited mandibular range of motion
 - ▶ Anterior open bite
 - ▶ Stiffness

"Wow! Those 2 Aleve really helped
my arthritis pain!"

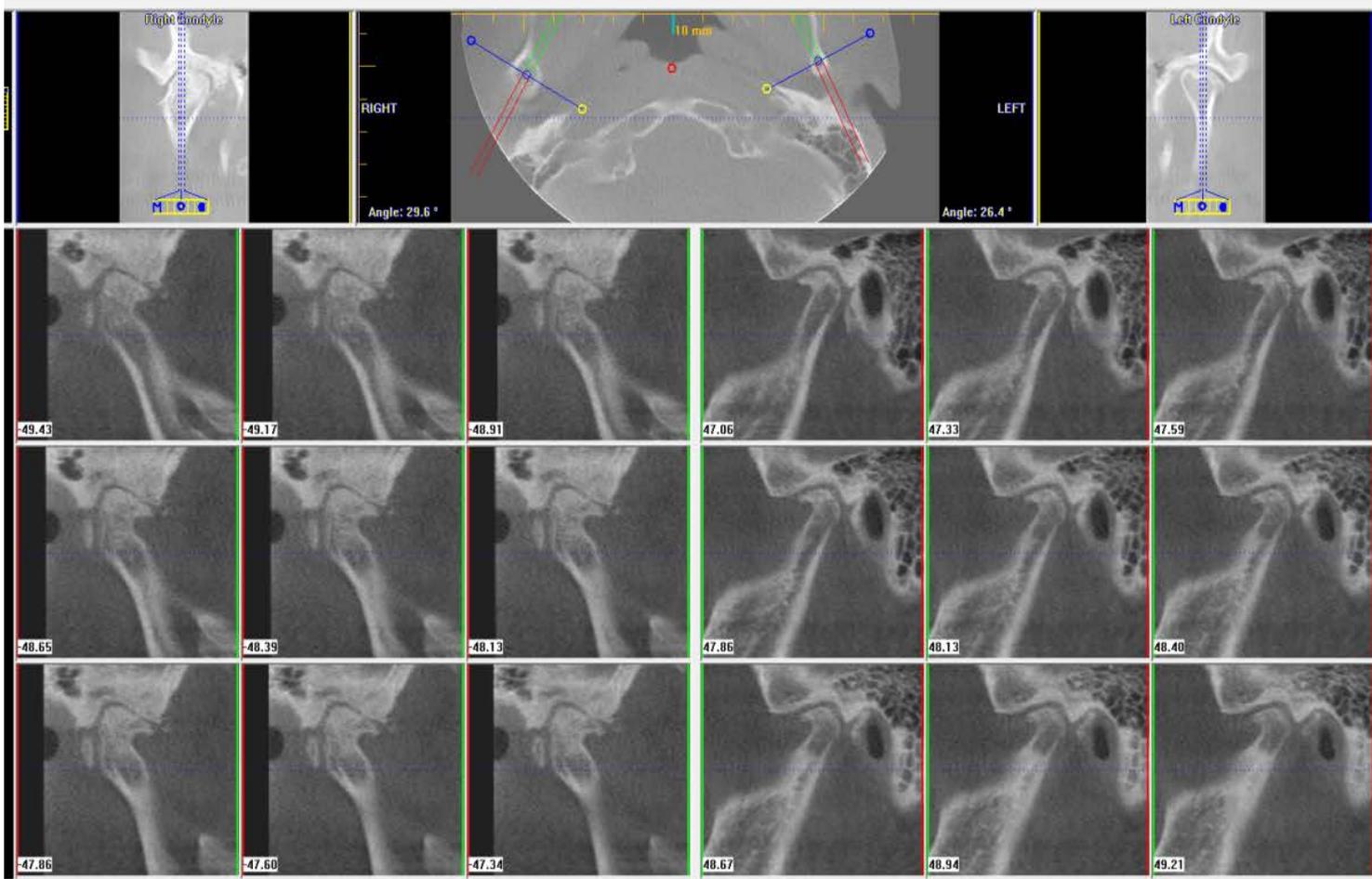
Said no one with
RA ever.

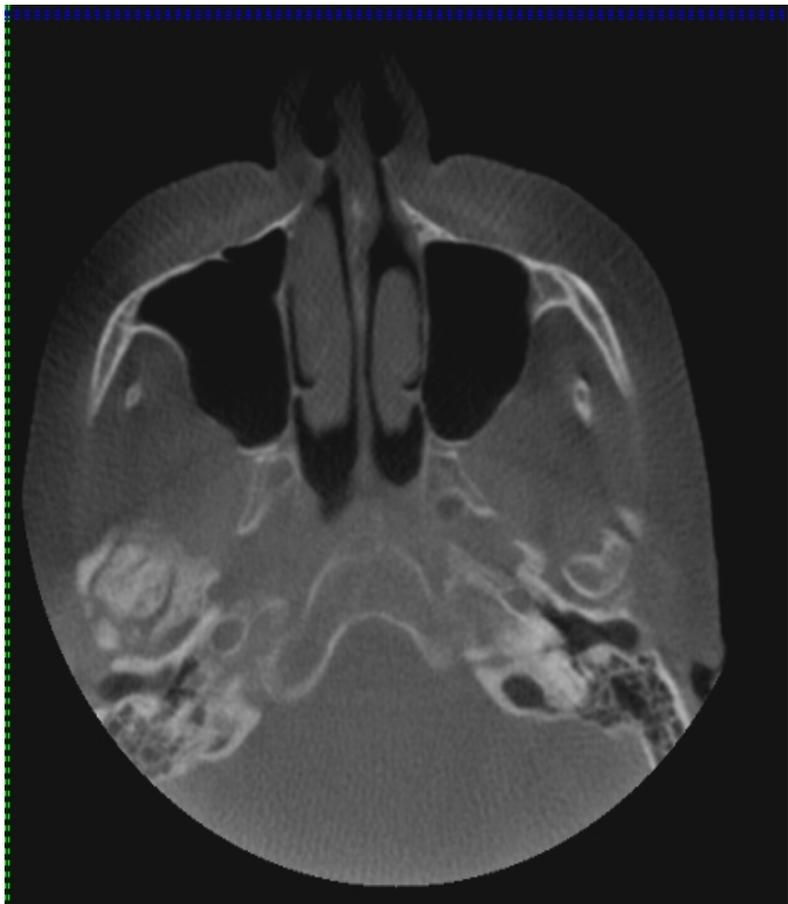
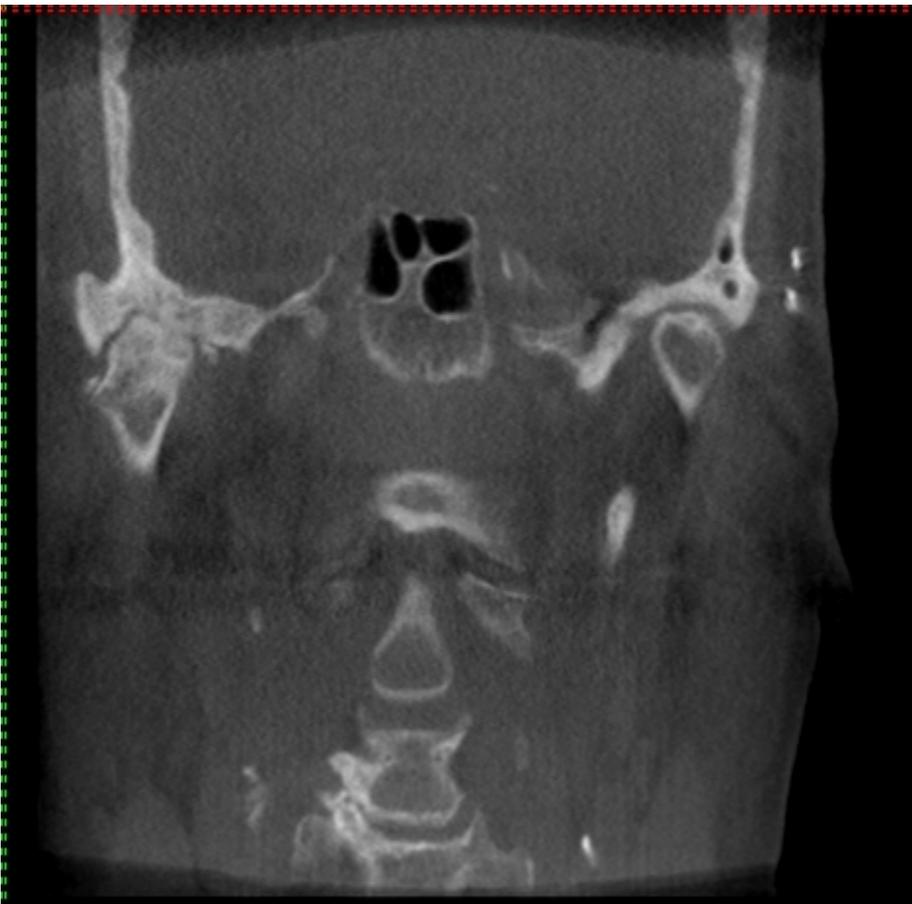
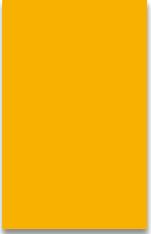


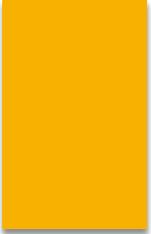
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user card

Synovial Chondromatosis

- ▶ Affects synovium
- ▶ 3 stages: a) early, b) transitional, c) late
- ▶ Usually affects one joint
- ▶ Tx: remove loose bodies, partial or complete synovectomy







53 yo female presents with left-sided ear and TMJ pain

Pain History:

Onset: 2+ years ago

Location: left ear and TMJ area

Quality: sharp, stabbing, accompanied by "ear stuffiness"

Frequency: a few times per week, 10-20 episodes per day

Attack duration: a few seconds

Severity of Pain: 7-8/10

Ameliorating factors: ibuprofen

Factors that made pain worse: laying down

Associated symptoms: "crunchy sounds" in the left TMJ area



Surgical procedure: Left TMJ arthroplasty with removal of benign tumor by the oral and maxillofacial surgeon. Post-operative healing was excellent. Photo taken 3 months post-op.

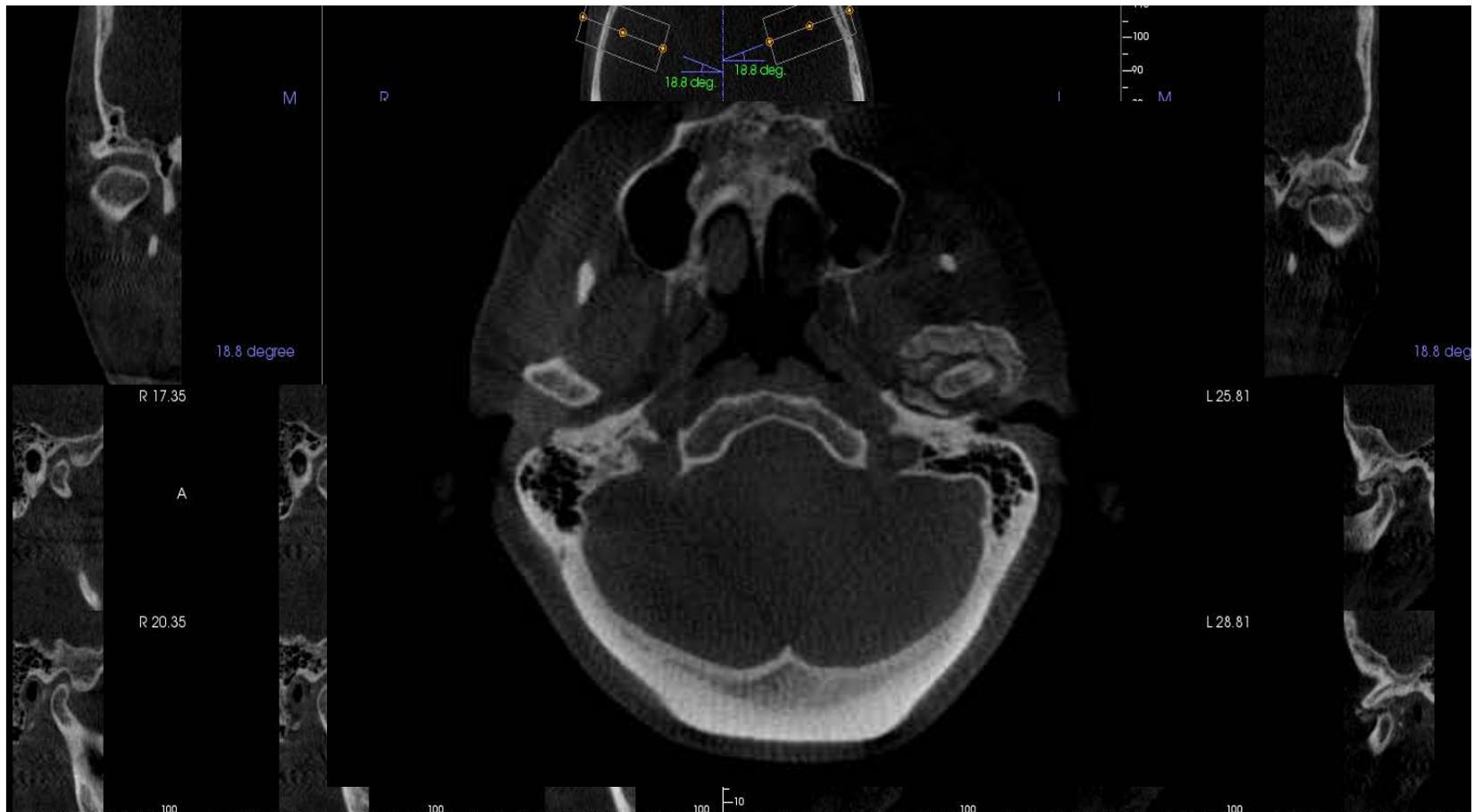


70 yo female with pain on the left

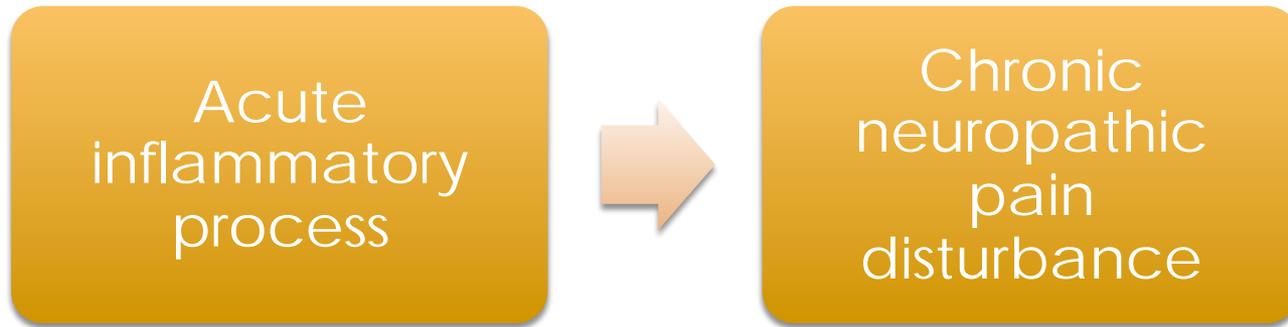
Tender on all palpations
Passive opening: 25 mm
Crepitus on the left
Left teeth have not come together in years

Onset	4-5 years ago
Location	Left joint
Quality	Throbbing
Frequency	Daily
Attack duration	Almost all day
Severity	5/10
Ameliorating factors	Prior splint
Exacerbating factors	Yawning
Associated symptoms	Headaches, neck pain, ear pain, jaw popping

imaging



Chronic pain associated with TMJ dysfunction and joint arthrosis



Peripheral and central sensitization of afferent nerves

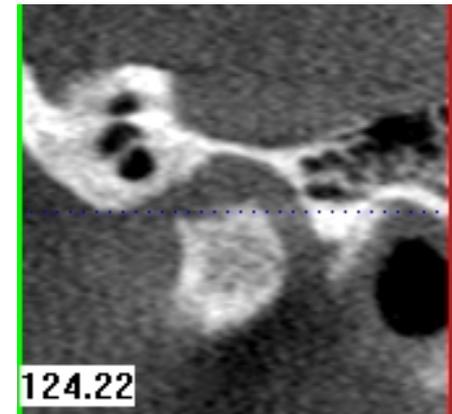
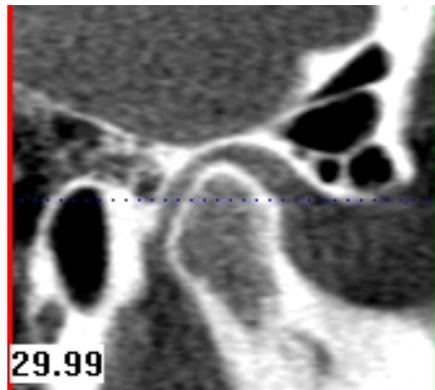
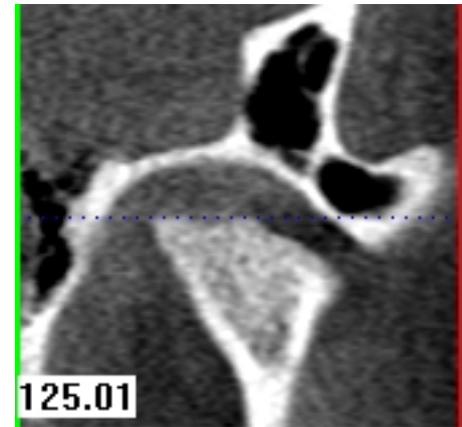
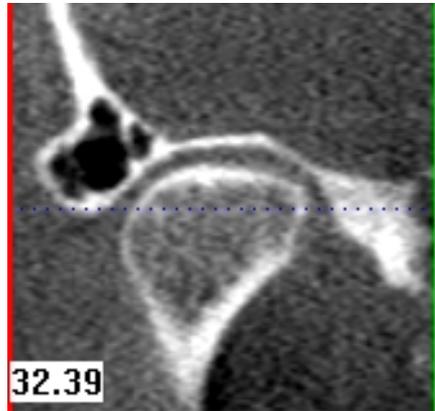
Increased sensitivity to tactile and pin-prick stimuli

Lower pressure thresholds on the TMJ

Idiopathic condylar resorption

- ▶ Localized condition affecting the jaw joints
- ▶ Commonly found in teenage girls
- ▶ Etiology is poorly understood
- ▶ Need to rule out local and systemic etiologies
- ▶ Causes mandibular condylar resorption
 - ▶ → loss of vertical dimension of the condyle
 - ▶ → anterior open bite/occlusal dysfunction
 - ▶ → TMJ pain and dysfunction

Idiopathic condylar resorption



Right

Left

15 yo girl referred by ortho for occlusal change

- ▶ 1 year ago, developed a bite change
- ▶ Ortho was completed at age 12

Onset	3 years ago
Location	Right side
Quality	Achy
Frequency	Varies from weekly to daily
Attack duration	Hours
Severity	2-3/10
Ameliorating factors	Not moving her jaw
Exacerbating factors	Chewing, yawning, talking
Associated symptoms	Headaches, neck pain, bite change, jaw popping, locking

Exam

Tenderness to palpation: severe on dorsal aspect of condyles

Range of Motion:

Comfort Opening: 62 + 3 mm

Passive Opening: 63mm no pain

RT Laterotrusive: No Pain 12mm

LFT Laterotrusive: No Pain 12mm

Midline: WNL mm

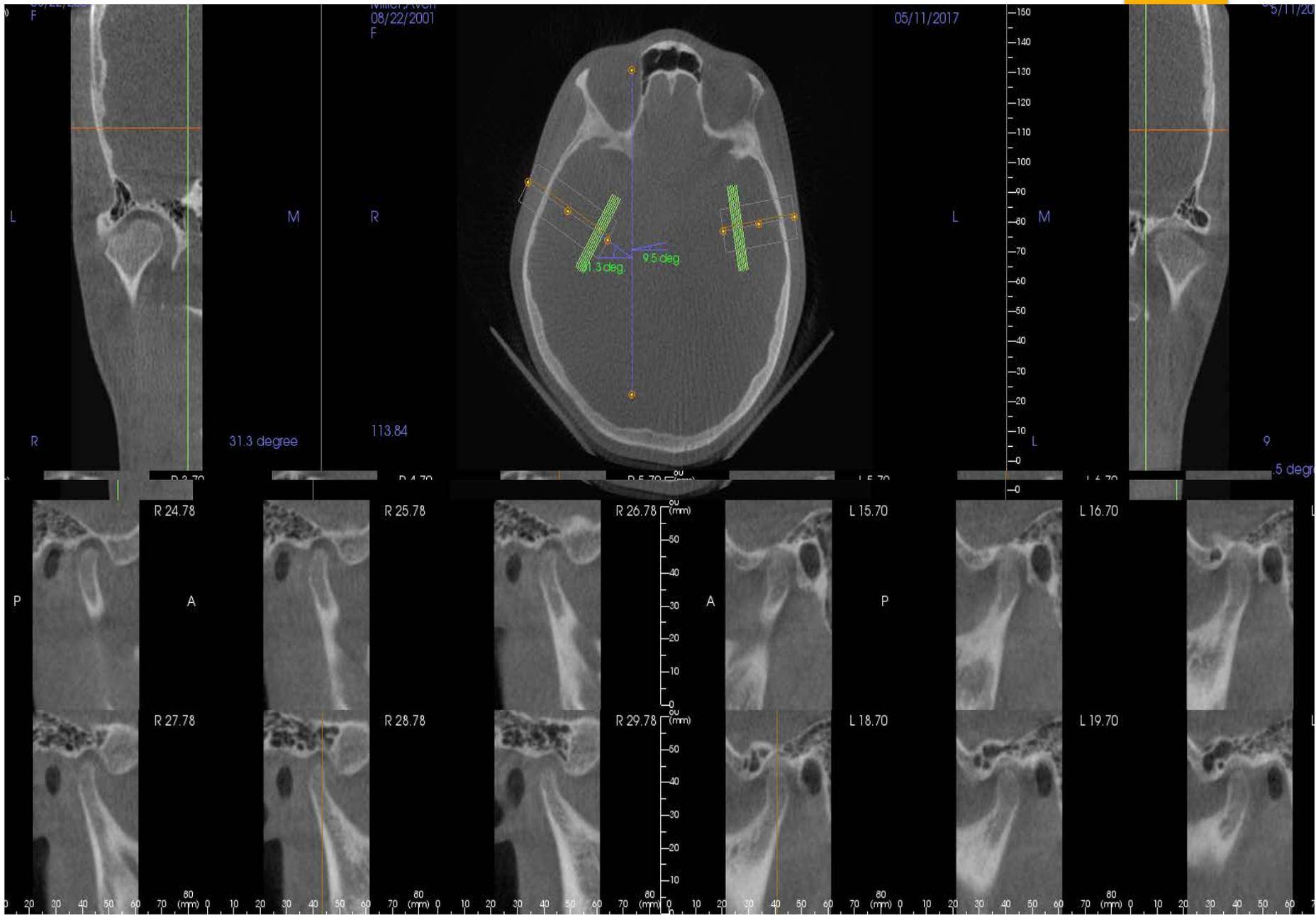
Opening Path: straight

TMJ Noise Dysfunction: right side early opening



Imaging





Treatment

- ▶ NO RCTs identifying treatments for ICR
- ▶ Multifactorial treatments (depends on symptom severity)
 - ▶ Orthotics
 - ▶ Arthrocentesis, Arthroscopy
 - ▶ Condylar replacement: costochondral graft
 - ▶ Orthognathic surgery



Questions?