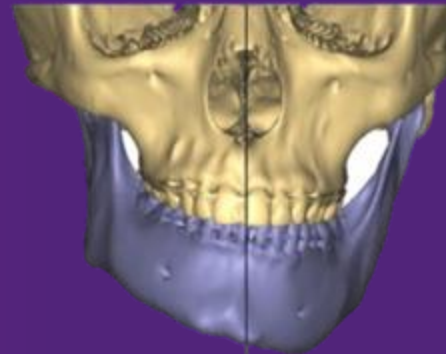


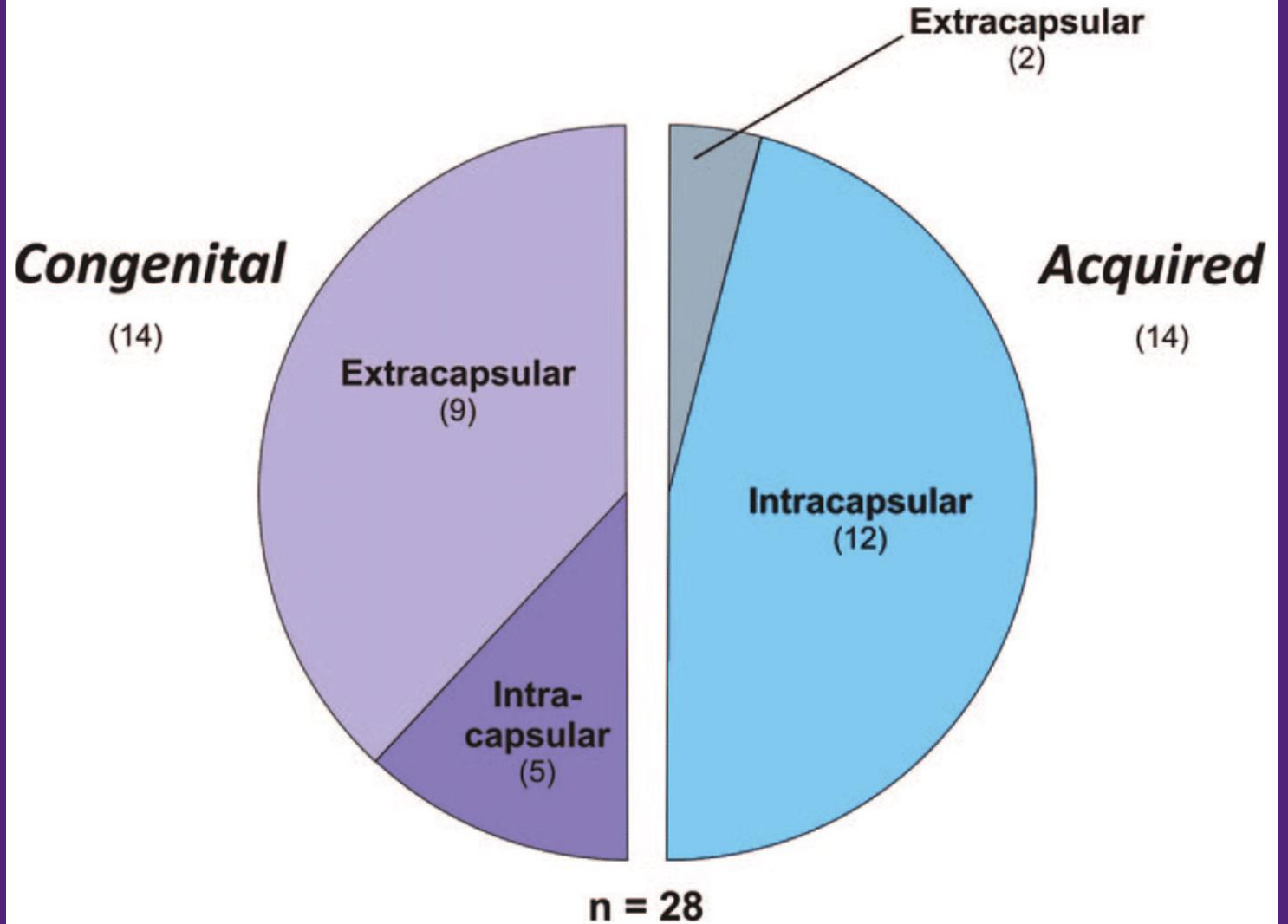
Beyond the bite: Physiotherapy assessment and management of developmental temporomandibular condylar dysplasia (TMCD) and malocclusion.



(Higginson, 2018)

Prevalence

- 44.7% female
- 30% male
- 50% of temporomandibular disorders in children are due to congenital abnormality
- ~9.6 per 100,000 individuals



Congenital and acquired skeletal cases of temporomandibular joint disorders, categorized anatomically as involving intracapsular or extracapsular abnormality. Most congenital disorders involve extracapsular abnormality (e.g., coronoid hypertrophy or zygomatic hypoplasia), whereas most acquired disorders directly involve the joint itself.

Temporomandibular condylar dysplasia (TMCD)

Hyperplasia

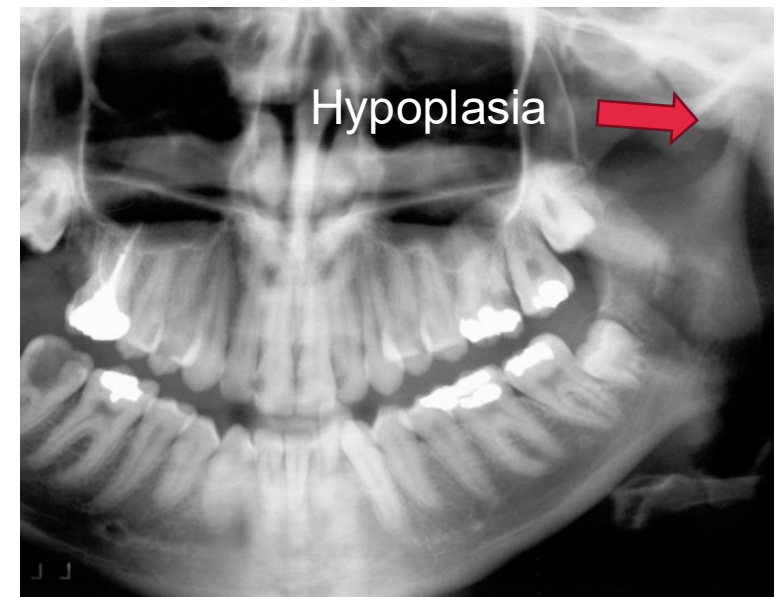
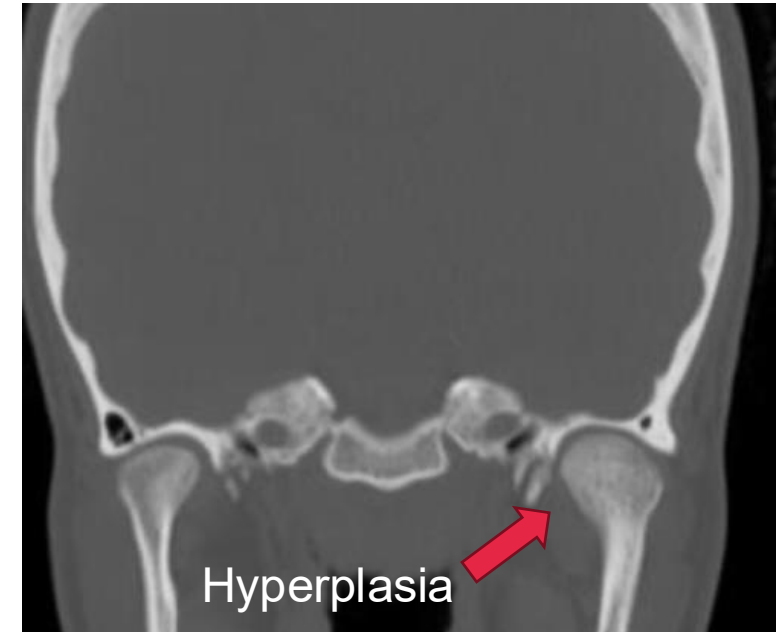
- Increased bony growth mandibular condyle
- 2014 Woford Classification: Condylar Hyperplasia (CH) 1A, CH1B, CH2A, Ch2B, CH3, CH4

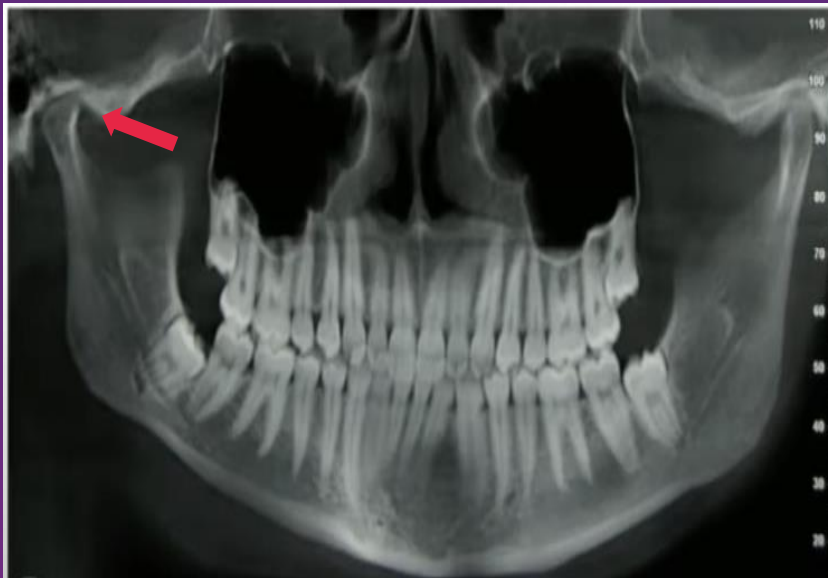
Hypoplasia

- Reduced/underdeveloped mandibular condyle
- Common in hemifacial microsomia, Pierre Robin Syndrome, Treacher Collins Syndrome

Aplasia

- Absence of mandibular condyle





- 30 participants
- Two objectives:
 - 1. look at tone and elasticity of masticatory/cervical postural muscles with a MyotonePro Mytonometer
 - 2. Looked at how patients with and without malocclusion performed in balance assessments to see if there is a correlation



(Mytonometer)

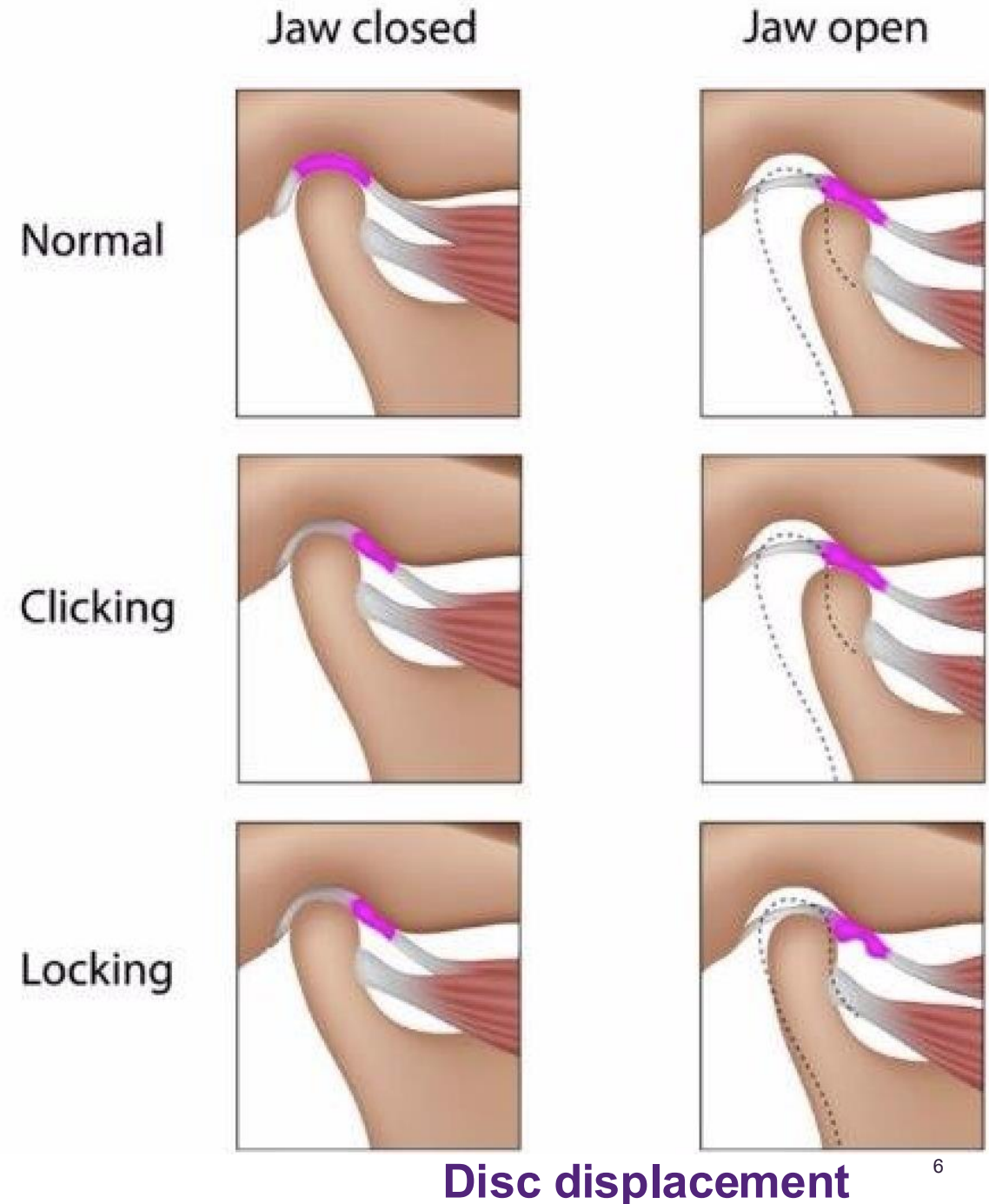
> [Front Physiol.](#) 2020 Jan 31:10:1626. doi: 10.3389/fphys.2019.01626. eCollection 2019.

The Influence of Dental Occlusion on Dynamic Balance and Muscular Tone

Sonia Julià-Sánchez ¹, Jesús Álvarez-Herms ¹, Rafel Cirer-Sastre ², Francisco Corbi ²,
Martin Burtcher ³

Significance of TMCD

- 62% have disc displacement
- TMCD increases disc displacement without reduction by 32.4%
- Risk factors for degenerative joint disease (osteoarthritis)



Significance of TMCD

Pain

↓ maximal mouth
opening

Disc displacement
(clicking)

Disc displacement
without reduction
(locking)

Facial asymmetry

Impact on patient
self-esteem

↑ masseter and
erector spinalis
longissimus tone

↓
sternocleidomastoid
tone

↑ risk TMJ joint
degeneration

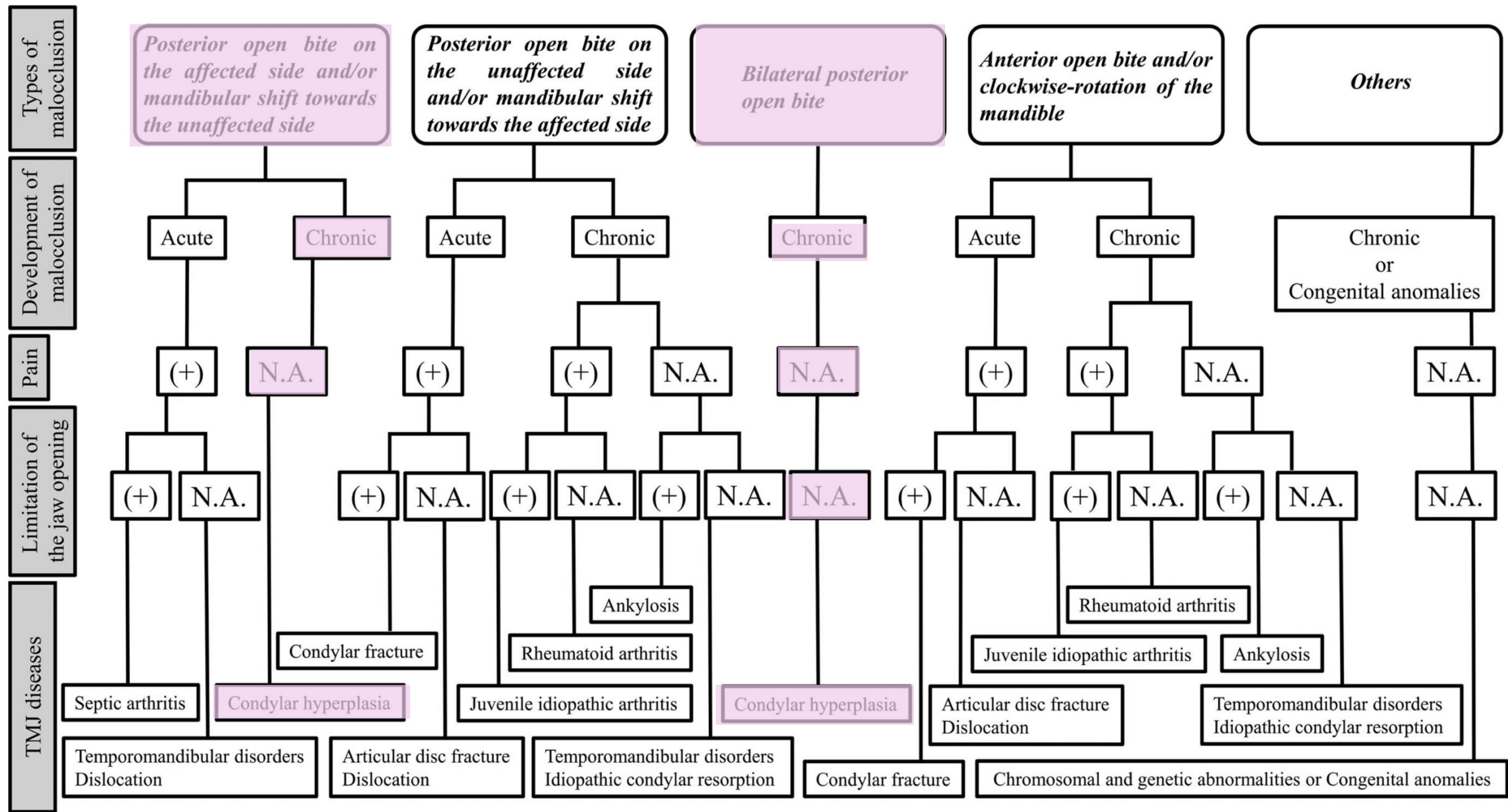
Red flags

- **History of trauma**
 - Mandibular fracture
- **New and rapidly progressive asymmetry**
 - Septic arthritis
 - Cancer
 - Condylar resorption
- **Multi-joint involvement**
 - Rheumatoid arthritis can cause degeneration of the condyle
- **Typical red flags – severe unrelenting pain, redness/heat, systemic symptoms**



Imaging

- **CT scan – most clinically reliable to diagnose TMCD** ★
 - Karssemakers *et al* – 156 patients, investigating TMCD, sensitivity (Sn) 87.0%, specificity (Sp) 88.6%
- **MRI**
 - No sensitivity/specificity data for TMCD
 - Liu *et al* – 122 patients, investigating degenerative joint disease, Sn 95.3%, Sp 43.1%
- **Bone scan**
 - Chan & Leung; Xiao *et al* – unreliable to detect TMCD as the growth centre of condyles is so small, there is minimal isotope uptake, therefore false negatives
- **orthopantogram (OPG)**



Diagnostic tree of TMJ diseases based on types of malocclusion, and 4 other variables of clinical characteristics and symptoms, TMJ = temporomandibular joint.

Assessment – TMCD specific

- Observation
 - Hemifacial elongation of affected side
- Palpation
 - Hypertrophy of the affected condyle
- Joint glides – caution!
- Occlusal assessment
 - Mandibular plane angle measurement



Malocclusion

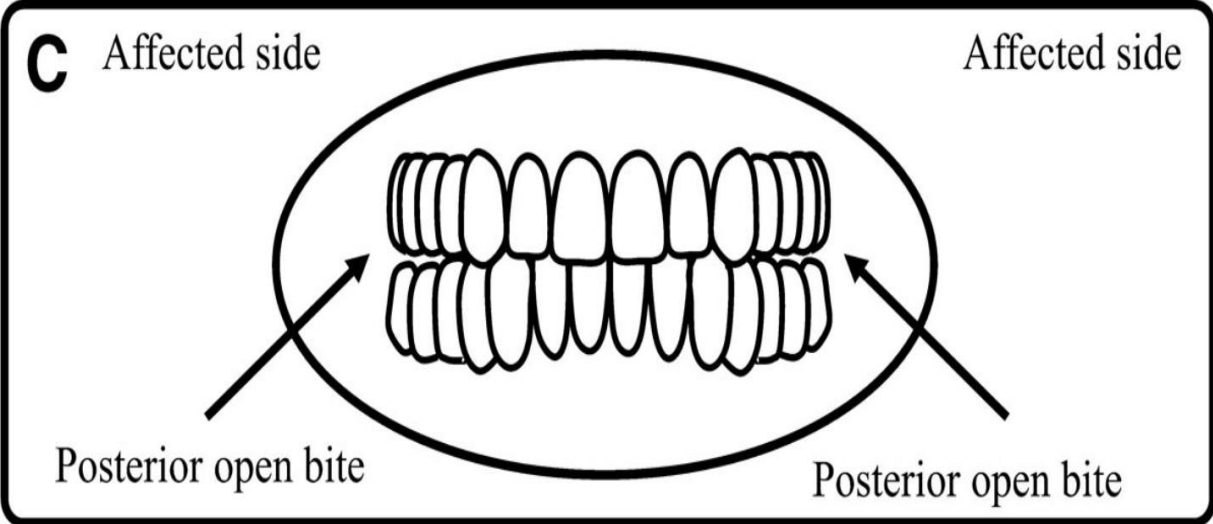
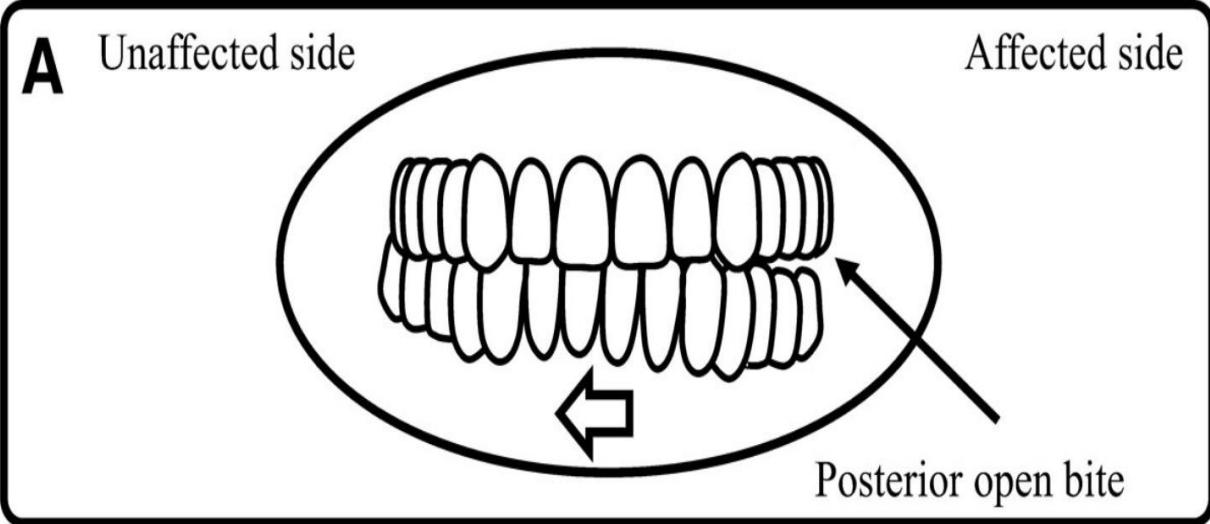


(CrestedButte dental, 2025)

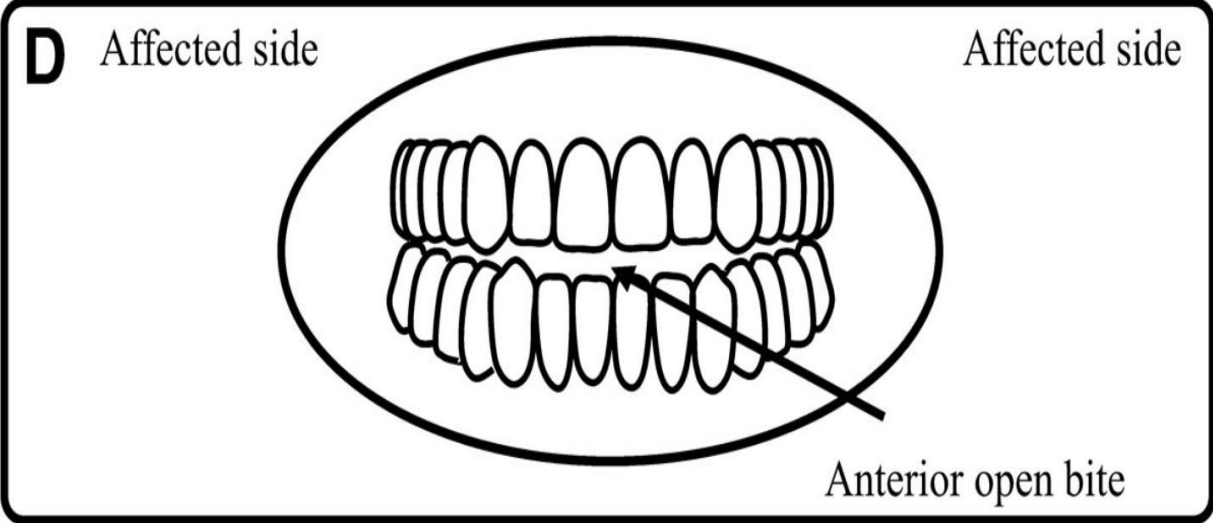
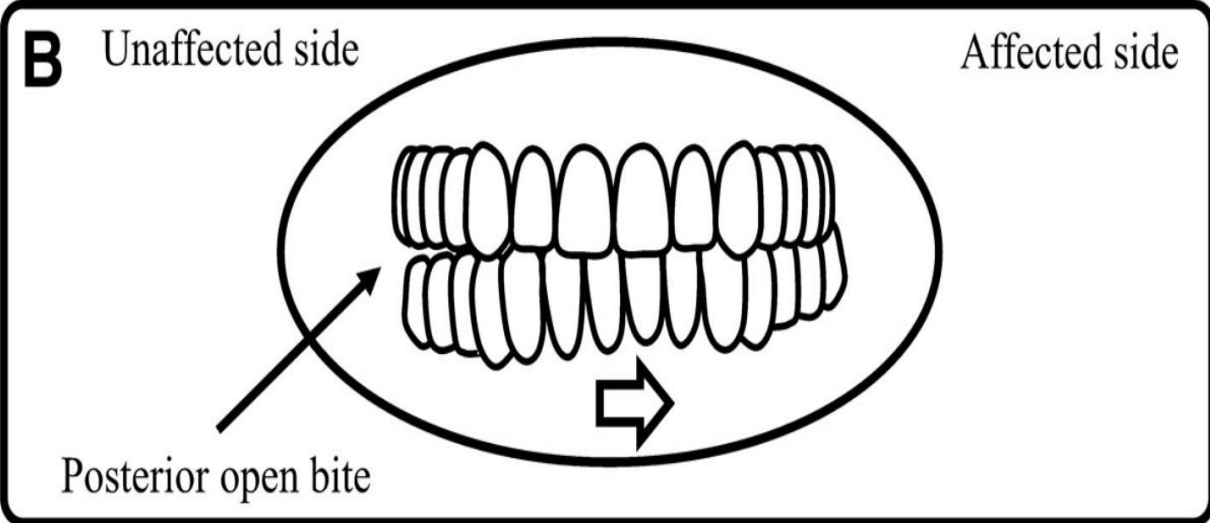
- WHO – malocclusion listed as a handicapping dentofacial deformity
- Hyperplasia bilateral: underbite (prognathism)
- Hyperplasia unilateral: underbite + crossbite
- Hypoplasia bilateral: overbite (retrognathism)
- Hypoplasia unilateral: overbite + crossbite

Malocclusion in TMCD

Hyperplasia



Hypoplasia



Pattern of movement

Deviation



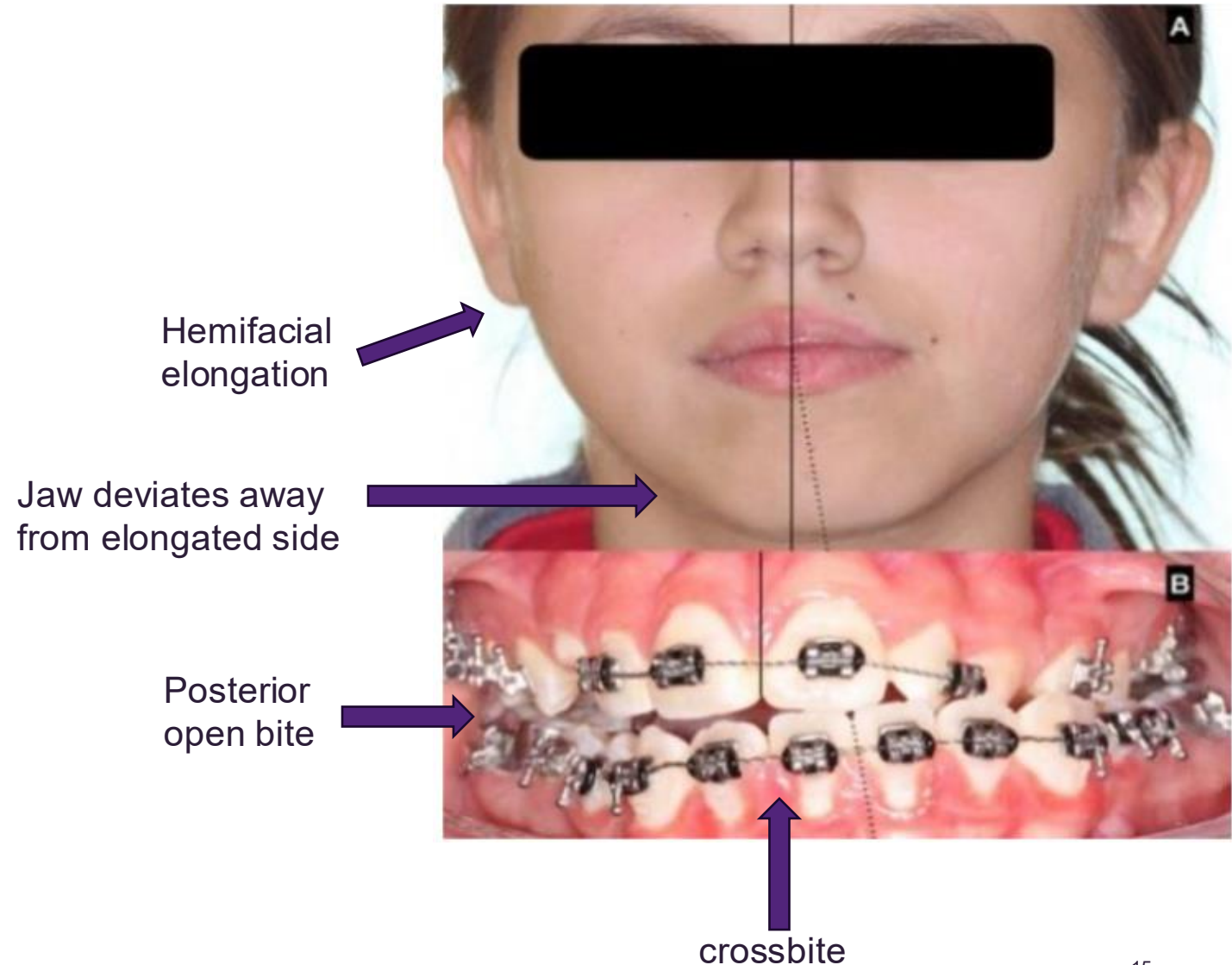
Deflection



Summary - Sue

- 14-year-old female
- 2 yr Hx progressively worsening asymmetry
- Pain and clicking on R) side
- R) hemifacial elongation
- Occlusal plane slants downwards towards the R)
- Crossbite
- R) posterior open bite

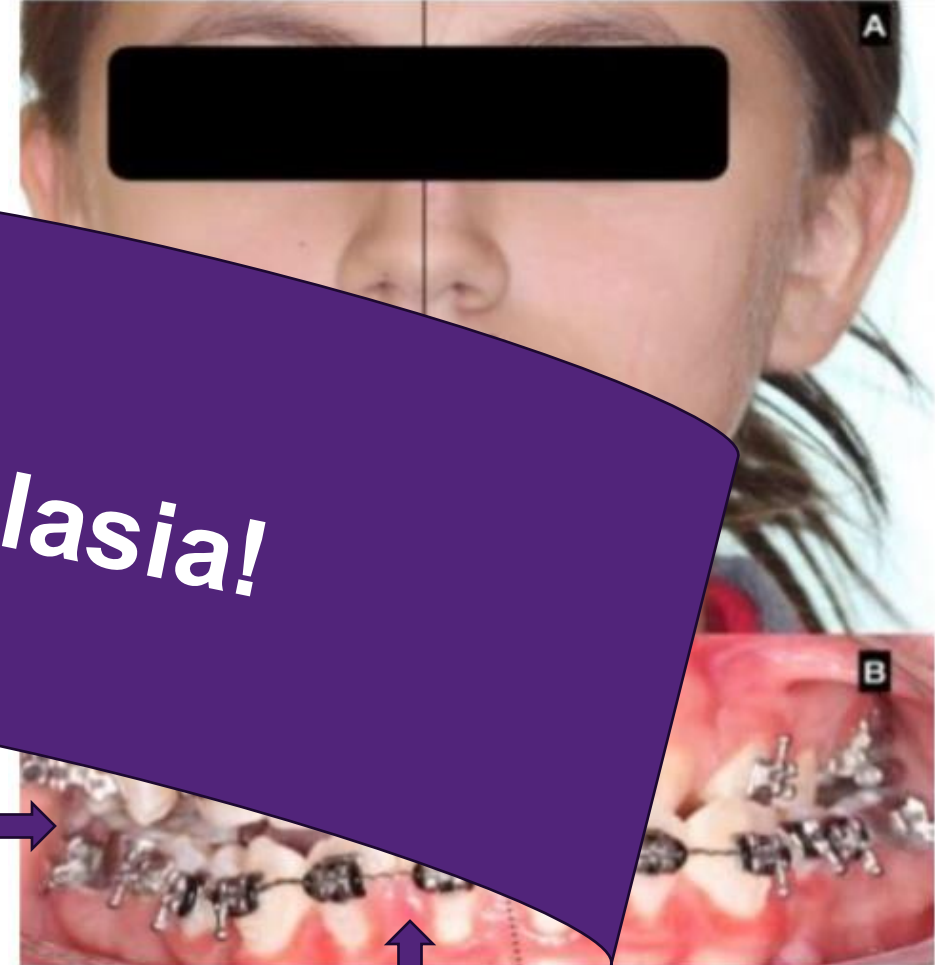
What does Sue have?



Summary - Sue

- 14-year-old female
- 2 years of orthodontic treatment
- W
- R
-
- Occlusal
- downwards towards
- Crossbite
- R) posterior open bite

R) Condylar Hyperplasia!



What does Sue have?

Current evidence - TMD

Intervention	Evidence Quality	Studies	Treatment outcomes	Length of treatment effect
Education and self-management	Moderate	Tran et al (3) Herrera-Valencia et al (4) Rezaie et al (7)	Reduced pain Reduced depression	Long-term
Manual therapy	Moderate	Herrera-Valencia et al (4) Rezaie et al (7) Gonzalez-Sanchez et al (8)	Reduced pain Improved maximal mouth opening Improved cervical range	Short-term
Exercise therapy	Moderate	Dickerson et al (6) Tran et al (3)	Reduced pain Improved range of motion	Varying medium- to long-term
Posture correction	Low	Tran et al (3)	Improved range of motion	Not defined
Pharmacological management	Moderate	Haggman-Henrikson et al (10)	Reduced pain	Short-term
Cervical manipulation	Low	Reynolds et al (5)	No change	Not defined
Splints	Low	Dickerson et al (6) Herrera-Valencia et al (4)	No change when used alone Good effect if combined with physio.	Long-term
Acupuncture	Extremely low	Park et al (9)	Improved pain ONLY IF combined with physiotherapy	Not defined

Referral

- **Maxillofacial surgeons**

- High condylectomy – excision of extra tissue for hyperplasia patients
- Joint replacement for condylar hypoplasia

- **Dentists**

- Orthodontic treatment to correct crossbites and occlusion

Correction of
hemifacial
elongation and jaw
deviation



Conclusion

- **Congenital TMJ deformities are under-screened and misunderstood**
- **TMCD has a significant impact on TMJ function**
- **Malocclusion changes the biomechanics and function of the TMJ**
- **Diagnosis requires correlation of clinical findings with imaging**

Look beyond the bite!

Contact

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