

Dental Issues in DMD

Elizabeth Vroom, DDS

Changes in orofacial form and functions seen in DMD

(most recommendations are expert opinions and not evidence based)

Lack of dystrophin

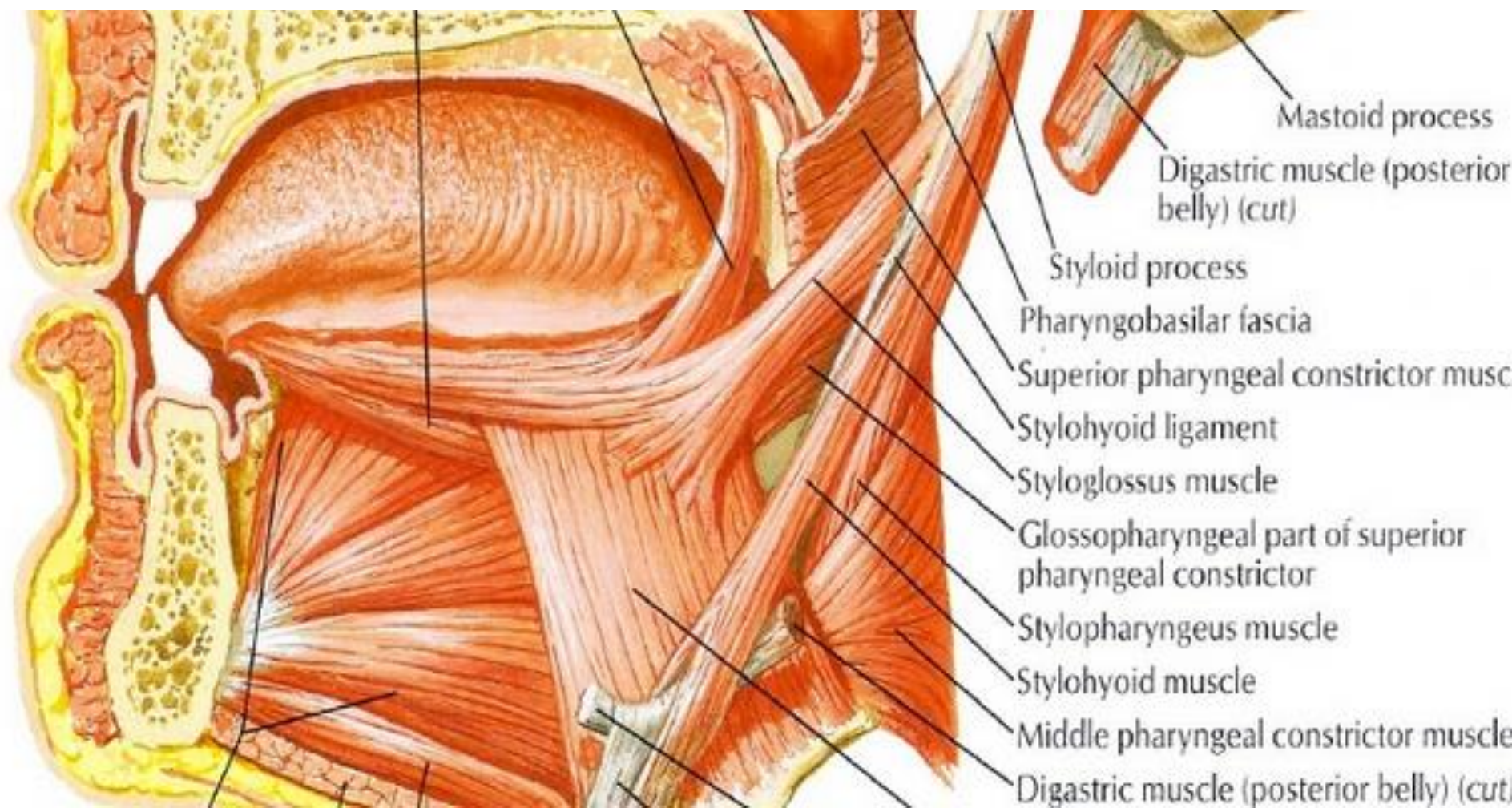
Muscle breakdown

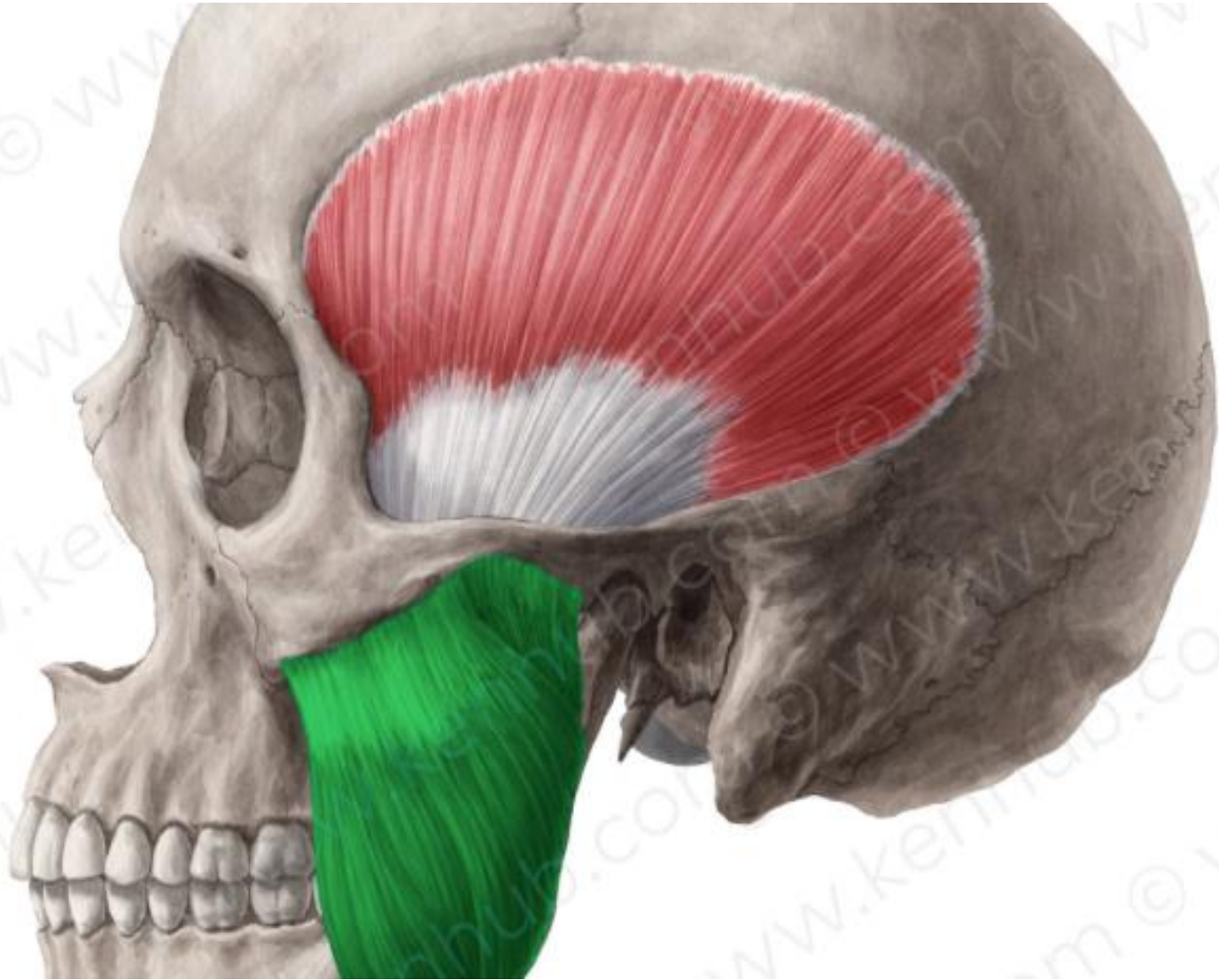
Fibrosis

Infiltration Fatty Tissue

Leading to loss of function and deformities

Orofacial changes in DMD described since 1990's by orthodontists but not picked up by the NMD community





Lack of dystrophin causes

Progressive weakness of masticatory and perioral muscle groups

Tongue enlarged and reduced motility (progressive)

Progressive oropharyngeal and hypolaryngeal weakness

Tongue

- Thickness tongue increases with age/stage
- Tongue motility decreases
- Tongue pressure decreases
- Lies on the occlusal surfaces of the mandibular teeth as the jaws are relaxed
- Protrudes over the anterior teeth

Enlarged and weaker tongue causes

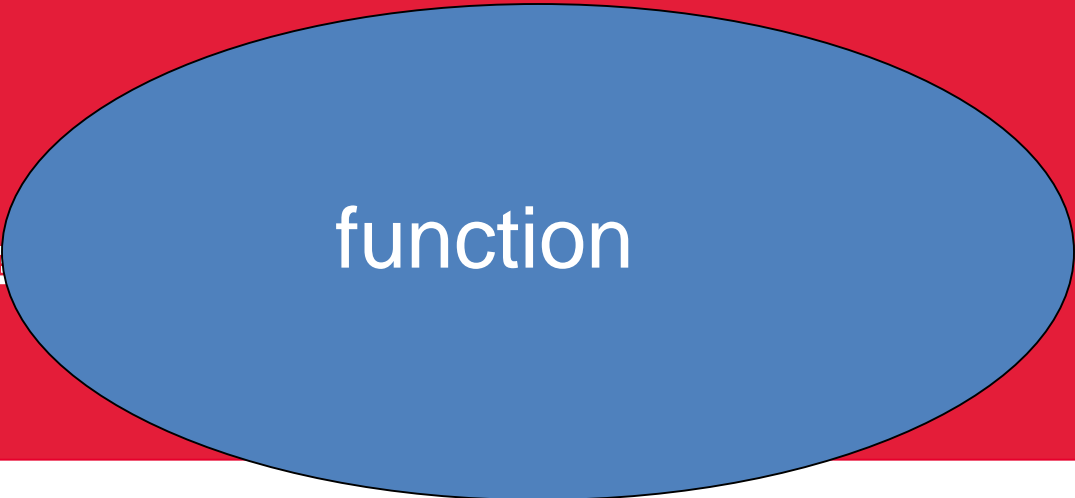
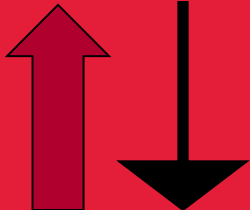
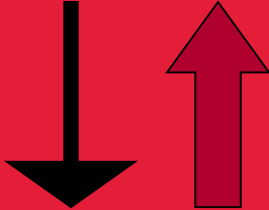
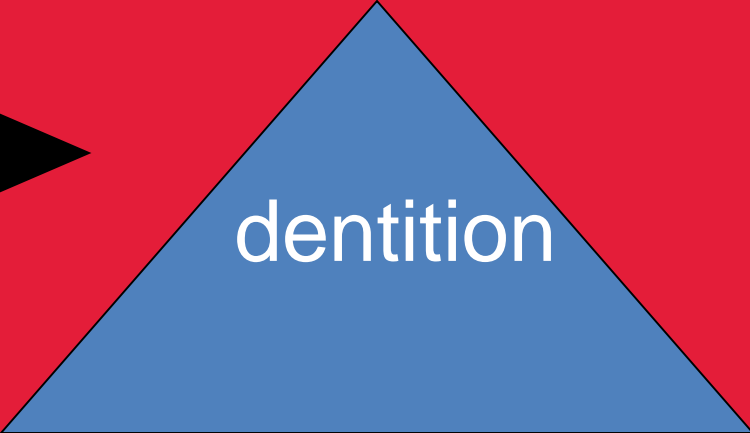
- Dental deformities (causing problems chewing)
- Problems to move the food through the mouth
- Problems with cleaning
- Problems with speech
- Problems with appearance

Reduced bite force and reduced contacts causes

- Mastication difficulties including less fragmentation of food.
- Poor fragmentation of food in combination with weak pharyngeal clearance may increase pharyngeal post swallow residue
- Which may cause in advanced stages swallowing difficulties like choking and the feeling of sticking food in the throat.

Changes in form and function

- Changes in dental arches
- Skeletal changes
- Changes in occlusion
- Reduced contacts between the upper and lower (pre) molars
- Changes in bite force
- Difficulties in speech
- Swallowing problems
- Limited mouth opening
- Difficulties oral cleaning



Parent Project Muscular Dystrophy
JOIN THE FIGHT.
END DUCHENNE

Form follows function which we know from

- Thumb sucking
- Mouth breathing
- Tongue position during swallowing and in rest position

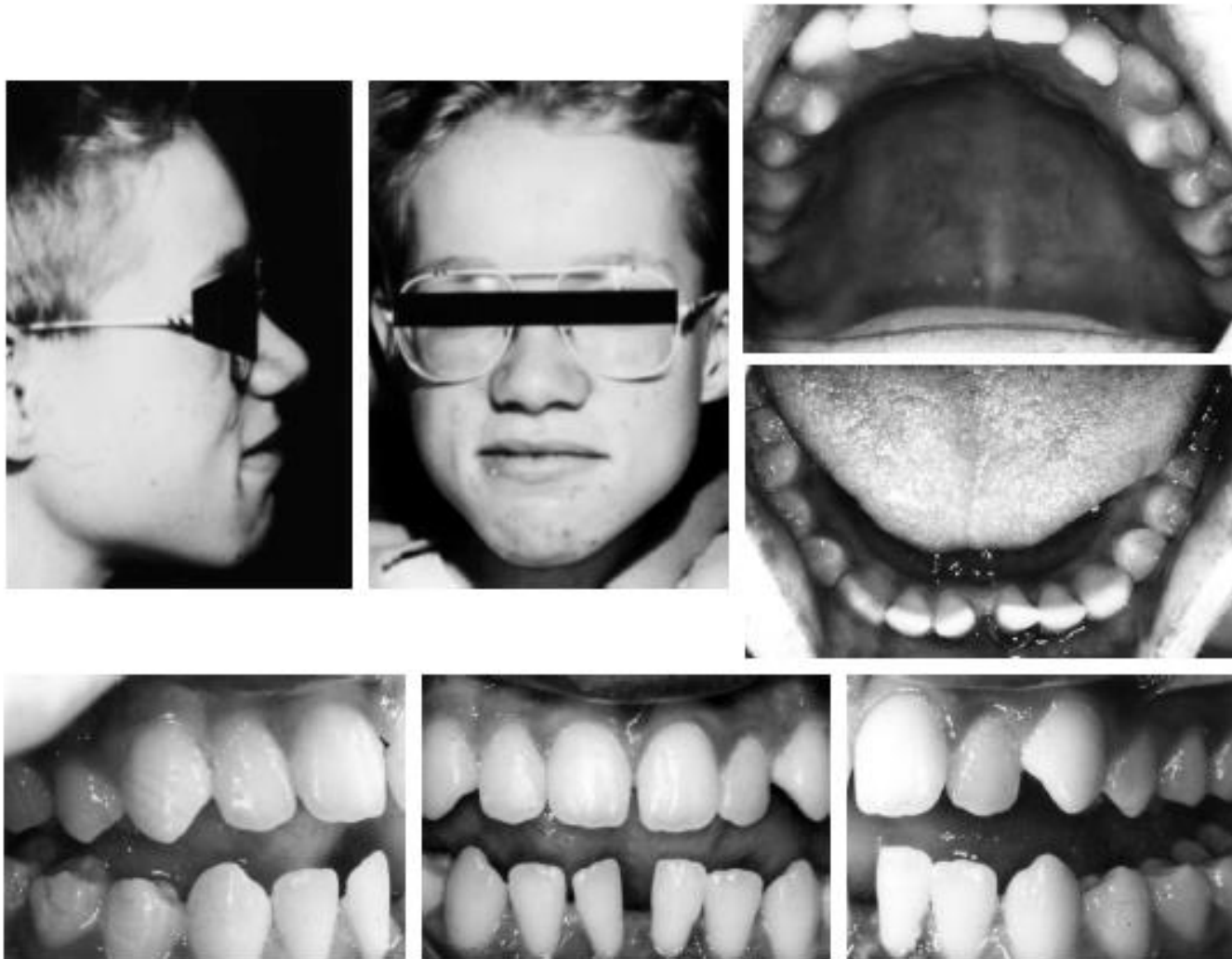
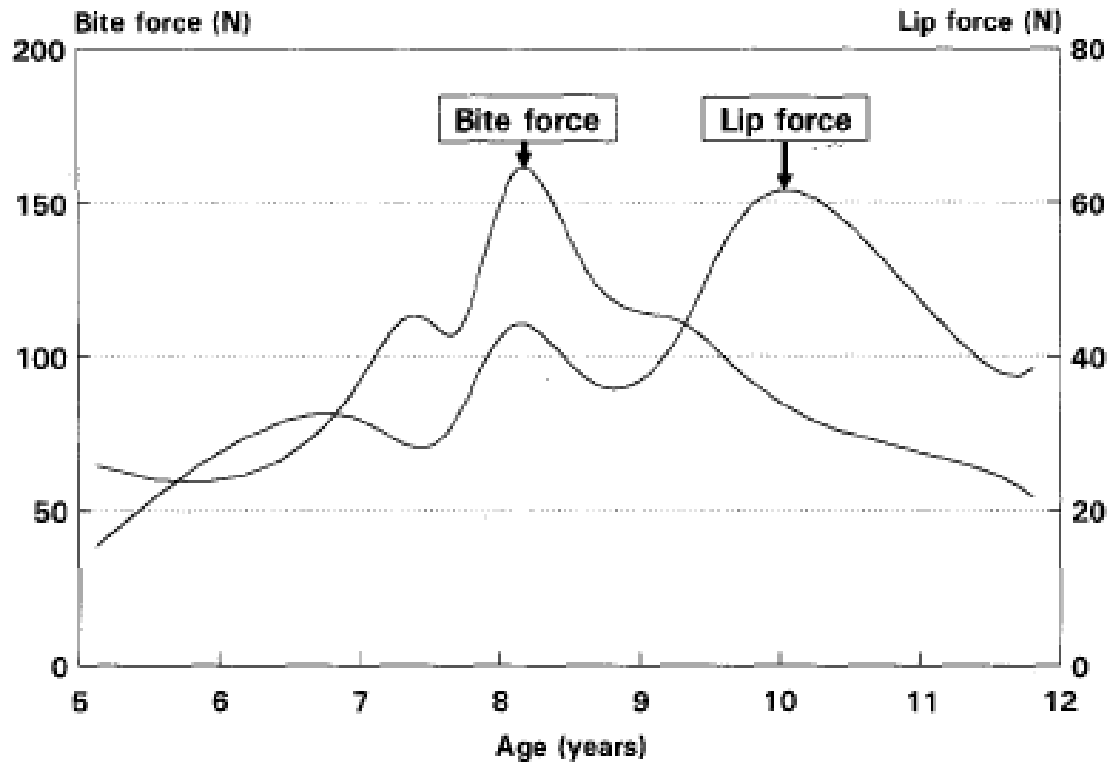


Fig. 2. Patient with Duchenne muscular dystrophy. Notice the wide maxillary and mandibular dental arches, with posterior crossbite and





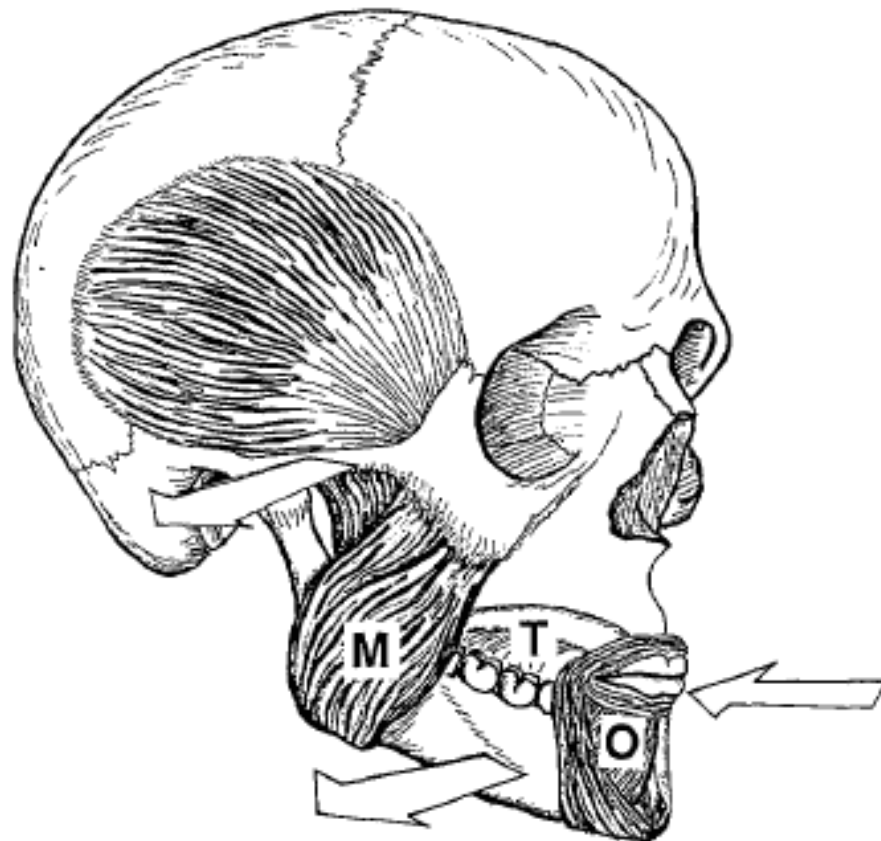
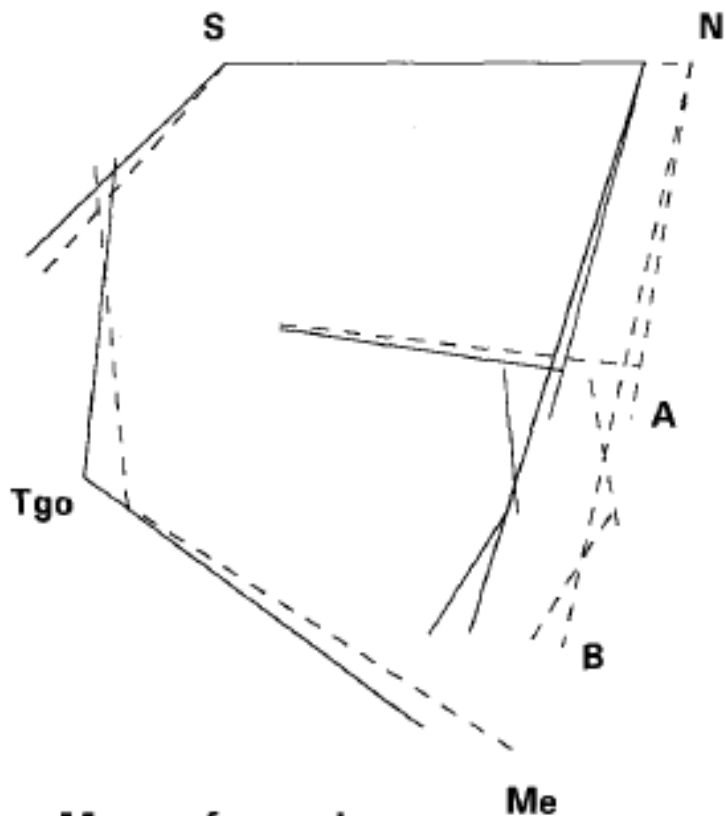


Transversal expansion of skull and dental arches caused by

- Decreased activity of masticatory muscles starting 2 yrs earlier than the perioral muscles
- enlarged hypotonic tongue

Orofacial changes

- transversal over-development of the dental arches
- sagittal shortening of the dental arches
- sagittal under-development of the cranial, maxillary and mandibular base
- reduction of overbite and overjet
- retrusion of incisors
- concave profile
- increase in bizygomatic width



Mean of sample

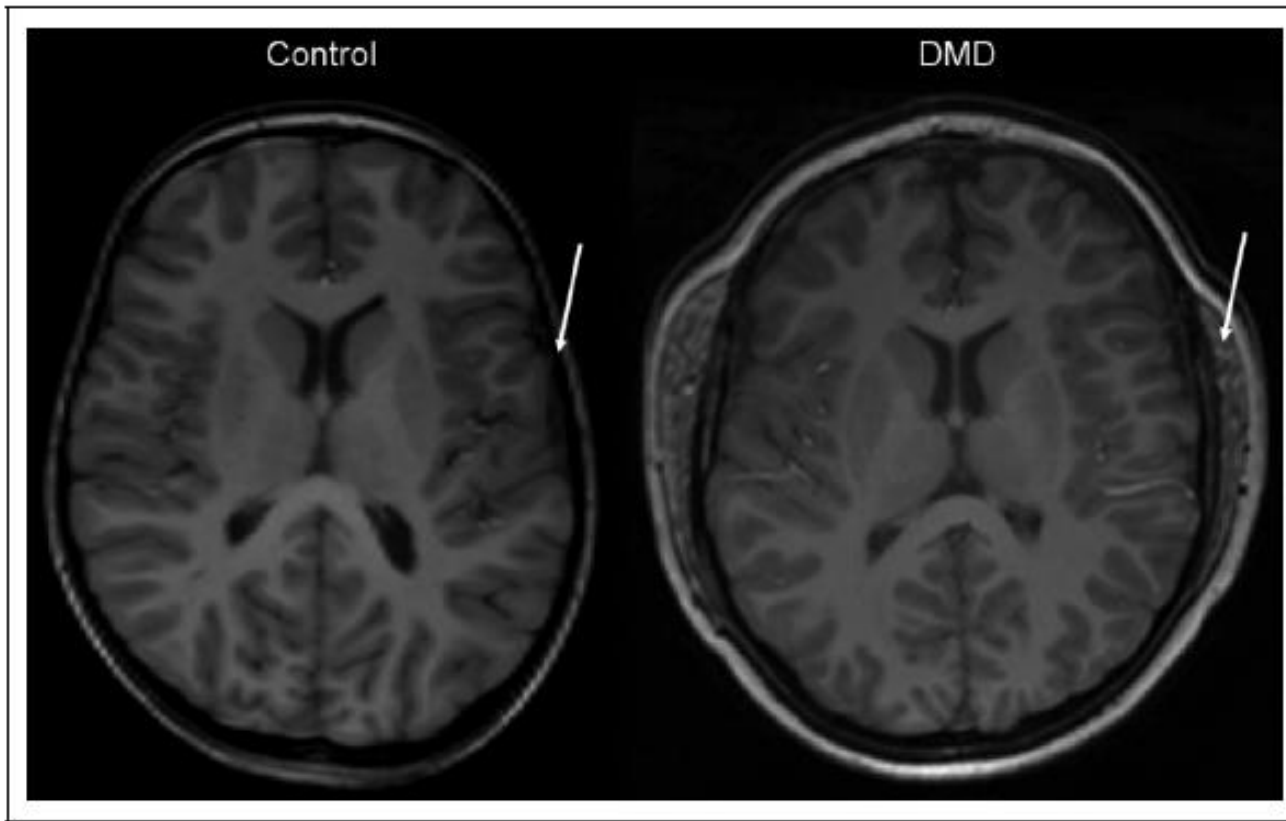
Progressive muscular dystrophy

Superposition of cephalograms from 10-year-old patient with PMD and same age controls, along SN line at sella

- M - masticatory muscles - weak
- O - orbicularis oris - normal
- T - tongue - weak and voluminous
- change direction of morphology

'To treat or not to treat'?

- Esthetics are very important so lining up front teeth could and should be done
- Changes caused by abnormal function will relapse if function does not change. This may even cause root resorption
- Avoid use of braces 'taking space'



I. Transverse sections taken parallel to the anterior and posterior commissure (AC/PC) of a healthy 10-year-old boy (left) and a 10-

Transverse sections taken parallel to the anterior and posterior commissure (AC/PC) of a healthy 10-year-old boy (left) and a 10-year-old boy with Duchenne muscular dystrophy. The boy with Duchenne muscular dystrophy shows a rounder head and skull shape and bilateral temporal muscle hypertrophy (indicated by arrows).

Limited mouth opening causes

- Difficulties feeding
- Difficulties dental cleaning
- Difficulties during dental treatments

Recommendation

- Measurement of the Active Maximum Mouth Opening
- Keep opening your mouth
- Consider use of 'stretcher' to maintain or regain mouth opening (be gentle 😊)?

Fighting Against Disuse of the Masticatory System in Duchenne Muscular Dystrophy: A Pilot Study Using Chewing Gum

*H. Willemijn van Bruggen, DDS, MSc^{1,2},
Lenie van den Engel-Hoek, PhD³, Michel H. Steenks, DDS, PhD²,
Andries van der Bilt, PhD², Ewald M. Bronkhorst, PhD⁴,
Nico H. J. Creugers, DDS, PhD¹, Imelda J. M. de Groot, MD, PhD³, and
Stanimira I. Kalaykova, DDS, PhD¹*

J Child Neurol. 2015 Oct;30(12):1625-32. doi: 10.1177/0883073815575575

Parent JOIN THE FIGHT.
Project END DUCHENNE.
Muscular
Dystrophy

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Mastication training in Duchenne muscular dystrophy using chewing gum for 4 weeks.

Mastication training by using sugar-free chewing gum in Duchenne muscular dystrophy patients improved their masticatory performance.

Since bite force did not improve, the working mechanism of the improvement in chewing may relate to changes of the neuromuscular function and coordination, resulting in improvement of skills in performing mastication.

Dental health

- Dental hygiene is poor in DMD
- More caries
- High DMF score (Decayed, Missing, Filled)
- Gingival inflammation
- Heavy plaque accumulation and calculus deposits (especially around the lower anterior teeth)
- Mouth breathing
- Very often unhealthy periodontium.
- Delayed eruption of permanent dentition

- *Prof. Maria Mielnik-Baszczak, PhD, DDS;* Borowska Malgorzata, PhD, DDS*

Recommendation

(pediatric)

- For children with DMD, dental and prophylactic treatment should begin early.
- The pediatrician who diagnoses a child with DMD should be obliged to inform the parents about the necessity of regular dental check-ups.
- Proper diet is important
- Oral hygiene (from 3 years of age oral hygiene agents should include fluoride)
- Fluoride prophylaxis
- Pit and fissure sealants and fluoride
- Regular dental check-ups
- Avoid treatment under full anesthesia

• *Prof. Maria Mielnik-Baszczak, PhD, DDS; * Borowska Malgorzata, PhD, DDS*

Dental healthcare

(older boys)

- Dental hygiene more difficult when hand function decreases and other people (often not trained) have to take over
- Large tongue
- Less 'natural cleaning' bij tongue and cheeks
- Think twice before removing wisdom teeth (every patient needs a personal benefit risk)
- Risk of aspiration

Recommendations

- Rinse after every meal (and drink during and after meals)
- Avoid mouth breathing and open mouth (tongue 'in')
- Don't start orthodontic treatments without a thorough understanding of all aspects caused by the disease
- Consider chewing gum
- Teach dental cleaning to care givers
- Tongue cleaning

Recommendations

In case of swallowing problems in DMD, based on the disturbed mechanisms of swallowing, it is suggested to:

- (1) adjust meals in terms of less solid food
- (2) drink water after meals to clear the oropharyngeal area.

Longer lifespan, shift of attention

- Rehabilitation and proper management of medical complications have improved the quality and duration of life for children and adults with DMD.

This should lead to a shift in attention to the non-fatal medical complications of the disease.

Starting young could prevent problems later

Dental treatments at a more advanced stage are complicated and challenging because of

- Positioning in the dental chair
- Mouth opening
- Large (and less mobile) tongue
- Risk of aspiration
- Anesthesia
- Difficulties with implants

Keep in mind

- In healthy population risk of osteonecrosis is higher when using biphosphonates
- Periodontitis and diabetes: a two-way relationship
- Higher risk for cardiovascular problems
- 'Germs from the oral cavity' often play a role in infections of the respiratory system

Thanks

