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THE EVALUATION OF TONGUE POSITION AND MOBILITY

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Abstract. The tongue is a muscular organ that has a major impact on the condition of the dentition and alveolar ridges. **The purpose of the study.** To analyze existing tools for assessing tongue position and mobility. **Results.** The position of the tongue in the oral cavity can be assessed on lateral cephalograms as the distance of the tongue surface from the palatal plane (T-PL). Orthotropic scale of resting tongue position can be divided into five categories. The functional classification of ankyloglossia is based on both the degree of tongue elevation and the assessment of its myofunctional state and consists of four grades. **Conclusions.** Alterations of the lingual frenulum may contribute to oromyofacial dysfunction, speech and swallowing impediments, underdevelopment of the maxillofacial skeleton, and even predispose to sleep breathing disorder.

Key words: ankyloglossia, tongue-tie, resting tongue position, myofunctional disorders.

Introduction.

The tongue is a muscular organ that has a major impact on the condition of the dentition and alveolar ridges. It exerts 500 grams of pressure on each tooth. The tongue is involved in many important processes: it determines the taste and temperature of food; helps to mix food and saliva, starting the digestive process; ensures swallowing; and participates in the formation of speech. In addition, making several thousand movements per day (about 2000 swallowing movements alone), the tongue participates in the formation of the palate and bite. The correct position of the tongue, which should be taught to the child from childhood, is a determining factor in the formation of an orthognathic bite. For proper tooth growth, the so-called myodynamic equilibrium must be established in the oral cavity, i.e. the pressure of the tongue on the dentition of the upper jaw from the inside must correspond to the pressure of the lip and cheek muscles from the outside [1].

The purpose of the study. To analyze existing tools for assessing tongue position and mobility.

Material and methods. We conducted a web search of the databases to identify relevant articles. For this review, we considered publications on the assessment of tongue position and the degree of tongue elevation in the clinical examination and on lateral head cephalograms.

Results.

The position of the tongue in the oral cavity can be assessed on lateral cephalograms as the distance of the tongue surface from the palatal plane (T-PL). The measurements are made at the distal end of the upper first molars (Fig. 1), because identification of the tongue surface is difficult in the middle and anterior area of the oral cavity.

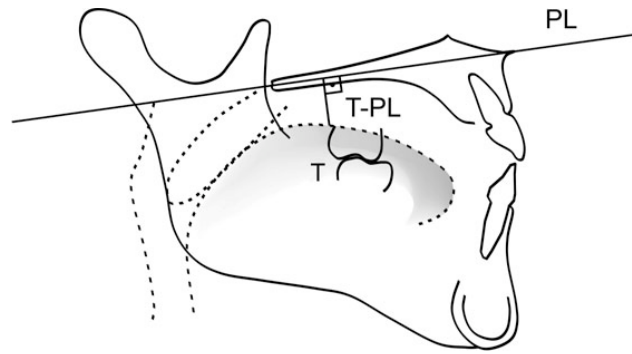


Figure 1: Tongue position. T-PL, the perpendicular distance of the tongue surface from the palatal plane at the distal end of the upper first molar.

Source of the figure: [2].

To assess tongue posture, it can again be helpful to watch the patient talk or swallow. These may be easier to recognize if the patient is also asked to swallow, observing any conjunctive contraction of the buccinator, modiolus or lip. When talking the activity of the tongue can be divided into five categories. Orthotropic scale of resting tongue position: 1. Against palate. These patients will have ‘ideal occlusion’. 2. Touching upper teeth. These patients may have ‘slight crowding’. 3. Covering the lingual cusps. These patients will have ‘lingual inclination’. 4. Covering lower buccal cusps. These patients will have a deep or open bite depending on tongue position and scalloping. 5. Against lower teeth. These patients will have ‘Class III’ [3].

Limitation of tongue mobility (ankyloglossia, tongue-tie) is caused by shortening of the frenulum, sometimes resulting in a fusion of the tongue with the floor of the mouth. The functional classification of ankyloglossia (Fig. 2) is based on both the degree of tongue elevation and assessment of its myofunctional state: normal - 100% tongue elevation; when fully open, the tongue is up to the palate. The I degree of ankyloglossia - >80% tongue elevation; at full opening the tongue touches the incisors of the upper jaw. The II degree of ankyloglossia - 50-80% tongue elevation; tongue does not pass the maxillary incisors when fully open. The III degree of ankyloglossia - <50% tongue elevation; when fully open, the tongue is midway between the jaws. The IV degree of ankyloglossia - <25% tongue elevation; tongue can barely rise when fully open [4].

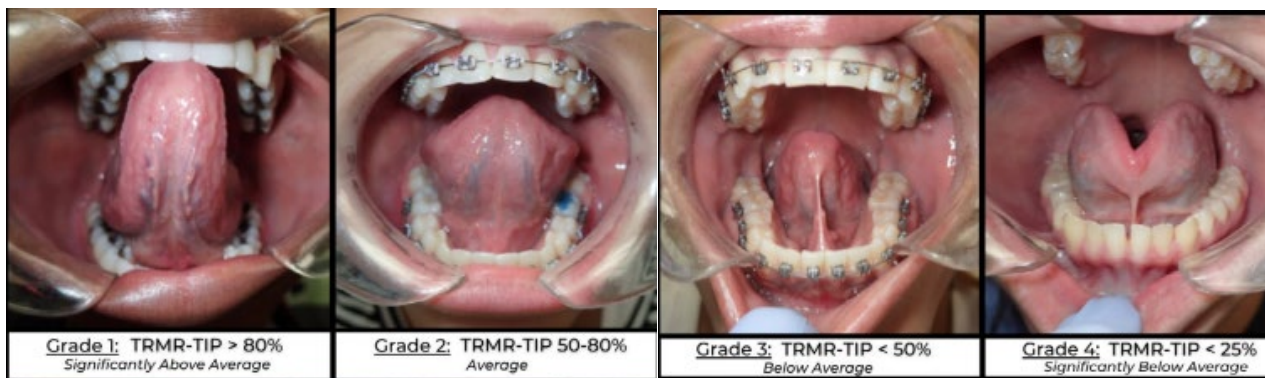


Figure 2: The functional classification of ankyloglossia.

Source of the figure: [4].

Normally, tongue movements should not be carried out at the expense of active work of other muscles, but, as a rule, already in the second degree of ankyloglossia the muscles of the floor of the mouth and neck begin to be activated.

Conclusions.

Alterations of the lingual frenulum may contribute to oromyofacial dysfunction, speech and swallowing impediments, underdevelopment of the maxillofacial skeleton, and even predispose to sleep breathing disorder. In diagnosing myofunctional disorders, the clinician needs to focus more on function than on the anatomy of the soft tissue ligaments. It is necessary to ask the patient "is it easy for you to lift your tongue", "can you open your mouth wide and touch the front teeth of the upper jaw", and with lateral movements of the tongue and wide-open mouth, the clinician pays attention to the immobility of the lower jaw.

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