

Education Forum

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Tongue stretching: technique and clinical proposal

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Abstract

Objectives: The tongue is an organ with multiple functions, from sucking to phonation, from swallowing to postural control and equilibrium. An incorrect position or mechanics of the tongue can cause sucking problems in the newborn or atypical swallowing in the adult, with repercussions on the position of the head and neck, up to influencing upright posture and other problems. Tongue dysfunctions are quite frequent (10–15%) in the population. For the manual therapist, this frequency indicates one to two subjects every 30 patients. Exercises have been proposed to improve the tone and strength of the swallowing muscles but the results are not so clear in the literature. The aim of this study is to describe and provide a tongue muscle normalization technique that helps the manual therapist in the treatment of problems related to it.

Methods: The literature has been investigated through PubMed, Google Scholar of the last 10 years, the keywords used and combined with the Boolean operators AND and OR, are: “tongue, tongue habits, tongue diseases, taste disorder, neck pain, posture, postural balance, atypical swallowing, muscle stretching exercise, tissue expansion, soft tissue therapy, osteopathic manipulative treatment”.

Results and Conclusions: The technique is possible to be executed even in a sitting position, in the case the patient is unable to assume a supine position, the subject should provide immediate feedback that allows the therapist to understand if the technique has been correctly executed. The simplicity of execution and application of the technique makes it a possible and immediate therapeutic tool in the clinical setting.

Keywords: atypical swallowing; manual therapy; muscle stretching exercise; osteopathic manipulative treatment; postural balance; tongue; tongue diseases.

Introduction

Tongue is one of the first organs developed embryologically, it starts to develop around week four and five, its primary function is sucking which becomes swallowing and phonation during first ages. Other important function is its role in head and neck postural control, affecting also upright posture and equilibrium [1].

The tongue, with its neurophysiological characteristics, given from the huge numbers of mechanoreceptors [1], and the size of the somatosensory cortical area, has always been taken into consideration in the study of the postural system [1]. Lingual nerve information, received from deep mechanoreceptors, affect balance and posture also in absence of tongue tactile contact inside the oral cavity. These information affect postural control more than the stimuli received from skin [1].

Tongue normal position can change between stance position and supine position, in upright posture it rests on premolar, reducing pressure in an anterior posterior way, in a lying down position it rests more posteriorly on molars [2], the tip of the tongue rests on the anterior palate [3, 4].

An incorrect tongue position can promote atypical swallowing, where the tip touches anterior teeth lateral surface or both arches instead of the palate, the back of the tongue is curved downwards and its base touches the back of the palate and the anterior pharyngeal area [3].

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Dysfunctional swallowing has a 10–15% frequency in adult population. According to Maspero et al., literature (around 11%) shows frequent correlations between atypical swallowing and posture, in particular between altered tongue position and cranial posture [3].

The tongue and the suprioid musculature, in particular the genioglossus muscle, are also implicated in breathing mechanics and a dysfunction of this musculature is clinically relevant in night apneas [5, 6]; the correct functioning of this musculature promote the lymphatic drainage of the upper airways, reducing the hypertrophy of these tissues that often do not find a solution after tonsillectomy and adenoidectomy [7].

The tongue and swallowing are also involved in ENT (otolaryngology) issues, such as otitis media [7], upper cervical spine and temporomandibular joint [8] and can cause headaches [9, 10].

Target

The tongue is involved in many day and night functions, such as swallowing [3], breathing [1, 5], sleep quality [6], posture and balance [1, 11].

Exercises have been proposed to improve the tone and strength of the muscles of swallowing, but the results are conflicting in literature [8, 12, 13] the age of the subjects seems to be an element that influences the results [14, 15]. The aim of this study is to describe and provide a tongue muscle normalization technique that helps the manual therapist in the treatment of problems related to it.

Bibliographic research strategy and eligibility criteria

The literature has been investigated through pubmed, Google scholar of the last 10 years, the keywords used and combined with the Boolean operators AND and OR, are: “tongue, tongue habits, tongue diseases, taste disorder, neck pain, posture, postural balance, atypical swallowing, muscle stretching exercise, tissue expansion, soft tissue therapy, osteopathic manipulative treatment”. The research produced 84 articles, between January 2010 and February 2020. Articles that spoke of surgery, pharmacology, pathology, trauma, deformity of the facial mass, disorders of the central and peripheral nervous system, piercing, nutrition were excluded. 16 articles were taken into consideration.

Description of the technique

The patient lying on his back, ask the subject to put his tongue out of his mouth and squeeze it between his teeth to relax his tongue (Figure 1; tongue protrusion of about 1.5–2 cm. The operator places himself at the side of the patient at head level, the cranial hand stabilizes the patient's head with a frontal grip, the caudal hand grasps the hyoid bone and the thyroid cartilage with a gripping grip (Figure 2). The operator will exert a longitudinal traction towards the patient's feet (Figure 3) three times with a speed of 1 cm per second [16], the traction must be well tolerated by the patient, not stimulate coughing or a sense of vomiting. The technique can be repeated two, three times; it is considered concluded when the patient, swallowing, has a wider/larger tongue sensation on the back palate.

Technique aim

The goal of the technique is to reset the deep tongue receptors [1] by stretching the tongue muscle. The normal



Figure 1: The patient lying on his back, ask the subject to put his tongue out of his mouth and squeeze it between his teeth to relax his tongue.

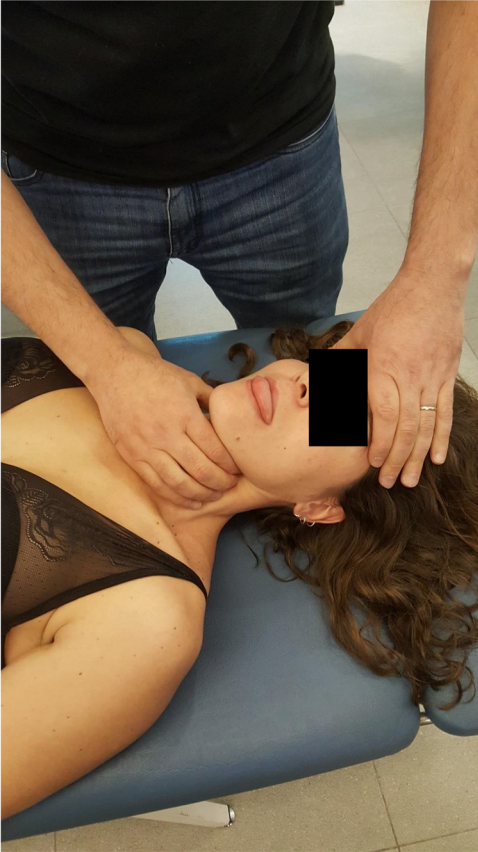


Figure 2: The operator places himself at the side of the patient at head level, the cranial hand stabilizes the patient's head with a frontal grip, the caudal hand grasps the hyoid bone and the thyroid cartilage with a gripping grip.

position of tongue reduces anteroposterior tensions [2], as result the tongue should be more relaxed, shorter and wider latero-lateral way, this justifies the feeling of wider/largest tongue to retropalatal when the technique is successful. The inherent muscles of the tongue will adapt to the new position in the oral cavity and a wider and larger tongue sensation will be felt.

Discussion – conclusion

In clinical practice, tongue dysfunctions have a frequency of 10–15% [3], they can cause various problems such as musculoskeletal pain in the cervical spine [8], postural disorders [1, 11], respiratory disorders [5, 7], sleep disturbance [6], atypical swallowing [3], headache [9, 10]. The simplicity of execution and application of the technique makes it a possible therapeutic tool in the clinical setting. So the sensory feedback of the patient with a wider/larger tongue during swallowing is a good indicator of the

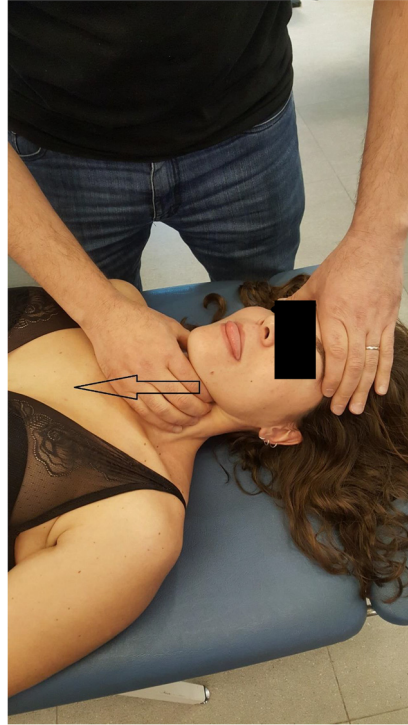


Figure 3: The operator will exert a longitudinal traction towards the patient's feet.



Figure 4: The technique in a sitting position: Start position.



Figure 5: The technique in a sitting position: Execution of the technique.

success of the technique for the operator. This sensation may be justified by the effects of manual therapy on brain correlates, in particular on the insula-based networks and its associated interceptive role. Manual therapy could exploit an interceptive paradigm that could explain the enhanced body awareness [17]. After the technique the patient will not compensate during swallowing with an extension movement of the head [8]. The auto fixed point of the tongue performed by the patient by squeezing the tongue between the teeth allows the operator a good manual control of the stabilization of the head and allows to perform the technique even in a sitting position (Figures 4 and 5) if the patient is unable to assume the declining position. We propose the application and evaluation of the effectiveness of the technique in the clinical setting as the next study objective.

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