

Revision articles

Orofacial myofunctional therapy program for individuals undergoing orthognathic surgery

Programa de terapia miofuncional orofacial para indivíduos submetidos à cirurgia ortognática

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Conflict of interest: non-existent

ABSTRACT

Purpose: to present an Orofacial Myofunctional Therapy Program for individuals submitted to orthognathic surgery.

Methods: 3 different steps were performed: the first involved preparation of the initial program, by reviewing the literature on the therapeutic process after surgery; the second comprised the application of the initial program by two speech therapists qualified in orofacial motricity, to 21 individuals, after orthognathic surgery, who suggested changes in the initial protocol, resulting in a second version; on the third and last stage, the content of the Therapy Program was analyzed by three speech therapists specialists in Orofacial Motricity and further changes were made.

Results: the Therapy Program was developed based on 38 scientific papers, whose application by the speech therapists resulted in changes, taking into account the facial typology and dento-occlusal conditions, storage of saline, detailing of the goals of proposed activities and elongation of the upper lip. After the experts' suggestions, the final version consisted of 12 sessions, the first being assessment, 10 sessions of therapy once a week, involving myofunctional exercises, sensorial stimulation and functional training, and the last session for re-assessment.

Conclusion: it was possible to develop a Myofunctional Orofacial Therapy Program aimed at individuals submitted to orthognathic surgery, to be validated in future studies.

Keywords: Myofunctional Therapy; Orthognathic Surgery; Speech, Language and Hearing Sciences

RESUMO

Objetivo: apresentar um Programa de Terapia Miofuncional Orofacial para indivíduos submetidos à cirurgia ortognática.

Métodos: foram realizadas 3 etapas distintas: a primeira envolveu a elaboração do programa inicial a partir da revisão da literatura sobre o processo terapêutico após a cirurgia; a segunda a aplicação do programa inicial por duas fonoaudiólogas especialistas em motricidade orofacial em 21 indivíduos, após ortognática, que sugeriram modificações no protocolo inicial, resultando numa segunda versão; na terceira e última etapa, o mesmo foi analisado quanto ao conteúdo por três fonoaudiólogas especialistas em Motricidade Orofacial e novas modificações foram realizadas.

Resultados: o programa foi elaborado com base em 38 trabalhos científicos, cuja aplicação pelas fonoaudiólogas resultou em modificações considerando a tipologia facial e as condições dento-oclusais, armazenamento do soro fisiológico; detalhamento dos objetivos das atividades propostas e alongamento do lábio superior. Após as sugestões das especialistas a versão final foi constituída de 12 sessões, sendo a primeira avaliação, 10 sessões de terapia uma vez por semana, envolvendo exercícios miofuncionais, estimulação sensorial e treino funcional, sendo a última sessão de reavaliação.

Conclusão: foi possível desenvolver um Programa de Terapia Miofuncional Orofacial para indivíduos submetidos à cirurgia ortognática, sendo necessário que o mesmo seja validado.

Descritores: Terapia Miofuncional; Cirurgia Ortognática; Fonoaudiologia

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INTRODUCTION

Dentofacial deformity (DFD) is defined as a facial and dental disproportion that is severe enough to affect the quality of life of an individual¹⁻⁵.

The correction of DFD at completion of craniofacial growth and development involves orthodontic treatment followed by orthognathic surgery⁵. The surgical procedure allows correction of facial disproportions of the mandible, maxilla and/or mentalis, as well as asymmetries⁶. However, it leads to variation in the structural balance of the facial skeleton, which may result in signs and symptoms of temporomandibular dysfunction (TMD)⁷⁻¹¹ and changes in orofacial musculature and functions^{11,12}.

Based on information related to the treatment planning of the DFD, the speech therapist may perform the therapy aimed at preparing the musculature involved in the surgical procedure, as well as to eliminate harmful oral habits and address cases of habitual mouth respiration, signs and symptoms of TMD and / or other conditions not related with the DFD¹³. After surgery, speech therapy aims to reduce the facial edema, stimulate the orofacial sensitivity, facial mimic and range of mandibular movements, with gradual reintroduction of food consistencies and adjustment of orofacial functions within the limits of each case¹⁴.

The literature on myofunctional therapy after orthognathic surgery presents the aspects to be addressed^{15,16} and case reports¹¹. So far, only one scientific study was found that demonstrated Orofacial Myofunctional Rehabilitation in 19 individuals, using a protocol that proved the efficacy of treatment after orthognathic surgery¹⁷.

Most patients seek for treatment for the deformity unaware of the role of speech therapist in an orthognathic surgery team, and many teams are still unaware of such performance. Additionally, the diagnosis and treatment of these individuals should be conducted by interdisciplinary teams, aiming to understand the adaptation and disorders presented, as well as the therapeutic possibilities in the different stages of orthodontic-surgical treatment¹⁸, highlighting the need to direct the action of specialists in Orofacial Motricity working in this field.

Thus, the objective of this study was to present a proposal of myofunctional therapy program for individuals submitted to orthognathic surgery.

METHODS

Initially, a 10-year literature review was conducted including national and international manuscripts, books, monographs, dissertations, theses, case reports and articles related to this subject published in the databases Science Direct, Pubmed, Scielo and Bireme, besides the Google Scholar search engine. The following terms were used in Portuguese and English: dentofacial deformity, orthognathic surgery, severe malocclusion, orthodontic-surgical treatment, myofunctional therapy, myofunctional rehabilitation and speech therapy.

The material was initially selected by title, followed by reading the abstract and then the full texts, analyzing the objectives, number and gender of participants, study method and results achieved. Studies that did not reach the objectives or whose full texts were not found were excluded.

Development of the protocol comprised three distinct stages, the first based on the literature found, resulting in the initial version of the myofunctional therapy protocol. For that purpose, the most frequent aspects described in texts addressing the therapeutic process after surgery were selected, as well as those considered relevant according to the clinical experience of the protocol designers.

This initial version was applied by two speech therapists specialists in orofacial motricity in 21 patients submitted to orthognathic surgery, being 10 individuals for speech therapist A and other 11 for speech therapist B, aiming to verify the feasibility of the instrument. Among these, eight presented DFD pattern II and 13 pattern III, who were submitted to Le Fort I osteotomy, sagittal/vertical ramus and chin surgery. Referrals for speech therapy were performed by the surgeons between 30 and 45 days after surgery.

After application of this first protocol, it was changed from the experience of myofunctional orofacial intervention, aiming to enhance the understanding and application of proposed exercises. Then, these suggestions were analyzed by the authors, some of which were accepted and some were rejected, resulting in a second version of the therapy protocol.

In the third and last stage, it was analyzed as to the content by three speech therapists specialists in Orofacial Motricity, with at least five years of experience in the care of individuals with dentofacial deformity submitted to orthognathic surgery, considering the number of sessions proposed, the division of objectives, selected exercises, relationship between

objectives and exercises, clear description of procedures, proposed assessments, additional explanatory information, and overview of the protocol.

The necessary changes were made based on the results achieved in the third stage, yielding the final version of the protocol.

RESULTS

The number of publications found by search on the different databases is presented in Figure 1.

Among the 108 papers found, 64 were full texts, among which 26 were excluded, remaining 38 papers for the study, as observed in Figure 2.

ENTRY KEYWORDS	DATABASES / SEARCH ENGINE					Total
	Science Direct	Pubmed	Scielo	Google Scholar	Bireme	
Deformidade dentofacial <i>Dentofacial deformities</i>	1,882	644	23	5,170	30	7,749
Cirurgia Ortognática <i>Orthognathic Surgery</i>	5,263	1,269	58	9,750	210	16,550
Má oclusão severa <i>Severe malocclusion</i>	3,281	624	10	10,900	48	14,863
Tratamento ortodôntico-cirúrgico <i>Orthodontic-surgical treatment</i>	5,686	59	24	195,000	39	200,808
Terapia miofuncional <i>Myofunctional therapy</i>	2	160	19	21,500	288	21,969
Fonoterapia <i>Speech therapy</i>	23,995	6,093	113	23,700	1,579	55,480
Reabilitação Miofuncional <i>Myofunctional rehabilitation</i>	1	146	0	3,610	56	3,813

Figure 1. Results of search performed in databases on orofacial myofunctional therapy for individuals undergoing orthognathic surgery

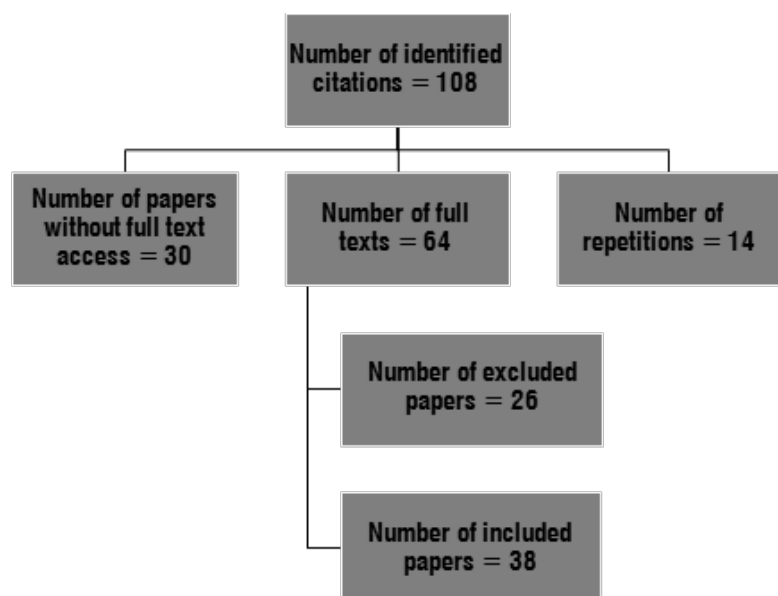


Figure 2. Summary of search performed

The initial version of the Orofacial Myofunctional Therapy Protocol was designed based on therapy proposals presented in the selected papers.

After application of the first version of therapy program by the speech therapists, the authors accepted suggestions that led to inclusion of information to further elucidate the description of items comprising the second version of the Protocol, as follows:

- consider the facial typology and dento-occlusal conditions, even after orthognathic surgery;
- include care on the storage of saline solution;
- provide details on the objectives of proposed activities;
- add one more strategy for elongation of the upper lip, such as keeping a rubber tube in the upper vestibule elongating the upper lip, whose thickness depends on the need of each patient.

Thereafter, the proposed therapy was analyzed by three experts that suggested changes in the Protocol, most of which were accepted:

- consider the types of surgical procedures to guide the aspects addressed in the therapy;
- rule out mobility of the upper facial third;
- elongate the muscle after training the mobility of facial mimic to avoid formation of wrinkles;
- elucidate the suggested movement for tongue mobility;
- change the term "Protocol" by "Therapy Program".

This led to the final version, proposing 12 weekly sessions, being one assessment before treatment onset and one re-assessment after therapy completion, as well as 10 sessions of Orofacial Myofunctional Therapy (Figures 3 and 4).

Figure 3 presents the approaches of Orofacial Myofunctional Therapy per week, and the suggested exercises are presented in detail in Figure 4.

OVERALL INSTRUCTIONS

Therapy program initiated 30 days after surgery with duration of three months, comprising one session per week.

FIRST WEEK

- Application of Clinical History and Orofacial Myofunctional Assessment Protocols.
- Record keeping (photographs and video recordings).
- Explanation on the orofacial myofunctional adaptations/dysfunctions presented by the patient before and after orthognathic surgery.
- Explanation about the therapeutic process.

SECOND WEEK

- Promotion of awareness and perception on harmful oral habits with indication of strategies to eliminate them, including mobile alarm and records that may be promptly seen by the patient (working desk, computer, car, restroom, headboard, fridge, close to the TV, and others).
- Promotion of awareness on alterations in tone, mobility, sensitivity and orofacial functions presented by the patient. For that purpose, show photographs and video recordings of the patient, as well as static and dynamic images illustrating the normality of anatomical and physiological aspects of the stomatognathic system. Ask the patient to identify differences between his or her records and the normal standards. Explain the causes of alterations/adaptations found and the need to restore the orofacial functions.
- Perception on the respiratory type and mode presented by the patient presented by the patient.
- Respiratory training (type and/or mode).
- Stimulation of sensitivity.
- Mobility exercises.
- Counseling on home accomplishment of strategies for:
 - stimulation of sensitivity;
 - respiratory training;
 - training of habitual positioning of mandible, lips and tongue at rest;
 - mobility exercises.

THIRD WEEK

- Perception of change in the frequency and duration of harmful oral habits.
- Perception of change in respiratory function.
- Respiratory training (type and/or mode).
- Perception of habitual positioning of mandible, lips and tongue at rest.
- Training of habitual positioning of mandible, lips and tongue at rest.
- Mobility exercises.
- Tone exercises.
- Perception of masticatory pattern performed by the patient and awareness on the new pattern to be achieved.
- Training of simultaneous bilateral mastication.
- Counseling on home accomplishment of strategies for:
 - stimulation of sensitivity;
 - respiratory and mastication training;
 - training of habitual positioning of mandible, lips and tongue at rest;
 - mobility and tone exercises.

FOURTH WEEK

- Perception of change in the frequency and duration of harmful oral habits.
- Perception of change in respiratory and masticatory functions.
- Respiratory training (type and/or mode).
- Training of habitual positioning of mandible, lips and tongue at rest.
- Mobility exercises.
- Tone exercises.
- Training of simultaneous bilateral mastication.
- Perception of masticatory pattern performed by the patient and awareness on the new pattern to be achieved.
- Training of function of the mandible, lips and tongue during swallowing of solid foods.
- Counseling on home accomplishment of strategies for:
 - stimulation of sensitivity;
 - respiratory, mastication and swallowing training;
 - training of habitual positioning of mandible, lips and tongue at rest;
 - mobility and tone exercises.

<p>FIFTH WEEK</p> <ul style="list-style-type: none"> • Perception of change in the frequency and duration of harmful oral habits. • Perception of change in respiratory, masticatory and swallowing functions. • Respiratory training (type and/or mode). • Training of habitual positioning of mandible, lips and tongue at rest. • Mobility exercises. • Tone exercises. • Training of simultaneous/alternate bilateral mastication (dependent on dento-occlusal condition, temporomandibular joints and mandibular movements). • Training of function of the mandible, lips and tongue during swallowing of solid and liquid foods. • Counseling on home accomplishment of strategies for: <ul style="list-style-type: none"> - stimulation of sensitivity; - respiratory, mastication and swallowing training; - training of habitual positioning of mandible, lips and tongue at rest; - mobility and tone exercises.
<p>SIXTH / SEVENTH / EIGHTH WEEKS</p> <ul style="list-style-type: none"> • Perception of change in the frequency and duration of harmful oral habits. • Perception of change in respiratory, masticatory and swallowing functions. • Mobility exercises. • Tone exercises. • Training of simultaneous/alternate bilateral mastication. • Training of function of the mandible, lips and tongue during swallowing of solid and liquid foods and saliva. • Perception on the speech pattern performed by the patient and promotion of awareness on the correct pattern. • Speech training (phonetic). • Counseling on home accomplishment of strategies for: <ul style="list-style-type: none"> - stimulation of sensitivity; - tone exercises; - monitoring of respiratory, masticatory and swallowing functions; - speech training (phonetic).
<p>NINTH / TENTH / ELEVENTH WEEKS</p> <ul style="list-style-type: none"> • Perception of change in the frequency and duration of harmful oral habits, sensitivity and orofacial functions. • Training of simultaneous/alternate bilateral mastication. • Training of swallowing of liquid and solid foods. • Speech training (phonetic). • Counseling on monitoring of orofacial functions. • Counseling for the accomplishment of strategies for stimulation of sensitivity at home, if necessary.
<p>TWELFTH WEEK</p> <p>Reapplication of protocols for assessment and recording (photographs and video recordings).</p> <p>Patient's perception on his or her improvement.</p> <p>Counseling and definition of approach.</p> <p>Note: During application of the Therapy Program, the clinician should be attentive to signs and symptoms of temporomandibular dysfunction and consider these aspects in the therapeutic planning.</p>

Figure 3. Orofacial myofunctional therapy program after orthognathic surgery

SENSITIVITY		
Objective/Reason	Strategies/Accomplishment	Frequency and Duration of Exercises
Stimulate the orofacial sensitivity, directing the process of functional reorganization by sensitive afferent information.	Mouth rinsing with tepid water, followed by cool water.	Perform 3 sequences of application of opposite and alternate stimuli, with 5-second duration each and 15-second interval between series.
	Apply tepid water on facial regions with altered sensitivity, followed by cool water.	
	Stimulate the face with cotton, followed by rough sponge, on altered regions.	
MOBILITY		
Objective/Reason	Strategies/Accomplishment	Frequency and Duration of Exercises
Increase the mobility of mimic and facial expression muscles and tongue, allowing coordinate and accurate muscle recruitment for adequate performance of orofacial functions.	Lips: - ask for alternate movements of protraction of closed lips and retraction of open lips; - ask for clicking movements with the lips protracted (smack).	Perform 3 series of 10 to 15 movements, at a rhythm of one movement per second, with 10- to 15-second interval between series. Note: in the presence of asymmetry between movements performed on the right and left, ask for maintenance of movement to the side with greater difficulty during 5 to 10 seconds at completion of each series.
	Tongue: - ask for anteroposterior tongue movements on the palate; - ask for tongue lateral movements inside the oral cavity, alternately touching the right and left buccal mucosa, keeping the lips occluded and the mandible lowered with stability; - ask for lateralization of a dietary candy in the oral cavity, alternately transferring it from the right to the left buccal region.	
	Mandible: - ask for mouth opening and closure movements keeping the tongue tip on the incisive papilla as a guide; - ask for mouth opening and closure movements keeping the tongue tip on the incisive papilla as a guide, keeping the mouth open for 10 to 30 seconds at completion of each series of movements; - ask for alternate lateral mandibular movements to the right and left, keeping a tongue depressor between the tooth occlusal surfaces as a guide. ** It should be emphasized that the patient should perform this exercise looking at the mirror, monitoring the mouth opening and closure movements, which should occur without deviations or deflection.	
Note:	<i>For exercises targeted to the suprahyoid muscles, the surgical movement performed should be considered. Mandibular protrusive movements are indicated in cases of mandibular advancement. Cases of mandibular setback should perform exercises recruiting the mandibular retrusion muscles.</i>	
TONE		
Objective/Reason	Strategies/Accomplishment	Frequency and Duration of Exercises
Increase the tone of lips, tongue and cheeks, allowing muscle strength and force for adequate performance of orofacial functions.	Lips: - upper: apply resistance with a tongue depressor against the buccal vestibule in three positions: central and right and left laterals; - lower: apply resistance with a tongue depressor against the buccal vestibule in three positions: central and right and left laterals.	Perform 3 series of 5 to 30 seconds of sustained contraction, with 5- to 30-second interval between series. Note: in the presence of tone asymmetry, ask for maintenance of muscle contraction for twice the time on the weakest side.
	Tongue: - apply resistance with a tongue depressor against the upper and lateral tongue regions; - ask for tongue sharpening inside the oral cavity; - ask for tongue backward movement inside the oral cavity. * After full maxillary bone repair ** After full mandibular bone repair	
	Cheeks: apply resistance with a tongue depressor against the buccal region on 3 bundles of the buccinator muscle.	
Reduce the mentalis tone, allowing deactivation of muscle recruitment during functions	Perform slow and deep massage in the direction of fibers of the mentalis muscle.	Perform 3 series of 10 to 30 seconds with 10- to 30-second interval between series.

LIP MORPHOLOGY		
Objective/Reason	Strategies/Accomplishment	Frequency and Duration of Exercises
Elongate the upper lip and eliminate eversion of the lower lip, aiming to promote adequate lip closure during orofacial functions	Upper lip: - perform massage using two fingers to elongate the philtrum and upper orbicularis oris, initiating from the nose base downwards. Position one finger in the buccal vestibule and the other in the same direction, yet externally. - keep a 5-mm thick rubber tube on the upper vestibule, elongating the upper lip*. If necessary and/or indicated, a 9-mm rubber tube may be used. In the presence of contraction of the mentalis muscle, apply massage to the mentalis during the exercise.	Perform 3 series of 10 massages with 10-second interval between series. Perform 3 series of 10 to 30 seconds with 10- to 30-second interval between series.
	Lower lip *: - ask the patient to gently bite the lower lip with the maxillary teeth, when the patient should hold and maintain the lower lip. * These exercises should be monitored to avoid compensatory mandibular movements.	Perform 3 series of 10 to 30 seconds with 10- to 30-second interval between series.
HABITUAL POSITIONING OF MANDIBLE, LIPS AND TONGUE		
Objective/Reason	Strategies/Accomplishment	Frequency and Duration of Exercises
Adjust the habitual positioning of the mandible, lips and tongue, allowing maintenance of nasal respiration and adequate tone achieved by orofacial myofunctional exercises.	Ask the patient, during specific activities, to maintain: - the mandible raised, yet without tooth contact, keeping the free functional space; - the lips in contact or slightly apart; - the tongue behind the maxillary or mandibular teeth, with the tongue tip touching the alveolar region. * The facial typology and dento-occlusal conditions should be considered, even after orthognathic surgery.	Place records that may be promptly seen by the patient (working desk, computer, car, restroom, headboard, fridge, close to the TV, and others).
RESPIRATION		
Objective/Reason	Strategies/Accomplishment	Frequency and Duration of Exercises
Nasal hydration and hygiene.	Clean the nostrils with saline *: - apply saline solution at room temperature in the nostrils, slowly aspirating; following, blow the nose gently, one nostril at a time. * Care with the saline solution: store in the refrigerator; renew at every 07 days; do not allow the dropper to contact the saline flask (place the saline to be used for cleaning in a small cup and discard the remaining solution).	Perform 3 to 4 times a day, every day.
Increase the local blood and lymph circulation to improve the nasal aeration.	Perform finger massage on the nasal alae, maintaining the two index fingers at the nasal ala region, with up-down and front-back circular movements.	Perform 5 series of 5 to 10 circular movements with 30-second interval between series.
Stimulate the nasal respiration.	Ask sealing of one nostril followed by deep inspiration. Alternate the nostril sealing and ask for expiration.	Perform 3 series of sequences of inspiration/expiration, alternating the side of nostril sealing
Train the lower middle respiration	Ask the patient, lying back and with the hands on the abdomen, to perform nasal inspiration expanding the diaphragm region, followed by deep and slow expiration.	Perform 3 series of 5 respirations with to 30- to 60-second interval between series.
Note	The exercises for nasal respiration should be performed in cases without signs of nasal obstruction.	

MASTICATION*		
Objective/Reason	Strategies/Accomplishment	Frequency and Duration of Exercises
Adjust the masticatory pattern, aiming at maintenance of orofacial functional and esthetic balance.	<ul style="list-style-type: none"> - ask for monitoring of the function of orbicularis oris, mentalis and/or buccinator muscles during mastication, as well as the speed applied to perform the function. - ask for simultaneous bilateral mastication: bite the food with the anterior teeth (after allowed by the surgeon), initiate by the mastication preference side, distribute the food on the occlusal aspect of posterior teeth bilaterally and masticate on both sides for some time, at one cycle per second. - ask for alternate bilateral mastication (in the absence of occlusal interferences, signs or symptoms of temporomandibular dysfunction): bite with the anterior teeth, initiate by the mastication preference side and alternate the mastication side systematically, at one cycle per second. <p>* the consistency of foods will depend on the guidance of the maxillofacial surgeon.</p> <p>* the alternate bilateral mastication will depend on the evolution of orthodontic treatment.</p>	Perform masticatory training during one meal per day.
SWALLOWING		
Objective/Reason	Strategies/Accomplishment	Frequency and Duration of Exercises
Adjust the swallowing pattern, aiming at maintenance of orofacial functional and esthetic balance.	Solid food: ask for swallowing of solid foods sequentially to the masticatory training, guiding maintenance of mandibular stability, labial occlusion and tongue positioning against the palate during swallowing.	Perform training during one meal per day.
	<p>Liquid food*:</p> <ul style="list-style-type: none"> - directed swallowing: ask to place some water in the mouth and maintain the mandible stable, lips occluded, with tongue movements in contact with the palate. - habitual swallowing: ask for water swallowing sequentially, controlling the tongue positioning and movement. Initially employ a small cup (coffee) and increase the cup according to the patient's performance. <p>*employ other liquids besides water, as juices of varied flavors.</p>	Perform training with one glass of water 3 times a day.
	Saliva: ask for voluntary control of tongue positioning on the palate during swallowing of saliva.	Note the swallowing of saliva stimulated by a dietary candy 3 times a day.
SPEECH		
Objective/Reason	Strategies/Accomplishment	Frequency and Duration of Exercises
Adjust the phonetic aspects of speech and facial expressivity, aiming at maintenance of orofacial functional and esthetic balance.	<ul style="list-style-type: none"> - ask for production of isolated phonemes, followed by syllables, words and sentences. - ask for monitoring of production of target phoneme in directed speech activities. - employ auditory (in case of distortions) and visual biofeedback (for monitoring of recruitment of mimic and facial expression muscles). <p>*Attention should be given to the mandibular movements (projection or deviations) during speech.</p>	Perform training of articulatory production in specific activities combined with the patient.

Figure 4. Details of exercises proposed in the Orofacial Myofunctional Therapy Program

DISCUSSION

Considering that speech-language rehabilitation in cases submitted to orthognathic surgery aims at favoring the orofacial and cervical functions for muscular balance, reducing the risk of relapse caused by maintenance of inadequate functional patterns, the present study aimed to develop an Orofacial Myofunctional Therapy Program to guide professionals in the intervention on such patients. According to Pimenta et al. (2000)¹⁹, the use of protocols tends to improve the care, favor the use of scientifically based practices, minimize the variability of information and approaches between team members, as well as to establish limits of action and cooperation between the different professionals.

Regarding the results of search on databases on speech-language therapy in individuals submitted to orthognathic surgery, studies on adaptation of the stomatognathic system were found^{11,20,21}, as well as case reports^{22,23}. Other studies theoretically demonstrated the speech-language intervention in the different stages of care to patients submitted to this type of surgery, yet without presenting a program or protocol^{11,24-28}. Additionally, one study demonstrated the functional response of mastication after speech therapy intervention in patients submitted to orthognathic surgery²⁹, in which the investigators applied a treatment protocol whose objectives were similar to those proposed in this paper, yet without description of the therapeutic procedures.

Thus, the first step in establishing the therapy program comprised a literature review with selection of 38 papers, from which the aspects to be addressed in the therapy were defined, as follows: increased strength and mobility of the lips, tongue and cheeks³⁰⁻³²; perception of the stomatognathic system^{11,29}; adaptation of the habitual posture of the lips, tongue and mandible; exercises for mandibular mobility^{11,29}; adequacy of respiratory functions^{11,29,31-33}; mastication^{11,29,32,33}; swallowing^{11,29,30} and speech^{11,29,31,33}. These aspects were distributed in a program comprising 12 sessions to be held once a week, while another study designed a program of 6 sessions²⁸, yet with a technical focus only on masticatory function, which explains the greater number of sessions proposed in this paper.

The first version of the program was applied by two speech therapists in 21 patients. This experience of application resulted in changes, so that the program presented a clearer language, favoring the understanding of proposals and leading to the second

version. No study found in the literature described the process of designing protocols and programs of orofacial myofunctional therapy to allow comparison of such results. However, the application of assessment protocols by specialists has been described as an important step in the development of such assessment tools³⁴⁻³⁸.

In the third stage, after changes, the program was sent to three specialists for analysis; this process was also performed in another study¹¹, in which the case studies, assessments and reassessments, as well as checking of all final data were reviewed and monitored by three speech therapists with more than 10 years of experience in the field. The changes suggested by the examiners allowed to consider the types of surgical procedures to guide the aspects addressed in therapy³⁹; rule out mobility of the upper facial third; elongate the muscles after training the mobility of facial mimic to avoid formation of wrinkles; and to better elucidate the movements suggested for tongue mobility.

The limitations of the therapy program herein presented should be taken into account, considering the types of surgeries performed and the individual characteristics of each patient (neuromuscular, bone and mucosa repair, temporomandibular dysfunctions, evolution of orthodontic treatment), which determines individual approaches, in which the program is a proposal of foundations of myofunctional work for this population.

It should be considered that, for intervention in cases submitted to orthognathic surgery, it is necessary to have knowledge on the anatomical, functional, surgical and orthodontic aspects, as well as close contact with the orthodontist and maxillofacial surgeon, to seek information about the evolution of cases and thus adapt the speech therapy treatment for each patient. Finally, it should be highlighted that selection of proposed exercises should take into account the moment when the patient is referred for speech therapy, the process of remodeling of temporomandibular joints after orthognathic surgery, as well as the time of bone consolidation and the response of healing of each patient.

Finally, the American Speech-Language-Hearing Association – ASHA (2004)⁴⁰ published recommendations regarding the need for evidence-based practices, advocating the use of validated protocols for diagnosis and therapy. To verify the total validity of an instrument, it should be composed of three parts: content validity, criterion validity and construct validity. Thus, it is

necessary to continue the present study for validation of the myofunctional treatment proposal related to orthognathic surgery herein presented.

CONCLUSION

It was possible to develop an Orofacial Myofunctional Therapy Program comprising myofunctional exercises, sensorial stimulation and functional training, aimed at individuals submitted to orthognathic surgery, which should yet to be validated in future studies.

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