

EFFECTIVENESS OF SPEECH THERAPY IN PATIENTS WITH FACIAL PARALYSIS AFTER PAROTIDECTOMY

Efetividade da fonoterapia em pacientes com paralisia facial pós-parotidectomia

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ABSTRACT

The goal of this research was to verify the effectiveness of speech therapy in patients with facial paralysis due to the manipulation of the facial nerve performed during surgical treatment for cancer of the parotid gland, as well as identify and promote phoniatrics of changes as sucking, chewing and swallowing. This was a qualitative survey with descriptive analysis. The evaluation consisted of analysis of the patient's face at rest and at motion, photographic documentation, use of Digital Caliper for quantification of facial palsy in addition to evaluation and followed the particularities of each individual. Speech therapy was defined based on the findings of the evaluation and followed the needs of each individual. In the evaluation at rest after the speech therapist there was improvement in all aspects. In the valuation at move three patients showed 3 as lowest quote, that indicates clearer skins with increase in the number and death of wrinkles. In photographic record all patients had significant improvement in the movements evaluated, possible to observe an increase in expression lines and greater symmetry between hemifaces. The values of the incompetence of motion measured post speech therapy showed noticeable improvement in all measured points. Speech therapy proposed for cases of facial palsy after parotidectomy was effective for the improvement of facial mime, especially for changes in stomatognathic functions. It's important to stress the need for further studies involving a larger number of participants to ensure the reliability of the findings.

KEYWORDS: Neoplasms; Parotid Gland; Facial Paralysis; Speech Therapy

■ INTRODUCTION

The pleomorphic adenoma is the most common benign tumor from the parotid gland, with high incidence in females and being more frequent from the 4th decade of life^{1,2}.

The parotid gland is anatomically divided into superficial and deep lobe, from the crossing of the facial nerve^{3,4}. The parotidectomy, which consists of surgical resection of the tumor is the most commonly used form of treatment, and the extent of surgery depends on the size of the disease. The surgical procedure can be performed superficially or deeply with the majority of neoplasms being superficial to the facial nerve³.

Studies have reported factors associated with facial paralysis after parotidectomy, among these are the involvement with the superficial or deep lobe of the gland, tumor size, recurrence and whether there was manipulation of the facial nerve during surgery⁵.

As a result of facial paralysis, the patient may experience difficulties in stomatognathic functions, such as speech, chewing, swallowing, suction,

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in addition to changes in facial expression^{6,7}. The clinical manifestations present in facial paralysis range from the asymmetry of the face to the disturbances of form and function such as incomplete eye closure, diversion of naso-labial fold, reduction of the force of the orbicularis oris muscles, inability to smile and disfigurement of facial mimic⁸.

In addition to the visible changes involving facial movements and stomatognathic functions, facial paralysis can cause emotional and psychosocial changes that directly affect the quality of life of patients⁹⁻¹¹.

The speech therapist, whose work field consists of Orofacial Motricity and Dysphagia, is the health professional able to address the structural and functional aspects of facial paralysis. Therefore, possible changes arising from parotidectomy sequelae can be addressed through speech therapy.

Based on the findings of the assessment, one may act with orofacial passive maneuvers and functional execution of each movement^{12,13}. The manual manipulations must follow the direction of muscle fibers and implementation of the functional facial movements can be done isometrically and/or isotonicly. Isometric exercises should be used to increase muscle strength and isotonic ones to maintain muscle tone and movement control¹²⁻¹⁵.

Considering the damage to somatic, social and emotional levels⁹ that facial paralysis can cause, the aim of this study was to verify the effectiveness of speech therapy in patients with facial paralysis resulting from the manipulation of cranial nerve VII performed during surgical treatment for neoplasms of the parotid gland, as well as to identify alterations of suction, chewing and swallowing and promote speech therapy intervention.

■ PRESENTATION OF CASES

The sample consisted of four individuals, two males and two females aged between 30 and 41 years, with a mean age of 35.75 years with standard deviation of ± 5.56 who were attended at the Speech Therapy Department of Head and Neck Ambulatory Care of Aristides Maltez Hospital (HAM).

This case study met the principles of beneficence, non-maleficence, autonomy and justice envisaged in Resolution MS/CNS/CNEP No 196/96 and only started after the approval of the Research Ethics Committee (REC) of the State University of Bahia, under the number 179,896/12 and the REC protocol of the referred hospital under the number 204,652 / 13. All subjects agreed to participate and signed the Informed Consent Form (ICF).

This is a qualitative research with descriptive analysis of four cases. A digital caliper was used to

measure peripheral facial paralysis and, based on previous study¹⁶, the incompetence of the movement (IM) was measured by simple percentage both in the first and last day of service. It is worth to mention that the evaluations of the face at rest and in motion of the stomatognathic functions and the measurement with a digital caliper were performed before and after speech therapy service in order to outline the gain obtained with the speech therapy.

Patients were selected according to the treatment carried out for parotid gland neoplasm and the information about the surgical and immediate postoperative procedures contained in the medical reports. Therefore, the inclusion criteria were: performance of total or subtotal parotidectomy with total preservation or sacrifice of a maximum of one branch of the facial nerve or parotidectomy without facial nerve involvement and sequela presence of peripheral facial paralysis and/or facial paresis.

According to medical record data, all patients underwent Fine Needle Aspiration (FNA) with cytopathologic diagnosis of pleomorphic adenoma. By anatomo-pathological examination it was found negative cytological diagnosis of malignancy. All patients meet the D110 code that refers to benign neoplasm of the parotid gland in accordance to the International Classification of Diseases (ICD-10).

Patient 01: male, 41 years, went through the first appointment in the Department of Head and Neck on September 4, 2012, presenting a tumor with progressive growth associated with pain, itching and burning in the right parotid gland region. The patient had already undergone two previous surgeries for treatment of neoplasm in the same region, but no sequelae of facial mimic. The first surgery was performed in 2010 and the second in early 2012, due to recurrence. As further offense occurred, he was forwarded to HAM and on March 11th, 2013 a total right parotidectomy was performed with sacrifice of the marginal branch of the facial nerve. Altered facial mimic was stated in the discharge summary, with paresis of the right side of the mouth.

Patient 02: female, 37 years, was attended on October 1st, 2012 at HAM with complaints of lump in the left region of parotid gland with pain, itch, burn, sting, headache and report of earache on the left side. She underwent removal of the parotid lump five years ago in the city in which she resides, however no sequelae of facial mimic were observed at the time. Due to recurrence, she was forwarded to HAM and on March 21st, 2013 a subtotal left parotidectomy was performed. In the discharge summary, it was written that she presented mild paresis of the orbicularis branch of the facial nerve.

Patient 03: male, 30 years, was attended on October 9th, 2012 at HAM with complaints of a lump

in the right parotid region that had been there for 1 year, with progressive growth. He referred to local pain, right sided earache and headache. Around 1 year ago, he was attended by a doctor at another hospital where he received palliative treatment, but did not use drugs. On April 15th, 2013, total parotidectomy was performed at HAM with an attempt to preserve the facial nerve, since the tumor was attached to the upper trunk of the VII pair of cranial nerves. According to the discharge summary, the patient recovered uneventfully and facial mimic was preserved.

Patient 04: female, 40 years, was attended on September 24th, 2012, at HAM referring to a pain in the right parotid region that had been occurred for two months, denying other symptoms. She underwent surgery on April 30th, 2013, with resection of superficial and deep lobe tumor and preservation of facial nerve. The discharge summary stated that the patient complained of tearing in the right eye and presented paralysis of the marginal branch and paresis of the orbicularis branch.

The speech therapy treatment started within fifteen to twenty days after the surgical procedure, noting that evaluations of facial mimic and stomatognathic functions were firstly performed. The speech therapy service was defined accordingly to the assessment findings and followed the needs of each individual.

Subjective analysis of the patient face at rest and in motion was outlined by an assessment form, and objective analysis through photographic documentation and measurement of peripheral facial paralysis by Digimess digital caliper.

Based on previous study¹⁷, it was observed whether there were total or partial alterations or if the following aspects were normal in the subjective evaluation of the face at rest (ANNEX 1): abolition of forehead wrinkles, lowering the tip of the eyebrow, more open eye/falling lower eyelid, deviated nose to the healthy side, abolition of nasolabial folds, deviation and depression of labial commissure, "collapsed" upper lip, saggy cheek.

In the subjective evaluation of the face in motion (ANNEX 1), patients were asked to perform the expressions of "closing the eyes gently" and the gap was measured, "face of bad smell", "grin" and "beak". The movements were set accordingly to the literature suggestions¹⁷ and were classified under the following scores: 0 = contraction visible neither by naked eye nor under oblique light; 1 = little mobility of skin; 2 = the skin moves more, wrinkles can slightly be noted; 3 = skin moves more evidently, increase of wrinkles as well as their depth; 4 = large range of movement is performed synchronously and symmetrically in relation to the healthy side.

During photographic documentation with a Kodak Easyshare C813 digital camera, each patient was asked to sit comfortably on a backrest chair with flat feet on the floor and the evaluator was positioned in a chair just in front at a distance of about 90 cm. The expressions "scared face", "face of bad smell", "beak" and "grin" were requested in order to identify the change of upper, mid and lower third facial mobility.

The measurement of facial movement (ANNEX 1) was carried out using a Digimess digital caliper (0.00 to 157.42 mm) and according to a study¹⁶, the movements of smile and nasal contraction were measured from fixed points such as the tragus (T), inside (ICO) and outside corners of the eye (OCE) and as moving points, the labial commissure (LC) and the wing of the nose (WN). Smile movements were measured bilaterally at three different distances: T-LC, ICO-LC and OCE-LC and nasal contraction movements were measured on both sides of the face from the ICO to the WN. While measuring movements of smile and contraction of the wing of the nose, the patient was asked to sit comfortably and the therapist positioned himself in front, so that he could measure the face from one side to another. To avoid altering the obtained values the patient was instructed to keep looking ahead at the time of measurement.

As suggested by the literature, the values obtained in the measurement of peripheral facial paralysis with the caliper were used to obtain the value of the incompetence of movement (IM), which represents how much the paralyzed side (PS) is more flaccid than normal side (NS) in simple percentage. The calculation was based on the average distances of the smile movement and the contraction of the wing of the nose, applying the following formula:

$$IM = \frac{PS-NS}{NS} \times 100$$

Besides the subjective and objective evaluation of facial paralysis, the evaluation of stomatognathic functions of suction, chewing and swallowing were carried out with the following consistencies: liquid (water), pasty (yogurt) and solid (stuffed cookies). To observe the functions, patients received no instruction, they were just asked to eat in a usual way.

For rehabilitation, eight to ten speech therapy sessions were conducted weekly, each of them lasted approximately fifty minutes. At this time, cryotherapy associated with stimulation of the movements was carried out with a maximum duration of five minutes; as well as inducing massage for ten minutes; fifteen

minutes of isometric and/or isotonic oro-myofunctional exercises; ten minutes of exercises aimed at stomatognathic functions and ten minutes of patient orientation and training concerning exercises of facial mimic movements and relating to the tasks to be performed at home, which were about ten to twenty repetitions three times a day.

Cryotherapy was carried out on the the paralyzed side to stimulate the contraction of the affected region and the regions of lower sensitivity. Ice cubes of approximately 25x25 mm and covered by a plastic surface were used to make sliding movements in the direction of the muscle fibers.

The inducing massage was performed on the affected muscle region following the direction of the muscle fiber, from bottom to top with speed and pressure aimed at inducing the movement of muscles with paresis or paralysis.

Isometric myofunctional exercises with movements of "scared face", "angry face", "face of bad smell", "closing the eyes gently", "closing the eyes tightly", "shaving the mustache", "beak", "grin", "closed smile" and "having the dental floss", aimed to gain muscle strength and were done with manual help in order to provide greater symmetry of movements. After recovery of movements, exercises started to be performed isotonicly and the number of repetitions varied according to presence of tremors and muscle fatigue.

Exercises of stomatognathic functions such as tongue rotation in oral vestibule, against resistance of cheek and tongue, masticatory training with chewing gum, inflating cheeks separately and alternating sides, beak smile and lip smacking were focused on gaining oral muscle tone and subsequent control of the muscles involved in chewing and suction.

All the proposed exercises for facial improvement were performed in front of a mirror to ensure visual feedback and to help in the perception of symmetry of the movements.

At the end of the treatment the patients were reassessed, taking into account the same subjective and objective analyses, in order to compare the results before and after speech therapy.

■ RESULTS

In the subjective evaluation of the face at rest, the previously mentioned aspects were scored 1-3: 1 meaning total, 2 partial and 3 normal, as shown in Table 1.

It could be observed in the evaluation at rest (Table 1) of patient 01 that all evaluated aspects were normal, except the abolition of forehead

wrinkles that received score 1. According to the subjective evaluation in motion (Table 2) and based on photographic documentation, patient 01 showed paralysis in two-thirds of the face. The evaluation of stomatognathic functions of suction, chewing and swallowing before speech therapy showed escape of liquid in suction, alternating bilateral chewing and normal swallowing.

In the evaluation of face at rest (Table 1) patient 02 presented partial abolition of the forehead wrinkles and upper lip partially collapsed. In the subjective evaluation in motion (Table 2) and the photographic documentation, the patient presented paresis in the upper third and paralysis in the lower and mid third, except in the "beak". The evaluation of stomatognathic functions of suction, chewing and swallowing before speech therapy showed escape of pasty when ingested in large quantities, slight mentalis contraction in swallowing solid food, right unilateral chewing, and changes were observed such as mouth opening limitation and reported pain when chewing and opening the mouth.

There was a total abolition of forehead wrinkles and partial abolition of nasolabial folds in the evaluation of the face at rest of patient 03 (Table 1). Based on subjective evaluation in motion (Table 2) and the photographic documentation, the patient presented paresis in three thirds of the face. The evaluation of stomatognathic functions of suction, chewing and swallowing before speech therapy showed adequate lip closure in both liquid and pasty suction, vertical chewing movements and good lip closure in swallowing liquid, pasty and solid, although with contraction of mentalis.

In the evaluation of the face at rest (Table 1) of patient 04, it was observed that only two of the evaluated aspects were normal. In the evaluation in motion (Table 2) and the photographic documentation, paresis in the upper third and paralysis in the lower and mid third were observed. The evaluation of stomatognathic functions of suction, chewing and swallowing before speech therapy showed lip closure difficulty in suction of liquid and pasty, extraoral escape of liquid, mild tongue anteriorization in order to compensate for the difficulty of lip closure. Chewing was predominantly left unilateral (non paralyzed) with contraction of the masseter muscle on the same side, difficulty of lip closure and presence of bolus spread in the oral cavity after swallowing. During swallowing, lip closure difficulty and contraction of mentalis were observed. Furthermore, it was observed contraction of the masseter muscle on the affected side during swallowing pasty and solid food.

Table 1 – Values of evaluation of the face at rest before speech therapy

Patient nº	Score 01	Score 02	Score 03	Score 04
Abolition of forehead wrinkles	1	2	1	2
Lowering the tip of the eyebrow	3	3	3	3
More open eye/ falling lower eyelid	3	2	3	2
Deviated nose to the healthy side	3	2	3	1
Abolition of nasolabial folds	3	2	2	2
Deviation and depression of labial commissure	3	2	3	1
Collapsed upper lip	3	2	3	3
Saggy cheek	3	3	3	2

Score: 1=total; 2 = parcial; 3= Normal

Table 2 – Values of evaluation in motion before speech therapy

Patient nº	Score 01	Score 02	Score 03	Score 04
<i>Expressions</i>				
“Closing the eyes gently”	2	1	3	1
<i>Gap</i>	-	5,5	-	2,3
“Face of bad smell”	0	0	2	0
“Grin”	0	0	3	0
“Beak”	0	1	2	0

Score: 0 = contraction visible neither by naked eye nor under oblique light; 1 = little mobility of skin; 2 = the skin moves more, wrinkles can slightly be noted; 3 = skin moves more evidently, increase of wrinkles as well as their depth; 4 = the large range of movement is performed synchronously and symmetrically in relation to the healthy side¹⁶. Gap measured in millimeters.

During the therapeutic process, the technique of cryotherapy was only carried out in three patients, as patient 02 reported severe headaches with the use of ice. Patients 02 and 04 that had a significant gap in the movement of «closing the eyes gently» were stimulated with inducing circular movements in the region of the orbicularis oculi in order to activate the compromised muscles.

Regarding the stomatognathic functions, patients 01 and 02 who presented lip closure difficulty did not perform specific therapy for function. They were able to strengthen the orbicularis oris only with exercises for facial muscles. Patient 03 did not require therapy directed to the functions.

Patient 04 showed significant difficulties in stomatognathic function, requiring manual assistance in movements such as inflating the cheek to achieve an adequate lip closure. Therefore, exercises were conducted with the aim of improving

the tone and the strength of the lips, tongue and cheeks which are needed to the control of the bolus in the oral cavity, oral cleanliness and lip closure.

Besides the proposed assessment for this study which consisted of the analyses of the face at rest and in motion and of the quantification of facial paralysis using the digital caliper and stomatognathic functions, it was found that the patient 02 presented 21 mm of mouth opening indicating a limitation for both speech and feeding issues. In this case, it was necessary to set a specific treatment plan in which the following were performed: (maximum) mouth opening and closing exercises; lateralization of the mandible to the left and right side; protrusion and retraction of the lower teeth and protrusion of the jaw with manual assistance. In the fifth session there was significant improvement in mouth opening of this patient, enabling the return of solid food that was previously reported difficulty.

Patients 01, 02 and 03 had regular attendance and demonstrated commitment during the sessions and dedication to the therapeutic planning. However, patient 04 stayed away for a while from speech therapy due to personal problems and when she returned at the sixth session, it was possible to notice a significant improvement in facial symmetry, both at rest and in motion, there was no complaint with respect to stomatognathic functions and the gap was not found while «closing the eyes gently.» The patient reported that during the period that she did not attend the therapy the exercises were conducted periodically and systematically.

Evaluation after speech therapy was performed when ten sessions were completed, with the exception of patient 01 who was reassessed at the eighth session and showed no interest in continuing the treatment considering the movements he had gained and patient 04 who attended the seventh

session and did not return to perform a complete evaluation. The reevaluation was based on the same protocols used in evaluation before speech therapy.

In the evaluation at rest, it was observed improvement in all aspects evaluated. It was possible to observe in all patients a higher number of expression lines and symmetry between hemifaces.

In the findings of the evaluation in motion after speech therapy, shown in Table 3, the lowest score was 3 which indicates a gain in facial movements especially in patients 01, 02 and 04. The same patients scored 0 in at least three facial expressions required in the evaluation in motion before speech therapy, cited in Table 2. In Table 3, it is seen that the gap found in patient 02 decreased considerably and parallel to this the complaints of ocular dryness. Although the patient 04 failed to appear for the evaluation after speech therapy, gap was not visualized in the photographs taken on his return.

Table 3 – Values of evaluation in motion after speech therapy

Patient nº	Score 01	Score 02	Score 03	Score 04
<i>Expressions</i>				
“Closing the eyes gently”	4	4	4	4
<i>Gap</i>	-	1,3	-	-
“Face of bad smell”	3	3	4	4
“Grin”	3	3	4	4
“Beak”	2	3	4	4

Score: 0 = contraction visible neither by naked eye nor under oblique light; 1 = little mobility of skin; 2 = the skin moves more, wrinkles can slightly be noted; 3 = skin moves more evidently, increase of wrinkles as well as their depth; 4 = the large range of movement is performed synchronously and symmetrically in relation to the healthy side¹⁶. Gap measured in millimeters.

According to photographic record, all patients achieved significant improvement in the evaluated movements, it is possible to observe an increase in lines of expressions and greater symmetry between hemifaces.

As can be seen in Table 4, the values of IM measured before and after speech therapy showed noticeable improvement in all measured points,

especially in the distance of ICO-WN that patients 03 and 04 showed in the evaluation before speech therapy with more difficulty to perform the contraction of the wing of the nose.

In Table 5, there is a noticeable improvement in the values of the distances measured with the caliper between the paralyzed side before and after speech therapy.

Table 4 – Values of IM evaluation measured with a digital caliper before and after speech therapy

Paciente nº	IM 01		IM 02		IM 03		IM 04	
	before	after	before	after	before	after	before	after
Smile								
T – LC	4,46	2,43	9,76	3,78	6,53	-2,20	26,51	*
ICO – LC	13,97	1,83	5,41	-6,08	1,03	-0,41	9,90	*
OCE – LC	0,11	-0,69	17,66	-3,90	1,71	3,34	26,59	*
Contraction of the wing of the nose								
ICO – WN	14,42	8,18	33,95	9,51	53,75	3,73	14,28	*

Key: before (before speech therapy), after (after speech therapy), T (Tragus) – LC (Labial Commissure), ICO (Inside Corner of the Eye) – LC, OCE (Outside Corner of the Eye) – LC, ICO (Inside Corner of the Eye) – WN (Wing of the Nose). IM (incompetence of the movement): IM = PS-NS/NS x 100.¹⁵ (*) Patient did not return to perform the last evaluation.

Table 5 – Difference between the measurement values of anthropometric points using a caliper on the paralyzed side before and after speech therapy

Patient nº	IM 01			IM 02			IM 03			IM 04		
	before	after	Dif.	before	after	Dif.	before	after	Dif.	before	after	Dif.
T – LC	110,27	99,59	10,68	92,37	78,50	13,83	116,82	94,77	22,05	120,47	*	-
ICO – LC	78,78	67,25	11,53	78,35	59,11	19,24	71,50	65,38	6,12	69,71	*	-
OCE – LC	69,90	62,92	6,98	78,07	56,59	21,48	74,65	65,43	9,22	80,30	*	-
ICO – WN	36,81	35,82	0,99	43,63	35,32	8,31	31,72	32,65	- 0,93	41,59	*	-

Key: before (before speech therapy), after (after speech therapy), Dif. (difference), T (Tragus) – LC (Labial Commissure), ICO (Inside Corner of the Eye) – LC, OCE (Outside Corner of the Eye) – LC, ICO (Inside Corner of the Eye) – WN (Wing of the Nose). IM (incompetence of the movement): IM = PS-NS/NS x 100.¹⁵ (*) Patient did not return to perform the last evaluation; (-) It was not possible to measure values.

■ DISCUSSION

Facial mimic changes are some of the main factors that affect the self-esteem of patients with facial paralysis. The ability to smile and other facial functions are generally valued only when they are lost, and the damage in life quality becomes evident¹⁰. Thus, we can confirm the importance of facial expressiveness regarding the emotional and psychosocial aspects^{10,11}.

The cases presented in this study confirms findings in the literature^{6,7,17} and show that the facial paralysis can cause sequelae from the inability to perform facial movement to the effective implementation of stomatognathic functions.

According to the literature⁴, facial paralysis tends to unconfigure the patient's face, making it possible to observe a decrease or loss of wrinkles, depression of the labial commissure on the paralyzed side and deviation of the nasolabial filter and labial commissure to the normal side. These data corroborate with the findings of the evaluation

at rest which showed partial and total alterations of forehead wrinkles and nasolabial folds, deviation of labial commissure and nose to the non-paralyzed side. In addition to the aforementioned changes, the patient could face lack or excess of tearing and blinking which may lead to ocular dryness. Therefore, they need lubrication and protection of the eyes during the day and protection during the night^{4,14}.

It is possible to see some eating-related compensatory behaviors caused by facial paralysis that are not often reported by patients, but are observed during evaluation¹⁸. This study confirms literature findings¹⁸. Patients 01 and 02 did not complain about eating difficulties, but evaluation showed escape of food in the oral cavity and although patient 04 reported difficulties in controlling the bolus with consequent escape of food and lot of residue in the mouth after swallowing, she did not notice changes such as excessive contraction of the mentalis muscle and tongue anteriorization.

Besides the stomatognathic functions, it was observed that patient 02 presented difficulty in opening and closing the mouth and pain in the TMJ region to chew and open the mouth just on the paralyzed side (left). This finding correlates to the case study of idiopathic facial paralysis in which the sequelae of facial paralysis contributed to the triggering of temporomandibular disorder¹⁹. In both cases the patients showed masticatory preference for the unaffected side, such factor justifies a higher pain sensitivity in the contralateral TMJ.

The speech therapy rehabilitation in these cases is to ensure the return of the movements of muscles that are responsible for facial movements and the reintegration of stomatognathic functions such as suction, chewing and swallowing in order to improve the quality of life of the affected individual^{12-14,20}. In addition to the weekly speech therapy sessions, an individualized program of exercises designed to be performed at home is crucial since it promotes learning motor which is required for neuromuscular reeducation. Therefore, the exercises that the patient cannot perform efficiently, but are necessary for the goal of treatment, should be trained in therapy and asked to be done daily at home²¹.

The treatment for peripheral facial paralysis should start as soon as possible to prevent muscle atrophy and make better use of the period of reinnervation¹². In general speech therapy consists of cold thermal stimulation, toning and inducing massages, followed by isometric and/or isotonic exercises^{12,20}. The techniques carried out in this study proved to be efficient with the use of ice, inducing massage with passive movements and functional exercises performed initially in an isometric way and isotonic after the gain of movement.

Recent study cites the use of mirror as visual feedback during exercise that can help patients, but looking at the paralyzed face can cause more grief than benefit in recovery²¹. However, in this study the visual feedback with the use of the mirror was positive and, besides being used as a therapeutic resource, helped patients to perform the exercises recommended for home.

The use of ice aimed to promote contraction of paralyzed muscles through proprioceptive and exteroceptive reflexes of the arc. The general somatic afferent fibers of the trigeminal nerve have connections with the facial motor nucleus, so the cold is perceived and generates a contraction of the muscles of the face through stimulation of visceral efferent fibers of the cranial nerve VII²². Based on this, the cold thermal stimulation was the first step to rehabilitation and proved to improve muscle tone and stimulate involuntary muscle contraction.

In Tessitore's research²³, it was observed that although the study group and the control were ranked at the same level, according to the House-Brackmann scale, there was a decrease in the labial commissure angle (LCA) in the study group, indicating better symmetry of the face at rest. This finding did not rule out the possibility that the improvement came from the muscle reinnervation, but proved by the results of LCA that therapy has an important role in rehabilitation. Based on this, it can be concluded that the proposed exercises for speech therapy facilitated recovery of facial movements, although the patient 04 did not attend all proposed sessions and the improvement of the facial muscles probably occurred by spontaneous reinnervation.

The therapy focused on stomatognathic function aims at reducing the chewing difficulties caused by the flaccidity of the muscles buccinator and orbicularis of the mouth, decreasing food stasis in the oral cavity and labial incompetence on the paralyzed side responsible for the escape of food and liquid in the oral cavity. The patient 04 confirmed findings in the literature^{7,13,18} regarding the difficulty of chewing on the paralyzed side due to flaccidity of the muscles and the need for manual support and larger tongue movements to perform cleaning oral cavity. The lack of strength seems to be the cause of the difficulty in synchronizing the movements of the chewing muscles with the face muscles. There is also great difficulty in drinking fluid continuously, adaptations are needed to perform the function¹⁸.

In the present study, it was observed through exercises for stomatognathic functions, which aimed to gain tone and strength of the oral muscles, an improved lip closure, decreasing in compensatory tongue movements, muscle adequacy for bilateral chewing, reduction of excess contraction of mentalis muscle and masseter in patient 04.

The sessions made it possible to draw the line of treatment for cases of peripheral paralysis noting the uniqueness of each patient. It is important to emphasize the need for further research involving a larger number of participants to ensure the reliability of the findings.

The proposed treatment focused on facial mimic of the cases presented in this study was effective proved by the quantification of peripheral facial paralysis using the digital caliper both before and after speech therapy. Amid the lack of objective evaluation tools and the difficulties in establishing a prognosis in the treatment of facial paralysis, quantification methods have emerged in order to clinically measure the facial movements²⁴. The measurement

taken by digital caliper was efficient for determining the gain obtained during therapy and helped to remove the idea of an empirical prognosis for the treatment of facial paralysis, besides giving greater precision to the descriptions and subsidies to quantify its evolution^{16,25}.

■ CONCLUSION

The proposed speech therapy for cases of paresis and facial paralysis after parotidectomy was effective in improving the facial movements, as well as the alterations of stomatognathic functions.

RESUMO

O objetivo deste estudo foi verificar a efetividade da fonoterapia em pacientes com paralisia facial decorrente da manipulação do VII nervo encefálico realizada durante o tratamento cirúrgico para neoplasia de glândula parótida, assim como, identificar e promover intervenção fonoaudiológica das alterações de sucção, mastigação e deglutição. Trata-se de uma pesquisa qualitativa com análise descritiva. A avaliação constou da análise da face em repouso e em movimento, documentação fotográfica, uso do Paquímetro Digital para quantificação da paralisia facial, além da avaliação das funções estomatognáticas. A fonoterapia foi definida com base nos achados da avaliação e seguiu a necessidade de cada indivíduo. Nos resultados da avaliação pós-fonoterapia em repouso houve melhora em todos os aspectos avaliados nos quatro pacientes. Na avaliação em movimento três pacientes apresentaram movimentação mais clara da pele com aumento do número e profundidade das rugas. No registro fotográfico todos os pacientes obtiveram melhora significativa nos movimentos avaliados, sendo possível observar um aumento nas linhas de expressões e maior simetria entre as hemifaces. Os valores da incompetência dos movimentos, mensurados pós-fonoterapia, demonstraram melhora significativa em todos os pontos medidos. A fonoterapia proposta para os casos de paralisia facial pós-parotidectomia foi eficiente na melhora da mímica facial, sobretudo para as alterações das funções estomatognáticas. É importante salientar a necessidade de novas pesquisas envolvendo um número maior de participantes para garantir a fidedignidade dos achados.

DESCRITORES: Neoplasia; Glândula Parótida; Paralisia Facial; Fonoterapia

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■ ANNEX 1

PROTOCOL FOR EVALUATION AND MEASUREMENT OF FACIAL PARALYSIS WITH THE USE OF DIGITAL CALIPER AND EVALUATION OF STOMATOGNATHIC FUNCTIONS^{16,17,26}

Evaluation before and after speech therapy

1. Evaluation at rest

- 1.1 - Abolition of forehead wrinkles: (1) Total (2) Parcial (3) Normal.....|_|
- 1.2 - Lowering the tip of the eyebrow: (1) Total (2) Parcial (3) Normal.....|_|
- 1.3 - More open eye/falling lower eyelid: (1) Total (2) Parcial (3) Normal.....|_|
- 1.4 - Deviated nose to the healthy side: (1) Total (2) Parcial (3) Normal.....|_|
- 1.5 - Abolition of nasolabial folds: (1) Total (2) Parcial (3) Normal.....|_|
- 1.6 - Deviation and depression of labial commissure: (1) Total (2) Parcial (3) Normal.....|_|
- 1.7 - “Collapsed” upper lip: (1) Total (2) Parcial (3) Normal.....|_|
- 1.8 - Saggy cheek: (1) Total (2) Parcial (3) Normal.....|_|

2. Evaluation in motion

Key to evaluation in motion.

Score: 0 = contraction visible neither by naked eye nor under oblique light.

1 = little mobility of skin.

2 = the skin moves more. Wrinkles can slightly be noted.

3 = skin moves more evidently. Increase of wrinkles as well as their depth.

4 = large range of movement is performed synchronously and symmetrically in relation to the healthy side.

Synkinesis: mouth/eye, eye/mouth, others.

0 = lack of synkinesis.

+1 = voluntary inhibition of synkinesis (patient/mirror).

+2 = inhibition of synkinesis by digital pressure (digital pressure in the opposite direction of the pathological one).

+3 = uncontrollable synkinesis.

2.1 - “Closing the eyes gently” (Orbicularis of the eyes – palpebral portion):

Mobility | Synkinesis.....|_|_|

GAP measurement:

2.2 - “Face of bad smell” (Pyramidal muscle of the nose/transverse of the nose and e LLSAN muscle):

Mobility | Synkinesis.....|_|_|

2.3 - “Grin” (Levantador labii superioris; Zygomaticus major and minor musclus):

Mobility | Synkinesis.....|_|_|

2.4 - “Beak” (Orbicularis of the lips): Mobility | Synkinesis.....|_|_|

3. Evaluation of Neurovegetative Functions

3.1 – Suction

a - Liquid

(1) Lip closure (2) Escape (3) Tongue anteriorization (4) Participation of the buccinator muscle

(5) Others|_|_|_|_|_|

b – Pasty

(1) Lip closure (2) Escape (3) Tongue anteriorization (4) Participation of the buccinator muscle

(5) Others|_|_|_|_|_|

3.2 – Chewing

a – Stuffed Cookies

- (1) Rotatory movements (2) Vertical movements (3) Bilateral chewing (4) Right unilateral chewing
- (5) Left unilateral chewing (6) Contraction of the right masseter (7) Contraction of the left masseter
- (8) Labial closure (9) Bolus spread in the oral cavity
- (10) Others..... | | | | | | | | | | | | | | | |

3.3 – Swallowing

a - Liquid

- (1) Labial closure (2) Contraction of mentalis (3) Contraction of the masseter on the compromised side (4) Efficient propulsion of the bolus (5) Escape
- (6) Others..... | | | | | | | | | | | | | | | |

b - Pasty

- (1) Labial closure (2) Contraction of mentalis (3) Contraction of the masseter on the compromised side (4) Efficient propulsion of the bolus (5) Escape
- (6) Others..... | | | | | | | | | | | | | | | |

c – Solid

- (1) Labial closure (2) Contraction of mentalis (3) Contraction of the masseter on the compromised side (4) Efficient propulsion of the bolus (5) Escape
- (6) Others..... | | | | | | | | | | | | | | | |

4. Quantification of Paralysis with Digital Caliper

(T = tragus, LC = labial commissure, ICO = inside corner of the eye, OCE = outside corner of the eye, WN = wing of the Nose, PS = paralyzed side, NS = normal side, IM = incompetence of the movement).

4.1 - Right Side

Smile:

- a - T – LC: 1^a measurement:..... 2^a measurement: 3^a measurement:..... Average:.....
- b - ICO – LC: 1^a measurement:..... 2^a measurement: 3^a measurement:..... Average:.....
- c - OCE - LC: 1^a measurement:..... 2^a measurement: 3^a measurement:..... Average:.....

Contraction of the nose:

- d - ICO–WN: 1^a measurement:..... 2^a measurement: 3^a measurement:..... Average:.....

4.2 – Left Side

Smile:

- a - T – LC: 1^a measurement:..... 2^a measurement: 3^a measurement:..... Average:.....
- b - ICO – LC: 1^a measurement:..... 2^a measurement: 3^a measurement:..... Average:.....
- c - OCE - LC: 1^a measurement:..... 2^a measurement: 3^a measurement:..... Average:.....

Contraction of the nose:

- d - ICO–WN: 1^a measurement:..... 2^a measurement: 3^a measurement:..... Average:.....

$$IM = \frac{PS-NS}{NS} \times 100$$