

Protocolo de cooperação fonoaudiológica para avaliação nasofibrolaringoscópica da mobilidade laríngea em doenças da tireóide (PAN)***

Speech-language cooperation protocol for the fiberoptic laryngoscopy evaluation of larynx mobility

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Abstract

Background: voice protocol. Aim: to propose a protocol for the fiberoptic laryngoscopy evaluation of larynx mobility in thyroid illnesses (PAN), with the intention of having an objective, precise and consensual instrument for this assessment. Method: the first version of the protocol was elaborated based on data found in the literature; the protocol was judged twice, using the triangulation method; a pilot version was presented and applied in 11 patients; it was then judged again by doctors and speech-language pathologists; based on the analysis of the judges and after the application of the pilot version, the final version of the PAN was proposed. Results: the final protocol was composed by two parts. The first part, considered a standard procedure, is composed by 4 essential items that necessarily should be evaluated: normal inspiration; forced inspiration; vowel /é/ isolated and sustained; and sharp vowel /i/, isolated and sustained. The second part, considered a speech-language complementation, is composed by items that should be understood as being important for speech-language pathologists as they are informative or predictive of the effectiveness of therapy: vowel /é/ sustained and weak; vowel /é/ sustained and sharp; vowel /é/ sustained and deep; vowel /é/ short with abrupt vocal onset. Conclusions: the PAN, in its final version, contributes for the systematization of the assessment procedures based on evidence and on the agreement of professionals. The PAN results in the description of items to be obtained during medical and speech-language assessment during the fiberoptic laryngoscopy evaluation of larynx mobility in thyroid illnesses.

Key Words: Protocol; Laryngoscopy; Thyroidectomy; Vocal Cord Paralysis; Vocal Alterations.

Resumo

Tema: protocolo de avaliação da voz. Objetivo: proposição de um protocolo de cooperação fonoaudiológica para avaliação nasofibrolaringoscópica da mobilidade laríngea em doenças da tireóide (PAN), visando a composição de um instrumento objetivo, preciso e consensual para avaliação. Métodos: a primeira versão do protocolo foi elaborada a partir de fundamentação bibliográfica; o PAN foi julgado em duas instâncias pelo método de triangulação por seis juízes em três etapas; foi constituída uma versão piloto do protocolo e aplicada em 11 pacientes; houve novo julgamento de médicos e fonoaudiólogos; a partir da concordância dos juízes, após a aplicação do piloto, foi construída a versão final do PAN. Resultados: o PAN final foi composto por duas partes. A primeira parte considerada o procedimento padrão composta por 4 itens imprescindíveis e que devem necessariamente ser avaliados são: inspiração normal; inspiração forçada; vogal /é/ isolada e sustentada e vogal /i/ aguda isolada e sustentada. A segunda parte considerada de complementação fonoaudiológica é composta pelos itens que são entendidos pelos fonoaudiólogos como fatores informativos ou preditivos para a eficácia da terapia. Esses itens são: vogal /é/ sustentada e fraca; vogal /é/ sustentada e aguda; vogal /é/ sustentada e grave; vogal /é/ curta com ataque vocal brusco. Conclusões: o PAN, em sua versão final, contribui para a sistematização dos procedimentos de avaliação fundamentados em evidências e concordâncias profissionais. O PAN resulta na descrição de itens a serem solicitados durante a avaliação médica e fonoaudiológica no exame de nasofibrolaringoscopia da alteração da mobilidade laríngea em doenças da tireóide.

Palavras-Chave: Protocolo; Laringoscopia; Tireoidectomia; Paralisia Laríngea; Alterações Vocais.

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Introduction

The thyroid gland produces the hormones T3 (triiodothyronine) and T4 (thyroxine) which are responsible for metabolism regulation 1. It is a single endocrine secretion organ located at the median region of the neck. It involves the larynx and the trachea as a ring 2-3.

The thyroidectomy - partial or total withdrawal of the thyroid gland - is a surgery indicated and utilized, according to Surgeons, for the removal of both benign and malignant nodules of thyroid 1-2 ,4-5.

Thyroid disorders have high prevalence in general population, and most of the cases occur in women 3-4. In the United States about 80,000 thyroid surgeries are conducted each year 4.

The recurrent laryngeal nerve injury during the thyroidectomy is responsible for almost 40% of laryngeal mobility alterations 1-3 ,9-11. Signs and symptoms of laryngeal immobility might vary according to the positions of the vocal folds and according to the functioning of vocal tract structures, requiring a specific evaluation and rehabilitation process with a Speech-Language Pathologist 5-8.

The flexible laryngoscopy is a quite indicated method for the evaluation of post operative thyroidectomies, presenting effectiveness in almost 100% of the cases, even under adverse anatomical conditions such as trismus or exacerbated nausea reflex. This test allows accurate assessment of the upper airways, hypopharynx structures and all areas of the larynx.

In addition to provide the static evaluation of these structures, this technique makes the analysis of functional activities during speech movements, crying and swallowing possible 12-28.

The purpose of this study was to propose a Protocol of Speech-Language Pathology cooperation for the fiberoptic laryngoscopy evaluation of larynx mobility (PAN) in thyroid disorders. The PAN is proposed as an objective protocol for assessing the functionality of larynx and vocal tract. It should be used prior and after Speech-Language Pathology treatment, thus enabling the analysis and definition of conduct based on objective measures. It is considered a protocol of cooperation, because its implementation in nasofibrolaryngoscopy is carried through by a diverse range of healthcare professionals.

Methods

The study was approved by regulatory committees of research involving human subjects under Protocol number 938/06.

Initially the PAN was elaborated based on clinical experience and on a literature review comprised by 88 references being: 58% journals (45.5% of them from the last five years) and 42% of specific and fundamental articles on the area.

In the second phase, PAN was judged in three stages by six judges, three Speech-Language Pathologists with Doctoral Degree and specialization in the area of voice and three Head and Neck Surgeons with experience in laryngoscopy.

Evaluation items for which the level of agreement among the judges reached the minimum of 67% were maintained in the pilot version of the PAN. Modifications or additions suggested by judges whose levels of agreement reached 67% were also added to this pilot version (Appendix).

The PAN, in the pilot version, was applied in eleven subjects that were submitted to thyroidectomy (partial or total), with six subjects presenting alterations in vocal folds mobility and five subjects without mobility alteration.

All participants were female; adults (over 18 years) and patients of the Department of the Head and Neck Surgery. The examinations were performed at the same Department by the responsible Surgeons.

The nasofibrolaryngoscopic used on this study was a Welch Allyn, with 4mm flexible fibroscopy, model RL-100 and serial number A01638 Japan, with recording system direct on the computer. The results obtained on the nasofibroscopy were not compared to laryngeal estroboscopy - which could provide more precise data concerning the vibration of the vocal folds mucosa - because this examination is not performed as a routine service where the study was conducted.

The inclusion criteria of participants for the pilot study followed medical guidelines: patients with thyroid disorder, previously diagnosed by a Head and Neck Surgeon who had performed thyroidectomy for removal of tumor which evolved or not to laryngeal mobility alteration. The medical exclusion criteria were: previous treatment of head and neck tumors, radiotherapy, chemotherapy, nasogastric tube, neck dissection, neurological disorders and cognitive deficits.

Results

Two tables were initially designed in order to analyze the efficiency of the pilot PAN application.

Table 1 presents items considered valid and essential by Surgeons for the assessment of

laryngeal mobility (the protocol was filled concomitantly to evaluation).

Table 2 presents the items considered by Speech-Language Pathologists as valid and essential to the assessment of laryngeal mobility. (The protocol was filled while the judges watched the tape recordings of the examination. This type of measure was necessary in order to avoid accumulation of people at the time of testing which could impair the visibility of the analyzed material). The judges of this phase were not the same from the initial phases of the study in order to guarantee a previous knowledge free judgment.

Preliminary results were subjected to statistical analysis. For the data analysis, one point was attributed for each "yes" response and zero point for each "no" response. With the purpose to establish whether the groups (Surgeons and Speech-Language Pathologists) differentiate on total score the Mann-Whitney test with significance level of 5% was used.

As observed on the Mann-Whitney test, the groups did not differ on the total score (Surgeons, median 7.00; Speech-Language Pathologists median 11.00; W 230.0; p-value 0,169). Thus, both the groups presented a consistent behavior on the judgments.

Chi-square tests were used to verify whether the groups presented a similar pattern of responses regarding the necessity or not of inclusion of each item on the protocol. The calculation was made from 2 x 2 tables and the number of degrees of freedom was equal to one.

Table 3 shows the chi-square value and the p-value for each of the comparisons. For some tasks, it was not possible to calculate Chi-Squares because the groups had presented identical responses. According to the exposed in Table 3, items 1, 2, 3, 4 and 6 were identical for both groups, once they were accepted by 100% of

medical professionals and Speech-Language Pathologists. Items 5, 7 and 8 tended to differentiate: all Speech-Language Pathologists had accepted these items while not all Surgeons agreed with their permanence. The groups differed on the questions number nine to sixteen. The questions numbered from nine to twelve were accepted by 100% of Speech-Language Pathologists while not all Surgeons agreed with their permanence on the protocol.

With regards to questions issues 13 to 16, they were accepted by a proportion of Surgeons while all Speech-Language Pathologists did not see the need for the permanence of such items.

TABLE 1. Items considered essential by physicians after examinations.

| Tasks/Subjects | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | % concordance |
|---|----|----|----|----|----|----|----|----|----|-----|-----|---------------|
| 1. Normal Inhale | X | X | X | X | X | X | X | X | X | X | X | 100 |
| 2. Effort Inhale | X | X | X | X | X | X | X | X | X | X | X | 100 |
| 3. Isolated and sustained vowel /é/ (laryngeal mobility and vocal fold position) | X | X | X | X | X | X | X | X | X | X | X | 100 |
| 4. Isolated and sustained vowel /é/ (vocal fold, median vestibular and Antero-posterior constriction) | X | X | X | X | X | X | X | X | X | X | X | 100 |
| 5. Cough | X | | X | | X | | X | X | X | X | X | 72,7 |
| 6. Isolated and sustained high pitch vowel /i/ | X | X | X | X | X | X | X | X | X | X | X | 100 |
| 7. Counting from 1 to 10 | | X | | X | X | X | X | X | X | X | X | 81,8 |
| 8. Isolated and sustained strong vowel /é/ | X | X | X | | | | X | X | X | X | X | 72,7 |
| 9. Isolated and sustained weak vowel /é/ | | | | | | | X | X | X | X | X | 45,45 |
| 10. Isolated and sustained high pitch vowel /é/ | | X | | | | | X | X | X | X | X | 54,5 |
| 11. Isolated and sustained low pitch vowel /é/ | | X | | | | | X | X | X | X | X | 54,5 |
| 12. Short vowel /é/ with vocal attack | X | | | | | | X | X | X | X | X | 54,5 |
| 13. Vowel /é/ with head inclined to the right shoulder | X | X | X | | | | X | | | | X | 45,45 |
| 14. Vowel /é/ with head inclined to the left shoulder | X | X | X | | | | X | | | | X | 45,45 |
| 15. Vowel /é/ with head turned to the right side | X | X | X | | | | X | | | | X | 45,45 |
| 16. Vowel /é/ with head turned to the left side | X | X | X | | | | X | | | | X | 45,45 |

TABLE 2. Items considered essential by Speech Pathologists after examination.

| Tasks/Subjects | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | % |
|---|----|----|----|----|----|----|----|----|----|-----|-----|-----|
| 1. Normal Inhale | X | X | X | X | X | X | X | X | X | X | X | 100 |
| 2. Effort Inhale | X | X | X | X | X | X | X | X | X | X | X | 100 |
| 3. Isolated and sustained vowel /é/ (laryngeal mobility and vocal fold position) | X | X | X | X | X | X | X | X | X | X | X | 100 |
| 4. Isolated and sustained vowel /é/ (vocal fold, median vestibular and Antero-posterior constriction) | X | X | X | X | X | X | X | X | X | X | X | 100 |
| 5. Cough | X | X | X | X | X | X | X | X | X | X | X | 100 |
| 6. Isolated and sustained high pitch vowel /i/ | X | X | X | X | X | X | X | X | X | X | X | 100 |
| 7. Counting from 1 to 10 | X | X | X | X | X | X | X | X | X | X | X | 100 |
| 8. Isolated and sustained strong vowel /é/ | X | X | X | X | X | X | X | X | X | X | X | 100 |
| 9. Isolated and sustained weak vowel /é/ | X | X | X | X | X | X | X | X | X | X | X | 100 |
| 10. Isolated and sustained high pitch vowel /é/ | X | X | X | X | X | X | X | X | X | X | X | 100 |
| 11. Isolated and sustained low pitch vowel /é/ | X | X | X | X | X | X | X | X | X | X | X | 100 |
| 12. Short vowel /é/ with vocal attack | X | X | X | X | X | X | X | X | X | X | X | 100 |
| 13. Vowel /é/ with head inclined to the right shoulder | | | | | | | | | | | | 0 |
| 14. Vowel /é/ with head inclined to the left shoulder | | | | | | | | | | | | 0 |
| 15. Vowel /é/ with head turned to the right side | | | | | | | | | | | | 0 |
| 16. Vowel /é/ with head turned to the left side | | | | | | | | | | | | 0 |

TABLE 3. Chi-Square Test

| | X ² | p-value |
|--|----------------|---------|
| 1. Normal Inhale | | # |
| 2. Effort Inhale | | # |
| 3. Isolated and sustained vowel /é/ (laryngeal mobility and vocal fold position) | | # |
| 4. Isolated and sustained vowel /é/ (vocal fold, median vestibular and Antero-posterior constriction) | | # |
| 5. Cough | 3,474 | 0,062 |
| 6. Isolated and sustained high pitch vowel /i/ | | # |
| 7. Counting from 1 to 10 | 2,200 | 0,138 |
| 8. Isolated and sustained strong vowel /é/ | 3,474 | 0,062 |
| 9. Isolated and sustained weak vowel /é/ | 8,250 | 0,004* |
| 10. Isolated and sustained high pitch vowel /é/ | 6,471 | 0,011* |
| 11. Isolated and sustained low pitch vowel /é/ | 6,471 | 0,011* |
| 12. Short vowel /é/ with vocal attack | 6,471 | 0,011* |
| 13. Vowel /é/ with head inclined to the right shoulder | 8,250 | 0,004* |
| 14. Vowel /é/ with head inclined to the left shoulder | 8,250 | 0,004* |
| 15. Vowel /é/ with head turned to the right side | 8,250 | 0,004* |
| 16. Vowel /é/ with head turned to the left side | 8,250 | 0,004* |

#: groups presented identical responses.

Discussion

According to the literature 4, 9-10, 14-15, 21, 23, 25, the vocal tract should be evaluated before and after the thyroid surgery in order to detect possible previous alterations and in order to evaluate the characteristics of both anatomy and physiology of this region pre and post-surgical treatment.

As already pointed in the introduction of this study, there is no consensus on which items should be addressed on evaluation, specifically on nasofibrosocopy, for the evaluation of laryngeal mobility of patients undergoing thyroidectomy. There is also no consensus on which items of assessment could be considered within the examination.

The present study indicates that the necessary and indispensable items are: normal inspiration (aiming the removal of the vocal folds in breath at rest); forced inspiration (aiming the maximum dislocation of the vocal folds in forced breathing); isolated and sustained vowel /é/ (aiming laryngeal mobility and the positioning of vocal folds); isolated and sustained vowel /i/ (aiming the constriction of the vocal folds, median and antero-posterior vestibular as well as glottic closure) and sustained and sharp vowel /i/ (aiming the stretching of the vocal folds and, thus, the stretching of the cricothyroid muscle).

The study also indicates that there are items that are not usually assessed, but are seen by Speech-Language Pathologists as important and informative as predictive factors for therapy effectiveness. These items are: sustained and weak vowel /é/ (targeting the larynx coaptation with minimal subglottic pressure through vestibular, median, and anterior-posterior constriction of vocal fold); sustained and sharp vowel /é/ (targeting the vestibular and anterior-posterior constrictions of vocal fold along with the action of the cricothyroid muscle); sustained and deep vowel /é/ (targeting the vestibular median and anterior-posterior constriction of vocal fold along with the action of thyroarytenoid muscle); short with abrupt vocal

onset vowel /é/ (seeking the hyperactivity of vocal folds and / or median vestibular fold while performing a task with phonatory effort).

The present study indicates the existence of controversial items (5,7-8,13-16) that are raised as valid by some practitioners and as irrelevant by others. These items should be considered with caution and should, therefore, be further investigated on their need or not to be included on a protocol as PAN.

Differences were observed on questions and tasks judged as fundamentals by Surgeons and by Speech-Language Pathologists. It is believed that these differences are due to different backgrounds and focus that each professional has in his/her clinical practice. The Surgeons focused mainly on the injury itself (in change of laryngeal mobility), while Speech-Language Pathologists focused such on the injury as, more specifically, on the laryngeal physiology.

Conclusion

The objective of the PAN, in its final version, is to contribute to systematic assessment procedures based on evidence and professional agreements. It is necessary for the professional to act on a improved manner. To base on specific protocols permeates these aspects and allows the professional to act on a planned manner, documenting the processes, and sedimenting and evaluating their practice and working patterns.

The PAN is based on a theoretical and practical proposition, besides judged evaluations. It resulted on the description of the items to be requested during medical and Speech-Language Pathology nasofibrolaryngoscopy evaluation on the alteration of laryngeal mobility in thyroid diseases. Thus, the PAN intends to be an objective and standardized, instrument aiming to assist Surgeons and Speech-Language Pathologists on a consistent professional practice, giving support for the evaluation and subsequent rehabilitation, full recovery and improvement in life quality of the patient.

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Appendix

Protocol of Speech Pathology cooperation for laryngeal mobility fiberoptic nasolaryngoscopy evaluation in thyroid diseases (PAN)

| | | | | | | | |
|--|--|-------------|----------------------|-----------------------------|--------------------|-------------------|--------------|
| Evaluation Date: ____ / ____ / ____ Name: _____ Gender: M () F () Occupation: _____ Age: _____ | | | | | | | |
| STANDARD PROCEDURE | | | | | | | |
| 1.Normal Inhale | Adduction | | | | | | |
| | R | 0 | 1 | 2 | 3 | | |
| | L | 0 | 1 | 2 | 3 | | |
| | | N.A | Complete | Limited Adduction(D M S) | Fixed | | |
| 2.Effort Inhale | Effortd Adduction | | | | | | |
| | R | 0 | 1 | 2 | 3 | | |
| | L | 0 | 1 | 2 | 3 | | |
| | | N.A | Complete | Li mited Adduction(D M S) | Fixed | | |
| | Position / Arytenoids Mobility | | | | | | |
| | R | 0 | 1 | 2 | 3 | 4 | |
| | L | 0 | 1 | 2 | 3 | 4 | |
| | | N.A | W/ rotation | Rotation to the side | Fixed | Fixed to the side | |
| 3.sustained /é/ | Vocal folds Adduction | | | | | | |
| | R | 0 | 1 | 2 | 3 | | |
| | L | 0 | 1 | 2 | 3 | | |
| | | N.A | Complete | Limited Adduction(D M S) | Fixed | | |
| | Glottic closure | | | | | | |
| | N.A () Complete () | | | | | | |
| | Incomplete () Triangular post () Triangular med-post() Parallel () Hourglass () | | | | | | |
| | Atrophy () Straight () Arched/ fusiform () | | | | | | |
| | Vocal folds leveling | | | | | | |
| | R | 0 | 1 | 2 | 3 | | |
| | | N.A | Same level | Below | Above | | |
| | Supraglottic Activity | | | | | | |
| C. Median Vestibular | | | | | | | |
| R | 0 | 1 | 2 | 3 | 4 | 5 | |
| L | 0 | 1 | 2 | 3 | 4 | 5 | |
| | N.A | None | Discrete | Moderate | Severe | Supraglottic | |
| C. Anteroposterior | | | | | | | |
| R | 0 | 1 | 2 | 3 | 4 | | |
| L | 0 | 1 | 2 | 3 | 4 | | |
| | N.A | None | Discreet | Moderate | Severe | | |
| Position / Arytenoids Mobility | | | | | | | |
| R | 0 | 1 | 2 | 3 | 4 | | |
| L | 0 | 1 | 2 | 3 | 4 | | |
| | N.A | W/ rotation | Rotation to the side | Fixed | Fixed to the side | | |
| 4.isoltade and sustained high pitch /i/ | Vocal fold Stretching | | | | | | |
| | R | 0 | 1 | 2 | 3 | 4 | |
| L | 0 | 1 | 2 | 3 | 4 | | |
| | N.A | Stretched | Discreet | Moderate | Without Stretching | | |
| SPEECH PATHOLOGY COMPLEMENT | | | | | | | |
| 5.sustained weak /é/ | Vocal folds Adduction | | | | | | |
| | R | 0 | 1 | 2 | 3 | | |
| | L | 0 | 1 | 2 | 3 | | |
| | | N.A | Complete | Limited Aduction (D M S) | Fixed | | |
| | Supraglottic Activity | | | | | | |
| | C. Median Vestibular | | | | | | |
| | R | 0 | 1 | 2 | 3 | 4 | 5 |
| | L | 0 | 1 | 2 | 3 | 4 | 5 |
| | | N.A | None | Discrete | Moderate | Severe | Supraglottic |
| | C. Anteroposterior. | | | | | | |
| | R | 0 | 1 | 2 | 3 | 4 | |
| | L | 0 | 1 | 2 | 3 | 4 | |
| | N.A | None | Discrete | Moderate | Severe | | |

| | | | | | | | |
|---------------------------------|------------------------------|----------|--------------------------------|--------------------------------|------------------|----------------------------------|-----------------------|
| 6.sustained and high pitch /é/ | Vocal Folds Adduction | | | | | | |
| | R | 0 | 1 | 2 | 3 | | |
| | L | 0 | 1 | 2 | 3 | | |
| | N.A | Complete | Limited Aduction (D M S) Fixed | | | | |
| Supraglottic Activity | | | | | | | |
| C. Median Vestibular | | | | | | | |
| R | 0 | 1 | 2 | 3 | 4 | 5 | |
| L | 0 | 1 | 2 | 3 | 4 | 5 | |
| | N.A | None | Discrete | Moderate | Severe | Supraglottic | |
| C. Anteroposterior | | | | | | | |
| R | 0 | 1 | 2 | 3 | 4 | | |
| L | 0 | 1 | 2 | 3 | 4 | | |
| | N.A | None | Discrete | Moderate | Severe | | |
| 7.sustained and low pitch /é/ | Vocal Folds Adduction | | | | | | |
| | R | 0 | 1 | 2 | 3 | | |
| | L | 0 | 1 | 2 | 3 | | |
| | N.A | N.A | Complete | Limited Aduction (D M S) Fixed | | | |
| Supraglottic Activity | | | | | | | |
| C. Median Vestibular | | | | | | | |
| R | 0 | 1 | 2 | 3 | 4 | 5 | |
| L | 0 | 1 | 2 | 3 | 4 | 5 | |
| | N.A | None | Discrete | Moderate | Severe | Supraglottic | |
| C. Anteroposterior. | | | | | | | |
| R | 0 | 1 | 2 | 3 | 4 | | |
| L | 0 | 1 | 2 | 3 | 4 | | |
| | N.A | None | Discrete | Moderate | Severe | | |
| 8.short /é/ with brusque attack | Vocal Folds Adduction | | | | | | |
| | | | R | 0 | 1 | 2 | 3 |
| | L | 0 | 1 | 2 | 3 | | |
| | N.A | Complete | Limited Aduction (D M S) Fixed | | | | |
| Supraglottic Activity | | | | | | | |
| C. Median Vestibular | | | | | | | |
| R | 0 | 1 | 2 | 3 | 4 | 5 | |
| L | 0 | 1 | 2 | 3 | 4 | 5 | |
| | N.A | None | Discrete | Moderate | Severe | Supraglottic | |
| C. Anteroposterior | | | | | | | |
| R | 0 | 1 | 2 | 3 | 4 | | |
| L | 0 | 1 | 2 | 3 | 4 | | |
| | N.A | None | Discrete | Moderate | Severe | | |
| R | Without Alteration () | | Median () | Para-median () | Intermediate () | Adduction () | Effortd Adduction () |
| L | Without Alteration () | | Median () | Para-median () | Intermediate () | Adduction () | Effortd Adduction () |
| Level | Respiratory Mobility | | Phonatory Mobility | | | Conduta | |
| I | () Without alteration | | () Without alteration | | | () Speech Pathology Orientation | |
| II | () Discrete alteration | | () Discrete alteration | | | () Speech Pathology Evaluation | |
| III | () Moderate alteration | | () Moderate alteration | | | () Speech Therapy | |
| IV | () Severe alteration | | () Severe alteration | | | () Referral: | |
| OBSERVATION: | | | | | | | |

N.A= not acessable; C.= constriction ;D= Discreet; M= Moderate; S= Severe. R=Right; L=Left