

# The Role of Speech Therapy in Patients Who Underwent Laryngeal Microsurgery due to Phonotraumatic Lesions and Lesions Unrelated to Phonotrauma

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## Abstract

**Introduction** The role of the speech-language pathology in the multiprofessional team dealing with laryngology and the voice has been recognized for a long time. Scientific studies in this field recommend therapies for laryngeal microsurgeries; few of the studies, however, effectively evaluate the result of postoperative speech therapy.

**Objective** To compare speech therapy evaluation and treatment among patients with phonotraumatic lesions and patients with lesions unrelated to phonotrauma who underwent laryngeal microsurgery.

**Methods** This study was performed at IPO Hospital (Paranaense Institute of Otorhinolaryngology, Curitiba, Paraná, Brazil) between February 2010 and February 2011. Of 254 patients who underwent laryngeal microsurgery, 208 patients were included in the study and divided in two groups: group A with phonotraumatic lesions ( $n = 131$ ) and group B with lesions unrelated to phonotrauma ( $n = 77$ ). The number of sessions and the functional result after speech therapy were evaluated.

**Results** The number of postoperative phonotherapy sessions after microsurgery was up to 10 sessions in 89.31% and 87.71% for groups A and B, respectively. Phonotherapy treatment showed a better functional evolution in group A (92.37%).

**Conclusion** A significant difference was observed only in functional evolution, which was better in the group with phonotraumatic lesions ( $p < 0.0001$ ).

## Keywords

- ▶ speech therapy
- ▶ larynx
- ▶ microsurgery

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## Introduction

The incidence of phonation problems in the general population varies according to the populations studied; globally, the incidence is between 3 and 9%.<sup>1</sup> When specific populations are studied, however, notably by speech-language pathologists, 60% of cases have dysphonia at some point throughout their professional lives,<sup>2</sup> and the incidence of vocal fold lesions was 20% of this population.<sup>3</sup> When such lesions are caused by a vocal trauma, they are called *phonotraumatic lesions*. Those data also reveal that some patients with vocal fold lesions will need to undergo surgery at some point in their lives.

Speech therapy pathology plays a necessary role in the evaluation and conduct for the treatment of dysphonias that have multiple causes and is particularly important in the rehabilitation of phonation disorders, notably those that need to be treated with laryngeal microsurgery. The prognosis of laryngological treatments depends on the accurate interaction between otorhinolaryngology and speech therapy pathology, which enables the best selection of diagnostic methods and rehabilitation treatment for the recovery of the desired phonation function.

Despite the existence of reports in textbooks and medical journals, few studies analyzed the effectiveness of speech therapy in otorhinolaryngologic surgeries.<sup>4</sup>

In this study, we evaluated the results of postoperative speech therapy treatment in patients who underwent laryngeal microsurgery due to several causes, with a special observation of patients who had phonotraumatic lesions.

## Methods

This study was performed at IPO Hospital (Paranaense Institute of Otorhinolaryngology, Curitiba, Paraná, Brazil). Two hundred forty-five patients with laryngeal disorders who were recommended to have microsurgery were prospectively evaluated from February 2010 to February 2011; of those patients, 139 (56.73%) were female and 106 (43.27%) were male, of ages 9 to 79 years. Medical records were filled out 1 day before the surgery, right after the preanesthesia consultation. Those records were paired with the postoperative follow-up records.

The SINPE Software (Sistema Integrado de Prontuários Eletrônicos) program devised by Malafaia and coauthors<sup>5</sup> was used in this study with the data and later computerized analysis. With the use of this electronic medical record, 20,320 items were recorded in the master record of otorhinolaryngological disorders and 12,044 items in the specific record of laryngeal disorders. Such items included detailed clinical, diagnostic, and therapeutic information.

For the speech therapy evaluation, the following were considered as exclusion criteria: patients with malignant neoplasia and patients with recurring papillomatosis. This left 208 patients in the sample for evaluation and speech therapy treatment.

A comparative study between two groups was proposed: group A patients with phonotraumatic lesions that include

vocal nodules, polyps, pseudocysts, and contact ulcers/granulomas, and group B patients with lesions not related to phonotrauma, such as Reinke edema and minor structural alterations. Group A had a total of 131 patients and group B, 77.

All the patients underwent postoperative speech therapy evaluation at least 7 days after the laryngeal microsurgery. Following the global evaluation of the patient and general instructions, such as those related to vocal hygiene, the following speech therapy techniques were used: support of sounds, change in posture, combination of movements in the phonoarticulatory organs, and use of connected speech.

Two main comparative parameters were evaluated: (1) the time of speech therapy sessions and (2) the patients' conditions at speech therapy discharge—in other words, their functional result. Functional evolution ranged from optimal to unsatisfactory. "Optimal evolution" was considered when the patient achieved clinical speech therapy parameters, when the patient showed improvement in voice symptoms, when the patient became aware of body-voice relationship, and also when the patient received positive feedback from family and friends regarding the improvement in his or her voice. "Unsatisfactory evolution" was considered when the patient did not achieve clinical speech therapy goals, when the patient did not appropriately commit to the therapy, when the patient did not accept his or her "new" voice, and finally when the patient received negative feedback.

The project was approved by the Ethics Committee of the Hospital of the UFPR under number 2617.224/2011-10.

## Results

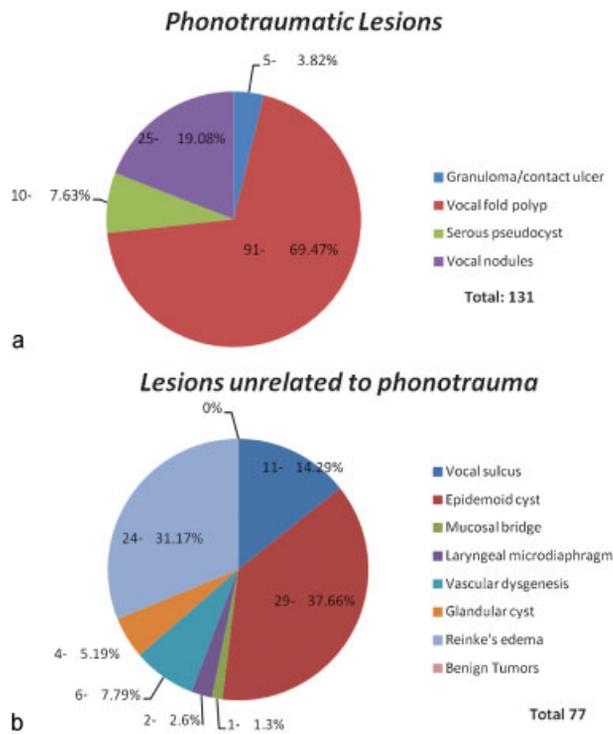
There were 131 patients in the group with phonotraumatic lesions, with the most frequent lesion being one vocal fold polyp in 91 cases (69.47%), vocal nodules in 25 cases (19.08%), vocal fold pseudocysts in 10 cases (7.63%), and granuloma/contact ulcers in 5 cases (3.82%). There were 77 patients in the group with lesions unrelated to phonotrauma, with the most frequent lesions in this group being intracord cyst in 29 cases (27.66%), Reinke edema in 24 cases (23.17%), vocal sulcus in 11 cases (14.29%), among others (► **Figs. 1a** and **1b**).

There was no statistically significant difference in time of postoperative speech therapy sessions between patients with phonotraumatic lesions and those with lesions unrelated to phonotrauma (► **Table 1**)

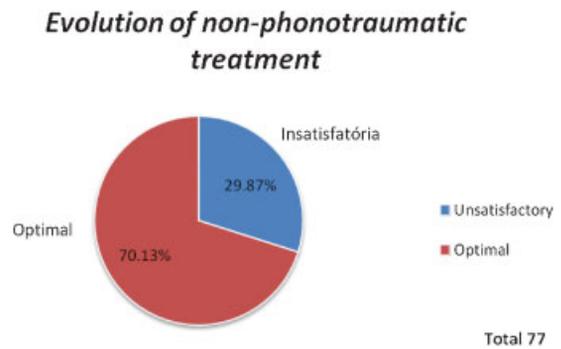
Speech therapy resulted in optimal evolution in 92.37% of cases with phonotraumatic lesions as well as 70.13% of cases with lesions unrelated to phonotrauma and in unsatisfactory evolution in 7.63 and 29.87% of cases, respectively (► **Table 2**; ► **Fig. 2** and **3**). ► **Table 2** shows a statistically significant difference between the patients with phonotraumatic lesions and patients lesions unrelated to phonotrauma after speech therapy ( $p < 0.00001$ ).

## Discussion

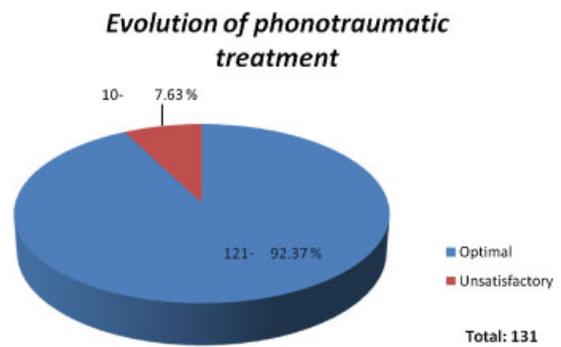
Speech therapists have an essential role in the treatment of individuals with vocal disorders. Accurate treatment can be



**Fig. 1** Phonotraumatic lesions (a), and lesions unrelated to phonotrauma (b).



**Fig. 2** Result of the evolution in speech therapy treatment.



**Fig. 3** Result of the evolution in speech therapy treatment.

crucial for the restoration and preservation of the voice, which will be reflected in the quality of life and even in the economic and professional situation of individuals.<sup>6,7</sup>

As previously referred to, there is abundant literature on the role of speech therapy in voice disorders, in the functional diagnostic on laryngology, and also in the evaluations and instructions for the postoperative stages of laryngeal microsurgery.<sup>7,8</sup>

Behlau and Pontes have already precisely pointed out several situations that encompass speech therapy service when laryngeal surgery is taken into account.<sup>8</sup> According to those authors, a patient can undergo speech therapy in one of the following situations: (1) preoperative referral in which surgery indication is not imperative; (2) preoperative referral with surgery indication defined; (3) postoperative referral due to organic alterations arising from the use of the voice; (4)

**Table 1** Statistical analysis of the time of sessions for phonotraumatic lesions and lesions unrelated to phonotrauma

Sessions	Lesions		Total	p
	Phonotraumatic	Not phonotraumatic		
10	117	66	183	0.12
20	9	3	12	
30	5	8	13	
Total	131	77	208	

**Table 2** Statistical analysis of the evolution in phonotraumatic and not phonotraumatic treatments

Evolution	Treatment		Total	p
	Phonotraumatic	Not phonotraumatic		
Optimal	121	54	175	<0.0001
Unsatisfactory	10	23	33	
Total	131	77	208	

postoperative referral of an organic condition not arising from the use of the voice; (5) postoperative referral due to the removal of structures essential to the phonation function.<sup>8</sup> All the subjects encompassed in this study are included in situations 3 and 4.

The number of postoperative speech therapy sessions after laryngeal microsurgery in this study was up to 10 sessions in 89.31 and 87.71% for the treatment of phonotraumatic and lesions unrelated to phonotrauma, respectively. This finding is in accordance with preoperative expectation, because the removal of phonotraumatic lesions facilitates speech therapy, thus shortening its time. This is different from lesions unrelated to phonotrauma, many of which are minor structural alterations, which led to a higher number of patients reaching 30 sessions. Even so, no statistically significant difference was found between the groups.

Over 90% of patients with phonotraumatic lesions showed optimal evolution results after speech therapy (92.37%). For many, with removal of the lesions (nodules, polyps, pseudocysts, and granulomas), the problem was solved, and speech therapy was in charge of the postoperative functional rehabilitation care. Because of this, in general, a better functional result is expected from this group. In the group with lesions unrelated to phonotrauma, patients showed optimal results in 70.13% of cases and unsatisfactory results in 29.87%. In such cases, we handled more difficult lesions by dealing with the internal structure of the vocal folds, similar to surgery of minor structural alterations, such as intracordal cyst or vocal sulcus. In this group, big lesions of vocal folds are also included, such as big or gigantic Reinke edema (third and fourth degrees). Postoperatively, these cases are more complex, because the structural recovery of the vocal fold layers and the vibration function takes longer. The rate of dissatisfaction does not reflect a bad result, but rather, that speech therapy will take longer and the final qualitative result will be seen later.

We found and we were able to prove that the role of speech therapy in postoperative evaluation, guidance, and rehabilitation therapy is important for patients who undergo laryn-

geal microsurgery. More studies are recommended at a medical level based on evidence that will provide the foundations for the results of current and future studies.

## Conclusion

Phonotraumatic lesions were found in 62.9% of cases seen in our service, and lesions unrelated to phonotrauma occurred in 37.1% of cases. Patients in the group of lesions unrelated to phonotrauma showed a longer period of therapy. Postoperatively, more patients in the phonotraumatic lesions group achieved the optimal functional result compared with patients with lesions unrelated to phonotrauma, 92.37 and 72.13%, respectively ( $p < 0.0001$ ). Therefore, the importance of speech therapy in the postoperative stage of laryngeal microsurgeries is noted, but its results are still dependent on the group of lesions treated.

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