





Combined frequency of patient-reported swallowing and voice complaints before thyroidectomy

Frequência combinada de queixas relacionadas à deglutição e voz antes da tireoidectomia

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ABSTRACT

Purpose: To analyze the combined frequency of patient-reported swallowing and voice complaints before thyroidectomy. **Methods:** This is a retrospective analysis of 51 interviews of patients referred for partial or total thyroidectomy. The combined frequency of patient-reported swallowing and voice complaints was determined from the median of the total number of related symptoms in each group. We also investigated how patients rated each function (excellent, very good, good, fair, poor) and whether this rating was related to the number of symptoms and the combined frequency. For bivariate analysis, Pearson's chi-square test or Fisher's exact test and the nonparametric Mann-Whitney test were used. The level of significance was 5%. **Results:** The combined frequency of patient-reported swallowing and voice complaints before thyroidectomy was 31.4%. The most commonly swallowing-related symptoms were throat clearing after swallowing (39.3%), swallowing effort (37.2%), and choking (35.3%). The most commonly voice-related symptoms were dry throat (72.6%), throat clearing (72.5%), and itchy throat (47%). The total number of symptoms was significantly higher among those who rated swallowing (3.13 ± 2.21) and voice (5.91 ± 2.81) negatively. Negative self-assessment of the voice was associated with the combined frequency of patient-reported swallowing and voice complaints ($p=0.003$). **Conclusion:** The combined frequency of patient-reported swallowing and voice complaints before thyroidectomy occurs in one third of the patients and is associated with negative self-assessment of the voice.

Keywords: Thyroid gland; Thyroidectomy; Voice; Swallowing; Self-assessment

RESUMO

Objetivo: Analisar a frequência combinada de queixas relacionadas à deglutição e voz, antes da tireoidectomia. **Métodos:** Foi realizada uma análise retrospectiva de 51 entrevistas de pacientes encaminhados para tireoidectomia parcial ou total. A partir da mediana da quantidade total de cada grupo de sintomas de deglutição e voz, determinou-se a frequência combinada de queixas relacionadas à deglutição e voz. Investigou-se, ainda, como os pacientes classificaram cada uma das duas funções (excelente, muito boa, boa, razoável ou ruim) e se esta classificação se relacionava com a quantidade de sintomas e com a frequência combinada. Para a análise bivariada, foram utilizados os testes Qui-quadrado de Pearson ou exato de Fisher e o teste não paramétrico de Mann-Whitney. O nível de significância foi de 5%. **Resultados:** A frequência combinada de queixas relacionadas à deglutição e voz antes da tireoidectomia foi de 31,4%. Os sintomas mais citados, relacionados à deglutição, foram pigarro após deglutir (39,3%), esforço para deglutir (37,2%) e engasgo (35,3%) e os relacionados à voz foram garganta seca (72,6%), pigarro na garganta (72,5%) e coceira na garganta (47%). A quantidade de sintomas foi significativamente maior entre os que classificaram a deglutição ($3,13 \pm 2,21$) e a voz ($5,91 \pm 2,81$) de forma negativa. Houve associação entre autoavaliação negativa da voz e a frequência combinada de queixas relacionadas à deglutição e voz ($p=0,003$). **Conclusão:** A combinação de queixas relacionadas à deglutição e voz antes da tireoidectomia ocorre em um terço dos pacientes e está associada à autoavaliação negativa da voz.

Palavras-chave: Glândula tireoide; Tireoidectomia; Voz; Deglutição; Autoavaliação

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INTRODUCTION

Benign or malignant thyroid disorders affect hormone production and secretion⁽¹⁾ and may alter functional patterns of voice⁽¹⁻³⁾ and swallowing^(1,3,4). Such diseases can be treated by thyroidectomy, which consists of partial or total removal of the thyroid gland^(1,5,6). This procedure can lead to voice and swallowing changes due to multiple factors such as extent of surgery^(1,7), technique used in the procedure^(8,9), orotracheal intubation^(5,6), dissection of cervical muscles⁽⁶⁾, bruising⁽⁶⁾, and manipulation of the laryngeal nerves^(1,5,6,10).

However, voice and swallowing changes may be present even before thyroidectomy due to a possible hormonal disorder^(1,2,4). In addition, increased gland volume^(1,11,12) and the presence of benign or malignant nodules^(1,13,14) may cause compressive symptoms such as shortness of breath^(1,13,14), swallowing effort^(1,4,14), foreign body sensation in the throat^(1,4,13,15-17), choking⁽¹⁷⁾, and odynophagia^(1,4,13,17), impacting the biomechanics of swallowing. Similarly, communication may be affected by vocal symptoms such as hoarseness, voice weakness, and monotonous voice^(1,6,10,16), as well as by physical symptoms such as throat clearing, pain and discomfort when speaking⁽¹⁸⁾.

Although voice and swallowing complaints are still considered minor complications of thyroid disease in clinical routine, they significantly affect patients' quality of life^(1,19,20). Considering that voice and swallowing share common structures and pathways, it is assumed that the simultaneous occurrence of voice and swallowing complaints may represent the presence of more severe functional and quality of life impairments even before surgical intervention.

Many studies on thyroidectomy have addressed preoperative occurrence of voice and swallowing symptoms in isolation⁽¹³⁻²⁰⁾, but the combined frequency of these conditions before surgery is unknown. Therefore, this study analyzes the combined frequency of voice and swallowing complaints before thyroidectomy.

METHOD

This is a quantitative, retrospective, and documentary study derived from a structuring project approved by the Human Research Ethics Committee of the Lauro Wanderley University Hospital (HULW/UFPA/EBSERH), João Pessoa city, Paraíba State, under n°. 2,382,441/2017.

Collection was performed from the database of a service that provides multiprofessional care to patients with head and neck cancer in a university hospital. This study considered collection records made between July 2016 and May 2017.

We included records of patients aged 18 years and over, of both sexes, with medical diagnosis of thyroid disease and indication of partial or total thyroidectomy. Records with incomplete data were excluded. The sample consisted of 51 patients aged between 20 and 81 years (averaging 52.6 ± 14.8 years), predominantly female ($n=49$; 96.1%), referred for partial ($n=11$, 21.6%) or total ($n=40$; 78.4%) thyroidectomy due to nodular disease ($n=31$; 60.8%) or goiter ($n=20$; 39.2%).

Voice and swallowing complaints recorded in the database were obtained from a checklist prepared by the professionals responsible for the service. The checklist consisted of 11 symptoms related to swallowing and ten related to voice, recording the presence, absence, and frequency of symptom occurrence (sometimes or always) (Appendix 1).

To define the combined frequency of voice and swallowing complaints, the following steps were taken: 1) collection of the total amount of symptoms reported for each of the two functions analyzed and for each patient; 2) calculation of the median of each of the two functions analyzed, to determine the minimum amount of symptoms for the complaint to be considered (two or more swallowing symptoms; five or more voice symptoms); 3) definition of the combined frequency by the concomitant presence of complaint in both functions.

Another piece of data collected was the classification the patient gave to his or her own swallowing and voice, based on the following questions: "how do you evaluate your swallowing?" and "how do you evaluate your voice?". The answers to both questions followed a Likert scale with five options: excellent, very good, good, reasonable, or poor. For purposes of analysis, these five categories were dichotomized into "positive self-assessment" (excellent, very good, and good) and "negative self-assessment" (reasonable or poor). Other independent variables of interest included clinical data: type of surgery indicated, diagnosis of thyroid disease, smoking history, and self-reported gastroesophageal reflux.

The descriptive analysis of the variables included the calculation of measures of central tendency and variability, as well as the presentation of the absolute and relative distribution of data. In the bivariate analysis, Pearson's chi-square or Fisher's exact tests were used to verify the association between variables. The nonparametric Mann-Whitney test was applied to determine mean differences between categories. The significance level was 5% and the software used was SPSS version 20.0.

RESULTS

The number of swallowing-related symptoms ranged from 0 to 7, with 38 participants (74.4%) reporting at least one symptom. The most cited symptoms, regardless of frequency, were throat clearing after swallowing (39.3%), swallowing effort (37.2%), and choking (35.3%). When considering the frequency, the most recurrent symptom was throat clearing after swallowing (11.8%) (Figure 1).

The number of voice-related symptoms, in turn, ranged from 0 to 10, and 44 (86.3%) patients reported at least one voice symptom. The three most cited symptoms were dry throat (72.6%), throat clearing (72.5%), and itchy throat (47%). When considering the frequency, dry throat was the most recurrent symptom (31.4%) (Figure 2).

There was a balanced distribution between patients who rated their swallowing positively ($n=27$; 52%) and patients who rated it negatively ($n=24$; 48%) (Figure 3). However, the number of swallowing complaints was higher among those who rated swallowing negatively (3.13 ± 2.21) compared to those who rated it positively (1.04 ± 1.16), this difference being statistically significant ($p<0.001$; 95% CI = 1.11-3.06).

In voice self-assessment, there was also a balanced distribution between positive ($n=29$; 57%) and negative ($n=22$; 43%) ratings (Figure 3). Patients who rated their voice negatively had more voice symptoms (5.91 ± 2.81) compared to those who rated it positively (1.04 ± 1.16), this difference being statistically significant ($p<0.001$; 95% CI = 1.56-4.59).

The combined frequency of voice and swallowing complaints was 31.4% ($n=16$), being approximately four times higher in patients who rated their voice negatively compared to those who rated it positively ($p=0.003$). No other associations were found (Table 1).

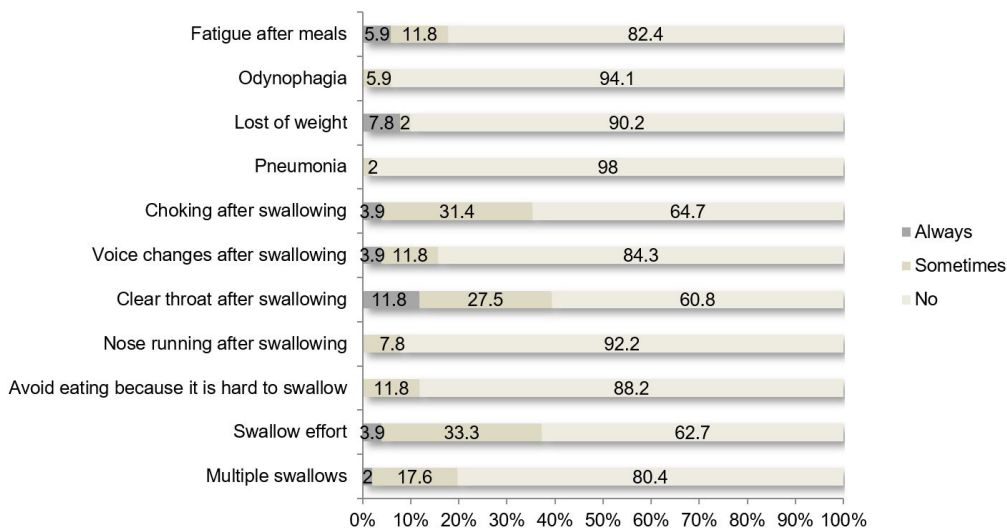


Figure 1. Percentage distribution of swallowing complaints reported by patients before thyroidectomy. João Pessoa - PB, 2017

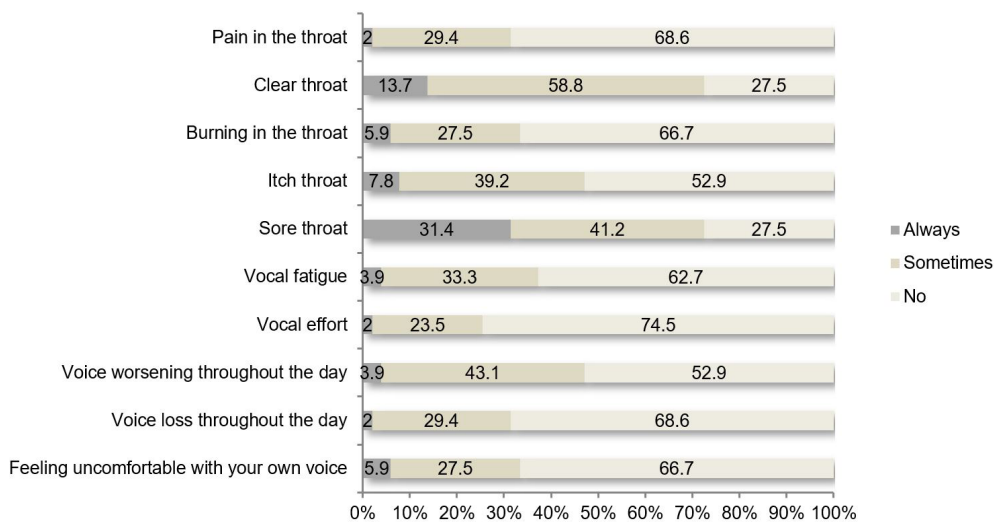


Figure 2. Percentage distribution of voice complaints reported by patients before thyroidectomy. João Pessoa - PB, 2017

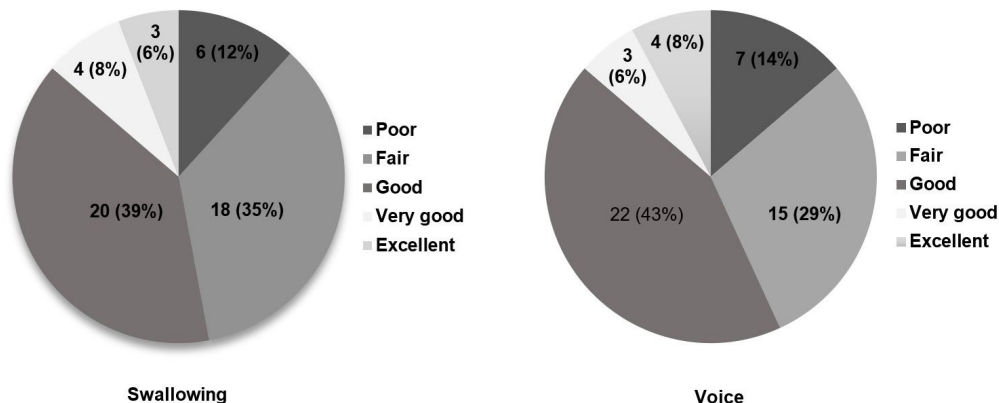


Figure 3. Absolute and percentage distribution of self-rated swallowing and voice as reported by patients before thyroidectomy. João Pessoa - PB, 2017

Table 1. Association between the combined frequency of voice and swallowing complaints before thyroidectomy and independent variables

	Combined frequency of voice and swallowing complaints				p-value	PR (CI:95%)
	Yes		No			
	n	%	n	%		
Indicated surgery						
Total thyroidectomy	13	32.5	27	67.5	0.741 [†]	1.19 (0.41-3.45)
Partial thyroidectomy	3	27.3	8	72.7		
Diagnosis						
Nodule	10	32.3	21	67.7	0.86 [*]	1.07 (0.46-2.49)
Goiter	6	30.0	14	70.0		
Smoking						
Yes	2	14.3	12	85.7	0.17 [†]	1.37 (0.99-1.91)
No	14	37.8	23	62.2		
Gastroesophageal reflux (self-reported)						
Yes	4	30.8	9	69.2	1.00 [†]	1.01 (0.38-2.49)
No	12	31.6	26	68.4		
Self-rated swallowing						
Negative	10	41.7	14	58.3	0.13 [*]	1.87 (0.80-4.38)
Positive	6	22.2	21	77.8		
Self-rated voice						
Negative	12	54.5	10	45.5	0.003 [†]	3.95 (1.47-10.60)
Positive	4	13.8	25	86.2		

*Chi-square test; [†]Fisher's exact test; p<0.05

Subtitle: n = absolute frequency; % = relative frequency; PR = prevalence ratio; CI = confidence interval. Source: Elaborated by the authors

DISCUSSION

Almost half of the participants of this study rated voice and swallowing negatively. As expected, this group of patients had a higher number of symptoms in both functions compared to those whose self-assessment was positive. This result is in line with the literature, indicating that voice^(1,11,14-16,18-21) and swallowing^(1,4,13-17,21-23) symptoms may be reported by patients referred for thyroidectomy. This is especially due to the compressive characteristics of thyroid disease, in addition to hormonal changes and impairment of laryngeal mobility or laryngotracheal complex^(1,4).

Among swallowing complaints, throat clearing after swallowing was the most cited, followed by swallowing effort and choking. The proximity of the thyroid gland to the trachea and laryngopharynx⁽²⁴⁾ may alter both hyolaryngeal and epiglottis elevation during swallowing, leading to stasis in valleculae and/or piriform sinuses⁽¹¹⁾, which may justify throat clearing, swallowing effort, and choking.

Stasis may also be referred to as a foreign body sensation in the throat and is cited in the literature as a frequent symptom in patients with thyroid disease^(1,4,13,15-17,21,22). Therefore, it is assumed that in attempting to minimize the discomfort caused by the permanence of residues in the laryngopharynx, the patient develops throat clearing after swallowing, referred to in this study as the most frequent symptom among all related to swallowing.

Regarding voice, there was a predominance of physical symptoms such as dry throat, throat clearing, and itchy throat, with dry throat being the most recurrent. Physical symptoms were also the most reported in other studies that investigated voice complaints before thyroidectomy^(18,20,21). Although the

symptom of dry throat has already been mentioned in other studies^(8,21), there is no clear justification in the literature to explain its occurrence in these patients. It is possible that inadequate hydration or vocal effort may be related to dry throat⁽²¹⁾, also cited as a symptom associated with adverse effects of voice-related medications⁽²⁵⁾. Although medications used by patients were not a controlled variable in this study, it should not be ruled out as a possible explanation for dry throat complaints.

It is also known that thyroid hormone receptors located in the lamina propria of human vocal folds control polysaccharide levels and thus regulate fluid retention therein, preventing edema⁽²⁶⁻²⁸⁾. Hence, it is assumed that the symptoms reported by the patients in this study may also be related to the hormonal dysregulation occurring in patients with thyroid disease.

As expected, the number of voice and swallowing symptoms was higher among those who rated their voice negatively. Those who rated swallowing or voice positively reported, on average, only one symptom. Therefore, results indicated that negative self-assessment of swallowing or voice before thyroidectomy is related to the presence of multiple symptoms.

The simultaneous presence of self-reported complaints of swallowing and voice drew even more attention because it occurred in approximately 30% of patients before surgery, a proportion ten times higher than that reported in the literature for the postoperative period⁽³⁾. This result reinforces that thyroid disease can cause cumulative effects on voice and swallowing functions. This way, investigation of these conditions should be incorporated into the preoperative clinical routine, considering the negative impact of these symptoms on the functionality and quality of life of patients with thyroid disease^(1,10,20).

It is noteworthy that the combined frequency of voice and swallowing complaints was approximately four times higher in participants who rated their voice as reasonable or poor. This

association showed that the negative rating of voice seems to be more sensitive to detect the presence of combined voice and swallowing complaints. This means that if the patient referred for thyroidectomy is asked to rate his/her voice and the result is negative, he/she is more likely to have concomitant voice and swallowing symptoms. Thus, it is recommended that voice complaint be especially valued before thyroidectomy, as it may indicate the presence of multiple symptoms.

Overall, the results of this study corroborate that patient perception seems to be an important measure in swallowing^(8,12,15,17,21-23) and voice^(8,10,15,19-23) assessment, as it can report subjective aspects not considered by the evaluator^(17,19). Based on the results, it can be inferred that swallowing and voice self-assessments should be considered in the care of patients referred for thyroidectomy, mainly because complaints in these two functions may appear concomitantly.

This study had some limitations. The sample from a single health service and the predominance of female participants represented selection bias. Variables such as medications used, results of biochemical and laryngological examinations, as well as more detailed information about tumor, nodule, or goiter characteristics were inconsistent in the database, making the analysis of this information unfeasible. Confounding variables such as laryngeal changes and medical diagnosis of gastroesophageal reflux may have interfered with the results and should be controlled in future studies. Future research should include larger samples and the association of self-assessment results with clinical and instrumental assessment of swallowing and voice prior to thyroidectomy.

CONCLUSION

The combined frequency of voice and swallowing complaints before thyroidectomy occurs in one third of patients and is more present among those who rate their voice as reasonable or poor.

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Appendix 1. Checklist of symptoms and signs related to swallowing and voice

Swallowing	No	Yes	Sometimes	Always
Fatigue after eating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Odynophagia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Weight loss	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pneumonia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Choking after swallowing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Voice change after swallowing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Throat clearing after swallowing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tiredness while eating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Runny nose after swallowing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stop eating due to difficulty in swallowing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Swallowing effort	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multiple swallows	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Voice				
Sore throat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Throat clearing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Burning in the throat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Itchy throat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dry throat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tiredness while speaking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Speaking effort	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Voice worsening during the day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Loss of voice during the day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feel uncomfortable to speak	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Erratum

In the article **Combined frequency of patient-reported swallowing and voice complaints before thyroidectomy**, DOI: <http://dx.doi.org/10.1590/2317-6431-2019-2180>, published in journal *Audiology - Communication Research*, 24:e2180, page 1:

Where it reads:

“Daniela de Souza Xavier”

It should read:

“Daniela Xavier de Souza”

In the Authors’ contribution item:

Where it reads:

“DSX”

It should read:

“DXS”

In the header:

Where it reads:

“Xavier DS”

It should read:

“Souza DX”