

# Speech Therapy for Post Thyroidectomy Patients: A Clinical Audit

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## ABSTRACT

**Objective:** We aim to audit the provision of speech counselling to those patients who underwent thyroidectomy for their respective diseases who presented to surgery department in 2021

**Methodology:** This clinical audit was conducted in surgical D unit department of Surgery, Khyber Teaching Hospital, Peshawar from January 2021 to November 2022. A total of 50 patients each for the audit group and the re-audit group were selected through non-probability consecutive sampling for both genders. A predesigned proforma According to clinical practice guidelines and British association of endocrine and thyroid surgeon's guidelines (BAETS) was used. Data was entered into Microsoft excel, analyzed through SPSS version 23 and results were presented in the form of descriptive writing and tables.

**Results:** The mean age of the study population was 42.64 +/- 11.51 with relatively more female patients. None of the patients in the audit group were properly given speech counselling irrespective of their disease or surgery status. In the re-audit group, 100% of the patients were given proper post-operative speech therapy which resulted in 84% percent of the patients attaining their usual voice, seven patients having some roughness in their tone and only one patient having occasional problems with breathing.

**Conclusion:** Despite their rarity, voice changes after a straightforward thyroidectomy can be quantified. For ethical and legal reasons, this is significant in the preoperative and postoperative counselling of patients before thyroidectomy.

## INTRODUCTION

There are some disorders of the thyroid gland for which a thyroidectomy is performed which is an operation that involves the surgical removal of all or part of the thyroid gland<sup>1-2</sup>. Some indications for thyroidectomy include thyroid cancer<sup>3</sup>, noncancerous enlargement of thyroid gland (goiter)<sup>4</sup>, hyperthyroidism and indeterminate or suspicious thyroid nodules<sup>5</sup>.

Even though thyroidectomy is potentially curative and definite treatment in a variety of clinical settings but the procedure is not without its fair share of complications. Some common post thyroidectomy complications include temporary or permanently low calcium<sup>6-8</sup>, bleeding<sup>9</sup>, dysphagia<sup>10</sup>, temporary or permanent change in voice (hoarseness and dysphonia) secondary to recurrent laryngeal nerve injury, and the remote possibility of airway obstruction due to bilateral vocal cord paralysis<sup>11-13</sup>.

The reason why post-thyroidectomy patients develop speech problems like hoarseness and dysphonia is due to per-operative damage to the recurrent laryngeal nerve (RLN). The nerve can be injured by compression from surrounding edema due to tissue trauma, heat generated by electrocoagulation instruments and a foreign body reaction by prolonged endotracheal intubation. Voice changes can also be observed without damage to the RLN as mentioned in one study that damage to the superior laryngeal nerve (SLN), pre-thyroid strap muscles and the cricothyroid are additional causes<sup>14</sup>. Although salvaging the recurrent laryngeal nerve during thyroid surgery is dependent upon the surgeon's skill and experience, there is evidence that those patients who are given proper post-operative guidelines on speech can regain most, if not all, of their voice function and return back to normal life<sup>15</sup>.

**Standard Criteria:** According to clinical practice guidelines and British association of endocrine and thyroid surgeon's guidelines (BAETS), patients with mild to severe voice changes, with or without associated swallowing difficulties, can be offered post thyroidectomy voice therapy as shown in Table-1. If such specialized service is not available than the

operating surgeon can request a referral to a speech pathologist.

## METHADODOLOGY

In order to check the thyroid disease patients admitted in surgical department in 2021, we examined the files of all adult patients admitted to the surgical department who underwent thyroidectomy for their respective diseases. We investigated the files of these patients including examination notes, progress notes, surgical notes and medication history and post-operative counselling. We compared our clinical practice with the policy of clinical practice guidelines and British association of endocrine and thyroid surgeon's guidelines (BAETS).

**The following data was collected from the patient's files:**

- Type of thyroid disease
- Type of thyroidectomy (hemi, subtotal, near total or total)
- Post-operative complications especially related to speech
- Was pre-discharge speech counselling done or not?

Then a process of re-audit began after 3 months in which all patients who presented to surgical department for thyroidectomy due to respective thyroid diseases received proper post-operative counselling on speech therapy according to the clinical practice guidelines and British association of endocrine and thyroid surgeon's guidelines (BAETS) as mentioned in Table-1. After discharge patients were called back to OPD for follow up after 7 days and their quality of speech was assessed using the GRBASI scale (Hirano 1981) which stands for grade of hoarseness, roughness, breathiness, asthenia and strain and instability (table-2). The results were depicted in the form of descriptive writing and tables.

## RESULTS

**Audit group:** A total of 52 patients who underwent thyroidectomies for their respective diseases over a 12-month period from January 2021 to December 2021 were included in the audit group. The mean age of the study population was 40.4 +/- 10.23 and majority of them were females (92.3%).

Multinodular goiter was the leading thyroid disorder (n=38, 73.1%) followed by toxic thyroid nodules on right and left sides, 4 patients each (7.7%). The study sample also contained five patients with primary thyrotoxicosis (9.6%) (Table 3). The most commonly performed procedure was total thyroidectomy (n=44, 84.6%) succeeded by right hemi done for four patients (7.7%) and left hemi for two patients (3.8%) (Table 4). Also, two of these patients underwent subtotal thyroidectomies for their respective diseases. In the audit group, none of the patients received post thyroidectomy speech counselling to help them achieve their normal voice as swiftly as possible.

**Re-audit group:** A total of 50 patients who underwent thyroidectomies for their respective diseases over a 10-month period from February 2022 to November 2022 were included in the re-audit group. The mean age of the study population was 42.64 +/- 11.51 and similar to the audit group most of the patients were females. Age categories were defined to assess the type of disease distribution. Again, multinodular goiter was the predominant condition with 29 patients (58%) having this disease followed by right and left thyroid nodules (14%) each and, less commonly, enlarged thyroid lobes (8%). Only two patients had a colloid goiter as well (Table 5). The most frequently performed procedure was total thyroidectomy, 22 cases (44%) followed by near total thyroidectomy, 11 cases (22%) (Table 6). All the patients were properly counselled regarding speech utilization and other preventive measures to re-gain their normal pitch and tone. On seventh day post-operative follow up the GRBASI score was calculated for all patients (Table 7). It was observed that 84% percent of the patients had achieved their normal voice, only seven patients had some roughness in their tone and only one patient had occasional problems with breathing.

Table 1:

Generic advice	Voice advice
Don't smoke • Keep a supply of drinking water handy • Humidify the environment • Eliminate habitual throat clearing • Avoid all non-speech voice use (throat clearing, coughing, "voiced" sneezing, crying, "voiced" laughing and odd sound-effects) Referral to a speech therapist	Minimize voice use: – Be brief when talking – Avoid any loud use of voice – Keep phone calls brief • Speak more slowly, articulate clearly • Speak at a comfortable pitch and loudness level • Balance extra vocal demands with vocal rest

Table 2: GRBASI score chart.

Component	Description
G	Grade Degree of hoarseness of the voice
R	Roughness Impression of irregularity of the vibration of the vocal folds
B	Breathiness Degree to which air escaping from between the vocal folds can be heard by the examiner
A	Asthenia Degree of weakness heard in the voice
S	Strain Extent to which strain or hyperfunctional use of phonation is heard
I	Instability Changes in voice quality over time

Rating scale: 0, normal; 1, slight; 2, moderate; 3, severe.

Source: Yamauchi, E.J., Imaizumi, S., Maruyama, H. & Haji, T. (2010). Perceptual evaluation of pathological voice quality: A comparative analysis between the RASATl and GRBASI scales. *Logopedics Phoniatrics Vocology*, 35, 121–128.

Table 3: Thyroid disease

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Left thyroid Nodule	4	7.7	7.7	7.7

Medullary thyroid CA	1	1.9	1.9	9.6
Multinodular Goiter	38	73.1	73.1	82.7
Primary thyrotoxicosis	5	9.6	9.6	92.3
Right thyroid Nodule	4	7.7	7.7	100.0
Total	52	100.0	100.0	

Table 4: Thyroid Surgery

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Left hemithyroidectomy	2	3.8	3.8	3.8
Right hemithyroidectomy	4	7.7	7.7	11.5
Subtotal Thyroidectomy	2	3.8	3.8	15.4
Total Thyroidectomy	44	84.6	84.6	100.0
Total	52	100.0	100.0	

Table 5: Thyroid Disease

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid colloid goiter	2	4.0	4.0	4.0
enlarged left thyroid lobe	1	2.0	2.0	6.0
enlarged right thyroid lobe	3	6.0	6.0	12.0
follicular thyroid CA	1	2.0	2.0	14.0
left thyroid nodule	7	14.0	14.0	28.0
Multinodular Goitre	29	58.0	58.0	86.0
right thyroid nodule	7	14.0	14.0	100.0
Total	50	100.0	100.0	

Table 6: Thyroid surgery

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid left hemithyroidectomy	8	16.0	16.0	16.0
Near total thyroidectomy	11	22.0	22.0	38.0
right hemithyroidectomy	9	18.0	18.0	56.0
total thyroidectomy	22	44.0	44.0	100.0
Total	50	100.0	100.0	

Table 7: GRBASI Score on follow up

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0	42	84.0	84.0	84.0
1	7	14.0	14.0	98.0
2	1	2.0	2.0	100.0
Total	50	100.0	100.0	

## DISCUSSION

Time and again, patients who undergo thyroidectomy for various indications, often complain of voice dysfunction in the post operative period despite the advances in modern thyroid surgery<sup>16</sup>. Recurrent laryngeal nerve injury, which results in

vocal fold paralysis, is one of the most frequent causes of dysphonia, even though there are other causes mentioned in literature as well<sup>17-18</sup>. There is improper glottic closure that can lead to dysphonic symptoms such as low pitch, breathiness, decreased voice distance and loudness<sup>19</sup>. Speech therapy is a non-surgical therapeutic option available with speech pathologists to rehabilitate patients with communication problems secondary to possible vocal cord paralysis<sup>20</sup>. Thus, timely intervention in the form of speech therapy can significantly improve quality of life especially in the post-operative period.

Multiple techniques have been devised to treat vocal cord paralysis<sup>21</sup> and they are broadly classified into hygiene approaches and physiological approaches<sup>22</sup>. Hygiene technique revolves around maintaining throat hydration and voice rest while physiological methods involve vocal function exercises<sup>23</sup>. There are maneuvers and scores to analyze voice function before and after speech counselling has been done<sup>24</sup>. Voice therapy is typically performed over the course of several sessions by a speech-language pathologist with experience in voice disorders<sup>25</sup>. There is substantial evidence that speech counselling enhances voice recovery in patients after thyroidectomy<sup>26-27</sup>.

Our study evaluated these techniques, both hygiene related and physiological, as mentioned in the British association of endocrine and thyroid surgeon's guidelines (BAETS), table-1, to assess the impact of speech counselling irrespective of significant injury to the recurrent laryngeal nerve. All the patients were properly counselled regarding precautionary measures to attain their usual daily voice. The GRBASI score is a useful tool to investigate post-operative voice changes, if any, in such patients and it has been utilized in multiple studies worldwide<sup>28-34</sup>. In our analysis the GRBASI score was calculated for all patients on seventh post op day and it was perceived that 84% percent of the patients had achieved their normal voice, only seven patients had some roughness in their tone and only one patient had occasional problems with breathing.

## CONCLUSION

Alterations in the quality of voice are common complications associated with thyroid surgeries. The effectiveness of speech counselling to treat symptoms related to dysphonia are well documented in medical literature and the purpose of this audit was to implicate the advantage of this technique in our setup and make it a part of daily post thyroidectomy management which obviously wasn't practiced before. There is a constant need to educate and motivate post graduate residents, nurses and other health related staff to either provide this service to patients directly or referring them to a speech pathologist irrespective of their clinical status.

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