

Assessment Of Dysphagia In Patients With Enlarged Thyroid Gland Using Ent Diagnostic Techniques

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ABSTRACT

Background: An enlarged thyroid gland otherwise known as a goiter has the potential to cause swallowing difficulties (dysphagia) as it may compress and modify the functionality of the larynx. An otolaryngologist's timely evaluation may elucidate the etiological and pathophysiological aspects leading to the dysphagia. An endoscopic examination provides a direct view that enables the appreciation of laryngeal displacement, laryngeal elevation, and pharyngeal constriction or narrowing, thereby enhancing the assessment of dysphagia and helping to develop a targeted treatment plan.

Objectives: To evaluate the routine ENT diagnostic method techniques in estimating proportions as well as the severity of endoscopic dysphagia features relative to the size of the thyroid glands, and to explore associations with thyroid volumetry and structural deviation.

Methodology: Clinically and radiologically enlarged thyroid glands from the Department Of ENT Kabir Medical College, Peshawar from July 2023 to July 2024 were gathered for this cross-sectional study which involved 100 patients. Each patient underwent an ENT evaluation which involved indirect laryngoscopy, flexible nasopharyngolaryngoscopy, and FEES. The ultrasound was used to determine the size of the thyroid and the degree of tracheal deviation. To assess dysphagia, EAT-10 was used. Analysis of the data was carried out using SPSS v24, deeming $p < 0.05$ to be statistically significant.

Results: Among 100 patients the average age was 42.3 years (SD, 10.4 years). Dysphagia was present in 52.0% of the patients. Persistent endoscopic retrospective findings uncovered bulging of the posterior pharyngeal wall in 34.0%, laryngeal elevation was restricted in 22.0%, and valleculate residues were evident in 18.0%. Dysphagia was significantly associated with Treichel deviation of 5 mm or more ($p = 0.018$). Mild to moderate pharyngeal stage impairment in 28% of symptomatic patients were the result of FEES. Greater volumes of thyroids were statistically significant for the elevation of EAT-10 scores ($p = 0.032$).

Conclusion: Patients with enlarged thyroid glands often report difficulty swallowing dysphagia which can be attributed to structural displacement and dysfunctional pharyngeal biomechanics. Objective assessment to the degree of early functional compromise is possible with ENT diagnostic methodology particularly Flexible Endoscopic Evaluation of Swallowing (FEES) and flexible laryngoscopy. Adding these assessments to routine evaluations of the thyroid improves the accuracy of diagnoses and informs the timely implementation of management options and reduction of morbidity.

Keywords: Thyroid Enlargement • Dysphagia • Laryngoscopy • FEES

1. INTRODUCTION

Dysphagia is frequently encountered yet inadequately

documented in case reports on patients with goiters in dysphagia endemic regions. [1] Thyroid glands can enlarge for several reasons, such as multinodular goiters, Hashimoto thyroiditis, Graves' disease, solitary nodules, or malignancies [2]. An enlarged thyroid may compress or shift the neighboring trachea, esophagus, or larynx, thereby affecting the physiology of normal swallowing as illustrated in [3]. The swallowing dysfunction can vary in severity dysphagia, with some patients only experiencing mild discomfort while others have difficulty in transit of the ingested bolus due to compression. The posterior located esophagus is especially affected by the mass effect from enlarged thyroids from goiters [4]. Also, larynx elevation during swallowing may be restricted due to mechanical mass effect, contributing to weak airway protection. It has been documented that only mildly enlarged thyroids can alter swallowing biomechanics [5,6]. Instrumental swallow evaluations can

include. Traditionally, evaluations of dysphagia in thyroid disease were based on self-reported symptoms, along with still radiographic imaging [7]. While high-resolution ultrasound and computed tomography (CT) scans obtain useful details on the size of the gland, positional anatomy, and degree of tracheal deviation, they still lack functional swallowing details. Functional endoscopic evaluation of swallowing (FEES) can demonstrate pharyngeal bolus flow, pharyngeal muscle coordination, laryngeal closure, and residue, and offers the opportunity for dynamic assessment, thus serving well as a dysphagia evaluation adjunct in the case of enlarged thyroid glands. Many recent works have highlighted the use of FEES [8,9]. the assessment of true obstructive dysphagia and functional impairments from dysphasia due to soft tissue, muscular, or biomechanical factors. In many low-resource areas, the evaluation of dysphagia with thyroid enlargement lacks significant study, and where it exists, the study focuses predominantly on obstructive symptoms, particularly dyspnea and voice changes, leaving for less attention symptoms of swallowing, their gland size, tracheal deviation, and endoscopic correlates. These would significantly contribute to the quality of preoperative assessment, surgical planning, and subsequent postoperative care [10,11].

Study Objectives:

To assess the prevalence, severity, and endoscopic features of Dysphagia related to enlarged thyroid glands, and its correlation with thyroid volume, tracheal deviation, and functional impairment in swallowing.

2. MATERIALS AND METHODS

Study Design & Setting:

Department Of ENT Kabir Medical College, Peshawar from July 2023 to July 2024 a cross-sectional observational study was undertaken which involved thorough clinical, radiological, and endoscopic evaluations of patients with enlargements of the thyroid.

Participants:

The study incorporated a hundred adult individuals who had thyroid glands with clinical and radiological enlargement, irrespective of underlying cause. Each of them went through ENT evaluation, ultrasound study and FEES. Patients with previous thyroid surgery, known neurological swallowing disorders, or acute infections were excluded. Written informed consent was obtained before enrollment.

Sample Size Calculation:

A minimum sample size of 100 was estimated at the 95% confidence level, with a 10% margin of error and an assumed dysphagia prevalence of 50% in patients with thyroid enlargement. A final sample of 100 patients was selected to increase statistical power and allow subgroup analysis.

Inclusion Criteria:

Adults aged ≥ 18 years with clinically palpable and ultrasound-confirmed thyroid enlargement (benign or malignant) presenting to the ENT or General Surgery clinic were included. All patients who were able to undergo flexible laryngoscopy and FEES assessments were recruited.

Exclusion Criteria:

Patients with previous thyroid or neck surgery, neurological disorders affecting swallowing, upper aerodigestive malignancies other than thyroid, or acute infections interfering with swallowing assessment were excluded to avoid confounding functional abnormalities.

Diagnostic and Management Strategy

All patients underwent ENT evaluation, including indirect laryngoscopy, flexible nasopharyngolaryngoscopy, and FEES. The thyroid size and tracheal deviation were assessed by ultrasound. Management planning was determined by symptom scoring and its association with findings from endoscopy.

Statistical Analysis

The analytical tools used were SPSS v24. For quantitative variables, descriptive statistics summarized the data using mean \pm SD, while frequency distributions were used for categorical variables. For the analysis of associations, the Chi-square and t-test were used considering a p-value of 0.05 as statistically significant. As for the assessment of the relationship between the severity of dysphagia and the size of the thyroid, correlation analysis was performed.

Ethical Approval

Ethical approval was obtained from the Institutional Review Board of T Kabir Medical College, Peshawar. Informed consent was acquired from all participants, with confidentiality preserved throughout the study, as per the Declaration of Helsinki.

3. RESULTS

The primary outcome indicated that 52% of patients experienced dysphagia, which was significantly associated with thyroid volume and degree of tracheal deviation ($p < 0.05$). Among secondary outcomes, further evaluation of dysphagia (FEES) was abnormal in 28% of patients, and included findings of vallecular residue and reduced laryngeal elevation which were associated with higher EAT-10 scores.

Intervention Outcomes

Even though the study focused on diagnosis, meaningful clinical results were obtained from the evaluative steps undertaken. Patients identified with considerable Dysphagia on the EAT-10 scoring and FEES were counselled on further management, which included dietary changes, swallowing therapy, and consideration for thyroid surgery, where relevant. Out of the 52 Dysphagia patients, 38% experienced symptom relief following the identified conservative Dysphagia management, particularly swallow exercises and the positional strategies, Dysphagia within the follow-up period. Those with worst cases of structural compression were directed for endocrine surgery, with 12% clearly requiring thyroidectomy due to symptomatic airway or esophageal obstruction. Endoscopic evaluations were crucial in making these management control choices. Importantly, those exhibiting significant tracheal deviation or bulging of the pharyngeal wall during laryngoscopy had a higher likelihood of needing a surgical referral ($p < 0.05$). Overall, the use of the ENT additional diagnostic approach allowed more accurate symptom description and more individualized management approach to be developed.

Table 1: Baseline Demographic and Clinical Characteristics of Patients (n = 100)

Variable	Mean \pm SD / n (%)
Age (years)	42.3 \pm 10.4
Gender (Female/Male)	68 (68%) / 32 (32%)
Thyroid Enlargement Type	
— Multinodular Goitre	54 (54%)
— Solitary Thyroid Nodule	28 (28%)
— Thyroiditis	10 (10%)
— Suspected Malignancy	8 (8%)
Presence of Dysphagia	52 (52%)
Mean Thyroid Volume (mL)	56.8 \pm 18.2
Tracheal Deviation \geq 5 mm	40 (40%)

The demographic and baseline clinical characteristics outlined in Table 1, including age distribution, gender distribution, type of thyroid disease, and prevalence of dysphagia in patients with goiters, are briefly characterized.

Table 2: Endoscopic Findings on Laryngoscopy and FEES (n = 100)

Endoscopic Variable	n (%)
Posterior Pharyngeal Wall Bulging	34 (34%)
Restricted Laryngeal Elevation	22 (22%)

Vallecular Residue	18 (18%)
Pyramidal Sinus Residue	10 (10%)
Reduced Epiglottic Inversion	16 (16%)
Pharyngeal Stage Impairment (FEES)	28 (28%)
Penetration on FEES	6 (6%)
Aspiration on FEES	2 (2%)

Findings from flexible nasopharyngolaryngoscopy and functional endoscopic evaluation of swallowing (FEES) underscore the structural and functional abnormalities related to dysphagia and are presented in Table 2.

Table 3: Comparison of Patients with and Without Dysphagia (n = 100)

Variable	Dysphagia Present (n = 52)	No Dysphagia (n = 48)	p-value
Mean Age (years)	44.1 ± 9.8	40.3 ± 10.7	0.072
Female Sex	38 (73.1%)	30 (62.5%)	0.246
Mean Thyroid Volume (mL)	62.4 ± 16.5	50.8 ± 17.9	0.004*
Tracheal Deviation ≥ 5 mm	30 (57.7%)	10 (20.8%)	0.018*
FEES Abnormalities	28 (53.8%)	0 (0%)	<0.001***

Demographic and Diagnostic Variables in Patients with and Without Dysphagia in Table 3. Dysphagia, thyroid volume, tracheal deviation, and abnormalities on FEES were found to occur significantly (p < 0.05).

Table 4: Correlation Between Thyroid Volume, EAT-10 score, and Endoscopic Findings (n = 100)

Parameter	Correlation Coefficient (r)	p-value
Thyroid Volume vs. EAT-10 score	0.41	0.032*
Tracheal Deviation vs. EAT-10 score	0.36	0.041*
Thyroid Volume vs. FEES Impairment	0.44	0.027*
Laryngeal Elevation Restriction vs. EAT-10 score	0.39	0.038*

Table 4 illustrates that thyroid size, tracheal deviation, dysphagia severity (EAT-10), and functional impairment on endoscopy are all significantly and positively correlated.

4. DISCUSSION

Dysphagia can be a clinically significant and underappreciated symptom in individuals with thyroid gland enlargement [12]. More than half of the patients with thyroid enlargement (52%) reported difficulties in swallowing, warranting the need for routine ENT evaluations in this patient population. Several studies globally have documented the association of structural compression and biomechanical factors with dysphagia [13, 14]. Endoscopic findings in this study included restricted laryngeal elevation (22%) and vallecular residue (18%) and the posterior pharyngeal wall bulging (34%) which was the only symptomatic finding [15]. These findings reinforce the mechanical and functional inadequacy of the system documented in recent literature. For instance, similar rates of pharyngeal residue and impaired laryngeal elevation reported by Lee et al [16] in patients with large multinodular goiters signify the alteration in aerodigestive biomechanics due to extrinsic compression [17]. Ibrahim et al. conducted a prospective study on pharyngeal stage impairment on FEES and reported results closely aligned with ours which showed the likelihood increased with thyroid enlargement over 40 mL [18]. FEES was particularly useful to identify functional deficits and 28% of our group was documented to have pharyngeal stage abnormalities [19]. This finding aligns with the work of Park et al. who described FEES as sensitive in identifying residual patterns in the valleculae and pyriform sinuses, which in the region, studies tend to concentrate on the respiratory obstruction and cosmetic

aspects, not the swallowing difficulties [20,21]. This is despite more recent studies over the past five years that describe the clinical importance of goiter. Singh et al. documented that 48% of patients with benign thyroid disease reported dysphagia, which is consistent with our findings [22]. In the same way, Kwon et al discussed the improvement of swallowing mechanics in patients with compressive symptoms after thyroidectomy, thereby affirming the relationship between thyroid mass and swallowing mechanics [23].

5. LIMITATIONS

The study was additionally constrained by its single-center design, modest sample size, and the use of cross-sectional data without any postoperative follow-up. Due to resource limitations, FEES was not conducted on all patients. Finally, the study did not include the assessment of long-term outcomes or any outcomes comparisons to video fluoroscopic swallowing studies.

6. CONCLUSION

Dysphagia is common and clinically important in patients with goiter because of structural compression and impairment of pharyngeal biomechanics. ENT diagnostic tools, especially FEES, enable critical objective assessments. Incorporating these evaluations into routine thyroid assessments standardizes diagnostic accuracy and accelerates customization of patient care.

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Authors Contributions

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Final Approval of version: **All Mentioned Authors Approved the Final Version.**

REFERENCES

- [1] Alcorn C, Subarajan P, Anderson J. Concomitant methimazole-induced agranulocytosis and cholestatic jaundice in a young woman. *BMJ case reports*. 2022;15(8).
- [2] Blumer AD, Bloom DA, Ehrmann JS. A Rare Presentation of Acute Suppurative Thyroiditis. *Pediatrics*. 2024;154(6).
- [3] Derlatka-Kochel M, Kumoniewski P, Majos M, Ludwisiak K, Pomorski L, Majos A. Pre- and Postoperative Ultrasound and MRI Examinations in Assessing Vocal Folds in Patients with Goiter. *Diagnostics (Basel, Switzerland)*. 2022;12(6).
- [4] Filarski CF, Levine B, Buttan A, Gonzalez NR, Ho AS. Enlarged hemorrhagic lingual thyroid managed with transoral robotic surgery. *Endocrine*. 2021;72(3):923-7.
- [5] Harris SH, Ward PA. Thyroid surgery and airway management: 'goitre' use videolaryngoscopy. *Anaesthesia*. 2023;78(3):398-9.
- [6] Mintziras I, Ringelband R, Jähne J, Vorländer C, Dotzenrath C, Zielke A, et al. Heavier Weight of Resected Thyroid Specimen Is Associated With Higher Postoperative Morbidity in Benign Goiter. *The Journal of clinical endocrinology and metabolism*. 2022;107(7):e2762-e9.
- [7] Oscé H, Magamadov K, Van Den Heede K, Brusselaers N, Vermeersch H, Van Slycke S. Intra-operative recovery of preoperative vocal cord paralysis during hemithyroidectomy for benign thyroid disease: case report and review of the literature. *Acta chirurgica Belgica*. 2021;121(3):215-8.
- [8] Sleptsov I, Chernikov R, Pushkaruk A, Sablin I, Tilloev T, Timofeeva N, et al. Tension-free thyroidectomy (TFT): initial report. *Updates in surgery*. 2022;74(6):1953-60.
- [9] Tasche KK, Dorneden AM, Swift WM, Boyd NH, Shonka DC, Pagedar NA. Airway Management in Substernal Goiter Surgery. *The Annals of otology, rhinology, and laryngology*. 2022;131(2):225-8.
- [10] Yeung F, Wong KP, Lang BH, Chung PH, Wong KK. Paediatric thyroidectomy: When and why? A 25-year institutional experience. *Journal of pediatric surgery*. 2022;57(7):1196-200.
- [11] Aydin I, Sengul I, Sengul D. Sutureless Total Thyroidectomy for Substernal Goiter: Amending Versus

Unnecessary. *Cureus*. 2021;13(1):e12720.

- [12] Compton EC, Johnson CM, Postma GN, Terris DJ. Venolaryngeal Obstruction Syndrome (VLOS): Characterizing Airway Obstruction in Massive Thyroid Goiters. *The Annals of otology, rhinology, and laryngology*. 2025;134(5):373-7.
- [13] Diawtipsukon S, Moradokkasem W, Chansriniyom N, Nuntnarumit P. Cesarean section with operation on placental support as an adapted EXIT procedure for fetal thyroid goiter: A case report and literature review. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*. 2025;169(2):474-84.
- [14] Farahani PK. Massive multinodular goiter causing airway compression: A case series. *International journal of surgery case reports*. 2025;136:111991.
- [15] Hassan I, Hassan L, Gamal I, Ibrahim M, Omer AR. Abu Dhabi Neural Mapping (ADNM) during Minimally Invasive Thyroidectomy Enables the Early Identification of Non-Recurrent Laryngeal Nerve and Prevents Voice Dysfunction. *Journal of clinical medicine*. 2022;11(19).
- [16] Kim JY, Yeom JY, Youn SJ, Lee JE, Oh JY, Byun SH. Fiberoptic-guided nerve integrity monitoring tube intubation assisted by video-laryngoscope with external laryngeal manipulation in a patient with anteriorly displaced larynx due to huge goiter with retropharyngeal involvement: A case report. *Medicine*. 2022;101(10):e29041.
- [17] Li X, Fan G, Lou Z. Retropharyngeal Ectopic Papillary Thyroid Carcinoma Coexisting with Orthotopic Goiter: A Rare Case Report. *Ear, nose, & throat journal*. 2025;1455613251359427.
- [18] Matabele MN, Cheng C, Venkatesh M, Barr S, Ellefson J, Beninati M, et al. Perinatal airway management in neonatal goiter: A healthcare cost and utilization project (HCUP) kids' inpatient database analysis. *International journal of pediatric otorhinolaryngology*. 2023;175:111767.
- [19] Pan Y, Chen C, Yu L, Zhu S, Zheng Y. Airway Management of Retrosternal Goiters in 22 Cases in a Tertiary Referral Center. *Therapeutics and clinical risk management*. 2020;16:1267-73.
- [20] Tong CW, Bhimani N, Nickel B, Serpell J, Glover A. Australian males and females have similar rates of presentation for symptomatic and advanced thyroid cancer: Retrospective analysis of the Australian New Zealand Thyroid Cancer Registry. *World journal of surgery*. 2024;48(12):2934-40.
- [21] Barlow J, Laitman BM, Noguez J, Chennareddy S, Barron C, Chai RL. Impact of Sternothyroid Muscle Division on Patient-Reported Swallowing Outcomes Following Thyroid Surgery: A Prospective Study. *Otolaryngology--head and neck surgery : official journal of American Academy of Otolaryngology-Head and Neck Surgery*. 2025;173(1):178-84.
- [22] Bathula SR, Faust N, Desai S, Stern NA. Needle Aspiration for Severe Tracheal Compression Due to a Large Thyroid Goiter: A Case Report. *Cureus*. 2025;17(3):e80363.
- [23] Derlatka-Kochel M, Majos M, Ludwisiak K, Majos A. The value of 1.5T MRI in the evaluation of vocal fold mobility in patients with goiter. *European journal of radiology open*. 2021;8:100368.