

Outcomes of Transnasal Esophagoscopy: Experience in a Tertiary Hospital

Chaowaphon Ittiphanitphong, MD¹, Sawitree Jirawatthanaanan, MD¹, Naret Taengyai, MD¹, Plubplung Nopakoon, NR¹

¹ Department of Otolaryngology, Sawanpracharak Hospital, Nakhon Sawan, Thailand

Objective: To report and analyze outcomes of transnasal esophagoscopy (TNE).

Materials and Methods: The present study retrospectively reviewed the medical records of patients who underwent TNE at Sawanpracharak Hospital, a provincial public hospital between September 2022 and August 2023. Data collected included demographics, indications for TNE, biopsy results, timing of the procedure, changes in diagnosis following TNE, and any complications encountered were collected and analyzed.

Results: Forty-eight patients underwent the TNE with a mean age of 59.2±13.18 years. The most frequent indications for TNE were dysphagia at 37.5%, biopsy tumor at 20.8%, head and neck cancer surveillance at 20.8%, complete examination for neck node unknown primary at 8.3%, suspected foreign body in aerodigestive tract at 6.3%, and follow-up treatment at 6.3%. Biopsies were performed in 23 cases, with a rapid urease test conducted in nine cases. Of these tests, 44.4% were positive for *Helicobacter pylori*. Additionally, pathological examination was performed in 14 cases and revealed squamous cell carcinoma in 35.7% of those examined. Importantly, TNE led to a change in diagnosis in 41% of the studied patients. Notably, minor complications were observed in only 2.1% of the cases.

Conclusion: TNE emerges as a valuable diagnostic tool for the comprehensive assessment of laryngeal, tracheal, and esophageal lesions. This minimally invasive procedure eliminates the need for sedation, expediting the examination process while minimizing complication risks. Moreover, TNE is well-suited for head and neck cancer patients, facilitating both diagnosis and treatment follow-up.

Keywords: Transnasal esophagoscopy; Esophagoscopy; Head and neck cancer; Dysphagia; *Helicobacter pylori*

Received 25 January 2024 | Revised 20 March 2024 | Accepted 22 March 2024

J Med Assoc Thai 2024;107(4):262-5

Website: <http://www.jmatonline.com>

Transnasal esophagoscopy (TNE) offers a minimally invasive approach for visualizing the upper aerodigestive tract, including the pharynx, larynx, trachea, esophagus, and stomach. This procedure can be performed in an otolaryngologist's office setting, allowing for a patient-centered and efficient diagnostic evaluation. Notably, TNE is typically performed under local anesthesia, eliminating the need for general anesthesia and its associated risks. While complications associated with TNE are uncommon, potential adverse events may include difficulty passing the endoscope, transient discomfort in the nasal and pharyngeal regions, minor

nosebleeds, and vasovagal syncope⁽¹⁻⁹⁾.

The present study presented a retrospective analysis of TNE performed at a single-tertiary care center. Initiated in September 2022, the study encompassed 48 patients who underwent TNE by a single otolaryngologist within a one-year period ending in August 2023. The primary objective was to evaluate the outcomes of TNE for these patients, focusing on indications for the procedure, biopsy results, procedural timing, changed of diagnosis following TNE, and any complication encountered.

Materials and Methods

The present study was approved by the Sawanpracharak Institutional Review Board (COA. 42/2566). The medical records of 48 patients who underwent TNE between September 2022 and August 2023 were retrospectively reviewed. The present study included all patients who underwent TNE at Sawanpracharak Hospital. The exclusion criteria were the patient whose procedure was incomplete.

Before the procedure, all patients received topical anesthesia by placing cotton soaked pledget

Correspondence to:

Jirawatthanaanan S.

Sawanpracharak Hospital, 43 Attakawee Road, Pak Nam Pho Subdistrict, Mueang Nakhon Sawan District, Nakhon Sawan 60000, Thailand.

Phone: +66-97-9213257

Email: poopaypoopay@gmail.com

How to cite this article:

Ittiphanitphong C, Jirawatthanaanan S, Taengyai N, Nopakoon P. Outcomes of Transnasal Esophagoscopy: Experience in a Tertiary Hospital. *J Med Assoc Thai* 2024;107:262-5.

DOI: 10.35755/jmedassocthai.2024.4.13970

with 10% lidocaine and 0.05% oxymetazoline in each nasal cavity. Pharyngeal anesthesia was provided by applying 2% lidocaine viscous in the oral cavity 15 minutes before the procedure began. The patient was seated in a standard ear, nose, and throat (ENT) examining chair. The TNE procedure started with insertion of a 4.9-mm flexible endoscope through the wider nasal passage. Following insertion, a systematic evaluation of the nasopharynx, oropharynx, larynx, trachea, hypopharynx, esophagus, and stomach was performed. In patients with suspected neck node metastases of unknown primary origin or head and neck malignancies, particular attention was directed towards visualization of the central trachea. Biopsies of any identified mucosal abnormalities were obtained for subsequent pathologic examination.

The rapid urease test (Clo test) was performed in symptomatic laryngopharyngeal reflux (LPR). All cases were observed for 30 minutes after completion of the procedure. Data collected for evaluation included age, gender, indication for TNE, procedure duration, diagnosis, biopsy results, and any complication encountered.

The patient outcomes were defined as indications for TNE, biopsy results, timing of the procedure, changes in diagnosis following TNE, and any procedural complications.

Descriptive analysis was used to analyze patient demographics and clinical characteristics. Quantitative variables such as age were presented as mean \pm standard deviation (SD), while qualitative variables such as indications for TNE were presented as frequencies and percentages. The software employed for data analyses was IBM SPSS Statistics, version 26.0 (IBM Corp., Armonk, NY, USA).

Results

Forty-eight patients underwent TNE. The mean age of the patients was 59.2 years old (SD \pm 13.18 years), with a range of 22 to 92. Most of the patients were male. Additionally, 27% of the patients had pre-existing medical conditions such as diabetes mellitus, hypertension, dyslipidemia, chronic kidney disease, cardiovascular disease, cerebrovascular accidents, gout, thyroid carcinoma, asthma, and hepatitis B virus infection. Further details on demographics, clinical variables, and outcomes are provided in Table 1.

TNE was performed for various indications, including dysphagia, biopsy for suspected tumor, tumor surveillance in head and neck cancer patients, evaluation of a neck mass with unknown primary origin, suspicion of foreign body in the aerodigestive

Table 1. Demographic data, clinical variable, and outcomes of transnasal esophagoscopy

Characteristics	Total number of patients n=48
Sex; n (%)	
Male	33 (68.8)
Female	15 (31.2)
Comorbidities; n (%)	
Yes	13 (27.1)
Age (years); mean \pm SD	59.52 \pm 13.18
Indication; n (%)	
Dysphagia	18 (37.5)
Biopsy tumor	10 (20.8)
Tumor surveillance in head and neck cancer	10 (20.8)
Complete examination for neck node unknown primary	4 (8.3)
Suspected foreign body in the aerodigestive tract	3 (6.3)
Follow-up treatment	3 (6.3)
Biopsy; n (%)	(n=23)
Rapid urease test	9 (39.1)
• Positive for <i>Helicobacter pylori</i>	4 (44.4)
• Negative for <i>Helicobacter pylori</i>	5 (55.6)
Pathological exam	14 (60.9)
• Squamous cell carcinoma	5 (35.7)
• Dysplasia	2 (14.3)
• Benign squamous epithelium	7 (50.0)
Complication; n (%)	
Yes	1 (2.1)
Change in diagnosis and treatment; n (%)	
Yes	20 (41.7)
No	28 (58.3)
Times of procedure (minutes); mean \pm SD	35.15 \pm 14.71

SD=standard deviation

tract, and follow-up of non-cancer patients. Biopsies were obtained in 23 cases. Of the 14 cases sent for pathological examination, squamous cell carcinoma was revealed in 35.7% of cases. A rapid urease test (Clo test) was performed in nine cases and demonstrated *Helicobacter pylori* in 44.4%. Only one patient experienced a minor complication. Twenty patients received new diagnoses and subsequent treatment changed based on the TNE findings. The average duration of TNE was 35.15 minutes. The data is shown in Table 1.

TNE revealed a variety of final diagnoses, as detailed in Table 2. These diagnoses included head and neck cancers, LPR, new cases of head and neck esophageal cancers, *H. pylori* infection, benign conditions requiring follow-up, suspected head and neck cancers with negative biopsies, candida esophagitis as fungal infection of the esophagus, and foreign bodies within the digestive tract.

Table 2. The final diagnosis from transnasal esophagoscopy

Final Diagnosis	n (%)
Carcinoma of head and neck	21 (43.7)
Laryngopharyngeal reflux	10 (20.8)
Head neck esophagus cancer (new diagnosis)	5 (10.4)
<i>Helicobacter pylori</i> infection	4 (8.3)
Follow-up treatment of non-cancer patients	3 (6.3)
Suspicious for head neck cancer (negative on biopsy)	2 (4.2)
Candida esophagitis	2 (4.2)
Foreign bodies in the digestive tract	1 (2.1)
Total	48 (100)

Discussion

Indication

TNE offers a safe and efficient method for investigating head and neck tumors, aligning with the previously reported indications including dysphagia, tumor biopsy, suspicion of foreign body, comprehensive evaluation of neck nodes with unknown primary origin, tumor surveillance in head and neck cancers, and post-treatment follow-up for non-cancerous patients⁽¹⁰⁻¹⁴⁾. By virtue of its minimally invasive nature, TNE is a safe procedure, allowing for an outpatient setting. This facilitates a time-efficient process for both patients and physicians. Furthermore, TNE eliminates the need for general anesthesia, thereby reducing the risk of anesthesia-related complications, especially advantageous for patients with coexisting medical conditions.

Biopsy

Biopsies were performed in 14 cases suspected of malignancy, recurrence, or residual tumors. Pathological analyses revealed squamous cell carcinoma in five cases and dysplasia in two. For dysplasia cases, patients underwent repeat biopsies using rigid esophagoscopy to obtain a larger tissue sample. The smaller biopsy device of TNE may lead to false-negative results. In suspected malignancy cases, a subsequent rigid laryngoscopy and esophagoscopy with biopsy is recommended to increase the positive yield. Additionally, as experience with TNE biopsy grows, the likelihood of false-negative results may decrease. In nine cases with severe LPR symptoms unresponsive to proton pump inhibitors, TNE was combined with gastric mucosal biopsy. Four cases showed positive results, leading to a treatment shift to triple therapy. Notably, TNE allows for a one-stop service examination within the otolaryngology outpatient department, eliminating the need for

separate consultations with gastroenterologists.

Change in diagnosis

TNE facilitated a change in diagnosis in 20 cases, enabling patients to receive faster and more accurate treatment. Notably, TNE offers a valuable tool for investigating ENT symptoms that might originate from underlying esophageal or gastric pathologies. This minimally invasive procedure can be performed in an outpatient setting, eliminating the need for general anesthesia. In contrast, routine fiberoptic laryngoscopy may not be able to adequately visualize the upper aerodigestive tract beyond the larynx.

For instance, TNE testing in dysphagia patients could reveal alternative pathologies like *H. pylori* infection, candida esophagitis, or laryngeal cancer, prompting adjustments in treatment plans. Furthermore, TNE allows examination of the main trachea in head and neck cancer patients, facilitating proper evaluation. Its reaching into the nasal cavity, nasopharynx, oropharynx, larynx, trachea, hypopharynx, and esophagus makes it comparable to a panendoscopy examination, with the added benefit of not requiring anesthesia^(15,16).

Complication

According to the previous report^(1-8,16), TNE complications were infrequent, including endoscope passage difficulties, nasal and pharyngeal discomfort, nosebleeds, and vasovagal syncope. The present study observed only one case of mild nosebleed, which resolved with nasal packing using cotton and 0.05% oxymetazoline for approximately 15 minutes. While complications could occur, proper implementation and equipment within an appropriate setting minimize patient risk.

Limitation

The present study has limitations inherent to its retrospective design. The authors were unable to control for potential confounding variables, which may introduce bias in the observed outcomes. Additionally, the small sample size limited the generalizability of the findings to the study population and increased the risk of a type II error, meaning the authors might have missed true effects due to a lack of statistical power.

Conclusion

TNE serves as an excellent diagnostic tool for comprehensive evaluation of laryngeal, tracheal, and esophageal lesions without sedation. It offers

time-saving examinations with a low complication rate. Moreover, TNE is well-suited for head and neck cancer patients, facilitating both diagnosis and treatment follow-up.

What is already known on this topic?

TNE is an excellent diagnostic tool for the complete examination of the larynx trachea esophagus and stomach but no previous data about its use in tertiary hospitals in Thailand exists.

What does this study add?

TNE is an excellent diagnostic tool. Suitable for use in hospital centers for examining patients with head and neck cancer.

Acknowledgement

The authors gratefully acknowledge Associate Professor Pawin Ketkul and Assistant Professor Sunun Ongard of the Department of Otolaryngology, Faculty of Medicine Siriraj Hospital for teaching a course in performing the procedures.

Funding disclosure

The present study received a grant from Sawanpracharak Medical Education Center.

Conflicts of interest

The authors declare no conflict of interest.

References

1. Belafsky PC, Cates D. Transnasal esophagoscopy. *Oper Tech Otolaryngol Head Neck Surg* [Internet]. 2012 [cited 2023 Dec 20];23:86-91. Available from: <https://doi.org/10.1016/j.otot.2011.11.001>.
2. Peery AF, Garman KS, Daugherty N, Hoppo T, Bream S, Sanz AF, et al. 882 feasibility, safety and acceptability of office-based, screening transnasal endoscopy. *Gastrointest Endoscop* [Internet]. 2011 [cited 2023 Dec 20];73:AB157. Available from: <https://doi.org/10.1016/j.gie.2011.03.138>.
3. Peña S, Zuzukin V, Beahm DD, Nuss DW, Walvekar RR. Transnasal esophagoscopy (TNE) in the staging of head and neck cancers: Feasibility and impact in a public hospital setting. *Laryngoscope* [Internet]. 2010 [cited 2023 Dec 20];120(S3):S46. Available from: <https://doi.org/10.1002/lary.21230>.
4. Price T, Sharma A, Snelling J, Bennett AM, Qayyum A, Bradnam T, et al. How we do it: The role of transnasal flexible laryngo-oesophagoscopy (TNFLO) in ENT: one year's experience in a head and neck orientated practice in the UK. *Clin Otolaryngol* 2005;30:551-6.
5. Wang CP, Lee YC, Lou PJ, Yang TL, Chen TC, Huang CC, et al. Unsedated transnasal esophagogastroduodenoscopy for the evaluation of dysphagia following treatment for previous primary head neck cancer. *Oral Oncol* 2009;45:615-20.
6. Sombuntham P, Rawangban W. Unsedated transnasal esophagoscopy: A sensitive and safe outpatient screening tool. *Asian Biomedicine* 2015;9:491-4.
7. Wellenstein DJ, Schutte HW, Marres HAM, Honings J, Belafsky PC, Postma GN, et al. Office-based procedures for diagnosis and treatment of esophageal pathology. *Head Neck* 2017;39:1910-9.
8. Wellenstein DJ, Honings J, Schutte HW, Herruer JM, van den Hoogen FJA, Marres HAM, et al. Cost analysis of office-based transnasal esophagoscopy. *Eur Arch Otorhinolaryngol* 2019;276:1457-63.
9. Yagi J, Adachi K, Arima N, Tanaka S, Ose T, Azumi T, et al. A prospective randomized comparative study on the safety and tolerability of transnasal esophagogastroduodenoscopy. *Endoscopy* 2005;37:1226-31.
10. Andrus JG, Dolan RW, Anderson TD. Transnasal esophagoscopy: a high-yield diagnostic tool. *Laryngoscope* 2005;115:993-6.
11. Su YY, Fang FM, Chuang HC, Luo SD, Chien CY. Detection of metachronous esophageal squamous carcinoma in patients with head and neck cancer with use of transnasal esophagoscopy. *Head Neck* 2010;32:780-5.
12. Gerson LB, Triadafilopoulos G. Screening for esophageal adenocarcinoma: an evidence-based approach. *Am J Med* 2002;113:499-505.
13. Meyer V, Burtin P, Bour B, Blanchi A, Cales P, Oberti F, et al. Endoscopic detection of early esophageal cancer in a high-risk population: does Lugol staining improve videoendoscopy? *Gastrointest Endosc* 1997;45:480-4.
14. Tsikoudas A, Mochloulis G. Role of transnasal oesophagoscopy in diagnosis of early malignancy in the area of the oesophagus and hypopharynx. A review of the literature. *Eur Arch Otorhinolaryngol* 2014;271:203-4.
15. Belafsky PC, Postma GN, Daniel E, Koufman JA. Transnasal esophagoscopy. *Otolaryngol Head Neck Surg* 2001;125:588-9.
16. Sabirin J, Abd Rahman M, Rajan P. Changing trends in oesophageal endoscopy: a systematic review of transnasal oesophagoscopy. *ISRN Otolaryngol* 2013;2013:586973.