

# Transnasal Esophagoscopy Procedure in Outpatient Clinic at Dr. Soetomo General Academic Hospital

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## Abstract

**Background:** Transnasal esophagoscopy is a small caliber flexible esophagoscopy technique that has the same as diagnostic accuracy as conventional esophagoscopy. In addition, this technique is safer than any other techniques and has patient tolerance. **Aims:** This study aims to analyze and evaluate the transnasal esophagoscopy (TNE) procedure in patients. **Method:** retrospectively approach was used in this study by taking data from the activity register of the broncho-esophagology division of outpatient unit of ORL-HNS Dr. Soetomo General Academic Hospital. TNE report book and patient medical records were collected to have the data. The observation period was 2013 to 2017. **Result:** patients who met the inclusion and exclusion criteria was 99 patients, with a male to female ratio of 2.3: 1. Most endoscopic findings were normal esophagus (56.57%). Existing abnormal findings included esophageal stenosis (18.18%), esophageal mucosal lesions (14.14%), and esophageal tumors (11.11%). TNE examination complications were found to be 1%. **Conclusion:** Transnasal esophagoscopy is widely used in patients aged 51-60 years with dysphagia, reflux or globus as the most common indications. TNE is quite safe to do in an outpatient hospital setting.

**Keywords:** Esophagoscopy, Transnasal, Outpatient, Esophagus Disease, Dysphagia, Health Policy.

## Introduction

Transnasal esophagoscopy (TNE) is a small caliber flexible esophagoscopy technique performed transnasally to evaluate the esophageal lumen. This technique aims to observe the entire upper aero digestive tract, from the vestibule of the nose to the gastroesophageal junction, and to examine the actions

of water flushing, water insufflation, suction and biopsy of the esophagus.<sup>1-3</sup>

The TNE diagnostic procedure objectify to evaluate patients with dysphagia, esophageal stricture, laryngopharyngeal reflux, esophageal foreign body and other esophageal disorders. The patient is treated in a sitting position, where the scope is inserted through the nose under topical anesthesia without the use of sedation. This examination can be carried out easily, safely and effectively<sup>4,5</sup>. In contrary, conventional (rigid) esophagoscopy requires routine general anesthesia and carries a risk of aspiration, hypoventilation and cardiopulmonary complications. The rigid esophagoscopy procedure also needs

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intensive care and monitoring both before and after the procedure<sup>6,7</sup>.

On the other hand, TNE has as the same diagnostic accuracy as conventional esophagoscopy, however it has better safety and patient tolerance. TNE is performed without sedation, hence the side effects and risks of sedation can be eliminated which allows the patient to carry out routine activities immediately after the procedure.<sup>8,9</sup>.

This study aims to analyze and evaluate the description of TNE results in outpatients at Dr. General Academic Soetomo Hospital.

### **Methods**

The study was conducted retrospectively by taking data from the activity register of the bronchoesophagology division of ORL-HNS outpatient clinic Dr. Soetomo General Academic Hospital, including TNE report book and patient medical records. The population were all patients who underwent TNE examinations at the bronchoesophagology division of outpatient unit of ENT-KL RSUD Dr. Soetomo hospital from January 2013 to December 2017.

### **Sample of Research**

The study sample was patients who qualify to the inclusion criteria, namely patients who underwent TNE from January 2013 to December 2017. Meanwhile, the exclusion criteria included incomplete medical record data and patients who failed to perform TNE. A total of 99 patients met the criteria of the study sample. All patients signed an informed consent form prior to the TNE procedure and were provided with an overview of the goals and benefits of undergoing this procedure.

### **Examination Procedure**

Transnasal esophagoscopy was performed using topical anesthesia without sedation. Topical anesthesia was administered to the nasal cavity bilaterally using 2% lidocaine - ephedrine at least 10 minutes before the TNE procedure. The objective of topical anesthetics and decongestants was to have a vasoconstrictive effect and reduce pain. Then they gave a 10% xylocaine spray on the oropharynx and hypopharynx to reduce cough reflex and reduce pain.

A flexible esophagoscope with a scope diameter of 6.8 mm using the Olympus Evis Excera II camera system is used as a research instrument. The device has a water flushing and air insufflation system, as well as suction through the available working channels. The tip of the scope is lubricated with lidocaine gel before it inserted into the nose into the pharynx. The scope entered to the esophagus via cricopharynx. The patient was in a sitting position and asked to swallow at the same time when the scope was inserted into the esophagus. The scope is entered to the lumen until it reached the gastroesophageal junction.

### **Analysis Data**

All data collected from the patient's medical record were recorded in the data collection sheet and then tabulated. The results are presented descriptively in the form of tables, diagrams and narrative.

## **Result**

### **Data Demography**

Demographic data in this study were divided based on age and gender. The mean age of the patients in the study was 52 years, with an age range of 16-77 years. Most patients were in the age range 51-60 years as many as 34 people (34.35%). Most of the patients were male (69.69%) with a male to female ratio of 2.3: 1 (Table 1).

**Table 1. Patient characteristics**

Age	Total (n)		Total Percentage (%)
	Men	Women	
< 11 Years	0	0	0%
11-20 Years	5	1	6.06%
21-30 Years	2	3	5.05%
31-40 Years	6	2	8.08%
41-50 Years	9	5	14.14%
51-60 Years	24	10	34.35%
61-70 Years	18	3	21.21%
71-80 Years	9	2	11.11%
> 80 Years	0	0	0%
Total	73	26	100%

### Clinical Data

Clinical data in this study include indications of examination, endoscopic findings and complications. The indications for TNE examination consist of dysphagia, reflux or globus, screening for head and neck malignancies, evaluation of esophageal foreign bodies and evaluation of tracheoesophageal fistula. Endoscopic findings consist of normal esophagus, esophageal stenosis, esophageal mucosal lesions and esophageal tumors. The most indications for TNE were dysphagia, reflux or globus (46.47%), followed by

screening for head and neck malignancies (38.38%), evaluation of esophageal foreign bodies (13.13%) and evaluation of tracheoesophageal fistulas which were the least indicators obtained (2.02%) (Table 2).

The most indications for TNE examination in the form of dysphagia, reflux or globus are in the age range 51-60 years. Screening for head and neck malignancies is mostly in the age range 51-60 years. Most evaluations of esophageal foreign bodies were in the 51-60 years age range (Figure 2).

**Table 2. Patient characteristics based on TNE indications**

Inspection indication	Total (n)	Percentage (%)
Dysphagia, reflux / globus	46	46.47%
Head and neck malignancy screening	38	38.38%
Esophageal foreign body Evaluation	13	13.13%
Tracheoesophageal fistula Evaluation	2	2.02%
Total	99	100%

Based on gender, TNE examination in the form of dysphagia, reflux or globus were found in 25 male patients and 21 female patients. Screening for head and neck malignancies were 36 male patients and 2 female patients. Evaluation of esophageal foreign bodies in 7 male patients and 6 female patients. Tracheoesophageal fistula evaluated 1 male patient and 1 female patient (Figure 3).

Most endoscopic findings were normal esophagus (56.57%). Other findings recorded included esophageal stenosis (18.18%), esophageal mucosal lesions (14.14%), and esophageal tumors (11.11%).

Endoscopic findings for dysphagia, reflux or globus indications were normal esophagus in 15 patients, esophageal stenosis in 18 patients, esophageal mucosal lesions in 3 patients and esophageal tumor in 10 patients. In the indication for head and neck malignancy screening, the results showed normal esophagus in 37 patients and esophageal tumor in 1 patient. The indication for the evaluation of esophageal foreign bodies obtained normal esophageal results in 2 patients and esophageal mucosal lesions in 11 patients. The indication for the evaluation of tracheoesophageal fistula obtained normal esophageal results in 2 patients (Table 3 and 4).

**Table 3. Patient characteristics based on TNE endoscopic findings**

	<b>Total (n)</b>	<b>Percentage (%)</b>
Endoscopic findings		
Normal	56	56.57
Esophageal stenosis	18	18.18
Esophageal mucosal lesions	14	14.14
Esophageal tumor	11	11.11

In this study, the indication for TNE examination of dysphagia, reflux or globus was the highest in esophageal stenosis. The most indications for screening for head and neck malignancies are found in normal esophagus. The indication for the evaluation

of esophageal foreign bodies has the highest results in esophageal mucosal lesions. The most indication for tracheoesophageal fistula evaluation was found in normal esophagus (Figure 3). TNE examination in this study, as many as 99 patients, found no complications.

**Table 4. Patient characteristics based on TNE indications**

<b>Inspection indication</b>	<b>Normal</b>	<b>Stenosis</b>	<b>Lesions</b>	<b>Tumor</b>
Dysphagia, reflux / Globus	15	18	3	10
Head and neck malignancy screening	37	0	0	1
Esophageal foreign body Evaluation	2	0	11	0
Tracheoesophageal fistula Evaluation	2	0	0	0

## Dicussion

Based on the age category, TNE examinations were found mostly in the age range 51-60 years. The youngest patient was 16 years old and the oldest patient was 77 years old. The mean age of the patients was 52 years. This is consistent with a study conducted by Chung et al (2014) in Korea involving 137 patients with an average patient age of 55 years. The youngest age of the study was 19 years and the oldest 78 years<sup>9</sup>. This equation can be caused by the similarity of the indications.

Based on gender, the researchers were found that most of patients were male. The ratio of male to female is 2.3: 1. The incidence of head and neck malignancies is mostly found in males, hence it explained why the participants of this study were dominated by males. Sombuntham, et al., (2015) reported a retrospective use of TNE in Thailand as many as 58 patients, showing the same results where there were more men than women with a ratio of 2.8:1<sup>11</sup>. Our study found that the most research samples were head and neck malignancies as much as 60%. Another study in England on 257 patients, showed different results where it was found that men were equal to women with a ratio of 1: 1<sup>10</sup>. There were not many patients with head and neck malignancies in the study sample which led to balance proportion of the ratio of men and women.

The most indication for TNE examination was the evaluation of dysphagia as much as 46.47%. Dysphagia patients in this study were found to be more male than female as much as 54%. Research by Hoy, et al (2013) reported 96 patients, showing the same results where the most indication of TNE was an evaluation of dysphagia as much as 79%.<sup>11</sup> Another study reported that out of 100 patients with dysphagia the majority were male as much as 58%<sup>12</sup>.

The patient characteristics of this study were

dominated by the age range 51-60 years. This shows that dysphagia is common in patients of this age range. Another reason for this age range is that many patients with head and neck malignancies undergo screening using TNE. Patients with head and neck malignancies undergoing total laryngectomy require screening for esophageal malignancy. Dysphagia is one of the swallowing problems found in older people. Dysphagia can be in the form of anatomical or physiological deficits in the mouth, pharynx, larynx and esophagus. The process of swallowing changes with age. Increasing age will cause a decrease in the quality and effectiveness of the swallowing process<sup>13</sup>. The results of this study are in accordance with the literature.

Transnasal esophagoscopy with indications for evaluation of head and neck malignancies was performed on 38 patients. The role of TNE in head and neck malignancies is growing, both routine screening, suspected esophageal tumors and post chemotherapy and radiation to head and neck malignancies<sup>14</sup>. TNE is the best alternative for the initial screening of esophageal malignancies in patients with head and neck malignancies, whereas rigid esophagoscopy is used for malignancies for which the primary is unknown and in large malignancies of the base of the tongue.<sup>15</sup>

The evaluation of esophageal foreign bodies was 13.13%. The use of TNE for the extraction of foreign objects at outpatient unit in our hospital had never been done because there was no extraction forceps available. One study reported the use of TNE for the extraction of foreign bodies. Most of the foreign body of the esophagus was successfully extracted but 32% had to undergo rigid esophagoscopy because of the large size of the foreign body, its sharp shape and the risk of esophageal perforation<sup>16</sup>. The use of TNE in the diagnosis of foreign bodies is superior to that of plain neck radiographs. The sensitivity and positive

predictive value of plain radiographs in diagnosing the presence of foreign bodies were only 59% and 52% because most of the foreign bodies were radiolucent<sup>16</sup>. Bennett, et al., States that TNE improved the diagnosis and management of the extraction of several types of foreign bodies compared to the rigid esophagoscopy method, but that certain foreign bodies cannot be extracted by this method because of their large size<sup>17</sup>.

Esophageal abnormalities in this study were found in 42% of the 99 patients examined by TNE. The most common abnormality was esophageal stenosis as much as 18.18%. Other esophageal abnormalities were esophageal mucosal lesions in 14.14% and tumors in 11.11%. The number of positive findings as much as 42% is according to reports from several researchers. Research by Chung et al (2014) reported positive findings in 38.7% of 137 patients<sup>9</sup>. Meanwhile, Abou-Nader et al (2014) reported positive findings in 44% of 257 patients<sup>10</sup>. Bellafsky (2001) reported positive findings on the TNE examination in 44% of 96 patients<sup>11</sup>. Research by Shariff, et al., Reported that there was a strong association between Barrett's esophageal images found by TNE (98% sensitivity, 100% specificity) and conventional esophagoscopy<sup>18</sup>.

There were no complications in the 99 patients who were examined using TNE in this study. The study on 257 patients reported that none of the patients had complications<sup>10</sup>. A study by Postma, et al., Reported that out of 592 patients who underwent TNE examinations in America, 2 patients had complications (0.33%).<sup>19</sup>.

### Conclusion

Transnasal esophagoscopy is a procedure that is experienced by many patients in the 51-60 years age range, with a male to female ratio of 2.3: 1. Dysphagia, reflux or globus are the most common indications for transnasal esophagoscopy. In this study, there were no complications.

### Competing interests

All authors declare that no competing interests were disclosed.

### Grant information

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**Ethics and consents:** Ethical clearance was approved by the Ethics Medical Research Committee of the Dr. Soetomo General Academic Hospital, Surabaya, Indonesia (Ref. No.: 0442/LOF/301.4.2/IV/2021) on April 16, 2021.

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