

## The Importance of Diagnostic Mediastinoscopy in Patients with Mediastinal Lymphadenopathy

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### Abstract

**Objectives:** Mediastinoscopy is a safe and invasive diagnostic method allowing to obtain sufficient tissue samples in the diagnosis of many malignant and benign intrathoracic diseases. In this study, it was aimed to determine the importance of mediastinoscopy in diagnosing mediastinal diseases and also provide patient data in the resolution of mediastinal diseases.

**Methods:** Between January 2016 and December 2020, 76 cases of mediastinal lymphadenopathy that could not be diagnosed by other diagnostic methods were evaluated.

**Results:** 64 (84,2%) of these 76 cases were diagnosed by mediastinoscopy. 12 cases (15.7%) were reported as reactive lymphoid hyperplasia. Since the definitive diagnosis of these cases could not be proven, they were considered as false-negative. Histopathological examination revealed chronic granulomatous lymphadenitis in 16 cases, non-necrotizing granulomatous lymphadenitis in 27 cases, metastasis of malignant disease in 18 cases, and lymphoma in 2 cases. In our study, the sensitivity of mediastinoscopy was determined as 84.2%. Neither mortality nor morbidity was detected in our cases.

**Conclusion:** As a result, mediastinoscopy continues to maintain its traditional place for patients that cannot be diagnosed, because it is reliable and less invasive.

**Keywords:** granulomatous lymphadenitis, lymphoid hyperplasia, mediastinoscopy

# **The Importance of Diagnostic Mediastinoscopy in Patients with Mediastinal Lymphadenopathy**

## **Introduction**

Mediastinoscopy is an important method in diagnosing and planning the treatment of diseases such as mediastinal lymphadenopathy, carcinoma metastases, sarcoidosis, tuberculosis, lymphoma and mediastinal tumors. Mediastinal lymph node evaluation was initiated by Albert C. Daniels in 1949. Further developed by Carlens (1959) and Pearson (1965), by making a suprasternal incision, mediastinoscopy has become a popular surgical method for diagnosing and staging purposes [1, 2]. As indicated in the studies, in cases that cannot be diagnosed with other methods, it is a safe and effective diagnostic method in which sufficient tissue samples can be obtained. Lymph node examination maintains its importance with its short hospital stay, 1-2% morbidity and low mortality [3].

According to the mediastinal lymph node map, developed by Mountain and Dressler, mediastinal lymph node stations are as follows: 2R, 2L, 4R, 4L and station number 7. It is advised to proceed a biopsy considering the mentioned stations [4]. Endoscopic ultrasonography (EUS) and endobronchial ultrasound (EBUS), which have recently been used in the evaluation of mediastinal lymphadenopathies, have also become popular tool methods nowadays. Although the specificities of these techniques were found to be high, their negative predictive values were low. Preoperative mediastinoscopy has a sensitivity of more than 90% and a specificity of 100% in lung cancer staging. Considering these values, it is reasonable to state that mediastinoscopy is a reliable method that is widely used. Mediastinoscopy maintains its traditional place for patients that cannot be diagnosed [4-6].

In this study, the place and importance of diagnostic mediastinoscopy were evaluated.

## **Method**

Between January 2017 and December 2020, 76 patients (32 males and 44 females) with mediastinal lymphadenopathy that could not be diagnosed with other diagnostic methods were evaluated by videomediastinoscopy in the Department of Thoracic Surgery of Sakarya University Training and Research Hospital. Mediastinoscopies for staging were not included in the study. All surgical procedures were performed under general anesthesia in operating room conditions. Sampling was done from peritracheal, paratracheal and subcarinal (2R, 2L, 4R, 4L, 7) stations in the mediastinal lymph node map.

## **Results**

A total of 76 patients who mediastinal lymphadenopathy were included in the study. Amongst all the patients, 42% (n=32) were males and 58% (n=44) were females. Mean age was  $44.9 \pm 8.2$  years ranging from 24 to 77 years. Diagnosis was made by mediastinoscopy in 64 (84.2%) of 76 cases that could not be diagnosed by other

noninvasive and invasive diagnostic methods. The remaining 12 cases (15.7%) were reported as reactive hyperplasia. Since the definitive diagnosis of these cases could not be proven, they were considered false-negative. Histopathological examination revealed chronic granulomatous lymphadenitis in 16 cases, non-necrotizing granulomatous lymphadenitis in 27 cases, metastasis of malignant disease in 18 cases, and lymphoma in 2 cases (Table 1).

With these findings, the sensitivity was evaluated as 84.2%. No mortality or morbidity was found in the cases.

## **Discussion**

Mediastinoscopy has an indispensable role in the diagnosis of unidentified cases (such as sarcoidosis, tuberculous lymphadenopathy, tumor metastases, lymphomas) having mediastinal lymphadenopathy. Studies have shown that the sensitivity of cervical mediastinoscopy varies between 72% and 89% (mean 81%) [7, 8]. In the study of Gunda Leschber et al., the sensitivity was found to be 93.7% [9]. In this study, a diagnostic success rate of 84.2% was achieved. The findings were compatible with the literature data.

Depending on the underlying disease, epithelioid granulomas resembling sarcoidosis can be seen in regional lymph nodes for many reasons [10, 11]. In the study of Kaya et al. [12] the most common cause was sarcoidosis (82, 61.2%) and tuberculosis (24, 17.9%) was the second most common cause in 134 patients with granulomatous lymphadenitis. In another study conducted in Turkey, 124 (85.5%) of 145 cases that could not be diagnosed by other methods were diagnosed by mediastinoscopy, and chronic granulomatous lymphadenitis was found in 64 cases (44.1%) and non-necrotizing granulomatous lymphadenitis was found in 25 cases (17.2%) [13]. In parallel with these data, we see that granulomatous diseases constitute the majority of diagnoses in our study. We found the rate of non-necrotizing lymphadenitis (27/76) to be 35.5%, and the rate of necrotizing lymphadenitis (16/76) to be 21%. Granulomatous lymphadenitis accounts for 56.5% of our cases.

The most common cause of malignant mediastinal lymphadenopathy is metastatic lung cancer. Other causes of malignant mediastinal lymphadenopathy can be listed as lymphomas [14]. Lung cancer is the most frequently diagnosed cancer in both gender and remains the leading cause of cancer deaths. The 5-year survival rate in lung cancer is only 18% due to late diagnosis. Also, about 40% of cancer deaths are due to lung cancer. However, considering that more than half of the patients in lung cancer are diagnosed at an advanced stage, diagnosis and staging of lung cancer are very important [15, 16]. Identification and confirmation of pathology is critical for early diagnosis and improving survival. In clinical practice, fiberoptic bronchoscopy, CT-guided PTNB (Percutaneous Transthoracic Needle Biopsy), ENB (Electromagnetic Navigation Bronchoscopy), EBUS-TBNA (Endobronchial Ultrasonography-Transbronchial Needle Aspiration) and mediastinoscopy are the methods used for diagnosis [16, 17].

EBUS-TBNA is suitable for lesion biopsy in the subcarinal and bilateral hilar regions. Mediastinoscopy is required for larger tissue sampling in suspicious cases, especially in cases where no diagnosis can be made because of relatively high false-negative rates at stations 4R or 7. EBUS-TBNA is relatively safe, but mediastinoscopy

provides more tissue uptake and better diagnostic yield for lymph nodes 4R and 7 [17]. If EBUS-TBIAB and EUS-IAB are used together, it has been observed that the sensitivity is increased in mediastinal staging, especially in lung cancers. When EBUS is combined with EUS, paraoesophageal (station 8), pulmonary ligament (station 9) lymph nodes in the lower zone can be evaluated. In a study by Wallace et al., the sensitivity was found to be 69% and 93% in malignant mediastinal lymph nodes when only EBUS and EBUS-TBIAB+EUS-IAB were performed together, respectively [15].

Further, mediastinoscopy is a valuable method with its high sensitivity rate and larger tissue sampling in the diagnosis of mediastinal lung cancer and other cancer metastases that cannot be detected by other diagnostic methods. The morbidity rate is 1-2% and the mortality rate is 0.3-0.08% [3, 15, 17]. No morbidity or mortality was found in our study.

## **Conclusions**

Mediastinoscopy sustains its traditional place in cases that could not be definitively diagnosed and requiring tissue diagnosis that cannot be accomplished with less invasive methods. Mediastinoscopy is a safe, fast and effective method for diagnosis and treatment of mediastinal lymph nodes, which are frequently affected by cancer metastases and granulomatous diseases.

**Table 1:** Histopathological diagnosis

<b>Histopathological diagnosis</b>	<b>Number of cases (Rate %)</b>
Non-necrotizing granulomatous lymphadenitis	27 (% 35.5%)
Chronic granulomatous lymphadenitis	16 (21%)
Reactive lymphadenitis	12 (15.7%)
Lung adenocarcinoma metastasis	6 (7.8%)
Small cell lung cancer metastasis	4 (4.7%)
Squamous cell lung cancer metastasis	3 (3.9%)
Lymphoma	2 (2.6%)
Anthracosis	2 (2.6%)
Calcified lymph node	1 (1.3%)
Thymoma	1 (1.3%)
Sarcoma	1 (1.3%)
Stomach cancer	1 (1.3%)

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