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How to do it

A method in difficult to sample mediastinal lymph nodes: the needle dissection technique

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ABSTRACT

Background: The diagnostic reach of mediastinoscopy depends on adequate tissue sampling. However, adequate tissue sampling may not be possible with conventional blunt dissection methods, especially in the presence of thick encapsulated mediastinal lymph nodes or a mass. It reduces the diagnostic success of mediastinoscopy, and patients may therefore easily result in misdiagnosis. Here, we present a new sharp dissection technique, which we use in cases where adequate tissue sampling from the mediastinal lymph nodes is essential and blunt dissection does not provide it.

Materials and Methods: Between 2016-2022, we performed mediastinoscopy in 298 patients and analysed retrospectively. Biopsy could not be taken from mediastinal lymph node and/or mediastinal mass by conventional methods in 26 patients (8.7%). While biopsy could be taken with surgical instruments developed for other operations in 14 of these patients, the needle dissection technique was performed in the remaining 12 patients who cannot be taken a biopsy with conventional and/or surgical instruments developed for other operations.

Results: In patients who needed this technique in mediastinoscopy, all of the tissue with diagnostic value was sampled, no complications were observed, and the most common diagnosis was tuberculosis (n = 8, 66.6%).

Conclusions: The use of surgical instruments developed for other operations such as long and thin aspirator and forceps, endoscopic scissors, injection needle and endoclips in addition to standard surgical instruments in mediastinoscopy and also performing this needle dissection technique may increase the diagnostic success of mediastinoscopy.

Keywords: mediastinoscopy, lymph node sampling, sharp dissection

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Introduction

A variety of techniques are available for a mediastinal nodal and/or mass evaluation including tissue sampling. Mediastinoscopy is an effective method in the investigation of diseases with mediastinal lymphadenopathy or those localized in the mediastinum especially in patients who cannot be diagnosed with noninvasive techniques [1,2]. However, it should be noted that the success of mediastinoscopy is directly correlated to the amount of pathological material harvested. It was indicated that between 2% and 10% of the patients who had a mediastinal disease could not be diagnosed by mediastinoscopy [2]. The factors negatively affecting the success may be the presence of encapsulated mediastinal lymph nodes, therefore sampling can be difficult. Lazzaro and LoCicero stated that endoscopic scissors, endo dissectors and endoclips were additionally used during mediastinal lymph node sampling [3]. When necessary, surgical instruments developed for other operations such as energy devices, endoscopic scissors and forceps supported injection needle can be used through the videomediastinoscope [4]. In this study, we describe a new method in order to increase the amount of tissue harvested which can be used in both video-assisted and conventional mediastinoscopy.

Materials and methods

Between 2016-2022, we performed mediastinoscopy in 298 patients who cannot be diagnosed with noninvasive techniques, and analysed retrospectively. The mediastinal lymph node can neither be dissected with aspirators nor sampled with forceps due to the thickness of its capsule is included in the study.

Technique

Blunt dissection to lymph nodes with thick capsules is generally ineffective. Therefore, 5-6 holes are made with the injection needle placed at the tip of the forceps in the most suitable part of the capsule for sampling (Figure 1A). These holes should be drilled in different places at intervals of about 1 millimeter, thereby weakening the capsule. Then, the capsule is cut slowly by making sharp dissection to the weakened capsule with the lower end of the endoscopic scissors (Figure 1B). The same procedure is repeated at 30 degrees apical and the triangular capsule flap is raised (Figure 1C). All cases were performed by a single surgeon.

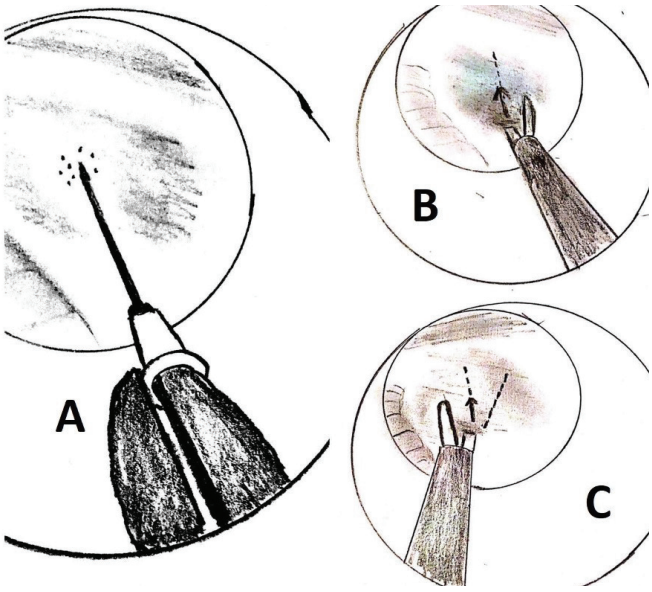

Figure 1. The illustration shows the needle punctures (A), sharp dissection of capsule (B, C).

Results

Biopsy could not be taken from mediastinal lymph node and/or mediastinal mass by conventional method in 26 patients (8.7%). While biopsy could be taken with surgical instruments developed for other operations in 14 of these patients, the needle dissection technique was performed in the remaining 12 patients who cannot be taken a biopsy with conventional and/or surgical instruments developed for other operations. In patients who needed this technique in mediastinoscopy, all of the tissue with diagnostic value was sampled, no complications were observed, and the most common diagnosis was tuberculosis (n = 8, 66.6%). Diagnosis determined using the needle dissection technique shown in table 1.

Table 1. Diagnoses determined using the needle dissection technique.

Diagnosis	n=12
Tuberculous lymphadenitis	8
Anthracosis	2
Lymphoma	1
Small cell carcinoma	1

Comment

In many diseases, especially in the differential diagnosis of granulomatous diseases, a large amount of histological material may be required. This results in noninvasive techniques being insufficient for the diagnosis of granulomatous diseases [5]. Another problem arising from this situation is that tuberculosis, a type of gran-

ulomatous disease, causes technical difficulties in the operations of some patients. The link between fibrosing mediastinitis that is thickening of the fibrous tissue in the mediastinum and tuberculosis has been documented [6]. This may explain why tuberculous mediastinal lymphadenitis has a hard capsule. In this respect, the rigidity of the capsule in benign lesions suggests that it is a sign of tuberculosis disease, and therefore, this issue should be further investigated.

It has been stated that 1% of patients could not be diagnosed during mediastinoscopy, and some patients with tuberculosis could actually get wrong diagnosis [7]. The failure to diagnose tuberculosis or the misdiagnosing a potential case of tuberculosis as another disease infers will cause both social and individual problems. If our technique had not been used in these patients, they would have been deprived of treatment, and they would easily be misdiagnosed. Therefore, it can be considered that the use of surgical instruments developed for other operations and this needle dissection technique will increase the diagnostic power of mediastinoscopy. Complications such as massive hemorrhage and hoarseness were not seen in cases where our technique were used, thus, it can be performed safely when it is necessary, with no extra costs incurred.

In conclusion, the use of surgical instruments developed for other operations such as long and thin aspirator and forceps, endoscopic scissors, injection needle and endoclips in addition to standard surgical instruments in mediastinoscopy and also performing this needle dissection technique may increase the diagnostic success of mediastinoscopy.

Declaration of conflicting interests

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Authors' contributions

KK,UK: conceived and designed this study, contributed to data collection, analyses and interpretation, co-wrote the study. All authors have read and approved the final manuscript.

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