Research Progress of the Diagnostic Value of Video Mediastinoscopy in the Staging of Lung Cancer

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Abstract: In the process of diagnosing patients with lung disease, traditional imaging diagnosis has certain limitations, which can easily lead to missed diagnosis and misdiagnosis. In recent years, with the advancement and development of imaging technology, video mediastinoscopy has gradually been promoted and applied in clinical practice, and has significant advantages in the identification of benign and malignant lung lesions, lung cancer staging, and efficacy evaluation. This study mainly discusses the specific application of video mediastinoscopy and its diagnostic value in staging of lung cancer.
***Keywords*:** video mediastinoscopy, lung cancer, staging, diagnosis

1. Introduction

Lung cancer is a malignant tumor disease with a high incidence worldwide. Its incidence in my country is gradually increasing, posing a serious threat to people's health and life safety. At present, CT, positron emission computed tomography (PET) and magnetic resonance imaging are important imaging procedures for disease screening, diagnosis and follow-up of lung cancer patients, and can effectively reflect tumor morphology and function[1]. In recent years, with the introduction of new adjuvant treatment programs, people have gradually strict requirements for the accuracy of the diagnosis and staging of lung cancer before treatment [2]. In addition, the limitations of traditional imaging diagnostic methods such as CT and PET in the staging of lung cancer have gradually emerged, so that the application value of mediastinoscopy in the staging of mediastinal lymph nodes of lung cancer and the establishment of standardized treatment plans have gradually attracted people's attention [3]. However, due to the limitation of its own equipment, the traditional mediastinoscopy operation has shortcomings such as narrow surgical field and only one-handed operation, which further reduces the diagnostic accuracy. Video mediastinal surgery is a relatively safe, effective and easy-to-operate diagnosis and treatment method, and can promote the effective solution of the above-mentioned problems, thereby effectively improving its diagnostic value in the staging of lung cancer.

2. Video mediastinoscopy equipment and its surgical methods

2.1 TV mediastinum equipment

The TV mediastinum is an optical endoscope and a TV imaging system added to the original mediastinum. In terms of its appearance, the tube of the TV mediastinum is more like a duckbill endoscope, about 16cm long. In order to accurately display the mediastinal structure, the lower lobe of the tube can be opened. Compared with the traditional mediastinum, the tail end of the TV mediastinum can be connected with the fiber optic cable and the camera. With the help of the monitor, the field of vision under the microscope is clearer, and the operator can also observe the operation process clearly. At the same time, through the use of full-standard video recorders and color printers, surgical data can be saved at any time, which is convenient for later communication and teaching.

2.2 Operation method

During the surgical operation with the video mediastinoscope, the principle is the same as that of the traditional mediastinoscope. The patient needs to be subjected to general anesthesia, and the patient is intubated through a single-chamber trachea. The surgical procedure is mainly determined according to the specific location of the patient's lesions and enlarged lymph nodes, mainly with cervical video mediastinoscopy and parasternal video mediastinoscopy.

3. The diagnostic value of video mediastinoscopy in the staging of lung cancer

At present, in the diagnosis of clinical staging of lung cancer patients, chest spiral CT is a more commonly used diagnostic method. With the advancement and development of imaging technology, the resolution of CT detection has

also been gradually improved. In the diagnosis of lymph nodes, its specificity and sensitivity have not been significantly improved, and the false-negative and false-positive rates of this test diagnosis are both high, which makes its clinical application more limited. PET is a new imaging diagnosis method that has been applied in recent years. Compared with spiral CT detection, PET has a relatively high diagnostic accuracy in the diagnosis of mediastinal lymph node metastasis [4]. However, for patients with small N2 metastases, false negatives are prone to be diagnosed by PET, and most false positives are diagnosed as lymphadenitis. For patients with intramediastinal lesions, if the PET diagnosis is positive, and then the video mediastinoscopy is performed to see the sweat, the diagnosis accuracy can be effectively improved, which is beneficial to the diagnosis of the patient's condition.

In addition, compared with traditional mediastinoscopy, the video mediastinoscopy is used for preoperative examination of lung cancer patients, and the surgical field of view is relatively clear, so that the resolution of the operator for the fine anatomical structure has been significantly improved. At the same time, through effective cooperation, surgical operators can perform two-handed operations, and their intraoperative flexibility, comfort, and accuracy of pathological biopsy have been significantly improved. The operation time has been significantly shortened, and it can be used for lung cancer patients. Make accurate judgments in advance by stages.

In clinic, mediastinal lymph node enlargement due to various reasons is the best indication during video mediastinoscopy. Compared with the previous spiral CT and PET, the diagnosis is accurate in the judgment of lung cancer mediastinal lymph node metastasis. The sex is relatively high, and most of them use it as the gold standard for judging whether there is metastasis in mediastinal lymph nodes [5]. Video mediastinoscopy is mainly divided into cervical video mediastinoscopy surgery and parasternal video mediastinoscopy surgery. Among them, cervical video mediastinoscopy surgery mainly refers to the lengthening of a transverse finger on the sternal notch of the patient. A transverse incision of about 3-4 cm is dissected to the patient’s trachea, and the mediastinoscope is inserted into it along the posterior vessel tunnel. The enlarged lymph nodes on both sides of the trachea, under the carina, and left and right adjacent to the main bronchus are carefully explored according to the sequence of exploration. It should be noted that the lymph nodes next to the trachea on the right side of the patient, and pathological biopsy should be performed at the same time [6]. Parasternal video mediastinoscopy surgery is to make an incision about 4-5 cm in length 2 cm next to the sternum in the second or third intercostal space of the patient, and separate it along the posterior sternum in a deep position, and use a narrow deep retractor to perform the operation. The lateral phrenic nerve and the mediastinal pleura are pushed to the outside and enter the anterior mediastinum along the extrapleura. After the mediastinoscope is inserted, the 5th and 6th groups of lymph nodes or mediastinal masses can be explored, and multiple pathological tissues can be taken for biopsy. Most of the postoperative drainage tube does not need to be placed [7]. However, if a lung biopsy is performed at the same time or a pleural rupture occurs during the operation, a closed thoracic drainage tube should be routinely indwelled. During the video mediastinoscopy for lung cancer patients, it has the characteristics of less trauma, short operation time, effective examination results, and reproducible materials. Compared with video thoracoscopy, the cost of video mediastinoscopy is relatively higher. Low [8]. In addition, for unexplained simple mediastinal lymphadenopathy or mediastinal occupancy, such as lymph node tuberculosis, chronic lymphadenitis, mediastinal malignant tumors, and sarcoidosis, it is difficult to distinguish effectively with the help of CT and PET examinations, but with the help of video mediastinoscopy Then the pathological diagnosis can be clarified, and the disease stage can be accurately determined, which will help the targeted implementation of the treatment plan.

4. The limitations of video mediastinoscopy in staging diagnosis of lung cancer

Video mediastinoscopy is an invasive procedure and requires general anesthesia for the patient. There are certain complications, such as infection, hemorrhage, pneumothorax, and tracheoesophageal injury. At the same time, there is a certain blind area in this examination. It is difficult for patients with upper left lung cancer to perform effective examinations on the 5th and 6th groups of lymph nodes, which can easily lead to false negatives. Therefore, experienced thoracic surgeons should adopt the method during the examination. Combined with PET or video-assisted thoracoscopic surgery to improve the accuracy of staging diagnosis of lung cancer patients. In addition, in terms of treatment costs, the cost of video-mediastinoscopy is relatively high compared with traditional mediastinoscopy. This situation is mainly related to the expensive imaging equipment used during the operation. However, compared with the advantages of video mediastinoscopy, the cost is acceptable for most patients. Compared with traditional mediastinoscopy, the video mediastinoscopy can clearly enlarge the field of vision during the operation, and the operator can perform two-handed operation, which significantly improves the flexibility and accuracy of the operation. At the same time, it has a positive role in promoting intraoperative teaching and postoperative experience exchange, which is of vital importance to the popularization and development of this technology in my country.

5. Conclusion

To sum up, although mediastinal surgery is a kind of invasive examination, as long as the operation skills are strictly mastered during the operation process, the safety of the operation will also be significantly improved. With the advancement and development of imaging technology, in the staging diagnosis of lung cancer, through the use of video mediastinoscopy, the tissue lesions can be clearly displayed, thereby providing a more reliable diagnosis of the condition of lung cancer patients, prediction and evaluation of curative effects, etc. The basis for diagnosis. At the same time, this test has the characteristics of simple operation, safety and reliability, high sensitivity and specificity, and can be used as a routine program for the staging of lung cancer.

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