



Mediastinal 4L lymph node dissection in left lung cancer

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Lymph node dissection is an important surgical treatment for the accurate staging and selection of patients who require postoperative adjuvant therapy, including chemotherapy and radiotherapy, for non-small cell lung cancer (NSCLC). Furthermore, the complete removal of unsuspected or microscopic cancer by lymph node dissection can reduce the risk of local recurrence and metastasis and increase the possibility of a cure. Lymph node dissection can be roughly divided into three procedures: systematic lymph node dissection, wherein the lymph nodes are removed along with the surrounding adipose tissue as a cluster; selective lymph node dissection, which involves dissection to omit the range of dissection depending on the tumor location; and sampling, where only an arbitrary lymph node is extracted. No significant difference in the treatment outcome was noted between systematic lymph node dissection and sampling in the Z0030 trial, a randomized controlled trial of the American College of Surgery Oncology Group (1). In addition, the operation time of systematic lymph node dissection was longer than that of sampling lymph node dissection, but no marked difference in the postoperative complication rate or surgical related mortality rate was noted (2). Although many studies and reviews have explored the usefulness of mediastinal lymph node dissection, the findings are controversial, with some stating that it is effective (3,4) while others found that it does not contribute to the prognosis (5-7).

Mediastinal lymph node resection is necessary for the accurate staging and resection of possible metastatic lesions. However, the omission of lymph node dissection or sampling dissection used to be performed for the patients who are not suspected of mediastinal lymph node metastasis by preoperative imaging. Dissecting mediastinal lymph nodes carries a risk of a prolonged operation time and postoperative complications. However, no data has

unequivocally shown that lymph node dissection has a better prognosis than sampling. Therefore, the utility of systematic mediastinal lymph node dissection has not yet been established. Furthermore, the indications for patients requiring systematic lymph node dissection differ among institutions and surgeons, and the precision differs depending on the surgical technique used, such as thoracotomy versus video-assisted thoracoscopic surgery (VATS). This makes it difficult to clarify the utility of mediastinal systematic lymph node dissection.

There are several reports concerning the validity of systematic lymph node dissection (1-7), but relatively few have described 4L lymph node dissection. Wang *et al.* (8) investigated the validity of 4L lymph node dissection in left lung cancer and reported the possibility of the prognosis being improved by adding 4L lymph node dissection. However, because that study was a retrospective study with no mention of how patients were selected for 4L lymph node dissection versus non-dissection, it was impossible to conclude that 4L lymph node dissection was effective in improving the prognosis. Furthermore, the study included all patients with left lung cancer, regardless of upper or lower lobe; the method of lymph node dissection should be divided at least by the location of the tumor. The results of the progression-free survival and overall survival is important and interesting, but readers want to know the recurrence form, especially the 4L lymph node recurrence or not. Because the patients underwent mediastinal 4 L lymph node dissection will be selected by each institution and surgeon based on the general condition of the patient or tumor progression, it may be difficult to clarify whether the 4L lymph node dissection improve prognosis or not. Darling *et al.* (9) reported that 21 patients (4%) had occult N2 disease identified by mediastinal lymph node dissection that was not found by rigorous pre-randomization

systematic sampling, and non-4L metastasis was found in 207 cases of left-sided NSCLC. It is also necessary to pay close attention to the risk of serious complications, such as bleeding requiring blood transfusion, recurrent nerve paralysis or chylothorax, caused by 4L lymph node dissection.

In the study of mediastinal lymph node dissection, we have to evaluate the short-term survival, including perioperative complications, as well as the long-term survival. Given recent improvements in the accuracy of preoperative clinical staging, especially for lymph node metastasis, thanks to advances in preoperative imaging, such as positron emission tomography, the role of mediastinal lymph node dissection for staging is expected to change. The technique and range of mediastinal lymph node dissection differs among surgeons and surgical operation type, including thoracotomy, VATS or robotic-assisted thoracoscopic surgery (10). In order to clarify the usefulness of mediastinal lymph node dissection, a study must consider such detailed background factors.

Mediastinal lymph node dissection including 4L lymph nodes would be necessary for truly accurate staging and decision of postoperative adjuvant therapy, at least for the patients underwent left upper lobectomy. However, because there is a risk of serious perioperative complications, joint prospective studies of other institutions with as little bias as possible due to differences in case selection and surgical method will be necessary to prove the usefulness of 4L lymph node dissection.

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