CASE REPORT

Endoscopic Ultrasonography-guided Fine Needle Aspiration for Computed Tomography-negative and Positron Emission Tomography-positive Mediastinal Lymph Node in a Patient with Recurrent Lung Cancer

Hansoo Kim, Su Jin Chung, Sang Gyun Kim, Joo Sung Kim, Hyun Chae Jung, and In Sung Song

Department of Internal Medicine and Liver Research Institute, Seoul National University College of Medicine, Seoul, Korea

Biopsy is required to confirm lymph node (LN) metastasis in positron emission tomography (PET)-positive LN due to the low specificity of PET. Currently, invasive surgical techniques such as mediastinoscopy or mediastinotomy are standard procedures for obtaining LN specimen. It would be desirable to have a less invasive way of sampling suspicious LN. Herein, we report a case of successful endoscopic ultrasonography-guided fine needle aspiration (EUS-FNA) for the diagnosis of CT-negative and PET-positive LN that was found after curative resection in lung cancer. To the best of our knowledge, this is the first description in Korea to perform EUS-FNA for the evaluation of metastatic LN during the follow-up period after lung cancer resection.

A 63-years old male patient was diagnosed as a stage T4N0M0 non-small lung cancer. VATS-aided left upper lobectomy with mediastinal LN dissection was performed, and the patient revealed no recurrence for a year. During the follow up, serum level of CEA increased to 7.8 ng/mL, but CT failed to show any suspicious lesions. On PET-CT finding, a hypermetabolic lesion was noted in paraesophageal LN. We performed EUS-guided FNA to obtain a biopsy specimen from paraesophageal lymph node, and this proved to be a metastatic adenocarcinoma. In conclusion, EUS-FNA provided minimally invasive confirmation of the metastatic LN in recurrent a lung cancer patient after curative resection. EUS-FNA should be considered for suspicious metastatic LN to confirm malignancy. (*Gut and Liver* 2007;1:90-92)

Key Words: Endoscopic ultrasonography; Fine needle aspiration; Lymph node; Metastasis; Lung cancer

INTRODUCTION

Diagnosis and staging of lung cancer are pivotal steps to determine an appropriate treatment modality. Tissue confirmation of suspicious mediastinal lymph node (LN) for metastasis is also critical because chemotherapy is the backbone of treatment for patients with LN metastasis, while surgery is the treatment of choice for the patients without distant metastasis.^{1,2} To date, invasive surgical techniques such as mediastinoscopy or mediastinotomy have been considered as standard procedures in obtaining LN specimen, but drawbacks are its invasiveness, requirement of general anesthesia, and the relative high risk of its complications.³ Consequently, it is more desirable to perform a less invasive sampling method for suspicious LN.

Endoscopic ultrasonography-guided fine needle aspiration (EUS-FNA) is a safe and an accurate method for the diagnosis of submucosal tumors in gastrointestinal tract and mediastinal disease such as lymphadenopathy in lung cancer.⁴ Recent studies reported that EUS was successfully performed instead of invasive mediastinoscopy in patients with suspiciously enlarged mediastinal LN.²

Herein, we report a case of a 64-year-old man who was diagnosed as metastatic mediastinal LN after curative resection for non small cell lung cancer (NSCLC).

Correspondence to: Sang Gyun Kim

Department of Internal Medicine and Liver Research Institute, Seoul National University College of Medicine, 28, Yeongeong-dong, Jongno-gu, Seoul 110-744, Korea

Tel: +82-2-740-8112, Fax: +82-2-743-6701, E-mail: harley1333@hanmail.net

Received on June 5, 2007. Accepted on June 19, 2007.

Fig. 1. Positron-emission tomography with F-18 fluorodeoxyglucose (FDG). Increased accumulation of F-18 FDG is noted on the paraesophageal LN bearing area (arrows); (A) cross section and (B) coronal images.

Fig. 2. Endoscopic ultrasonography shows a 1.7×0.7 cm mixed echogenic mass in subcarinal level. An echogenic needle is passing through the lymph node (arrow).

CASE REPORT

A 64-year-old male with a history of NSCLC was evaluated for suspicious mediastinal LN. He was diagnosed as lung adenocarcinoma, and video assisted thoracoscopic surgery (VATS)-aided left upper lobectomy with mediastinal LN dissection was performed 18 months ago. Pathologic staging was T4N0M0. The patient was in good health till four months before when the serum level of carcinoembryonic antigen (CEA) revealed elevation to 7.8 ng/mL from 1.0 ng/mL. On physical examination, vital signs were normal without significant findings. There was no palpable LN. Lung sounds were clear, and laboratory findings revealed normal except mild elevation of CEA. Computerized tomography (CT) of the chest and bone scan were underwent, but revealed no abnormal finding. Positron-emission tomography (PET) revealed increased focal accumulation of F-18 fluorodeoxyglucose (FDG) in

the paraesophageal LN bearing area (Fig. 1).

We planned to perform EUS-FNA to confirm the lesion pathologically. The procedure was applied with a linear-array echoendoscope (EUCT-2000; Olympus, Tokyo, Japan) which demonstrated a 1.7×0.7 cm sized ovoid, hypoechoic mass in the subcarinal level (Fig. 2). Several biopsies were attempted with the aid of 21-gauge fine needle (NA 200H-8022; Olympus, Tokyo, Japan). The patient tolerated the procedure well without any complication.

Cytologic evaluation of the specimens showed atypical cells with hyperchromatic nucleus accompanying high nuclear to cytoplasmic ratio. These findings were compatible with metastatic adenocarcinoma from NSCLC. Based on excellent performance status, chemotherapy with gemcitabine and navelbine was initiated. The patient tolerated well and is sustaining a good quality of life.

DISCUSSION

Metastasis to mediastinal LN or distant organ is associated with poor prognosis in lung cancer, and surgical resection of the primary tumor generally does not provide significant clinical benefit. To date, chemotherapy is thought to be the backbone of treatment for metastatic disease despite its poor efficacy. Surgery is still the treatment of choice in patients with resectable tumor without distant metastasis. Therefore, an accurate diagnosis of metastasis in mediastinal LN is a critical step when selecting proper management.

Whole body PET with F-18 FDG is known to be superior to conventional chest CT scan because it enables to demonstrate an increased tumor metabolism even in a normal-sized LN.⁵ However, the pathologic confirmation is still required in PET-positive LN because the specificity is low. Moreover, no single imaging method alone can predict the nature or the stage of the lesions. Conclusively, tissue confirmation is essential to diagnose a meta-

static LN.

Current guidelines⁶ suggest that patients with suspicious mediastinal lymphadenopathy with suspected or proven NSCLC should undergo tissue sampling before surgical interventions. Although mediastinoscopy is regarded as the standard technique for tissue sampling with a sensitivity of 81% and a specificity of 100%, there are several limitations in its diagnostic reach because of the need of general anesthesia, clinical admission, and high costs with a reported morbidity around 2%.

Wiersema et al⁷ described the first successful case of EUS-FNA of a mediastinal LN in 1993. Thereafter, several studies reported that EUS-FNA is very effective, highly sensitive, and minimally invasive when evaluating LN.³ They reported on high accuracy, a sensitivity of 84-98% and a specificity near 100%, low complication rate of EUS-FNA obviating the need for invasive mediastinoscopy. Mohamad et al⁸ reported that EUS-FNA was more accurate and highly predictive than PET or CT scan for mediastinal LN. Higher resolution of EUS possibly enables to detect small LN better than CT scan or PET. Several reports established the role of EUS-FNA in confirming the suspicious mediastinal LN which is targeted by CT scan or PET in patients with suspicious lung cancer. EUS-FNA has emerged as a most useful technique in evaluating very small mediastinal metastasis.

The current American Thoracic Society (ATS) guidelines still suggest CT scan as the standard investigation for the evaluation of mediastinal involvement of lung cancer. Although PET may be useful to define distant metastasis, a major drawback of PET is that the FDG uptake can only be localized to the hilar or mediastinal areas differentiating left-sided from right-sided activity. Besides, nonspecific inflammatory conditions in LN, such as tuberculosis, sarcoidosis and fungal reactions, may also accumulate FDG, which provides false positive results. Consequently, a combination of imaging studies might provide improved results by compensating individual drawbacks. Thus, the combination of PET and EUS-FNA might be a qualified, minimally invasive, and most sensitive method for the evaluation of suspicious metastatic mediastinal LN.⁹

In this case, we evaluated PET positive- and CT negative-mediastinal LN by EUS-FNA in patient after curative resection for lung cancer. We obtained LN tissue

sample by several passes with a 21-gauge fine needle without evident complication. Thus, we could diagnosis a metastatic mediastinal LN without invasive intervention accurately, which led to an appropriate therapy. To our knowledge, this is the first case that performed EUS-FNA for the evaluation of postoperative metastatic LN in lung cancer in Korea.

In conclusion, EUS-FNA provided a safe and an accurate confirmation of the metastatic LN in recurrent lung cancer after curative resection. EUS-FNA should be considered as initial diagnostic approach in patient with suspicious metastatic LN to confirm metastasis before making therapeutic decisions.

REFERENCES

1. Savides TJ, Perricone A. Impact of EUS-guided FNA of enlarged mediastinal lymph nodes on subsequent thoracic surgery rates. *Gastrointest Endosc* 2004;60:340-346.
2. Leblanc JK, Devereaux BM, Imperiale TF. Endoscopic ultrasound in non-small cell lung cancer and negative mediastinum on computed tomography. *Am J Respir Crit Care Med* 2004;171:177-182.
3. Hammound ZT, Anderson RC, Meyers BF. The current role of mediastinoscopy in the evaluation of thoracic disease. *J thorac Cardiovasc Surg* 1999;118:894-899.
4. Chen VK, Eloubeidi MA. Endoscopic ultrasound-guided fine needle aspiration is superior to lymph node echofeatures: a prospective evaluation of mediastinal and perintestinal lymphadenopathy. *Am J Gastroenterol* 2004;99:628-633.
5. Chin R Jr, Ward R, Keyes JW. Mediastinal staging of non-small cell lung cancer with positron emission tomography. *Am J Respir Crit Care Med* 1995;152:2090-2096.
6. Silvestri GA, Tanoue LT, Margolis ML, et al. American College of Chest Physicians. The noninvasive staging of non-small cell lung cancer: the guidelines. *Chest* 2003;123:S147-S156.
7. Wiersema MJ, Kochman ML, Chak A. Real-time endoscopic ultrasound-guided fine-needle aspiration of a mediastinal lymph node. *Gastrointest Endosc* 1993;39:429-431.
8. Mohamad AE, Robert JC, Victor KC, et al. Endoscopic ultrasound-guided fine needle aspiration of mediastinal lymph node in patients with suspected lung cancer after positron emission tomography and computed tomography scans. *Ann Thorac Surg* 2005;79:263-268.
9. Annema JT, Hoekstra OS, Smit EF, et al. Towards a minimally invasive staging strategy in NSCLC: analysis of PET positive mediastinal lesions by EUS-FNA. *Lung Cancer* 2004;44:53-60.