

## CASE REPORT

# High Serum Neuron-Specific Enolase (NSE) Level Firstly Ignored as Normal Reaction in a Small Cell Lung Cancer Patient: a Case Report and Literature Review

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### SUMMARY

**Background:** High serum neuron-specific enolase (NSE) level has been in use as a tumor marker; however, some physicians may ignore NSE levels in serum, especially when the patients are asymptomatic. Here we report a case that a 51 year old female patient with no respiratory symptoms who had a NSE level which increased extremely over three months and was eventually diagnosed small cell lung cancer (SCLC).

**Methods:** Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) in right pulmonary hilar enlarged lymph node was performed for diagnosis.

**Results:** EBUS showed right pulmonary hilar lymph node enlargement. A TBNA biopsy histopathology diagnosed SCLC.

**Conclusions:** We should pay attention to high serum NSE levels, especially when the index increased extremely over a short time.

(Clin. Lab. 2019;65:xx-xx. DOI: 10.7754/Clin.Lab.2018.180703)

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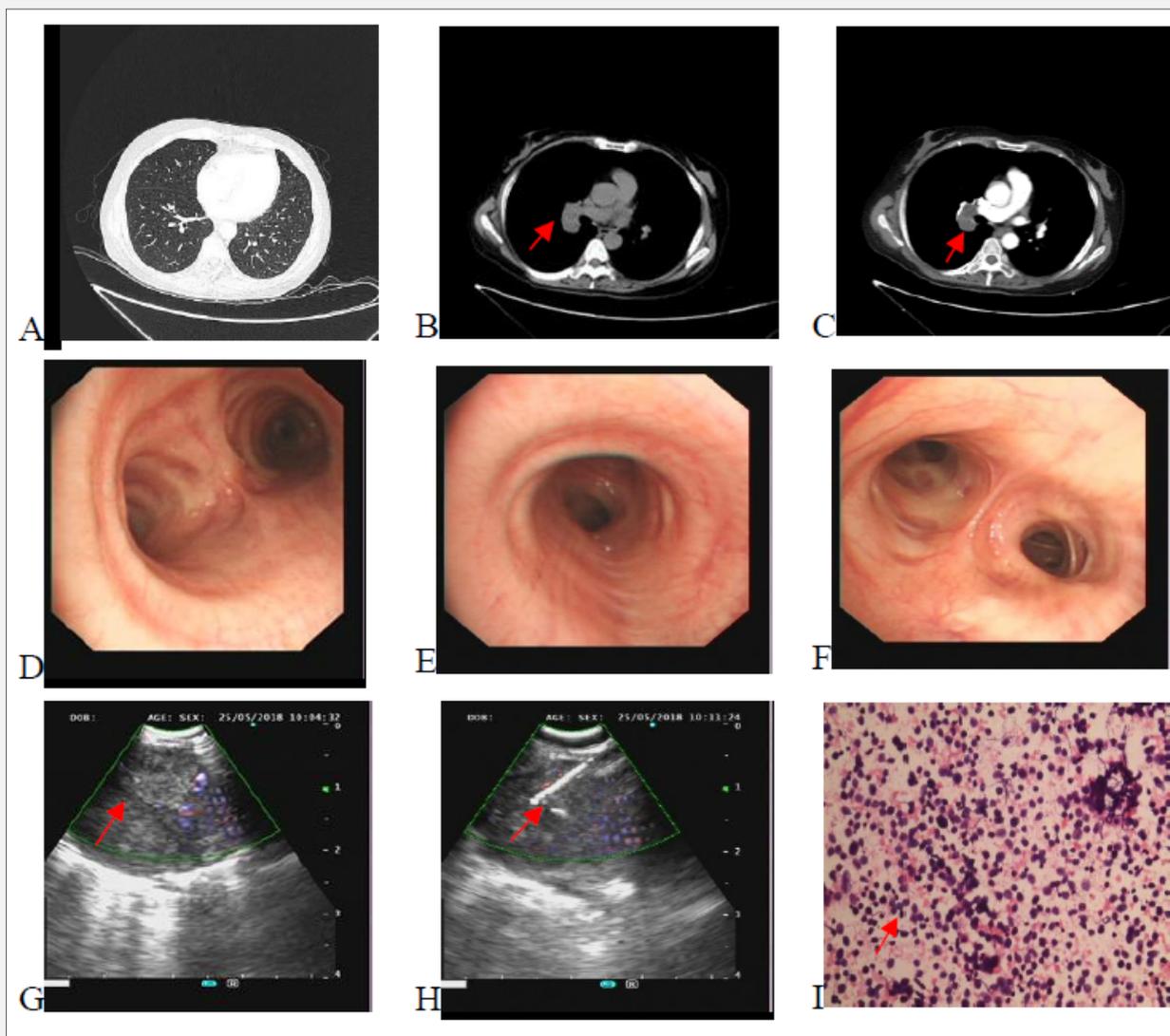
### KEY WORDS

small cell lung cancer, neuron-specific enolase, EBUS-TBNA

### CASE PRESENTATION

In the present study, we report a case of SCLC found incidentally in a 51 year old female patient. The patient had a routine annual checkup, the blood test showed an elevated NSE level (71.85 µg/L, a value of < 15.2 µg/L was used as the biological reference for NSE) which was measured by electrochemiluminescence detection. The NSE level was normal the previous year and carcinoembryonic antigen (CEA) was normal this time. The patient had no respiratory symptoms and the chest X-ray was normal, she did not receive a chest CT scan. She was asked to repeat NSE level test three months later.

Case Report accepted July 9, 2018



**Figure 1. Patient imaging and histological results.**

The chest contrast-enhanced CT scan showed no mass and patch in the either lung (Figure 1A), right pulmonary hilar lymph node enlargement and slight enhancement (Figure 1B, 1C). Electronic bronchoscope showed that the trachea and each segment of the bronchus were normal (Figure 1D - 1F). EBUS showed right pulmonary hilar lymph node enlargement and the internal echo of lymph node was inhomogeneous (Figure 1G), a TBNA biopsy was performed (Figure 1H). Histopathology diagnosed SCLC, and immunohistochemistry showed Syn, TTF-1, and NSE were positive, and expression of Ki-67 was 80% (Figure 1I).

NSE level increased greatly to 279.99  $\mu\text{g/L}$ . The patient was then transferred to the oncology clinic and received a chest contrast-enhanced CT scan. The chest contrast-enhanced CT scan showed right pulmonary hilar lymph node enlargement and no mass and patch in either lung (Figure 1A - 1C). The patient was transferred to the respiratory department. Electronic bronchoscope and endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) in the right pulmonary hilar en-

larged lymph node was performed (Figure 1D - 1H). Electronic bronchoscope showed that the trachea and each segment of the bronchus were normal, and EBUS showed right pulmonary hilar lymph node enlargement and the internal the echo of lymph node was inhomogeneous. A TBNA biopsy histopathology diagnosed SCLC. Immunohistochemistry showed Syn, TTF-1, and NSE were positive, and expression of Ki-67 was 80% (Figure 1I).

## DISCUSSION

Small cell lung cancers (SCLC) are extremely aggressive malignancies, which comprise about 15 - 20% of all lung cancers. Because the cure rate of SCLC is extremely low at later stages, detections with high sensitivity and specificity are needed for screening and monitoring at an early stage of disease [1-3]. The use of non-invasive modalities has gained increasing advantages [4,5]. Among all the non-invasive tools, tumor-related substances can be detected as tumor markers in easily accessible body fluids. Among these indicators, high neuron-specific enolase (NSE) levels in serum as a reflection of the disease, have been in use as a tumor marker, and some studies showed there was a strong specific and sensitive relationship with the biology and behavior of SCLC [6-9]. While some SCLC patients are asymptomatic or manifest as other organ metastases, some physicians may misdiagnose the disease or ignore the high NSE level in serum, especially when the patients had ischemic diseases of nervous system [10-12]. In our report, elevated NSE level were found incidentally in the patient and it increased extremely in three months. However, at the beginning, physicians did not connect the elevated NSE level with lung cancer and let the patient receive chest CT scan, while just advising the patient to followed up the abnormal serum index. Physicians should pay attention to elevated NSE levels and should take chest CT scans as a routine test when patients have abnormal tumor markers.

## CONCLUSION

High NSE levels in serum showed a strong specific and sensitive relationship with the biology and behavior of SCLC. We should pay attention to elevated NSE levels and should take chest CT scans as a routine test when patients have abnormal tumor markers.

### Acknowledgment:

We thank the other members of the Department of Respiratory Medicine of North China University of Science and Technology Affiliated Hospital for their critical comments.

### Declaration of Interest:

There are no commercial or other associations that may pose a conflict of interest for this article.

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