

## CASE REPORT

# High Serum Level of CA 19-9 not Always Related to the Pancreas: An Asymptomatic Case of Highly Elevated CA 19-9 Related to Lung Adenocarcinoma

Shenq-Jie Wong<sup>1,3</sup>, Chun-Ming Hong<sup>1</sup>, Hsiu-Po Wang<sup>1</sup>, Tsu-Yao Cheng<sup>1,2</sup>

Departments of <sup>1</sup>Internal Medicine and <sup>2</sup>Laboratory Medicine, National Taiwan University Hospital and National Taiwan University College of Medicine, Taipei, Taiwan

Department of <sup>3</sup>Internal Medicine, En Chu Kong Hospital, New Taipei City, Taiwan

### ABSTRACT

**Context** CA 19-9 is widely used as tumor marker of pancreatic cancer. Extra-pancreatic tumors with increased serum levels of CA 19-9 are uncommon but should be taken into consideration in some cases. **Case report** We present an asymptomatic case of highly elevated serum CA 19-9 related to lung adenocarcinoma but not to pancreatic tumors. The serum CA 19-9 level returned to nearly normal after chemo-radiotherapy for lung cancer. **Conclusion** In addition to pancreatic cancer, highly elevated serum levels of CA 19-9 may be present in other extra-pancreatic conditions such as lung cancer in this case. A physician should not limit tumor survey in biliopancreatic fields in a patient with highly elevated serum CA 19-9 and clinical suspicion of malignancy.

### INTRODUCTION

The tumor marker carbohydrate antigen 19-9 (CA 19-9) has been used widely as a tool for the investigation and management of patients with pancreatic cancer since its discovery. However, elevated serum CA 19-9 levels may exist not only in patients with pancreatic cancer but also in many other conditions, either benign or malignancy. Abnormal serum CA 19-9 is becoming a concern not only to the physicians but also to the public as the increment of screening evaluation for tumor survey. We hereby present a rare case of asymptotically elevated serum CA 19-9 level related to lung adenocarcinoma.

### CASE REPORT

A Fifty-year-old man was referred to the gastroenterology clinic due to elevated serum level of CA 19-9 (5247 U/mL) noted in health examination. The patient did not report any discomfort. He received serial examinations for the alimentary system. Upper and lower endoscopy examinations did not show any malignancy. Abdominal computed tomography (CT) showed no biliary or pancreatic lesion but one hemangioma of the liver. Endoscopic ultrasound (EUS) revealed chronic

pancreatitis pattern and one 0.5 cm pancreatic body neuroendocrine tumor (NET) confirmed after fine-needle aspiration (**Figure 1**). Chest CT showed one 2.3 cm nodule with irregular margin in the left upper lung and one 0.5 cm nodule in the right lower lung. The patient had received left upper lung biopsy once one year ago, and the pathology report showed fibrotic change only. Positron emission tomography scan detected small hot spots over lung fields, mediastinal and supraclavicular regions but not pancreas (**Figure 2**). Due to the serum level of CA 19-9 kept increasing during follow-up, repeated CT-guided biopsy of the left upper lung nodule was performed but still showed no evidence of malignancy. Bronchoscopy examination did not find any endobronchial lesion. However, echo-guided biopsy over the supraclavicular lymph node showed infiltrated cancer cells positive for thyroid transcription factor-1 (TTF-1) staining (**Figure 3, left**), which were compatible with metastatic adenocarcinoma of the pulmonary origin. The immunohistochemistry study of the lymph node tissue section was also positive for CA 19-9 staining (**Figure 3, right**). After six cycles of concurrent chemo-radiotherapy for lung cancer, serum CA 19-9 level decreased to 61.6 U/mL.

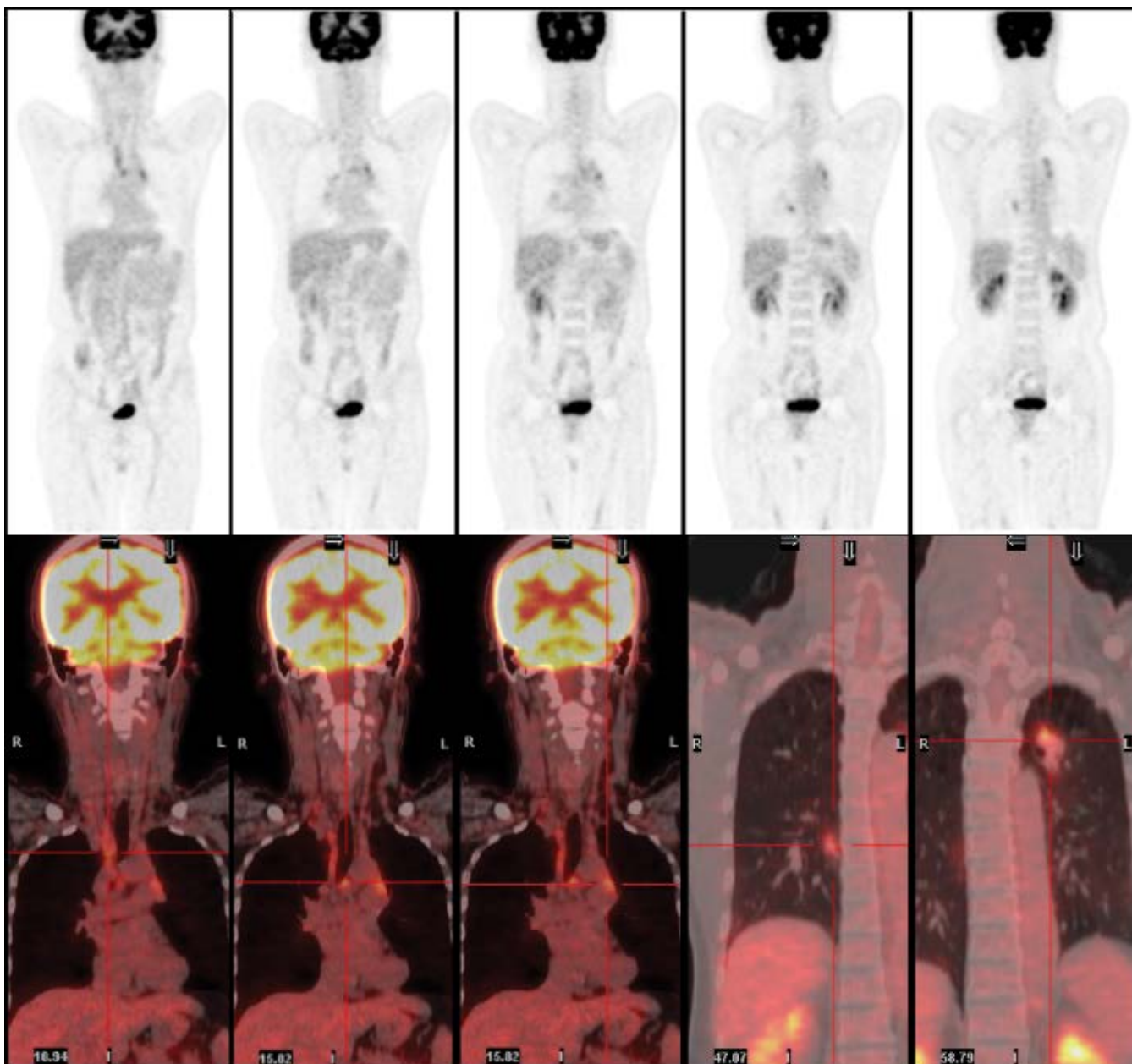
### DISCUSSION

CA 19-9 was originally identified by a monoclonal antibody in a colorectal cancer cell line but has been more useful in the management of pancreatic cancer [1]. In general practice, serum CA 19-9 level is currently the single most useful blood test to help differentiating benign from malignant pancreatic disorders in patients with pancreatic tumors after relief of jaundice. A serum CA 19-9 level is

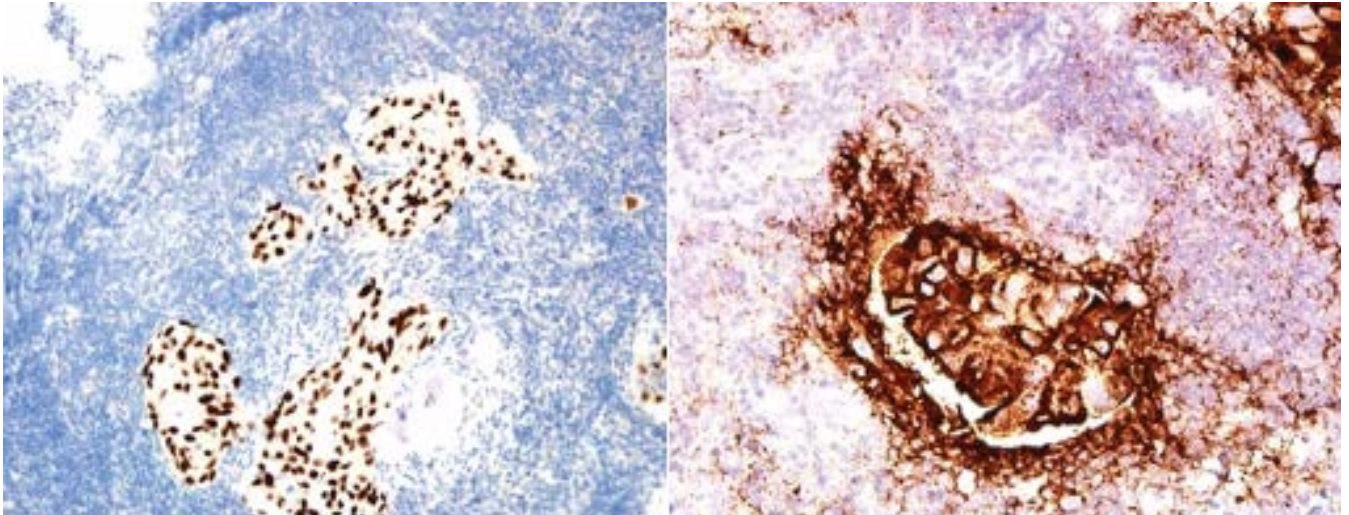
Received May 20th, 2016 - Accepted June 17th, 2016  
**Keywords** Biomarkers, Tumor; CA-19-9 Antigen; Lung Neoplasms  
**Correspondence** Tsu-Yao Cheng  
Division of Gastroenterology  
Department of Internal Medicine  
National Taiwan University Hospital  
Taipei City, Taiwan  
**Tel** +886-2-23123456 ext.62389  
**Fax** +886-2-23947899  
**E-mail** tycheng@ntu.edu.tw



**Figure 1.** EUS showed one 0.5 cm hypochoic tumor with increased Doppler signals over the pancreatic body.



**Figure 2.** PET scan showed bilateral lung tumors with mediastinal and supraclavicular lymphadenopathies.



**Figure 3.** Immunohistochemical study showed positive TTF-1 (left) and CA 19-9 (right) stains of the lymph node.

also used to monitor treatment response and recurrence of pancreatic cancer. However, serum CA 19-9 level is found to be elevated in many other benign and malignant conditions on clinical practice, although the serum level in malignancies is usually significantly higher. The common benign conditions related to elevation of CA 19-9 include many biliopancreatic diseases other than cancer, pneumonia, renal failure and autoimmune diseases. In addition to biliopancreatic cancer, the commonly reported malignancies with elevated CA 19-9 levels include gastric, colorectal, breast, ovarian and endometrial cancer [2].

The presence of elevated serum CA 19-9 in patients with lung adenocarcinoma has rarely been reported. Most cases were reported from Japan [3]. CA 19-9 had been detected in tissue specimens from both small and non-small cell lung cancers, and the existence may explain the presence of elevated serum CA 19-9 levels in lung cancer patients [4]. High levels of CA 19-9 were reported to be related to advanced stage of lung adenocarcinoma [5]. Besides, elevated serum CA 19-9 levels are also noted in non-malignant lung diseases including idiopathic interstitial pneumonia, collagen disease-associated pulmonary fibrosis, diffuse panbronchiolitis, bronchiectasis, and pulmonary sequestration [6, 7].

A small, asymptomatic pancreatic NET was incidentally found in this case and follow-up EUS six months later showed no interval change. There is no clear association between high serum CA 19-9 levels and small pancreatic NETs. Though many pancreatic NETs can be immunolabeled with CA 19-9, the serum levels of CA 19-9 are within normal limits for pancreatic NETs [8].

In conclusion, highly elevated serum levels of CA 19-9 may exist not only in patients with pancreatic cancer but also in patients with many other extra-pancreatic conditions such as lung cancer in this case. The responding

physician should not limit tumor survey in biliopancreatic fields in patients with a high serum of CA 19-9 and clinical suspicion of malignancy. The interpretation of serum CA 19-9 level must be made after a systemic survey along with other significant clinical findings.

---

### Conflicting Interest

The authors had no conflicts of interest.

---

### References

1. Locker GY, Hamilton S, Harris J, Jessup JM, Kemeny N, Macdonald JS, Somerfield MR, et al. ASCO 2006 update of recommendations for the use of tumor markers in gastrointestinal cancer. *J Clin Oncol* 2006; 24:5313-5327. [PMID: 17060676]
2. Passerini R, Cassatella MC, Boveri S, Salvatici M, Radice D, Zorzino L, Galli C, et al. The pitfalls of CA 19-9: routine testing and comparison of two automated immunoassays in a reference oncology center. *Am J Clin Pathol* 2012; 138:281-7. [PMID: 22904141]
3. Hagiwara K, Sato K, Takahashi K, Shishido M, Awano N, Abe Y, Nagata K, et al. Two cases of CA 19-9 producing pulmonary papillary adenocarcinoma. *Kyobu Geka* 1995; 48:925-928. [PMID: 7564016]
4. Ohshio G, Yamaki K, Imamura T, Suwa H, Chang CY, Wada H, Sueno Y, et al. Distribution of the carbohydrate antigens, DU-PAN-2 and CA 19-9, in tumors of the lung. *Tumori* 1995; 81:67-73. [PMID: 7754546]
5. Mizushima Y, Tsuji H, Izumi S, Hirata H, Kin Y, Kawasaki A, Matsui S, et al. Clinical evaluation of five tumor marker assay in patients with lung cancer. *Anticancer Res* 1991; 11:91-95. [PMID: 2018388]
6. Kodama T, Satoh H, Ishikawa H, Ohtsuka M. Serum levels of CA 19-9 in patients with nonmalignant respiratory diseases. *J Clin Lab Anal* 2007; 21:103-6. [PMID: 17385665]
7. Liu KL, Chen JS, Cheng TY. Pulmonary Sequestration: An Unusual Cause of Elevated CA 19-9. *Am J Gastroenterol* 2016; 111:598. [PMID: 27151113]
8. Kamisawa T, Tu Y, Egawa N, Ishiwata J, Tsuruta K, Okamoto A, Hayashi Y, et al. Ductal and acinar differentiation in pancreatic endocrine tumors. *Dig Dis Sci* 2002; 47:2254-2261. [PMID: 12395898]