

Case Report

A presenting with obstructive jaundice in pulmonary adenocarcinoma: a case report

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Received April 9, 2015; Accepted June 20, 2015; Epub July 15, 2015; Published July 30, 2015

Abstract: Introduction: Obstructive jaundice caused by metastases to the distal common bile duct or the ampulla of Vater is often observed in patients with various advanced cancers; however, metastasis of lung cancer to the ampulla of Vater with subsequent development of jaundice is rare. Case presentation: The patient was a 41-year-old Chinese female who presented with apparent jaundice and itching. An enlarged right supraclavicular lymph node was found during physical examination. Laboratory tests revealed significantly elevated bilirubin and aminotransferase. Imaging examinations, including ultrasonography, computed tomography (CT), and magnetic resonance cholangiopancreatography (MRCP) revealed a 3.1×2.5×2 cm mass in the distal common bile duct and the ampulla of Vater. The routine chest x-ray film revealed a 4-cm nodule in the upper lobe of the left lung and further CT scan confirmed the diagnosis of left lung cancer. A biopsy of supraclavicular lymph node was performed and the histopathology showed poorly differentiated adenocarcinoma with cytokeratin-7 (CK-7) and thyroid transcription factor-1 (TTF-1) being positive immunohistochemically. The patient underwent a pylorus preserving pancreaticoduodenectomy and the histology of the resected specimen revealed characteristic of pulmonary adenocarcinoma. Thus, the final diagnosis was periampullary metastasis from pulmonary adenocarcinoma. The patient's postoperative recovery was uneventful and the jaundice was disappeared one month later. A pulmonary lobectomy was followed by chemotherapy with combination of vinorelbine and cisplatin for six cycles. Conclusion: Similar situations are bound to occur again in the future and we believe that this report could demonstrate that there is a case for aggressive surgical management in patients with periampullary metastasis from pulmonary adenocarcinoma.

Keywords: Obstructive jaundice, pulmonary adenocarcinoma, periampullary metastasis

Introduction

Adenocarcinoma is the most common form of lung cancer [1]. Metastatic potential is a feature, with frequent widespread dissemination and multiple synchronous visceral involvements even at diagnosis [2]. However, the frequency of manifestations related to obstructive jaundice is low [3]. Obstructive jaundice with highly elevated serum concentrations of transaminase can be occasionally observed, but it is most commonly determined by diffuse liver parenchymal involvement. A few cases of extrahepatic jaundice due to abdominal lymph nodes involvement or pancreatic metastasis by lung cancer, mostly small cell type, have been reported [4-6]. However, obstructive jaundice by direct metastasis to the ampulla of Vater seems to be a rare manifestation of lung cancer.

We herein describe a patient with pulmonary adenocarcinoma who developed obstructive jaundice due to metastasis to the ampulla of Vater, an extremely rare manifestation of lung cancer. This patient's course illustrates the possibility of aggressive surgical management for periampullary metastasis from pulmonary adenocarcinoma.

Case presentation

A 41-year-old Chinese female with apparent jaundice and itching was admitted to our hospital. An enlarged right supraclavicular lymph node was found during physical examination. The patient had no history of liver disease or alcohol abuse. Laboratory tests showed significantly elevated levels of serum total bilirubin (346.5 μmol/L), aspartate aminotransferase (322 IU/L), alanine aminotransferase (284

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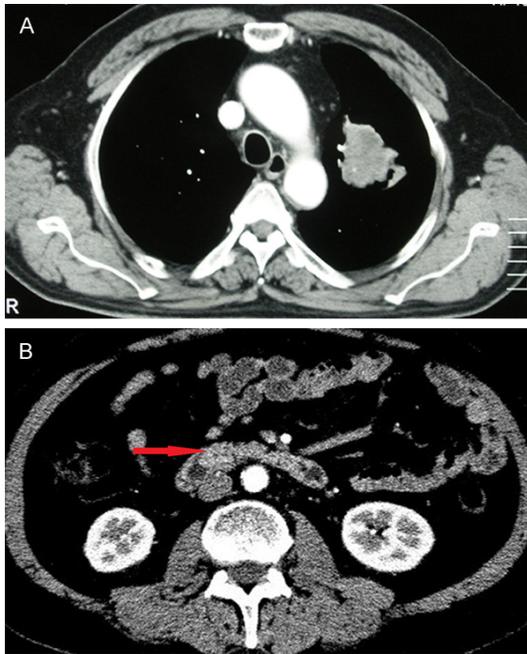


Figure 1. Chest and abdominal CT scan showing primary pulmonary adenocarcinoma and periampullary metastasis. A. Contrast-enhanced chest CT scan revealed a solitary round-like mass measuring 3.7×2.8 cm in the upper lobe of the left lung. B. Abdominal CT scan showed a lesion with 1 cm in diameter in Vater ampullary (red arrow).

IU/L), and γ -glutamic transpeptidase (869 IU/L). Serologic markers for hepatitis were negative. The carcino-embryonic antigen (CEA) and carbohydrate antigen 19-9 (CA19-9) levels were 540.1 ng/ml and 76.87 U/ml, respectively. Imaging examinations, including ultrasonography, computed tomography (CT), and magnetic resonance cholangiopancreatography (MRCP) revealed a 3.1×2.5×2 cm mass in the distal common bile duct and the ampulla of Vater, with significant dilatation of intrahepatic and extrahepatic bile ducts (**Figure 1B**). The routine chest X-ray film revealed a 4-cm nodule in the upper lobe of the left lung and further CT scan confirmed the diagnosis of left lung cancer (**Figure 1A**). A ^{18}F fluorodeoxyglucose-positron emission tomography (FDG-PET) scan was performed and both the lesions in ampulla of Vater and left lung were reported as positive, thus raising the possibility of: (1) a lung primary with periampullary metastasis; (2) synchronous periampullary and lung primaries; (3) a periampullary primary with lung metastasis. A biopsy of supraclavicular lymph node was then per-

formed and the histopathology showed poorly differentiated adenocarcinoma. Immunohistochemistry revealed strong positivity for cytokeratin-7 (CK-7) and thyroid transcription factor-1 (TTF-1), and negativity for CK20, Hepatocyte, CK5/6, G-15, MG, and Villin, appearances consistent with the pulmonary adenocarcinoma (**Figure 2**). To further clarify the diagnosis and reduce jaundice, the patient underwent a pylorus preserving pancreaticoduodenectomy. There was no evidence of intra-abdominal spread at laparotomy. Resection margins were clear and resected lymph nodes were tumor free. The histology of the resected specimen revealed characteristic of pulmonary adenocarcinoma staining strongly positive to CK-7 and TTF-1, which was similar with that of right supraclavicular lymph node. The patient's post-operative recovery was uneventful and the jaundice was disappeared one month later. A pulmonary lobectomy was followed by chemotherapy with the combination of gemcitabine and carboplatin for six cycles. Four weeks after her lung resection, the patient was started on adjuvant chemotherapy with gemcitabine and carboplatin. This regimen was continued for 6 months. The patient was seen twenty months from presentation. Clinically he remained symptom free and a follow-up CT of his chest and abdomen revealed no evidence of recurrence.

Discussion

Lung cancer metastasizes to many sites, but most frequently to bone, the liver and the adrenal glands [7]. Approximately one third of patients will present with symptoms relating to extra thoracic spread [2]. Adenocarcinoma is the most common type of lung cancer and it consists of approximately 40% of lung cancers [1]. It has been very rare to cause obstructive jaundice due to its metastatic lesions adjacent the extrahepatic biliary tract. The majority of those which do are small cell lung cancer [4]. The primary sites of secondary tumors in the porta hepatis including the biliary tract, the head of the pancreas, and the ampulla of Vater associated with obstructive jaundice are gastric, colon, and breast cancer in that order. Only 1% of those tumors originate from lung cancer [8]. Jaundice with highly elevated serum concentrations of transaminases can be occasionally observed, but these features are more often observed in the context of multiple clini-

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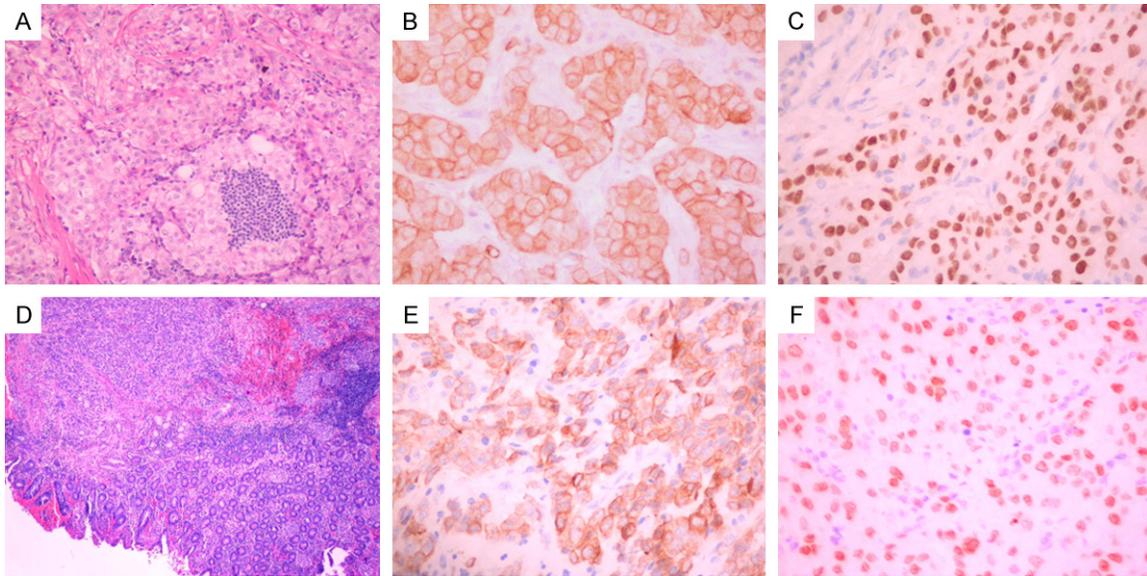


Figure 2. H&E and immunohistochemistry staining images of the pathological specimens. (A) H&E staining of the right supraclavicular lymph node showed poorly differentiated adenocarcinoma forming papillary glandular structures, which consist of neoplastic cells with large nuclei and prominent nucleoli ($\times 200$). The neoplastic cells showed strong cytoplasmic immunoreactivity for CK-7 (B) and strong nuclear immunoreactivity for TTF-1 (C) ($\times 400$). (D) H&E staining of the periampullary tumor tissue showed cohesive neoplastic cells forming irregular gland-like tubular structures, which was consistent with the pathology of the right supraclavicular lymph node ($\times 100$). The immunohistochemistry staining also revealed strong positive for CK-7 (E) and TTF-1 (F) ($\times 400$).

cal and biochemical alterations which are typical of widespread liver metastases. One case report published in March 2008 reported the first case of lung adenocarcinoma with a metachronous isolated deposit in the pancreas and no evidence of other disease [3]. This case was treated with biliary stenting and palliative chemotherapy. To our knowledge, this is the second report of metastasis of lung adenocarcinoma to the ampulla of Vater with subsequent development of obstructive jaundice as the initial presentation. We were unable to identify any previous case reports of lung adenocarcinoma with such a presentation which were ultimately treated with resection of both lesions.

TTF-1 is a 38 kDa homeodomain-containing nuclear protein that plays a role in transcriptional activation during embryogenesis in the thyroid, diencephalon, and respiratory epithelium [9]. TTF-1 has been demonstrated to be expressed specifically in the lung or thyroid neoplasm [10, 11]. TTF-1 expression varies according to the subtype of lung cancers. TTF-1 is expressed in 26% to 76% of adenocarcinomas, in 0% to 38% of squamous cell carcinomas, in 40% of large cell carcinomas, in 40% to 75% of large cell neuroendocrine carcinomas,

and in 81% to 100% of small cell carcinomas [11]. Thus, it could serve as a reliable marker of primary lung cancer. Roh and Hong reported that TTF-1 was expressed in 69% of metastatic lung cancers in the cervical lymph nodes and had a specificity of 95% and a sensitivity of 69% for metastatic lung cancer [12]. In our case, we found both supraclavicular lymph node and the lesion in the ampulla of Vater to be strong positive for TTF-1 immunohistochemically, which was consistent with the final immunohistochemical study of the lung specimen, indicating the homogeneity of the three lesions. Therefore, when it is necessary to differentiate between primary periampullary carcinoma and metastatic periampullary cancer from pulmonary adenocarcinoma, immunohistochemical study of the biopsy samples from this site with TTF-1 can be useful in differential diagnosis.

Conclusion

In summary, we have reported a rare case of obstructive jaundice caused by periampullary metastasis from pulmonary adenocarcinoma. Our case emphasized the role of aggressive surgical management in treating patients with lung cancer and distant metastasis. Also we

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should bear in mind that TTF-1 has a predictive value in lung cancer, especially in metastatic pulmonary adenocarcinoma.

Acknowledgements

We thank Dr. Jie Hua for his technical assistance of revising our manuscript. Written informed consent was obtained from the patient for publication of this Case Report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Disclosure of conflict of interest

None.

Abbreviations

CT, computed tomography; MRCP, magnetic resonance cholangiopancreatography; FDG-PET, fluorodeoxyglucose-positron emission tomography; TTF-1, thyroid transcription factor-1; CK-7, Cytokeratin 7.

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