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

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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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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 18F 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 peripancreatic metastasis; (2) synchronous peripancreatic and lung primaries; (3) a peripancreatic primary with lung metastasis. A biopsy of supraclavicular lymph node was then performed 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 gradular structures, which was consist of neoplastic cells with large nuclei and prominent nucleoli (×200). The neoplastic cells showed strong cytoplasim immunoreactivity for CK-7 (B) and strong nuclear immunoreactivity for TTF-1 (C) (×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 (×100). The immunohistochemistry staining also revealed strong positive for CK-7 (E) and TTF-1 (F) (×400).

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.

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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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References