Secondary Tumors of the Pancreas: A Case Series

BEIQING PAN, YOOMI LEE, TERESA RODRIGUEZ, JAMES LEE and MUHAMMAD WASIF SAIF

Columbia University College of Physicians and Surgeons, New York, NY, U.S.A.

Abstract. Metastatic carcinoma of the pancreas from another primary site is uncommon and accounts for 2-5% of all pancreatic cancer cases. We reported the case of one patient with pancreatic metastasis from colon carcinoma in the past and would like to add another six cases of pancreatic metastases from different types of cancer. The diagnosis of cancer metastatic to the pancreas should be suspected when patients have a history of malignancy, especially of kidney, skin, lung, colon and breast cancer. Besides imaging studies, such as computed tomography (CT) scan, bone scan and positron emission tomography (PET)/CT scan, endoscopic ultrasound (EUS)-guided biopsy has most value in ruling out second primary pancreatic cancer. The prognosis of pancreatic metastases is essentially determined by the underlying primary cancer and the potential treatment options.

Metastatic carcinoma of the pancreas from another primary site is uncommon and accounts for 2-5% of all pancreatic carcinomas (1). There are a variety of cancer types which have been shown to metastasize into the pancreas as mass lesions, such as renal cell carcinoma (RCC), lung cancer, colon rectal cancer, breast cancer, liver, ovary, urinary bladder, prostate, uterus, Merkel cell carcinoma, lymphoma and melanoma (1-5). Most single-center series published in the literature report a case or few case reports. Multiple literature reviews suggest that pancreatic metastases are usually seen in patients with disseminated disease (1, 6, 7) and the majority of pancreatic metastases are from lung in autopsy series (1). However, most common primary tumors are RCC in clinically encountered patients. Patients with RCC have better prognosis compared to those with other types of primary tumor (8). In patients with pancreatic metastases from RCC who have only limited disease, pancreatic resections are the treatment of choice allowing for better palliation and improving survival (7).

We reported the case of one patient with pancreatic metastasis from colon carcinoma in the past (9) and would like to add another six cases of pancreatic metastases from different types of cancer. All the information was obtained by retrospective analysis of the inpatient and outpatient charts, or through direct contact with patients. The interval since the primary tumor was defined as the interval between presentation with primary tumor and development of pancreatic metastases. The characteristics and clinical course are summarized in Table I.

Case Series

Case no. 1. A 73-year-old man with history of hypertension, coronary artery disease, stage 3 chronic kidney disease due to prior left nephrectomy for chronic pyelonephritis, was performed incidentally found to have 1.9 cm renal mass in the right lower pole by magnetic resonance imaging (MRI) which was to evaluate renal artery stenosis in August 2006. He underwent partial right nephrectomy in October 2006 and pathology showed RCC, clear cell type, grade 1-2, pT1aN0M0. He was followed-up with surveillance MRI and found to have a 2.1 cm renal mass, again, in October 2010. He underwent another right partial nephrectomy in November 2010 and pathology showed clear cell RCC, nuclear grade 3, pT1a. Unfortunately, he was found to have a 1.8×2.0 cm lesion in the body of the pancreas in September 2011. On retrospective review of scans, this was found to have been present since 2006 with a size of 4×7 mm, and it had been slowly growing since that time. The size of the lesion increased to 10×8 mm in April 2009. An EUS-guided core biopsy in January 2012 revealed clear cell RCC similar to the patient’s prior RCC. The patient underwent partial pancreatectomy in February 2012. The histology showed a circumscribed focus of metastatic clear cell carcinoma measuring approximately 2.0 cm in diameter and composed of a proliferation of uniform clear cells arranged in cystic spaces and cords, and focally in solid nests. The tumor had features of RCC, clear cell type, Fuhrman’s nuclear grade 1 to 2. The tumor involved the pancreas and extended into the peripancreatic adipose tissue and was surrounded by a thick fibrous pseudocapsule. The patient is recovering well after surgery.

Correspondence to: Wasif Saif, MD, MBBS, Professor of Clinical Medicine, Director, Cl. Sec. of GI Cancers, Medical Director, Pancreas Center, Columbia University College of Physicians and Surgeons, New York Presbyterian Hospital, New York, NY, U.S.A. Tel: +1 2123050592, Fax: +1 2123053035, e-mail: mws2138@columbia.edu

Key Words: Pancreas, pancreatic neoplasm, metastasis.

0250-7005/2012 $2.00+.40
Case no. 2. A 60-year-old man with a history of hypertension, benign prostate hyperplasia and horseshoe kidney was diagnosed with stage III atypical carcinoid/neuroendocrine tumor of the right kidney in 2005, for which he underwent partial right nephrectomy. He was disease-free and monitored by annual computed tomography (CT) scan/screening ultrasound (US) until May 2011, when he developed right upper quadrant pain associated with weight loss. Abdominal CT scan revealed multiple liver lesions and also multiple pancreatic lesions in the body and the tail of the pancreas, consistent with metastatic disease, in August 2011. The patient had liver lesion biopsy in September 2011 which was consistent with metastasis from the prior renal carcinoid with positive cytokeratin (AE1/AE3), synaptophysin, and the cluster of differentiation 56. The biopsy was negative for CK7, CK20, chromogranin, thyroid transcription factor-1 (TTF-1) and homeobox protein CDX-2. The patient has been receiving octreotide-LAR depot monthly and doing well with asymptomatic stable disease as last seen in January 2012 in the clinic.

Case no. 3. A 69-year-old man with a history of hypertension, hyperlipidemia and chronic kidney disease was diagnosed with right upper non-small cell lung cancer in July 2009, for which he had right upper lobectomy. The patient had extensive multiple malignancies in the past. He was diagnosed with ureteral tumor which was resected in December 2001. He was diagnosed with right RCC in May 2002 for which he underwent right nephrectomy. In April 2006, he was also diagnosed with bladder tumor which was resected via cystoscopy. The patient had left kidney papillary renal carcinoma in August 2010 for which he had cryoablation. In May 2011, he was found to have left lung cancer for which he had left upper lobe wedge resection. The patient had a positron emission tomography (PET) scan in July 2011 which revealed a 16mm fluorodeoxyglucose (FDG)-avid mass in the tail of the pancreas. The mass was biopsy-proven poorly-differentiated adenocarcinoma, consistent with lung origin (TTF1, CK8 were positive and CK7 was negative). Meanwhile, he had right temporal hemorrhagic tumor resection in August 2011 which was metastatic carcinoma consistent with lung origin. The patient was started on erlotinib and currently is doing well.

Case no. 4. A 57-year-old man with history of hypertension, hyperlipidemia and 50 pack-year smoking history was diagnosed with left lower lobe 2.5 cm moderately differentiated squamous cell carcinoma in November 2010. He underwent left lower lobectomy and was disease free until October 2011, when he developed abdominal pain. CT scan showed 7 mm liver lesion and a 2.0×1.8 cm pancreatic mass in the body of pancreas. Pancreatic biopsy showed poorly differentiated carcinoma with features of both glandular and squamous differentiation. The patient is currently receiving palliative chemotherapy with gemcitabine and docetaxel.

Case no. 5. A 71-year-old man was diagnosed with colon adenocarcinoma cancer in 2005 and had colectomy with unclear staging. He developed a liver metastasis in August 2010 for which he underwent partial hepatectomy. The course was complicated by postoperative hepatic abscess and methicillin-resistant staphylococcus aureus (MRSA) infection. He also had chronic thrombocytopenia at the range

Table I. Summary of patients with pancreatic metastases.

<table>
<thead>
<tr>
<th>Case</th>
<th>Age/Gender</th>
<th>Primary tumor type/treatment</th>
<th>Interval since primary treatment (months)</th>
<th>Localization of pancreatic metastasis/no. lesions, size (cm)</th>
<th>Symptoms</th>
<th>Other metastatic sites</th>
<th>Follow-up (months)</th>
<th>Treatment</th>
<th>Current status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>73/M</td>
<td>Renal cell carcinoma/stage I Right partial nephrectomy</td>
<td>61</td>
<td>Body/single, 1.8×2.0</td>
<td>Asymptomatic</td>
<td>None</td>
<td>4</td>
<td>Surgical resection</td>
<td>Alive</td>
</tr>
<tr>
<td>2</td>
<td>60/M</td>
<td>Right kidney carcinoid tumor, stage III/Right nephrectomy</td>
<td>76</td>
<td>Body and tail/multiple</td>
<td>Abdominal pain</td>
<td>Liver</td>
<td>6</td>
<td>Octreotide Lar depot</td>
<td>Alive</td>
</tr>
<tr>
<td>3</td>
<td>69/M</td>
<td>Lung adenocarcinoma/resection</td>
<td>24</td>
<td>Tail/single, 1.6</td>
<td>Asymptomatic</td>
<td>Brain</td>
<td>7</td>
<td>Erlotinib</td>
<td>Alive</td>
</tr>
<tr>
<td>4</td>
<td>67/M</td>
<td>Lung squamous cancer/resection</td>
<td>11</td>
<td>Body/single, 2.2×1.8</td>
<td>Abdominal pain</td>
<td>Liver</td>
<td>4</td>
<td>Chemotherapy</td>
<td>Alive</td>
</tr>
<tr>
<td>5</td>
<td>71/M</td>
<td>Colon cancer/resection</td>
<td>72</td>
<td>Body/single, 2.9×3.3</td>
<td>Abdominal pain</td>
<td>Lung, liver, bone</td>
<td>2</td>
<td>Supportive</td>
<td>Dead</td>
</tr>
<tr>
<td>6</td>
<td>59/F</td>
<td>Breast cancer stage IIA/mastectomy</td>
<td>182</td>
<td>Head/single, 2.6×3.2</td>
<td>Jaundice</td>
<td>Bone, liver</td>
<td>13</td>
<td>Chemotherapy/ hormonal therapy</td>
<td>Alive</td>
</tr>
</tbody>
</table>

#As at 03/08/2012.
from 60 to 80 thousand per milliliter likely secondary to splenomegaly. These clinical features all prevented chemotherapy. In March 2011, the patient was found to have liver and pancreatic lesions on PET/CT scan. By June 2011, he had developed pulmonary, pleural (large bilateral pleural effusion), hepatic, nodal and skeletal metastases with FDG-avid pancreatic lesion (2.9×3.3cm, standardized uptake value 9.5). Pancreatic mass biopsy, on June 28th, proved adenocarcinoma from gastrointestinal tract origin. He had splenic artery embolization in June 2011 with improved platelet count and pleurodesis in July 2011 for his pleural effusion. Unfortunately, the patient was unable to undergo systemic chemotherapy for his colon cancer because of comorbidities. He died in August 2011 because of sepsis and respiratory failure.

Case no. 6. A 59-year-old woman was diagnosed with stage IIA (T2N0M0) multifocal right breast cancer with both ductal and lobular features in 1995 which was estrogen receptor/progesterone receptor positive (ER/PR+). She underwent right modified radical mastectomy and adjuvant chemotherapy followed by tamoxifen for 5 years. In 2000, she had ductal carcinoma in situ and atypical ductal hyperplasia of the left breast and underwent left modified radical mastectomy with none out of eight lymph nodes being positive for disease. She developed multiple pathologic fractures in May 2008 which with PET scan revealed FDG-avid foci in the spine, ribs, sternum and sacrum. She was also found to have heterogeneous FDG uptake in the liver, which was biopsy-proven hepatic metastatic breast cancer (ER/PR+, human epidermal growth factor receptor 2 negative). The patient had palliative radiation in August 2008 for her bony metastases. She was treated with arimidex and zometa, but had progression of disease in bone in December 2009 which required radiation therapy to her hip. Arimidex was switched to aromasin. The patient presented with jaundice in November 2010 and the workup confirmed a mass in the head of the pancreas and common bile duct stricture. The biopsy was consistent with metastatic breast cancer. The patient had a stent placed in her common bile duct and then was started on gemcitabine which was only given for two doses before she had to be admitted for cholecystitis and had external drainage for six weeks through April 2011. The patient refused further intravenous chemotherapy at that point, therefore, capecitabine alone was started. However, she had progression of disease in her bones and required future radiation therapy to her hip. Capecitabine was switched to faslodex in June 2011, but the disease progressed again with more bony metastases. Subsequently the patient was started on tamoxifen at 20 milligrams daily as a palliative treatment. Currently she has stable disease.

Discussion

We, here, report six cases with pancreatic metastases from another primary site, including the kidney, lung, colon and breast. Similar to previous reports, kidney and lung primary tumors are more common than other primary sites (1, 5, 10). Except for case no. 1, all the cases with pancreatic metastases were seen in patients with disseminated disease either to liver, bone or brain, which is consistent with previous reports (1, 3, 4). Case no. 1 is the only one with limited metastasis in the pancreas, which resulted in successful resection. As reported by Volk et al., isolated metastatic disease to the pancreas is uncommon relative to sites such as the brain, lungs and liver (7). Although complete resection of metastatic pancreatic lesion was successfully performed with a low rate of complication, and the small size of metastatic lesion correlated to better survival after resection (7, 10), a small lesion may indicate that the patient has relatively slow growing tumor with less aggressive biology as seen in case no. 1. Although the patient was thought to have a metastatic pancreatic lesion five years after the primary was first identified, a retrospective review of the scan suggested the pancreatic metastasis had been present at the beginning of the disease. The tumor grew very slowly from 4×7 mm to 2 cm in five years. The histology showed a circumscribed focus of metastatic clear cell carcinoma, with a surrounding thick fibrous pseudocapsule. In addition, Fuhrman's nuclear grade was 1 to 2. All these features suggested case no. 1 has very slow growing tumor and the patient may have long-term survival, given the nature of cancer biology.

The diagnosis of cancer metastatic to the pancreas should be suspected when the patient has a history of malignancy, especially one of kidney, skin, lung, colon or breast cancer (10). Besides imaging study, such as CT, bone and PET/CT scan, EUS-guided biopsy has a most important value for ruling out a second primary pancreatic cancer. The prognosis of pancreatic metastases is essentially determined by the underlying primary cancer and the potential treatment options (10). Compared with pancreatic metastases from RCC, metastases from melanoma and lung cancer were associated with worse survival (5). Although patients with metastatic colon cancer have a relatively higher survival rate because of the availability of multiple chemotherapy agents, case no. 5 died two months after the finding of the pancreatic metastasis along with lung, liver and bone metastases. Unable to undergo chemotherapy, his co-morbidities might have contributed to his early death. The patients of the other five cases are still alive and long-term follow-up will be important in order to observe the course of the disease. The patient of case no. 3 has a substantial history of multiple malignancies; it would be interesting to investigate this case by cytogenetic and genomic sequencing.
In conclusion, metastatic carcinoma of the pancreas from another primary site is relatively rare and treatment options should be tailored to the specific case according to the underlying primary cancer.

References


