

Brief Report

Metastatic Tumors to the Pancreas, a Single Center Study

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Background: Most pancreatic masses are primary ductal adenocarcinomas; however, with the advent of new imaging studies and increasing survival of cancer patients, there are more cases with the diagnosis of secondary metastatic cancer to the pancreas. There is no study regarding cancer metastases to the pancreas from Iran. In this study, we retrieved all of the cases with the diagnosis of secondary cancer of pancreas in the affiliated hospitals of Shiraz University of Medical Sciences.

Methods: In 5 years (2012–2017), we evaluated all cases with the diagnosis of any pancreatic tumors and extracted all of the demographic and clinicopathologic findings of the cases with the diagnosis of metastatic pancreatic tumors from the clinical charts and pathology reports.

Results: For the duration of 5 years in our center, there were 131 cases of pancreatic tumors with different diagnoses, 9 of which were diagnosed as metastatic cancers from other organs. Two cases were diagnosed with gastric adenocarcinoma, 2 cases were colonic adenocarcinoma, one case was lung small cell carcinoma, 2 cases were renal cell carcinoma (RCC) and one case was gastrointestinal stromal tumor (GIST). The mesenchymal metastatic cancer to the pancreas has been a case of pleomorphic sarcoma of retroperitoneum.

Conclusion: Pancreas is not a common location for metastases; however, colon, stomach, kidney and lung seem to be the most common primary tumors with metastases to the pancreas. Our report is the first study about pancreatic metastatic tumors from Iran.

Keywords: Metastatic tumor, Pancreas

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Introduction

The most common malignant tumor of the pancreas is primary ductal adenocarcinoma of pancreas and secondary metastasis to pancreas is a rare event. The incidence of metastatic cancers to the pancreas is most commonly detected in autopsy studies. In living patients, less than 15% of pancreatic tumors are secondary metastases, but in autopsy studies, this figure rises to 15%–65%.¹⁻⁵ There are different reports about the common metastatic tumors to the pancreas and overall most commonly reported cancers have been renal, colorectal, lung, breast, skin and stomach.² Most of the metastatic tumors to the pancreas are asymptomatic and recent progress in imaging techniques is diagnosing more cases.^{3,4} There are limited studies regarding choice of surgical or medical treatment and appropriate management in metastatic pancreatic tumors.⁴ To the best of our knowledge, there are few published studies regarding secondary metastases to the pancreas. In this brief report, we present our experience with metastatic cancers to the pancreas for the duration of 5 years in our center as the largest referral center of pancreaticobiliary surgery in South of Iran (2012–2017).

Patients and Methods

For 5 years (2012–2017), all cases with the diagnosis of metastatic secondary pancreatic tumors were collected from affiliated hospitals of Shiraz University of medical Sciences. Clinical charts and pathology reports of patients with the diagnosis of secondary pancreatic tumors were evaluated regarding the primary origin of the cancer, demographic findings, presenting symptoms, imaging studies, size of the tumor, treatment methods and clinical outcome.

Results

During in 5 years (2012–2017), there were 126 patients with the tissue diagnosis of different types of benign and malignant pancreatic tumors in the affiliated hospitals of Shiraz University of Medical Sciences, 9 (6.8%) of which had been secondary metastatic tumors to the pancreas. There were 7 male patients and 2 females. The age range was 33–62 years (51.8 ± 8.8). Table 1 shows detailed clinicopathologic findings of these 9 metastatic tumors to the pancreas.

As the table shows, size of the tumor was 4–10 cm (6.4 ± 2.4). The most common symptom was abdominal and flank pain with and without radiation to the back. Pancreatic

Table 1. Clinicopathologic Characteristics of 9 Cases of Pancreatic Secondary Malignant Tumors

Primary Origin	Years After Primary Cancer Diagnosis	Age/Sex	Site of Tumor in Pancreas	Size (cm)	Main Presenting Symptom	Amylase/Lipase Level (U/L)*	Surgical Procedure	Follow-up
1 Gastric adenocarcinoma	1	62/M	Distal	4	Abdominal Pain	8/13	Biopsy	Died 2 years after surgery
2 Gastric adenocarcinoma	2	50/M	Distal	4	Abdominal pain	NA**	Biopsy	Died after surgery
3 Colon adenocarcinoma	5	50/M	Head	4	Abdominal pain	NA**	Biopsy	Died 2 years after surgery
4 Colon adenocarcinoma	7	47/M	Head	7.8	Loss of Appetite	86/38	Biopsy	Died 1 year after surgery
5 Renal cell carcinoma	16	60/M	Head	7	Abdominal pain	NA**	Whipple's operation	Alive 3 years later (free of symptom)
6 Renal cell carcinoma	6	33/F	Head	8	Flank pain	302/11	Whipple's operation	Alive 6 years later (free of symptom)
7 Gastrointestinal stromal tumor	7	50/M	Head	4.5	Constipation	89/48	Whipple's operation	Alive 5 years later (Free of symptom)
8 Pleomorphic sarcoma	1	58/F	Head	10	Abdominal pain	36/49	Whipple's operation	Died after surgery
9 Lung small cell carcinoma	6 months	57/M	Head	8.9	Abdominal pain	NA**	Biopsy	Died after 1 year

*Normal level of amylase: 23–85 U/L; *Normal level of lipase <160 U/L; **NA, Not available.

tumors were located in the head of pancreas, and jaundice with or without pruritis was also reported. Other less common symptoms were weight loss and loss of appetite. Most of the tumors were located in the head of pancreas.

One patient was identified with the primary tumor origin being from gastrointestinal stromal tumor (GIST) of stomach, and two patients with renal cell carcinoma (RCC) had solitary pancreatic metastasis, but there were six metastatic tumors two of which originated from adenocarcinoma of stomach, 2 originated from colonic adenocarcinoma, one originated from retroperitoneal sarcoma and the last one from lung cancer with disseminated disease.

Discussion

Primary pancreatic carcinomas are from ductal origin and are called ductal adenocarcinoma. This category constitutes the majority of pancreatic tumors, so that “pancreatic cancer” is the synonym of pancreatic ductal adenocarcinoma.⁵ Metastatic tumors of pancreas are much more uncommon and there have been controversial reports regarding the frequency of secondary pancreatic cancers. The highest frequency has been from autopsy studies and percentages rise to 65% of pancreatic cancers being reported as secondary metastatic cancers from different organs in autopsies. However, reported frequencies of studies from living patients have been much lower and frequencies between 2%–11% have been reported from different centers in the literature.¹⁻⁶ In our center, during 5 years, 6.8% (9 out of 131) of the pancreatic tumors in living patients were metastases from other origins to the pancreas.

Common origins for metastases to the pancreas have been reported as lung, colon, breast, kidney and skin (malignant melanoma).⁷ Primary pathologic diagnosis of metastatic

origin from gastrointestinal (GI) tract is commonly adenocarcinoma; however, there are also reports of metastatic GIST and neuroendocrine tumors.⁸ In our study, 4 out of 9 metastatic tumors to the pancreas were adenocarcinoma with GI tract origin and one was GIST with gastric origin. As table-1 shows, the common metastatic origins in our experience were the GI tract as well as lung, retroperitoneal sarcoma and kidney.⁹

The most common presenting symptom was reported as abdominal pain with or without jaundice and sometimes with pruritis, weight loss and anorexia (which has been the same in our cases).¹⁻⁹

Laboratory studies in metastatic tumors of the pancreas are also nonspecific and are not different from primary pancreatic cancer.^{1,2} Amylase and lipase levels can be normal or mildly elevated. They were not even been checked in most of our cases.

Radiologic findings (ultrasonography, CT scan and MRI) in metastatic tumors of pancreas were nonspecific and were either solitary isolated masses, multiple nodules or with diffuse involvement of the whole pancreas.¹⁰ Overall imaging findings in metastatic tumors of pancreas were not different from primary pancreatic ductal adenocarcinoma and the diagnosis of metastasis should be considered in patients with the previous history of cancer.¹¹ Some authors believe that pancreatic metastases are more commonly well-defined compared to the irregular margin of primary ductal adenocarcinoma, however, there is no statistically significant difference between these tumors regarding tumor size, echogenicity and location.^{12,13} In our cases, some had ultrasonography, CT scan or MRI, however no specific finding was detected and the only clue was patient's history.

In some cases, metastatic pancreatic tumors are part of disseminated disease which harbors poor prognosis, so there

is no indication for major surgery.⁸ However in isolated solitary metastasis, en bloc resection with or without pre- and post-operative chemoradiation (depending on the primary diagnosis) can be lifesaving.¹⁴⁻¹⁶

In our experience, patients with isolated metastases from RCC and GIST were alive and free of symptom at time of this study. Metastases from stomach, colon, retroperitoneal sarcoma and lung with pancreatic involvement as part of disseminated disease carried poor survival. In Conclusion, secondary metastatic tumors of the pancreas are rare but should be considered in the differential diagnosis for pancreatic masses in patients with previous history of cancer.

Authors' Contribution

BG: Idea of the paper, writing the paper, analysis of the data, searching for the data; AK: Collecting the data; SAM and SN: Surgery of the cases.

Conflict of Interest Disclosures

The authors have no conflicts of interest.

Ethical Statement

Not applicable.

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