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Total pancreatectomy for the treatment of multifocal pancreatic recurrence of renal cell carcinoma: A case report and literature review

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Abstract
Background: Clear Cell Renal Cell Carcinoma (ccRCC) can rarely metastasize to the pancreas, particularly in a multifocal pattern, posing diagnostic and therapeutic challenges.
Clinical case: This case report describes a 67-year-old female with a history of radical nephrectomy in 2014 due to renal cell carcinoma who, after ten years, presented with four pancreatic nodules suspected for metastatic recurrence. A total pancreatectomy was performed, achieving clear margins and negative lymph nodes and the suspicion was confirmed. The postoperative course was favorable.
Conclusion: The literature lacks a defined standard for managing such a situation, but selected patients may benefit from curative surgery. This case highlights the late metastatic potential of ccRCC and supports surgical treatment for specific scenarios.

Keywords: Carcinoma, renal cell, neoplasm metastasis, pancreatectomy, case reports

Introduction

Background

Renal cell carcinoma (RCC) is the most typical type of kidney cancer. When looking at the different types of RCC under a microscope, there are three main kinds: clear cell, papillary, and chromophobe. Among these, clear cell renal cell carcinoma (ccRCC) is the most common and important. Among patients with ccRCC, the occurrence of pancreatic metastasis is rare, particularly when metachronous, with an estimated prevalence of 5–10% according to recent studies[1]. Interestingly, these metastases tend to appear later in the course of disease progression compared to metastases to other organs, often manifesting as a late recurrence, sometimes more than a decade after initial treatment [1]. In fact, in approximately 20–25% of patients with pancreatic involvement, the presentation may occur as an isolated recurrence of ccRCC [2].

Non-primary pancreatic tumors are uncommon, and the pancreas is rarely the site of metastatic disease. However, among the few cases reported, ccRCC stands out as the most frequent primary tumor responsible for secondary pancreatic lesions. This behavior highlights the unique biological and metastatic pattern of ccRCC, which differs from other renal and non-renal malignancies.

The molecular pathogenesis of ccRCC includes well-described genetic abnormalities, such as mutations in the tumor suppressor gene Von Hippel-Lindau (VHL), which plays a central role in the pathophysiology of this malignancy. Additionally, chromosomal alterations-particularly deletions in the short arm of chromosome 9 (9p) have been implicated in metastatic spread. Recent studies suggest that mutations at locus 11 of chromosome 9p may be specifically associated with the propensity of ccRCC to metastasize to the pancreas [3].

Metastatic disease involving endocrine organs, such as the pancreas, is generally associated with a more indolent clinical course and improved overall survival compared to metastases to other sites. This is attributed to the less violent phenotype of the commonly encountered pancreatic metastases from ccRCC. In the Spanish multicenter PANMEKID study, surgical resection for isolated pancreatic metastases from renal cell carcinoma had good long-term prognosis for the treated patients. The median follow-up time was 43 months, ranging from 13 to 78 months. During this period, the overall survival rates remained high, with 96% of patients surviving at one year, 88% at three years, and 83% at five years [4].

In the present case report, we describe a rare instance of multifocal pancreatic metastases from ccRCC occurring 11 years after the initial radical nephrectomy. Given the isolated nature of the pancreatic lesions and their multifocal distribution, the multidisciplinary team opted for curative surgical management through total pancreatectomy. This case illustrates the late hematogenous metastatic potential of ccRCC and reinforces the importance of long-term surveillance, as well as the potential role of aggressive surgical intervention in selected patients with isolated pancreatic recurrence.

Objective

This article aims to report a rare clinical case of multifocal pancreatic recurrence of clear cell renal cell carcinoma in a patient with a history of radical nephrectomy performed ten years earlier. In addition to the clinical description and surgical management through total pancreatectomy, a review of the available literature on the subject is provided.

Clinical case

A 67-year-old woman, with a background of right radical nephrectomy in 2014 due to clear cell renal cell carcinoma staged pT2b Fuhrman IV, with negative surgical margins remained under regular clinical follow-up until 2024, when she presented with loss of appetite, nausea, and a 3 kg weight loss. She denied urinary symptoms or jaundice.

Imaging investigation revealed pancreatic lesions in the head, uncinate process, and body of the pancreas compatible to metastatic ccRCC lesions. Abdominal CT revealed four pancreatic nodules located in the head, uncinated process, body and tail of the pancreas, with the most prominent in the body, causing compression of the main pancreatic duct. CA 19-9 levels were normal. MRI confirmed the findings and ruled out other metastases.

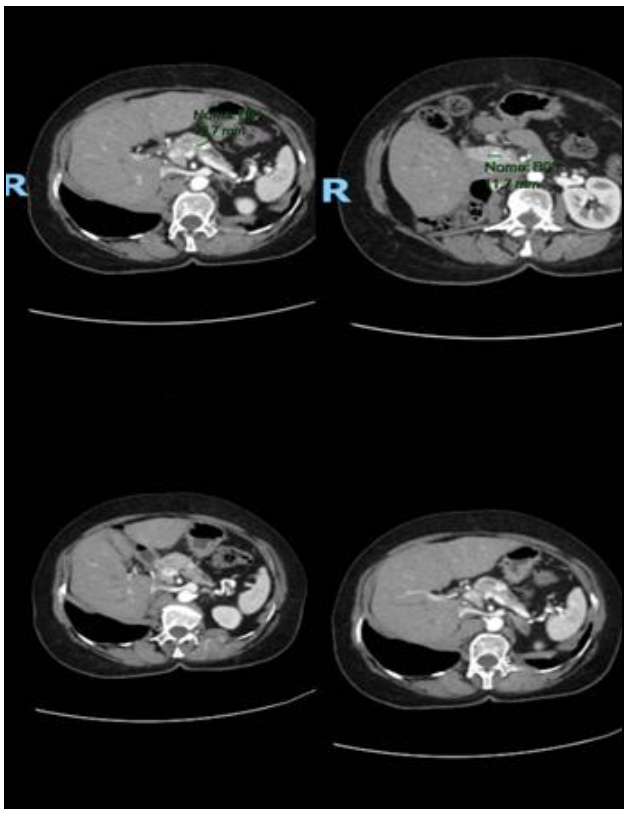

Fig 1: Computed tomography showing pancreatic nodules.

Surgical therapy was chosen after a multidisciplinary team discussion at Hospital Felício Rocho, which included digestive surgeons, gastroenterologists, oncologists, and radiologists.

The patient was submitted to gastroduodeno total pancreatectomy and splenectomy, pancreatojejunal, coledochojejunal and gastrojejunal anastomosis and choleciscetomy. The splenectomy was taken due to adhesions to the splenic vein visualized during the procedure. A silicone drain was placed near the choledochojejunal and pancreatojejunal anastomosis and was removed on postoperative day five as there were no signals of fistula. The immediate postoperative recovery occurred in the intensive care unit, with transfer to the ward on postoperative day two. Oral feeding was resumed on day one, starting with a full liquid diet, progressing to a soft diet. Intensive endocrinological care was taken, to successfully minimize the consequences of glycemic discontrol. She was discharged on postoperative day six.

The first outpatient follow-up was taken two weeks after surgery. The patient reported epigastric pain, heartburn, and dyspnea. She was referred to the emergency department for evaluation of possible thrombosis and infection, which were ruled out. A new follow-up appointment 30 days post-op showed good tolerance to a soft diet and no pain complaints. The patient remains under biannual outpatient surveillance.

Diagnosis

The main hypothesis was pancreatic metastases from ccRCC, highly suggested by CT and MRI The main differential diagnosis was neuroendocrine tumors. The definitive diagnosis was established through histopathological analysis of the surgical specimen.

Therapeutic Intervention

The patient underwent oncologic surgery: gastroduodenal total pancreatectomy, splenectomy, and single limb anastomosis.

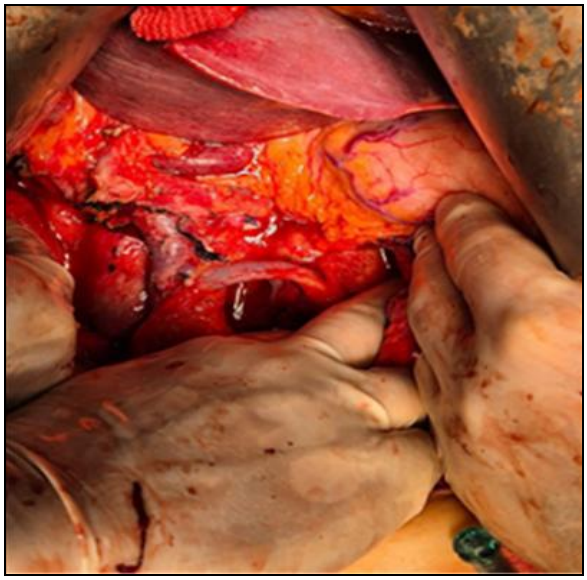

Fig 2: Intraoperative image after resection

Follow-up and Outcomes

Histopathology confirmed metastatic clear cell carcinoma in the head, body, and tail of the pancreas, with negative margins and negative for lymph nodes involvement. There

was no vascular or neural invasion, nor necrosis. Postoperative recovery was favorable, and the patient remains clinically stable under periodic outpatient follow-up.

Fig 3: Surgical specimen

Discussion

Currently, there isn't an established standard therapy for the care of recurrence or synchronous pancreatic metastases of clear cell renal cell carcinoma [5]. Most studies are limited only to case reports and retrospective analyses. As stated by the National Comprehensive Cancer Network (NCCN), systemic therapy, surgical intervention, radiotherapy, and ablative therapies are all acceptable options for the management of metastatic disease [6]. Thus, this case contributes to the limited body of evidence guiding the management of isolated multifocal pancreatic metastases from ccRCC. It highlights the importance of careful patient selection, multidisciplinary evaluation, and the need for long-term follow-up.

Surgical resection remains a potentially curative option for isolated pancreatic metastases, particularly in well-selected patients. Some multicenter cohort studies and reviews have demonstrated promising long-term survival following pancreatic surgical removal, especially when the metastases are limited only to the pancreas. For example, the previously stated Spanish PANMEKID study involving 116 patients reported excellent overall survival rates at 1, 3, and 5 years (96%, 88%, and 83%, respectively), supporting surgery as a viable treatment in appropriately selected cases[4]. Similarly, a Japanese multicenter study found a 5-year survival rate of 69%, further reinforcing the prognostic value of resection in these patients [7].

Total pancreatectomy, however, remains an uncommon surgical strategy due to its association with high perioperative complication rates, substantial morbidity, mortality, and the lifelong metabolic consequences of total pancreatic insufficiency(e.g., brittle diabetes, exocrine insufficiency) [8]. As such, it is typically reserved for specific clinical situations where an R0 resection cannot otherwise be achieved [8]. In the presented case, total pancreatectomy was justified by the multifocal nature of the lesions and the objective of obtaining clear surgical margins, aligning with one of the few validated indications for this approach.

This case also highlights the unique behavior of ccRCC, which is characterized by its potential for late, isolated hematogenous spread, sometimes many years after nephrectomy. When metastases are confined exclusively to the pancreas, surgical resection offers a favorable prognosis, even in cases of multi-site disease. Nonetheless, the risk of recurrence remains, making long-term, multidisciplinary follow-up essential to optimize patient outcomes and manage late complications or relapses [9, 10].

Conclusion

Pancreatic metastasis from ccRCC remains a rare and often late manifestation, particularly in multifocal forms. This case illustrates that, despite the challenges associated with total pancreatectomy, surgical intervention can be a viable curative approach in well-selected patients with isolated pancreatic recurrence. The favorable postoperative outcome and absence of residual disease reinforce the duty of aggressive surgical management in achieving oncological control when systemic involvement is excluded [8],[11]. Given the limited data in the recent medical literature, especially regarding multifocal presentations, this report contributes to the growing body of evidence supporting individualized, multidisciplinary treatment strategies and underscores the importance of long-term surveillance in persons under care of ccRCC.

Ethics responsibilities

Confidentiality of Data, Right to Privacy, and Informed Consent: All patient data were handled in strict accordance with ethical standards to ensure confidentiality and protect the right to privacy. Informed consent was obtained from the patient for the publication of this case report and any accompanying images, with assurances that no identifying information would be disclosed. This document is in the possession of the corresponding author.

Conflicts of interest

The authors declare not having any conflict of interest.

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