Frontiers in Medical Case Reports, ISSN: 2582-8142

Peritoneal Carcinomatosis Secondary to Papillary Renal Cell Carcinoma: Case Report

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Received: 25 March 2021; **Accepted:** 30 March 2021

ABSTRACT

Renal cell carcinoma accounts for approximately 5% and 3% of all neoplasms diagnosed in men and women respectively, making it the 7th most common neoplasm in the adult population. Nowadays, localized neoplasm can be surgically treated and has a good overall prognosis. When presenting metastatic disease, the most frequent locations of metastasis are the lungs, liver, and bone. Approximately one third of patients with renal stage IV renal cell carcinoma will develop peritoneal metastatic disease but this is a rare presentation as first metastatic localization. We are presenting a 68-year-old patients who underwent partial nephrectomy to treat a localized renal carcinoma who three years after surgery presented peritoneal carcinomatosis as first metastatic location.

Keywords: *Renal Cell Carcinoma, Peritoneal Carcinomatosis, Biopsy, CT-Scan, PET-CT*

Introduction

Renal cell carcinoma accounts for approximately 5% and 3% of all neoplasms diagnosed in males and females respectively, making it the 7th most common neoplasm in the adult (Escudier *et al*., 2019)

The classical presentation of this entity consists of the following triad (Cohen and Mcgovern, 2005): pain on the affected flank, hematuria, and the palpable mass. Currently, this is a rare presentation, being more commonly found as an incidental finding in an imaging test (Cohen and Mcgovern, 2005).

Renal cancer is classified is four main groups according to its anatomopathological characteristics (Cohen and Mcgovern, 2005): clear cell carcinoma (75%), papillary carcinoma (12%), chromophobe carcinoma (4%) and oncocytoma (4%).

We are presenting a case of a patient with renal papillary carcinoma, an entity with a prevalence for the male sex (5:1). Papillary carcinoma can be classified in two subgroups (Escudier *et al*., 2019): type I and type II being the latter the one with worse prognosis and the greatest incidence of recurrences (Escudier *et al*., 2019). Although the prevalence of metastasis is more common in clear cell carcinoma

than in papillary, the latter group has a worse prognosis when metastasis are present (Cohen and Mcgovern, 2005).

Peritoneal involvement of renal neoplasm is a rare complication that has not been systematically studied due to the low incidence of this complication. One cohort has reported incidences up to 20% during the evolution of the disease with an average time of 16 months between diagnosis of metastatic disease and the development of carcinomatous ascites (Sidana *et al*., 2017).

In our case the patient had peritoneal carcinomatosis as the first relapse of a kidney neoplasm intervened by laparoscopic partial nephrectomy. The special interest in this case lies in the infrequent presentation of this entity being peritoneal metastasis the first remote manifestation of a retroperitoneal neoplasm.

Clinical Presentation

We are presenting a 68-year-old male patient, active smoker. This patient had been diagnosed with a renal papillary type II adenocarcinoma at the inferior pole of 6 cm diameter (T1B, N0, M0) which was treated by laparoscopic partial nephrectomy three years before the present time. The patient had no other pathological history relevant to the case.

The patient showed no new signs of disease recurrence until a control CT study conducted three years after the intervention. In this abdominal CT study, performed with no iodate contrast due to the antecedent of an allergic reaction, we found reticulation of the peritoneal fat accompanied by multiple micronodules. This presentation is suggestive of peritoneal carcinomatosis and is classically defined as "omental cake" (Fig. 1) (Zamir *et al*., 2011). No other solid lesions or lymphadenopathies were found in the CT scan.

With these findings and taking into consideration the history of neoplastic disease a nuclear medicine test was performed in order to complete the study and assess possible neoplastic lesions not visualized in the abdominal CT study.

A PET/CT study was conducted which found no other lesions suspicious of malignancy. The only positive finding in this test was the radiopharmaceutical deposit in the peritoneal cavity especially in pre-hepatic, left sub-phrenic and left para-colonic spaces droplet regions (Fig. 2). With these findings a differential diagnosis was established between relapse of the previous renal neoplasm, a new metastatic malignancy and a rare presentation of an infectious disease such as peritoneal tuberculosis (Zamir *et al*., 2011).

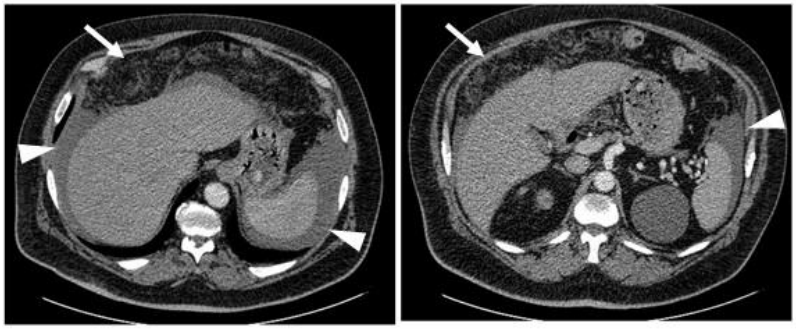

Figure 1: No-contrast enhanced CT-scan that shows peritoneal fat reticulation and micronodules, known as omental cake (arrow) and abdominal free liquid (arrowheads) suggesting peritoneal carcinomatosis

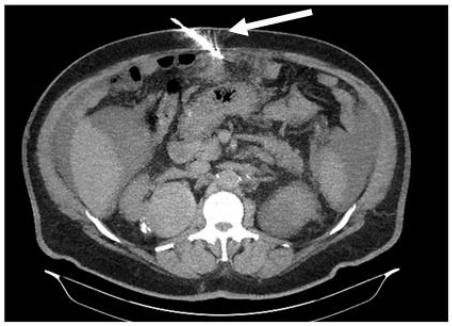

Figure 2: CT-scan guided biopsy of the peritoneal fat (arrow)

During the study, the patient developed a first event of ascites from which was obtaining a sample of ascitic fluid by paracentesis. The immunohistochemical profile of ascitic fluid sample cells matches that of the primary renal tumor operated three years earlier establishing a diagnostic suspicion of carcinomatosis ascites.

Being this a very unusual presentation, we decided to perform a biopsy of the peritoneal fat guided by CT (Fig. 3). The anatomopathological analysis of this biopsy was found compatible with papillary adenocarcinoma type II sharing immunohistochemical markers (EMA, VIM, CK7, PAX8) with those of the primary tumoral lesion (Table 1).

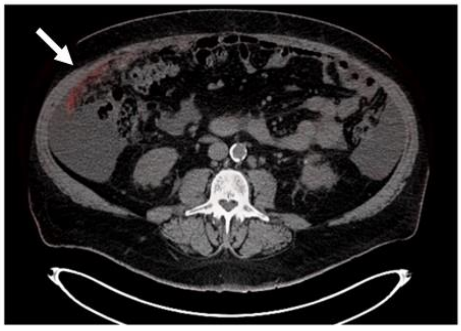

Figure 3: PET/CT scan with radiopharmaceutical deposit in the peritoneal cavity especially, pre-hepatic space (arrow)

Table 1: Similarities between the primary renal tumor and the ascitic fluid immunohistochemical profiles

	EMA	VIM	CK7	CD10	TFE3	P504s	CD57	WT1	PAX8
Primary	+	+	+	+	-	+	+	-	+
Biopsy	+	+	+		-				+

Diagnostic confirmation of peritoneal metastatic disease led to a re-staging of the neoplasia to a stage IV. With this diagnosis, the patient started palliative treatment by atezolizumab + bevacizumab (Rini *et al*., 2019) persisting multiple relapses in ascites that required palliative evacuating paracentesis. In the present moment, the patient presents a stable disease with a good overall performance status.

Discussion

This case is relevant for the atypical presentation of metastatic lesions in renal carcinoma, being peritoneal fat, the only region affected by the metastatic disease. We should keep in mind that the metastatic main metastatic locations of renal carcinoma tend to affect solid organs following the characteristic pattern of systemic venous drainage being the most frequently affected organs the lung, liver and bone (Zamir *et al*., 2011).

Peritoneal metastasis and tumoral ascites are considered factors of poor prognosis of neoplastic disease (Sidana *et al*., 2017). Ovarian, colorectal and pancreatic carcinomas are the neoplasms that more commonly metastasize to the peritoneum (Sidana *et al*., 2017). Only 2% of cases of peritoneal carcinomatosis are secondary to renal carcinomas (Zamir *et al*., 2011).

In the case of renal carcinoma, peritoneal spaces most often affected by peritoneal carcinomatosis and ascites are Douglas space, mesosigma, and both para-cholic spaces (García *et al*., 2006).

Stavropoulos *et al* proposed two possible mechanisms to explain peritoneal carcinomatosis spread in renal cancer, a retroperitoneal neoplasm. These authors suggested that the involvement of the renal capsule and Gerota's fascia predisposes to a local peritoneal involvement. When the patient develops ascites, these carcinomatous cells are distributed through the rest of the peritoneum. Another theory that explains the peritoneal metastatic spread of renal carcinoma is through hematic metastasis to omentum, mesentery and peritoneum causing peritoneal implants, when ascites appears this carcinomatous cells will be distributed through the peritoneum (Stavropoulos *et al*., 1995)

In our case the patient had a neoplastic lesion of 6 cm T1b that did not affect adjacent structures or compromised vascular structures, being this the reason to choose a partial nephrectomy as the first therapeutic approach. As it is a localized disease, the chances of contiguous and vascular invasion are less likely.

In postoperative patients, as in our case, it has been proposed that implantation occurs secondary to the disruption of the planes that define the peritoneal and retroperitoneal cavities during the surgery, being this the most probable way that tumoral cells spread into the peritoneal cavity.

Conclusion

Peritoneal carcinomatosis is a rare presentation of first metastatic location of renal cell carcinoma and a sign of bad prognosis. Story of surgical intervention as well as the presence of bulky tumor are risk factors for peritoneal disease spreading.

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