Multiple hypervascular pancreatic metastases from renal cell carcinoma
Dynamic MR and spiral CT in three cases

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Abstract
Pancreatic metastases are rare. Melanoma, lung cancer and breast carcinoma are the most common origin of pancreatic metastases, whereas renal cell carcinoma is counted in only 1–2%. Renal cell carcinoma usually leads to a solitary pancreatic metastasis, whereas multiple pancreatic metastases are uncommon. We present three cases of multiple hypervascular pancreatic metastases from renal cell carcinoma, studied with spiral CT and dynamic MR.

Keywords: Pancreatic metastasis; Renal cell carcinoma; CT; MR

1. Introduction
Pancreatic metastases are extremely rare, being found at autopsy in 3–12% of patients with advanced malignant tumours [1]. In clinical series, the pancreatic metastases varied between 2% and 5% of all pancreatic malignant tumours [2]. The most common origins of pancreatic metastases are melanoma, lung cancer and breast carcinoma, whereas renal cell carcinoma is a rare cause, counted only 1–2% between all pancreatic metastases.

Renal cell carcinoma usually leads to a solitary pancreatic metastasis, whereas multiple pancreatic metastases are uncommon [3,4].

We present three cases of multiple hypervascular pancreatic metastases from renal cell carcinoma, studied with spiral CT and dynamic MR. In one patient, the pancreatic metastases were detected at the moment of renal cell carcinoma diagnosis. The remaining two patients presented metachronous metastases respectively 10 and 2 years after nephrectomy.

2. Case report

2.1. Case 1

A 71-year-old man was admitted to our hospital for staging of left kidney expansive lesion previously diagnosed. The patient underwent a three-phase contrast-enhanced abdominal helical CT and dynamic MR that showed a large renal cell carcinoma of the left kidney and the presence of multiple small hypervascular lesions of the pancreas (Fig. 1).

Plain chest radiography and whole body scintigraphy were normal.

2.2. Case 2

A 69-year-old man with right nephrectomy in 2001 came to our observation for periodic follow-up.

Abdominal spiral CT and dynamic MR demonstrated the presence of multiple small pancreatic metastases. Extension of the CT study to the head and neck, and thoracic district also showed multiple metastases in the

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Fig. 1. Large renal cell carcinoma in a 71-year-old man. Multiple hypervascular metastases of the pancreas (white arrows) are demonstrated by contrast-enhanced CT during the arterial phase (A). The lesions are hypointense on a fat-saturated T1-weighted image (B) and hyperintense on a T2-weighted MR image. On a dynamic Gd-enhanced MR (C), metastases demonstrate enhancement similar to that described for CT.

Fig. 2. Epigastric pain in a 65-year-old man with left nephrectomy for renal cell carcinoma. Pancreatic metastases are easily identified by CT (A) during the arterial phase of enhancement. The lesions appear hyperintense on an arterial phase Gd-enhanced T1-weighted gradient-echo MR image (B).
right infratemporal fossa, bilateral neck lymph nodes and pulmonary parenchyma.

2.3. Case 3

A 65-year-old man was admitted to our hospital for epigastric pain (Fig. 2).

The patient had undergone a left nephrectomy 10 years ago for renal cell carcinoma and a thyroidectomy after 2 years for renal carcinoma metastasis.

Total body spiral CT and abdominal MR showed the presence of multiple small pancreatic nodules without other signs of metastatic involvement.

The patient underwent distal pancreatectomy and histological examination confirmed renal cell metastases. At 16 months after surgery, the follow-up of patient did not demonstrate other recurrence of neoplasm.

3. Discussion

Renal cell carcinoma accounts for 2–3% of all malignant tumours in adults [5]. The most common sites of tumour spread are the lung (50–60%), liver (30–40%), bone (30%) and brain (5%) [2]. Pancreatic metastases are a rare event; to our knowledge, in a review of literature, only 96 cases have been reported [4,6,7], most of which regarding solitary metastases in other regions of the body. Metastases do not have a predilection for a particular part of the pancreas. Pancreatic metastases have a favourable outcome compared with primary pancreatic cancer.

When there are no detectable metastases in other organs, the correct diagnosis is crucial. In fact, the surgical resection offers only some chance for long-term survival [5,8,9].

Renal cell carcinoma can recur at any time after nephrectomy. The interval from diagnosis of a primary tumour to detection of pancreatic metastases varies from few months to some years. Usually, the metastases from renal cell carcinoma can be very late [10]. McNichols et al. [11] reported that 11% of patients developed metastases 10 or more years after nephrectomy, even with early stage disease. The longest interval is reported by Muranaka [1], who observed pancreatic metastases 27 years after treatment of the primary renal tumour.

Three patterns of metastatic involvement of the pancreas have been described: single localized nodule, reported in 50–73% of cases; diffuse pancreatic enlargement, in 15–44% of patients; multiple pancreatic nodules, in 5–10% of patients.

The single nodule is well margined, round or ovoid and may simulate pancreatic adenocarcinoma. However, adenocarcinoma is usually hypovascular in the early arterial phase due to its desmoplastic reaction [12].

Diffuse pancreatic involvement is characterized by diffuse enlargement of pancreatic gland with smooth or lobulated contours and heterogeneous structure, similar to pancreatitis [3,4].

In this pattern, lymphomatous infiltrate should also be considered for differential diagnosis.

Islet cell tumour could be mimicked for multinodular metastatic pattern [2,4].

On unenhanced CT study, the pancreatic metastases appear isodense or hypodense compared to normal parenchyma. On contrast-enhanced CT, all metastases avidly enhance in the arterial phase. Usually, the nodules, smaller than 1.5 cm in diameter, have homogeneous enhancement while large masses are characterized by heterogeneous enhancement with central hypodense area. In these cases, splenic vein involvement may be observed. In portal and delayed phase images, the lesions demonstrated a rapid wash-out between 60 and 120 s [3,4,7,13,14].

On MR imaging, pancreatic lesions appear hypointense compared to normal pancreatic parenchyma on unenhanced T1-weighted images, both with and without fat saturation. On T2-weighted images, they have heterogeneous or moderately hyperintense signal. If the lesions are very large, in this case, they can appear hypointense also. After intravenous paramagnetic contrast administration, a rim of enhancement is visible in larger lesions, and homogeneous enhancement is usually demonstrated in smaller metastases, as seen on CT scans [3,15].

In all multiple pancreatic metastases from RCC in our three cases, hypervascular arterial pattern was seen both at helical CT and dynamic MR.

In patients with a history or an actual diagnosis of renal cell carcinoma, pancreatic metastases should be suspected and carefully sought both with spiral CT and dynamic MR. If necessary, percutaneous guided biopsies should be performed to confirm diagnosis, because surgical resection represent an effective chance for prolonging patient survival.

References


