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Pancreatic Metastases of Renal Cell Carcinoma: Report of Two Cases

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Abstract. Two cases of renal cell carcinoma, metastatic to the pancreas, are presented. The lesions were hypoechoic with ultrasound examination, and were mixed iso- and hypodense with computed tomography. Angiography was performed in one case, and showed a typical hypervascular pattern of the metastatic tumor.

Key words: Kidney, renal cell carcinoma – Pancreas, secondary neoplasms – Pancreas metastasis, ERCP, CT, US, angiographic studies

Renal cell carcinoma (RCC) is a not uncommonly diagnosed tumor. Metastatic spread can occur early or late in the course of the disease, but rarely gives rise to diagnostic problems. When metastases develop at uncommon sites, problems in recognition and interpretation of clinical and radiological signs may occur. In this report we present radiological and clinical findings in two patients with pancreatic metastases of RCC.

Case Reports

Case 1

A 59-year-old male underwent left-sided nephrectomy for RCC in 1977. At that time metastases were not demonstrated. In 1982, he developed weight loss and diarrhea. Clinical evaluation demonstrated steatorrhea caused by pancreatic enzyme insufficiency. Computed tomography (CT) revealed a mass in the pancreas that proved to be hypoechoic on ultrasound (US). Endoscopic retrograde cholangiopancreatography (ERCP) showed extrinsic narrowing of the common bile duct (CBD) and obstruction of the pancreatic duct (Fig. 1).

Fine needle aspiration biopsy (FNAB) was performed, but yielded a hemorrhagic specimen in which no malignant cells could be demonstrated.

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The patient was treated with oral pancreatic enzyme replacement medication, with beneficial effects. Two years later, weight loss recurred, and blood was demonstrated in the feces. At the same time, a solid thyroid nodule was removed, which proved to be metastatic RCC.

Barium examination and duodenoscopy revealed a prominent papilla, which bled easily. ERCP, CT, and US were repeated, and showed progression of the abnormalities (Fig. 2). It was decided to operate for palliative purposes. A choledochojejunostomy was constructed for bile duct decompression and excision of the papilla was performed to prevent bleeding. Histologic examination of multiple operative biopsies revealed RCC. The patient died 20 months later.

Case 2

A 39-year-old male underwent right-sided nephrectomy for RCC in 1979. At that time metastases were not demonstrated. In 1985 and 1986 several cutaneous and muscular nodules were removed, which proved to be metastatic RCC. The patient did not have clinical symptoms. CT was performed for further screening and a hypodense lesion in the tail of the pancreas was seen (Fig. 3A), which proved to be hypoechoic on US examination (Fig. 3B). No other lesions were demonstrated. On several occasions, FNAB was performed, but the specimens were very hemorrhagic with insufficient cells for a definite cytological diagnosis. The lesion gradually increased in size, but no other metastases became evident. Angiography was performed to evaluate the resectability of the lesion (Fig. 4). In April 1987 the lesion was resected and histologic examination revealed metastatic RCC. At the moment – more than one year after the operation – there is no evidence of disease.

Discussion

When RCC is diagnosed, metastases are present in about 25% of patients [1–4]. Most frequently involved sites are the lungs, lymph nodes, bones, and liver. However, metastatic RCC also occurs in a number of less obvious organs and body regions, like the thyroid, spleen, bowel, skin, and pancreas [3–5].

The risk for development of metastatic disease in RCC persists for many years: it is not rare for metastases to become manifest more than 10 years after the initial diagnosis [3]. Whereas the usual

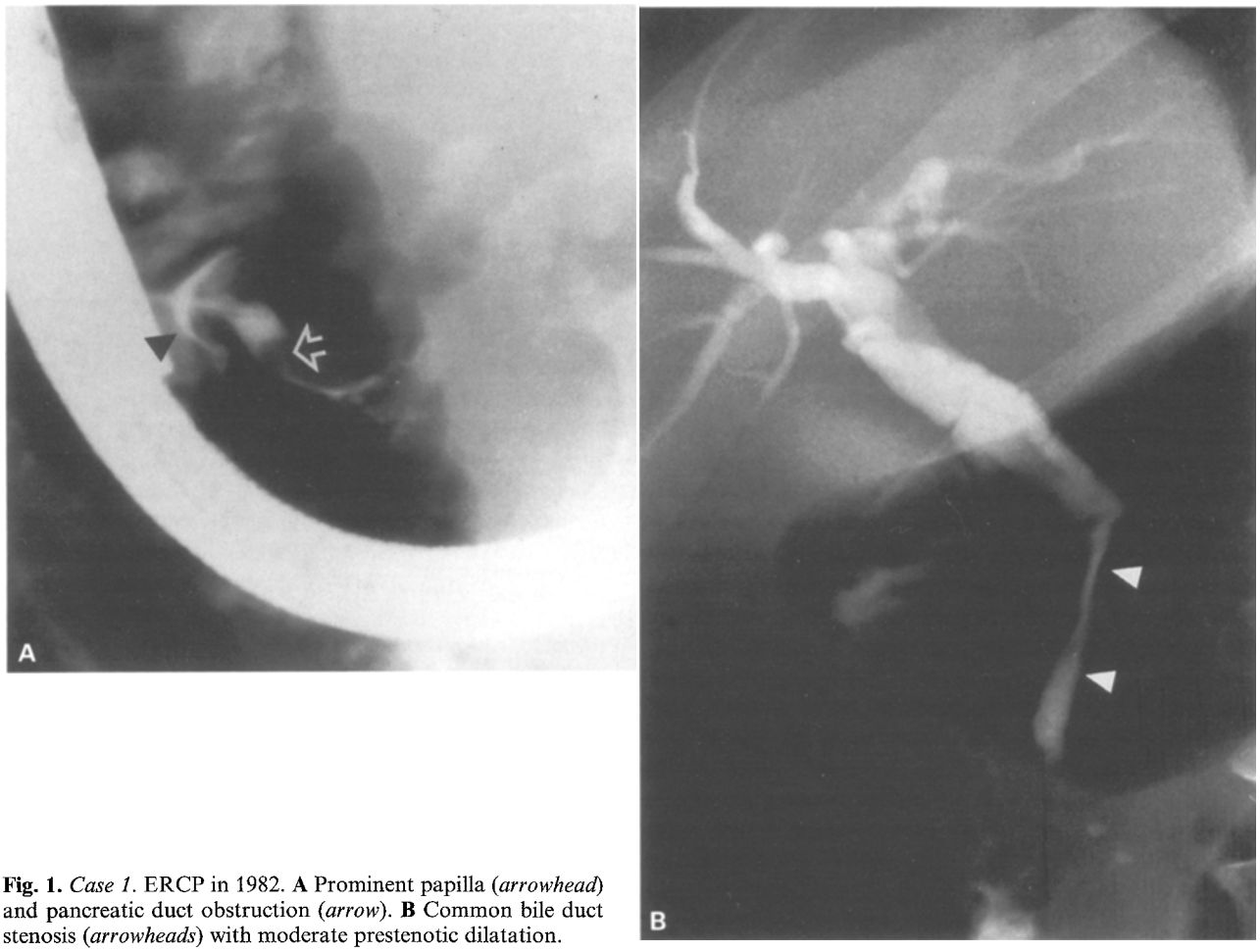

Fig. 1. *Case 1.* ERCP in 1982. **A** Prominent papilla (*arrowhead*) and pancreatic duct obstruction (*arrow*). **B** Common bile duct stenosis (*arrowheads*) with moderate prestenotic dilatation.

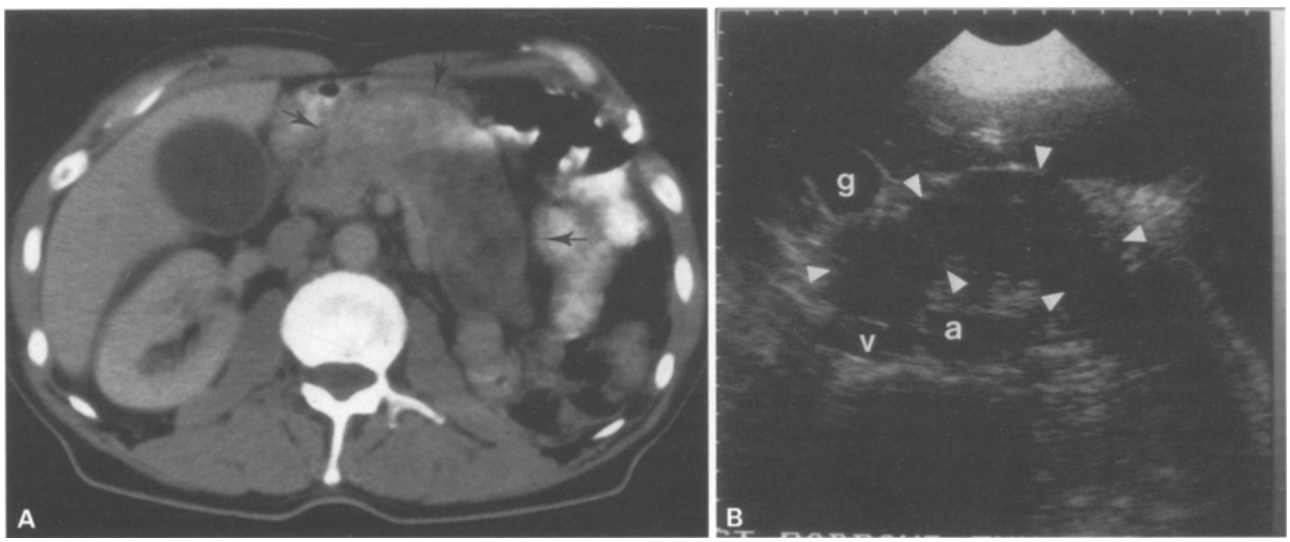

Fig. 2. *Case 1.*
A CT scan in 1985 (after contrast medium infusion). Diffuse enlargement of the pancreas (*arrows*) with irregularly spaced hypodense areas. Dilated gallbladder.
B US in 1985, transverse section. Diffusely enlarged, hypoechoic pancreas (*arrowheads*). *g*, Gallbladder; *a*, aorta; *v*, inferior vena cava.

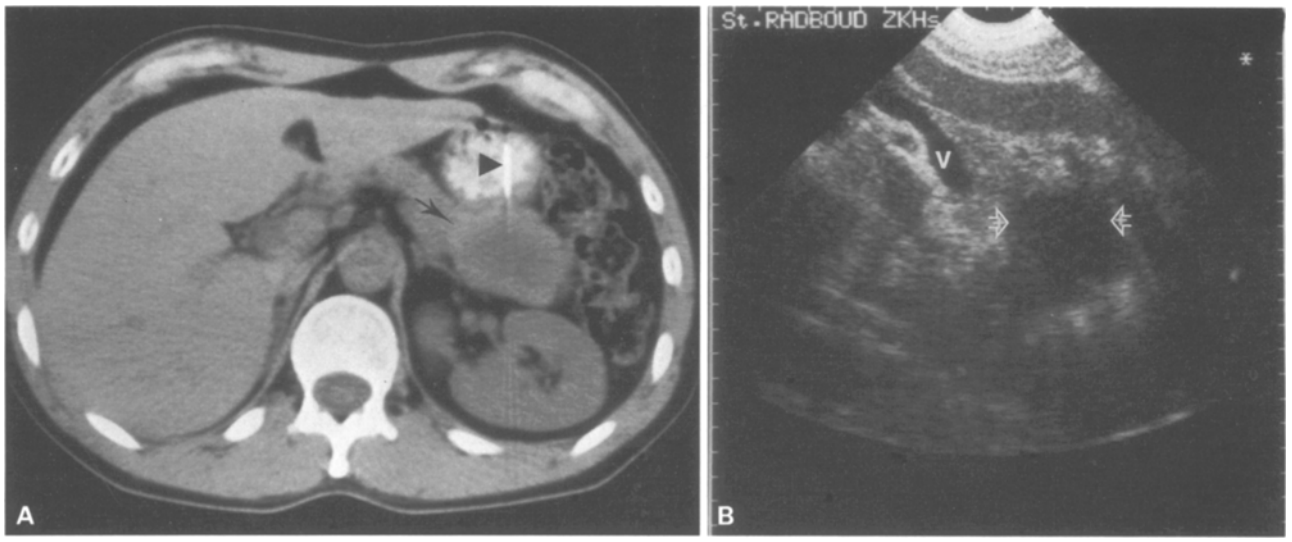

Fig. 3. *Case 2.*
A CT scan. Hypodense mass in the tail of the pancreas (*arrows*). Biopsy needle partly visible (*arrowhead*). **B** US, transverse section. Hypoechoic mass in the tail of the pancreas (*arrows*). *v*, Splenic vein.

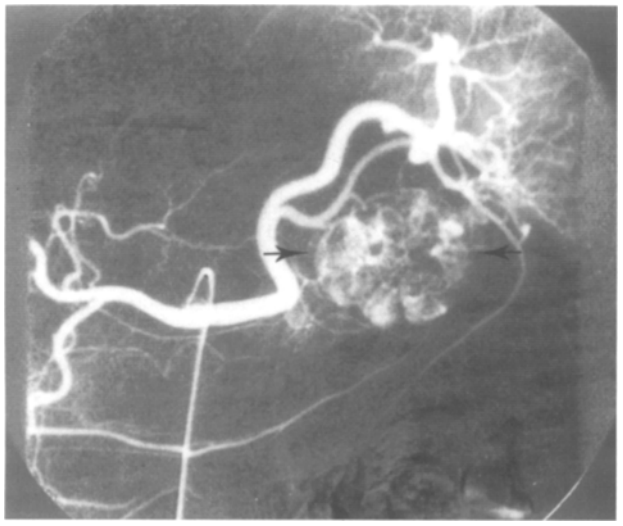

Fig. 4. *Case 2.* Intraarterial digital subtraction angiogram, celiac trunk injection. Hypervascular mass in the tail of the pancreas (*arrows*).

appearances of metastatic RCC are well-known, less commonly involved sites may pose problems in recognition both radiologically and clinically as well as histologically [6]. The pancreas is such a rare site of involvement. Willis [7] found at autopsy of 500 patients with a malignant disease that pancreatic metastases were present in 3% of cases. The majority of these patients also had metastases elsewhere in the body. The latter finding was also noted in two recently published series in the radiologic literature: out of the total number of 16 patients with pancreatic metastases of various tumors, 14 patients had evidence of metastatic disease elsewhere in the body [8, 9].

With regard to RCC, Lubarsch diagnosed pancreatic metastases in 1.3% of 320 autopsy cases, and Bennington in 1.9% of 523 cases (citation by Tongio et al. [10]). Pancreatic metastases are also diagnosed during life: Klugo et al. [5] found that 2.8% of 101 patients with metastatic RCC had localizations in the pancreas. Conversely, in two large series presenting malignant pancreatic tumors diagnosed during life, the disease proved to be of metastatic origin in 4.5 [6] and 3.7% [11] of cases. Of these, the source was RCC in 1 and 1.7%, respectively.

Clinical manifestations of pancreatic metastases vary: exocrine and/or endocrine function disturbances may occur [6, 12], as in our first case. The main complaint of this patient was weight loss and diarrhea due to pancreatic insufficiency. The same patient later developed gastrointestinal bleeding from the papilla, and this is one of the most frequent symptoms: Tongio et al. [10] found in a review of 12 cases of pancreatic metastases of RCC collected from the literature that in more than 60% of cases intestinal bleeding was the main symptom. Patients may also have pain, bile duct obstruction, pancreatitis, but in some it is asymptomatic [8, 10, 11], as it was in the second case.

Radiological manifestations of pancreatic metastases are those of a space-occupying lesion: in a series of seven patients with pancreatic metastases of various tumors who underwent ultrasonography [8], single or multiple hypoechoic masses

were seen. Both our patients showed similar findings (Figs. 2 and 3). The CT findings are focal or multiple contour deformities, sometimes with pancreatic duct dilatation [9]. Our patients had a mixed iso/hypodense lesion (Figs. 2 and 3). Dynamic CT scanning following intravenous bolus injections might have demonstrated the hypervascular character of the lesion, but this was regrettably not performed. Wernecke et al. [8] found that US was more sensitive than CT in demonstrating small metastatic foci.

Opocher et al. [11] performed angiography in 350 patients with a pancreatic tumor, and concluded that RCC metastases could be recognized by their hypervascular nature. This phenomenon was also found in our second case (Fig. 4). These and other authors are of the opinion that the demonstration of hypervascularity and tumor vessels is an important clue in the differentiation from primary pancreatic carcinoma [9–11].

ERCP findings in one of our patients showed the nonspecific findings of pancreatic duct obstruction and common bile duct stenosis (Fig. 1). Cytologic examination by percutaneous fine needle biopsy may contribute to the correct diagnosis, but the specimens in our patients were very hemorrhagic due to the hypervascular nature of the lesion, and tissue samples were inadequate for a definitive diagnosis.

The left and right kidney, respectively, were the site of the primary tumor in our two patients. In a limited review of the literature, the primary tumor was approximately as frequently located in the right as in the left kidney [6, 8–10, 12, 13]. The mode of spread of RCC to the pancreas can be either hematogenous or lymphogenous. Lymphogenous spread may occur by retrograde lymph flow secondary to tumorous infiltration of the retroperitoneal lymph nodes [10]. In none of our cases were lymph node metastases demonstrated during operation or follow-up. Hematogenous dissemination may occur along the draining collateral veins of a hypervascular tumor, whether or not associated with main renal vein thrombosis. Also, arterial hematogenous tumor emboli may lodge in the pancreas in cases where the disease has reached the lungs [10]. None of our patients had lung metastases demonstrated, but both had soft tissue metastases elsewhere in the body. Which of the possible routes of dissemination is responsible for the spread of disease in the given patient is, however, difficult to determine.

The time interval between the diagnosis of the primary tumor and the pancreatic metastases was five and six years, respectively. In the literature the interval varied from synchronous presentation [9, 13] to 17 years [6, 9]. Especially in cases with a long-term interval, the initial diagnosis may therefore be neglected, and special clinical attention and histological comparison is necessary to make a correct diagnosis in a patient with a pancreatic tumor [6].

Conclusion

Pancreatic metastases of RCC are a rare occurrence, to be expected in 1–3% of patients who develop metastatic disease. Conversely, other reports indicate that 1–2% of malignant pancreatic tumors are due to metastatic RCC. Clinical and radiological findings mimic primary pancreatic tumors, with intestinal bleeding from the pancreas as a main symptom. Angiography will contribute to the correct diagnosis in the appropriate context if a hypervascular lesion is found.

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