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CASE REPORT

Pancreatic Carcinoma Recurrence in the Remnant Pancreas after a Pancreaticoduodenectomy

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ABSTRACT

Context We report a rare case of a repeated pancreatic resection in the remnant distal pancreas 18 months after a Whipple R0 procedure.

Case report In September 2003, a 63-year-old man underwent a Whipple procedure with an extended lymphadenectomy, portal vein resection and direct reconstruction for pancreatic cancer. In September 2004, the tumor marker level increased and MR revealed a tumor in the remnant pancreas. There were no findings of invasion into the surrounding tissue or distant metastasis. After three months of systemic chemotherapy and a radiological reevaluation (PET and CT) in March 2005, we removed the remnant pancreas. Histopathologically, the tumor was classified as a ductal adenocarcinoma like the tumor which had been removed during the first operation, with infiltration of peripancreatic adipose tissue and a segmentary tract of the transverse mesocolon, without lymph node metastasis.

Conclusions There are very few reports of pancreatic carcinoma recurrence in the remnant pancreas after a pancreaticoduodenectomy in the literature. In most of these cases, it is difficult to assess whether the remnant pancreatic cancer is a recurrence or a second primary cancer. In our patient, the first hypothesis seems to be more realistic due to the brief recurrence-free survival period. Otherwise the high rate of multicentricity in pancreatic cancer may also explain the development of a secondary cancer in the remnant pancreas, even though the interval was relatively brief.

INTRODUCTION

Long-term survival is rarely achieved in patients with pancreatic cancer. Recurrence is frequently located in the pancreatic bed, even after an R0 resection. Only a few reports of pancreatic carcinoma recurrence in the remnant pancreas after a pancreaticoduodenectomy have been reported in the literature. Here we discuss the case of a patient presenting a carcinoma in the remnant pancreas, 12 months after a Whipple procedure for a ductal carcinoma with portal vein invasion.

CASE REPORT

A 63-year-old man presented with jaundice (10 mg/dL; reference range: 0.1-1.1 mg/dL) in September 2003. His serum carbohydrate antigen level (CA 19-9) was elevated to 84.2 U/mL (reference range: 0-35 U/mL). US and CT showed a mass lesion in the head of the pancreas, about 4 cm in diameter. The tumor was in contact with the mesenteric-portal

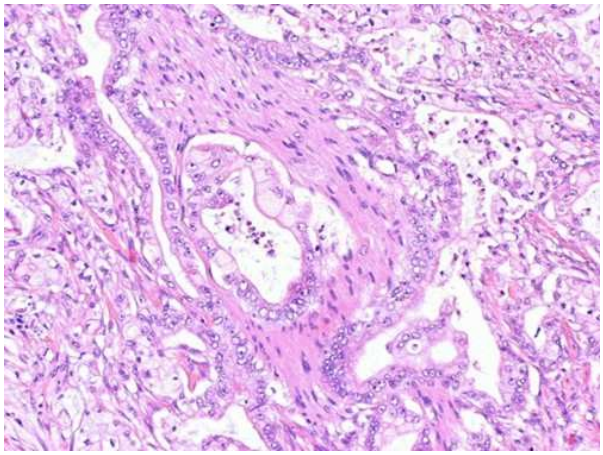

Figure 1. High-power view: the neoplastic glands are lined by cells with a clear cytoplasm, big round to oval nuclei variable in size and a sharp nuclear membrane, with a distinct nucleolus. In the left corner: solid clusters of undifferentiated cells were sharply merged with glandular structures.

confluence without any evidence of mesenteric artery invasion. He underwent a Whipple procedure with an extended lymphadenectomy, portal vein resection and direct reconstruction, without interposition graft. Histopathologic examination diagnosed the tumor as moderately differentiated adenocarcinoma, infiltrating the peri-pancreatic connective adipose tissue, without regional lymph node invasion (0/18), pStage: T3NoMx, R0 according to the International Union Against Cancer (UICC). No carcinoma invasion of the pancreatic stump was detected (Figures 1 and 2).

After the operation, systemic chemotherapy (6 cycles of 5-fluorouracil given intra-venously) and radiotherapy were carried out. The CA 19-9 level decreased to a normal value but, after September 2004, it gradually rose to 256 U/mL. Therefore, a recurrence of pancreatic cancer was suspected but an abdominal CT proved negative. A subsequent MR revealed a mass lesion, about 3 cm in diameter, at the site of the remnant pancreas without any sign of retropancreatic soft tissue or mesenteric vessel invasion. Systemic chemotherapy was begun again with gemcitabine and cisplatin for three months. Then, an imaging re-evaluation, including CT and MR, confirmed the pancreatic cancer recurrence with an invasion of the splenic vessels and the gastro-jejunal anastomosis. A PET reconfirmed the absence of any distant metastasis. Since the patient was in good clinical condition, we planned a relaparotomy to verify the possibility of a repeated pancreatectomy. The preoperative level of CA 19-9 had risen to 474 U/L.

In March 2005, a second operation was then performed: a resection of the remnant pancreas with a distal gastrectomy, segmentary resection of the transverse mesocolon, splenectomy and extended lymph node dissection. The pancreatic bed and the perivascular tissue were apparently free of recurrence as was confirmed by the pathologist.

Histopathologically, the tumor was classified as a ductal adenocarcinoma, as was the initial tumor removed during the first operation, with the infiltration of peripancreatic adipose tissue and gastro-jejunal anastomosis without lymph node metastasis (0/7) (Figure 3).

The patient's postoperative course was uneventful and the patient is still alive at 24 months after the second operation, without severe metabolic complications related to the pancreatectomy. A recent CT-scan revealed a recurrence around the superior mesenteric artery which has been confirmed by the rise of the level of the CA 19.9 to 64.3 U/L. Thus, systemic chemotherapy was re-initiated, but the patient's condition is worsening.

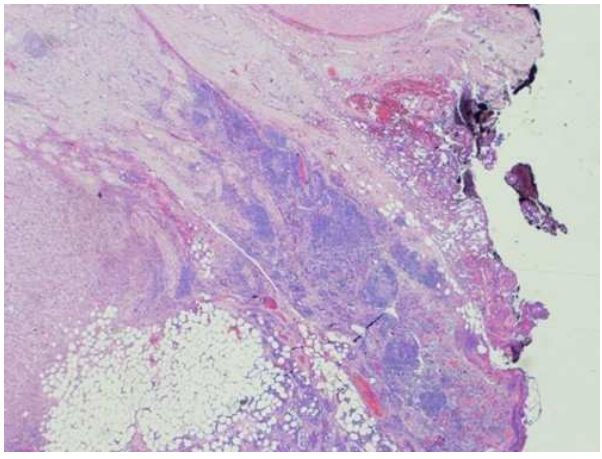

Figure 2. Tumor-free surgical margin.

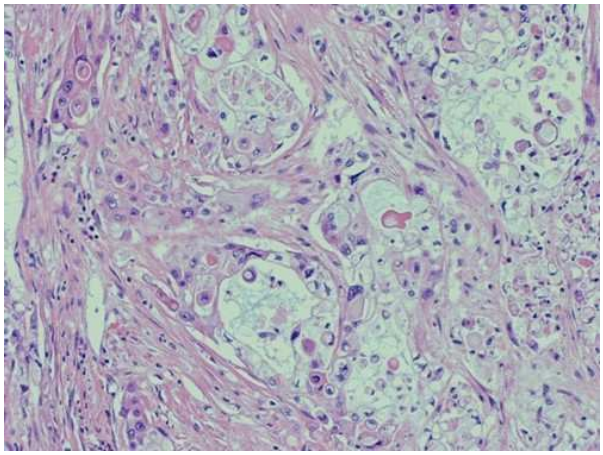

Figure 3. Medium-power view of the histopathologic specimen of the second operation. The tumor is composed of irregular glands, lined by cells with eosinophilic cytoplasm and a condensed hyperchromatic nucleus with large conspicuous nucleoli; many tumor cells contain large unusual nuclei.

DISCUSSION

Invasive ductal carcinoma of the pancreas is one of the cancers with the poorest prognosis, despite relevant progress made in understanding the modality of development and the genetical basis.

Adjuvant and neoadjuvant treatments do not have a significant impact on survival, and complete surgical resection remains the only chance for a cure. The 5-year survival rate range from 5% to 20% and more than half of the patients have a relapse with the same cancer within two years after resection [1, 2]. The most common sites of recurrence are the pancreas bed, the liver and the peritoneal surface. Local spreading of pancreatic cancer limits the possibility of a second resection in most cases. In the literature, we found very few reports of a resectable cancer developing in the remnant pancreas after a pancreatico-duodenectomy for cancer of the pancreatic head [3, 4, 5, 6]. In these very rare cases, the critical issue is essentially the mode of tumor development: local recurrence or a second primary cancer. This question is difficult to clarify. The idea of the multicentricity of pancreatic cancer is well-known. In 1979, Tryka and Brooks, observed the presence of multiple foci of carcinoma along the pancreas in 36 patients who had undergone a total pancreatectomy for ductal adenocarcinoma [7]. Launois *et al*. also noted an incidence of 32% of multifocal carcinoma in a series of 46 total pancreatectomies [8]. Recently, Andea *et al*. reported an incidence of 59% of higher grade pancreatic intraepithelial neoplasia lesions in pancreata resected for ductal adenocarcinoma [9]. The progression of atypical ductal hyperplasia, or carcinoma in situ to an invasive adenocarcinoma is well-described in the literature, but the time of invasive transformation of the so-called PanIn lesions is still unclear. The long term interval between the first and second operation in two of the 5 cases encountered (Table 1) seems to confirm the hypothesis of two different tumors but, also in the other 3 cases, it is not possible to eliminate the possibility of the development of a second tumor. The surgical margins during the first surgery were negative in all the cases described and this finding is also in contrast with the idea of the recurrence of the primary tumor. Furthermore, the technical feasibility of a second operation, with apparent radicality, may be another argument favoring this hypothesis. On the contrary, in our case as in the case of Wada *et*

Table 1. Cases of repeated pancreatectomy reported in the literature.

Patient #	Author	Age (years)	Sex	Time between operation and diagnosis[a]	Follow-up
1	Eriguchi *et al*., 2000 [5]	67	F	7 years and 4 months	8 months (alive)
2	Wada *et al*., 2001 [4]	52	F	12 months	Not reported
3	D'Amato *et al*., 2002 [2]	44	M	29 months	22 months (alive)
4	Takamatsu *et al*., 2005 [3]	63	M	3 years and 7 months	10 months (alive)
5	Present case	63	M	12 months	24 months (alive)

[a] Interval between operation for primary carcinoma and diagnosis of remnant pancreas carcinoma.

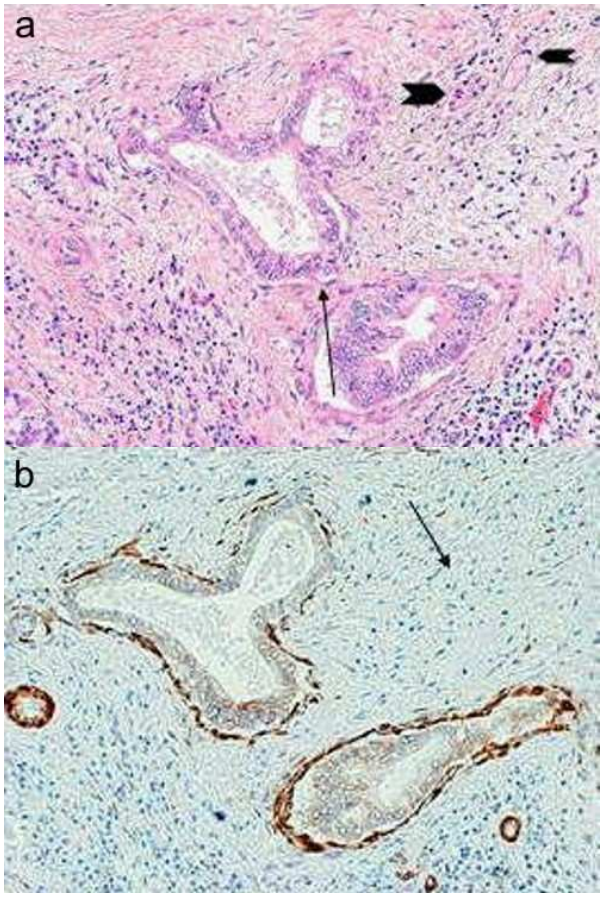

Figure 4. High power view of the histopathologic specimen of the second operation. **a.** The duct is lined by a dysplastic epithelium (arrow) near an invasive adenocarcinoma (arrow-heads). **b.** Immunohistochemical stains showing a continuous basal membrane in severe ductal dysplasia and discontinuous basal membrane in the invasive carcinoma (arrow): calponin.

al. [4], histopathologically, there were similar findings in the first and the second tumors, and the brief time interval between the two operations in these two cases is more amenable to the idea of a tumor recurrence, even if, reassessing the 2nd operation specimen, we found PanIn lesions near the ductal adenocarcinoma (Figure 4).
Finally, we have no clear data on the long-term follow-up of these few cases and this finding poses another question as to the real necessity for a second operation after a pancreaticoduodenectomy for ductal cancer.

CONCLUSIONS

Pancreatic carcinoma recurrence in the remnant pancreas after a pancreaticoduodenectomy is a rare event. Also in our case, it was difficult to assess whether this cancer in the remnant pancreas was a recurrence or a second primary cancer, even if the first hypothesis seems to be more realistic due to the brief recurrence-free survival period. Otherwise, the high rate of multicentricity in pancreatic cancer may explain the development of a second cancer in the remnant pancreas, even in a relatively brief time interval. The real necessity of a second operation of pancreatectomy in these cases is uncertain.

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