

# Pancreatoblastoma: A Case Report and Literature Review

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## Abstract

Pancreatoblastoma (PB) in children is extremely rare. Although pancreatoblastoma in children has been well reported in some literature, very few cases have been reported in China. In this paper, we report a case of pancreatoblastoma. This patient was a 4-year-old girl who complained of abdominal pain for a week. Imaging studies showed an about 5 cm in diameter mass located at the head of pancreas. Whipple's procedure was performed but this girl died 4 months later because the tumour was found again. Here, we describe the diagnosis, clinical and histological characteristics of the tumour, and the management.

**Key words** Children; Pancreatoblastoma; Treatment

## Introduction

Pancreatoblastoma (PB), or infantile pancreatic carcinoma, is an extremely rare pancreatic tumour in children, comprising 0.5% of pancreatic non-endocrine tumours.<sup>1</sup> The clinical presentations of these tumours are varied. They can present with abdominal pain, abdominal mass, diarrhoea, or upper gastrointestinal bleeding. Most of the time, they are asymptomatic. The presenting features are highly non-specific and this leads to diagnostic dilemmas. Ultrasound and computed tomography (CT) scan may be useful but preoperative diagnosis is often quite difficult. Surgery is the most optimal treatment for pancreatoblastoma. Prognosis of this rare tumour is good, when the tumour is resected completely. Prognosis is poorer, when there is metastasis or when the tumour is

inoperable. We describe a case occurring in China with an accompanying literature review.

## Case Report

The patient, a 4-year-old girl, was admitted to our department complaining of abdominal pain for a week. She complained of a painful swelling in the upper abdomen and had diarrhoea during the month prior to admission. There was no fever, or vomiting followed. CT scan of abdomen in local hospital showed a well-demarcated mass in the region of pancreatic head. On admission the vital signs were stable and the body weight was 12 kg. Physical examination revealed that no palpable mass was found in the abdomen, and the abdomen was soft and non-tender.

Blood analysis showed elevated SGOT 92 U/L, SGPT 88 U/L; direct bilirubin 11.5  $\mu\text{mol/l}$  (reference range <8.0  $\mu\text{mol/l}$ ), and total bilirubin 24.4  $\mu\text{mol/l}$  (reference range 1.0-24  $\mu\text{mol/l}$ ). The level of serum glucose (fasting) is 5.4 mmol/l (reference range 4.4-6.7 mmol/l). Tumour markers revealed elevated levels of alpha-1 fetoprotein (AFP) 394.6 ng/ml (normal 0-20 ng/ml), and blood serum levels of carcinoembryonic antigen (CEA), serum amylase was within normal limit. Flow cytometry showed ganglioside D2 (GD2) positive cells were 17 among 142,170 healthy cells.

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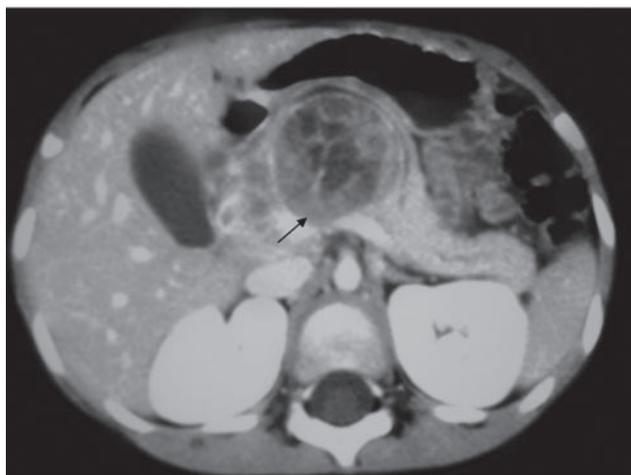
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Ultrasonography of the abdomen showed a mass originating in the retroperitoneal space, probably of pancreatic origin. CT scan (Figure 1) revealed a well-defined mass measuring 5 cm x 4 cm x 4 cm in the region of pancreatic head. MRI scan also exhibited a mass in the region of pancreatic head, and the dilated pancreatic ducts could be seen.

A preoperative diagnosis of carcinoma originating in the retroperitoneal space, probably of pancreatic origin, was made. The patient underwent laparotomy. At surgery, a large mass measuring 7 cm x 6 cm x 4 cm was identified in the head of pancreas. The liver and spleen appeared free of tumour. After feature of tumour was identified by frozen section, the mass was removed by gross total resection with the Whipple's course (pancreatoduodenectomy, excision of the head of the pancreas and part of the duodenum) including resection of the mass in the pancreas.

Postoperative chemotherapy was refused by her parents who worried that adverse reaction of postoperative chemotherapy would further hurt their daughter. One month later the patient underwent ultrasonography again, which revealed a mass measuring 4 cm x 3 cm x 2 cm in the region of pancreas, suggesting augmentation of residual tumour. We believed that the second operation was very difficult and suggested that she should accept chemotherapy but her parents refused again, so no further treatment was given. The patient died 4 months later.

Microscopically, the tumour of the pancreas showed the typical features of pancreatoblastoma. The tumour consisted of uniform epithelial cells typically arranged in solid sheets and nests, admixed with well-formed acinar structures and occasional dilated ductular formations, and interspersed



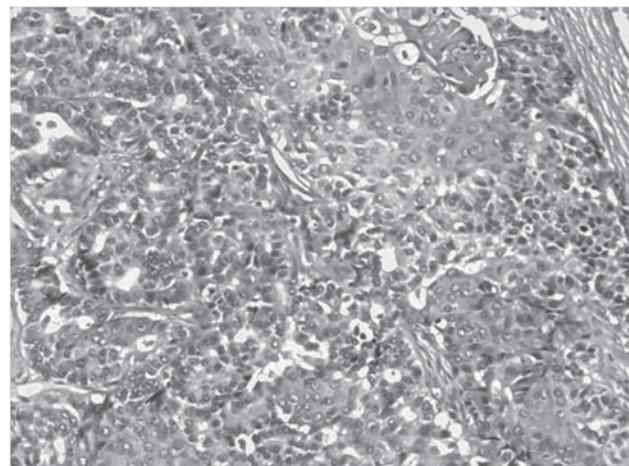
**Figure 1** CT scan showed an about 5 cm in diameter and well-defined mass located at the head of pancreas.

squamoid corpuscles that could occasionally show keratinization. The epithelial component was dominant and showed acinar architecture, solid sheets, and squamoid corpuscles, separated into lobules by fibrous stroma. Tumour cells often showed mitosis without evidence of abnormal mitotic figures. The tumour tissue invaded the connective tissue of the capsule and the surrounding pancreatic tissue. The incisal margin of common bile duct is positive (residual tumour). Both mitoses and confluent necrosis were partly seen in the nodules. Areas consisting of monomorphic cells, as seen in the primary tumour, were not observed anymore. No lymphovascular invasion was seen.

## Discussion

Pancreatoblastoma is a rare pancreatic tumour of acinar cell origin. Reportedly, most of pancreatoblastomas have been found in children less than 8 years old, but the entity also occurs very rarely in adulthood. Male are affected more than females.<sup>2</sup> Unlike the pancreatic tumour in adults, prognosis of this rare tumour is good, when resected completely. Prognosis is poorer, when there is metastasis or when it is inoperable.<sup>3</sup>

Pancreatoblastoma was first described by Becker<sup>4</sup> in 1957, which was termed "infantile pancreatic carcinoma". The tumour's histology resembled fetal pancreatic tissue at approximately 7 weeks' gestation as reported by Horie<sup>5</sup> in 1977, to account for the histologic features of this tumour and suggested the term pancreatoblastoma. Although it is rare, the pathologic features of pancreatoblastoma have



**Figure 2** A cellular tumour with uniform epithelial cells arranged in lamellar, nests, and acini (haematoxylin & eosin, 100x).

been well described. Microscopically, it composed of epithelial cells and variable amounts of stroma. The uniform epithelial cells are polygonal, which typically arranged in a glandular or acinar pattern. When the cells formed structures resembling acini and short tubules, usually these cells contain zymogen granules. "Squamoid corpuscles" are a constant and characteristic finding. The tumour cells present within these corpuscles often have optically clear nuclei, apparently due to the accumulation of biotin. The stroma may be scant to fibrotic, and may consist of plump fibroblasts. Pancreatoblastomas can be well-circumscribed or may invade the pancreas and surrounding structures. By immunohistochemistry, the tumours exhibited acinar, endocrine, and ductal differentiation, with positivity for pancreatic enzymes (100%), endocrine markers (82%), and carcinoembryonic antigen (85%).<sup>2</sup>

The diagnoses of pancreatoblastoma should combine the clinical findings, CT or MRI scan imaging features and pathologic findings. Usually the patient presented with abdominal pain and abdominal mass. In some cases the large masses are palpable. And jaundice could be seen occasionally in the patients with the mass in the region of pancreatic head. Elevated AFP levels occur in most of patients with this tumour.<sup>6</sup> Ultrasonography, CT or MRI scan often reveal a well-demarcated mass originating in the retroperitoneal space. Pancreatoblastoma has several similarities to hepatoblastoma, including association with the Beckwith-Wiedemann syndrome and elevated plasma levels of AFP. These raise the possibility that genetic events on chromosome 11p might play a role. Recently, molecular investigation has disclosed a mosaic paternal 11p uniparental disomy in the tumour cells of pancreatoblastoma.<sup>7-10</sup>

Laparotomy should be performed as early as possible when the preoperative diagnosis was made. In our case, the tumour located in the pancreatic head. And the tumour involvement of the superior mesenteric artery and portal vein was found intraoperatively. So we decided for tumour resection with the Whipple's course (pancreatoduodenectomy, excision of the head of the pancreas and part of the duodenum). Taking the postoperative life quality into account, the decision should be made after extremely careful consideration. Postoperative chemotherapy should be performed routinely. Cisplatin, doxorubicin, etoposide, cyclophosphamide and vincristine have been proven to be effective.<sup>11,12</sup> However, the most effective combination of chemotherapy for Pancreatoblastoma is not yet established. High-dose chemotherapy with peripheral blood stem cell transplantation (PBSCT) can prevent tumour recurrence and improve the prognosis of advanced pancreatoblastoma.<sup>13</sup>

In this case, We found residual tumour under the microscope at incisional margin of common bile duct. We had suggested that she should accept chemotherapy but her parents refused. If we performed the up-front chemotherapy, the extent of the operation might be reduced and we might be have a better opportunity to remove the tumour completely. These factors might affect the prognosis.

In conclusion, pancreatoblastoma is a rare pancreatic tumour in childhood, an early resection of the tumour with postoperative chemotherapy is the key to the good outcome. Prognosis is poor when there is metastasis or when the tumour is inoperable.

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