Pancreatoblastoma: a rare tumour accidentally found

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ABSTRACT

A 15-year-old girl, who was previously well, complained of a mass in the abdomen after a minor motor vehicle accident. Physical and radiological investigations revealed a mass in the body of pancreas containing proteinaceous material and multiple nodules in both lobes of liver. Serological investigations for malignancy were normal. Histopathological examination of the resected specimen showed pancreatoblastoma. Pancreatoblastoma is an unusual malignant tumour seen in infants and children although rare cases have also been reported in adults. They are clinicopathologically distinct from adult pancreatic ductal carcinoma. The histogenesis, clinical features and treatment options are discussed along with presentation of the case.

Keywords: alpha-foetoprotein, pancreas, pancreatic tumour, pancreatoblastoma

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INTRODUCTION

Pancreatoblastoma is a rare distinct neoplasm that is most commonly encountered in infants and young children, although rare cases have been reported in adults. They comprise less than 1% of pancreatic and periampullary tumours. Pancreatoblastoma was first described by Frantz in 1959. Subsequently, Frable et al in 1971 described the histological and ultrastructural findings and called it as "infantile carcinoma of pancreas". These tumours are considered to be embryonic in origin, based on the histological appearance. Evidence of endocrine component, acinar cells containing zymogen granules and the presence of alpha-foetoprotein, suggests that this neoplasm arises from multipotential stem cells. A potential molecular association between pancreatoblastoma and hepatoblastoma is suggested by the occurrence of both tumours in young patients with Beckwith-Wiedemann syndrome, raising the possibility that genetic events on chromosome 11p might play a role.

The clinical presentations of these tumours are varied. They can present as 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. The tumour is slightly more frequent in males, with the median age of presentation being five years. Though malignant, these tumours have an indolent course. They can be cured by complete resection alone and in cases of unresectable tumours, incomplete resection and in those with metastatic lesions, radiotherapy or chemotherapy may be given. The prognosis is worse in the presence of synchronous or metachronous metastasis and non-resectable disease at presentation[1].

CASE REPORT

A 15-year-old girl presented to the casualty department with a history of falling off from a motorcycle onto a cemented surface. She complained of a painful swelling in the upper abdomen and had vomited three to four times. The vomitus contained only ingested food particles. There was no loss of consciousness, bleeding from the ear or nose, or chest pain after the fall. Physical examination revealed a tender lump in the left hypochondriac region. The rest of the abdomen was soft and non-tender. Bowel sounds were sluggish.

Ultrasonography of the abdomen showed a well-defined heterogeneous mass in the epigastric region measuring 6.4x5.5x2 cm. This mass was situated medial to the spleen and was compressing the stomach. There was also a well-defined heterogeneous hyperechoic lesion in the seventh segment of liver. With these findings, a radiological diagnosis of intra-abdominal haematoma and adenoma or haemangioma of liver was made.

Computed tomography (CT) of abdomen showed that the epigastric lesion was a well-defined cystic mass in the region of pancreatic tail. The contents

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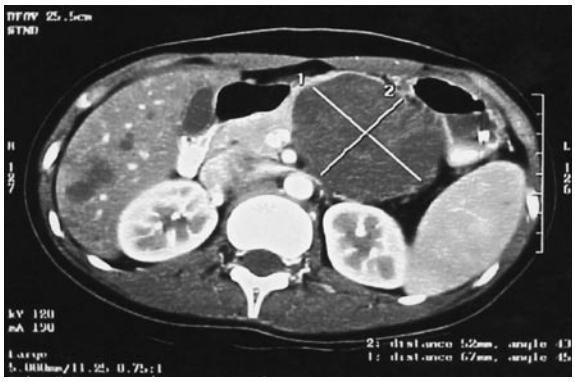

Fig. 1 Enhanced axial CT image shows a large well-defined cystic tumour in the tail of pancreas and multiple small nodules in the liver.

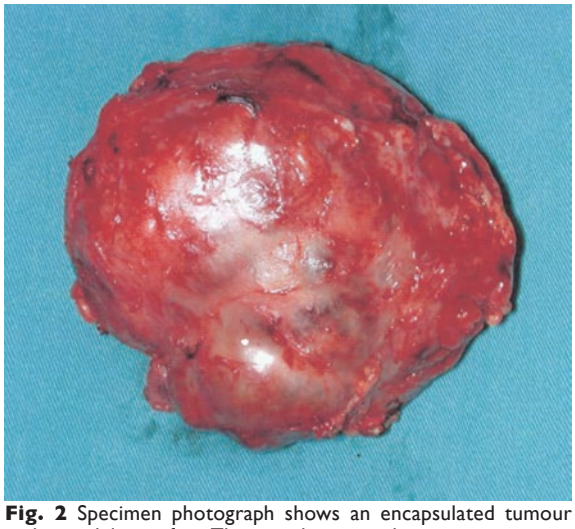

Fig. 2 Specimen photograph shows an encapsulated tumour with a nodular surface. The capsule is complete.

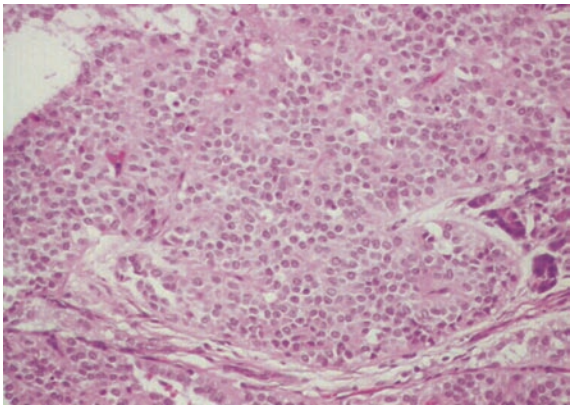

Fig. 3 Photomicrograph shows a cellular tumour with uniform epithelial cells arranged in nests and acini (Haematoxylin & eosin, x 250).

were proteinaceous (Fig. 1). The liver had multiple lesions of varying sizes in both lobes. These findings were interpreted as being a malignant pancreatic cyst with secondaries in the liver. Other organs appeared normal. Blood serum levels of beta-human chorionic gonadotropin hormone, carcinoembryonic antigen, serum amylase and alpha-foetoprotein were all within normal limits.

The patient underwent splenectomy and resection of the mass in the pancreas. Intraoperatively, there was a well-defined encapsulated firm mass arising from the body of pancreas adherent to mesocolon and wall of stomach. There was also a soft nodule in the right lobe of liver. This cystic mass was resected in total but the nodule in the liver was not resected. Grossly, the resected tumour was globular and encapsulated, measuring 110x70x70 mm and weighing 213 g (Fig. 2). The surface was bossellated and the tumour was soft in consistency. Serial cut sections revealed a greyish white solid tumour with central area of haemorrhage and necrosis.

Microscopical examination of this resected tumour showed pancreatic tissue and a tumour that was arranged in glandular and acinar pattern with interspersed focal solid areas. In the solid areas, whorled nests of spindle cells and islands of plump epithelioid cells were seen (Fig. 3). Dilated duct-like structures were also present. The stroma showed extensive desmoplastic reaction. Extensive tumour necrosis was also present. The tumour cells showed diffuse strong positivity for cytokeratin, alpha-foetoprotein and also positivity for synaptophysin and chromogranin in the glandular and acinar cells. Microscopic examination of the spleen did not show any abnormality.

After surgery, the patient was referred to an oncologist for further management. She was offered chemotherapy, but her family refused it for social reasons. Currently, she is under close follow-up and is currently doing well.

DISCUSSION

Pancreatic tumours are rare in children, and pancreatoblastoma comprises only half a percent of pancreatic non-endocrine tumours occurring in children. This tumour is more common in Asians than in the white population. They have also been diagnosed in-utero and in adults, with the oldest patient being 68 years old. The histogenesis of this tumour is still uncertain. It is said to be hamartomatous or dysembryogenic development of ductal cells of ventral portion of primordial pancreas. Pancreatoblastoma contains pluripotent cells capable of differentiating along the pathway of all three pancreatic cell types. Molecular investigation has disclosed a mosaic paternal 11p15 uniparental disomy in the tumour cells of pancreatoblastoma[2]. Recently genetic alterations also have been characterised and the commonest change is allelic loss of 11p[3].

The presenting complaints are varied but our patient had no prior complaints and was identified following investigations after a motor vehicle accident. Elevated serum alpha-foetoprotein levels have been reported in up 68% of cases[3]. The level comes down once the tumour is resected. In our case, the key learning issue is that serum alpha-foetoprotein levels were not elevated but immunohistochemical stain for alpha-foetoprotein was strongly positive in the tumour cells. This kind of behaviour has not been reported earlier. Other tumour markers do not show any significant correlation.

This tumour is commonly present in the body and tail of the pancreas[4] and the prognosis is poorer if the tumour is situated at this site as it is difficult to resect, and hence, there are more chances of recurrence. Tumours measuring up to 25x20x15 cm and weighing up to 2.5 kg have been reported. Majority of the tumours are encapsulated, while the rest are partially encapsulated. Encapsulated tumours have a better prognosis. Histopathological features that are readily seen include haemorrhage, capsule formation and necrosis. In our case, the tumour was situated in the body of pancreas, encapsulated and had extensive areas of haemorrhage and necrosis.

The tumour can exhibit acinar, endocrine and ductal differentiation[5], with ultrastructural examination of the epithelial cells showing electron dense zymogen granules or small dense neuroendocrine granules[6]. The tumour has an indolent course and is amenable for various modes of treatment but surgery is the most optimal treatment. Complete resection of the tumour offers the best prognosis. However, in the presence of metastatic disease, it is of limited value. In these situations where there is suspected or documented metastatic lesions, empirical chemotherapy regimens that include cisplatin and doxorubicin have been used. A higher rate of metachronous metastasis has been reported in patients undergoing chemotherapy. When the tumour is unresectable and the patient is non-responsive to chemotherapy, radiotherapy is given. Significant shrinkage of the tumour has been reported after treatment with radiotherapy.

Pancreatoblastoma, though not common, is said to be less aggressive in infants and children compared to adults. Prognosis of this rare tumour is good, when resected completely. Prognosis is poorer, when there is metastasis or when it is inoperable. On the whole, pancreatoblastoma is regarded to be a curable tumour, hence the clinical diagnosis should be made early. Awareness of the various modes of presentation of this tumour is essential for early detection and proper management.

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