

Low Alpha-Fetoprotein (AFP) Producing Hepatoblastoma - An unusual Case Report

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ABSTRACT

Introduction: Hepatoblastoma is the most common malignant liver tumour in children and comprises approximately 1% of pediatric cancers. Nearly 90% of cases occur between the ages of 6 months and 5 years. The lesion has a male preponderance. The tumour has been seen in association with a variety of congenital abnormalities, wilms tumour, glycogen storage disease and familial colonic polyposis.

Case report: An one year old female was admitted with symptoms of gradual loss of appetite and weight. A mass was noted in the upper abdomen since 2 months. Patient's serum AFP level was 7.3 IU/ml. The patient underwent wedge resection of left hepatic lobe tumour. Gross examination revealed a bosselated tissue measuring 8×6×4 cm. Microscopically, it shows presence of both fetal and embryonal epithelial cells as well as osteoid. Immunohistochemistry for Hep-par1, CK 19 were positive and AFP was only focally positive.

Conclusion: Low AFP producing hepatoblastoma is a rare pediatric tumor which is found in 5-10% of patients. Very low and very high AFP levels are associated with poorer prognosis than intermediate AFP level. The survival rate of hepatoblastoma is better than hepatocellular carcinoma and largely determined by clinical stage.

Keywords: Hepatoblastoma, AFP, Hep-par1, CK19

INTRODUCTION

Hepatoblastoma is the most common malignant liver tumor in children and comprises approximately 1% of pediatric cancers. Nearly 90% of cases occur between the ages of 6 months and 5 years. This tumor can occasionally arise in older children¹, and very rarely, in adults.² The lesion has a male preponderance of almost 2 : 1, but the sex incidence is similar in older cases. The tumor has been seen in association with a variety of congenital abnormalities, wilms tumor, glycogen storage disease and familial colonic polyposis.² In contrast with liver cell carcinoma, hepatoblastoma does not have a relationship with cirrhosis. Some patients present with virilization as a result of ectopic sex hormone production.³ Serum levels of AFP are often elevated. Hepatic angiography and CT scans provide the most valuable preoperative assessment of the tumor location and extent.⁴ Cytogenetically, the most consistent alterations are trisomies 2, 8, 20 and rearrangements of 1q.⁵ A high proportion of cases exhibit somatic mutation of the *CTNNB1* gene (β -catenin), which explains the abnormal nuclear translocation of the protein as detected by immunohistochemistry.⁶

CASE REPORT

We present a case of 1 year old female patient with symptoms of gradual loss of appetite and weight since 2 months. Physical examination revealed a mass in the left hypochondrium which was mobile and firm in consistency.

Contrast enhanced CT scan abdomen reveals a fairly well defined heterogeneously enhancing mass lesion arising from the left lobe of liver filling the left half of the abdominal cavity with internal necrosis and calcific foci; abutting the abdominal wall displacing the small bowel loops medially. Posteriorly the mass abuts the stomach and the pancreatic body and head region. Few vascular twigs arising from the surface of the mass are noted to drain into the left hepatic vein and branches of left portal vein-suggestive of malignant neoplastic etiology of hepatic origin. Patient's serum AFP (alpha-fetoprotein) level was 7.3 IU/ml and serum beta HCG 6.57 mIU/ml.

The patient underwent wedge resection of left hepatic lobe tumour and the specimen was sent for histopathological examination. Grossly received a wedge shaped tissue measuring 8×6×4 cm, firm in consistency. Outer surface was bosselated. On cut section, well demarcated multinodular mass with presence of some hemorrhagic and brownish and greenish areas noted. Received separately a lymph node, measuring 0.8×0.5×0.5 cm. Microscopically, presence of both epithelial and mesenchymal component seen. Epithelial component is of mixed fetal and embryonal pattern. Embryonal pattern consists of small tumor cells arranged in cords as well as occasional tubules having scanty cytoplasm. Cells in the fetal pattern are slightly larger than the cells in the embryonal pattern having moderate amount of eosinophilic cytoplasm. Areas of clear cell and necrosis seen. Mesenchymal component consists of osteoid.

Section from lymph node shows features of reactive lymph node.

Immunohistochemistry for Hep-par1, CK 19 were positive and AFP was only focally positive.

DISCUSSION

Fuchs J et al. (2002) studied pediatric liver tumour and found that very low (<100 IU/ml) and very high (>1,000,000 IU/mL) AFP levels are associated with poorer prognosis than intermediate AFP level.⁷

On the German Cooperative Group HB89 study, only one of four patients with AFP less than 100 ng/ml survived. Two of these patients, with normal AFP and anaplastic histology, had no response to treatment.⁸ On the CCG 823F trial, two of two

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Figure-1: Gross photograph of hepatoblastoma with areas of necrosis

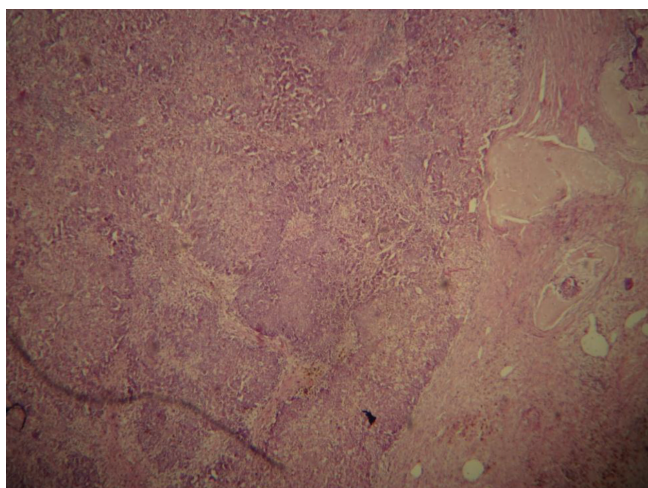


Figure-2: Photomicrograph of hepatoblastoma having epithelial component and osteoid

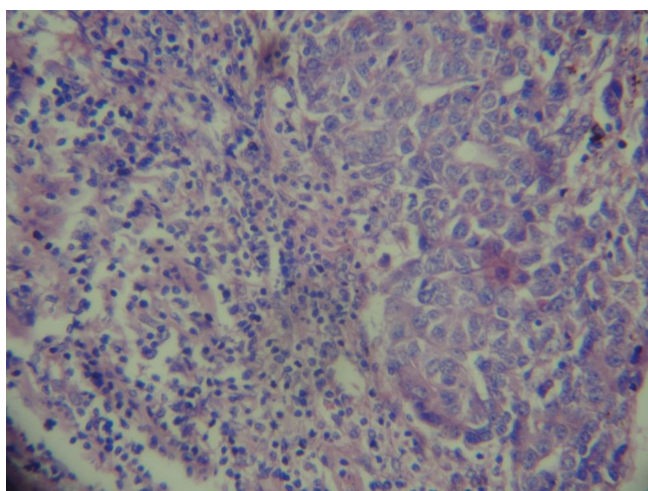


Figure-3: Photomicrograph of hepatoblastoma having both fetal and embryonal epithelial cells

patients with AFP less than 100 ng/ml died.⁹

Low serum AFP during diagnosis of hepatoblastoma is a poor predictor of survival. Although most patients present with elevated levels, serum AFP is low or normal in approximately 5–10% of cases. Children with hepatoblastoma and low AFP level at diagnosis have been identified as a high-risk group. This group of patients will generally present with more advanced disease at diagnosis and have a high degree of treatment failure.¹⁰

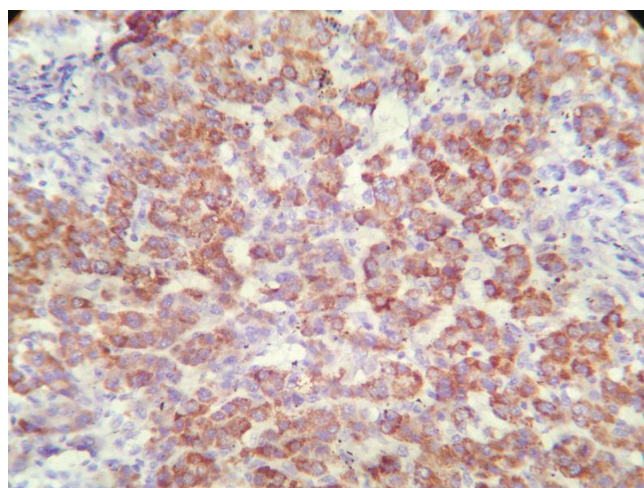


Figure-4: Photomicrograph of Hep-par1 positive in epithelial cells of hepatoblastoma

Differential diagnosis includes metastatic primitive tumor of infancy (nephroblastoma and neuroblastoma) and childhood hepatocellular carcinoma. Immunohistochemical stains may be of value in proper histologic context- WT-1 in nephroblastoma; endocrine markers in the absence of keratin in neuroblastoma. Childhood HCC generally resembles normal adult liver with platelike growth of tumor cells separated by CD34-positive vascular sinusoids.

CONCLUSION

Low AFP producing hepatoblastoma is a rare pediatric tumor which is found in 5-10% of patients. Very low (<100 IU/ml) and very high (>1,000,000 IU/mL) AFP levels are associated with poorer prognosis than intermediate AFP level. The survival rate of hepatoblastoma is better than hepatocellular carcinoma and largely determined by clinical stage.

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