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Cytological Diagnosis of Hepatoblastoma-A case report

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Abstract

Hepatoblastoma is the most common primary hepatic tumour occurring in children. Here, we present a case of Hepatoblastoma diagnosed on FNAC in a five month old female presented to paediatrics emergency department with chief complaint of abdominal distension since 1 month which was gradually progressive in nature and breathing difficulty since 1 day. Ultrasound guided fine needle aspiration was done from liver lesion. At places, nuclear indentation and binucleation were seen with scant to moderate amount of cytoplasm. Background showed fragments of eosinophilic chondromyxoid stroma and RBCs. It is concluded that FNAC can be helpful in preoperative diagnosis of most cases of HBs using the characteristic features. It is not only cost effective but also a simple, rapid and minimally invasive procedure compared to core needle biopsy.

Keywords: Hepatoblastoma, FNAC

Introduction

Hepatoblastoma (HB) is the most common malignant tumour of liver in newborns accounting for less than 1% of all paediatrics malignancies.[1] It is an embryonal neoplasm arising from multipotential blastemal cells, which are capable of differentiating into epithelial and mesenchymal cell-lines. Most of cases occur in children under the age of 2 years. Fine-needle aspiration cytology (FNAC) is a minimally invasive procedure with lesser complications which can be used for primary diagnosis and management. The accuracy of FNAC in diagnosis of HB has been reported to be greater than 90%.[2] As HB is a deep-seated lesion, an ultra-sound guided FNAC is a preferred procedure. Also, simultaneous preparation of cell block can help in difficult situations along with ancillary techniques like immunohistochemistry (IHC).

Here, we describe a case of hepatoblastoma diagnosed on FNAC in a five month old female.

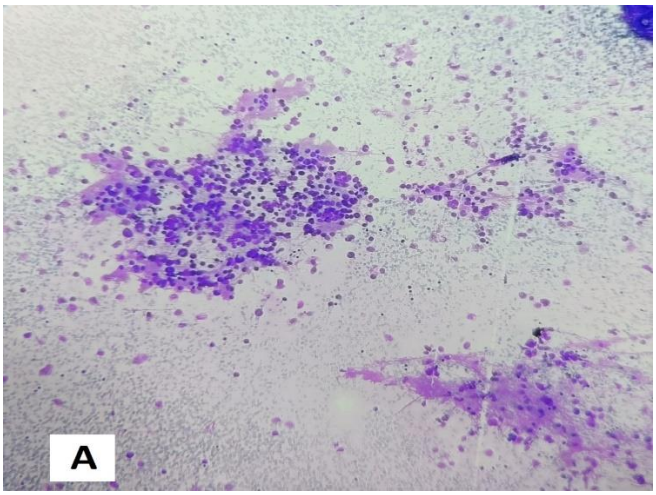
Materials & Methods

A 5 months old female patient presented to paediatrics emergency department with chief complaint of abdominal distension since 1 month which was gradually progressive in nature and breathing difficulty since 1 day. On general examination (GE) the child was malnourished and showed pallor. Palpation of upper abdomen revealed enlarged liver (6-8 cm) and distended superficial veins.

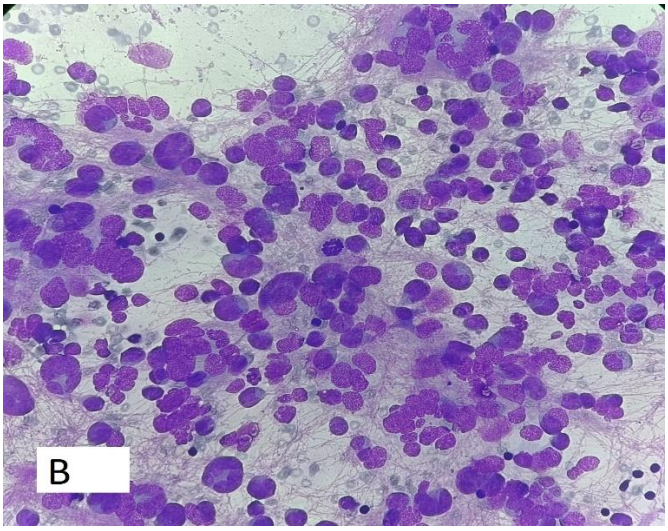
Routine investigations were done. Complete haemogram was within normal limit. Aspartate Transaminase was 108IU/L, and hepatitis B surface antigen was negative. Ultrasound revealed enlarged liver measuring 14.6 cm and showing multiple nodular lesions measuring 1-2 cm with altered echotexture. Ultrasound-guided FNAC was carried out with a 22- gauge needle. Blood mixed material was aspirated. Aspirated material was used to prepare smears. Smears were air dried and stained with May-Grunwald-Giemsa (MGG) stain.

Results

Ultrasound guided fine needle aspiration (FNA) was done from liver lesion. Smears examined were cellular comprising of round to oval cells arranged in sheets, singly scattered and at places forming acinar structures having high N:C ratio and fine nuclear chromatin. At places, nuclear indentation and binucleation were seen with scant to moderate amount of cytoplasm. Background showed fragments of eosinophilic chondromyxoid stroma and RBCs.



A – Leishman stained smear revealing atypical cells arranged in sheets in a fibrillary chondromyxoid background admixed with RBCs.(100X)



B- Smear revealing tumour cells with high N:C ratio and fine nuclear chromatin showing nuclear indentation and binucleation at places were seen with scant to moderate amount of cytoplasm(400X)

Cytological features were positive for malignancy favoring hepatoblastoma.

Discussion

HB is the most common primary hepatic tumour in children and nearly 90% of cases occur before 5 years of age with a male predominance (2:1). Hepatoblastoma has varied clinical presentation with the most common being abdominal mass and others including nausea,

vomiting, anorexia, weight loss, and abdominal pain. Jaundice is seen in only 5% of the cases and 5.5% patients have an associated congenital abnormality like Beckwith-Widemann syndrome.[3] The serum alpha-fetoprotein (AFP) level is elevated in up to 90% of cases, usually with very high titers.[3,4]

HB is subclassified histologically into six patterns - fetal (31%), embryonal (19%), macrotrabecular (3%), small cell undifferentiated (3%), mixed epithelial/mesenchymal - non teratoid (34%) and teratoid (10%).[4] Differential diagnosis of small cell undifferentiated type of HB includes small blue cell tumours of childhood, such as neuroblastoma, embryonal rhabdomyosarcoma, Wilms' tumour (WT), or Ewing's sarcoma, which may be metastatic to the liver. However cells of HB are larger and less cohesive than those of WT which are usually oval to spindle shaped and blastemal cells often form three dimensional clusters. Tubular formation, stromal fragments and mitotic figures are also more frequent in WT. HB may show presence of extra-medullary haematopoiesis in the form of erythropoietic cells and/or megakaryocytes which is more common in the fetal than in embryonal type. HB, especially small cell type can be differentiated from neuroblastoma by absence of neuropil, Holmer–Wright rosette and more dispersed population of cells. In case of difficulty we can differentiate HB from other malignant small round cell tumour (SRCT) of childhood with the help of immunostains like Hep par-1, alpha fetoprotein, vimentin, EMA and betacatenin applied on cell block.[5] To differentiate HB from well differentiated HCC we should keep in mind that HCCs usually occur in children older than 5 years of age and in already diseased livers with manifestation of hepatitis, cirrhosis, obstruction or storage disorders. Unlike HB, the cells of HCC are larger and more pleomorphic with marked anisonucleosis, macronucleoli, tumour giant cells and intra nuclear cytoplasmic inclusion, including bile. Subtyping of HB has been attempted based on FNAC findings.[6]

Conclusion

To conclude, FNAC can be helpful in preoperative diagnosis of most cases of HBs using the characteristic features. It is not only cost effective but also a simple, rapid and minimally invasive procedure compared to core needle biopsy.

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