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Fine Needle Aspiration Cytology of Mesenchymal Hamartoma of the Liver

A Case Report

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BACKGROUND: Mesenchymal hamartoma (MH) of the liver constitutes the third or fourth most common tumor of the liver in childhood and occurs most commonly in the first two years of life. MHs of the liver are seldom aspirated, and reports on the role of fine needle aspiration (FNA) in the diagnosis of MH are scarce. Clinically, cytologically and even histologically, MH can be mistaken for a number of reactive and neoplastic hepatic lesions that may occur in children under 2 years of age.

CASE: A 10-month-old Pakistani female presented with a history of a right-sided, nonpainful abdominal swelling. Abdominal computed tomography showed a large, partly solid and partly cystic, heterogeneous hepatic mass. FNA cytology showed clusters of both epithelial and mesenchymal/spindle-shaped cells with pieces of loose connective tissue. A cytologic differential diagnosis of mesenchymal hepatic hamartoma and hepatoblastoma of the possible mixed mesenchymal/epithelial subtype was rendered. The histopathologic diagnosis of the resected tumor mass was benign mesenchymal hamartoma of the liver.

FNA of MH is characterized by the presence of clusters of predominantly bland looking bile duct or cuboidal epithelial cells....

CONCLUSION: In children under 2 years of age who present with partly solid and partly cystic hepatic masses, the possibility of MH of the liver should be considered. FNA has a role in the diagnosis of MH. The cytopathologist should be aware of the patient's age, radiologic features and cytologic appearances of this rare, benign neoplasm. Histologic examination of tru-cut biopsies and immunohistochemical stains can help to exclude other pediatric neoplasms that may show cytologic features similar to or mimicking those of MH. (Acta Cytol 2000;44:449–453)

Keywords: hamartoma, mesenchymal; aspiration biopsy.

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Tumors and nodular "pseudotumors" of the liver account for <2% of tumors in children and vary considerably in incidence throughout the pediatric age range, with hepatoblastoma, infantile hemangioendothelioma and mesenchymal hamartoma (MH) seen most frequently in the first two years of life and hepatocellular carcinoma, focal nodular hyperplasia and undifferentiated "embryonal" sarcoma (also called malignant mesenchymoma) noted in older children.[1] The role of fine needle aspiration (FNA) cytology in the diagnosis of hepatic MH is not well defined and scarcely mentioned in the medical literature.[2]

Immunohistochemical stains for desmin, myoglobin and neurofilaments can help in certain cases.

Below, we describe the clinical, radiologic, FNA and histologic features of a rare case of MH of the liver in a 10-month-old female.

Case Report

A 10-month-old, Pakistani female presented to the pediatric surgical unit of our hospital with a history of a right-sided and nonpainful abdominal swelling. There were no associated symptoms apart from poor appetite, noticed by the mother. The previous clinical history was unremarkable, and the child was the product of a full-term pregnancy followed by spontaneous and normal vaginal delivery.

Clinical examination revealed the presence of a large, firm, well-defined, nontender abdominal mass occupying most of the right hypochondrium and extending to the right iliac fossa. Laboratory investigations revealed a normal hematology profile and slightly raised liver enzymes: gamma glutamyl transferase, 84 μ/L (reference range, 7–32). The serum α-fetoprotein was within normal limits.

Abdominal computed tomography (CT) showed a large, partly solid, partly cystic heterogeneous mass extending from the level of the inferior hepatic border to the right iliac fossa and measuring 13×13×10 cm. The mass showed poor contrast enhancement and did not contain calcified foci (Figure 1). The mass was compressing the lower part of the inferior vena cava and slightly displacing the pancreas and right ureter. Both kidneys, the adrenals and the spleen were normal. The clinical and radiologic impressions at that stage were that the mass was either retroperitoneal or hepatic in origin.

A CT guided fine needle aspiration (FNA) was recommended and performed using standard procedures.[3,4]

Cytologic Findings

The aspirates were obtained using a bevelled-edge Chiba needle in conjunction with a triggering device.

The aspirated material was expelled onto uncoated glass slides. The air-dried slides were stained by the Diff-Quik (Baxter Healthcare Corp., McGaw Park, Illinois, U.S.A.) technique.

The material obtained was blood stained and moderately cellular and consisted of several clusters of tightly packed cells with round, hyperchromatic and minimally pleomorphic nuclei and surrounding, scanty cytoplasm.

A second and less-predominant population of cells showed bland and spindle-shaped nuclei (Figure 2A and B). Tiny pieces of loose connective tissue and scanty groups of vacuolated hepatocytes were also observed in places.

Based on the cytologic material and favoring a benign lesion with varying epithelial and mesenchymal differentiation in addition to the clinical and radiologic findings, a differential diagnosis of hepatic MH and hepatoblastoma of the possible mixed epithelial/mesenchymal subtype was ren-

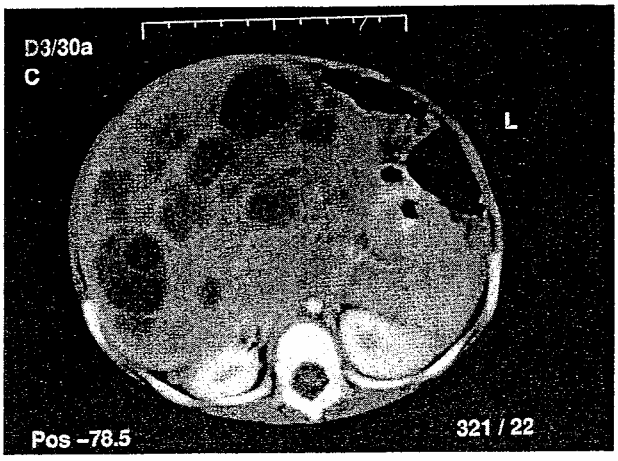

Figure 1 Abdominal CT showing a large, heterogeneous, solid and cystic hepatic mass that appears to be slightly compressing the right kidney.

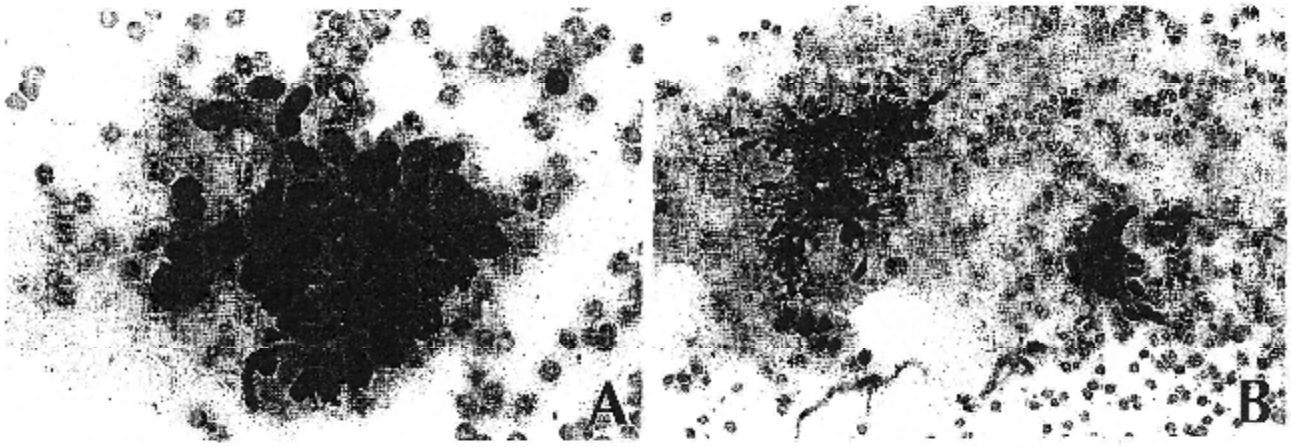

Figure 2 (A) FNA of mesenchymal hamartoma of the liver showing a cluster of cohesive and slightly pleomorphic epithelial cells (Diff-Quik, ×400). (B) FNA of mesenchymal hamartoma of the liver showing two populations of cells: epithelial (right) and spindle (left) (Diff-Quik, ×100).

dered with a clear recommendation for excision to enable further histologic assessment.

Histologic Findings

The specimen consisted of an unremarkable gallbladder with a separate, huge, oval, solid tumor mass measuring 13×12.5×8 cm and weighing 925 g. The outer surface of the tumor was smooth and slightly glistening and showed a sutured excision margin near its base. On sectioning, the tumor showed a variegated cut surface containing large, solid and yellowish areas with several scattered and relatively small cystic spaces of variable size.

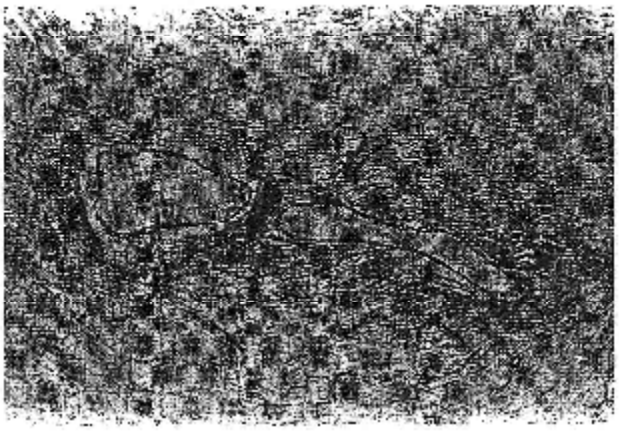

Figure 3 Histologic section of mesenchymal hamartoma of the liver showing two large and distorted bile ducts with surrounding myxoid/loose connective tissue (hematoxylin and eosin, ×200).

Histologic sections showed that the tumor consisted of well-formed partly myxoid and partly hyalinized connective tissue stroma intermixed with numerous elongated, dilated and branching bile ducts (Figure 3).

A variable number of spindle or small stellate cells were scattered within the myxoid stroma, which also contained thick-walled blood vessels. Sections taken from the peripheral parts of the tumor contained islands and trabeculae of vacuolated hepatocytes with occasional clusters of hematopoietic cells.

The histopathologic diagnosis was benign MH of the liver.

Discussion

MH of the liver, although uncommon, is the third or fourth most common tumor of the liver in childhood. It has been reported to occur in adults.[2,5,7] The male:female ratio is 3:1,[8] and the tumor usually presents clinically as an abdominal swelling.

MH can be associated prenatally with mesenchymal stem villous hyperplasia of the placenta[9] and nonimmune hydrops.[10] Postnatal associations with disseminated intravascular coagulation[11] and undifferentiated embryonal sarcoma[12] of the liver have also been reported.

The nature and pathogenesis of MH are not clear, and it has been postulated that the lesion arises from the mesenchyme of the portal vein and thus represents a ductal plate malformation.[13]

In 1993, Lennington et al[14] suggested that MH

could be a regional ischemic lesion of a sequestered hepatic lobe because of the similarity of histologic features of MH to those seen in torsion of an accessory lobe.

The detection of specific translocations involving chromosome 19[15] and the presence of an aneuploid subset of MH[16] favor a neoplastic nature of this lesion.

MHs of the liver are seldom aspirated, and reports on the role of FNA in the diagnosis of MH are scarce.[2] To the best of our knowledge, this case report is one of two published reports describing the cytologic features of MH.

Our findings show that FNA of MH is characterized by the presence of clusters of predominantly bland looking bile duct or cuboidal epithelial cells presumably arising from the lining of the above-described cystic and distorted ducts. These epithelial cells are usually seen in conjunction with single or groups of spindle stromal cells (Figure 2A and B). Loose fragments of myxoid connective tissue can also be seen in some cases. The pathologist, however, should be aware of other reactive and neoplastic hepatic lesions that occur in children under 2 years of age and that can cytologically or even histologically be mistaken for MH. These lesions include nonparasitic hepatic cysts, hepatoblastoma, undifferentiated stromal sarcoma and hemangioendothelioma.

Embryonal rhabdomyosarcoma can arise from the hepatobiliary tree and should be considered in the differential diagnosis. Neuroblastoma can also present with liver metastases in young children.

Benign nonparasitic cysts of the liver usually show a variety of epithelial cells on FNA. They include cuboidal columnar and ciliated forms, which may be associated with squamous metaplasia.[17]

Hepatoblastoma differs from MH by the presence of fetal cells with abundant dense, granular or clear cytoplasm, due to the accumulation of fat or glycogen. Furthermore, mesenchymal elements are rarely seen in aspirates from hepatoblastomas.[18]

Undifferentiated (embryonal) sarcoma is usually seen in 6- to 10-year-old children. FNA of this highly malignant sarcoma shows marked cellularity, anaplastic tumor cells and occasional multinucleated giant cells. This tumor is usually not cystic and may show desmin-positive cells by immunohistochemistry.[8]

Epithelioid hemangioendothelioma can occur in the same age group as MH and usually produces nondiagnostic cellular material on FNA. Characteristic vascular channels and positive immunohistochemical staining for factor VIII–related antigen can be seen in tissue fragments obtained by a tru-cut needle.[19]

Embryonal rhabdomyosarcoma and neuroblastoma can present as hepatic deposits. Cytologic differentiation of these two tumors from MH depends on the presence of anaplastic tumor cells in the former and rosette formation with a fibrillary background in the latter.

Immunohistochemical stains for desmin, myoglobin and neurofilaments can help in certain cases.

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