Case Report

An unexpected diagnosis of ectopic liver diagnosed by fine needle aspiration

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INTRODUCTION

Accessory and ectopic liver lobes have a low incidence and are usually identified during imaging studies or autopsy.[1] These lesions result from embryologic heteroplasia which may be congenital or acquired.[2] They are classified as accessory liver lobes when connected to the liver by a stalk and as ectopic liver tissue when there is no connection. Reports of ectopic liver are rare although this entity has been reported in the thorax, lung, gallbladder,
pancreas, umbilicus, adrenals, pylorus, and inferior vena cava.\textsuperscript{1,3,4} In the abdomen, patients rarely manifest physical complaints, unless complications occur, such as torsion, bleeding, or obstruction.\textsuperscript{5,5,6}

**CASE REPORT**

A 47-year-old male was diagnosed with malignant melanoma of the scalp in May 2015 at our tertiary care hospital. In reviewing treatment options, he underwent imaging surveillance, including an abdominal computed tomography. This showed a 2.6 cm enhancing mass adjacent to the fundus of the stomach and immediately below the diaphragm [Figure 1a and b]. The radiology differential included a gastrointestinal stromal tumor (GIST), splenule, and metastatic melanoma. The patient had opted to receive biochemotherapy for his primary melanoma, and a biopsy of the perigastric mass was needed to exclude a metastasis. The patient was referred to endoscopy.

Endoscopic ultrasound (EUS) identified a 2.5 cm oval mass in the perigastric space below the diaphragm, without definite involvement of the stomach. These images were suggestive of a lesion arising independently from the gastric wall. Five passes were performed with a 22-gauge Shark Core needle (Medtronic, Dublin, Ireland) to maximize tissue acquisition [Figure 1c]. Rapid on-site evaluation (ROSE) was performed by a cytopathologist. After reviewing the first pass, the cytopathologist communicated with the endoscopist to ask if the needle had passed through the liver. The endoscopist confirmed that the needle was not in or near the liver and that it had been passed through the stomach to obtain the biopsy. Small tissue fragments were touched on the slide, and those which did not smear were placed in formalin for the cell block preparation.

Diff-Quik smears of the second fine needle aspiration (FNA) demonstrated flat sheets, single cells, and small clusters of polygonal cells with distinct cell borders, round to ovoid centrally placed nuclei with some size variation, but smooth nuclear contours, open chromatin, and no pleomorphism. Occasionally, prominent nucleoli were identified. Cells had abundant granular cytoplasm which contained some pigments [Figure 1d]. The smear findings appeared consistent with hepatocytes. The cell block confirmed this, demonstrating small core fragments of hepatic parenchyma with portal tracts. Immunohistochemistry for arginase-1 confirmed that this was hepatic tissue [Figure 1e and f] and a reticulin stain demonstrated normal hepatic plates (figure not shown). The cytologic and histologic findings, in conjunction with the imaging, were consistent with ectopic liver.

**DISCUSSION**

The differential diagnosis of an incidentally discovered perigastric mass is broad and includes both benign and neoplastic entities. Benign primary lesions and neoplasms include, but are not limited to, leiomyoma, schwannoma, neurofibroma, GIST, lymphoma, and carcinoid. Metastases may also present as an incidental lesion. In our case, the top clinical differential included GIST or metastatic melanoma.

Although it is a rare entity, it is important to realize that ectopic liver is in the differential of abdominal and perigastric lesions. In our case, the FNA Diff-Quik smear demonstrated cytology that appeared consistent with benign hepatocytes during ROSE, which raised the possibility of ectopic liver. However, confirmation that this was not one of the other entities in the differential was critical, especially since they can have overlapping cytologic features. Epithelioid GISTs, for instance, may be admixed with or entirely lack spindle cells.
usually demonstrate intermediate-sized cells with round to occasionally irregular nuclei, intranuclear inclusions, some binucleations, and scant to moderate clear to granular cytoplasm, which tends to get pulled away from the cell clusters in wispy strands.[7]

Malignant melanoma has variable cytoplastic findings. Cells may be spindled, epithelioid, or mixed, and while they may demonstrate frank dysplasia, with large nuclei, prominent nucleoli, and abundant cytoplasm, they can also look bland, and like hepatocytes and epithelioid GISTs, binucleation, intracytoplasmic vacuoles, and intracytoplasmic pigment are occasional findings.[6]

ROSE, with active intra procedural communication between the cytologist and the endoscopist, was extremely helpful in this case to rule out the possibility of liver contamination. When cells that appeared to be hepatocytes were noted on the first few passes, there was an immediate discussion with the endoscopist about the placement of the needle. It was confirmed the needle passed through the stomach to obtain the biopsy, and was within the perigastric mass, far from the liver.

Confirmation that the lesion consisted of benign hepatocytes was ultimately facilitated by use of a new EUS needle (Shark Core) designed to give either generous cytologic samples by touch prep or core biopsy material for the cell block. Tissue architecture was available, and there was abundant material to perform immunohistochemistry. In addition to confirming the presence of hepatic tissue, it was also useful to exclude the possibility of hepatocellular carcinoma, which has been reported in ectopic liver.[8‑12] This needle is new to the US market. One pilot study on this device currently in press was performed at our institution and showed that the device performs very well when compared to a standard EUS-FNA needle in terms of yield and reduced number of passes.[13]

In summary, ectopic liver is rare and usually incidentally discovered entity. The cytology from the material biopsied by FNA may have overlapping features with other entities more commonly considered in the differential of perigastric masses. ROSE is helpful to communicate with the endoscopist about placement of the needle. From our literature review, while FNA of presumed ectopic liver within the thorax has been reported,[12] ours is the first report of perigastric ectopic liver diagnosed by FNA.

COMPETING INTERESTS STATEMENT BY ALL AUTHORS

All authors declare no competing interests.
13. Adler DG, Witt B, Chadwick B, Wells J, Taylor LJ, Dimaio C, et al. Pathologic evaluation of a new EUS needle designed to obtain core tissue samples: A pilot study. Endosc Ultrasound 2016;5:178-83.

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