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FINE NEEDLE ASPIRATION CYTOLOGY OF THE LIVER: HOW DO I GET IT? IS IT USEFUL?

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Fine needle aspirate of the liver is simple and requires no special equipment. It can be performed with a 6- or 12-cc syringe and a 22-gauge, 1.5- to 3.5-inch disposable hypodermic or spinal needle. The 22-gauge spinal needle is useful in larger animals because of the longer sizes available but is rarely necessary when being used in cats. The needle is inserted into the liver via a percutaneous transabdominal (in cats and most dogs) or transthoracic approach (in large deep chested dogs) and gentle suction (3-5 ml) is applied. While maintaining suction, the needle is gently but quickly thrust into the liver parenchyma and then brought back to the original position without exiting the liver. The suction is then released and the needle is withdrawn. If the technique is properly performed, blood will rarely be noted in the syringe or needle hub as the entire specimen should remain in the needle. To transfer the specimen to a clean glass slide detach the needle, draw a few milliliters of air into the syringe, reattach the needle, and gently expel the liver sample onto the slide. Do not forcibly "blow" the specimen onto the slide as this may damage the cells and result in preparation artifacts. Squash prep smears or blood film techniques may be used to smear hepatic samples. The transabdominal technique can be performed either in dorsal or right lateral recumbency with the pelvis of the animal positioned slightly lower than the head. I prefer lateral recumbency because patient restraint is generally easier. With the animal in lateral recumbency the needle is inserted at the point where the left costal arch begins its dorsal ascent. It is angled at about 45° to the body wall. The left caudal thoracic mammary gland is usually just ventral and slightly caudal to the point where the needle is to be inserted. Once the peritoneal cavity has been entered the needle is brought parallel to the body wall and slowly advanced while gently feeling down for the liver with the tip of the needle. Once the liver is felt the needle is again angled at 45°, the needle tip is placed into the liver parenchyma, and the aspirate is performed.

FNA is most useful in evaluating patients with hepatomegaly but it often gives valuable information in patients with normal sized livers as well. Diffuse infiltrative, inflammatory, and neoplastic diseases lend themselves best to an FNA diagnosis. FNA is less applicable to focal or multifocal diseases or diseases in which cells do not exfoliate easily, such as fibrosis or sarcoma. Kristensen, et al. recently described a classification scheme for interpretation of hepatic cytology: their categories include normal, hyperplastic, inflammatory, degenerative, necrotic, cholestatic, neoplastic, mixed reactions, other reactions, and non-diagnostic.

HEPATIC CYTOLOGY

The predominant cell type in a normal hepatic FNA is the hepatocyte, often found in cohesive clusters or regular sheets. Hepatocytes are large polyhedral to rounded cells with abundant gray to basophilic cytoplasm. They have a single (occasionally two) eccentric nucleus with uniformly course chromatin and a small, distinct nucleolus. The cytoplasm is usually granular with a small amount of green bile pigment occasionally present. Small columnar epithelial cells of biliary origin may also be observed. Low numbers of macrophages (Kupffer's cells) with or without intracellular hemosiderin are sometimes seen. Because of the highly vascular nature of the hepatic sinusoidal milieu, a background of erythrocytes and blood-borne leukocytes is invariably present.

Degenerative diseases are characterized by cytoplasmic vacuolar changes. The differential diagnosis for hepatic vacuoles includes fat, glycogen, hydropic degeneration, and storage diseases. Feline hepatic lipidosis is the characteristic example of diseases of this type. In the dog, glycogen deposition associated with steroid hepatopathy or hydropic degeneration associated with an ischemic or toxic insult is more likely. Extracellular deposition of amorphous material is seen in hepatic amyloidosis. It is not uncommon to see mild hepatocellular vacuolization in cats with a large variety of chronic diseases so care must be taken in interpreting the finding vacuolar hepatopathy in this species. Inflammatory specimens are characterized by increased numbers of inflammatory cells interspersed between normal and/or reactive hepatocytes. The predominant inflammatory cell type characterizes the inflammation present. A definitive diagnosis can be made in some protozoal or systemic fungal diseases based on the presence of identifiable organisms. Histoplasmosis is the systemic fungal disease most likely to be diagnosed via hepatic FNA. One of the most useful applications of hepatic FNA is the diagnosis of hepatic neoplasia. Lymphosarcoma, biliary carcinoma, or metastatic neoplasias are the most likely hepatic tumors to be diagnosed.

Because FNA is usually a blind tissue sampling technique it is most applicable when the clinical evaluation suggests diffuse parenchymal disease. Focal diseases are less likely to be diagnosed by blind aspirate techniques. The accuracy of hepatic FNA can be improved by obtaining multiple aspirates so at least 3 aspirates taken from slightly different angles should be routinely obtained. Complications of hepatic FNA are extremely rare. Bleeding is rarely a clinically significant problem even in animals with coagulation abnormalities. Using a blind technique to aspirate cells from the liver will occasionally result in inadvertent gall bladder aspiration. Aspiration of the gall bladder rarely causes serious problems for the patient.

In fact, with ultrasound guidance the technique is routinely used to sample bile in cases of suspected cholangitis or liver fluke infestation. It should be noted that while FNA is a quick and easy technique, the sample does not always accurately reflect the underlying histopathologic diagnosis. Few studies have looked at correlation between FNA cytology and histopathology in the dog and cat. There was a 66% correlation in one study. The fact that correlation is not 100% stresses the point that care should be taken when interpreting results that do not seem to fit the presenting clinical picture. Liver biopsy is still often needed for definitive diagnosis.