Outpatient Cytopathology® center

TOPICS IN CLINICAL FNA

Aspiration Biopsy Cytology April 2013

What's My Cell Line?

Remember the game show "What's My Line"? It ran from 1950 to 1967 and then returned in syndication from 1968 to 1975. The show featured celebrity panelists asking contestants questions to determine the contestents' occupations. At the Outpatient Cytopathology Center (OCC), we play "What's My Cell Line." We employ fine needle aspiration to query a patient's mass, to determine if it is a primary tumor, recurrent or metastatic tumor, or other process. The results of "What's My Cell Line" help guide the referring clinician to the next step in patient care.

Patients with known malignant disease are often very concerned about any lump or bump that they detect, whether or not the mass is clinically suspicious. The patient's overwhelming concern is about a recurrence. But what else could this be? There are several entities that can occur after cancer treatment such as post-radiation or post-chemotherapy effect, a lymphocele, fat necrosis, or a granulomatous process due to retained sutures. The presence of long-standing masses such as a ganglion or epidermal inclusion cyst or even a lipoma can worry the patient after their bout with malignancy. A new palpable nodule could also represent a non-neoplastic tumor or a second tumor primary. Treatment plan depends on the etiology of the mass and fine needle aspiration biopsy is a sensitive and safe procedure for determining the etiology of the mass.

Metastatic Disease

Assessing for recurrent metastatic disease is usually straightforward. If the aspirated cells look like the primary tumor, you have the answer. Sometimes additional testing is requested by oncology to help guide treatment options. For example, if a person has a history of non-small cell carcinoma of the lung and the FNA shows cells compatible with non-small cell carcinoma, the FNA sample could be analyzed for EGFR, KRAS and ALK. These are molecular markers used to guide targeted therapy.

Second Primary Malignancy

Not infrequently patients who have one malignancy can develop a second or even third malignancy. One cannot assume that a new mass is related to the patient's original cancer. FNA biopsy is ideally suited to sample the new mass, and if a new primary is identified, this new tumor can be further investigated with ancillary techniques such as immunohistochemical (IHC) stains, flow cytometry, molecular markers, and fluorescent in-situ hybridization (FISH) and in-situ hybridization (ISH).

Radiation and Chemotherapy

Radiation and chemotherapy can cause tissue destruction, fibrosis, fat necrosis and even inflammation/abscesses. Clinical presentation can vary from dense tissue ridges or slightly raised firm plaques to a nodule with irregular margins. Other changes seen after therapy include acute infections, inflammation, hemorrhage, edema and fibrin deposition within tissues. Fibrosis, coagulative necrosis and tissue repair are all later features. Radiation changes begin soon after exposure and cellular changes may persist for the life of the patient. Chemotherapy may induce similar changes. Radiation and/or chemotherapy can cause changes in cellular morphology that can be visualized microscopically. The history of having radiation or chemotherapy and the dates of treatment are important since the various changes appear differently depending when the treatment occurred. Post-radiation sarcomas may occur any where from 4-27 years (mean 12.6 years). These sarcomas are usually high grade and they usually have a dismal prognosis. The most common type is malignant fibrous histiocytoma.

Post-Operative Masses

Post-operatively a lymphocele can develop near the surgical site. This is an abnormal collection of fluid that presents as a firm maybe fluctuant nodule near the surgical site. Lymphoceles can occur weeks after the original surgery and are the most common complication

of lymphadenectomy. The incidence has been reported from 5-35%. It occurs from compression, obstruction or injury to lymphatic channels. If the lymphatic vessel is injured it is quite susceptible to leakage since lymphatics have a low concentration of clotting factors and contain no platelets. Lymphatics are also devoid of smooth muscle and lack constrictive properties that veins and arteries have. A CT scan or ultrasound exam will confirm the presence and location of the fluid collection. Aspiration reveals clear to yellow fluid which contains numerous mature lymphocytes. Once drained they usually resolve. If they are of a large size, sclerotherapy may be used.

Fat necrosis is also common after surgery or radiation. It can be related to trauma, seatbelt injuries or minor trauma that the patient cannot recollect. It is a benign inflammatory process that mimics malignancy. Clinically palpable masses may be irregular or smooth, and may or may not be tender. The skin over it may be indurated, thickened or even have skin retraction. If it is related to surgery the mass is usually near the excision site. There are no specific radiographic features. Ultrasound may reveal solid masses, cystic or even complex masses. Borders may be discrete or ill-defined. Distortion of the surrounding architecture can be present. Calcification may be present. Fine needle aspiration of these areas reveals breakdown products of adipose tissue, inflammation, giant cells and foamy macrophages.

Suture granulomas located near scar sites and occur months after surgery. They are usually firm nodules that can be either well-circumscribed or ill-defined. They are usually non-tender and flesh colored. On FNA we see granulomas that surround foreign material.

Benign Cysts

Cysts such as epidermal inclusion cysts or ganglion cysts are common and can worry the patient if they previously had a cancer. These benign cysts can be located anywhere. Clinically these masses are firm, non-tender, usually well-circumscribed and non-ulcerative. It moves with ease. It may have a punctum (small opening on the skin surface) if it is an epidermal inclusion cyst/sebaceous cyst. Ganglion cysts can occur anywhere that ganglion cells reside. The classic site is on the dorsal wrist. It is caused by myxomatous degeneration of a capsule of the joint. These swellings tend to be round, sessile and tense. It may also be translucent and be seen with a pen light. Fine needle aspiration of these lesions show very gelantinous mucoid material and ganglion cells.

Fine needle aspiration can be performed to help diagnose and differentiate these entities from the metastatic lesion. It is the easiest and quickest way to delineate these entities.

Scheduling

To schedule a patient for appointment or to ask questions about a particular patient to determine if the patient is a good candidate for an FNA biopsy, call the Outpatient Cytopathology Center at 423-283-4734. Additional information about the practice and a video clip of a FNA biopsy can found on our website at www.fnabx.com.

Company Profile

OUTPATIENT CYTOPATHOLOGY CENTER (OCC) is an independent pathology practice that specializes in performing and interpreting fine needle aspiration biopsy specimens. OCC is accredited by the College of American Pathologists. The practice was established in 1991 in Johnson City, Tennessee. Patients may be referred for aspiration biopsy of most palpable masses as well as for aspiration of non-palpable breast and thyroid masses that can be visualized by ultrasound. OCC is a participating provider with most insurance plans. Our referral area includes Virginia, West Virginia, North Carolina, South Carolina, Kentucky and Georgia.

Dr. Rollins

SUSAN D. ROLLINS, M.D., F.I.A.C. is Board Certified by the American Board of Pathology in Cytopathology, and in Anatomic and Clinical Pathology. Additionally, in 1994 she was inducted as a Fellow in the International Academy of Cytology. She began her training under G. Barry Schumann, M.D. at the University of Utah School of Medicine, subsequently completed a fellowship in Cytopathology under Carlos Bedrossian, M.D. at St. Louis University School of Medicine, and has completed a fellowship in Clinical Cytopathology under Torsten Lowhagen, M.D. at the Karolinska Hospital in Stockholm, Sweden. The author of numerous articles in the field of cytopathology, Dr. Rollins also has served as a faculty member for cytopathology courses that are taught on a national level.

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JANET F. STASTNY, D.O. is Board Certified by the American Board of Pathology in Anatomic Pathology and has specialty boards in Cytopathology. She completed a pathology residency at the University of Cincinnati and subsequently a one-year fellowship in cytopathology and surgical pathology at the Virginia Commonwealth University / Medical College of Virginia. She was on the faculty at the University for 7 years specializing in gynecologic pathology and cytopathology. She has written numerous articles in the field of cytopathology and gynecologic pathology and has taught cytopathology courses at national meetings. She is currently involved on national committees dealing with current issues concerning the practice of cytology.