

EDITORIAL

ROLE OF FINE NEEDLE ASPIRATION IN THE DIAGNOSIS OF NEOPLASMS

It may surprise non-readers of medical history that aspiration cytology dates back to medieval times when an Arabian physician, Abulcasim (1013-1107 AD) described needle puncture of the thyroid to diagnose various types of lesions(1). The use of cytologic techniques in modern times markedly declined with the arrival of the microtome for thin tissue sectioning. Hayes Martin, a head and neck surgeon, Edward Ellis, a laboratory technologist, and Fred Stewart, a pathologist, gave a brief rebirth to aspiration for cytologic diagnosis in the early 1930s in the United States(2,3). The Scandinavians re-introduced the fine needle aspiration technique to clinical medicine after World War II(4,5). Today, because of its many advantages, FNA biopsy is routinely used the world over as a reliable method of making a rapid morphologic diagnosis(6).

Fine needle aspiration biopsy can be defined as the removal of a sample of cells using a fine needle, from a suspicious mass for diagnostic purposes(7). From this "sample" an attempt is made to predict the nature of the entire lesion. As with any biopsy procedure, the assumption is made that the lesion is more or less homogeneous, an assumption that is not always correct as a focus of malignancy may be missed or the lesion not hit by the needle altogether. FNA biopsy works best when a lesion is clinically suspicious of being a neoplasm and the number of diagnostic possibilities are limited. FNA biopsy should not be used as a diagnostic shot-in-the-dark(7). Vague inflammations or indurations are not good targets for FNA biopsy and the procedure should be done only when a surgical tissue biopsy would be considered, for "diagnostic purposes"(9). The higher the degree of clinical suspicion, the higher the predictive value of a positive test. Commonly aspirated superficial lumps include thyroid, lymph node, breast and salivary gland, or deep-seated lesions in the lung, liver, pancreas, kidney, or retroperitoneum.

A "fine needle", 22 gauge or smaller diameter [23, 25 gauge] is used in this procedure and most lesions can be reached with a one to one and a half inch long needle. With the fine needle, complications are minimal or rare and ultra-fine needles [26-27 gauge] offer further advantages in vascular organs like the thyroid or trans-thoracic aspirations(10,11). Long needles, with imaging guidance, are used to reach deep sites and intra-cranial and osseous lesions may require a trocar to introduce the needle.

The FNA procedure appears deceptively simple, but it takes considerable skill and experience to master the technique(6). Although any physician can be trained to perform the aspiration and make high quality smears, the best results are obtained when a single physician (the cytopathologist) performs the biopsy, and interprets the smears(11,13). Similarly, when a cytopathologist is present during deep-seated aspiration biopsies, fewer

unsatisfactory specimens and a more accurate diagnosis may be obtained(14). As a rule, only cellular smears should be considered diagnostic of malignancy and attempts to interpret inadequate smears can be dangerous and should not be made(13). As in histopathology, indicating the degree of uncertainty in the cytologic report is perfectly acceptable and if a diagnosis is uncertain, a follow up biopsy or a repeat cytology should be recommended. FNA biopsy is generally highly sensitive (to the presence of disease) and highly specific (to the absence of the disease) with very rare false positive results in experienced hands. Major therapeutic decisions should however, not be based on the FNA biopsy report alone and an FNA biopsy should never be a replacement for clinical judgement. If cytologic findings do not correlate with the clinical suspicion, further work-up should be performed as indicated. A FNA biopsy is most useful when there is close communication between the cytopathologist and the clinician, who should provide all relevant historical, physical, radiologic and pathologic data in the consultation. This was emphasised about seventy years ago by Stewart(15) when he said: "Diagnosis by aspiration is as reliable as the combined intelligence of the clinician and the pathologist make it".

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