Making the Diagnosis:
Increasing the Cellular Yield of Pathology Samples Through a Motorized Rotating, Aspirating Device

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Purpose

Attaining adequate pathological samples while causing the least amount of damage to tissue during a biopsy can be challenging even for highly experienced clinicians. An IRB approved project was initiated within the Arnot Ogden Medical Center Department of Interventional Radiology using a device known as CytoCore that has an internal motor that rotates and aspirates through the needle during biopsy to improve the acquisition of cellular material.

Core biopsies range from 14-gauge to 20-gauge while CytoCore and Fine Needle Aspiration (FNA) range from 22-25 gauge. Smaller gauge is typically associated with a safer biopsy, however it is typically not utilized due to lower cellular yield. However, if the tissue is highly vascular, core biopsies in particular can result in significant bleeding. The CytoCore device can thus potentially provide adequate samples for biopsy without the increased risk of larger tissue removal.

The aim of this project was to evaluate the consistency and diagnostic quality of cellular material obtained with a 22 to 25-gauge fine needle by employing CytoCore as compared to traditional core biopsy.

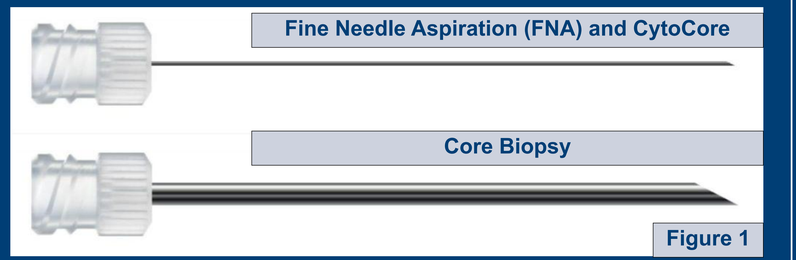


Figure 1

Figure 1: Comparison of the relative sizes of a typical FNA and CytoCore needle (21 gauge) versus traditional Core biopsy needle (14

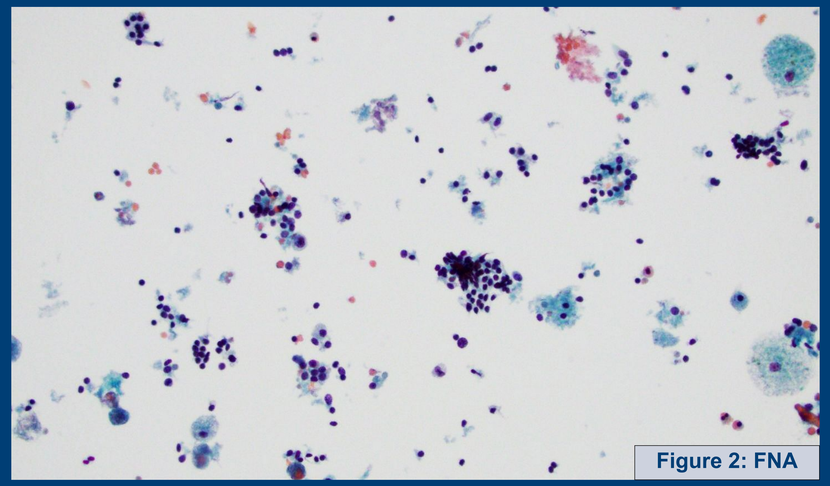


Figure 2: FNA

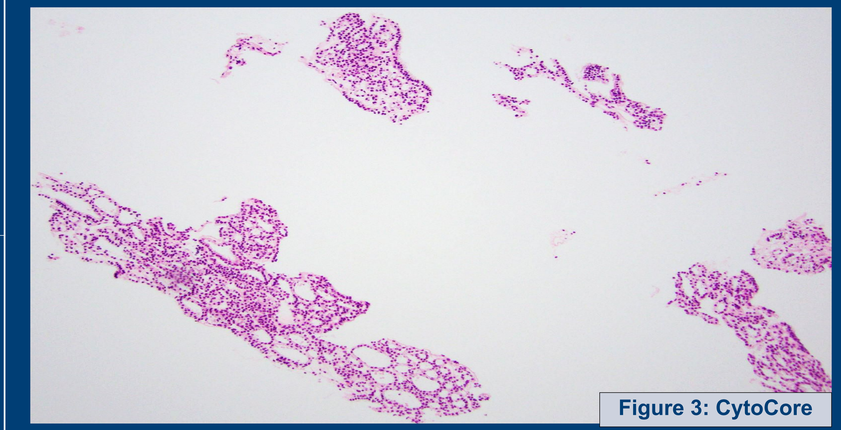


Figure 3: CytoCore

Figure 2 represents a FNA thyroid specimen, and **Figure 3** is the comparable CytoCore thyroid specimen.

CytoCore provided significantly more cells, which is valuable in obtaining an accurate diagnosis. The FNA slide, which was marginally diagnostic, had nearly no cells seen on pathology.

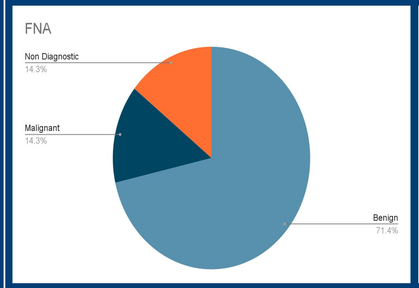
Material and Methods

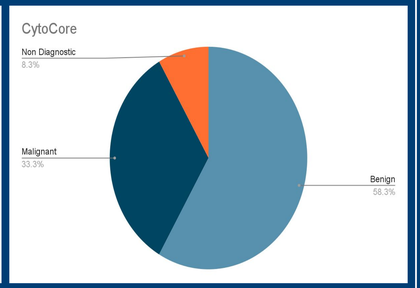
This prospective, observational study involved obtaining samples utilizing a traditional biopsy device (such as FNA syringe and core biopsy) and comparing it to samples obtained with the CytoCore device. These samples were analyzed in pathology separately for diagnostic adequacy.

Results and Conclusions

The Fisher exact test statistic values for FNA versus CytoCore and Core biopsy versus CytoCore were both 1, with sample sizes of 14 and 12 respectively. This indicates that there was no significant difference at a $p < .05$. Specifically, CytoCore was successful in obtaining a diagnosis in 78% of biopsies, which was unchanged from FNA. However, the cellular yield of samples obtained with the CytoCore device were overall superior to FNA biopsy samples. Furthermore, when compared to traditional core samples, CytoCore specimens were capable of yielding a diagnosis (99% for CytoCore and 100% for core biopsy) with significantly less trauma to surrounding tissue.

Protocol changes that are being considered on the basis of this research include the utilization of CytoCore in instances where a benign diagnosis is favored on imaging, but traditional core biopsy would have been the standard of practice. CytoCore provides a reliably high amount of cellular material with significantly less tissue damage, which is especially useful for vascular tissue such as lymph nodes and breast tissue.





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