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Title: IMPROVED OUTCOMES WITH THE RECIPROCATING PROCEDURE DEVICE FOR FINE NEEDLE ASPIRATION BIOPSY OF THE THYROID

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Purpose: The reciprocating procedure device (RPD) permits one handed generation of vacuum and precise anatomic positioning of the biopsy needle during fine needle aspiration biopsy (FNA). We hypothesized that the enhanced control of the biopsy needle and vacuum provided by the RPD would result in improved outcomes during ultrasound (US) guided FNA of the thyroid compared to the conventional syringe.

Materials and Methods: A group of 4 interventional radiologists performed a total 76 US-guided FNA of the thyroid, 44 with the 10 ml conventional syringe and 32 with the 10 ml RPD. Outcome measures included the adequacy and diagnostic quality of thyroid biopsy material as determined by a cytopathologist blinded to device used in the procedure, patient pain as rated by the operating physician (Visual Analogue Pain Scale, VAPS), and overall physician satisfaction with the biopsy device (Visual Analogue Satisfaction Scale, VASS).

Results: FNA of the thyroid with the conventional syringe provided inadequate material requiring a repeat procedure in 11.4% (5/44) of subjects vs. 0% (0/32) of subjects with the RPD ($p < 0.01$). During FNA, the conventional syringe in 44 subjects demonstrated a VAPS (patient pain) score of 4.19 \pm 1.72, and a mean VASS (operator satisfaction) score of 2.13 \pm 3.40. In contrast, the RPD in 32 subjects reduced patient pain (VAPS score) to 2.93 \pm 2.56 (30% reduction) ($p < 0.001$), and increased operator satisfaction (VASS score) to 7.74 \pm 0.91 (72% increase) ($p < 0.001$).

Conclusions: The greater control of vacuum and precise anatomic positioning provided by the RPD improves FNA biopsy yield, reduces inadequate biopsies, reduces the need for repeat procedures, reduces patient pain, and improves operator satisfaction with the biopsy device. The RPD is superior to the conventional syringe for FNA of the thyroid.