



# Diagnostic Yield of Fine Needle Aspiration of Thyroid Nodules using One-Pass Technique

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# Background

- ▶ There is wide discrepancy in the literature regarding the method of thyroid nodule sampling that will yield adequate diagnosis while minimizing risk and discomfort.
- ▶ While previous data suggested poor sampling with fine needle aspiration (FNA) compared with non-suction aspiration or core needle biopsy (1, 2, 3), there is ample current data to support FNA for preoperative identification of thyroid nodules (4, 5).
- ▶ It is unclear, however, which needle size or technique results in the highest diagnostic sampling rate with the least amount of complication. Larger needles may lead to more bloody specimens that affect cytopathology analysis, while smaller needles may yield insufficient cell counts (6, 7, 8, 4) .
- ▶ Also, the number of required passes is subject to debate, with some evidence for higher yield with multiple-pass FNA (9, 6) , however this may be more time consuming and lead to greater bleeding risk.
- ▶ The purpose of this study is to determine whether a single-pass technique for fine needle aspiration using a 21 gauge needle yield high enough diagnostic sampling without significant complication.

# Purpose

- ▶ There is wide discrepancy in the literature regarding the method of thyroid nodule sampling that will yield adequate specimen while minimizing risk and discomfort. The purpose of this study is to determine whether a single-pass technique for fine needle aspiration, using a 21 gauge needle, yields high diagnostic sampling without significant complication.

# Materials and Methods

- ▶ Patients underwent ultrasound-guided thyroid fine needle aspiration in a 10 month period from August 2016 through May 2017.
- ▶ All sampling were performed by a single operator.
- ▶ Fine needle aspiration was performed using a 21 gauge needle and single-pass technique. Additional passes were obtained if the first pass was deemed not adequate on gross inspection.

# Results

- ▶ 99 patients underwent thyroid FNA from August 2017 through May 2017
- ▶ A total of 115 nodules were sampled.

# Results (cont)

- ▶ Sampling was deemed adequate on gross inspection using single-pass technique in **73.0 %** [ n = 84 ] of nodules.
- ▶ 25.2 % [ 29 ] of nodules underwent a second pass and 1.7 % [ 2 ] a third pass, based on inadequate sampling on gross inspection.

# Results (cont)

- ▶ 63.1 % [ n = 53 ] of nodules sampled by single-pass technique were solid on ultrasound.
- ▶ 29.8 % [ 25 ] of nodules were categorized as complex solid/cysts.
- ▶ 7.1 % [ 6 ] were mostly cystic.

# Results (cont)

- ▶ Mean nodule size:
  - ▶ 1.7 cm for solid (range 0.5-3.8 cm)
  - ▶ 2.1 cm for complex solid/cystic (0.8 - 4.8 cm )
  - ▶ 2.6 cm for cystic (1.4 - 3.4 cm )

# Results (cont)

- ▶ **92.0 % [ 76/ 84]** of nodules sampled by single-pass FNA technique with 21 gauge needle were **diagnostic**:

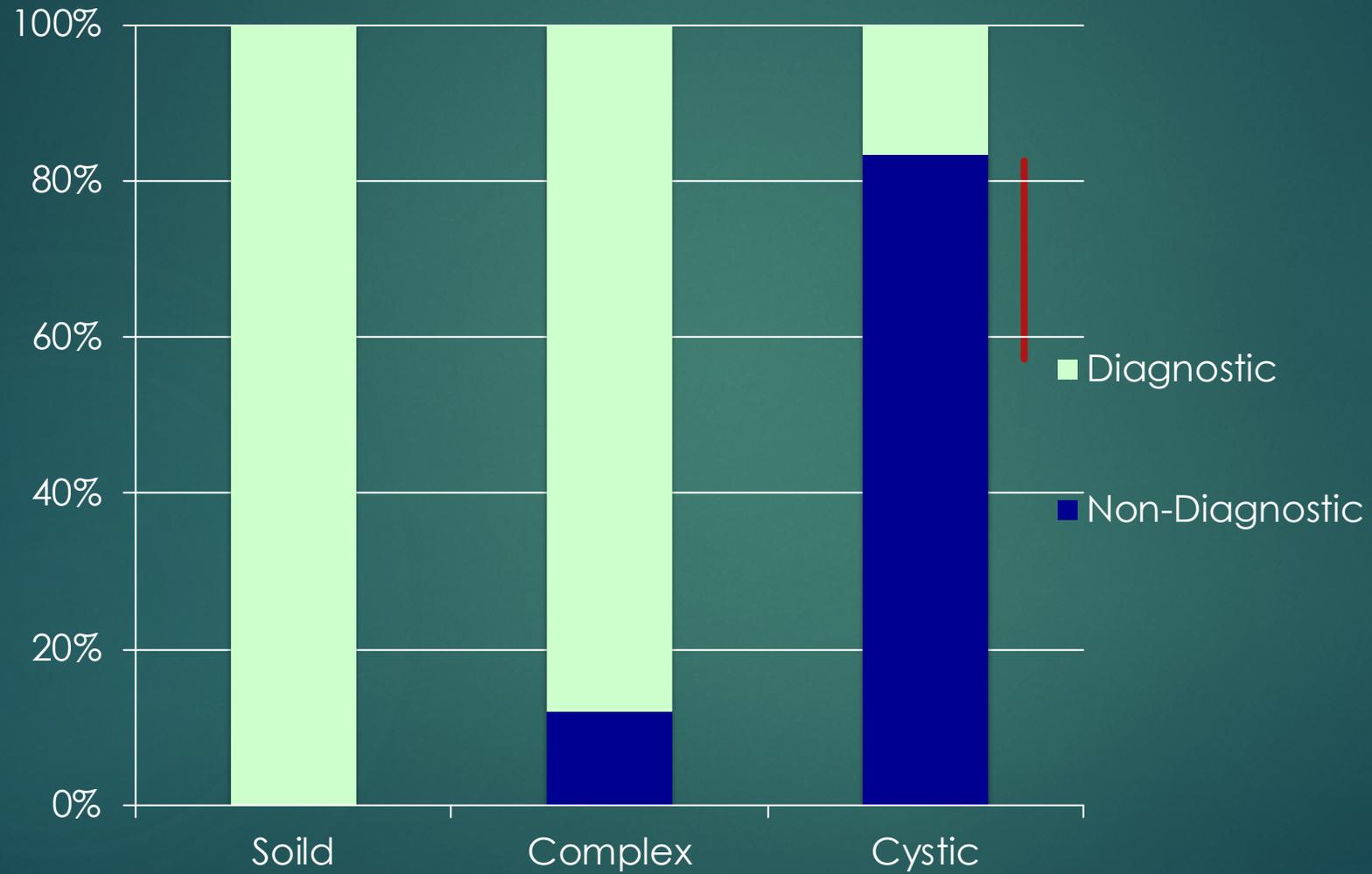
- ▶ 100% [ 53/53] diagnostic for solid nodules
- ▶ 88.0% [ 22/25] diagnostic for complex nodules
- ▶ 16.7% [1/6] diagnostic for cystic nodules

Solid vs. Non-solid diagnostic rate:  
**OR 38.7**, 95% CI 2.14 – 698.6, **P = 0.0133**

- ▶ **8.0 %** were **non-diagnostic**:

- ▶ 0% [0/53] non-diagnostic for solid nodules
- ▶ 12.0% [ 3/25] non-diagnostic for complex nodules
- ▶ 83.3 % [ 5/6] non-diagnostic for cystic nodules

# Results (cont)



# Results (cont)

- ▶ Of nodules with positive diagnostic sampling:
  - ▶ 82.6 % Bethesda 2 (Benign, including follicular nodule, lymphocytic thyroiditis, granulomatous thyroiditis)
  - ▶ 13.0 % Bethesda 3 (Atypia of undetermined significance)
  - ▶ 2.9 % as Bethesda 4 (Follicular neoplasm or suspicious)

# Results (cont)

- ▶ Complication rate for single-pass technique using 21 gauge needle:
  - ▶ Hematoma 1.7%
  - ▶ Dysarthria 0 %
  - ▶ Dysphagia 0 %
  - ▶ Nerve injury 0 %
  - ▶ ER admission within 48 hours 0 %

# Conclusions

- ▶ Ultrasound-guided fine needle aspiration of thyroid nodules can be performed with high diagnostic accuracy for non-cystic nodules using a 21-gauge needle with single-pass technique.
- ▶ Diagnosis is higher for solid nodules compared with complex solid/cystic nodules.
- ▶ Complication rate for sampling with this method is very low.

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