

A CLINICAL ALGORITHM FOR FINE-NEEDLE ASPIRATION MOLECULAR TESTING GUIDES THE APPROPRIATE EXTENT OF INITIAL THYROIDECTOMY

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Background/Purpose: Thyroid surgery (Tx), either total thyroidectomy (TT) or lobectomy, is often needed to diagnose differentiated thyroid cancer (DTC). Determining the correct extent of initial Tx is challenging.

Objective: To test if a clinical algorithm using routine cytologic molecular testing (MT) promotes initial TT for clinically significant thyroid cancer (sTC) and correctly limits surgery to lobectomy when appropriate.

Methods: After implementing an algorithm for prospective molecular testing (MT) of in-house fine needle aspiration biopsy (FNAB) specimens, we conducted a single-institution cohort study of all patients (n=671) with non-malignant cytology who had Tx from 10/10-3/12, cytologic diagnosis using 2008 Bethesda criteria, and ≥ 1 indication for Tx by 2009 ATA guidelines. sTC was defined by histologic DTC ≥ 1 cm and/or lymph node metastasis. Cohort 2 patients did not have MT or had inevaluable results. In Cohort 1, MT for a multigene mutation panel was performed for non-benign cytology and positive MT results indicated initial TT.

Results: MT guidance was associated with a higher incidence of sTC after TT (p=0.006) and a lower rate of sTC after lobectomy (p=0.03). Without MT results, patients with indeterminate (FLUS/FN) cytology who received initial lobectomy were 2.5X more likely to require 2-stage surgery for histologic sTC (p<0.001). In the 501 patients with non-sTC for whom lobectomy is the appropriate extent of surgery, lobectomy was correctly performed more often with routine preoperative MT (p=0.001).

Discussion & Conclusion: FNAB-MT for *BRAF*, *RAS*, *PAX8PPARG* and *RET-PTC* expedites optimal initial surgery for DTC, facilitating succinct definitive management for patients with thyroid nodules.