

## INTRODUCTION

- A high proportion of thyroid nodules that undergo fine-needle aspiration are classified as cytologically indeterminate.
- Molecular testing offers a unique approach to improve risk stratification. This allows clinicians to assess indeterminate lesions and also prevents unnecessary surgical procedures.
- Currently, 4 tests are commercially available, with ThyraMIR™/ThyGeNEXT™ being one of the cheapest options.

## AIM

Our aim was to determine the clinical accuracy of ThyraMIR™/ThyGeNEXT™ by retrospectively reviewing documented clinical outcomes of our patients after surgery and/or post-testing sonographic and serologic surveillance.

## METHOD

- Retrospective analysis was carried out utilizing data from a university-affiliated community practice.
- Medical records from September 2015 to October 2018 were reviewed.
- A total of 250 patients were deemed eligible and were included in the study.

## RESULTS

- Of the 250 patients, about 87.2% (n=218) had either clear-cut benign or malignant cytopathology results. Thus, they were eliminated from the study.
- Only 12.8% (n=32) patients who had cytologically indeterminate results were included.
- Age of patients ranged from 21 years to 79 years with a mean of 54 years. Table 1 below shows a summary.
- Of the 32 clinical cases, 4 had an NRAS mutation, 2 had HRAS, 2 had BRAF and 1 had TERT mutation.
- All the patients with positive results underwent surgical resection and postsurgical pathology was compatible with the molecular analysis.
- Over the course of follow-up and at the time of this analysis, none of the patients who had a positive molecular result have developed any evidence of recurrent disease.
- Post-surgery, patients who had negative test results with ThyGeNEXT™/ThyraMIR™ did not develop a malignancy at two years follow-up.

	Benign	Malignant
No. of Cases, n	23	9
Male, n	5	2
Female, n	18	7
Mutation positive, n	0	9

Table 1: Baseline Characteristics of patients with cytologically indeterminate nodules .

Molecular Results From Indeterminate Thyroid Nodules

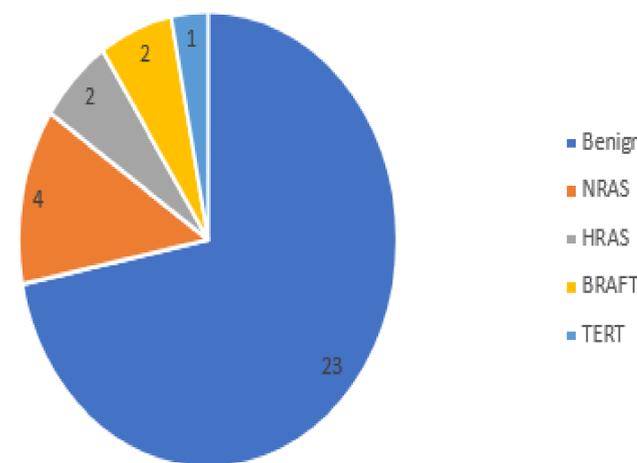


Figure 1: Molecular Results From Indeterminate Thyroid Nodules. The majority of patients who required molecular analysis after indeterminate results in cytological evaluation were benign. Those who were positive for a mutation were deemed malignant, which was consistent with post-surgical pathology results.

## CONCLUSIONS

- Among the subset of thyroid nodules cytologically classified as atypia of undetermined significance/follicular lesion of undetermined significance or follicular neoplasm/suspicious for follicular neoplasm, the majority will have no molecular evidence of malignancy.
- From our experience, ThyraMIR™/ThyGeNEXT™ appear to be a valid tool for patients with indeterminate cytology
- Our current findings suggest that there might be a correlation with ultrasonographic findings for both benign nodules and post surgery malignancy at 2 years of follow up.
- Multicenter studies are necessary to validate these findings.

## ACKNOWLEDGEMENTS

Internal Medicine Residency Program, University of Texas RGV

## REFERENCES

- 1.- Labourier E, et al, Molecular Testing for miRNA, mRNA, and DNA on Fine-Needle Aspiration Improves the Preoperative Diagnosis of Thyroid Nodules with Indeterminate Cytology. Journal of Clinical Endocrinology & Metabolism. 2015; 100: 2743.
- 2.- Vagas-Salas S, et al. Genetic testing for indeterminate thyroid cytology: review and meta-analysis. Endocrine Related Cancer. 2018. 25:R163–R177
- 3.- Tadeu dos Santos M. et al. Molecular Classification of Thyroid Nodules with Indeterminate Cytology: Development and Validation of a Highly Sensitive and Specific New miRNA-Based Classifier Test Using Fine-Needle Aspiration Smear Slides. Thyroid. 2018; 28(12): 1618-1626.