



PATIENT INFORMATION

PATIENT: John Doe	DOB: 01 Jan 1973	GENDER: M	LAB ID: L123	MRN: M123
COLLECTION DATE 18 Sep 2019	FACILITY NAME University Hospital of Anytown			
RECEIVED DATE 20 Sep 2019	SUBMITTING PHYSICIAN Jane Demo		PHONE (555) 555-5555	
REPORT DATE 26 Sep 2019	TREATING PHYSICIAN/CC ---		PHONE ---	

CLINICAL HISTORY: Suspicious Ultrasound Characteristics: Nodule A: Hypoechoic, Solid: >95% solid

RESULTS

Nodule: **A** 2.1 cm, Middle Left

CYTOPATHOLOGY

I Non Diagnostic	II Benign	III Atypia of Undetermined Significance	IV Suspicious for Follicular Neoplasm	V Suspicious for Malignancy	VI Malignant
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Cytopathology Diagnosis: Indeterminate - Suspicious for Follicular Neoplasm

Diagnostic Comments: These features are best categorized as suspicious for follicular neoplasm, Hürthle cell type.

Microscopic Description: The cytologic preparations are highly cellular and predominantly contain Hurthle cells in single cells or crowded groups. Several of the Hurthle cells are enlarged and show round, pale nuclei. Some colloid and relatively few lymphocytes are also seen.

AFIRMA GENOMIC SEQUENCING CLASSIFIER

AFIRMA XPRESSION ATLAS

Benign (Risk of Malignancy ~4%)	MTC: Negative Parathyroid: Negative	BRAF:p:V600E c. 1799T>A: Negative RET/PTC1, RET/PTC3: Not Detected
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N/A

RESULTS INTERPRETATION

The result of this 2.1 cm Bethesda IV nodule A is Afirma GSC Benign, which suggests a low risk of cancer at approximately 4%. Treatment like a cytologically benign nodule may be appropriate, including clinical correlation. Afirma XA is not performed on GSC Benign nodules.⁷

GROSS DESCRIPTION

Received one vial of Cytolyt and one vial of FNAprotect, each labeled with the Requisition Form # and patient initials.

E-SIGNED ON 26 Sep 2019 12:51 PM BY:

Robert J Monroe MD, PhD, Veracyte Inc. CLIA # 05D2014120
6000 Shoreline Ct, Suite 100, South San Francisco, CA 94080
Test Methodology: RNA Sequencing

CYTOPATHOLOGY E-SIGNED ON 20 Sep 2019 11:22 AM BY:

Tom Traweek, MD, Thyroid Cytopathology Partners, PA
Veracyte Austin, CLIA # 45D2052137
12357-A Riata Trace Parkway, Bldg. 5, Suite 100, Austin, TX 78727

CLIA#05D2014120, #45D2052137
CA License CLF340176, COS00800859
Lab Director: Robert J Monroe, MD, PhD

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TEST PERFORMANCE

	Cytopathology Diagnosis Indeterminate*	MTC ^{3,5}	BRAF ^{1,2,5,11}	RET/PTC ^{2,5,7,11}	Parathyroid ^{5,6}
Afirma GSC^{1,5}					
Risk of Malignancy: Afirma GSC Benign	~4%	>99% / >99%	>99% / >99%	>99% / >99%	>99% / >99%
Risk of Malignancy: Afirma GSC Suspicious	~50%				
Sensitivity:	91%				
Specificity:	68%				
Limit of Detection [†] :	5%				
Afirma Xpression Atlas^{7,8} (Afirma GSC suspicious, suspicious for malignancy, or malignant cytopathology)					
	BRAF V600E^{1,4,5}	Nucleotide Variant Panel^{**}		Fusion Panel^{***}	
NPA	>99%	>99%		>99%	
PPA	>99%	74%		82%	
Confirmation Rate [§]	>98%	>98%		>99%	
Limit of Detection [†]	5%	5%		10%	

References: 1. Patel KN, et al. *JAMA Surg* 2018. 2. Haugen BR, et al. *Thyroid* 2016. 3. Randolph G, et al. *ATA* 2017. 4. Angell TE, et al. *ATA* 2017. 5. Hao, et al. *Frontiers in Endo* 2019. 6. Sosa JA, et al. *ATA* 2017. 7. Angell, et al. *Frontiers in Endo* 2019. 8. Data on file. 9. TCGA Research Network. *Cell* 2014 10. Yoo, et al. *PLoS Genetics* 2016 11. Goldner, et al. *Thyroid* 2019. 12. Stack, et al. *ATA* 2019.

* Indeterminate includes Atypia of Undetermined Significance / Follicular Lesion of Undetermined Significance and (suspicious for) Follicular Neoplasm / Hürthle Cell Neoplasm.
[†] Analytical sensitivity studies demonstrated the test's ability to detect malignant cells in a background of benign cells.
[‡] BRAF classifier performance is based on a comparison to a castPCR DNA assay for the BRAF V600E mutation.
^{**} Nucleotide variant performance, excluding BRAF V600E, is based on a comparison to a DNA AmpliSeq assay that measures variants using a 5% variant allele frequency threshold.
^{***} Fusion performance is based on a comparison to an RNA AmpliSeq fusion assay and TaqMan assays.
[§] Confirmation rate is the proportion of positive calls that are confirmed positive by the reference method.
^{††} Analytical sensitivity studies demonstrate the test's ability to detect a positive variant in a background of wild type.
[#] FDA approved therapies for thyroid cancer, both specific for genomic alterations and non-specific, may be found at <https://www.cancer.gov/about-cancer/treatment/drugs/thyroid> and <https://www.cancer.gov/about-cancer/treatment/drugs/solid-tumors>. See <https://clinicaltrials.gov> for potentially relevant clinical trials. Afirma XA is not a companion diagnostic and is not conclusive for any therapy.

Associated Neoplasm Type abbreviations – FA, Follicular Adenoma; FTC, Follicular Thyroid Carcinoma; FVPTC, Follicular Variant of Papillary Thyroid Carcinoma; NIFTP, Noninvasive Follicular Thyroid Neoplasm with Papillary-Like Nuclear Features; PTC, Papillary Thyroid Carcinoma.

This NGS assay cannot differentiate somatic and germline variants. Further testing and/or genetic counseling may be warranted depending on the patient's clinical findings, family history and/or variant identified.

Afirma Thyroid FNA Analysis is a diagnostic service provided by Veracyte, Inc. for the assessment of thyroid nodules that includes cytopathology and gene expression testing. Afirma GSC, BRAF, MTC and RET/PTC tests and their performance characteristics were determined by Veracyte. MTC is an RNA classifier that identifies the presence of medullary thyroid carcinoma (MTC); BRAF is a BRAF p. V600E, c. 1799T>A RNA classifier; RET/PTC is a gene expression marker of somatic rearrangements of the RET protooncogene (RET/PTC1 and RET/PTC3).

Afirma Xpression Atlas (XA) is a diagnostic service provided by Veracyte, Inc. Afirma XA sequences 511 genes to measure the presence or absence of 761 nucleotide variants and 130 fusion pairs. The performance characteristics were determined by Veracyte. Genomic coordinates or full list of genes and variants available upon request.