

Ultrasonographic features and management of thyroid nodules undergoing ultrasound-guided fine needle aspiration

Cardona Attard C^{1,2}, Psaila A^{1,2}, Buttigieg L¹, Gruppetta M^{1,2}

¹Diabetes and Endocrine Centre, Mater Dei Hospital, Malta

²Department of Medicine, University of Malta



Introduction

Thyroid nodules are a common clinical problem and can be detected in 50 to 60% of healthy individuals, particularly in the elderly and females. Thyroid cancer is found in 7-15% of thyroid nodules, especially in the presence of risk factors such as family history, age and radiation exposure.

In this audit we aimed to assess the extent of disease, the different approaches to management and the histological nature of thyroid nodules in Malta. We also evaluated the association of ultrasound characteristics with biochemical and histological features.

Methods

All thyroid nodules undergoing ultrasound-guided fine needle aspiration (FNA) between July 2013 and December 2017 were evaluated. Data was collected on:

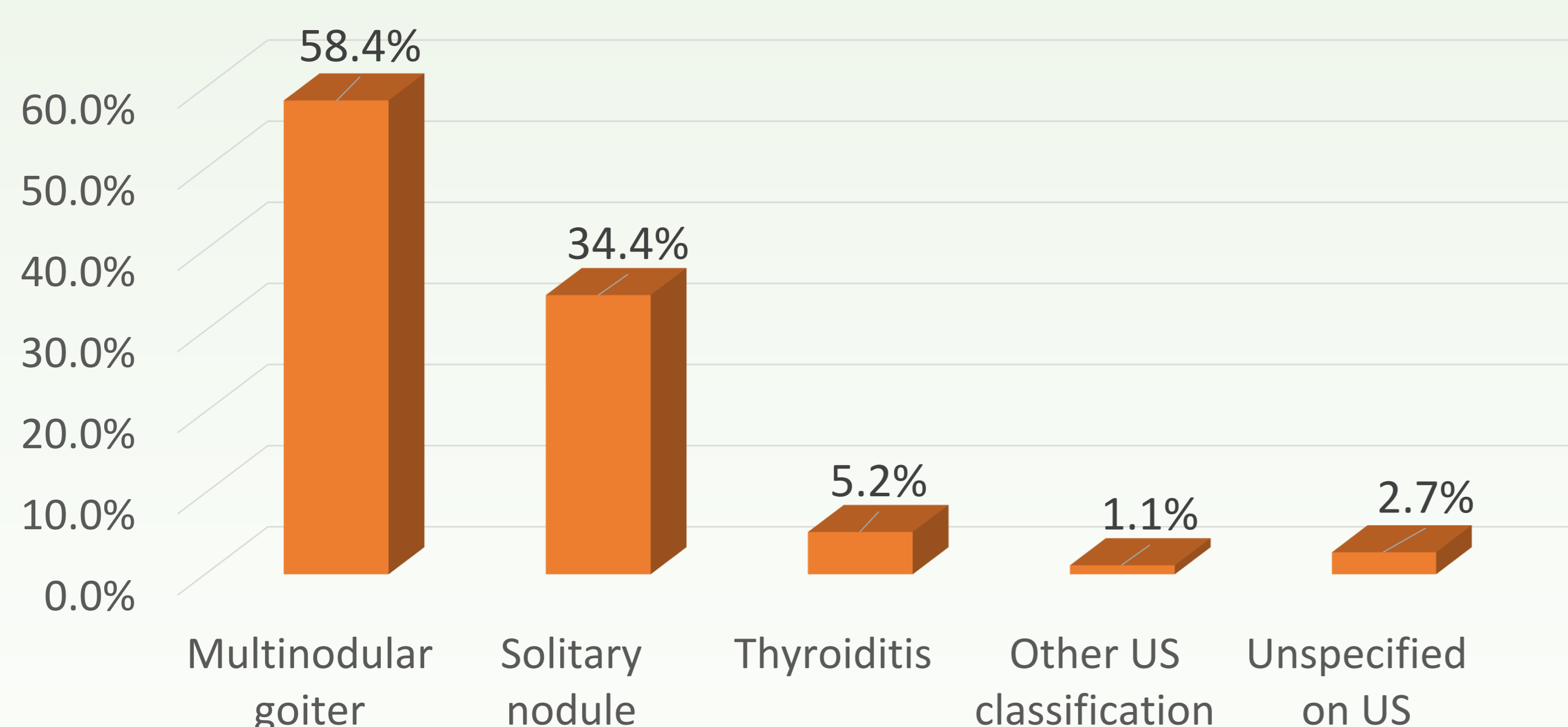
1. Ultrasonographic nodule characteristics.
2. FNA histology (using the Bethesda System for Reporting Thyroid Cytopathology [TBSRTC]).
3. Details of management and follow-up of these nodules.
4. Thyroidectomy details and histology report of surgically removed nodules.
5. Biochemical thyroid status.

The sensitivity, specificity, positive predictive value and negative predictive value of thyroid nodule FNA was calculated.

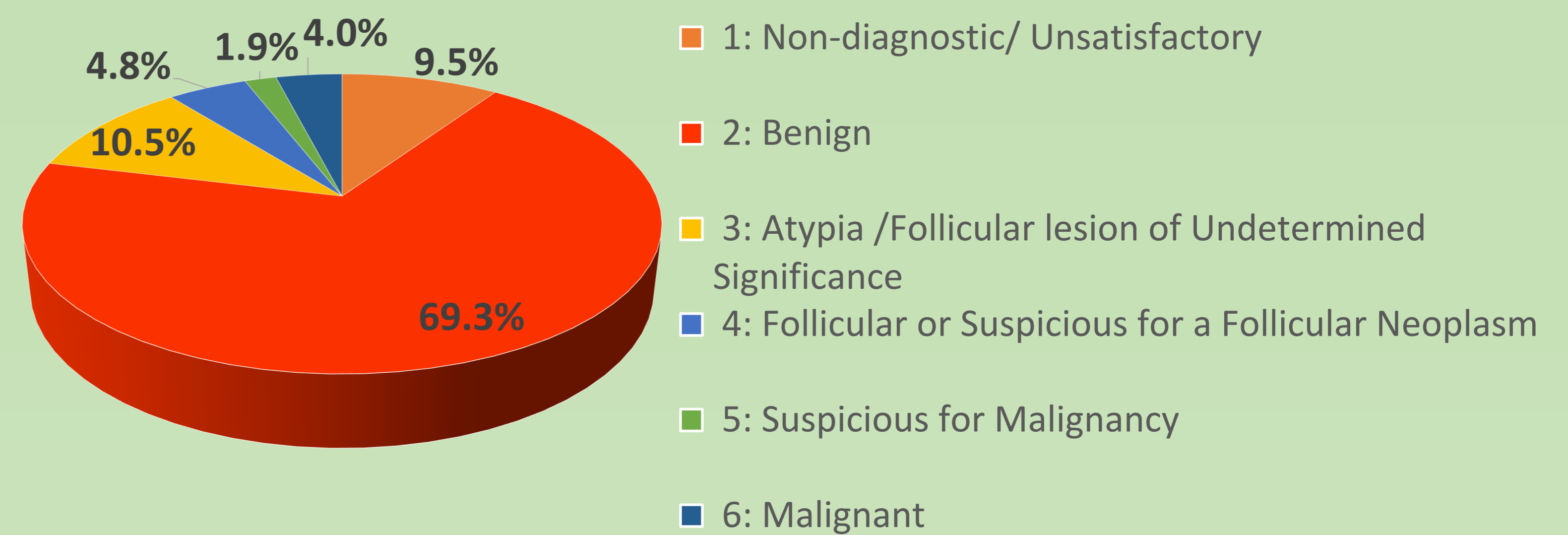
Results

A total of 1420 patients who had 1522 FNAs were identified. They had a mean age of 57.4 (+/- 15.3) years at the time of FNA and the majority (76.1%) were female.

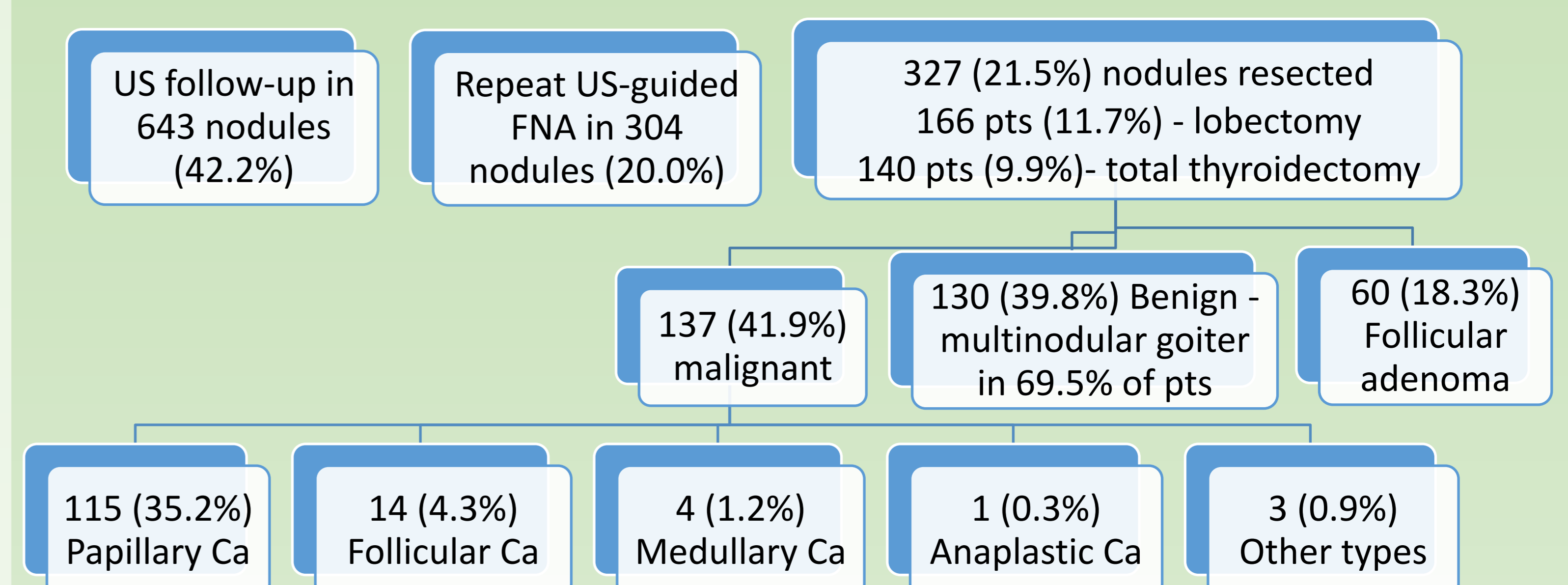
Classification on US



Histology of 1st FNA



Management and histology of resected thyroid nodules



Characteristics of malignant nodules confirmed post-operatively

	Patients N=129 (9.1% of all included pts)	%	Ultrasonographic characteristics (where documented)	Nodules N=137 (9% of all nodules)	%
Patient Age	*51.4 (±14.3)		≥2cm	51	37.2%
Multifocal	49	38.0%	Solid	33	24.1%
Extrathyroidal extension	11	8.5%	Solid/cystic	23	16.8%
Lymph node involvement	18	14.0%	Cystic	1	0.7%
Distant mets	4	3.1%	Hypoechoic	85	62.0%
Biochemical thyroid status			Chaotic intranodular vascularity	49	35.8%
Euthyroid	108	83.7%	Irregular borders	31	22.6%
Hypothyroid	10	7.8%	Microcalcifications	38	27.7%
Hyperthyroid	11	8.5%	Suspicious lymphadenopathy	12	8.8%

*mean (SD)

	TBSRTC 6 for malignancy	TBSRTC 5 and 6 for malignancy	TBSRTC 4 for follicular lesion
Positive Predictive Value	98.5%	95.9%	50.6%
Negative Predictive Value	82.8%	82.8%	92.2%
Sensitivity	80%	85.3%	73.6%
Specificity	98.7%	95.1%	81.3%

Conclusions

In our series, approximately a tenth of all nodules undergoing US-guided FNA were found to be malignant post-operatively, with papillary thyroid cancer being the most prevalent. More than a third of malignant cases were found to have multifocal disease. Our sensitivity and specificity results for FNA cytology compare well with ranges quoted by current guidelines, especially specificity and the positive predictive value for malignancy. A major limitation was the lack of reporting of important ultrasonographic nodule features on US.

References

1. Haugen BR, Alexander EK, Bible KC, Doherty GM, Mandel SJ, Nikiforov YE, et al. 2015 American Thyroid Association Management Guidelines for Adult Patients with Thyroid Nodules and Differentiated Thyroid Cancer: The American Thyroid Association Guidelines Task Force on Thyroid Nodules and Differentiated Thyroid Cancer. *Thyroid*. 2016;26(1):1-133.
2. Gharib H, Papini E, Garber JR, Duick DS, Harrell RM, Hegedus L, et al. AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS, AMERICAN COLLEGE OF ENDOCRINOLOGY, AND ASSOCIAZIONE MEDICI ENDOCRINOLOGI MEDICAL GUIDELINES FOR CLINICAL PRACTICE FOR THE DIAGNOSIS AND MANAGEMENT OF THYROID NODULES--2016 UPDATE. *Endocr Pract*. 2016;22(5):622-39.