Evaluating the role of Ultrasound-guided Fine Needle Aspiration Cytology in preoperative diagnosis of malignancy within Intrathoracic Goitre

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BACKGROUND

Ultrasound-guided fine needle aspiration cytology (USS-FNAC) is the gold-standard when evaluating thyroid nodules with a false-negative rate of <3%.

However, the utility of USS-FNAC in evaluation of Intrathoracic Goitre (ITG) remains controversial.

METHODS

237 patients undergoing surgery for ITG from 2004 to 2016 were evaluated with USS-FNAC.

All patients were discussed in a dedicated thyroid multidisciplinary meeting.

Inclusion and exclusion criteria are detailed (Table 1)

Radiological, cytological and histological data was collected prospectively and analysed to evaluate the utility of USS-FNAC in ITG.

Inclusion Criteria	Exclusion Criteria
1. Non-toxic Multinodular Goitre	1. Proven evidence of malignancy on FNAC, Core biopsy of histological analysis
2. Toxic Multinodular Goitre	2. Proven evidence of mediastinal involvement from primary of metastatic deposits
3. Goitres with benign cytology (Thy 2)	3. Recurrent thyroid cancers
4. Goitres with indeterminate cytology (Thy 3)	4. Revision surgery for metastatic thyroid cancer requiring sternotomy
5. Goitres with suspected malignancy (Thy 4)	5. Patients requiring sternotomy for a different indication

Table 1: Inclusion and Exclusion criteria for current study

RESULTS

Of 1045 patients undergoing thyroidectomy in our unit, 237 were conducted for ITG (22.7%).
29 required a combined cervical and thoracic approach

Malignancy was detected histologically in 19 patients giving an overall rate of malignancy in ITG of 8.02%.

18 (of 19) patients had benign pre-operative cytology results giving a rate of unexpected occult malignancy of 7.59%.

USS-FNAC had 5.26% sensitivity and 93.6% specificity to exclude cancer. (Figure 1A).

A		FNAC Suspicious of Malignancy		Total	B	Our Group	Literature
		Yes	No		Sensitivity	5.26%	83%
		Specificity	93.6%		98%		
Occult Malignancy	Yes	1	18	19	Positive Predictive Value	6.67%	71.4%
	No	14	204	218	Negative Predictive Value	91.9%	98.4%
Total		15	222	237			

Figure 1: Findings and statistical evaluation of USS-FNAC in our study. (A) Results of Preoperative cytology in patients with ITG. (B) Statistical evaluation of USS-FNAC in predicting malignancy – our findings vs. the literature.

CONCLUSION

Our findings of occult malignancy are close to the mean (10.1%) found in series of over 50 patients reported in the literature (Table 2).

USS-FNAC has poor sensitivity but good specificity to exclude cancer in ITG compared with the literature (Figure 1B).

Patients should therefore undergo either hemi- or total thyroidectomy and be counselled about risk of malignancy necessitating further treatment.

Author	Year	Country	N	Study Type	Cancer %
Chauhan et al. ¹	2006	Frankston - Australia	199	Prospective	2.5
Nervi et al. ²	1998	Pisa - Italy	621	Retrospective	3.7
Shai et al. ³	2000	Taichung - China	55	Retrospective	5.4
Vadasz et al. ⁴	1998	Budapest - Hungary	175	Retrospective	5.7
Rios et al. ⁵	2004	Murcia - Spain	247	Retrospective	5.7
Shen et al. ⁶	2004	San Francisco - USA	60	Retrospective	6.7
Torre et al. ⁷	1995	Genoa - Italy	237	Retrospective	6.8
Hsu et al. ⁸	1996	Sydney - Australia	234	Prospective	7.7
Present Study	2017	London - UK	237	Prospective	8.01
Parra-Membrives et al. ⁹	2003	Seville - Spain	83	Retrospective	9.6
De Perrot et al. ¹⁰	2007	Paris - France	185	Retrospective	9.7
Arici et al. ¹¹	2001	Antalya - Turkey	52	Retrospective	11.5
Ben Nun et al. ¹²	2006	Haifa - Israel	75	Retrospective	12.0
Erbil et al. ¹³	2004	Istanbul - Turkey	170	Retrospective	12.9
Cui et al. ¹⁴	2002	Beijing - China	64	Retrospective	15.6
White et al. ¹⁵	2008	Ann Arbor - USA	115	Retrospective	15.7
Hedayati et al. ¹⁶	2002	Cleveland - USA	116	Prospective	21.6
Pieracci et al. ¹⁷	2007	New York - USA	1153	Retrospective	22.6

Table 2: Rates of occult malignancy within reported series of over 50 patients.

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