ORIGINAL ARTICLE

Ultrasound Guided Fine Needle Aspiration Biopsy of Thyroid Nodules: Our experience at Surayya Azeem Teaching Hospital and Alrazi Healthcare

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ABSTRACT

The aim of this study is to establish efficacy of FNAb of thyroid nodules. This retrospective study was carried out from January 2007 to June 2013. Total of 487 cases were studied who had ultrasound guided thyroid FNA biopsy. The diagnostic yield of initial FNAb was 82.6%, with two out of 13 indeterminate lesions turned out malignant. Sensitivity, specificity, positive predictive value and negative predictive value were 82.7%, 99.7%, 93.3% and 99.3% respectively. Results of our study are quite comparable with other published literature.

Keywords: Ultrasound, FNAb (Fine needle Aspiration biopsy), Nodule, Thyroid

INTRODUCTION

Fine Needle Aspiration Biopsy (FNAB) is the technique of choice for exclusion of malignancy in a thyroid nodule. Ultrasound (US) guided FNAB has an advantage over palpation guided FNAB, as up to 20% of these yield non-diagnostic cytology results[1]. Ultrasound guided thyroid FNAB is considered to be most sensitive and specific diagnostic test in the management of patients presenting with thyroid nodule[5]. We retrospectively reviewed the results of US guided FNAB of thyroid lesions performed without a cytotechnician on site, over a period of five years. The diagnostic efficacy for diagnosis and exclusion of thyroid malignancies was assessed.

MATERIALS AND METHODS

Patients who had undergone US-guided thyroid FNAB between January 2007 and June 2013 were identified. US guided FNAB of thyroid nodules were performed under real-time sonography guidance (using a 7.5MHz ultrasound probe) and a 21G needle. FNAB specimens collected were smeared on 2-4 slides (air-dried and fixed in ethanol) and any residual aspirates were placed in a preservative solution. The nodules were categorized into the following categories by the cytopathologist - benign, suspicious for papillary thyroid carcinoma, malignant, indeterminate, and nondiagnostic.

RESULTS

487 patients (79 males and 408 females) with 603 nodules and a mean age of 51.3 years were analysed (Table 1). Outcomes of all patients are shown in Fig. 1. The diagnostic yield of initial FNAB was 498(82.6%), with 2 out of 13 indeterminate lesions confirmed to be malignant (15.4%) (Table 2). 16 patients with non-diagnostic yield underwent either ultrasound follow-up or further FNAB/excision (Fig. 2). Sensitivity, specificity, +ve predictive value and negative predictive value were 82.3%, 99.7%, 93.3% and 99.3% respectively.

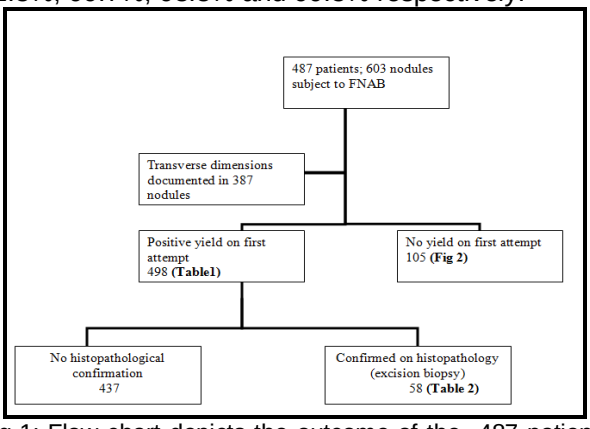

Fig-1:-Flow chart depicts the outcome of the 487 patients and the 603 nodules that were subject to FNAB and included in the study

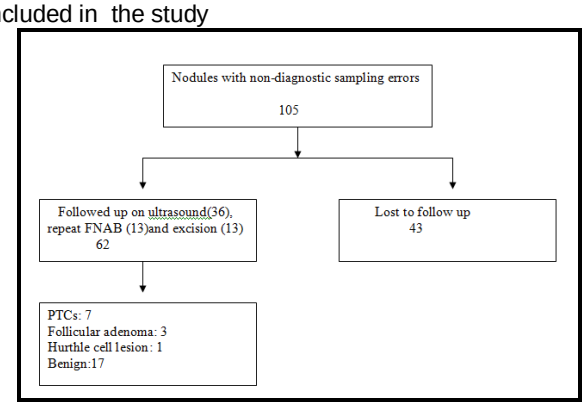

Fig 2: Flow chart depicts the outcome of nodules with non-diagnostic sampling errors on the initial US guided FNAB

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Table 1: Cytology results of 498 nodules with a diagnostic yield on the initial US guided FNAB; PTC: Papillary Carcinoma; *sPTC*: Suspicious for PTC

Cytology	Nodules with FNAB	Nodules with excision biopsy
PTC	14	11
sPTC	4	4
Intermediate	29	13
Benign (inclusive cyst contents)	451(60)	30 (3)
Total	498	58

Table 2: Outcome of the 58 nodules that underwent surgical excision and histopathological evaluation;

FNAB	Histopathology				
	PC	FA	HCA	FC	Benign
PTC(11)	11				
sPTC(4)	3	-	-	-	1
Intermediate (13)	1	2	2	1	7
Benign (30)	2	1	-	-	27

Fig. A

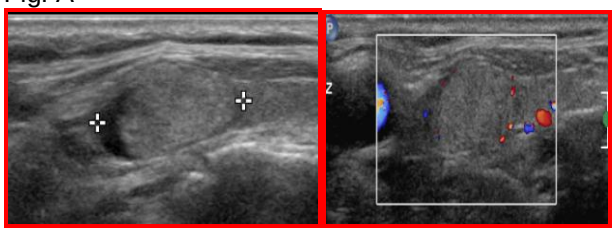
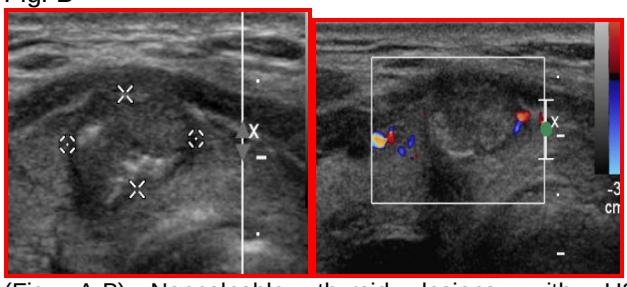
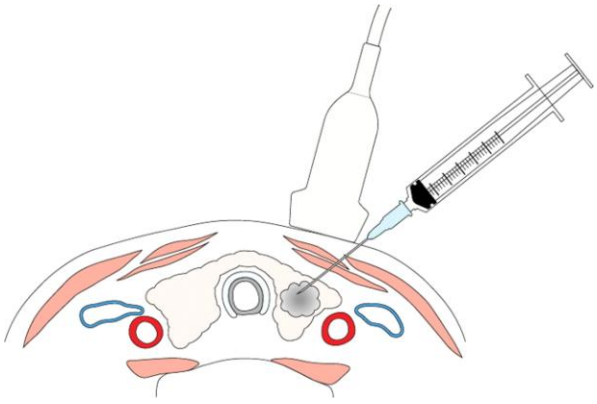
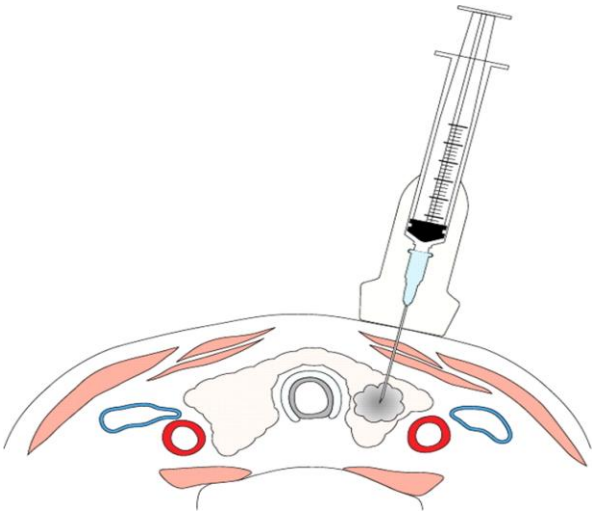


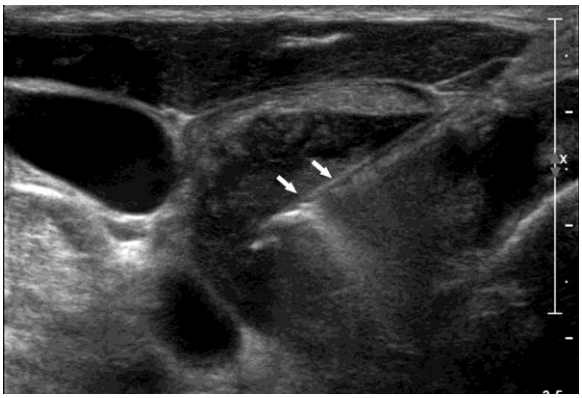
Fig. B



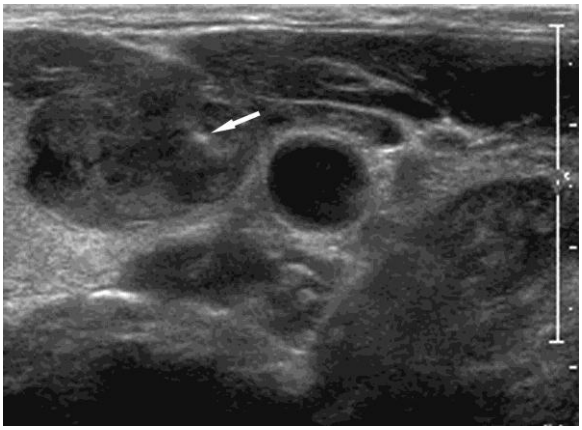
(Fig A-B)---Nonpalpable thyroid lesions with US characteristics of malignancy. images show the following malignant characteristics: microcalcifications, hypoechogenicity; irregular or microlobulated margins , intrinsic vascularity.







Anaplastic carcinoma in an 80-year-old man with a palpable mass in the right thyroid lobe.



Perpendicular positioning of the fine-gauge needle for thyroid nodule biopsy.

DISCUSSION

US is used to screen thyroid nodules for possible FNAB and follow up of benign nodules[6]. Patients referred for FNAB are based on suspicious sonographic features. These include

microcalcifications, marked hypoechogencity (more hypoechoic than strap muscles), taller-than-wide, irregular margins, and intrinsic hypervascularity. Review of the literature shows a higher false negative rates with palpation guided FNAB compared to US guided FNAB[2]. Hatada et al. reported a higher diagnostic accuracy of US guided FNAB compared to palpation guided FNA (68% vs 48%, p <0.05), particularly for nodules <2cm, cystic, or in deep locations[3]. Our diagnostic yield of 82.6% is comparable to studies published[4]

CONCLUSION

Our diagnostic yield of 82.6% is comparable to elsewhere. Cytologically "indeterminate" nodules needs appropriate follow-up as approximately 15% may be malignant.

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