

# Cytological and Histological Correlation of Solitary Thyroid Nodule

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**Objective:** To assess the role of fine needle aspiration cytology (FNAC) in the management of solitary thyroid nodule and to correlate the FNA cytodiagnosis with histopathological results of surgically excised specimens of thyroid. **Design:** It was a retrospective study. **Place and duration of study:** This study was carried out at Jinnah Hospital Lahore in the year 2006. **Patients and methods:** In this period patients files and slides were retrieved from record. Both FNA cytodiagnosis and histopathological results were correlated. **Results:** Out of these 64 cases, 5 cases were diagnosed malignant on histology. These were 2 cases of papillary carcinoma, 2 cases of Non Hodgkin's lymphoma (NHL) and 1 case of follicular carcinoma. 1 case of NHL and 2 cases of papillary carcinoma were correctly diagnosed on FNA. 1 case of NHL was misdiagnosed as benign cystic lesion of thyroid on FNA and 1 case in which cytodiagnosis of hyperplastic colloid nodule/follicular neoplasm was made, turned to be follicular carcinoma on histology. In the remaining 59 benign cases, a wide range of overlap was seen among benign thyroid lesions. **Conclusion:** Despite, the overlap of the spectrum of cytological features of different thyroid lesions, FNA cytological examination of solitary thyroid nodules is strongly recommended.

**Key words:** Hyperplastic. Papillary. Lymphoma.

Solitary thyroid nodule is the common form of thyroid disease. Solitary cold nodule is one of the frequent causes of solitary nodule. The incidence of malignancy in solitary thyroid nodule has been reported from 6.5 to 28 percent<sup>1</sup>. The objective is to identify malignancy, while managing the patient presenting with cold nodule. FNAC is being used on large number of patients to evaluate thyroid nodule with a high degree of accuracy<sup>2</sup>. FNAC is a simple procedure with minimum trauma and almost no complications<sup>3</sup>. Diagnostic sensitivity and specificity are higher to isotope scanning and ultrasound examination in case of thyroid swelling. FNAC with cytological diagnosis offers a rational procedure for planning operation on solitary thyroid nodule. Low percentage of false negative and false positive results can be achieved good aspiration techniques. The purpose of this study was to assess the usefulness and limitations of fine needle aspiration cytology in evaluation and management of solitary thyroid nodule and to correlate its results with histopathological diagnosis.

## Patients and methods

It was a retrospective study carried out at Jinnah Hospital, Lahore in 2006. The histopathological reports and FNA Cytodiagnosis along with slides of respective cases were retrieved from record and were studied simultaneously. Hot and warm nodules were excluded from this study. The patients of both sex and all ages were included in this study. Cytodiagnosis was made after examining the aspiration smears following FNA. Based on the cytological diagnosis on needle aspiration, the nodules were subjected to surgery. The histopathological results of surgically resected specimens of thyroid were correlated with aspiration cytodiagnosis.

## Results

Out of these 64 patients 5 patients (7.8%) were male and 59 patients (92.2%) were female. On FNAC Hyperplastic colloid nodule/follicular neoplasm was diagnosed in 41 cases (64.06%), Benign cystic lesion of thyroid in 20 cases (31.25%). Non Hodgkin's lymphoma (NHL) 1 case (1.56%) and papillary carcinoma in 2 cases (3.13%). The aspiration cytology of follicular neoplasm is not very different from hyperplastic nodule. Because of the lack of definitive cytologic criteria for differentiating follicular neoplasm of thyroid (follicular adenoma/carcinoma) from hyperplastic nodule, the cytodiagnosis of hyperplastic nodule/follicular neoplasm was made in these aspirates. 4 cases (6.25%) had to be subjected to re-aspiration as the first sample was found to be inadequate.

On histology hyperplastic colloid nodule 15 cases (23.4%) follicular adenoma 14 cases (21.9%), multinodular goiter 29 cases (45.3%), Hashimoto's thyroiditis 1 case (1.6%), papillary carcinoma 2 cases (3.1%) NHL 2 cases (3.1) and follicular carcinoma 1 case (1.6%).

Two cases of papillary carcinoma were correctly diagnosed on FNA. One case of follicular carcinoma was diagnosed hyperplastic: colloid nodule/follicular neoplasm on aspiration cytology. Some authors recommend that aspirates from follicular adenomas and carcinomas should be grouped and named as follicular neoplasm on FNA cytology and this cytodiagnosis should be an indication for removal of the nodule. Consequently follicular neoplasm reported by FNA that subsequently proved to be follicular carcinoma on histology should not be regarded as false negative.

One case in which cytodiagnosis of benign cystic lesion of thyroid was made, turned out to be NHL on histology. In this case, aspiration failed to sample the wall

of cyst and aspirate was diluted by cyst fluid mixed with blood. The results of aspiration cytology and histopathology of thyroid nodule are shown in table. There was therefore only one false negative case in this series. No false positive case was seen.

Table: Results of aspiration cytology and histopathology

<b>Malignant on histology</b>	05
<b>Cytological diagnosis</b>	
*Total malignant	04
True positive	04
False positive	0
*False negative	1

### Discussion

In this study, the sensitivity for the thyroid lesion was 80% and specificity was 100%. The diagnostic sensitivity in case of thyroid reported in literature ranges widely from 43 to 100% and specificity ranges from 47 to 100%<sup>4</sup>. Factors contributing to this broad range of sensitivity and specificity include handling of suspicious cases, technique of aspiration and interpretation of cytological smears. The complications of aspiration cytology as hematoma formation or bleeding<sup>5</sup> were not seen in this series. Although a degree of overlap was observed in benign thyroid lesions including hyperplastic colloid nodules and follicular neoplasms and one case of NHL was misdiagnosed as benign cystic lesion of thyroid, the remaining aspirates were correctly labeled as benign or malignant.

There are certain limitations of aspiration cytology. It is not possible to distinguish between a follicular adenoma and well differentiated follicular carcinoma on aspiration. The cytological profiles of these two conditions follicular adenoma and follicular carcinoma overlap to the extent of making such distinction unreliable on cytological grounds only. These lesions can be differentiated with certainty only after examining the capsular and vascular invasion in

surgically resected specimen. Most colloid nodules, papillary and anaplastic carcinoma, can be identified on aspiration. "Cysts" are well recognized diagnostic pitfall in FNA cytology of thyroid, as a diversity of thyroid lesions can exhibit cystic degeneration which appear as solitary cold nodules on radioisotope scans. These include multinodular goiter, follicular adenomas and papillary carcinoma<sup>6</sup>. It is the clinically solitary, non toxic (cold) thyroid nodule which has usually been a strong indication for surgery because it is considered to be a highly suspicious sign of carcinoma. Due to the frequent occurrence of cystic degeneration in a diversity of thyroid lesions, both benign and malignant, any "recurrent cyst" should be excised surgically for correct diagnosis. FNAC provides a definite plan for the surgery. The patient acceptance is excellent. FNAC has a low complication rate. It is also, a rapid and relatively inexpensive procedure<sup>7</sup>.

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