



CODEN [USA]: IAJPB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.2094128>Available online at: <http://www.iajps.com>

Research Article

**IMPORTANCE AND RELIABILITY OF FINE NEEDLE ASPIRATION
CYTOLOGY (FNAC) FOR THE DIAGNOSIS OF MULTINODULAR
GOITER AND SOLITARY THYROID NODULE**¹Dr.Fizzah Shahid, ²Dr.Almas Adil, ³Dr.Mishaal Naseem¹Gujranwala Medical College²Quaid -e-Azam medical college Bahawalpur³Central Park Medical College**Abstract**

Objective: To evaluate the role of FNAC in the early management and treatment of multinodular goitre with solitary thyroid nodules and dominant nodules.

Study Design: A Case Series.

Configuration and duration: In the Surgical Unit II of Services Hospital Lahore for one year duration from June 2017 to June 2018.

Methodology: 90 patients were selected for the analysis, but in 10 patients FNAC aspirate was not adequate and these patients were not included in the study and 20 patients underwent surgery. Previously, we examined routine investigations and physical examination, Thyroid profile and radioisotopes (Tc-99) thallium scan. Patients with multinodular or solitary cold nodules were selected for the analysis. In all multinodular dominant nodules or solitary nodules performed with FNAC. The preoperative diagnosis of FNAC was compared with the histopathological findings of the surgical specimens.

Results: 60 operated patients had histological findings for comparison with FNAC results statistically. Fnac was benign 51 (84.23%) and in 11 (17.06%) malignant. 30 patients (51%) were of Hashimoto thyroiditis and subacute thyroiditis and 3 (5%) follicular adenoma, 8 (13.33%) as nodular goiter, 9 (15%). In the 10 patients in the malignant patient group, 2 (3.33%), undifferentiated carcinoma, lymphoma and 2 (3.33%) papillary thyroid carcinoma 1 (1.66%), follicle carcinoma, five (8 was 33%). There were malignant lesions in 11 (17.93%) and 50 (82.06%) benign lesions. Comparison of FNAC histopathological findings shows 3 false negative results and 2 false positive results. For the detection of malignant and malignant thyroid nodules, fnac showed 96.6% accuracy in dominant thyroid, 75%, specificity and 95.83% sensitivity, negative predictive value 81.81% and 93% positive predictive value.

Conclusion: Due to high sensitivity and specificity, in the diagnosis FNAC may play an important role in the treatment planning of dominant nodules and solitary thyroid nodules in multinodular goiter.

Key Words: FNAC, Multinodular Goitre, Thyroid Nodule.

Corresponding author:**Dr.Fizzah Shahid,**

Gujranwala Medical College

QR code



Please cite this article in press Fizzah Shahid et al., **Importance And Reliability Of Fine Needle Aspiration Cytology (Fnac) For The Diagnosis Of Multinodular Goiter And Solitary Thyroid Nodule.**, Indo Am. J. P. Sci, 2018; 05(12).

INTRODUCTION:

The thyroid disease prevalence is common in Pakistan and presents an important diagnostic dilemma for the surgeon who treats thyroid nodules. Otherwise, a separate inflammation in non-implanted glands is considered a clinically multinodular dominant gland. In the United States, the incidence of clinically diagnosed thyroid nodules is 5-7% and the approximately 0.1% annual incidence. The approximately developing of the palpable thyroid nodule risk is approximately 11%. Each year, thyroid nodules are diagnosed approximately 275,000 but 1,400 thyroid cancer is detected only. Although in women thyroid nodules are common, in males thyroid nodules are mostly malignant than women. Under 20 years of age patients, Nodules tend to be malignant and also in above 60 years of age. Thyroid carcinomas estimate approximately 2% of total malignancies, about 1.5% in females and 0.5% in males. Methods such as ultrasound and radio isotope scanning are widely used, but the functional status of the nodule is not fully evaluated from these investigations. Most of the cold nodules, which account for about 9% of the nodules, being malignant in 5%. Franzen and Soderstorm used FNAC in the detection of thyroid disease in the 1950s and 1960s for the first time. The aim of this analysis was to evaluate the FNAC role in early multinodular nodules of thyroid nodules and goitre for early diagnosis and appropriate treatment line.

MATERIALS AND METHODS:

This Case Series was conducted in In the Surgical Unit II of Services Hospital Lahore for one year duration from June 2017 to June 2018. Ninety patients presented with enlarged thyroid gland. The total number of patients were 60 in the last study group. All patients had a complete physical examination and medical history, radioisotope (Tc-99) scan and hormonal analysis (serum T3, T4 and TSH) . Only cold nodules were shown or multinodular patients were included in the analysis. In all multinodular dominant nodules and solitary nodules FNAC was performed. FNAC was performed in OPD procedure or accepted cases room. Patients were classified only in patients with thyroid nodules or multinodular goiter according to preoperative clinical diagnosis. The preoperative clinical diagnosis was confirmed by histopathological findings of FNAC and operative specimens. Surgical specimens were sent for histopathology in all operated patients.

RESULTS:

Ninety patients were included in this study, but 10 were unsatisfactory and 20 patients were not selected for the analysis. In the final analysis was the total number of cases were 60.

Age (Yrs.)	Male	Female	Total	%
10-20	1	7	8	13.3
21-30	3	17	20	33.3
31-40	1	11	12	20
41-50	2	12	14	23.3
51-60	0	3	3	5
61-70	1	2	3	3
Total	8	52	60	100%

Table I. Age and Sex distribution

Table 1 shows the distribution by age and gender. Only 60 patients were operated and there was histopathological correlation in Table II. According to histopathological diagnosis, specificity, sensitivity, positive and negative predictive value were calculated statistically for all malignancies. On FNAC was 51 (82.93%) benign cases and 11 (17.06%) cases were malignant Table III. 30 patients (51%) were Hashimoto thyroiditis subacute thyroiditis and 3 (5%) follicular adenoma, 8 (13.33%) as nodular goiter, 9 (15%). In the 10 patients in the malignant patient group, 2 (3.33%), undifferentiated carcinoma, lymphoma and 2 (3.33%) papillary thyroid carcinoma 1 (1.66%), follicle

carcinoma, five (8 was 33%). 49 (81.66%) benign lesions and 12 (19.03%) malignant lesions diagnosed histopathologically Table II.

Table II. Histopathological diagnosis (n=60)

Diagnosis	Histopathological Diagnosis	FNAC Findings
Benign	49 (81.66%)	50 (83.33%)
Nodular goiter	29 (48.33%)	30 (50.00%)
Follicular adenoma	9 (15.00%)	9 (15.00%)
Subacute thyroiditis	7 (11.66%)	8 (13.33%)
Hashimoto's thyroiditis	4 (6.66%)	3 (5.00%)
Malignant	11 (18.33%)	10 (16.66%)
Follicular carcinoma	5 (8.33%)	2 (3.33%)
Papillary carcinoma	4 (6.66%)	5 (8.33%)
Undifferentiated carcinoma	1 (1.66%)	1 (1.66%)
Lymphoma	1 (1.66%)	2 (3.33%)

FNAC histopathological findings Comparison revealed three false negative results and two false positive results.

Diagnosis	FNAC Diagnosis	Histopathological
False Positive=2	Papillary carcinoma-1	Nodular goiter
	Lymphoma-1	Hasimoto's thyroiditis
False Neagative=3	Subacute thyroiditis-1	Follicular carcinoma
	Nodular goiter-2	Follicular carcinoma

Table III. Correlation of FNAC & Histopathological Findings

Table III. The dominant thyroid fnac for diagnosis of malignant and malignant thyroid nodules shows statistical analysis of individual malignancies in 96% accuracy, 75%, specificity and sensitivity of 95.83. Negative predictive value was 93% and positive predictive value 81.81%.

Thyroid Disease	Sensitivity	Specificity	PPV	NPV
Follicular Carcinoma	62.50%	100%	100%	94.82%
Papillary Carcinoma	100%	98.24%	80%	100%
Undifferentiated Carcinoma	100%	100%	100%	100%
Lymphoma	100%	98.33%	50%	100%

DISCUSSION:

Fine needle aspiration cytology (FNAC) is a well-known technique for the preoperative examination of thyroid nodules. This technique is an almost non-invasive, cost-effective method to differentiate benign and malignant thyroid nodules. Many investigators have shown that the most sensitive and low-cost specific research in cytology with fine needle aspiration is the nodules of the cold thyroid method. FNAC is a sensitive and highly specific method for evaluating thyroid nodules for malignancy.^{13,14} FNAC of the thyroid nodule has been reported to have a sensitivity range of 65-98% and a specificity range of 72% to 100%. . . Nggada showed 94.2% accuracy, 88.9% sensitivity and 96.1% specificity, and suggested that FNAC was more specific than sensitivity to detect malignant thyroid tumors. In this study, 96.8% accuracy showed 75% sensitivity, 95.83% specificity, 81.81% positive predictive value and 93.81% negative predictive value. In contrast to this study, which has a sample size smaller than 60 cases, Godinho-Matos reported 83.3% FNAC accuracy, 73.3% sensitivity, 100% specificity and positive predictive value in his study of 144 cases. Morgan's study of 253 patients accounted for 69.2% of 69.2% of the negative predictive value, while FNAC had a general sensitivity of 55.0% and specificity of 73.7% in the detection of thyroid neoplasms. Our results are similar to other international studies, suggesting that FNAC is more sensitive to the detection of malignant thyroid neoplasms and therefore should not be exaggerated by a reliable diagnostic test. There are many local data on the subject.

CONCLUSION:

Due to its high sensitivity, accuracy and specificity, FNAC can play an important role in the planning and treatment of dominant nodules and solitary thyroid nodules in multinodular goiter. Expert hands are profitable and complex.

REFERENCES:

1. Sirry, Mohammed A., Elsayed M. Abdelwahab, Heba T. Abdelaziz, and Maher F. Badr. "A study of correlation of fine-needle aspiration cytology with postoperative histopathological examination in patients with either solitary thyroid nodule or multiple nodules." *The Scientific Journal of Al-Azhar Medical Faculty, Girls* 2, no. 2 (2018): 41.
2. Pompili, Giovanni Guido, Silvia Tresoldi, Anna Ravelli, Alessandra Primolevo, Giovanni Di Leo, and Gianpaolo Carrafiello. "Use of the ultrasound-based total malignancy score in the management of thyroid nodules." *Ultrasonography* 37, no. 4 (2018): 315.
3. Kim, Bo Hyun, Seong Jang Kim, Mijin Kim, Sang-Woo Lee, Shin Young Jeong, Kyoungjune Pak, Keunyoung Kim, and In Joo Kim. "Diagnostic performance of HMG2 gene expression for differentiation of malignant thyroid nodules: A systematic review and meta-analysis." *Clinical endocrinology* (2018).
4. Sinhasan SP, Harthimath BC, Nandini S. Patterns of Thyroid Disorders Diagnosed on Cytology with Histopathological Correlation in A Tertiary Care Hospital in South India-A Retrospective Study. *PARIPEX-INDIAN JOURNAL OF RESEARCH*. 2018 Feb 17;5(9).
5. Liu, Y., Yuan, L., Yang, D. and Jin, Y., 2018. Serum calcitonin negative mixed medullary-follicular carcinoma initially diagnosed as medullary thyroid carcinoma by fine-needle aspiration cytology: A case report and review of the literatures. *Diagnostic cytopathology*.
6. de Koster, Elizabeth J., Lioe-Fee de Geus-Oei, Olaf M. Dekkers, Ilse van Engen-van Grunsven, Jaap Hamming, Eleonora PM Corssmit, Hans Morreau et al. "Diagnostic utility of molecular and imaging biomarkers in cytological indeterminate thyroid nodules." *Endocrine reviews* 39, no. 2 (2018): 154-191.
7. Kim, S.J., Lee, S.W., Jeong, S.Y., Pak, K. and Kim, K., 2018. Diagnostic Performance of Technetium-99m Methoxy-Isobutyl-Isonitrile for Differentiation of Malignant Thyroid Nodules: A Systematic Review and Meta-Analysis. *Thyroid*, 28(10), pp.1339-1348.
8. Akhter, Tayyiba, Khubaib Shahid, and Usman Afzal. "Diagnostic Accuracy of Ultrasound U Classification System of Thyroid Ultrasound in Predicting Thyroid Malignancy by Using Histopathology as Gold Standard." *Annals of PIMS-Shaheed Zulfiqar Ali Bhutto Medical University* 14, no. 3 (2018): 222-226.
9. Menon, Shalini S., Priyanka Tandon, Balakrishnan Ramaswamy, and Kailesh Pujary. "A Retrospective Study to Assess the Role of Using Fine Needle Aspiration Cytology and Frozen Section in the Diagnosis of Thyroid Swelling." *Indian Journal of Otolaryngology and Head & Neck Surgery* 70, no. 4 (2018): 471-476.
10. Gupta, Nalini, Parikshaa Gupta, and Arvind Rajwanshi. "Trucut/Core biopsy versus FNAC: Who wins the match? thyroid lesions and salivary gland lesions: An overview." *Journal of cytology* 35, no. 3 (2018): 173.
11. Agrawal S, Mohanty P, Mohanty R. COMPARISON OF DIAGNOSTIC EFFICACY BETWEEN CONVENTIONAL

- CYTOPATHOLOGY & LIQUID BASED CYTOLOGY IN THYROID FNA SMEARS USING BETHESDA SYSTEM OF REPORTING. *Journal of Evidence Based Medicine and Healthcare*. 2018 Jan 1;5(9):790-4.
12. Manchanda, G. S., Alok Mohan, Nupur Garg, R. K. Thakral, Shafira Bharti, Veena K. Sharma, and Rajnish Kumar. "Comparative Study of Aspiration and Non Aspiration Techniques in Diagnosis of Thyroid Lesions." *Indian Journal of Public Health Research & Development* 9, no. 3 (2018).
 13. Kaur, Jasmine, Sonam Sharma, Tejinder Singh Bhasin, Ranjan Agarwal, and Rahul Mannan. "A rare incidental case of an occult breast carcinoma micrometastasis in papillary thyroid carcinoma: A view within a view." *Thyroid Research and Practice* 15, no. 3 (2018): 142.
 14. Todsen, T., Melchior, J., Charabi, B., Henriksen, B., Ringsted, C., Konge, L. and von Buchwald, C., 2018. Competency-based assessment in surgeon-performed head and neck ultrasonography: A validity study. *The Laryngoscope*, 128(6), pp.1346-1352.
 15. Trimboli, Pierpaolo, Gaetano Paone, Giorgio Treglia, Camilla Virili, Teresa Ruberto, Luca Ceriani, Arnoldo Piccardo, and Luca Giovanella. "Fine-needle aspiration in all thyroid incidentalomas at 18F-FDG PET/CT: Can EU-TIRADS revise the dogma?" *Clinical endocrinology* 89, no. 5 (2018): 642-648.