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CORRELATION OF FINE NEEDLE ASPIRATION CYTOLOGY WITH HISTOPATHOLOGICAL DIAGNOSIS IN THYROID LESIONS

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ABSTRACT

Introduction: Thyroid lesions are easily accessible for Fine needle aspiration cytology (FNAC). FNAC is very safe and simple rapid process to rule out malignancies. Since majority of thyroid lesions are benign and require simple excision of the tumor, FNAC may be a cost effective method for the diagnosis of thyroid lesions. The aim of present study is to evaluate sensitivity, specificity and predictive value of FNAC in Thyroid lesions. Material and method: The present study is retrospective analysis of FNAC of 120 patients who were operated for biopsy and Histopathological diagnosis. Result and conclusion: Patients ranging from 20 to 70 years show that majority of patients fall between 21 to 30 years and majority of patients were female. Male to female ratio was 1:4. Histopathological diagnosis in majority of cases was follicular adenoma followed by colloid adenoma. By FNAC most of the patients were diagnosed as follicular adenoma followed by Colloid adenoma and Hashimoto's / lymphocytic thyroiditis. Papillary carcinoma and follicular carcinoma was suspected in 8.33% and 5.0% patients respectively. Correlating the FNAC diagnosis with Histopathology reveals accuracy in follicular adenoma 89.2%, in colloid adenoma 87%, in papillary carcinoma 80% and in follicular carcinoma 83.3%. Overall concordance was found to be 86.66%. Sensitivity of FNAC calculated was 76.7% and Specificity was 97.08% hence positive predictive value was 81.25% and negative predictive value was 96.15%. FNAC is a very reliable, rapid and accurate procedure to differentiate a malignant lesion from a benign.

KEYWORDS: Thyroid lesions, FNAC, Sensitivity, specificity, predictive value.

INTRODUCTION

Thyroid lesions usually present with swelling in neck region. The prevalence of thyroid nodules ranges from 4% to10% in the general adult population and from 0.2% to 1.2% in children.[1] The majority of clinically diagnosed thyroid nodules are nonneoplastic; only 5%–30% are malignant and require surgical intervention.[2]

Many conditions of thyroid swelling may be managed by medical treatment while many others require surgical intervention. Fine needle aspiration cytology is a very safe simple and rapid method of diagnosis and a valuable adjunct to preoperative evaluation of thyroid lesions.[3][4]

Since swelling neck is easily accessible site FNAC has proved to be a very cost effective method for the diagnosis of thyroid lesions. However, Fine needle Aspiration has certain limitations like inadequacy of specimen, mixing of blood, cystic fluid etc.[5]

The present study has been carried out to correlate the cytological accuracy with the Histopathological diagnosis in thyroid lesions. The aim is to analyze the false positive and false negative diagnosis so that the pitfalls of FNAC and probable reasons for the same can be discussed

MATERIAL AND METHOD

The present study is a retrospective analysis of 120 cases selected which were operated for biopsy and Histopathological examination was done at Gupta clinical laboratory during January 2013 to December 2015. Clinical details were noted and FNAC was performed by 22 gauge needle and 10 ml syringe. Material obtained was spread over slides, stained by May Grunwald Giemsa stain and examined under microscope for the types of cells, pattern of arrangement, nuclear and cytoplasmic abnormalities, secretions, inflammatory infiltrate etc. Cystic fluid material aspirated was centrifuged and sediment obtained was smeared over slide, stained by Mc Grunwald Giemsa stain and examined under microscope.

Corresponding Biopsy specimen of same patients were processed by Microwave Rapid tissue processor for routine Histopathological examination. Haematoxylin and Eosin stained slides were examined under microscope for diagnosis.

Patients of both sexes and all age groups were included in the study. Correlation of histopathological findings was performed with FNAC. Age, sex distribution, Sensitivity, specificity and diagnostic accuracy of FNAC was analysed.

RESULTS

During the period from January 2013 to December 2015 total number of FNAC thyroid was 286 at Gupta clinical lab. Of 286 patients, we received resected biopsy specimen of 120 patients.

Age of patients ranges from 20 to 70 years. Median age calculated was 42.2 years. Majority of patients fall between 21 to 30 years. Majority of patients were female (80%). Male to female ratio was 1:4.

Majority of patients presented with single nodular mass. Few patients present with diffuse enlargement of thyroid glands. Aspirated material was blood mixed in majority of cases and dark brown fluid was aspirated in cystic lesions varying from 0.5 to 15 ml.

Histopathological diagnosis in majority of cases was follicular adenoma (46.6%) and colloid adenoma in 25.8% cases. 13.3% patients were diagnosed as Hashimoto's thyroiditis / lymphocytic thyroiditis. Papillary carcinoma was diagnosed in 8.3% patients and follicular carcinoma was diagnosed in 5.8% patients.

By FNAC majority of the patients were diagnosed as follicular adenoma (48.3%). Colloid adenoma was concluded in 25.8% patients. Hashimoto's / lymphocytic thyroiditis were suspected in 12.5% patients. Papillary carcinoma and follicular carcinoma was suspected in 8.33% and 5.0% patients respectively.

Correlating the FNAC reports with Histopathological diagnosis leads to accuracy in follicular adenoma 89.2%. Accuracy in colloid adenoma was 87%. Accuracy in papillary carcinoma could reach to 80% while in follicular carcinoma accuracy was 83.3%.

Overall concordance was found to be 86.66%. False positive diagnosis of papillary carcinoma was given in 20% patients.

Sensitivity of FNAC calculated was 76.7% and Specificity was 97.08% hence positive predictive value was 81.25% and negative predictive value was 96.15%.

Table: 1 Age and sex distribution of Thyroid lesion

Age group	Total		Follocular adenoma		Colloid adenoma		Hashimoto's thyroiditis		Papillary carcinoma		Follocular carcinoma	
years	M	F	M	F	M	F	M	F	M	F	M	F
11-20	4	19	0	6	3	8	1	3	0	0	0	2
21-30	9	39	5	24	3	8	1	5	0	1	0	1
31-40	7	18	2	8	1	4	2	3	1	2	1	1
41-50	3	15	2	5	0	4	0	1	1	3	0	2
51-60	1	3	1	3	0	0	0	0	0	0	0	0
>60	0	2	0	0	0	0	0	0	0	2	0	0
Total	24	96	10	46	7	24	4	12	2	8	1	6

Table: 2. FNAC and Histopathological correlation

Histopathological diagnosis	Cytological diagnosis					
	Follocular adenoma	Colloid adenoma	Hashimoto's thyroiditis	Papillary carcinoma	Follocular carcinoma	Total
Follocular adenoma	50	4	1	0	1	56
Colloid adenoma	3	27	0	1	0	31
Hashimoto's thyroiditis	1	0	14	1	0	16
Papillary carcinoma	2	0	0	8	0	10
Follocular carcinoma	2	0	0	0	5	7
Total	58	31	15	10	6	120

Table: 33. Statistical analysis for carcinoma thyroid by FNAC

FNAC diagnosis	Histopathological diagnosis		Total
	Positive	Negative	
Positive	13	3	16
Negative	4	100	104
Total	17	103	120

DISCUSSION

Fine needle aspiration cytology (FNAC) is regarded as a gold standard in the initial diagnosis of thyroid nodules. It is simple, reliable, time saving, minimally invasive and cost effective[6][7] With certain limitations it has been found very sensitive to distinguish benign and malignant

lesions of thyroid.[8] In the present study age of the patient ranges from 20 to 70 years with the mean of 42.2 years. Male to female ratio was 1:4. Other studies also have reported vary similar values.[9][10][11][12]

The Sensitivity and specificity of FNAC in our study was 76.7% and 97.08 respectively. Sensitivity and specificity in another study by Cusick et al they were 76% and 69%, respectively,[13] 93.5% and 75%, respectively, in a study by Bouvet et al.[12] and 79% and 98.5% respectively, in a study by Kessler et al.[14] As FNAC is mainly aimed to rule out malignancy, it should have a low false-negative rate, acceptable sensitivity and specificity for detection of malignancy and high negative predictive value. The reported sensitivity of thyroid FNA ranges from 65% to 99% and its specificity from 72% to 100%[15][16][17] The determinant factors for wide range of difference could be number of cases, the included diagnostic categories and how the cytopathologist classifies the suspicious lesions. High specificity signifies the use of FNAC for preoperative evaluation of thyroid swellings.

The positive predictive value in our series was 81.25% compared to 85.7–98.6% in other studies[18],[19] and.[20] The negative predictive value in our series was 96.15% as compared to 91.8–94% in similar studies in literature[21],[19] and[20]

Misinterpretation was seen in papillary carcinoma in Fine needle aspiration cytology, however we were able to distinguish malignancy of the lesion from its benign counterpart. Lymphocytic and Hashimoto's thyroiditis could be easily diagnosed and not missed by FNAC. The study also emphasize that nuclear features are important to identify malignant lesions. Many times cystic fluid may affect the cellularity but nuclear features are helpful in diagnosis. Although, fine-needle biopsy is the best predictor of malignancy in either cystic or solid thyroid lesions, but it is slightly less reliable when a thyroid lesion is cystic rather than solid.[22]

CONCLUSION

FNAC is a very reliable, rapid and accurate procedure to differentiate a malignant lesion from a benign with certain pitfalls which should be kept in mind while reporting. Since in most cases cells are mixed with blood, several smears should be examined meticulously. Care should be taken while reporting cystic lesions because of low cellularity. In spite of certain pitfalls and misleading diagnosis, FNAC should be considered as routine preoperative investigation.

REFERENCES

1. Ridgway EC. The Thyroid: A Fundamental and Clinical Text. Philadelphia, Pa, USA: G. B. Lippincott. Clinical evaluation of solitary thyroid nodules, 1986; 1377–1385.
2. Bakhos R, Selvaggi SM, DeJong S, et al. Fine needle aspiration of the thyroid: rate and causes of cytopathologic discordance. Diagn Cytopathol, 2000; 23(4): 233–237.
3. M. Amrikachi, I. Ramzy, S. Rubenfeld, T.M. Wheeler. Accuracy of fine-needle aspiration of thyroid, Arch Pathol Lab Med, 2001; 125: 484–488.
4. Oertel YC. Fine-needle aspiration and the diagnosis of thyroid cancer. Endocrinology and Metabolism Clinics of North America. 1996; 25(1): 69–91.
5. G. Sangalli, G. Serio, C. Zampatti, M. Bellotti, G. Lomuscio. Fine needle aspiration cytology of the thyroid: a comparison of 5469 cytological and final histological diagnoses Cytopathology, 2006; 17: 245–250.
6. G. Jayaram, Papillary carcinoma. Atlas and text of thyroid cytology. Arya publications, New Delhi, 2006; 35–48.
7. S. Smeds, S. Lennquist, The role of aspiration cytology in the management of thyroid nodules. Eur J Cancer Clin Oncol, 1988; 24(2): 293–297.
8. S.K. Kumar, T. Seetharamaiah, D. Rampure, C. Ramakrishna, R.Y. Devi Thyroid Nodule: cytohistological Correlation. Scholar J Appl Med Sci., 2013; 1: 745–747.
9. Sharma chetna, Diagnostic accuracy of fine needle aspiration cytology of thyroid and evaluation of discordant cases, Journal of the Egyptian National Cancer Institute, September, 2015; 27(3): 147–153
10. Manoj Gupta, Savita Gupta, Ved Bhushan Gupta, Correlation of Fine Needle Aspiration Cytology with Histopathology in the Diagnosis of Solitary Thyroid Nodule, J Thyroid Res., 2010; 2010: 379051.
11. Dorairajan N, Jayashree N. Solitary nodule of the thyroid and the role of fine needle aspiration cytology in diagnosis. Journal of the Indian Medical Association, 1996; 94(2): 50–52.
12. Bouvet M, Feldman JI, Gill GN, et al. Surgical management of the thyroid nodule: patient selection based on the results of fine-needle aspiration cytology. Laryngoscope, 1992; 102(12): 1353–1356.
13. Cusick EL, MacIntosh CA, Krukowski ZH, Williams VMM, Ewen SWB, Matheson NA. Management of isolated thyroid swelling: a prospective six year study of fine needle aspiration cytology in diagnosis. British Medical Journal, 1990; 301(6747): a318–321.
14. Kessler A, Gavriel H, Zahav S, et al. Accuracy and consistency of fine-needle aspiration biopsy in the diagnosis and management of solitary thyroid nodules. Israel Medical Association Journal, 2005; 7(6): 371–373.
15. N.P. Caraway, N. Sneige, N. Samaan. Diagnostic pitfalls in thyroid fine-needle aspiration: a review of 394 cases Diagn Cytopathol, 1993; 9: 345–350.
16. M.K. Sidawy, D.M. Del Vecchio, S.M. Knoll. Fine-needle aspiration of thyroid nodules: correlation between cytology and histology and evaluation of discrepant cases Cancer, 1997; 81: 253–259.
17. H. Gharib, J.R. Goellner. Fine needle aspiration biopsy of the thyroid: an appraisal Ann Intern Med., 1993; 118: 282–289.

18. G. Sangalli, G. Serio, C. Zampatti, M. Bellotti, G. Lomuscio... and final histological diagnoses. Cytopathology, 2006; 17: 245–250.
19. E.A. Sinna, N. Ezzat. Diagnostic accuracy of fine needle aspiration cytology in thyroid lesions J Egypt Natl Cancer Inst, 2012; 24: 63–70.
20. P.B. Jarwani, S. Patel. Fine-needle aspiration cytology (FNAC) of the thyroid: a cytohistologic correlation with critical evaluation of discordant cases GCSMC J Med Sci, 2013; 2: 5–12.
21. R. Borgohain, R.K. Lal, P. Chatterjee, N. Brahma, S. Khanna. A study of cyto-histological correlation in the diagnosis of thyroid swelling IOSR J Dent Med Sci., 2014; 13(11): 46–49.
22. E.T. de los Santos, S. Keyhani-Rofagha, J.J. Cunningham, E.L. Mazzaferr. Cystic thyroid nodules. The dilemma of malignant lesion Arch Intern Med., 1990; 150: 1422–1427.