Original Research Article

DOI: http://dx.doi.org/10.18203/2349-2902.isj20181139

Diagnostic accuracy of fine needle aspiration cytology in thyroid swellings with histopathological correlation

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Received: 12 February 2018 **Accepted:** 09 March 2018

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ABSTRACT

Background: Thyroid swellings are common in India. It is important to differentiate malignant from benign thyroid swellings for definitive planning of appropriate surgery. This study is undertaken to study sensitivity and specificity of FNAC in diagnosis of thyroid swellings by comparing preoperative FNAC with postoperative histopathology. **Methods:** A total of 156 patients with thyroid swellings were evaluated for a period of three years. Pre-operatively FNAC was done and was compared with post-operative histopathology and sensitivity and specificity of FNAC was studied.

Results: Thyroid swellings are more common in females. In present study of 156 thyroid swellings, 90.38% cytologies were benign while 7.05% were malignant and 2.56% were suspicious for malignancy. Sensitivity of FNAC for malignant lesions was 93.75% and specificity was 100%.

Conclusions: FNAC with its very high specificity, and diagnostic accuracy approaching 100% can help to rule out malignancy in most of thyroid swellings and prevent unnecessary surgeries.

Keywords: Fine needle aspiration cytology, Histopathology, Thyroid swellings

INTRODUCTION

Thyroid swellings are more common in India. Thyroid swellings can be benign as well as malignant. It is very important to differentiate malignant thyroid swellings from benign swellings preoperatively for planning of appropriate surgery and relevant patient counselling. FNAC is a simple, speedy, safe, cost effective and accurate technique being used worldwide. Diseases of thyroid gland especially multinodular goitre due to iodine deficiency are prevalent in India. Majority of these nodules are benign and may not require surgery. Hence the main aim is to distinguish between benign and malignant thyroid swellings. For this preoperative FNAC and postoperative histopathological report was correlated to evaluate sensitivity and specificity of FNAC in diagnosis of thyroid swellings.

The present study was undertaken to study epidemiological factors, clinical presentation and assess the pattern of pathological outcomes in patients with thyroid swellings coming to Department of surgery in Dr. D. Y. Patil Medical College, Kolhapur over a period of three years. The main aim is to evaluate accuracy of preoperative FNAC in thyroid swellings by correlating with postoperative histopathological report.

METHODS

A total of 156 patients with thyroid swellings were evaluated for a period of three years from August 2014 to July 2017. All patients were evaluated in detail including age, sex, residence, history and duration of illness, hypo, or hyperthyroid or euthyroid status, pressure symptoms,

any history of radiation and any associated symptoms, along with detailed clinical examination.

Inclusion criteria

- All patients with thyroid swellings coming to Department of Surgery Dr. D.Y. Patil Medical College, Kolhapur.
- Patients between age group of 20 years to 60 years.
- Patients in whom both FNAC and surgery was performed.

Exclusion criteria

- Patients of age less than 20 years.
- Patients in whom surgery was not done.
- Patients in whom FNAC was inconclusive or nondiagnostic.

All patients undergoing FNAC were divided into benign, suspicious of malignancy and malignant. The FNAC reports were compared with histpathological reports.

RESULTS

Majority of patients were in age group 31-40 (33.33%) (Table 1). Also, neoplastic lesions were most commonly seen in age group 41-50 in males and 21-30 years in females.

Table 1: Age wise distribution of patients.

Age in years	No of patients	Percentage
20-30	34	21.79%
31-40	52	33.33%
41-50	42	26.92%
51-60	28	17.94%

In this study out of 156 patients, 133 were females (85.26%) and 23 were males (14.74%). The male to female ratio for thyroid swellings was 1:5.78. FNAC findings were divided into three categories benign, malignant and suspicious of malignancy (Table 2).

Table 2: Cytological break up of cases (FNAC).

FNAC findings	No. of cases
Benign	141
Malignant	11
Suspicious of malignancy	04
Total	156

In this study 90.38% cytologies were benign, 7.05% were malignant and 2.56% were suspicious of malignancy. Most of benign lesions were colloid goitre, while malignant were follicular and papillary neoplasms. In benign, FNAC correlated with histopathology in 140 cases out of 141 cases (diagnostic accuracy 99.29% in

benign cases). While in one case it turned out to be malignant on histopathology.

Table 3: Correlation of preoperative FNAC and postoperative histopathological findings.

FNAC classification	No. of patients	Histopathology findings	
Classification		Benign	Malignant
Benign	141	140	01
Suspicious of malignancy	04	-	04
Malignant	11	-	11

In malignant cases out of 15 cases (Table 3) FNAC was suspicious of malignancy in 4 and was malignant in 11 cases. In all cases it turned out to be malignant on histopathology, except for one in which FNAC was benign and histopathology was malignant (false negative).

DISCUSSION

In this series maximum patients were in age group 31-40, which collaborates with the literature and as reported by Sengupta et al.⁴ In a study by Kamal et al in 2002, 86.5% of patients were females which was similar to our study where 85.26% were females while in a study by Afroze, 71.76% of patients were females.^{5,3}

In the present study we evaluated the ratio of comparison of neoplastic to non-neoplastic lesions on FNAC as 1:9.61, whereas in reports of Safirullah et al and Kamal et al, the ratio of neoplastic to nonneoplastic lesions on FNAC were 1:7.6 and 1:7.2 respectively.^{5,6}

In a study by Rizvi and Khan, non-neoplastic group consisted of 82 % of patients with colloid goitre. While in another study by Sengupta A and colleagues 76% of cases were diagnosed as colloid goitre on FNAC. In the present study out of benign cases 130 patients (83.33%) had colloid goitre.

In the present study out of 156 cases 141 cases were benign on FNAC, out of which one turned out to be malignant on histopathology and 140 were benign on histopathology. So, the sensitivity of FNAC in diagnosing benign lesions was 99.29% and specificity was 100%. While out of 15 malignant FNACs, all turned out as malignant on histopathology. So, the sensitivity of FNAC in diagnosing malignant thyroid swellings was 93.75% and specificity was 100%. While in literature, study by Sengupta et al demonstrated sensitivity around 90% and specificity 100%.⁴ Agarwal et al evaluated 100 cases and demonstrated sensitivity of 76.5% and specificity of 95.9%.8 This shows that there is significant correlation of FNAC and final histopathological diagnosis. The presentation of thyroid gland diseases is widely varied. The course of treatment depends upon preoperative diagnosis. So FNAC is a technique that helps in differentiating thyroid lesions that require surgery from those which can be managed conservatively. Also by preoperative diagnosis of malignancy the type of surgery can be planned.

CONCLUSION

FNAC is a minimally invasive highly accurate and costeffective procedure for preoperative assessment of patients with thyroid lesions. FNAC is usually not associated with any complications. FNAC with its very high diagnostic accuracy, specificity approaching 100% can help to rule out malignancy in most of thyroid swellings.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

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Cite this article as: Patil MR, Patil SM. Diagnostic accuracy of fine needle aspiration cytology in thyroid swellings with histopathological correlation. Int Surg J 2018;5:1511-3.