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FNAC Findings of Thyroid Lesions in a Tertiary Care Hospital, Dhaka, Bangladesh

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Abstract

Introduction: Fine needle aspiration cytology is a very helpful and relatively noninvasive techniques in the diagnosis of various thyroid lesions. The main aim of thyroid FNAC is to distinguish benign from malignant lesion and to determine the cases that require surgery.

Methods: A one-year retrospective study was done from August 2024 to July 2023 in all patients (both males and females) who presented with thyroid swelling in Department of Endocrinology BSMMU. Detailed medical history along with thorough physical examination and relevant biochemical and radiological investigations were taken into consideration. FNA cytology was done, smear were made and stained using Leishman/Giemsa and Haematoxylin/Eosin stain and they were examined under microscope for cytological diagnosis.

Results: Among 226 cases, 200 were females and 26 were males. 202 were benign lesion whereas 25 were cases of malignancy. The most common age group that presented with thyroid lesion was 21-30 years. The incidence of malignancy seemed to increase with age. Among the benign conditions, the most common was colloid goiter, i.e. 120 cases and among the malignancies follicular neoplasm, i.e. 17 cases.

Conclusions: Thyroid disorders are one of the very common health problems that we come across. Benign lesion are far more common. Due to introduction of this technique, the incidence of surgery in thyroid has been reduced considerably. The endocrine surgeon have widely accepted FNAC of thyroid.

Keywords: Thyroid disorders, FNAC (Fine Needle Aspiration Cytology), Thyroid nodules, Benign thyroid lesions

Introduction

Thyroid disorders are widespread and can manifest as either a systemic condition like Grave's disease or a localized abnormality such as goiter or tumor mass. FNAC can provide an equivocal benign diagnosis in 60% of patients with benign nodules, and its potential to reduce the number of necessary surgeries is significant ^[1]. The prevalence range of thyroid nodule is 4–10% in the adult and 0.2–1.2% in children. Thyroid nodules are a common clinical problem. It is important to differentiate benign from malignant nodules. Fine needle aspiration (FNA) is utilized as a safe, simple, and cost effective preoperative diagnostic technique for patients with thyroid nodules for triaging them into groups requiring invasive and non-invasive management ^[2]. FNAC is a minimally invasive, highly accurate and cost-effective procedure for the assessment of patients with oromaxillofacial lesions. When applied in a proper manner, FNAC can help avoid a surgical biopsy in many cases. FNA, which has excellent sensitivity, specificity, and diagnostic accuracy, is a frequently used method for diagnosing thyroid lesions ^[3, 4]. In the past five or six decades, fine needle aspiration cytology of thyroid has been increasingly utilized for the investigation of thyroid lesions ^[5]. Martin and Ellis in New York in 1930 first time reported the usefulness of FNAC of thyroid ^[6]. Evaluation of lesions detected initially by imaging, measuring 1-1.5 cm in diameters with features of malignancy ^[7].

The age adjusted incidence ratio of thyroid cancer per 100,000 are about 1 for male and 1.8 for females as per the Mumbai cancer registry which covered the population of 9.81 million subjects [8]. This method can help to differentiate between benign and malignant salivary gland tumors. It was found that FNAC in comparison to histological findings of parotid gland lesions in particular had a concordance rate of 86%, a specificity of 98%, a sensitivity of 86%, and a diagnostic accuracy of 94% [9]. The new recommendations included six diagnostic categories for thyroid FNAC-unsatisfactory/nondiagnostic (ND), benign, atypical follicular lesions of undetermined significance (AFLUS), suspicious of follicular neoplasm (SFN), suspicious for malignancy (SM), and malignant [9, 10].

Materials and Methods

A one-year retrospective study was done from August 2024 to July 2023 in all patients (both males and females) who presented with thyroid swelling in Department of Endocrinology BSMMU. Detailed medical history along with thorough physical examination and relevant biochemical and radiological investigations were taken into consideration.

While performing The FNA individual patients were kept in a supine position with a small pillow under their neck to make the thyroid prominent. After cleaning the area of thyroid the gland was hold between the two fingers so that the thyroid become more prominent. FNAC was performed using a 23 gauge needle along with 10 ml syringe. The needle was gently withdrawn and the syringe was attached with the hub. The material on the needle was immediately spread on the slide. The smear was stained using Leishman/Giemsa and Hematoxylin/Eosin stain. The smear were observed under a microscope and the cytological diagnosis was given.

A portion of the literature, in analyzing the causes of the growth slowdown in the transition countries, concentrates on political decision-making, excessive spending, cumbersomeness, and the combination of political decision-making, excessive spending, and cumbersomeness, which

leads to rising costs and expenditure and a departure from economically effective practices.

Results

Total number of cases were 226 among which females with thyroid lesion were 200 (88.49%) and males 26 (11.5%). The relative frequency of benign and malignant thyroid lesion were: Benign 202 cases (89.3%) and malignant 25 cases (11.1%). The most common age group that present with thyroid lesion was 21- 30 years .ie 70 out of 226 cases (30.1%) in which colloid goitre dominates the picture. We got total 130 cases of colloid goitre among which 9 were with hurthle cell changes. We came across 2 rare cases of thyroid malignancy. 1 case were of anaplastic carcinoma which were both in male patients above 60 years of age. 1 cases of metastasis, one in a 58 years male with metastasis to supraclavicular region and fore head and the other a 11 years old boy with metastasis to lymph node in anterior triangle of right neck.

Table 1: Age wise distribution of the thyroid lesion

Age Groups	Numbers
A. 0 -10	8
B.11-20	33
C.21-30	70
D. 31-40	48
E.41-50	39
F.51-60	16
G.>60	12

The following bar diagram shows the relative frequency of various benign thyroid lesion

- Colloid cyst-31
- Colloid goiter-129
- Graves' disease-2
- Lymphocytic thyroiditis-31
- Granulomatous-8
- Oncocytic adenoma 1

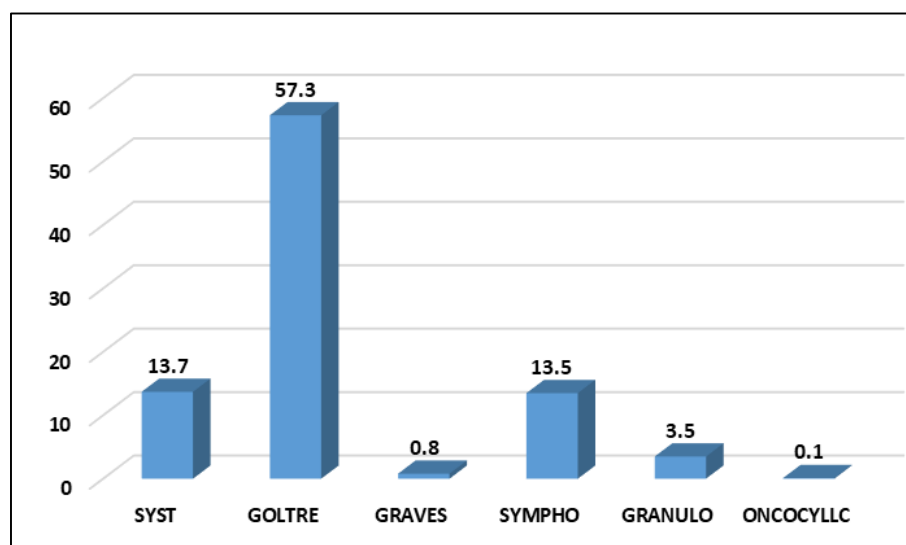


Fig 1: Bar diagram shows the relative frequency of various benign thyroid lesion

Discussion

The high frequency of benign versus malignant nodules creates a dilemma; how to manage patients with thyroid nodules that most probably are benign. To overcome this

dilemma, thyroid nodules in FNAC are classified as benign, malignant, suspicious, and insufficient for diagnosis. By considering this classification, clinicians will be able to decide if the thyroid nodule should be removed by surgery or

not [2]. In fact, introduction of FNAC into the field of thyroid diagnostic tests has reduced thyroid surgeries considerably. Thyroid diseases are arguably among the commonest endocrine disorders worldwide. India too, is no exception. According to a projection from various studies on thyroid disease, it has been estimated that about 42 million people in India suffer from thyroid diseases [4]. One of the important limitations of FNAC is its inability to differentiate follicular hyperplastic nodules and follicular adenomas from well-differentiated follicular carcinoma, which causes a high incidence of “suspicious” category in all studies [6, 5]. Recent studies have demonstrated that the application of molecular-based techniques such as analysis for BRAF and RAS gene mutations and RT-PCR for RET/PTC gene rearrangements is very helpful and improve the differentiation of malignant lesions from their benign counterparts among the patients of “suspicious” category [6, 7]. The thyroid disease are different from other diseases in term of their ease of diagnosis, accessibility of medical treatment and the relative visibility that even a small swelling of thyroid offers to the treating physician. Early diagnosis and treatment remains the cornerstone of management [5]. Recently, USG localization of thyroid lesions followed by USG guided FNAC of palpable thyroid nodule has been advocated to reduce the rate of the non-diagnostic material and subsequently reduced the false negative interpretation [7]. It is difficult to assess the sensitivity and specificity of FNAC of thyroid, because majority of the benign lesions of thyroid do not have any surgical intervention and therefore no histological correlations are available. False negative rate of thyroid FNAC varies from 1-11% [8, 9]. Which is mainly due to inadequate sampling. False positive rate is about 3% and it largely depends on the diagnostic category [10]. The error in FNAC of thyroid depends both on sampling error and interpretation. The inability to distinguish (FA) from follicular carcinoma (FC) has been debated at length [11-13] and in turn has led to the use of ancillary techniques to resolve this problem. Marked reduction in the incidence of FC (from 20% of thyroid cancers to less than 2%) since the practice of iodide supplementation of food supplies [14] has, however, shifted the focus to other follicular lesions such as cellular nodular goiter (NG) and FV-PC [15]. In experienced hands, and in situations where the pathologist performs the needling, cytology can be a very sensitive tool with sensitivity and specificity of FNA to distinguish follicular adenoma up to 94% and 98% for the diagnosis of malignant lesions and nearly 90% accuracy rates for the identification of malignancy if follicular lesions are excluded. Cytologic diagnosis is generally accurate in thyroiditis, usual type of PC, medullary carcinoma (MC), anaplastic carcinoma (AC) and high-grade lymphoma. False negatives generally occur in cystic lesions harboring malignancy, in low-grade or intermediate-grade lymphomas occurring in a background Hashimoto's thyroiditis (HT), in AC with necrosis, in focal involvement of the gland by thyroiditis and in cases with dual pathology where the dominant non-neoplastic lesion overlies or obscures a small carcinoma.

Conclusion

The reason for high prevalence of thyroid disorders in spite of iodine supplement should be looked on. Jharkhand being an iodine deficient state proper awareness and understanding along with upgradation of health facilities is required for reducing the disease burden. Prior to FNAC, the relevant

biochemical tests and radiological examination should be carried out in order to help the clinician as well the surgeon for correct management of the cases.

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