

Correlation of thyroid enlargement with histopathological and FNAC diagnoses

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Abstract

Background: Fine needle aspiration cytology (FNAC) is an easy, secure, and economical implement in the primary examination of thyroid swelling. Fine needle aspiration cytology is helpful in assessment before the operation and histopathological examinations are needed for the final diagnosis.

Objective: The main purpose of this research is to examine the association between Fine needle aspiration cytology outcome and the final detection by histopathological examination.

Materials and Methods: This study includes 50 patients who went through thyroidectomy in MKCG Medical College, Odisha, India for one year. The outcome of Fine needle aspiration cytology collates with the conclusive histopathological investigation outcome.

Results: 46 patients had similar reports for Fine needle aspiration cytology and histopathology, but 3 patients had different reports. Among 46 patients, Fine needle aspiration cytology reveals 42 patients as benign and 4 patients as malignant. Multinodular goiter was more frequently seen in benign tumors and papillary carcinoma in malignant tumors.

Conclusion: Fine needle aspiration cytology is an effortless, economical, and accepted method in the detection of thyroid malignancy. Thyroid disorders are more common in females than in males. Multinodular goiter was more common benign tumor.

Keywords: *Fine needle aspiration cytology, thyroidectomy, histopathology.*

Introduction

Disorders of the thyroid gland are frequently seen in 3-6 % of the overall population [1, 2]. It is more prevalent in women and age is a crucial element in the incidence of goiter [3, 4]. Fine

needle aspiration cytology is a suitable method for the detection of thyroid swellings. Fine needle aspiration cytology is distinguished as quick, less encroaching, and economical. As per many studies, Fine needle aspiration cytology leads to a considerable reduction in the operations of patients with thyroid growth [5, 6]. A large number of methods like ultrasonography, thyroid scan, and FNAC are present for the diagnosis of thyroid swelling. For the definitive detection Fine aspiration needle cytology and histopathology investigation are needed. The only drawback of Fine needle aspiration cytology is an incorrect negative estimate.

The inflammation of the thyroid gland is on the surface and comfortably approachable with physical evaluation. The inflammation of the thyroid can be benign or malignant. An increase in thyroid hormone, a decrease in thyroid hormones, solitary goiter, and multi-nodular goiter are thyroid disorders [7-9]. The increase in thyroid hormone (hyperthyroidism) causes an increase in BP, an increase in heart rate, tremors, and nervousness. The decrease in thyroid hormone (hypothyroidism) causes an increase in body weight, tolerance to cold, constipation, and restlessness. The diagnosis of swelling in the thyroid includes a physical examination, complete blood test, and ultrasounds are required [9].

Thyroid carcinoma is the most frequent endocrine carcinoma. The prevalence of this disorder is growing universally quickly as compared to any other cancer [7]. A study was conducted by Pusztaszeri [8] in which fine needle aspiration cytology and histopathology results were compared and FNAC was 91% correct. Ultrasounds are secure and low-cost examinations of choice to find out the level of thyroid nodules. It is used to comprehend benign and malignant nodules. Ultrasounds are crucial in handling cases with solitary nodules. Thyroid ultrasound is more responsive in recognizing numerous nodules.

Thyroid imaging reporting and data system is the best system in describing the nodules in ultrasounds. This uses a comprehensive arrangement process in describing thyroid lumps. Fine needle aspiration cytology is very crucial in finding out the requirements of surgical treatment [6]. Many other methods are there for the detection of thyroid detection, for example, elastography and diffusion-weighted magnetic resonance imaging. The main purpose of this research is to examine the association between Fine needle aspiration cytology outcome and the final diagnosis by histopathological examination.

Methods and Materials

Study Design: This study includes 50 patients who went through thyroidectomy in MKCG Medical College, Odisha, India. Clinical examination and regular evaluation including complete blood evaluation, thyroid function test, bleeding time, clotting time, sonography of neck, chest X-ray, and Fine needle aspiration cytology was done.

Inclusion criteria: Patients who came with thyroid inflammation and were suitable for surgical treatment were included in this study.

Exclusion criteria: Patients having swelling in other parts other than the thyroid and patients who are unsuitable for surgical treatment excluded from this study.

Preoperative investigation: Fine needle aspiration cytology was carried out and a perceptible mass was sucked applying a 22 gauge needle joined to an 11cc syringe which was clutched in a gun. The liquid smears were put in glass slides and stained with 95% alcohol for 30 minutes. All the procedure was done without anesthesia.

Subjects were classified into four categories

- Benign lesion: The samples that were classified benign for cancer involve samples with plentiful colloid, a varying amount of undistinguished follicular cells, and consist of many macrophages.
- Follicular lesion: In this sample, there is less, or no colloid is present. Follicular cells 3-d clusters and secluded, sound, single cells are also absent.
- Suspicious malignancy: The majority of the samples in this group have abnormal cytological characteristics for example larger and abnormal nuclei.
- Malignancy: Samples having cytological characteristics corresponding to malignant tumors, anaplastic carcinoma, and lymphoma are categorized as definitive carcinoma.

Results

Table 1: Gender prevalence

<i>Gender</i>	<i>Solitary nodular goiter</i>	<i>Multinodular goiter</i>
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Male	2	13
Female	15	20

As shown in Table 1, the disease is more common in females. Solitary nodular goiter was found in 15 female patients and 2 male patients. Multinodular goiter was found in 20 female and 13 male patients.

Table 2: Age prevalence

<i>Age</i>	<i>Solitary nodular goiter</i>	<i>Multinodular goiter</i>
20-30	1	2
31-40	2	5
41-50	5	8
51-60	5	19
61-70	2	1

In Table 2, in the age group of 20-30 years 1 patient had solitary nodular goiter and 2 patients had multi nodular goiter. 2 patients had solitary nodular goiter and 5 patients had multi nodular goiter in the age group of 41-50 years. In the age group of 51-60, 5 patients had solitary nodular goiter and 19 patients had multi nodular goiter and in the age group of 61-70 years 2 patients had solitary nodular goiter and 1 patient had multi nodular goiter.

Table 3: Prevalence according to fine needle aspiration cytology

<i>Diagnosis cytology</i>	<i>Number of patients</i>
Nodular colloid goiter	38
Papillary carcinoma	4
Suspicious follicular carcinoma	6
Medullary carcinoma	2

In Table 3, according to Fine needle aspiration cytology reports. 38 patients were diagnosed with nodular colloid goiter, 4 cases diagnosed with papillary carcinoma, 6 cases had suspicious follicular cancer, and 2 of the patients were detected with medullary carcinoma.

Table 4: Prevalence according to histopathological reports

<i>Histopathological diagnosis</i>	<i>Number of patients</i>
Nodular colloid goiter	28
Papillary carcinoma	6
Follicular carcinoma	3
Medullary carcinoma	5
Follicular adenoma	10

As shown in Table 4, according to histopathological reports. 31 patients were diagnosed with nodular colloid goiter, 6 patients were detected with papillary carcinoma, 3 patients had papillary carcinoma, 2 had medullary carcinoma and 8 patients were diagnosed with follicular adenoma.

Table 5: Prevalence in male and female according to histopathological examination

<i>Diagnosis</i>	<i>Female</i>	<i>Male</i>
Nodular colloid goiter	25	3
Papillary carcinoma	4	2
Follicular carcinoma	2	1
Medullary carcinoma	3	2
Follicular adenoma	10	0

In Table 5, it is shown the prevalence in males and females according to histopathological examination. 25 female and 3 male patients had nodular colloid goiter. Papillary carcinoma was diagnosed in 4 female and 2 male patients. 2 female cases diagnosed with follicular carcinoma and 1 male patient has follicular cancer. 3 female and 2 male patients were diagnosed with medullary carcinoma and 10 female patients were detected with follicular adenoma.

Discussion

Fine needle aspiration cytology is the best technique for the primary detection of thyroid swelling. This is a secure, easy, and prompt method with fewer complications and is used to determine patients before surgery if they require surgical treatment [3, 4]. Sufficient samples should be procured, around 4 to 7 aspirations are required. The detection of papillary carcinoma using Fine needle aspiration cytology found on distinct nuclear alteration is valid and correct with sensitivity and specificity. In the initial stages of the disorder, it is asymptomatic which leads to a delay in the detection of the carcinoma. For the detection of carcinoma biopsy is needed. With the emergence of a lump or inflammation, the procedure for the detection of disease started. Imaging techniques like ultrasonography helps to detect thyroid disorder, mostly in youngsters.

In the present study, it is seen that carcinoma is more frequent in women than in man. As per a study conducted by Fenn et al [9], there was not much relation between gender and malignancy. In the study carried out by Rao [10], thyroid adenoma was frequently seen as benign carcinoma and papillary carcinoma most frequent malignant tumor. According to a study conducted by Gharib and Papini [11], lumps dimensions don't anticipate the carcinoma. They evaluated that the chances of cancer in single nodulars are less as compared to glands with multiple nodules. As per the study carried out by Koh and Chang [12], the prevalence of cancer in multi-nodular ranges from 8 to 18%.

In a study carried out by Paol [13], 58 patients underwent surgery for multi-nodular goiter. They evaluated the prevalence of cancer as 13%. Research carried out by Pedamallu [14], evaluated that the incidence of multi nodular goiter in women is 88% and in men is 12%. According to another research conducted which included 75 patients, only 55 cases had accurate results after fine needle aspiration cytology [15]. According to a different study, the correctness of Fine needle aspiration cytology was 80% [16].

As per research carried out by Rout et al [17], and Amjad et al [18], the disease is more common in women because at the time of puberty, high hormone is needed. The result is close to the present research. In a study by Kumari and Mrudula [19] the disease is more prevalent in the age group of 30-40 years. The accuracy and reactivity of Fine needle aspiration cytology is not

constant, it varies accordingly. It may be due to the way of procedure done by doctors or numerous nodules having both benign and malignant lesions in a solitary goiter. It is indicated that ultrasound lead Fine needle aspiration cytology can give precise outcomes for the detection of malignant nodules.

Conclusion

Fine needle aspiration cytology is an effortless, secure, and low cost diagnostic technique in the examination of thyroid lesions with great precision and reactivity. The only drawback was an incorrect negative outcome. Fine needle aspiration cytology is a perfect method to comprehend benign and malignant cancer. In the current research, it was evaluated that multi-nodular goiter is more common. The definitive detection of the disease should depend on histopathological examination.

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