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Original Research Article

# A Study of Thyroid Swellings in Tertiary Care Center

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**Abstract**

**Background:** The thyroid gland is unique among all the endocrine glands. Thyroid disorders are one of the common problems encountered in clinical practice with majority of benign in nature. Ultra-sonographic examination, Fine needle aspiration cytology, and Thyroid function tests are the investigations done to determine who needs surgery or can be managed conservatively. The ultimate test for diagnosis is by Histopathological examination of excised thyroid gland. The purpose of this study is to highlight the different thyroid swelling in tertiary care center.

**Methods:** A retrospective study with 100 patients of thyroid swellings was conducted from August 2022 to May 2023, after taking consent from each patient. Patients were clinically examined by inspection, palpation, percussion, auscultation and underwent thyroid function tests. Ultrasonography (USG) and fine needle aspiration cytology (FNAC) was done in all patients and also assessed with histopathological examination report.

**Results:** A total of 100 subjects with thyroid swelling were identified in our study with 87 were females and 13 were males with maximum number of cases in 21-40 years. FNAC report revealed colloid nodule in 66%, followed by colloid goitre in 18% cases. 92% cases had non-neoplastic lesions with colloid goitre being most common comprising 80% cases.

**Conclusion:** In our study, FNAC is required to confirm histopathological diagnosis. FNAC has an important role in initial evaluation of patients with thyroid swelling but histopathological examination of specimen is the gold-standard investigation for arriving at a correct diagnosis.

**Keywords:** Thyroid Swelling, Fine needle aspiration cytology (FNAC), Histopathological examination (HPE).

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## Introduction

The thyroid gland is unique among the endocrine glands because of its size. It is the largest endocrine gland and one of the most responsive organs in the human body. [1] The thyroid is situated in the lower part of the front and sides of the neck. It regulates the basal metabolic rate, stimulates somatic and psychic growth, and plays an important role in calcium metabolism. Diseases of the thyroid are of great importance because most are amenable to medical or surgical management. They include conditions associated with excessive release of thyroid hormones (hyperthyroidism), those

associated with thyroid hormone deficiency (hypothyroidism) and those that present as mass lesions of the thyroid.[1] Incidence of thyroid gland diseases also vary with geographical location. They are endemic in mountainous region of the world, where the soil, water & food supply contains little iodine. Thyroid disorders are one of the common problems encountered in clinical practice with majority of benign in nature. The prevalence of thyroid swelling ranges from 4% to10% in the general adult population and from 0.2% to 1.2% in children. [2] In our country the national prevalence rate is 10 -15%, which indicate the whole country is endemic.[1] The majority of clinically diagnosed thyroid swellings are non-neoplastic; only 5%-30% are malignant and require surgical intervention. Swellings in thyroid may be solitary nodule, multiple nodules in single lobe or diffuse swelling. It can be toxic or nontoxic. Colloid goitre was most common among thyroid swelling followed by colloid goitre with cystic degeneration. [3] Thyroid swellings are predominantly present in females of ratio 5:1. Women often develop thyroid enlargement during puberty, pregnancy, lactation and the menopause due to variation of thyroid hormones. Risk for malignancy is more in isolated than diffuse, solid swellings and men more than women. Thyroid swelling whether diffuse or solitary has to be evaluated to rule out neoplasm. Ultra-sonographic examination, Fine needle aspiration cytology, and Thyroid function tests (TSH, FT3, FT4) are the investigations done to determine who needs surgery or can be managed conservatively. Fine needle aspiration cytology has excellent patient compliance and is readily repeated. Some malignancies are difficult to be diagnosed by cytology alone, like follicular carcinoma, papillary carcinoma. [3] Histological examination of the removed thyroid swelling is the most accurate way to determine the pathology. Laboratory investigations other than FNAC have limited role to find out the histological nature of thyroid swelling. Isotope scan can demonstrate the functioning capacity of the nodule but cannot predict the histopathological character. Ultra-sonographic scanning is capable of differentiating solid from cystic lesion but cannot distinguish malignant from benign one. As histopathology is the best way to determine the pathology. The purpose of this study is to highlight the different thyroid swelling in tertiary care center.

**Aims and Objectives:**

1. To study the various clinical presentations of thyroid swellings.
2. To record the FNAC findings in each case along with other necessary investigations.
3. To perform histopathological examination of all operative specimens and compare the results with preoperative diagnosis.

**Materials and Methods:** This study was carried out in tertiary care hospital in Ahmedabad, Gujarat from August 2022 to May 2023. The patients were chosen from those presenting with thyroid swelling in the ENT outpatient department. 100 patients were identified during a study period

**Inclusion Criteria:**

- All patients presenting with thyroid swelling.
- Voluntary participation in the study

**Exclusion Criteria:**

- When surgical intervention was indicated but not possible (due to other co-morbidities) and definitive diagnosis could not be reached.
- Patients lost to follow up.

Permission for the study was obtained from department head of unit. The study consists of 100 patients with thyroid swelling. They were evaluated by thorough clinical examination of neck swelling along with vocal cord mobility and relevant clinical examination. They were evaluated with thyroid function tests, ultra-sonographic examination of neck (computed

tomography of neck in selected cases) and other preoperative profile along with fine needle aspiration cytology. Ultra-sonographic examination helps to know about the nature and vascularity of thyroid swelling. Fine needle aspiration cytology helps to know about cytological impression of swelling.

Fine needle aspiration cytology was carried out by pathologist with 23G needle, smears were fixed and staining was performed. According to FNAC report, patients were operated for thyroid surgery, specimen was excised, processed in automated tissue processing units and sent for histopathological examination. The report of FNAC and HPE were compared. FNAC diagnosis was done on Bethesda system of diagnosis.

**Results:**

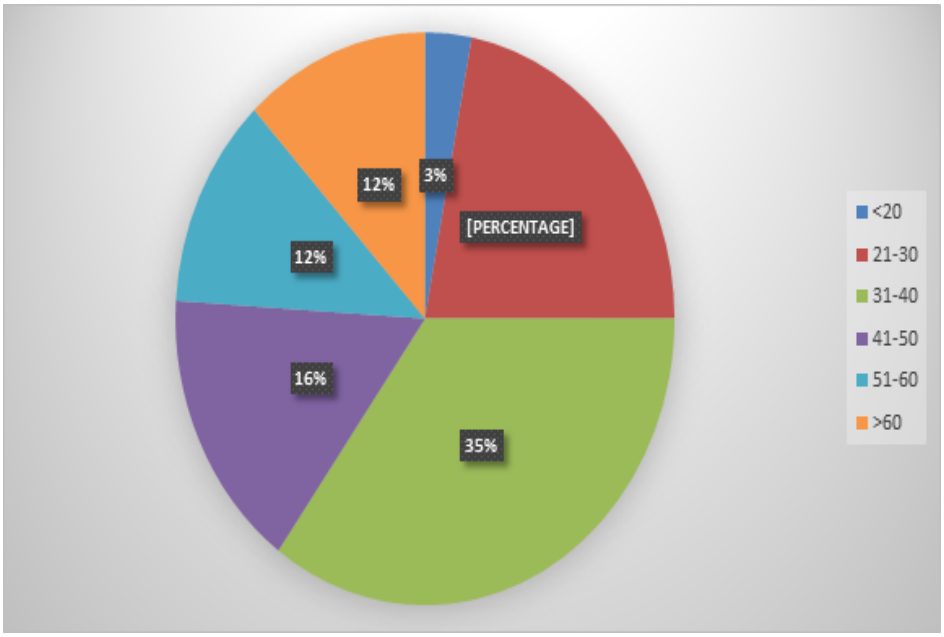


**Chart-1: Age Distribution**

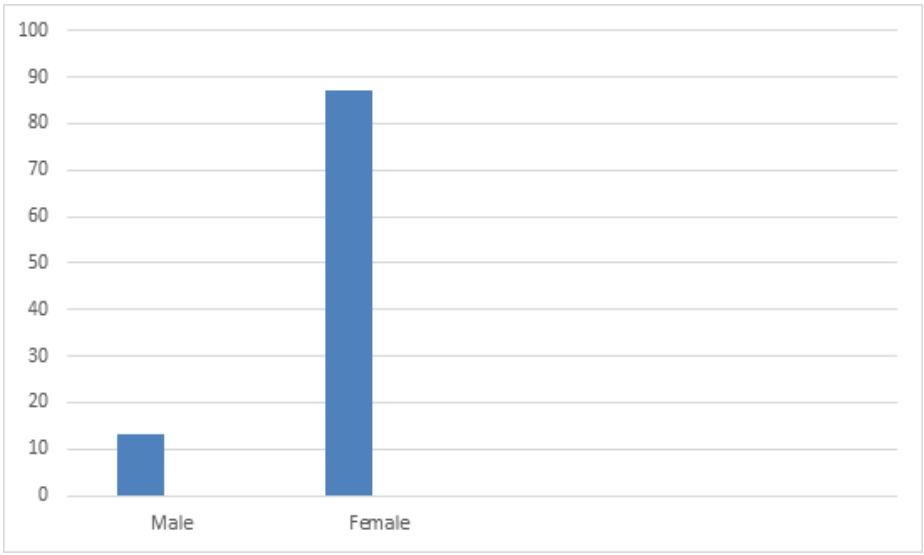


**Chart- 2: Sex Distribution**

**Table 1: Ultra sonographic Findings**

| Ultra-sonographic findings | No. of Patients | Percentage |
|---|---|---|
| Colloid Nodule | 72 | 72 |
| Multinodular Goitre | 15 | 15 |
| Thyroid Malignancy | 3 | 3 |
| Thyroiditis | 7 | 7 |
| Thyroid cyst | 1 | 1 |
| Thyroglossal cyst | 2 | 2 |
| Total | 100 | 100 |

**Table 2: Diagnosis of Thyroid swelling by Fine needle aspiration cytology**

| FNAC findings | No. of Patients | Percentage |
|---|---|---|
| Colloid Goitre | 18 | 18 |
| Colloid Nodule | 66 | 66 |
| Colloid Cyst | 1 | 1 |
| Thyroglossal cyst | 2 | 2 |
| Thyroiditis | 5 | 5 |
| Hashimoto's thyroiditis | 1 | 1 |
| Lymphocytic thyroiditis | 1 | 1 |
| Papillary thyroid carcinoma | 3 | 3 |
| Hürthle cell carcinoma | 1 | 1 |
| Hyperplastic thyroid nodule | 0 | 0 |
| Benign follicular thyroid nodule | 1 | 1 |
| Follicular lesion/atypia of undetermined significance | 1 | 1 |
| Total | 100 | 100 |

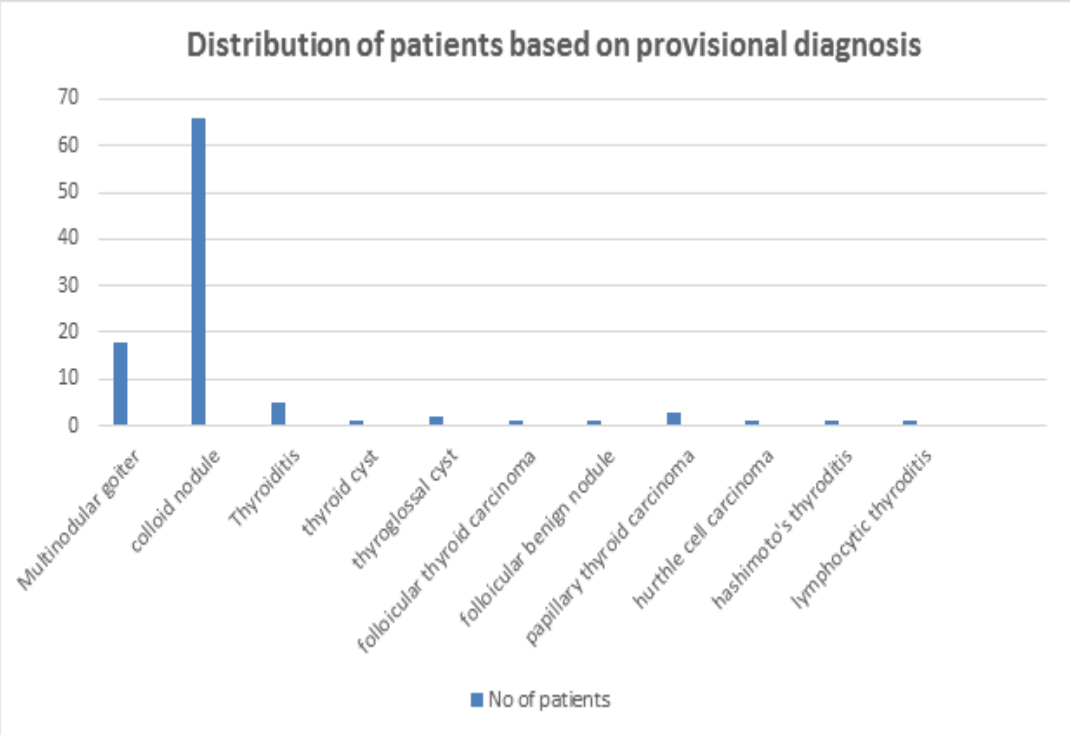


**Chart- 3: Distribution of patients based on provisional diagnosis**

**Table 3: Final Diagnosis by Histopathological Report**

| Final Diagnosis | No. of patients | Percentage |
|---|---|---|
| Puberty goitre | 5 | 5 |
| Hashimoto's thyroiditis | 6 | 6 |
| Colloid goitre | 80 | 80 |
| Papillary carcinoma | 6 | 6 |
| Langerhans cell Histiocytosis | 1 | 1 |
| Follicular adenoma | 1 | 1 |
| Follicular carcinoma | 1 | 1 |
| Total | 100 | 100 |

## Discussion

The modality of treatment of thyroid swellings can differ based on the diagnosis, age of patient, underlying comorbid conditions. USG and FNAC form back bone of investigative tests in determining nature of thyroid lesions. In this context, the current study was conducted to evaluate the thyroid swellings seen in patients presenting to a tertiary care hospital in 100 patients.

A total of 100 subjects with thyroid swelling were identified in our study. Out of them, 87 were females and 13 were males. Thus, females far outnumbered males in a ratio of 6.7:1. The ratio of female preponderance in our study is nearly similar to that found in study of Hariprasad et al [4] with the female: male ratio of 10:1. Most common age group in which thyroid swelling was identified was 31-40 years (35%) followed by 21-30 years' age group (22%). Least number of patients <20 years' age group (3%). The age of the patients was ranging from 15-60 years in our study. In our study, it was also found that thyroid swellings are common in age group of 21-40 years i.e. in 3rd and 4th decade. Similar results were observed in studies conducted by Hariprasad et al4 and Bose et al. [5]

The patients with thyroid swellings commonly present with symptoms like swelling in anterior part of neck, pain in the swelling, sometimes with dysphagia or hoarseness of voice, heat or cold intolerance, palpitations. In our study, after examining all the patients clinically, it was found that the most common presenting symptom was anterior neck swelling, while pain in swelling and weight loss was found only in 8% and 4% of cases respectively. Similar findings were seen in study by Tonape et al. [6]

Most of the patients showed Euthyroid state. USG findings revealed that most of the patients had colloid nodule – (72%,) followed by multinodular goitre(MNG) (15%), thyroid malignancy (3%), thyroiditis (7%), thyroid cyst (1%) and Thyroglossal cyst (2%). On USG, 97% cases showed benign lesions while only 3% showed malignant lesion, while on FNAC, 95% cases were confirmed as that of benign lesions and only 5% of malignant lesion. On USG, in our study, colloid nodule was the commonest thyroid swelling followed by MNG, which differed from that found by Santosh et al. [7] The ultra-sonographic findings help in distinguishing whether the thyroid swelling is benign or malignant, by providing information about the nodularity, vascularity, calcification and extension of thyroid swelling. A high suspicion in needed to identify malignant swellings**. [3]**

FNAC report revealed colloid nodule in 66%, followed by colloid goitre in 18% cases, thyroiditis in 5% cases, colloid cyst in 1% cases, Thyroglossal cyst (2%) and papillary thyroid carcinoma in 3% cases each and 1% cases each of Hashimoto's thyroiditis, lymphocytic thyroiditis, Hürthle cell carcinoma, benign follicular thyroid nodule and follicular lesion/atypia of undetermined significance.

In the current study, the most common operation performed was hemi thyroidectomy in majority of patients followed by total thyroidectomy. However, in the study by Aytac and Karamercan [8], subtotal thyroidectomy was the most commonly performed.

Final diagnosis of the 100 cases in our study showed that 92% cases had non-neoplastic lesions with colloid goitre being most common comprising 80% cases. 8% of total cases consisted of thyroid neoplasms of which papillary carcinoma was most common (6%) followed by 1 case each (2% each) of follicular adenoma and follicular carcinoma. In another study performed by Gupta et al [9] in Jammu, India, the histopathological examination of excised specimens showed 42 (56%) cases as colloid nodular goitre.

The limitation of FNAC in diagnosis of follicular neoplasm is also well established. The 1 case of Follicular lesion/atypia of undetermined significance and 1 case of Benign follicular thyroid nodule identified pre-operatively by FNAC came out to be one case each of follicular adenoma and follicular carcinoma on histopathology. In spite of its shortcomings, FNAC has an important role in evaluation of patients with thyroid swellings. According to Borgohain et al [10], FNAC is a simple, safe and cost-effective diagnostic modality. The procedure has a central role in the management of thyroid nodules and should be used as the initial diagnostic test. According to them, a benign or inconclusive FNAC result should be viewed with caution as false negative results do occur and these patients should be followed up and any clinical suspicion of malignancy even in the presence of benign FNAC requires surgery. So, final diagnosis and treatment pattern should be based upon histopathology. [10]

## Conclusion

In our study, we observed that the commonest presentation of patients with thyroid swellings is anterior neck swelling. Thyroid swellings can have a wide range of age at presentation appearing in children as well as geriatric patients, but the commonest age group is between 21-40 years. Thyroid swellings are commonly seen in female patients. The thyroid function tests help in knowing the thyroid status of the patient. Majority of the patients with thyroid swellings belonged to the Euthyroid state in this study. The ultra-sonographic findings provide information about the nodularity, vascularity, calcification, extension and infiltration into surrounding structures. Ultra-sonographic findings cannot give definitive diagnosis and the histopathological features, so FNAC is required to confirm histopathological diagnosis. The commonest benign thyroid swellings are colloid nodules. Malignancies are not very common commonest of malignancy being papillary thyroid carcinoma. Most cases required surgery and most common operation performed was hemi thyroidectomy. FNAC has an important role in initial evaluation of patients with thyroid swelling but histopathological examination of specimen is the gold-standard investigation for arriving at a correct diagnosis.

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