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Original Research Article

Assessment of Thyroid Swellings: A Cross-Sectional Study

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Abstract:

Background and Aim: Thyroid swellings are commonly observed in ENT practice, varying from benign cysts to malignant tumours. A clinical study was conducted to investigate the prevalence of different types of thyroid disorders among patients presenting with thyroid swellings in the region, focussing on their age and sex distribution as well as any notable trends.

Material and Methods: A total of 100 patients with thyroid swellings were examined in this study. The study included patients over the age of 6 who presented with thyroid swellings. Patients underwent a thorough clinical examination that included inspection, palpation, percussion, and auscultation, along with thyroid function tests to assess their health status. All patients underwent ultrasonography (USG) and fine needle aspiration cytology (FNAC).

Results: Significant portion of thyroid swellings presented bilaterally, accounting for 52% of cases. The majority of unilateral thyroid swellings observed were predominantly located in the right thyroid lobe, accounting for 24% of cases. Ultrasound and fine needle aspiration cytology revealed that 91% of the cases presented benign lesions, whereas a mere 9% were identified as malignant lesions. The FNAC report indicated that colloid goitre was present in the majority of cases, accounting for 44%. This was followed by colloid nodules in 14% of cases, thyroiditis in 10%, and colloid cysts also in 10% of cases.

Conclusion: The ultrasonographic findings yield critical insights into various aspects such as nodularity, vascularity, calcification, and the extent of infiltration into adjacent structures. Ultrasonographic findings alone are insufficient for a definitive diagnosis, making it essential to perform FNAC to confirm histopathological features.

Keywords: Colloid Goitre, FNAC, Malignant Tumour, Ultrasonography.

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Introduction

The thyroid gland stands out as the largest and most accessible endocrine gland within the human body. The thyroid gland, when functioning normally, cannot be felt during a physical examination. This gland was among the first to be identified, studied, and explored in the field of endocrinology. The location is found in the lower region of the front and sides of the neck. [1] The primary role of this hormone involves the regulation of the basal metabolic rate, as well as the stimulation of both physical and mental growth. The nodular thyroid presents a diagnostic challenge for clinicians, as while some nodules are malignant, many are benign. The occurrence of cancer in multinodular goitre is reported to be 0.5%, while solitary nodular goitre presents a slightly higher incidence at 2%. [2-3] Thyroid disorders can be categorized into three main types: functional disorders, structural disorders, and miscellaneous conditions. Structural disorders, influenced by a range of etiological factors, can lead to the development of thyroid swelling in the neck area. Thyroid swellings encompass a spectrum that ranges from benign diffuse physiological goitre to more serious high-grade malignancies. The clinical signs and symptoms alone are insufficient for diagnosing thyroid disorders, as similar presentations can occur in various types of thyroid swellings. Thyroglossal cysts and isthmic cysts often manifest as midline neck swellings

characterised by a cystic consistency. Accurate differentiation between the two requires a thorough clinical examination. A thyroglossal cyst exhibits movement when the tongue is protruded, in contrast to the isthmic cyst, which remains stationary. Another example includes both benign and malignant disorders of the thyroid gland, characterised by thyroid swelling. This condition may manifest as diffuse swelling, making clinical differentiation challenging. The investigations focus on identifying biochemical thyroid dysfunctions, such as hypothyroidism and thyrotoxicosis, as well as the characteristics of any structural lesions present in the thyroid gland. [4]

The approach to managing thyroid swelling starts with a comprehensive patient history, followed by a detailed clinical examination. Essential laboratory investigations include thyroid function tests—specifically free T3, free T4, and serum levels of thyroid-stimulating hormone (TSH)—to assess the functional status of the thyroid gland. Additionally, fine-needle aspiration cytology (FNAC) and radiological assessments, such as ultrasound, are conducted to gather further insights. The ultrasound examination provides a comprehensive assessment of the thyroid gland, focusing on various factors such as its size, echotexture, and multicentricity. It evaluates the shape of the gland, identifies the presence of nodules along with their characteristics, and examines vascularity. Additionally, the evaluation includes the involvement of the lobes and isthmus, checks for calcification, assesses any infiltration into surrounding structures, localises lesions for fine needle aspiration cytology (FNAC), and evaluates cervical lymphadenopathy, among other important aspects. Fine Needle Aspiration Cytology (FNAC) provides essential cytological information that is crucial for arriving at a definitive diagnosis, which in turn is necessary for effective management planning. [5,6] A clinical study was conducted to investigate the prevalence of different types of thyroid disorders among patients presenting with thyroid swellings in the region, focussing on their age and sex distribution as well as any notable patterns.

Material and Methods

This prospective study focused on the clinical evaluation of thyroid swellings was conducted in the ENT outpatient department of a tertiary care teaching institute in India over the course of one year. A total of 100 patients with thyroid swellings were examined in this study. The study included patients over the age of 6 who presented with thyroid swellings.

Exclusion Criteria:

- Children with neck swelling (below 6 year).
- Head & Neck swelling other than thyroid origin
- Patients refusing for investigation/management Study Tool: Information regard

All patients with thyroid swellings underwent a comprehensive history assessment to determine the onset, duration, and progression of their conditions. The subjects underwent a thorough clinical examination, which included inspection, palpation, percussion, and auscultation. The patients were subjected to thyroid function assessments, which included measurements of free T3, free T4, and ultra-sensitive TSH levels in serum. All patients underwent ultrasonography of the neck, providing crucial insights into the size, extent, vascularity, echotexture, calcification, and consistency (solid or cystic) of thyroid swellings. The procedure also assessed laterality, infiltration into surrounding structures, and the presence of cervical lymphadenopathy.

The patients underwent fine needle aspiration cytological examination, leading to a histopathological diagnosis of the thyroid swellings.

Statistical analysis

The collected data was organised and input into a spreadsheet application (Microsoft Excel 2019) before being exported to the data editor interface of SPSS version 19 (SPSS Inc., Chicago, Illinois, USA). Quantitative variables were characterised using means and standard deviations or medians and interquartile ranges, depending on their distribution patterns. Qualitative variables were reported in terms of counts and percentages. The confidence level for all tests was established at 95%, while the level of significance was set at 5%.

Results

This study examined a cohort of 100 patients presenting with thyroid swellings. The youngest participant in the study was 10 years old, while the oldest was 80, resulting in a mean age of 40.10 years. Thyroid swelling was predominantly observed in female patients, accounting for 72% of the cases, with a total participation of 72 females and 28 males in the study. Thyroid swelling predominantly occurred in individuals aged 20 to 40 years, with a significant majority being females.

A significant portion of thyroid swellings presented bilaterally, accounting for 52% of cases. The majority of unilateral thyroid swellings were observed in the right thyroid lobe, accounting for 24% of cases. In the study, it was observed that thyroid swelling in the left thyroid lobe and midline occurred in only 12% of the cases examined.

The majority of patients, accounting for 80%, exhibited a euthyroid state. This was followed by 9% who were hyperthyroid, 7% with subclinical hypothyroidism, and 2% each for hypothyroidism

and subclinical hyperthyroidism. The ultrasound findings indicated that the majority of patients presented with colloid nodules, accounting for 45% of cases. This was followed by multinodular goitre at 25%, thyroiditis at 10%, thyroid malignancy at 9%, and both thyroid cysts and thyroglossal cysts at 5% each, as detailed in Table 1.

Ultrasound-guided and fine-needle aspiration cytology revealed that 91% of the cases exhibited benign lesions, whereas a mere 9% were identified as malignant lesions. The FNAC report indicates that colloid goitre was the most prevalent diagnosis, accounting for 44% of cases. This was followed by colloid nodules at 14%, thyroiditis at 10%, and colloid cysts also at 10%.

Additionally, thyroglossal cysts and papillary thyroid carcinoma were each identified in 4% of cases. Hürthle cell carcinoma and hyperplastic thyroid nodules were noted in 3% of cases each, while benign follicular thyroid nodules, follicular lesions/atypia of undetermined significance, Hashimoto's thyroiditis, and lymphocytic thyroiditis were each present in 2% of cases. Table 2.

Table 1: Ultrasonographic findings among Study Participants

Ultrasonographic findings	N (%)	Male	Female
Colloid nodule	45 (45)	14	31
MNG	25 (25)	2	23
Thyroid malignancy	9 (9)	6	3
Thyroiditis	11 (11)	0	11
Thyroid cyst	5 (5)	3	2
Thyroglossal cyst	5 (5)	3	2
Total	100 (100)	28	72

Table 2: FNAC findings among Study Participants

Ultrasonographic findings	N (%)	Male	Female
Colloid goitre	44 (44)	10	34
Colloid nodule	14 (14)	0	14
Colloid cyst	10 (10)	4	6
Thyroglossal cyst	4 (4)	2	2
Thyroiditis	10 (10)	0	10
Hashimoto's thyroiditis	2 (2)	0	2
Lymphocytic thyroiditis	2(2)	0	2
Papillary thyroid carcinoma	4 (4)	2	2
Hürthle cell carcinoma	3 (3)	3	0
Hyperplastic thyroid nodule	3 (3)	3	0
Benign follicular thyroid nodule	2 (2)	2	0
Follicular lesion/atypia of undetermined significance	2 (2)	2	0
Total	100	28	72

Discussion

The approach to treating thyroid swellings varies depending on the diagnosis, the patient's age, and any underlying health conditions. Ultrasound and fine needle aspiration cytology are essential components of diagnostic testing for assessing the characteristics of thyroid lesions.

This study aimed to assess thyroid swellings observed in patients at a tertiary care hospital, involving a sample of 50 individuals. The average age of patients exhibiting thyroid swelling was 40.10 years. In our study, the patients' ages spanned from 10 to 80 years.

Our research indicates that thyroid swellings frequently occur in individuals aged 20 to 40 years, specifically during the third and fourth decades of life. Comparable findings were reported in research carried out by Hariprasad et al, Kusum et al, and Bose et al. [3,7,8] Our research indicates that thyroid swelling predominantly occurs in females. Several other studies have also highlighted the concept of female dominance. The ratio of females to males was reported as 3.1 according to Wani et al., while Nagarkar et al. found it to be 1.9. However, this was identified as 5.1 by T Pramod and colleagues. [10]

The current investigation revealed that, upon clinical examination of all patients, the predominant presenting symptom was anterior neck swelling. In contrast, pain associated with the swelling and weight loss were observed in only 8% and 4% of cases, respectively. Comparable results were observed in the research conducted by Tonape et al. [11] Robbinsons et al. [12] reported this finding in all study participants, while Wani et al. noted a prevalence of 96.9%. [9] Pain can be a common symptom across various forms of thyroid

cancer. Additionally, symptoms such as difficulty breathing, trouble swallowing, and changes in voice may suggest the presence of a significant multinodular goitre, a persistent mass, or, in the case of anaplastic papillary carcinoma, the invasion of surrounding tissues.

The thyroid function test provides insights into the operational status of the thyroid gland. Our research revealed that the majority of patients exhibited a euthyroid state following thyroid function tests, with a smaller group presenting in a hyperthyroid state.

These findings align with the results reported by Tonape et al. and Bose et al. [8,11] Our investigation into unilateral swellings revealed a predominant occurrence in the right lobe of the thyroid, with only 12% of swellings identified in the left lobe. These results align with the observations made by Vyas et al. and Deepthi et al. [13,14] In a clinical examination correlated with ultrasonographic findings, it was observed that most patients exhibited bilateral swelling, followed by unilateral swelling, while a few presented with midline swelling. This pattern contrasts with other studies, which reported a higher frequency of unilateral swelling.

Ultrasonographic findings play a crucial role in differentiating between benign and malignant thyroid swellings. They offer valuable insights into nodularity, vascularity, calcification, and the extent of the thyroid swelling. Heightened vigilance is essential for recognising malignant swellings. Research conducted by Venkates et al., Tonape et al., Sudershan et al., and Rout et al. has identified colloid goitre as the most prevalent benign thyroid lesion. [11,15-17]

In our study, we observed that colloid goitre emerged as the most prevalent benign thyroid lesion, accounting for 48% of cases, while papillary carcinoma was identified as the most common malignant thyroid lesion. The results of our study align closely with those observed in numerous other investigations, particularly regarding age-sex distribution, thyroid functional status, and the prevalence of both benign and malignant thyroid lesions.

Conclusion

The commonest presentation of patients with thyroid swellings is anterior neck swelling. Majority of the patients with thyroid swellings belonged to the euthyroid state in this study. The ultrasonographic findings provide information about the nodularity, vascularity, calcification, extension and infiltration into surrounding structures. Ultrasonographic findings cannot give definitive diagnosis and the histopathological features, so FNAC is required to confirm histopathological diagnosis.

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