

# A Study of Clinical Profile and Management of Nodular Goiter

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## Abstract

**Introduction:** Nodular goiters are enlargements of the thyroid gland. In the absence of thyroid dysfunction, autoimmune thyroid disease, thyroiditis, and thyroid malignancy, they constitute an entity described as non-toxic nodular goiter, which occur both endemically and sporadically.

**Aim:** The aim of the study was to study the clinical presentation and management of patients with nodular goiter.

**Materials and Methods:** In this prospective observational study, patients admitted with nodular goiter – solitary or multinodular were included in the study. The patients diagnosed as a case of solitary or multinodular will undergo detailed history taking, clinical examination, and investigations such as complete blood count, thyroid profile, fine-needle aspiration cytology, X-ray chest and neck, and ultrasonography of the neck. Histopathology of the excised specimens was studied to evaluate the incidence of malignancy.

**Results:** A total of 18 patients were included, 68% of cases were in 21–40 years age group, all patients had swelling, 33% had pain, 22% had difficulty in swallowing, 16 patients were euthyroid, and 2 patients had hypothyroidism. The incidence of malignancy was found to be 8%, 42% of the patients had benign follicular adenomas. The incidence of inflammatory goiter was 11% and 3% of patients showed evidence of toxicity. Preoperatively, regional lymph node metastasis evaluated and hemithyroidectomy in adenoma thyroid and colloid nodules, subtotal and total thyroidectomy in multinodular goiters and total thyroidectomy in carcinoma thyroid were done. About 89% had an uneventful post-operative period.

**Conclusion:** Nodular goiter of the thyroid was found to be more common in young and middle-aged patients. The majority of nodular goiter was found to be a benign lesion. The incidence of malignancy was found to be 8% overall, 12.5% nodules in female were malignant.

**Key words:** Fine-needle aspiration cytology, Histopathology, Malignancy, Papillary carcinoma, Thyroid tumors

## INTRODUCTION

Thyroid disease affects many people worldwide. The spectrum of diseases is wide, ranging from minor structural changes not influencing the life of the patients to a variety of disorders that may reduce the quality of life and, in some circumstances, also affect life expectancy. Among the mild but frequent disorders are goiter and benign thyroid nodules. These two conditions often develop

simultaneously, but many subjects harbor nodules within the thyroid gland without the development of goiter, and in populations with excessive iodine intake, goiters are often without nodules.<sup>[1,2]</sup>

Nodules are discrete lesions that may be detected by palpation, autopsy/surgery, ultrasound, or other types of imaging procedures. Nodular goiter is a recognizable thyroid enlargement “characterized by excessive growth and structural and/or functional transformation of one or several areas within the normal thyroid tissue.”<sup>[3]</sup>

Nodular goiters are enlargements of the thyroid gland. In the absence of thyroid dysfunction, autoimmune thyroid disease, and thyroiditis and thyroid malignancy, they constitute an entity described as non-toxic nodular goiter, which occur both endemically and sporadically. In the early

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phase of goitrogenesis, goiters are diffuse and, with time, such goiters tend to become nodular.<sup>[4]</sup>

**Aim**

The aim of the study was to study the clinical presentation and management of patients with nodular goiter.

**MATERIALS AND METHODS**

This prospective observational study was conducted in the Department of General Surgery at Government Headquarters Hospital, Ramanathapuram.

**Inclusion Criteria**

All patients admitted with nodular goiter solitary or multinodular were included in the study.

**Exclusion Criteria**

Patients with severe comorbid illness, patients with nodular goiter with regional lymphadenopathy, and patients with distant metastasis were excluded from the study. The patients diagnosed as a case of solitary or multinodular will undergo detailed history taking, clinical examination, and investigations such as complete blood count, thyroid profile, fine-needle aspiration cytology (FNAC), X-ray chest and neck, and ultrasonography (USG) of the neck. The patients underwent hemithyroidectomy, subtotal thyroidectomy, and total thyroidectomy and the histopathology of the excised specimens was studied to evaluate the incidence of malignancy. After surgery, the patients will be followed up for any immediate post-operative complications. The specimen will be sent for histopathological examination, and the results will be recorded.

**RESULTS**

In this study, 18 patients with nodular goiter of the thyroid were included in the study. A higher number of cases were noted in 21–40 years of age group [Figure 1]. In this study, 16 females and 2 males were included in the study. All the 18 patients complained about swelling in the front of their neck. Six patients had pain and 4 patients complained of some difficulty in swallowing [Figure 2].

About 77.7% of cases are solitary nodules of thyroid of varying sizes from 4 to 7 cm confined to the right or left lobe with or without, the involvement of the isthmus of thyroid was noted. About 33.3% of cases are multinodular goiter with varying sizes of nodules.

Sixteen patients were euthyroid, 2 patients had hypothyroidism, and no case of hyperthyroidism was noted [Figure 3]. None of the cases were found with lymph node metastasis. Nine cases were reported to have colloid nodules

on FNAC and 8 cases reported as adenomatous goiter. One case of papillary carcinoma was reported in FNAC [Figure 4]. CT scan was done selectively for multinodular goiter to assess tracheal compression. All 18 patients were assessed for surgery under general anesthesia and preoperatively regional lymph node metastasis evaluated and hemithyroidectomy in adenoma thyroid and colloid nodules, subtotal and total thyroidectomy in multinodular goiters, and total thyroidectomy in carcinoma thyroid were done.

The incidence of malignancy was found to be 8%, 42% of the patients had benign follicular adenomas. Incidence of

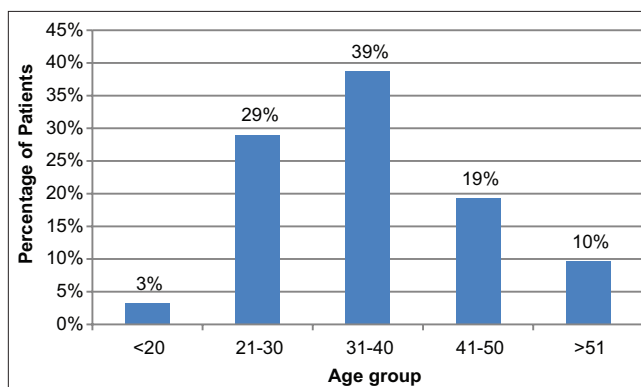


Figure 1: Distribution of age group

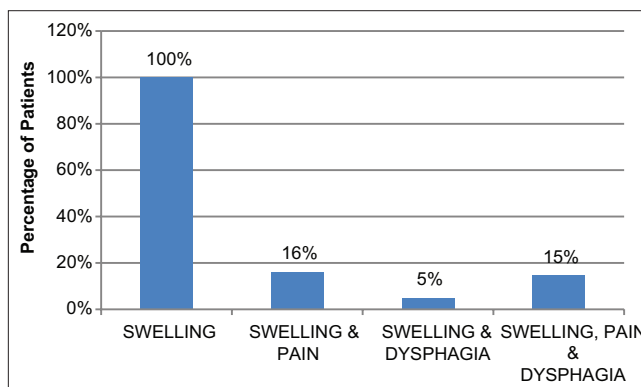


Figure 2: Distribution of symptoms

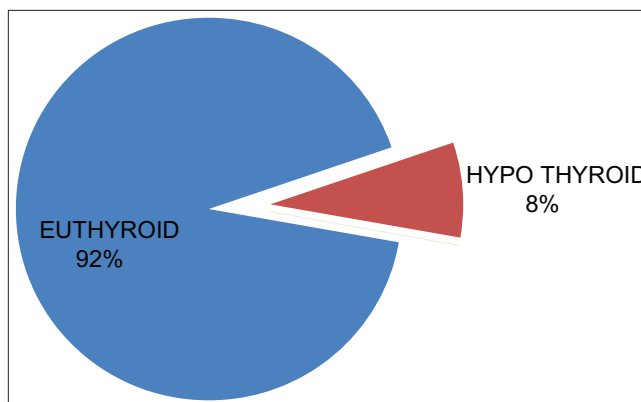


Figure 3: Distribution of thyroid function

inflammatory goiter was 11% and 3% of patients showed evidence of toxicity [Figure 5]. About 12.5% of nodules in females were malignant [Table 1]. The majority of patients, 89%, had an uneventful post-operative period. One patient developed hypothyroidism and was given L-thyroxine. One patient had transient dysphonia in the form of loss of pitch of voice which improved subsequently [Figure 6].

## DISCUSSION

Surgical management of thyroid disease has changed significantly over the course of the 20<sup>th</sup> century. Advances in the investigations to diagnose thyroid disease have provided for adequate treatment and control of functional problems. The main indication for thyroid surgery is the presence of thyroid nodule, multinodular goiter, and malignancies. The risk of complications varies with the skill and experience of the surgeon, as well as the extent of resection. The basic principle of surgery to avoid damage to any vital structure dictates that the structure must be clearly identified.

Thyroid nodules are present in 4%–7% of the population by neck palpation (the incidence increases with increasing age) and 30% to 50% by USG.<sup>[5-7]</sup> It has been believed that fewer than 5% of these nodules are malignant and require surgical treatment and that extensive evaluation or surgical excision is not practical.<sup>[8]</sup> However, Stoffer *et al.*<sup>[9]</sup> reported that 13% of the glands resected in thyroid operations for any reason contained carcinoma.

Previous studies have shown that the diagnostic accuracy of fine-needle aspiration biopsy is improved with USG guidance compared with palpation alone.<sup>[10,11]</sup> In addition, USG guidance is required for aspiration of non-palpable thyroid nodules.<sup>[12,13]</sup>

Fine-needle aspirate cytology is a fast, accurate, and inexpensive test to obtain cellular samples. A series of reviews have reaffirmed its importance in the assessment of thyroid nodules.<sup>[14-16]</sup>

There are a variety of tests of thyroid function available. The number of investigations requested should be the minimum necessary to reach a diagnosis and formulate a management plan. Only a small number of parameters need to be measured as a routine, although this may require supplementation or repeat when inconclusive.<sup>[17]</sup> The serum thyroid-stimulating hormone (TSH) may be used as a single, initial test of thyroid function because of the high sensitivity of the TSH assay to diagnose both hyperthyroidism and hypothyroidism. TSH levels can be measured accurately down to very low serum concentrations, and if the serum TSH level is in the normal

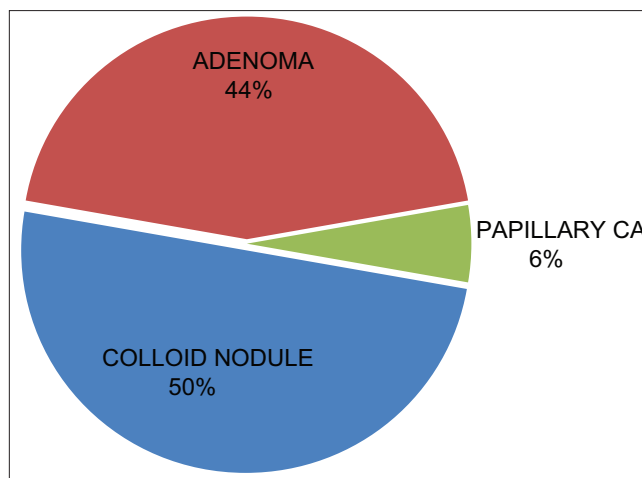


Figure 4: Distribution of cytological analysis – fine-needle aspiration cytology

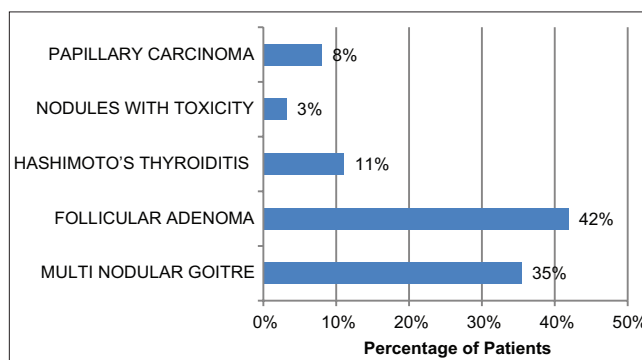


Figure 5: Distribution of pathological diagnosis

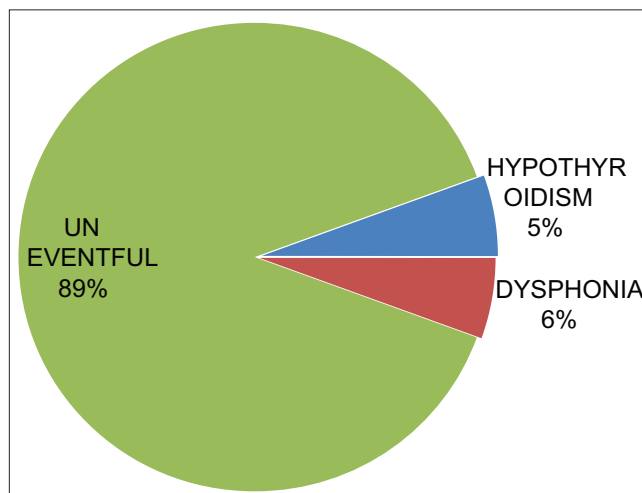


Figure 6: Distribution of complications

Table 1: Distribution of nodular goiter of the thyroid

Gender	Benign	Malignant	Total
Male	2	0	2
Female	14	2	16
Total	16	2	18

range, it is redundant to measure the T3 and T4 levels. Interpretation of deranged TSH levels, however, depends on knowledge of the T3 and T4 values.<sup>[18]</sup> In the euthyroid state, T3, T4, and TSH levels will all be within the normal range. Florid thyroid failure results in depressed T3 and T4 levels with the gross elevation of the TSH. Incipient or developing thyroid failure is characterized by low normal values of T3 and T4 and elevation of the TSH. In toxic states, the TSH level is suppressed and undetectable.<sup>[19]</sup>

## CONCLUSION

Nodular goiter of the thyroid was found to be more common in young and middle-aged patients. The majority of nodular goiter was found to be benign lesions. The incidence of malignancy was found to be 8% overall, 12.5% nodules in female were malignant. About 89% of patients had an uneventful postoperative period. One patient developed hypothyroidism and 1 patient had transient dysphonia.

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