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Surgical Thyroid Disorders: Clinical and Epidemiological Insights

Kei Xhixhabesi [1], Ergita Nelaj [2,*] and Irida Kecaj [2]

[1] *Faculty of Medicine, University of Medicine, Tirana, Albania.*
[2] *Department of Internal Medicine, University Hospital Center "Mother Teresa", Tirana, Albania.*

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Abstract

Background: Thyroid disorders represent some of the most common endocrine conditions worldwide, and considerable proportions require surgical intervention. Their burden remains particularly relevant in countries with a history of or ongoing iodine deficiency, where nodular thyroid disease continues to be widespread.

Objective: This study aimed to describe the epidemiological and clinical characteristics of patients undergoing thyroid surgery at a tertiary referral center in Albania.

Methods: A retrospective descriptive study was conducted, including 211 patients managed at the "Mother Teresa" University Hospital Center in Tirana. Data were analyzed regarding age, sex, residence, symptoms, family history, clinical presentation, preoperative diagnosis, and hospital stay.

Results: Among 211 patients, 88.1% were female, with a mean age of 46.4 years. The most frequent diagnosis was nodular goiter. Neck swelling was the main complaint in over 60% of cases. Total thyroidectomy was performed in 86% of patients. Thirty percent had a family history of thyroid disease. Most patients lived in urban areas, mainly Tirana.

Conclusions: Nodular thyroid disease remains highly prevalent with a marked female predominance. Neck swelling is the most frequent presenting symptom. Despite preventive strategies, iodine deficiency continues to play a role as a contributing factor. Early diagnosis, appropriate surgical management, and structured follow-up are essential to improve outcomes.

Keywords: Thyroid surgery; Surgical indications; Multinodular goiter; Solitary nodule

1. Introduction

Thyroid diseases are among the most common endocrine disorders worldwide, varying from benign nodular goiter to autoimmune and malignant conditions. Their prevalence depends on geographic, environmental, and genetic factors, with nodular thyroid disease remaining common in areas with a history of iodine deficiency [1,2]. Thyroid dysfunction can significantly affect cardiovascular health, leading to hypertension, arrhythmias, and dyslipidemia, which increase overall cardiovascular risk [3,4,5].

Surgical management is recommended for malignancy, compressive symptoms, cosmetic concerns, or hyperfunctioning nodules that do not respond to medical treatment, and it remains a key approach despite advances in imaging and medical therapies [6]. Understanding local epidemiology, clinical presentations, comorbidities, and surgical patterns is essential for optimizing patient care and reducing cardiovascular complications related to thyroid disease.

* Corresponding author: Ergita NELAJ

This study retrospectively examines patients evaluated and operated on for thyroid disorders at a major tertiary hospital in Albania, focusing on demographic, clinical, cardiovascular comorbidity, and surgical features, to inform both clinical practice and public health policies.

2. Materials and Methods

A retrospective, descriptive study was conducted at the "Mother Teresa" University Hospital Center in Tirana, Albania, the country's main tertiary referral hospital. All patients treated or monitored for thyroid disorders with surgical indications between September 2024 and March 2025 were included. A total of 211 consecutive patients were enrolled. Demographic data (age, sex, residence), clinical features (symptoms, family history, presentation pattern), preoperative diagnosis, comorbidities, type of surgical intervention, and length of hospital stay were obtained from hospital records. Primary outcomes included the distribution of thyroid pathologies, surgical indications, and procedure types. Secondary outcomes involved demographic and clinical characteristics.

3. Results

Among 211 patients, 186 (88.1%) were female and 25 (11.9%) were male, with a mean age of 46.4 years (range 18-75) (Fig. 1). Neck swelling was the most common complaint reported in over 60% of patients. Other symptoms primarily relate to metabolic processes (constipation, diarrhea, fatigue, weight loss, sweating, etc.) and compression of nearby organs (exertional or resting dyspnea, dysphagia, hoarseness of voice, especially in cases of goiters extending retrosternally). Thirty percent of patients reported a family history of thyroid disease. Most patients lived in urban areas, primarily Tirana.

The most common diagnosis was non-toxic nodular goiter, with 164 cases (77.73%). Neoplastic thyroid lesions accounted for 18 cases (8.53%), while diffuse goiter was observed in 3 cases (1.42%). Toxic multinodular goiter, also known as Plummer's disease, was identified in 16 cases (7.58%). Parathyroid disorders were less frequent: primary hyperparathyroidism in 4 patients (1.90%) and other thyroid conditions in 6 patients (2.84%) (Fig. 2).

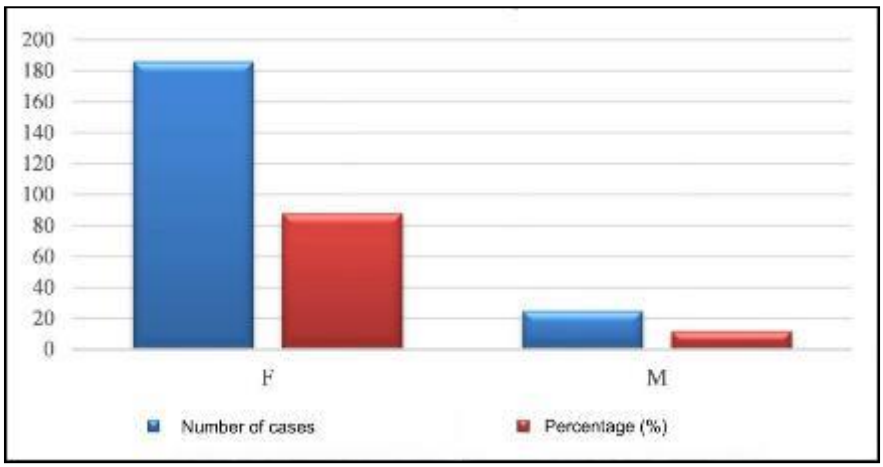

Figure 1 The number and percentage of females and males in our study

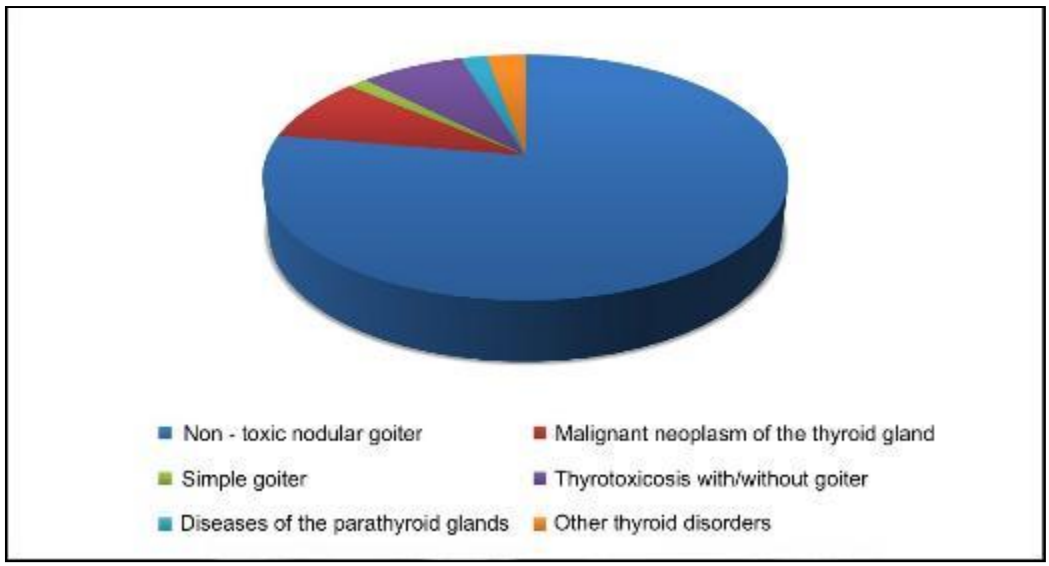

Figure 2 Types of thyroid disorders before surgery.

Arterial hypertension was the most common comorbidity, affecting 80 patients (37.9%), followed by atrial fibrillation in 54 patients (25.6%) and dyslipidemia in 49 patients (23.2%) (Fig. 3).

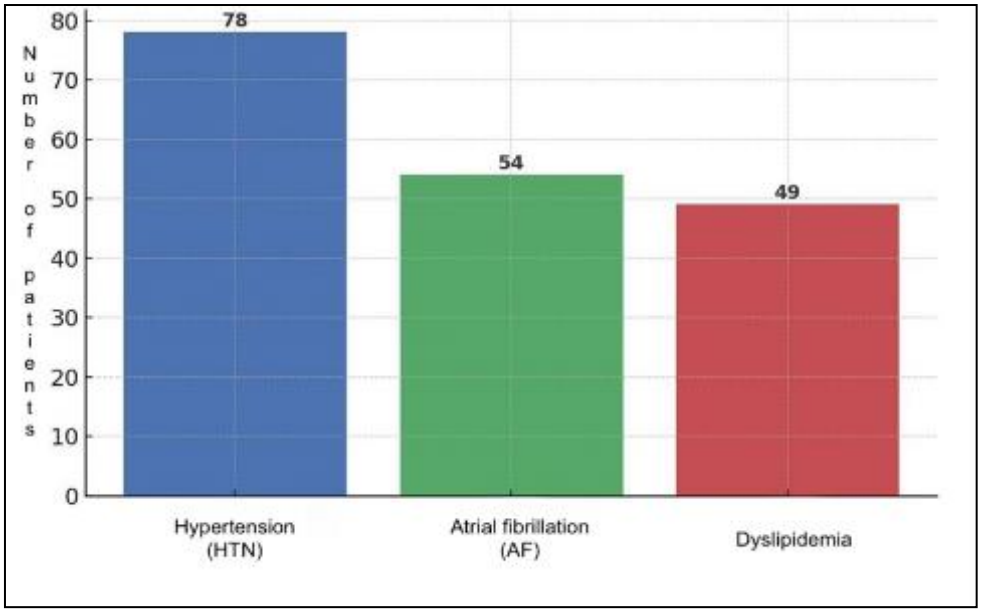

Figure 3 The most common comorbidities observed in our patients

Total thyroidectomy was performed in 86% of patients; the remaining patients underwent subtotal thyroidectomy, lobectomy, or other procedures as needed (Fig. 4).

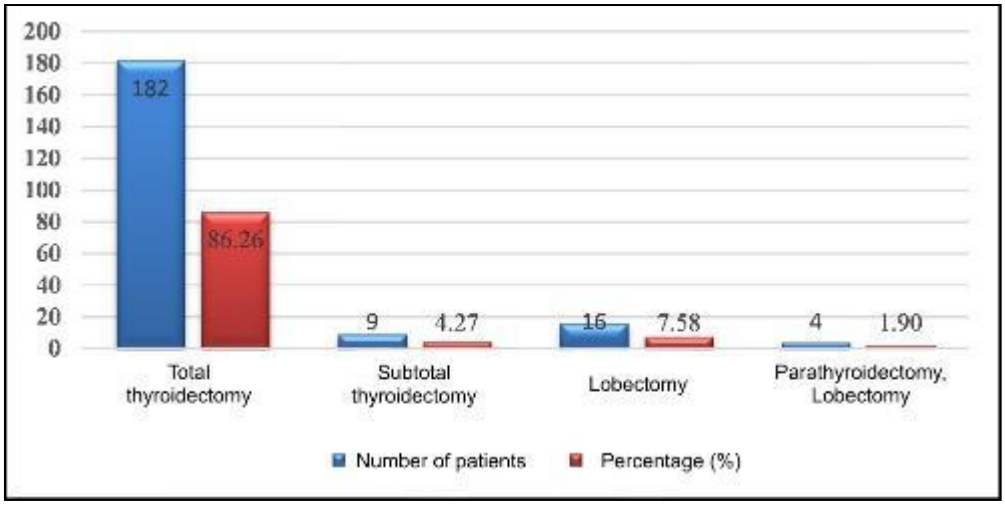

Figure 4 Distribution of patients by type of thyroid surgery

Regarding hospital stay, most patients (108) stayed for 3–4 days, followed by 80 patients who stayed 1–2 days. A small number had longer stayed: 20 patients for 5–6 days and 3 patients for 7–8 days.

4. Discussion

This study involving 211 patients with thyroid disorders shows a high percentage of female patients (88.1%), which aligns with well-known epidemiological patterns where females are more frequently affected, often with a female-to-male ratio ranging from 3:1 to 9:1 depending on the population and specific thyroid condition [1,7]. The average age of 46.4 years corresponds to the typical age range for clinically significant thyroid issues, especially nodular goiter and thyroid tumors, which tend to occur in middle-aged adults [8,9].

Neck swelling was the most common presenting complaint, reported in over 60% of patients, reflecting the typical clinical sign of goiter. This finding aligns with previous studies in both endemic and non-endemic areas, where neck enlargement remains the main reason for seeking medical help [10]. Other reported symptoms include metabolic issues (fatigue, constipation, diarrhea, weight changes) and compressive symptoms (dyspnea, dysphagia, hoarseness), illustrating the diverse clinical presentation of thyroid disorders, especially in cases with retrosternal extension or large multinodular goiters, as demonstrated in several international cohort studies [11].

The high prevalence of non-toxic nodular goiter (77.7%) in this group reflects global trends, especially in regions with a history of iodine deficiency or inadequate supplementation programs [12]. The rate of neoplastic lesions (8.5%) corresponds with the reported frequency of thyroid cancer among surgically treated nodular thyroid disease, which generally ranges from 5–15% depending on risk factors and diagnostic methods [13]. Toxic multinodular goiter, also known as Plummer's disease, was identified in 7.6% of cases, aligning with literature estimates that suggest only a small portion of nodular thyroid disease is hyperfunctioning [14,15]. Diffuse goiter and less common thyroid or parathyroid disorders constitute a small percentage of cases, reflecting their typical distribution in routine clinical practice [7,8,15].

Comorbidities observed in this cohort highlight the systemic effects of thyroid disorders, especially within the cardio-metabolic profile. Arterial hypertension (37.9%) was the most common comorbidity, followed by atrial fibrillation (25.6%) and dyslipidemia (23.2%). These findings support previous studies showing the link between thyroid dysfunction, particularly subclinical hyper- or hypothyroidism, and cardiovascular risk factors [16,17]. The high prevalence of these comorbidities underscores the importance of a comprehensive, multidisciplinary approach to patient care, which combines cardiovascular risk assessment with effective thyroid disease management.

Surgical intervention patterns in this study align with current clinical practice guidelines. Total thyroidectomy was performed in 86% of patients, consistent with recommendations favoring complete resection in cases of multinodular goiter, suspicion of malignancy, or compressive symptoms [18,19]. The remaining patients underwent subtotal thyroidectomy, lobectomy, or tailored procedures based on intraoperative findings and individual risk assessments. Most patients had a hospital stay of 3–4 days, which matches international standards for uncomplicated thyroid surgery; extended stays were limited to those with perioperative complications or more complex procedures [20].

The reported family history of thyroid disease in 30% of patients underscores the genetic predisposition involved in thyroid pathophysiology, aligning with previous studies that show familial clustering of nodular thyroid disease and autoimmune thyroid disorders [21,22]. Furthermore, the predominance of urban residency, especially from Tirana, may indicate better access to tertiary care facilities and referral patterns rather than representing a true epidemiological trend.

Overall, the findings of this study align well with the global literature on thyroid disease epidemiology, clinical presentation, and management. They reinforce established patterns such as female predominance, peak incidence in middle age, and the occurrence of non-toxic nodular goiter. The documented cardiovascular comorbidities emphasize the importance of integrated care models, especially in populations with metabolic and cardiac risk factors.

5. Conclusion

This study emphasizes the dominance of non-toxic nodular goiter among thyroid disorders in our population, with a notable female predominance and peak occurrence in middle-aged adults. Neck swelling remains the main clinical sign, while metabolic and compressive symptoms are also common. Cardiovascular comorbidities, especially hypertension, atrial fibrillation, and dyslipidemia, are frequent and highlight the need for comprehensive patient management. Surgical treatment, primarily total thyroidectomy, is effective and safe, with most patients having short hospital stays. These findings are consistent with international epidemiological trends and highlight the importance of thorough evaluation and personalized management of thyroid disorders.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare no conflicts of interest.

Statement of ethical approval

This study was conducted in accordance with the Declaration of Helsinki. Institutional approval was obtained. Patient confidentiality was maintained throughout.

Statement of informed consent

Written informed consent was obtained from all participants before inclusion in the study.

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