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Original article

Surgical Indications in Hashimoto's Thyroiditis: A Retrospective Study from Tobruk Medical Center

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Abstract
Hashimoto's thyroiditis (HT) is the most common cause of hypothyroidism and an autoimmune disorder characterized by chronic inflammation of the thyroid gland. While most patients are managed medically, a subset requires surgical intervention. This study was conducted to identify the clinical, laboratory, and radiological indications for surgery in patients with Hashimoto's thyroiditis. A retrospective analysis of 63 patients diagnosed with HT between January 2010 and December 2021 at Tobruk Medical Center. Data included clinical presentation, thyroid function tests (T3, T4, TSH), autoantibodies (Anti-TPO, Anti-TG), ultrasound findings, and fine needle aspiration cytology (FNAC). Statistical analysis was performed using the Chi-square test (SPSS 23). Of 63 patients, 51 (80.9%) were treated medically and 12 (19.1%) surgically. Significant associations with surgical treatment were found for age <40 years ($p<0.05$), female sex ($p<0.05$), positive family history ($p<0.05$), diagnostic ultrasound findings ($p<0.05$), and informative FNAC ($p<0.05$). Hypothyroidism was present in 57.2%, euthyroidism in 39.6%, and hyperthyroidism in 3.2%. All patients were Anti-TPO positive, and 58.7% were Anti-TG positive. Surgery for Hashimoto's thyroiditis is indicated in patients with compressive goiter, persistent high autoantibody levels despite medical therapy, or thyroid nodules with suspected or confirmed malignancy.
Keywords. *Hashimoto's Thyroiditis, Thyroidectomy, Surgical Indications, anti-TPO, Goiter.*

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Introduction

Hashimoto's thyroiditis (HT) is an autoimmune disease and the most common cause of hypothyroidism. It is also known as chronic autoimmune thyroiditis and chronic lymphocytic thyroiditis. The pathology begins with the formation of antithyroid antibodies that attack thyroid tissue, causing progressive fibrosis. The most common laboratory findings are elevated thyroid-stimulating hormone (TSH) and low levels of free thyroxine (fT4), coupled with increased antithyroid peroxidase (TPO) antibodies. However, throughout the disease course, patients may experience signs, symptoms, and laboratory findings of hyperthyroidism or normal values due to intermittent destruction of thyroid cells. Women are more affected, with a female-to-male ratio of 10:1, and most are diagnosed between ages 30 and 50 years (1,2).

Hakaru Hashimoto first reported the condition in 1912 after examining surgical specimens from four middle-aged women who underwent thyroidectomy for compressive symptoms (3). In 1931, Graham and McCullagh first used the term "Hashimoto" in an article title, arguing that struma lymphomatosa was distinct from Riedel's thyroiditis (4). In 1939, British thyroid surgeon Cecil Joll coined the term "Hashimoto disease" (5). Since then, HT has become one of the most common autoimmune and endocrine diseases, with an incidence of approximately 1 case per 1,000 persons per year (6) and a prevalence of 8 to 46 cases per 1,000 (7,8).

While the vast majority of HT patients respond well to medical management with levothyroxine replacement, a subset develops complications that require surgical intervention. These include large goiters with compressive symptoms (dysphagia, dyspnea), persistent high autoantibody levels unresponsive to medical therapy, and thyroid nodules in which malignancy is confirmed or cannot be excluded. This study aims to identify the specific indications for surgery in HT patients treated at Tobruk Medical Center over a 12-year period.

Methods

Study Design and Setting

This retrospective observational study was conducted at the Department of General Surgery, Tobruk Medical Center, over a twelve-year period between January 2010 and December 2021. The study aimed to evaluate clinical, laboratory, and therapeutic aspects of patients diagnosed with Hashimoto's thyroiditis (HT).

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Study Population

A total of 63 patients with a confirmed diagnosis of Hashimoto's thyroiditis were included. All participants provided informed consent prior to enrollment. Eligible patients were those with hypothyroidism adequately compensated by thyroxine preparations, elevated serum levels of anti-thyroid peroxidase (Anti-TPO) and anti-thyroglobulin (Anti-TG) antibodies, and no evidence of common somatic or systemic autoimmune diseases.

Data Collection

Each patient underwent a comprehensive clinical assessment, including documentation of presenting complaints and family history. Laboratory investigations comprised measurement of serum T3, T4, TSH, Anti-TPO, and Anti-TG levels. Imaging evaluation was performed using thyroid ultrasound, and fine needle aspiration cytology (FNAC), with or without ultrasound guidance, was conducted to further characterize nodular lesions.

Variables Analyzed

The study analyzed demographic and clinical variables including age group (<40 years vs. ≥40 years), sex, family history of HT, and chief presenting complaint (thyroid nodules, goiter, myalgia, or other symptoms). Hormonal status was categorized as hypothyroid, euthyroid, or hyperthyroid, while antibody status was determined by Anti-TPO and Anti-TG positivity. Ultrasound findings were classified as positive or negative, and FNAC results were recorded as informative or non-informative. Additionally, travel distance to the medical center was noted to assess accessibility of care.

Treatment Groups

Patients were stratified into two treatment groups. The medical treatment group consisted of 51 patients who received levothyroxine replacement therapy. The surgical treatment group included 12 patients who underwent thyroidectomy based on clinical indications.

Statistical Analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 23 (SPSS, Chicago, IL, USA). Categorical variables were expressed as frequencies and percentages. Comparisons between medical and surgical treatment groups were performed using the Chi-square test**. A** p-value < 0.05 was considered statistically significant.

Results

Table 1 exhibited that the majority of patients were younger than 40 years (74.6%), with a median age of 40 years at diagnosis. This indicates that Hashimoto's thyroiditis in this cohort predominantly affected younger adults, consistent with the known epidemiology of autoimmune thyroid disease.

Table 1. Demographic Characteristics of Patients with Hashimoto's Thyroiditis (N = 63)

Age	Number	Percentage
Below 40 years	47 patients	(74.6%)
Above 40 years	16 patients	(25.4%)

Females accounted for nearly four-fifths of the study population (79.4%), yielding a female-to-male ratio of approximately 4:1. This strong female predominance aligns with the established gender bias in autoimmune thyroid disorders.

Table 2. Sex Distribution of Patients with Hashimoto's Thyroiditis (N = 63)

Sex	Number	Percentage
Females	50 patients	(79.4%)
Males	13 patients	(20.6%)

Female-to-male ratio: Approximately 4:1

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A positive family history of Hashimoto's thyroiditis was reported in 63.5% of patients, suggesting a significant hereditary component in disease susceptibility within this population.

Table 3. Family History of Hashimoto's Thyroiditis among Study Patients (N = 63)

Family History	Number	Percentage
Positive family history of HT	40 patients	(63.5%)
No family history	23 patients	(36.5%)

Thyroid nodules were the most common presenting complaint (80.5%), followed by myalgia (36.5%) and goiter (26.9%). A smaller proportion presented with other symptoms such as dyspnea, dysphagia, or weight gain. Notably, several patients reported multiple concurrent complaints, reflecting the heterogeneous clinical spectrum of HT.

Table 4. Clinical Presentation of Patients with Hashimoto's Thyroiditis (N = 63)

Chief Complaint	Number of Patients	Percentage
Thyroid nodules	51	80.5%
Goiter	17	26.9%
Myalgia	23	36.5%
Other (dyspnea, dysphagia, weight gain)	9	14.2%

Note: Some patients had multiple complaints.

More than half of the patients (57.2%) were hypothyroid at presentation, while 39.6% were euthyroid and only 3.2% were hyperthyroid. This distribution highlights hypothyroidism as the predominant hormonal abnormality in HT.

Table 5. Hormonal Status of Patients with Hashimoto's Thyroiditis (N = 63)

Hormonal Status	Number	Percentage
Hypothyroid	36	57.2%
Euthyroid	25	39.6%
Hyperthyroid	2	3.2%

All patients were Anti-TPO positive, confirming the diagnostic hallmark of HT. Additionally, 58.7% were Anti-TG positive, reinforcing the autoimmune nature of the disease and its serological variability.

Table 6. Autoantibody Profile of Patients with Hashimoto's Thyroiditis (N = 63)

Antibody Profile	Number	Percentage
Anti-TPO positive	63 patients	(100%)
Anti-TG positive:	37 patients	(58.7%)

Ultrasound successfully identified HT in 60% of cases, while 40% were not diagnosed by imaging alone. This underscores the complementary role of ultrasound in diagnosis, which should be interpreted alongside serological and cytological findings.

Table 7. Ultrasound Findings in Patients with Hashimoto's Thyroiditis (N = 63)

Ultrasound Findings	Number	Percentage
Diagnosed by ultrasound	38 patients	(60.0%)
Not diagnosed by ultrasound	25 patients	(40.0%)

FNAC was informative in 68.2% of patients, providing cytological confirmation of HT. However, in nearly one-third of cases (31.8%), FNAC was non-informative, reflecting its limitations and the need for multimodal diagnostic approaches.

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Table 8. Fine Needle Aspiration Cytology (FNAC) Results in Patients with Hashimoto's Thyroiditis (N = 63)

Fine Needle Aspiration Cytology (FNAC)	Number	Percentage
Informative FNAC	43 patients	(68.2%)
Non-informative FNAC	20 patients	(31.8%)

The majority of patients (80.9%) received medical management with levothyroxine, while 19.1% underwent surgical intervention. This distribution reflects the standard therapeutic approach, reserving surgery for selected cases.

Table 9. Treatment Distribution among Patients with Hashimoto's Thyroiditis (N = 63)

Treatment Distribution	Number	Percentage
Medical treatment	51 patients	(80.9%)
Surgical treatment	12 patients	(19.1%)

Several variables were significantly associated with surgical management, including age ≥40 years, male sex, positive family history, ultrasound diagnosis, informative FNAC, and longer travel distance to the medical center (all $p < 0.05$). These findings suggest that demographic, clinical, and logistical factors collectively influenced the decision for thyroidectomy.

Table 10. Factors Associated with Surgical Treatment in Patients with Hashimoto's Thyroiditis

Variable	Chi-square value	P-value	Significance
Age (<40 vs. ≥40)	4.21	0.04	Significant
Sex (female vs. male)	5.68	0.017	Significant
Family history (positive vs. negative)	6.02	0.014	Significant
Ultrasound diagnosis (yes vs. no)	7.34	0.007	Significant
FNAC (informative vs. non-informative)	5.91	0.015	Significant
Travel distance (long vs. short)	4.85	0.028	Significant

All p-values were <0.05, indicating statistically significant associations between these variables and the likelihood of undergoing surgical treatment.

Discussion

This study of 63 patients with Hashimoto's thyroiditis over a 12-year period demonstrates that while the majority (80.9%) can be successfully managed with medical therapy alone, a substantial minority (19.1%) require surgical intervention. These findings are consistent with previously published literature, which reports surgical rates in HT ranging from 10% to 25% depending on the patient population and referral patterns (9,10). The predominance of female patients (79.4%) in our cohort aligns with the well-established female predilection of autoimmune thyroid disease, though our ratio (4:1) is lower than the classic 10:1 ratio reported in some Western populations (1). This difference may reflect regional variations in healthcare access or referral bias. The majority of patients (74.6%) were under 40 years of age, consistent with HT typically presenting in young to middle-aged adults.

Among the 17 patients presenting with goiter, those with compressive symptoms (dysphagia, dyspnea, neck tightness) were more likely to undergo surgery. This finding supports the well-established principle that mechanical obstruction from an enlarged thyroid gland is a clear indication for thyroidectomy, regardless of hormonal status (11). All surgical patients had persistently elevated Anti-TPO and Anti-TG levels despite adequate medical therapy. While levothyroxine replaces deficient hormones, it does not halt the autoimmune process. Some studies suggest that total thyroidectomy may reduce autoantibody burden by removing the target organ of the immune attack (12). However, this remains controversial, and surgery for this indication alone should be considered carefully.

The most common presenting complaint was thyroid nodules (80.5%). Among surgical patients, the decision to operate was often driven by FNAC results showing atypia, follicular lesion of undetermined significance, or frank malignancy. Hashimoto's thyroiditis is associated with an increased risk of thyroid cancer, particularly papillary thyroid carcinoma (13). Therefore, any nodule in an HT patient that grows over time or has suspicious ultrasound features (microcalcifications, irregular margins, taller-than-wide shape) warrants FNAC and possible surgical excision. Our

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statistical analysis revealed several significant predictors of surgical intervention: Age <40 years: younger patients may be more willing to undergo surgery or may have more aggressive disease. Female sex: Reflects overall higher prevalence in women. Positive family history: Suggests a genetic predisposition to more severe autoimmune activity. Diagnostic ultrasound**:** Patients with clear ultrasound evidence of thyroiditis or nodules were more likely to be referred for surgery. Informative FNAC: When FNAC provides a definitive diagnosis (benign, suspicious, or malignant), clinical decision-making is facilitated, leading to more surgical referrals. Long travel distance: Interestingly, patients living farther from the medical center were more likely to undergo surgery. This may reflect a preference for definitive surgical management to avoid repeated long-distance follow-up visits.

Conclusion

In conclusion, Hashimoto's thyroiditis is a common autoimmune disease and the leading cause of hypothyroid goiter, with a strong female predominance. While most patients respond well to medical management with levothyroxine, surgery is indicated in specific circumstances.

Conflict of interest. Nil

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