

Research Article

CLINICOPATHOLOGICAL PROFILE AND SURGICAL OUTCOMES OF PATIENTS UNDERGOING THYROIDECTOMY AT A TERTIARY CARE TEACHING HOSPITAL: A FIVE-YEAR EXPERIENCE

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Abstract: **Introduction:** Thyroid disorders are among the most common endocrine diseases worldwide and frequently require surgical intervention for both benign and malignant conditions. Thyroidectomy remains the definitive treatment for multinodular goitre, solitary thyroid nodules, Graves' disease, and thyroid malignancies. Evaluation of the clinicopathological profile and surgical outcomes helps improve patient management and assess the quality of surgical care in tertiary healthcare institutions. **Aim:** To evaluate the clinicopathological profile and surgical outcomes of patients undergoing thyroidectomy at a tertiary care teaching hospital over a five-year period. **Objectives:** 1To study the demographic characteristics, clinical presentation, and histopathological spectrum of thyroid diseases among patients undergoing thyroidectomy. 2To evaluate the surgical procedures performed, postoperative complications, and surgical outcomes and determine their association with clinicopathological variables. **Materials and Methods:** A hospital-based retrospective observational study was conducted in the Department of General Surgery of a tertiary care teaching hospital. Medical records of 100 patients who underwent thyroidectomy were reviewed. Demographic characteristics, clinical presentation, imaging findings, FNAC reports, type of surgery, histopathological diagnosis, postoperative complications, and surgical outcomes were analyzed. Data were analyzed using SPSS version 26.0. **Results:** The mean age of patients was 43.8 ± 12.4 years, with the majority (30%) belonging to the 41–50-year age group. Females constituted 76% of the study population. Multinodular goitre (42%) was the commonest indication for thyroidectomy, followed by solitary thyroid nodules (25%), while malignant lesions accounted for 18% of cases. Total thyroidectomy was performed in 58% of patients and hemithyroidectomy in 42%. A significant association was observed between malignant histopathology and total thyroidectomy ($p < 0.001$). Transient hypocalcaemia was the most common postoperative complication (15.5% after total thyroidectomy), whereas recurrent laryngeal nerve palsy, postoperative haematoma, and wound infection were uncommon. Patients with malignant thyroid disease had significantly longer hospital stays (5.1 ± 1.8 days) than those with benign disease (3.2 ± 1.1 days, $p < 0.001$). Overall, 87% of patients had an uneventful postoperative recovery. **Conclusion:** Thyroidectomy is a safe and effective surgical procedure for the management of both benign and malignant thyroid diseases. Middle-aged females constituted the majority of patients, and multinodular goitre remained the most common indication for surgery. Total thyroidectomy was significantly associated with malignant thyroid lesions and carried a slightly higher risk of transient postoperative complications, particularly hypocalcaemia. Careful preoperative assessment, meticulous surgical technique, and structured postoperative monitoring resulted in excellent surgical outcomes with minimal morbidity. These findings support the continued role of thyroidectomy as the standard surgical treatment for appropriately selected thyroid disorders in tertiary care centres.

Keywords:

Thyroidectomy; Clinicopathological profile; Multinodular goitre; Thyroid carcinoma.

INTRODUCTION

The thyroid gland is one of the largest endocrine organs in the human body and plays a central role in regulating metabolism, growth, thermogenesis, cardiovascular function, and normal neurological development through the secretion of triiodothyronine (T3) and thyroxine (T4). Disorders of the thyroid gland are among the most common endocrine diseases worldwide and encompass a broad spectrum of pathological conditions, including benign multinodular goitre, solitary thyroid nodules,

Graves' disease, thyroiditis, and thyroid malignancies. The prevalence of thyroid nodules increases with advancing age and is higher in women, with ultrasonography detecting nodules in up to 60–70% of adults, although only a small proportion are malignant.¹ The increasing use of high-resolution ultrasonography and fine-needle aspiration cytology (FNAC) has resulted in earlier detection and more accurate preoperative characterization of thyroid lesions, thereby improving patient selection for surgery.^{1,2}

Globally, thyroid disorders represent a major public health concern, affecting hundreds of millions of individuals. Thyroid cancer is currently one of the fastest rising endocrine malignancies, primarily because of improved detection of papillary thyroid carcinoma and increased awareness among clinicians. Despite this increase in incidence, survival rates remain excellent when timely diagnosis and appropriate surgical management are undertaken. Current international guidelines emphasize individualized management based on clinical findings, imaging characteristics, cytology, molecular markers where appropriate, and patient-specific risk stratification.³ Total thyroidectomy, hemithyroidectomy, completion thyroidectomy, and selective lymph node dissection remain the cornerstone surgical procedures depending on the nature and extent of disease.³ Surgical decision-making has evolved significantly over the last decade with greater emphasis on balancing oncological clearance while minimizing postoperative complications.

In India, thyroid disorders constitute a significant healthcare burden because of the country's large population, regional variations in iodine intake, environmental influences, and increasing awareness leading to improved diagnosis. Epidemiological studies have estimated that nearly 1 in 10 Indian adults suffers from hypothyroidism, while thyroid nodules and multinodular goitre continue to be frequently encountered in surgical practice. Women are disproportionately affected, particularly during reproductive and middle age. Although universal salt iodization has substantially reduced iodine deficiency disorders, thyroid enlargement, autoimmune thyroid disease, and differentiated thyroid carcinoma continue to contribute considerably to hospital admissions and endocrine surgical workload.⁴ Early recognition and appropriate management remain essential for preventing compressive symptoms, hyperthyroidism-related complications, and progression of malignant disease.

Thyroidectomy remains the definitive treatment for a wide range of thyroid diseases including multinodular goitre causing compressive symptoms, toxic goitre refractory to medical therapy, suspicious or malignant thyroid nodules, Graves' disease, recurrent cystic lesions, and confirmed thyroid carcinoma. Advances in preoperative imaging, FNAC using the Bethesda system, intraoperative nerve monitoring, refined surgical techniques, improved anaesthesia, and meticulous preservation of the recurrent laryngeal nerves and parathyroid glands have significantly enhanced surgical safety. Nevertheless, thyroid surgery continues to demand considerable technical expertise because complications such as recurrent laryngeal nerve injury, hypocalcaemia due to hypoparathyroidism, postoperative haemorrhage, wound infection, and hypothyroidism can adversely affect patient quality of life.^{5,6}

The clinicopathological spectrum of thyroid disease varies considerably across different geographical regions owing to differences in dietary iodine status, genetics, healthcare access, referral patterns, and environmental factors. Consequently, institutional audits provide valuable information regarding demographic characteristics, clinical presentation, cytological findings, histopathological diagnoses, operative procedures performed, postoperative complications, and long-term outcomes. Such analyses help identify local disease patterns, evaluate adherence to evidence-based surgical guidelines, improve quality assurance, and facilitate comparison with national and international literature.⁶

A comprehensive evaluation of patients undergoing thyroidectomy in a tertiary care teaching hospital offers an opportunity to understand the changing trends in thyroid disease over time while simultaneously assessing the effectiveness and safety of surgical management. A five-year institutional experience can provide robust evidence regarding the distribution of benign and malignant thyroid lesions, demographic characteristics, indications for surgery, clinicopathological correlations, perioperative complications, and surgical outcomes. Such information is valuable for optimizing patient care, refining surgical protocols, strengthening resident training, and contributing to the growing body of evidence from India.⁷ Therefore, the present study entitled "Clinicopathological Profile and Surgical Outcomes of Patients Undergoing Thyroidectomy at a Tertiary Care Teaching Hospital: A Five-Year Experience" was undertaken to comprehensively evaluate the demographic characteristics, clinicopathological features, histopathological spectrum, surgical procedures, postoperative complications, and outcomes among patients undergoing thyroidectomy.

Aim

To evaluate the clinicopathological profile and surgical outcomes of patients undergoing thyroidectomy at a tertiary care teaching hospital over a five-year period.

Objectives

1. To study the demographic characteristics, clinical presentation, preoperative investigations, and histopathological spectrum of thyroid diseases among patients undergoing thyroidectomy.
2. To evaluate the surgical procedures performed, postoperative complications, and surgical outcomes in patients undergoing thyroidectomy and determine their association with clinicopathological variables.

MATERIALS AND METHODS

Study

A Hospital-based retrospective observational study.

Design:

Study Setting:

Department of General Surgery in collaboration with the Department of Pathology at a tertiary care teaching hospital.

Study Population:

All patients who underwent thyroidectomy during the study period.

Sample Size:

A total of 100 patients who fulfilled the eligibility criteria were included in the study.

Inclusion Criteria

- Patients aged ≥ 18 years.
- Patients who underwent hemithyroidectomy, total thyroidectomy, completion thyroidectomy, or near-total thyroidectomy.
- Availability of complete medical records and histopathological reports.

Exclusion Criteria

- Patients with incomplete medical records.
- Patients who underwent thyroid surgery elsewhere.
- Re-operative thyroid surgeries performed for recurrent disease.
- Patients with missing postoperative follow-up details.

Study Variables

- Age
- Gender
- Clinical presentation
- Duration of symptoms
- Thyroid function status
- Ultrasonography findings
- FNAC (Bethesda classification)
- Type of thyroidectomy
- Histopathological diagnosis
- Postoperative complications
- Duration of hospital stay

Data Collection

Data were collected retrospectively from operation theatre registers, inpatient case records, pathology reports, and hospital electronic medical records using a structured proforma.

Statistical Analysis

Data were entered into Microsoft Excel and analysed using SPSS version 26.0. Categorical variables were expressed as frequencies and percentages. Continuous variables were expressed as mean $\pm$ standard deviation. Chi-square test/Fisher's Exact test was used to compare categorical variables. Independent Student's t-test was used for comparison of continuous variables. A p-value < 0.05 was considered statistically significant.

RESULTS

Table 1. Distribution of patients according to demographic characteristics (n=100)

Variable	Frequency	Percentage
Age (years)		
18–30	18	18.0
31–40	27	27.0
41–50	30	30.0
51–60	17	17.0
>60	8	8.0
Mean age	43.8 $\pm$ 12.4	-
Gender		
Male	24	24.0
Female	76	76.0

Interpretation:

Most patients belonged to the 41–50-year age group (30%) with a mean age of 43.8 $\pm$ 12.4 years. Females constituted 76% of the study population, indicating a marked female predominance.

Table 2. Distribution according to clinical diagnosis and histopathology

Diagnosis	Frequency	Percentage
Multinodular goitre	42	42.0
Solitary thyroid nodule	25	25.0
Papillary carcinoma	18	18.0
Follicular neoplasm	8	8.0
Graves' disease	5	5.0
Hashimoto thyroiditis	2	2.0

Interpretation:

Multinodular goitre was the commonest indication for thyroidectomy (42%), followed by solitary thyroid nodules (25%). Malignant lesions accounted for 18% of the cases.

Table 3. Type of surgery according to final histopathological diagnosis

Histopathology	Hemithyroidectomy	Total Thyroidectomy	Total
Benign lesions	40	42	82
Malignant lesions	2	16	18
Total	42	58	100

p-value <0.001*

*Significant

Interpretation:

Patients with malignant thyroid lesions underwent total thyroidectomy significantly more often than patients with benign lesions (p<0.001).

Table 4. Postoperative complications according to type of thyroidectomy

Complication	Hemithyroidectomy (n=42)	Total Thyroidectomy (n=58)	p-value
Transient hypocalcaemia	1 (2.4%)	9 (15.5%)	0.028*
Permanent hypocalcaemia	0	2 (3.4%)	0.221
Transient RLN palsy	1 (2.4%)	4 (6.9%)	0.395
Postoperative hematoma	1 (2.4%)	2 (3.4%)	0.782
Wound infection	1 (2.4%)	2 (3.4%)	0.782
No complications	38 (90.5%)	39 (67.2%)	0.009*

Interpretation:

Transient hypocalcaemia occurred significantly more frequently following total thyroidectomy than hemithyroidectomy (15.5% vs 2.4%, p=0.028). Overall complication-free recovery was significantly higher after hemithyroidectomy (p=0.009).

Table 5. Surgical outcome according to histopathological diagnosis

Outcome	Benign (n=82)	Malignant (n=18)	p-value
Uneventful recovery	75 (91.5%)	12 (66.7%)	0.006*
Postoperative complications	7 (8.5%)	6 (33.3%)	0.006*
Mean hospital stay (days)	3.2 ± 1.1	5.1 ± 1.8	<0.001*

*Significant

Interpretation:

Patients with malignant thyroid disease experienced significantly higher postoperative complication rates and longer hospital stays compared with those having benign thyroid lesions (p<0.05). Most patients (87%) had an uneventful postoperative recovery with favorable surgical outcomes.

DISCUSSION

The present study evaluated the clinicopathological profile and surgical outcomes of patients undergoing thyroidectomy over a five-year period at a tertiary care teaching hospital. The findings demonstrated that thyroid disorders predominantly affected middle-aged women, with benign thyroid diseases constituting the majority of surgical cases. Total thyroidectomy was the most frequently performed procedure, particularly for malignant lesions, while postoperative complications were generally low and comparable with internationally accepted standards. These findings reaffirm the safety and effectiveness of thyroid surgery when performed in specialized tertiary care centres.⁸

The present study showed a mean patient age of 43.8 ± 12.4 years, with the majority (30%) belonging to the 41–

50-year age group. Similar findings were reported by Alqahtani et al., who observed a mean age of 44.7 ± 13.1 years, with the highest incidence occurring during the fourth and fifth decades of life.⁹ Likewise, Sakorafas et al. reported that thyroidectomy was most commonly performed among patients aged 40–50 years, reflecting the increased prevalence of multinodular goitre and differentiated thyroid carcinoma in this age group.¹⁰ These similarities may be attributed to hormonal influences and cumulative exposure to environmental risk factors during middle age.

A marked female predominance (76%) was observed in our study, which is consistent with the well-established higher incidence of thyroid disorders among women. Brito et al. reported that females constituted approximately 78% of patients undergoing thyroid surgery, while Adam et al. documented a female

proportion of 74.5% in a multicentre surgical cohort.^{11, 12} Female predominance has been attributed to autoimmune susceptibility, hormonal influences, and greater healthcare-seeking behaviour.

Benign thyroid diseases accounted for 82% of surgical specimens in the present study, with multinodular goitre (42%) being the commonest indication for thyroidectomy, followed by solitary thyroid nodules (25%). This finding closely resembles the study by Agarwal et al., in which multinodular goitre represented 46% of thyroidectomy specimens, whereas papillary carcinoma constituted approximately 19%.¹³ Similar observations have also been reported in several Indian tertiary care centres, where multinodular goitre remains the predominant surgical pathology despite universal salt iodization.¹³

Malignant thyroid lesions constituted 18% of our cases, predominantly papillary thyroid carcinoma. Kim et al. similarly reported papillary thyroid carcinoma accounting for approximately 85% of thyroid malignancies, with excellent long-term survival following surgical treatment.¹⁴ The relatively lower proportion of malignant lesions in our series compared with high-volume oncology centres is likely due to the inclusion of a larger number of benign thyroid disorders requiring surgery.

The present study demonstrated a statistically significant association between histopathological diagnosis and the type of surgery performed ($p < 0.001$), with 88.9% of malignant lesions undergoing total thyroidectomy. These findings are consistent with the recommendations of contemporary endocrine surgical practice, where total thyroidectomy is preferred for most differentiated thyroid cancers. Adam et al. similarly reported significantly higher rates of total thyroidectomy among patients with malignant thyroid disease, emphasizing improved oncological clearance and reduced recurrence risk.¹²

Postoperative complications in the present study were low, indicating good surgical outcomes. Transient hypocalcaemia occurred in 15.5% of patients undergoing total thyroidectomy compared with 2.4% after hemithyroidectomy ($p=0.028$). Comparable findings were reported by Edafe et al., whose systematic review documented transient hypocalcaemia rates ranging from 14% to 27%, depending on the extent of surgery and parathyroid preservation techniques.¹⁵ The lower complication rate observed in our study may reflect meticulous capsular dissection and preservation of parathyroid vascularity.

Transient recurrent laryngeal nerve palsy occurred in 6.9% of patients undergoing total thyroidectomy and 2.4% following hemithyroidectomy, while no permanent nerve injuries were observed. Similar outcomes were described by Kim et al., who reported temporary

recurrent laryngeal nerve palsy rates between 3% and 6%, with permanent palsy occurring in less than 1% of patients undergoing thyroid surgery in experienced centres.¹⁴ These findings highlight the importance of meticulous identification and preservation of the recurrent laryngeal nerve during surgery.

Postoperative haematoma and wound infection each occurred in less than 4% of patients in our study, comparable to international reports. Previous multicentre studies have demonstrated postoperative haematoma rates of 0.5–3% and wound infection rates below 2%, emphasizing that these complications remain uncommon following modern thyroid surgery.¹² These low complication rates indicate adherence to standard surgical techniques and perioperative care protocols.

Our study also demonstrated that patients with malignant thyroid disease experienced significantly longer hospital stays (5.1 ± 1.8 days) than those with benign disease (3.2 ± 1.1 days, $p < 0.001$). Similar observations were reported by Alqahtani et al., who found prolonged hospitalization among patients requiring total thyroidectomy with lymph node dissection owing to increased postoperative monitoring and calcium supplementation.⁹

Overall, 87% of patients in the present study experienced uneventful postoperative recovery, reflecting excellent surgical outcomes in a tertiary care teaching hospital. These findings compare favourably with published international series reporting successful postoperative recovery in 85–95% of patients undergoing thyroidectomy.^{8, 12} The low complication rates observed in the present study support the effectiveness of standardized preoperative evaluation, experienced endocrine surgical teams, careful preservation of the recurrent laryngeal nerves and parathyroid glands, and structured postoperative monitoring.

In summary, the present study demonstrates that thyroidectomy is a safe and effective treatment for both benign and malignant thyroid diseases when performed in experienced tertiary care centres. The clinicopathological profile observed in our patients is comparable to that reported in national and international literature, while the surgical outcomes achieved are consistent with contemporary evidence supporting thyroidectomy as the standard of care for appropriately selected patients.^{8–15}

CONCLUSION

The present study demonstrated that thyroid disorders requiring surgical intervention predominantly affected middle-aged females, with benign thyroid diseases, particularly multinodular goitre, constituting the majority of cases. Total thyroidectomy was the most commonly performed procedure for malignant thyroid lesions, while hemithyroidectomy remained the preferred surgical option for selected benign conditions.

The clinicopathological profile observed in this study was comparable with findings reported in national and international literature. Postoperative complications, including transient hypocalcaemia and recurrent laryngeal nerve palsy, were infrequent and occurred predominantly following total thyroidectomy, whereas major complications such as permanent nerve injury and postoperative haemorrhage were rare. Most patients experienced an uneventful postoperative recovery with favorable surgical outcomes, highlighting the safety and effectiveness of thyroidectomy when performed in a tertiary care teaching hospital with meticulous surgical technique and appropriate perioperative care. The findings emphasize the importance of comprehensive preoperative evaluation, accurate clinicopathological diagnosis, and standardized surgical management in optimizing patient outcomes and minimizing postoperative morbidity.

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