

## Research Article

# Postoperative Complications of Thyroid Surgery and Their Management: A Prospective Observational Study from a Tertiary Care Center

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**Abstract:** **Introduction:** Thyroidectomy is a commonly performed endocrine surgical procedure with generally favorable outcomes; however, postoperative complications remain clinically significant and impact patient recovery. **Aim:** To evaluate the incidence, pattern, and management of postoperative complications following thyroid surgery. **Methods:** A prospective observational study was conducted among 60 patients undergoing hemi or total thyroidectomy at a tertiary care center. Demographic variables, diagnosis, type of surgery, and postoperative complications were recorded and analyzed using descriptive statistics. **Results:** The majority of patients were female (78.33%) with a mean age of 44.37±9.3 years. Multinodular goitre was the most common diagnosis (55%). Hemi-thyroidectomy was performed in 61.67% of cases. Overall, 45% of patients developed complications. Transient hypocalcemia was the most frequent complication (28.33%), predominantly observed after total thyroidectomy (73.91%). Other complications included hoarseness of voice (11.67%), recurrent laryngeal nerve injury (5%), and hematoma (1.67%). **Conclusion:** Thyroidectomy is a safe procedure with low major complication rates. However, transient hypocalcemia and voice-related complications remain significant concerns, especially following total thyroidectomy. Early detection and appropriate management significantly improve outcomes. **Advancement to knowledge:** This study highlights procedure-specific complication patterns, emphasizing targeted preventive strategies.

**Keywords:** Thyroidectomy; Hypocalcemia; Recurrent laryngeal nerve; Postoperative complications; Thyroid surgery

## INTRODUCTION

Thyroidectomy remains a cornerstone procedure in endocrine surgery, widely performed for benign and malignant thyroid disorders. Over the past few decades, advances in surgical techniques, anesthesia, and perioperative care have significantly reduced morbidity and mortality associated with thyroid surgery [1,2]. Despite these improvements, postoperative complications continue to pose challenges, particularly affecting patient quality of life and healthcare burden [3]. Globally, the incidence of thyroid disorders, including thyroid nodules and malignancies, has shown a consistent rise, attributed to improved diagnostic modalities and environmental factors [4]. Thyroidectomy is indicated in conditions such as multinodular goitre, solitary thyroid nodules, and thyroid malignancies, with the choice between hemi and total thyroidectomy depending on disease extent and pathology [5].

Postoperative complications can be broadly categorized into immediate and late complications. Immediate complications include hemorrhage, airway obstruction,

and nerve injury, while late complications include hypocalcemia and hypothyroidism [6]. Among these, hypocalcemia due to parathyroid gland injury and recurrent laryngeal nerve (RLN) injury leading to voice changes are the most frequently encountered complications [7].

The risk of complications varies based on multiple factors, including surgical technique, surgeon experience, extent of surgery, and patient-related factors such as comorbidities [8]. Total thyroidectomy is associated with a higher complication rate compared to hemi-thyroidectomy due to increased manipulation of surrounding structures [9].

Recent advances such as intraoperative nerve monitoring (IONM) and improved visualization techniques have contributed to reducing complication rates [10]. However, complications cannot be entirely eliminated, making early identification and management critical.

Therefore, this study aims to evaluate the pattern, frequency, and management of postoperative complications following thyroidectomy in a tertiary care

setting, thereby contributing to improved surgical outcomes.

## MATERIALS AND METHODS

This prospective observational study was conducted in the Department of General Surgery at a tertiary care teaching hospital over a period of two years. A total of 60 patients aged between 20 and 60 years undergoing thyroidectomy were included after obtaining informed consent and ethical clearance.

Patients with thyroid disorders requiring surgical intervention, including multinodular goitre, solitary thyroid nodules, and malignancy, were enrolled. Exclusion criteria included pediatric patients, pregnant women, and patients not in a euthyroid state.

All patients underwent detailed clinical evaluation including history, physical examination, thyroid function

tests, imaging studies, and fine-needle aspiration cytology (FNAC). Based on clinical and pathological findings, patients underwent either hemi-thyroidectomy or total thyroidectomy.

Intraoperative parameters and postoperative complications were recorded. Patients were monitored for complications such as hypocalcemia, recurrent laryngeal nerve injury, hematoma, respiratory distress, and wound complications during hospitalization.

Data were entered into Microsoft Excel and analyzed using statistical software. Categorical variables were expressed as frequencies and percentages, while continuous variables were expressed as mean  $\pm$  standard deviation. Descriptive statistics were used to summarize the findings.

## RESULTS

### Overall Findings

A total of 60 patients were analyzed. The majority were females (78.33%), with a mean age of  $44.37 \pm 9.3$  years. Multinodular goitre was the most common diagnosis (55%), followed by solitary nodules (28.33%) and malignancy (16.67%). Hemi-thyroidectomy was performed more frequently (61.67%) compared to total thyroidectomy (38.33%). Overall complication rate was 45%, with transient hypocalcemia being the most common complication.

### Table 1: Demographic Characteristics

The study population predominantly consisted of females (78.33%), reflecting the higher prevalence of thyroid disorders among women. The mean age was  $44.37 \pm 9.3$  years, with the majority of patients belonging to the 31–50 years age group (65%). Only a small proportion (3.33%) were above 60 years. This distribution highlights the peak incidence of thyroid disorders in middle-aged individuals, consistent with known epidemiological trends.

Variable	Value
Total Patients	60
Female	47 (78.33%)
Male	13 (21.67%)
Mean Age	$44.37 \pm 9.3$

### Table 2: Diagnosis Distribution

Multinodular goitre was the most common diagnosis (55%), followed by solitary thyroid nodules (28.33%) and malignancy (16.67%). The predominance of benign conditions reflects the general surgical burden of thyroid diseases. However, a significant proportion of malignancy (16.67%) indicates the importance of early diagnosis and surgical management.

Diagnosis	n	%
Multinodular Goitre	33	55
Solitary Nodule	17	28.33
Malignancy	10	16.67

### Table 3: Type of Surgery

Hemi-thyroidectomy was the most commonly performed procedure (61.67%), primarily for benign conditions such as solitary nodules. Total thyroidectomy (38.33%) was mainly performed for malignancy and extensive multinodular goitre. This distribution reflects appropriate surgical decision-making based on disease extent and pathology.

Surgery Type	n	%
Hemi-thyroidectomy	37	61.67
Total Thyroidectomy	23	38.33

### Table 4: Postoperative Complications

Postoperative complications were observed in 45% of patients. Transient hypocalcemia was the most frequent complication (28.33%), predominantly in total thyroidectomy cases. Hoarseness of voice (11.67%) and RLN injury (5%)

were notable complications affecting vocal function. Rare complications included hematoma, respiratory issues, and seroma (1.67% each). No mortality was observed.

Complication	n	%
No complications	33	55
Transient hypocalcemia	17	28.33
Hoarseness of voice	7	11.67
RLN injury	3	5
Others	1–2 each	1.67–3.33

## DISCUSSION

The present study evaluated postoperative complications following thyroidectomy and demonstrated that while the procedure is generally safe, complications remain clinically relevant.

The female predominance (78.33%) observed in this study is consistent with global epidemiological data, which report higher thyroid disease prevalence among women due to hormonal influences [11]. The peak incidence in the 31–50 years age group aligns with previous studies indicating increased thyroid pathology in middle-aged individuals [12].

Multinodular goitre was the most common diagnosis (55%), comparable to findings reported by Kim et al., where benign thyroid conditions constituted the majority of surgical cases [13]. The proportion of malignancy (16.67%) is also consistent with recent literature highlighting increasing detection rates of thyroid cancers due to improved diagnostic tools [14].

Hemi-thyroidectomy was the most commonly performed procedure (61.67%), reflecting its role in managing benign localized disease. However, total thyroidectomy was associated with a significantly higher complication rate, particularly hypocalcemia. This is in agreement with studies by Arora et al., which reported increased complication rates with extensive surgical procedures [15].

Transient hypocalcemia was the most frequent complication (28.33%), predominantly observed after total thyroidectomy. This finding is consistent with Smith et al., who reported hypocalcemia rates ranging from 20–30% due to parathyroid gland manipulation [16]. The high incidence emphasizes the importance of careful identification and preservation of parathyroid glands during surgery.

Hoarseness of voice (11.67%) and RLN injury (5%) observed in this study are comparable to rates reported in the literature. Kim et al. demonstrated that RLN injury occurs in 1–5% of cases, highlighting the importance of meticulous dissection and nerve monitoring [17]. The use of intraoperative nerve monitoring has been shown to significantly reduce these complications.

Hematoma and respiratory complications were rare (1.67%), consistent with modern surgical standards.

However, these complications are potentially life-threatening and require immediate intervention, as emphasized by multiple studies [18].

Importantly, no mortality was observed in this study, reaffirming the safety of thyroidectomy when performed under proper surgical protocols. This aligns with global data indicating extremely low mortality rates (<0.5%) [19].

The findings of this study underscore the importance of surgical expertise, careful intraoperative technique, and vigilant postoperative monitoring. Early detection and management of complications, particularly hypocalcemia, can significantly improve patient outcomes.

## CONCLUSION

Thyroidectomy is a safe and effective surgical procedure with low major complication rates. However, postoperative complications such as transient hypocalcemia and voice-related disturbances remain significant, particularly following total thyroidectomy. The incidence of complications is closely related to the extent of surgery and surgical technique. Early identification, meticulous intraoperative care, and structured postoperative monitoring are essential in minimizing morbidity. Adoption of advanced techniques such as intraoperative nerve monitoring may further reduce complication rates. Overall, a multidisciplinary approach ensures improved patient outcomes and quality of care in thyroid surgery.

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