

Research Article

A Comparative Study of Complication Rates of Total Thyroidectomy versus Partial Thyroidectomy

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ABSTRACT

Background: Thyroidectomy is one of the most commonly performed endocrine surgical procedures. The choice between total thyroidectomy and partial thyroidectomy remains controversial, particularly regarding postoperative complications. This study aims to compare complication rates associated with total versus partial thyroidectomy.

Methods: A prospective comparative study was conducted on 100 patients undergoing thyroid surgery at a tertiary care center. Patients were divided into two groups: total thyroidectomy (n=50) and partial thyroidectomy (n=50). Postoperative complications such as hypocalcemia, recurrent laryngeal nerve injury, hemorrhage, and wound infection were assessed.

Results: The overall complication rate was higher in the total thyroidectomy group (32%) compared to the partial thyroidectomy group (18%). Transient hypocalcemia was significantly more common in total thyroidectomy cases (20% vs. 6%). Recurrent laryngeal nerve injury occurred in 6% of total thyroidectomy cases and 2% of partial thyroidectomy cases. No significant difference was observed in wound infection rates.

Conclusion: Total thyroidectomy is associated with a higher complication rate, particularly hypocalcemia, compared to partial thyroidectomy. However, it remains a definitive procedure with lower recurrence risk. Surgical decision-making should balance risks and benefits.

Keywords: Thyroidectomy, Complications, Hypocalcemia, Recurrent Laryngeal Nerve, Endocrine Surgery.

INTRODUCTION

Thyroid disorders represent a significant global health concern, with increasing prevalence due to improved diagnostic techniques and awareness. Surgical management remains a cornerstone in the treatment of various thyroid conditions, including multinodular goiter, Graves' disease, thyroid malignancies, and suspicious thyroid nodules. Thyroidectomy, therefore, is one of the most frequently performed endocrine surgical procedures worldwide.

The two principal surgical approaches—total thyroidectomy and partial thyroidectomy (including hemithyroidectomy and subtotal thyroidectomy)—have been widely debated in surgical practice. Total thyroidectomy involves complete excision of the thyroid gland, whereas partial thyroidectomy preserves a portion of functional thyroid tissue. Each approach has its own advantages and limitations, and the choice of procedure often depends on disease

pathology, surgeon preference, and institutional protocols.

Total thyroidectomy has gained increasing popularity, particularly in the management of thyroid malignancies and bilateral multinodular goiter, due to its definitive nature. It eliminates the risk of recurrence within the residual thyroid tissue and facilitates postoperative monitoring using serum thyroglobulin levels and radioactive iodine therapy. However, this extensive surgical approach is associated with a higher risk of complications, notably hypocalcemia due to parathyroid gland injury and recurrent laryngeal nerve (RLN) damage leading to vocal cord dysfunction.

On the other hand, partial thyroidectomy is considered a safer procedure in terms of immediate postoperative complications. Preservation of thyroid tissue reduces the likelihood of hypocalcemia and nerve injury. Additionally, some patients may avoid lifelong thyroid hormone replacement therapy.

However, partial thyroidectomy carries a risk of disease recurrence, which may necessitate reoperation—often associated with higher complication rates compared to primary surgery.

Postoperative complications remain a major concern in thyroid surgery, as they significantly affect patient morbidity, quality of life, and healthcare costs. Hypocalcemia is the most common complication, resulting from inadvertent removal or devascularization of the parathyroid glands. RLN injury, although less frequent, is one of the most feared complications due to its impact on speech and airway protection. Other complications such as postoperative hemorrhage, which can lead to airway compromise, and wound infection, though less common, also contribute to postoperative morbidity.

With advancements in surgical techniques, including nerve monitoring and meticulous dissection methods, complication rates have decreased over time. However, the debate regarding the optimal extent of thyroidectomy persists. Several studies have attempted to compare outcomes between total and partial thyroidectomy, yet results vary due to differences in study design, patient populations, and surgical expertise.

In developing countries, where healthcare resources and follow-up facilities may be limited, the choice between these surgical approaches becomes even more critical. Surgeons must carefully balance the benefits of definitive treatment against the risk of complications, especially in settings where long-term follow-up may not be feasible.

Therefore, this study was undertaken to compare the complication rates associated with total thyroidectomy and partial thyroidectomy in a tertiary care setting. The findings aim to provide evidence-based guidance for surgical decision-making and contribute to improving patient outcomes in thyroid surgery.

METHODOLOGY

Study Design and Setting

A prospective comparative study was conducted in the Department of General Surgery at a tertiary care hospital.

Study Population

A total of 100 patients undergoing thyroid surgery were included and divided into two groups:

- Group A: Total Thyroidectomy (n=50)
- Group B: Partial Thyroidectomy (n=50)

Inclusion Criteria

- Patients aged ≥ 18 years
- Diagnosed with benign or malignant thyroid disease
- Undergoing elective thyroidectomy
- Provided informed consent

Exclusion Criteria

- Previous thyroid surgery
- Emergency thyroid procedures
- Severe comorbid conditions
- Incomplete follow-up

Data Collection

All patients underwent:

- Detailed clinical evaluation
- Thyroid function tests
- Ultrasonography and FNAC

Postoperative Monitoring Included:

- Serum calcium levels
- Voice assessment
- Wound inspection

Outcome Measures

The following complications were recorded:

- Hypocalcemia (transient/permanent)
- Recurrent laryngeal nerve injury
- Postoperative hemorrhage
- Wound infection

Statistical Analysis

Data were analyzed using SPSS software. Categorical variables were expressed as percentages. A p-value < 0.05 was considered statistically significant.

RESULTS

Table 1: Demographic Characteristics

Parameter	Total Thyroidectomy	Partial Thyroidectomy
Mean age (years)	42.5 \pm 12.3	40.8 \pm 11.7
Female (%)	70%	68%
Male (%)	30%	32%

Most patients were females, reflecting higher prevalence of thyroid disorders in women.

Table 2: Postoperative Complications

Complication	Total Thyroidectomy (%)	Partial Thyroidectomy (%)
Hypocalcemia	20%	6%

RLN Injury	6%	2%
Hemorrhage	4%	2%
Wound Infection	2%	2%
Total Complications	32%	18%

Key Findings

- Hypocalcemia was the most common complication, significantly higher in total thyroidectomy.
- RLN injury was more frequent in total thyroidectomy.
- Hemorrhage and infection rates were low and comparable.

DISCUSSION

The present study provides a comparative evaluation of complication rates between total thyroidectomy and partial thyroidectomy, highlighting important clinical considerations in the surgical management of thyroid disorders. The findings demonstrate a higher overall complication rate in patients undergoing total thyroidectomy compared to those undergoing partial thyroidectomy, with hypocalcemia emerging as the most significant postoperative complication.

Hypocalcemia was observed in 20% of patients in the total thyroidectomy group, compared to only 6% in the partial thyroidectomy group. This difference can be attributed to the increased likelihood of parathyroid gland injury or devascularization during complete removal of the thyroid gland. The close anatomical relationship between the thyroid and parathyroid glands makes preservation challenging, particularly in extensive surgeries. These findings are consistent with previous studies that report higher rates of transient hypocalcemia following total thyroidectomy. While most cases are transient, the risk of permanent hypoparathyroidism, though low, remains a serious concern.

Recurrent laryngeal nerve injury, another critical complication, was also more frequent in the total thyroidectomy group. Although the overall incidence in this study was relatively low, even temporary nerve injury can significantly impact patient quality of life due to hoarseness, voice fatigue, and swallowing difficulties. The higher incidence in total thyroidectomy may be explained by the need for bilateral nerve identification and dissection, increasing the risk of traction or thermal injury. Advances such as intraoperative nerve monitoring have shown promise in reducing RLN injury, but their availability may be limited in resource-constrained settings.

Postoperative hemorrhage, though infrequent, remains a life-threatening complication due to the risk of airway compression. In this study, the incidence was low and comparable between the two groups, suggesting that factors such as surgical technique and hemostasis play a more significant role than the extent of surgery. Similarly, wound infection rates were minimal in both groups, reflecting adherence to aseptic surgical protocols.

Despite the higher complication rates associated with total thyroidectomy, it offers distinct advantages, particularly in the management of malignant and bilateral thyroid diseases. Complete removal of thyroid tissue eliminates the risk of recurrence in the residual gland and simplifies postoperative surveillance. In contrast, partial thyroidectomy, while associated with fewer immediate complications, carries a risk of recurrence that may necessitate reoperation. Secondary thyroid surgeries are technically more challenging due to fibrosis and altered anatomy, and they are associated with significantly higher complication rates.

The decision between total and partial thyroidectomy should therefore be individualized, taking into account patient-specific factors such as age, comorbidities, disease pathology, and risk of malignancy. Surgeon experience also plays a crucial role, as complication rates are significantly lower in high-volume centers and among experienced surgeons.

This study reinforces the importance of meticulous surgical technique, including careful identification and preservation of the parathyroid glands and recurrent laryngeal nerves. Preoperative planning, intraoperative vigilance, and postoperative monitoring are essential components in minimizing complications.

However, this study has certain limitations. Being a single-center study with a relatively small sample size, the findings may not be generalizable to all populations. Additionally, long-term outcomes such as recurrence rates and permanent complications were not assessed. Future multicenter studies with larger sample sizes and extended follow-up periods are needed to provide more comprehensive insights.

Overall, the study highlights the need for a balanced approach in thyroid surgery, emphasizing that while total thyroidectomy offers definitive treatment, it comes with increased risk of complications. Careful patient selection and adherence to surgical best practices are essential to achieve optimal outcomes.

CONCLUSION

Total thyroidectomy is associated with higher complication rates, particularly hypocalcemia and RLN injury, compared to partial thyroidectomy. However, it remains the preferred procedure in many cases due to its definitive nature.

Careful surgical technique and proper patient selection are essential to minimize complications and optimize outcomes.

Ethical Approval: This study was approved by the Institutional Ethics Committee.

Conflict of Interest: The authors declare no conflict of interest.

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