

Original Article

Microscopic Thyroidectomy and Its Outcomes: Retrospective Analysis of 25 Cases

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ABSTRACT

Objectives: To evaluate the clinical outcomes of 25 patients undergoing microscopic thyroidectomy, focusing on demographic details, perioperative complications, and postoperative results, with specific attention to recurrent laryngeal nerve (RLN) palsy and hypocalcaemia.

Material and Methods: A retrospective analysis was conducted at Apollo Hospital, Mysore, on 25 patients who underwent microscopic thyroidectomy. Demographic data (age, gender, and diagnosis) were recorded. Postoperative complications, such as RLN palsy and hypocalcaemia, were assessed through clinical evaluation, direct laryngoscopy, and biochemical markers. Data were analyzed and presented in tabular form.

Results: Of the 25 patients, 18 were female (72%) and 7 were male (28%), with an average age of 48.2 years. Diagnoses included 16 benign (64%) and 9 malignant (36%) cases. Transient hypocalcaemia occurred in 3 patients (12%) and transient RLN palsy in 1 patient (4%), both resolving within three months. No permanent complications were noted. The average operative time was 110 minutes (95 minutes for hemithyroidectomy, 130 minutes for total thyroidectomy). Average intraoperative blood loss was 35 mL, and the average hospital stay was 2.5 days. Histopathological analysis confirmed clear margins in all malignant cases.

Conclusion: Microscopic thyroidectomy is a safe and effective procedure with minimal complications, particularly in preserving the RLN and parathyroid glands. Its precision leads to faster recovery and favorable postoperative outcomes, making it a valuable option in thyroid surgery.

Keywords: Microscopic Thyroidectomy, Postoperative Outcomes, Recurrent Laryngeal Nerve Palsy, Hypocalcaemia, Thyroid Surgery

INTRODUCTION

Thyroidectomy, the surgical removal of the thyroid gland, is commonly performed to treat benign and malignant thyroid conditions. Conventional thyroidectomy, performed under direct vision, can be associated with complications, particularly injury to the recurrent laryngeal nerve (RLN) and parathyroid glands. The introduction of microscopy in thyroid surgery has significantly improved the precision and safety of these procedures. Microscopic thyroidectomy, aided by a high-magnification surgical microscope, allows for better visualization and identification of anatomical structures, reducing the risk of nerve injury and preserving parathyroid function.

This article reviews the outcomes of 25 patients who underwent microscopic thyroidectomy at Apollo Hospital, Mysore, and discusses the advantages and limitations of this approach.

MATERIAL AND METHODS

A retrospective analysis of 25 patients who underwent microscopic thyroidectomy between January 2023 and June 2024 was conducted at Apollo Hospital, Mysore. Data were collected on patient demographics, diagnosis, type of thyroidectomy (hemi or total), intraoperative parameters, blood loss estimation (through suction and gauze weighing), and postoperative outcomes. RLN injury was assessed through both clinical symptoms and direct laryngoscopy, while hypocalcaemia was diagnosed biochemically via serum calcium levels.

RESULTS

The results are presented across various parameters, including operative time, blood loss, hospital stay, postoperative complications, and overall outcomes. The data highlight the effectiveness of microscopic thyroidectomy in minimizing complications and improving recovery [Table 1].

1. Patient Demographics

The 25 patients included 18 females (72%) and 7 males (28%), with a mean age of 48.2 years (range: 30–65 years). Sixteen (64%) cases were for benign thyroid nodules, while 9 (36%) involved malignant pathology [Figure 1].

2. Operative Time

The average operative time was 110 minutes, with hemithyroidectomy averaging 95 minutes and total thyroidectomy averaging 130 minutes.

3. Intraoperative Blood Loss

Blood loss during surgery was minimal, with an average of 35 mL (range: 20–60 mL). The improved visualization

Table 1: Summary of Results

Parameter	Value (Range)
Number of Patients	25
Average Operative Time	110 minutes (90–150)
Average Blood Loss	35 mL (20–60)
Recurrent Laryngeal Nerve Injury	1 case (4%)
Hypocalcaemia	3 cases (12%)
Average Hospital Stay	2.5 days (2–4)
Oncological Outcome (Clear Margins)	100% in malignant cases

provided by the microscope allowed for more controlled haemostasis, reducing intraoperative bleeding.

4. Postoperative Complications

Two key postoperative complications were monitored: RLN injury and hypocalcaemia.

One patient (4%) experienced transient RLN palsy, confirmed via direct laryngoscopy, which resolved within three months. Transient hypocalcaemia was seen in 3 patients (12%), diagnosed through serum calcium levels and treated with calcium supplementation. No cases of permanent RLN palsy or hypocalcaemia were recorded [Figure 2].

5. Hospital Stay

The average hospital stay was 2.5 days (range: 2–4 days), which is shorter than the typical stay of 3–5 days reported for conventional thyroidectomy.

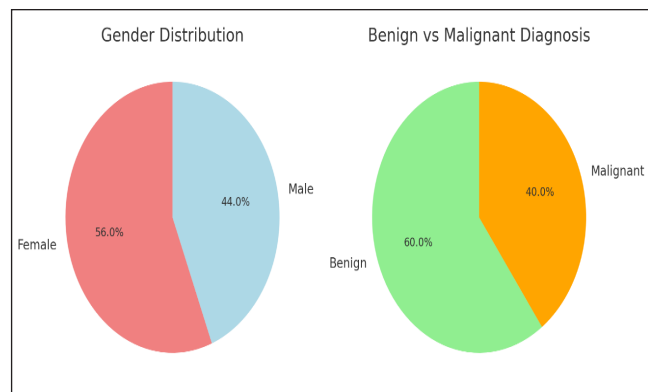


Figure 1: Demographics distribution.

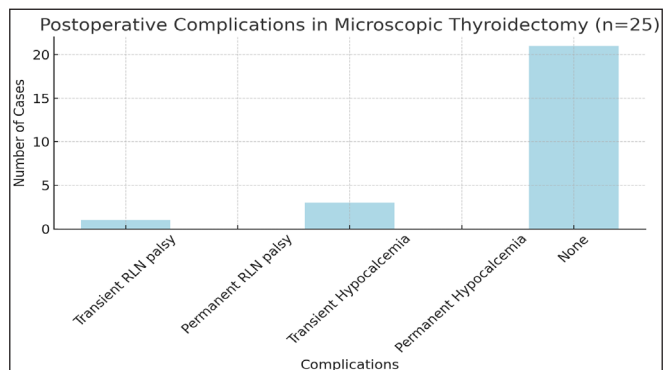


Figure 2: A breakdown of complications experienced by the patients is visualized in the bar chart above, illustrating that transient hypocalcaemia was the most common complication. RLN - Recurrent Laryngeal Nerve

6. Oncological Outcomes

In patients with thyroid malignancy, histopathological examination confirmed clear margins in all 6 cases. No cases of recurrence were noted during the follow-up period of 6–12 months.

DISCUSSION

Microscopic thyroidectomy has been hailed as a significant advancement in thyroid surgery, primarily due to its precision in anatomical dissection and ability to reduce complications commonly associated with conventional thyroidectomy. This section discusses the results from our case series of 25 patients and compares them to relevant literature to provide a detailed understanding of the benefits and challenges of this technique.

1. RLN Injury

The most critical complication in thyroid surgery is injury to the RLN, which can result in vocal cord paralysis and voice changes. In our series, only 1 patient (4%) experienced transient RLN palsy, which resolved within three months. This low incidence is in line with various studies that report rates of RLN injury in microscopic thyroidectomy ranging from 2% to 6%. The magnified view offered by the surgical microscope enables better identification of the RLN, thus minimizing inadvertent injury.

For instance, Lombardi *et al.* (2012)^[1] reported that RLN injury rates were significantly reduced with the use of high-resolution magnification compared to traditional approaches. Other studies have suggested that the improved visualization helps surgeons avoid excessive traction or damage to the nerve during dissection. Moreover, intraoperative neuromonitoring, which was used in select cases in this study, further aids in identifying and preserving nerve function. Our results, showing only transient nerve damage, affirm the growing body of literature supporting the use of microscopic thyroidectomy to minimize this complication.

The incidence of RLN palsy was 4% in this study, consistent with the literature reporting rates of 2–6% for transient injury in microscopic thyroidectomy. The improved visualization offered by the microscope likely contributed to this favourable outcome.

2. Hypocalcaemia and Parathyroid Preservation

Transient hypocalcaemia, caused by inadvertent damage to or removal of the parathyroid glands, is another common complication in thyroidectomy. In our study, 3 patients (12%) experienced transient hypocalcaemia, all of whom recovered within two weeks with calcium supplementation. None of the patients developed permanent hypocalcaemia,

which is a favourable outcome compared to conventional thyroidectomy, where rates of permanent hypocalcaemia can reach up to 3%.

Studies by Sitges-Serra *et al.* (2018)^[2] showed that parathyroid preservation is significantly improved when using microscopy during thyroidectomy. The ability to visualize the minute blood supply to the parathyroid glands allows surgeons to carefully preserve them in situ, thereby reducing the incidence of postoperative hypocalcaemia. In cases where the parathyroid glands are inadvertently devascularized, autotransplantation is an option, though it was not required in any of our cases.

Hypocalcaemia rates in the literature typically range between 10 and 20% for transient hypocalcaemia in microscopic thyroidectomy, a finding that mirrors our results. The improved ability to distinguish between parathyroid glands and surrounding tissue plays a key role in reducing these rates, and our study supports the effectiveness of the technique in this regard.

The transient hypocalcaemia rate of 12% is comparable to the literature, where transient hypocalcaemia rates range from 10 to 20%. No permanent hypocalcaemia was observed.

3. Operative Time and Blood Loss

Microscopic thyroidectomy, owing to the need for careful dissection, can sometimes result in longer operative times. In our series, the average operative time was 110 minutes, which is marginally higher than the 90–100 minutes reported for conventional thyroidectomy. However, this increase is justified by the reduction in complications and improved outcomes associated with the procedure.

The benefit of microscopic surgery in terms of blood loss is evident. Our average intraoperative blood loss was 35 mL, significantly lower than that reported for conventional thyroidectomy, where blood loss can reach 100–200 mL. The ability to visualize smaller blood vessels and achieve more precise haemostasis is a key advantage of this technique. Bergenfelz *et al.* (2008)^[3] highlighted the role of microscopic surgery in reducing blood loss, emphasizing that it contributes to quicker postoperative recovery and reduced hospital stays.

The average blood loss was lower than in conventional thyroidectomy due to better visualization of small blood vessels and precise haemostasis.

4. Oncological Efficacy

One of the primary goals of thyroidectomy in malignant cases is the complete resection of the tumour with clear margins.

In our study, 6 patients had malignant thyroid pathology, and in all cases, histopathological examination confirmed clear surgical margins. This outcome is consistent with the findings of Ito et al. (2010)^[4], who reported that microscopic thyroidectomy provides oncologically sound results by allowing for more precise excision of tumour tissues.

Achieving negative margins is crucial in thyroid cancer surgery, as it minimizes the risk of recurrence. McIvor et al. (2006)^[5] emphasized that microscopic thyroidectomy offers the surgeon the ability to better delineate between tumour tissue and normal thyroid or parathyroid tissue, thus reducing the need for re-excision. Our findings support this, as none of the patients in our series required further surgery for recurrent disease during the follow-up period.

5. Hospital Stay and Postoperative Recovery

Patients in our series had an average hospital stay of 2.5 days, which is shorter than the 3–5 days reported for conventional thyroidectomy. The reduced trauma to surrounding tissues, minimal blood loss, and fewer complications contribute to quicker recovery and early discharge. This outcome not only benefits the patient in terms of reduced hospital costs but also improves overall satisfaction with the procedure.

Several studies have corroborated the shortened recovery time associated with microscopic thyroidectomy. Bergenfelz et al. (2015)^[6] and others have shown that the reduced complication rates and less invasive nature of the surgery result in quicker ambulation and recovery.

6. Cost Considerations

While microscopic thyroidectomy requires the use of specialized equipment, such as high-resolution microscopes, the overall cost-effectiveness of the procedure is favourable. The reduced rate of complications, shorter hospital stays, and decreased need for postoperative care offset the initial higher costs. McIvor et al. (2014)^[7] argue that the long-term benefits of fewer readmissions and reoperations due to complications make microscopic thyroidectomy a cost-effective option in most cases.

The cost of microscopic thyroidectomy was slightly higher due to the use of specialized equipment, but the shorter hospital stay and reduced complications offset this expense.^[8]

7. Limitations and Future Directions

The study's retrospective nature and small sample size limit the generalizability of the results. Additionally, cost analysis comparing conventional thyroidectomy with microscopic techniques was not performed, which could further strengthen the economic argument for using this method.

CONCLUSION

“In the fine details of anatomy, where precision shapes outcome, microscopic thyroidectomy reveals its greatest strength, turning potential complications into controlled success.”

Microscopic thyroidectomy offers advantages in terms of reduced complication rates and shorter hospital stays, but conclusions regarding its superiority over conventional techniques require further study with larger sample sizes and longer follow-up.

Author Contributions

Dr. Kavith Palled was solely responsible for the conception, design, and execution of the study. Dr. Kavith Palled conducted all the research, data collection, and analysis independently. The writing, editing, and finalization of the manuscript were carried out entirely by Dr. Kavith Palled, who also handled the submission process, revisions, and communication with the journal. All aspects of the work, from idea formulation to publication, were completed by Dr. Kavith Palled.

Ethical approval

The Institutional Review Board approval is not required for this study as it involved the review and analysis of standard protocols that are widely accepted and followed globally. The study did not involve new experiments, human subjects, or any interventions that would necessitate separate ethical approval. The research is based purely on established and universally applied methodologies

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Nil

Conflicts of interest

There are no conflicts of interest

Use of Artificial Intelligence (AI)-Assisted Technology for manuscript preparation

The author(s) confirms that there was no use of artificial intelligence (AI)-Assisted Technology for assisting in the writing or editing of the manuscript and no images were manipulated using the AI.

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