

Demographics, Surgical Practices, and Outcomes of Thyroid Surgeries: A Retrospective Analysis in an Indian Tertiary Care Center

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Abstract:

Background: Thyroid disorders present a significant global health challenge, often necessitating thyroid surgeries for both benign and malignant conditions.**Objective:** This study aims to examine the demographic characteristics, surgical procedures, and postoperative outcomes of thyroid surgeries performed at a tertiary care center in India.**Methodology:** A retrospective analysis was conducted on 55 cases of thyroid surgeries, where 88.75% of cases were diagnosed with benign pathologies and 11.25% with malignant pathologies. Various surgical procedures, including hemithyroidectomy, total thyroidectomy, and near-total thyroidectomy, were performed. Preoperative evaluations and postoperative complications were meticulously documented.**Results:** The study revealed a predominance of benign pathologies, with hemithyroidectomy being the most common surgical procedure. Postoperative complications, such as temporary recurrent laryngeal nerve injury and temporary hypocalcemia, were observed, with higher rates in surgeries for benign lesions compared to malignant ones.**Conclusion:** The findings underscore the necessity for tailored approaches in thyroid surgery, taking into account the specific pathology and clinical presentation of each case. Emphasizing meticulous surgical technique and diligent postoperative monitoring is crucial for minimizing complications and optimizing patient outcomes.**Keywords:** Thyroid Surgery, Thyroid Disorders, Benign Lesions, Malignant Lesions, Postoperative Complications, India.

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Introduction

Thyroid disorders represent a significant burden on healthcare systems worldwide, with India being no exception. As the second most common endocrine disorder after diabetes mellitus, thyroid disorders encompass a spectrum of conditions ranging from benign nodules to malignant tumors, necessitating surgical intervention in many cases.[1] Thyroid surgery has undergone remarkable evolution over the centuries, from its early days marked by high mortality rates to the modern era characterized by advanced techniques and improved outcomes.[2]

In the Indian scenario, the prevalence of thyroid disorders has been steadily rising, with estimates suggesting that approximately 42 million individuals in India suffer from thyroid disorders, making it one of the most common endocrine diseases in the country.[1] Factors such as iodine deficiency, genetic predisposition, environmental pollutants, and lifestyle changes contribute to the high prevalence of thyroid disorders in India.[3] Despite the increasing prevalence, the landscape of thyroid sur-

gery in India has witnessed significant advancements, mirroring global trends. Modern thyroid surgery in India is characterized by a multidisciplinary approach involving otolaryngologists, endocrinologists, radiologists, and pathologists, aimed at providing comprehensive care to patients with thyroid disorders.

The evolution of thyroid surgery in India can be attributed to several factors. First and foremost is the advent of modern surgical techniques and instrumentation, coupled with improvements in anesthesia and perioperative care. These advancements have led to a significant reduction in the morbidity and mortality associated with thyroid surgery, rendering it a safe and effective treatment option for patients with thyroid disorders.[4] Furthermore, the increasing availability of diagnostic modalities such as high-resolution ultrasound, fine-needle aspiration cytology (FNAC), and molecular testing has revolutionized the preoperative evaluation of thyroid nodules, enabling clinicians to make more

accurate diagnoses and tailor surgical interventions accordingly.[5] In this comprehensive review, we aim to provide insights into the various aspects of thyroid surgery in the Indian context, including indications, surgical techniques, postoperative complications, and long-term outcomes. By synthesizing existing literature and drawing upon our own institutional experience, we seek to offer valuable perspectives on the current state of thyroid surgery in India and its implications for clinical practice and patient care.

Methodology:

The study aimed to assess the incidence of complications following various types of thyroid surgeries conducted for benign and malignant thyroid disorders in a tertiary care center in India. The study period spanned from February 2023 to December 2023. This was an analytical study conducted retrospectively, utilizing data from patients who underwent thyroid surgery during the specified study period.

A total of 55 cases were included in the study. These cases comprised individuals who underwent thyroid surgeries for benign and malignant thyroid disorders at the tertiary care center during the study period. Data pertaining to patient demographics, preoperative evaluations, and surgical procedures performed, intraoperative findings, and postoperative outcomes were collected from electronic medical records and surgical databases of the tertiary care center.

All patients undergoing thyroid surgery underwent a comprehensive preoperative evaluation. This included complete ear, nose, and throat examination, indirect laryngeal examination, blood tests (including thyroid profile), neck ultrasound, and needle aspiration cytology. Additional imaging studies such as computed tomography or magnetic resonance imaging were conducted when indicated. The types of surgeries performed included total thyroidectomy (TT) with or without neck dissec-

tion, near-total thyroidectomy (NTT), subtotal thyroidectomy (STT), hemithyroidectomy, and isthmusectomy. Surgeons made efforts to identify and preserve recurrent and superior laryngeal nerves, as well as parathyroid glands. In cases of accidental parathyroid removal, auto transplantation into the ipsilateral sternomastoid muscle was performed. In cases of accidental recurrent laryngeal nerve transection, end-to-end anastomosis was conducted. Postoperative complications were documented and included wound infection, hematoma/hemorrhage, hypocalcemia, recurrent laryngeal nerve injury, and vocal cord dysfunction. Temporary and permanent hypoparathyroidism were distinguished based on the duration of hypocalcemia despite supplementation. Laryngeal endoscopy was performed in patients who developed postoperative hoarseness. Serum calcium levels were measured postoperatively, except in isthmusectomy cases.

The study was approved by the Ethics in Research Committee of the institute, ensuring adherence to ethical standards in research involving human subjects. Data were analyzed descriptively to determine the incidence of complications following various types of thyroid surgeries for benign and malignant thyroid disorders.

Results

Out of the total 55 subjects included in the study, a significant majority were female, comprising 43 individuals (78.18%), while the male population accounted for 12 individuals (21.82%). The mean age of the participants was calculated to be 42.5 years, indicating a relatively middle-aged demographic profile among the study population.

In terms of preoperative diagnosis, benign pathologies were predominant, accounting for 88.75% of the cases, whereas malignant pathologies were identified in 11.25% of the cases. This distribution reflects a higher prevalence of benign thyroid disorders among the study population undergoing thyroid surgeries at the tertiary care center.

Table 1: Distribution of Thyroid Pathologies among Study Subjects:

Pathology	Number	Percentage
Colloid goiter	26	47.5
Nodular/MNG	19	33.75
Cyst	1	2.5
Hyperplastic nodule	3	5
Papillary carcinoma	5	8.75
Follicular carcinoma	1	2.5

The analysis of thyroid pathologies among the 55 study subjects revealed a diverse spectrum of conditions.

Colloid goiter emerged as the most prevalent pathology, accounting for 47.5% of cases, followed by nodular or multinodular goiter (MNG) at 33.75%. Other identified pathologies included hy-

perplastic nodules (5%), papillary carcinoma (8.75%), cysts (2.5%), and follicular carcinoma (2.5%). This distribution underscores the varied nature of thyroid disorders observed among the study population, with benign conditions such as colloid goiter and nodular goiter being the most common, while malignant pathologies like papil-

lary and follicular carcinoma represented a smaller yet notable proportion.

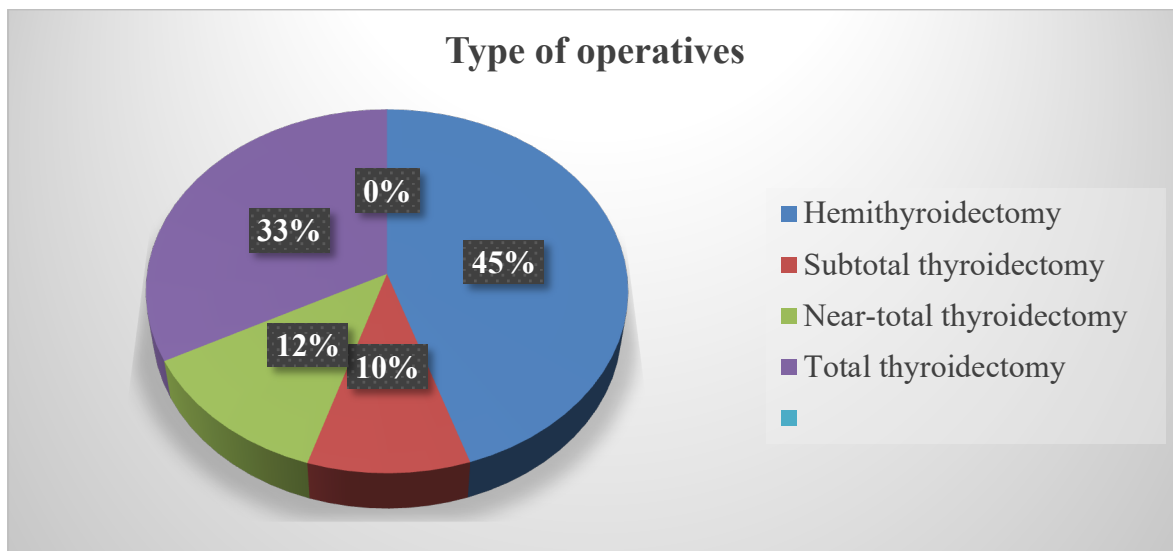


Figure 1: Types of Thyroid Surgeries Performed

Among the 55 cases included in the study, various types of thyroid surgeries were conducted to address the diverse range of thyroid pathologies observed.

Hemithyroidectomy emerged as the most frequently performed operation, accounting for 45% of cases, followed by total thyroidectomy (33%), and

near-total thyroidectomy (12.5%), and subtotal thyroidectomy (10%). This distribution reflects the tailored approach adopted by surgeons to address the specific nature and extent of each individual's thyroid disorder, with procedures ranging from partial gland removal to complete excision based on the pathology and clinical presentation.

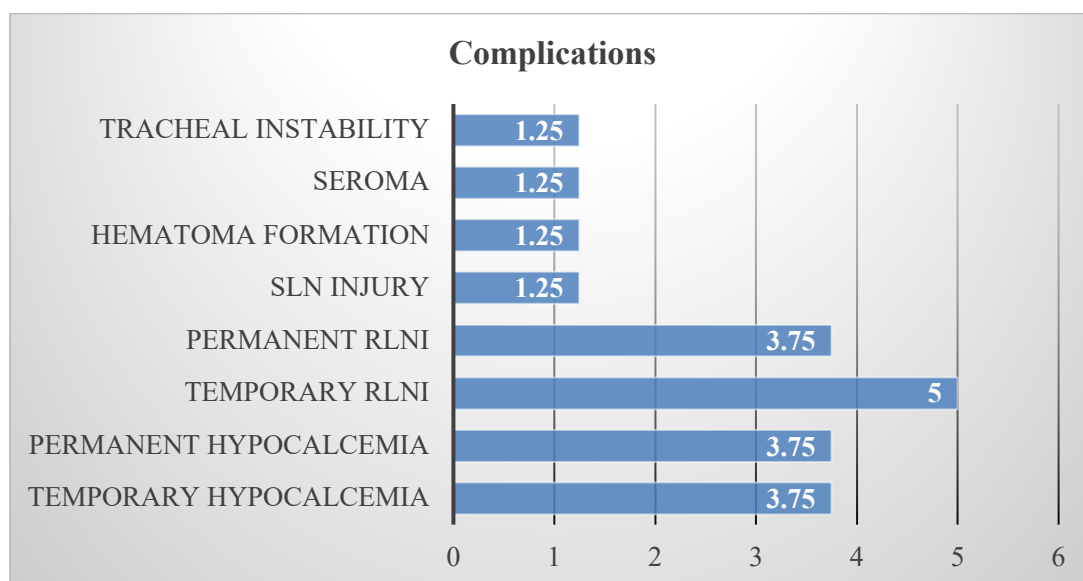


Figure 2: Postoperative Complications Following Thyroid Surgeries

The overall postoperative complication rate was 21.25%. Hypocalcemia and recurrent laryngeal nerve injury (RLNI) were noted in six cases each and were observed as the most common postoperative complication.

The analysis of postoperative complications among the study subjects revealed a varied spectrum of adverse events. Temporary hypocalcemia was observed in 3.75% of cases, while permanent hy-

pocalcemia occurred in a similar proportion. Temporary recurrent laryngeal nerve injury (RLNI) was documented in 5% of cases, with an additional 3.75% experiencing permanent RLNI.

Other complications included superior laryngeal nerve (SLN) injury (1.25%), hematoma formation (1.25%), seroma (1.25%), and tracheal instability (1.25%). These findings underscore the importance of careful monitoring and management of postop-

erative complications following thyroid surgeries to ensure optimal patient outcomes.

Table 2: Comparison of Postoperative Complications Based on Surgical Indication:

Complication	Surgery for malignant lesion	Surgery for benign lesion
Permanent RLNI		3
Temporary RLNI		6
Hematoma		2
SLN injury		2
Permanent HPT	2	
Temporary HPT	2	
Seroma		
Tracheal instability		1

A comparative analysis of postoperative complications between surgeries conducted for malignant and benign thyroid lesions highlights notable differences. Permanent recurrent laryngeal nerve injury (RLNI) was documented in 3 cases undergoing surgery for malignant lesions, whereas no cases of permanent RLNI were reported in surgeries for benign lesions. Temporary RLNI occurred in 6 cases for benign lesions compared to none in sur-

geries for malignant lesions. Hematoma formation was observed in 2 cases for benign lesions, while SLN injury occurred in 2 cases for malignant lesions. Additionally, permanent hypoparathyroidism (HPT) was documented in 2 cases undergoing surgery for benign lesions, with 2 cases of temporary HPT observed in the same group. No instances of seroma were reported, but tracheal instability was noted in 1 case for benign lesions.

Table 3: Type of Anaesthesia used and associated complication

Anesthetic Component	Number of Cases	Percentage	Description/Remarks
Type of Anesthesia Used			
General Anesthesia	50	90.91	Majority of cases
Regional Anesthesia	5	9.09	For specific conditions
Anesthetic Complications			
Post-operative Nausea and Vomiting	8	15.5	
Respiratory Complication	3	5.45	Rare
Allergic reaction	1	1.82	
Anesthetic awareness	0	0	
Intraoperative Hypotension	4	7.27	Managed promptly

The table provides an overview of the types of anesthesia used and associated complications observed during the study. The majority of cases (90.91%) utilized general anesthesia, while regional anesthesia was employed in a small percentage (9.09%) for specific conditions. Among the observed complications, postoperative nausea and vomiting were reported in 15.5% of cases, while respiratory complications were rare, occurring in 5.45% of cases. Allergic reactions were infrequent (1.82%), and no instances of anesthesia awareness were reported. Intraoperative hypotension, occurring in 7.27% of cases, was managed promptly. These findings underscore the importance of careful consideration of anesthesia type and vigilant management of associated complications to ensure patient safety and optimal surgical outcomes.

Discussion:

The findings of this study provide valuable insights into the demographics, surgical procedures, and postoperative outcomes of thyroid surgeries conducted for benign and malignant thyroid disorders in a tertiary care center in India. The discussion

will elaborate on the implications of the results and contextualize them within the existing literature.

The predominance of females in our study population aligns with the well-established higher prevalence of thyroid disorders among women, which is attributed to hormonal factors and autoimmune mechanisms.[6] The mean age of 42.5 years reflects the middle-aged demographic commonly affected by thyroid disorders.[7] The higher proportion of benign pathologies compared to malignant ones corroborates with global trends, where benign thyroid diseases such as colloid goiter and nodular goiter are more prevalent.[8]

Hemithyroidectomy emerged as the most frequently performed surgery, indicating the preference for conservative approaches in managing thyroid disorders whenever feasible. This finding is consistent with guidelines advocating for thyroid lobectomy as a first-line treatment for certain benign thyroid conditions.[9] However, the substantial proportion of total thyroidectomies underscores the necessity for aggressive surgical interventions, particularly in cases of malignancy or extensive benign disease.

The occurrence of postoperative complications poses significant clinical challenges. Temporary RLNI and temporary hypocalcemia were the most frequent complications observed, highlighting the inherent risks associated with thyroid surgery, including nerve injury and parathyroid dysfunction.[10]

The higher incidence of temporary RLNI in surgeries for benign lesions could be attributed to the complexity of dissection required to preserve critical structures in cases of large goiters. Furthermore, the occurrence of hematoma, SLN injury, and tracheal instability underscores the importance of meticulous surgical technique and vigilant postoperative monitoring to prevent adverse outcomes.[11]

The disparity in postoperative complications between surgeries for benign and malignant lesions is noteworthy. While both groups experienced RLNI and temporary hypoparathyroidism, the incidence was higher in surgeries for benign lesions.

This observation could be attributed to the greater technical complexity and extent of dissection often required in cases of benign thyroid disease.

Conclusion

In conclusion, this study sheds light on the demographics, surgical practices, and postoperative outcomes of thyroid surgeries in a tertiary care center in India.

The findings underscore the need for personalized approaches in managing thyroid disorders, with a focus on minimizing postoperative complications through meticulous surgical technique and tailored patient care.

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