

POSTOPERATIVE COMPLICATIONS AFTER TOTAL THYROIDECTOMY- A SINGLE CENTER EXPERIENCE FROM KERALA

Rakesh B A¹, Ashok A², Santhosh R³, Jayanth Gopal²

¹Department of General Surgery, Dr. Moopen's Medical College, Wayanad, Kerala, India

²Department of General Surgery, MVJ Medical College, Bangalore, Karnataka, India

³Department of General Surgery, SIMSRC, Bangalore, Karnataka, India

Received : 28/10/2023
Received in revised form : 06/12/2023
Accepted : 22/12/2023

Keywords:

Total Thyroidectomy, Hypocalcemia, Recurrent Laryngeal Nerve injury.

Corresponding Author:

Dr. Rakesh B A,
Email: drakeshba@gmail.com

DOI: 10.47009/jamp.2023.5.6.238

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2023; 5 (6); 1163-1165



Abstract

Background: Thyroidectomy is a routinely conducted surgical intervention, encompassing a broad range of indications. The purpose of the current study is to identify the rates and types of postoperative complications in patients undergoing total thyroidectomy in a tertiary care center in Kerala. **Materials and Methods:** A retrospective study was conducted on 118 patients who underwent total thyroidectomy in the Department of General Surgery from January 1, 2019, to May 31, 2020. **Result:** Mean age of the study population was 43 years (SD-10). The highest incidence of thyroid disorders was in the age group 41-50 years. Complications following total thyroidectomy include hypocalcemia (23.73%), unilateral RLN injury (5.08%) and wound hematoma (2.54%). **Conclusion:** Thyroidectomy poses a significant risk of recurrent laryngeal nerve (RLN) injury, with a 5.08% occurrence in the current study. However, overall evidence indicates that total thyroidectomy can be performed safely, with a low risk of complications, by employing meticulous surgical techniques and intraoperative measures.

INTRODUCTION

Thyroidectomy stands as a frequently performed surgical intervention with diverse indications spanning from benign conditions such as simple multinodular goiter and solitary thyroid nodule to neoplastic scenarios like differentiated thyroid cancer.^[1] The spectrum of potential complications associated with thyroidectomy include hemorrhage, respiratory obstruction, injury to the recurrent laryngeal nerve (RLN), hypocalcemia, hypothyroidism, thyroid storm, and wound infection.^[2] Among these complications, hypocalcemia emerges as the most prevalent in many centers. Various factors contribute to the incidence of complications, including the surgeon's expertise, the nature of thyroid pathology, the size of the goiter, and the variable anatomy of the recurrent laryngeal nerve.^[3,4] Strategies such as meticulous preoperative planning, utilization of intraoperative adjuncts, and consideration of anesthesia type have been suggested to mitigate and minimize complication rates.^[5] The purpose of the current study is to identify the rates and types of postoperative complications in patients undergoing total thyroidectomy in a tertiary care center in Kerala.

MATERIALS AND METHODS

A retrospective study was conducted on 118 patients who underwent total thyroidectomy in the Department of General Surgery at Dr. Moopen's Medical College, Wayanad district, Kerala from January 1, 2019, to May 31, 2020. The clinical records were retrospectively reviewed, and a proforma was utilized to extract information related to epidemiology including age, gender, comorbidities at admission, preoperative and postoperative vocal cord examination and main diagnosis. Preoperative vocal cord examinations were performed using indirect laryngoscopy, while postoperative assessments were conducted under anesthesia through direct laryngoscopy. Before thyroidectomy, preoperative corrected serum calcium levels were measured in all patients. Postoperatively, corrected serum calcium levels were monitored at 48 hours and 6 weeks. Corrected calcium (mg/dl) calculated as Serum Calcium (mg/dl) + [0.8 × (4 - Serum Albumin)], and hypocalcemia defined as corrected serum calcium < 8.5 mg/dl. Statistical analysis was performed using SPSS version 16, Mean standard deviation (SD), frequency, and percentage were calculated. Association was analyzed with Student t test. A p-value of <0.05 was considered statistically significant.

RESULTS

Mean age of the study population was 43 years (SD-10). The highest incidence of thyroid disorders was 29.66% in the age group 41-50 years and the lowest incidence was 4.25% in the age group above 60 years [Figure 1]. Out of the 118 patients 104 were females. A majority was presented with multi nodular goiter (57.63%). Thyroid malignancy was present in 23.73% of the cases. Post operative hypocalcaemia was seen in 23.73%, of which only 16.11 had clinical symptoms. Basic characteristics of the study population are shown in [Table 1]. Mean value of the postoperative serum calcium level at 48 hours and 6week were 8.27 and 8.52 respectively; which was significantly low compared to the preoperative level [Table 2]. Complications following total thyroidectomy include hypocalcemia (23.73%),

unilateral RLN injury (5.08%) and wound hematoma (2.54%). Females accounted for 96.5% of the cases where hypocalcemia developed.

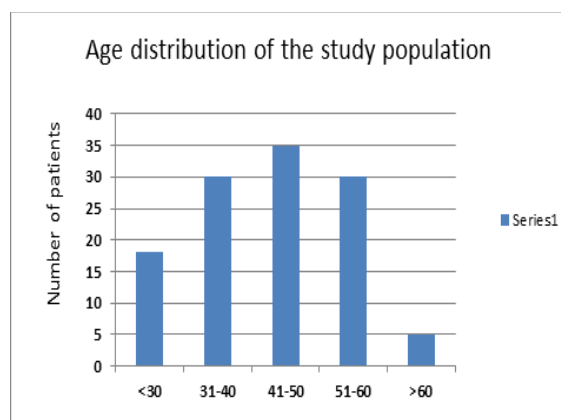


Figure 1: Age distribution of the study population

Table 1: Basic characteristics of the study population

	N [118]	%
Age		
<30	18	15.25
31-40	30	25.42
41-50	35	29.66
51-60	30	25.42
>60	5	4.25
Sex		
Male	14	11.86
Female	104	88.14
Diagnosis		
Carcinoma	28	23.73
Papillary carcinoma	19	16.11
Mixed Papillary /Follicular carcinoma	3	2.54
Follicular carcinoma	6	5.08
Benign Disorder	90	76.27
Multinodular Goiter	68	57.63
Colloid Goiter	17	14.41
Hashimoto's thyroiditis	4	3.38
Mixed Follicular/Hurthle	1	0.85
Thyroid status		
Euthyroid	105	88.99
Hyperthyroid	7	5.93
Hypothyroid	6	5.08
Post-thyroidectomy complications		
Postoperative hypocalcaemia[Male=1 Female=27] (Transient-26,Permanent-2)		
Yes	28	23.73
No	90	76.27
Hypocalcaemic symptom(N=28)		
Yes	19	16.11
No	9	83.89
U/L Recurrent laryngeal nerve palsy	6	5.08
Wound hematoma	3	2.54

Table 2: Distribution of serum calcium level at various intervals

	Mean(SD)	Range
Age	43.75(10.45)	25-66
Preoperative calcium	9.01(0.45)	7.8-9.9
48 hour- Post operative calcium	8.27(0.66)	7.0-9.8
6 Week-Post operative calcium	8.52(0.72)	5.0-9.8

Normal serum calcium (8.5-10.5 mg/dl)

DISCUSSION

Thyroidectomy is a surgical procedure that demands a profound understanding of anatomy to prevent

adverse outcomes for the patient and potential medical liability for the surgeon. Complications resulting from thyroidectomy cover a range, extending from temporary issues like hypocalcemia

or cord paralysis to more serious consequences such as persistent hypocalcemia, respiratory obstruction, and the potential for mortality.^[1-3]

Thyroidectomy commonly leads to hypocalcemia, with an incidence of 23.73% in our study, primarily affecting females following total thyroidectomy. The condition, often asymptomatic and transient, results from factors like devascularization during surgery.^[6,7] The audit from the British Association of Endocrine and Thyroid Surgeons revealed rates of 27.4% and 12.1% for transient and permanent post-thyroidectomy hypocalcemia, respectively.^[4] Prevalence rates globally range from 34.8% to 65.3%. Factors influencing hypocalcemia include sex, surgical procedure, and perioperative changes in serum calcium. To prevent parathyroid gland injury, strict adherence to capsular dissection and distal ligation of thyroid arteries is recommended.^[8,9]

Thyroidectomy poses a significant risk of recurrent laryngeal nerve (RLN) injury, with an incidence of 5.08% in the present study. Temporary and permanent RLN damage rates can be as high as 23.6% and 15.5%, respectively.^[10] Extensive thyroidectomy increases the risk, making total thyroidectomy more hazardous than conservative excision. Strategies for preventing RLN injury vary, with some recommending routine visualization, while others caution against nerve exploration.^[11,12] Intraoperative nerve monitoring lacks conclusive evidence for reducing permanent nerve injury.^[13] According to Zahoor et al, exploring the nerve is recommended exclusively in complex thyroid surgeries, such as those featuring large goiters, recurrent cases, malignancies, and inflammation.^[14]

CONCLUSION

Thyroidectomy is a routinely conducted surgical intervention, encompassing a broad range of indications. The most common complication observed in this present study was temporary hypocalcemia. Thyroidectomy carries a notable risk of injury to the recurrent laryngeal nerve (RLN), with an occurrence of 5.08% in the current study. Overall, the evidence suggests that total thyroidectomy can be safely performed with a low risk of complications, employing careful surgical technique and the use of intraoperative measures.

REFERENCES

1. Chen A.Y., Bernet V.J., Carty S.E., Davies T.F., Ganly I., Inabnet W.B. 3rd American Thyroid association statement on optimal surgical management of goiter. *Thyroid*. 2014; 24:181–189
2. Cannizzaro MA, Lo Bianco S, Picardo MC, Provenzano D, Buffone A. How to avoid and to manage post-operative complications in thyroid surgery. *Updates Surg*. 2017;69(2):211-215. doi: 10.1007/s13304-017-0475-3.
3. Das, D., Gayen, G.C., Pradhan, A. et al. Complications of Thyroidectomy and Learning Curve for Thyroid Surgeons: An Institutional Experience. *Indian J Otolaryngol Head Neck Surg* 75, 94–99 (2023).
4. Chadwick D, Kinsman R, Walton P, Systems DC. *The British Association of Endocrine and Thyroid Surgeon Fourth National Audit*. Dendrite Clinical Systems Ltd: Henley-on-Thames, 2012
5. Huang CF, Jeng Y, Chen KD, et al. The preoperative evaluation prevents the postoperative complications of thyroidectomy. *Ann Med Surg (Lond)*. 2014;4(1):5-10. doi: 10.1016/j.jamsu.2014.11.005
6. Pesce CE, Shiue Z, Tsai HL, et al. Postoperative hypocalcemia after thyroidectomy for Graves' disease. *Thyroid* 2010 Nov;20(11):1279-83. DOI: <https://doi.org/10.1089/thy.2010.0047>
7. Hamada N, Mimura T, Suzuki A, et al. Serum parathyroid hormone concentration measured by highly sensitive assay in post-thyroidectomy hypocalcemia of patients with Graves' disease. *Endocrinol Jpn* 1989 Apr;36(2):281-8. DOI: <https://doi.org/10.1507/endocrj1954.36.281>
8. Kakava K, Tournis S, Papadakis G, Karelas I, Stampouloglou P, Kassi E, et al. Postsurgical Hypoparathyroidism: A Systematic Review. *In Vivo*. 2016;30(3):171-9
9. Edafe O, Antakia R, Laskar N, Uttley L, Balasubramanian SP. Systematic review, and meta-analysis of predictors of post-thyroidectomy hypocalcemia. *BJS*. 2014; 101:307–20
10. Padur AA, Kumar N, Guru A, Badagabettu SN, Shanthakumar SR, Virupakshamurthy MB, et al. Safety and Effectiveness of Total Thyroidectomy and Its Comparison with Subtotal Thyroidectomy and Other Thyroid Surgeries: A Systematic Review. *J Thyroid Res*. 2016
11. Acun Z, Cinar F, Cihan A, Ulukent SC, Uzun L, Ucan B, et al. Importance of identifying the course of the recurrent laryngeal nerve in total and near-total thyroid lobectomies. *Am Surg* 2005; 71:225-7.
12. Godballe C, Madsen A.R, Sørensen C.H, Schytte S, Trolle W, Helweg-Larsen J. Risk factors for recurrent nerve palsy after thyroid surgery: a national study of patients treated at Danish departments of ENT head and neck surgery. *Eur Arch Otorhinolaryngol*. 2014; 271(8):2267–2276.
13. Zakaria HM, Al Awad NA, Al Kreedes AS, Al-Mulhim AM, Al-Sharway MA, Hadi MA, et al. Recurrent laryngeal nerve injury in thyroid surgery. *Oman Med J* 2011; 26:34-8
14. Zahoor A, Ammar K, Youssef H, Peshraw A, Amjad KM. Complication rates of thyroidectomy by an experienced, high-volume thyroid surgeon in a private hospital in Abu Dhabi, United Arab Emirates. *Ham Med J*. 2018; 11 (1): 17-21