

# **Evaluation of Postoperative Complications after Total Thyroidectomy: A Hospital-Based Retrospective Study**

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#### Abstract:

**Introduction:** Total thyroidectomy is a commonly performed surgical procedure for a range of thyroid disorders, including benign and malignant conditions. Despite being generally safe, it carries a risk of peroperative and postoperative complications. This study aimed to evaluate the frequency and nature of such complications and to identify potential risk factors in a hospital-based population.

**Methods:** This retrospective observational study was conducted in the Department of Otolaryngology–Head and Neck Surgery, Anwer Khan Modern Medical College Hospital, Dhaka, Bangladesh, from January 2024 to December 2024. In this study, we included 50 patients who underwent total thyroidectomy within the study period at the otolaryngology department of our institution.

**Result:** The majority of patients were aged 41–60 years (48%), and most of the patients were female (62%). The mean age of the patient was  $35.84\pm14.35$  years, and the mean BMI was  $25.7\pm3.8$  kg/m2. Multinodular goitre was the most common indication for surgery (62%), followed by papillary carcinoma (16%). Most surgeries (72%) were completed within 60 minutes. Hemorrhage was the predominant per-operative complication, observed in 78% of patients. Postoperative complications included hemorrhage (56%), pain (42%), dysphagia (24%), vocal cord paralysis (16%), and voice change (10%). Identified risk factors for postoperative complications included iodine intake (68%), tobacco use (44%), a family history of thyroid disease (36%), intraoperative hemorrhage (28%), and comorbid conditions such as hypertension and diabetes (24%).

**Conclusion:** Postoperative complications following total thyroidectomy remain a clinical concern, with hemorrhage being the most frequent. Identification of key risk factors, such as iodine intake and comorbidities, may aid in risk stratification and improved per-operative management.

Keywords: Total thyroidectomy, Postoperative complications, Hemorrhage, Thyroid cancer, Risk factors

#### **1. INTRODUCTION**

Thyroid diseases are among the most commonly reported endocrine disorders. The thyroid gland, a butterfly-shaped organ located in the neck, plays a vital role in regulating the body's metabolism through hormone production [1,2]. It is composed of two lobes connected by an isthmus and is one of the largest endocrine glands in the human body, typically weighing between 20–30 grams in adults. Thyroid lesions, which are often asymptomatic and associated with normal hormone levels, are found in approximately 4–7% of the population [3].

Management of thyroid disorders can involve either medical therapy or surgical intervention. Thyroidectomy, the surgical removal of part or all of the thyroid gland is a common treatment for a range of thyroid conditions, both benign and malignant. Benign disorders such as goiter, thyroid nodules, and thyroiditis may necessitate surgical intervention when symptoms are significant or refractory to medical treatment [4]. Malignant conditions, including thyroid cancers, often require thyroidectomy as a primary treatment modality [5]. The procedure has become increasingly feasible with advancements in diagnostic tools and surgical techniques, which have contributed to reduced postoperative morbidity and mortality [6].

Despite being generally considered safe and effective, thyroidectomy is not without risk [7,8]. Complications may include bleeding, infection, hypothyroidism, and injury to nearby structures, including the recurrent laryngeal nerve [4,9]. Additionally, persistent hypoparathyroidism, hypocalcemia, and postoperative hemorrhage remain notable concerns [10,11]. Long-term outcomes vary depending on the underlying thyroid condition and patient-specific factors, though most patients report symptom relief and improved quality of life following surgery [12]. Nevertheless, complications such as hypoparathyroidism, vocal cord dysfunction, recurrence, and scar formation should also be considered [13,14].

Previous studies have reported varying rates of postoperative complications, including vocal cord paralysis, hypoparathyroidism, and surgical site infections [15,16]. Furthermore, risk factors such as age, sex, and the type of thyroid disease have been identified as contributing to complication rates [17,18].

Therefore, the aim of this study was to evaluate the frequency and nature of postoperative complications following total thyroidectomy and to identify potential risk factors among patients in a hospital-based setting.

# 2. METHODOLOGY & MATERIALS

This retrospective observational study was conducted in the Department of Otolaryngology– Head and Neck Surgery, Anwer Khan Modern Medical College Hospital, Dhaka, Bangladesh, from January 2024 to December 2024. In this **3. RESULTS**  study, we included 50 patients who underwent total thyroidectomy within the study period at the otolaryngology department of our institution.

These are the following criteria to be eligible for enrollment as our study participants:

## 2.1. Inclusion Criteria

- a) Patients of all age groups and genders;
- b) Patients who underwent total thyroidectomy within the study period;
- c) Patients with complete medical records and documented postoperative follow-up were included in the study.

## 2.2. Exclusion Criteria

- a) Patients who underwent hemithyroidectomy or subtotal thyroidectomy
- b) Patients with incomplete data or loss to follow-up
- c) Patients with any history of chronic illness (e.g., renal or pancreatic diseases, ischemic heart disease, asthma, COPD, etc.) were excluded from our study.

## 2.3. Data Collection

Patient data were extracted manually from the hospital's surgery registry and medical charts. The following parameters, like demographic data (age, sex, and occupation), blood group distribution, duration of surgery, per-operative and postoperative complications, were recorded. Complications were categorized into peroperative and postoperative. Per-operative complications mainly included hemorrhage, while postoperative complications assessed included pain, hemorrhage, vocal cord paralysis, and voice changes.

# 2.4. Statistical Analysis

All data were recorded systematically in a preformatted data collection form. Quantitative data was expressed as mean and standard deviation; qualitative data was expressed as frequency distribution and percentage. The data were analyzed using the chi-square ( $X^2$ ) test, Fisher's exact test. A p-value <0.05 was considered significant. Statistical analysis was performed by using SPSS 22 (Statistical Package for Social Sciences) for Windows version 10.

 Table 1. Baseline characteristics of our study patients

Baseline characteristics	N=50	P (%)
Age		
0–20 years	4	8.0
21–40 years	22	44.0
41–60 years	24	48.0

Mean age (years)	35.84±14.35	
Sex		
Male	19	38.0
Female	31	62.0
BMI (kg/m <sup>2</sup> )		
Underweight	14	28.0
Normal	30	60.0
Overweight	6	12.0
Mean BMI (kg/m <sup>2</sup> )	25.7±3.8	
Education level		
Intermediate	10	20.0
Graduate	24	48.0
Postgraduate	16	32.0
Occupation		
Student	12	24.0
Housewife	16	32.0
Job	22	44.0
Blood Group		
O+ve	23	46.0
A+ve	10	20.0
B+ve	17	34.0

Table 1 presents the baseline characteristics of the 50 patients included in the study. The majority of patients were in the 41–60 year age group (48%), and females constituted a higher proportion (62%) compared to males (38%). The mean age of our patients was  $35.84\pm14.35$  years. Most of our patients had normal BMI (60%), and

the mean BMI was  $25.7\pm3.8$  (kg/m<sup>2</sup>). Most patients had completed graduate (48%) or postgraduate (32%) education, and the most common occupations were jobs (44%) and housewives (32%). Regarding blood group distribution, O+ve was the most prevalent blood group (46%).

Table 2. Distribution of study patients by pathological findings and operation time

Diagnosis	N=50	P (%)
Multinodular goitre	31	62.0
Papillary carcinoma	8	16.0
Follicular carcinoma	4	8.0
Medullary carcinoma	2	4.0
Follicular adenoma	3	6.0
Hashimoto's thyroiditis	2	4.0
Duration of operation		
0–60 minutes	36	72.0
60–80 minutes	14	28.0

Table 2 shows the distribution of patients by histopathological findings and duration of surgery. Multinodular goitre was the most frequent diagnosis, observed in 62% of patients, followed by papillary carcinoma (16%) and follicular carcinoma (8%). Most operations (72%) were completed within 60 minutes, while 28% extended up to 80 minutes.

Table 3. Distribution of study patients by per-operative and post-operative complications

Per-operative Complication	N=50	P (%)
Hemorrhage	39	78.0
Post-operative Complications		
Pain	21	42.0
Hemorrhage	28	56.0
Vocal cord paralysis	8	16.0
Voice change	5	10.0
Dysphagia	12	24.0

Table 3 shows that hemorrhage was the most common per-operative complication, occurring in 78% of patients. Postoperatively, the most frequently reported complications included **Table 4** *Pisk Factors for Postoparative Complication*  hemorrhage (56%), pain (42%), dysphagia (24%), vocal cord paralysis (16%), and voice change (10%).

Risk Factors	N=50	P (%)
Family history	18	36.0
Tobacco users	22	44.0
Iodine intake	34	68.0
Duration of surgery $> 60$ minutes	8	16.0
Large goiter/multinodular thyroid	15	30.0
Malignant thyroid pathology	10	20.0
Intraoperative hemorrhage	14	28.0
Comorbid conditions (e.g., HTN, DM)	12	24.0

**Table 4.** Risk Factors for Postoperative Complications in Patients Undergoing Total Thyroidectomy

Table 4 summarizes potential risk factors associated with postoperative complications. Iodine intake (68%) and tobacco use (44%) were among the most common risk factors identified. Family history of thyroid disease was reported in 36% of patients. Other contributing factors included large goiters (30%), malignant pathology (20%), intraoperative hemorrhage (28%), comorbidities such as hypertension and diabetes (24%), and longer surgical duration exceeding 60 minutes (16%).

#### 4. **DISCUSSION**

In the present study, the incidence of thyroid disease was higher in females (62%), and the most common indication for thyroid surgery was multinodular goiter (62%). Kazi Atikuzzaman et al. also reported a higher incidence in females (66%). The most frequently performed thyroid surgery in their study was hemithyroidectomy (50.3%), and multinodular goiter was the leading indication (78.5%) [19]. Similarly, Algahtani et al. found that females in Saudi Arabia experienced more complications than males among those who underwent thyroidectomy [20]. A study by Pandey et al. reported that 70 out of 80 patients were female [21], while another study by Algahtani et al. found that 151 out of 182 patients were female [22].

In our study, the most commonly reported complications were hemorrhage (56%), pain (42%), dysphagia (24%), vocal cord paralysis (16%), and voice change (10%). According to Kazi Atikuzzaman et al., 29 patients (17.8%) experienced postoperative complications, with hypocalcemia being the most common at 10.43% [19]. Hypocalcemia is consistently reported in literature as the most frequent postoperative complication. Previous studies have shown that the incidence of transient hypocalcemia ranges from 2% to 53%, while permanent hypocalcemia occurs in 0.4% to 13.8% of cases [23–25]. In the study by Seo et al., transient hypocalcemia was reported in 42% of patients [24], while Suwannasarn et al. observed it in 38.5% of cases [25].

Additional complications noted in Kazi Atikuzzaman et al.'s study included hoarseness, hematoma, hypertrophic scars, and wound infections. Voice changes were temporary and returned to normal within three months. Vocal cord movement was assessed using flexible laryngoscopy (FOL) [19]. Other studies have identified recurrent laryngeal nerve (RLN) hypocalcemia, injury, transient and hypoparathyroidism as common complications following thyroid surgery, whereas rare complications include cellulitis, infections, and injury to nearby structures such as the carotid artery, jugular vein, and esophagus [26,27].

Steurer et al. reported that RLN injury was the most common complication, with rates of 0.3% in benign thyroid cases, 1.2% in malignant cases, and none in patients with hyperparathyroidism [28]. Javidi et al. observed hypocalcemia in 34 patients in their study population [29]. Sousa et al. conducted a study on 333 patients and found transient and permanent hypocalcemia rates of 40.8% and 4.2%, respectively. They also noted that surgery type, hyperthyroidism, and malignancy influenced these outcomes [30].

Regarding hematoma, Javidi et al. reported this rare complication in 8 patients (0.8%) [29]. Bononi et al. found a much higher incidence of hematoma (53%) following total thyroidectomy (TT) [31], while Karamanakos et al. observed it in 1.3% of 2043 patients, highlighting the potential for airway obstruction as a surgical emergency [32]. Mishra et al. identified postoperative dysphagia as the most frequent complication in their study, followed by temporary voice change and wound infection [33].

Several studies have noted increased rates of vocal fold paralysis and hypoparathyroidism following TT. It is crucial for surgeons to assess the risks and benefits of each surgical approach and to apply meticulous techniques and postoperative care to minimize complications [34]. Common early complications after TT include hypoparathyroidism, due to potential inadvertent damage or removal of the parathyroid glands. Additionally, RLN damage remains a concern, often resulting in vocal cord paralysis and changes in voice quality [35].

In our study, the most commonly identified risk factor was inadequate iodine intake (68%), followed by tobacco use (44%) and a family history of thyroid disease (36%). Mishra et al. found that tobacco and alcohol use, along with a non-vegetarian diet, were associated with increased complications, although the associations were not statistically significant. However, iodine deficiency and a family history of thyroid disease were significantly associated with postoperative complications (p < 0.05) [33].

#### 5. LIMITATIONS OF THE STUDY

Our study was a single-center study. We took a small sample size due to the short study period. After evaluating those patients, we did not follow up with them for the long term and did not know other possible interference that may happen in the long term with these patients.

#### 6. CONCLUSION AND RECOMMENDATIONS

The findings of this study show that postoperative complications following total thyroidectomy are not uncommon, with hemorrhage, pain, and vocal cord-related issues being the most frequently observed. Importantly, several modifiable and non-modifiable risk factors-such as iodine intake, tobacco use, intraoperative hemorrhage, and pre-existing comorbidities-were identified as contributing to the likelihood of postoperative complications. Although total thyroidectomy is generally considered a safe and effective procedure, continuous evaluation and individualized risk stratification remain essential for optimizing patient outcomes and minimizing complications.

So, further prospective studies with larger sample sizes are recommended to validate these findings and support the development of standardized protocols for complication prevention and management.

#### REFERENCES

- [1] 89th Annual Meeting of the American Thyroid Association. 2022. Available from: https://www.thyroid.org/89th-annualmeeting-ata/
- [2] Salman AG, et al. Physiological aspects of thyroid disorders: Anatomy, hormones, diagnosis and management. Curr Clin Med Educ. 2024; 2(5):17–32.
- [3] Al-Suhaimi EA, Khan FA. Thyroid glands: Physiology and structure. In: Emerging Concepts in Endocrine Structure and Functions. Springer; 2022. p. 133–60.
- [4] Durante C, et al. The diagnosis and management of thyroid nodules: A review. JAMA. 2018; 319(9): 914–24.
- [5] Schlumberger M, Leboulleux S. Current practice in patients with differentiated thyroid cancer. Nat Rev Endocrinol. 2021; 17(3):176–88.
- [6] Al-Qurayshi Z, et al. Association of surgeon volume with outcomes and cost savings following thyroidectomy: a national forecast. JAMA Otolaryngol Head Neck Surg. 2016; 142:32–9.
- [7] Nguyen QT, et al. Diagnosis and treatment of patients with thyroid cancer. Am Health Drug Benefits. 2015;8(1):30.
- [8] Raue F, Frank-Raue K. Thyroid cancer: Riskstratified management and individualized therapy. Clin Cancer Res. 2016; 22(20):5012–21.
- [9] Lukinović J, Bilić M. Overview of thyroid surgery complications. Acta Clin Croat. 2020; 59(Suppl 1):81–6.
- [10] Bai B, Chen Z, Chen W. Risk factors and outcomes of incidental parathyroidectomy in thyroidectomy: a systematic review and metaanalysis. PLoS One. 2018; 13:e0207088.
- [11] Kanat BH, et al. A complication of thyroidectomy: do not forget suture reaction. Turk J Surg. 2017; 33:58–61.
- [12] Lin YS, et al. The long-term outcomes of thyroid function after subtotal thyroidectomy for Graves' hyperthyroidism. J Surg Res. 2017; 220:112–8.
- [13] Uludağ M, et al. Main surgical principles and methods in surgical treatment of primary hyperparathyroidism. Sisli Etfal Hastan Tip Bul. 2019; 53(4):337–52.
- [14] Erfanifar E, et al. Evaluating the effect of mindfulness-based cognitive therapy (MBCT) on sexual function and sexual self-efficacy of postpartum women: A systematic review. Sex Disabil. 2024; 42:317–48.
- [15] Jiang WJ, et al. Comparison of total endoscopic thyroidectomy with conventional open thyroidectomy for treatment of papillary thyroid cancer: A systematic review and meta-analysis. Surg Endosc. 2020; 34:1891–903.

- [16] Rocke DJ, et al. The effect of lateral neck dissection on complication rate for total thyroidectomy. Am J Otolaryngol. 2020; 41(3): 102421.
- [17] Karamanakos SN, et al. Complications and risk factors related to the extent of surgery in thyroidectomy. Hormones (Athens). 2010; 9:318–25.
- [18] Kwak HY, et al. Predictive factors for longer operative times for thyroidectomy. Asian J Surg. 2017; 40:139–44.
- [19] Atikuzzaman K, et al. Early and late complications after thyroid surgery: A retrospective study in 163 patients. Bangladesh J Otorhinolaryngol. 2022; 28(1):50–5.
- [20] Alqahtani SM, et al. Post-thyroidectomy complications and risk factors in Tabuk, Saudi Arabia: a retrospective cohort study. Cureus. 2020; 12:e10852.
- [21] Pandey AK, et al. Postoperative complications of thyroid surgery: a corroborative study with an overview of evolution of thyroid surgery. Int J Head Neck Surg. 2015; 6:149–54.
- [22] Alqahtani SM, et al. Post-thyroidectomy hypocalcemia: a single-center experience. Cureus. 2021; 13:e20006.
- [23] Abboud B, et al. Risk factors for postthyroidectomy hypocalcemia. J Am Coll Surg. 2002; 195:456–61.
- [24] Seo ST, et al. Transient and permanent hypocalcemia after total thyroidectomy: early predictive factors and long-term follow-up results. Surgery. 2015; 158:1492–9.
- [25] Suwannasarn M, et al. Single measurement of intact parathyroid hormone after thyroidectomy can predict transient and permanent hypoparathyroidism: a prospective study. Asian J Surg. 2017; 40:350–6.
- [26] Shiryazdi SM, et al. Risk of postoperative hypocalcemia in patients underwent total

thyroidectomy, subtotal thyroidectomy and lobectomy surgeries. Acta Med Iran. 2014; 52:206–9.

- [27] Berri T, Houari R. Complications of thyroidectomy for large goiter. Pan Afr Med J. 2013; 16:138.
- [28] Steurer M, et al. Advantages of recurrent laryngeal nerve identification in thyroidectomy and parathyroidectomy and the importance of preoperative and postoperative laryngoscopic examination in more than 1000 nerves at risk. Laryngoscope. 2002; 112(1):124–33.
- [29] Javidi S, et al. Postoperative complications and long-term outcomes after total and subtotal thyroidectomy: a retrospective study. Sci Rep. 2025; 15(1):3705.
- [30] Sousa AD, et al. Predictors factors for postthyroidectomy hypocalcaemia. Revista do Colegio Brasileiro de Cirurgioes. 2012; 39:476-82.
- [31] Bononi M, et al. Incidence and circumstances of cervical hematoma complicating thyroidectomy and its relationship to postoperative vomiting. Head Neck. 2010; 32(9):1173–7.
- [32] Karamanakos SN, et al. Complications and risk factors related to the extent of surgery in thyroidectomy. Hormones (Athens). 2010; 9: 318–25.
- [33] Mishra T, et al. Assessment of post-operative complications in patients undergoing thyroid surgery in a tertiary care hospital in Eastern India. Cureus. 2023; 15(7):e42549.
- [34] Tatakis DN, et al. Guided implant surgery risks and their prevention. Periodontol. 2019;81(1): 194–208.
- [35] Nagel K, et al. Definition and diagnosis of postsurgical hypoparathyroidism after thyroid surgery: Meta-analysis. BJS Open. 2022;6(5): zrac102.

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