

Clinicopathological Characteristics and Surgical Management of Papillary Thyroid Carcinoma in a Tertiary Care Hospital

Rifat Hassan^{1*}, Ashraful Islam², Shanjidah Hoque³, Mahbobul Haque⁴, Rezaul Karim⁵, Rahat Tanvir Anwar⁶, Mohammad Shahjahan Sarker⁷

ARTICLE INFO

Received: 5 August 2026
Accepted: 12 August 2026
Published Online: 19 August 2026

DOI: 10.5281/zenodo.22012209

Volume: 10, Number: 1, Page: 194-197

e-ISSN: 2789-5912
ISSN: 2617-0817

*Corresponding author



ABSTRACT

Background: Papillary thyroid carcinoma (PTC) is the most common endocrine malignancy and generally has an excellent prognosis. However, clinicopathological characteristics and lymph node involvement influence surgical management and postoperative outcomes. This study evaluated the clinicopathological characteristics and surgical management of PTC in a tertiary care hospital in Bangladesh. **Methods & Materials:** This cross-sectional study was conducted in the Department of Otolaryngology and Head–Neck Surgery at the National Institute of ENT, Dhaka, Bangladesh, from January 2020 to December 2021. A total of 125 patients aged 15–60 years with histopathologically confirmed PTC who underwent total thyroidectomy, with or without neck dissection, were enrolled using purposive sampling. Clinicopathological, operative, and follow-up data were collected from patient interviews and hospital records. Postoperative thyroid function tests and ultrasonography were performed during follow-up. Data were analyzed using SPSS version 23.0, with $p < 0.05$ considered statistically significant. **Results:** Of the 125 patients, 69.6% were female, 69.6% had tumors ≥ 2 cm, and 69.6% had clinically positive cervical lymph nodes. Bilateral cervical lymph node involvement was the most common pattern (53.6%), and 80.5% of involved lymph nodes measured ≥ 0.5 cm. Total thyroidectomy with neck dissection was the most frequently performed procedure (55.0%). During follow-up, FT3 and FT4 levels increased significantly, whereas TSH levels decreased significantly (all $p < 0.05$). Ultrasonography demonstrated a clear thyroid bed in 87.2% of patients, while 12.8% had residual thyroid bed lesions or cervical lymph node positivity. **Conclusion:** Papillary thyroid

carcinoma predominantly affected middle-aged women and was commonly associated with larger tumors and cervical lymph node involvement. Total thyroidectomy with neck dissection was the most common surgical procedure and achieved favorable postoperative outcomes, highlighting the importance of appropriate surgical management and regular postoperative follow-up.

Keywords: Papillary Thyroid Carcinoma, Clinicopathological Characteristics, Surgical Management.

1. Assistant Professor, Department of Otolaryngology & Head Neck Surgery, National Institute of ENT, Tejgaon, Dhaka, Bangladesh (ORCID: 0009-0004-6614-8021)
2. Assistant Registrar, Department of Otolaryngology & Head Neck Surgery, National Institute of ENT, Tejgaon, Dhaka, Bangladesh (ORCID: 0009-0001-0387-8797)
3. Consultant, Department of General Surgery, Unico Hospitals Green Road, Dhaka, Bangladesh (ORCID: 0009-0007-4405-9652)
4. Assistant Professor, Department of ENT, General Hospital, Faridpur, Bangladesh Attachment -National Institute of ENT, Tejgaon, Dhaka, Bangladesh (ORCID: 0009-0004-8671-0974)
5. Research Officer, Department of Otolaryngology & Head Neck Surgery, National Institute of ENT, Tejgaon, Dhaka, Bangladesh (ORCID: 0009-0005-6173-618X)
6. Assistant Registrar, Department of Otolaryngology & Head Neck Surgery, National Institute of ENT, Tejgaon, Dhaka, Bangladesh (ORCID: 0009-0005-7659-1710)
7. Assistant Professor, Department of ENT, National Institute of ENT, Tejgaon, Dhaka, Bangladesh (ORCID: 0009-0005-9188-1927)

INTRODUCTION

Papillary thyroid cancer (PTC) is the most common endocrine malignancy and accounts for the majority of cases of thyroid cancer in iodine-sufficient areas of the world [1]. PTC typically presents a low-risk profile, achieving over 90% long-term survival rates. Prognosis deteriorates with increasing age, larger tumor size, extrathyroidal spread, lymph node involvement, and incomplete removal [2,3]. In papillary thyroid carcinoma, locoregional recurrence can occur before distant metastasis. While the prognosis is typically favorable, long-term monitoring is crucial but frequently overlooked [4]. Lymph node metastasis occurs frequently (~67.9%) and correlates with recurrence; however, it minimally affects disease-specific survival, except in older patients with lateral neck involvement [5]. PTC displays a range of behaviors, from mild to aggressive. Risk is primarily influenced by age, tumor

dimensions, multifocality, and lymph node metastasis, steering TNM/ATA-related treatment [6].

Surgery is the primary treatment for PTC, involving total thyroidectomy for higher-risk or tumors larger than 1 cm, and lobectomy for specific low-risk instances. The scope of surgery is determined by tumor characteristics, patient risk factors, and the potential requirement for radioactive iodine treatment [7]. Despite ideal surgery for PTC, recurrence—primarily locoregional—may still happen, particularly in high-risk cases, and most instances are manageable, highlighting the importance of ongoing follow-up [8].

Mao et al. (2015) found that patients with papillary thyroid carcinoma who had central lymph node involvement were more frequently male and exhibited greater tumor size, extrathyroidal extension, and multifocal disease. These clinicopathological characteristics suggest a

more aggressive tumor behavior and are helpful for forecasting disease progression and assisting in surgical planning [9]. Chereau et al. (2016) discovered that older PTC patients experienced more aggressive disease and increased recurrence risk, yet disease-specific survival following thyroid resection remained mostly positive, emphasizing the need for diligent follow-up in this population [10].

Rahman et al. (2016) study in Bangladesh discovered that PTC primarily manifests as a thyroid nodule displaying nonspecific clinical characteristics. Diagnosis necessitates histopathological examination using immunohistochemistry, and treatment primarily involves surgical intervention (thyroidectomy) alongside long-term monitoring [11].

In Bangladesh, extensive information regarding the clinicopathological characteristics and surgical treatment of papillary thyroid carcinoma is scarce. This

research seeks to assess these traits and their relationship with clinical results in a tertiary care hospital.

METHODS & MATERIALS

This cross-sectional study was conducted in the Department of Otolaryngology and Head–Neck Surgery at the National Institute of ENT, Tejgaon, Dhaka, Bangladesh, over a two-year period from January 2020 to December 2021. A total of 125 patients aged 15–60 years with histopathologically confirmed papillary thyroid carcinoma who underwent total thyroidectomy, with or without neck dissection, were enrolled using a purposive sampling technique. Patients with nodular goiter, follicular carcinoma, medullary carcinoma, anaplastic carcinoma, or significant comorbidities such as cerebrovascular disease and chronic kidney disease were excluded.

Following written informed consent and approval from the Institutional Review Board (IRB) of the Bangladesh College of

Physicians and Surgeons (BCPS), demographic, clinical, operative, and histopathological data were collected using a structured checklist from patient interviews and hospital records. All surgical procedures were performed by experienced otolaryngology surgeons according to standard institutional protocols. Postoperative follow-up was conducted at 3, 6, 12, 18, and 24 months, during which thyroid function tests (FT3, FT4, and TSH) and ultrasonographic findings were recorded.

Data were analyzed using SPSS version 23.0. Continuous variables were expressed as mean $\pm$ standard deviation (SD), while categorical variables were presented as frequency and percentage. Changes in postoperative thyroid function over time were analyzed using repeated-measures analysis of variance (ANOVA). A p-value <0.05 was considered statistically significant. Participant confidentiality was

maintained throughout the study, and participation was voluntary.

RESULTS

A total of 125 patients with histopathologically confirmed papillary thyroid carcinoma were included in the study. *Table I* shows the baseline clinicopathological characteristics of the study patients. The highest proportion of patients (30.4%) belonged to the 45–54 years age group, followed by 35–44 years (22.4%) and 15–24 years (20.0%). Females constituted 69.6% of the study population. Most patients (69.6%) had a tumor size of ≥ 2 cm, and clinically positive lymph nodes were present in 69.6% of cases. The most common presenting symptom was dysphagia (27.2%), followed by pain (24.8%) and stridor (4.8%). The mean age of the patients was 39.0 ± 12.5 years, while the mean tumor size was 2.0 ± 0.6 cm (range: 1.0–3.0 cm).

Table I

Baseline clinicopathological characteristics of the study patients ($n=125$).

Variables	Number of patients	Percentage
Age group (years)		
15–24	25	20.0
25–34	22	17.6
35–44	28	22.4
45–54	38	30.4
≥ 55	12	9.6
Sex		
Male	38	30.4
Female	87	69.6
Tumor size		
<2 cm	38	30.4
≥ 2 cm	87	69.6
Clinically positive lymph node		
Yes	87	69.6
No	38	30.4
Presenting symptoms*		
Dysphagia	34	27.2
Pain	31	24.8
Stridor	6	4.8

Table II shows the distribution of cervical lymph node involvement among the 87 patients with clinically positive lymph nodes. Bilateral cervical lymph node involvement was the most common finding

(53.6%), followed by unilateral involvement (28.7%) and central compartment involvement (17.2%). Among these patients, 70 (80.5%) had cervical lymph nodes measuring ≥ 0.5 cm, whereas

17 (19.5%) had lymph nodes measuring <0.5 cm. The mean cervical lymph node size was 2.9 ± 1.3 cm (range: 1.0–5.0 cm).

Table II

Distribution according to site and size of cervical lymph nodes ($n=87$).

Variables	Number of patients	Percentage
Site of cervical lymph node involvement		
Bilateral	47	53.6
Unilateral	25	28.7
Central compartment	15	17.2
Size of cervical lymph nodes		
≥ 0.5 cm	70	80.5
<0.5 cm	17	19.5

Figure 1 show that total thyroidectomy with neck dissection was the most frequently performed surgical procedure (55.0%), followed by total thyroidectomy with central clearance (25.0%) and total thyroidectomy alone (20.0%).

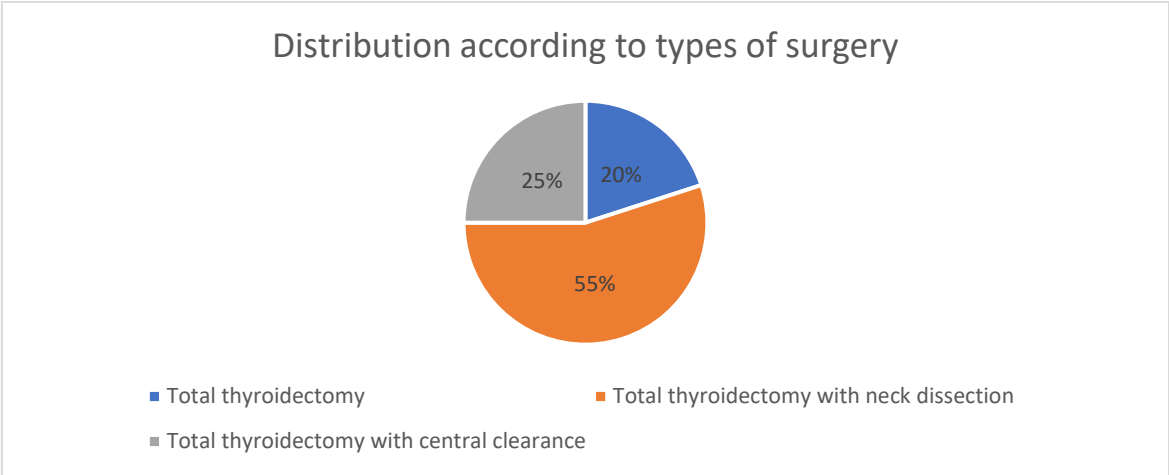


Figure I: Distribution according to types of surgery (n=125)

Table III shows that postoperative thyroid function changed significantly during follow-up. Mean FT3 levels increased modestly from 2.6±0.8 pg/ml at 3 months to 3.0±0.7 pg/ml at 24 months (p=0.018). Mean FT4 levels also increased significantly from 1.3±0.3 ng/ml to 1.7±0.3 ng/ml over the same period (p<0.001). In contrast, mean TSH levels decreased progressively from 3.8±1.2 mIU/ml at 3 months to 0.6±0.4 mIU/ml at 24 months, reflecting effective postoperative TSH suppression therapy (p<0.001).

Table III
Postoperative thyroid function tests among study patients.

Thyroid function tests	After 3 months (Mean±SD)	After 6 months (Mean±SD)	After 12 months (Mean±SD)	After 18 months (Mean±SD)	After 24 months (Mean±SD)	P value
FT3 (pg/ml)	2.6±0.8	2.7±0.8	2.8±0.7	2.9±0.7	3.0±0.7	0.018*
FT4 (ng/ml)	1.3±0.3	1.4±0.3	1.5±0.3	1.6±0.3	1.7±0.3	<0.001*
TSH (mIU/ml)	3.8±1.2	2.5±1.0	1.8±0.8	1.1±0.6	0.6±0.4	<0.001*

* Significant. P value obtained using repeated-measures ANOVA.

Table IV shows the postoperative ultrasonographic findings. A clear thyroid bed was observed in 109 (87.2%) patients, whereas 16 (12.8%) had residual thyroid bed lesions. Similarly, cervical lymph node positivity was detected in 16 (12.8%) patients, while 109 (87.2%) had no ultrasonographic evidence of lymph node involvement.

Table IV
Postoperative ultrasonographic findings of the thyroid bed and cervical lymph nodes (n=125).

USG findings	Number of patients	Percentage
Thyroid bed		
Clear	109	87.2
Residual lesion	16	12.8
Cervical lymph nodes		
Positive	16	12.8
Negative	109	87.2

DISCUSSION

In this study, the majority of patients were between the ages of 45 and 54, with an average age of 39.0±12.5 years. Females made up most of the cases. The tumor size was at least 2 cm in 70.0% of patients, and 70.0% exhibited clinically positive lymph nodes. The primary symptom observed was dysphagia, with pain and stridor following. Average tumor size was 2.0±0.6 cm. These results align with the study by Islam MA et al. (2018), which similarly indicated a predominance of females, a peak incidence in middle age, common lymph node

involvement, and larger tumor sizes at presentation in thyroid cancer [12]. In this study, cervical lymph node involvement was primarily bilateral, with unilateral and central cases following. In this study, bilateral cervical lymph node involvement was the most common finding, followed by unilateral and central compartment involvement. Most patients with cervical lymph node involvement had lymph nodes measuring ≥0.5 cm. Similarly, Lee YS et al. (2010) reported that central lymph node metastasis is common in papillary thyroid carcinoma and that greater

nodal burden is associated with more extensive disease and poorer prognosis [13]. In our study, total thyroidectomy coupled with neck dissection was the most prevalent procedure, followed by total thyroidectomy with central clearance and total thyroidectomy on its own. Likewise, Hwangbo et al. (2017) indicated that 86% of patients had total, near-total, or subtotal thyroidectomy, with the majority also undergoing RAI ablation, emphasizing that total thyroidectomy management is the standard for papillary thyroid carcinoma [14]. In the present study, postoperative FT3 and FT4 levels increased significantly, whereas

TSH levels decreased progressively during follow-up, reflecting effective thyroid hormone replacement and TSH suppression after surgery. Similar findings were reported by Ito et al. (2018), who demonstrated that appropriate levothyroxine therapy maintains euthyroid status while achieving TSH suppression in patients with differentiated thyroid carcinoma following thyroidectomy^[15].

In this study, postoperative ultrasonography demonstrated a clear thyroid bed in 87.2% of patients, whereas cervical lymph node positivity was detected in 12.8%, indicating good locoregional disease control following surgery. Similar findings were reported by Durante et al. (2013), who emphasized that although most patients achieve an excellent structural response after surgery, a small proportion develop persistent or recurrent cervical disease, highlighting the importance of postoperative ultrasonographic surveillance^[16].

Overall, papillary thyroid carcinoma predominantly affected middle-aged women and was frequently associated with cervical lymph node involvement. Total thyroidectomy, with or without neck dissection, resulted in favorable postoperative outcomes characterized by appropriate thyroid hormone replacement, effective TSH suppression, and satisfactory locoregional disease control on follow-up ultrasonography.

CONCLUSION

Papillary thyroid carcinoma occurred predominantly in middle-aged women and was commonly associated with larger tumors and cervical lymph node involvement. Total thyroidectomy with neck dissection was the most frequently performed surgical procedure and was associated with favorable postoperative outcomes, including effective thyroid bed clearance and appropriate postoperative thyroid hormone control. These findings highlight the importance of timely diagnosis, appropriate surgical management, and regular postoperative follow-up to optimize patient outcomes and detect residual or recurrent disease at an early stage.

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