The Role of Conservative Surgery in the Treatment of Papillar Thyroid Microcarcinoma at Thong Nhat Hospital

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Background: Although very common and full of the dangers of cancer, many recent studies have noted that small papillary thyroid carcinoma progresses slowly and there are cases where conservative thyroidectomy gives good results even though it is not from the perspective of radical surgery. In Vietnam, there is currently little information on this issue. What are the results of surgical treatment in these cases?.

Objectives and method: the descriptive cross-sectional study of 49 cases of small papillary thyroid cancer, evaluation of surgical results and mid-term follow-up from 01/2022 to 01/2025 at Thong Nhat Hospital.

Results and discussion: The mean age was 45.1. The male/female ratio was 1/3.9(p=0.003). Multiple tumors were 22.4%. Tumors invading the capsule were 16.3%. Neck lymph node metastasis was 16.3%. There was no distant metastasis. Stage I according to cTNM was 91.8%. The total lobectomy and isthmus group had 34 cases; the total thyroidectomy group had 15 cases. In the two groups: hypothyroidism after 6 months of surgery was 36.7%, 30.6% (p=0.002); 12 months was 06.1%, 28.6% (p=0.001). In each group: total lobectomy with isthmus, postoperative hypothyroidism at 6 months and 12 months was 36.7% and 06.1% (p=0.002); Total thyroidectomy, the rate was 30.6% and 28.6% (p=0.52). 01 case of hoarseness, 01 thoracic duct rupture, 02 cases of tetany. There was no surgery-related death. Recurrence was 2% in 24-month follow-up.

Conclusion: Microcarcinoma papillary thyroid cancer is mainly stage 1. Surgery gives good results. There is no surgery-related mortality. Hypothyroidism after total lobectomy is lower than total thyroidectomy and recovery after 12 months. low recurrence rate in 24 months follow-up.

***Key words**: thyroid cancer, papillary, microcarcinoma*

INTRODUCTION

Papillary thyroid carcinoma (PTC) is the most common endocrine malignancy, with an increasing incidence worldwide. Microcarcinoma is defined as a PTC measuring ≤1 cm in its greatest dimension [1]. In the United States, over 40,000 new cases of thyroid cancer were expected to be diagnosed in 2023 [2]. According to GLOBOCAN 2022, Vietnam also exhibits a high cancer incidence rate, including thyroid cancer [3].

To date, total thyroidectomy with or without lymph node dissection has been the standard and effective treatment approach.

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However, recent studies have reported that approximately 10% of tumors may grow up to 3 mm and 4% may metastasize to regional lymph nodes over 10 years, implying that the remaining 90% of tumors remain indolent and non-metastatic [4]. In countries such as the United States, there has been a shift toward more conservative thyroid surgery and omission of lymph node dissection in selected cases. Nonetheless, in Vietnam, data regarding these approaches are limited. Therefore, we conducted this study with: *the objectives of characterizing patients with papillary thyroid microcarcinoma (PTMC), evaluating surgical outcomes of either total or hemithyroidectomy, and analyzing mid-term follow-up results up to 24 months.*

PATIENTS AND METHODS

Study Population

This study included patients diagnosed with papillary thyroid carcinoma who underwent surgery at Thong Nhat Hospital between January 2022 and January 2025.

Inclusion criteria were: papillary thyroid carcinoma ≤1 cm in diameter; first-time thyroid surgery.

Exclusion criteria included: coexisting malignancies; any prior treatment for thyroid cancer; multifocal tumors with any lesion >1 cm.

Study Design and Sample Size Calculation

This was a descriptive cross-sectional study.

Sample size was calculated using the formula for estimating a proportion:

$$n = Z^2_{1-\alpha/2} \frac{P \times (1-P)}{d^2}$$

- P is the estimated recurrence proportion (5% based on prior studies [5]), Z = 1.96 for a confidence level of 95%, and d = 0.05. Accounting for a 15% loss to follow-up, the minimum required sample size was 45 patients.

Diagnostic and Evaluation Protocol

Diagnosis: included clinical examination, ultrasound imaging, fine needle aspiration (FNA) of thyroid nodules and suspicious lymph nodes, and postoperative histopathology. Contrast-enhanced neck and chest computed tomography was performed when supraclavicular lymph node metastasis was suspected. Histopathologic diagnosis was confirmed as papillary thyroid carcinoma [6]. Tumor staging followed the 9th edition AJCC TNM classification [7]. Tumor size was confirmed as ≤1 cm by ultrasound. Overweight was defined as BMI >23, and obesity as BMI >25 [8].

Surgical Approach: All patients underwent surgery under general anesthesia in a supine position with a 6-cm transverse cervical incision. The thyroid gland and surrounding structures were carefully dissected, including identification of the recurrent laryngeal nerve (RLN) and superior laryngeal nerve. In cases of a solitary encapsulated tumor ≤1 cm with no evidence of lymph node or distant metastasis and no family history of thyroid cancer, hemithyroidectomy with isthmusectomy was performed [1]. In all other cases, total thyroidectomy was performed, with lymph node dissection if clinically indicated [1]. Efforts were made to preserve the parathyroid glands and nerves unless there was evidence of local invasion. Incisions were closed in layers with drain placement as necessary.

Patients were followed up every six months for up to 24 months to assess for recurrence (via ultrasound and biopsy if needed) and hypothyroidism (evaluated by serum T3, T4, and TSH levels).

Complication assessment: Tetany (Clinical of hypocalcemia due to hypoparathyroidism following surgery). Chyle Leak (Leakage of lymphatic fluid following injury to the thoracic duct or its branches during surgery). Postoperative hoarseness (transient or permanent injury to the recurrent laryngeal nerve); mortality (death within 24 hours postoperatively related to surgery).

Data Collection and Statistical Analysis: Data collected included: age, sex, clinical symptoms, tumor stage, size, number, surgical outcomes, complications, recurrence, and thyroid function parameters. Data were entered and analyzed using SPSS version 20. Continuous variables were presented as means or medians; categorical variables were analyzed using Chi-square test. A p-value <0.05 was considered statistically significant. Kaplan–Meier analysis was used to estimate recurrence-free survival.

Ethics Approval: All data were collected retrospectively from medical records without direct patient contact. No patient identifiers were disclosed. The study was approved by the Institutional Review Board of Thong Nhat Hospital (Approval No. 07/2024/CN-BVTN-HĐĐĐ, dated 01/02/2024).

RESULTS

Patient Characteristics

Table 1. Summarizes demographic and clinical characteristics

Patient Characteristics n = 49 (100%)	**Papillary thyroid microcarcinoma ≤ 1cm**			**p**
	Total n (%)	Male 10 (20,4%)	Female 39 (79,6%)	
Age *(year)*				
< 20 years old	03 (06.1)	00	03 (06.1)	
20 - ≤ 40 y.old	16 (32.6)	03 (06.1)	13 (26.5)	<0.05
40 - ≤ 60 y.old	21 (42.8)	05 (10.2)	16 (32.6)	
>60 y.old	09 (18.4)	02 (04.1)	07 (14.3)	
prior radiation exposure				
Overweight status	02 (04.1)	02 (04.1)	00	
Obesity status	04 (08.2)	01 (02.0)	03 (06.1)	0.42
Autoimmune thyroiditis	00	00	00	
Family history of thyroid cancer	06 (12.2)	01 (02.0)	05 (10.2)	
(parents, siblings)	05 (10.2)	01 (02.0)	04 (08.2)	
Symptoms *(clinical)*				
Dysphagia	07 (14.3)	01 (02.0)	06 (12.2)	0.24
Neck mass	09 (18.4)	03 (06.1)	06 (12.2)	
Incidental findings	19 (38.8)	06 (12.2)	13 (26.5)	

Tumor *(ultrasound)*				
Solitary nodule	38 (77.5)	07 (14.3)	31 (63.3)	
Multiple nodules	11 (22.4)	03 (06.1)	08 (16.3)	
Right thyroid	22 (44.9)	05 (10.2)	17 (34.7)	0.25
Left thyroid	15 (30.6)	02 (04.1)	13 (26.5)	
Isthmus thyroid	03 (06.1)	01 (02.0)	02 (04.1)	
Multiple lobes	09 (18.4)	02 (04.1)	07 (14.3)	
Capsular invasion *(ultrasound)*				
No	41 (83.7)	08 (16.3)	33 (67.3)	0.42
Yes	08 (16.3)	02 (04.1)	06 (12.2)	
Lymph node metastasis *(FNA)*				
Cervical lymph node	08 (16.3)	03 (06.1)	05 (10.2)	0.17
Supraclavicular lymph node	00	00	00	
Fine needle biopsy				
once	43 (87.7)	08 (16.3)	35 (71.4)	0.21
≥ 2 times	06 (12.2)	02 (04.1)	04 (08.2)	
Metastases *(MSCT)*				
Yes	00	00	00	0.31
No	49 (100)	10 (20.4)	39 (79.6)	
Stage *(cTNM, [7])*				
I	45 (91.8)	09 (18.4)	36 (73.5)	0.23
II	04 (08.2)	01 (02.0)	03 (06.1)	

The mean age was 45.1 ± 3.8 years (range: 18–72 years). The female-to-male ratio was 3.9:1 (p = 0.003). Family history of thyroid cancer was present in 10.2%. Cervical mass was reported in 18.4%, while multifocal tumors were found in 22.4%. Capsular invasion was present in 16.3%, and cervical lymph node metastasis in 16.3%. No distant metastases were detected. Stage I disease accounted for 91.8% of cases according to cTNM classification [7].

Surgical Outcomes

Table 2 Presents surgical outcomes and postoperative thyroid function

Surgical outcomes n = 49 (100%)	**Hemithyroidectomy With Isthmusectomy** 34 (69.4%)	**Total thyroidectomy With/without lymph node dissection** 15 (30.6%)	**p**
Surgery			
Mean operative time (minute)	84.4 ± 43.7	94.8 ± 11.2	0.33
hospitalization time (day)	04.2 ± 02.8	04.7 ± 02.5	0.24
Blood loss (ml)	107.3 ± 24.4	121 ± 43.2	0.31
Lymph node dissection (prepared, n%)	00	08 (16.3)	N/A
Lymph node dissection (in operation, n%)	03 (06.1)	02 (04.1)	
lymphadenitis	02 (04.1)	01 (02.0)	N/A
Metastatic lymph nodes	01 (gourp VI) (02,0)	01 (group IV) (02.0)	

Complications			
Hoarseness	01 (02.0)	01 (02.0)	0.52
Tetany	00	02 (04.1)	
Thoracic duct injury	00	01 (02.0)	
Bleeding	01 (02.0)	01 (02.0)	
Surgical site infection	01 (02.0)	01 (02.0)	
Perioperative mortality	00	00	
Thyroid function after surgery *(T3, T4,TSH)*			
Preoperative hypothyroidism			N/A
Yes	02 (04.1)	00	
No	32 (65.3)	15 (30.6)	
Postoperative hypothyroidism (06 month)			
Yes	18 (36.7)	15 (30.6)	
No	16 (32.6)	00	
Postoperative hypothyroidism (12 month)			
Yes	03 (06.1)	14 (28.6)	
No	31 (63.2)	01 (02.0)	

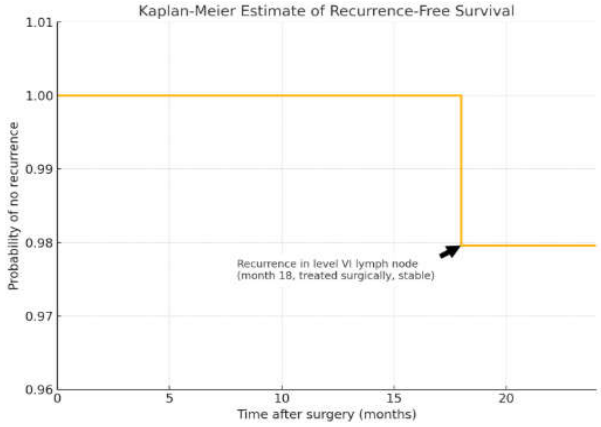
A total of 34 patients (69.4%) underwent total lobectomy with isthmus. Intraoperative detection of metastatic lymph nodes occurred in 2%. Mean operative time was 84.4 ± 43.7 minutes; hospitalization time was 4.2 ± 2.8 days. Complications included one case each of RLN injury (hoarseness), bleeding, and surgical site infection.

The remaining 15 patients (30.6%) underwent total thyroidectomy. Lymph node dissection was performed in 16.3% based on preoperative assessment, and intraoperatively in 2% due to detection of metastasis. Complications included one RLN injury, one thoracic duct injury, and two cases of tetany. No perioperative mortality occurred in either group.

Postoperative hypothyroidism at 6 months was reported in 36.7% (hemithyroidectomy with isthmusectomy group) and 30.6% (total thyroidectomy group). At 12 months, rates were 6.1% and 28.6%, respectively.

Mid-Term Follow-Up

The mean follow-up duration was 16.71 months (range: 5–24 months). One patient (2%) experienced recurrence in level VI cervical lymph nodes at month 18 and underwent reoperation with stable outcome thereafter.



Plot 01 Kaplan-Meier plot of recurrence-free survival after surgery papillary thyroid microcarcinoma cancer

Kaplan–Meier analysis demonstrated a flat survival curve with a 2% recurrence rate during 24 months of follow-up, indicating favorable recurrence-free survival.

DISCUSSION

Thyroid cancer, predominantly papillary carcinoma, can occur at any age. According to many studies, the most commonly affected age group is middle-aged adults. In our study, the mean age (± SD) was 45.1 ± 3.8 years, ranging from 18 to 72 years. Mao Y et al. reported an average age of thyroid cancer diagnosis around 40 years [9], consistent with domestic studies. In our study, the female-to-male ratio was 3.9:1, which was statistically significant ($p < 0.05$). Similar to previous reports, thyroid cancer predominantly affects females [5]. The most common presenting symptom was a neck mass, observed in 18.4% of patients. Initially, thyroid cancer often presents with local symptoms; dysphagia, hoarseness, and dyspnea are less frequent [5,10]. However, several studies have noted that thyroid cancer tends to progress slowly and may remain asymptomatic or have very subtle signs. Hershman and Blahd [10] reported incidental diagnosis in 15.2% of cases. In our study, 38.8% of patients were asymptomatic. This suggests that small papillary thyroid carcinomas often have an indolent clinical course, aligning with recent observations that early detection has improved due to advancements in imaging and screening. Zhang C et al., through a meta-analysis of a large sample size, found that papillary carcinoma is the most prevalent subtype and has shown an increasing trend [11].

The size of the primary tumor (T), as part of the TNM staging system, has become a focus in determining the extent of surgical intervention in recent years, particularly for papillary thyroid microcarcinoma (tumors ≤1 cm). In our study, all patients were diagnosed with papillary thyroid carcinoma with a tumor size ≤1 cm. For such cases, some studies have proposed lobectomy with isthmectomy based on histopathology and absence of lymph node metastases. We followed the recommendations of the American Thyroid Association (ATA) [1]. The 2015 ATA guidelines provide evidence-based recommendations for the classification and management of differentiated thyroid cancer, which typically has a >90% 5-year survival rate and slow progression. As such, limited surgery may be appropriate for localized cancers without capsular invasion, lymph node or distant metastases, and solitary nodules [1]. In our results, multifocality was observed in 22.4%, right lobe involvement in 44.9%, cervical lymph node metastasis in 16.3%, and capsular invasion in 16.3%. Currently, total thyroidectomy remains indicated in cases with these clinical and pathological features. However, despite their small size, papillary thyroid microcarcinomas can still exhibit multifocality and metastasis comparable to larger tumors, contrary to their often minimal clinical symptoms. Therefore, cautious management is warranted.

The 9th edition (2023) of the AJCC TNM staging system introduced several updates [7]: the age cutoff for prognostic classification was raised to 55 years. Thyroid cancer mortality rates increase with age starting around 35 years. Our study adopted these latest updates. Stage I was observed in 91.8% and Stage II in 8.2% of cases. However, this raised age threshold seemed to have minimal impact on overall prognosis in our cohort, given the mean age was 45.1 years.

Nonetheless, 18.4% of our patients were aged 60 years or older, placing them in a higher risk category. Some recent opinions support expanding the age threshold due to the indolent and relatively non-aggressive nature of this cancer type. Further updates in the AJCC system include exclusion of microscopic extrathyroidal extension and regional lymph node metastasis from the T3 definition. T3a refers to tumors >4 cm confined within the thyroid, while T3b includes tumors of any size with gross extrathyroidal extension. Level VII lymph nodes, previously classified as lateral cervical (N1b), are now reclassified as central compartment (N1a) nodes. In our study, preoperative cervical lymph node metastases were found in 16.3%, including three N1a cases. All three patients had favorable surgical outcomes with no recurrence observed during 24 months of follow-up.

We recorded a low rate of surgery-related complications with no procedure-related mortality. The complication rate in thyroid cancer surgery has been decreasing. However, postoperative hypothyroidism and its consequences, especially after total thyroidectomy, remain a major concern for patients as the condition is often permanent and burdensome. Therefore, lobectomy with isthmectomy, which preserves a portion of the contralateral lobe, is considered a major advantage of this conservative surgical approach [1]. However, recurrence and follow-up are major concerns. The mean follow-up duration in our study was 16.71 months (range 5 to 24 months). One patient had a recurrence in the level VI cervical lymph node at month 18 and underwent reoperation with successful outcome. A recent study found no significant difference in outcomes between conservative and total thyroidectomy for papillary microcarcinomas <10 mm without capsular invasion or lymph node involvement [11]. According to the ATA, approximately 90% of these tumors do not grow or metastasize over 10 years of observation [4]. The relatively short follow-up duration in our study may limit conclusions, but Kaplan-Meier survival analysis showed relatively flat recurrence-free survival curves in both surgical groups. Longer follow-up is needed to enhance statistical power.

CONCLUSION

Microcarcinoma papillary thyroid cancer is mainly stage 1. Surgery gives good results. There is no surgery-related mortality. Hypothyroidism after total lobectomy is lower than total thyroidectomy and recovery after 12 months. low recurrence rate in 24 months follow-up.

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