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CLINICAL AND PATHOLOGICAL CHARACTERISTICS OF DIFFERENTIATED THYROID CARCINOMA AT MILITARY HOSPITAL 175

Le Minh Phong[1*],Ha Bao Xuyen[2], Nguyen Thanh Chung[3]

[1]*Military Hospital 175 - 786 Nguyen Kiem, Ward 3, Go Vap Dist, Ho Chi Minh City, Vietnam*
[2]*Can Tho Oncology Hospital - 4 Chau Van Liem Street, Ninh Kieu Ward, Can Tho City, Vietnam*
[3]*Le Huu Trac National Burn Hospital - 263 Phung Hung, Phuc La Ward, Ha Dong Dist, Hanoi City, Vietnam*

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ABSTRACT

Objective: To describe the clinical and histopathological characteristics of differentiated thyroid cancer at Military Hospital 175.

Subjects and Methods: A descriptive cross-sectional study combined with a prospective design was conducted on 42 patients diagnosed with differentiated thyroid cancer at Military Hospital 175 from July 2022 to January 2024.

Results: The mean age of patients was 45.8 ± 9.6 years, with a predominance of females (71.4%). Papillary carcinoma accounted for the majority of histopathological types (90.5%), with capsular invasion in 11.9% and invasion of adjacent organs in 4.8% of cases. The disease stages were predominantly T1 and T2 (64.3%), with no lymph node metastasis (76.2%) and no distant metastasis (97.6%). There were significant associations between age, gender, tumor size, and the status of lymph node metastasis and capsular invasion ($p<0.05$). Within one year post-surgery, the recurrence-free rate was 92.9%, with local recurrence at 4.7% and distant recurrence at 2.4%.

Conclusion: Differentiated thyroid cancer has a favorable prognosis with a high one-year recurrence-free rate. However, risk factors such as tumor size and invasion status should be carefully considered in diagnosis and treatment.

Keywords: Thyroid cancer, differentiated type, capsular invasion.

1. INTRODUCTION

Thyroid cancer is among the most common malignancies of the endocrine system and has shown a steadily increasing global incidence. According to the GLOBOCAN 2020 report, the incidence rate of thyroid cancer was 10.1 per 100,000 in females and 3.1 per 100,000 in males, with differentiated thyroid carcinoma (DTC) accounting for the majority of cases, particularly papillary thyroid carcinoma (PTC) [1]. DTC represents the most prevalent form of thyroid cancer, comprising approximately 80–90% of all diagnosed cases worldwide [2]. This category includes papillary and follicular thyroid carcinomas, both of which generally have a favorable prognosis when detected early and appropriately treated [3]. According to the American Thyroid Association, the 10-year survival rate for DTC can exceed 90%, especially when timely surgical intervention is combined with radioactive iodine therapy [4].

In Vietnam, the incidence of DTC has been increasing, mainly due to advancements in diagnostic imaging techniques such as ultrasound and fine-needle aspiration (FNA). Military Hospital 175 is a tertiary healthcare center in Vietnam, where a significant number of thyroid cancer cases are diagnosed and treated. However, comprehensive data on the clinical and histopathological characteristics of DTC in this institution remain limited. Therefore, this study was conducted to describe the clinical and histopathological features of differentiated thyroid carcinoma at Military Hospital 175 from July 2022 to June 2024.

*Corresponding author
Email: drphonglm175@gmail.com **Phone**: (+84) 975636378 **Http**s://doi.org/10.52163/yhc.v66ienglish.2745

2. SUBJECT AND METHOD

2 .1. Subject

This study was conducted on 42 patients diagnosed and treated for differentiated thyroid carcinoma (DTC) at Military Hospital 175 from July 2022 to January 2024.

2.2. Inclusion Criteria

Diagnosed with differentiated thyroid carcinoma, including papillary and follicular subtypes, confirmed by postoperative histopathology or biopsy.

Treated and followed up at Military Hospital 175 between July 2022 and January 2024.

Complete medical records with sufficient clinical and paraclinical data (including ultrasound, scintigraphy, CT/MRI if available) and histopathological results.

Provided informed consent to participate in the study.

Exclusion Criteria

Diagnosed with anaplastic or medullary thyroid carcinoma.

Patients who did not complete the diagnostic or treatment process at the hospital.

Incomplete medical records lacking critical data.

Patients who declined participation or were lost to follow-up.

2.2. Methods

Study Design:

A descriptive cross-sectional study with a prospective component was conducted without a control group.

Sample Size:

Convenience sampling was used, including all patients who presented for evaluation and were diagnosed with differentiated thyroid carcinoma at Military Hospital 175 from July 2022 to January 2024.

Study Variables and Parameters:

- General patient characteristics: Mean age, gender distribution (male-to-female ratio), and reasons for hospital visit (routine check-up, detection of a neck mass, dysphagia, or hoarseness).

- Histopathological features: Classification of thyroid cancer subtypes (papillary, follicular), presence of capsular invasion, and involvement of adjacent structures.

- TNM staging: Assessment of T, N, and M components before and after treatment.

Recurrence within one year: Proportion of patients with no recurrence, local recurrence, or distant metastasis.

- Correlation between risk factors and complications: Analysis of the association between age, gender, tumor size, type of surgery, and presence of invasion or lymph node metastasis.

Postoperative survival and recurrence rate: Evaluation of overall survival and influencing factors within one year after surgery.

Data Analysis

Data were entered and analyzed using SPSS Statistics version 22.0 and Microsoft Excel 2016. Descriptive statistics were used to calculate frequencies and percentages for qualitative variables, and mean ± standard deviation (SD) for quantitative variables. Independent t-tests were used to compare mean values, and the Chi-square test was used to assess associations between categorical variables. A p-value < 0.05 was considered statistically significant.

2.3. Ethical Considerations

This study was conducted following the ethical approval process of the Institutional Review Board (IRB), Military Hospital 175. The research commenced only after obtaining IRB approval, along with permission from the hospital leadership and relevant administrative departments. All research data were kept confidential and used solely for scientific purposes.

3. RESULTS

Table 1. General characteristics of the study population (n = 42)

Characteristics		Number (n)	Percentage (%)
Sex	Male	12	28.6
	Female	30	71.4
Age group (years)	18 – 39	10	23.8
	40 – 59	22	52.4
	≥ 60	10	23.8

Characteristics		Number (n)	Percentage (%)
Reason for hospital visit	Routine health check-up	8	19.0
	Palpable neck mass/ lymphade-nopathy	20	47.6
	Dysphagia or odynophagia	8	19.0
	Hoarseness	6	14.3
Mean age (years)	45.8 ± 9.6		

As shown in the table above, the mean age of the patients was 45.8 ± 9.6 years. Males accounted for 28.6%, while females made up the majority at 71.4%. The 40–59 age group represented the highest proportion (52.4%), followed by both the 18–39 and ≥60 age groups, each accounting for 23.8%. The most common reason for hospital admission was the detection of a neck mass or cervical lymphadenopathy (47.6%), followed by dysphagia or odynophagia (19.0%), cancer identified during routine health check-ups (19.0%), and hoarseness (14.3%).

Table 2. Histopathological characteristics (n = 42)

Histopathological features		Number (n)	Percentage (%)
Type of differentiated thyroid carcinoma	Papillary carcinoma	38	90.5
	Follicular carcinoma	4	9.5
Capsular invasion	Present	5	11.9
	Absent	37	88.1
Invasion of adjacent structures	Absent	40	95.2
	Present	2	4.8

Histopathological assessment revealed that among the differentiated types of thyroid carcinoma, papillary carcinoma was the most prevalent, accounting for 90.5% of cases, while follicular carcinoma constituted only 9.5%. Capsular invasion was observed in 11.9% of patients, whereas 88.1% showed no evidence of capsular invasion. Regarding invasion into adjacent structures, only 4.8% of patients exhibited such extension, with the majority (95.2%) showing no invasion beyond the thyroid capsule.

Table 3. Disease stage according to TNM Classification (n = 42)

Stage (TNM)		Number (n)	Percentage (%)
T	T1	15	35.7
	T2	12	28.6
	T3	10	23.8
	T4	5	11.9
N	N0	32	76.2
	N1a	8	19.0
	N1b	2	4.8
M	M0	41	97.6
	M1	1	2.4

The proportion of patients at stage T1 was the highest, accounting for 35.71%, followed by stage T2 with 28.6%. Stages T3 and T4 accounted for 23.8% and 11.9%, respectively. Regarding lymph node metastasis, the majority of patients had no nodal involvement (N0), representing 76.2%, whereas N1a and N1b accounted for 19.0% and 4.8%, respectively. Regarding distant metastasis, most patients had no distant metastasis (M0), accounting for 97.62%, while only 2.38% of cases presented with distant metastasis (M1).

Table 4. Association between age, sex, and lymph node metastasis status (n = 42)

Characteristics			
	No metastasis (n = 32)	Metastasis (n = 10)	P-value
Age			
< 55	20 (62.5%)	5 (50.0%)	0.04
≥ 55	12 (37.5%)	5 (50.0%)	
Sex			
Male	8 (25.0%)	2 (20.0%)	0.03
Female	24 (75.0%)	8 (80.0%)	

The rate of lymph node metastasis was comparable between patients under and over 55 years of age, with each group accounting for 50.0% of cases with metastasis. In contrast, among those without lymph node involvement, 62.5% were under 55 years of age, and 37.5% were 55 years or older. This difference was statistically significant ($p < 0.05$). Regarding sex, lymph node metastasis was more common in female patients (80.0%) than in male patients (20.0%), and this difference was statistically significant ($p < 0.05$).

Table 5. Association between tumor size and local invasion (n = 42)

Tumor size	No invasion (n = 37)	Invasion (n = 5)	P-value
≤ 2 cm	30 (81.1%)	2 (40.0%)	0.2
> 2 cm	7 (18.9%)	3 (60.0%)	

The proportion of tumors without local invasion was higher in patients with tumor size ≤ 2 cm, accounting for 81.1%, compared to only 18.9% in those with tumor size > 2 cm. Conversely, tumors larger than 2 cm were more likely to exhibit local invasion (60.0%) than those measuring ≤ 2 cm (40.0%). This difference was statistically significant (p = 0.02).

Table 6. Recurrence status within 1 year (n = 42)

Recurrence status	Number (n)	Percentage (%)
No recurrence	39	92.9
Local recurrence	2	4.7
Distant recurrence	1	2.4

The majority of patients (92.9%) showed no recurrence within one year of treatment. Local recurrence was observed in 4.7% of patients, while distant recurrence occurred in 2.4% of patients.

4. DISCUSSION

4.1. Clinical Characteristics

The results of this study showed that the mean age of patients was 45.8 ± 9.6 years, with a predominance of female patients (71.4%). This finding is consistent with the study by Nguyen Ngoc Thang et al. (2022), in which the average age was 47.5 ± 12.1 years, and female patients were more common than male patients (female-to-male ratio = 5.5:1) [5]. This aligns with previous reports indicating that differentiated thyroid carcinoma (DTC) is more prevalent in females, with a female-to-male ratio ranging from 3:1 to 4:1 in extensive population-based studies [6]. Similarly, Cakir et al. (2023) reported that DTC predominantly affects women, with a female-to-male ratio of 7:1 [7].

4.2. Histopathological Features

Papillary thyroid carcinoma (PTC) accounted for the majority of cases (90.5%), followed by follicular thyroid carcinoma (FTC) at 9.5%. These results are consistent with those reported by Nguyen Ngoc Thang et al., in which PTC made up 87.0% of cases [5]. Moslehin et al. (2016) also found that PTC represented 83% of differentiated thyroid carcinoma cases [6]. The rates of capsular invasion (11.9%) and adjacent organ invasion (4.8%) observed in this study were consistent with findings from other national and international studies. The extent of tumor invasion varies depending on the stage of the disease; in our study, most patients were diagnosed at early stages, which may explain the relatively low rates of invasion.

4.3. TNM Staging

Most patients were diagnosed at early tumor stages, with 64.3% classified as T1 or T2, 76.2% showing no lymph node metastasis (N0), and 97.6% with no distant metastasis (M0). These findings are typical of differentiated thyroid carcinoma, which generally carries a favorable prognosis when diagnosed at an early stage. Several studies on PTC treatment also report a predominance of patients at T1 or T2 stages, likely due to advancements in healthcare systems and increased public awareness that promote early medical consultation and diagnosis. These results also reflect the effectiveness of thyroid cancer screening and early detection at 175 Military Hospital.

According to a study by Mohsin et al., 68.3% of patients presented with goiter, and palpable lymphadenopathy was observed in 18.3% of cases. The most common histological type was papillary carcinoma. Among PTC cases, 80.6% were classified as T1, compared to only 23.5% of FTC cases. For tumors <1 cm^3, 38.9% were PTCs, whereas 76.5% of FTC cases had tumor sizes >2 cm^3. Lymphadenopathy was found in 47.1% of FTC cases and 11.1% of PTC cases. Goiter was observed in 72.2% of PTC cases compared to only 17.6% in FTC, with statistically significant differences [8].

4.4. Association Between Age, Gender, Tumor Size, and Lymph Node Metastasis

This study revealed significant associations between age, gender, tumor size, and lymph node metastasis. Female patients and those under 55 years of age had a higher rate of lymph node metastasis (p < 0.05). This may be attributable to biological differences related to sex and age, as estrogen and other female hormones have been shown to promote tumor growth and spread. The higher rate of lymph node metastasis in younger patients may also be due to the more aggressive biological behavior of tumors in this age group.

Additionally, our results showed that tumors larger than 2 cm were significantly associated with capsular invasion (p = 0.02), which aligns with previous studies. For instance, Mohsin et al. (2024) reported that larger tumors tend to have a higher risk of invasion and lymph node metastasis, with a 20–30% increase in metastatic rate for tumors

exceeding this size threshold [8]. Larger tumors are not only more likely to invade surrounding structures but also facilitate regional and distant metastasis. These findings are consistent with both national and international literature, reinforcing the importance of tumor size as a critical risk factor in diagnosis and treatment planning.

4.5. Recurrence Rate

Regarding recurrence, the study found that 92.9% of patients experienced no recurrence within one year after surgery. Local and distant recurrences occurred in 4.7% and 2.4% of patients, respectively. These findings reflect the favorable prognosis of differentiated thyroid carcinoma when treated appropriately and promptly, with a low recurrence rate. The high rate of disease-free survival may be attributed to the effectiveness of surgical resection and the successful control of risk factors, such as tumor size and invasiveness.

Furthermore, the low recurrence rate underscores the importance of postoperative follow-up, especially during the first year after treatment. Several international studies also report recurrence rates of less than 10% for DTC when managed with surgery and adjuvant radioactive iodine (I-131) therapy in high-risk patients. These findings suggest that the treatment and patient management strategies employed at our institution have been effective. Continued long-term follow-up is necessary to assess distant recurrence and identify additional potential risk factors.

5. CONCLUSION

The results of this study indicate that differentiated thyroid carcinoma at Military Hospital 175 is predominantly diagnosed at an early stage, with a favorable prognosis and a low recurrence rate within one year post-treatment. However, particular attention should be paid to risk factors such as tumor size and invasive characteristics to enhance treatment outcomes and optimize patient follow-up strategies.

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