

# Risk factors of lymph node metastasis in central region of thyroid micropapillary carcinoma

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Research

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**ABSTRACT**

**Objective:** To investigate the correlation between clinico-pathological features and lymph node metastasis of thyroid micropapillary carcinoma (PTMC).

**Methods:** the clinico-pathological data of 142 cases of thyroid micropapillary carcinoma were collected, the relationship between sex, age, tumor location, multi-focality and cervical lymph node metastasis was analyzed.

**Results:** There was a high rate of lymph node metastasis in male patients with PTMC. There was no significant correlation between age, multifocality and lymph node metastasis.

**Conclusion:** The histological subtypes of PTMC have different clinicopathological characteristics and are important factors for cervical lymph node metastasis. Further evaluation of its histological classification is helpful for clinical treatment strategy.

**Key words:** lymph node metastasis, thyroid micropapillary carcinoma

## INTRODUCTION

Thyroid cancer is one of the most common malignant tumors in the endocrine system in recent years, along with thyroid ultrasound as a routine physical examination technology. The thyroid ultrasound makes the detection rate of thyroid tumors significantly higher. The incidence rate of thyroid cancer shows a significant upward trend in the world. The World Health Organization (WHO) defines thyroid micropapillary carcinoma (PTMC) as papillary thyroid carcinoma (PTC) with a maximum diameter  $\leq 1$  cm and regarded it as a subtype of PTC. PTMC is generally considered a low risk tumor, but there is indeed a risk of local recurrence and metastasis. As a histological subtype of the PTC, the risk factors of lymph node metastasis were still not to be confirmed. This study mainly investigates the correlation between clinicopathological features and lymph node metastasis of thyroid micropapillary carcinoma (PTMC), expecting helpful for clinical treatment strategy.

## 2. MATERIALS AND METHODS

### 2.1. Clinical data

The pathological data of 142 patients with PTMC from January 2018 to August 2018 in the pathology department of the Affiliated Hospital of Chengde Medical College were selected, including 22 males (15.49%) and 120 females (84.51%). The average age was  $47.06 \pm 9.59$ .  $< 45$  years old 47 cases (33.10%),  $\geq 45$  years old 95 cases (66.90%). There were 106 cases (74.65%) with single foci, including 52 cases in the left side, 54 cases in the right side, and 36 cases (25.35%) with multiple foci. There were 100 cases (70.42%) without cervical lymph node metastasis and 42 cases (29.58%) with positive lymph node metastasis.

### 2.2. Methods

Thyroid surgical specimens were routinely fixed with 4% neutral formaldehyde solution for 24 hours, routinely dehydrated, paraffin embedded, sectioned, and stained with HE. All the sections were analysed by experienced pathologists with double-blind method. The clinicopathological data of thyroid micropapillary carcinoma were analyzed by SPSS 19.0. The re-

lationship between the gender, age, single focus / multiple focus and the positive rate of cervical lymph node metastasis were further analyzed.  $P < 0.05$  was statistically significant.

### 2.3. Statistical Analysis

SPSS 19.0 statistical software package was used for analysis. The distribution of pathological types was compared by  $\chi^2$  test, and the difference was statistically significant if  $P < 0.05$ .

## 3. RESULTS

### 3.1. The Correlation between gender and Cervical lymph node metastasis of PTMC

Among the 142 patients with PTMC, 22 were male (15.49%), of which 13 were negative for lymph node metastasis and 9 were positive, the positive rate was 40.91%. 120 cases (84.51%) were female, of which 87 cases were negative for lymph node metastasis and 33 cases were positive, the positive rate was 27.5%. There was statistical significance between the two groups ( $P = 0.048$ ), and the rate of lymph node metastasis was higher in males.

### 3.2. The correlation analysis between age and cervical lymph node metastasis of PTMC

Among the 142 patients with PTMC, the average age was  $47.06 \pm 9.59$  years old (25-69).  $< 45$  years old 47 cases (33.10%), among which, 30 patients were negative for lymph node metastasis and 17 patients were positive, the positive rate of lymph node metastasis was 36.17%.  $\geq 45$  years old 95 cases (66.90%), including 70 cases with negative lymph node metastasis and 25 cases with positive, the positive rate of lymph node metastasis was 26.32%. There was no significant difference between the two groups ( $P = 0.217$ ).

### 3.3. The correlation analysis between multifocality of PTMC and cervical lymph node metastasis

Among the 142 patients with PTMC, 106 (74.65%) cases had a single tumor, of which 78 were negative for lymph node metastasis and 28 were positive, the positive rate of lymph node metastasis was 26.42%. 36 cases (25.35%) were multifocal, among which 22 cases were negative and 14 cases were positive, the

positive rate of lymph node metastasis was 38.89%. There was no significant difference between the two groups ( $P = 0.098$ ).

#### 4. DISCUSSION

Papillary thyroid carcinoma (PTC) is a common seen endocrine system tumor, and it has a tendency of rapid development in recent years with the improvement of ultrasonic diagnostic technology and the application of Fine Needle Aspiration. PTC with a maximum diameter  $\leq 1$  cm was defined to be PTMC [1, 2]. The detection rate of PTMC has increased year by year. In spite of favorable outcome, the patients infected by PTMC still face the risk of recurrence. Presence of neck lymph node metastasis in PTMC patients is a high risk factor leading to poor prognosis. Therefore, it is necessary to analyze the risk factors of cervical lymph nodes metastasis to reduce the risk of metastasis and recurrence for PTMC.

The patient's age was one of the important indicators of the prognosis in PTMC. It is generally recognized that  $> 45$  years is a risk factor for lymph node metastasis and recurrence. But in some study [3, 4], it was found that the node metastasis is higher in young patients. Zhang et al [5] investigated that, the patient  $< 45$  years old with PTMC presented high risk factor for central lymph node metastasis. Some scholars [6, 7] believe that young PTMC patients can be observed regularly, not immediate surgery. Because young patients have an increased risk of lymph node metastasis, early detection, early diagnosis and early treatment should be considered. In our study, there was no significant difference between the two groups.

Papillary thyroid cancer occurs mostly in female, and the male to female 1:3. In this study, the number of female patients (84.51%) was more than that of male patients (15.49%). Some study [8, 9] showed the rate of cervical lymph node metastasis in male patients is higher than that in female patients. This may be related to the high hormone level of male patients. In our study, among the 142 patients with PTMC, 22 were male (15.49%), of which 13 were negative for lymph node metastasis and 9 were positive, the posi-

tive rate was 40.91%. 120 cases (84.51%) were female, of which 87 cases were negative for lymph node metastasis and 33 cases were positive, the positive rate was 27.5%. There was statistical significance between the two groups ( $P = 0.048$ ), and the rate of lymph node metastasis was higher in males.

A study including 933 cases [10] of PTMC patients found that, patients with multi-focal PTMC was 17.9 times higher than that of single focus in lymph node metastasis. If multi-focal, the clearance of lymph nodes in central area is needed.

Although PTMC is understood as an "inert" tumor, there are still a small number of tumor patients with poor prognosis [11, 12]. Different patients need to receive individualized treatment, according to the patient Clinical information, immunological tissue markers, and BRAF gene and other factors.

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