

**Risk factors of lymph node metastasis in central region in Papillary thyroid micro carcinoma**XING ZHAO<sup>1</sup>, MINGZHEN ZHAO<sup>2</sup>, GANG ZHANG<sup>3</sup><sup>1</sup>Department of Pathology, Affiliated Hospital of Chengde Medical College, Chengde, Hebei 067000<sup>2</sup>Experimental Center, Affiliated Hospital of Chengde Medical College, Chengde, Hebei 067000;<sup>3</sup> Department of General Surgery IV, Baoding First Hospital, Baoding, Hebei 071000, P.R. China**Abstract:****Objective:** To investigate the correlation between clinico-pathological features and lymph node metastasis of papillary thyroid microcarcinoma (PTMC).**Methods:** The clinico-pathological data of 142 cases of papillary thyroid microcarcinoma were collected. The relationship between sex, age, tumor location, multi-focality and cervical lymph node metastasis were analyzed.**Results:** There was increased 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; papillary thyroid microcarcinoma***Introduction**

Thyroid cancer is one of the most commonly diagnosed malignant tumors in the endocrine system in recent years, especially after wide spread use of ultrasound as a tool of routine physical examination. The thyroid ultrasound has made 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 papillary thyroid microcarcinoma (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 was still to be confirmed. This study mainly investigate the correlation between clinico-pathological features and lymph node metastasis of papillary thyroid microcarcinoma (PTMC), expecting to draw some idea in decision making for clinical treatment strategy.

**Materials and Methods****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. These included 22 males (15.49%)

and 120 females (84.51%). The average age was  $47.06 \pm 9.59$ , age  $< 45$  years old were 47 cases (33.10%) and  $\geq 45$  years old were 95 cases (66.90%). Single foci were present in 106 cases (74.65%), including left side in 52 cases and right side in 54 cases. Multiple foci were present in 36 cases (25.35%). There were 100 cases (70.42%) without cervical lymph node metastasis and 42 cases (29.58%) with positive lymph node metastasis.

### Methods

The surgical specimens sent after surgery were routinely fixed with 4% neutral formaldehyde solution for 24 hours, routinely dehydrated, paraffin embedded, sectioned, and stained with H&E stain. All the sections were analyzed by experienced pathologists with double-blind method. The clinicopathological data of papillary thyroid microcarcinoma (PTMC) were analyzed by SPSS 19.0. The relationship between the gender, age, single / multiple focus and the positive rate of cervical lymph node metastasis were further analyzed.  $P < 0.05$  was statistically significant.

### Statistical Analysis:

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

### Results

#### 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.

#### 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). In age  $< 45$  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%. In age  $\geq 45$  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 ( $P = 0.217$ ).

#### 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%. In 36 cases (25.35%) where tumor was multifocal, 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 ( $P = 0.098$ ).

### Discussion

Papillary thyroid carcinoma (PTC) is the most common thyroid cancer, and it has a tendency of rapid rise in incidence in recent years. After advent of and improvement of ultrasonic diagnostic technology and the application of Fine Needle Aspiration, the detection rate has gone further up. PTC with a maximum diameter

$\leq 1$  cm was defined to be PTMC.<sup>1,2</sup> The detection rate of PTMC has increased year by year. Despite favorable outcome, the patients diagnosed with PTMC still have the risk of recurrence and metastasis. 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 in PTMC to categorically differentiate and give them individualized care.

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. Some of the studies have found that the node metastasis is high in younger patients.<sup>3,4</sup> Zhang et al in one of their studies found that, the patient  $<45$  years of age with PTMC presented with high risk for central lymph node metastasis.<sup>5</sup> Still some scholars believe that young PTMC patients can be observed periodically and should not be offered immediate surgery.<sup>6,7</sup> In our study, there was no significant difference between the two age groups.

Papillary thyroid cancer occurs mostly in female, and the male to female ratio is 1:3. In this study, the number of female patients (84.51%) was more than that of male patients (15.49%). Some study showed the rate of cervical lymph node metastasis in male patients is higher than that in female patients.<sup>8,9</sup> 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 positive rate was 40.91%. Among the 120 female cases (84.51%), 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 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.<sup>10</sup>

Although PTMC is understood as an "inert" tumor, there are still a small number of patients with poor prognosis.<sup>11,12</sup> 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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