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## ORIGINAL ARTICLE

# The Frequency of Cervical Lymph Node Metastasis in Multifocal Papillary Thyroid Carcinoma

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## ABSTRACT

**Objective:** To determine the frequency of metastatic cervical lymphadenopathy among cases presented with multifocal papillary thyroid carcinoma (PTC) planned to undergo total thyroidectomy (TT) with or without neck dissection.

**Materials and Methods:** A retrospective study was conducted based on data of 35 patients who presented with PTC and had been managed at East Surgical ward, Mayo Hospital, Lahore from August 2010 to April 2011. Data of 35 patients of PTC was collected from inpatient department of East Surgical ward. Confidentiality of information was ensured. All the patients underwent total thyroidectomy with or without cervical lymph node dissection.

**Results:** Of these 35 patients, 11 had multifocal PTC proven on histopathology. Among these multifocal tumors, cervical lymphadenopathy was identified in 6 (54.5%) patients and underwent neck dissection. Remaining 5 cases did not have lateral neck nodes so underwent T.T only. Post operative recurrence was noted in 1 patient who had not undergone neck dissection.

**Conclusion:** In present case series, cervical lymph node involvement is significantly higher in multifocal tumors and recurrence in cervical lymph nodes is significantly related to tumor multifocality. As central compartment lymph nodes are first to be affected by metastasis from PTC, so prophylactic central compartment dissection should be carried out in patients having multifocal tumors.

**Key words:** multifocal papillary thyroid carcinoma, total thyroidectomy.

## INTRODUCTION

Thyroid carcinoma is the commonest endocrine cancer that accounts for 92% of all endocrine malignancies. It represents 1 to 1.5% of all malignancies in adults and 3% in children.<sup>1,2,3</sup> Papillary thyroid cancer (PTC), derived from follicular epithelium of thyroid gland, is the most common and well differentiated histological subtype of thyroid cancer with an excellent prognosis, occurring in about 80% of cases.<sup>1,4,5,6</sup> It frequently presents as a multifocal process.<sup>3</sup> Multifocal disease is defined when more than one focus of PTCs are found in the thyroidectomy specimen.<sup>7</sup> Often, there is a primary tumor that is >1 cm and additional microscopic foci measuring <1 cm Papillary thyroid Microcarcinomas (PTMC).<sup>8</sup> Thyroid gland is located in the neck and its lymphatic drainage follows the venous drainage of the gland. So lymphatic drainage of thyroid carcinoma is central cervical compartment metastasis followed by lateral cervical compartment metastasis. However, slip metastasis may also occur.<sup>9</sup> As PTC has a propensity to spread through lymphatics, almost 40% patients

present with cervical lymphadenectasis.<sup>6</sup> Presence of multifocal disease is considered an aggressive form of the tumor due to its association with bad prognostic factors both in microcarcinomas and large PTCs.<sup>10,11</sup> Multifocality is significantly associated with cervical lymph node metastasis as well as locoregional recurrence in lymph nodes.<sup>12,13,14</sup> Prophylactic lymph node dissection is controversial in PTC as most of the authorities believe that micrometastasis can be eliminated with post operative radioiodine ablation.<sup>3,6</sup> Cervical lymph nodes are a common site for tumor recurrence.<sup>6</sup> They are more commonly involved in patients of old age, who do not show good response to radioablation.<sup>15</sup> The present study was conducted to evaluate the frequency of lymph node involvement in patients with multifocal PTC. As central compartment nodes are first to pick metastasis so prophylactic central compartment lymph node dissection should be routinely performed for PTC.<sup>6</sup> Knowledge of the frequency of nodal metastasis in multifocal PTC will help to formulate guidelines for prophylactic central

compartment lymph node dissection for this aggressive variant of PTCs.

## MATERIALS AND METHODS

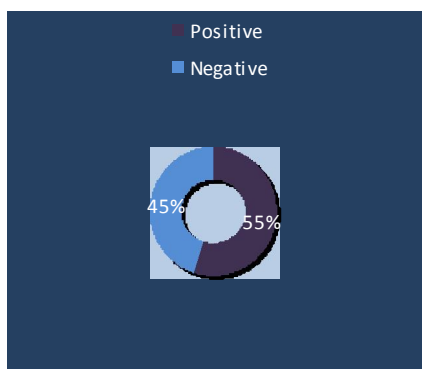
This study was conducted to determine the frequency of cervical lymph node involvement in multifocal PTC. The study was carried out in East Surgical ward, Mayo Hospital, Lahore over a period of 8 months from August 2010 to April 2011. This was a descriptive, case series with non probability consecutive sampling. A total of 35 patients of age 13 to 70 years of both genders were included. The patients who do not consent to be part of study were excluded. Data was tabulated and statistical analysis was done. All the variables were identified. Multifocal disease is defined when >1 focus of PTCs is found in the thyroidectomy specimen. Cervical lymph node metastasis was identified as unilateral or bilateral cervical lymph nodes enlargement confirmed to have tumor focus on histological examination in resected specimen.

## RESULTS

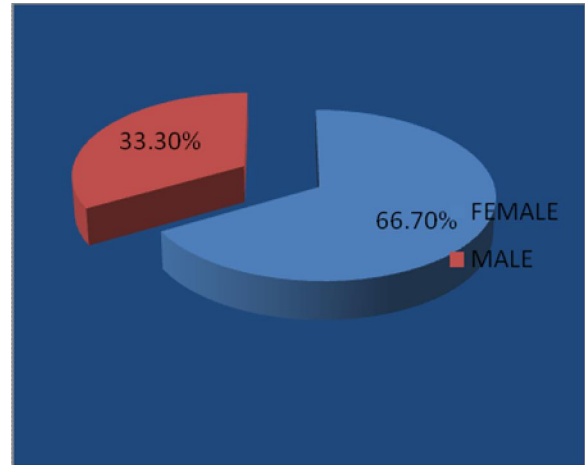
Among multifocal PTC patients, 6 (54.5%) patients had involved cervical lymph nodes. (Table 1) (Figure 1)

**Table 1:** Frequency of Cervical Lymph Node Involvement in Multifocal PTC (n=11)

Nodal status	Frequency	Percent
Positive	6	54.5
Negative	5	45.5
Total	11	100.0



**Figure 1:** Percentage of Cervical Lymph Node Involvement In Multifocal PTC Among them 4 (66.7%) were females and 2 (33.3%) males with a male to female ratio 1:2. (Figures 2)



**Figure 2:** Gender Distribution of Patients with Cervical Lymphadenopathy (Percentage)

However among all patients of multifocal PTC, 50% (4/8) females and 66.7% (2/3) were males with positive cervical lymph nodes. All patients (100%) with positive cervical lymph nodes had their central compartment involved with 4 patients (66.7%) having involvement of lateral compartment. Mean age for the patients with positive cervical lymph nodes was 50 years ( $\pm$  SD 8.37) with minimum age 40 and maximum age 65 years. The maximum number of patients (n=4) (66.7%) were in 4<sup>th</sup> decade of life. (Table 2)

**Table 2:** Distribution of Age Groups Among Patients with Cervical Lymphadenopathy (n=6)

Age Range (Yrs)	Frequency (n=6)	Percent (%)
31-40	1	16.7
41-50	4	66.7
61-70	1	16.7
Total	6	100.0

The mean age of presentation was higher for males ( $55 \pm 14.14$ ) as compared to females ( $47.5 \pm 5$ ). (Table 3)

**Table 3:** Comparison of Mean Ages Among Males and Females In Patients with Cervical Lymphadenopathy

Gender	N	MEAN	S.D
Female	4	47.50	5.00
Male	2	55.00	14.14
Total	6	50.00	8.37

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The minimum age for females was 40 years (n=1) (25%) and the maximum age was 50 years (n=3) (75%). Among males minimum age was 45 years (n=1) (50%) and maximum age was 65

years (n=1) (50%). Maximum females were in 4<sup>th</sup> decades of life (75%) while males were in 4<sup>th</sup> and 6<sup>th</sup> decade (50% each). (Table 4)

**Table 4:** Age Group Distribution Among Males and Females with Cervical Lymphadenopathy (n=6)

AGE	GENDER				Total	
	FEMALE		MALE			
	n	%	n	%	N	%
31-40	1	25			1	16.7
41-50	3	75	1	50	4	66.7
61-70			1	50	1	16.7
<b>TOTAL</b>	4	100	2	100	6	100

**DISCUSSION**

PTC is the well differentiated and the most common histological subtype of thyroid carcinoma with an excellent prognosis. PTC has a propensity to spread through lymphatics.<sup>6</sup>In a study by Zuberi LM, cervical lymphadenectomy is seen in 40% of PTC patients.<sup>9</sup>In a study by Karakoc D et al for PTC central compartment nodal metastasis were 76%, lateral nodal metastasis were 65% and skip metastasis were 7%.<sup>9</sup>The incidence of lymph node metastasis increases with the presence of multifocal disease in primary tumors (39.9% vs 20%).<sup>11</sup>Multifocality is quite common in patients of PTC.<sup>6</sup> Multifocality is considered a high risk factor in PTC.<sup>12</sup> Multifocality is significantly associated with cervical lymph node metastasis as well as locoregional recurrence in lymph nodes.<sup>13,14,15</sup>In a study by Chaw et al lymph node recurrence increased in patients with cervical lymph node metastasis at presentation, multifocal disease and absence of radio-ablation. The lymph node recurrence rate increased 6.2 fold when there was positive lymph node metastasis at presentation and increased 5.6 fold when multifocal tumors were present in thyroidectomy specimen.<sup>11</sup> In our study, cervical lymph node involvement was found in 54.54% patients of multifocal PTC patients at the time of diagnosis. In a Korean study by Kim JY et al. cervical lymphadenopathy is reported to be 64%.<sup>13</sup> Bardet S et al. reported this to be 58%.<sup>15</sup> These studies show that there was statistically significant difference in nodal involvement between multifocal and unifocal PTC patients.<sup>13,14,15</sup> As most series show that cervical lymph node involvement is significantly higher in multifocal tumors and recurrence in cervical lymph nodes is significantly related to tumor multifocality,<sup>15</sup> it is not

surprising that central compartment lymph node dissection is advocated as part of surgery in guidelines for the treatment of patients with PTC.<sup>16</sup>So prophylactic central compartment dissection should be carried out in patients having multifocal tumors. However, dissection should be done very carefully so as to avoid damaging the recurrent laryngeal nerves and Parathyroid glands. If central neck dissection is not done routinely, which is the situation with prevailing in out setup, then the expected incidence of microscopic lymph node metastasis after thyroidectomy would be high. The clinical significance of these micro metastasis is difficult to predict. It may be a good policy to support the use of Radio active iodine ablation in regions where lymphadenectomy is not a routine practice.

**CONCLUSION**

On the basis of present study and international data, it is recommended that all patients with multifocal PTC should undergo prophylactic central lymph node dissection to minimize the chances of recurrence of disease.

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