



## INCIDENCE AND CLINICOPATHOLOGICAL FEATURES OF PAPILLARY MICROCARCINOMA THYROID

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### ABSTRACT

**Background** Papillary microcarcinoma thyroid (PMCT) are mostly diagnosed incidentally after thyroidectomy even in this era with advanced diagnostic modalities. Even though PMCT have a good prognosis and low rate of recurrence, PMCT can rarely behave as cancer with metastasis and invasion. Hence there is a need for determining clinicopathologic features associated with PMCT to help clinicians optimise thyroidectomy in such patients and avoid complications of frank malignancy. **Methods** This cross-sectional observational study was done in surgery department of a tertiary care hospital in India. All patients diagnosed with PMCT in thyroidectomy specimen from 2003 to 2018 were included. The case sheets and histopathology reports were retrieved from the computerised filing system, and their contact details were collected for follow up. **Results** Incidence of PMCT in thyroidectomy was 1.8%, and 79% of them were diagnosed incidentally. The most common age group for occurrence of PMCT was 30 to 50 years and the most common presentation was swelling in front of neck (96.0%). Euthyroid status (78%) was seen in most cases. The most common benign pathology associated was follicular nodular disease (55.7%) and the malignant condition associated was papillary carcinoma thyroid (20.7%). The pathologic examination showed that unifocal lesions were more common (79%). **Conclusion** PMCT are mostly hidden in thyroid pathologies and diagnosed incidentally. From this study we could determine the clinicopathologic features associated with PMCT. Cases with unifocal lesions with euthyroid status and follicular nodular disease should be considered with utmost care for detecting hidden PMCT.

**KEYWORDS :** Euthyroid, Incidental papillary microcarcinoma thyroid, Neck swelling, Oncology, Papillary microcarcinoma thyroid, Surgical pathology,

### INTRODUCTION

With approximately 9/100,000 cases per year, thyroid carcinoma is the most common malignancy of the endocrine system. There are various forms of these carcinomas, from incidentally identified microcarcinomas to destructive and practically deadly anaplastic malignant neoplasms. Among these, papillary thyroid cancer is the most common type [1]. They usually present as a solitary or multiple nodules. Rarely, they may present with metastatic disease even without a clinically detectable primary lesion

Papillary microcarcinoma thyroid (PMCT), is defined as papillary carcinoma of the thyroid less than 10 mm in diameter [2]. Even though PMCT have a good prognosis and low rate of recurrence, PMCT can rarely behave as cancer with metastasis and invasion [3,4]. Various terminologies existed for this tumour including small papillary carcinoma, occult papillary carcinoma and incidentaloma [5]. This has resulted in lack of accurate data on the incidence of these tumours even though various autopsy studies have revealed an incidence of 1.0% to 35.6% [6-8].

PMCT are typically seen either during autopsy, or incidentally found in the histopathology of a gland removed for benign conditions, or found during neck ultrasound, which is the most frequent presentation, or in the unlikely situation of a clinically palpable thyroid mass. They are frequently found as a histological surprise following excision of benign thyroid tumours. PMCT focus that is clinically unsuspected before thyroid surgery and identified in the final pathological examination of a thyroidectomy specimen is called Incidental PMCT (I-PMCT) [9].

In this era of well flourished conservative surgeries and well-advanced medical treatments for thyroid pathologies, there are very high chances of missing an incidental PMCT in thyroid lesions being treated medically or in the remnant thyroid after conservative surgeries, which have the potential

to grow into a fully malignant papillary thyroid cancers, and even metastasis and complications. This main objective of this study was to find the incidence and clinicopathological features of PMCT among patients visiting the surgery department.

### MATERIAL AND METHODS

This cross-sectional observational study was conducted at inpatient wards and outpatient department of surgery in a tertiary care hospital in India. The study was initiated following the approval of the institutional scientific and ethical committee. Informed written consent was obtained prior to the initiation of the study. Inclusion criteria was all patients diagnosed with PMCT on histopathology who consented to participate in the study. Cases with insufficient clinical details were excluded from the study.

All patients diagnosed with PMCT in thyroidectomy specimen from 2003 to 2019, who gave consent were included in this study. The case sheets and histopathology reports were retrieved from the computerised filing system, and their contact details were collected for follow up. Numerical variables were expressed as either mean and standard deviation or median with interquartile range. Categorical variables were expressed as frequency and percentages. The baseline variables were summarised as frequency percentage tables. The main outcome variables were expressed as proportion.

### RESULTS

A total of 8423 thyroidectomy cases were done during the study period. Out of the 8423 cases 154 (1.8%) cases were diagnosed to be PMCT by histopathological examination. After excluding 14 cases due to insufficient clinical details, 140 cases were studied for clinicopathological features. In this study there were 111 (79.0%) incidental cases and 29 (21.0%) non incidental cases of PMCT.

The most common age group for occurrence of PMCT in our study was 30 to 50 years. More than three fourth of the cases were females. In our study, the most common presentation of PMCT was swelling in front of neck (96% cases), around 4% cases presented with lymph node involvement, along with thyroid enlargement. On further clinical examination, 83% of the cases revealed no abnormal findings other than a simple swelling in front of neck. In the study, 8.0% patients had features suggesting lymph node involvement (lymph node enlargement or invasion, fixity of node to nearby structures). 6.0% cases had features suggestive of malignancy in thyroid (invasion or fixity of lesion to neighbouring structures like strap muscles or trachea) (Table 1).

**Table 1: Socio-demographic characteristics and clinical features of study participants (N= 140).**

Socio-demographic variables		N = 140	
		Frequency	%
Age	10-19	1	0.71%
	20-29	12	8.57%
	30-39	47	33.57%
	40-49	48	34.28%
	50-59	25	17.85%
	60-69	7	5%
Gender	Males	34	24%
	Females	106	76%
Initial symptom	Thyroid enlargement	134	96%
	Thyroid with lymph node	6	4%
Clinical features	Unknown or nil significant	116	83%
	Lymph node involvement	12	8%
	Retrosternal extension	3	2%
	Malignant features in thyroid	9	6%
	Diagnosis	Incidental	111
	Non incidental	29	21%

In our study PMCT was associated most commonly with euthyroid status (78%) followed by hyperthyroid condition (16%). PMCT was associated with multiple overlapping thyroid pathologies, mostly benign than malignant conditions. The most common benign pathology associated with PMCT was follicular nodular disease (55.7%) followed by lymphocytic thyroiditis including Hashimoto thyroiditis (28.6%). Solitary nodule thyroid was the third most common condition (14.3%) associated with PMCT. Two cases of PMCT were diagnosed in patients with concomitant medullary carcinoma thyroid. Among the malignant conditions, papillary carcinoma thyroid (20.7%) was the most common condition, followed by follicular neoplasm of thyroid (10.0%). The pathologic examination of PMCT specimen in our study showed that unifocal lesions were more common (79%). Around one fifth of cases were multifocal and 2% cases were bilateral and multifocal. More than two third of cases had a PMCT lesion of size less than 5mm (Table 2).

**Table 2: Associated thyroid disease, thyroid status and pathological features of study participants (N= 140).**

Variables		N = 140	
		Frequency	Percentage
Benign disease	Multinodular goitre or follicular nodular disease	80	55.71%
	Chronic lymphocytic thyroid	40	28.57%
	Solitary nodular thyroid	20	14.28%
	Toxic goiter	11	7.85%

	Adenoma	5	3.57%
	Graves' disease	4	2.85%
	Simple goiter	2	1.42%
	Thyroid cyst	1	0.71%
Malignant	Papillary carcinoma	29	20.71%
	Follicular neoplasm	14	10.0%
	Hurthle cell neoplasm	8	5.71%
	Medullary carcinoma	2	1.42%
Thyroid status	Euthyroid	109	78%
	Hyperthyroid	22	16%
	Hypothyroid	9	6%
Unifocal vs multifocal	Unifocal	111	79%
	Multifocal	27	19%
	Multifocal with bilateral	2	2%
Size	Small size <5mm	99	71%
	Large size >/=5mm	41	29%

**DISCUSSION**

PMCT is a carcinoma hidden behind benign pathologies of thyroid gland. This study looked at 140 cases of PMCT to understand the clinicopathological features of the same. It was found that majority of the cases were females in the 30 – 35 years age group. Studies conducted by Lin et al., and Alsaif et al., showed similar results [10, 11]. In this study majority of the cases (79.0%) were incidental PMCT. This is almost similar to the proportion of incidental cases seen in the study conducted by More et al [12]. The findings of this study also showed that PMCT was associated more with benign thyroid disease compared to malignant conditions. Li et al., and Zang et al., also found similar findings in their study [13, 14].

Majority of the patients with PMCT was found to be euthyroid in this study. In the study conducted by Fiore et al., the TSH levels were significantly higher in patients with papillary thyroid cancer [15]. Zafon et al., in their study found that, mean TSH was  $1.71 \pm 1.52$  mIU/L among those patients with PMCT [16]. In the Lun et al., study it was observed that, the mean TSH levels were  $2.02 \pm 1.76$  mIU/L. The mean TSH was higher compared to benign thyroid nodular disease in the same study [17]. Slijepcevic et al in their study showed that hyperthyroid diseases were independent negative predictors of PMCT [18].

Pathological examination of PMCT lesion in our study revealed majority as unifocal lesion although multifocal lesion was found in around 30% of the subjects. The most common lesion size in our study was less than 5 mm which was in concurrence with the mean size of 4-6 mm found in previous studies [9,11,19]. Multiple authors have found significant association between the size of the lesion and risk of lymph node involvement and recurrence [13,14,20].

These clinicopathologic characters associated with incidental PMCT gives an idea to the clinician that there could be a hidden PMCT in thyroid lesion which could be detected incidentally after thyroidectomy or completion thyroidectomy for patients undergoing conservative thyroid surgeries or following medical management of the thyroid pathology.

**CONCLUSION**

PMCT are essentially papillary thyroid cancer with size less than 1cm, and even in this era with advanced diagnostic modalities, PMCT are hidden behind other thyroid pathologies and are mostly diagnosed incidentally. Though PMCT has very good prognosis, very rarely PMCT is associated with recurrences and lymph node involvement, and if left untreated have the potential to grow into fully malignant lesion. Clinicians should always remember the possibility of a hidden PMCT in any thyroid pathology. Cases with unifocal lesions with euthyroid status and follicular nodular disease should be considered with utmost care for

identifying hidden PMCT. This fact brings the need for determining the clinicopathologic features associated with incidental PMCT, and optimising thyroidectomy in such patients, so that complications of frank malignant papillary thyroid cancer can be avoided.

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