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Clinico-pathological Characteristics of Incidental Papillary Thyroid Microcarcinoma

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Abstract
More than ten microscopic variants of PTC have been documented. The most common variant is classical type PTC, which may also be referred to as typical PTC or usual type PTC. The majority of PTCs are of the classical type. Diagnosis is based on typical nuclear features, which should be present in tumour cells. Papillary structures are not present in all tumours. Psammona bodies are sometimes present. Surgically treated patients between January 2017 and December 2020 were retrospectively analysed. The study involved 329 surgical patients with benign disease of the thyroid, without any diagnosis of preoperative malignancy. Generally cells with nuclear clearing were arranged around the fibrovascular core in histopathological eaxamination. No lymphovascular invasion was detected in any of the cases. Other histopathological findings accompanying I-PTM were MNG in 7 cases (64%), lymphocytic thyroiditis in 4 cases (36%) and Hashimoto's thyroiditis in 1 case (9%).The mean size of the papillary thyroid foci was 5.7 mms.

Keywords: Incidental, Papillary Thyroid Microcarcinoma, MNG

Introduction
The thyroid gland is an endocrine organ located at the caudal part of the neck on the sides and in front of the trachea. The thyroid gland derives its name from the Greek word 'thyreos', meaning shield. The normal weight of the thyroid gland is between 15 and 25 g in adults [1]. Thyroid anatomy consists of lateral lobes, which are connected medially by the isthmus. The lobes are approximately 4 cm in length, 1 to 2 cm in thickness and 2 cm in width. The isthmus is located at the level of second to fourth tracheal ring and measures about 2 to 6 mm in thickness [2].

More than ten microscopic variants of PTC have been documented. The most common variant is classical type PTC, which may also be referred to as typical PTC or usual type PTC. The majority of PTCs are of the classical type. Diagnosis is based on typical nuclear features, which should be present in tumour cells. Papillary structures are not present in all tumours. Psammona bodies are sometimes present. Pseudoinclusions may be visible in nuclei, as well as nuclear grooves, as a sign for nuclear membrane folding. Due to chromatin margination tumour nuclei may resemble the "Eye of Little Orphan Annie", the character in the comic strip. Small PTCs sized 10 mm or less are categorized as PTC microcarcinomas [3-4]. The malignancy potential of these lesions is low and microcarcinomas are a frequent incidental finding in autopsy studies. If sub-millimeter carcinomas are included, the prevalence of PTC microcarcinomas may be as high as 35% in autopsy series. Follicular variant is the most common subtype of PTC after the classical type. It consists of follicles surrounded by cells with the typical nuclear features of PTC. The follicular variant of PTC has a comparable or more favourable prognosis than the classical type, but the typical papillary structures are rare or absent in tumours. A diffuse sclerosing variant of PTC occurs predominantly in young patients and has a diffuse growth pattern and dense sclerosis, but with typical PTC elements [5-6]. LN and distant metastases are more common than in the classical type, but the prognosis appears to be as good as in classical PTC. Tall cell, columnar cell and hobnail variants of PTC are rare but more aggressive tumours than classical PTC. The tall cell variant is a PTC subtype with tall cells, at least twice as high as they are long. A tall cell variant of PTC has a high risk of recurring and causing mortality.

Methodology

Surgically treated patients between January 2017 and December 2020 were retrospectively analysed. The study involved 329 surgical patients with benign disease of the thyroid, without any diagnosis of preoperative malignancy. Total thyroidectomy or hemithyroidectomy was performed for the treatment of benign thyroid diseases. A total of 22 patients with PTM incidentally diagnosed on postoperative histopathological examination of the excised thyroid tissue were analysed for assessing the rate of incidental diagnosis of PTM and their demographic features and the surgical procedures used for their treatment.

Histopathological parameters were established by microscopic criteria, including the size of PTM, location in the thyroid gland, multifocality and bilaterality in the thyroid lobes,thyroid capsule invasion , presence of lymphovascular invasion(LVI),lymphnode metastasis and tumor recurrence.

As an adjuvant treatment, analysed completion thyroidectomy or I-PTM cases with unilateral thyroidectomy, L-Thyroxin (LT4) treatment for the suppression of Thyroid stimulating hormone (TSH) and Radioiodine (RAI) treatment.

Follow-up: were done at a tertiary referral centre.

First and third month post-operatively. Biochemical analyses for Serum TSH and Thyroxin (FT4) were performed in order to determine the suppressive dose of LT4 (suppression of TSH at a level of <0.25 uIU /ml.

Sixth month post-operatively biochemical analyses for Serum TSH,FT4,Thyroglobulin (Tg) and Anti-thyroglobulin antibody (anti-TgAb) were performed in total thyroidectomy cases.An ultrasound scan of the cervical lymphnodes in all patients and the remaining lobe in hemithyroidectomy patients was also performed.

Yearly- An ultrasound scan of the cervical lymphnodes in all patients and the remaining lobe in patients with hemithyroidectomy was repeated. Biochemical analyses for Serum TSH, FT4, Tg and anti Tg Ab were performed.

Outcome:

Locoregional or distal recurrence of thyroid malignancy in the follow-up period and disease –free or overall survival of patients with I-PTM were the primary outcome parameters.

Results

Table 1: Clinicopathologic characteristics of Incidental papillary thyroid microcarcinoma (I-PTM)

Characteristics N=22(%)	
Tumor localization	
Right lobe	11(50%
Left lobe	8(36%)
Isthumus	1(4.5%)
Multifocal	2(9%)
Pre-diagnosis	
MNG	14(63%)
Solitary nodule	8(36%)
Surgical treatment	
Total thyroidectomy	11(50%)
Sub-total thyroidectomy	9(40.9%)
Hemi-thyroidectomy	2(9.1%)

Table 2: Size distribution of Incidental Papillary thyroid microcarcinoma (I-PTM) foci

Size	Right lobe	Left lobe	Isthumus %	%
0-3 mm	0	1	0	9%
4-6 mm	0	5	0	45%
7-10 mm	4	1	1	36 %
Total: 11. Mean size of foci is 5.7 mms.				

Generally cells with nuclear clearing were arranged around the fibrovascular core in histopathological eaxamination. No lymphovascular invasion was detected in any of the cases. Other histopathological findings accompanying I-PTM were MNG in 7 cases (64%), lymphocytic thyroiditis in 4 cases (36%) and Hashimoto's thyroiditis in 1 case (9%).The mean size of the papillary thyroid foci was 5.7 mms.

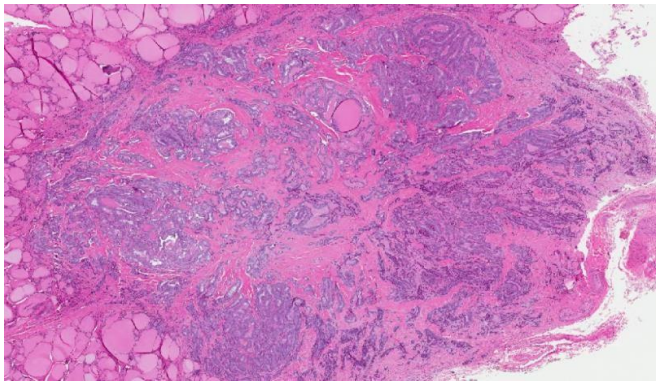

Fig 1: Papillary thyroid microcarcinoma showing an infiltrative pattern of growth measuring 5 mms in maximal diameter

Discussion

In general, incidental tumour foci are relatively smaller in size than nonincidental tumour foci. The average size of the tumour foci was <5 mm in patients with I-PTM. Our results confirmed the relatively small size (average5.7 mm) of the tumour foci in the thyroid glands of patients with incidental PTM, of which 54% of foci were ≤6 mm. A study reported that the tumour foci were ≤6 mm in 83% of such patients.[7] Previous studies have reported tumour size as a risk factor for lymph node metastasis and recurrence.[8] In general, tumour foci diameter >5 or 6 mm has appeared as an independent risk factor. Therefore, patients with foci >6 mm in diameter should be followed up more closely. The recurrence rate of PTM is very low even among tumour foci > 6 mm, which has been reported to range from 0% to 5%.

In our endemic goitre area, diagnosis of I-PTM in thyroid tissue is not an uncommon situation after thyroid surgery for benign diseases. The prevalence of I-PTM increases parallel to the increase of total thyroidectomy rate for benign thyroid diseases. Multifocality and bilateralism are main pathologic features of PTM. Size of I-PTM foci in thyroid tissue is relatively small and the majority are smaller than 6 mm. Small foci of PTM create very low risk of lymph node metastasis and locoregional or distant recurrences in the follow-up period. The prognosis is exczllent after surgical treatment and TSH suppression with LT4 administration. Routine adjuvant surgical and nuclear treatment as

completion thyroidectomy, lymph node dissection, and RAI application is unnecessary in vast majority of patients due to low risk of recurrence. Such adjuvant procedures should be reserved for small number of recurrent cases discovered in the follow-up period.

Conclusion

Other histopathological findings accompanying I-PTM were MNG in 7 cases (64%), lymphocytic thyroiditis in 4 cases (36%) and Hashimoto's thyroiditis in 1 case (9%).The mean size of the papillary thyroid foci was 5.7 mms.

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