

Retrospective Evaluation of Papillary Thyroid Carcinoma : Clinicopathological Features



Medical Science

KEYWORDS : Papillary thyroid carcinoma, Multifocality, extrathyroid extension, lymph node metastasis.

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ABSTRACT

Papillary carcinoma is the most common malignancy of thyroid gland and presents as a solitary thyroid nodule or multifocal tumour which is typically cold on radioactive iodine scan with or without cervical lymph node enlargement. In the present study, we analysed various variants of papillary carcinoma in the context of clinicopathological features. We studied the age wise and sex wise distribution of the tumour as well as size of the tumour, which plays an important role in tumour staging. We also analysed histological features of various types of papillary carcinoma, multifocality, cervical lymph node metastases, central group of lymph node metastases, extrathyroid extension of the tumour, sclerotic stroma, vascular invasion and associated Hashimoto thyroiditis and found that papillary microcarcinoma and diffuse sclerosing variant of PTC tend to be more aggressive with increased rate of extrathyroid extension and nodal metastases. Total thyroidectomy with bilateral neck dissection with possible central lymphadenectomy is the rational treatment in such cases.

Introduction :

Papillary carcinoma is the most common type of thyroid malignancy and constitutes about 85 % of it. [1] The most common clinical presentation is solitary thyroid nodule with or without cervical lymph node enlargement. Some of the cases present as cervical lymph node enlargement with no discernible thyroid swelling. Extrathyroid extension is seen in 4 to 16 % of cases and carries with it an increased risk of disease recurrence and reduces overall survival rate. [1,2] Extrathyroid extension involves invasion of trachea, oesophagus, recurrent laryngeal nerve, strap muscles and skin. Patients with extrathyroid extension were more likely to fail treatment and to die of their disease. PTC shows various histological variants like papillary microcarcinoma, encapsulated variant, follicular variant, diffuse sclerosing variant, tall cell variant, oncocytic variant and cribriform-morular variant. Papillary thyroid microcarcinoma defined as papillary thyroid carcinoma [PTC] < 1 cm in size is rapidly rising in incidence accounting for 49 % of the increase in PTC incidence from 1973 – 2002. Currently it represents 43 % of PTC in patients older than 45 yrs. [3] In the present study, we analyse the clinicopathological features of various histological variants of PTC.

Aims and Objectives :

The aims and objectives of present study are to study the clinicopathological features of various histopathological variants of papillary carcinoma of thyroid with respect to histological features, multifocality, cervical lymph node metastases, central group of lymph node metastases, extrathyroid extension of the tumour, sclerotic stroma, vascular invasion and associated Hashimoto thyroiditis.

Materials and methods

The material for the present study included surgical specimens of thyroid, sent in 10 % buffered formalin solution in the Department of Pathology, Bharati Vidyapeeth Deemed University Medical College and Hospital Sangli, India from Sept 2011 to Aug 2015 and purposive information including age, sex and clinical presentation were noted from the requisition forms sent along with the specimens and relevant clinical data was collected from medical records department of Bharati Vidyapeeth Deemed University Medical College and Hospital Sangli for study of retrospective cases.

Observations and Results :

Papillary carcinoma of thyroid [PTC] was more common in females than males [65.6 % vs 34.4 %] and increased incidence was noted in the age group 21– 40 yrs [71.8 %] as compared with

0 – 20 yrs [9.3 %], 41 – 60 yrs [12.5 %] and > 61 yrs [6.2 %].

Table 1 : Distribution of PTCs according to age

Age group in years	Papillary carcinoma of thyroid No of cases
0 – 20 yrs	03
21 – 40 yrs	23
41 – 60 yrs	04
61 – 80 yrs	02
Total no. of cases	32

Table 2 : Distribution of PTCs according to sex

	Males	Females
Papillary carcinoma of thyroid	11	21
Total no. of cases	32	

There were 12 cases of papillary microcarcinoma, 3 cases of encapsulated variant of PTC, 6 cases of follicular variant of PTC, 10 cases of diffuse sclerosing variant and a single case of oncocytic variant of papillary carcinoma diagnosed during the study period. Papillary microcarcinoma showed increased incidence [37.5 %] as compared with other histologic variants.

Table 3 : Histological variants of PTCs

Histological variants	PTCs Total No of cases n = 32	%
Papillary microcarcinoma	12	37.5
Encapsulated variant	03	9.4
Follicular variant	06	18.7
Diffuse sclerosing variant	10	31.2
Tall cell variant	00	0.0
Oncocytic [Oxyphillic] variant	01	3.1
Cribriform – morular variant	00	0.0

Multifocality and lymph node metastases were two adverse prognostic factors of PTCs observed commonly 53.1 % and 56.2 %

% respectively. Associated Hashimotos thyroiditis in cases of PTCs was observed in 25 % of cases.

Table 4 : Clinicopathological features of PTCs

Clinicopathological features	PTCs Total No of cases n = 32	%
Tumours < 1 cm	12	37.5
Tumours > 1 cm	20	62.5
Multifocality	17	53.1
Lymph node metastases	18	56.2
Central group of lymph node metastases	06	18.7
Extrathyroid extension	05	15.6
Vascular invasion	04	12.5
Sclerotic stroma	10	31.2
Associated Hashimotos thyroiditis	08	25.0

Microscopic foci of tumour are commonly found in the thyroid , topographically separate from the main tumour mass , as a result of intraglandular lymphatic spread or , more rarely , multifocal origin . Compared to follicular variant and diffuse sclerosing variant of PTC , papillary microcarcinoma had significantly higher rates of multifocality [40 % , 30 % vs 83.3 % respectively] , while extrathyroid extension was common in diffuse sclerosing variant as compared with papillary microcarcinoma [40 % vs 8.3 % respectively]. Extrathyroid extension of PTC involved invasion of trachea in one case, invasion of strap muscles in 3 cases and skin involvement in one case.

Table 5 : Clinicopathological features of PTC variants

Histological variants of PTCs	Clinicopathological features of PTC variants				
	M	E	L	C	V
Papillary microcarcinoma n = 12	10	01	09	04	01
Encapsulated n = 3					
Follicular n = 6	04		02		
Diffuse sclerosing n = 10	03	04	07	02	03
Oncocytic n = 1					

Abbreviations : M = Multifocality , E = Extrathyroid extension , L = Lymph node metastases , C = Central lymph node metastases , V = Vascular invasion

Cervical lymph node metastases were observed commonly in papillary microcarcinoma [75 %] as compared to follicular variant of PTC [33.3 %] and diffuse sclerosing variant of PTC [70 %]. No cervical lymph node metastases were seen in encapsulated variant and oncocytic variant of PTC. In patients with nodal metastases , patients of papillary microcarcinoma tended to metastasize to the central compartment more frequently than those with diffuse sclerosing variant [22.2 % vs 11.1 % respectively]. Papillary carcinoma has a tendency to spread into lymphatic channels and hence regional nodal metastases at presentation are found in a significant proportion of cases. Vascular invasion was noted more frequently in diffuse sclerosing variant of PTC as compared with papillary microcarcinoma [30 % vs 8.33 % respectively].

Discussion :

The present study reveals that the PTC is more common in the females and in the age group between 21 – 40 yrs. Papillary microcarcinoma and diffuse sclerosing variant are the most frequently detected variants of PTCs. The number of papillary microcarcinoma is increasing in all age groups and now the most commonly found PTC in the United States is a microcarcinoma in a patient older than 45 yrs. [4]

In comparison with papillary microcarcinoma , diffuse sclerosing variant was characterised by higher rates of extrathyroid

extension and vascular invasion , while papillary microcarcinoma was characterised by higher rates of multifocality and nodal metastasis. Metastasis to central group of lymph nodes observed commonly in papillary microcarcinoma. [5] Papillary microcarcinoma < 7 mm is less likely to have aggressive features , including central lymph node metastasis , capsule invasion , extrathyroid extension and lymphovascular invasion than a papillary microcarcinoma > 7 mm. [6] Because papillary microcarcinoma and diffuse sclerosing variant of PTC appear to exhibit aggressive characteristics with increased rate of multifocality , extrathyroid extension and nodal metastasis , we postulate that it is more likely that patients may experience higher rates of tumour recurrence.

In patients with cytologic diagnosis of PTCs , if e/o extrathyroid extension , multifocality or e/o lymph node metastases is seen , we recommend total thyroidectomy , central lymphadenectomy and post-operative RAI if indicated. The cases diagnosed after initial lobectomy should undergo completion thyroidectomy.

The widespread use of neck ultrasound [US] and US guided fine needle aspiration cytology has made possible early diagnosis of papillary thyroid carcinoma and identification of small asymptomatic nodules with indeterminate clinical relevance. The overall sensitivity of FNAC in the diagnosis of neck masses was 83.01 % and specificity was 78.94 % . Sensitivity was highest for neck nodes. [7]

Nevertheless, preoperative diagnosis of PTC variants on FNAC has limitations and usually in most of the patients, PTC is diagnosed post-operatively after histopathological examination.

Conclusion :

The papillary microcarcinoma and diffuse sclerosing variant of PTC tend to be more aggressive in correlation with our findings of increased rate of extrathyroid extension and nodal metastases and may have higher recurrence rates. Principal clinical features correlating with prognosis depend on risk group definition , which is defined primarily by age , but also by size , extrathyroid extension , completeness of surgery and distant metastases. Total thyroidectomy with bilateral neck dissection with possible central lymphadenectomy is the rational treatment followed by radioiodine ablation. Long term data on recurrence and mortality will elucidate the prognosis of patients with papillary microcarcinoma and diffuse sclerosing variant of PTC.

Conflict of interest : Nil

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