The Implications of Micro-Papillary Thyroid Carcinoma in Surgical Treatment of Multi-nodular Goiter

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ABSTRACT
Background: papillary thyroid micro-carcinoma (PTMC) is defined as papillary thyroid carcinoma less than 10mm in diameter, it is common pathology and form one third of PTC, its management is debatable due to its aggressive behavior in some cases. its diagnosis are done incidentally in most of cases but recent ultrasound with FNCA increase the incidence of diagnosis.
Patients and methods: The Study is conducted on 147 cases of papillary thyroid carcinoma (PTC) that operated upon between 2018-2022 for goiter randomly. The type of surgery is either lobectomy, total thyroidectomy or partial thyroidectomy. The pathologist decreases the thyroid lesion to less than few mm in diameter instead of more than 10 mm that done previously. the cases are divided into 3 group: group A include micro-carcinoma; group B include malignant nodule more than 1 cm in multi-nodular goiter (MNG) and group C that include single papillary nodule.
Result: of 149 cases with PTC, 47 cases are PTMC (group A), 27 cases are in group B that include PTC more than one centimeter in diameter and group C that present with solitary malignant nodules that include 75 cases. Of 47 cases with PTMC, 27 cases contain malignant foci between 1-3 mm while in 11 cases, the size between 4-5 mm and 9 cases with diameter between 6 to 9 mm. Thirty–nine of PTMC cases are seen in MNG, 7 cases in Hashomoto s thyroiditis and one case in graves' disease.
Ten of 16 cases of colloid MNG are between, the size of malignant nodule are in range of 1-1.5 cm. seven of 11 cases of PTC in Hashomoto s are multifocal.
Conclusion: PTMC is common pathology, mainly seen in MNG, and in most of the cases, they are small in size 3mm or less in diameter and difficult to recognize by ultrasound so adoption of total lobectomy or total thyroidectomy instead of partial thyroidectomy ensure complete excision of this pathology which may have unexpected behavior in some cases. PTC (more than 1 cm) on background of MNG, mainly are of small size and present in non-dominant nodule.

1. Introduction

Papillary carcinoma is the most common malignancy of thyroid gland and form 80%, in addition to many patients live with this type of malignancy but undetected. Autopsy study show up to 30% of persons who die of non-thyroid disease deposit of papillary thyroid cancer (PTC). (1)

Papillary micro-carcinoma is refer to carcinoma 1 cm or less in size, without lymph node metastasis,

These lesions are common and detected in up 10% of benign thyroid resection and not associated with recurrence or effect on survival. (1)

Studies have demonstrated micro-carcinoma to be present in 2-36% of thyroid gland removed at autopsy in persons who die of non-thyroid disease. (2) Use of new version of ultrasound and its wide use in the management of thyroid disease identify more cases.

The management of MPTC is controversial, in Japans two trials show safety of active surveillance without surgery in management of low risk group without lymph nodes metastasis .(3) in USA , ablation technique using ethanol or radio- and no evidence of invasion through thyroid capsule or angio-invasion.(2) Frequency, lobectomy is also indicated as proper step in its management.(4) Most of the world, by limiting the biopsies to more than 10 mm lesions , miss the diagnosis and not take active steps in management.(1)

MPTC is not palpable and usually diagnosed incidentally at operative, histological or autopsy. MPTC also can diagnose by ultrasound which may partially explain its increase in its incidence. (2)

Its prognosis is better than larger tumor but its behavior is more aggressive than previously appreciated. About 25% of MPTC are associated with occult lymph nodes metastasis. (2)

Aim of study: to study the micro-papillary carcinoma and its implication in treatment of thyroid disease.

2. Methodology

Retrospective random study done on 150 cases of thyroid carcinoma that operates by total and subtotal thyroidectomy in addition to lobectomy.

The PTC are divided into 3 group, group A that contain all micro carcinoma whatever the background, group B that include PTC in the background of nodular goiter, and group C that include the single nodule. Cases are seen in colloid multi-nodular goiter incidentally

3. Results and discussion

Of 149 cases with PTC, 47 cases are micro-carcinoma (group A). 39 of them are females and 8 cases are male

Thirty-nine cases are seen in colloid multi-nodular goiter, 7 cases are hashomots and only one is Graves' disease.

Regarding the size of micro carcinoma, 27 cases are 1-3 mm in size, 11 cases are 4-5 mm while only 9 cases are more than 5 mm and less than 10 mm.

Group B of PTC include 27 cases, 16 cases are papillary carcinoma of more than 10 mm in background of colloid multi-nodular goiter and 10 of them are between 1-1.5 cm in diameter, the largest nodule is 2.5 cm and 4 cases are multiple foci or nodules.

Eleven cases are papillary carcinoma nodule in background of hashomoto disease, and 7 of them are multifocal foci of malignancy or two or more malignant nodule. Seventy five cases are solitary thyroid papillary nodule.(group C)

Discussion

The incidence of micro-carcinoma is increasing as incidental finding in the benign specimens in our study and this high incidence may explain by adoption of new method in pathological examination of surgical specimens by limiting the biopsy to less than few mm. Fortyseven (30%) cases of PTC are PTMC and this finding is supported by other studies. (5) The prevalence of PTMC in thyroid cancer varies from 20 - to 40% with average of 30 %.(6, 7)

39 cases of them are females and 8 cases are males. Mean age is 37.5 year; it is 10 years earlier than mean age of PTMC in other study. (7) Because the disease is indolent in most of cases, this difference in mean age may reflect the time of diagnosis rather than reflect the behavior of disease, in our study this reflect the time of surgery on MNG which show incidentally the disease. The PTMC in young age, less than 40 years, are more liable for progression to clinical PTC than PTMC that are seen in older age (more than 60 years). (8) So adoption total lobectomy or total thyroidectomy rather than partial thyroidectomy in treatment of benign MNG is logic decision to completely eradicate hidden PTMC, which may progress to PTC, and avoid future surgery on remaining thyroid that are difficult and hazard.

the mean age of patients with PTC that present as solitary nodules (group C) is 34.5 years, while the mean age of cases with PTC that present as multi-nodular goiter (group B) is 42 years, this finding reflect that most papillary tumor in MNG are of different behavior than PTC in solitary nodule.

The diagnosis PTMC has been highly reliant on high resolution of new ultrasound and FNAB (7) but in our study all the cases that diagnosed with PTMC are incidental finding in nodular goiter so all the cases are diagnosed postoperatively and no case is diagnosed by ultrasound preoperatively. Thirty-nine cases of PTMC are seen in colloid multi-nodular goiter as incidental finding, and 7 cases are seen in hashmotos thyroiditis and one case only is seen in graves disease, so most cases are seen in the background of colloid multi-nodular goiter. this finding is supported by other study (9)

The size of nodules are small and in 25 cases are between 1-3 microns. 9 cases between 4 to 5 micron

so majority of cases are less than 5 mm and this finding is supported by other study.(9) Seven cases are more than 5 microns, so most of cases are small sizes and easily miss by ultrasound examination and the preoperative diagnosis becomes difficult. It seems logic for the surgeon tochoice the option of total lobectomy or total thyroidectomy rather than partial thyroidectomy to ensure complete excision of small malignant foci in thyroid that miss in preoperative diagnosis in dealing with benign indication for surgery on MNG.

PTMC is often multifocal, 15 to 40% of them in surgical series show this character. (10). In our study 11 cases of 27 cases with papillary carcinoma are multifocal. This other cause that make total lobectomy or total thyroidectomy is more proper option in surgical management of benign causes of surgery in MNG.

16 cases of TPC , the malignant nodule that are seen in colloid nodular goiter are more than 1cm in diameter and 10 of them are between 1- 1.5 cm and only 6 nodules reach larger size so most of cancer that are seen in multi-nodular goiter are not present as dominant nodule, and according to that most of papillary cancer that are seen in colloid multi-nodular goiter are either micro carcinoma or small-size nodule(1-1.5cm) PTC ,but PTMC is more common twice times . (11) the size of incidental papillary carcinoma are between 1-1.5 in 10 cases and the largest nodule is 2.5 cm indicating slow growth papillary cancer in colloid MNC. this mean that dominant nodule in the multi-nodular goiter is commonly not malignant. The surgical implication of this finding is that in preoperative management of nodular goiter need carful assessment of each nodule by ultra sound for evidence of malignancy whatever its size, even present with dominant nodule. this means that cancer are seen more frequently in non-dominant nodule than dominant nodule, this finding support by other study (12)

Although the clinical significant of papillary micro-carcinoma is debatable. Some authors have found aggressive behavior. (13,14,15) So in situation that you expect to enface this pathology in high percentage which may be 10 % or high, you must eradicate the pathology completely by total rather than partial thyroidectomy.

4. Conclusion and future scope

PTMC are common pathology and form one third of PTC, PTMC in most of cases are small size that are difficult to diagnosis preoperatively, PTMC are aggressive in behavior in some cases and has multifocal character, in addition most of PTC in MNG are small and present as non- dominant nodule. So the adoption of total lobectomy or total thyroidectomy rather than partial thyroidectomy is option of choice in dealing with thyroid in cases of benign indications of surgery to ensure compete excision of high unexpected malignant nodules .

Ligands

Classification of PTC

GROUP	NUMBER OF CASES
Group A (PTMC)	47
GROUP B(more than 1cm papillary nodule in MNG	27
Group C (solitary PTC more than I cm in diameter)	75

PTMC according to size

size	Number of patients
1-3 mm	27
4-5 mm	**11**
6-10 mm	**9**

The background of PTMC

DISEASE	Number of patients
Colloid MNG	39
Hashmotos disease	7
Graves disease	1

PTC in MNG more than 1 cm in dimeter

background	Number of patients
Colloid MNG	16
Hahomots	11

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