Original Article

Papillary carcinoma thyroid – A cytomorphological study

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ABSTRACT

Background: Fine Needle Aspiration Cytology is a widely accepted diagnostic tool for thyroid lesions. It is well known that nuclear features form the mainstay of diagnosis for papillary carcinoma thyroid. Focal nuclear features can be missed unless carefully looked for and pose diagnostic difficulty. The aim was to study the cytomorphological features of papillary carcinoma thyroid and to calculate the percentage of nuclear grooving.

Materials and Methods: This retrospective study was carried out by reviewing the data and cytology smears of 21 histopathologically confirmed cases of papillary carcinoma thyroid. The percentage of nuclear grooves was calculated in oil immersion by counting 200 to 500 cells depending on the cellularity. The study was approved by the institution ethical and research committee.

Results: Out of the total 21 cases, 03(14.2%) were males and 18(83.8%) were females. Mean age was 38.9 years. Predominant papillary arrangement was seen in 17(80.9%) of the cases. Nuclear crowding and overlapping, pale chromatin, nuclear grooves, nuclear enlargement and prominent nucleoli were seen in all (100%) the cases. Intranuclear cytoplasmic pseudoinclusions were seen in only 5(23.8%) of the cases. The percentage of nuclear grooving ranged from 15% to 85%. Greater than 20% nuclear grooves were observed in 19(90.4%) of the cases. Histiocytes, metaplastic cells and multinucleated giant cells were seen in 12(57.1%), 10(47.6%) and 6(28.5%) of the cases.

Conclusion: The cytologic diagnosis of papillary carcinoma is easy when majority of the classical features are present. But it becomes really challenging when the features are either present focally or classical features are absent.

INTRODUCTION

Fine Needle Aspiration Cytology is a widely accepted diagnostic tool for thyroid lesions. It is well known that nuclear features form the mainstay of diagnosis for papillary carcinoma thyroid. The classical features of papillary carcinoma include enlarged, overlapping nuclei with powdery chromatin, intranuclear cytoplasmic pseudoinclusions and nuclear grooves.¹ Focal nuclear features are associated more commonly with follicular variant of papillary carcinoma thyroid.² Focal nuclear features can be missed unless carefully looked for and pose diagnostic difficulty. The aim of this study was to study the cytomorphological features of papillary carcinoma thyroid.
and to calculate the percentage of nuclear grooving.

**MATERIALS AND METHODS**

This retrospective study was carried out in the Department of Pathology, Father Muller Medical College during a 2 year period from September 2013 to September 2015. Study was conducted after acquiring permission from ethical review committee. The study was approved by the institution ethical and research committee. The data and cytology smears of 21 histopathologically confirmed cases of papillary carcinoma thyroid were reviewed and the following data- age, gender, distribution, cellular arrangement, nuclear features, colloid, histiocytes, metaplastic cells, were analysed. The nuclear size was compared to that of RBC and greater than twice the size of RBC was considered nucleomegaly. The percentage of nuclear grooves was calculated in oil immersion by counting 200 to 500 cells depending on the cellularity. Statistical analysis was performed using Excel and frequencies were calculated.

**RESULTS**

A total of 21 histopathologically confirmed cases of papillary carcinoma were studied. The age at presentation ranged from 17years to 65 years with the mean age being 38.9 years. A female predominance was observed with 03(14.2%) males and 18(83.8%) females. Predominant papillary arrangement was seen in 17(80.9%). Nuclear crowding and overlapping, pale chromatin, nuclear grooves, nuclear enlargement and prominent nucleoli were seen in all(100%) the cases. Intranuclear cytoplasmic pseudoinclusions were seen in only 5(23.8%) of the cases. Histiocytes, metaplastic cells and multinucleated giant cells were seen in 12(57.1%), 10(47.6%) and 6(28.5%) of the cases respectively. The percentage of nuclear grooving ranged from 15% to 85%. Greater than 20% nuclear grooves were observed in 19(90.4%) of the cases.

**DISCUSSION**

FNAC is a widely accepted and reliable test in the diagnosis of papillary carcinoma thyroid. Various studies have shown a very high sensitivity and specificity. A sensitivity greater than 90% is demonstrated by several studies. Chen et al showed that FNAC can be solely relied upon in diagnosis of papillary carcinoma thyroid to warrant surgical resection with a specificity as high as 98 percent. Nuclear grooves are one feature observed to be more consistently associated with papillary carcinoma thyroid. However nuclear grooves can be seen in other thyroid lesions like hashimotos thyroiditis, colloid goiter, adenomatous hyperplasia and follicular lesions. When to consider nuclear grooves as significant is a diagnostic dilemma. Various authors have evaluated the percentage of cells showing nuclear grooves and given their results. In a study by Yang et al, the specificity and sensitivity of nuclear grooves for papillary carcinoma at >=20% were 95% and 65% respectively and those at >=10% were 68% and 100% respectively. In a study by Francis et al, nuclear grooves at >=20% were seen in 88% of the total cases, (n=34).

Another issue is interpretation of FNA smears of nodules arising in a background of thyroid diseases. These cells from a nodule arising in a background of Graves disease exhibit significant nuclear atypia in the form of nuclear enlargement with hyperchromasia or nuclear clearing. Therefore it is wise to make diagnosis of papillary carcinoma diagnosis in nodule arising in a background of Graves disease only when all other features are also present. In cases of papillary carcinoma arising in a background of Hashimotos thyroiditis the diagnosis becomes difficult because of the overlapping features. Presence of two types of cellular proliferations are seen. One is composed of tumour fragments with features of
papillary carcinoma and without infiltrating lymphocytes. While the other is composed of reactive cell groups or hurthe cells with some atypia, infiltration of lymphocytes but without other features of papillary carcinoma. Apart from these there are various technical factors like staining, sampling, air drying etc which add to the difficulties in interpretation.

Papillary carcinoma is known for its varied cytologic features. In a given case all the features are not present always. When present in combination and diffusely, it is very easy to render a confident cytologic diagnosis. But most of the times the features are focal making it a tuff task. A study by Renshaw et al showed that presence of focal features (less than 20 cells with features) of papillary carcinoma are strongly associated with papillary carcinoma at resection. This study suggests that surgical resection for cases even with focal cytological features is justified.

CONCLUSION

The cytologic diagnosis of papillary carcinoma is easy when majority of the classical features are present. But it becomes really challenging when the features are either present focially or classical features are absent. It is worth the effort to carefully look for focal and subtle features as these can be easily missed.

REFERENCES

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