



FNAC vs Biopsy – Papillary Carcinoma Thyroid

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Background and Rationale

Thyroid nodules are the most common thyroid disorders and their incidence increases with advancing age. Palpable thyroid nodules among adults are very common with prevalence of approximately 4- 7 % and more common in women. Fortunately most are benign, the incidence of thyroid malignancy is about 3.7/100000, and however, 30-50 % of previously irradiated neck harbours thyroid malignancy. Most common thyroid malignancy is papillary carcinoma. (PCT). FNAC (Fine Needle Aspiration Cytology) is the preliminary investigation of choice in establishing the nodule being malignant or benign, major pitfall of FNAC is that it cannot differentiate between follicular adenoma and carcinoma. We are trying to identify the efficacy of FNAC for choosing the treatment in PCT (Papillary Carcinoma Thyroid).

There are numerous histopathologic variants of PTC. Each variant shows a combination of specific growth patterns, cell types and stromal changes. A major problem in classifying PTC into various subtypes is that the criteria used to define these subtypes are not rigorously defined, so different pathologist may not agree with these subtype classifications. There is general agreement that the subtype classification that is

used should constitute the predominant pattern of the neoplasm.

Variant of papillary thyroid carcinoma

- Conventional
- Follicular variant
- Papillary microcarcinoma
- Tall cell
- Oncocytic
- Columnar cell
- Diffuse sclerosing
- Solid
- Clear cell
- Cribriform morular
- Macrofollicular
- PTC with prominent hobnail features
- PTC with fasciitis-like stroma
- Combined papillary and medullary carcinoma
- PTC with dedifferentiation to anaplastic carcinoma

Pathological features

- Characteristic Orphan Annie eye nuclear inclusions (nuclei with uniform staining, which appear empty due to powdery chromatin and marginal micronucleoli [and psammoma bodies on light microscopy. The former is useful in identifying the follicular variant of papillary thyroid carcinomas.

- Lymphatic spread is more common than hematogenous spread
- Multifocality is common

Objectives

1. To calculate sensitivity and specificity of FNA in diagnosing Papillary carcinoma thyroid
2. To assess the predictive value of positive and negative results

Materials and Methods

This study was conducted in Medical college hospital, Alapuzha for a period of two years from June 2015 to May 2017. This study is based on the reports of biopsy and FNA by department of pathology, Medical College, Alapuzha and the case records of the patient admitted in the surgical wards of Medical College hospital, Alapuzha. Patients attending the outpatient department with thyroid swelling were first subjected to physical

examination followed by FNAC. They were admitted to and subjected to surgery. The specimens were sent for histopathological examination. The collected HPR (biopsy reports) of these patients were compared with the FNAC reports.

Observations

During the period of study, ie 24 months 2408 thyroid lesions were subjected to surgery and histopathological examinations of which 297 were PCT in which various procedures ranging from Lobectomy to Total Thyroidectomy were done. This comprises 12.33 % of the total number of thyroid lesions. The total number of specimens during this time was 35286.

Total number of specimens	35286
Total number of thyroid specimens	2408
Total number of PCT	297
Percentage of PCT	12.33%

Biopsy Reports

FNAC ↓	CG	AG	T	FA	FC	PCT	MCT	ACT	TOTAL
CG	575	101				20			696
AG		262		119		8			389
T			215			24			239
FN		128		452	95				675
PCT		24				217			241
MCT							24		24
ACT								30	30
CYSTIC LESION		86				28			114
TOTAL	575	601	215	571	95	297	24	30	N =2408

CG – colloid goitre,
FN- follicular neoplasm,
FC- follicular carcinoma

AG- adenomatous goitre,
ACT- anaplastic carcinoma thyroid,
PCT- papillary carcinoma thyroid,

T- lymphocytic / hashimoto's thyroiditis
FA- follicular adenoma
MCT- medullary carcinoma thyroid

Calculations

Total (n) = 2408

True positive (TP) = 217

False positive (FP) = 24

True negative (TN) = 2087

False Negative (FN) = 80

1. Sensitivity = $TP \times 100 \div TP + FN = 73 \%$
2. Specificity = $TN \times 100 \div TN + FP = 98 \%$
3. Predictive value of positive result = $TP \times 100 \div TP + FP = 90 \%$

4. Predictive value of negative result = $TN \times 100 \div TN + FN = 96 \%$
5. Percentage of false negative = $FN \times 100 \div FN + TP = 27 \%$
6. Percentage of false positive = $FP \times 100 \div FP + TN = 1.13 \%$

Discussions

Palpable thyroid nodule among adults are very common with a prevalence of approximately 4-7 %. They commonly occur in women and increase

in prevalence with advancing age. 30- 50 % of previously irradiated gland harbours thyroid cancers especially PCT.

The history and physical examination of the patient may be of value in determining the direction of subsequent evaluation. A detailed history might provide useful clue as to the risk factors for malignancy.

Local symptoms such as dysnea, dysphagia may signify local tissue invasion from an aggressive malignancy. But these symptoms may occur in benign disease as well. Physical examination may reveal the size, extent, consistency and tenderness, regional lymphadenopathy, local infiltration

In prepubertal children thyroid nodules are rare and if present should screen with suspicion. For the incidence of malignancy being 15- 40 % in elderly population, thyroid nodules are common. But the proportionate increase in cancer incidence has not been documented. If present, it will be more aggressive. Thyroid in men are more likely to harbour malignancy than women. Cold nodules occasionally and hot nodules rarely are malignant. Exposure to ionising radiation is a well-documented risk factor for the development of thyroid cancer, especially PCT

On analysing the histopathological report it is seen that diagnosing PCT made by FNAC is accurate in 90 % cases, hence a very good positive predictive value.

The incidence of PCT is about 2.5 times that of follicular carcinoma. The most common pathological variant of PCT being follicular, this has got a similar pathological behaviour and natural history as that of PCT.

Conclusions

- 1) The percentage of PCT is higher than any other carcinomas of thyroid ie, 12.33 %.
- 2) The sensitivity and specificity of FNAC in diagnosing PCT in comparison with biopsy result is 73 % and 98 %.
- 3) The predictive value of negative and positive result being 96 % and 90 %.

- 4) FNAC is an ideal preoperative investigation based on which appropriate management can be instituted for PCT.

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