



## COMPARITIVE STUDY ON FINE NEEDLE ASPIRATION CYTOLOGY AND HISTOLOGY IN THYROID DISEASE.

### General Surgery

**Dr. S. Nirmaladevi** Senior Assistant professor, Department of General Surgery , Government Sivagangai Medical college \*Corresponding Author  
**M.s \***

**Dr.Arunmozhivijay** Senior resident, Department of General Surgery , Government Sivagangai Medical college  
**M.s**

### ABSTRACT

Thyroid nodule or swelling also called as goiter can be easily diagnosed clinically. Many tests and procedures are available for evaluation of the thyroid nodules. Among them FNAC is the initial investigation in euthyroid nodules.

**AIMS:** To observe the correlation of FNAC and Histopathology in various thyroid disorders, To stress the importance of HPE as final diagnostic tool and The role of surgery as diagnostic and therapeutic method.

**METHODS AND MATERIALS:** This study includes about 100 patients who were operated for solitary and multinodular thyroid disease, suspicious malignant disease and malignant disease.

**RESULTS & CONCLUSION:** In our study the commonest thyroid disease affecting the study population are solitary nodular goiter, multi nodular goiter, hashimoto's, papillary carcinoma of thyroid. This study concludes nodular colloid goiter is the commonest benign lesion and papillary carcinoma is the commonest malignant lesion. The incidence of malignancy in multi nodular goiter 10.9%. The incidence of carcinoma in solitary nodular goiter is 22.2%. FNAC is simple, safe and cost effective but HPE remains final diagnostic tool, because FNAC cannot differentiate between adenoma and carcinoma in follicular and hurthle cell lesions.

### KEYWORDS

Thyroid swelling, FNAC, Histopathological examination, Carcinoma thyroid

### INTRODUCTION

A thyroid nodule is a palpable swelling in a thyroid gland with an otherwise normal gland. Prevalence ranges from 4 % to 10 % in general adult and 0.2 to 1.5 % in children. Nodular goiter are more common in women because of the presence of oestrogen receptors in the thyroid tissue. Most of the nodules are benign and only 5 to 10 % of these nodules are malignant. Many tests and procedures are available for evaluation of the thyroid nodules. Among them FNAC is the initial investigation in euthyroid nodules. The incidence of malignant disease in cold nodule varies from 9 to 35 % and the incidence of carcinoma in cystic lesion <4cm in size is less than 2%.

Brightness- mode ultrasound is the most sensitive test to detect lesions in the thyroid. It accurately measures the dimensions, identifies structures and evaluates diffuse changes in thyroid parenchyma. It is non invasive and relatively inexpensive and can identify nodules not apparent on physical examination, isotope scanning or other imaging techniques. Ultrasound features of malignancy are microcalcification, irregular nodules, chaotic vascular images, hypochoecic nodules, suspected cervical lymphadenopathy. FNAC (fine needle aspiration cytology) :-It was first reported by martin and ellis at sloan kettering cancer institute in 1930. The utility of FNAC depends on the experience of the pathologist to specify and predict neoplasia to rule out malignancy. It is relatively cost effective procedure and has gained patient acceptance. FNAC can confirm the diagnosis of most primary cancer like papillary, medullary and anaplastic thyroid cases as well as lymphomas. But follicular and hurthle cell carcinomas cannot be differentiated from benign counterparts by cytology, it requires histological evidence of vascular or capsular invasion. **ULTRASOUND GUIDED FINE NEEDLE ASPIRATION (US - FNAC) :-** Recently ultrasound guided FNAC has become popular because of increased precision and the ability to guide the biopsy needle to the desired location in real time.

### AIM OF THE STUDY :

1. To observe the correlation of FNAC and Histopathology in various thyroid disorders
2. To stress the importance of HPE as final diagnostic tool,
3. The role of surgery as diagnostic and therapeutic method.

### MATERIALS AND METHODS :

This study includes about 100 patients who were operated for solitary and multinodular thyroid disease, suspicious malignant disease and malignant disease. All cases were studied in detail with detailed clinical examination and investigations.

### INCLUSION CRITERIA :

- Cases with hard thyroid swelling, male sex,
- fixity to surrounding structures,
- nerve involvement,
- cold nodules
- 

are studied in details to rule out malignancy.

Cases with cystic swelling are not aspirated they were subjected to surgery to rule out papillary carcinoma.

### EXCLUSION CRITERIA :

- Cases who are not giving consent for surgery,
- Cases with recurrent goiters are excluded from the study.

### RESULTS :

In our study out of 100 patients 11 were male and 89 were female patients. Solitary thyroid nodule observed in 36 cases (Male -7, female - 29). Multinodular goiter observed in 64 cases (Male -4 and female 60). In our study, the incidence of goiter in female is 89% and male is 11%.

### AGE INCIDENCE :

- Nodular thyroid disease occurred in age group of 10 to 70 years
- Youngest patient with solitary nodular goiter is of 16 years of age,
- Oldest patient with multi nodular goiter is 67 years,
- Maximum of 13 cases of solitary nodular goiter recorded in 21 to 30 years of age group,
- Maximum of 21 cases of multi nodular goiter recorded in 30 to 40 years of age group.

### INCIDENCE OF BENIGN AND MALIGNANT LESION :

- In our study as per HPE report, Among 89 female cases,
- 12 cases are papillary carcinoma of thyroid.
  - 2 cases are medullary carcinoma,
  - 75 cases are benign disorders, Among 11 male cases,
  - 3 cases were papillary carcinoma,
  - 8 cases are benign disorders.

### TABLE NO1: GENDER DISTRIBUTION OF BENIGN AND MALIGNANT LESIONS

Gender	Benign lesion(%)	Malignant lesion(%)
Male	84.3	72.7
Female	15.7	27.2

**AMONG SOLITARY NODULAR GOITER :- AS PER FNAC,**

- Nodular colloid goiter = 23 cases,
- Follicular neoplasm = 7 cases,
- Hurthle cell neoplasm = 1 case,
- Papillary neoplasm = 5 cases.

**AMONG MULTI NODULAR GOITER :- AS PER FNAC,**

- Nodular colloid goiter = 59 cases,
- Follicular neoplasm = 4 cases,
- Hurthle cell neoplasm = 1 case.

**Among 13 cases, pre operative FNAC,**

- Correlated with biopsy = 8 cases, Percentage of correlation = 61.5%,
- Discordance in biopsy = 5%, percentage of discordance = 38.5%

**SOLITARY NODULAR GOITER,**

- Female = 5 cases, male = nil,
- Correlated with biopsy = 5 cases, percentage of correlation = 100%,
- Percentage of discordance = 0%

**DISCUSSION :**

In our study, among 100 cases, 5 cases are reported as papillary carcinoma in FNAC. But after HPE report 15 cases are diagnosed as papillary carcinoma. Among 15 cases, 5 cases are follicular variant type, and 2 cases are tall cell variant type. About 10 cases of papillary carcinoma are misdiagnosed in FNAC. In cases of follicular neoplasm the sensitivity of FNAC is about 90% and specificity is less than 50% this limits the usefulness of FNAC. Tpo immune chemistry with monoclonal antibody (MO Ab 47) improves the accuracy of FNAC for follicular lesions. It increases sensitivity to 100% & specificity to 70%. B. Mundasad, p.c. pyper 2006 (15) conducted a study on Accuracy of FNAC in diagnosis of thyroid swellings. In their study among 144 patients – FNAC revealed 94% benign, 6% malignant, 4% suspicious, 13% inadequate, 4% indeterminate. But histopathology showed about 82% benign, 18% malignant. In their study, the inadequate sample rate was 13%. The most important factors include experience of the aspirator and criteria used to define a satisfactory sample. Published dates suggest inadequate sample ranges between 9 to 31 % in their study false negative rate is 23%. Oliver H beechers stated that goiters were frequently seen in women. However, the incidence of carcinoma in man is greater than in women. In our study among 100 cases, the incidence of carcinoma in male (27.7%) is greater than in female (15.7%). This is in accordance with the various research papers. Fenn.krishnan found that there was no great sex predominance in the incidence for malignancy. According to Prof R.C. Suryaprakash – Andhra Pradesh – adenoma thyroid was the commonest benign lesion and papillary carcinoma was the commonest malignant lesion. [1] Prof. R.L.Gupta Delhi analyses 370 cases of solitary nodule. [1] In his study, about 38.7% of HPE report was different from FNAC. His study showed the fact that FNAC is not foolproof and surgery with HPE report the only method of confirmation. As per Hossein gharib and gapini nodule size is not predictive of malignancy. They have reported the following features as associated with the increased risk of Malignancy in thyroid nodule. They are childhood irradiation, family history of MEN2, MTC, PTC. AGE <20 years & > 70 years. Male sex. Fixed nodules. Vocal cord paralysis. They concluded that risk of cancer is not significantly higher for solitary nodular than for glands with multiple nodules. But in our study the incidence of carcinoma in solitary nodular goiter (22.2%) is more than in multinodular goiter (10.9%). As per Feld while the prevalence of thyroid nodule is less common in children, the risk of malignancy appears to be much higher 14 to 40 % as opposed to 5% in adults. According to Koh and Cole WH, [2] the incidence of carcinoma in MNG varies from 7% to 17%. In our study the incidence of carcinoma in MNG is 10.9%. Pier Paolo Gandolfi, [3], Antonio Frisina, Italy conducted a retrospective study among 58 cases who were operated for MNG. In their study, the incidence of carcinoma is 13.7%. They have stated that risk of malignancy should not be underestimated and a dominant nodule in MNG should be valued as it were a single nodule in an otherwise abnormal gland. Raghuvveer pedamullu, Kasturi Medical College conducted retrospective study of 98 cases of MNG who underwent total thyroidectomy at Guntur government general hospital from 2001 to 2004, he found the prevalence of MNG in female is 888% and in male is 12%. He concluded that in spite of negative FNAC the patients

can still harbor a malignant focus due to high sampling errors with MNG. [4] Ghosal analysed 75 patients with solitary nodular accurate correlation of FNAC & HPE, report was only 55% [5]. In our study among 36 solitary nodular goiter FNAC and HPE report correlation was only 27%. Gita Jayaram of New Delhi 1984 conducted FNAC study in 308 cases of SNG. She also pointed out difficulty in diagnosing follicular neoplasm and more number of false negative reports [6]. Kelly Lester Layfield reported the evaluation of cold nodule is a problem. It needs HPE for further management [7]

**CONCLUSION :-**

- In our study the commonest thyroid disease affecting the study population are solitary nodular goiter, multi nodular goiter, hashimoto's, papillary carcinoma of thyroid.
- The percentage of correlation in group 1 solitary nodular goiter 87% and multi nodular goiter 66%. The percentage of discordance in group 1 solitary nodular goiter is 13% and multi nodular goiter is 34%.
- This study concludes nodular colloid goiter is the commonest benign lesion and papillary carcinoma is the commonest malignant lesion.
- The incidence of malignancy in multi nodular goiter 10.9%.
- The incidence of carcinoma in solitary nodular goiter is 22.2%.
- FNAC is simple, safe and cost effective but HPE remains final diagnostic tool. Because FNAC cannot differentiate between adenoma and carcinoma in follicular and hurthle cell lesions.
- For example in our study 10 cases were follicular adenoma, 3 cases were papillary carcinoma and one case of medullary carcinoma in HPE report.
- In our study 2 cases were suspected as hurthle cell neoplasm in FNAC. After surgery one case became hurthle cell adenoma and one case as hashimoto's thyroiditis. Hence, FNAC has uncertainty which is often resolved by diagnostic surgical resection.
- In case of MNG, even if preoperative FNAC is negative it does not exclude with certainty the possibility of a carcinoma because the error in sampling the right area is greater. Such variation may lead to non radical operation and the need of a second surgery or radiotherapy.
- In our study 8 cases reported as nodular goiter in FNAC turned out to be papillary carcinoma in 7 cases and medullary carcinoma in one case after HPE report.

**REFERENCES :**

1. Dr.C.Suryaprakash Rao, Dr.Ramakrishna, Kakinada, Andhra Pradesh – An analysis of 100 cases of thyroid disease – ASI con 1990 – abstract of short papers.
2. Svante R orell – fine needle aspiration cytology fourth edition.
3. Pier Paolo Gandolfi, Antonio Frisina Acta Biomedica Ateno Parmense 2004;75:1014-117.
4. Raghuvveer pedamallu, S.B.Pedamallu, K Rama Rao and C pedamallu, Incidence of occult cancer in MNG using HPE findings internet journal of surgery 2008 vol 17 no 1.
5. Ghosal B. Paul.N.C Majundas PM 1984 (46) FNAC in diagnosis of thyroid nodules correlation with HPE report and application in thyroid surgery, Indian Journal of Surgery 1984 : 16:p 76-83.
6. Gita Jayaraman FNAC study in 308 cases of SN thyroid with HPE 1984:16:P76-83.
7. Kelly Lester J.Layfield Renee John – clarifying the role of FNAC evaluation and frozen section examination intra operative management – thyroid cancer arch surgery 1989 vol 124, pg : 1201 – 1205.