



ULTRASONOGRAPHIC AND FNAC CORRELATION OF THYROID GLAND LESIONS

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ABSTRACT

The thyroid gland is the largest of all endocrine glands and is the only one which is amenable to direct physical examination because of its superficial location which allows excellent visualization and evaluation of its normal anatomy and pathologic condition by high resolution real-time grey-scale sonography. The aim is to evaluate the utility of FNAC in preoperative diagnosis of various thyroid lesions and to evaluate the efficacy of in USG and FNAC differentiating between benign and malignant lesions. The goal of USG and FNAC diagnosis work up now is to select those patients for surgery who have a high likelihood of harboring malignancy in the nodule.

Materials and Methods:

This prospective study was carried out on 100 patients who came to our department from period of June 2019 to May 2020. Grayscale ultrasound of neck followed by USG guided FNAC of thyroid swelling in 100 patients, in the age group of equal to or above 18 years.

Results:

Out of 100 cases, 2% were malignant, 94% were benign and 4% were indeterminate lesions on grayscale ultrasound. All the 2 malignant cases were correctly diagnosed as malignant on pathology. Out of 94 benign as a hypo echoic lesion with well defined margin and coarse calcification. Due to coarse calcification they were diagnosed as benign on ultrasonography but turned out to be malignant on pathology as papillary carcinoma. Out of 4 indeterminate cases, 0 cases proved to be malignant and 4 cases benign on pathology

Conclusion:

High resolution grayscale ultrasound has emerged as an initial imaging modality of choice for the evaluation of patients with thyroid enlargement. Ultrasound can detect solitary nodule, multiple nodules and diffuse thyroid enlargement. It can also differentiate solid and cystic lesions.

Materials And Methods:

Type of study: Prospective

Source of data: 100 patients, in the age group of equal to or above 18 years, with thyroid swellings referred to the department of ENT sent for USG and FNAC at radiology and pathology department.

KEYWORDS :

INTRODUCTION:

The thyroid gland is the largest of all endocrine glands and is the only one which is amenable to direct physical examination because of its superficial location. Superficial location of the thyroid gland allows excellent visualization and evaluation of its normal anatomy and pathologic condition by high resolution real-time grey-scale sonography. Ultrasound is generally the first choice for the evaluation of thyroid morphology because of its high sensitivity for small nodule detection. The spatial resolution achieved by ultrasound is of the order of 0.7 to 1 mm, not achieved by any other imaging method.

The advantage of ultrasound are that it is an easily accessible, inexpensive, non-invasive and highly sensitive imaging modality for distinguishing cystic from solid lesion. Colour Doppler study helps in assessment of blood flow in addition to depiction of the morphology.

The aim of this study is to prove USG as the best first line investigation for thyroid lesions supported by FNAC correlation.

SELECTION CRITERIA:

• Inclusion Criteria:

All adult male and female patients with clinically palpable

thyroid swellings.

• Exclusion Criteria:

All patients who have not given consent for fine needle aspiration cytology and patients with bleeding diathesis.

Table 1 : Age Distribution

| SL. NO. | Age group(yrs) | Male | Female | Total | Percentage(%) |
|---------|----------------|------|--------|-------|---------------|
| 1 | 0-10 | 0 | 0 | 0 | 0 |
| 2 | 11-20 | 1 | 11 | 12 | 12 |
| 3 | 21-30 | 1 | 32 | 33 | 33 |
| 4 | 31-40 | 5 | 14 | 19 | 19 |
| 5 | 41-50 | 3 | 20 | 23 | 23 |
| 6 | 51-60 | 0 | 7 | 7 | 7 |
| 7 | 61-70 | 0 | 6 | 6 | 6 |
| | Total | 10 | 90 | 100 | 100 |

In our study, the youngest patient was 17 years old and the eldest patient was 66 years. The average age of patients with thyroid lesions according to our study was 36.27 years. So, the thyroid lesions are commoner in females in their active reproductive age group and are uncommon in postmenopausal age group

Table 2 : Consistency

| Consistency | No.ofpatients | Percentages |
|--------------|---------------|-------------|
| Soft | 34 | 34% |
| Firm | 58 | 58% |
| Hard | 6 | 6% |
| Cysticlesion | 2 | 2% |
| Total | 100 | 100% |

Swelling

| Duration | Numbersofcases | Percentage(%) |
|-------------|----------------|---------------|
| 0-6months | 46 | 46 |
| 7-12months | 23 | 23 |
| 13-24months | 19 | 19 |
| >2years | 12 | 12 |
| Total | 100 | 100 |

Table-3: Classification Of Cases According To Duration Of

Table-4:Distribution Of Cases According To Ultrasound Diagnosis

| | Ultrasound Diagnosis | | Numbersof cases | Percentage(%) |
|-----------|-----------------------|-------------------|-----------------|---------------|
| Benign | NonInflammatory | Adenomatousnodule | 20 | 20 |
| | | Mutinodulargoiter | 26 | 26 |
| | | Colloidgoiter | 36 | 36 |
| | Inflammatory | Thyroiditis | 12 | 12 |
| Malignant | Suspicious malignancy | | 4 | 4 |
| | Malignancy/Carcinoma | | 2 | 2 |
| | Total | | 100 | 100 |

Table-5: Distribution Of Cases According To FNAC Diagnosis

| | FNAC Diagnosis | | Numbers of cases | Percentage(%) |
|-----------|----------------------|-------------------|------------------|---------------|
| Benign | Non Inflammatory | Adenoma | 11 | 11 |
| | | Mutinodulargoiter | 24 | 24 |
| | | Colloidgoiter | 36 | 36 |
| | Inflammatory | Thyroiditis | 12 | 12 |
| Malignant | Papillary Carcinoma | | 2 | 2 |
| | Follicular Carcinoma | | 15 | 15 |
| | Total | | 100 | 100 |

DISCUSSION:

• Age Distribution:

In the present study most of the patients (33%) were in 21-30 years age group, the youngest being 17years old and the eldest 66years old. The mean age was 36.27 years.

• Gender Distribution:

In the present study, 90% patients were female and 10% were male.The male to female ratio was 1:9. So, females are more commonly affected than males.

CLINICAL PRESENTATION:

- All the100 patients presented with clinical thyroid enlargement, either in the mid line or on the lateral aspect. 940 patients presented with gradual onset and 60 presented with sudden onset of thyroid swelling. Pressure effects from thyroid swelling (Dyspnoea, Dysphagia, Hoarseness of voice) was seen in 13, signs of thyrotoxicosis (loss of weight in spite of good appetite, insomnia, tremors, irritability, exophthalmos, menstrual irregularities, dry skin, hair loss, lethargy, hoarseness of voice) was present in 6%, pain in 15%, fever 10%, pathological fracture due to metastases from thyroid malignancy seen in 2% and convulsion in 1% from CNS metastases.
- Thus USG is helpful in finding other nodules in cases of clinically suspected solitary thyroid nodule, though the detection rate was lower in our study as compared to others.

Pathological Diagnosis:

- Out of 100 cases, 83% were benign and 17% were malignant. Percentage of Papillary carcinoma seen in (50%) cases, follicular carcinoma in 4 (33.37%) and anaplastic carcinoma in 2 (16.7%) of cases.In a study by Joseph F. Simeone, 87.2% cases were benign and 12.7% cases were malignant. Out of 17 malignant cases, 9(52.9%) had papillary carcinoma, 2(11.7%) had medullary carcinoma, 2(11.7%) had follicular carcinoma, 2(11.7%) had anaplastic carcinoma and 2(11.7%) had metastases.
- Most common benign pathology in the present study was benign goiter seen in 72% cases. Follicular adenoma was found in 10% and thyroiditis in 6% of patients.

BENIGN THYROID LESION (88Cases):

Ratio of Male:Female was 1:2.7

Thyroiditis(6 Cases):

2 were seen in male and 4 in female patients. The ratio of male to female being 1:2. All the 6 (100%) cases were diffusely enlarged hypoechoic thyroid with ill defined margine. In a study of Joseph F. Simeoneet all 100% patients showed diffusely abnormal echo-pattern consisted of multiple small low-level echoes with a decrease in overall echogenicity.

MALIGNANT THYROID LESIONS (12Cases):

•In present study our of 12 cases, 66.6% were in the age group of 30-60 years and 33.3% patients were more than 60years of age. Mary C.Frate, CasolB.Benson, Peter M.Doubilet etal, showed that malignancy was more common in patients who were younger than 20 years or older than 60 years of age,than in patients between 20 and 60 years of age.

- Percentage of malignancy in male was 17.85% and in female it was 9.72% in present study.
- The rate of malignancy was significantly higher in women than in men (23.6% in women and 11.9% in men).
- In present study 50% malignant lesions were hypoechoic,33.3%were mixed echogenic and 16.7% were isoechoic.
- In our study, 10 (83.3%) malignant lesions had single nodule and 2 (16.7%) had multiple nodules.
- In present study 83.3% malignant cases had calcification within nodules.
- Study done by Mary C.Frates, BensonC.B., DoubiletPM noted that the presence of any calcification within nodule raises the likelihood of malignancy. In particular micro calcification in a predominantly solid nodule is associated with approximately three-fold increase in cancer risk as compared with solid nodule without calcification.
- Margin of lesion was well-defined in 50% and ill-defined in 50% of cases in present study.
- L.Solbiatieta showed that margin was ill-defined and irregular in 69.7% and well-define in 30.3%. Thyroid

lesion with well-defined margin suggests benign pathology. However, results are equivocal in our study. None of the malignant lesions showed perilesional halo or comet-tail artifacts due to cholesterol crystal.

- **Sensitivity/Specificity of ultrasound for detecting malignant thyroid lesion:** In our study for detection of malignancy ultrasound had sensitivity of 83.3%, specificity 72.7%, PPV 29.4%, NPV 96.9% and accuracy of 74%. In a study Eisuke Koike et al., the sensitivity was 81.8% and specificity was 91%.

CONCLUSION:

- High resolution grey scale ultrasound has emerged as an initial imaging modality of choice for the evaluation of patients with thyroid enlargement. Ultrasound can detect solitary nodule, multiple nodules and diffuse thyroid enlargement. It can also differentiate solid and cystic lesions.
- Ultrasound has detected additional occult nodules in 8 patients out of 56 presented with solitary thyroid nodule clinically.
- Various sonographic features like number, echogenicity, solid/cystic component, margin, peripheral halo calcification and comet tail artifact help to characterize the thyroid lesion which is not possible on any other imaging modality.
- Neck masses can be differentiated whether they are arising from thyroid or extra thyroidal tissue. Thyroid lesions with capsular invasion, displacement of adjacent structure and cervical lymph nodes enlargement can also be detected.
- Thyroid malignancy cannot be diagnosed on ultrasonography but various sonographic features in combination can be used to predict malignancy in thyroid lesions. Using these multiple features gray scale ultrasound has accuracy of 74% with sensitivity of 83.3% and specificity of 72.7% for detecting thyroid malignancy, considering USG guided FNAC as a standard.
- FNAC is always suggested for the final confirmation of diagnosis in sonographically detected suspicious thyroid nodule.
- Realtime sonography is a valuable tool to guide the needle for FNAC, especially for the small size thyroid nodule (< 1.5cm) as well as for the aspiration of cyst.

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