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Ultrasonography Guided Fine Needle Aspiration Cytology as a Valuable Tool for Management of Solitary Thyroid Nodule

Meenakshi Kekre[1], Anant Kekre[2]

[1]Associate Professor, Department of ENT, Shri Shankara Institute of Medical Sciences, Bhilai, Chhattisgarh, India; [2]Ex Executive Director Medical SAIL, Bhilai, India.

ABSTRACT

Background: Ultrasonography (USG) in today's scenario is extremely crucial for detection of the dimensions of the tumour, for the diagnosis of multinodular goitres, and more importantly the nature of the solitary thyroid nodule whether it is solid or cystic. Very rarely cystic nodule is associated with malignancy.

Aims & Objectives: Our study on solitary thyroid nodules will try to corroborate the pre-operative cytological diagnosis obtained by USG guided Fine Needle Aspiration Cytology with the postoperative histopathological diagnosis.

Methods: We have studied 60 patients taken from a tertiary care hospital for one year. We have considered to only the patients with solitary thyroid nodule of both sexes and all age groups. The type of operation was planned as per the report of USG guided fine needle aspiration cytology (FNAC).

Results: Patients were aged between 15-75 years. 83 % of the patients in our study were females. Commonly associated symptoms were of hoarseness of voice, lymph node involvement & those nodes are fixed to the underlying structures & all these symptoms strongly suggestive of malignancy.

Conclusion: When properly done by an expert cytopathologist, we can reliably diagnose the benign cases, that can be managed reasonably by conservative approach rather than subjecting all patients to operations.

Key Words: Multinodular goitre, Solitary thyroid nodule, USG, FNAC

INTRODUCTION

A solitary thyroid nodule is the commonest presentation of thyroid carcinoma & studies suggest that only 10% of them are cancerous. After doing proper examination & investigation, most of them looking solitary thyroid nodules will be as a part of a multinodular goiter[1,2]. On radiological investigation, if the nodule turns out to be truly solitary then the chances of it being malignant rises by 20%. Hence it is extremely crucial to find out these cases so that we can plan safe & effective surgical intervention. Rest of the patients can be managed by a conservative approach along with judicious follow-up so that unnecessary operations can be avoided. In the general population, the chances of having solitary thyroid nodule may be up to 3%. It may be a simple adenoma or carcinoma[3,4,5].

Whereas if adenoma is there then simple excision will solve the purpose but if it turns out to be a carcinoma then surgical intervention differs as per the type of carcinoma. USG is very convenient and extremely proficient for the detection of the dimensions of the tumour, for the diagnosis of multinodular goitres, and more importantly the nature of the solitary thyroid nodule whether it is solid or cystic. Very rarely cystic nodule is associated with a malignancy[6,7]. Its accuracy of detection by USG is directly proportional to its resolution.

Similarly, if FNAC is carried out under the guidance of USG then the specificity and sensitivity of the procedure increase. Most importantly. This procedure is free from radiation exposure[8,9].

Aims and objectives: Our study on solitary thyroid nodules will try to corroborate the pre-operative cytological diagnosis obtained by USG guided FNAC with the postoperative histopathological diagnosis.

Corresponding Author:

Dr. Meenakshi Kekre, Associate Professor, Department of ENT, Shri Shankara Institute of Medical Sciences Bhilai, Chhattisgarh, India.
Mobile: 09893156057

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MATERIAL AND METHODS

Study type: Observational study.

Study Period: one year

Place of study: tertiary care hospital

Sample size: We have studied 60 patients. We have considered only the patients with solitary thyroid nodule of both sexes and all age groups (Table 1).

Study design: The modules which were small, difficult to palpate and deeply seated were particularly chosen. The cases of multinodular goitres were excluded from our study. The detailed history of the patient's illness, any history of radiation exposure, the familial background particularly in respect of thyroid carcinoma was taken which was followed by thorough clinical examination & local examination. We clinically assessed the functional status of the thyroid. Routine blood tests, chest X-Ray, urine and stool examination, ECG was done to assess the general condition of the patient. Then we proceed to the specific investigation of the disease proper. We checked the functional status of the thyroid gland by examining blood for T_3, T_4 and TSH. We consider the patients with a normally functioning thyroid status for our study. We then performed USG guided FNAC in all patients to detect the size of the lesion and more importantly the consistency of the nodule. The material obtained by USG guided FNAC was subjected to cytological examination to diagnose the nature of the lesion. We have done Radionuclide uptake and thyroid scan in selective patients.

After a thorough evaluation, we did operative intervention under general anaesthesia whenever required, after taking consent and following the norms of medical ethics. The type of operation was according to the report of USG guided FNAC. The post-operative specimen was sent for histopathological examination. The results were compared with the pre-operative USG guided FNAC report.

RESULTS

Table 1: Age and sex distribution

Age group (in years)	No. of cases	Female	Male
0 – 15	2	2	0
16 – 25	8	6	2
26 – 35	18	16	2
36 – 45	22	20	2
46 – 55	4	2	2
56 – 65	2	2	0
66 – 75	4	2	2
Total	60 (100%)	50(83%)	5 (17%)

As per table no. 1, Most of our study subjects were middle-aged females.

Table 2: Associated signs and symptoms

Associated signs and symptoms	No. of cases
Hoarseness of voice	8 (13.3%)
Lymph node involvement	4(6.6%)
Fixation to deep structures	2 (3.3%)

As per table no. 2, all the three associated symptoms of Hoarseness of voice, Lymph node involvement & Fixation to deep structures are in favour of malignancy.

Table 3: USG guided FNAC result

Result	No. of cases
Malignant	
Papillary Ca	14
Anaplastic Ca	2
Benign	
Colloid nodule	30
Follicular neoplasms	14
Total	60

As per table no. 3, on USG guided FNAC, 16 cases were diagnosed as the clear malignant lesion, out of this 14 were papillary Ca and 2 were anaplastic Carcinoma. As per table no. 4, 30 cases out of 60 were diagnosed as a colloid nodule.

Table 4: Histopathological examination

Histopathological Report	No. of Cases
Malignant	
Papillary Ca	14
Anaplastic Ca	6
Benign	
Colloid nodule	22
Follicular neoplasms	10
Total	52

As per table no. 5, eight cases were managed conservatively.

Table 5: Incidence of Malignancy

Sex	Total	Benign	Malignant
Females	50	34	16 (27.7%)
Males	10	6	4 (6.6%)
Total	60	40	20 (33.3%)

DISCUSSION

In our study, the age of the patients was between 15-75 years. According to Russel, the majority of patients with solitary thyroid nodules present in between 30-55 years and 80% are females. Watkinson noted that a solitary thyroid nodule is more likely to be malignant if the patient is male. We also noted that male patients are more prone to develop a malignant thyroid nodule[10]. Apart from swelling in the neck, there were symptoms such as hoarseness of voice, fixity to the deeper structures and lymph node enlargement. All the above symptoms correlate with malignancy. We have selected the cases with small thyroid nodules. Out of 60 patients in our study, 58 patients (96.6%) were clinically and biochemically euthyroid[11,12]. Only 2 patients were seen to have hypothyroidism on biochemical examination though they both were clinically euthyroid. We did not encounter any case of hyperthyroidism. As almost all patients of solitary thyroid nodule are euthyroid, it is not necessary to do all thyroid function tests (T3, T4 and TSH) in every patient. One parameter is enough and according to Russel, that parameter is T4. The FNAC is a very simple, rapid procedure that can be done on OPD basis and is devoid of any complication and radiation exposure. It does not require any anaesthesia and hospitalization. The procedure is economical and inflicts minimal trauma. When this procedure is done under the guidance of USG the sensitivity and specificity are increased and the chance of complications is also minimized. For better results, the aspiration should be done by the person who will interpret the result. To get adequate samples, multiple punctures at different sites should be done. The cytopathologist should have a view of all relevant clinical and radiological data. Proton magnetic resonance spectroscopy may be used on FNAC smears to help to differentiate benign from malignant follicular neoplasms[13,14,15]. In this technique, the spectral ratio of resonance from amino acid lysine and lipid is used to differentiate normal follicular cell from cancerous follicular cells in FNAC smears. In our study, we have operated 52 cases out of 60 patients and all the specimens were sent for histopathology. 8 cases of a small solitary thyroid nodule, reported as colloid goitre in USG guided FNAC, were not subjected to operation and they have been managed conservatively with regular follow up. We have operated those patients which were benign on cytology but have a strong suspicion of malignancy clinically. We also emphasized regular follow up with repeat USG guided FNAC whenever required[16].

CONCLUSION

All patients were clinically euthyroid. Among the associated symptoms there were hoarseness of voice, lymph node involvement and fixity to deeper structures go in favour of malignancy. All patients were subjected to USG guided FNAC. We found this technique very simple, safe, practically atraumatic. Due to low false-negative report of USG guided FNAC, it would be easy to plan the conservative management of solitary thyroid nodule. When compared with postoperative histopathology report, it can be concluded that USG guided FNAC can guide the course of management of "Solitary Thyroid Nodule".

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