

ROLE OF FINE NEEDLE ASPIRATION CYTOLOGY IN THYROID SWELLINGS

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ABSTRACT : Fine needle aspiration cytology (FNAC) is a recognised and sensitive screening test that yields correct diagnosis in most cases at low costs. One hundred cases of aspiration cytology were done on thyroid swellings. This method of evaluating thyroid swellings is simple, rapid, inexpensive and well tolerated. It did not show any morbidity. The sensitivity and specificity were appreciable.

KEY WORDS : Thyroid, Needle Biopsy, Cytology.

INTRODUCTION

The incidence of thyroid enlargement is quite variable depending on geographical areas surveyed and the type of survey. Non-toxic goitre is a world wide problem. WHO estimated that about 7% of the world population has goitre. At present research workers still does not have accurate information on the incidence of goitre but it is a problem of enormous magnitude¹.

Thyroid lesions continue to be investigated by open biopsy; if laboratory fails to give conclusive clue. It often requires a second definitive operation. Laboratory testing is of limited value. Most of the patients with thyroid nodule are euthyroid. The presence of antibodies suggest thyroiditis but does not exclude coexisting malignancy; with the exception of elevated level of calcitonin for medullary carcinomas² no other specific tumour marker is available. Radioactive scintiscanning is widely used in evaluating thyroid nodules. However, the relatively low incidence of malignancy (15-20%) in cold nodule does not recommend this as a method of selecting patients for surgical treatment³.

FNAC is recognised as a sensitive screening test that yields correct diagnosis in the highest percentage of cases. It is not a new procedure. In the later half of 10th century famous Arabian physician Abul Qasim described needle puncture to distinguish different types of goitre⁴.

The technique was first used for cytological diagnosis of thyroid tumour in America in 1996⁵. FNAC has been practiced over 50 years to diagnose infection and malignancy⁶.

This method is becoming popular due to its better interpretation and improved technique of staining. Closed biopsy technique such as trucut and high speed drill biopsy have ceased to have a place in histological diagnosis as they can result in complications like bleeding and nerve damage.

PATIENTS & METHODS

One hundred patients of both sexes and all ages were included in this study who had a thyroid swelling. The technique consists of stabilizing the tumour with one hand while a 22 G needle attached to a 20 cc empty plastic disposable syringe is inserted into the mass. Local anaesthesia is not necessary. Suction is applied to the syringe and needle is moved to and fro within the confines of the mass. The suction of the syringe is then released before removing the needle from the mass, the syringe is detached. After filling with air the specimen is expressed on the slide. It is dealt with alcohol, and prepared and stained with Papanicolaou stain⁷.

RESULTS

One hundred cases were evaluated by fine needle aspiration cytology between 1990-94. Their ages ranged from 14-70 years, the mean age was 41 years. There were 84 females and 16 males. Majority of the cases were symptomatic. Two cases presented with signs of acute inflammation and in one patient there was respiratory difficulty⁷. FNAC was performed in 100 cases and cytological diagnosis was made on 66 aspirations. In 22 cases the smear

Table 1. Comparison between FNAC and Histology

Histology	Cases	F N A C D i a g n o s i s			
		Benign	Malignant	Haemorrhagic	Inadequate
	100	60	6	12	22
Malignant	7	1	4	—	2
Follicular Ca	1	—	—	—	1
Papillary Ca	4	1	3	—	—
Lymphoma	1	—	—	—	1
Anaplastic Ca	1	—	1	—	—
Benign Lesions	93	59	2	12	20
Multinodular goitre	58	39	—	6	13
Simple goitre	15	9	—	3	3
Adenoma	9	5	1	1	2
Hashimoto's	2	1	—	1	—
Tuberculosis	1	—	1	—	—
Abscess	2	2	—	—	—
Grave's	6	3	—	1	2

was haemorrhagic and in twelve cases it was found to be inadequate (Table 1).

There were seven malignant and 93 benign lesions. Among malignant lesions there were four papillary carcinomas, one follicular carcinoma, lymphoma and anaplastic carcinoma each. Among benign lesions there were 58 cases of multinodular goitre, 15 simple goitres, nine cysts, six toxic goitres, one tuberculosis, two abscesses and two Hashimoto's thyroiditis. Four (57%) out of seven malignant lesions were correctly diagnosed on cytology, three were papillary carcinomas and one was anaplastic carcinoma. In two cases the smear was haemorrhagic. Among 93 benign conditions diagnosed on histology, 59 were consistent with benign lesions on cytology.

Out of 100 cases three aspirations were diagnosed incorrectly on cytology. Two benign lesions were diagnosed as malignant on cytology (false positive) and one malignant lesion diagnosed benign on cytology (false negative). In thyroid cytology by FNAC the sensitivity was 75% and specificity 95%.

DISCUSSION

Thyroid neoplasia can present either as discrete nodules or diffusely enlarged gland, although the former is more likely to be malignant. Thyroid nodules are relatively common in population. The incidence of solitary nodule that is confirmed malignant on surgical excision ranges from 8 to 33%.⁸ Diffuse thyroid enlargement usually presents as benign goitre but may actually hide malignant

disease. Although malignant thyroid neoplasm is the most common endocrine tumour, they account for 5% of patients with thyroid nodule. Only 65 people per million population annually have thyroid neoplasm.⁹

The management of thyroid nodules remain controversial. The methods used to evaluate thyroid nodule include radio-isotope scan, soft tissue neck X-rays, clinical information and suppressive therapy¹. Clinical and laboratory methods can diagnose 20%-60% of carcinomas but lack sensitivity and specificity⁹. This discrepancy necessitates a specific diagnostic procedure to avoid unnecessary surgery and FNAC has proved useful. In this study the success rate of the procedure was found to be 27%. In remaining 57% the procedure remained unsuccessful. A comparison of this study with other published reports is given in Table 2.

Table 2. Accuracy, Specificity and Sensitivity of different series

Year	Author	Cases	Accuracy	Specificity	Sensitivity
1980	Calacchio et al ¹⁰	300	97.3%	98.6%	82.6%
1962	Einhorn & Frazen ¹¹	177	94.4%	92.3%	95.2%
1987	Genschengern ¹²	32	81.3%	77.3%	90.0%
1981	Young et al ⁷	16	93.6%	95.8%	84.6%
1994	Present study	100	86.0%	95.0%	75.0%

In the present study the sensitivity for the thyroid lesion was 75% which correlates well with other series. The FNAC procedure is simple, easy to learn and inexpensive. No difficulty was faced in localizing the site of aspiration and in majority the first attempt was successful in obtaining the material. However complications such as excessive bleeding or haematoma as reported by others¹³ were not found.

The procedure is time saving without requiring hospitalization. It is appreciably acceptable by most patients with good compliance. FNAC provides a definite plan for surgery, as well as to avoid surgery in certain lesions like anaplastic carcinoma and lymphoma, where chemotherapy and radiotherapy is the treatment of choice³.

In some instances this procedure can be of therapeutic value. In case of thyroid cysts¹⁴, aspiration not only establishes the diagnosis but is the only treatment required. There are fewer complications and limitations of FNAC like bleeding and seeding. A literature search has revealed only one case of seeding with 22 gauge needle under computerised tomography.

The important limitation of FNAC is the error in diagnosis in the form of false negative and false positive reporting of tumour which can be overcome by improving the technique of aspiration and experience in interpretation. Evaluating a test for its ability to identify patients with malignancy, sensitivity is more important than specificity, since a negative report encourages delay due to necessary further investigations and treatment, therefore caution is mandatory. If a malignancy must be ruled out, a negative report must be disregarded⁷. With FNAC, the histological classification of the tumour is not possible. The only contraindication to aspiration cytology is in cases of primary malignant melanoma. It will induce inflammation which will confuse the subsequent histology and it may facilitate deep spread, so crucial is the assessment of prognosis³.

CONCLUSION

Fine needle aspiration cytology is a safe, easy, cheap, fast and accurate procedure of diagnosis in thyroid swellings. It requires a minimum time to learn the technique, and

skill and practice to interpret the cytological findings but close co-operation can provide valuable information and in most cases a correct diagnosis.

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