

## Analysis of Fine Needle Aspiration Cytology of Thyroid Lesions at Derna Hospital, Libya

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### Abstract

This is a four years study of 225 cases of thyroid lesions at Surgical Department in a Derna tertiary care hospital, Libya. These lesions were studied for Cytological features and correlation with Clinical, Radiological, Hormonal features. Neoplastic lesions were classified according to WHO guidelines. The study concluded that thyroid lesions were more common in females with male to females ratio 1:14. Non-neoplastic lesions were more common 75.1% as compared to Neoplastic lesions. Mulinodular goitre was the most common Non-neoplastic lesion and follicular neoplasm was the most common Neoplastic lesion.

**Keywords:** Thyroid nodules, Fine needle aspiration, thyroid lesions,

### تحليل عينات الخلايا من اصابات الغدة الدرقية في مستشفى درنة، ليبيا

هذه دراسة لمدة أربع سنوات من يناير ٢٠٠٩ وحتى فبراير ٢٠١٣، واشتملت ٢٢٥ حالة من اصابات الغدة الدرقية في قسم الجراحة في مستشفى درنة، ليبيا. تمت دراسة هذه الاصابات لتحليل الخلايا النسيجية وارتباطها مع الاعراض السريرية واشعة الموجات الصوتية وتحليل الهرمونات للغدة الدرقية. وتم تصنيف الاصابات الورمية وفقا لإرشادات منظمة الصحة العالمية. وخلصت الدراسة الى أن اصابات الغدة الدرقية كانت أكثر شيوعا في الإناث مع الذكور إلى الإناث نسبة ١: ١٤. كانت الاصابات غير الورمية أكثر شيوعا ٧٥,١%. كان تضخم الغدة الدرقية متعدد النوديول هو الأكثر شيوعا.  
**كلمات البحث:** الغدة الدرقية، تحليل الخلايا بالإبرة الدقيقة، اصابات الغدة الدرقية.

**Introduction:**

Thyroid nodules are common clinical findings and have a reported prevalence of (4- 7)% in general population. Thyroid nodules are common in women. The vast majority of these nodules are non neoplastic lesions. However distinction of these benign lesions from a malignancy cannot be based reliably on the clinical presentation only. Several diagnostic tests have been used for diagnosis of these lesions. Recent studies have demonstrated that among all the diagnostic modalities, FNA is most accurate and simplest screening test for rapid diagnosis of thyroid lesions.<sup>(1)</sup>

Fine needle aspiration (FNA) of thyroid is recognized to be the first line investigation for a solitary thyroid nodule, has a valuable role in the diagnosis of the diffuse non- toxic goitre and can be used to confirm the diagnosis of clinically obvious malignancy, enabling the separation of treatable lymphomas from anaplastic carcinomas. The purpose of aspiration cytology is to obtain diagnostic material for cytology study from organs that do not shed cells spontaneously. The bone marrow, spleen, liver, breast, thyroid gland and lymph nodes are typical targets for this type of diagnostic procedure.<sup>(1)</sup>

Fine needle aspiration cytology of thyroid gland is firmly established as a first line diagnostic test for the evaluation of thyroid lesions and single most effective test for the preoperative diagnosis of thyroid lesions. FNAC carried out by a well- trained cytopathologist is a reliable, cost effective and simple diagnostic procedure for palpable thyroid swellings. This procedure is painless and may obviate the need of subjecting the patients to open biopsy.<sup>(2)</sup>

If aspiration cytology is done with care and the smears are interpreted carefully, the accuracy rates are quite high.<sup>(3)</sup>

**Objective:**

The aim of the present study is to analyze Fine Needle Aspiration Cytology of Thyroid Lesions at Derna Hospital, Libya

**Subjects And Methods:**

This descriptive prospective study was conducted for four years analysis of patients referred to Derna tertiary care hospital, Libya, from January, 2009 to February, 2013 for FNAC of Thyroid lesions. Smears were prepared and stained by Papanicolaou, Giemsa and H& E.

**Staining Of Smears:**

1. Dry fixed smears were prepared by air drying and then fixing in methanol followed by staining with Giemsa
2. Wet- fixed smears were prepared by immediately fixing in 95% isopropyl alcohol and stained by H& E and Papanicolaou.

For all cases the following were done:

1. Complete medical history and clinical examination.
2. T3, T4 and TSH hormonal assay.
3. Ultrasonography For Neck And Thyroid
4. Fine needle aspiration cytology of thyroid gland.

**Statistical Analysis:**

The data obtained will be organized, tabulated and analyzed using the Statistical Package for the Social Science (SPSS) on the computer (Ver. 16).

Ethical Considerations Were Done.

**Results:**

This study was conducted for four years in Derna tertiary care hospital, Libya from January, 2009 to February, 2013. There were a total 225 patients who underwent fine needle aspiration of thyroid lesions.

In the present study out of the total 225 cases, 210 were females and 15

were males. Thus male to female ratio was 1: 14.

Table (1) Distribution Of Subjects According To Hormonal Status

Type	No.	Percentage
Normal	175	77.7
Increased	33	14.7
Decreased	17	7.6
Total	225	100

Hormonal status was known in cases. Out of which 77.7% cases had normal T3, T4 and TSH levels. T3, T4 and TSH were increased in 14.7% of the cases. T3, T4 and TSH were decreased in 7.6%.

Table(2) Distribution Of Subjects According To Ultrasonography

USG	No.	Percentage
Multinodular Swelling	148	65.7
Solid Nodules	39	17.3
Cystic Nodules	20	9
Diffuse Enlargement	18	8
Total	225	100

The commonest clinical presentation of patients in thyroid lesions in this study was in the form of multinodular swelling (65.7%) followed by solid nodule (17.3%), Cystic nodules (9%) and diffuse swelling (8%).

Table (3): Division Of Neoplastic And Non Neoplastic Thyroid Lesions

Fnac Findings	No.	Percentage
Multinodular Goiter Negative For Malignancy	105	46.7
Hurthle Cell Adenoma	37	16.5
Hashimotos Thyroiditis	17	7.6
Colloid Cystic Lesion	13	5.8
Adenomatous Nodule	11	4.9
Toxic Nodule	11	4.9
Hyperplastic Nodule	10	4.4
Follicular Neoplasma	8	3.5
Lymphocytic Thyroiditis	7	3
Non- Toxic Goitre	5	2.2
Papillary Carcinoma	1	0.5
Total	225	

Non neoplastic lesions were Multinodular Goiter 46.7%, Hashimoto's Thyroiditis 7.6%, colloid nodule 5.8%.

Neoplastic lesions were Hurthle cell adenoma 16.5% and Follicular neoplasma 3.5%.

**Discussion:**

The age of presentation of various thyroid lesions ranged from 17 years to 61 years.

Dorairagan et al.<sup>(5)</sup> observed that majority of the patients with thyroid lesions were in the age group of (30- 50) years and a very small number were below 20 years of age. Our study is in concordance with this study.

Thyroid lesions are more prevalent in females than males. In the present study 93.3% of cases were females and 6.7% males. Male to female ratio was 1: 14. Similar findings were reported by Dorairagan et al.<sup>(5)</sup> with Male to Female ratio being 1: 9.<sup>(1)</sup>

Hormonal status was known in cases. Out of which 77.7% cases had normal T3, T4 and TSH levels. T3, T4 and TSH were increased in 14.7% of the cases. T3, T4 TSH were decreased in 7.6%.

Cytological smears in thyroid lesions were divided into benign, malignant, suspicious/ indeterminate& unsatisfactory/ nondiagnostic as per criteria given in observations. Benign lesions were more common constituting 70.4% in this study.

Gharib et al.<sup>(7)</sup> examined 10917 cytological smears of thyroid lesions and

observed that 64% were of benign lesions, 4% malignant, 11% suspicious and 21% were nondiagnostic. Our findings were in concordance with this study. The variability of various lesions could be due to studies being conducted on different population of various countries and variable influences of geographical, environment, dietary and hereditary factors.

The various non neoplastic lesions seen in the present study were multinodular goiter, Hashimoto's thyroiditis, lymphocytic thyroiditis, colloid nodule benign cystic lesion and diffuse goiter. Multinodular constituted 46.7% of non neoplastic lesions, hashimoto's thyroiditis (7.6%), lymphocytic thyroiditis (3%) and benign cystic lesions (5.8%).

In an analysis of 1344 cases of thyroid lesions conducted by Hyang et al.<sup>(6)</sup> 83.4% cases were non- neoplastic, 1.6% follicular neoplasm, 7.3% malignant, 2.7% indeterminate & 5% unsatisfactory. Out of 83.4% nonneoplastic lesions maximum cases were of diffuse & multinodular goiter (61%), remaining 22.4% cases were of hashimoto's & dequervains thyroiditis. which is in concordance with our study. Diffuse goiter is most common in the iodine deficient areas where the prevalence may be as high as 40%. Endemic goitre as well as non endemic goitre showed striking females preponderance

In the present study. Follicular neoplasms represented (3.5%), colloid adenoma (4.9%), papillary carcinoma (0.5%), hyperplastic nodules (4.4%), and hurthle cell neoplasm (16.5%).

Silverman et al.<sup>(8)</sup> in their study on neoplastic lesions observed that maximum cases were of follicular neoplasms (81%) followed by hurthle cell neoplasm (9.3%), papillary carcinoma (4.6%), medullary carcinoma (2.3%) and anaplastic carcinoma (2.3%). Studies by various authors showed follicular neoplasm ranged from (66- 81)%, papillary carcinoma (4.6- 25)%, medullary carcinoma (2.3- 16.2)%, anaplastic carcinoma (2.3- 24.3)% and hurthle cell neoplasm (0- 9.3)%. Our findings are in concordance with this study.

Thyroid neoplasms like follicular and hurthle cell type are usually reported as neoplasms without further distinguishing them into benign and malignant on the basis of cytology. We have put them under the category of neoplasms.

Follicular neoplasms are the most difficult tumors to categorise into benign or malignant, because of the similarity in the morphology of the cytological smears. In such cases only histological biopsy can confirm the true nature of the neoplasm.

In the present study abundant colloid was seen in cases of colloid goiter, multinodular goiter, colloid nodule, benign cystic lesions & colloid adenoma. Hurthle cell change was noted in 37 cases (16.5%) out of 225 cases.

Jayaram et al.<sup>(12)</sup> in her study on various thyroid lesions observed colloid was abundant in benign lesions & was scanty or absent in malignant lesions. Similar findings are seen in our study.

Hormonal status: The patients are grouped into three states based on clinical symptoms: euthyroid, hyperthyroid & hypothyroid. These states reflect the hormonal status of thyroid gland i.e. within normal limits (euthyroid), higher (Hyperthyroid) or lower (Hypothyroid) than normal.

Hormonal status was known in cases in the present study. 77.7% cases were biochemically euthyroid i.e. normal T3 and T4. Only 14.7% had increased T3, T4 & TSH and 7.6% patients had decreased T3, T4 & TSH levels.

Decreased levels of T3, T4 & TSH were seen in goiter & hashimoto's thyroiditis. This is in concordance with the study by Boigen et al.<sup>(14)</sup> according to which in majority of benign lesions and in almost all malignant thyroid lesions thyroid function tests were normal.

USG in the present study showed that multinodular represented (65.7%), solid nodules (17.3%), cystic (9%) and diffuse swelling (8%) of all cases.

#### Conclusion:

There were a total 225 patients who underwent fine needle aspiration of thyroid lesions. Benign lesions were more common. Cytodiagnosis showed good correlation with Clinical presentation, Radiological findings, and Hormonal status.

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