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RESEARCH ARTICLE

ROLE OF FNAC IN GOITER

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ABSTRACT

Goitre is quite a common clinical presentation in surgical practice. Fine needle aspiration cytology is a well established first line diagnostic test for evaluation of goitre and is a more useful investigation than others like ultrasonography, thyroid function tests and serological studies. **Materials and methods:** Prospective study of 50 cases of goitre who underwent FNAC during period Jan 2017- Dec 2017. The results of Fine needle aspiration cytology and histopathology were compared and sensitivity and specificity were studied. **Results:** The results were that majority of patients were having colloid goitre 62%, followed by multi nodular goitre (20%), thyroiditis 12%, papillary carcinoma 4% and anaplastic carcinoma 2%. Carcinoma among patients was diagnosed in 3 patients by FNAC while by histopathology among 5 patients. Also, sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of FNAC are 97%, 71%, 95.7% and 83.3% respectively. **Conclusion:** FNAC is base line investigation in case goiter & appears to be reliable and best used in conjunction with thyroid function test and ultra sonography

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INTRODUCTION

The word thyroid originated from thyreos a Greek word meaning shield. It was first used by Thomas Wharton (1614-1673) of London. He named it as 'Glandular thyroideis' in 1656. In old times it was called struma (Latin for a swollen gland), bronchocele (a cystic mass in the neck) and goiter (Latin word gutter meaning throat) (Shuja, 2008). Diseases of the thyroid gland are common and comprise a spectrum of entities causing a systemic disease (Grave's disease) or a localised abnormality in the thyroid gland such as nodular enlargement (goitre) or a tumour mass. After diabetes mellitus, the thyroid gland is the most common organ to cause endocrine disorders. Thyroid disorders are the most common endocrine diseases particularly in countries where iodine intake through diet is low (Gritzmann, 2000). A significant number of goitre cases are encountered in the clinical setting. Besides, cosmetic deformity, goitre may also cause various pressure symptoms related to trachea and esophagus and major blood vessels according to size and histopathological type. Fine Needle Aspiration Cytology (FNAC) of the thyroid gland is a well established first-line diagnostic test for the evaluation of diffuse thyroid lesions as well as thyroid nodules with the main purpose of confirming benign lesions and thereby, reducing unnecessary surgery (Rathod, 2015).

It is also well known that high resolution ultrasound is useful diagnostic imaging modality for detection of thyroid nodule. But FNAC is found to be the most sensitive line of investigation than other investigations like ultrasonography (USG), thyroid function test (TFT), thyroid scan and serologic studies (Rathod, 2015) FNAC leads to early diagnosis and aids in the treatment of thyroid lesions. FNAC has good amount of accuracy up to 97% in the preoperative diagnosis of various thyroid lesions. This has been claimed by various authors [Gupta, 2010; Yoon, 2011; Gunvanti Rathod, 2012]. The present study was conducted to study sensitivity and specificity of FNAC in a thyroid swelling.

MATERIALS AND METHODS

This prospective study was carried out on 50 patients who were admitted in dept of surgery and ENT, Al Ameen Medical College and underwent surgical treatment and were referred to dept of Pathology for FNAC and histopathology from Jan 2015- Dec 2015 were included. FNAC was performed using a 22 gauge needle attached to a 10ml syringe. The cases were operated and evaluated for histopathological changes. The results of Fine needle aspiration cytology and histopathology were compared. All these information was collected and data was analysed statistically.

Patient Selection

FNAC of the goitre was done.
It was based on following criteria:

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Physical examination suggestive of palpable thyroid swelling in lower neck in midline or on either side. Sign and symptoms suggestive of thyroid disorder (Hyper/ Hypothyroidism).

Exclusion criteria : Patient already diagnosed and treated for thyroid lesion FNAC showing inadequate aspirated material.

OBSERVATION AND RESULTS

Age distribution: The above table shows distribution of patients according to age. It was observed that majority of patients were in the age group of 31-40 years (36) followed by 21-30 yrs (30) with the youngest being 12 yrs old and the oldest being 72 yrs old. The above table shows distribution of patients according to sex. It was observed that majority of patients were female (80%) and males were 10%. The above table shows distribution of patients according to clinical complaints. It was observed that majority of patients were having swelling (100%) followed by pain (20%).

Age distribution

Age Group (yrs)	Number of Cases	Percentage
0-10	0	0%
11-20	1	2%
21-30	12	24%
31-40	18	36%
41-50	10	20%
51-60	5	10%
61-70	3	6%
>70	1	2%
TOTAL	50	100%

SEX	No. Of cases	Percentage
Female	40	80%
Male	10	20%
TOTAL	50	100%

Clinical Complaints

COMPLAINTS	No. Of patients	Percentage
Swelling	50	100%
Pain	10	20%
Pressure Effects	8	16%
Hoarseness	4	8%
Dysphagia	3	6%
Fever	2	2%

CLINICAL DIAGNOSIS	Number of patients	Percentage
Solitary Thyroid Nodule	29	58
Diffuse Thyroid Swelling	11	22
Multi-Nodular Goitre	7	14
Cystic Lesion	3	6

Distribution by benign and malignant lesions

Lesions	Number of patients	Percentage
Benign	47	94%
Malignant	3	6%
TOTAL	50	100%

Distribution by FNAC diagnosis

Diagnosis	Number of Patients	Percentage
Colloid Goitre	30	62
Multi nodular colloid goitre	10	20
Thyroiditis	6	12
Papillary Carcinoma	2	4
Anaplastic Carcinoma	1	2
TOTAL	50	100

The above table shows distribution of patients according to clinical diagnosis. It was observed that majority of patients were having solitary thyroid nodule (58) followed by diffuse thyroid swelling (22), multi nodular goitre (14) and cystic lesion (6). The above table shows distribution of patients according to lesions. It was observed that majority of patients were having benign lesions (94) and malignant lesions (Gunvanti Rathod, 2012). The above table shows distribution of patients according to FNAC diagnosis. It was observed that majority of patients were having colloid goitre (62). Papillary carcinoma was more common among patients (Gupta, 2010). The above table shows FNAC diagnosis distribution of patients by age. It was observed that majority of patients with goitre were in the age group (31-40) years 15.

The above table shows FNAC diagnosis distribution of patients by sex. It was observed that majority of the patients with goitre were females 34 as compared to male. The carcinomas were also more prevalent in males as compared to females. The above table shows comparison of FNAC diagnosis with histopathological diagnosis. It was observed that carcinoma among patients was diagnosed in 3 patients by FNAC while by histopathology among 5 patients. The above table shows sensitivity and specificity of FNAC diagnosis. It was observed that sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of FNAC was 97%, 71%, 95.7% and 83.3% respectively.

DISCUSSION

In the present study most of the patients were from the 31-40 age group. The youngest was 12 and the oldest 72 yrs of age. In a similar study by Dhanadia et al., the age-range was from 18 to 74. (Dhanadia, ?). The male female ratio is 1:4. Dhanadia et al shows male female ratio of 1:2.5. So females are more commonly affected than males (Dhanadia, ?)

In our study it was observed that majority of patients were having swelling 100%, followed by pain 20%, pressure effects 8%, hoarseness 4%, dysphagia 3%, fever 2% respectively. While Gunvanti et al observed that patients in their study had swelling 100%, pain 32%, no pressure effects and hoarseness 9%, (3), Dhanadia et al found that patients had swelling 100%, pain 32%, pressure effects 13% and hoarseness 11%. (Dhanadia, ?). In our study, It was observed that majority of patients were having solitary thyroid nodule 58% followed by diffuse thyroid swelling 22%, multi nodular goitre 14% and cystic lesion 6%. While study by Gunvanti et al found that 29% had solitary thyroid nodule, 38% diffuse thyroid swelling, 20% multinodular goitre and 10% cystic lesion (Rathod, 2015), dhanadia et al. (Dhanadia, ?) found that 56% had solitary thyroid nodule, 32% diffuse thyroid swelling, 6% multi nodular goitre and 6% cystic lesion. In our study it was observed that majority of patients were having benign lesions 94% and malignant lesions 6%. Similar findings were seen in a study by Gunvanti B. Rather et al and Ankush Dhanadia et al, ie, benign lesions were seen in 91% and 92% patients respectively (Rathod, 2015; Dhanadia, ?). Our study found that majority of patients were having colloid goitre 30%, followed by multi nodular goitre (10%), thyroiditis 6%, papillary carcinoma 2%, anaplastic carcinoma 1%. Gunvanti et al found that 30% colloid goitre, 30% mncg, 2% its, 4% papillary ca, 2% anaplastic ca while dhanadia et al found that 72% had cg, cg, no cases on mncg, 6% thyroiditis, 6% pa ca, and 2% ana ca. (Rathod, 2015; Dhanadia, ?).

Distribution by FNAC diagnosis according to age

Age Group	Goitre	Thyroiditis	Anaplastic Ca	Papillary Ca	Total
0-10	0	0	0	0	1
11-20	1	0	0	0	1
21-30	9	3	0	0	12
31-40	15	3	0	0	18
41-50	9	0	0	1	10
51-60	4	0	0	1	5
61-70	3	0	0	0	3
>70	0	0	1	0	1
Total	41	6	1	2	50

Distribution by FNAC diagnosis according to sex

Diagnosis	Female	Male	Total
Goitre	34	7	41
Thyroiditis	3	3	6
Anaplastic	1	0	1
Papillary	2	0	2
Total	40	10	50

Comparison of FNAC with histopathology diagnosis

Classification	FNAC (%)	Histopathology (%)
Benign Lesions	47	45%
Malignant	3	50%
Total	50	50%

Sensitivity and Specificity of Fnac

FNAC	Value	95% CI
Sensitivity	97%	91.06% to 99.96
Specificity	71%	34.90% to 92.21%
PPV	95.7%	66.43% to 97.16%
NPV	83.3%	60.60% to 98.74%

The patients with goiter were in the age group 31-40 formed about 30%. It was observed that majority of patients with glitter were females, i.e., 80% as compared to the males at 20%. The carcinomas were also more prevalent in females as compared to the males. It was observed that carcinoma among patients are diagnosed in 3, (6%) by fnac while, by histopathology among 5(10%) of patients. The distribution of FNAC diagnosis according to age and sex is comparable to Dhanadia et al. (2015). The sensitivity and specificity, PPV and negative predictive value of FNAC was 97%, 71%, 95.7%, 83.3% respectively. Gunvanti et al and Dhanadia et al found similar findings. Gunvanti et al found them to be 91%, 71%, 94% and 88% respectively while Dhanadia found 83.3% and 72% for sensitivity and specificity (Rathod, 2015; Dhanadia, ?)

Conclusion

Thyroid FNAC proves to be a reliable and simple first line diagnostic procedure and used in conjugation with other investigations like TFT and USG findings in view of possibility of false negative or false positive cytological diagnosis.

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