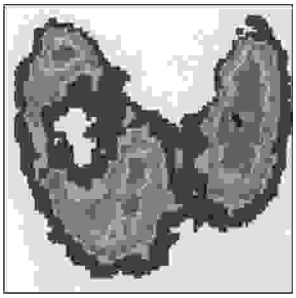
ORIGINAL PROF-995

COLD THYROID NODULE;
A COMPARISON OF FINE NEEDLE ASPIRATION CYTOLOGY WITH HISTOPATHOLOGY



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ABSTRACT... drtariqwaqar@yahoo.com. **Objectives:** To determine the diagnostic potential of FNAC. **Study Design:** Comparative diagnostic procedure study. **Place and Duration:** Surgical outdoor and surgical unit-I Nishtar Hospital Multan during December 2003 to November 2004. **Patients and Methods:** Study was carried out on 50 patients of either sex, above the age of 15 years and who had cold thyroid nodule. These patients were subjected to FNAC. The findings of FNAC were adopted as a guide for their further management. **Results:** 50 patients, on FNAC 8 patients (16%) had cystic nodules, 30 patients (60%) had benign solid nodules, 4 patients (8%) had malignant disease while 8 patients (16%) had cytology indeterminate or suspicious for malignancy. Out of 8 patients with cystic nodules, which were aspirated. Three patients had no recurrence while 5 patients who had blood stained aspirate had lobectomy followed by histopathology showing benign lesions. Out of 30 patients with benign solid nodule, 26 (88.88%) had surgery. Seventeen patients (65.4%) had lobectomy while 9 patients had STT. 12 patients having malignant and indeterminate or suspicious cytology had near-total thyroidectomy. Four patients proved to have papillary carcinoma and 2 patients folicular carcinoma, 3 patients had follicular adenoma and 3 had colloid nodular goiter. The diagnostic specificity of FNAC in cold thyroid nodule in this study was 90%. There were 8% false positive and 0% false negative results. **Conclusion:** The fine needle aspiration cytology proved to be a reliable method for the preoperative diagnosis of cold thyroid nodule and better planning of their management.

Key words: FNAC, thyroid nodules, papillary carcinoma.

INTRODUCTION

Thyroid diseases are quite common in southeast Punjab. Nearly all the disorders result in swelling of the Thyroid gland and non-specific term "Goitre" embraces them all. In clinical practice, working classification is based on the biochemical status, physical characteristics of the gland and whether the gland is benign or malignant.

On physical examination, the swelling may be diffuse, multinodular or a discrete nodule. The discrete nodule is a common presentation of goiter[1] and is more common in females. On scintiscanning, it may be cold, warm or hot. However, 75% of discrete nodules are cold[2]. The nodule may be adenomatous (hypertrophic or colloid), adenoma, localized area of Hashimoto's thyroiditis, cystic or in only 5% of the cases, the nodule is malignant[3].

Keeping in mind the complications of thyroid surgery, surgeon should select those patients for operation who are at high risk of having thyroid cancer, i.e. discrete

nodule, exposure to radiation to their head and neck region[4], positive family history of medullary carcinoma or obstructive symptoms due to the pressure on the trachea or oesophagus.

Fine needle aspiration cytology should be performed on all cold thyroid nodules. It is safe, simple, cost effective, time saving technique, requiring no anaesthesia, no danger of tumour dissemination and has excellent patient compliance[5]. It can be performed in the outpatient department and leaves no scar. FNAC has a high level of accuracy[6]. It is considered as the only pre-operative diagnostic test that can often differentiate between benign and malignant nodules. So it helps in the operative planning of definite procedure based on cytology. Its only limitation is that it cannot differentiate between follicular adenoma and follicular carcinoma, as this distinction is only made on histological criteria of capsular and vascular invasion. FNAC can also serve its therapeutic purpose in cystic nodules.

PATIENTS AND METHODS

It was a prospective study. It was carried out on 50 patients of either sex above the age of 15 years. who had solitary thyroid nodule on physical examination and cold nodule on thyroid isotope scan. These patients also had ultrasonography and FNAC.

After admission of the patient, initial evaluation included a detailed history and thorough examination. Complete blood and urine examination, chest X-ray, ECG, T3 T4 & TSH and thyroid scan . Those who had cold thyroid nodule had ultrasonography and then they were subjected to FNA with a G-22 needle mounted on a 10 ml syringe. Slides were prepared and fixed in 95% alcohol for 30 minutes. Slides were then sent to pathology department where they were stained with H&E stain and were examined by an experienced Cytopathologist.

The findings of FNAC were adopted as a guide for the management of the patients having cold thyroid nodule as follows;

1. The cystic lesions were aspirated completely in the initial step. Excision was done in case of recurrence or haemorrhagic aspirate.
2.. In case of benign solid lesions, patients were reassured and observed after prescribing LT4 suppression therapy. Indications for surgery included size of the nodule, anxiety and cosmetic. Surgical procedures performed included lobectomy in case of solitary lesion and STT in case of multinodular goitre.
3. The malignant lesions and those nodules with indeterminate/suspicious cytology were treated by near-total thyroidectomy with or/without lymph node dissection.

A performa was prepared which included history, physical examination, laboratory investigations, chest x-ray, ECG, special investigations, operative findings, histopathology report and final diagnosis.

RESULTS

The age distribution observed in this study is shown in Figure-I. The peak incidence was in the 3rd decade of life. Of the 50 patients, 7 were male while 43 were female. The male to female ratio was 1: 6.1.

Symptoms are shown in table- I. No patient had past history of neck irradiation. Only 26 patients (52%) had positive family history of goitre.

Consistency of swelling was soft in 3 patients (6%) and firm in 47 patients (94%). No patient had hard swelling. Fluctuation was present in 3 patients (6%). Fixity to skin & underlying structure was not observed.

C.B.C. showed Hb more than 10 gm% in 43 patients (86%) while 7 patients (14%) had Hb below 10g. ECG was done to assess the cardiac status of the patients. CXR was done to rule out metastasis and to assess the cardiopulmonary status of the patients. All the patients in this study had T3, T4 and TSH within the normal range (euthyroid]. On 99mTC scan, 43 patients (86%) had solitary cold thyroid nodule while 7 patients (14%) had dominant nodule. USG was performed with the help of high resolution real-time ultrasonic scanner at the radiology department, Nishtar Hospital, Multan. 41 (82%) patients having solitary thyroid nodule had solid

consistency while 9 patients (18%) had cystic in nature. In 15 patients (30%), thyroid gland having solitary nodule on physical examination was found to have multiple nodules on USG while 35 patients (70%) had single nodule.

In all the 50 patients, FNAC was performed by a standard technique. The findings of FNAC were divided into four groups, shown in Table II.

The diagnostic sensitivity and specificity are 100% and 90% respectively. The Diagnostic accuracy is 92%. There are 8% false positive results while no false negative results.

On the basis of these investigations, the nodules were divided into three groups.

A = Benign cystic lesion
B = Benign solid lesion
C = Malignant and suspicious lesions.

Group A included 8 patients (16%). All these patients were females. Of the 8 patients in this group, 3 patients (37.5%) had complete decompression of the cyst and other 5 patients (62.5%) had blood stained aspirate. These 5 patients were subjected to surgery. Lobectomy was done followed by histopathology showing benign lesions.

Group B included 30 patients (60%), 4 patients (13.3%) were male while 26 patients (86.7%) were females, the two males were 25 and two were 50 years of age.

8 patients out of 30 (26.66%) were given suppression therapy with LT4 in divided doses of 0.2 - 0.3 mg/day and monitoring was done by TSH level estimation and USG at 3 months interval. 4 patients had 50 % decrease in size of nodule. Rest of 4 patients opted surgery due to anxiety about swelling or no benefit from LT4 therapy. Thus out of 30 patients, 26 patients (88.88%) had surgery. Lobectomy was the usual procedure in 17 patients (65.4%). 9 patients (34.6%) had S.T.T. in MNG. After surgery, all the patients were prescribed thyroxin. All of them had benign histopathology report.

Group C included 12 patients (24%). 4 patients out of 12 (33.33%) had papillary Ca while 6 patients (50%) had cytology labelled as follicular neoplasm. 2 patient (16.66%) had atypical cells on FNAC. Near-total thyroidectomy was performed in all 12 patients. On biopsy, 3 patients (25%) had follicular adenoma, 3 patients (25%) had goitre giving 3 cases of false positive results on FNAC, 2 patients (16.22%) had follicular carcinoma and 4 patients (33.33%) had papillary carcinoma. The malignant cases were treated at MINAR with RIT.

Thus 43 patients out of 50 (86%) were subjected to surgery in this study as shown in table-III. Regarding Post operative complications, haematoma occurred in one patient (2.32%). It was evacuated immediately. Unilateral paralysis of vocal cord was observed in one case (2.32%). Transient signs of hypocalcaemia were seen in two patients (4.65%). One of the two patients had undergone near-total thyroidectomy while the other one had subtotal thyroidectomy. Wound infection was seen in only one patient (2.32%) which was treated with antibiotics and dressing. There was no keloid formation or recurrence of carcinoma. Histopathology following surgery in 43 patients is shown in table-IV.

Fig-1. Age distribution of cold thyroid nodule

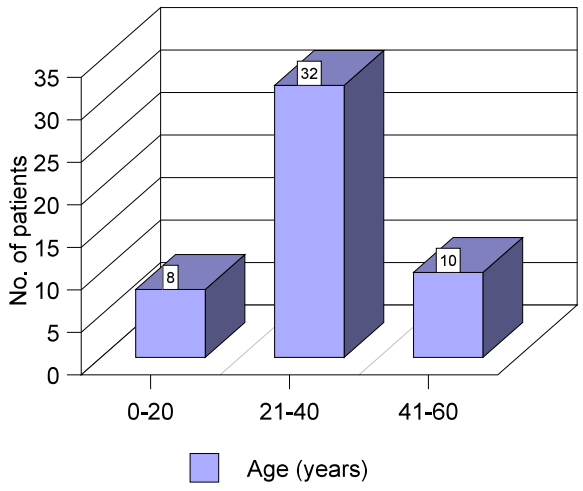

Table-I. Symptomatology		
Symptoms	**No of patients**	**%age**
Swelling in front of neck	50	100%
Mild pain	5	10%
Change of voice	3	6%
Palpitation	3	6%

Table-II. FNAC Diagnosis in 50 patients with Cold thyroid nodule		
Cytology diagnosis	**No of patients**	**%age**
Thyroid cyst (goitre with cystic degeneration)	8	16%
Colloid nodule	30	60%
Follicular neoplasm	6	12%
Atypical cells	2	4%
Papillary carcinoma	4	8%

Table-III. Surgical Treatment		
Type surgery	**No of patients**	**%age**
Lobectomy	22	51.16%
STT	9	20.93%
Near total thyroidectomy	12	27.90%

Table-IV. Histopathology Results (n=43)		
Diagnosis	**No of patients**	**%age**
Thyroid cyst	5	11.62%
Colloid goitre	17	39.53%
MNG	12	27.90%
Follicular adenoma	3	6.97%
Follicular Ca	2	4.65%
Papillary Ca	4	9.30%

DISCUSSION

Thyroid diseases are quite common in South East Punjab and present as a swelling in front of neck. Thyroid nodules are fairly common surgical problem and the prevalence rate is about 5% of the population[7]. Cold thyroid nodule has gained much importance because of increased potential for malignancy. The incidence of malignancy in cold nodule varies from 5 - 20% of the cases[3].

Thyroid nodule occurs early in endemic areas[8]. In the present study, the peak incidence was between 20 -40 years of age. The nodules are more likely to be malignant at the extremes of age and in male sex. Of the 7 male patients in this study, 2 had malignant nodule. Thyroid nodules are 4-5 times more frequent in women than men[9]. In present the female to male ratio is 6.1:1.

Out of 6 patients, having malignancy 2 patient (33.33%) had follicular carcinoma while 4 patients (66.66%) had papillary carcinoma. 2 patients were 55 years of age while 4 patients having papillary carcinoma were below the age of 30 years showing high incidence of papillary carcinoma in younger age group.

Thyroid scan is unable to distinguish benign nodules from malignant nodules[10]. In the present study, only 6 out of 50 cold nodules (12%) were malignant. USG has the advantage of differentiating cystic from solid lesions and also the fact that it is non-invasive and free from radiation[11]. In the present study, USG detected 9 lesions out of 50 (18%) as cystic. Five of these 9 patients (55.55%) were subjected to surgery and the nodules were proved cystic and benign. USG has no definite criteria to discriminate benign and malignant lesions[12].. It has been demonstrated that up-to 19-67% of the clinically solitary nodules are, in fact, multinodular on ultrasonography[13]. In the present study, 15 patients out of 50 (30%) having solitary nodules on physical examination were found to have multiple nodules on USG while thyroid isotope scan could detect multiple nodules in 7 patients (14%) due to the limited resolving capacity of the thyroid isotope scan[1].

With the help of FNAC, 4 patients (8%) were diagnosed as malignant, 8 patients (16%) had cytology indeterminate or suspicious for malignancy. However, all of the patients who did not show regression of nodules or who were symptomatic were subjected to surgery and histopathological examination. Diagnosis of carcinoma was confirmed in 6 cases out of 43 (13.95%).

In one study, diagnostic specificity of FNAC was 99% and diagnostic sensitivity and accuracy were 94.7% and 98.4% respectively. There were 1.2% false negative results while false positive results were found in 5%[14].

Kessler et al analysed 170 patients undergoing FNAC and had specificity of 98.5% while sensitivity and accuracy of 79% and 87% respectively[15]. Berner A and Pradhan in 2004 analysed 1770 patients, reported sensitively and specificity of 77.5% and 90.1% respectively. They reported 23.7% false negative and 1.2% false positive results[16].

In my study, the diagnostic specificity has been calculated to be 90%. The diagnostic sensitivity and accuracy were 100% and 92 % respectively. False positive results were 8% and no false negative results were seen.

FNAC is now the gold standard and is widely used in the management of thyroid nodules[17]. Because of its simplicity, excellent patient compliance and good histopathology correlation, the major use of FNAC is to reduce surgery and thus decrease morbidity in patients with benign nodules[5]. Its use has reduced the overall cost of medical care in these patients by 20%[18]. Ultrasound guidance dramatically reduces sampling error and significantly improves sensitivity, specificity, as well as overall diagnostic accuracy[19,20].

CONCLUSIONS

FNAC represents an economical, minimally invasive and a reliable method of providing tissue diagnosis and has become the first-choice investigation in the evaluation of solitary thyroid nodule, Pre-operative diagnosis can be followed by better treatment strategy.

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