Solitary Thyroid Nodule: Efficacy of FNAC in Diagnosing Malignancy and Various Surgical Modalities in Management

Sabu N. Satihal[1*], Eranna R. Palled[2#]

{[1]Assistant Professor, Department of Surgery} {[2]Assistant Professor, Department of Radio Diagnosis}

Belgaum Institute of Medical Sciences, Belgaum 590001 Karnataka, INDIA.

Corresponding Addresses:

[*]drsns558@yahoo.co.in, [#]drpalled_eranna@yahoo.com

Research Article

Abstract: **Introduction:** Thyroid nodule may present as an adenoma, cyst, toxic goiter, non-toxic goiter, malignacy, dominant nodule in the thyroid, Hashimotos thyroiditis. Hence preoperative diagnosis may help in the management. FNAC can be used as most efficient investigation to diagnose malignancy in patients with solitary thyroid nodule. And the diagnosis can be confirmed by the histopathological examination which is gold standard investigation. **Aims and objectives:** 1. To study the efficacy of diagnostic investigations and management of solitary nodule thyroid at KIMS, Hubli. 2. To study the various surgical modalities used in treatment and post operative complication. **Material and methods:** present study was conducted in department of surgery of KIMS, Hubli. By using a predefined inclusion and exclusion criterion 25 patients of solitary thyroid nodule were enrolled in the study. All details of patients including clinical findings were entered in the proforma. All the patients were subjected to FNAC. All the patients were managed by surgery. And Histopathological examination of the swelling was done. All patients were monitored post operatively for any complication. **Results:** 76% patients were from 20 -40 years of age group. 92% of patients were females. On FNAC 6 patients showed malignant changes. Whereas on histopathopathological examination malignancy was confirmed in 5 patients. Thus the sensitivity of FNAC was 100% and specificity was 95% in this study. All the patients were managed surgically. Hemi-thyroidectomy was the most common procedure was used to manage the patients with benign nodes. . Out of the six cases of malignancy diagnosed on FNAC two were follicular carcinoma and were managed by hemi-thyroidectomy. Whereas in two cases of papillary carcinoma total- thyroidedctomy was done. **Conclusion:** FNAC was the most sensitive and specific investigation to diagnose malignanacy in solitary thyroid nodule in this study. And patients with solitary nodule can be managed efficiently by surgery with minimum post operative surgical complications.

Keywords: Thyroid nodule, FNAC

Introduction

Solitary nodule of the thyroid is a common clinical entity though varying in incidence in different geographical regions. Often the swelling have been noticed accidentally by the patient or drawn to his / her attention by a family member, neighbour or friend. A Solitary thyroid nodule may become cosmetically distressing to a patient. The optimal management of a thyroid nodule continues to be a source of controversy and the operative intervention recommended by some physicians advocating either observation or thyroid suppression.[1] Thyroid nodule may present as an adenoma, cyst, toxic goiter, non-toxic goiter, malignacy, dominant nodule in the thyroid, Hashimotos thyroiditis. Hence preoperative diagnosis may help in the management.

This can be differentiated by FNAC and Histopathological examination.

- **Fine needle aspiration cytology[2,3]**

This technique promoted by **Karolinska institute in Sweden over 40** years has only recently gained wider acceptance. The accuracy and utility for fine needle aspiration biopsy of the thyroid are entirely dependent on the technical quality of the procedure. Data obtained from FNAC can be summarized in the 3 algorithms, serum TSH levels are measure in patients concomitant with FNAB to identify those patients who have smears which suggest a follicular neoplasm but who may instead, have a hot nodule.

Thyroid conditions diagnosed by FNAC are:

- Colloid goiter
- Thyroiditis
- Papillary carcinoma
- Medullay carcinoma
- anaplastic carcinoma
- lymphoma

Advantages of FNAC:

- Simple ,cost effective, quick
- OPD procedure, good patient compliance, early reporting
- Readily repeated if required
- In experienced hands , diagnostic accuracy is more than 90%
- Lesion as small as 0.5cm can be sampled

- The sensitivity of FNAC is 92% with specificity of 74%

Draw backs of FNAC:

- Require experienced pathologist.
- Can not differentiate follicular adenoma from follicular ca.
- **Trucut Large Needle Biopsy[4]:** This produces a core of tissue for histological examination.It has a high diagnostic accuracy but a poor patient compliance and may be associated with pain, bleeding, tracheal damage, and recurrent laryngeal nerve palsy.

Aims and Objectives

1. To study the efficacy of diagnostic investigations and management of solitary nodule thyroid at KIMS, Hubli
2. To study the various surgical modalities used in treatment and post operative complication.

Materials and method

The present study was conducted in the department of surgery at KIMS, Hubli. All the patients presenting with solitary thyroid nodule during **1st July 2003 to 30th June 2004** were enrolled in the study.

Inclusion criteria

- All patients admitted to surgical ward of KIMS, Hubli with solitary nodule of thyroid in all age group and both sexes.

Exclusion criteria

- All patients with thyroid swelling other than clinically diagnosed solitary nodule thyroid.
- Patients not willing to participate in the study.

Thus by using above mentioned inclusion and exclusion criterion total 25 patients were enrolled in the study in the above specified duration. All the patients were clinical examined and a note was made of all the clinically details such as age, sex, duration of symptoms, signs and symptoms suggestive of toxicosis and malignancy. After a clinical diagnosis of solitary thyroid nodule, FNAC was done for all the patients, making the cytological diagnosis. They were differentiated into the benign and malignant swellings and treatment was charted out accordingly. All the patients were taken up for surgery after basic investigations. Pre operative IDL was done for all patients to know the status of vocal cords before surgery. Postoperative status of the vocal cord was noted to confirm any recurrent laryngeal nerve injury. Thyroid function test and isotope scan is asked in few patients when altered function is suspected on clinical grounds. To get a uniformity of cases, the history, clinical features, investigations, operative procedures course was recorded in the **Proforma.** Post operative course of the patients was carefully noted till the patient was discharged; all the cases were called for follow up after a week in the OPD and later fortnightly then monthly for review. The histopathology report was obtained as the final diagnosis. Patient who needed revision surgery as and when indicated by the HPR were referred to **cancer hospital.**

Statistical tests

The statistical tests used in this study are the test of proportion and percentage.

Results

Table 1: Age and sexwise distribution of patients with solitary thyroid nodules

Variable		Cases (N=25)	%
Age	<20	1	4
	21-30	10	40
	31-40	9	36
	41-50	3	12
	>50	2	8
Sex	Male	2	8%
	Female	23	92%

Most of the patients were in their **3rd** decade and many others in the **4th** decade. The youngest was **14** years old and oldest was **70** years. There was a preponderance of females with thyroid nodules in this study with **F: M is 23:2**

Table 2: Distribution of patients according to histopathological report

Investigation		Cases	%
FNAC	Malignant	6	24
	Benign	19	76
HPR	Malignant	5	20
	Benign	20	80%

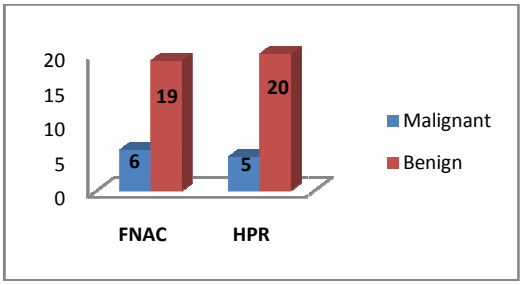

Figure 1: Distribution of patients according to FNAC and histopathological report

On FNAC most of the solitary nodules in this study were benign in nature 76% and 24% of cases were malignant in this study. On histopthological examination (which is the gold standard investigation) 20% lesions were malignant. Thus the incidence of malignancy in the patients with solitary nodule in present study was 20%.

Table 3: Efficacy of FNAC in diagnosing the malignant lesion

Investigation		Histopathological report		Total
		Malignant	Benign	
FNAC	Malignant	05	01	06
	Benign	00	19	19
Total		05	20	25

Sensitivity: 100%
Specificity: 95%.

It was observed that sensitivity of FNAC in diagnosing malignancy in solitary thyroid nodule was 100 and specificity was 95%.

Table 4: Surgical treatment as per diagnosis

Diagnosis	Hemi-thyroidectomy	Isthmusectomy	Subtotal thyroidectomy	Total thyroidectomy	Total
MNG	04	00	00	00	04
Benign nodules	10	00	00	00	10
Follicular adenoma	04	00	00	00	04
Papillary carcinoma	00	00	00	04	04
Follicular Carcinoma	02	00	00	00	02
Hashimotos thyroiditis	01	00	00	00	01
Total	21	00	00	04	25

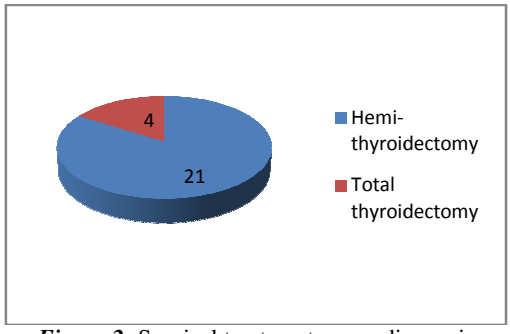

Figure 2: Surgical treatment as per diagnosis

All the benign lesions were managed by hemi-thyroidectomy. Out of the six cases of malignancy diagnosed on FNAC two were follicular carcinoma and were managed by hemi-thyroidectomy. Whereas in two cases of papillary carcinoma total- thyroidedctomy was done. All the benign cases were advised to come to the OPD for any complaints. All carcinoma patients were closely monitored and on any size of recurrence were referred to cancer hospital. There was no case of anaplastic or medullary carcinoma in this study. Very few patients turned up for long term follow up.

Table 5: Incidence of postoperative complications

Complications	Cases	%
Wound Infection	1	4%
Seroma	1	4%
Hoarseness of voice	-	-
No complications	23	92%

There were only 1 (4%) cases with wound infection and 1 patient (4%) with seroma. No other complications like tetany, hoarseness of voice, hemorrhage, thyroid crisis, RLN palsy etc was seen.

Discussion

In the present study the peak incidence of solitary thyroid nodule was observed between 20 to 40 years. Similar observations were reported by Fenn et al[5] and Bhansali et al[6] in their study. There was a preponderance of females (92%) with thyroid nodules in this study. Fenn et al[5] and Bhansali et al[6] also found female predominance in their study. All the patients were subjected were also subjected for histopathological examination. Out of 25 patients 5 were diagnosed malignancy on histopathological examination. Thus incidence of malignancy in the present study was 20%. Similar results were observed by Fenn et al[5] and Bhansali et al[6]. In the present study sensitivity of FNAC for diagnosing malignancy was 100% and specificity was 95%. Thus It was realized that FNAC as a sole diagnostic procedure which was sensitive. And also it was relatively a very safe type of procedure. Similar findings were also reported by H M Al-Sayer, Z H Krukowski, V M Williams, N A Matheson[7] and La Roas et al[3] All the 25 patients in this study underwent surgery. All the benign nodules underwent hemithyroidectomy. Out of the six cases of malignancy diagnosed on FNAC two were follicular carcinoma and were managed by hemi-thyroidectomy. Whereas in two cases of papillary carcinoma total- thyroidedctomy was done. A.S. Fenn et al[5] and L F Nagori et al[8] in their study stated that majority of the lesions were banign type and underwent hemi-thyroidectomy. It was observed that wound infection was observed in one case and seroma in one case. No ther complication such as tetany, hoarseness of voice, hemorrhage, thyroid crisis, RLN palsy etc was seen. Vocal cord palsy was reported by some authors. Fenn et al[5] (0.3%), Kapoor et al (0.6%) and Sinclair et al (5.2%) reported vocal cord palsy in their study. But no patients suffered vocal cord palsy in the present study post operatively.

Conclusion

Thus in the end we could conclude that FNAC was the most sensitive and specific investigation to diagnose malignanacy in solitary thyroid nodule in this study. We could also conclude that patients with solitary nodule can

be managed efficiently by surgery with minimum post operative surgical complications.

References

1. Das S. A manual of clinical surgery 3rd edn.
2. Woolner LB Beahrs oH et al: Classificaiton of prognosis of thyroid carcinoma. A study of 885 cases in 30 years period. AM J. Surg 1971;102;354
3. SA Abu Eshy et al : thyroid malignancy in multinodular goitre and solitary nodule: JR Coll Surg Edinb 40, October 1995 310-312.
4. Franklyn JA et al: Free needle aspiration cytology in diffuse or multinodular stogoitre compared with Solitary thyroid nodule. The birtis medical journal vol 307 J uly 1993m P-240
5. A.S. Fenn et al: Solitary nodules of the thyroid gland. A review of 342 cases. Indian Journal of surgery April 1950;p175-177.
6. S.K. Bhansali et al; Solitary nodule in the thyroid gland Indian journal of surgery September 1982.
7. H M Al-Sayer, Z H Krukowski, V M Williams, N A Matheson. FNAC in isolated thyroid swelling: prospective 2 year evaluation. British Medical Journal. 1985; 290: 1490-92.
8. LF Nagori et al: Solitary thyroid nodule. Indian Journal of surgery (1992), 54(2);75-78.