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A Prospective Clinical Study Diagnosis and Management of Solitary Thyroid Nodule

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Abstract:
Background: *Clinically solitary thyroid nodule may be defined as a goitre which on clinical examination appears to be a single nodule in an otherwise normal gland. In reality, solitary thyroid nodule is not a single disease process but a constellation of processes encountered in a variety of clinical diseases such as dominant nodule of a multi nodular goitre, true adenoma, malignancy, thyroiditis and cyst.*
Aim: *1. To study the epidemiology, different clinical and pathological types of presentations in solitary thyroid nodule. 2. To study the management of solitary thyroid nodule.*
Material and Method: *The study material consisted of 56 cases of solitary thyroid nodule who were admitted in General Surgery wards at SVRR Govt. General Hospital, Tirupati.*
Results: *In this study, solitary thyroid nodule was more common in females and in the third and fourth decades of life. While FNAC revealed 87.5% of cases to be benign, histopathological examination revealed only 76.78% of cases to be benign and rest were reported as malignant.*
Keywords: *Hemithyroidectomy, Malignancy, Solitary thyroid nodule, Thyroiditis.*

I. Introduction

Solitary thyroid nodule is a common way of presentation of thyroid disease. Solitary nodule in the thyroid has aroused interest of the thyroidologist since the time Warren H. Cole (1949) [1] by his study concluded that the incidence of malignancy is higher in solitary nodule when compared with that of multi nodular goitre. Clincally solitary thyroid nodule may be defined as a goitre which on clinical examination appears to be a single nodule in an otherwise normal gland [2]. In reality, solitary thyroid nodule is not a single disease process but a constellation of processes encountered in a variety of clinical diseases such as dominant nodule of a multi nodular goitre, true adenoma, malignancy, thyroiditis and cyst.

Aim of Study : To study the epidemiology, different clinical and pathological types of presentations in solitary thyroid nodule.

- To study the management of solitary thyroid nodule.

II. Material And Methodology

The study material consisted of 56 cases diagnosed clinically as solitary thyroid nodules who were evaluated and treated in SVRR Govt. General Hospital, Tirupati attached to S.V. Medical College, Tirupati. This was a prospective study. For the purpose of inclusion in this study, a solitary thyroid nodule was defined as a single palpable swelling involving either lobe or isthmus of thyroid gland. Thyroglossal cysts were excluded from the study. Histopathological reports of all the operated solitary thyroid nodules were analyzed at Dept. of Pathology of S.V. Medical College. A detailed study of 12 cases of solitary thyroid nodule was done included the management part also. The investigations done included complete haemogram, urine analysis, thyroid function tests, fine needle aspiration cytology, indirect laryngoscopy, Xray Chest & Neck, thyroid scan and ECG. A detailed study of histopathological examination of all cases was done and was compared with other studies.

III. Observations And Results

Table 1: Age and Sex wise Incidence of Solitary Thyroid Nodule and Malignancy

Age Group in Years	Females	Males	Total
11-20	3	0	3
21-30	27 (3)	0	27
31-40	18 (1)	1	19
41-50	1 (1)	3 (1)	4
51-60	1	2 (1)	3
Total	50	6	56

(Figures in parenthesis denote the number of patients with carcinoma)

In this study 50 patients were females (89.2%) and 6 patients (10.7%) were males indicating that majority of the patients were females. The peak age incidence was in the third and fourth decades of life. While the youngest patient was a 17 year old girl, the oldest patient was 60 years old woman. Although female patients outnumbered the males in this study, the incidence of carcinoma in male patients is much higher i.e., 4 times more than in female patients. The incidence of malignancy in females was 8% whereas in males it was 33.33%.

Table 2 Modes of Presentation

Modes of Presentation	Total : 56	Percentage
Swelling in the Thyroid Region	56	100.00
Sudden Increase in Size	2	3.50
Pain	4	7.14
Change in Voice	3	5.35
Discomfort on Swallowing	3	5.35
Euthyroid	55	98.20
Hyperthyroidism	1	1.70
Cervical Lymphadenopathy	2	3.50

In this study while all the patients had swelling in the thyroid region, the other most common complaints were pain (7.14%), change in voice (5.35%) and discomfort in swallowing (5.35%). Majority of the patients (98.2%) were euthyroid. Cervical lymphadenopathy was seen in 3.5% of patients. All the cases of both benign and malignant solitary thyroid nodules presented with swelling infront of the neck. A history of sudden increase in size as well as change in voice amounting to hoarseness or deepening of voice is common but not exclusive to malignant nodules. Most of the patients in younger age groups i.e., below 30 years have no other symptoms except swelling and sought advice for disfigurement.

Table 3 Duration of Symptoms

Duration	No. of Cases	Percentage
1-3 Months	1	1.78%
3-6 Months	9	16.07%
6-12 Months	15	26.78%
1-2 Years	21	37.50%
2-5 Years	8	14.28%
5-10 Years	2	3.57%

There is no difference between benign and malignant nodules with respect to duration of symptoms which varied from few months to several years. There are 2 cases of malignant nodules with a history of more than one year. In this study the nodules were more frequently seen on right side. Size and consistency varied from case to case. Smallest nodule was 2*2.5 cms in size while the biggest one was 7.5*10 cms.

Regarding the consistency of nodules, 43 nodules (76.78%) were firm, 10 nodules (17.85%) were soft while 3 nodules (5.35%) were hard. Preoperative indirect laryngoscopy was done in all cases and only one of them revealed recurrent laryngeal nerve palsy on right side which later proved to be malignant.

FNAC was done in all cases and the results were correlated with histopathological reports after surgery.

Table 4 FNAC Reports

Cytology Report	No. of Cases	Percentage
Malignancy	4	7.14%
Suspicious of Malignancy	3	5.35%
Follicular Adenoma	43	76.78%
Cystic	4	7.14%
Hashimato's	2	3.57%

In this study, 4 cases of nodules were found to be cystic and on aspiration, the aspirate cytology revealed no malignancy. So all of them were diagnosed as benign nodules. There were no false positive reports of malignancy on FNAC. The nodules which were malignant on FNAC were proved to be malignant later. FNAC could not differentiate the well differentiated follicular adenocarcinoma from follicular adenoma accurately as the malignancy is often determined by the capsular or vascular invasion on HPE.

Table 5 Histopathological Examination Reports

HPE Reports	No. of Cases	Percentage
Follicular Adenoma	40	71.42%
Adenomatous Goitre/ Colloid Goitre	5	8.92%
Hashimoto's Thyroiditis	4	7.14%

Malignancy	7	12.50%

In this study, 40 cases (71.42%) were follicular adenomas, 5 cases (8.92%) were adenomatous goiters/ colloid goiters, 4 cases (7.14%) were found to be hashimoto's thyroiditis and 7 nodules (12.50%) were found to be malignant. Among the 7 cases of malignancy, 2 patients were males and 5 patients were female. Papillary carcinoma was present in 4 patients and follicular carcinoma was diagnosed in 3 patients. Papillary carcinoma is least malignant of all and has got relatively good prognosis.

Among the 12 cases which were studied in a detailed manner, follicular adenoma was diagnosed in 5 patients, adenomatous goitre in 4 patients, Hashimoto's thyroiditis in 1 patient and malignancy in 2 patients. Initially all the patients underwent hemithyroidectomy. Later after receiving the histopathology reports the patients who had malignancy were advised to undergo near total thyroidectomy.

All the patients who had benign solitary thyroid nodules underwent hemithyroidectomy. Postoperatively all the patients were prescribed tablet Thyroxin. All the patients in this study had uneventful postoperative period.

IV. Discussion

In the present prospective clinico pathological study of solitary nodule of thyroid, female patients outnumbered the males. But the incidence of malignancy was 3 times more common in males than in females leading to the conclusion that solitary thyroid nodule in men must be viewed with great suspicion. In males, the malignancy occurred in older age groups and in females it occurred in relatively younger age groups.

Duration of symptoms gave no clue as to the nature of nodule. Patients with malignant nodules had a history of more than 2 years while a number of patients with benign nodules had noticed them only shortly before presentation. Similarly little difference was noted in the mode of presentation of the two entities. Functionally most patients were in euthyroid state. Nodules which were found to be cystic proved to be benign on HPE. The malignancy reported in cystic nodules is only 2 to 3% in literature whereas, 16.66% of solid nodules are malignant. FNAC is an accurate tool in diagnosing malignant nodules as it gives no false positive results regarding malignancy. FNAC will not differentiate follicular adenoma from follicular carcinoma because in FNAC, capsular invasion and vascular invasion cannot be diagnosed.

Ultrasound revealed that 73.45% of the swellings in this study to be solid ones and 26.55% to be cystic.

In this study all the patients with solitary thyroid nodules underwent hemithyroidectomy and specimen was sent for HPE. If HPE report showed evidence of malignancy, the patients were later treated with completion thyroidectomy. Patients with papillary carcinoma should be given large doses of thyroid hormones post operatively as these carcinomas are TSH dependent. Follicular adenomas are better excised early as all the tests including FNAC can fail to determine its nature as excision biopsy alone gives the diagnosis with certainty. The incidence of malignancy in solitary thyroid nodules as reported in the literature ranges from 5 to 30% [3] [4] [5] [6]. When compared to 12.5% in our study.

V. Conclusion

The total of 56 cases of solitary thyroid nodules were admitted, evaluated and treated in this study and the following conclusions were drawn.

1. The most of the patients in this study were in their 3rd and 4th decades of life.
2. All the cases, both benign and malignant nodules presented with swelling in the anterior aspect of the neck.
3. Most of the patients who were below 30 years of age had no other symptoms except swelling and sought advice for disfigurement.
4. Most of the nodules were present on right side. Size and consistency varied from case to case. Tracheal deviation was not seen in any patient.
5. FNAC revealed 87.5% of cases to be benign.
6. Ultrasound examination showed 26.65% of nodules to be cystic.
7. Histopathology showed 76.78% of nodules to be benign and 12.5% to be malignant.

All the cases were followed up after surgery for recurrence due to missed nodules, uncontrolled hypothyroidism and for development of malignancy in thyroid remnant.

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