



STUDY OF INCIDENCE OF MALIGNANCY AND ITS MANAGEMENT IN 50 CASES OF SOLITARY THYROID NODULE: A CASE SERIES

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ABSTRACT

Solitary thyroid nodule is defined as a single palpable nodule that is detected clinically in an otherwise normal thyroid gland. Though it is a common entity observed in the clinics, it has still managed to arouse a lot of interest among physicians and surgeons. The wide spectrum of its presentation and varied management owing to different pathological diagnosis and clinical picture makes it vital to update the knowledge in terms of its prevalence and outcome. Solitary thyroid nodule in particular has always been a topic of controversy as clinicians have divergent opinions regarding surgical management. This necessitates the purpose of review studies to narrow down the varied opinions. In this study, 50 cases of solitary thyroid nodule were included prospectively by random sampling and incidence of malignancy was determined along with other factors such as age, sex, site, size, clinical features, investigations and histopathology.

Objectives

1. To determine the incidence of solitary thyroid nodule in relation to age and sex
2. To determine the incidence of solitary nodule of thyroid turning out to be multinodular goitre
3. To study the incidence of euthyroid, hyperthyroid or hypothyroid states in patients presenting with solitary nodule of thyroid
4. To study the role of FNAC in the management of solitary nodule of thyroid
5. To determine the incidence of malignancy in solitary thyroid nodule

Materials and Methods

The present study on "Clinical Study of Solitary Nodule of Thyroid" has been conducted in a tertiary care center over a period of 18 months from January 2013 to July 2014 with a follow up of 1 year i.e. upto July 2015. Prospective analysis of 50 cases of solitary nodule of thyroid in the specified period was done. These cases were selected by random sampling method and studied in detail clinically and recorded. Routine investigations and specific investigations including Fine Needle Aspiration Cytology of the nodule, Thyroid profile, Indirect Laryngoscopy, Plain X-ray neck were done in all cases. Special investigations like radio isotope scanning was done in few cases where indicated. All the patients were managed by surgery and diagnosis was confirmed by histopathology examination. The patients were grouped according to different variables like age, sex, size of nodule, site of nodule, functional thyroid status, FNAC reports and histopathology reports, then analyzed and compared with the previous similar studies conducted elsewhere.

Inclusion Criteria

- All patients admitted for solitary thyroid nodule were included in this study.
- Patients diagnosed as multinodular goitre on ultrasonography, however, solitary nodule on clinical examination, were included in the study.
- Patients with recurrence who have been operated previously for a benign thyroid nodule in past (proven on HPE)

Exclusion Criteria

- All patients with multiple nodules on clinical examination were excluded from the study.
- Patients presenting with recurrence of nodule who have been operated previously for thyroid malignancy.
- Patients with recurrence of nodule with no HPE report available from previous surgery.

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INTRODUCTION

Since the time of Warren H Cole (1949) and his study that concluded a higher incidence of malignancy in solitary thyroid

nodule when compared with multinodular goiter, it has aroused a deep found interest of clinicians and surgeons.¹ Thyroid nodules are very common entities, though varying in the incidence in different geographical regions², the prevalence

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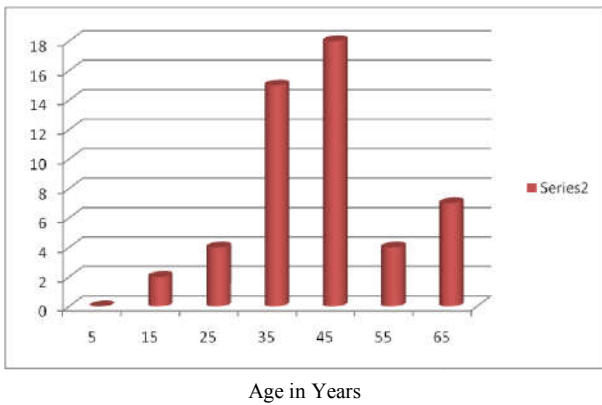
of palpable nodules in the general population is 4.7%. Solitary nodules of thyroid are about four times more common in women than in men. Overall incidence of malignancy in solitary thyroid nodule ranges from 10-30%.³ A single nodule in the thyroid is a definite clinical entity with important pathological significance. When considering the ‘solitariness’ of the nodule, it is necessary to consider the status of opposite lobe. Ignoring palpation of the opposite lobe is likely to lead to a higher incidence of solitary thyroid nodule turning out to be multinodular goitre. The usual presentation of a thyroid nodule is an asymptomatic swelling that is discovered by either the patient or the clinician. Nodules of at least 0.5cm to 1 cm can usually be detected by palpation.⁴ The thyroid nodule has been a subject of vigorous controversy with divergent opinions expressed by those who had wide experience in this field. The optimal management of thyroid nodule continues to be a course of controversy and the operative intervention recommended by most of surgeons is not always considered divine by some physicians advocating either observation or suppression.⁵ The importance of discrete swelling lies in the risk of neoplasm compared with other thyroid swellings.

RESULTS

Total of 50 cases of solitary nodule of thyroid were studied and following conclusion was drawn:

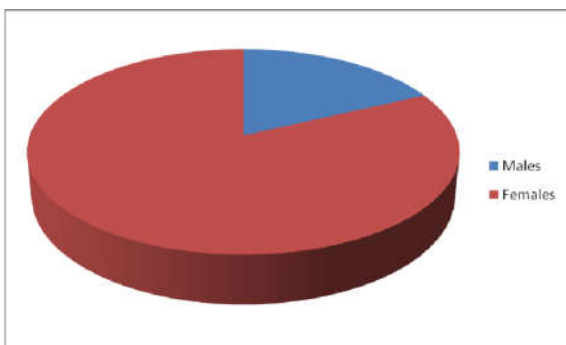
Age Incidence

The age of patients ranges from 18 years to 65 years, with peak incidence being in 3rd to 5th decade. The mean age of presentation is 42.8 years. Cases in the 3rd to 5th decades constitute 74% of the cases studied.



Sex Incidence

Solitary thyroid nodules are much more common in females. Out of 50 cases studied, 41 were females and 9 were males, and the ratio comes to M: F = 1 : 4.55 . Also the malignant nodules are common in females. Out of 6 cases of malignancy in the study, 4 were females and 2 were males.

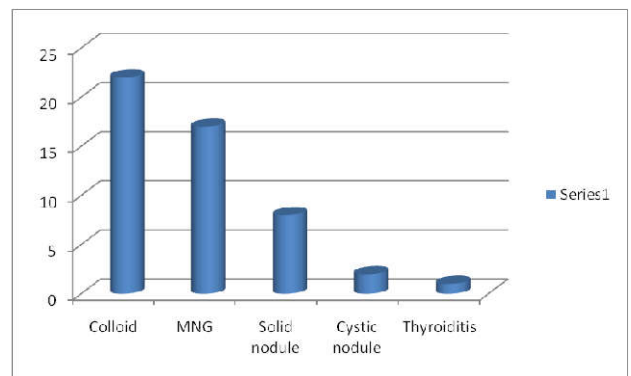


Clinical Features

All the cases in present study presented with complaint of swelling in the region of thyroid (neck swellings). Only few patients presented with pain, discomfort and dysphagia. All the mentioned additional symptoms were of mild degree. Out of 50 cases, 4 cases had pain, 2 cases had discomfort, and another 1 had dysphagia. Two patients had lymphadenopathy which was confirmed on ultrasonographic examination. 4 patients had symptoms of thyrotoxicosis and one had features of hypothyroidism. Rest of the patients were euthyroid on thyroid profile as well as clinically.

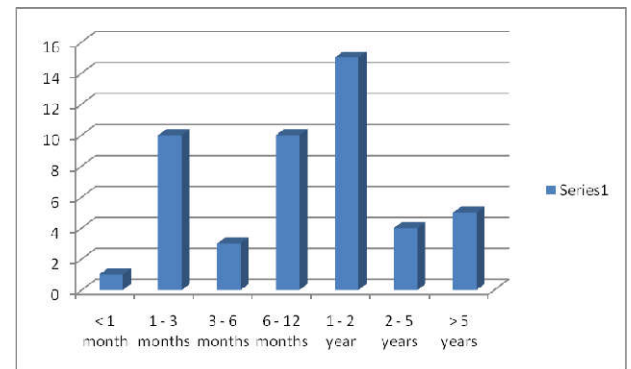
Ultrasonography

On Ultrasonography, 22 cases were reported as colloid nodule, 17 cases of solitary nodule diagnosed clinically turned out to be MNG, 8 cases were reported as solid nodule, 2 cases as colloid cyst and 1 case as thyroiditis.



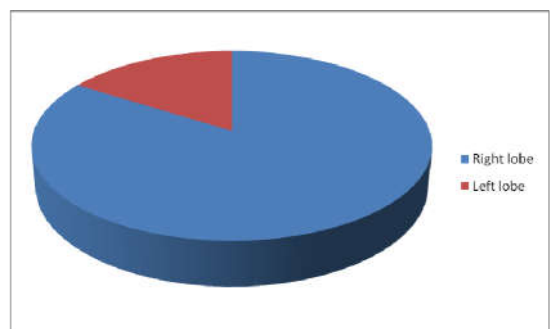
Duration of symptoms

In our study, the duration of symptoms varied from 1 month to 10 years.



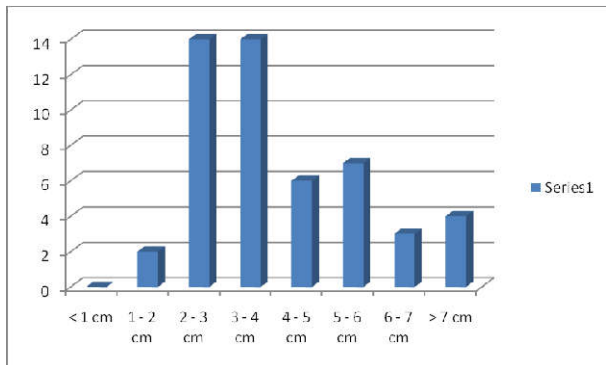
Site of the Nodule

Out of the 50 cases studied, 42cases presented with nodule in the right lobe of the thyroid gland, and the remainder 8 case presented with nodule in the left lobe of thyroid gland.



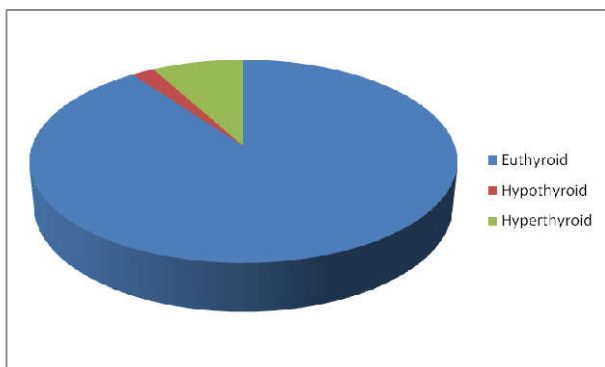
Size of the Nodule

In the present study, on clinical examination the size of the nodule, in its largest dimension, varied from 2cm to 16 cm. Most of the patients presented with the size of about 2 to 5 cm in the study. As such, there is no correlation between the size of the nodule and the occurrence of malignancy.



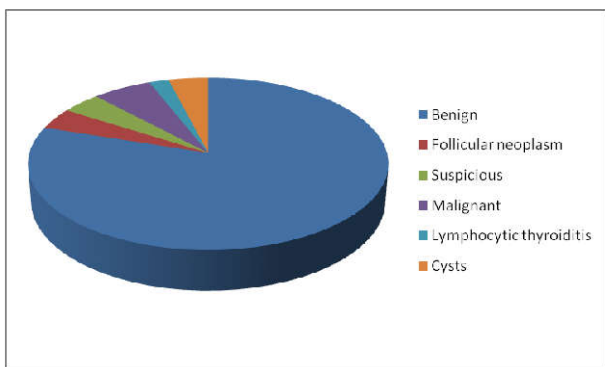
Thyroid Function Test

Out of 50 cases, 4 presented with thyrotoxicosis, 1 with hypothyroidism, and rest all were in euthyroid states. Patients with thyrotoxicosis were made euthyroid using antithyroid drugs. Patients with hypothyroidism were treated with thyroxine. Once they were euthyroid, they were taken for surgery.



Fnac Reports

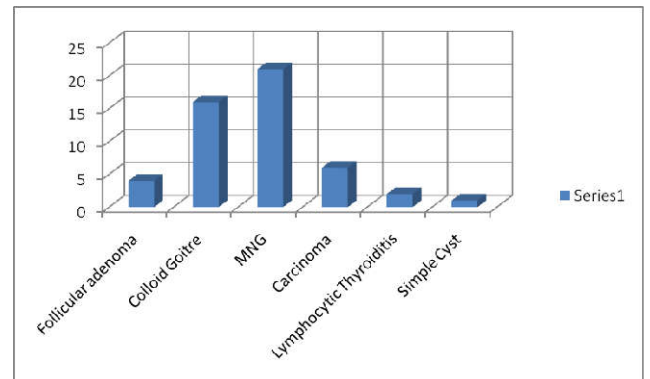
Fine Needle Aspiration Cytology is the most important investigation in the evaluation of solitary node of thyroid. All 50 cases were subjected to FNAC during the course of evaluation. FNAC reports are categorized mainly into six categories - Benign, follicular neoplasm, suspicious of malignancy, malignancy, lymphocytic thyroiditis, cysts.



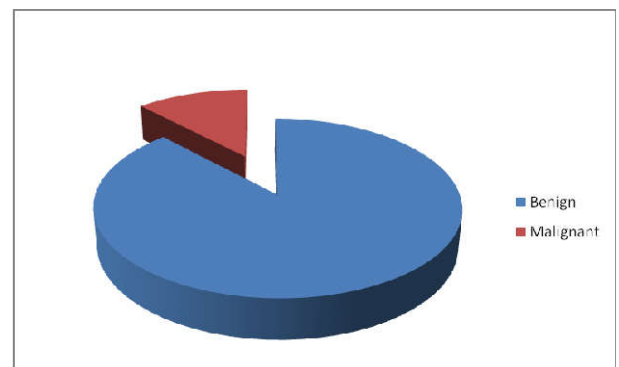
Aetiological Incidence of Solitary Nodule of Thyroid

Out of the 50 cases studied, common causes of solitary nodule are, colloid goitre, multinodular goitre, follicular adenoma, and

adenomatous goitre, the most common being multinodular goitre which constitutes about 42% of the cases. Follicular adenoma and adenomatous goitre account for 8% and 32% cases respectively. Out of 50 cases 6 were malignant, 3 cases of papillary, 2 cases of follicular and 1 case of medullary carcinoma.

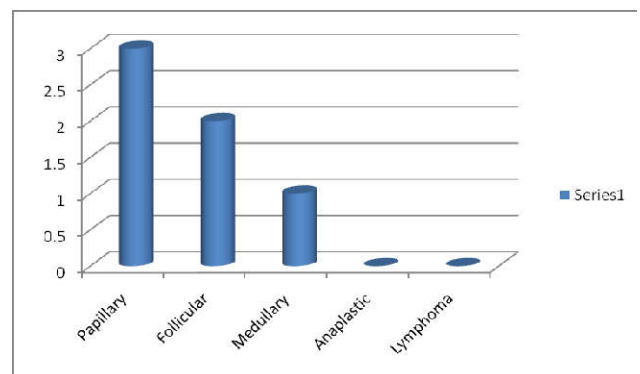


Histopathology report From the study, the incidence of malignancy in solitary nodule of thyroid is 12.0%



Type of carcinoma

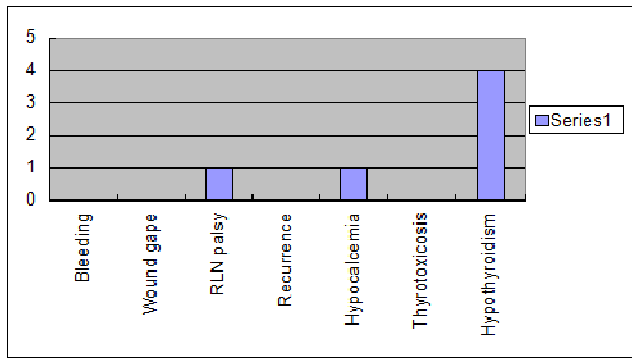
From the study, out of 6 cases of carcinoma, 3 were papillary, 2 were follicular, 1 was medullary and no cases of anaplastic or lymphoma. Papillary carcinoma accounts for 50% and follicular carcinoma account for 33% of the cases found out to be malignant.



Post op Complications

In the study, negligible complications were reported. No cases of post op bleeding or wound gape. No recurrences in any of the operated cases were noted in 1 year of follow up. Preoperatively hyperthyroid patients were euthyroid on follow up evaluation after thyroidectomy. None of them developed hyperthyroid features in post op period. One patient developed hypocalcemia after total thyroidectomy and was managed with intravenous calcium gluconate and oral calcium later. One patient developed hoarseness of voice after total

thyroidectomy.



DISCUSSION

The observation and results of the present study were compared with the available previous similar studies.

Mean age at Presentation

In the present study, the mean age at presentation was found to be 42.8 years, which correlates with the previous studies and the peak incidence was found to be in 3rd to 5th decades, which constitute about 66% of the cases studied.

Authors	Mean age in years
Das DK (1999) ⁶	35
Talepoor M (2005) ⁷	38.6
Quari F (2005) ⁸	36.7
REHMAN AU (2009) ⁹	34.7
Khurshid Anwar (2012) ¹⁰	37
Present Study	42.8

Sex Distribution

In the present study, it was found to be 1:4.55, which correlates with previous studies. Because of periods of fluctuations in the demands of the hormonal requirements in females in their life cycle (puberty, menstrual cycle, pregnancy, menopause), the chances of thyroid nodule formation are very high as compared with male counterparts.

Authors	Sex distribution
Dorairajan (1996) ¹¹	1:9
Das DK (1999) ⁶	1:5.39
Gupta C (2001) ¹²	1:5
Present Study	1:4.55

Clinical Features

In the present study, 78% patients presented with swelling in the anterior part of neck as the only complaint. 8% patients presented with pain, 2% patients with dyspnoea and 8% patients had features of hyperthyroidism. Approximately 2% patients presented with features of hypothyroidism.

Duration of Symptoms

Patients with thyroid swelling often present with a painless swelling. So, the time of presentation is varied among different groups and class of people. Some present as early as they notice the swelling, while others present only after they some other associated symptom such as pain, dysphagia, dyspnoea, toxic features, etc. In the present study, most of the patients presented between 6 months to 2 years of the disease course. 50% patients presented with a history of swelling for the past 6 months to 2 years. 28 % presented in the first 6 months, 8%

presented between 2 years to 5 years and 10% presented after 5 years of disease course.

Site of Nodule

In the present study, 84% patients presented with a swelling in the right lobe of thyroid gland and rest 16% with swelling in the left lobe. No cases of isolated isthmus swelling or pyramidal lobe enlargement were seen. Right lobe nodules are far more common than left lobe nodule.

Thyroid Function Test

Most often the first symptom of thyroid cancer is a nodule in the thyroid region of the neck. Thyroid cancer is usually found in a euthyroid patient, but symptoms of hyperthyroidism or hypothyroidism may be associated with a large or metastatic well-differentiated tumor.¹³

Ultrasonography

On Ultrasonography, 22 cases were reported as colloid nodule, 17 cases of solitary nodule diagnosed clinically turned out to be MNG, 8 cases were reported as solid nodule, 2 cases as colloid cyst and 1 case as thyroiditis.

Distribution of Non-Neoplastic and Neoplastic Lesions Diagnosed by Fnac

In the present study, neoplastic conditions include adenomas and all malignant lesions. From the study, the ratio of non-neoplastic cases is about 6.14: 1, which is comparable to the studies done earlier. On FNAC 3 cases were found to be malignant, all of which turned out to be papillary carcinoma. Two cases were found to be follicular, one turned out to be follicular carcinoma and the other was follicular adenoma. Two cases were found to be suspicious of malignancy, one of it was medullary carcinoma and the other was benign.

Authors	Non-neoplastic	Neoplastic	Ratio
Sarda AK (1997) ¹⁴	487	59	8.25:1
Das DK (1999) ⁶	346	85	4.07:1
Karur (2002) ¹⁵	32	15	2.13:1
Talepoor M (2005) ⁷	325	70	4.33:1
Nagada (2006) ¹⁶	51	18	2.83:1
Present Study	43	7	6.14:1

Aetiological Incidence (in Percentage)

From the present study, the commonest cause of solitary thyroid nodule is MNG (42%), comparable with the studies done previously. Other common causes are adenomatous goitre (38%) and follicular adenoma (8%), malignancy (12%). Hence, out of 50 cases diagnosed as solitary thyroid nodule clinically, 21 cases i.e. 42% of the cases turned out to be multinodular goitre on ultrasonography and histopathology.

Series	Mng	Adenoma	Carcinoma	Others	Total no of cases
Ananth Krishnan (1983) ¹⁷	12	47	2	2	104
Bhansali (1982) ¹⁸	71	20	9	-	449
Fenn (1980) ¹⁹	22	55	12	11	342
Kapur (1982) ²⁰	28	50	11	11	221
Present Series	21	4	6	19	50

Incidence of Carcinoma

Literature states that the malignancy in thyroid nodule ranges from 5% to 30%. In the present study, the incidence was found to be 12.0%, which is comparable with the study done previously. The most common type of thyroid malignancy is papillary carcinoma (50%), followed by follicular carcinoma

(33%) with very low incidence of medullary, anaplastic and lymphoma.

Study	Year	Percentage
A S Fenn et al ¹⁸	1980	12.0%
Bhansali S K ¹⁷	1982	9.0%
Kapur et al ¹⁹	1982	11.0%
Wagana et al ²¹	2002	16%
Rehman A U ⁹	2009	11.47%
Present Study	2013	12.0%

CONCLUSION

The present study is a prospective analysis of 50 cases of solitary thyroid nodule of thyroid, admitted at a tertiary care center, during the period of January 2013 to July 2014. Based on the data and results of the study, following conclusions can be drawn:

- Solitary Thyroid nodule is more common in females.
- Solitary nodule of thyroid is more common in the age group of 30-50years.
- Most of the patients with solitary nodule of thyroid present with swelling alone.
- Most of the patients of solitary nodule of thyroid are in euthyroid state and only few present with toxicity and hypothyroidism.
- Incidence of malignancy in male patients presenting with solitary nodule of thyroid is more when compared to the female patients presenting with the same. Commonest cause of solitary nodule of thyroid is multinodular goiter (66%).
- USG can be used to detect multinodular goitre in patients presenting with solitary nodule of thyroid.
- FNAC is the investigation of choice in the evaluation of solitary nodule of thyroid. It has few pitfalls. In such situations, only histopathology can confirm the exact pathology. It detects papillary carcinoma in a solitary thyroid nodule with high sensitivity and specificity
- Papillary carcinoma is the most common malignancy of thyroid, followed by follicular carcinoma.
- Commonest surgery performed in cases of solitary thyroid nodule is Hemithyroidectomy (64%), followed by Subtotal Thyroidectomy (26%).
- All patients are asymptomatic with no cases of recurrence after 1 year of follow-up.

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