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A Clinicopathological Study and the Incidence of Malignancy In A Solitary Thyroid Nodule

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Abstract

Background

Solitary thyroid lesions are a common presentation in the surgical OPD. The significance of solitary nodule is of its malignant potential. Over all the reported rate of malignancy is 8-12%, even increasing further up to 18 to 20%. Early diagnosis and prompt treatment cures the patient since thyroid carcinoma is most curable among all cancers.

Methods

We reviewed a total of 245 cases with thyroid lesions from medical records of our hospital that underwent appropriate treatment from January 2012- December 2017. Out of these 245 cases 97 cases were diagnosed as solitary thyroid nodule (STN). Apart from routine investigations, thyroid functional status was assessed. All the patients underwent USG, FNAC of the nodule preoperatively. Hemi-thyroidectomy and /or total thyroidectomy was done and modified radical neck dissection was done wherever it was indicated.

Results:

Out of the total 97 STN patients 16 were males, 81 were females. Right lobe was more commonly involved than the left lobe. 11 cases reported as malignant, out of these, 3 were males, 8 were females. 7 cases reported as papillary carcinoma and 4 follicular thyroid carcinoma.

Conclusion*:*

Solitary nodule is viewed with suspicion because of its malignant potential and needs thorough evaluation and proper treatment to achieve good survival rate. In our case, the incidence of malignancy is found as11.34%, however the reported rate of malignancy is variable from region to region.

Key Words: *Fine needle aspiration cytology – FNAC, Follicular thyroid carcinoma – FTC, Papillary thyroid carcinoma – PTC, Ultrasonography – USG, solitary thyroid nodule - STN.*

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I. Introduction

A solitary nodule in the thyroid evokes special interest to both surgeons and pathologists since it signifies the possibility of being malignant. It needs thorough investigation to rule out the possibility of malignancy and demands appropriate treatment expeditiously. The prevalence of STN in the literature is 12.2%\ [1]. The incidence increases as age advances. The reported incidence of malignancy in clinically detected solitary thyroid nodule (SNT) varies between 8-14% in various studies available in the literature and may have regional variations. Some authors reported incidence of 5-8% and even less than 5% [2, 3]. The consistency of the SNT with malignant potential can be firm or hard. Fixed nodule with palpable lymph nodes goes in favour of malignancy. USG findings of the nodule being taller than the width, presence of micro calcifications with increased intra nodular vascularity goes strongly in favour of it being malignant. FNAC is the initial diagnostic procedure choice having 85% of specificity and sensitivity of 100% [2, 4]. In indeterminate cases USG guided FNAC will help to further improve the diagnosis. However FNAC is inconclusive in case of follicular lesions since malignancy is ascertained only on the basis of vascular and capsular invasion by histological section after excision biopsy by means of hemi thyroidectomy. In Papillary thyroid carcinoma (PTC), total thyroidectomy is the treatment of choice along with lymph node dissection when lymph nodes are palpable. If FNAC is reported as follicular neoplasm, initially hemi thyroidectomy is required to be done, followed by completion thyroidectomy if indicated, depending on size and grading of the malignant lesion, age of the patient and extent of the tumour with capsular invasion. Prognosis in FTC is poor when compare to PTC, however the prognosis on either case is worse when patient presenting with metastatic disease at the time of presentation.

II. Materials And Methods

It is a retrospective/prospective study for five years, conducted from January 2012- December 2017, in the department of general surgery, MediCiti Institute of Medical Sciences, a tertiary care medical college hospital in Telangana state, in south India. All the patients presenting to the surgical outpatient department with clinically appearing SNT were taken in to the study group. Rest of the thyroid lesions were excluded from our study. The aims of our study were to assess the demographic variables of the patients, the modes of presentation, and pathological types of thyroid lesions and to find out the incidence of malignancies. The study was approved by ethics committee of our institution.

The data of the patients regarding age, gender, history of any pressure symptoms, history of radiation exposure and family history of thyroid disease were recorded. Solitary status of the thyroid nodule was confirmed by USG initially, followed FNAC. Tech 99^{m} isotope scan was done in patient presenting with hyper functioning nodule. Surgery was planed as per the results of USG, FNAC and isotope scan.

III. Results

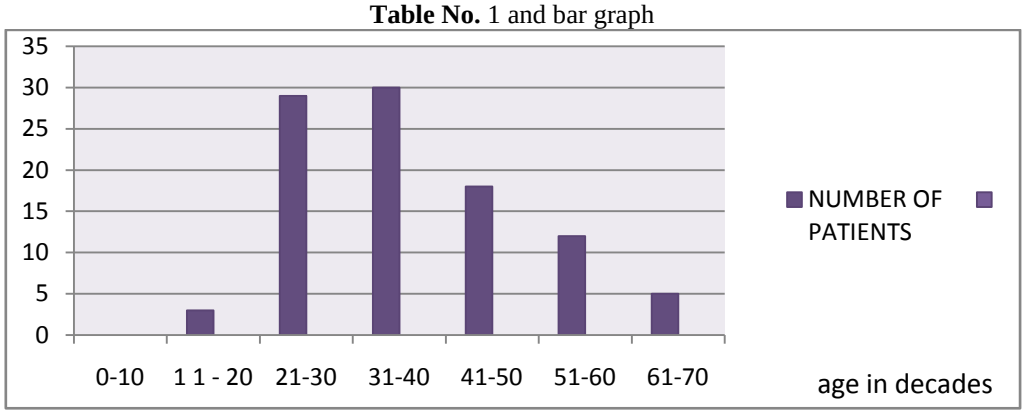
During the 5 year study period, a total of 245 patients with thyroid swellings were admitted in the Department of surgery, of which 97 (39.59%) cases were clinically diagnosed as STN. As per our observation STN is most common among all other thyroid lesions. Out of 97 cases 87 cases were in euthyroid state, 2 were toxic nodules and 8 were presented with hypothyroid status.

Age distribution of patients with STN revealed it is more common in the 4^{th} decade followed by 3^{rd} and 5^{th} decades (see table 1). Sex incidence showed strong female preponderance. Out of 97 patients, females were 81 (83.50 %) and males were 16 (16.49%) and male and female ratio was 1:5.06.

N=97

Age in decades	0-10	11-20	21-30	31-40	41-50	51-60	60-70
No. of patients	0	03	29	30	18	12	05

Table No. 1 and bar graph



The neck swelling is the most common presentation. Right lobe was commonly involved *n*52 (53.60%) than the left lobe *n*45 (46.39%). The size of the nodule measured varied from 2-7 cm in the study. However the size of the nodule did not have any significance as per incidence of malignancy is concerned. *Pain* was a symptom in 4 cases but none of them detected to have malignancy. Pain was observed in each case of Hoshimotos thyroiditis, multi nodular goitre, colloid goitre and thyroid cyst in the study. *Pressure symptoms* observed in our study group were, dysphagia in 4 cases, difficulty in respiration in 3 cases, voice change in 7 cases. But none of these symptoms correlated with the malignancy or any other specific pathology in our study.

Investigation of the functional status of thyroid revealed 87 cases were in euthyroid state, 8 were in hypothyroid state and 2 were in hyperthyroid state. USG of the thyroid was done in all the cases to confirm solitary status of the nodule and whether the lesion is solid or cystic. Out of 97 clinically STN cases, 81 were confirmed as STN and 16 cases turned out as multi nodular goitre (MNG). 9 cases reported as cystic lesions. Micro calcification was not found on USG in any of the eleven malignant lesions in the study. 44 cases reported as follicular neoplasms on FNAC, out of which only 4 turned out as follicular carcinoma. All the 7 cases of papillary carcinomas were diagnosed correctly by FNAC.

Histological findings: Adenoma was the most common histological lesion in a solitary nodule followed by multi nodular goitre and malignant neoplasms. Out of 97 STN cases 11(11.34%) cases reported as malignant, papillary carcinoma was the most common followed by follicular carcinoma (see table 2). Out of 11 malignancies 7 (7. 21%) reported as papillary carcinoma and 4 (4.12%) reported as follicular carcinoma. Among

the 11 malignant cases 8 (72.72) were females and 3 (27.27) were males, indicating thyroid carcinoma is more common in females than the males.

N 97

	Type of lesion	n	%
1	Adenomas	40	41.23
2	Multi nodular goitre	27	27,83
3	Simple cysts	09	09.27
4	Colloid goitre	05	05.15
5	Hoshimoto thyroiditis	03	03.09
6	Hurthle cell adenoma	02	02.06
7	Papillary carcinoma	07	07.21
8	Follicular carcinoma	04	04.12

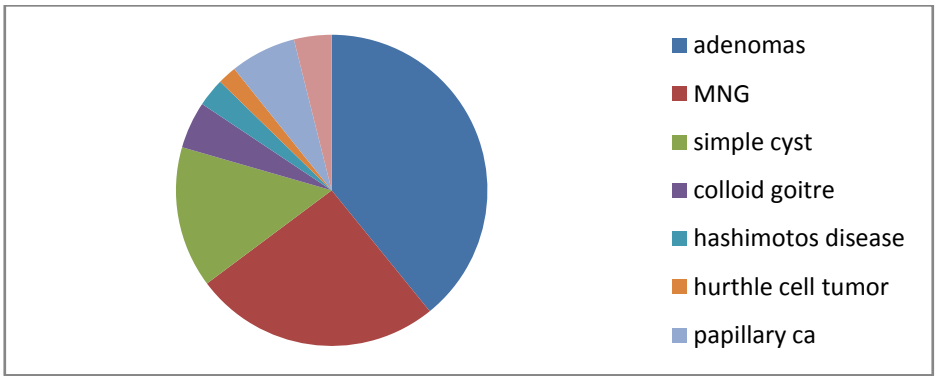


Table. 2 Histological types

Hemithyroidectomy was done in all the cases except papillary carcinoma of the thyroid. Hemithyroidectomy was done in two cases of toxic goitre after controlling the toxic symptoms. Hypothyroid cases were treated by thyroxin replacement. Total thyroidectomy was done in all 7 case of PTC. 3 of these cases were presented with central lymph nodal enlargement in which central (level VI) lymph nodal dissection was done. Hemithyroidectomy was done in 4 case of follicular neoplasm; completion thyroidectomy was done after confirmation. After surgery all the cases of differentiating carcinoma were referred to radiotherapy unit for further treatment.

IV. Discussion

Thyroid lesions are 3-4 times more common in females than males [5]. Solitary thyroid nodule is defined as a single palpable nodule within the thyroid gland while rest of the thyroid is normal. It has got special status among thyroid lesions because of its malignant potential [6, 3]. Early diagnosis and prompt treatment of the malignant nodule provides complete cure since thyroid cancer is more curable than other types of cancers. The prevalence of STN is reported as12.2% in south India [1]; however the prevalence rate in our study is 39.59%. The incidence of STN is more common in 4^{th} decade followed by 3rd and $5th^{th}$ decades. STN is more common in females (83.50 %) followed by males (16.49%) with male to female ratio is 1:5.06. therefore STN is more common in females which are consistent to the literature [7, 5]

Neck swelling is the most common presentation without any other symptoms. Some patients can present with pain and pressure symptoms like dysphagia, difficulty in respiration. There is no clinical correlation between the symptoms and the final diagnosis in this study. The duration of the symptoms ranged from 3 months to 5 years and above. Right lobe is commonly involved (53.60%) than the left lobe (46.39%) [8, 9, 10]. The size of the nodule at presentation varied from 2-7 cm; however the size of the nodule did not indicate any significance with regards to incidence of malignancy in the study. Most of the nodules are firm in consistency. In our study 83.50% were firm 14.43% were soft and 2.06% were hard in consistency.

USG helps in identifying the lesion with high specificity, whether it is a solitary nodule, multi nodular, solid or cystic, and also assess the nodal enlargement in a patient where nodes are clinically not palpable. It can also indicate the presence of any micro calcification in the node. FNAC was mainstay of the investigations. 100% accuracy is maintained in diagnosing the papillary thyroid carcinoma where as FNAC is inconclusive in diagnosing the follicular carcinoma as expected [11]. Histologically, adenomatous nodule (41.23%) is the most common finding followed by multi nodular goitre and carcinoma which is comparable with the study by Darwish el al [12].

Over all the reported rate of malignancy in STN is 8-14%, even increasing further up to 18% -20% [13]. It defers from study to study and region to region, over all reported rate is as low as 5% to as high as 20%

[14]. In our study the incidence of carcinoma we observed is 11.34% which is in line with the literature. Early diagnosis and prompt treatment cures the patient since thyroid cancer is most curable among all malignancies.

V. Conclusion

The solitary nodule is most common in women. It is more common in 3rd and 4th decade of the life. Commonly presents as neck swelling with or without any other symptoms. Right lobe is more commonly involved than the left lobe. Most of the nodules are firm in consistency. USG, FNAC are the common modalities of in investigation with high specificity and sensitivity. Isotope scan is indicated to confirm the toxic nodules. Adenoma is most common pathological entity followed by MNG and carcinoma in clinically detected STN. Carcinoma in a solitary nodule is a major concern. The reported incidence of malignancy in the literature ranges from 8-14% even quoted as high as 20% and as low as 3.33-5%. Our reported incidence of malignancy is 11.34% quite in line with other studies. Early diagnosis and prompt treatment will cure the disease since carcinoma thyroid is more curable among all cancers.

Disclosure: The authors declare no conflict of interest .

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