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Solitary Thyroid Nodule: Clinical Evaluation and Management-A Prospective Study

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Abstract: Thyroid nodules present a challenge in their diagnosis, evaluation, and management. The prevalence of these nodules in a given population depends on a number of factors like age, sex, diet, iodine deficiency, and even therapeutic and environmental radiation exposure. True solitary thyroid nodules (STN) occur in 4 - 7% of the adult population. They are more common in females (6.4%) as compared to males (1.5%) and this predisposition exists throughout all age groups. The ultimate aim in the evaluation of solitary thyroid nodule (STN) is to differentiate benign hyperplasia from true neoplasms. The study of minimum 30 cases with features of Solitary thyroid nodule during the study period (from January 2015 to December 2015) selected by Random Sampling Technique admitted to surgical wards in NMCH & RC, Raichur. Commonest presenting lesion was Benign lesions emerging as the single largest group with nodular goiter having the highest incidence of nearly 46.66% .This was followed by follicular adenomas which constituted 20%. Malignancy forms an important group constituting 20%. About 70% of nodules occurred on the right lobe and the remaining occurred in the left lobe. All the patients were treated surgically in the form of Lobectomy (Hemithyroidectomy+isthmusectomy) or total thyroidectomy and the specimens were subjected to histopathological examinations. Solitary thyroid nodules represented 1.9% of total number of surgical admissions. Male female ratio was 1:4. There were no cases below 10 years of age. Incidence was mainly between 20-50 years of age with the 3rd and 4th decade having the peak incidence.
Keywords: Solitary thyroid nodule, Carcinoma, Lobectomy, Thyroidectomy, FNAC

INTRODUCTION

Thyroid nodules present a challenge in their diagnosis, evaluation, and management. Solitary Thyroid Nodule is a clinical term, denoting the presence of a single palpable nodule in an otherwise normal thyroid gland.

The solitary nodule in the thyroid gland has aroused the interest of general surgeons because of its malignant potential (Warren H. Cole 1949) and because of possibility of toxicity in the nodule and also complications like pressure effects and haemorrhage [1].

Solitary thyroid nodule is quite common in incidence in the present day in and around the district of Raichur. As the clinical diagnosis may not correlate with the diagnosis during the time of management, this study is undertaken as it generates curiosity among the operating surgeons.

The patients who fit into the clinical definition of solitary nodule were included in this study. Evaluation of Solitary thyroid nodule (STN) includes history of the thyroid mass, past medical history, family and social history, a thorough review of all systems including a careful, complete head and neck examination. Past history of radiation exposure to neck is very important. Symptoms such as neck pain, dyspnoea, hoarseness of voice, stridor and dysphagia usually suggest thyroid malignancy, but are not diagnostic [2].

MATERIALS AND METHODS

The case material for the present study was taken from Navodaya medical college teaching Hospital, Raichur. Patients presenting to OPD and admitted to various surgical wards with features of Solitary thyroid nodule during the study period of January 2015 to December 2015 were screened. The study of solitary thyroid nodule is based on 30 cases admitted in various surgical units.

INCLUSION CRITERIA

Nearly 50 patients were screened out of which 30 cases were selected for the present study as they were fitting well to the definition of solitary thyroid nodule.

- Patients presenting to OPD and admitted to various surgical wards with features of Solitary thyroid nodule in NMC & RC, Raichur.

- Patients aged above or equal to 18 years.

EXCLUSION CRITERIA

- Patients with diffuse enlargement of thyroid.
- Patients presenting with MNG clinically.
- Patients with bleeding diasthesis.
- Patients refusing for investigations / management.
- Patients aged less than 18 years.

The recorded proformas included history, through clinical examination, investigations which were needed for the study including FNAC, thyroid function tests, and x -ray neck with special emphasis on the rate of growth of the swelling, any change in voice, pressure symptoms, and any clinical evidence of thyroid dysfunction. No history of exposure to radiation found in any of the patients.

RESULTS

The incidence of solitary thyroid nodule in total number of surgical admission was found to be 1.9% (Total no surgical Admissions=.5382 No of cases of solitary nodule of thyroid=104).

The incidence of solitary thyroid nodules is common in the 3rd and 4th decade of life. The youngest patient was 18 yrs old and the oldest being 65 years. (Figure-1)

There is marked female predominance compared to male. 6 male (20%) and 24 female (80%) patients in the age group of 10-60 and above years with palpable solitary thyroid nodule were evaluated. The male to female ratio being 1:4 and the incidence of malignancy in STN was more in females.

The commonest symptom in all the cases was swelling in front of the neck, one case had symptoms of metastasis in the form of lymph node involvement (3.33%), and there were no patient with toxic symptoms.

In all the 30 cases (100%) unilateral enlargement of the lobe and movement with deglutition were demonstrated Lymph node enlargement was seen in 1 patient (3.33%) clinically diagnosed as malignant. No cases had signs of toxicity and deviation of trachea.

The consistency of the nodule in this series varied from soft (3.33%), firm (80%), hard (6.66%) and cystic in 10.0% of cases. The lesion which was soft turned out to be papillary thyroid carcinoma. Out of the 3 lesions which were cystic, one turned out to be follicular adenoma without any cystic change. All the hard swelling turned out to be malignant. Out of the 24 swellings which were firm, 3 were malignant.

Out of the 30 cases, 28(93.33%) were diagnosed as benign adenomas .Two cases (6.67%) were diagnosed to be carcinoma clinically, no cases of toxicity was diagnosed.

FNA was done in 26 cases of which 22 cases had histopathological reports. Of the 4 cases reported false negative, 6 cases turned out to be papillary carcinoma and no other malignancies. (Figure -2)

Lobectomy (Hemithyroidectomy+isthmusectomy) was the commonest surgery done for 24 cases. Total thyroidectomy with L.N. Excision was done in one case of papillary carcinoma who had REGIONAL palpable lymph nodesclinically. In other cases of suspected malignancy along with thyroidectomy Lymph node sampling was done and sent to HPR.

On Histopathology, Nodular colloid goiter emerged as the single largest group with 14 cases (46.66%). Follicular Adenomas contributed for 6 cases (20%). There were 6 cases (20%) of papillary carcinoma. Hashimoto's thyroiditis was the diagnosis in 4 cases. (Figure-3)

Thus incidence of malignancy in solitary thyroid nodule in our study is 20 %. Out of the 30 solitary nodules studied, 6 (20%) were malignant. Out of 6 males 1(16.6%) had malignancy and out of 24 females 5 (20%) had malignancy. As shown by the table all the malignances occurred below 20 years or above 40 years .In this series all the carcinoma presenting as solitary thyroid nodule were papillary carcinoma with one case of mixed papillary follicular variant.

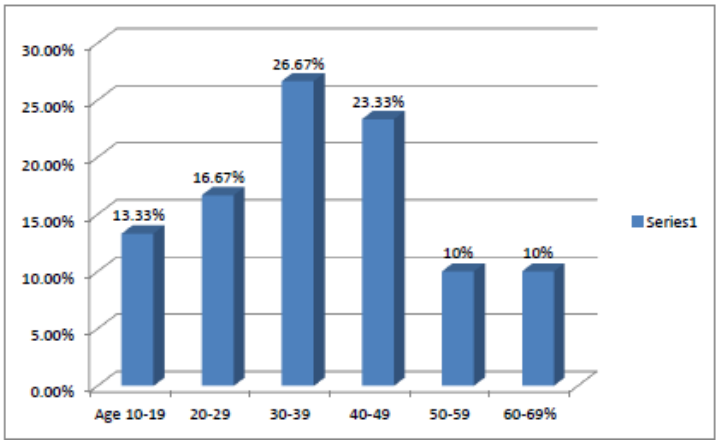

Fig-1: Distribution of incidence of solitary thyroid nodules in age groups

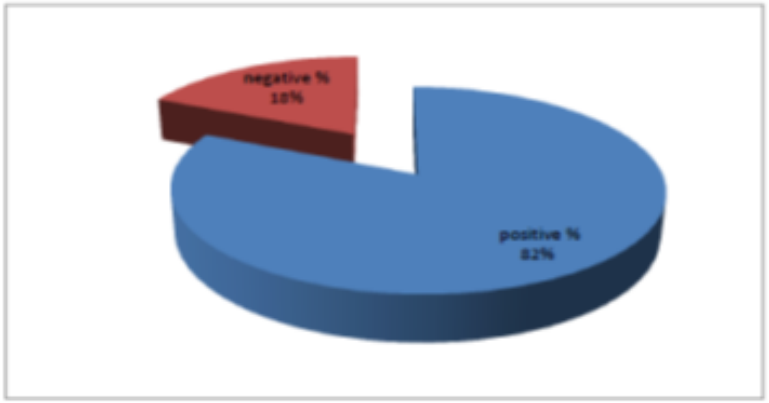

Fig-2: Sensitivity and specificity of FNA

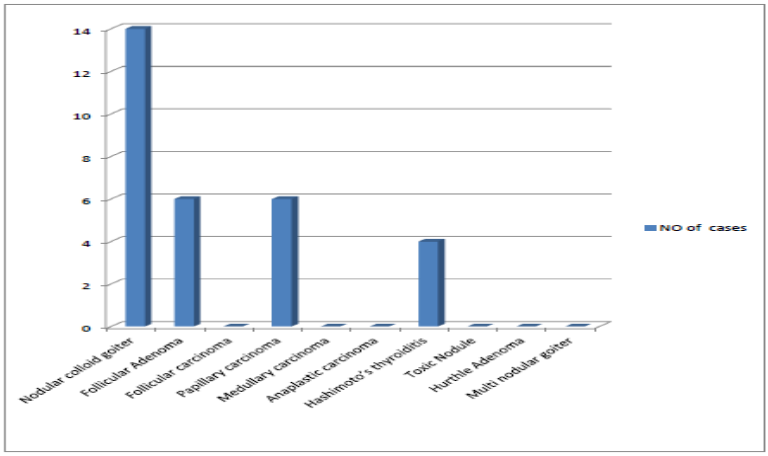

Fig-3: Histophathological reports

Table-1: comparison of various studies

C. Leigh [13]	1969	20.9%
A K Sarda [14]	1997	10.8%
Mazafferi *et al.* [15]	1998	11-12%
G. A Khairy *et al.* [16]	2004	13.9%
Catrherine Ihre Lundgreen [17]	2007	20.9%
Judy Jin *et al.* [18]	2009	15%
Salim Ahmed *et al.* [19]	2011	12.3%
Naz Akhtar Majeedullahbuzdar [10]	2015	15.3%
Rameshbabu, Madhavi Shyamala [11]	2015	10.83%
Present study	2015	20.00%

DISCUSSION

The solitary thyroid nodule is rather a common disease having an incidence of 4-7% reported in the general population and mostly benign [1, 2].

The most common indication for thyroidectomy is proven or potential thyroid malignancy, for which surgical resection is the recommended treatment. Malignancy formed an important group constituting 20% in our study. The commonest malignant lesions occurred below 20 years or above 40 years with female predominance. However, benign lesions were the majority group mainly colloid goitre. All the patients were treated surgically and patients were followed up for one year with satisfactory results [3].

The results of the present series were compared with various studies conducted. The comparison was done for age, sex, location of the nodule, post-operative complications and incidence of malignancies [4].

The highest age incidence in the present series as well as other series was between 21-50 years. The age group between 20-50 years is susceptible for the hormonal changes, hence the peak incidence during this period. The age distribution pattern is important as the incidence of malignancy in the solitary nodule is high and both extremes of age. Hence, nodules occurring in patients younger than 20 years and older than 50 years have to be considered malignant until proved otherwise.

The distribution of solitary thyroid nodules in the two different sexes is female preponderance concurrent with other series. The higher incidence of single nodules in females is more or less constant for all age groups [5, 6].

At present, fine needle aspiration cytology (FNAC) is the most reliable and widely used diagnostic tool in the clinical work up of solitary thyroid nodules [7]. In this study, the accuracy of FNAC is 81.81%.

The primary treatment for papillary carcinoma is surgical excision. The extent of resection, indications for regional lymph node dissection, and the post-operative follow up of patients are the most controversial aspects of management. Because of slow growth of these well differentiated neoplasms and the overall good prognosis, recurrences can occur several years after surgery [8].

In Adenomatous Non- Toxic Nodules the basic cause is, diminished synthesis of thyroxine in the body, this entity should be treated by thyroxine replacement therapy (0.1-0.2 mg/day orally). Preferably,serum levels of T3, T4 and TSH should be measured at regular intervals and the levels should be monitored by adjusting the dose of oral thyroxine administration some nodules regress during therapy.

Toxic nodule can be treated by surgery or by radioactive iodine therapy Radio iodine is the treatment of choice over the age of 45 years as toxic nodules are rarely malignant [9].

Naz akhtar *et al*. in 2015 in their study noted that Majority of the patients i.e. 53(42.7%) were between 31-40 years. Malignancy in solitary thyroid nodule shows 19 (15.3%) [10].

Ramesh babu and Madhavishyamala in 2015 studied on malignant incidence in solitary nodule thyroid The female male ratio are 8:1. The peak age incidence is in 21-30yrs of age group. The incidence of malignancy being 10.83% [11].

Surgical therapy for follicular carcinoma varies considerably among surgeons with lobectomy, near total thyroidectomy and total thyroidectomy being performed. The major controversy in the surgical management of follicular carcinoma is in the treatment of those patients with low grade encapsulated neoplasms with minimal capsular invasion diagnosed after Lobectomy by permanent section evaluation. The necessity to perform completion total thyroidectomy as a second stage operation in these cases is controversial [12].

CONCLUSION

About 70% of nodules occurred on the right lobe and the remaining occurred in the left lobe. No nodules were found in the isthmus. Fine needle aspiration cytology had proved to be 81% accurate. Other than FNAC, other investigations did not throw much light on the diagnosis. All the patients were treated surgically in the form of Lobectomy (Hemithyroidectomy + isthmusectomy) and the specimens were subjected to histopathological examinations

Benign lesions emerged as the single largest group with nodular goiter having the highest incidence of nearly 46.66% .This was followed by follicular adenomas which constituted 20%. Malignancy forms an important group constituting 20%. The commonest malignant lesions occurred below 20 years or above 40 years with female predominance. Total thyroidectomy was done for five cases, total thyroidectomy with lymph node excision for one case and twenty four lobectomies.

There was no mortality in any of the cases. Only one patient had developed ipsilateral vocal cord paralysis, who recovered during the follow-up after about three months.

The follow-up period was for a year. None of the patients developed any of the post- operative

complications. Patients who had undergone total thyroidectomy for papillary carcinoma were advised to take tablet Eltroxin 0.1 mg twice daily life long. Patients neck scar was also not that obvious or deformed in any of the cases cosmetically.

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