

Solitary Thyroid Nodule: Efficacy of Ultra-sonography, Histopathology and FNAC in Diagnosing Malignancy and Various Surgical Modalities in Management

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ABSTRACT

The main concern associated with Solitary thyroid nodules (STN) is their chances of malignancy, importantly only 5% of thyroid nodules have been found to convert into thyroid cancers. With prevalence of STN it becomes very important to define a clear evaluation strategy for management of STN and identify the cases of malignancy which either require surgical intervention or can be managed conservatively. Present study was a prospective study done on 50 cases of solitary thyroid nodule. All the selected subjects were evaluated for criteria's such as sex, age and site of occurrence. Clinical presentation studied for signs for STN such as swelling, pain and other defined points. Dignosis of STN was done by USG initially followed by histopathology studies and FNAC studies. Outcomes of study concluded thyroid enlargement more common in females compared to males with ratio of 6:1 suggesting female predominance for STN. According to age 60% cases were reported in age group 31-40 years, while only 2% in 51-60 years age group. Swelling in neck region was clinical feature in all cases. Right lobe involvement was most common (78%) compared to left lobe (22%). Incidence of malignancy was 12%. USG turned out to be the most successful technique in diagnosis of STN and there occurrence in Benin and malignant forms, whereas FNAC turned to the most accurate method.

Keywords: Solitary thyroid nodules; Dignosis; Ultrasonography; Malignancy; Benin.

INTRODUCTION

Solitary thyroid nodules (STN) are one of commonest problem found in adults. Prevalence of thyroid nodules increases along with age also females have a higher prevalence than males.¹ The nodules have been identified successfully with success rate of upto 67% by ultra sonography (USG) technique, 50% by autopsy and 8% by palpation.^{2,3} Palpable types of nodules have been found to reduce in size with disappearance rate of up to 38%.⁴ The main concern associated with thyroid nodules is their chances of malignancy, thyroid cancers are not common and account only 1% overall cancers and account only 0.5% of overall deaths associated with cancer.⁵ Importantly only 5% of thyroid nodules have been found to convert into thyroid cancers. With prevalence of thyroid nodules in general population, it becomes important to define a clear strategy for evaluation and management of thyroid nodules and identify the cases of malignancy which either require surgical intervention or can be managed conservatively.

Present study was a prospective study done on 50 cases of solitary thyroid nodule. Effective diagnosis of solitary nodules for malignancy was the main feature of study, which was done by techniques such as ultra-sonography (USG), Histopathology and Fine needle aspiration cytology (FNAC).

MATERIAL AND METHODS

Present investigation was a prospective study observed in the department of surgery at a tertiary care, government medical college, Nagpur between the periods of 2014 to 2016. In this study 50 patients of either sex were selected that suffer from STN. All the selected subjects were evaluated for criteria's such as sex, age and site of occurrence. Clinical presentation was studied for signs of STN such as swelling, pain and other defined points. Dignosis of STN was done by USG initially followed by histopathology studies and FNAC studies. The confirmed patients for malignancy were subjected to surgery either Hemi-Thyroidectomy (HT) or Total Thyroidectomy (TT). Ethical clearance and informed consent was taken before the start of study.

STATISTICAL ANALYSIS

Descriptive statistics like mean and percentages were used for the analysis.

RESULTS

Distribution of STL in accordance to sex and age groups:

In our study 50 cases were studied out of which 43 were females and 7 cases were males. As far as the distribution pattern of STN various age groups was 20% cases (10 patients) belonged to age group between 20-30 years, 60% cases (i.e. 30 patients) were in between 31-40 years group, 18% cases were recorded in age group 41-50 and least in age group 51-60 with only 1 case i.e. 2%. Results are depicted in table 1.

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Occurrence site and size of STN

In our study the STN were observed for site where they occurred, it was found that 39 patients (78%) were diagnosed for nodules in right lobe, while 11 cases i.e. 22% were reported for STN in left lobe of thyroid gland. The size of nodules was found to be between 2-6 cm.

Clinical presentation

The common signs for clinical presentation were recorded. Swelling in neck was a common clinical feature in all the 50 cases among them 4 (8%) complained for pain in neck, dyspna and dyspna was reported by 4 patients each i.e. 8%. Intolerance to both heat and cold was complained by 4 (8%) cases each. Sweating and tremors were reported by 4 (8%) cases each. Results are presented in Table 2.

Diagnosis of STN

The patients underwent USG followed by Histopathological evaluation for STN. Out of 50 cases undergoing USG, 45 were reported for reported to be benign while, 1 as suspicious and 4 cases to be malignant. Whereas on further evaluating USG identified cases by histopathology 44 where confirmed to benign and 6 where confirmed for carrying malignancy. Results showed that 1 case which was suspicious on USG, turned out to be malignant on histology, all the cases of USG malignant tumors were confirmed to results of histology, the results are presented in table 3.

Thyroid function test

Thyroid function test was done for all the patients reported for STN. Out of them 42 patients (84%) were reported for Euthyroid, were as 4 cases (8%) were reported as Hypothyroid and Hyperthyroid each.

Correlation of Fine Needle Aspiration Cytology studies with histopathology diagnosis

All the 50 cases were evaluated by FNAC, out of which 44 cases were found to benign, among them 28 cases were found to have colloid goiter, 07 with follicular adenoma, 4 with Hashimoto’s thyroiditis, 3 with Hemorrhagic cyst and 2 as multi nodular goiter, all of these 28 cases were histopathologically found to benign. The remaining 6 cases on FNAC evaluation were found to be malignant i.e 4 as case of papillary carcinoma and 2 with follicular carcinoma, the six cases were also hisopathologically proved to be malignant. The results are presented in table 4. Almost 100% cases evaluated by FNAC were tailed with results of histopathology.

Operative procedures

Hemithyroidectomy and Total Thyroidectomy were the two surgical approaches utilized for STN. Among them 42 cases i.e 84% cases underwent Hemithyroidectomy while 6 cases (12%) were operated with total thyroidectomy.

Postoperative complications

The cases after surgeries were monitored for post-operative complications. Among the 43 cases (86%) do not witnessed any complications, 1 case (2%) complained about hypothyroidism, 2 cases (4%) were found to have recurrent laryngeal nerve palsy (RLNP) and 4 cases (8%) reported for

Age in years	Number of patients		Total Patient	% of patient
	Male	Female		
20-30	2	8	10	20
31-40	3	27	30	60
41-50	2	7	9	18
51-60	0	1	1	02
Total	43	7	50	100

Table-1: Patient details as per the age and sex

Symptoms	Number of patients	% No. of patients
Swelling in neck region	50	100
Pain in neck region	4	8
Dyspna	4	8
Dyspna	4	8
Intolerance to cold	4	8
Intolerance to heat	4	8
Sweating	4	8
Tremors	4	8

Table-2: Clinical presentation for STN

USG	No. of cases	Histopathology studies	
		Benign	Malignant
Benign	45	44	1
Suspicious	1	0	1
Malignant	4	0	4
Total	50	44	6

Table-3: Comparative studies between USG and Histopathology

Histopathology studies	FNAC		%
	Benign	Malignant	
Colloid Goitre	28	00	56%
Follicular Adenoma	07	00	14%
Hashimoto’s Thyroiditis	04	00	8%
Hemorrhagic Cyst	03	00	6%
Papillary carcinoma	00	04	8%
Follicular carcinoma	00	02	4%
MNG	02	00	4%
Total	44 (88%)	6 (12%)	100%

Table-4: Correlation of FNAC with Histopathology diagnosis.

wound infection.

DISCUSSION

The present study was a hospital based prospective study done in the Department of Surgery at a tertiary care Government Medical College and hospital, Nagpur from period of June 2014 to July 2016, 50 cases of solitary thyroid nodule were selected from surgery OPD.

The outcomes of present study concluded cases of thyroid enlargement were commonly seen in females compared to males, the ratio of female to male was 6:1 suggestive of female predominance and contributing almost 86% of total study population. These results were in accordance to study reported earlier⁶, in which the authors reported prevalence of STN in 63 females and 10 males, with female to male ratio of 6.3:1. In another study⁷ who studied 35 cases of solitary thyroid nodule, the found female to male ratio was almost

about 7.7.

In Present Study maximum number of 30 cases i.e. 60% were seen in 31-40 years age group, while only 1 case i.e. 2% was fell in age group 51-60 years. The results were in accordance to reports published earlier⁸, in which they noted that majority of the patients i.e. 53(42.7%) were between 31-40 years age group. In a another study⁹ authors observed that male to female ratio was 1:7 and the highest number of patients with thyroid nodule were found in age group 31-40 years.

The clinical presentation of all the 50 cases reveled that all the patients reported with swelling in the anterior part of neck while pain associated with swelling was in 4 cases, tremors and sweating was seen in 4 cases respectively, dysphasia in 4 cases, heat intolerance in 4 case and cold intolerance seen in 4 case each. This findings were supported by studies carried out earlier¹⁰, who reported swelling in neck (100%) as that main presentation, 6 patients (12%) had pain and swelling, difficulty in swallowing was seen in 5 cases (10%), 8 cases (16%) showed difficulty in breathing whereas heat intolerance was seen in 12 cases (24%). In an study⁶ authors observed anterior neck swelling as the most common symptom (100%), followed by pain and swelling in 4 patients(5.4%), pressure symptoms were dyspnoea and dysphagia seen in 3(4.1%) patients.

On evaluation of patients for site of involvement in present study, solitary thyroid nodule (STN) was more common in right lobe of thyroid (78%) compared to left lobe (22%). This was in accordance to study done earlier⁶, in which authors reported the solitary nodules involved the right side (74%) of the thyroid more commonly than the left (26%).

The clinical features mainly were swelling in neck which was the commonest feature in all the patients while pain in neck, dyspn and dyspg, intolerance to heat and cold, sweating and tremors were reported by 4 (8%) subjects in each of the features. The results were association with studies reported earlier.⁶

Ultrasonography, histology were the two diagnostic techniques utilized among them USG proved to be the most successful diagnostic technique by detecting 45 (90%) cases positive for benign, and 4 cases for malignancy STN types, however histopathology proved to be accurate by predicting one of the benign case as reported by USG to malignancy. Our results were in association with studies reported earlier¹¹, who found USG as the most successful technique in diagnosing STN.

In present study thyroid function test was utilized to evaluate the functional status of all patients. It was evidenced that 42 patient (84%) were euthyroid whereas 4 patients were hypothyroid and 4 patients were hyperthyroid. These outcomes were accordance to reports published earlier¹² in which authors found similar results, with about 90% diagnosed to be euthyroid, 8% were hyperthyroid and 0.6% was hypothyroid.

The FNAC technique sensitivity in 50 subjects was tailed with histopathology. FNAC has been reported to be important diagnostic tool for colloid goitre, thyroiditis,

papillary carcinoma, medullary carcinoma and anaplastic carcinoma is possible. In the present study FNAC confirmed 84% cases (42) as benign and 12% (6) were malignant. Among the benign cases 28 were found for colloid goiter, 07 with follicular adenoma, 4 with Hashimoto's thyroiditis, 3 with Hemorrhagic cyst and 2 as multi nodular goiter, all of these 28 cases were histopathologically found to benign. The remaining 6 cases on FNAC evaluation were found to be malignant i.e 4 as case of papillary carcinoma and 2 with follicular carcinoma, the six cases were also hisopathologically proved to be malignant. The outcomes of study were in accordance to studies carried out by Sabu et al., 2014 [13] in which sensitivity of FNAC was 100% and specificity was 95%.

In present study, all the 50 reported cases were subjected to surgery of STN. Hemithyroidectomy was the most common operation perform in 44 cases (88%) cases and Total Thyroidectomy in 6 cases (12%). The results were found to be in association with studies reported⁶ previously in which authors reported about 90% subjects undergoing hemithyroidectomy and evolved to be the major operating procedure.

In the study 86% subjects were unaffected by complications after surgery whereas 2% cases were reported for complaining occurrence of hypothyroidism, 4% for recurrent laryngeal nerve palsy and 8% reported for wound infection. The study disagreed to the outcomes of the reports published¹³, in which the authors suggested wound infection as one of the major complaint after surgery.

CONCLUSIONS

Present study was carried out in department of surgery, department of surgery at a tertiary care, government medical college, Nagpur between the periods of 2014 to 2016. Study was conducted on selected 50 cases of Solitary Thyroid Nodule coming to OPD of department of surgery. The study concluded female predominance was observed, peak incidence was in the age group 31-40 years. Most common presenting complaint was swelling. Right lobe involvement was most common. Incidence of malignancy was 12% among the solitary nodule of thyroid. USG turned out to be the most successful technique in diagnosis of STN and there occurrence as Benign and malignant forms.

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