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A Clinicopathological Study On Incidence Of Malignancy In A Solitary Thyroid Nodule

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ABSTRACT: INTRODUCTION: Solitary thyroid nodule presents as diagnostic dilemma to the clinicians and management of thyroid nodules is controversial. The importance of solitary thyroid nodule lies in the increased risk of malignancy compared with other thyroid swellings. The incidence of malignancy varies from 5% to 38% in different studies. It has a high chance of being malignant (10-21%) than the multi nodular goiter (5%).

OBJECTIVES: To correlate clinical and cytological findings in the diagnosis of a solitary thyroid nodule.To know the incidence of malignancy in a solitary nodule of the thyroid.

MATERIALS AND METHODS : This **is a** prospective study done in patients with clinically palpable solitary thyroid nodule at NRI general hospital chinakakani.total duration of study is two years from august 2018 to July 2020.

RESULTS: Among a total of 100 thyroid cases**,**The mean age of presentation was 38.07 years for STN.In our study, female preponderance is seen with female to male ratio being 6.69:1 in STN and it is 11.5:1 in MNG.Swelling in front of neck is commonest syptom and present in all patients (100%). 8% of patients with STN and 6% of patients with STN had cervical lymphadenopathy, mostly metastatic.One patient of STN presented with skull metastasis and one patient of MNG presented with mediastinum secondaries.one patient of STN presented with D1 Verterbral metastasis. one patient of STN presented with Humerus metastasis which were diagnosed as follicular carcinoma. Parathyroid insufficency was the commonest post operative complication of the surgery.

CONCLUSION : Thyroid swellings and thyroid carcinomas are more common in females but a thyroid swelling in males have high chances of malignancy. Amongst the malignant lesions most common was papillary carcinoma in STN.

KEYWORDS :solitary thyroid nodule,malignancy,incidence.

I. INTRODUCTION

- India has the world`s largest goiter belt in sub-Himalayan region. About 9 million people are affected due to iodine deficiency. However iodination of salt under national goiter control programme is reducing the prevalence. Patients with solitary thyroid nodules are on the increase, so also is the worldwide incidence and it is presents as diagnostic dilemma to the clinicians and management of thyroid nodules is controversial. This is because of conflicting information concerning the incidence of thyroid cancer in surgical specimens, autopsy and infrequency of death from disease.The importance of solitary thyroid nodule lies in the increased risk of malignancy compared with other thyroidswellings. The incidence of malignancy varies from 5% to 38% in different studies. It has a high chance of being malignant (10-21%) than the multi nodular goiter (5%)[1]. Solitary palpable thyroid nodules are about four times more prevalent in women than in men [2].The clinical diagnosis of solitary thyroid nodule may not be perfect always, only 56.8% were really solitary at operation and histopathology.Thus my study is to know the **Incidence of malignancy in Solitary Thyroid Nodule and** To correlate clinical and cytological findings in the diagnosis of a solitary thyroid nodule.

II. Materials and methods

The present study titled as "**A CLINICOPATHOLOGICAL STUDY ON INCIDENCE OF MALIGNANCY IN ASOLITARY THYROID NODULE**" has been conducted by utilizing the cases diagnosed

clinically as STN and managed both as inpatient and outpatient basis in the department of General Surgery at NRI General Hospital, Chinakakani, from August 2018 to July 2020.All the patients of age more than 13 years, both sexes and Clinically solitary thyroid nodule are included in the study. Multi nodular goitre, Dominant nodule , Diffuse hyperplastic goitre, Patients who are unfit for surgery, and Patients refusing for investigations / management are excluded from study.All these cases were studied in detail, clinically and recorded as per the proforma that was prepared. The relevant investigations whenever indicated were performed.The investigations included Haemoglobin percentage, blood sugar estimation, blood urea estimation, blood grouping and Rh typing, chest X-ray x ray of the neck AP and lateral views and IDL examination. All patients were investigated for Thyroid profile, FNAC, ultrasound neck, post operative histopathology. The investigations included Haemoglobin percentage, blood sugar estimation, blood urea estimation, blood grouping and Rh typing, chest X-ray, x ray of the neck AP and lateral views and IDL examination. All patients were investigated for Thyroid profile, FNAC, ultrasound neck, post operative histopathology.

III. RESULTS :

Table 1 : Age and Sex Distribution in STN Cases

AgeinYears	Male	Female	Total	Percentage
21–30	0	24	24	24%
31–40	4	50	54	54%
41–50	2	16	18	18%
51–60	0	4	4	4%
61–70	0	0	0	0%
71–80	0	0	0	0%
Total	8	92	100	100%

There were 92 female and 8 male patients in STN group, resulting in a female to male ratio of 6.69:1. This ratio varied among the various age groups. Mean age for STN is 38.07, Malignant cases were 18 in STN out of which 3 are males and 15 are female.

TABLE 2 : COMPARISON OF INCIDENCE OF MEAN AGE IN STN CASES

Studies	Mean Age (yrs)
Manoj Gupta[3]	38.72
Talepoor M [4]	38.6
Amitabh jena[5]	36.8
Keh SM[6]	36
PRESENT STUDY	38.07

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TABLE 3 : COMPARISON OF INCIDENCE OF STN IN FEMALES AND MALES

Studies	**Sex Incidence (Female : Male)**
Manoj Gupta[7]	11.5 :1
Das DK[8]	5.39:1
Jan D	2.84 : 1
Amitabh jen[9]	2.30 : 1
Present Study	11.5 : 1

The mean age of the patients under the study was 38.07 years in STN which correlated with the study of other authors. The range was 16 to 80 years and majority of them were females, with female to male ratio being 11.5 : 1 in STN. These observations are similar to observations of other authors. 3 out of 8 men and 15 out of 92 women were malignant in STN

TABLE 4 : DURATION OF SWELLING OF STN CASES

Duration of Swelling	**Total No. of Cases**	**Percentage**
1–6 Months	34	34%
6–12 Months	28	28%
1–2 Years	30	30%
2–5 Years	8	8%
5–10 Years	0	0%
>10 Years	0	0%
Total	100	100%

In our study 62 cases with duration of 1 year, 30 cases with duration of 2years and 8 cases with duration of 5years.Swellings with long duration which are morethan 2yrs had an incidence of 12% of malignancy which is almost 66% of total incidence (18%).

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TABLE 5 : FNAC OF SWELLING OF STN CASES

Report of FNAC	Total No.of Cases	Percentage
Nodular Goitre	72	72%
Hashimoto`sThyroiditis	19	19%
Follicular neoplasm	2	2%
Malignancy	5	5
Inconclusive	2	2
Total	100	100%

Out of 100 cases 5 cases were diagnosed as malignancy by FNAC.

Table 6: TYPE OF SURGERY IN STN CASES

SURGERY	No.	Percentage	Completion Thyroidectomy
Right hemithyroidectomy	40	40%	4
Left hemithyroidectomy	40	40%	4
Total thyroidectomy	12	12%	
Total thyroidectomy + ND	8	8%	
Total	100	100%	

Out of 100 cases initially 40 cases underwent right hemithyroidectomy and 40 cases underwent left hemithyroidectomy, 12cases underwent total thyroidectomy and 8 cases underwent total thyroidectomy along with neck dissection.out of 80 hemithyroidectomy cases 8 cases were diagnosed as malignant and they required completion thyroidectomy.

TABLE 7 : POST OP HISTOPATHOLOGICAL REPORT IN STN CASES

TYPE	No. of Cases	Percentage
Papillary Carcinoma	12	12%
Follicular Carcinoma	5	5%
Medullary carcinoma	1	1%
Follicular adenoma	7	7%
Hurthle cell adenoma	9	9%

Hashimoto's Thyroiditis	27	27%
Adenomatoid nodule	6	6%
Nodular colloid goitre	33	33%
Total	100	100%

Table 8: FNAC CORRELATION WITH HPE (NEOPLASTIC AND NONNEOPLASTIC) IN SOLITARY THYROID NODULE

FNAC	No. Of Cases	HPE	No. Of Cases	REMARKS
NODULAR GOITRE	72	COLLOID GOITRE	29	TRUE NEGATIVE
		HASHIMITOS THYROIDITIS	17	TRUE NEGATIVE
		ADENOMATOUS NODULE	6	TRUE NEGATIVE
		HURTHLE CELL ADENOMA	5	FALSE NEGATIVE
		PAPILLARY CARCINOMA	8	FALSE NEGATIVE
		FOLLICULAR CARCINOMA	3	FALSE NEGATIVE
		MEDULLARY CARCINOMA	1	FALSE NEGATIVE
		FOLLICULAR ADENOMA	3	FALSE NEGATIVE
FOLLICULAR NEOPLASM	2	FOLLICULAR ADENOMA	1	FALSE NEGATIVE
		FOLLICULAR CARCIOMA	1	FALSE NEGATIVE
HASHIMOTOS THYROIDITIS	19	HASHIMOTOS HYROIDITIS	10	TRUE POSITIVE
		HURTHLE CELL ADENOMA	3	FALSE NEGATIVE
		FOLLICULAR ADENOMA	3	FALSE NEGATIVE
		COLLOID GOITRE	3	FALSE NEGATIVE
MALIGNANCY	5	PAPILLARY CARCINOMA	3	TRUE POSITIVE

		FOLLICULAR CARCINOMA	2	TRUE POSITIVE
INCONCLUSIVE	2	HURTHLE CELL ADENOMA	1	
		COLLOID GOITRE	1	

Out of 100 STN, 5 cases were diagnosed as neoplastic lesions by FNAC. All oftheseare carcinomaon histopathological examination72 cases were diagnosed asNodularGoitre(Non Neoplastic) by FNAC. 23 of these cases were nodular ColloidGoitre, 12were carcinoma, 3 was follicular adenoma 17 was hashimotos thyroiditis, 5was Hurthlecell adenoma on histopathologicalexamination.Two cases were diagnosed as Follicular Neoplasm by FNACone of themwereFollicularAdenoma, 1 of them were Follicular Carcinoma,onhistopathologicalexamination.
Out of 21 Non-Neoplastic cases(Hashimotos Thyroiditis -19, inconclusive – 02) 4were givenas non-neoplastic and 04 cases were given as Follicular Adenoma onhistopathologicalexamination. Two cases were insignificant by FNAC. Among two insignificant cases one was Hurthlecell adenoma and one was colloidgoitreon histopathological examination.

TABLE9 :COMPLICATIONSOFSURGERY

Complications	**Total No. of cases**	**Percentage**
ReactionaryHaemorrhage	0	0%
TransientHypoparathyroidism	4	4%
PermanentHypoparathyroidism	0	0%
TemporaryRecurrentlaryngealnervepalsy	2	2%
PermanentRecurrentlaryngealnervepalsy	0	0%
Woundinfection	0	0%
Total	6	6%

The incidence of postoperative complications of surgery is 6%.in our study most common complication is transient hypoparathyroidism which constitute around 4% and temporary recurrent laryngeal nerve palsy constitute around 2%.

Table 10: distribution of study subjects as per their hormonal status:

Hormonal status	Number	Percentage(%)
Euthyroid	96	96%

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Hyperthyroid	1	1%
Hypothyroid	3	3%

In our study out of 100 cases 96 cases are in euthyroid state. Three cases are in hypothyroid state, and 1 case in hyperthyroid case. Hypothyroid cases were made euthyroid by giving thyroid supplementation and hyperthyroid cases was made euthyroid using antithyroid drugs and operated.

IV. DISCUSSION :

In the present study most common age of presentationwas 38.07 years for STN.Simon et.al., revealed that age more than 60 years was associated with malignancy in solitary thyroid nodule which is seemingly in accordance with our study.They also revealednodule size larger than 4 cm is more closely related to thyroid malignancy, but we couldnot support the view in our study.We revealed that there was no great significance between nodule size largerthan 4 cm and nodule size less than 4 cm (P = 0.5). Nodule size is not a predictive risk factor for malignancy, but enlarging nodule over a short period may be an increased riskfor malignancy in thyroid nodule as reported by HosseinGharib et al.

In our study, female preponderance is seen with female to male ratio being 6.69:1 in STN and it is 11.5:1 in MNG.During our study period,there were 97 females with STN.Among female patients 18were reported asmalignantin HPE. Final HPE showed malignancy in 3 out of 3male patients with STN.Hence, thepredominance of thyroid nodules in females and increased incidence ofmalignantthyroid nodules in males noted in our study are similar to that of Tai et al[10]. Size of thenodule has no relation with the malignancy in our study which was alsoreported byTai et al. A study by Kamran et al. opined that the risk of follicularcarcinomas andother rare thyroid malignancies increases as nodules enlarge. However, no suchassociation with size was seen in our case.

Swelling in front of neck is commonest symptom and present in all patients (100%).None of the patients had radiation exposure in their past.45% of patients use rock salt in their diet and 32% are residents of hilly areas. 8% of patients with STN and 6% of patients with STN had cervical lymphadenopathy, mostly metastatic.One patient of STN presented with skull metastasis and one patient of MNG presented with mediastinum secondaries.one patient of STN presented with D1 Verterbral metastasis. one patient of STN presented with Humerus metastasis which were diagnosed as follicular carcinoma.

Clinically, with signs and symptoms ofhorseness of voice, cervicallymphadenopathy, hardness of nodule fixity and metastasis 5 cases out of 100STNcases operated were suspected clinically as malignant.All 5 cases were provenmalignant. **Norman A. Methosen et al** also has mentioned that the clinical diagnosisofmalignancy based on history and physical findings has not been so successful[12].Hence, although the accuracy of clinical diagnosis of thyroid malignancy islow, patients with high clinical suspicion of malignancy need surgical treatment whateverthe FNAC result may be.

Predominantly right lobe involved in 48 (48%)cases and predominantly left lobe involved in 52 (52%) of cases.2-4 cms nodule size is seen in 72 cases and size of 5-6 cms is seen in 28 cases.Out of 100STN cases, 91are Non Neoplastic, 2 are Follicular Neoplasm,5areMalignancy as per FNAC report. These 100 cases FNAC are analysedto correlate withthe histopathology to predict the accuracy of FNAC, 02Follicular Neoplasm areoperated to rule out Follicular maliganancy.Diagnosis of Follicular carcinoma preoperatively by FNAC was difficult ascapsular invasion and angioinvasion, are features of Follicular carcinoma. We had 19cases of STN with thyroiditis and were operated for cosmetic reasons. Papillarycarcinoma accounts 12 cases constituting 66.67% of all carcinoma cases.

Akerman et al quoted four reasons for low sensitivity. These include:

- Tumors missed at aspiration
- Microscopic misinterpretation
- Diagnosis of cellular atypia
- Indeterminate diagnosis[51]

Extent of the surgery depends on the

nature of the lesion. Hemithyroidectomy was the most common procedure done.In the present study postoperative complications were very few.Transienthypoparathyroidism was seen in 4 patients (4%) which was observed during the firstpost-operative week and all are recovered completely with oral calcium and Intra venous calciumtherapy. There was no permanent hypoparathyroidism. **T.A. Day et al**(2006) showsthat there was 8% of temporary hypocalcemia and 0.9% with permanent hypocalcemia.

Temporary recurrent laryngeal nerve palsy was seen in 2 cases (2%), both of which recovered within a month, which was similar to the study by **Chang WF et al** in which Unilateral vocal cord palsy occurred in 5.5% (15 patients) of which all recovered completely except 2 patient. In our study There was no permanent recurrent laryngeal nerve palsy postoperatively. Temporary RLN palsy was seen in 8%, permanent RLN palsy was seen in 0.9% in **T.A. Day et al** (2006).

The incidence of Temporary RLN plasy is less in our study may be due to lessnumber of study compared to other studies and careful dissection near RLN and did notuse any unipolar are bipolar cautery near the RLN.

V. CONCLUSION

Solitary thyroid nodule is most common in 3^{rd} – 5^{th} decade of life. females are most commonly affected than males.18% of solitary thyroid nodules are malignant out of which 12% had swelling with duration of more than 2years.ultrasound guided FNAC is the gold standard for evaluation of solitary thyroid nodule.most common malignancy in solitary thyroid nodule is papillary carcinoma.for malignant nodules total thyroidectomy is the procedure of choice.

CONFLICT OF INTEREST
There is no conflict of interest.

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