

Original Research Article


# A descriptive study on solitary nodular goitre

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## Abstract

**Background:** Solitary nodular goitre is clinically defined as a single nodule in otherwise normal thyroid gland. It can be benign or malignant. Solitary nodule has a higher risk of malignancy (15-20%) when compared to multi-nodular goitre (3-5%).

**Aim:** We conducted a study to evaluate the clinical and radiological factors associated with occurrence of malignancy in Solitary Nodular Goitre (SNG); to find out the incidence of SNG in this part of North Chennai; to analyze the correlation of preoperative cytological and postoperative histopathological results.

**Materials and methods:** It was a prospective study on fifty patients who were clinically diagnosed as SNG. All patients were evaluated with an Ultrasonogram (USG) Thyroid and Fine Needle Aspiration Cytology (FNAC). After surgery, the Histopathological Examination (HPE) reports were compared with the FNAC findings.

**Results:** SNG was more common in the age group of 21-40 years. 86% of SNG patients were females. The incidence of malignancy in SNG this study was 12% which commonly involved males. Among the malignancies, papillary carcinoma was the most common and Hashimoto's thyroiditis was found to be associated with it. The presence of microcalcifications and paratracheal nodes in USG were more in favour of malignancy. The FNAC report correlated well with the HPE reports, the accuracy of FNAC being 90% in this study.

**Conclusion:** SNG has a high risk of malignancy, especially in males and the most common type being papillary carcinoma. FNAC is the gold standard pre-operative investigation that is well correlated with post operative HPE results.

## Key words

Solitary Nodular Goitre, Fine Needle Aspiration Cytology (FNAC), Histopathological Examination(HPE), Papillary carcinoma, Ultrasonogram (USG).

## Introduction

Solitary nodular goitre (goiter – latin = gutter means throat) is clinically defined as a single nodule in otherwise normal thyroid gland. It can be benign or malignant. Solitary nodule has a higher risk of malignancy (15-20%) when compared to multi-nodular goitre (3-5%) [1, 8]. Solitary nodule can be a colloid nodule, benign adenoma, cyst or a malignant tumor (papillary, follicular, medullary or lymphoma). Hemithyroidectomy or total thyroidectomy is the advised surgery for Solitary Nodular Goitre (SNG) based on pre-op Fine Needle Aspiration Cytology (FNAC) reports whether benign or malignant. But by FNAC we cannot differentiate follicular adenoma and carcinoma [2]. This study was done to evaluate the clinical and radiological factors associated with occurrence of malignancy in SNG; to find out the incidence of SNG in this part of North Chennai; to analyze the correlation of preoperative cytological and postoperative histopathological results.

## Materials and methods

We conducted the study in Department of Surgery in a tertiary care centre in Tamil Nadu between 2014 and 2015. It was a prospective study and was approved by the local Ethics Committee.

Patients who clinically presented as SNG were included in the study. Those patients who were thyrotoxic and who had malignant thyroid with neck secondaries were excluded. Based on the inclusion and exclusion criteria 50 patients were taken up for the study. All patients underwent an Ultrasonogram (USG) Thyroid and FNAC. Cytology proven malignant cases was taken up for surgery and other cases were operated based on patient's anxiety and cosmetic reasons. The Histopathological Examination (HPE) reports were compared with the FNAC findings.

## Results

From our observation, it was found that SNG was more common in the age group of 21-40 years. In this study the youngest patient was 19 years old and the eldest was 65 years old. 43 were female and 7 were male patients in the study.

Out of fifty patients with SNG, six had malignancy which constitutes 12%. The incidence was more common in males (two out of seven - 30% approximately) than females (four out of forty three - 9%).

Swelling in thyroid region was a single palpable nodule in all cases. Four of them had associated pain and one of them had hoarseness of voice. Right lobe was involved in 35 patients (70%) and left lobe in 15 patients (30%).

USG thyroid was done in all cases of SNG. Of the 50 patients who were clinically found to have single nodule, 10 patients had multi-nodular goiter in USG, hence, 20% of solitary nodules was found to be dominant nodule of multi-nodular goitre (**Table – 1**). Microcalcifications in four patients and paratracheal nodes in one patient were identified in USG who were all found to have papillary carcinoma on HPE later.

**Table – 1:** FNAC reports of 50 patients.

FNAC	No. of patients
Nodular goitre	38
Papillary carcinoma	4
Adenomatous goitre	8

The most common finding in FNAC results was nodular colloid goitre which was found in 38 patients. Of the patients found to have adenomatous goitre, one was follicular adenoma and another one was hurthle cell adenoma. No case of follicular, medullary or hurthle cell

carcinoma was reported. 3 patients with nodular goitre with cystic degeneration were found to have Hashimoto's thyroiditis in HPE.

Out of 50 patients, 36 underwent hemithyroidectomy which is the standard procedure of choice for SNG. Of the 13 who underwent total thyroidectomy, 4 patients were proven cases of papillary carcinoma of thyroid. Total thyroidectomy with central compartmental neck dissection was done in one patient with paratracheal nodes- level 6. Prophylactic lymph node dissection in N0 disease is not advocated in case of papillary carcinoma of thyroid as it adds to the morbidity by increasing the risk of hypocalcemia and Recurrent Laryngeal Nerve palsy.

Most of the SNG (88%) was benign and the nodular colloid goitre was the most common. 12% of SNG was malignant; all being papillary type (**Table - 2**). No follicular, medullary or anaplastic carcinoma had been reported. In one case of papillary carcinoma, there was associated Hashimoto's thyroiditis which indicates that papillary carcinoma may arise from pre-existing Hashimoto's disease.

**Table - 2:** HPE report of 50 patients.

HPE report	No. of patients	%
Nodular goitre	34	68
Adenomatous goitre	5	10
Papillary carcinoma	6	12
Hashimoto's thyroiditis	3	6
Follicular adenoma	1	2
Hurthle cell adenoma	1	2

## Discussion

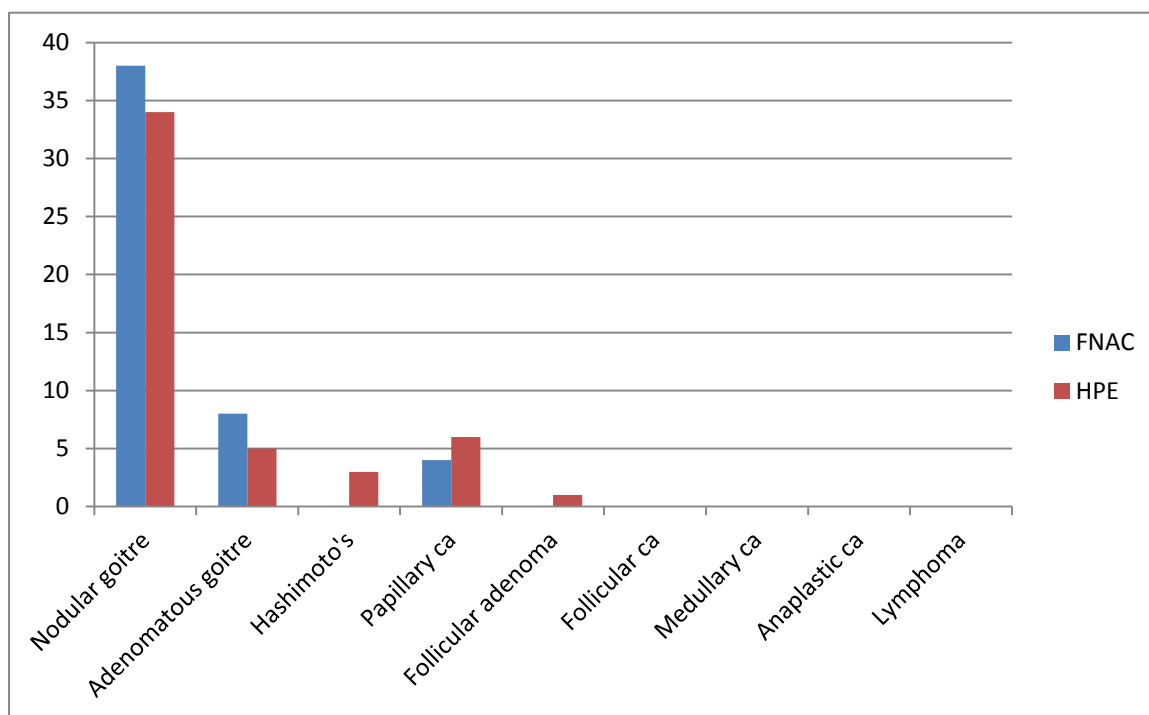
In our study, we found that SNG is more common in the age group of 21-40yrs. 86% of SNG patients were females (F:M- 6:1). Obviously in SNG, there is female preponderance because of the increased prevalence among females as the demand for thyroid hormones are higher in females than in males [3].

In this study, 2 of the 7 male SNGs were malignant that means nearly 30% of male thyroid nodules are malignant while in females it was 4 out of 43 which makes only 9%. Hence malignancy is common in males when compared to females. According to Matheson 1986, the potential of the thyroid nodule to be malignant is three times more common in males than in females, which exactly coincides with this study. Overall incidence of malignancy in this study was 12%. Studies by Kendall and Condon 1979 and Pnarras, et al. 1982 reported incidence of malignancy to be 11-20% and that by Cohn FJ Russell at Royal Victoria Hospital, Belfast, UK reported it to be 13% [4]. The result of our study is also comparable with the above data. 20% of solitary nodules were found to have multinodular goitre on USG. Presence of microcalcifications and paratracheal nodes in USG are more in favour of malignancy [5]. Among the malignancies, papillary carcinoma is the most common and in this study of solitary nodules we had only papillary carcinoma [6].

Though FNAC is found to be a reliable method for providing tissue diagnosis, in this study there was false negative result for two cases of papillary carcinoma. This could have been avoided probably by doing guided aspiration with the use of sonogram. Out of 50 patients who were operated, five patients had different histopathological reports when compared to FNAC. In 45 patients, FNAC reports correlated with the HPE report which means 45 were true positive. Two benign lesions turned out to be papillary carcinoma on histopathology. Three patients with the post-op biopsy report of Hashimoto's thyroiditis were missed by FNAC (**Chart - 1**).

From this, FNAC is found to be a safe, minimally invasive diagnostic tool and the gold standard pre-operative investigation in all cases [7]. The accuracy of FNAC is 90% and it can be increased further by sonography guided aspiration (**Table - 3**) [8].

**Chart – 1:** Incidence of various pathologies found in FNAC.



**Table – 3:** Predictive value of FNAC.

FNAC	True positive	False negative	False positive	Total
No of cases	45	5	0	50
Percentage	90	10	0	100

Hemithyroidectomy is the standard surgery for all benign SNGs. Recurrent laryngeal nerve palsy was found in only 6% of cases and all of them recovered by steroids and speech therapy. No bilateral recurrent laryngeal nerve palsy was reported. Four patients had symptoms of hypocalcemia who were treated by intravenous calcium followed by oral calcium supplements.

### Conclusion

SNG has a high risk of malignancy, especially in males and the most common type being papillary carcinoma. FNAC is the gold standard pre-operative investigation that is well correlated with post operative HPE results.

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