

A Study of Histopathology of Solitary Thyroid Nodules

B Shanti Damayanthi¹, K Ramachandraiah²

Author Affiliation: ¹Associate Professor, Department of Pathology, ²Assistant Professor, Department of Surgery, Viswabharathi Medical College, Kurnool, Andhra Pradesh 518463, India.

Corresponding Author:

K Ramachandraiah, Assistant Professor, Department of Surgery, Viswabharathi Medical College, Kurnool, Andhra Pradesh 518463, India.

Email: drramu2k@gmail.com

Abstract

Introduction: The most important consideration in evaluating patients with solitary thyroid nodule is whether the nodule is a thyroid carcinoma or not. Solitary thyroid nodule can be both neoplastic or non neoplastic. Histological examination helps in the final diagnosis and also to know the frequency of occurrence of various histological varieties in solitary thyroid nodules.

Aim: Our study was aimed to evaluate the solitary thyroid nodules histologically and categorise them according to their histomorphology findings.

Materials and Methods: A total of 68 cases of solitary thyroid nodules were studied over a period of 4yrs and histopathology findings were recorded.

Results: 68 cases of solitary thyroid nodules were studied for a period of 4yrs. The sex distribution of solitary thyroid nodules showed female preponderance. Mean age of presentation was 48yrs. Among 68 cases 38 were non neoplastic and 30 were neoplastic. Among non neoplastic, 20 were colloid nodule/colloid cyst, 16 were hyperplastic nodules of nodular goiter and 2 were hashimoto thyroiditis. Among 30 neoplastic, 20 were follicular adenoma, 5 were follicular carcinoma, 3 were papillary carcinoma and 2 were follicular variant of papillary carcinoma.

Conclusion: To conclude, the most common lesion of solitary thyroid nodule in our study was non neoplastic lesion. Preoperative evaluation helps us to minimize the extent of surgery and hence morbidity.

Keywords: Colloid nodule of thyroid; Hashimoto thyroiditis; Histopathology; Papillary carcinoma thyroid; Solitary thyroid nodule.

How to cite this article:

B Shanti Damayanthi, K Ramachandraiah/A Study of Histopathology of Solitary Thyroid Nodules/Indian J Pathol Res Pract. 2021;10(3):133-137.

Introduction

Thyroid disorders are the most common endocrine diseases and most of them are curable. Due to wider use of imaging, the incidence of solitary thyroid nodules has been on rise.¹ Solitary thyroid nodule is defined as discrete swelling in one lobe with no palpable abnormality elsewhere in the gland.² They can be of neoplastic or nonneoplastic. Thorough evaluation is necessary to differentiate them preoperatively. However histological examination was perfect tool for final diagnosis.³ Solitary thyroid nodules were more important to evaluate because of high probability of malignancy, which can range from 5-35% of all solitary thyroid nodules.⁴

Aim

The aim of our study is to evaluate histopathological diagnosis of solitary thyroid nodules.

Materials and Methods

A total of 68 cases were studied for a period of 4yrs in a tertiary health care centre. Cases diagnosed as solitary nodule clinically and on imaging were included in study but were found to be multinodular were excluded from the study. The specimens were received in 10% neutral buffered formalin fixative. The resected specimens were evaluated grossly for size, margins, capsule, consistency, colour, presence or absence of calcification, haemorrhage, necrosis, cystic changes, colloid and papillary projections. Multiple sections were submitted for routine processing and slides were stained with Hematoxylin and Eosin (H&E) stain and then microscopic evaluation of the cases was done on different sections. They were categorized according to their histological features.

Results

The present study was conducted in tertiary health care centre on 68 cases of solitary thyroid nodule. Of the 68 cases, 48 were female and 20 were males (Table 1). Mean age of presentation was 48yrs (Table 2). Out of 68 cases, 38 were found to be nonneoplastic and 30 were neoplastic (Table 3). Among nonneoplastic, 20 were found to be colloid nodule/cyst (Figure 2), (Fig 4), 16 were found to be hyperplastic nodule of nodular goiter and 2 were hashimoto thyroiditis (Table 4). Among neoplastic, 20 were benign (Figure 1) and 10 were malignant (Table 5). All 20 cases of benign nodules were diagnosed as follicular adenoma (Figure 3).

Among 10 malignant, 5 were follicular carcinoma, 3 were papillary carcinoma (Figure 5), and 2 were follicular variant of papillary carcinoma (Table 6).

Discussion

Solitary thyroid nodule in our study is more common in females with a ratio of 2.4 : 1, which is similar to the studies done by Yamashita et al⁵, Almaghrabi, J.A. et al⁶, Singh P et al⁷, Goutham, H.K et al⁸, Mandal S et al⁹. The female preponderance might be due to presence of oestrogen receptors in thyroid tissue.^{10,11}

In our study mean age of occurrence of solitary thyroid nodule was 48yrs which comparable to the study done by D. Sailaja et al.¹² Singh P et al⁷, in 2000, reported a mean age incidence of solitary nodules as 47 years in their study which was conducted on 108 cases having patients in the age range of 12-80 years. In a study done by Gupta M. et al.¹³, it was 38.7 years. In a study done by Rangaswamy M et al. on 585 cases of solitary nodules of thyroid the age range noted was 11-70 years and mean age was 40.57 years. All the above studies were comparable to our study.

In our study, maximum incidence of solitary thyroid lesions occurred during age intervals of 35-40yrs for non neoplastic and 45-50yrs in neoplastic cases which is comparable to the study done by Singh P et al.⁷ The age of occurrence of nonneoplastic lesions is less when compared to the occurrence of neoplastic lesions.

In the present study, out of 68 cases 38 were nonneoplastic which is comparable to the study done by D Sailaja et al.¹² Among 38 nonneoplastic, 20 were colloid nodule/cyst which is comparable to the study done by D Sailaja et al.¹² and higher incidence was seen in the study done by Md Iqbal karim et al.¹⁴

Out of 38 nonneoplastic, 16 were hyperplastic nodules of nodular goiter correlating with the study done by D. Sailaja et al.¹²

In our study 2 cases were of hashimoto thyroiditis which is comparable to the study done by Rabia Basharat et al.¹⁵ The incidence of hashimoto thyroiditis is less than the incidence of colloid/hyperplastic nodule which is similar to study done by Manojgupta et al¹³, Amitabh jena et al¹⁶ and Rabia Basharat et al.¹⁵

In the present study, out of 30 neoplastic, 20 were benign and 10 were malignant. Our study show correlation with the study done by Manoj gupta

et al¹³ and Rabia Basharat et al¹⁵ in which benign lesions were outnumbered the malignant ones. This is in contradiction to study done by D Sailaja et al¹², Amitabh jena et al¹⁶ and Khadikae et al¹⁷ in which malignant lesions outnumbered the benign lesions.

In our study among 10 malignant cases, 5 cases were follicular carcinoma, 3 were papillary carcinoma and 2 cases were follicular variant of papillary carcinoma. Sometimes it is difficult to differentiate hyperplastic nodule, follicular adenoma and follicular carcinoma, in such cases we have to do thorough sampling of specimens and we should use immunohistochemistry markers when in need to come to a final diagnosis.

Conclusion

The mean age of presentation of solitary thyroid nodule in this study was 48yrs. The incidence was more common in females (70%) compared to males (30%). Nonneoplastic lesions were common than neoplastic lesions. The most common non neoplastic lesion was colloid nodule and most common benign neoplastic lesion was follicular adenoma. Most common malignant lesions were follicular carcinoma and papillary carcinoma. This study helps us to know the frequency of occurrence of various histological varieties in solitary thyroid nodules.

Table 1: Sex wise distribution of cases.

Gender	No. of Cases
Male	48
Female	20

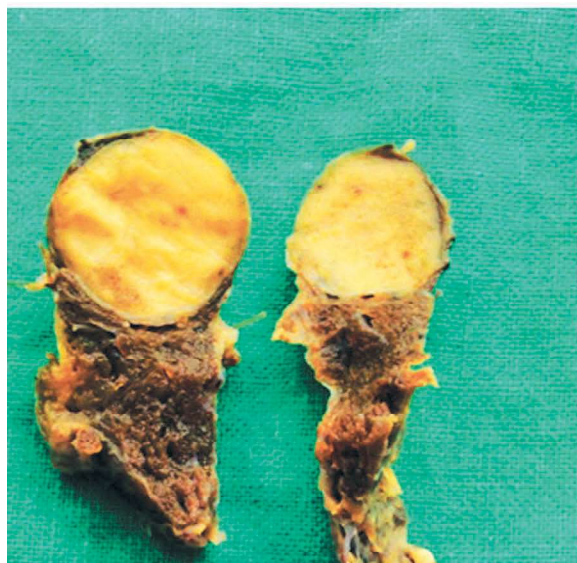


Fig. 1: Gross photograph of follicular adenoma.

Table 2: Age wise distribution of cases.

Age	No. of Cases
0-10 yrs	00
11-20yrs	01
21-30yrs	20
31-40yrs	14
41-50yrs	32
51-60yrs	01
>60yrs	00

Table 3: Distribution of Non neoplastic and Neoplastic Lesions.

Lesion	No. of Cases
Non Neoplastic	38
Neoplastic	30

Table 4: Distribution of Nonneoplastic lesions.

Lesion	No. of Cases
Colloid nodule/cyst	20
Hyperplastic nodule	16
Hashimotos thyroiditis	02

Table 5: Distribution of Neoplastic lesions.

Category	No. of Cases
Benign	20
Malignant	10

Table 6: Categorisation of neoplastic lesions.

Type of Lesion	No. of Cases
Follicular adenoma	20
Follicular carcinoma	05
Papillary carcinoma	03
Follicular carcinoma	02

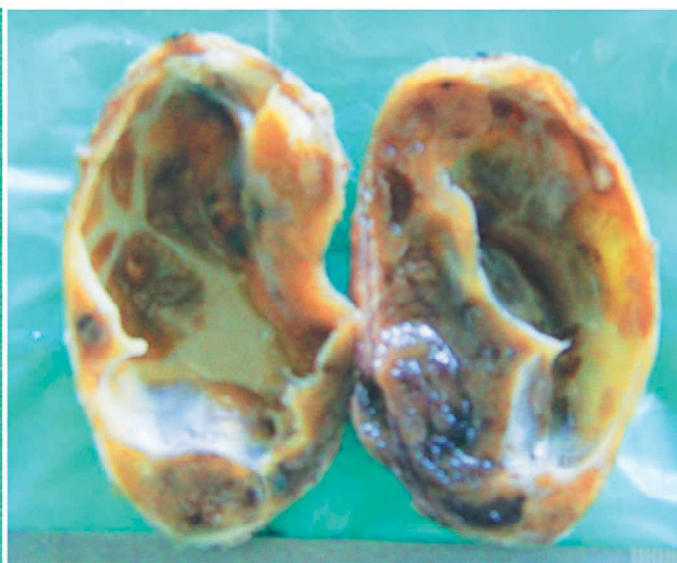


Fig. 2: Gross photograph of colloid nodule/cyst.

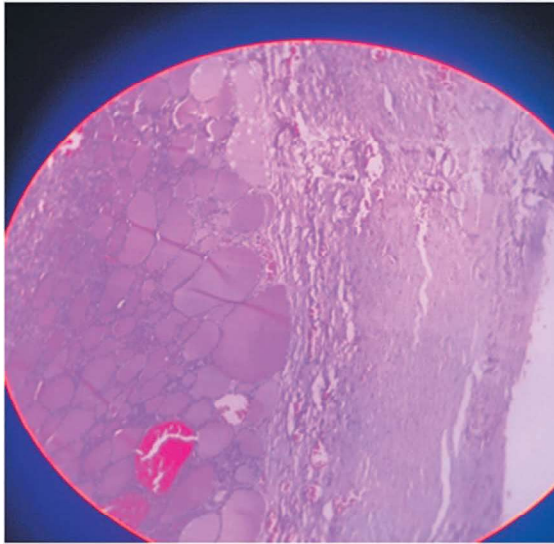


Fig. 3: Microphotograph of follicular adenoma.

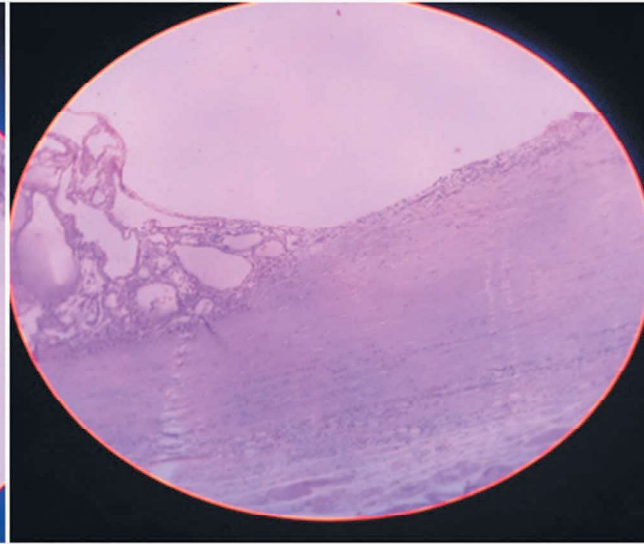


Fig. 4: Microphotograph of colloid nodule/cyst.

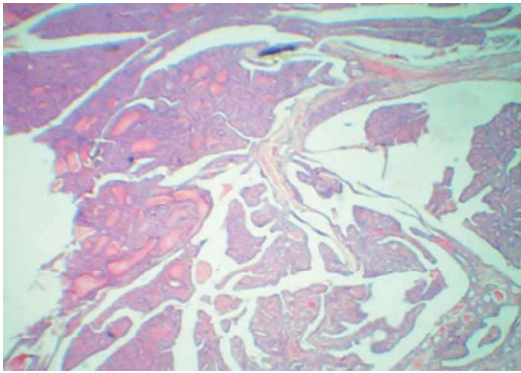


Fig. 5: Microphotograph of papillary carcinoma.

References

1. Polyzos SA, Kita M, Avramidis A. Thyroid nodules—stepwise diagnosis and management. *Hormones (Athens)* 2007 Apr-Jun; 6(2):101-19.
2. "The Thyroid gland and the Thyroglossal tract" chapter 37 in Bailey and Love 22nd Edition.
3. Gupta A et al. Histopathological study of thyroid lesions and correlation with ultrasonography and thyroid profile in western zone of Rajasthan, India *Int J Res Med Sci.* 2016 Apr;4(4):1204-1208.
4. Ananthkrishnan N, Rao KM, Narasimhans R, Veliath, Smilet SR, Jagadish S. The Single Thyroid Nodule: A South Indian Profile of 503 Patients with Special Reference to Incidence of Malignancy. *Indian J Surg.* 1993;55(10):487-92.
5. Okamoto T, Yamashita T, Harasawa A, Kanamuro T, Aiba M, Kawakami M, et al. Test performances of three diagnostic procedures in evaluating thyroid nodules. *Endocrine J.* 1994;41(3):243-7.
6. Al-Maghrabi, J. A., & Al-Enazi, M. H. (2009). Histopathological pattern of thyroid lesions in western region of Saudi Arabia. *New Egypt J Med*, 40, 580-585.
7. Singh P, Chopra R, Calton N, Kapoor R. Diagnostic Accuracy of Fine Needle Aspiration Cytology of Thyroid lesions. *Journal of Cytology.* 2000;17:135-9.
8. Gautam, H. K., Kanaujia, S. K., Kumar, V., Maurya, D., & Singh, S. (2018). Histopathological findings of solitary thyroid nodule: An institutional retrospective analysis. *International Journal of Head and Neck Pathology*, 1(2), 37.
9. Mandal S, Barman D, Mukherjee A, Mukherjee D et al. Fine needle aspiration cytology of thyroid nodules evaluation of its role in diagnosis and management. *J Indian Med Assoc.* 2011; 109:258-61.
10. Fahim A, Qureshi A, Alvi H, Azmi MA. Clinical Presentation and Evaluation of Histopathological Patterns of Hospital-based Frequency of Thyroidectomized Biopsies. *Medical Forum* 2012;9: 1-6.
11. H.S Sachdeva J, D Wig, S.M Bose. The solitary thyroid nodule. *British journal of surgery/ volume 61, issue 5.*
12. D.Sailaja, SpvTurlapati, Manishamohapathra, P.Gayatribevi, M.RuthPrasanna, O Srikanth. Histopathological evaluation of solitary nodules of thyroid. *Indian journal of contemporary medical research.*2020;(2):B17-B20.
13. Gupta, M., Gupta, S., & Gupta, V. B. (2010). Correlation of fine needle aspiration cytology with histopathology in the diagnosis of solitary thyroid nodule. *Journal of thyroid research*, 2010.
14. Mdiqbalkarim, Rosen nachev, Nikolayfuklev, Nazlimanargis. A study on evaluation of solitary

- nodular thyroid lesions by FNAC and its histopathological correlation. Bangladesh journal of medical science. Vol.18No.04 Octobe'19. Page:789-795.
15. Rabia Basharat, 1,2 Mulazim Hussain Bukhari, 1Research Article Comparison of Fine Needle Aspiration Cytology and Thyroid Scanning Solitary Thyroid Nodule Research Pathology Research International Volume 2011, Article ID 754041, 9 pages. doi:10.4061/2011/754041.
 16. Amitabh Jena, Rashmi Patnayak, Jaya Prakash, Alok Sachan V, Suresh Amarchala Yadagiri Lakshmi. Malignancy in solitary nodules of thyroid: A clinicoradio pathological evaluation, Indian Journal of Endocrinology and Metabolism 2015; 19: 498-503.
 17. Khadilkar UN, Maji P. Histopathological study of solitary nodules of thyroid. Kathmandu University Medical Journal 2008; 6: 486-490.



Indian Journal of Pathology: Research and Practice

Library Recommendation Form

If you would like to recommend this journal to your library, simply complete the form given below and return it to us. Please type or print the information clearly. We will forward a sample copy to your library, along with this recommendation card.

Please send a sample copy to:

Name of Librarian

Name of Library

Address of Library

Recommended by:

Your Name/ Title

Department

Address

Dear Librarian,

I would like to recommend that your library subscribe to the Indian Journal of Pathology: Research and Practice. I believe the major future uses of the journal for your library would provide:

1. Useful information for members of my specialty.
2. An excellent research aid.
3. An invaluable student resource.

I have a personal subscription and understand and appreciate the value an institutional subscription would mean to our staff.

Should the journal you're reading right now be a part of your University or institution's library? To have a free sample sent to your librarian, simply fill out and mail this today!

Stock Manager

Red Flower Publication Pvt. Ltd.

48/41-42, DSIDC, Pocket-II

Mayur Vihar Phase-I

Delhi - 110 091(India)

Phone: 91-11-79695648, 22754205, 22756995, Cell: +91-9821671871

E-mail: sales@rfppl.co.in