

Management of Solitary Thyroid Nodule at Al-Karama Teaching Hospital

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Abstract

A prospective study was done at Al-Karama Teaching Hospital from January 2011-April 2014 for management of solitary thyroid nodule.

Females were more frequently affected than males (96:16), with a ratio female to male of about 6:1, the right lobe was two times more frequently involved than the left.

One hundred and three cases treated surgically and nine cases treated by aspiration and follow up. Carcinoma was diagnosed in 7 cases (6.3%) only. The peak incidence of Carcinoma in solitary nodules was in third decade. The incidence of papillary neoplasm in this study was 5 cases (4.5%). **Aim** To evaluate the method of the management of the solitary thyroid nodule at Al-Karama Teaching Hospital.

Introduction:

Solitary thyroid nodule is defined as palpable discrete swelling within an otherwise normal gland and is usually benign. The prevalence of thyroid nodule which are solitary at palpation in general population is high, reported rates ranges from 0.7 to 6.5 %, being lowest in males and highest in middle aged women⁽¹⁾. The finding of a clinically solitary nontoxic thyroid nodule has usually been a strong indication for surgery because it is considered to be highly suspicious sign of carcinoma. The reported incidence of cancer in these cases has been very variable ranging between 3% and 36%. In most instances too many operations are performed in order to find a few cancers.

The management of the thyroid nodules has changed over the past two decades. The traditional approach of removing all thyroid nodules has given way to more cost effective and accurate diagnostic testing that allows to treat surgically those nodules likely to be malignant and treat conservatively those that are benign. Since the solitary nodule is the most common sign of thyroid carcinoma⁽²⁾, there is a need for inexpensive, simple and safe methods to identify correctly those nodules that have to be managed surgically because of malignancy.

Since the clinical features alone are not deciding⁽³⁾, various forms of investigations have been used to solve this problem but still each has its own limitations. One of the earlier and more useful methods is to determine the functional status of the nodule as measured by its ability to concentrate radioiodine. There are however distinct limitations of the ability of scans to differentiate benign from malignant thyroid nodules since vast majority of solitary cold nodules are still malignant^(4, 5).

Other methods, which have been developed to differentiate between benign and malignant nodules, include scanning with Selenomethionine, B-mode ultrasonography, thermography and serum human thyroglobulin levels. Fine needle aspiration is now a routine procedure in most offices. Many clinicians believe the results of fine needle aspiration are the most important parameter in the selection of the patients for thyroidectomy. Tissue obtained by fine needle aspiration undergoes cytological examination. With the help of an experienced pathologist, nodules can be classified according to their benign, inflammatory, cystic, or neoplastic nature. In most cases, benign cystic, colloid nodules, carcinomas, thyrioditis, and lymphomas can be diagnosed by the experienced pathologist. Cytologic material can be stained with Congo red for amyloid to confirm medullary carcinoma. Thus FNA has proved to be useful, safe, reliable and effective for differentiating benign from malignant nodules^(5, 6, 7, 8). However, many benign nodules still have to be excised in the search for malignancy, consequently there is a need for further attempts to refine existing methods and to introduce new methods.

Patients and Methods

The study comprised 112 patients consecutively presenting with solitary thyroid nodule and selected for surgery at our hospital during a three-year period. The series was prospectively collected. Each patient was interviewed and examined in accordance with a standardized form.

Thyroid scan has been done to all patients and the results of the scan were classified into cold, warm and hot nodules. The researcher performed most of the fine needle aspiration biopsies and the rest performed by the other surgical board students. The cytological examination performed by the laboratory staff and the results were then grouped as follows:

1. **Benign:** Where the aspirate revealed normal thyroid epithelial cells with various amount of RBC or colloid.
2. **Malignant:** Where the smears revealed high cellularity with variation in cellular shape, size and nuclear structures. In certain smears, the type of malignancy could also be found.

3. **Suspicious:** Where the smears revealed high cellularity with sheets of follicular cells that of nuclear variability; malignancy was suspicious for cytological diagnosis.
4. **Inadequate:** Where the aspirate was insufficient for cytological diagnosis.

The 103 patients have been treated surgically and the results of final histological diagnosis were correlated with the results of clinical examination, thyroid scan and the results of fine needle aspiration biops

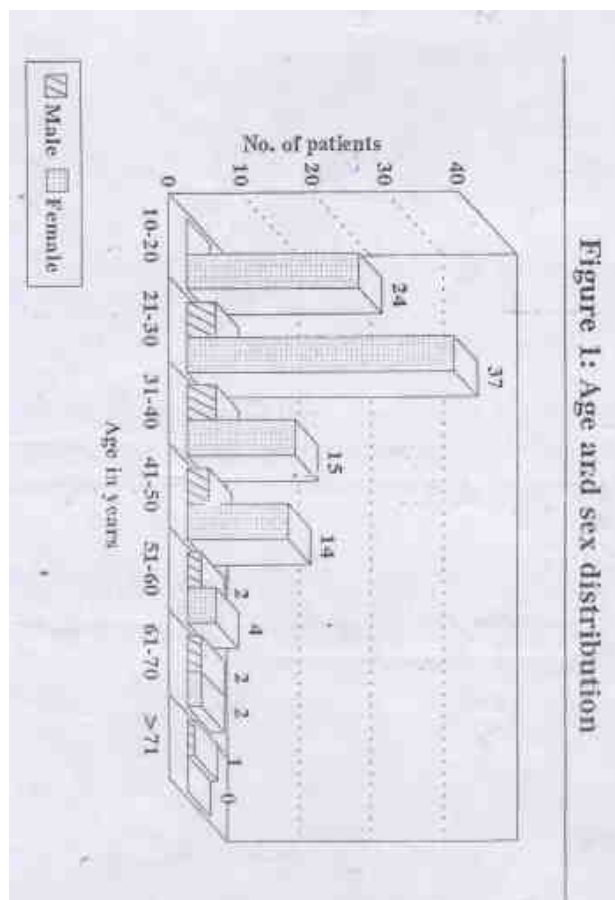
Results

One hundred twelve patients with solitary thyroid nodule met the criteria for inclusion in this study. The age and gender distribution are shown in figure 1. The highest incidence 57.7% occurred between 10-30 years of age.

More females were affected than male with a ratio of about 6:1. The highest incidence of females (61%) occurred in the early age groups (10-30 years) compared with low incidence of males in this age groups. The male to female ratio approximate towards the old age groups.

Clinically all cases presented with a swelling in the neck and complained of a variable degree of dysphagia and dyspnea that were encountered in 14 and 8 cases respectively. Two cases with unilateral lymphadenopathy and 88 cases with painless cervical swelling

- The thyroid function tests T3, T4 and TSH done for 70 cases, they were normal in 64 cases, low in 4 cases and high in two cases.
- Isotope scanning performed for 82 patients showed 3 hot nodules, 6 warm nodules and 73 cases with cold nodules.
- The right lobe was two times more frequently involved than the left



- Ultrasonography performed for 97 patients, all showed single thyroid nodule, from which 70 cases were solid and 27 cases were cystic. Thirty-six cases aspirated for cytology using 22 gauge fine needle connected to a 10ml plastic disposable syringe showed initially 26 benign cases, 1 suspicious, 2

malignant, and 7 insufficient cases. After surgery and histopathology, one benign case proved to be positive and the suspicious cases (which was considered to be positive) proved to be benign (follicular adenoma). The insufficient cases were excluded from calculation, where it constituted 7 cases

- Two cases who had initially treated by lobectomy by a different surgeon, had a second operation with near total clearance of the contra-lateral lobe after proved that it were malignant. About the nature of nodule was 70 cases(62.5%) and 42 cases(37,5%) cystic nodule.

Ninety-four cases were colloid nodule with focal fibrosis and hemorrhage, colloid nodule with cystic degeneration, and colloid nodule with regarding carcinoma, 5 cases were papillary carcinoma and 2 cases were follicular carcinoma with overall incidence of malignancy of 7 cases, two of them were male

Table 1
Results of histopathology

<i>Histopathology</i>	<i>No. of cases</i>	<i>Percentage</i>
Colloid nodule	94	88.9
Follicular adenoma	10	8.9
Hashimoto's thyroiditis	1	0.9
Papillary carcinoma	5	4.5
Follicular carcinoma	2	1.8
Total	112	100

Table 2
Incidence of Malignancy

<i>Gender</i>	<i>No. of cases</i>	<i>Percentage</i>
Female	5/96	4.5
Male	2/16	1.8
Total	7/112	6.3

Table 3
Age incidence of seven patients with carcinoma of solitary thyroid nodules

<i>No.</i>	<i>Age</i>	<i>Female</i>	<i>Male</i>
4	20-30 years old	3	1
1	30-40	1	0
0	40-50	-	-
2	50-60	1	1

Discussion:

Solitary thyroid nodule is common in young and early middle age (21-30) constituting 41% of the cases. Shukri⁽¹⁷⁾ found 63% between 18-37 years. Psarras et al⁽¹⁸⁾ found 43.3% between 21-40 years. Messaris et al⁽¹⁹⁾ found that the prevalence of palpable thyroid nodule was greatest between ages of 21 and 40 years with a decreased prevalence at the extremes of age. In the elderly the decreased prevalence of solitary thyroid nodules probably results from increased prevalence of multiple nodularity⁽¹³⁻¹⁸⁾.

In our series solitary thyroid nodules was more common in females, with female to male ratio of 6:1. Vander et al⁽²⁰⁾ found female to male ration of 4:1. Tunbridge et al⁽²¹⁾ reported a female to male prevalence ratio of 6:1. Psarras et al⁽¹⁸⁾ reported a female to male ratio of 7:1

Regarding the thyroid scanning techniques, 89% of these scintiscans indicated the presence of a nonfunctioning

(cold) nodules, nonfunctioning (warm) nodules were present in 7.31% of the total and only 3.76% of the total scans indicated the presence of hyperfunctioning (hot) nodule. Kummar et al ⁽²³⁾ found that 81.1 % cold, 8.5% warm and 12.4% hot. Griffin ⁽²²⁾ found that 84% of nodules were cold, 10.4% were warm and 5.5% of nodules were hot, he also said that thyroid carcinoma do not concentrate iodine as efficiently as the normal thyroid gland, so cold nodules have been considered to have a greater likelihood of being malignant, a cold nodule must be at least 1cm in diameter to be detectable under optimal conditions as a defect in the surrounding normal tissue, as it had been said before scans are limited in their ability to outline nodules at periphery or near the isthmus. Aspiration of as much cyst fluid as possible results in residual palpable nodule, repeated FNA of the solid component of mixed lesions should be performed. In our series, 37.5% cases were cystic and 62.2% cases were solid lesions. De Los Santos ⁽²⁵⁾, 32% cases were cystic and 68% solid noted. Shukri ⁽¹⁷⁾, 33% were cystic and 67% solid. The incidence of malignancy in our study was found to be 6.3%. Scaff et al ⁽²⁶⁾ 10%, Bapal et al ⁽¹¹⁾ at 5.7% and Shukri ⁽¹⁷⁾

Conclusion

The following guidelines seem to be useful in the management of patients with a solitary thyroid nodule:

1. The probability of malignancy in a solitary thyroid nodule is higher in women than in men and in young age group than elderly.
2. Nodules, which are hard at palpation, those associated with hoarseness or palpable cervical lymph nodes are more often malignant than benign.
3. Familial occurrence of benign goiter supports a benign diagnosis.
4. Thyroid scan showing hot lesion indicates mostly a benign process.
5. When cytological diagnosis is the benign, the risk of malignancy is low, clinical factors suggesting an increased risk of cancer should be used to decide in favour of surgery even when the cytological finding is benign.

Recommendation

The study is to evaluate the accuracy of frozen section in cases of suspicious of malignancy

References

1. Castro MR, Gharib H. Thyroid nodules and cancer. When to wait and watch, when to refer. *Postgrad Med* 2000;107:113-6,119-20,123-4.
2. Cooper DS, Doherty GM, Haugen BR, et al. Management guidelines for patient with thyroid nodules and differentiated thyroid cancer. *The American Thyroid Association Guidelines Taskforce Thyroid* 2006,16(2):109-142
3. Tournaire-J. management of solitary thyroid nodule; clinical evaluation. *Ann-Endocrinol-Paris*. 1993;54(4):226-9.
4. Kineafsey-B; Gillen-P; Brady-MP. Limitation of thyroid scanning in solitary thyroid nodules. *Ir-J-Med Sci*. 1994 Oct.;163(10); 451-4.
5. Al-Shaikh A, Ngan B, Daneman A, Daneman D. Fine-needle aspiration biopsy in the management of thyroid nodules in children and adolescents. *J Pediatr* 2001;138:140-2.
6. Hamming-JF; Vriens-MR; Gasting-BM; Songun-1; Fleuren-GJ; Van-de-VeldeCJ. Role of fine needle aspiration biopsy and frozen section examination in determining the extent of thyroidectomy. *World-J-surg*. 1998 June;22(6): 575-9.
7. Sidawy-MK; Del-Vecchio-DM; Knoll- SM. FNA cytology of thyroid nodule. Correlation between cytology and histology and evaluation of discrepant cases. *Cancer* 1997 Aug;25;81(4):253-9.
8. Lopez-LH; Canto-JA; Herreta-MF; Gamboa-Domingue; Rivera-R; Gonzalez-O; Perez-Enriquez-B; Anaeles-Angeles-A; Letayf-V; Rull-JA. Efficiency of FNA of thyroid nodule, experience of Mexican institution. *World J. Surg*. 1997 May; 21(4):408-11.
9. Giuffrida D, Gharib H. Controversies in the management of cold, hot, and occult thyroid nodules. *Am J Med* 1995;99:642-50.
10. Mazzaferri EL, Management of a solitary thyroid nodule. *N Engl J Med* 1993;328:553-9.

11. Burch HB. Evaluation and management of the solid thyroid nodule. *Endocrinol Metab Clin North Am* 1995;24:663-710.
12. Cancer facts & figures 2001. Atlanta: American Cancer Society, 2001.
13. Walsh RM, Watkinson JC, Franklyn J. The management of the solitary thyroid nodule: a review. *Clin Otolaryngol* 1999;24:388-97.
14. Surgical short cases for M.R.C.S. clinical examination Catherine parchment smith page 82 2003.
15. Tan GH, Gharib H. Thyroid incidentalomas: management approaches to nonpalpable nodules discovered incidentally on thyroid imaging. *Ann Intern Med* 1997;126:226-31.
16. Cochand-Priollet B, Guillausseau PJ, Chagnon S, Hoang C, Guillausseau-Scholer C, Chanson P, et al. The diagnostic value of fine-needle aspiration biopsy under ultrasonography in nonfunctional thyroid nodules: a prospective study comparing cytologic and histologic findings. *Am J Med* 1994; 97:152-7.
17. Shukri AM: The solitary thyroid nodule in Iraq. *The British Jour, of Clinical Practice*. Vol. 21, No. 3, March 1967. 123,124.
18. Psarras A, Papadopoulos SN, Livadas D, Pharmakiotis AD, Koutras DA. *Br. J. Surg.*, 1972, Vol. 59, No. 7, July.215,216.
19. Messoris G, Kyriakou K, Vasipoulos P, Tountas G. The single thyroid nodule and carcinoma. *Br. J. Surg.* 1974; 61: 943-944.
20. Vander JB, Gaston EA, Dawber TR. Significance of solitary nontoxic thyroid nodules : Preliminary report. *N. Engl. J. Med.* 1954;251:970-973.
21. Tumbridge WMG, Evered DC, Hall R, et al. The spectrum of thyroid disease in a community: The Whickham survey. *Clin. Endocrinol.(Oxf)* 1977; 7:481-493.
22. de-los-Santos-Et, Keyhani Rofagha S, Cunningham JJ, Mazzaferri EL. Cystic thyroid nodules. The dilemma of malignant lesion. *Arch. Intern. Med.* 1990 Jul, 150(7): 1422-7.
23. Kumar-A ; Ahuja-MM; Chattopadhyay – TK; Padhy-AK; Gupta-AK; Kapila-K; Goel-AK; Karmarker-MG. Fine needle aspiration cytology, sonography and radionuclide scanning in solitary nodule. *J. Assoc. Physicians, India* 1992 May; 40(5): 302-6
24. Altavill G, Pascale M, Mci I, Fine needle aspiration of thyroid gland disease, *Acta. Cytol.* 2:251-259 1990.
25. Kandall LW, Condon RE. Prediction of malignancy in solitary thyroid nodule. *Lancet* 1969; 1: 1071-1073.
26. Mazzaferri EL. Thyroid cancer in thyroid nodules: finding a needle in the haystack. *Am J Med* 1992; 93:359-62.
27. Filetti, Belfiore A, Amir SM, Daniels GH; Ippolito, Vigneri R, Ingbar SH. The role of thyroid-stimulating antibodies of Graves' disease in differentiated thyroid cancers. *N. Engl. J. Med.* 1988;318:753-759.
28. Rojeski MT, Charib H. Nodular thyroid disease: Evaluation and management. *N. Engl. J. Med.* 1988; 313: 428-36.
29. Gharib H, Goellner JR. Fine-needle aspiration biopsy of the thyroid: an appraisal. *Ann Intern Med* ^ 1993;118:282-9.
30. Jeffrey P. Campbell, Harold C. Pillsbury. Management of thyroid nodule. *Head and Neck* Sept/Oct 1989.