Original Research Article

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A clinicopathological study of solitary nodule of thyroid

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ABSTRACT

Background: Solitary thyroid nodule is considered a challenge by surgeons and pathologists alike. Prevalence increases with age and their occurrence is spontaneous.

Methods: This is a prospective study conducted in our hospital conducted over period of 2 years. About 100 patients who were confirmed as solitary nodule by clinical examination and ultrasound were included in this study and all relevant data were collected.

Results: The swelling was found to be more common in women and in the age group of 20 to 30 years. The lesion was found to be benign in 92% and malignant in 8%. Out of the 8%, 4% of cases were diagnosed as malignant by FNAC. About 90% patients had undergone hemithyroidectomy and 10% underwent total thyroidectomy. The most common complication was wound infection.

Conclusions: The majority of solitary nodule of thyroid was found to be benign and this clearly illustrates that hemithyroidectomy is the preferred surgery unless malignancy is suspected by fine needle aspiration cytology.

Keywords: Hemithyroidectomy, Solitary nodule, Swelling

INTRODUCTION

Solitary nodule of thyroid presents a challenge in diagnosis and management for the surgeons and pathologists. Often these swelling are large in size and develop on the edge of thyroid gland making them easy to be palpated and visible. The prevalence of these nodules in a given population depends on a number of factors such as age, sex, diet iodine deficiency, therapeutic and environmental radiation exposure. The prevalence of solitary nodule increases with age at the rate of 0.8% per year.^{1,2}

The prevalence of palpable thyroid nodules was found to be 4 to 7% with only 5 to 10% of nodules being malignant.³⁻⁶ Hence the decision to operate is made based on the clinical, radiological and cytological evaluation of the nodule. This explains the importance of a team work

in the management of these lesions. Many solitary nodules on palpation are actually prominent nodule of a multinodular goitre. This distinction is essential because solitary nodules are more likely to be malignant than a multinodular goitre.

The functional nature of the nodule can be established by chemical hormonal analysis and nuclear imaging method and this also helps in deciding the clinical outcome in patients. But the most important diagnostic tool in initial evaluation of thyroid lesions is fine needle aspiration cytology.⁶ It can be done by the clinician himself in an outpatient setup at a small expense and hence seems to be an ideal investigation in a developing country like India.

The objective of this study was to evaluate the role of FNAC in the diagnosis of solitary nodule of thyroid and the incidence of malignancy in solitary nodules. We also

evaluated management plans made for these nodules and the incidence of postoperative complications.

METHODS

This was a prospective study conducted in the department of surgery in our hospital during a period of 2 years from January 2015 to December 2016 and the study included 100 cases. All patients who were confirmed as solitary nodule by ultrasound were included in the study after signing an informed consent. Patients with multiple nodules and coexistent neck nodules were excluded from the study.

Data regarding the age and sex of the patient were recorded, the patient was then examined after which FNAC of the nodule was performed using 22-gauge needle with or without negative pressure. In the surgical patients, the postoperative complications were documented.

RESULTS

Out of the 100 cases studied 85% were females and 15% were males giving a male: female ratio of 1: 5.6. The majority of patients about 55% were in the young age group of 20 to 30 years while a small percentage of only 5% were above 50 years. Right lobe preponderance was noted in this study. About 90% of patients had presented in the outpatient department for the complaint of swelling in the neck while 2% had presented for loss of weight and the remaining 8% were diagnosed incidentally during master health check-ups.

Out of 90 cases diagnosed as benign on ultrasound 88 were confirmed as benign in histopathology and 2 were found to be malignant. Among the 8 cases given as suspicious, 7 were benign and 1 malignant and both the cases given as malignant were confirmed to be malignant in histopathology.

By FNAC 91 cases were reported as benign, 4 were reported as malignant and FNAC was contributory to diagnosis in 5 cases. On histological correlation among the 91 cases diagnosed as benign 90 were benign and 1 was malignant (papillary carcinoma). The retrospective viewing of slides also did not show any suspicious population of cells. Among the 3 cases given as malignant all cases correlated with the diagnosis (1 follicular carcinoma, 1 papillary carcinoma and 1 medullary carcinoma). Out of the FNAC not contributory cases 1 was found to be a follicular carcinoma and 1 was found to be a benign follicular adenoma and in these cases also retrospective viewing did not show suspicious cells and material was unsatisfactory. The overall histopathological correlation was found to be 97%.

For surgical management of the cases about 89% cases were decided for hemithyroidectomy and 11% cases underwent total thyroidectomy. One patient who was

diagnosed as papillary carcinoma on histopathology of a hemithyroidectomy specimen underwent revision thyroidectomy post diagnosis. In this study wound infection was most common postoperative complication seen in 6 cases followed by hypoparathyroidism in 4 cases and recurrent laryngeal nerve palsy in 2 cases.

DISCUSSION

In the study by Vojvodich et al, the overall accuracy of FNAC was found to be 85.6% while in the study by Kamaljit et al FNAC was found to be 83.3% sensitive and 100% specific. In the study by Davoudi et al the FNAC accuracy was 85.9%. Certain diagnosis involving follicular histology often cannot be made with needle biopsies alone. Though FNAC is a good initial mode of investigations it is more accurate if it could be complemented by frozen sections. Follicular neoplasms can be segregated into benign or malignant category conclusively only by demonstrating capsular or vascular invasion by histology either by frozen sections or permanent sections.

Further in cases of papillary carcinoma the possibility of missing the representative focus is quite possible when the procedure is done blindly without ultrasound guidance. Hence the utilisation of ultrasound guidance for solitary nodules will positively impact the sensitivity of the test. Similarly performing the FNAC by two or three passes on the nodule will also help in increasing the sensitivity and the role of aspiration versus non-aspiration method of FNAC may also contribute to the variations in sensitivity of the procedure.

In the study by Waseer and Sonkhya et al the specificity of FNAC in diagnosing malignant lesions was 100% correlating with our study while the specificity showed variations among the various studies.¹⁰

In the distribution of histology of the nodule the present study correlated with many other studies with colloid nodule as the most prevalent diagnosis. In the current study, out of the 95 benign cases 63 were colloid or adenomatous goitre while in the study by Fai CH et al it was 34 out of 54 and in the study by Darwish et al the prevalence was 45.5%. ^{11,12}

In this study, recurrent laryngeal nerve paly was 2%, 1 patient had a temporary paly with complete recovery and 1 had permanent paralysis as the procedure was a revision thyroidectomy and thyroid was adherent to the surrounding structures. This was in concordance with the study by Roh JL et al who had 2.8% temporary and 0.9% permanent palsy rates.¹³ In the study by John M et al the rate was 1% and it was a permanent palsy.¹⁴

CONCLUSION

Solitary nodule of thyroid are fairly common lesions seen in surgical department. So, formatting a standard

investigation protocol to be followed by all junior and senior doctors alike can increase the chances of appropriate management and avoid revision surgeries. Utilisation of radiology and pathological means such as guided FNAC and frozen sections have been found to be very useful tools for the surgeons. Further the standard surgical option of hemithyroidectomy in most cases of solitary nodule still stands good and sufficient in most cases thereby reducing the necessity of lifelong thyroxine and calcium supplementation.

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institutional ethics committee

REFERENCES

- Larsen PR, Ingbar SH. The thyroid gland: Wilson JD, Foster DW (eds), Williams Textbook of Endocrinology, 9th Edition, Philadelphia, WB Sauders; 1998:353-487.
- 2. Fraker DL. Radiation Exposure and other factors that predispose to human thyroid neoplasia. Surg Clin North Am. 1995;75(3):365-75.
- 3. Mortensen JD, Woolner LB, Bennett WA. Gross and microscopic findings in clinically normal thyroid glands. J Clin Endocrinol Metab. 1955;15(10):1270-80.
- 4. Singer PA. Evaluation and management of the solitary thyroid nodule. Otolaryngol Clin North Am. 1996;29(4):577-91.
- Papini E, Guglielmi R, Bianchini A, Crescenzi A, Taccogna S, Nardi F, et al. Risk of malignancy in nonpalpable thyroid nodules: predictive value of ultrasound and color-Doppler features. J Clin Endocrinol Metab. 2002;87(5):1941-6.
- 6. Nam-Goong IS, Kim HY, Gong G, Lee HK, Hong SJ, Kim WB, et al. Ultrasonography-guided fine-needle aspiration of thyroid incidentaloma:

- correlation with pathological findings. Clin Endocrinol (Oxf). 2004;60(1):21-8.
- Vojvodich SM, Ballagh RH, Cramer H, Lampe HB. Accuracy of fine needle aspiration in the preoperative diagnosis of thyroid neoplasia. J Otolaryngol. 1994;23(5):360-5.
- 8. Kaur K, Sonkhya N, Bapna AS, Mital P. A comparitive study of fine needle aspiration cytology, ultrasonography and radionuclide scan in the management of solitary thyroid nodule: a prospective analysis of fifty cases. Indian J Otolaryngol Head Neck Surg. 2002;54(2):96-101.
- 9. Davoudi MM, Yeh KA, Wei JP. Utility of fine needle aspiration cytology and frozen section examination in the operative management of thyroid nodules. AM Surg. 1997;63(12):1084-9.
- 10. Waseer MH, Hussain R, Malik MA. solitary thyroid nodule; role of FNAC. The Professional. 2001;8(2):1-6.
- 11. Fai CH. Dorothy law aspiration cytology in management of solitary thyroid nodule. J Hong Kong Med Associat. 1986;38(2):87-8.
- 12. Darwish AH, FRCPath, Al Sindi KA, Jihene EL Kafsi, Bacantab. Pattern of thyroid disease a histopathological study. Bahrain Med Bullet. 2006;28(4):1-6.
- 13. Roh JL, Yoon YH, Park Cl. Recurrent laryngeal nerve paralysis in patients with papillary thyroid carcinomas: evaluation and management of resulting vocal dysfunction. Am J Surg. 2009;197(4):459-65.
- 14. Chaplin JM, O'Brien CJ, McNeil EB, Haghighi K. Application of prognostic scoring systems in differentiated thyroid carcinoma. ANZ J Surg.

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