

THYROID LESIONS: SONOLOGICAL, CYTOLOGICAL, AND HISTOPATHOLOGICAL CORRELATION: A 3-YEAR EXPERIENCE

Ashok Yadav¹, Pankaj Yadav², CV Kulkarni¹, NP Tiwari¹

¹ Department of Pathology, Mahatma Gandhi Memorial Medical College, Indore, Madhya Pradesh, India

² Department of Radiodiagnosis, Gajra Raja Medical College, Gwalior, Madhya Pradesh, India

Correspondence to: Ashok Yadav (drashokmyh@gmail.com)

DOI: 10.5455/ijmsph.2014.081020142

Received Date: 14.07.2014

Accepted Date: 04.08.2014

ABSTRACT

Background: Thyroid is a superficial, readily accessible endocrine gland. Differentiation between nonneoplastic and neoplastic thyroid disease is not difficult. Accurate subtyping and grading of thyroid neoplasms are possible only with the combined efforts of sonologists and pathologists. With its increasing use, it is evident that ultrasonography (USG) is becoming more and more reliable as a predictor of the exact nature of neoplastic thyroid lesions.

Aims and Objectives: (1) To try and establish a correlation between the various sonography vs cytology, histopathology, and cytology plus histopathology findings. (2) To evaluate and compare the results of USG, fine-needle aspiration cytology (FNAC), and postoperative histopathology examination. (3) To detect any emerging trend in relation with the USG and histopathology and cytology findings.

Materials and Methods: Retrospective data were obtained from the Departments of Radiodiagnosis and Pathology of Mahatma Gandhi Memorial Medical College, Indore, Madhya Pradesh, India. The time frame of the study was 3 years in which 262 cases were considered.

Results: In this study, USG was found to emerge as a potent diagnostic modality to predict the exact nature of thyroid lesions. The results indicate that approximately 270% increase was found in the use of USG. At the same time, there is 250% increase was also found in the use of FNAC.

Conclusion: An accurate correlation (90%) between the USG and FNAC findings was found in nonneoplastic lesions (inflammatory and cystic). Histopathology remains a gold standard.

Key Words: Sonography; Cytology; Histopathology; Thyroid Lesions

Introduction

Thyroid is a superficial, readily accessible endocrine gland. Thyroid lesions are common in the general population, especially in iodine-deficient areas.^[1,2] With more intensive use of iodized salt and other measurements, the incidence of earlier common disorders such as goitre and congenital hypothyroidism has dropped dramatically, but other thyroid disorders such as thyroid neoplasia still pose a major problem. Nodular abnormality of thyroid represents a significant problem all over the world. Thyroid lesions are forming an increasing part of sonography practice. At the same time, fine-needle aspiration cytology (FNAC) is also gaining ground as a diagnostic modality. Pathology remains the final tool for diagnosis. Till date, ultrasonography (USG) was acting as a bridge between medicine and pathology.^[3,4]

Differentiation between nonneoplastic and neoplastic thyroid disease is not difficult. Accurate subtyping and grading of thyroid neoplasms are possible only with the combined efforts of sonologists and pathologists. With its increasing use, it is evident that USG is becoming more

and more reliable as a predictor of the exact nature of thyroid lesions.^[3-5]

This study was aimed to try and establish a correlation between the various findings reported by sonography vs cytology, histopathology, and cytology plus histopathology; to evaluate and compare the results of USG, FNAC, and postoperative histopathology examination; and to detect any emerging trend in relation with the results of USG and histopathology and cytology.

Materials and Methods

Retrospective data were obtained from the Department of Radiodiagnosis and Department of Pathology of Mahatma Gandhi Memorial (MGM) Medical College, Indore, Madhya Pradesh, India. The time frame of the study was 3 years and a total of 262 cases were considered.

Experimental Work

This study was conducted on the patients referred by the

Department of Surgery, MGM Medical College, Indore. Total 262 cases were considered in this study. In this study, in all cases USG results were compared with the findings of cytology (FNAC), histopathology, and cytology plus histopathology.

In this study, following exclusion criteria were considered: FNAC was not USG guided because of the heavy work load in both the departments; the age and sex were not used as determinants. Color Doppler and power angio study was considered in a few cases.

Report format: FNAC

1. Malignant
2. Benign
3. Cystic
4. Inflammatory
5. Granulomatous
6. Poorly cellular
7. Acellular/hemorrhagic

Report format: USG

1. Diffuse enlargement
2. Nodular: Solid/cystic/mixed
3. Echogenicity: iso/hyper/hypo/mixed
4. Calcification: absent/present: micro
5. Halo: absent/present
6. Vascularity
7. Lymph node in the vicinity

Pitfalls

- Dilution: blood/anaesthetic fluid
- Drying of cells
- Too thick/dry smear
- Fibrosis: scant cellularity
- Degeneration/necrosis/abscess formation

Thyroid cysts – Cytological features:

- Brown fluid (colloid + altered blood)
- Bloody background with degenerating blood cells
- Numerous foam cells (with ingested debris and hemosiderin)
- Scanty follicular epithelium

Results

In this 3-year study, USG was found to emerge as a potent diagnostic modality in predicting the exact nature of thyroid lesions. The results indicate that approximately 270% increase was found in the use of USG. At the same time, 250% increase was also found in the use of FNAC.

Table-1: Thyroid sonography performed during 2008–2010

Month	2008	2009	2010
January	12	28	31
February	19	32	28
March	22	15	31
April	10	31	43
May	12	34	19
June	25	31	30
July	16	19	24
August	10	17	28
September	19	22	44
October	13	32	34
November	21	21	55
December	18	20	39

Table-2: Number of thyroid cytology/FNAC performed

Month	2008	2009	2010
January	4	5	6
February	5	8	11
March	7	9	7
April	5	7	8
May	6	10	10
June	7	6	12
July	9	6	4
August	4	5	11
September	2	5	12
October	3	8	14
November	9	6	10
December	11	4	6

Table-3: Number of histopathology diagnoses done

Histopathological diagnostics	2008	2009	2010
Colloidal adenoma	10	22	33
Haemorrhagic cyst	02	01	01
Follicular carcinoma	00	00	01
Papillary carcinoma	05	11	03
Medullary carcinoma	01	00	01
Anaplastic carcinoma	00	02	00
Hashimoto thyroiditis	02	02	03
Total	20	38	42

Table-4: Year-wise distribution of lesions on the basis of FNAC findings

Lesions	2008	2009	2010
Malignant	1	2	1
Benign	25	39	27
Cystic	4	6	12
Inflammatory	4	3	4
Granulomatous	2	1	3
Psammoma body	2	3	1
Acellular/hemorrhagic	5	3	1

Table-5: Relationship between the USG and FNAC findings in the case of nodular lesions

Pathological Diagnosis	USG Findings					
	Solid	Cystic	Mixed	Microcalcification	Echogenicity	Mixed echogenicity
Benign Lesion	38	14	39	4	20	7
Malignant Lesion	3	0	1	3	3	1
Papillary carcinoma	2	0	0	2	2	0
Follicular carcinoma	0	0	1	0	0	1
Medullary carcinoma	1	0	0	0	1	0
Total	44	14	41	9	26	9

The results of the thyroid sonography performed during

2008–2010 are given in Table 1. The total number of cases considered being 262. The results of total number of thyroid cytology/FNAC performed are given in Table 2. The results of total number of histopathology diagnosis done during the study are given in Table 3. Year-wise distribution of lesions on the basis of FNAC is given in Table 4. The relationship between the USG and FNAC findings in regards to nodular lesion was also calculated, and the results of the same are given in Table 5.

Discussion

From 2008–2010, an increasing accuracy of the diagnosis has been documented; from 60% in 2008 to 70% in 2010 in the case of benign lesions. This accuracy has gone up from 61% to 83% from 2008 to 2010 in the case of malignant lesions. This is an extremely encouraging and heartening sign of progress because accuracy in sonography is beneficial for the patient as well as for the treating doctor.

An accurate correlation (90%) between the USG and FNAC findings was found in the case of nonneoplastic lesions (inflammatory and cystic). Histopathology remains a gold standard. From the results of this study, it was concluded that the presence of halo (thick and incomplete) appears to be a very useful predictor of malignancy. Microcalcification on USG is equivalent to

psammoma bodies on FNAC/histopathology and is well known as a predictor of papillary carcinoma, the most common malignancy of thyroid. Reporting of cystic lesion is inconclusive and often misleading. A more in-depth study of this aspect may prove fruitful. Many times hemorrhagic/acellular smear reported on FNAC are hindrance to a quick diagnosis.

Conclusion

An accurate correlation (90%) between the USG and FNAC findings was found in nonneoplastic lesions (inflammatory and cystic). Histopathology remains a gold standard.

References

1. Amodio F, Di Martino S, Esposito S, Iorio S, Hierholzer J, Rea G, et al. [Role of flowmetric analysis and of color-Doppler ultrasonography with contrast media in the different phases and follow up of Grave's disease]. *Radiol Med* 2001;102(4):233–7.
2. Yokazawa T, Fukata S, Kuma K, Matsuzuka F, Kobayashi A, Hirai K, et al. Thyroid cancer detected by ultrasound-guided fine-needle aspiration biopsy. *World J Surg* 1996;20:848–53.
3. Brander A, Vilkinoski P, Nickels J, Kivisaari L. Thyroid gland: US screening in middle aged women with no previous thyroid disease. *Radiology* 1989;737:505–10.
4. Caruso G, Attard M, Caronia A, Lagalla R. Color Doppler measurement of blood flow in the inferior thyroid artery in patients with autoimmune diseases. *Eur J Radiol* 2000;36(1):5–10.
5. Watters DA, Ahuja AT, Evans RM, Chick W, King WW, Metreweli C, et al. Role of ultrasound in the management of thyroid nodule surgery. *Am J Surg* 1992;164:654–7.

Cite this article as: Yadav A, Yadav P, Kulkarni CV. Thyroid lesions: Sonological, cytological, and histopathological correlation: A 3-year experience. *Int J Med Sci Public Health* 2014;3:1545-1547.

Source of Support: Nil

Conflict of interest: None declared