



:
 : 18
 21
 1 (), 2 (), 3 ()
 : 21
 1 5 (24%), 2 3 (14%), 3 13 (62%)
 . 21 가 18 가
 (86%). 1 3
 가 2 가 . 2
 3 2 (67%) 3 13 3 (23%)
 :
 2, 3

23-55 (36.7) ,
 21%, 39% 14 4 3-45 mm 16
 (1). 가 (1 - mm Aloka
 6). prosound SSD - 5000 (Wallingford, CT, U.S.A.) Toshiba
 aplio SSA - 770A (Otawara - shi, Japan) 10 MHz

(7 - 10)
 , 가 (1, 3, 11, 12). 가 3 가 18 ,
 4 가

1/3
 2004 1 2005 4 1 ()
 18 2 (),
 21 3 ()
 (Fig. 1).

21 (14%), 3 13 (62%) 1 5 (24%), 2 3 (Table 1).
 1 () 5 , 2
 가 , 3 가 , 2
 가 . 5
 (Fig. 2).
 2 () 3 1 가
 2
 (Fig. 3).
 3 () 13 9
 가
 1 가
 3

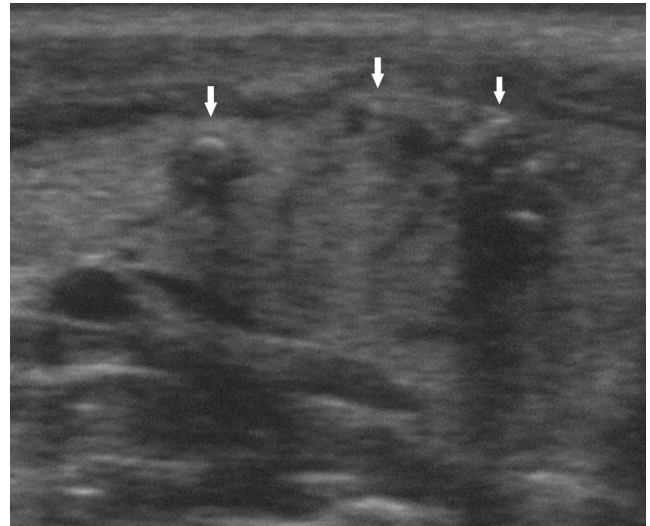


Fig. 2. A 38-year-old man with papillary carcinoma. Longitudinal sonogram of right thyroid lobe shows a solid mass with Type 1 peripheral nodular calcification. The histopathologic results of preoperative gun biopsy and surgery were same.

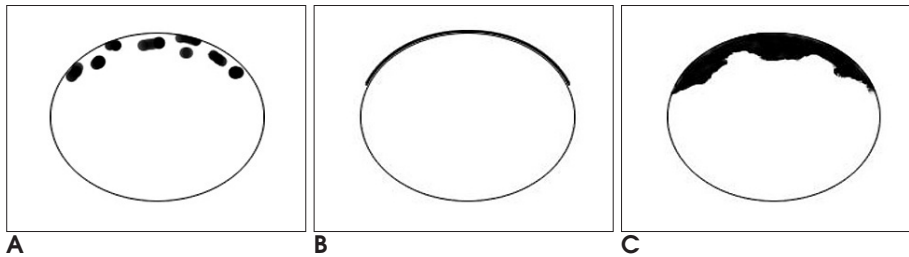


Fig. 1. Diagrammatic representation of peripheral calcification types of the thyroid tumors.

- A.** Type 1: peripheral nodular calcification
B. Type 2: peripheral smooth rim calcification
C. Type 3: peripheral irregular rim calcification

Table 1. Comparison of Pathologic Results between Preoperative Biopsy and Surgery

| NO. | Type | Preoperative biopsy | Bx method | Surgical results |
|-----|------|------------------------------------|-----------|---------------------|
| 1 | 1 | Papillary carcinoma | Gun | Papillary carcinoma |
| 2 | 1 | Papillary carcinoma | Gun | Papillary carcinoma |
| 3 | 1 | Follicular neoplasm | Gun | Follicular adenoma |
| 4 | 1 | Follicular neoplasm | Gun | Follicular adenoma |
| 5 | 1 | Papillary carcinoma | Gun | Papillary carcinoma |
| 6 | 2 | Benign lesion | FNA | Papillary carcinoma |
| 7 | 2 | Papillary carcinoma | Gun | Papillary carcinoma |
| 8 | 2 | Nodular hyperplasia | Gun | Papillary carcinoma |
| 9 | 3 | Suggestive of papillary carcinoma | Gun | Papillary carcinoma |
| 10 | 3 | Atypical cell | Gun | Papillary carcinoma |
| 11 | 3 | Papillary carcinoma | Gun | Papillary carcinoma |
| 12 | 3 | Atypical cell | Gun | Papillary carcinoma |
| 13 | 3 | Papillary carcinoma | Gun | Papillary carcinoma |
| 14 | 3 | Papillary carcinoma | Gun | Papillary carcinoma |
| 15 | 3 | Follicular cell lesion | Gun | Nodular hyperplasia |
| 16 | 3 | Suspicious papillary carcinoma | FNA | Papillary carcinoma |
| 17 | 3 | Atypical cell | Gun | Papillary carcinoma |
| 18 | 3 | Nodular hyperplasia | Gun | Papillary carcinoma |
| 19 | 3 | Benign lesion/ Papillary carcinoma | Gun | Papillary carcinoma |
| 20 | 3 | Benign lesion | Gun | Papillary carcinoma |
| 21 | 3 | Papillary carcinoma | Gun | Papillary carcinoma |

Bx: biopsy, FNA: fine needle aspiration biopsy

가 . 3 1

가

1 가 2

3 가 2 3

가

가

가

가

가

가 100% 가 가

가

가

가 86%가

1)

2)

3)

1 가 2 3

가

4) 가

가

1. Khoo ML, Asa SL, Witterick IJ, Freeman JL. Thyroid calcification and its association with thyroid carcinoma. *Head Neck* 2002;24:651-655

2. . *Korean J Otolaryngol* 2004;47:457-461

3. Seiberling KA, Dutra JC, Grant T, Bajramovic S. Role of intrathyroidal calcifications detected on ultrasound as a marker of malignancy. *Laryngoscope* 2004;114:1753-1757

4. Kakkos SK, Scopa CD, Chalmoukis AK, Karachalios DA, Spiliotis JD, Harkoftakis JG, et al. Relative risk of cancer in sonographically detected thyroid nodules with calcifications. *J Clin Ultrasound* 2000;28:347-351

5. Koike E, Noguchi S, Yamashita H, Murakami T, Ohshima A, Kawamoto H, et al. Ultrasonographic characteristics of thyroid nodules: prediction of malignancy. *Arch Surg* 2001;136:334-337

6. . 1997;13:30-34

7. Iannuccilli JD, Cronan JJ, Monchick JM. Risk for malignancy of the thyroid nodules as assessed by sonographic criteria: the need for biopsy. *J Ultrasound Med* 2004;23:1455-1464

8. Chan BK, Desser TS, McDougall IR, Weigel RJ, Jeffrey RB Jr. Common and uncommon sonographic features of the papillary thyroid carcinoma. *J Ultrasound Med* 2003;22:1083-1090

9. Kim EK, Park CS, Chung WY, Oh KK, Kim DI, Lee JT, et al. New sonographic criteria for recommending fine-needle aspiration biopsy of nonpalpable solid nodules of the thyroid. *AJR Am J Roentgenol* 2002;178:687-691

10. Tessler FN, Tublin ME. Thyroid sonography: current applications and future directions. *AJR Am J Roentgenol* 1999;173:437-443

11. Komolafe F. Radiologic patterns and significance of thyroid calcification. *Clin Radiol* 1981;32:571-575

12. Taki S, Terahata S, Yamashita R, Kinuya K, Nobota K, Kakuda K, et al. Thyroid calcifications sonographic patterns and incidence of cancer. *Clin Imaging* 2004;28:368-371

13. Yamana K, Nakano R, Kinoshita T, Morimatsu M, Nakashima T. Ultrastructure of anaplastic carcinoma with large calcification in the thyroid gland. *Acta Pathol* 1984;34:585-592

14. Klink GH, Winship T. Psammoma bodies and thyroid cancer. *Cancer* 1959;12:656-662

15. Katz JF, Kane RA, Reyes J, Clarke MP, Hill TC. Thyroid nodules: sonographic-pathologic correlation. *Radiology* 1984;151:741-745

16. Park CH, Rothermel FJ, Judge DM. Unusual calcification in mixed papillary and follicular carcinoma of the thyroid gland. *Radiology* 1976;119:554

17. . 2001;45:347-351

18. Taki S, Kakuda K, Kakuma K, Annen Y, Katada S, Yamashita R, et al. Thyroid nodules: evaluation with US-guided core biopsy with an automated biopsy gun. *Radiology* 1997;202:874-877

Patterns and Significance of Peripheral Calcifications of Thyroid Tumors seen on Ultrasound¹

Min Sook Kwak, M.D., Jung Hwan Baek, M.D., Yoon Suk Kim, M.D., Hyun Jo Jeong, M.D.

¹Department of Radiology, Daerim St. Mary's Hospital

Purpose: We wanted to analyze the peripheral calcification patterns of thyroid tumors that were seen on ultrasound and we also wanted to evaluate the clinical usefulness of the peripheral calcifications of the thyroid tumors.

Materials and Methods: We retrospectively analyzed 21 peripheral calcifications of the thyroid tumors of 18 patients; these were histopathologically confirmed by fine needle aspiration biopsy, automated gun biopsy and surgery. The peripheral calcification patterns were categorized into three types: type 1, peripheral nodular calcification, type 2, peripheral smooth rim calcification, and type 3, peripheral irregular rim calcification. The histopathologic results obtained during surgery, fine needle aspiration or automated gun biopsy were compared.

Results: Of the total 21 peripheral calcifications of thyroid tumors, 5 cases showed as being type 1 (24%), 3 cases showed as being type 2 (14%) and 13 cases showed as being type 3 (62%). Of the total 21 peripheral calcifications of the thyroid tumors, 18 were histopathologically confirmed as papillary carcinoma (86%). Among the type 1 peripheral calcification patterns, 3 cases were coincidentally diagnosed as papillary carcinoma and 2 cases were follicular neoplasm on the preoperative biopsy results and on the surgical results. Two cases of type 2 peripheral calcifications (67%) and three cases of type 3 peripheral calcifications (23%) were diagnosed as benign lesions upon preoperative biopsy, but the postoperative results were papillary carcinoma.

Conclusion: Peripheral calcifications of thyroid tumors are important feature that suggest malignancy together with the microcalcification and peripheral calcifications of the type 2 and type 3 patterns, and these lesions may be difficult to accurately diagnose with using only biopsy.

Index words : Thyroid, neoplasms
Thyroid, US
Calcification

Address reprint requests to : Min Sook Kwak, M.D., Department of Radiology, Daerim St. Mary's Hospital
978-13 Daerimdong, Yeongdeungpo-gu, Seoul 150-070, Korea.
Tel. 82-2-829-9362 Fax. 82-2-829-9166 E-mail: minsook486@hanmail.net