

:
 :
 가
 1
 28
 ,
 ,
 :
 1
 28
 17 (9 , 8)
 60.7%, 11 (7 , 4) 39.3% .
 $5.2 \pm 4.4 \text{ cm}^3$, $5.9 \pm 4.5 \text{ cm}^3$
 $12.1 \pm 10.3 \text{ cm}^3$,
 $10.1 \pm 9.9 \text{ cm}^3$.
 46.2%, $79.4 \pm 21.0\%$ $127.2 \pm$
 : (P < 0.05).
 가 50% 가 60%
 가
 4-7% ,
 7.5-27.3%
 (1). , 1 가
 7-25% 가
 (2-5).

1995 4 1998 12
 ,
 28
 가 35 28 가 2 ,
 26 , 18-63 42.2
 28 TSH(thyroid-stimulating hormone)
 0.3 ml/L 가 100-200 μg
 1

SSD-680(Aloka, Tokyo, Japan) SONOACE-7700
(Medison, Seoul, Korea) 7.5MHz

2

28

1

52%

250% 가 , 28 17 (60.7%)

9 (32.1%), 8 (28.6%)

(Fig. 1A,B)(Fig. 2A,B).

11 (39.3%)

7 (25.0%), 4 (14.3%)

(Fig. 3A,B.)(Table 1).

66% 250% 가 ,

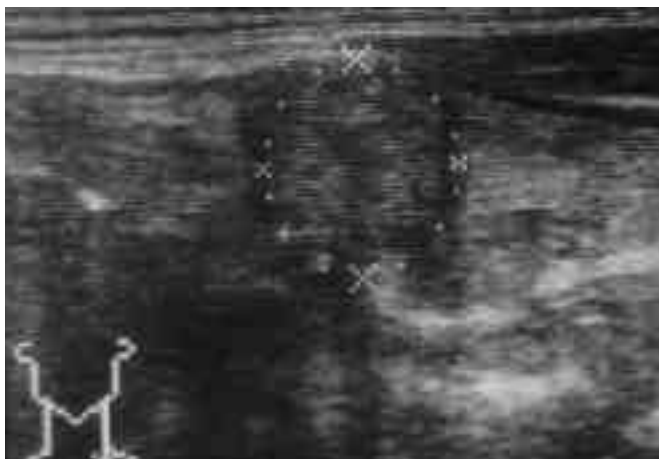
52% 119% 가 (Table 2).

Mann-Whitney test 17 12 , 5

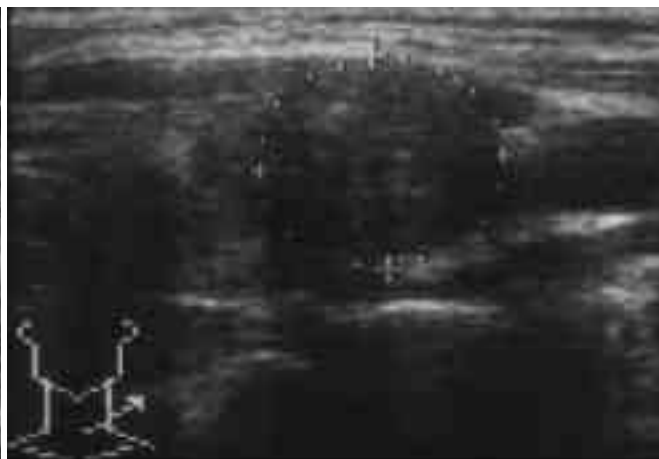
가 1 , 가 10 가 ,

1 , 2 , 가 2 . 11

5 , 6 ,



A



B

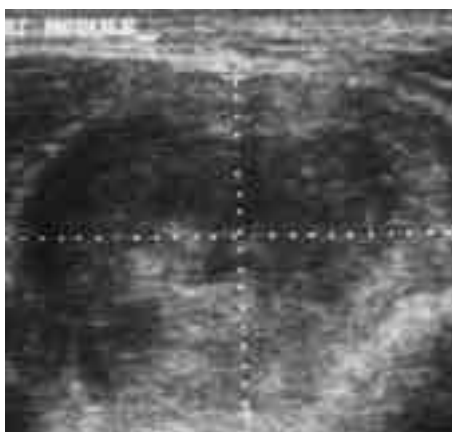
Fig. 1. Papillary carcinoma. The nodule volume suppression rate is 173 % after thyroxine therapy.

A. The volume of nodule before thyroxine therapy : 1.5 cm³

B. The volume of nodule after thyroxine therapy : 2.6 cm³



A



B

Fig. 2. Follicular carcinoma. The nodule volume suppression rate is 123% after thyroxine suppression therapy.

A. The volume of nodule before thyroxine therapy : 10.1 cm³

B. The volume of nodule after thyroxine therapy : 12.4 cm³

3 , 2 ,
가 3 .

17

2 ,

11 4 가 , 7 가 .

5.2 ±

4.4 cm³, 5.9 ± 4.5 cm³ ,

12.1 ± 10.3 cm³,

10.1 ± 9.9 cm³ .

127.2 ± 46.2% ,

79.4 ± 21.0%

Table 1. Histologic Findings of 28 Thyroid Nodules after Thyroidectomy

Type	Number	%
Benignancy	11	39.3
FA	7	25.0
AH	4	14.3
Malignancy	17	60.7
PC	9	32.1
FC	8	28.6

FA : follicular adenoma AH : adenomatous hyperplasia
PC : papillary carcinoma FC : follicular carcinoma

Table 3. Changes of Nodule Volume after Thyroxine Therapy Determined by Ultrasonogram

Type	Initial(cm ³)	Final(cm ³)	Suppression(%)
Benignancy (FA+ AH)	12.1 ± 10.3	10.1 ± 9.9	79.4 ± 21.0
Malignancy (PC+ FC)	5.2 ± 4.4	5.9 ± 4.9	127.2 ± 46.2

(P< 0.05)

FA : follicular adenoma AH : adenomatous hyperplasia
PC : papillary carcinoma FC : follicular carcinoma

Table 2. Changes of Nodule Volume after Thyroxine Therapy and Surgical Findings of 28 Thyroid Nodules

Cases	NVSR(%)	Diagnosis before therapy	Surgical findings
1	52	FL	FA
2	65	FL	FA
3	74	FL	FA
4	82	FL	FA
5	94	FL	FA
6	103	AH	FA
7	119	AH	FA
8	54	AH	AH
9	60	FL	AH
10	84	FL	AH
11	86	AH	AH
12	66	FL	PC
13	77	CD	PC
14	86	FL	PC
15	97	FL	PC
16	130	FL	FC
17	149	FL	PC
18	173	FL	PC
19	175	CD	PC
20	250	FL	PC
21	96	FL	FC
22	103	FL	FC
23	103	FL	FC
24	114	FL	FC
25	120	FL	FC
26	120	FL	FC
27	123	FL	FC
28	183	FL	FC

Nodule volume suppression rate(NVSR %)

$$= \frac{\text{nodule volume after treatment}}{\text{nodule volume before treatment}} \times 100$$

FA : follicular adenoma AH : adenomatous hyperplasia
PC : papillary carcinoma FC : follicular carcinoma
FL : follicular lesion CD : cystic degeneration



A



B

Fig. 3. Follicular adenoma. The nodule volume suppression rate is 65% after thyroxine suppression therapy.

A. The volume of nodule before thyroxine therapy : 3.4 cm³

B. The volume of nodule after thyroxine therapy : 2.2 cm³

:
 ($p < 0.05$)(Table 3).
 (15) (16)
 ,
 가
 ,
 가 ,
 가
 5-15% (10), (7,17).
 80%
 TSH
 (glucose oxidation)
 (iodine organic binding) TSH
 (18).
 TSH 가
 가
 가 50% 가
 가 (6-8).
 (follicular proliferation) (follicular lesion) (clump) (thyroid follicle)
 80%
 가 가 가
 20% (19) 58% (8)
 가
 60% 60%
 가
 Emerick (11) 88% 가 8%
 가
 50% 가
 가
 B-mode
 63-85% 가
 가
 가
 halo
 (12).

Fobb (13)

65

가가

, Hubsch(14)

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Volume Changes of Thyroid Nodules after Thyroxine Suppression Therapy : The Usefulness in Predicting Malignancy¹

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Purpose : To evaluate the usefulness of volume change after thyroxine suppression therapy in predicting the malignancy of thyroid nodules.

Materials and Methods : We analyzed 28 cases of thyroid nodules diagnosed as benign by aspiration cytology or biopsy before thyroxine suppression therapy and which did not decrease more than 50% in volume after therapy. Using Ultrasonography we measured the volume of nodules before and after thyroxine suppression therapy and then determined volume change by calculating nodule volume suppression rate (NVSR) and comparing this between benign and malignant nodules. All cases were surgically confirmed.

$$\text{NVSR}(\%) = \frac{\text{nodule volume after treatment}}{\text{nodule volume before treatment}} \times 100$$

Results : Seventeen (60.7 %) of 28 thyroid nodules which showed less than 50 % NVSR after thyroxine therapy were shown by surgical resection to be malignant, while 11(39.3 %) were benign. The malignant cases were papillary carcinoma (n= 9) and follicular carcinoma (n= 8), while benign cases were either follicular adenoma (n= 7) or adenomatous hyperplasia (n= 4). The mean volume of malignant thyroid nodules was $5.2 \pm 4.5 \text{ cm}^3$ before thyroxine suppression therapy and $5.9 \pm 4.5 \text{ cm}^3$ after therapy, and that of benign nodules, $12.1 \pm 10.3 \text{ cm}^3$ before therapy and $10.1 \pm 9.9 \text{ cm}^3$ after. NVSR was $127.2 \pm 46.2 \%$ in malignant nodules and $79.4 \pm 21.0 \%$ in benign nodules, with no significant difference between the two groups ($P < 0.05$).

Conclusion : Although further studies may be required, fine needle aspiration cytology or biopsy showed that among benign thyroid nodules which did not decrease more than 50 % in volume after thyroid therapy, the incidence of malignancy revealed by surgical resection was more than 60 %. Surgical exporation of these nodules is therefore highly recommended.

Index words : Thyroid, neoplasms
Thyroid, US

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