PROMEM O.R.I.A. OSSERVATORIO RICERCA INNOVAZIONE AZIENDALE

ORIA

(Osservatorio Aziendale Ricerca e Innovazione)

UOC Endocrinologia

Attività di ricerca clinica 2010

THYROID
Volume 00, Number 00, 2010

DOI: 10.1089/thy.2010.0189

Percutaneous Laser Ablation of Cold Benign Thyroid Nodules: A 3-Year Follow-Up Study in 122 Patients

Roberto Valcavi,[1] Fabrizio Riganti,[1] Angelo Bertani,[1] Debora Formisano,[2] and Claudio M. Pacella[3]

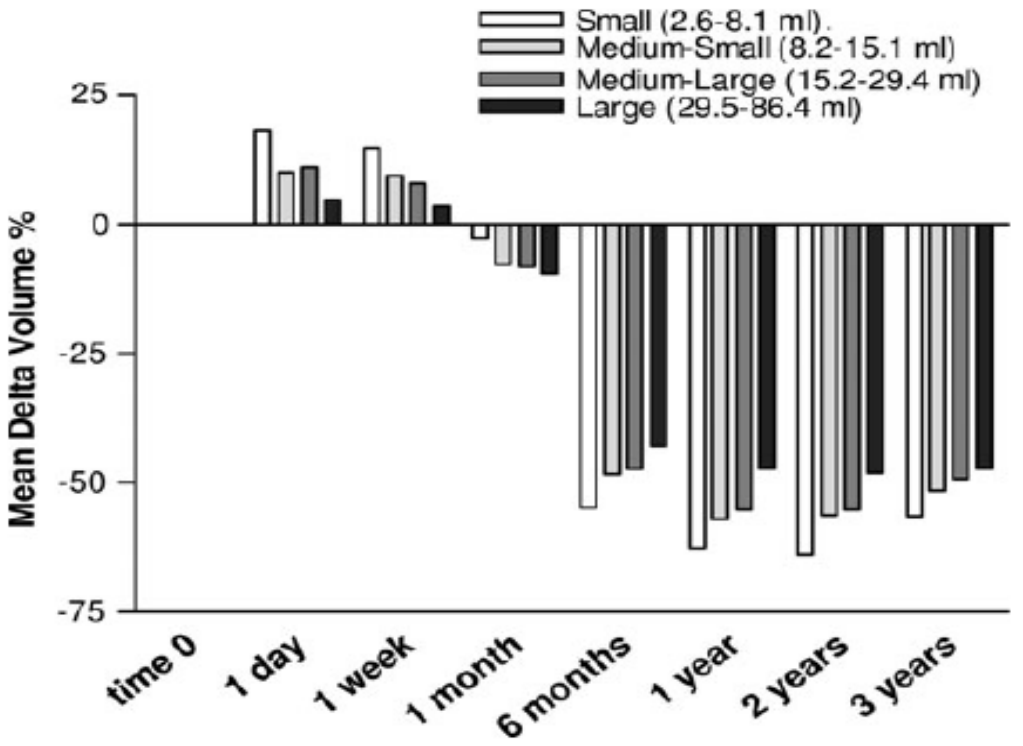
Methods: One hundred twenty-two patients (95 women and 27 men; age 52.2 ± 12.3 years) with benign cold thyroid solitary nodules or a dominant nodule within a normo-functioning multinodular goiter (volume range: 2.6–86.4 mL) underwent thermal Nd:YAG laser ablation of thyroid nodular tissue by 1–4 optical fibers positioned into the tissue by 21-gauge needles under ultrasound real-time assistance. The setting was an interventional suite and outpatient endocrine clinics in a community hospital in Italy. Nodule volume, ablation volume, side effects, serum thyroid-stimulating hormone (TSH), free triiodothyronine, free thyroxine (fT4), thyroglobulin (Tg), anti-Tg, anti-thyroperoxidase antibodies, symptoms, and cosmetic signs were recorded.

Results: Data are mean ± standard deviation. Energy delivered was 8522 ± 5365 J with an output power of 3.1 ± 0.5 W. Three years after PLA, nodule volume decreased from 23.1 ± 21.3 to 12.5 ± 18.8 mL (−47.8% ± 33.1% of initial volume, $p \leq 0.001$). At day 1, TSH and fT4 values significantly changed (time 0 vs. day 1: TSH = 1.16 ± 1.06 vs. 0.62 ± 0.81 μU/mL, $p \leq 0.001$; fT4 = 11.68 ± 1.88 vs. 13.20 ± 3.32 pg/mL, $p \leq 0.01$) and normalized within 1 month. No change in free triiodothyronine, thyroperoxidase antibodies, and Tg antibodies values was observed. Symptoms improved in 89 patients (73.0%), were unchanged in 28 (22.9%), and worsened in 5 (4.1%). Cosmetic signs improved in 87 patients (71.3%), were unchanged in 29 (23.8%), and worsened in 6 (4.9%). In 11 patients (9%), nodules regrew above baseline. Two patients (1.6%) experienced delayed (12–24 hours) laryngeal dysfunction with vocal cord motility recovery after 6–10 weeks. Two patients (1.6%) became hypothyroid and two patients (1.6%) hyperthyroid after PLA.

Conclusions: After 3 years, the PLA technique achieved shrinkage of about 50% of the initial volume in a wide size range of benign cold thyroid nodules, with an improvement in local symptoms and signs. Side effects and failures were few although not negligible. PLA may be a new option for the management of benign cold thyroid nodules. Long-term controlled studies are required to establish the eligibility of patients for routine PLA.

Table 3. Complications and Side Effects of the Percutaneous Laser Ablation Procedure on 122 Patients with Cold, Solid Benign Thyroid Nodules

Type of reaction	*No. of cases*	*%*	*SIR class[a] or equivalent[b]*
Intraoperative			
Pain			
Mild	14	11.5	A[b]
Intense	10	8.2	B[b]
Bleeding			
Intranodular	9	7.4	A[b]
Pericapsular	3	2.5	A[b]
Vasovagal reaction	4	3.3	A[b]
Vasovagal reaction with 14″ asystolia	1	0.8	A[b]
Cough	6	4.9	A[b]
Immediate postoperatory (within 24 hours)			
Stridor	1	0.8	A[a]
Swelling	11	9.0	A[a]
Cutaneous burn	1	0.8	A[a]
Laryngeal dysfunction	2	1.6	B[a]
Periprocedural (within 30 days)			
Bruise	3	2.5	A[a]
Fever (37.5°C–38.5°C)	5	4.1	A[a]
Persistent pain	9	7.4	B[a]
Pseudocystic transformation	6	4.9	B[a]
Pseudocyst with fasciitis	3	2.5	C[a]



Mean Volume Decrease = 47.8% ± 33.1%

Protocollo di studio“Multicentric Randomized Controlled Study of PLA Versus Follow Up in Benign Thyroid Nodules. Long term results”

Scopo dello studio

End Point Primari:

1. verificare se il volume di noduli tiroidei citologicamente benigni e la sintomatologia associata si modifica in modo significativamente diverso nei pazienti trattati con terapia ablativa laser rispetto ad un gruppo di controllo seguito senza terapia attiva.
2. escludere mediante una osservazione a lungo termine (3 anni di follow-up) che la recidiva a distanza osservata nelle lesioni tiroidee sottoposte ad altri tipi di trattamento ablativo (alcoolizzazione per cutanea) non abbia luogo anche dopo ablazione laser percutanea.

End Point Secondari:

1. dimostrare la riproducibilità in ambienti e con operatori diversi dei risultati ottenuti dalla metodica nella riduzione delle dimensioni delle lesioni
2. verificarne la descritta assenza di effetti collaterali maggiori o minori.

CENTRI PARTECIPANTI:

- Albano Laziale – Ospedale Regina Apostolorum
- Azienda Ospedaliera di Perugia - Policlinico di Monteluce
- Azienda Ospedaliero-Universitaria di Pisa – Presidio di Cisanello
- Arcispedale Santa Maria Nuova

Protocollo di studio“Multicentric Randomized Controlled Study of PLA Versus Follow Up in Benign Thyroid Nodules. Long term results”

Is a five-category reporting scheme for thyroid fine needle aspiration cytology accurate? Experience of over 18 000 FNAs reported at the same institution during 1998–2007

S. Piana*, A. Frasoldati†, M. Ferrari*, R. Valcavi†, E. Froio*, V. Barbieri‡, C. Pedroni‡ and G. Gardini*

Departments of *Pathology, †Endocrinology and ‡Otolaryngology, Arcispedale Santa Maria Nuova, Reggio Emilia, Italy

Objective: Fine needle aspiration (FNA) has long been recognized as an essential technique for the evaluation of thyroid nodules. Although specific cytological patterns have been recognized, a wide variety of reporting schemes for thyroid FNA results have been adopted. This study reports our experience with a five-category reporting scheme developed in-house based on a numeric score and applied to a large series of consecutive thyroid FNAs. It focuses mainly on the accuracy of thyroid FNA as a preoperative test in a large subset of histologically distinct thyroid lesions.

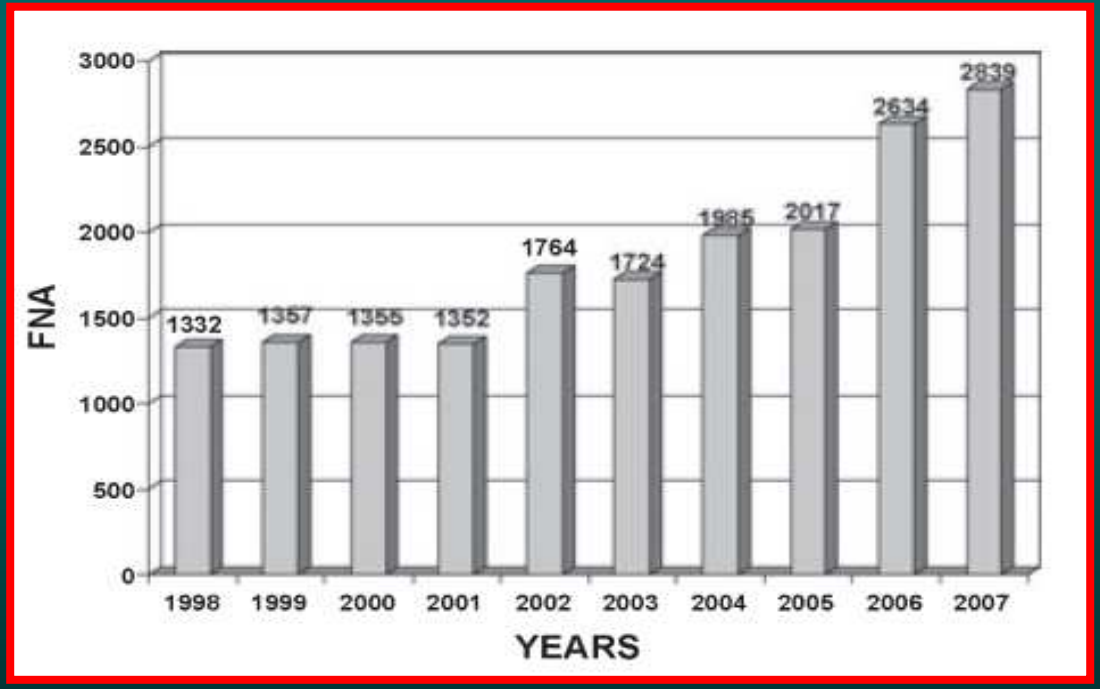
Methods: During the 1998–2007 period, 18 359 thyroid ultrasound-guided FNAs were performed on 15 269 patients; FNA reports were classified according to a C1–C5 reporting scheme: non-diagnostic (C1), benign (C2), indeterminate (C3), suspicious (C4), and malignant (C5).

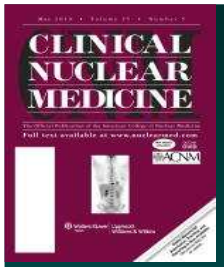
Results: Non-diagnostic (C1) and indeterminate (C3) FNA results totalled 2 230 (12.1%) and 1 461 (7.9%), respectively, while suspicious (C4) and malignant (C5) results totalled 238 (1.3%) and 531 (2.9%), respectively. Histological results were available in 2 047 patients, with thyroid malignancy detected in 840. Positive predictive value of FNA was 98.1% with a 49.0 likelihood ratio (LR) of malignancy in patients with a C4/C5 FNA report.

Conclusions: This five-category scheme for thyroid FNA is accurate in discriminating between the virtual certainty of malignancy associated with C5, a high rate (92%) of malignancy associated with C4, and a 98% probability of a histological benign diagnosis associated with C2. Further sub-classifications of C3 may improve the accuracy of the diagnostic scheme and may help in recognizing patients eligible for a 'wait and see' management.

Table 3. Cytohistological correlations

	Cytological category					
Histological results	C1	C2	C3	C4	C5	Total
% Surgical resection	7.2	5.6	56.2	82.1	81.5	
Benign	73	600	523	11	0	1207
Malignant	23	74	188	140	415	840
Total	96	674	711	151	415	2047





Ga-68 DOTATOC PET, Endoscopic Ultrasonography, and Multidetector CT in the Diagnosis of Duodenopancreatic Neuroendocrine Tumors

A Single-Centre Retrospective Study

Annibale Versari, MD, Lorenzo Camellini, MD,† Gabriele Carlinfante, MD,‡ Andrea Frasoldati, MD,§ Franco Nicoli, MD,¶ Elisa Grassi, MS,‖ Carmine Gallo, MD,‡ Francesca P. Giunta, MD,* Alessandro Fraternali, MD,* Diana Salvo, MD,* Mattia Asti, MS,* Francesco Azzolini, MD,† Veronica Iori, MD,† and Romano Sassatelli, MD†*

Purpose: In this report, we compared endoscopic ultrasonography (EUS), multidetector CT (MDCT), and Ga-68 DOTATOC PET/CT in patients with neuroendocrine tumors (NETs). We report our experience with use of these methods in patients suspected to have duodenopancreatic primitive NET.

Methods: Nineteen consecutive patients (mean age, 56; 21–80), who underwent both Ga-68 DOTATOC PET/CT and EUS between March 2007 and November 2008 were retrospectively included in the study (16 underwent MDCT). Suspicion of NET was confirmed by EUS-FNA and/or surgery. Operative characteristics of PET, EUS, and MDCT were compared.

Results: Twenty-three neuroendocrine lesions were diagnosed in 13/19 patients. EUS, PET, and MDCT correctly identified as affected 13/13 (100%), 12/13 (92%), and 10/11 (91%) patients, respectively. On a lesion basis, EUS, PET, and MDCT identified correctly as NETs 22/23 (96%), 20/23 (87%), and 13/18 (72%) lesions ($P = 0.08$ EUS vs. CT). Both on a patient and on a lesion basis, specificity was 67%, 83%, and 80% for EUS, PET, and MDCT, respectively.

Conclusions: EUS, Ga-68 DOTATOC PET, and MDCT seem to have comparable accuracy in diagnosis of duodenopancreatic NET and their combination may allow an optimal preoperative diagnosis.

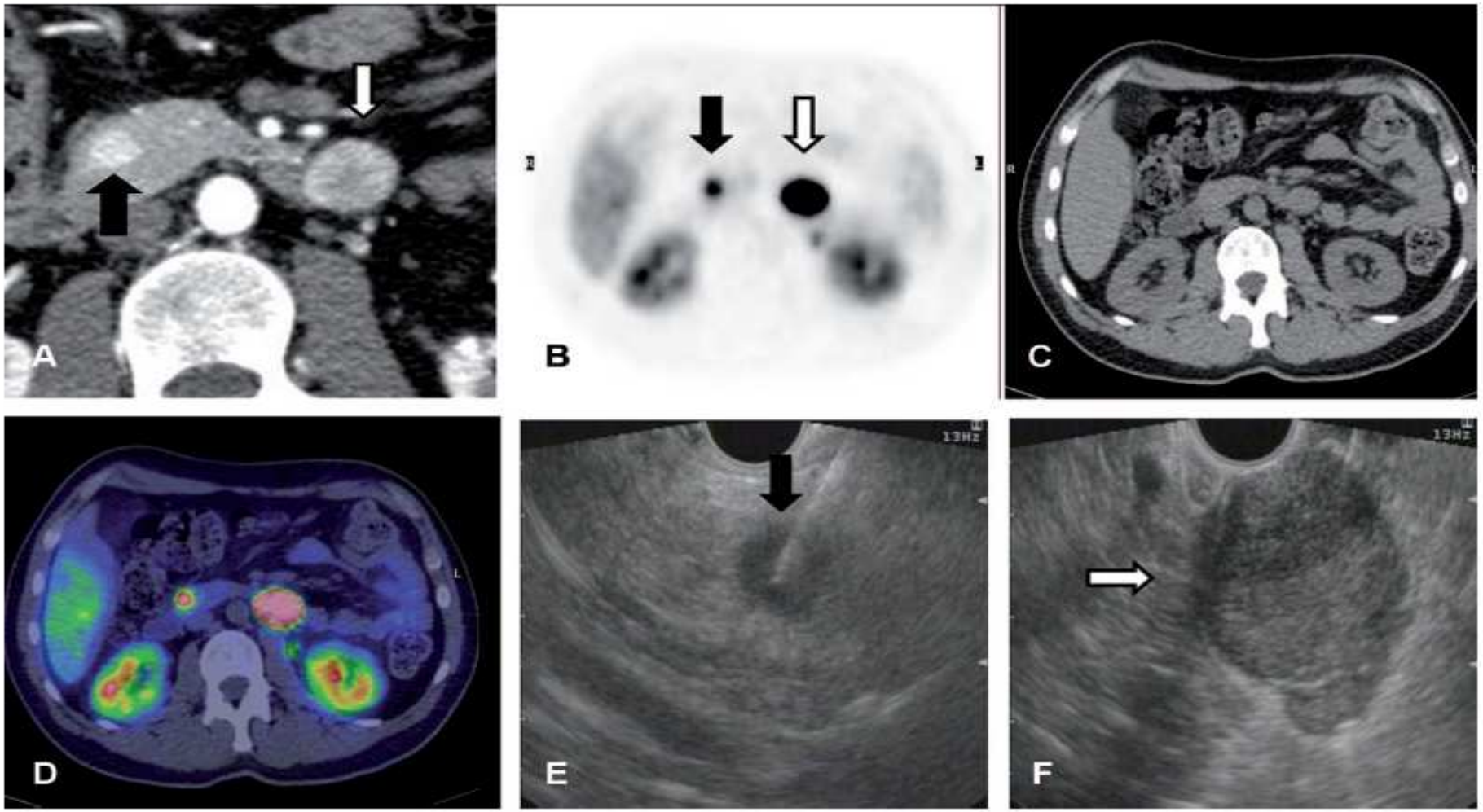


FIGURE 2. Patient 6. The patient, affected by MEN-1, had multifocal lesions. In the pictures a NET of the pancreatic head (black arrow) and the lymph node metastasis (white arrow) are shown. MDCT (**A**): the lesions show enhancement in the late arterial phase. Ga-68 DOTATOC PET (**B–D**): high uptake in both lesions. EUS-FNA of the same lesions (**E–F**): the tip of the needle is visualized.

TABLE 2. Lesions Detected in the Duodenopancreatic Area by EUS, PET and MDCT

Patient	Location	Diameter (mm)	Consistent With NET				Surgery	Conclusive Diagnosis
			EUS	FNA	PET	MDCT		
Patients affected by primary duodenopancreatic NET								
1	Head	20	+	+	−	+	Yes	NET (C + H)
2	Paraduodenal	35	+	+	+	+	Yes	Paraganglioma (C + H)
6	Head	5	−		−	+	Yes	NET (H)
	Head	12	+	+	+	+	Yes	NET (C + H)
	Body	8	+	+	+	−	No	NET (C)
	Body-tail	5	+	+	+	−	No	NET (C)
	Paraduodenal	30	+	+	+	+	Yes	Lymphnode, metastatic (C + H)
7	Body	7	+	+	+	+	No	NET (C)
	Body	5	+	NP	−	+	No	Not available
	Distal duodenum	10	−		+	−	No	Not available
9	Head	7	+	−	+	+	No	NET (C)
	Body	7	+	−	+	+	No	NET (C)
	Body	?	−		+	+	No	Not available
11	Head	35	+	+	+	+	No	NET (C)
12	Paraduodenal	20	+	+	+	+	No	NET (C)
13	Tail	80	+	+	+	+	Yes	NET (C + H)
14	Body	20	+	+	+	NP	No	NET (C)
	Body	8	+	+	+	NP	No	NET (C)
15	Body	8	+	−	+	NP	Yes	NET (H)
	Body	8	+	−	+	NP	Yes	NET (H)
	Tail	6	+	NP	+	NP	Yes	NET (H)
16	Tail	13	+	+	+	−	No	NET (C)
	Tail	6	+	+	−	−	No	NET (C)
	Head	5	+	+	+	−	No	NET (C)
17	Head	8	+	+	+	+	No	NET (C)
18	Head	30	+	+	+	+	No	NET (C)
Patients not affected by primary duodenopancreatic NET								
3	Paraduodenal	15	+	−	+	−	Yes	Necrotic lymphnode (C)
4	—	—	−		−	−	No	No lesion found
5	—	—	−		−	−	No	No lesion found
8	—	—	−		−	−	No	Liver, secondary NET (C)
10	—	—	−		−	NP	No	No lesion found
19	Head	26	+	−	−	+	Yes	Duct cell carcinoma (C, H)

C indicates cytology; H, histology; NP, not performed.

Encapsulated Well-differentiated Follicular-patterned Thyroid Carcinomas Do Not Play a Significant Role in the Fatality Rates From Thyroid Carcinoma

Simonetta Piana, MD, Andrea Frasoldati, MD,† Enza Di Felice, PhD,‡ Giorgio Gardini, MD,* Giovanni Tallini, MD,§ and Juan Rosai, MD‖,¶*

Abstract: A cohort of 1039 consecutive cases of thyroid carcinoma treated at a single institution and followed for an average of 11.9 years or until death included 102 encapsulated well-differentiated follicular-patterned tumors that had been diagnosed as carcinoma because of complete capsular invasion and/or papillary carcinoma-type nuclei. None of these cases were among the 67 patients from the cohort who died as a result of their thyroid carcinoma. The results of this study and a critical review of the pertinent literature indicate that tumors with these features are associated with an extremely favorable outcome and that they do not play a significant role in the fatality rate of thyroid carcinoma.

TABLE 2. Entire Cohort and Fatal Cases of Thyroid Carcinoma Listed According to Their Microscopic Types

	All Cases	Fatal Cases (%)
Papillary Ca, all types	847	29 (3.4)
Encapsulated follicular variant	66	0
Without capsular/vascular invasion	45	0
With capsular but no vascular invasion	18	0
With vascular invasion	3	0
Medullary Ca	46	6 (13)
Minimally invasive follicular Ca	29	0 (0)
With capsular but no vascular invasion	23	0
With vascular invasion	6	0
Anaplastic Ca*	23	17 (73.9)
Poorly differentiated Ca	21	9 (42.8)
Hürthle cell Ca	20	2 (10)
Well-differentiated Ca, NOS 6		0 (0)
With capsular but no vascular invasion	5	0
With vascular invasion	1	0
Tumor of uncertain malignant potential	11	0 (0)
Because of PTC-type nuclei	5	0
Because of capsule	6	0
Because of PTC-type nuclei and capsule	0	0
Follicular Ca, widely invasive	5	3 (60)
Mucoepidermoid carcinoma with eosinophilia	1	1
	1009	67

*Includes cases of focal anaplastic transformation in a well-differentiated carcinoma.

TABLE 1. Listing of the Possible Variations in the Morphology of Encapsulated Well-differentiated Follicular-patterned Thyroid Tumors, Depending on the Criteria of Capsular Invasion, Vascular Invasion, and PTC-type Nuclei

	Vascular Invasion	Capsular Invasion	PTC-type Nuclei	Tumor Type
X	No	No	No	Follicular adenoma
1	No	Yes	No	FCa with capsular invasion
2	Yes	Yes or no	No	FCa with vascular invasion
3	No	No	Yes	EFV-PTC
4	No	Yes	Yes	FV-PTC with capsular invasion
5	Yes	Yes or no	Yes	FV-PTC with vascular invasion
6	No	Yes	Incomplete	WDCa-NOS with capsular invasion
7	Yes	Yes or no	Incomplete	WDCa-NOS with vascular invasion
8	No	Incomplete	No	FT-UMP
9	No	No	Incomplete	WDT-UMP (with questionable PTC-type nuclei)
10	No	Incomplete	Incomplete	WDT-UMP (with questionable capsular invasion)

In practice, some of these variations are grouped. The categories listed in italics (no.2, no.5, and no.7) are those showing vascular invasion, and therefore easily diagnosed as carcinomas, which were excluded for the purposes of this study.

EFV-PTC indicates Encapsulated follicular variant of papillary thyroid carcinoma; FCa, Follicular carcinoma; FT-UMP, Follicular tumor of uncertain malignant potential; FV-PTC, Follicular variant of papillary thyroid carcinoma; PTC, Papillary thyroid carcinoma; WDCa-NOS, Well-differentiated carcinoma, not otherwise specified; WDT-UMP, Well-differentiated tumor of uncertain malignant potential.