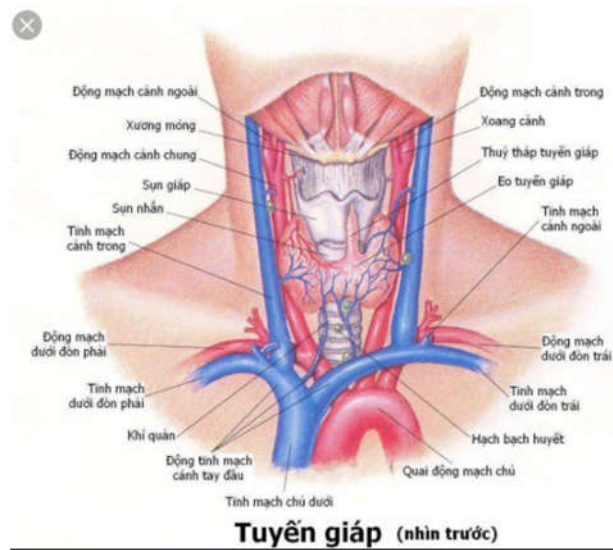


SIÊU ÂM CHẨN ĐOÁN UNG THƯ TUYẾN GIÁP

PGS. TS. TRẦN VĂN RIỆP
Bộ môn chẩn đoán hình ảnh

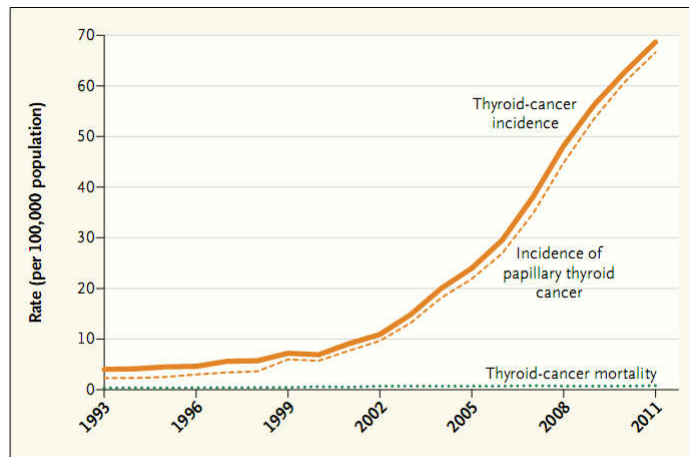
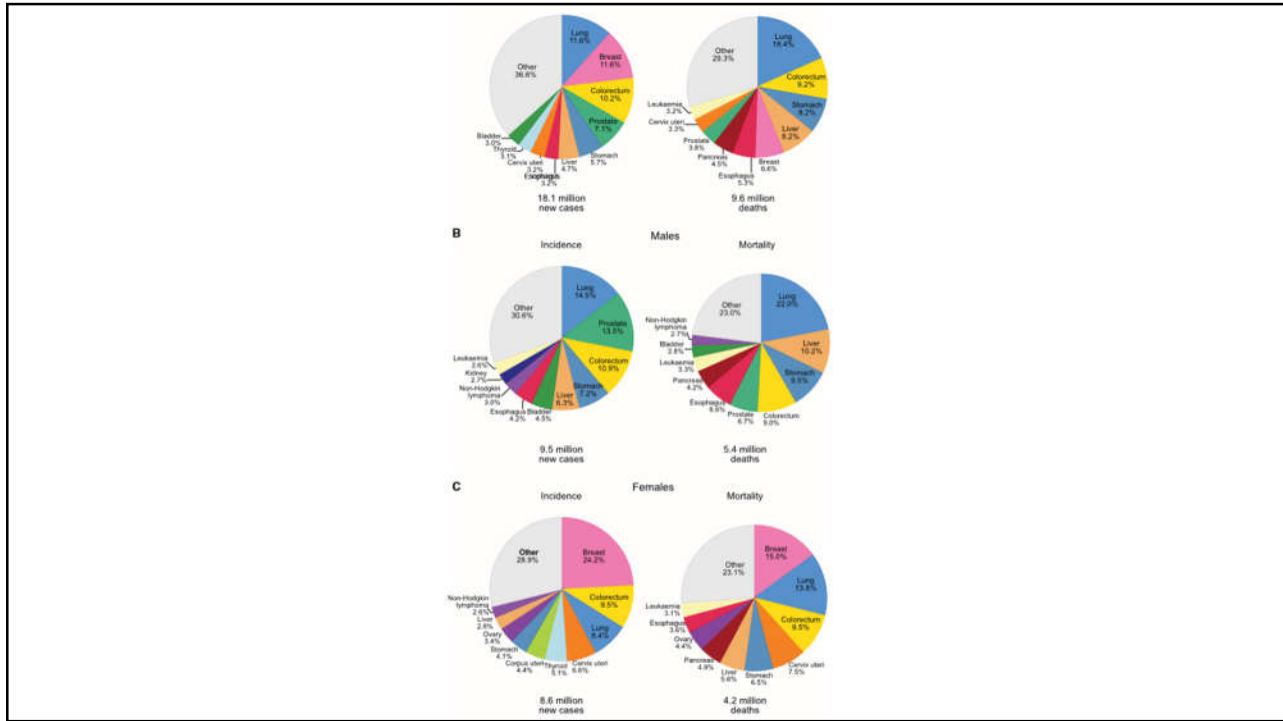




DỊCH TỄ TỔN THƯƠNG KHU TRÚ TUYẾN GIÁP

- Khám lâm sàng khoảng 5% dân số.
- Siêu âm khoảng 67%.
- CT và MRI khoảng 15%.
- Trong đó 1-5% ác tính.
- Những người có tiền sử gia đình, bị chiếu xạ vùng cổ lên tới 5-13%

Theo Gilles Russ *Eur Thyroid J.* 2014 (3) 154- 163

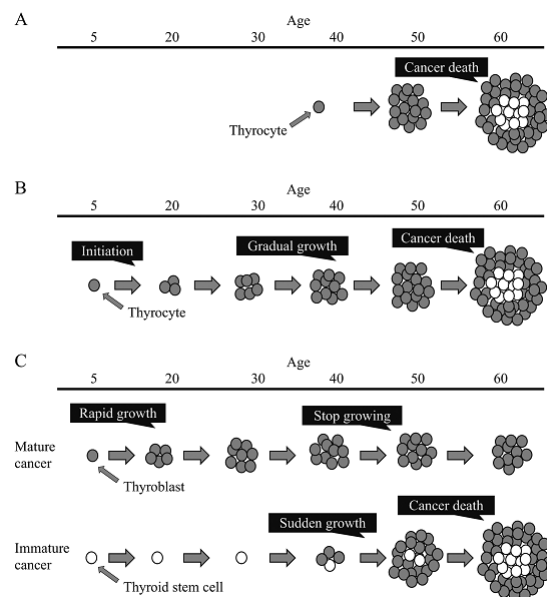


Thyroid-Cancer Incidence and Related Mortality in South Korea, 1993–2011.

Data on incidence are from the Cancer Incidence Database, Korean Central Cancer Registry; data on mortality are from the Cause of Death Database, Statistics Korea. All data are age-adjusted to the South Korean standard population.

NGUYÊN NHÂN TĂNG ĐỘT BIẾN UTTG

- Đưa siêu âm vào sàng lọc bệnh lý tuyến giáp.
- Tăng tỷ lệ FNA trong chẩn đoán tử 3/1000 lên 13,4/1000 sau 10 năm.
- UTTG là bệnh tiến triển chậm.
- Chẩn đoán quá mức (overdiagnosis)



SIÊU ÂM TRONG CHẨN ĐOÁN UNG THƯ TUYẾN GIẤP

Tiêu chuẩn chính: Dựa theo Siêu âm 2D.

Các tiêu chuẩn phụ:

- Siêu âm Doppler: Đánh giá tăng sinh mạch.
- Siêu âm đàn hồi: Đánh giá độ cứng của khối u.
- Siêu âm cản âm: Đánh giá tưới máu khối u.

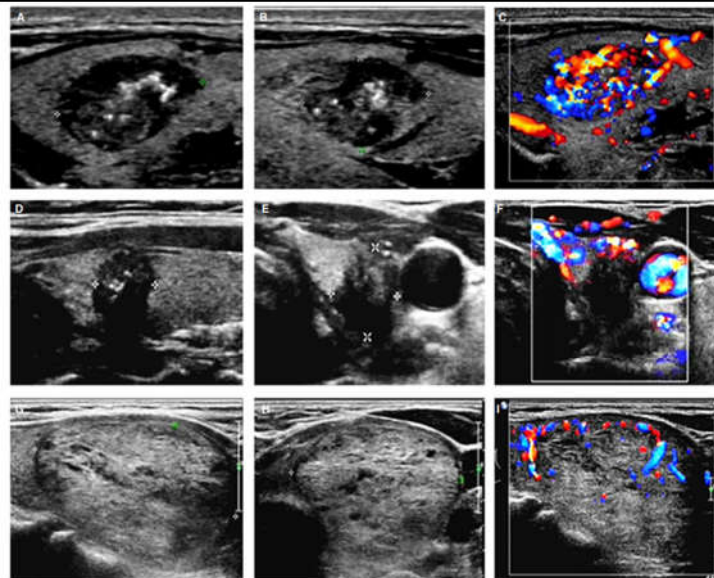


FIGURE 4 Ultrasonic images of different kinds of thyroid nodules. (A-C) were ultrasound images of a case of MTC. Male patient, 49 years old. (A) Lesion was solid, markedly hypochoic, well-defined, with microcalcification. (B) $A/T < 1$. (C) Enhanced blood flow. (D-F) were ultrasound images of a case of PTC. Female patient, 47 years old. (D) Lesion was solid, markedly hypochoic, with microcalcification, ill-define. (E) $A/T \geq 1$. (F) Absent of blood flow. (G-I) were ultrasound images of a case of benign nodules. Female patient, 63 years old. (G) Lesion was almost solid, isochoic, well-defined, with none of calcifications. (H) $A/T < 1$. (I) Few blood flow. MTC, medullary thyroid carcinoma; PTC, papillary thyroid carcinoma; $A/T \geq 1$, the shape of nodule is taller-than-wide; $A/T < 1$, the shape of nodule is wider-than-tall

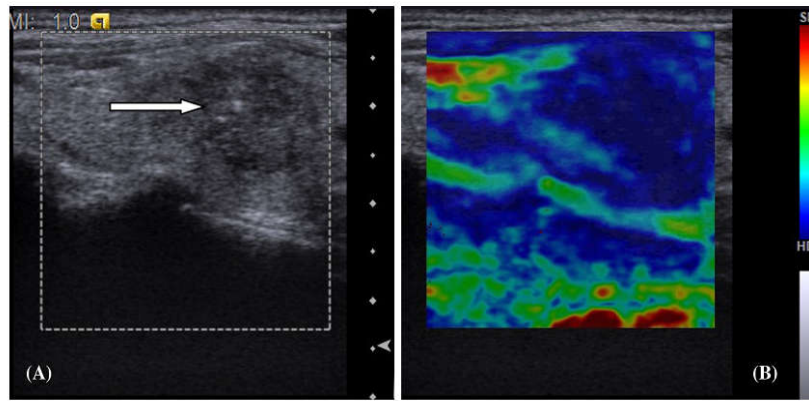


Figure 7 32 years old male patient presented with painless neck swelling since one year. The patient had positive family history of medullary carcinoma, bilateral pheochromocytoma and was diagnosed as MEN IIA. (A) Longitudinal grayscale US of a right thyroid nodule showing hypo-echogenicity, lobulated margin and multiple echogenic foci of micro-calcification (thick white arrow). (B) US elastogram showing elasticity score 5 and strain ratio 4.2. FNAC revealed Bethesda V. Total thyroidectomy was done and the final diagnosis was medullary carcinoma.

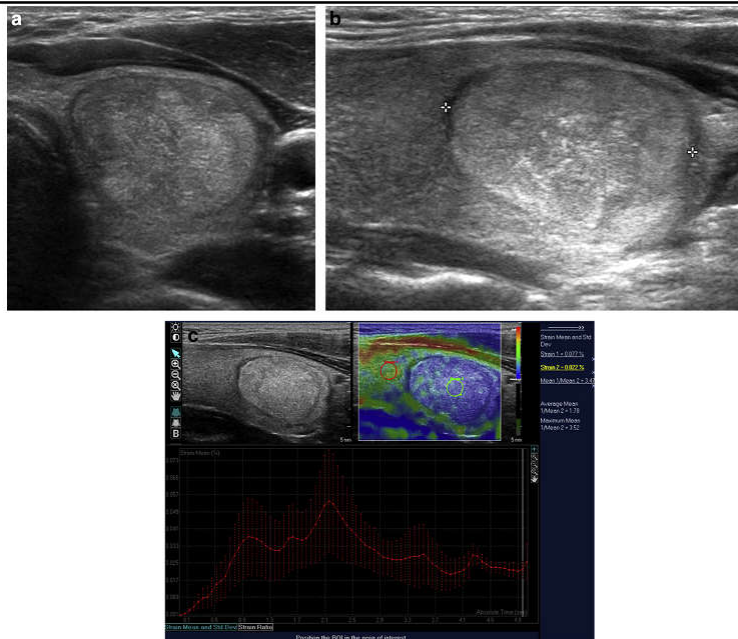
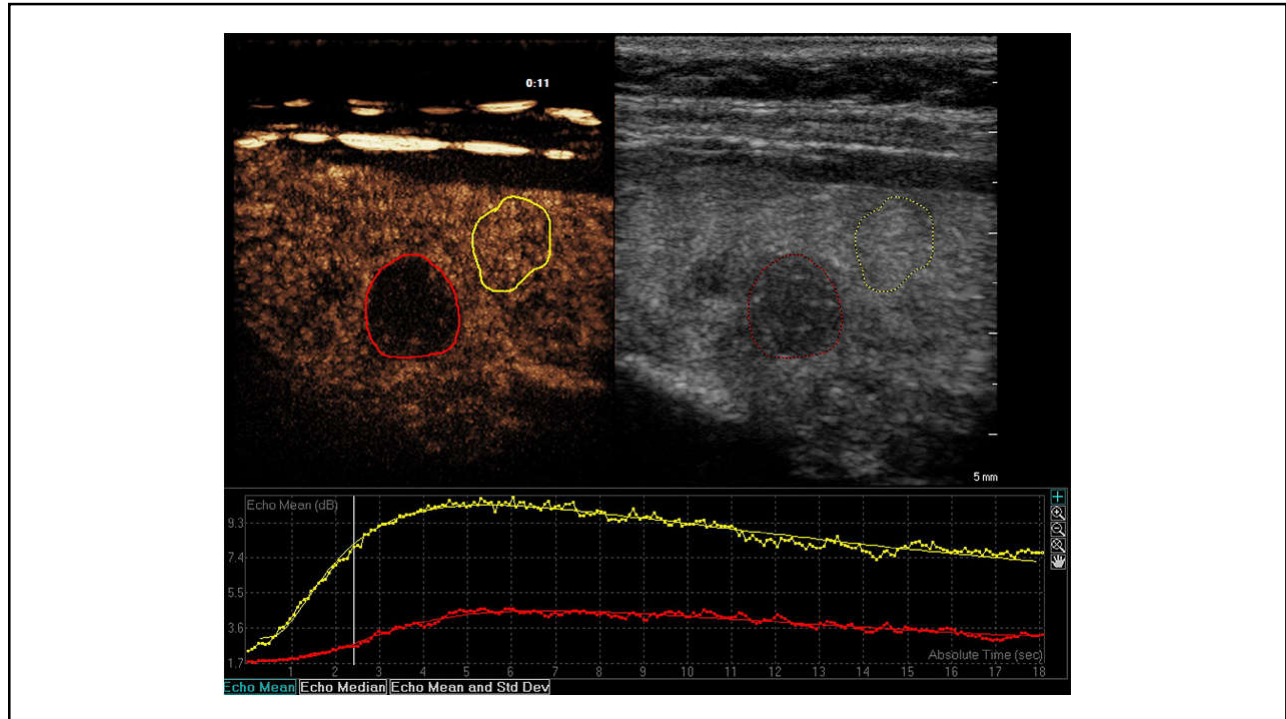


Fig. 4. A 2.9-cm circumscribed isoechoic nodule at the inferior portion of the left thyroid gland in a 36 y-old man: (a) transverse image; (b) longitudinal image (crosses). (c) The nodule was *blue* on the color mapping image, and the strain ratio was 1.78 (elastographic image with color mapping and strain ratio). The lesion was diagnosed as a follicular carcinoma after surgery. Ultrasound elastography was informative for this case.



CHẨN ĐOÁN UNG THƯ TUYẾN GIÁP THEO TI-RADS

(Thyroid Imaging Reporting and Data System)



- 2002, *Eun-Kyung Kim và cộng sự*. Đề nghị 4 dấu hiệu siêu âm gợi ý nốt ác tính.
- 2005, *Society of Radiologists in Ultrasound Consensus Conference Statement*. Đề nghị 5 dấu hiệu siêu âm gợi ý ác tính (Có vai trò của siêu âm Doppler).
- 2009, Phân loại TI-RADS đầu tiên được đề nghị bởi *Eleonora Horvath và cộng sự*. Dựa trên 10 dấu hiệu siêu âm: Phức tạp khi ứng dụng.
- 2011, **Phân loại TI-RADS thứ hai được đề nghị bởi *Jin Young Kwak và cộng sự***. (*Radiology* 2011; 260:892–899). Dựa trên 4 dấu hiệu siêu âm được đề nghị bởi *Eun-Kyung Kim và cộng sự*. Dễ ứng dụng.
- 2011, phân loại TI-RADS thứ ba được đề nghị bởi *Gilles Russ và cộng sự*. Dựa trên 4 dấu hiệu siêu âm được đề nghị bởi *Eun-Kyung Kim và cộng sự* (*Journal de radiologie* (2011; 92, 701-713). Không dễ ứng dụng.
 - 2013, Phân loại Russ’s TI-RADS cải biên. Có vai trò của siêu âm đàn hồi. Dễ ứng dụng.
 - 01/2016, **Phân loại Russ’s TI-RADS cải biên → Phân loại French TI-RADS**. Dễ ứng dụng.
- 2015, Guidelines của Hiệp hội tuyến giáp Hoa kỳ (*Bryan R. Haugen và cộng sự*).
- 2015, **ACR đưa ra bảng thuật ngữ ACR-TIRADS** thực hiện bởi *Edward G. Grant và cộng sự*.
- 05/2016, Phân loại K-TIRADS (Korean-TIRADS) được đề nghị bởi *Jung Hee Shin và cộng sự*. Dựa trên 4 dấu hiệu siêu âm được đề nghị bởi *Eun-Kyung Kim và cộng sự*. Dễ ứng dụng.
- 04/2017, **Phân loại ACR TI-RADS** được giới thiệu bởi *Franklin N. Tessler và cộng sự*.

MỨC ĐỘ NGHI NGỜ ÁC TÍNH THEO PHÂN ĐỘ TI-RADS

TI-RADS (Thyroid Imaging Reporting and Data System)

- TI-RADS 1: Bình thường.
- TI-RADS 2: Lành tính.
- TI-RADS 3: Nghi ngờ ác tính thấp.
- TI-RADS 4: Nghi ngờ ác tính trung bình.
- TI-RADS 5: Nghi ngờ ác tính cao.
- TI-RADS 6: Ác tính (đã có kết quả tế bào).

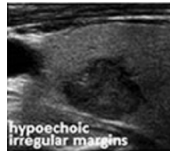


CÁC DẤU HIỆU SIÊU ÂM ĐÁNH GIÁ NHÂN GIÁP ÁC TÍNH

1. GIẢM ÂM



2. BỜ KHÔNG ĐỀU



3. VI VÔI HÓA



4. CHIỀU CAO > CHIỀU RỘNG

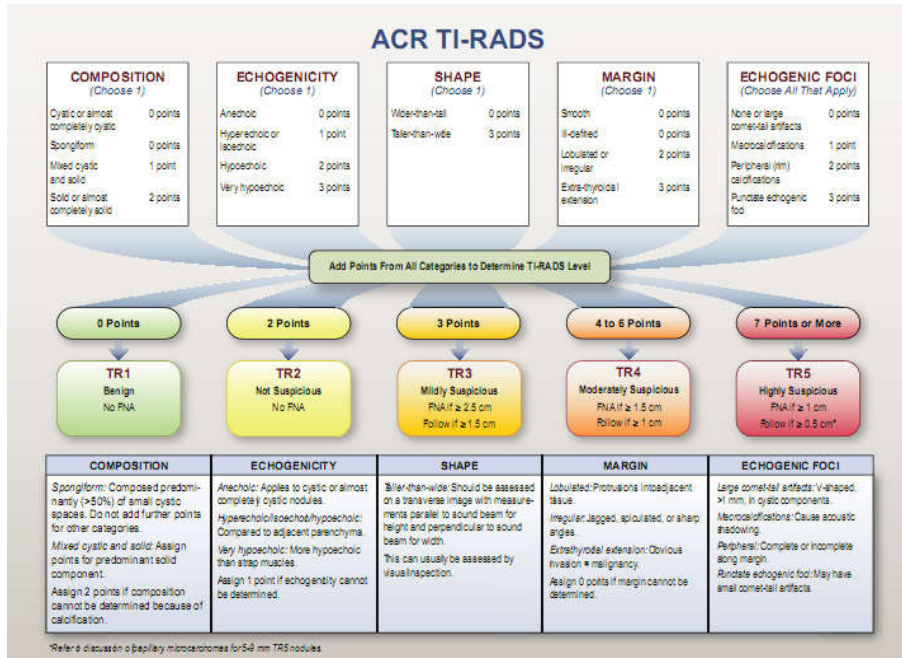


5. XÂM LẤN BAO TUYẾN GIÁP



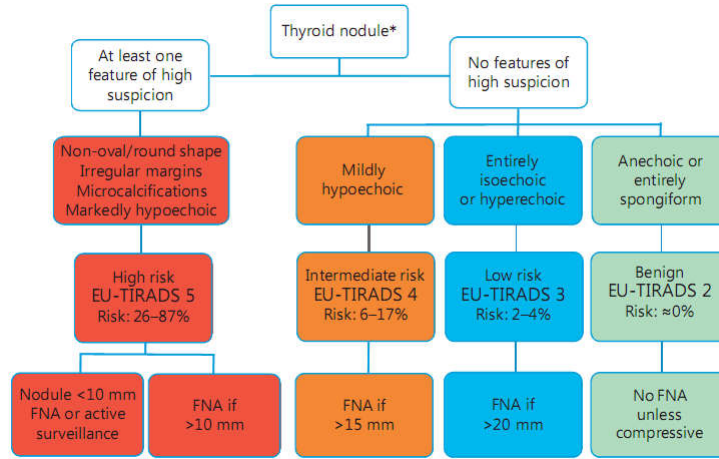
NHÓM CÁC DẤU HIỆU LÀNH TÍNH

- Dấu hiệu Halo.
- Đồng âm hoặc tăng âm.
- Nang.
- Bờ khối liên tục và đều.
- Khối u mềm (Elastography).
- Âm hỗn hợp dạng bọt biển.
- Chỉ có mạch trung tâm.



TI-RADS	Mô tả	Hình ảnh siêu âm	Tần suất ác tính
TIRADS 1	Âm tính	Không có nốt	0
TIRADS 2	Lành tính	Nang đơn thuần Nang có vách ngăn Thoái hóa nang dạng bột biển Vôi hóa thô đơn độc	0
TIRADS 3	Khả năng lành tính	Nốt hình bầu dục Đường bờ đều Đồng hồi âm hoặc hồi âm dày	0.25
TIRADS 4A	Nghi ngờ ác tính thấp	Nốt hình bầu dục Đường bờ đều Hồi âm kém	6%
TIRADS 4B	Nghi ngờ ác tính cao	Có từ 1 đến 2 dấu hiệu nghi ngờ cao: Hồi âm rất kém Vi vôi hóa Bờ đa cung hoặc không đều Hình dáng cao-hơn-rộng Độ cứng cao trên siêu âm đàn hồi	69%
TIRADS 5	Rất nghi ngờ ác tính	Có từ 3 đến 5 dấu hiệu nghi ngờ cao và/hoặc hiện diện hạch cổ nghi ngờ di căn.	#100%

Gilles Russ. Risk stratification of thyroid nodules on ultrasonography with the French TI-RADS: description and reflections. 13
Ultrasonography 35(1), January 2016. Korean Society of Ultrasound in Medicine (KSUM).



Gill Russ et al *Eur Thyroid J.* 2017 (6) 225- 237



PHÂN ĐỘ TIRADS THEO TIÊU CHUẨN HÀN QUỐC (K- TIRADS)

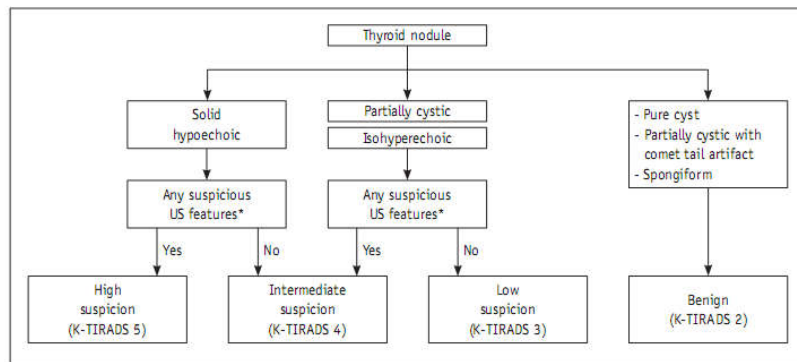


Fig. 1. Algorithm of K-TIRADS for malignancy risk stratification based on solidity and echogenicity of thyroid nodules. Modified from Na et al. *Thyroid* 2016;26:562-572 (25). *Microcalcification, nonparallel orientation, spiculated/microlobulated margin. K-TIRADS = Korean Thyroid Imaging Reporting and Data System, US = ultrasonography

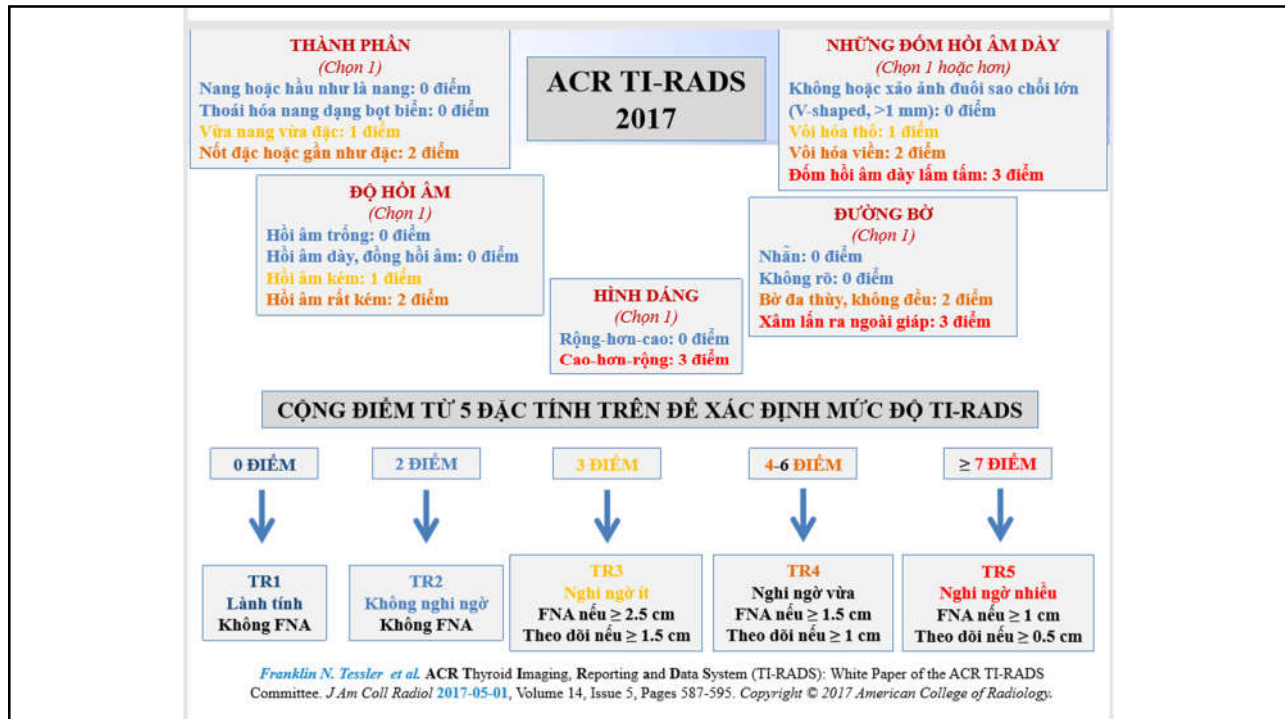
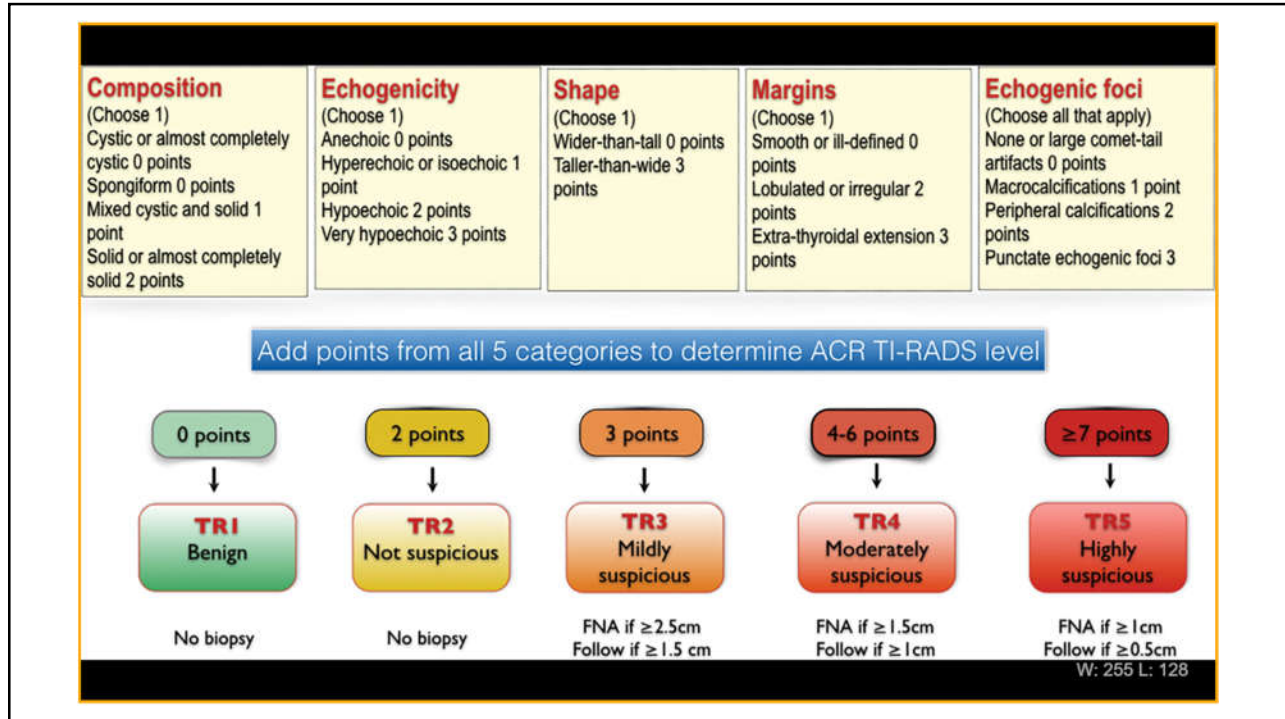




Table 2. Malignancy Risk Stratification According to Korean Thyroid Imaging Reporting and Data System (K-TIRADS) and FNA Indications

Category	US Feature	Malignancy Risk (%)	Calculated Malignancy Risk (%), Overall (LV, HV)	Calculated Sensitivity for Malignancy (%), Overall (LV, HV)	FNA ^a
5 High suspicion	Solid hypoechoic nodule with any of 3 suspicious US features*	> 60	79.3 (60.9, 84.9)	51.3 (35.9, 56.7)	≥ 1 cm (> 0.5 cm, selective)
4 Intermediate suspicion	1) Solid hypoechoic nodule without any of 3 suspicious US features* or 2) Partially cystic or isohyperechoic nodule with any of 3 suspicious US features*	15–50	25.4 (15, 33.6)	29.5 (29.9, 29.4)	≥ 1 cm
3 Low suspicion	Partially cystic or isohyperechoic nodule without any of 3 suspicious US features*	3–15	7.8 (6, 10.3) [†]	19.2 (34.2, 13.9)	≥ 1.5 cm
2 Benign [†]	1) Spongiform 2) Partially cystic nodule with comet tail artifact 3) Pure cyst	< 3 < 1	0 0	0 0	≥ 2 cm NA
1 No nodule	-	-	-	-	NA

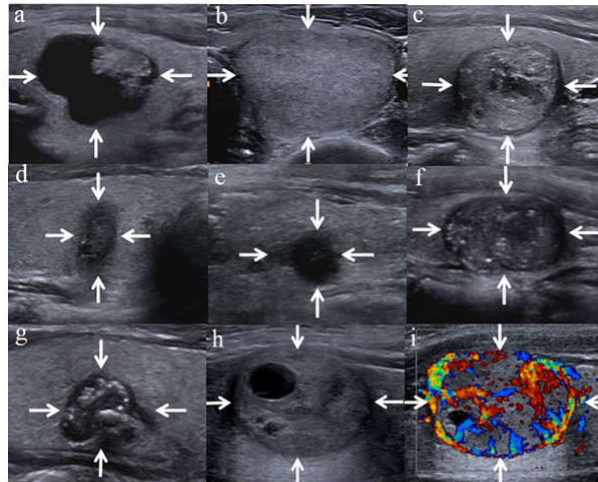


Figure 1. (a) Nodular goiter. Predominantly cystic nodule. TI-RADS H: 3; TI-RADS P: 1; TI-RADS K: 2; TI-RADS R: 3. (b) Follicular adenoma. Solid and isoechoic nodule. TI-RADS H: 4a; TI-RADS P: 2; TI-RADS K: 4a; TI-RADS R: 3. (c) Papillary thyroid carcinoma. Solid and iso-hypoechoic nodule with microcalcification and hypoechoic halo, TI-RADS H: 4c; TI-RADS P: 4; TI-RADS K: 4b; TI-RADS R: 4b. (d) Papillary thyroid carcinoma. Solid and hypoechoic nodule with taller than wide shape, microlobulated margin, and microcalcification. TI-RADS H: 4c; TI-RADS P: 4; TI-RADS K: 5; TI-RADS R: 5. (e) Papillary thyroid carcinoma. Solid and marked hypoechoic nodule with microlobulated margin. TI-RADS H: 4b; TI-RADS P: 4; TI-RADS K: 4c; TI-RADS R: 4b. (f) Papillary thyroid carcinoma. Solid and hypoechoic nodule with disperse microcalcifications. TI-RADS H: 4c; TI-RADS P: 4; TI-RADS K: 4c; TI-RADS R: 4b. (g) Papillary thyroid carcinoma. Solid and hypoechoic nodule with microlobulated and mixed calcification. TI-RADS H: 4c; TI-RADS P: 5; TI-RADS K: 4c; TI-RADS R: 5. (h,i) Follicular thyroid carcinoma. Predominantly solid nodule with hypoechoic halo and hypervascular. TI-RADS H: 4c; TI-RADS P: 2; TI-RADS K: 3; TI-RADS R: 4a.

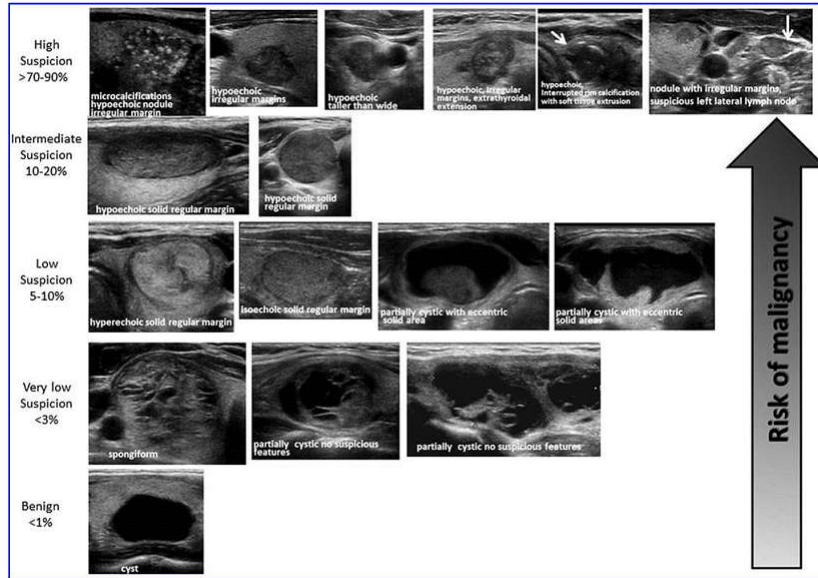


FIG. 2. ATA nodule sonographic patterns and risk of malignancy.

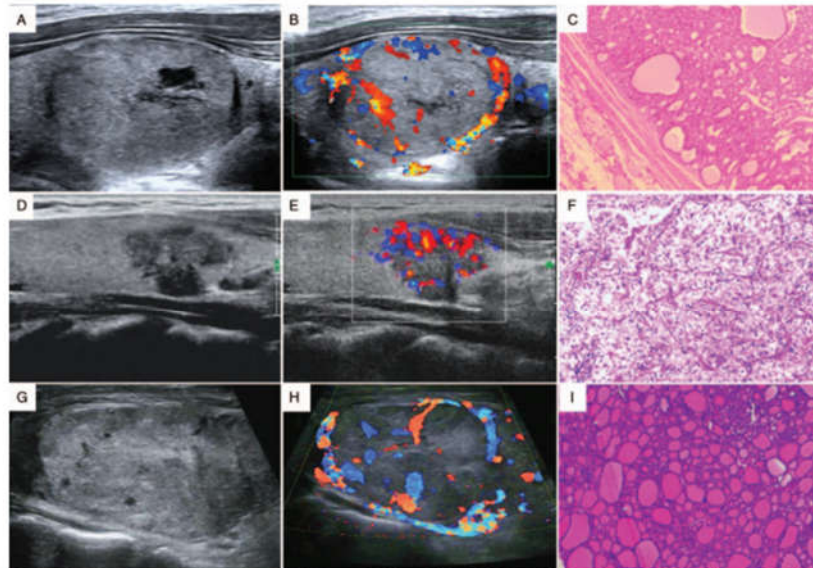
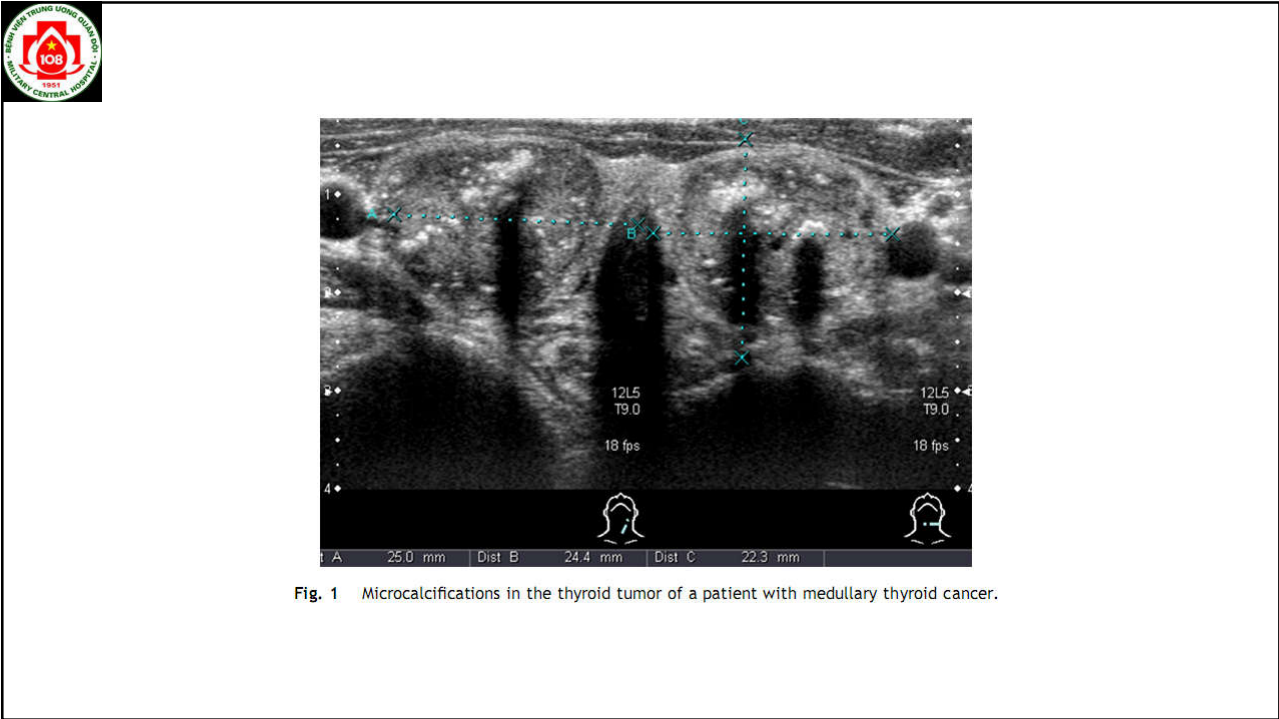
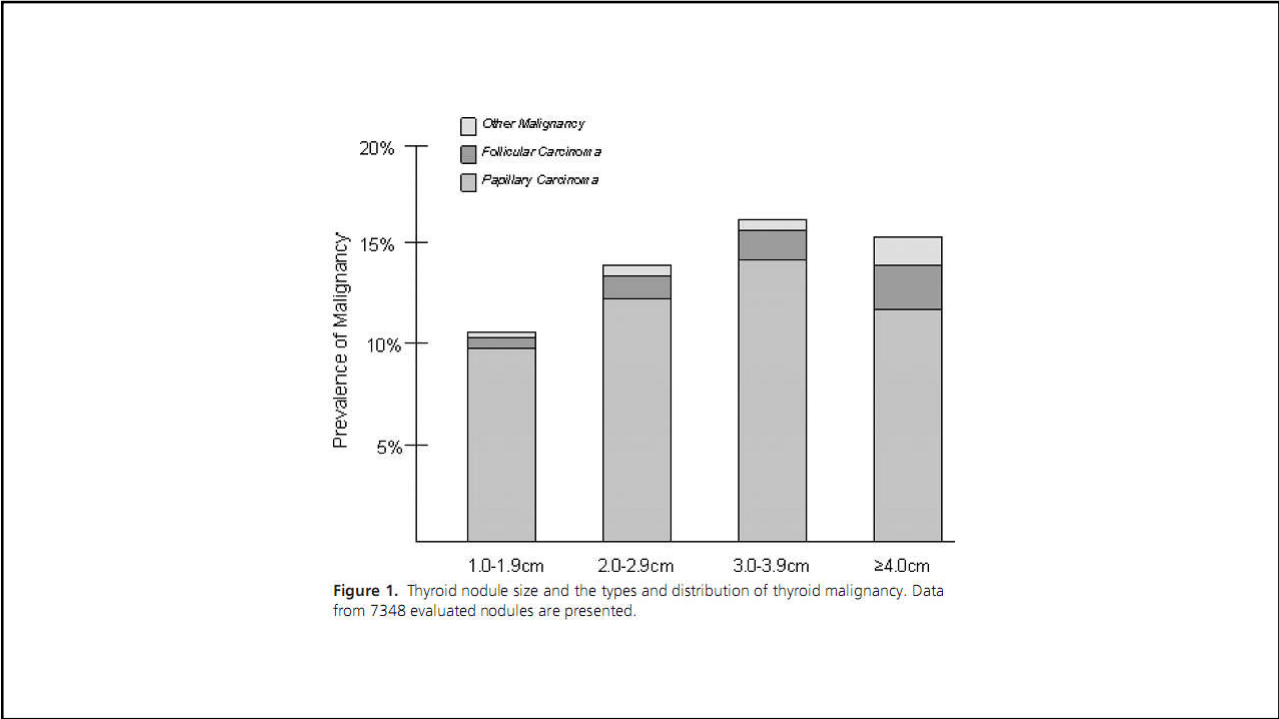


Figure 1: Benign and suspicious ultrasound features and pathological findings (HE staining, original magnification x 200) of thyroid nodules. (A-C) A nodular goiter. The two-dimensional image, color Doppler image, and pathologic image are shown. (D-F) A papillary thyroid carcinoma. The ultrasound image shows a hypochoic nodule with an irregular margin and microcalcification. (G) (H), and (I) A follicular carcinoma demonstrating a large isochoic nodule without microcalcification. HE: Hematoxylin and eosin.



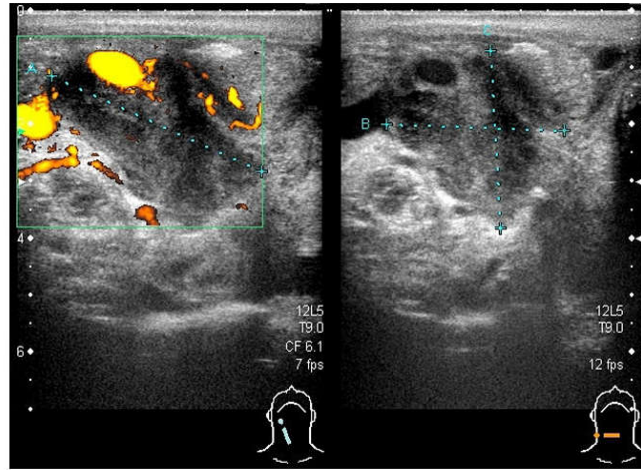
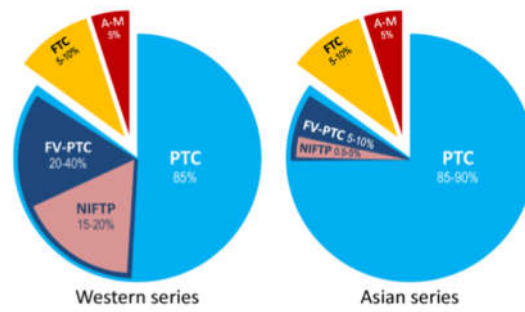


Fig. 2 Hypoechoogenicity, irregular margin, and extrathyroidal involvement of surrounding neck structures in a patient with anaplastic thyroid cancer.

CHỌC HÚT TẾ BÀO KIM NHỎ (fine-needle aspiration FNA)



Tỷ lệ các loại ung thư tuyến giáp



Tóm tắt chỉ định FNA theo 3 kiểu TI-RADS

- ACR: TI-RADS 5 FNA $u \geq 10\text{mm}$. Theo dõi $u \geq 5\text{mm}$.
TI-RADS 4 FNA $u \geq 15\text{mm}$. Theo dõi $u \geq 10\text{mm}$
 - Eu: TI-RADS 5 FNA $u > 10\text{mm}$. Theo dõi hoặc FNA $u < 10\text{mm}$.
TI-RADS 4 FNA $u > 15\text{mm}$.
 - K: TI-RADS 5 FNA $u \geq 10\text{mm}$ và $> 5\text{mm}$ (Chọn lọc)
TI-RADS 4 FNA $u \geq 10\text{mm}$
- Với TI-RADS 3: FNA ACR $\geq 25\text{mm}$, Eu $> 20\text{mm}$; K. $\geq 15\text{mm}$.



Việt Nam

1. Chưa có thống nhất giữa các bệnh viện, các trung tâm.
2. Tại Bệnh viện TƯ'QĐ 108: cân nhắc cho FNA khi khối u $\geq 5\text{mm}$, khi xem xét các yếu tố nguy cơ khác:
 - Nhóm nguy cơ cao.
 - Tuổi trẻ.
 - Vị trí gần vỏ, eo.
 - Bệnh nhân không có điều kiện theo dõi định kỳ theo hẹn.
 - khối u có tốc độ phát triển nhanh ($> 20\%$ kích thước/ 6 tháng).
 - Bệnh nhân có hạch nghi ngờ di căn.



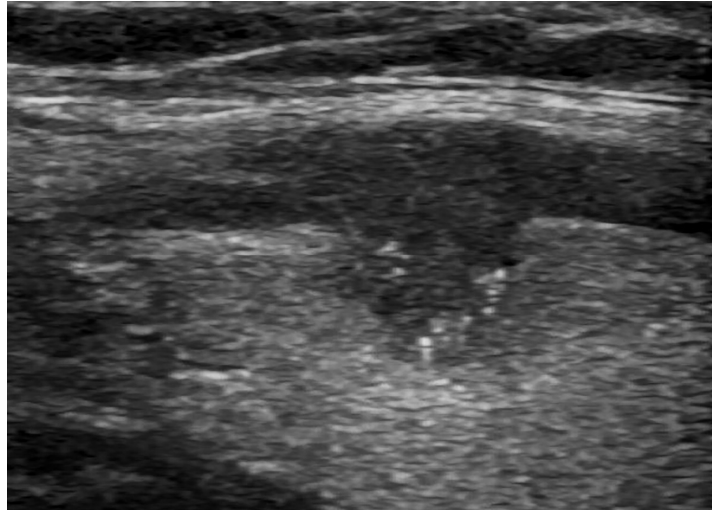


Figure 13: Small comet-tail artifacts and additional echogenic foci (punctate echogenic foci [PEF]) in a papillary carcinoma in a 54-year-old woman. In addition to 3 points for PEF, the nodule was assigned 2 points for solid composition, 2 for hypoechoogenicity, and 2 for a lobulated margin, for a total of 9 points (TR5).



TÓM TẮT KẾT QUẢ FNA

Table 6
Summary Characteristics for Thyroid FNA^a

Feature	Range %	Definition
Sensitivity	88.2-97.0	Likelihood that patient with disease has positive test results
Specificity	47.0-98.2	Likelihood that patient without disease has negative test results
PPV	52.0-98.0	Fraction of patients with positive test results who have disease
NPV	89.0-96.3	Fraction of patients with negative test results who do not have disease
False-negative rate	0.5-10.0	FNA negative; histologic findings positive for cancer
False-positive rate	1.0-7.0	FNA positive; histologic findings negative for cancer

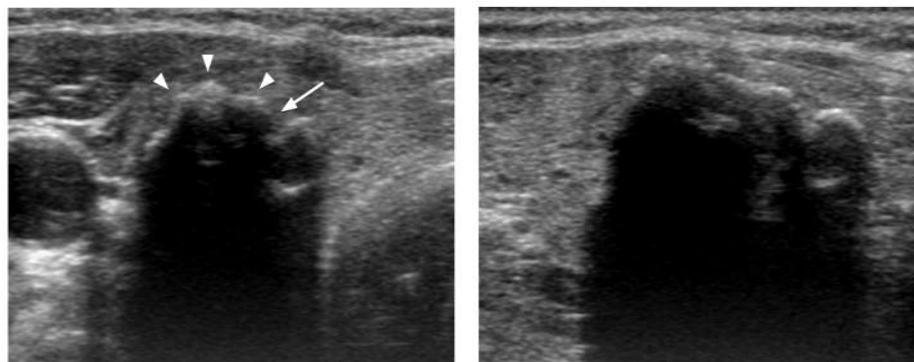
Abbreviations: FNA = fine-needle aspiration; NPV = negative predictive value; PPV = positive predictive value.
^aData from Bongiovanni et al, *Acta Cytol.* 2012;56:333-339; Piana et al, *Cytopathology.* 2010; Tee et al, *Ann Surg.* 246:714-720; Wang et al, *Thyroid.* 2011;21:243-251.

Một số nguyên nhân dẫn đến sai lầm

1. Do kỹ thuật: chọc hút, cố định tiêu bản, nhuộm, trình độ người đọc...

2. Nguyên nhân do tính chất khối u:

- Những khối vôi hóa thô, vôi hình vỏ trứng.
- Những khối lớn, có âm không đều (nên chọc vào vùng giảm âm).
- Những khối có hoại tử trong khối.
- Những khối có nhiều mạch nuôi.



A
B
Fig. 1. Benign nodule with isolated macrocalcification in a 56-year-old woman.

Dong Gyu Na *Ultrasonography* 35 (3) 2016



TABLE 8. THE BETHESDA SYSTEM FOR REPORTING THYROID CYTOPATHOLOGY: DIAGNOSTIC CATEGORIES AND RISK OF MALIGNANCY^a

Diagnostic category	Estimated/predicted risk of malignancy by the Bethesda system, % ^a	Actual risk of malignancy in nodules surgically excised, % median (range) ^b
Nondiagnostic or unsatisfactory	1-4	20 (9-32)
Benign	0-3	2.5 (1-10)
Atypia of undetermined significance or follicular lesion of undetermined significance	5-15	14 (6-48)
Follicular neoplasm or suspicious for a follicular neoplasm	15-30	25 (14-34)
Suspicious for malignancy	60-75	70 (53-97)
Malignant	97-99	99 (94-100)

^aAs reported in The Bethesda System by Cibas and Ali (1076).

^bBased on the meta-analysis of eight studies reported by Bongiovanni *et al.* (103). The risk was calculated based on the portion of nodules in each diagnostic category that underwent surgical excision and likely is not representative of the entire population, particularly of nondiagnostic and benign diagnostic categories.



Table 3 Joint distribution of BETHESDA & TIRADS categories

Diagnostic categories	TIRADS					Total
		2	3	4	5	
BETHESDA II		42	19	2	2	65
		23.33%	10.56%	1.11%	1.11%	
III		3	21	14	1	39
		1.67%	11.67%	7.78%	0.56%	
IV		0	1	33	7	41
		0%	0.56%	18.33%	3.89%	
V		0	0	13	22	35
		0%	0%	7.22%	12.22%	
Total		45	41	62	32	180

Varga: *Thyroid Research 2017*



TABLE 4. CU SCORING SYSTEM FOR MALIGNANCY RISK STRATIFICATION AND PROPOSED MANAGEMENT

<i>CU score</i>	<i>Malignancy risk</i>		<i>Calculated malignancy risk</i>	<i>FNA cytology</i>	<i>K-TIRADS</i>	<i>Management^a</i>
CU 1	Very low risk	<3%	0–2.4%	Non-diagnostic Benign AUS/FLUS	2 2, 3, 4 2	Observation
CU 2	Low risk	≥3%, <30%	3.6–20.2%	Non-diagnostic Benign AUS/FLUS FN/SFN	3, 4 5 3 3	Repeat biopsy
CU 3	High risk	≥30%, <90%	34–80%	Non-diagnostic AUS/FLUS FN/SFN	5 4, 5 4, 5	Repeat biopsy or Surgery
CU 4	Very high risk	≥90%	92.9–100%	Suspicious for malignancy Malignant	3, 4, 5 3, 4, 5	Surgery

^aManagement decisions may be modified by other factors including nodule size, presence of aggressive cancer behaviors, clinical risk factors, and individual patient factors.

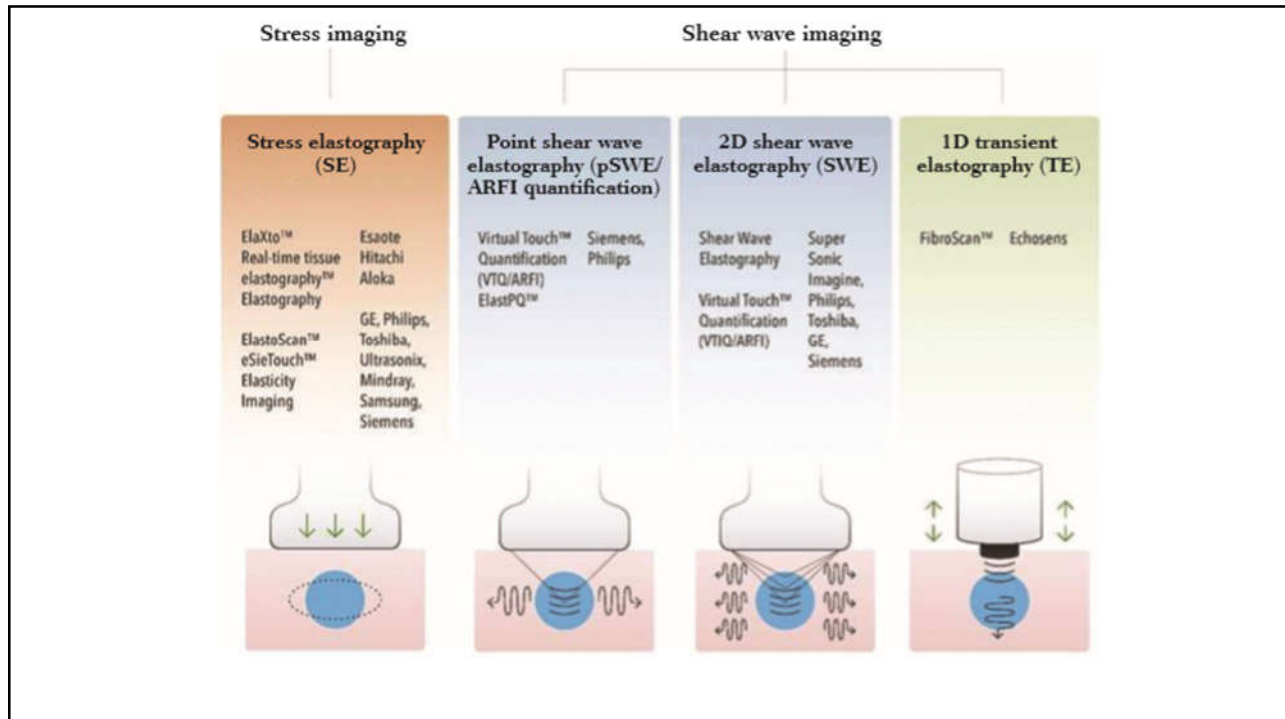
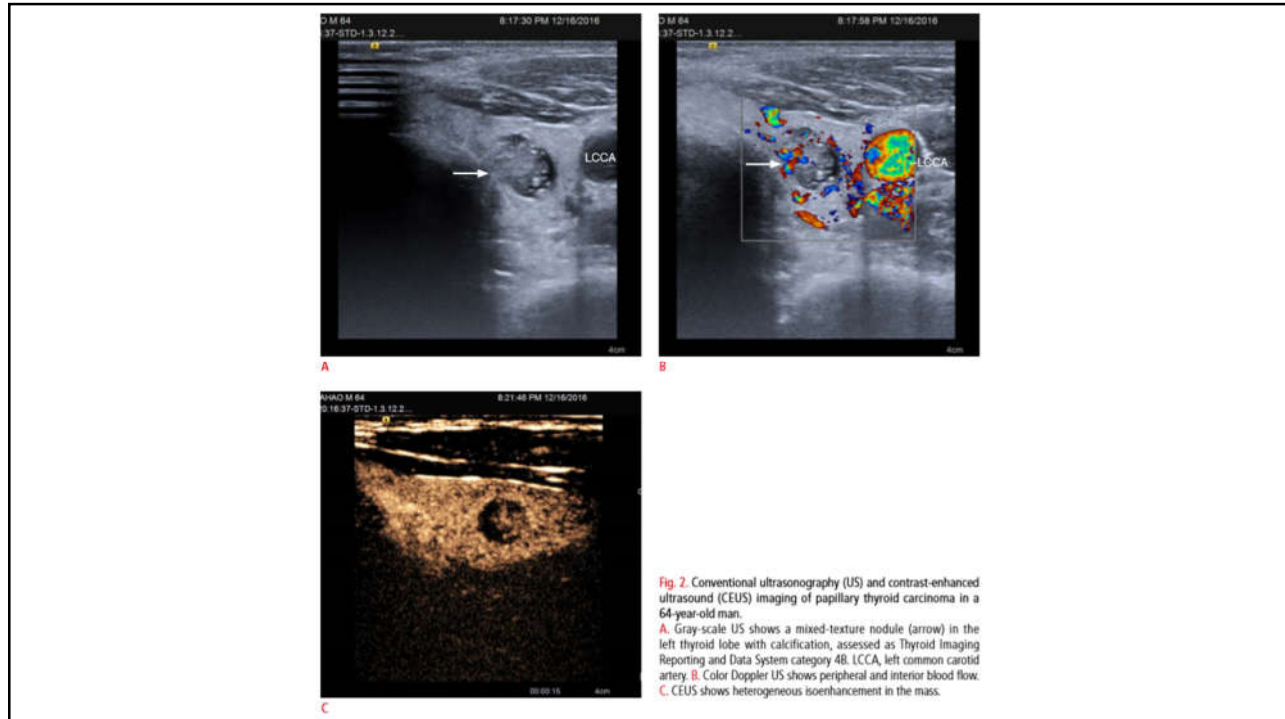
KẾT LUẬN

- Siêu âm có vai trò quan trọng trong chẩn đoán ung thư tuyến giáp.
- Có rất nhiều kiểu phân độ TI-RADS khác nhau: Có lẽ nên theo bảng phân độ của ACR.
 - Chọc hút tế bào kim nhỏ (FNA) là tiêu chuẩn vàng có ý nghĩa dự báo khả năng ác tính của khối u tuy vậy vẫn có tỷ lệ (-) và (+) giả nhất định.
 - Nên kết hợp giữa Phân độ TI-RADS và Bethesda trong nhận định kết quả và quản lý, theo dõi bệnh nhân.



Xin trân trọng cảm ơn







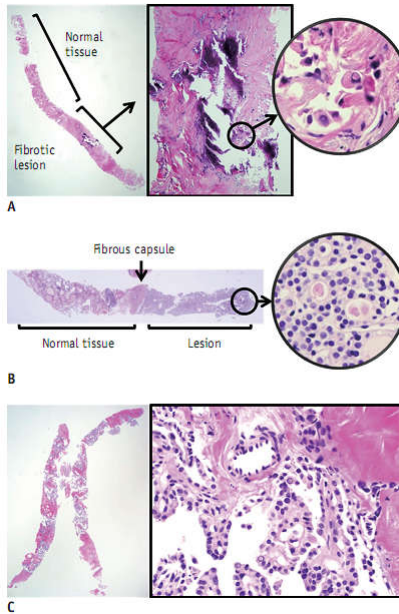
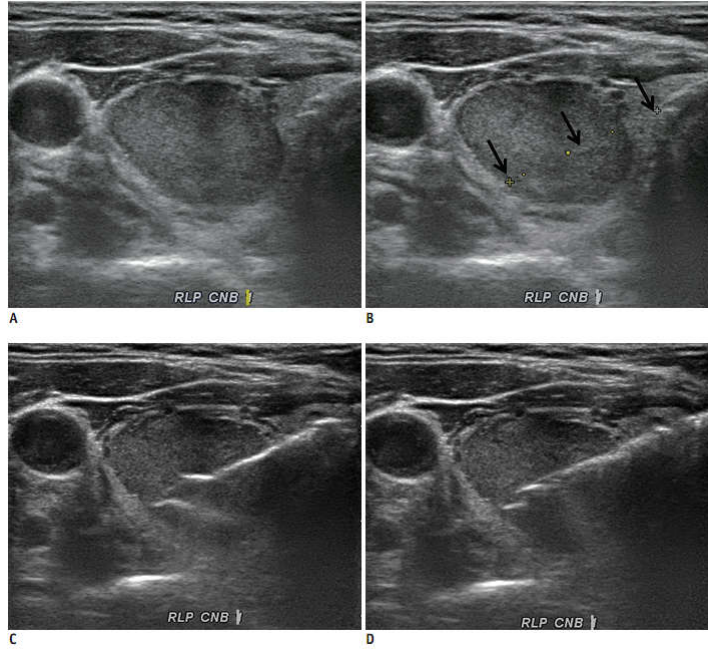
Chỉ định sinh thiết

- FNA không chẩn đoán được
- Các trường hợp FNA tế bào không điển hình
- Những trường hợp bệnh tiến triển nhanh, thể tủy, thể không biệt hóa
- Một số trường hợp tái phát



A





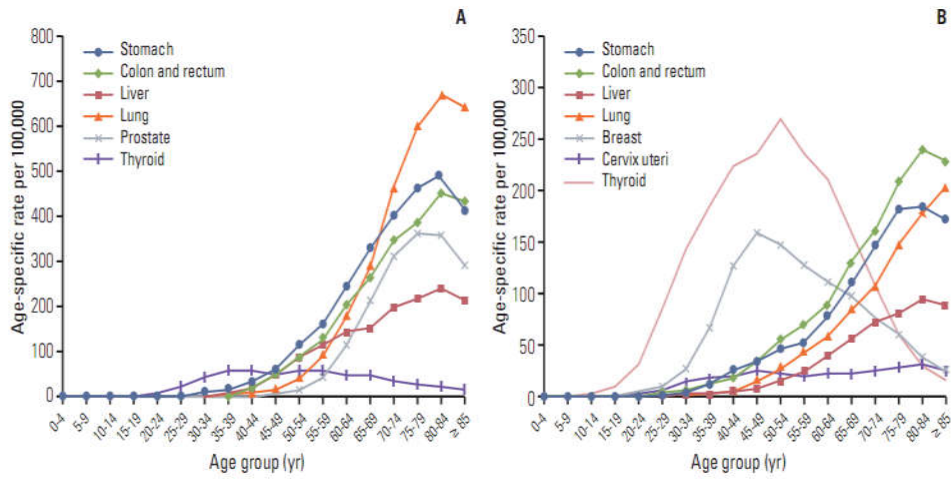
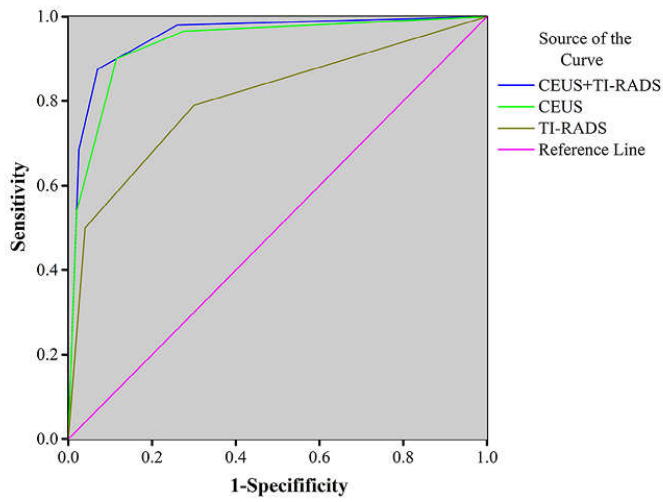


Fig. 4. Age-specific incidence rates of common cancers for 2013 in Korea. (A) Men. (B) Women.

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Differentiated thyroid cancer

<i>When age at diagnosis is...</i>	<i>And T is...</i>	<i>And N is...</i>	<i>And M is...</i>	<i>Then the stage group is...</i>
< 55 yrs	Any T	Any N	M0	I
	Any T	Any N	M1	II
≥ 55 yrs	T1	N0/NX	M0	I
	T1	N1	M0	II
	T2	N0/NX	M0	I
	T2	N1	M0	II
	T3a/T3b	Any N	M0	II
	T4a	Any N	M0	III
	T4b	Any N	M0	IVA
	Any T	Any N	M1	IVB

Anaplastic thyroid cancer

<i>T is...</i>	<i>And N is...</i>	<i>And M is...</i>	<i>Then the stage group is...</i>
T1-T3a	N0/NX	M0	IVA
T1-T3a	N1	M0	IVB
T3b	Any N	M0	IVB
T4	Any N	M0	IVB
Any T	Any N	M1	IVC

Theo R. Michael Tuttle *Thyroid 2017*



TABLE 2. COMPARISON OF THE AJCC SEVENTH AND EIGHTH EDITION STAGING SYSTEM

	<i>Stage</i>	<i>7th edition description</i>	<i>7th edition 10-year DSS</i>	<i>8th edition description</i>	<i>8th edition expected 10-year DSS</i>
Younger patients	I	<45 years old All patients without distant metastases, regardless of tumor size, lymph node status, or extrathyroidal extension	97–100%	<55 years old All patients without distant metastases, regardless of tumor size, lymph node status, or extrathyroidal extension	98–100%
	II	<45 years old Distant metastases	95–99%	<55 years old Distant metastases	85–95%
Older patients	I	≥45 years old ≤2 cm tumor Confined to the thyroid	97–100%	≥55 years old ≤4 cm tumor Confined to the thyroid	98–100%
	II	≥45 years old 2–4 cm tumor Confined to the thyroid	97–100%	≥55 years old Tumors >4 cm, or tumors of any size with central or lateral neck lymph nodes, or gross extrathyroidal extension into strap muscles	85–95%
	III	≥45 years old >4 cm tumor, or minimal extrathyroidal extension, or central neck lymph node metastasis	88–95%	≥55 years old Tumors of any size with gross extrathyroidal extension into subcutaneous tissue, larynx, trachea, esophagus, recurrent laryngeal nerve	60–70%
	IV	≥45 years old Gross extrathyroidal extension, or lateral neck lymph node metastasis, or distant metastasis	50–75%	≥55 years old Tumors of any size, or lymph node status with gross extrathyroidal extension into prevertebral fascia, encasing major vessels, or distant metastasis	<50%

Theo R. Michael Tuttle *Thyroid 2017*

Bảng so sánh tiêu chuẩn phân loại theo JACC 7 và JACC 8

Giai đoạn	JACC 7				JACC 8			
	T	N	M	Mô tả	T	N	M	Mô tả
I	T1	N0	M0	≤ 2cm	T1 T2	N0	M0	≤ 4cm
II	T2	N0	M0	2 - 4cm	T1T2 T3a T3b	N1 N bất kỳ	M0 M0	Hạch bên khối >4cm hoặc phá vỡ vỏ
III	T3 T1T2T3	N0 N1a	M0 M0	>4cm hoặc vỡ vỏ nhỏ Hạch đi căn	T4a	N bất kỳ	M0	Xâm lấn ra tổ chức xung quanh
IVa	T4a T1T2T3T4a	N bất kỳ	M0	Xâm lấn vào tổ chức xung quanh Hạch đi căn bên	T4b	N bất kỳ	M0	Khối hoặc hạch xâm lấn vào cơ mặt
IVb	T4b	N bất kỳ	M0	Khối u hoặc hạch xâm lấn cơ mặt	T bất kỳ	N bất kỳ	M1	Di căn xa
IVc	T bất kỳ	N bất kỳ	M1	Di căn xa				

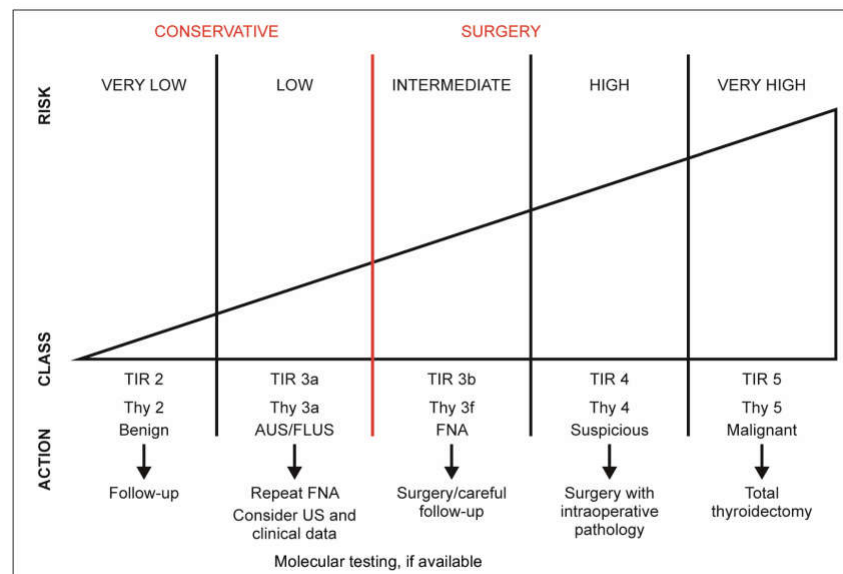


Fig. 3. Cytologic categories and suggested clinical actions. AUS/FLUS indicates follicular lesion/ atypia of undetermined significance. FNA = fine-needle aspiration; TIR = Thyroid Imaging Reporting; Thy = thyroid; US = ultrasonography.

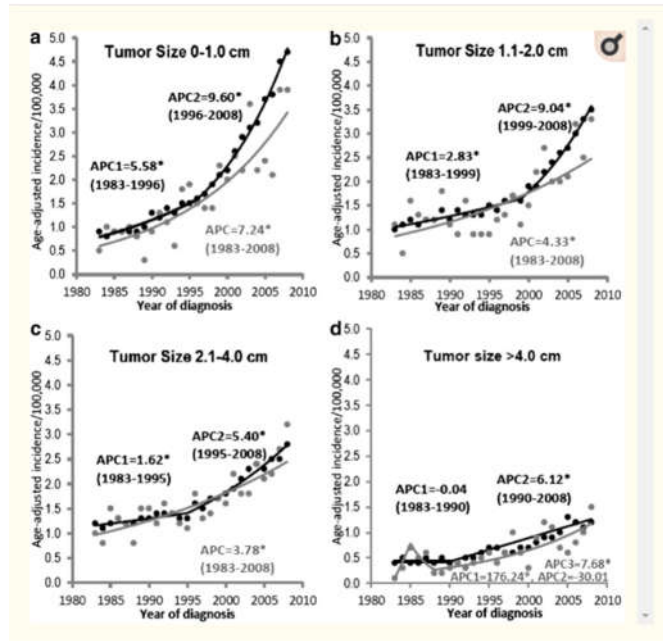


Table 1: Comparison of different ultrasound diagnostic criteria in the thyroid.

Items	Classification	Suspicious ultrasound features	Lymphatic metastasis	Indications for FNA
2016 AACE/ACE/AME ⁽¹⁾	Low risk, intermediate-risk, high risk	Solid, hypoechoic, taller than wide, intra-nodular vascularity, absence of peripheral halo, broken calcified rim and tumor extension beyond the calcified margin	Enlarged lymph node, cytologic assessment, microcalcification, absence of hilum	5-10 mm (clinical high-risk); ≥10 mm (ultrasound high-risk); ≥20 mm (ultrasound intermediate-risk, nodule increasing in size or associated with a high-risk history and before thyroid surgery)
2015 ATA ⁽²⁾	High suspicion, intermediate suspicion, low suspicion, very low suspicion, benign	Solid, hypoechoic, irregular margin, taller than wide, microcalcification, extra-thyroidal extension	Microcalcification, cystic aspect, peripheral vascularity, hyperechogenicity, round shape	≥10 mm (high/intermediate suspicion); ≥15 mm (Low suspicion); ≥20 mm (Very low suspicion)
2016 KSThr ⁽³⁾	Category 1-5	Solid, hypoechoic, irregular shape, microcalcifications, spiculated/microlobulated margins, non-parallel orientation	-	>10 mm (except for cystic nodule and spongiform appearance); >20 mm (spongiform appearance); <10 mm (any ultrasound suspicious feature)
2016 BTA ⁽⁴⁾	UI-US	Solid, hypoechoic, lobulated/irregular outline, microcalcification, intra-nodular vascularity, shape tall-wide, characteristic associated lymphadenopathy	-	Irrelevant to the nodule size, UI-US (has a significantly high risk of malignancy) UI-US (isolated, indeterminate or suspicious of malignancy) Any abnormal lymph node
2012 ESMO ⁽⁵⁾	ETA/ATA	Hypoechogenicity, irregular borders, microcalcification, absence of peripheral halo, solid aspect, intra-nodular blood flow and taller-than-wide	-	Any thyroid nodule >4 cm, <10 mm (history of head and neck irradiation, family history of thyroid cancer, suspicious features at palpation, presence of cervical adenopathy or ultrasound suspicion)
2017 ACR TI-RADS ⁽¹¹⁾	TR1-TR5	Solid or almost completely solid, hypoechoic, taller than wide, extra-thyroidal extension, lobulated or irregular margin, microcalcification	Globular shape, loss of the hilum, peripheral flow, heterogeneity, microcalcifications	>10 mm (highly suspicious); >15 mm (moderately suspicious); >25 mm (minimally suspicious)
2016 French TI-RADS ⁽¹²⁾	TI-RADS 1-5	Marked hypoechogenicity, taller than wide, spiculated borders, microcalcification, high stiffness on elastography	-	≥20 mm (TI-RADS 3-5 or simple cyst with compressive symptoms); 10-20 mm (TI-RADS 4A/4B); <10 mm (suspect cervical lymph node, focal uptake on PET scan, suspected multifocality or young patients)

US: Ultrasound; FNA: Fine needle aspiration; AACE/ACE/AME: American College of Endocrinology and Associazione Medici Endocrinologi Medical Guidelines; ATA: American Thyroid Association Management Guidelines; ETA: European Thyroid Association Guidelines; KSThr: Korean Thyroid Imaging Reporting and Data System; BTA: British Thyroid Association Guidelines; ESMO: European Society of Medical Oncology Clinical Practice Guidelines; ACR: American College of Radiology; TI-RADS: Thyroid imaging reporting and data system; PET: Positron emission tomography; - not available.

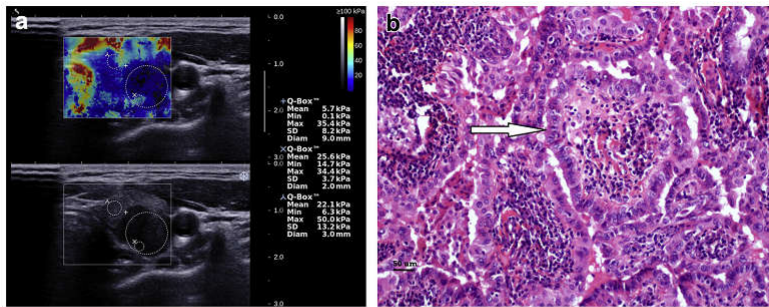
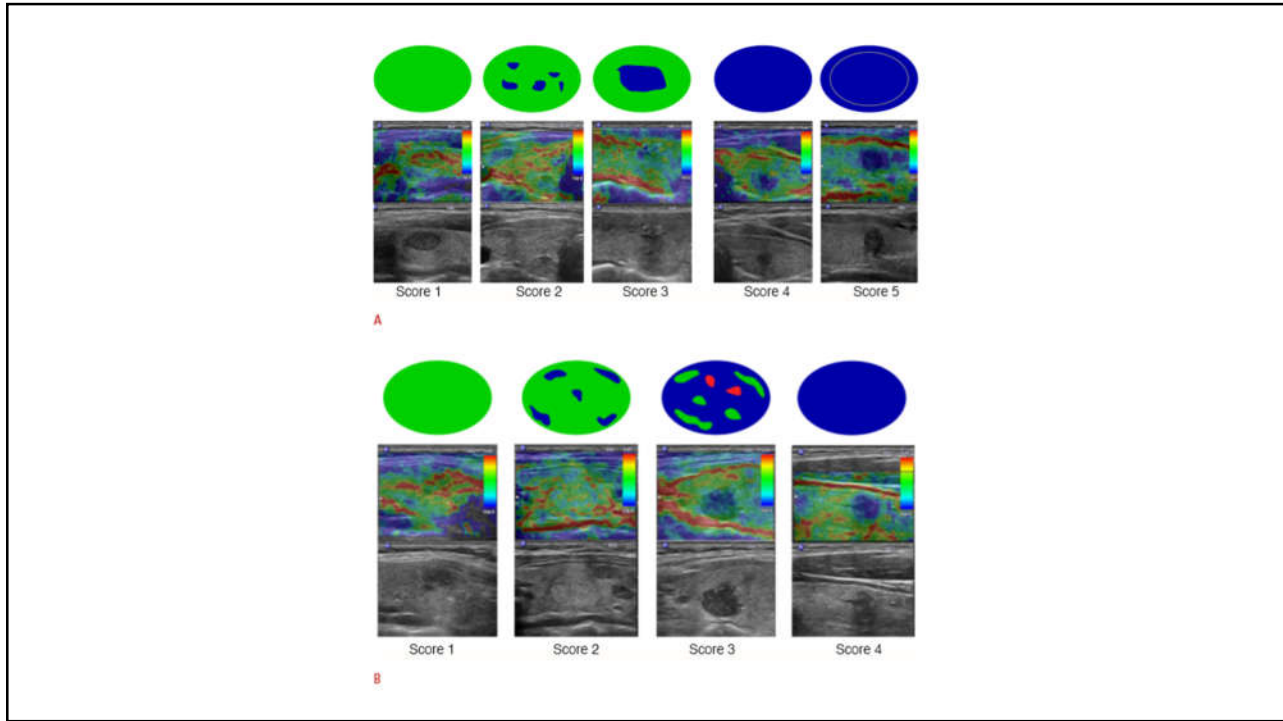


Fig. 2. Representative case of a 36-y-old woman with surgically proven papillary thyroid carcinoma. (a) B-Mode ultrasound image (down) reveals a hypo-echoic nodule with irregular margins. Shear wave elastography (SWE) reveals homogenous color elasticity. SWE-mean, 25.6 kPa; SWE-max, 34.4 kPa. (b) Microscopic appearance of papillary carcinoma (arrow). Local infiltration of lymphocytic cells is observed. There is no microcalcification or fibrosis.

I. NONDIAGNOSTIC OR UNSATISFACTORY

Cyst fluid only
 Virtually acellular specimen
 Other (obscuring blood, clotting artifact, etc.)

II. BENIGN

Consistent with a benign follicular nodule (includes adenomatoid nodule, colloid nodule, etc.)
 Consistent with lymphocytic (Hashimoto) thyroiditis in the proper clinical context
 Consistent with granulomatous (subacute) thyroiditis
 Other

III. ATYPYA OF UNDETERMINED SIGNIFICANCE or FOLLICULAR LESION OF UNDETERMINED SIGNIFICANCE**IV. FOLLICULAR NEOPLASM or SUSPICIOUS FOR A FOLLICULAR NEOPLASM**

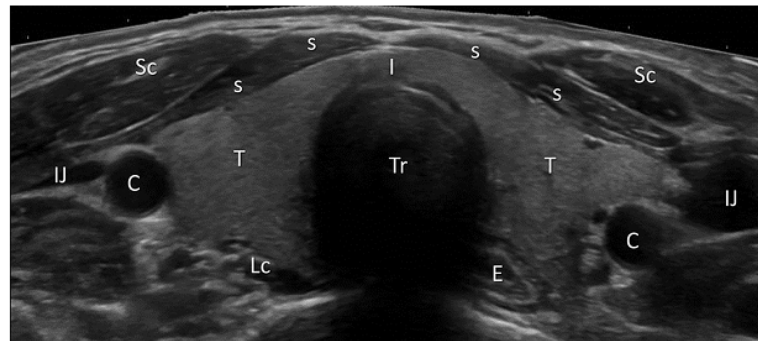
Specify if Hürthle cell (oncocytic) type

V. SUSPICIOUS FOR MALIGNANCY

Suspicious for papillary carcinoma
 Suspicious for medullary carcinoma
 Suspicious for metastatic carcinoma
 Suspicious for lymphoma
 Other

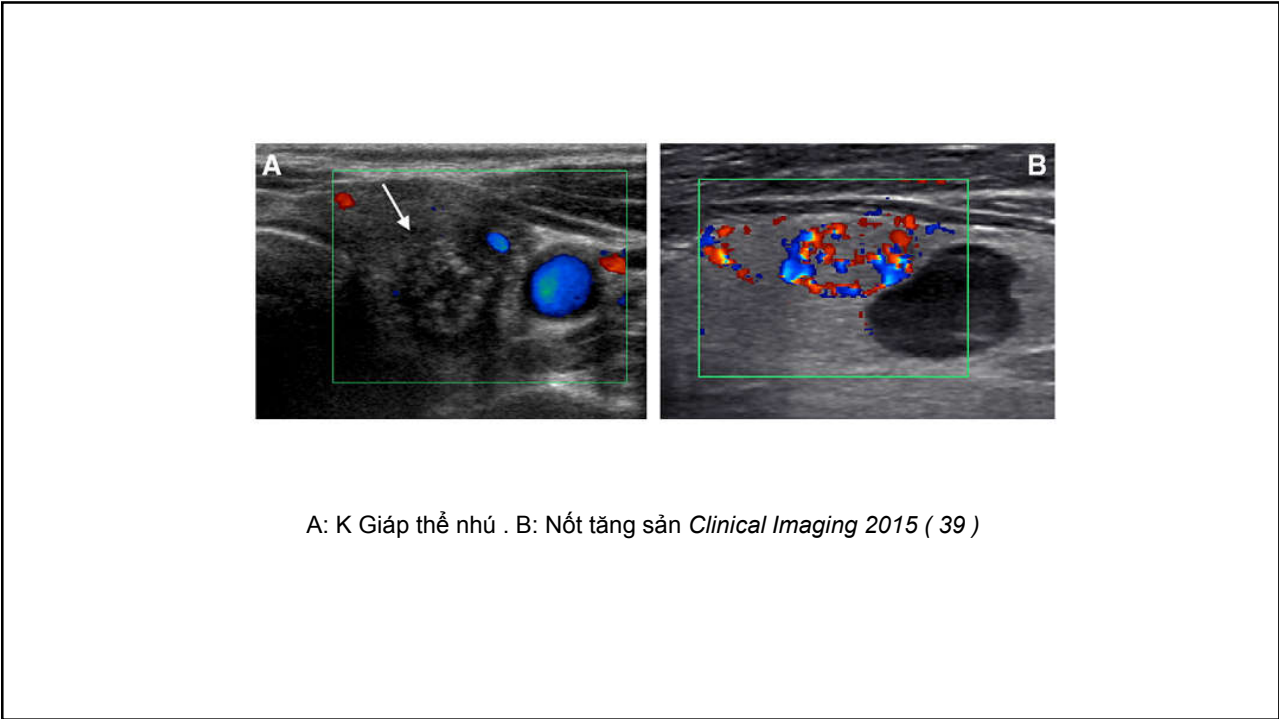
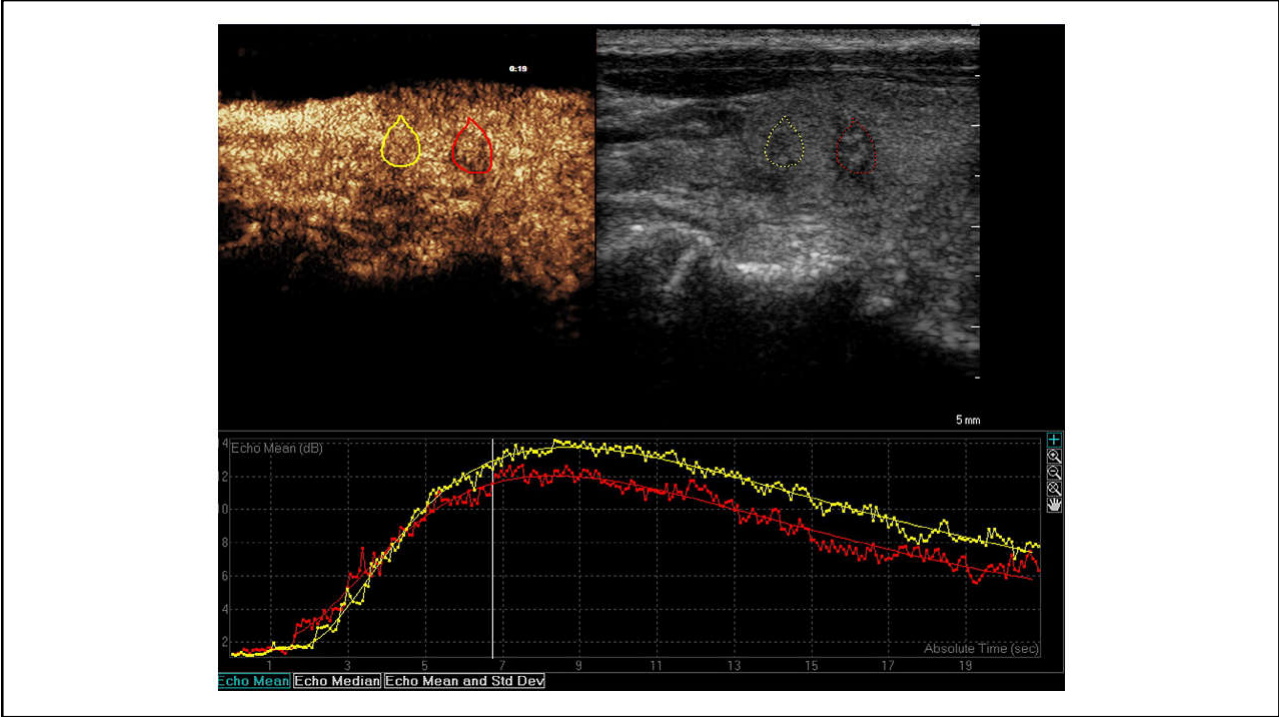
VI. MALIGNANT

Papillary thyroid carcinoma
 Poorly differentiated carcinoma
 Medullary thyroid carcinoma
 Undifferentiated (anaplastic) carcinoma
 Squamous-cell carcinoma
 Carcinoma with mixed features (specify)
 Metastatic carcinoma
 Non-Hodgkin lymphoma
 Other



Tuyến giáp bình thường

Kathryn A. Robinson *Ultrasound (9) 2014*



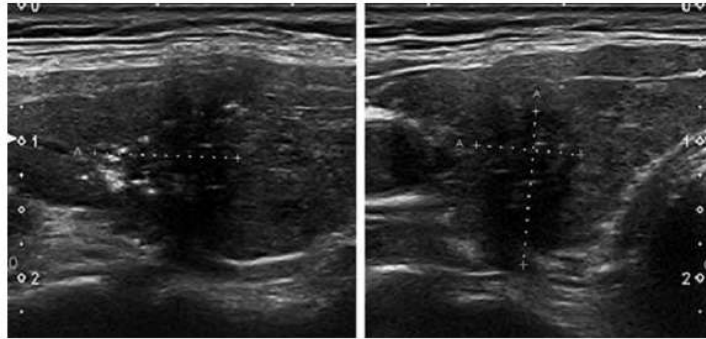


Fig. 8. EU-TIRADS 5: high-risk nodule with a taller-than-wide shape, irregular margins, microcalcifications, and marked hypoechogenicity. Longitudinal (left) and transverse (right) planes. 11 × 8 × 11 mm (length × width × thickness).

Gill Russ et al *Eur Thyroid J.* 2017 (6) 225- 237

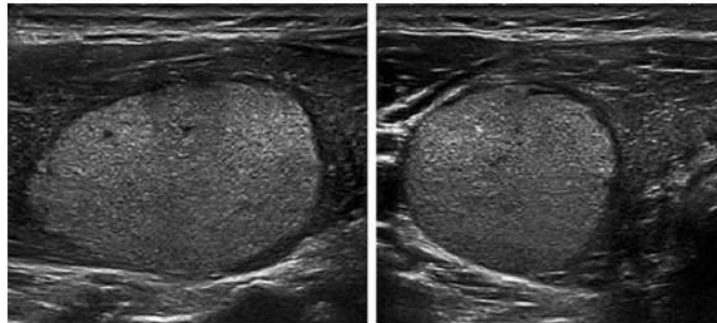


Fig. 5. EU-TIRADS 3: low-risk hyperechoic nodule with an oval shape and smooth margins without any high-risk features. Longitudinal (left) and transverse (right) planes.

Gill Russ et al *Eur Thyroid J.* 2017 (6) 225- 237

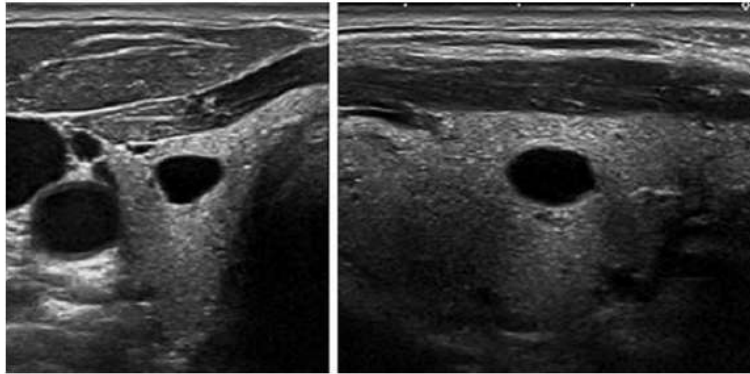


Fig. 2. EU-TIRADS 2: pure/anechoic cyst. Transverse (left) and longitudinal (right) planes.

Gill Russ et al *Eur Thyroid J.* 2017 (6) 225- 237

Parameter	TI-RADS H	TI-RADS P	TI-RADS K	TI-RADS R
Cut-off value	4a	3	4a	4a
Sensitivity (%)	98.9 (459/464)	96.8 (449/464)	99.1 (460/464)	99.4 (461/464)
Specificity (%)	49.0 (268/547)	71.3 (390/547)	52.5 (287/547)	45.2 (247/547)
PPV (%)	62.2 (459/738)	74.1 (449/606)	63.9 (460/720)	60.6 (461/761)
NPV (%)	98.2 (268/273)	96.3 (390/405)	98.6 (287/291)	98.8 (247/250)
Accuracy (%)	71.9 (727/1011)	83.0 (839/1011)	73.9 (747/1011)	70.0 (708/1011)
Az (95% CIs)	0.740 (0.711–0.766)	0.840 (0.816–0.862)	0.758 (0.730–0.784)	0.723 (0.694–0.750)

THEO DÕI SAU PHẪU THUẬT CẮT TUYẾN GIÁP



Tỷ lệ di căn hạch trong ung thư tuyến giáp

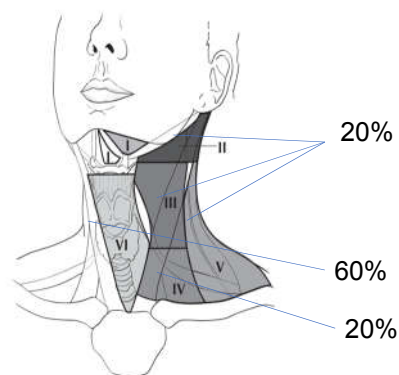
- Ung thư tuyến giáp di căn hạch

+ Tỷ lệ hạch di căn UTTG:

Trước điều trị: 7 - 18%

Sau điều trị: 30 - 90%

+ Thời gian: trong vòng 5 năm ~ 17,8%



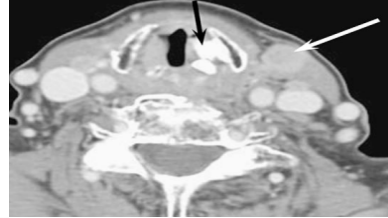
American Joint Committee on Cancer 2014 - AJCC



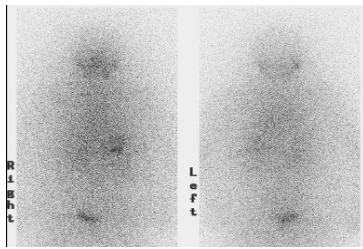
Các phương pháp chẩn đoán hình ảnh với hạch di căn



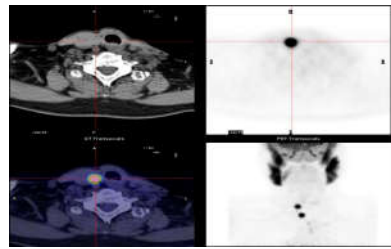
SIÊU ÂM



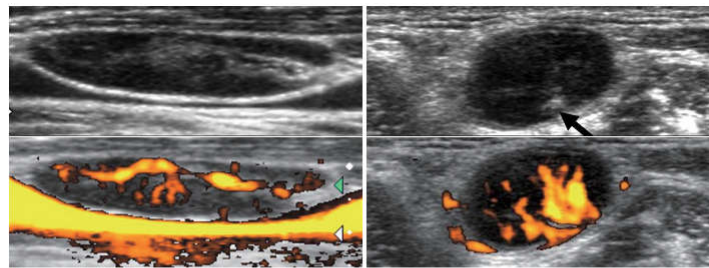
CLVT



XẠ HÌNH ¹³¹I

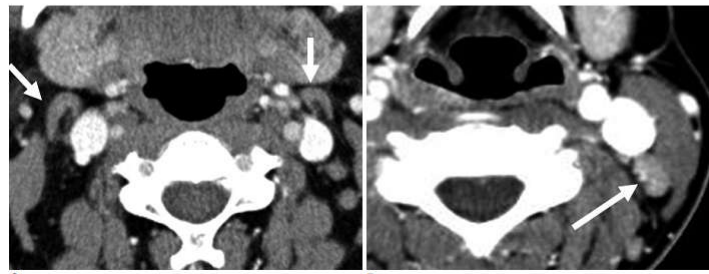


18 FDG - PET/CT



A

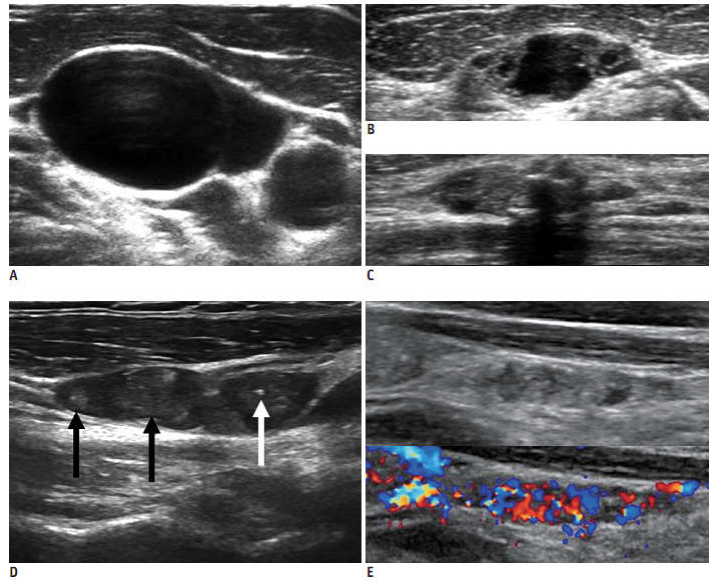
B



C

D

Hạch lành tính trên siêu âm và CT



CHẤT CẢN ÂM SONOVUE



- SonoVue 8 μ l/ml, 1 lọ chứa 25mg (Bracco, Milan, Italia), thế hệ thứ hai
 - Vi bọt khí có đường kính 2 – 6 μ m, qua được hệ thống mao mạch.



Vi bọt khí
(2–6 μ m)



Hồng cầu
(6–8 μ m)



Xin trân trọng cảm ơn

