

# **Nuevas técnicas USE diagnósticas: Elastografía, contrastes y armónicos. Aplicación en tumores pancreáticos**

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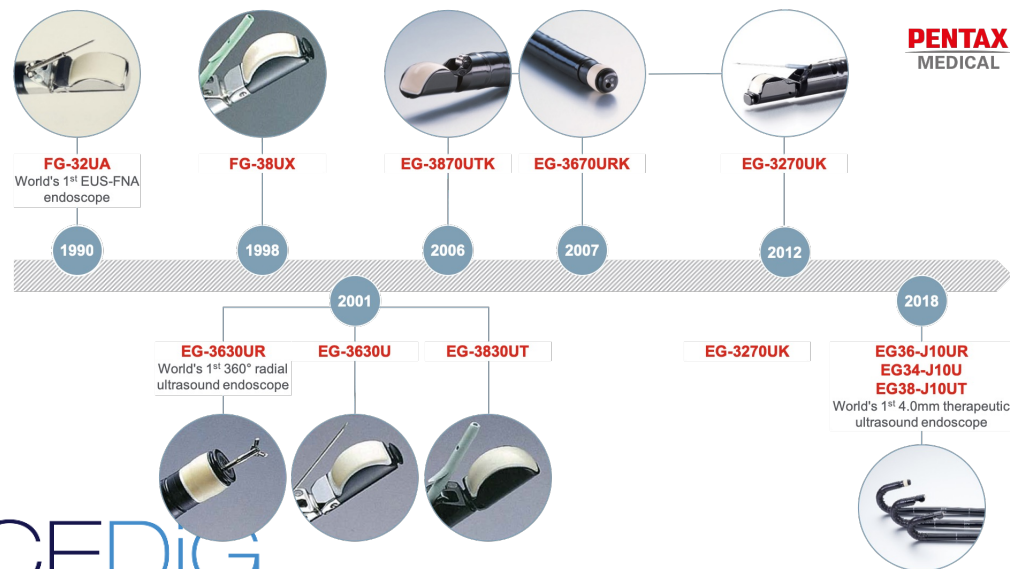
# Importante Desarrollo tecnológico



Continua actualización en innovaciones tecnológicas

# Ecoendoscopia

## Como hemos evolucionado



# Ecoendoscopia

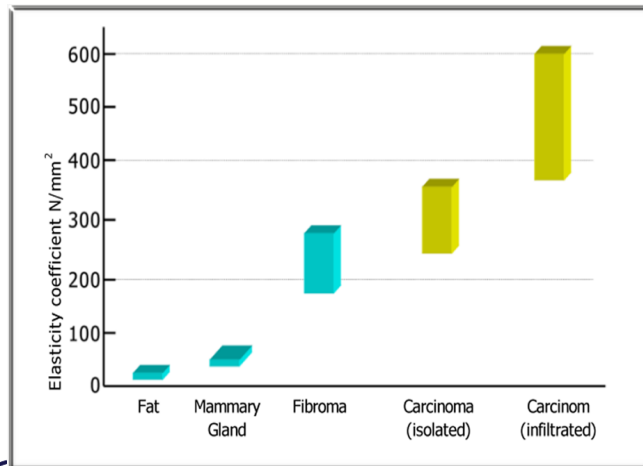
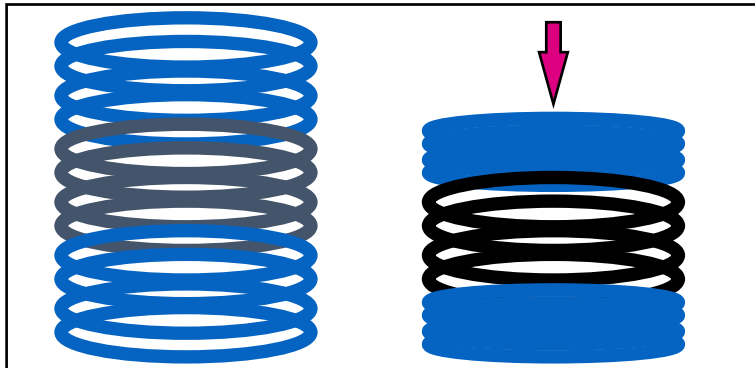
## Como hemos evolucionado



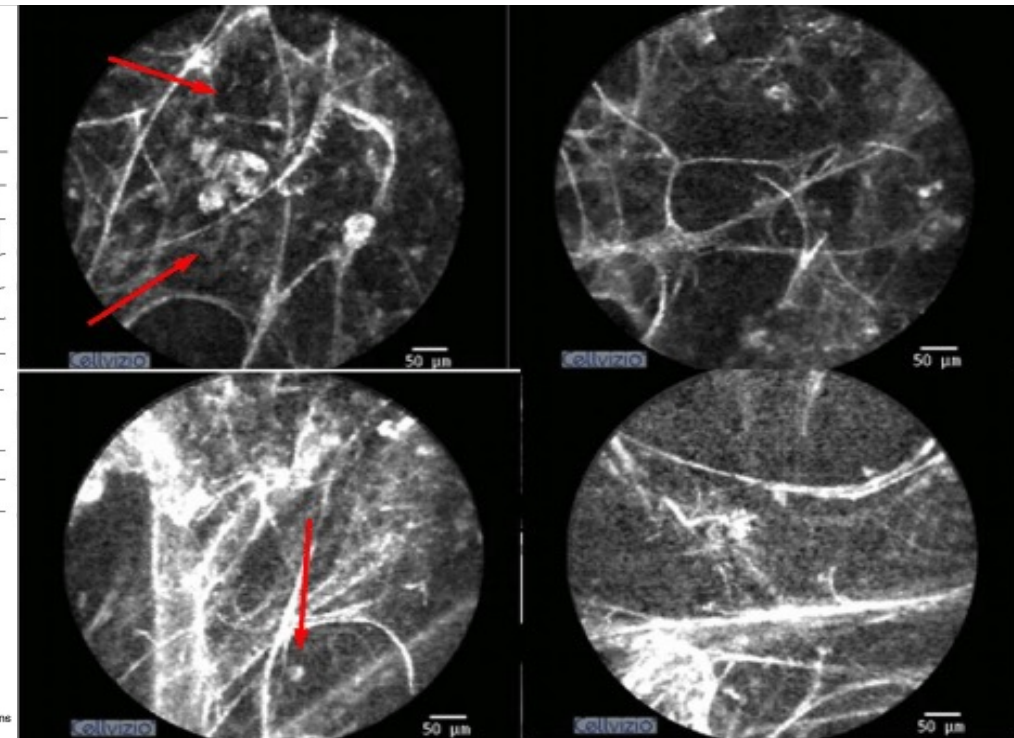
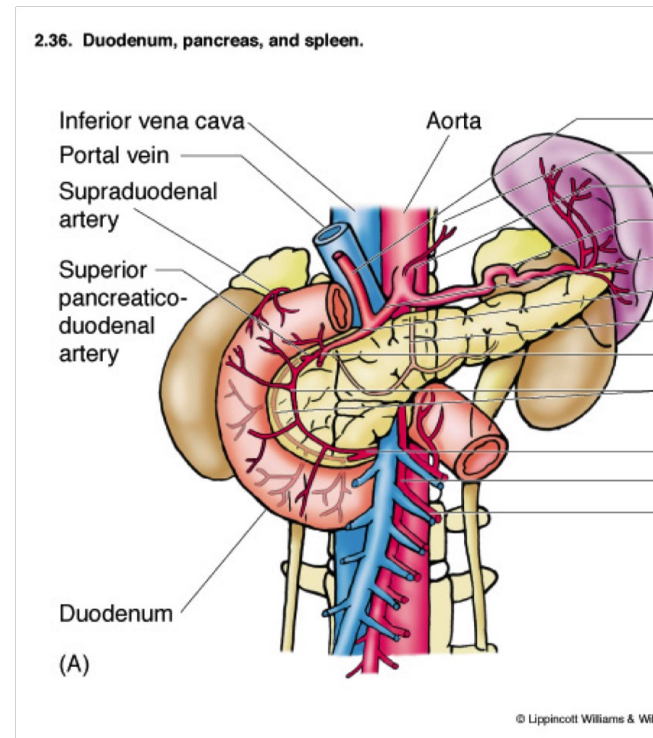
# Ecoendoscopia

## Evolución ... Imagen Avanzada

### Dureza



### Vascularización

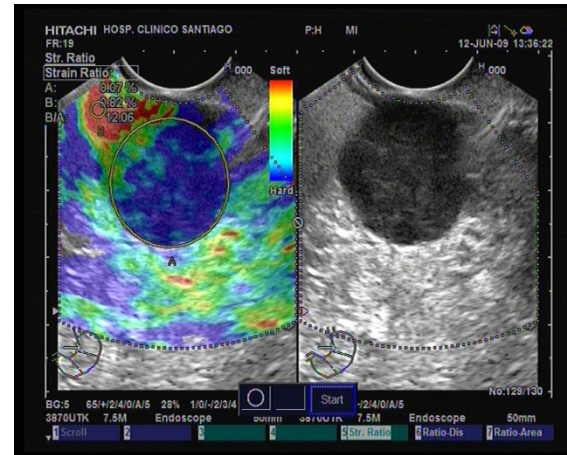
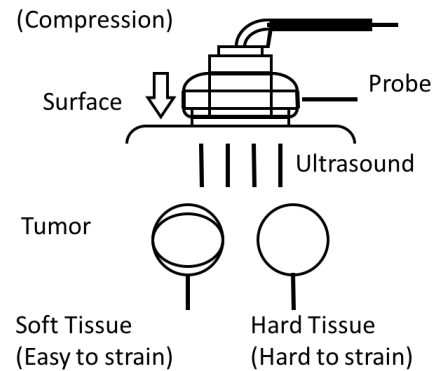


### Evaluación histológica en vivo

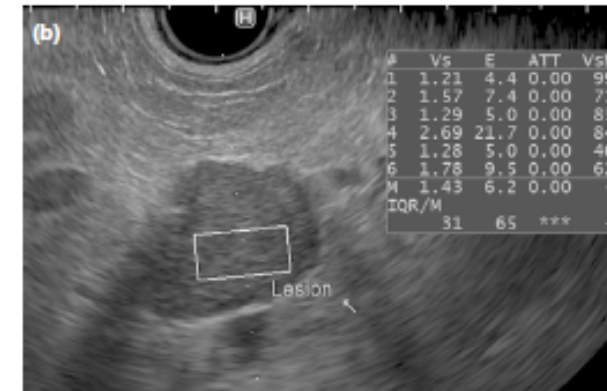
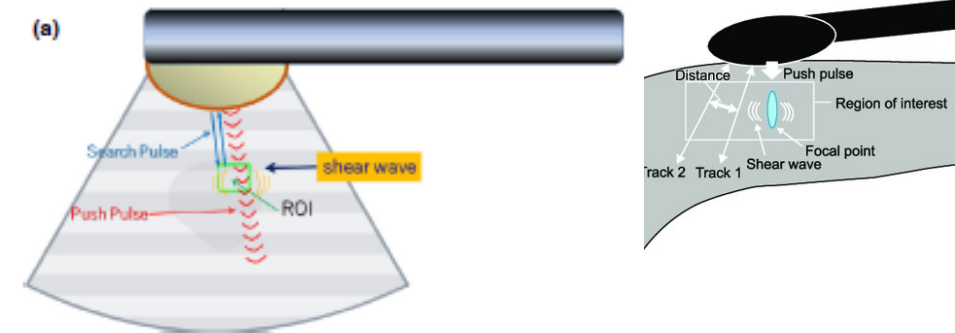
# Imagen Avanzada

## Elastografía guiada por Ecoendoscopia

- **Elastografía por compresión**
- Evalúa la rigidez relativa del tejido por su respuesta a la compresión
- Cualitativo (patrones) o cuantitativo (relación de deformación strain ratio] e histograma)



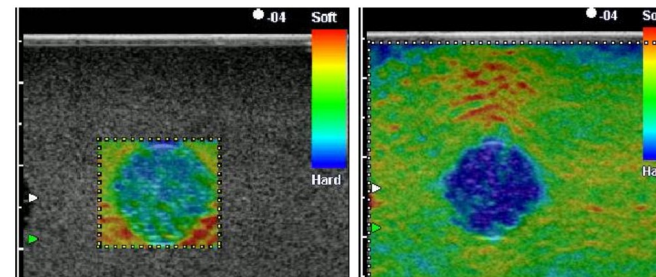
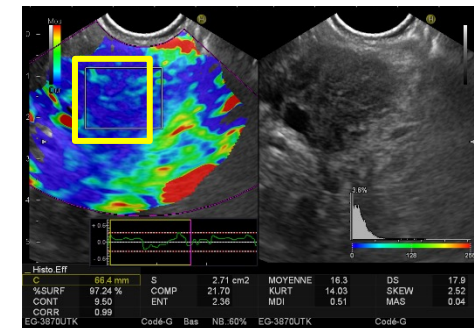
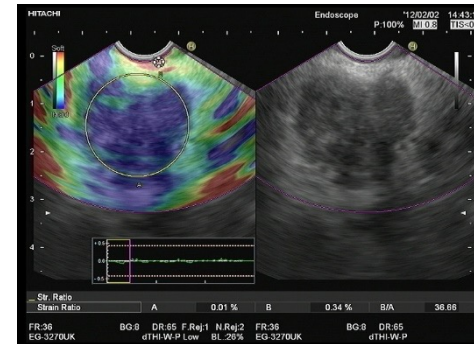
- **Elastografía Shear Wave (SWE)**



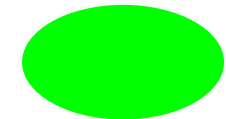
# Elastografía guiada por Ecoendoscopia

## Aspectos/Conceptos clave

- **Frame Reject** is a filter that removes noisy (2-3 for non-experts; 4-5 advance)
- **Noise Reject** is a filter that removes noisy pixels (reduce to obtain colors)
- **Persistence** setting to improve image quality
- **Density** – controls the line density
- **Frame rate** – provides additional control of frame rate with high, medium and low selections.
- **E-Dyn** - adjusts the dynamic range of the colour map, the default value of 4 is most commonly used
- **Relative strain** – lesion covered 25-50% of the ROI
- **Strain ratio and strain histogram**



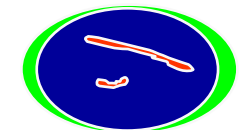
Score1



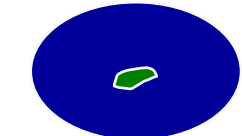
Score2



Score3



Score4

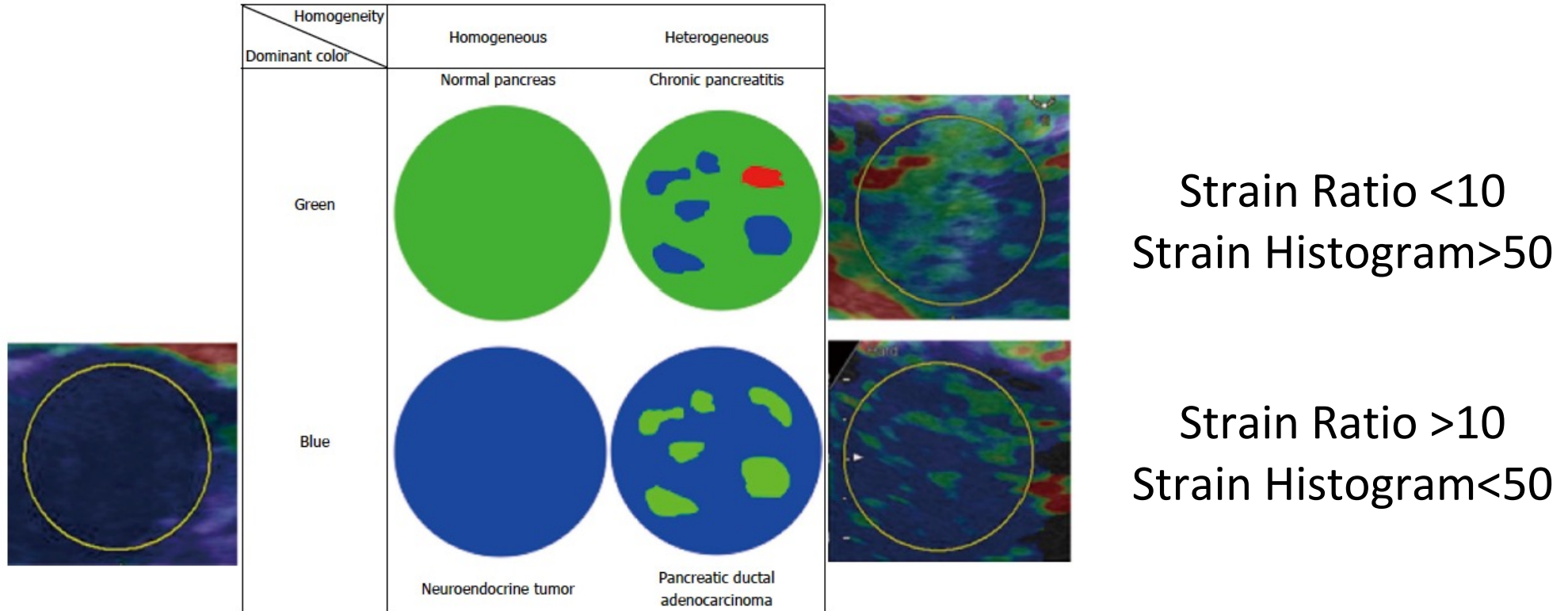


Score5



# Patrones elastográficos

## Elastografía guiada por Ecoendoscopia

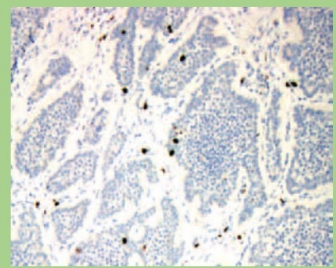


Iglesias-García et al, Gastrointest Endosc 2009; Giovannini et al, Endoscopy 2009; Kawada et al. WJG 2016; Iglesias-Garcia et al. UEG Journal 2017, Zhang et al Pancreatology 2018



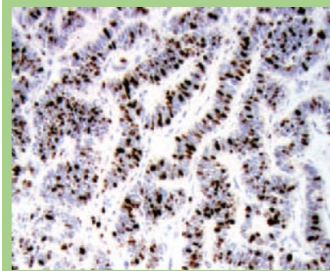
# Tumores Sólidos de Páncreas

## Entendiendo la elastografía



Low Grade  
Grade 1

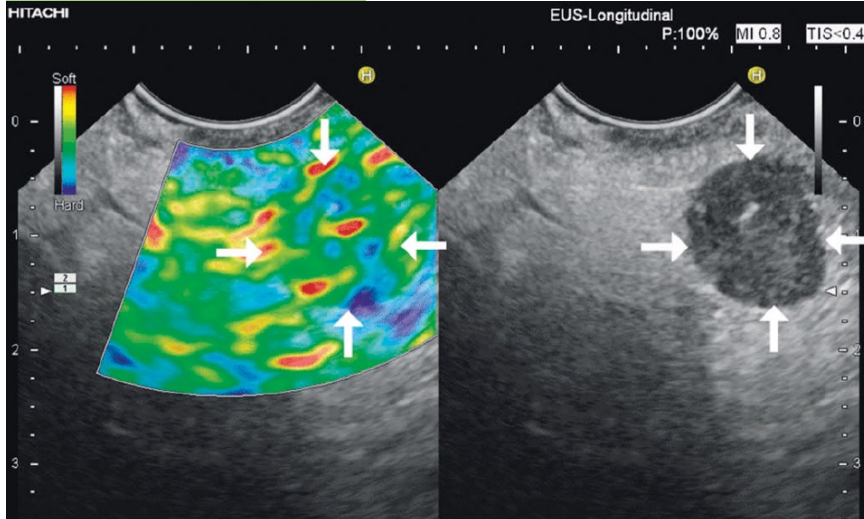
**Soft**  
Low “density”  
of cells



High Grade  
Grade 3

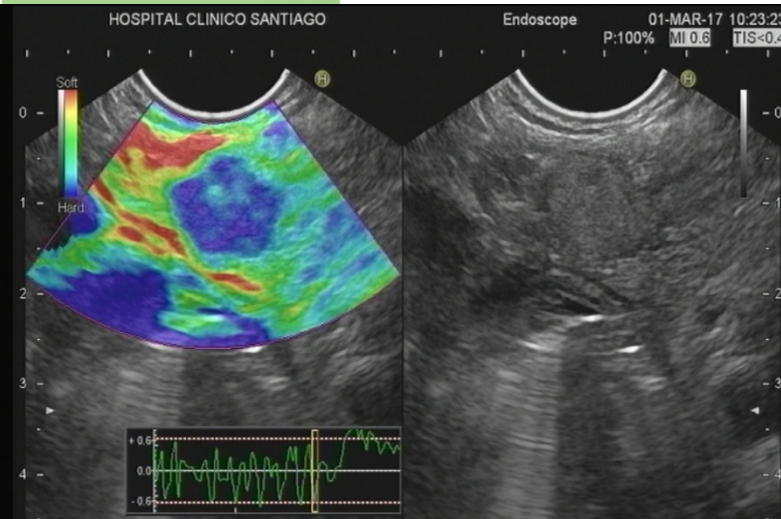
**Hard**  
High “density”  
of cells

Pancreatitis crónica  
con calcificaciones...



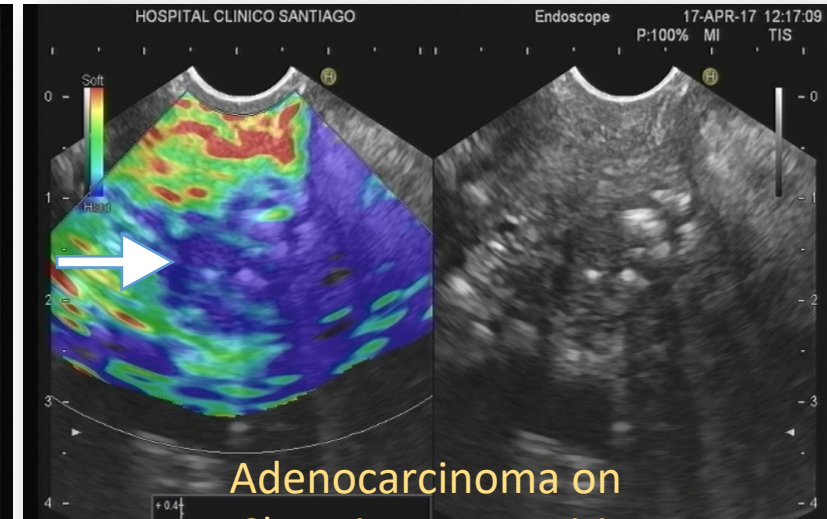
G1 Neuroendocrine Tumor

FR:17 BG:16 DR:80 F.Rej:4 N.Rej:3 FR:17 BG:16 DR:80  
EG-3870UTK T:10-3MHz dTHI-W-R Low BL:40% EG-3870UTK T:10-3MHz dTHI-W-R



G3 Neuroendocrine Tumor

FR:30 BG:5 DR:85 F.Rej:4 N.Rej:3 FR:30 BG:5 DR:85  
EG-3870UTK 7.5MHz High BL:50% EG-3870UTK 7.5MHz



Adenocarcinoma on  
Chronic Pancreatitis

FR: EG-3270UK BG:13 DR:65 F.Rej:4 N.Rej:3 FR: EG-3270UK BG:13 DR:65  
dTHI-W-P High BL:50% dTHI-W-P

# Imagen Avanzada

## Ecoendoscopia con contraste y armónicos

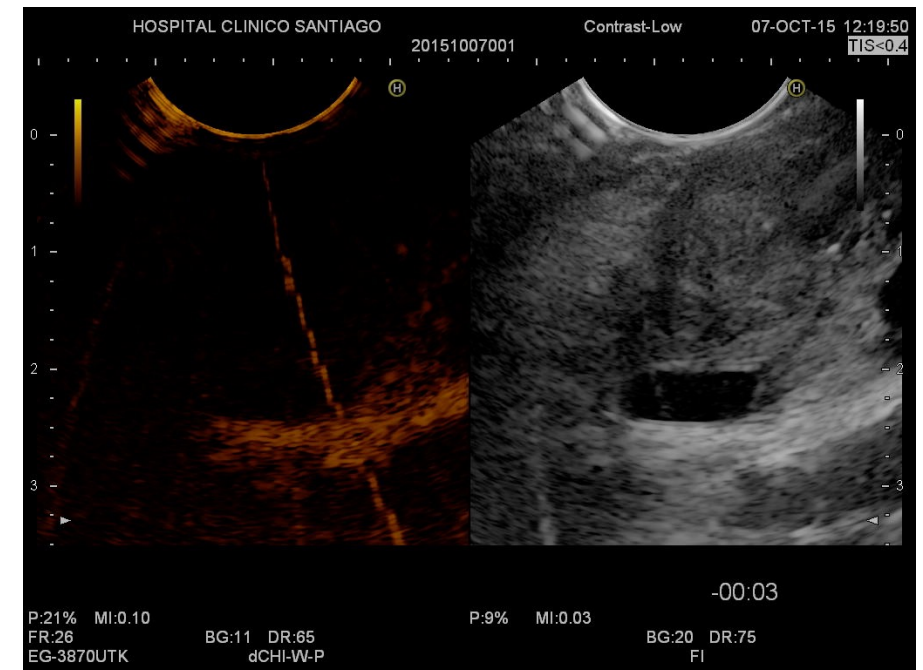
### Mejoría en la caracterización de imágenes difíciles:

- Las imágenes vasculares están artefactadas por la señal de tejido
- La señal de flujo esta por debajo de los limites del doppler

Mejora la sensibilidad  
del doppler

### Aporta información adicional:

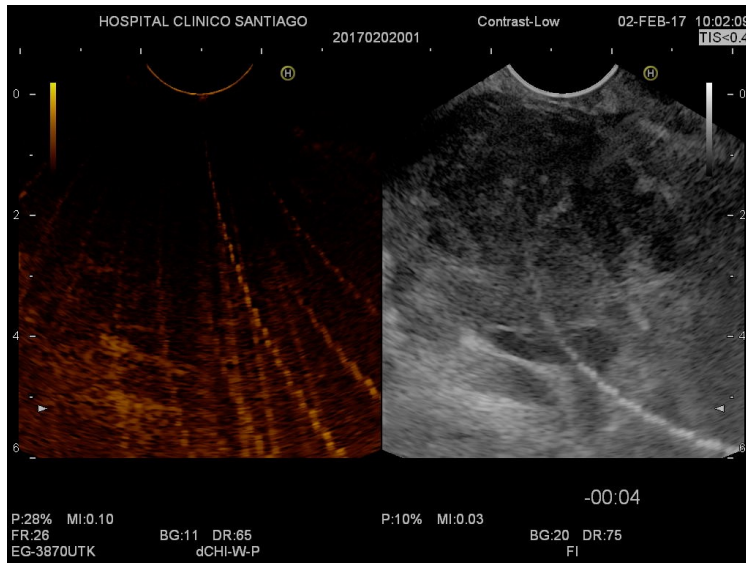
- Determina la perfusión tisular: normal vs patológicos
  - Optimiza la imagen de masas, nódulos o quistes
- Evaluación microcirculación
- Estudios funcionales (cuantitativos)
- Caracterización de lesiones sólidas y quísticas
- Soporte de procedimientos terapéuticos



# Ecoendoscopia con Contraste

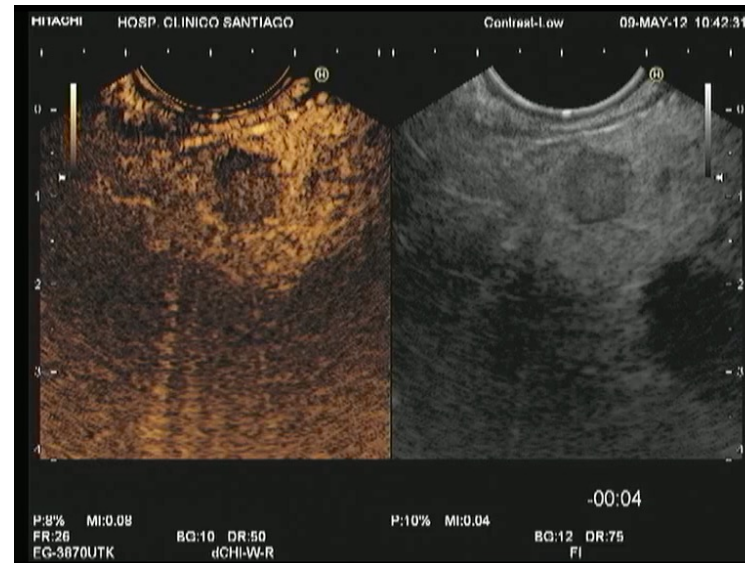
## Patrones Vasculares

- Hipovascular



- Cancer de Páncreas

- Hipervascular



- Tumores Neuroendocrinos

- Metastasis

- Isovascular



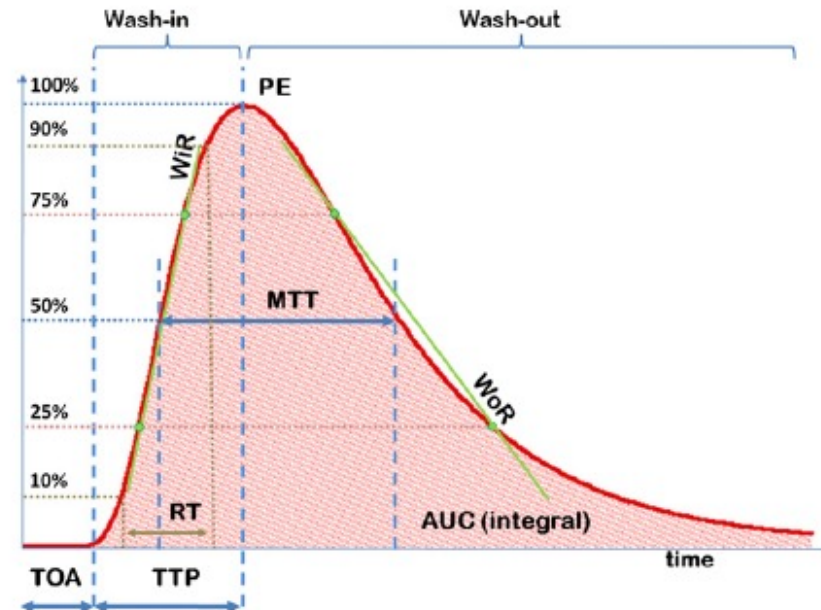
- Pancreatitis Crónica (PAI)

# Ecoendocopia con contraste y armónicos

## Aspectos/Conceptos clave

- **Contrast-harmonic imaging mode active**

- ✓ MI: 0.10-0.20, US Power Control: "MI Control"
- ✓ BG (CHI Gain): 4
- ✓ Frequency: d-CHI-W-R, on demand d-CHI-W-P
- ✓ HI REZ "on": 6 (4)
- ✓ D-Range: 50
- ✓ Gray Map: 4
- ✓ R-Filter: C
- ✓ Persistence: 2
- ✓ Line Density: 2
- ✓ B-Color: 21



Fase arterial (30 s)

Fase venosa (30 s)



# Imagen Avanzada por Ecoendoscopia

## Indicaciones

### 1. Tumores solidos de Páncreas

- **Diagnostico diferencial y estadiaje**

### 2. Tumores Quísticos de Páncreas

- Datos de alarma
- Diagnostico Diferencial

### 3. Pancreatitis Crónica

- Diagnostico diferencial y estadiaje

### 4. Adenopatías

- Diagnostico Diferencial

### 5. Tumores subepiteliales

### 6. ... futuro



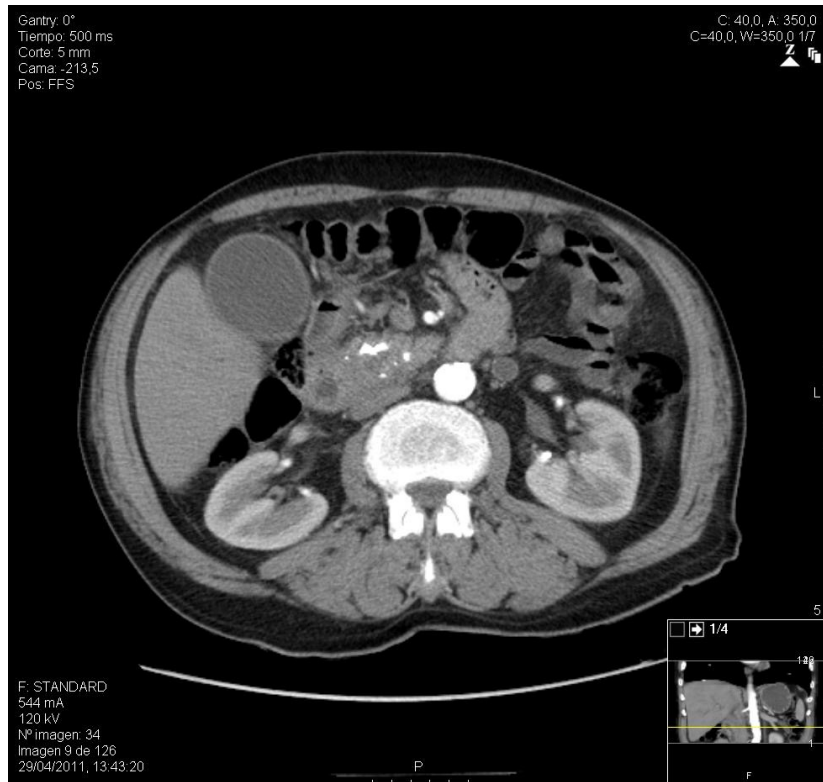
# Tumores Sólidos de Páncreas

## Diagnostico Diferencial

Tuberculosis

Tumor Endocrino

Cancer de Páncreas



Linfoma

PAI

Masa inflamatoria

Metastasis

# Tumores Solidos de Páncreas

## Diagnostico Diferencial

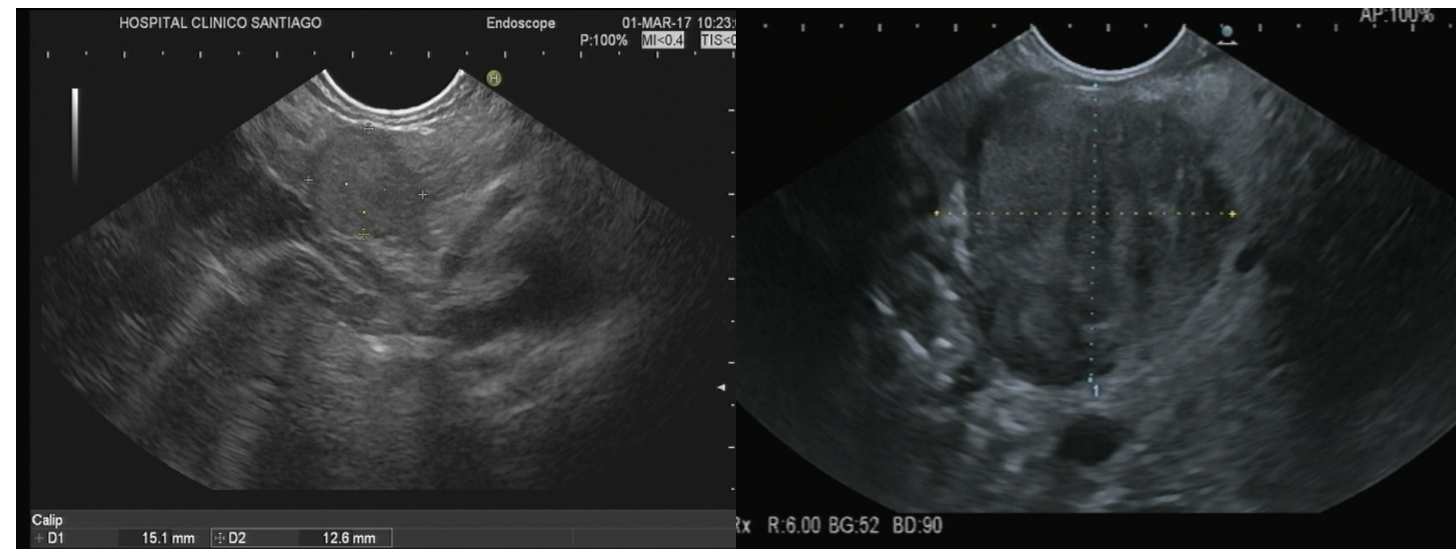
Pathological Diagnosis	%
Adenocarcinoma	71%
Inflammatory Mass in CP	9%
NET	6%
Metastasis	5%
Serous Cystadenoma	2%
Malignant IPMN	2%
Lymphoma	2%
Autoimmune Pancreatitis	1%
Focal Pancreatitis	1%
Others	1%
TOTAL	100%

TABLE 1. Clinical and pathologic characterization of 394 patients with solid pancreatic lesions

	All (%)	Benign (%)	Malignant (%)	PDAC (%)	NET (%)	Met (%)
No.	394	179/394 (45)	215/394 (55)	146/394 (37)	156/394 (40)	28/394 (7)
Age, median, $\pm$ SD, (range), y	60 $\pm$ 16 (18-100)	55 $\pm$ 16 (18-86)	64 $\pm$ 15 (18-100)	66 $\pm$ 15 (31-100)	58 $\pm$ 17 (18-90)	61 $\pm$ 11 (31-79)
Sex, m/f	158/236	70/109	88/127	55/91	66/90	13/15
Size, median, $\pm$ SD, (range), mm	11 $\pm$ 3 (4-15)	10 $\pm$ 3 (4-15)	12 $\pm$ 3 (4-15)	12 $\pm$ 3 (4-15)	10 $\pm$ 3 (4-15)	11 $\pm$ 2 (7-15)
Surgery, no. (%)	303/394 (77)	103/179 (58)	200/215 (93)	145/146 (99)	116/156 (74)	20/28 (71)

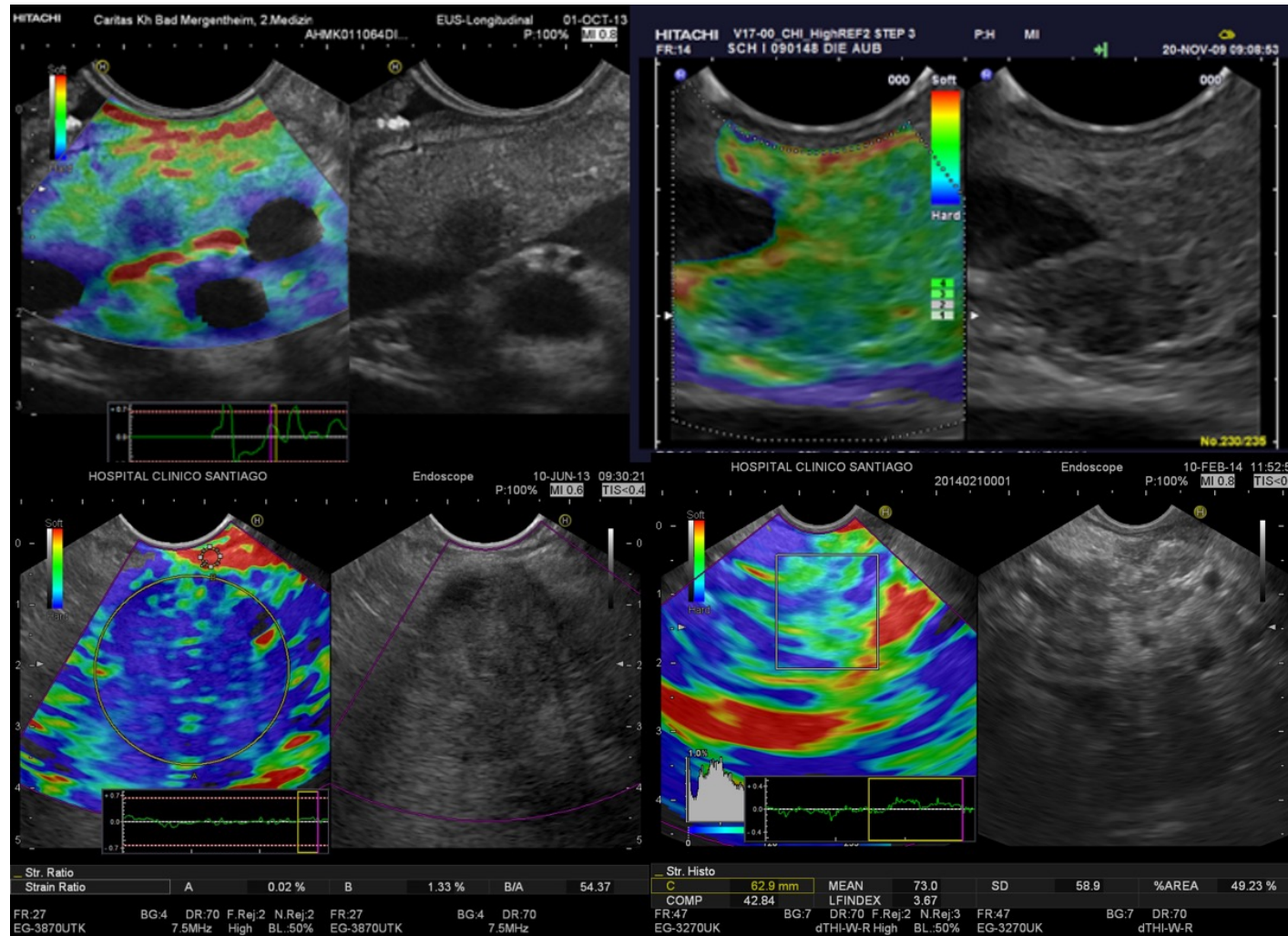
PDAC, Pancreatic ductal adenocarcinoma; NET, neuroendocrine tumor; Met, metastasis from nonpancreatic primary; SD, standard deviation; m, male; f, female.

Dietrich et al. GIE 2016



# Tumores Sólidos de Páncreas

## Elastografía guiada por Ecoendoscopia



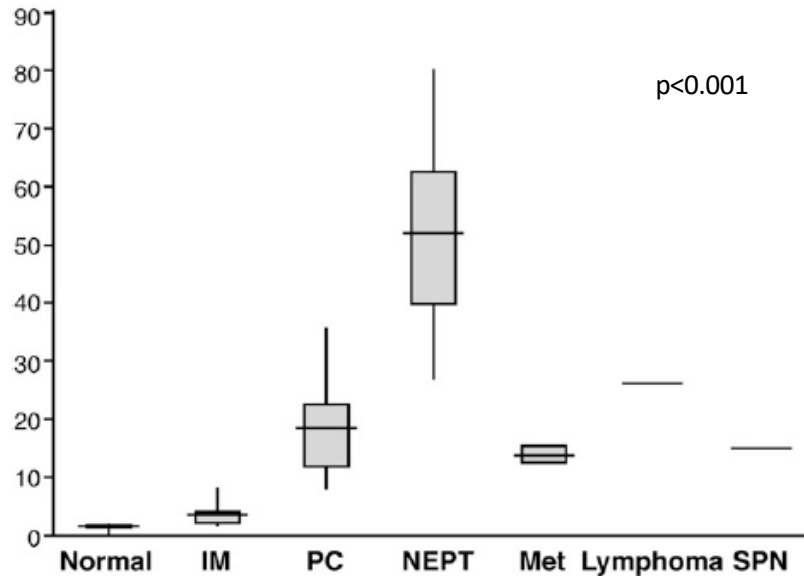


# Tumores Sólidos de Páncreas

## Elastografía Cuantitativa por Ecoendoscopia

> 10 ... malignant

Strain ratio



OA for malignancy 97.7%

Iglesias-García et al. Gastroenterology 2010

Strain Histogram and Strain Ratio

	IM	NET-B	NET-M	PDCA	Met
SR	6.00 (2.15-43.22)	3.41 5.18	32.33	32.38 (14.27-106)	38 77.25
SH	77.7 (22.7-118.1)	96.2 111.3	13.2	30 (7.5-42.7)	22.8 30.3

< 50 ... malignant

OA for malignancy 98.4%

Iglesias-García et al. UEG Journal 2017

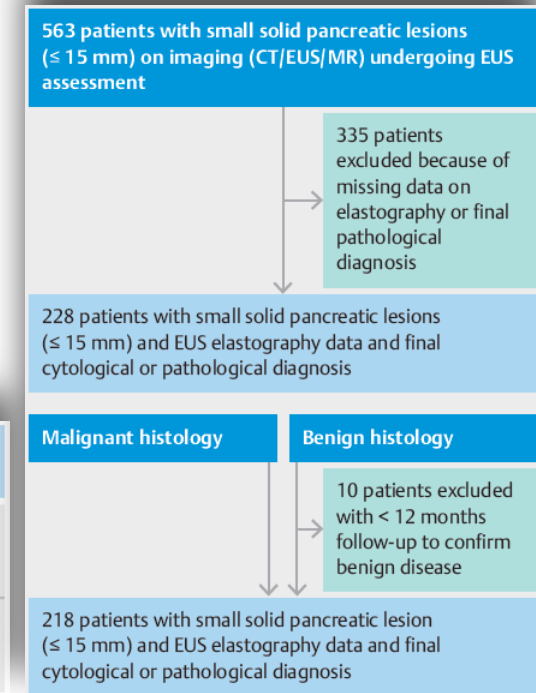
# Solid Pancreatic Tumors

## EUS guided Elastography

### Endoscopic ultrasound elastography of small solid pancreatic lesions: a multicenter study

	All (%)	Benign diagnosis (%)	Malignant diagnosis (%)	PDAC (%)	NET (%)	Met (%)
Number of patients	218 (100%)	144/218 (66%)	74/218 (34%)	51/218 (23%)	114/218 (52%)	17/218 (8%)
Age, mean ± SD [range], years	60 ± 15 [21–92]	57 ± 15 [21–86]	65 ± 12 [40–92]	65 ± 12 [40–92]	59 ± 15 [21–86]	65 ± 7 [49–75]
Sex, male : female	97:121	82:62	34:40	23:28	52:62	9:8
Size, mean ± SD [range], mm	11 ± 3 [4–15]	10 ± 3 [4–15]	12 ± 3 [5–15]	12 ± 3 [5–15]	10 ± 3 [4–15]	11 ± 2 [7–14]
Surgery	121/218 (56%)	59/144 (41%)	62/74 (84%)	45/51 (88%)	56/114 (49%)	12/17 (71%)
Classification of lesions %						
• Soft	50%	67%	16%	4%	64%	41%
• Stiff	50%	33%	84%	96%	36%	59%

	Sensitivity, % [95%CI]	Specificity, % [95%CI]	Positive predictive value, % [95%CI]	Negative predictive value, % [95%CI]	Accuracy, % [95%CI]
Malignancy* (n = 74)	84% [73%–91%] 62/(62+12)	67% [58%–74%] 96/(48+96)	56% [50%–62%] 62/(62+48)	89% [83%–93%] 96/(12+96)	73% [66%–78%] (62+96)/(62+12+48+96)
PDAC (n = 51)	96% [87%–100%] 49/(49+2)	64% [56%–71%] 107/(60+107)	45% [40%–50%] 49/(49+60)	98% [93%–100%] 107/(2+107)	72% [65%–77%] (49+107)/(49+2+60+107)



Andre Ignee<sup>1</sup>, Christian Jenssen<sup>2</sup>, Paolo G. Arcidiacono<sup>3</sup>, Michael Hocke<sup>4</sup>, Kathleen Möller<sup>5</sup>, Adrian Saftoiu<sup>6</sup>, Uwe Will<sup>7</sup>, Pietro Fusaroli<sup>8</sup>, Julio Iglesias-García<sup>9</sup>, Ryan Ponnudurai<sup>10</sup>, Maria C. Petrone<sup>3</sup>, Barbara Braden<sup>11</sup>, Eike Burmester<sup>12</sup>, Yi Dong<sup>13</sup>, Nathan S. Atkinson<sup>11</sup>, Christoph F. Dietrich<sup>1,14</sup>

Endoscopy 2018; 50: 1–9

# Elastografía por Ecoendoscopia

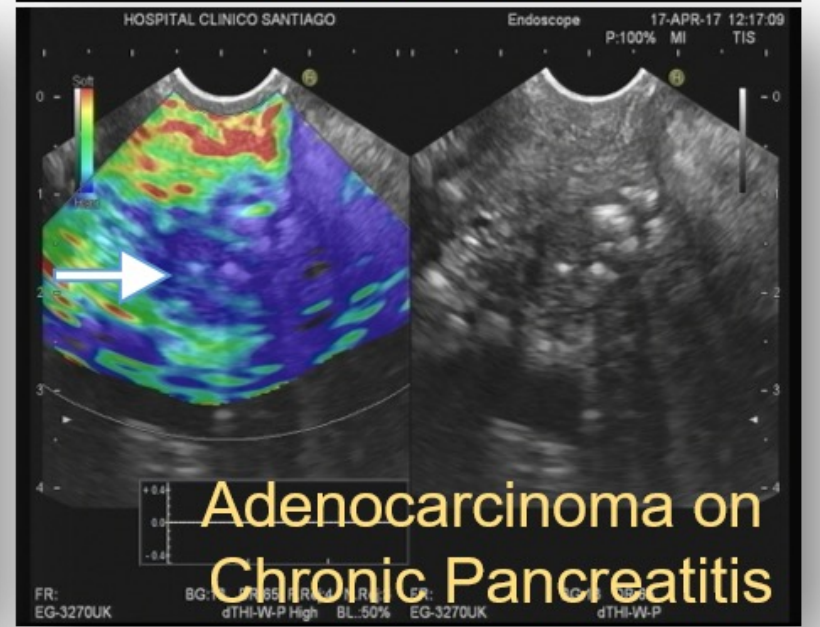
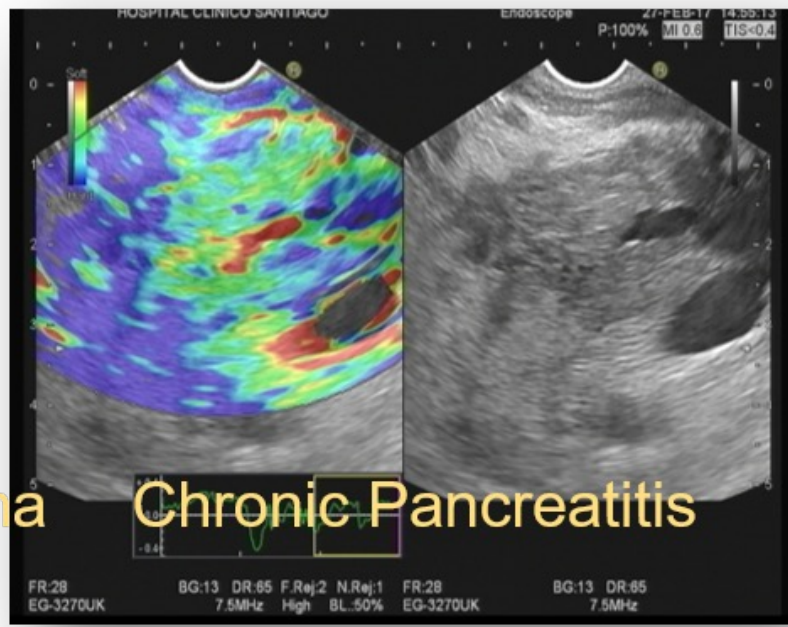
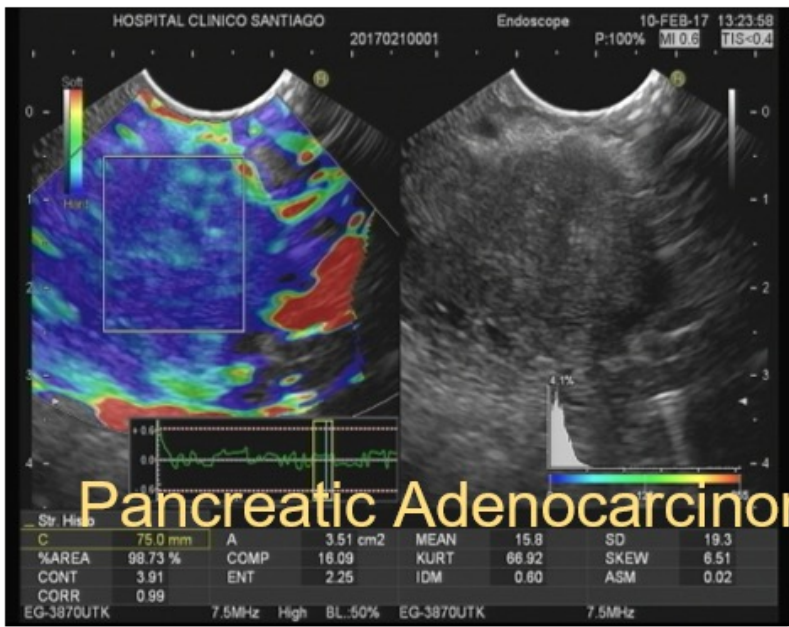
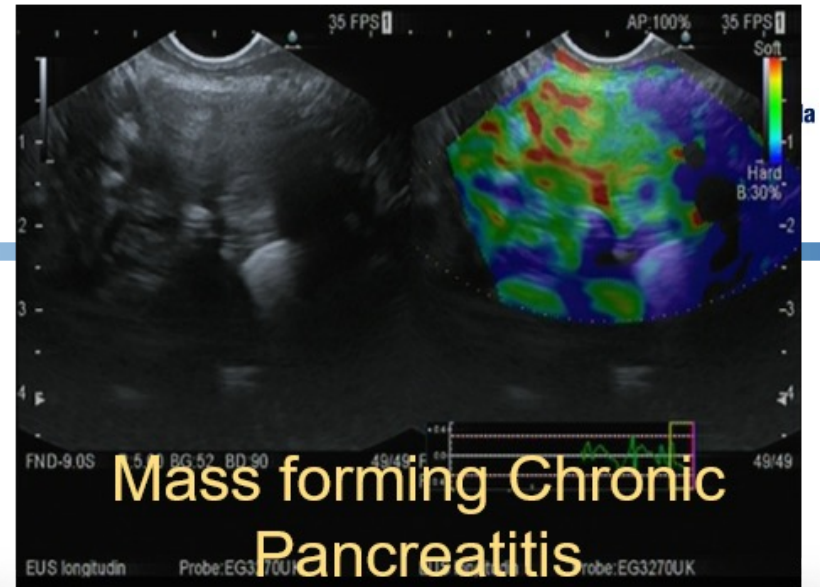
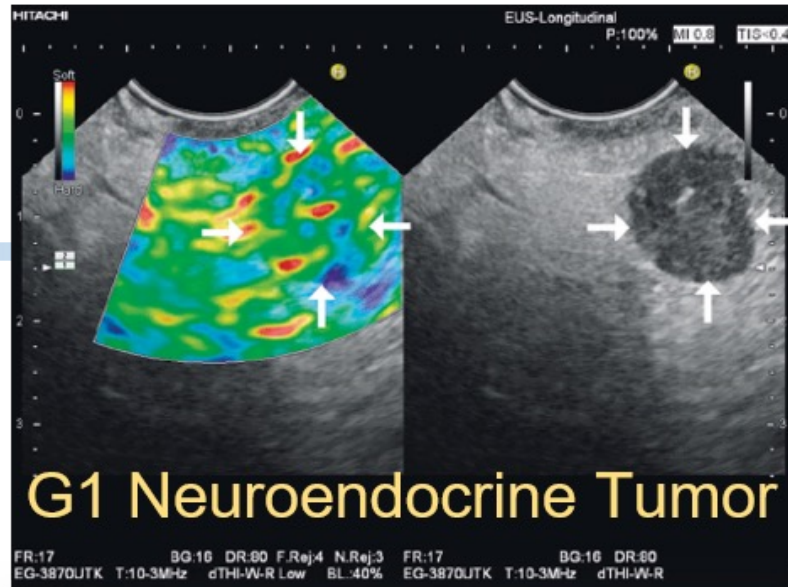
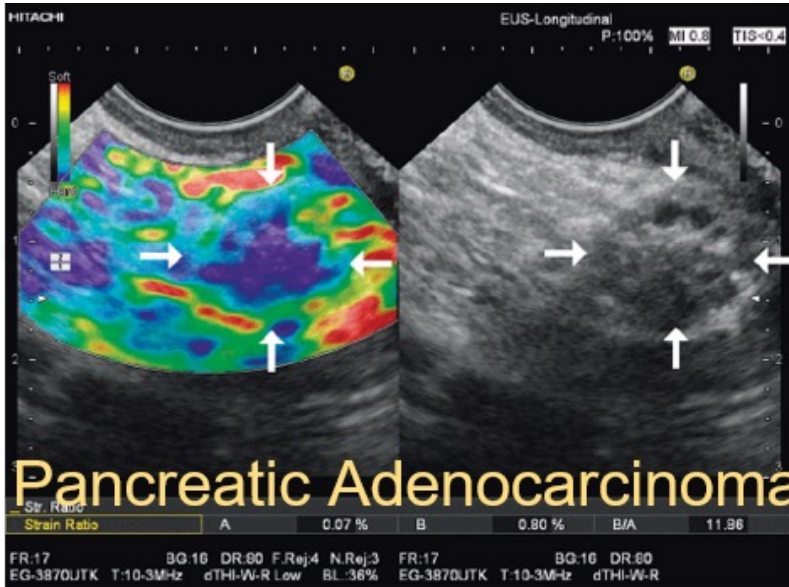
## Diagnóstico Diferencial Tumores Sólidos Páncreas

Summary of results of EUS guided elastography in solid pancreatic tumors.

Reference	Patients	Methodology	Sensitivity (%)	Specificity (%)
Giovannini et al., 2006 [57]	24	Qualitative	100	67
Saftoiu et al., 2008 [71]	43	Hue Histogram	91	87
Iglesias-Garcia et al., 2009 [72]	130	Qualitative	100	85
Giovannini et al., 2009 [58]	121	Qualitative	92	80
Iglesias-Garcia et al., 2010 [73]	86	Strain-ratio	100	92
Saftoiu et al., 2011 [74]	258	Hue Histogram	93	66
Figueiredo et al., 2012 [75]	47	Strain-ratio	90	75
Dawwas et al., 2012 [76]	111	Strain-ratio	100	22
Havre et al., 2014 [77]	48	Strain-ratio	67	71
Opacic et al., 2015 [78]	149	Histogram	98	50
Mayerle et al., 2016 [79]	85	Strain-ratio	96	43
Okaaha et al., 2017 [80]	172	Qualitative & Strain-ratio	98	77
Rustemovic et al., 2017 [81]		Strain-ratio	100	95
Iglesias-Garcia et al., 2017 [27]	62	Strain-ratio Histogram	100	92.3
Ignee et al., 2018 [30]	218 (<15 mm)	Qualitative Strain-ratio	84	68
Ohno et al., 2021 [33]	64	SWE Strain-Histogram		
Kataoka et al., 2021 [82]	126	Qualitative	94	23

	Sensibilidad	Especificidad
Qualitative Elastography	80-100%	43-90%
Quantitative Elastography Strain Ratio (>10) Strain Histogram (<50)	67-100%	25-90%
Shear Wave Elastography	**	**

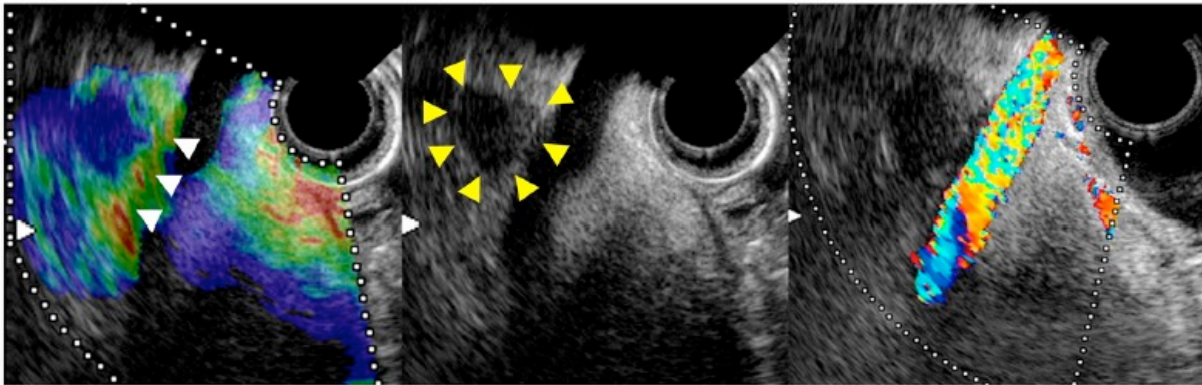
Iglesias-Garcia et al. Best Pract & Clin Gastroenterol 2022; Iglesias-Garcia et al. GIE Clin North Am 2017; Iglesias-García et al, Gastrointest Endosc 2009; Iglesias-Garcia J. Gastroenterol 2010; Giovannini et al, Endoscopy 2009; Iglesias-Garcia J, UEG Journal 2017; Kawada et al. WJG 2016; Ignee et al. Endoscopy 2018; Zhang et al Pancreatology 2018; Costache et al. EUS Journal 2020; Ohno E et al. Dig Endosc 2021



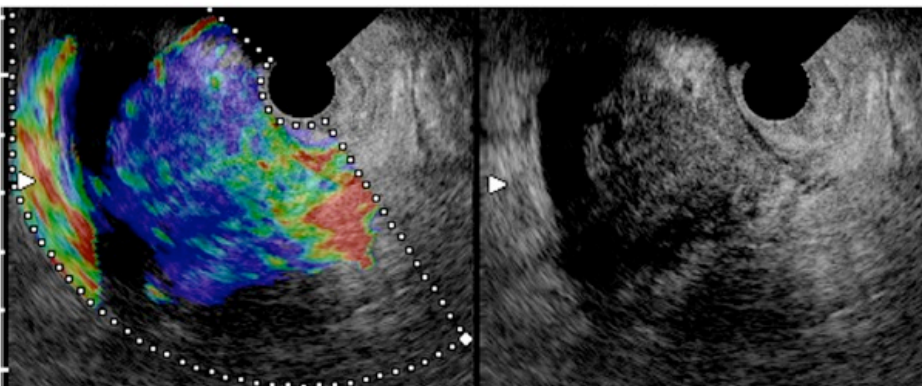
# Elastografía guiada por Ecoendoscopia

## Estadificación Cáncer de Páncreas

(a) Vascular invasion-negative case



(b) Vascular invasion-positive case



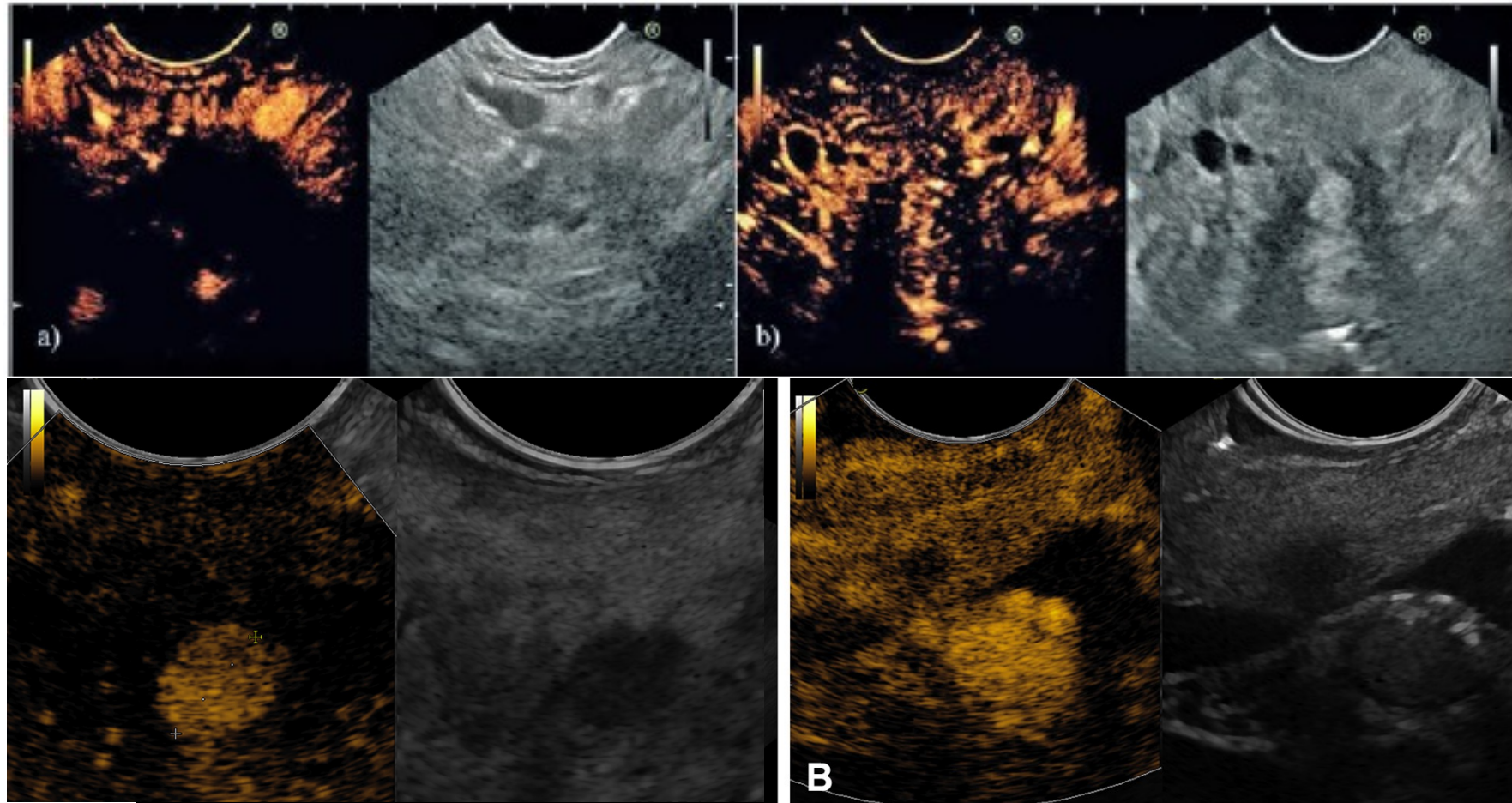
**Table 3** Results in group of difficult diagnosis sites (29 sites) (95% confidence interval)

	dynamic CT	EUS B-mode	EUS-EG
Sensitivity	0.556 (0.303–0.772)	0.667 (0.400–0.863)	0.889 (0.635–0.979)
Specificity	0.750 (0.636–0.847)	0.700 (0.580–0.788)	0.850 (0.736–0.890)
PPV	0.500 (0.273–0.694)	0.500 (0.300–0.647)	0.727 (0.520–0.801)
NPV	0.789 (0.670–0.892)	0.824 (0.682–0.927)	0.944 (0.818–0.989)
Accuracy	0.690 (0.533–0.824)	0.690 (0.524–0.811)	0.862 (0.705–0.918)

		Dynamic CT	EUS B-mode	EUS-EG
Sensitivity	Artery	1.000 (0.418–1.000)	1.000 (0.413–1.000)	1.000 (0.413–1.000)
	Portal vein	0.429 (0.185–0.619)	0.571 (0.290–0.806)	0.857 (0.567–0.971)
Specificity	Artery	0.500 (0.306–0.500)	0.833 (0.638–0.833)	0.833 (0.638–0.833)
	Portal vein	0.857 (0.735–0.952)	0.714 (0.573–0.832)	0.857 (0.712–0.914)
PPV	Artery	0.400 (0.167–0.400)	0.667 (0.275–0.667)	0.667 (0.275–0.667)
	portal vein	0.600 (0.258–0.866)	0.500 (0.253–0.705)	0.750 (0.496–0.850)
NPV	artery	1.000 (0.612–1.000)	1.000 (0.765–1.000)	1.000 (0.765–1.000)
	portal vein	0.750 (0.643–0.833)	0.769 (0.617–0.896)	0.923 (0.767–0.985)
accuracy	artery	0.625 (0.334–0.625)	0.875 (0.581–0.875)	0.875 (0.581–0.875)
	portal vein	0.714 (0.552–0.841)	0.667 (0.479–0.823)	0.857 (0.664–0.933)

# Tumores Sólidos de Páncreas

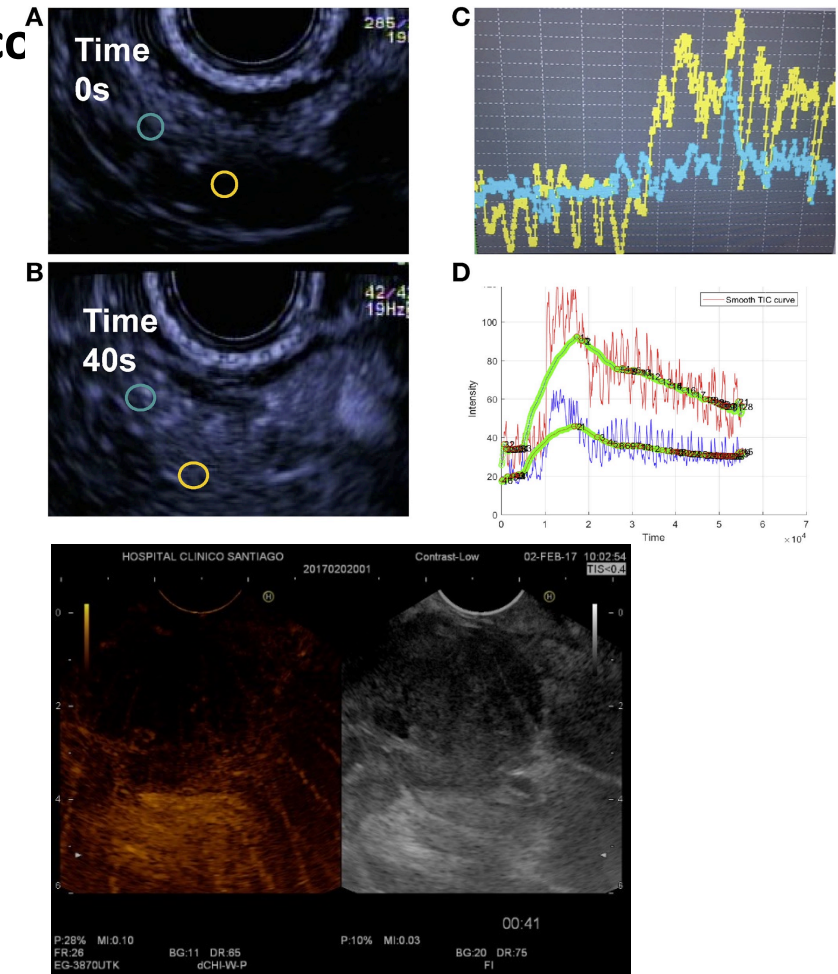
## Ecoendoscopia con contraste y armónicos



# Tumores Sólidos de Páncreas

## Ecoendoscopia con Contraste

- **Eficacia para el diagnóstico del adenocarcinoma pancreático**
  - ✓ Sensibilidad – 92% (78-100)
  - ✓ Especificidad – 90% (64-100)
  - ✓ Eficacia Global – 90% (70-95%)
- **El patrón ayuda a clasificar los tumores**
  - ✓ PDAC – hipovascular in 92%
  - ✓ NET – hipervascular in 81%
  - ✓ Metastasis – hipervascular in 61%\*
  - ✓ Masa Inflamatoria– isovascular
- **Cuantificación** incrementa la calidad y eficacia

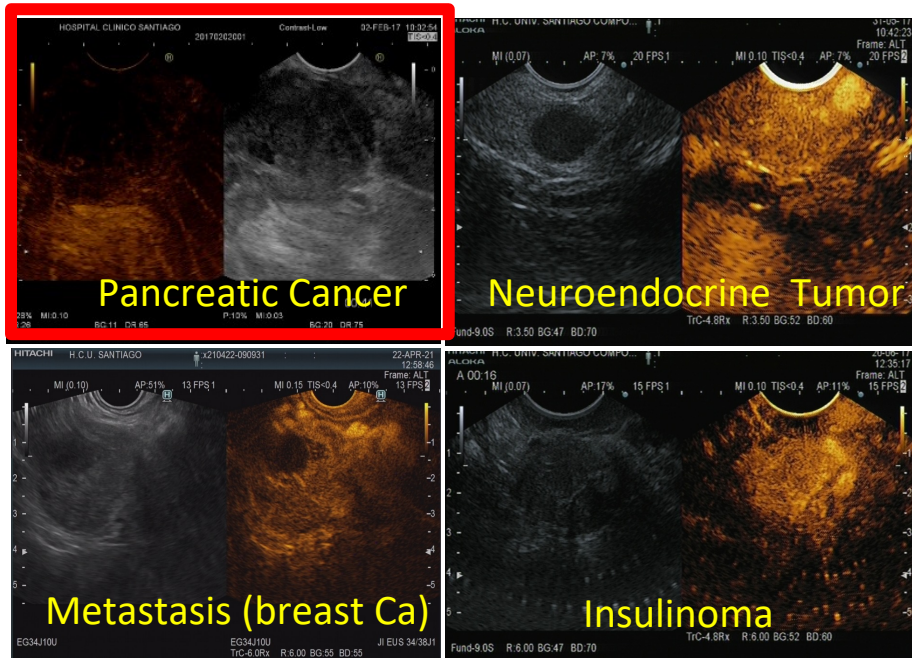




# Tumores Sólidos de Páncreas

## Ecoendoscopia con Contraste

- Meta-analysis mostrou una sensibilidad del 93% y especificidad del 80%



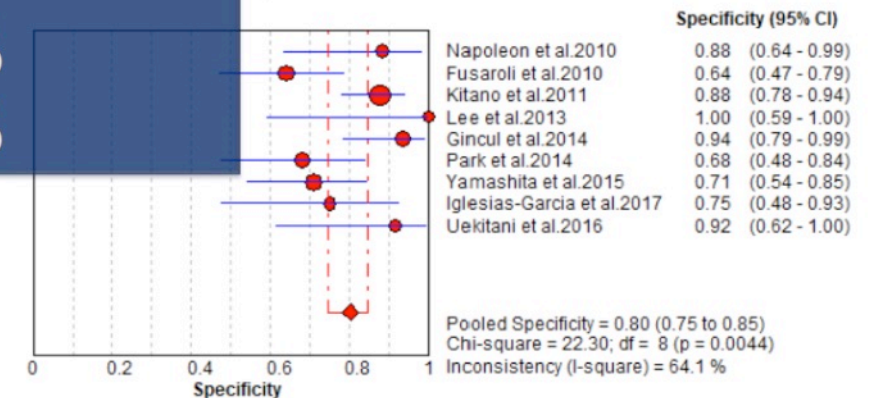
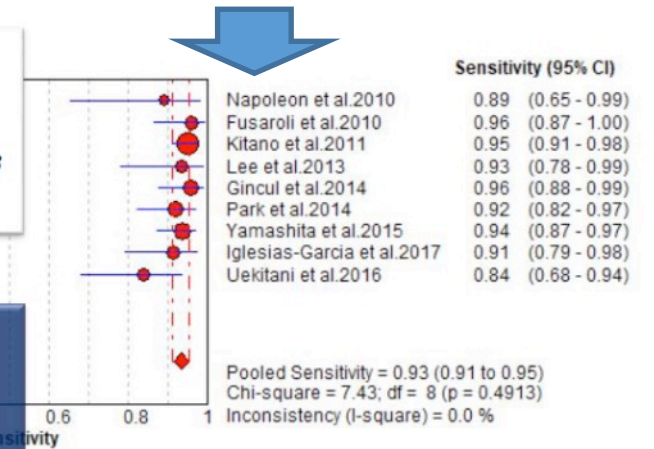
Value of contrast-enhanced harmonic endoscopic ultrasonography with enhancement pattern for diagnosis of pancreatic cancer: A meta-analysis

*Digestive Endoscopy* 2019; 31: 125–133

Yasunobu Yamashita,<sup>1</sup> Toshio Shimokawa,<sup>2</sup> Bertrand Napoléon,<sup>4</sup> Pietro Fusaroli,<sup>5</sup> Rodica Gincul,<sup>4</sup> Masatoshi Kudo<sup>3</sup> and Masayuki Kitano<sup>1,6</sup>

Diagnostic ability of CH-EUS for pancreatic cancer

Sensitivity 93%  
Specificity 80%



Yamashita et al. *Digestive Endoscopy* 2019



# Tumores Sólidos de Páncreas

## Ecoendoscopia con contraste y armónicos

TABLE 2. Localization and EUS contrast enhancement pattern of patients with solid pancreatic lesions

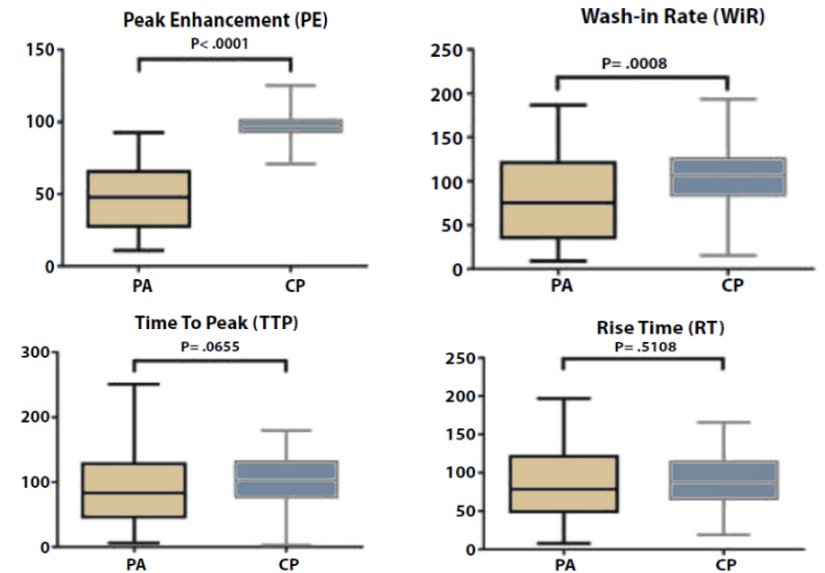
	All (%)	Benign	Malignant	PDAC	NET	Met
Localization, no. (%)						
Head	229/394 (58)	84/179 (47)	145/215 (67)	106/146 (73)	81/156 (52)	13/28 (46)
Body	133/394 (34)	61/179 (34)	72/215 (33)	39/146 (27)	58/156 (37)	14/28 (50)
Tail	52/394 (13)	37/179 (28)	15/215 (7)	10/146 (1)	24/156 (15)	3/28 (11)
CE EUS or US enhancement, no. (%)						
Hyper	122/219 (56)	96/122 (79)	26/97 (27)	3/62 (5)	83/102 (81)	11/18 (61)
Iso	15/219 (7)	9/122 (7)	6/97 (6)	2/62 (3)	8/102 (8)	2/18 (11)
Hypo	82/219 (37)	17/122 (14)	65/97 (67)	57/62 (92)	11/102 (11)	5/18 (28)

Dietrich et al , GIE 2016

TABLE 3. Synthesis of the diagnostic characteristics of each modality

	EUS-FNA	CEH-EUS (qualitative)	CEH-EUS (ANN)
Sensitivity	84.82% (95% CI, 76.52%-90.65%)	87.5% (95% CI, 79.58%-92.74%)	94.64% (95% CI, 88.22%-97.80%)
Specificity	100% (95% CI, 91.86%-100.00%)	92.72% (95% CI, 81.57%-97.64%)	94.44% (95% CI, 83.93%-98.58%)
PPV	100% (95% CI, 95.15%-100.00%)	96.07% (95% CI, 89.68%-98.73%)	97.24% (95% CI, 91.57%-99.28%)
NPV	76.63% (95% CI, 64.65%-85.26%)	78.46% (95% CI, 66.19%-87.32%)	89.47% (95% CI, 78.165-95.72%)

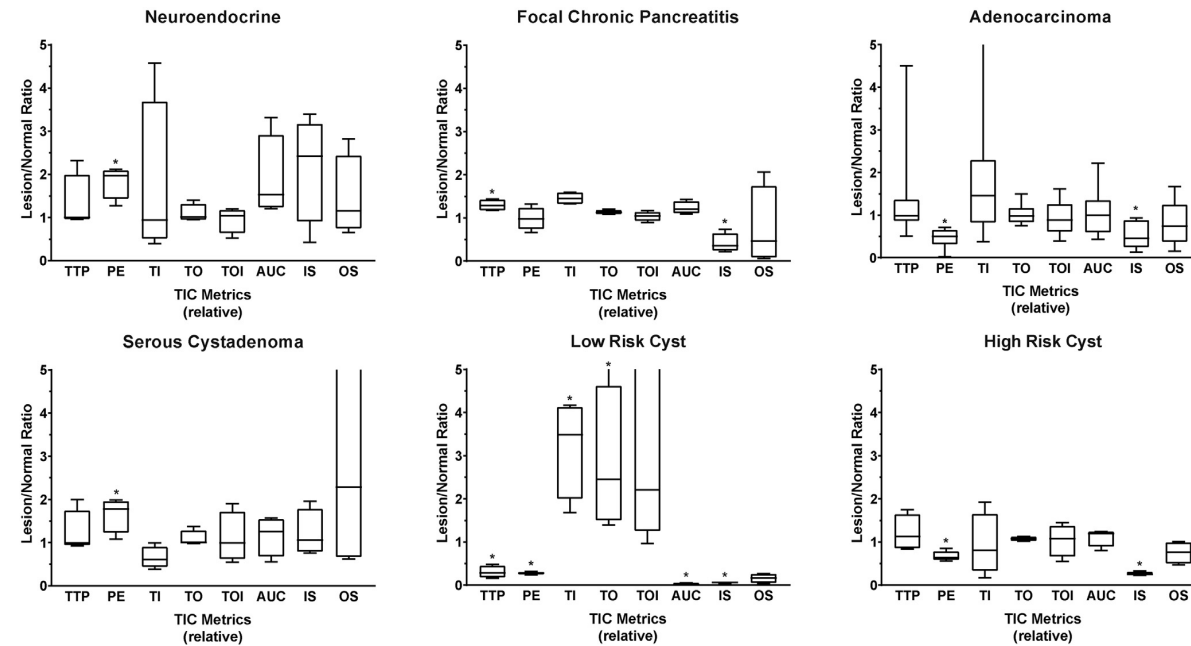
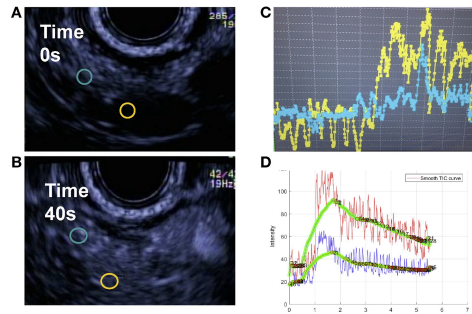
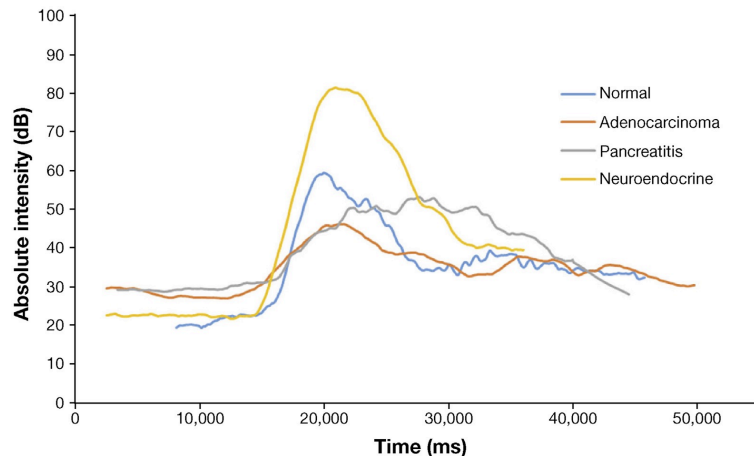
Saftoiu et al , GIE 2015



# Tumores Sólidos de Páncreas

## Ecoendoscopia con contraste y armónicos

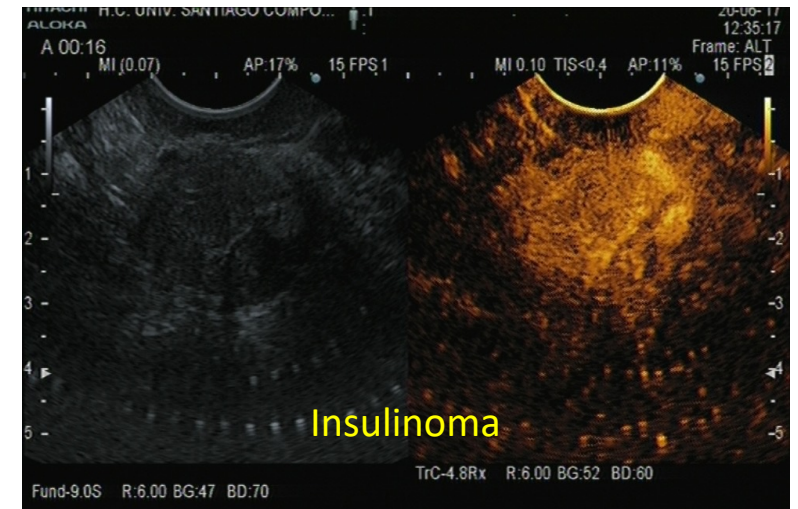
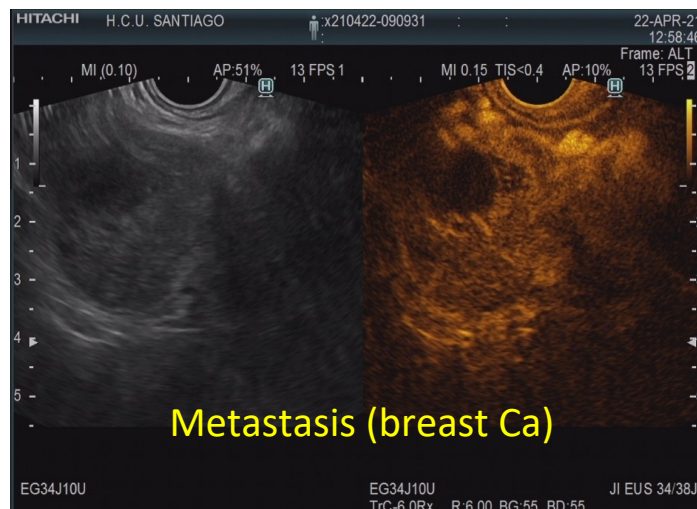
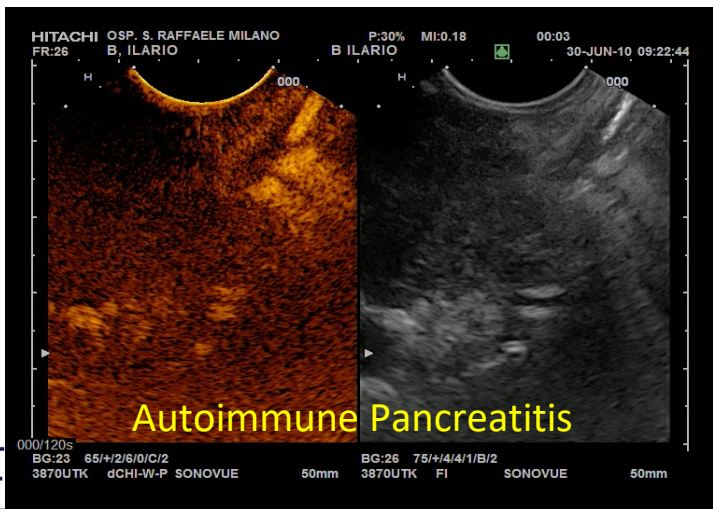
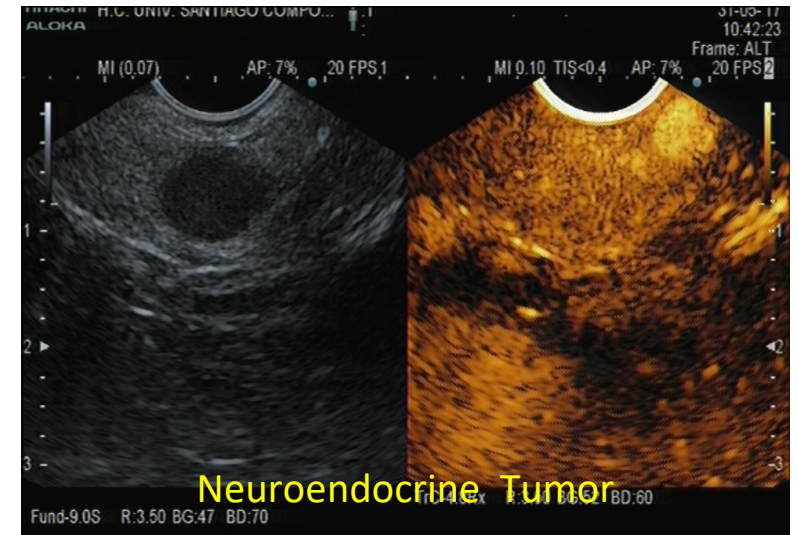
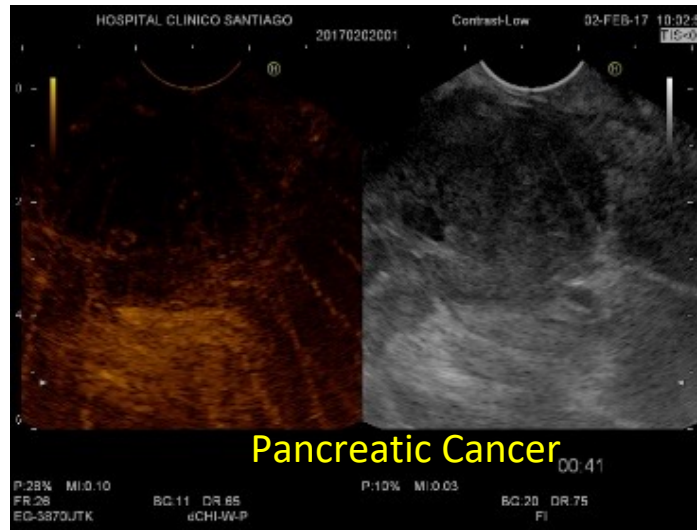
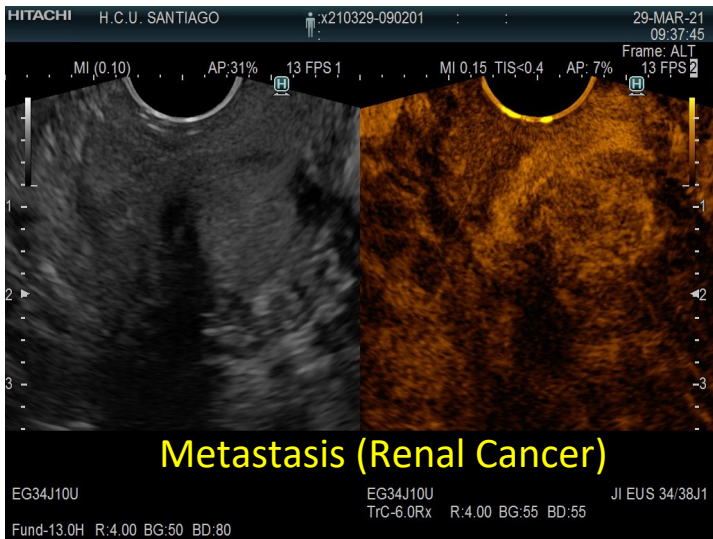
- **Aumento rentabilidad diagnóstica** de la USE del **64% al 91%** (OR - 7.8)
- Incremento de eficacia en el estudio de masas pancreáticas (OR - 6.0) (mejora la valoración de NET y otros tumores no adenocarcinoma)
- En la corte de validación, se **clasificaron correctamente el 91%** de las lesiones, incrementándose la eficacia diagnóstica



Buxbaum et al,  
Clinical Gastroenterology and Hepatology 2020

# Tumores Sólidos de Páncreas

## Ecoendoscopia con Contraste



# Tumores Sólidos de Páncreas

## Ecoendoscopia con Contraste y Elastografía



# Tumores Sólidos de Páncreas

## Ecoendoscopia con Contraste y Elastografía

**Table 3.** Diagnostic performance of contrast-enhanced harmonic endoscopic ultrasound (CEH-EUS), elastography strain ratio, and strain histogram

	Benign versus malignant			Pancreatic cancer versus chronic pancreatitis		
	Elastography <sup>a</sup>	CEH-EUS	Combination <sup>b</sup>	Elastography <sup>a</sup>	CEH-EUS	Combination <sup>b</sup>
Sensitivity (95% CI)	100 (92.7–100)	89.8 (78.2–95.6)	89.8 (78.2–95.6)	100 (92.3–100)	91.3 (79.7–96.6)	91.3 (79.7–96.6)
Specificity (95% CI)	92.3 (66.7–98.6)	69.2 (42.4–87.3)	100 (77.2–100)	90.9 (62.3–98.4)	81.8 (52.3–94.9)	100 (74.1–100)
Positive predictive value (95% CI)	98.0 (89.5–99.7)	91.7 (80.5–96.7)	100 (92.0–100)	97.9 (88.9–99.6)	95.5 (84.9–98.7)	100 (91.6–100)
Negative predictive value (95% CI)	100 (75.8–100)	64.3 (38.8–83.7)	72.2 (49.1–87.5)	100 (72.3–100)	69.2 (42.4–87.3)	73.3 (48.1–89.1)
Accuracy (95% CI)	98.4 (91.4–99.7)	85.5 (74.7–92.2)	91.9 (82.5–96.5)	98.3 (90.7–99.7)	89.5 (78.9–95.1)	93.0 (83.3–97.2)

CI: confidence interval.

<sup>a</sup>Diagnostic performance of strain ratio and mean strain histogram was identical and these modalities are therefore presented together.

<sup>b</sup>Cases were classified as positive if both CEH-EUS and elastography were positive.

Iglesias-Garcia J, Lindkvist B, Lariño-Noia J, Abdulkader-Nallib I, Dominguez-Muñoz JE. UEG Journal 2017

# Tumores Sólidos de Páncreas

## Ecoendoscopia con Contraste y Elastografía

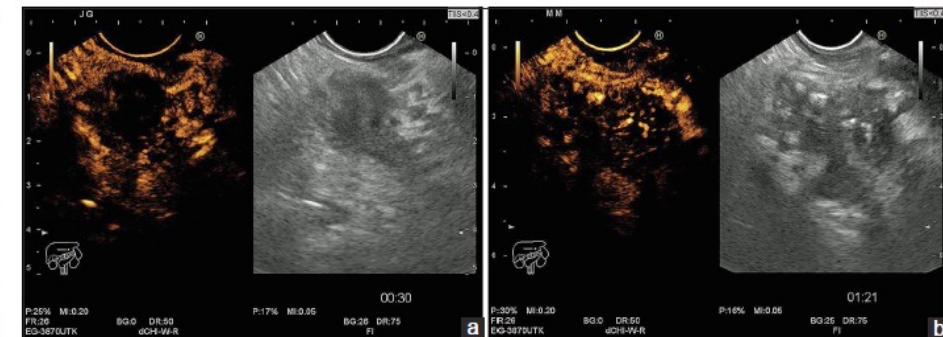
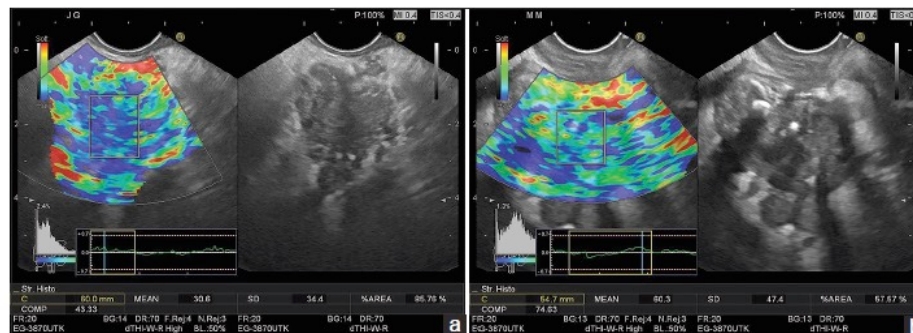
Clinical impact of strain histogram EUS elastography and contrast-enhanced EUS for the differential diagnosis of focal pancreatic masses: A prospective multicentric study



Mădălin Ionuț Costache<sup>1</sup>, Irina M. Cazacu<sup>1,2</sup>, Christoph F. Dietrich<sup>3</sup>, Maria Chiara Petrone<sup>4</sup>, Paolo Giorgio Arcidiacono<sup>4</sup>, Marc Giovannini<sup>5</sup>, Erwan Bories<sup>5</sup>, Julio Iglesias Garcia<sup>6</sup>, Sun Siyu<sup>7</sup>, Erwin Santo<sup>8</sup>, Carmen Florina Popescu<sup>1,9</sup>, Alina Constantin<sup>10</sup>, Manoop S. Bhutani<sup>2</sup>, Adrian Saftoiu<sup>1</sup>

	Strain histogram (cut-off:80)	Strain histogram (cut-off:60)	Strain histogram (cut-off:40)	Strain histogram (cut-off:33)	CE-EUS (arterial phase)	CE-EUS (venous phase)	Combined CE-EUS (hypovascular) and SH (cut-off:80)
Sensitivity (%)	100	98.57	92.86	85.71	98.57	98.57	98.57
Specificity (%)	29.63	37.04	55.56	62.96	77.78	66.67	81.48
Accuracy (%)	80.41	81.44	82.47	79.38	92.78	89.69	93.81
PPV (%)	78.65	80.23	84.42	85.71	92	88.46	93.24
NPV (%)	100	90.91	75	62.96	95.45	94.74	95.65

NPV: Negative predictive values, PPV: Positive predictive values, CE: Contrast enhanced, SH: Strain histograms



# Elastografía y Contrastes por USE

## Estudios de Concordancia

CEH-EUS	Kappa	Sensitivity (%)	Specificity (%)
A (2 observers with long experience)	<b>0.63</b>	80	55
B (3 observers short experience)	<b>0.38</b>	62	48.5
C (3 observers with experience in EUS, no en CH-EUS)	<b>0.54</b>	64	51.5
D (3 observers no experience)	<b>0.21</b>	58.5	42.4
Overall (11 observers)	<b>0.32</b>	65	49

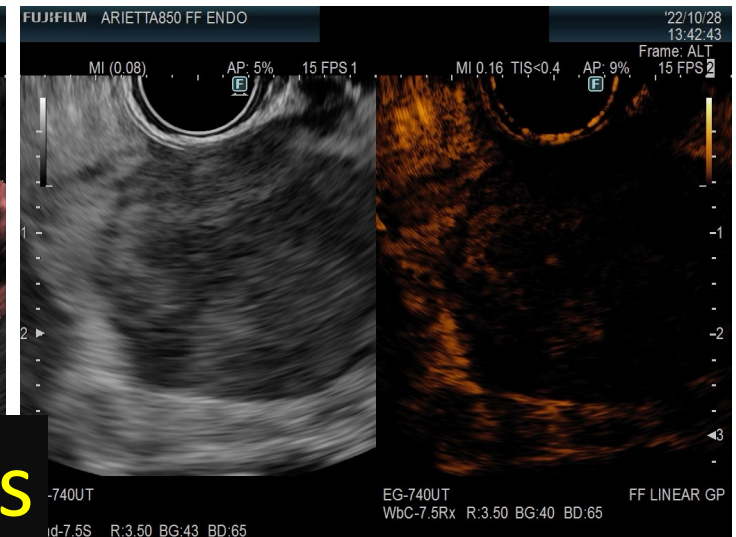
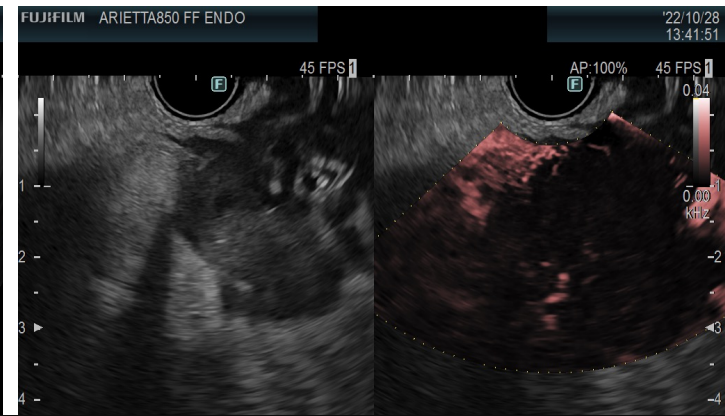
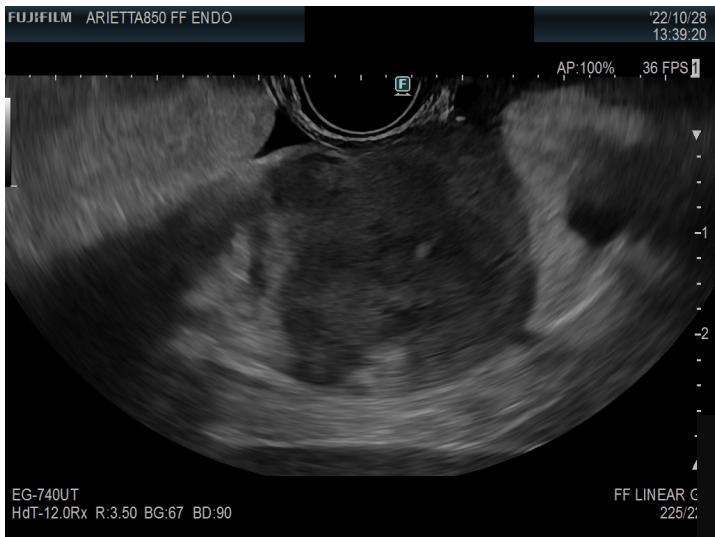
Elastography	Kappa	Sensitivity (%)	Specificity (%)
A (2 observers with long experience)	<b>0.80</b>	93	73
B (3 observers short experience)	<b>0.54</b>	79	76
C (3 observers with experience in EUS, no en CH-EUS)	<b>0.54</b>	70	79
D (3 observers no experience)	<b>0.28</b>	79	70
Overall (11 observers)	<b>0.42</b>	79	75

[Interobserver agreement of contrast-enhanced harmonic endoscopic ultrasonography in the evaluation of solid pancreatic lesions.](#) Soares JB, Iglesias-Garcia J, Gonçalves B, Lindkvist B, Lariño-Noia J, Bastos P, Caetano AC, Ferreira A, Pimentel-Nunes P, Lopes L, Moutinho P, Dominguez-Muñoz JE. *Endosc Int Open*. 2015 Jun;(3):E205-9

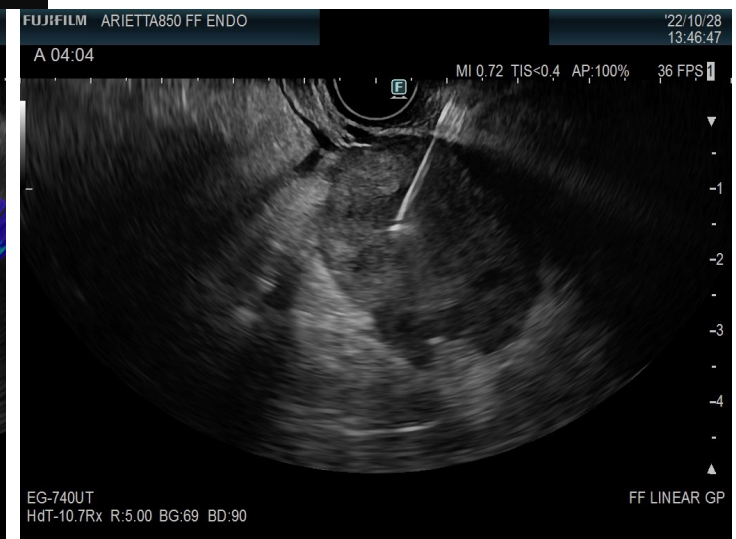
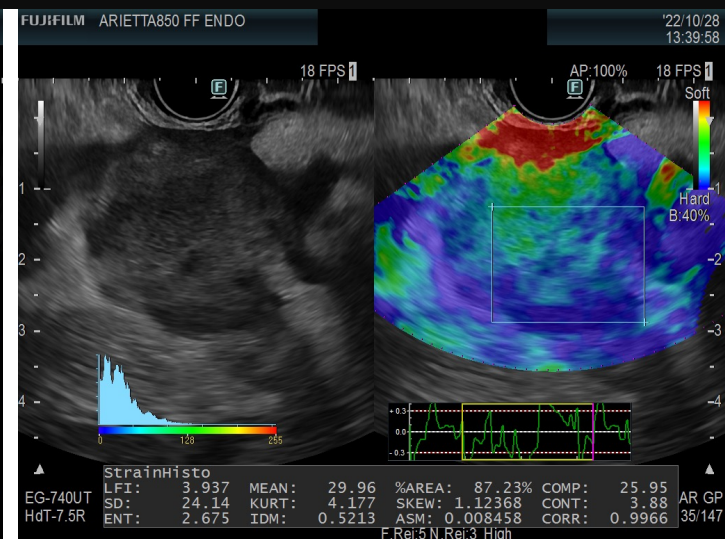
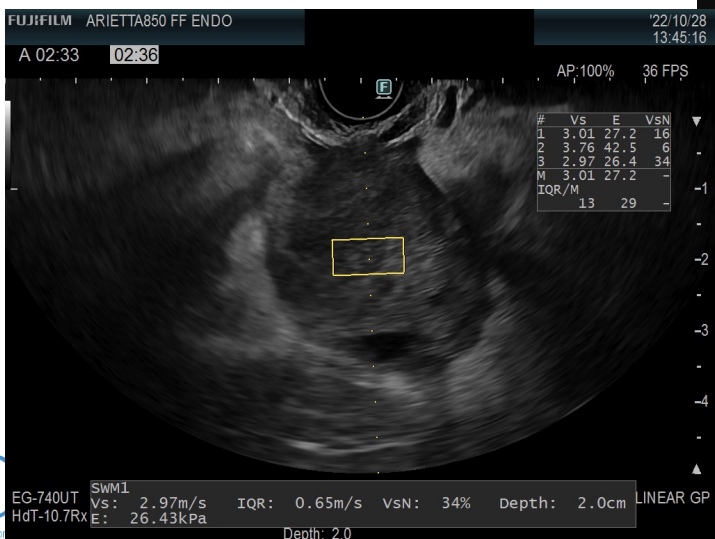
[Interobserver agreement of EUS elastography in the evaluation of solid pancreatic lesions.](#) Soares JB, Iglesias-Garcia J, Gonçalves B, Lindkvist B, Lariño-Noia J, Bastos P, Caetano AC, Ferreira A, Pimentel-Nunes P, Lopes L, Moutinho-Ribeiro P, Dominguez-Muñoz JE. *Endosc Ultrasound*. 2015;4(3):244-9

# Tumores Sólidos de Páncreas

## EcoEndoscopia en el Diagnóstico Diferencial



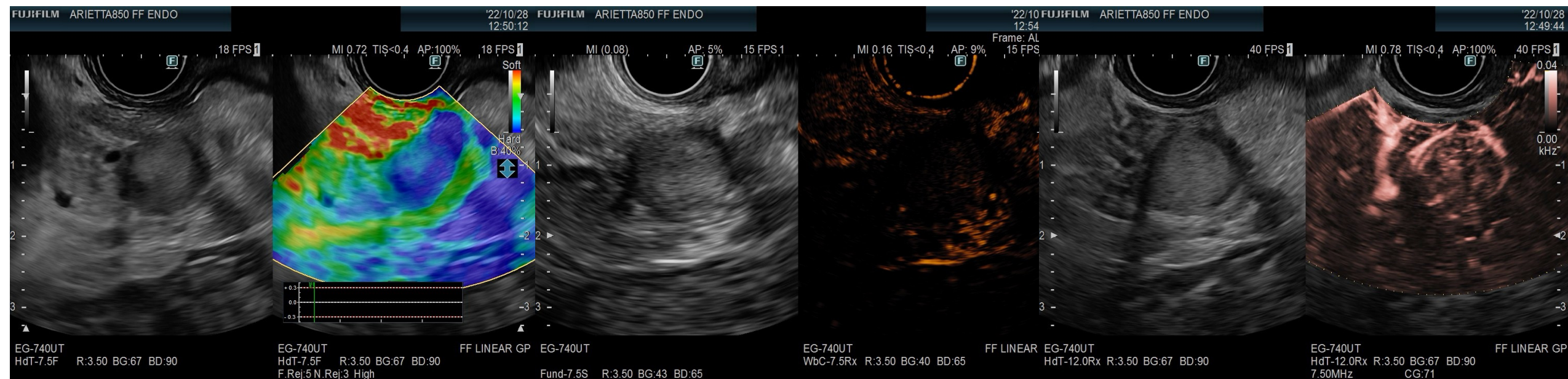
## Cáncer de Páncreas





# Tumores Sólidos de Páncreas

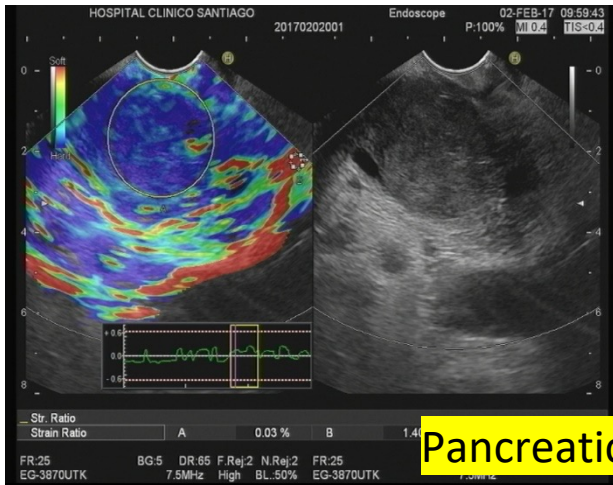
## EcoEndoscopia en el Diagnóstico Diferencial



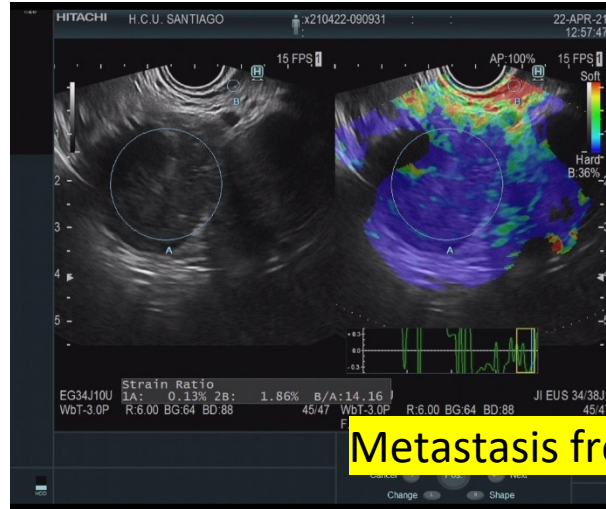
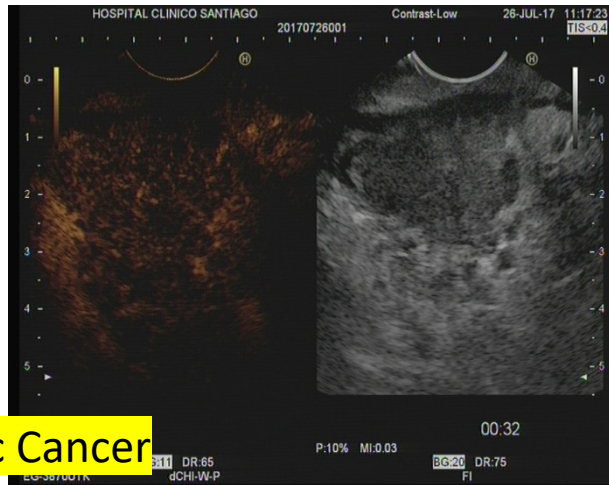
## Tumor Neuroendocrino de Páncreas

# Tumores Sólidos de Páncreas

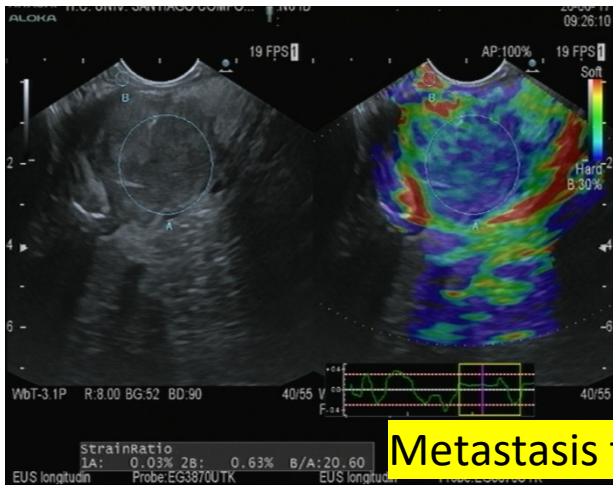
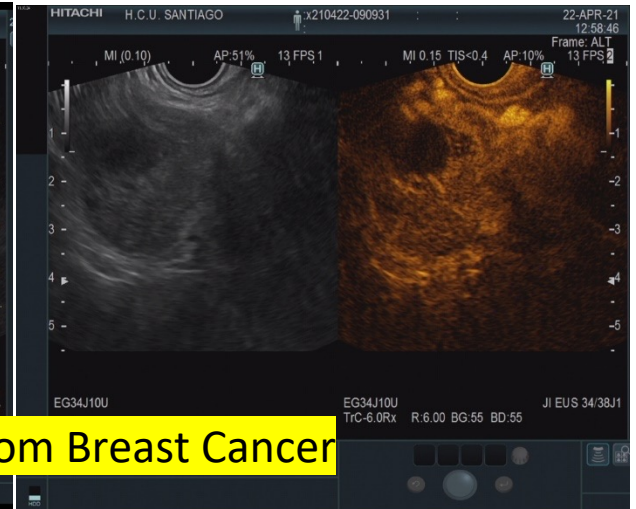
## EcoEndoscopia en el Diagnóstico Diferencial



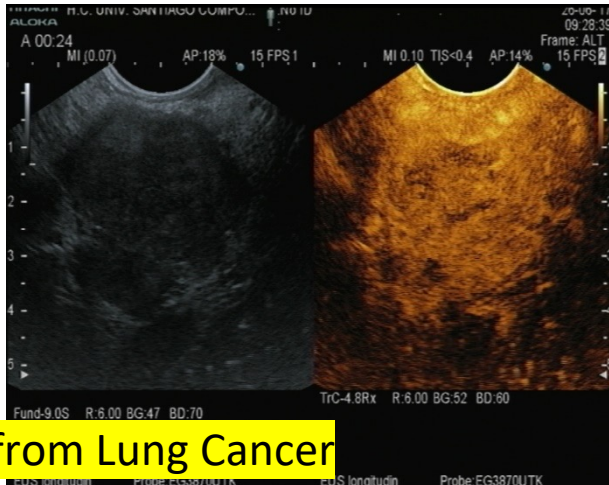
Pancreatic Cancer



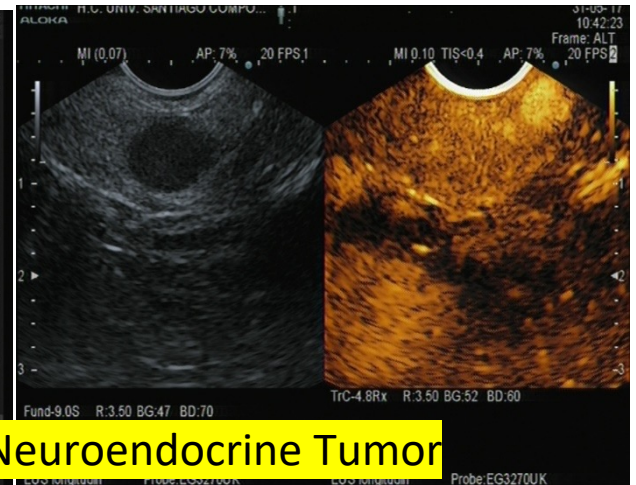
Metastasis from Breast Cancer



Metastasis from Lung Cancer

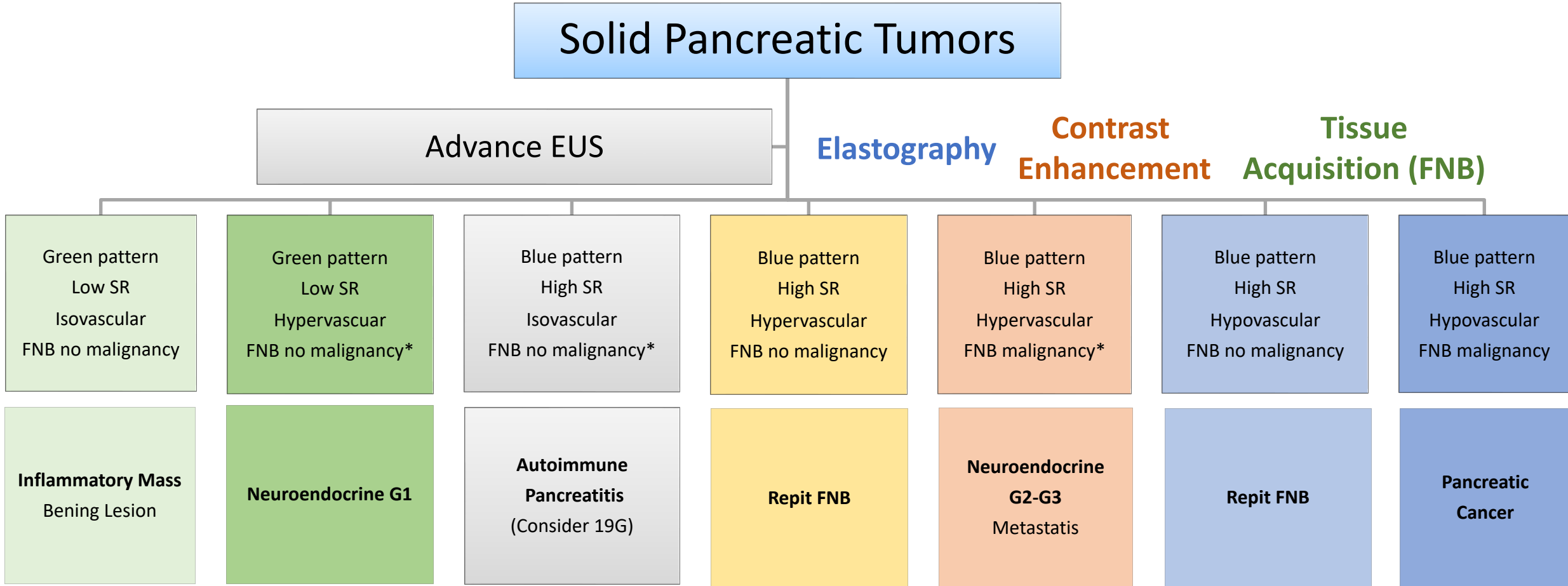


Neuroendocrine Tumor



# Tumores Solidos de Páncreas

## Estrategia basada en USE para Diagnostico Diferencial



# Tumores Sólidos de Páncreas

## Imagen Avanzada por Ecoendoscopia

- El diagnóstico diferencial de los tumores sólidos de páncreas continúa siendo un verdadero reto ... donde la biopsia juega un papel clave
- Los avances en la imagen por ecoendoscopia dan un valor añadido
- Tanto la elastografía como el uso de contrastes guiado por ecoendoscopia incrementa la rentabilidad diagnóstica
- El uso combinado de ambas técnicas es la estrategia ideal
- Es muy importante aprender, aprender y aprender a interpretar lo que vemos

# Bienvenidos a Santiago de Compostela y al mundo de la EcoEndoscopia

Hands-On Masterclass Program on EUS | Masterclass Program on Pancreatic Diseases | Fellowship Program | Management

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