PUNCIÓN GUIADA POR ECOENDOSCOPIA

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Areas accesibles a punción

Indicaciones frecuentes:
Mediastino,Esófago,Estómago,Hígado
Adenopatias,Pancreas.
Indicaciones infrecuentes:
Tiroides, riñón,Espacio pleuropulmonar,
aurícula, ovario,Estructuras pélvicas,
Endometriosis.

Punción de Lesiones pancreáticas

- Clasificación de lesiones : Tumor pancreático

(Adenocarcinoma y TNE, Lesiones quísticas.)

- Indicaciones de la punción.
- Citologia vr Biopsia.
- Manejo de la Muestra.

Que debemos saber cuando empezamos

- Riesgos asociados de la punción . Cuando hay que pinchar.
- Consentimientos informados ajustados a la técnica a realizar.
- Manejo actualizado de las nuevas guías de antiagregantes. Pinchar con seguridad.
- Manejo de las muestras- Técnica multidisciplinar
- Biopsia vr Paff en función de servicios asociados.
- A donde se dirige la muestra: Diagnóstico molecular.
- No asumir que los demás saben lo que están solicitando..

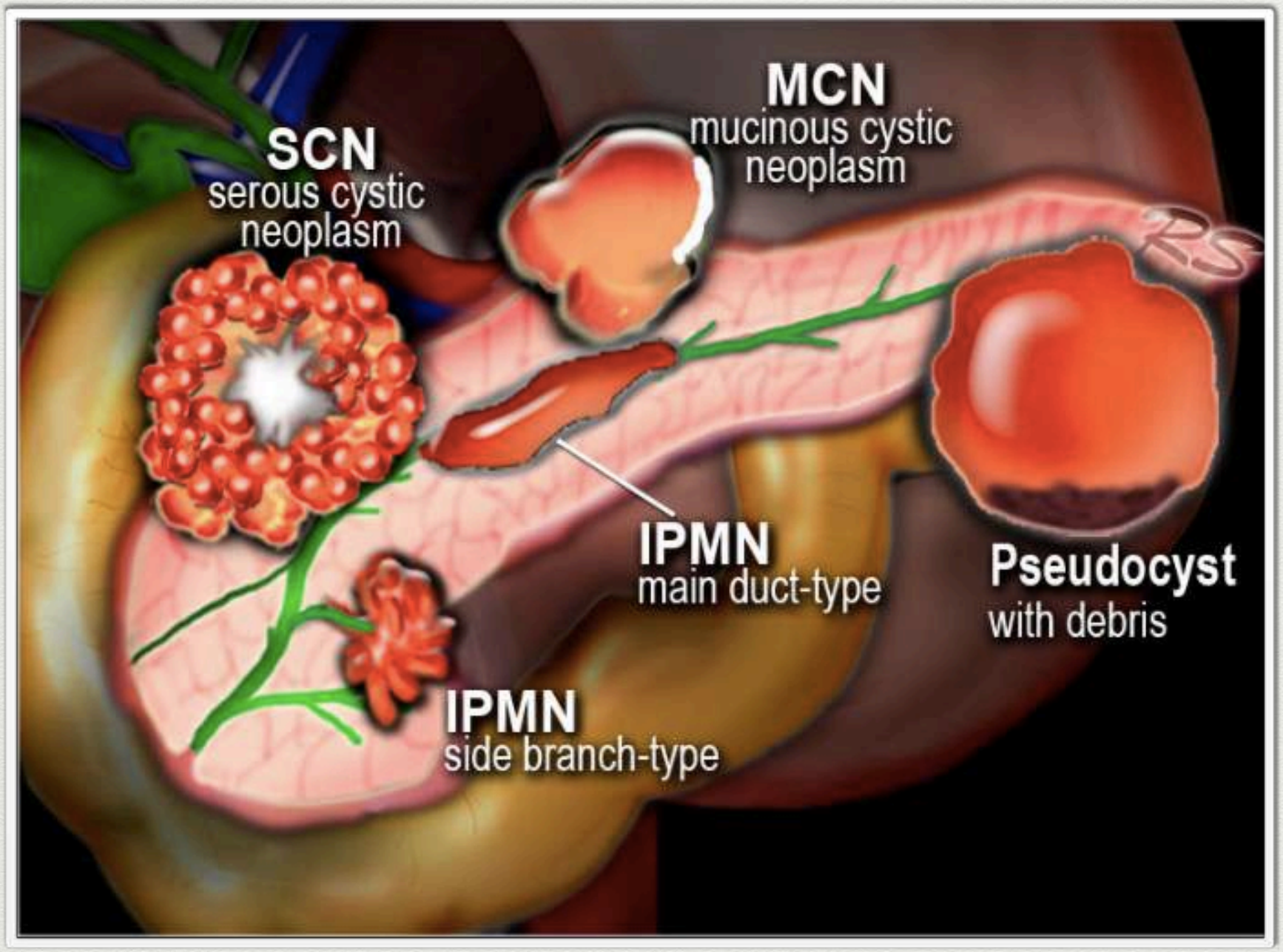
Punción en lesiones pancreáticas

- Goal: Filiación de lesión pancreática.
- En lesiones quísticas pre-malignas dar seguimiento clínico siguiendo guías actualizadas para evitar riesgos innecesarios y reducción de consumo económico.
- Avance en nuevos biomarcadores que incrementen sensibilidad y especificidad de las lesiones .

Lesiones Quísticas Pancreáticas

- Caracterización de las lesiones, localización.
- Permite la toma de Muestras para citología y marcadores bioquímicos para intento de diferenciación de las distintas lesiones.
- Permite la punción de nódulos sólidos intra quísticos y el uso de contrastes .
- Permite aconsejar seguimiento con Guias clínicas o Consensus Internacionales al médico referente disminuyendo pruebas innecesarias.
- Lo mas importante es crear un seguimiento adecuado a guias actualizadas y tranquilizar al paciente.

Lesiones Quísticas



Lesiones Quísticas

Tabla 1: Clasificación de las lesiones quísticas pancreáticas

- Pseudoquiste
  - Pseudoquiste convencional
  - Distrofia quistica
  - Pseudoquiste de origen infeccioso
- Quiste con epitelio mucinoso
  - Tumor mucinoso papilar intraductal
  - Cistoadenoma mucinoso
  - Cistoadenocarcinoma mucinoso
  - Mucocelle y quistes de retención
- Tumores quísticos serosos
  - Cistoadenoma seroso
  - Cistoadenocarcinoma seroso
  - Quistes asociados a VHL
- Quistes con epitelio escamoso
  - Quiste linfoepitelial
  - Quiste dermoide
  - Quiste escamoso de los conductos
- Quistes delimitados por células acinares
  - Cistadenocarcinoma de células acinares
  - Cistoadenoma de células acinares
- Quiste endotelial
  - Linfangioma
- Quistes necróticos en tumores sólidos
  - Tumor sólido pseudopapilar
  - Tumor neuroendoscrino quistico
  - Adenocarcinoma ductal
  - Neoplasia quística mesenquimal
- Otros lesiones quísticas
  - Hamartoma quístico
  - Quiste endometriosico
  - Tumores secunadrios
  - Quistes congénitos
  - Otras lesiones quísticas

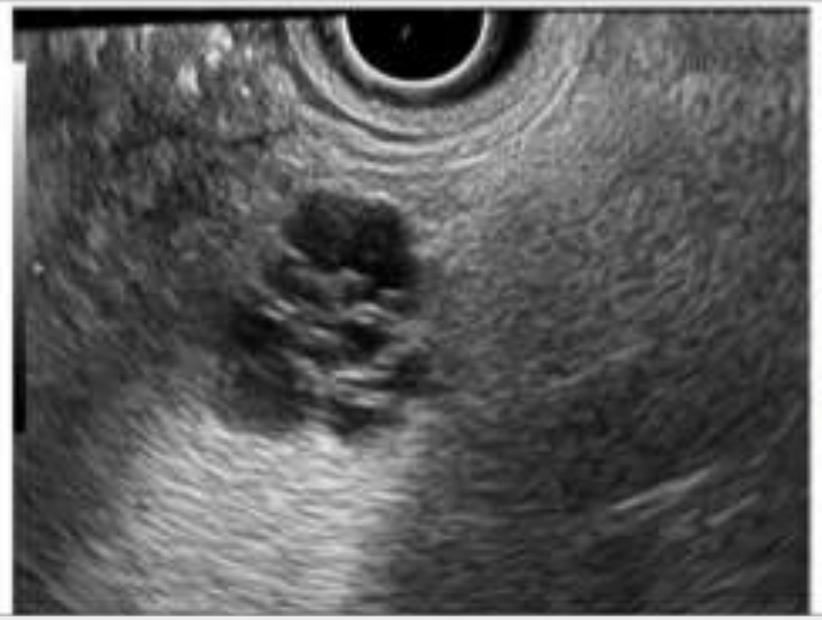


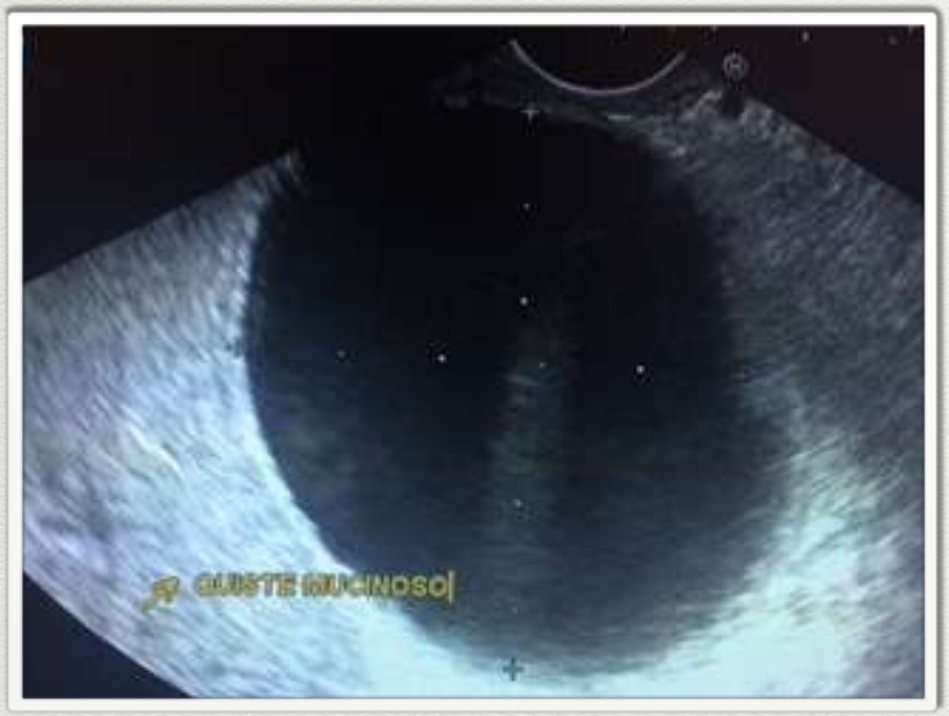
Figura 2

Cistoadenoma seroso con finos septos en su interior que confluyen en una cicatriz central

Quistes Mucinosos

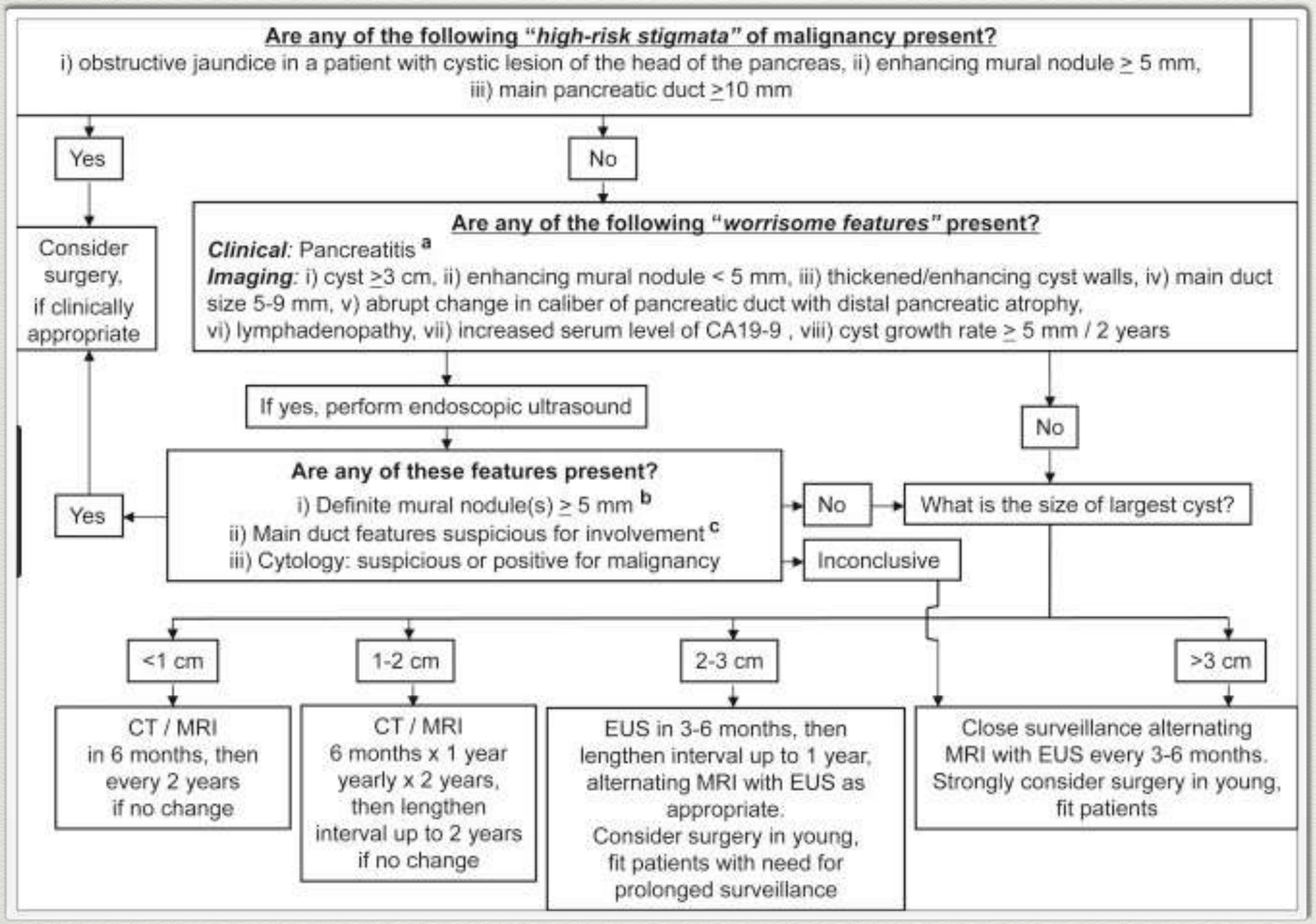
Figura 3

Cistoadenoma mucinoso en cuerpo de páncreas



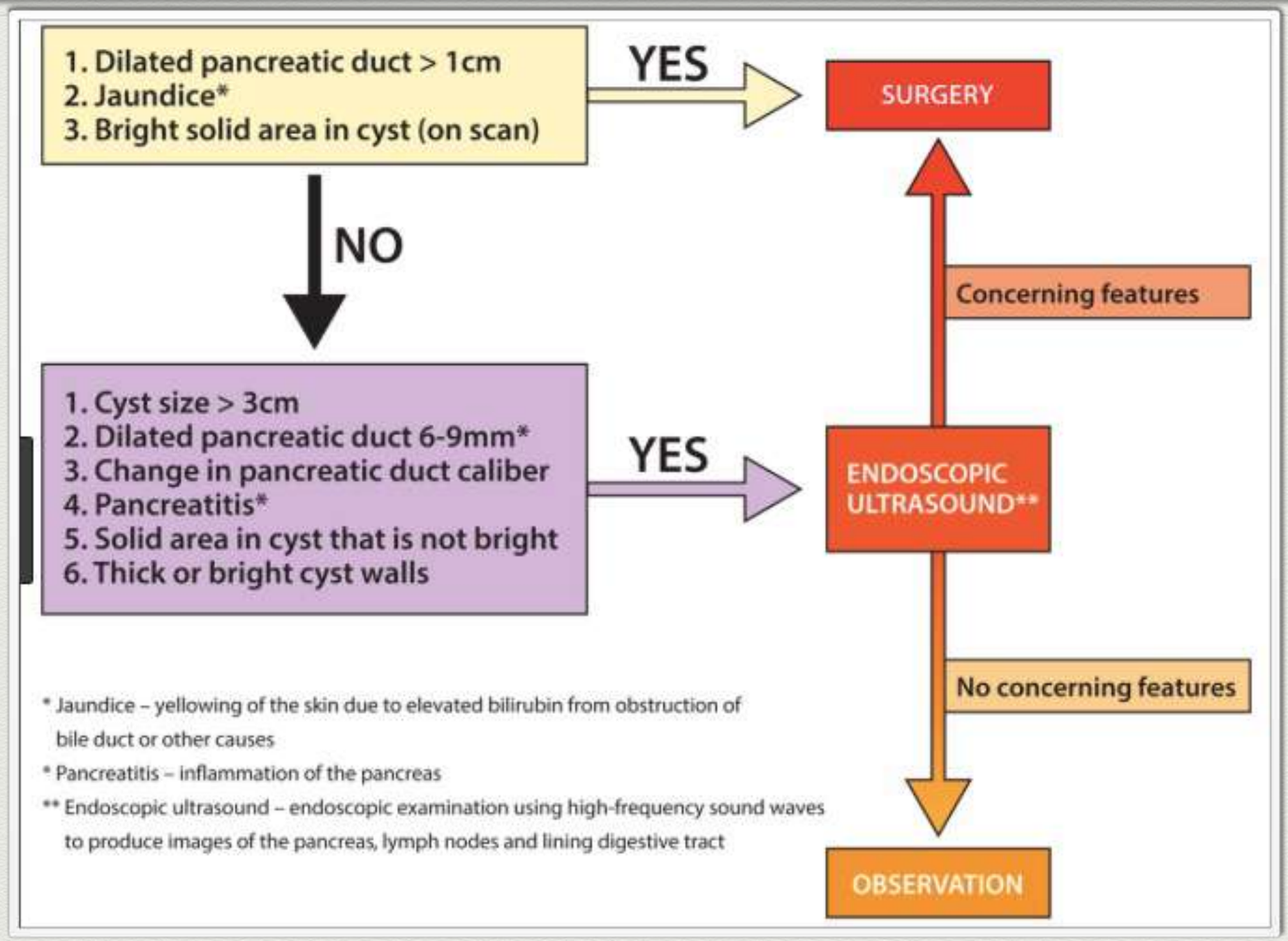
Characteristic	Pseudocyst	SCA	MCN	MD-IPMN[1]	BD-IPMN[1]	SPEN
Male:female	1:1	1:4	Nearly all female	2:1	2:1	1:4
Age (yr)	40-70	60-80	30-50	60-80	60-80	20-30
Location	Any	Any	Body, tail (90%)	Any (head and uncinate 50%)	Any (head and uncinate 50%)	Body, tail (60%)
Imaging features	Unilocular, thick or thin walled	Multilocular, lobulated. Typically microcystic appearance. Central scar	Unilocular, smooth and encapsulated. Septations and peripheral calcifications possible	Diffuse or focal main duct dilation. Fish-mouth papilla with visible mucus	Dilated side branches. Lobular with septations. "Bunch of grapes" appearance	Unilocular, encapsulated with solid and cystic structure. Hemorrhagic components
Communication with main duct	Variable	None	None	Yes	Yes	None
Cytology	Cyst contents	Cuboidal cells. Glycogen (+), PAS (+) and hemosiderin-laden macrophages	Columnar cells. Atypia varies. Mucin (+)	Columnar cells. Atypia varies. Mucin (+)	Columnar cells. Atypia varies. Mucin (+)	Branching papillae and fibrovascular stroma. Vimentin (+), chromogranin (-) and keratin (-)
Amylase (U/L)	> 250	< 250	< 250	> 250	> 250	N/A
CEA (ng/mL)	< 5	< 5	> 192	> 192	> 192	N/A
KRAS mutation	None	None	Yes	Yes	Yes	N/A
Malignant potential	None	Very rare	Yes (6%-27%)	Yes (40%-70%)	Yes (15%-20%)	Yes (2%-15%)
Morphological predictors of malignancy	None	None	> 6 cm, solid component, peripheral nodules or calcifications	Main duct ≥ 8 mm, solid component, nodules	≥ 3 cm, solid component, nodules, main duct ≥ 1 cm, and suspicious/malignant cytology	None

Consensus de Fukuoka

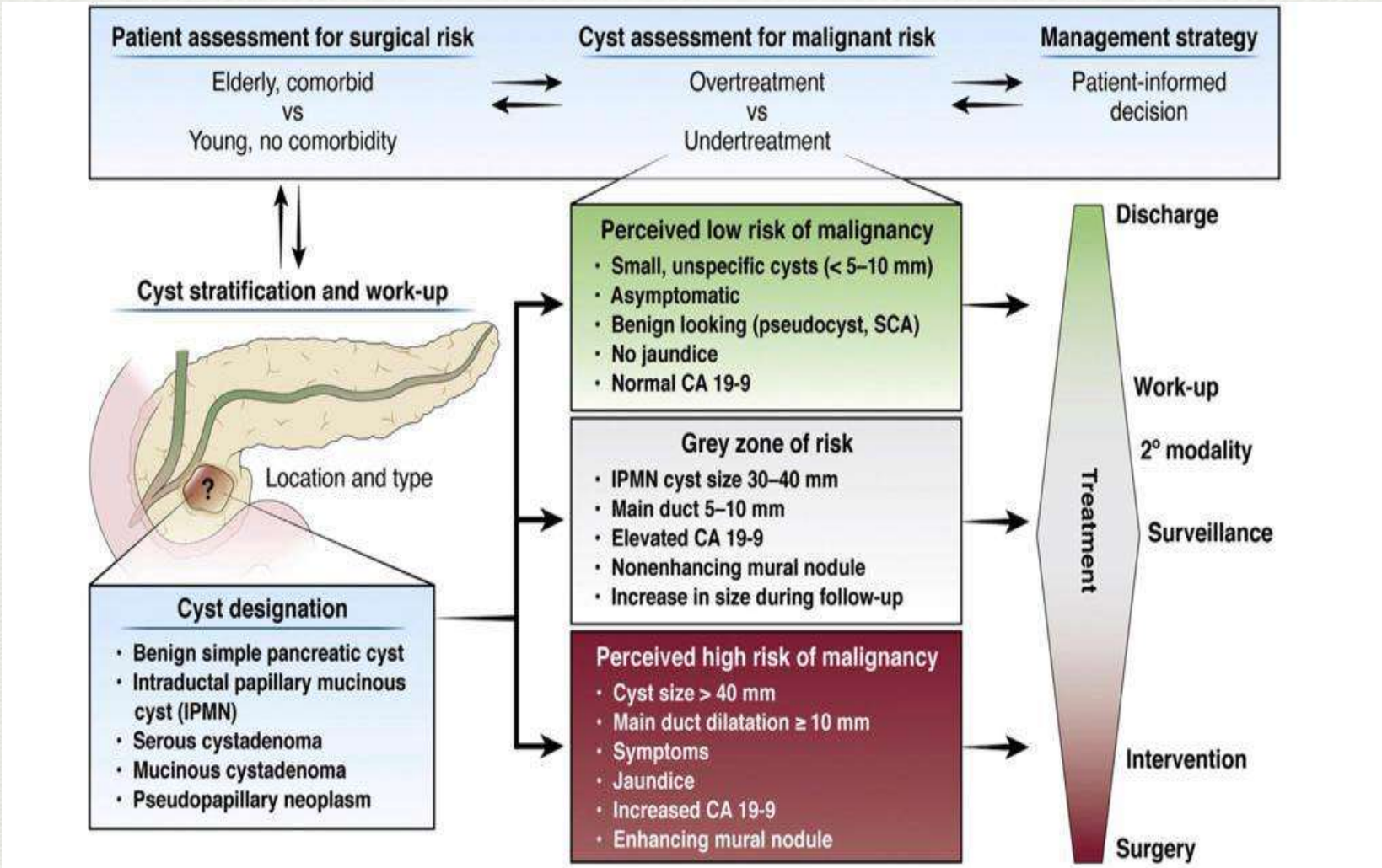


- Análisis de glucosa en líquido pancreático
- Niveles inferiores a 50mg/dl tienen una sensibilidad del 92%, especificidad del 87%.
- Niveles de CEA mayores de 192ng/dl .sensibilidad del 58%, 96% especificidad

Fukuoka


1. Dilated pancreatic duct > 1cm
2. Jaundice*
3. Bright solid area in cyst (on scan)
YES
SURGERY
NO
Concerning features
1. Cyst size > 3cm
2. Dilated pancreatic duct 6-9mm*
3. Change in pancreatic duct caliber
4. Pancreatitis*
5. Solid area in cyst that is not bright
6. Thick or bright cyst walls
YES
ENDOSCOPIC ULTRASOUND**
No concerning features
* Jaundice – yellowing of the skin due to elevated bilirubin from obstruction of bile duct or other causes
* Pancreatitis – inflammation of the pancreas
** Endoscopic ultrasound – endoscopic examination using high-frequency sound waves to produce images of the pancreas, lymph nodes and lining digestive tract
OBSERVATION

Quistes pancreáticos



Indicaciones de Paff con guías clínicas

- Fukuoka- “worrisome features”. (pancreatitis, quiste mayor de 3cm, mod 5-9mm ,nódulo mural, adenopatias, cambio del calibre del ducto pancreático con atrofia distal).

- AGA- mas de 2cm con factores de riesgo ecográfico (mayor o igual a 3cm ,ducto pancreático dilatado, componente sólido)

- Europeas- menor de 3cm con “risk factors”o paff si tamaño entre 3-4 cm .(nódulo mural, MPD 6 mm)

- ASGE -mayor de 3cm o “Risk factor”.(Nódulo mural , masa o dilatación de MPD)

Análisis del liquido quístico.

- Fukuoka - CEA,Citología, Análisis molecular solo en investigación.
- AGA solo citologia.
- European- CEA, citologia.
- ASGE -recomienda cea,citologia, amilasa.

Table 3. Summary of major guideline publications related to the management of pancreatic cystic neoplasms based on cyst size.

Cyst size	2015 AGA	2017 International Consensus	2018 ACG	2018 European
<1 cm	If no solid component and no dilated PD and cyst <3 cm: MRI in 1 year then every 2 years for 5 years if no change (then can stop if no change)	MRI or CT in 6 months, then every 2–3 years if no change	MRI every 2 years × 4 years (then consider lengthening)	Year 1: MRI or EUS every 6 months (in addition to serum CA-19-9 level and clinical evaluation) After Year 1: MRI and/or EUS every 1 year (in addition to serum CA-19-9 level and clinical evaluation) ⩾4 cm: resection
1–2 cm		MRI or CT: Year 1: every 6 months Years 2–3: yearly After 3 years: every 2 years if no change	MRI every 1 year × 3 years, then every 2 years × 4 years (then considering lengthening)	
2–3 cm		EUS in 3–6 months, then every year (can alternate with MRI)	MRI or EUS every 6–12 months × 3 years, then MRI every 1 year × 4 years (then lengthen)	
>3 cm		Alternate EUS and MRI every 3–6 months	Refer to multidisciplinary group and alternate EUS and MRI every 6 months × 3 years, then every 1 year × 4 years (then consider lengthening)	

ACG, American College of Gastroenterology; AGA, American Gastroenterological Association; CA-19-9, carbohydrate antigen 19-9; EUS

Indicaciones de Cirugia según guías.

- Fukuoka nódulos murales, citologia positiva, MPD de 10mm (High Risks features)

- AGA - 2 criterios suficiente (MPD dilatado, nódulos murales, citologia positiva).

- European (Síntomas, MPD mas de 6mm, nódulos murales, no menciona citologia, tamaño superior a 4cm.

CANCER DE PANCREAS

- Pancreas Exocrino (95%)
  Adenocarcinoma Ductal (90%) con predominio cabeza (70%) vs 30% cuerpo.
  Tumores Quísticos como precursores malignos.

- Pancreas endocrino (5%) Tumores funcionales.
  Sd de zollinger-Ellison (gastrinoma).
  Sd de neoplasias endocrinas Multiples(Men).
  Vipoma. Glucagonoma. Somatoetatinoma.

- Tumores no funcionales.

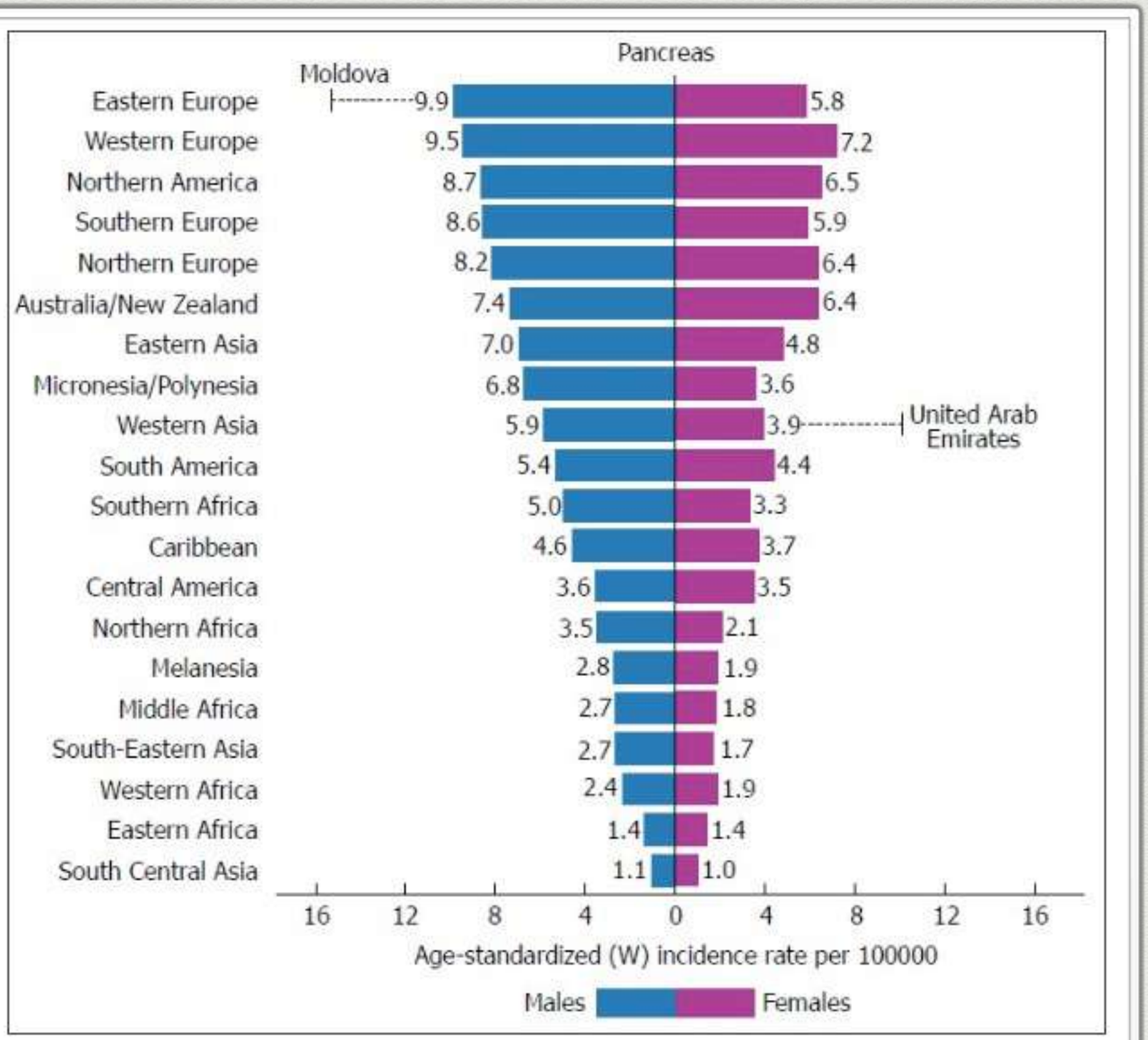


Figure 1

Diagram of incidence of pancreatic cancer in both sexes throughout the world Adapted from Globocan[1] 2018.

Risk of Pancreatic Cancer in Hereditary Syndromes

	% of Families	Increased Risk	Age 50 y, %	Age 70 y, %
No history	—	1	0.05%	0.5
Hereditary nonpolyposis colorectal cancer	?	8	1	3.7
BRCA2 (breast-ovarian)	6–12	3.5–10	0.5–2	5
PALB2	3	?	?	?
Familial atypical multiple mole melanoma (p16)	1–3	20–34	1	10–17
Familial pancreatitis (*PRSS1*)	<1	50–80	2.5	25–40
Peutz-Jeghers (*STK11/LKB1*)	<1	132	6.6	30–60
ATM	<2	?	?	?

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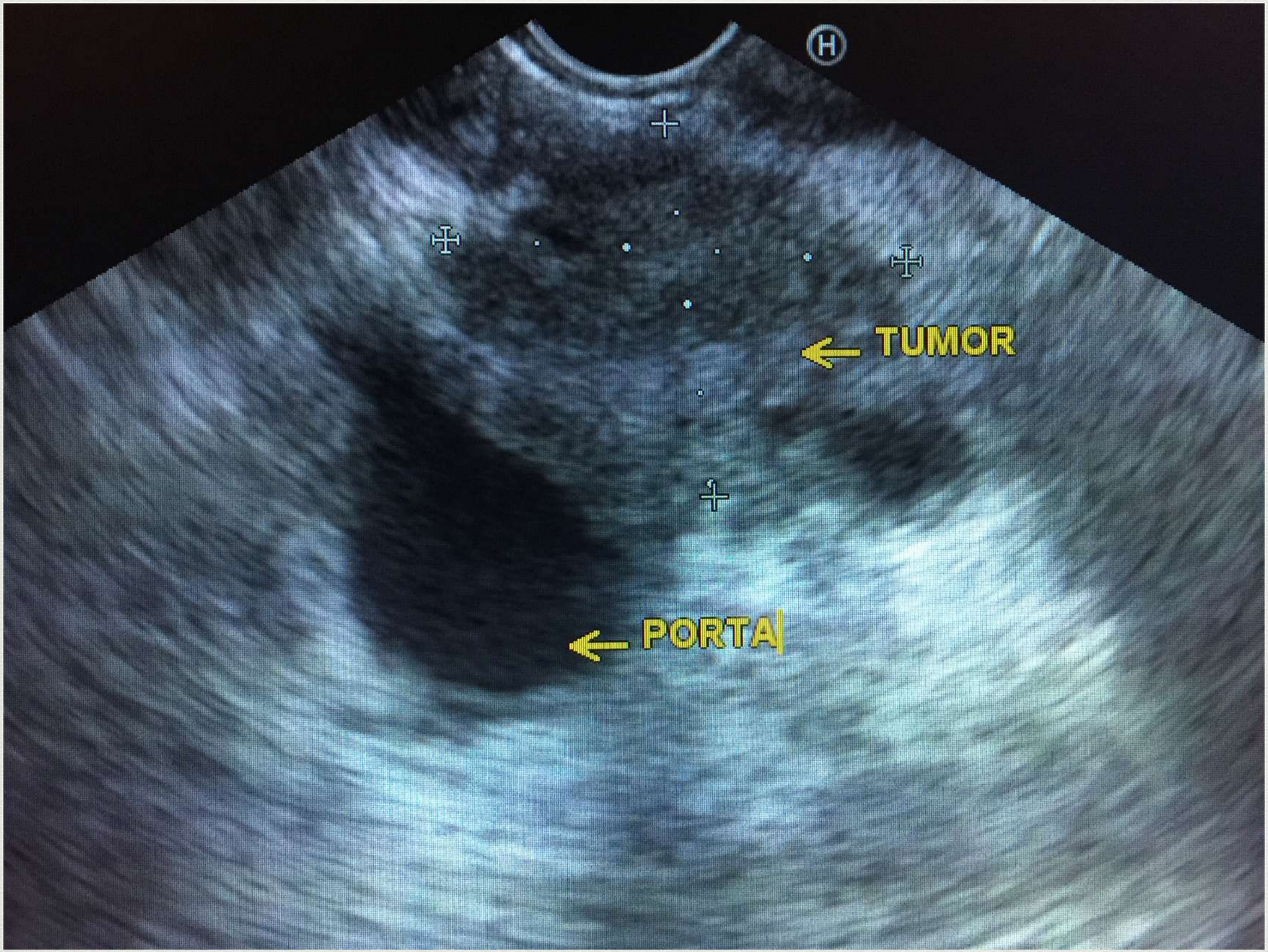

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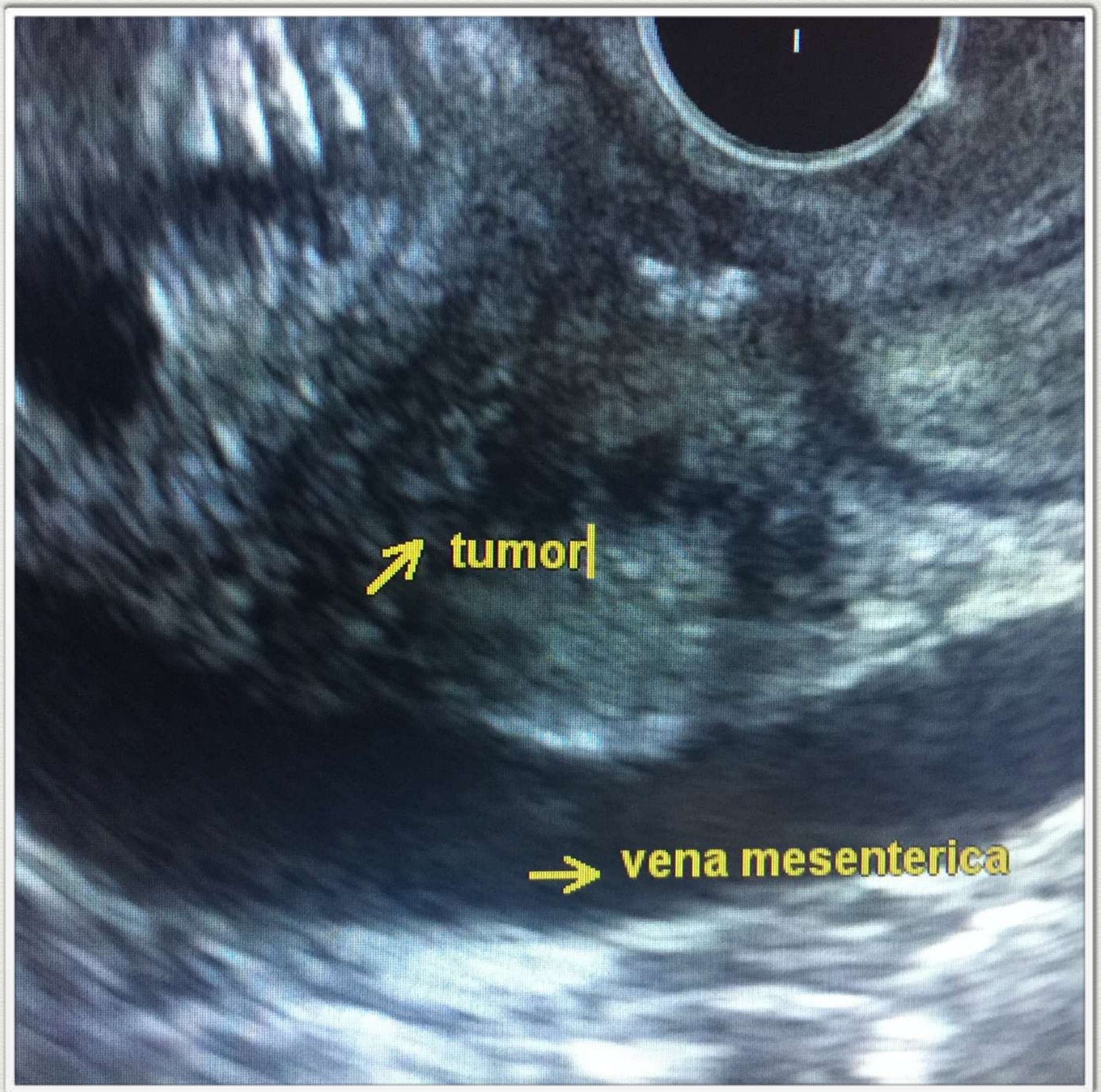

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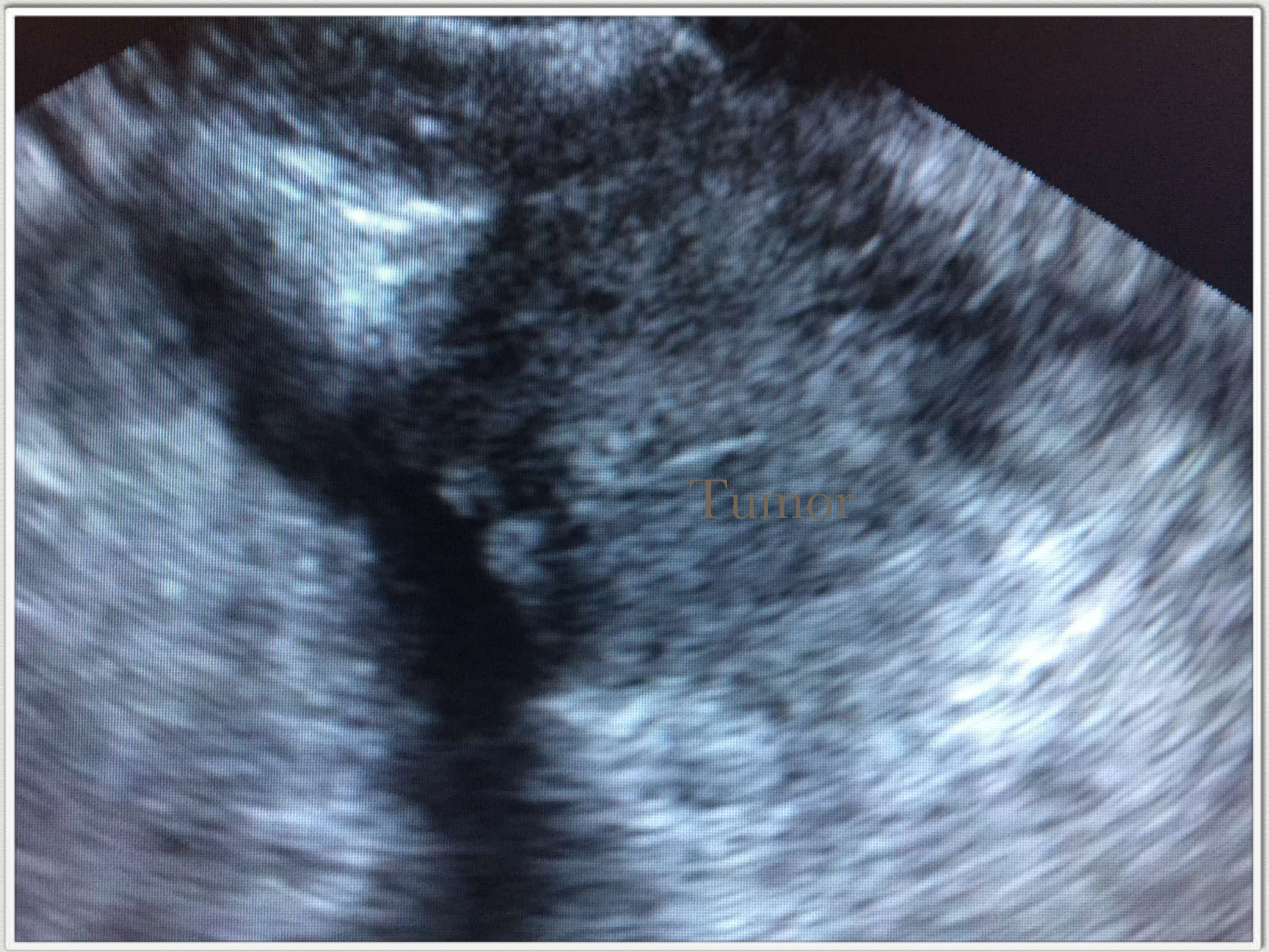


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Resectability NCCN Guidelines 2017

National Comprehensive Cancer Network®

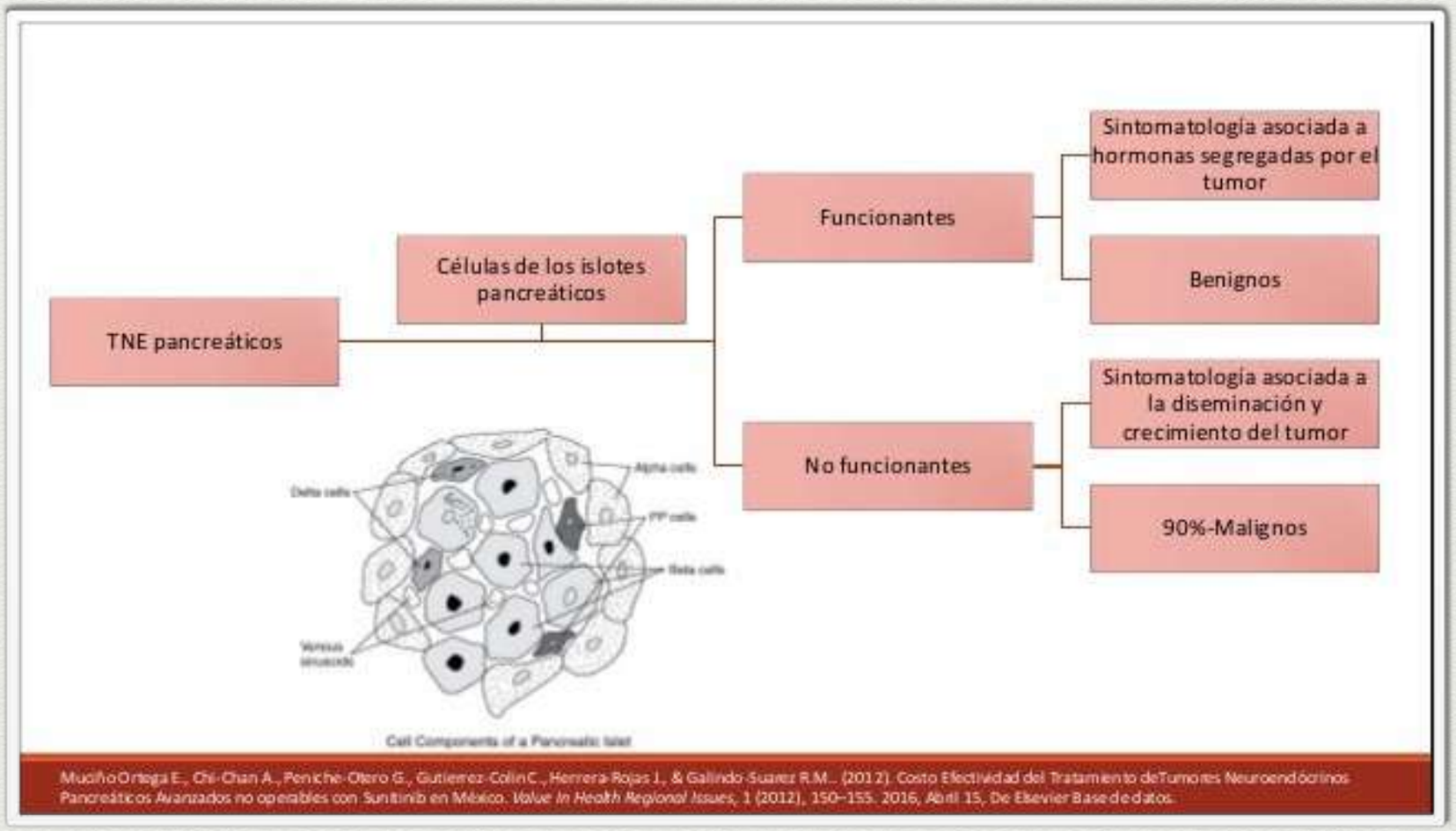
NCCN Guidelines Version 2.2017
Pancreatic Adenocarcinoma

NCCN Guidelines Index
Table of Contents
Discussion

CRITERIA DEFINING RESECTABILITY STATUS[1]

Resectability Status	Arterial	Venous
Resectable	No arterial tumor contact (celiac axis [CA], superior mesenteric artery [SMA], or common hepatic artery [CHA]).	No tumor contact with the superior mesenteric vein (SMV) or portal vein (PV) or ≤180° contact without vein contour irregularity.
Borderline Resectable[2]	<u>Pancreatic head/uncinate process:</u> • Solid tumor contact with CHA without extension to celiac axis or hepatic artery bifurcation allowing for safe and complete resection and reconstruction. • Solid tumor contact with the SMA of ≤180° • Solid tumor contact with variant arterial anatomy (ex: accessory right hepatic artery, replaced right hepatic artery, replaced CHA, and the origin of replaced or accessory artery) and the presence and degree of tumor contact should be should be noted if present as it may affect surgical planning. <u>Pancreatic body/tail:</u> • Solid tumor contact with the CA of ≤180° • Solid tumor contact with the CA of >180° without involvement of the aorta and with intact and uninvolved gastroduodenal artery thereby permitting a modified Appleby procedure [some members prefer this criteria to be in the unresectable category].	• Solid tumor contact with the SMV or PV of >180°, contact of ≤180° with contour irregularity of the vein or thrombosis of the vein but with suitable vessel proximal and distal to the site of involvement allowing for safe and complete resection and vein reconstruction. • Solid tumor contact with the inferior vena cava (IVC).
Unresectable[2]	• Distant metastasis (including non-regional lymph node metastasis) <u>Head/uncinate process:</u> • Solid tumor contact with SMA >180° • Solid tumor contact with the CA >180° • Solid tumor contact with the first jejunal SMA branch <u>Body and tail</u> • Solid tumor contact of >180° with the SMA or CA • Solid tumor contact with the CA and aortic involvement	<u>Head/uncinate process</u> • Unreconstructible SMV/PV due to tumor involvement or occlusion (can be due to tumor or bland thrombus) • Contact with most proximal draining jejunal branch into SMV <u>Body and tail</u> • Unreconstructible SMV/PV due to tumor involvement or occlusion (can be due to tumor or bland thrombus)

TNE Pancreaticos



Muciño Ortega E., Chi-Chan A., Peniche-Otero G., Gutierrez-Colin C., Herrera-Rojas J., & Galindo-Suarez R.M.. (2012). Costo Efectividad del Tratamiento de Tumores Neuroendócrinos Pancreáticos Avanzados no operables con Sunitinib en México. *Value In Health Regional Issues*, 1 (2012), 150–155. 2016, Abril 15, De Elsevier Base de datos.

Tumores Neuroendocrinos

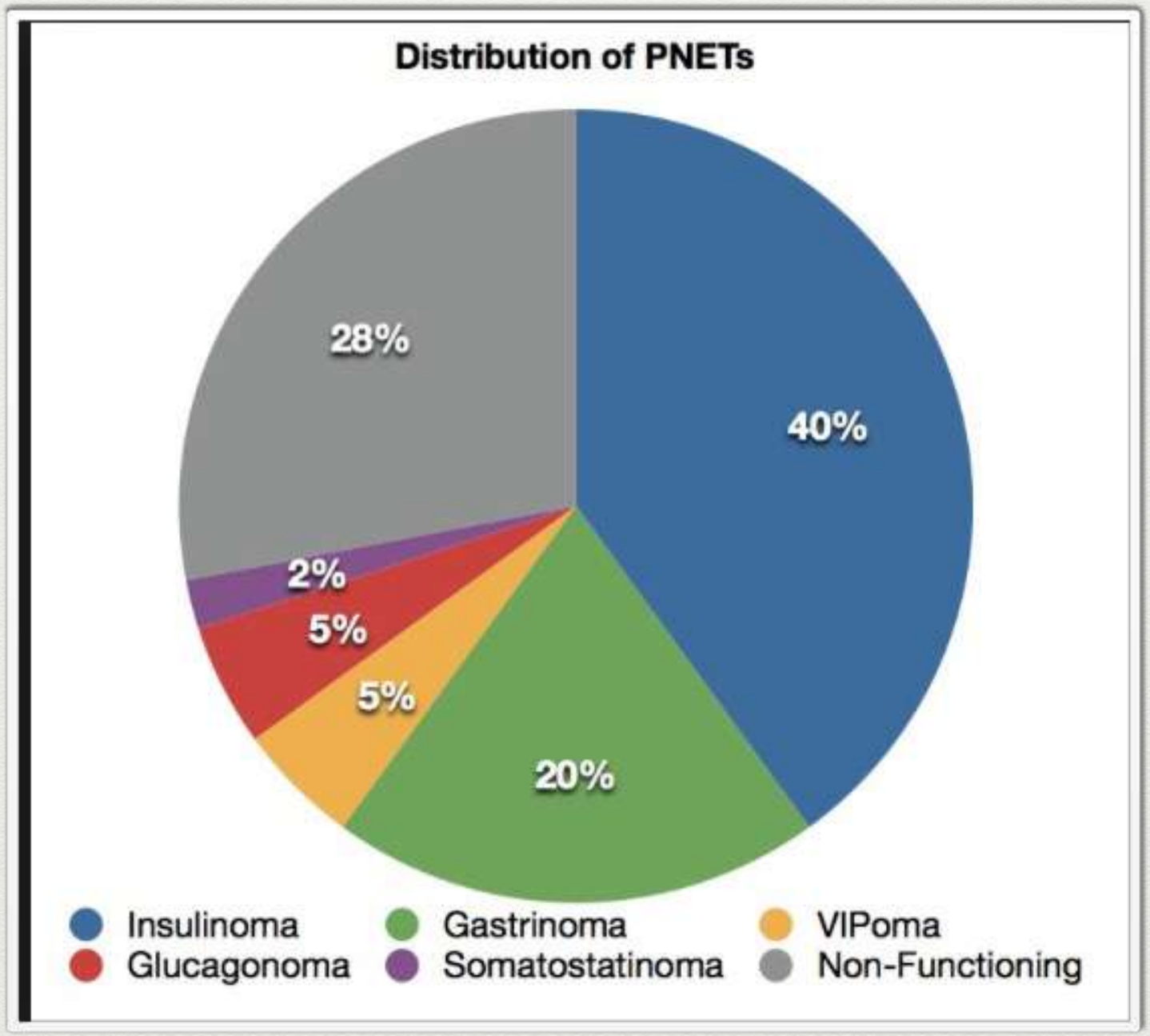
- Actualmente 1 de cada 14 quistes resecados son TNE.
- 10-17% de los quistes son TNE.
- La mayoría son incidentales y no funcionales.
- Asociados a MEN -1
- Supervivencia mayor al 85% si se resecan.
- Alta sensibilidad con citologia.

Distribución de TNE

Figura 1 Distribución porcentual de los sitios de TNE.

Villa Gisajeda M.G., Ronquillo Carreóna C.A., Morán Mendoza A., & Dip Borunda A.K. (2015, September 10). Tumores neuroendocrinos: experiencia de 6 años en un centro de tercer nivel. Gaceta Mexicana de Oncología. , 14(2015), 141-149. 2016, Abril 15, De Elsevier Base de datos.

TNE funcionales



Clasificacion de la OMS

Clasificación de la OMS 2010
1. TNE bien diferenciados[a]
TNE G1: Ki-67 ≤ 2% y/o índice mitótico < 2 × 10 CGA
TNE G2: Ki-67 3-20% y/o índice mitótico 2-20 × 10 CGA
2. CNE pobremente diferenciados[a]
CNE G3 de célula grande o pequeña (Ki-67 > 20% y/o índice mitótico > 20 × 10 CGA)
3. Carcinoma mixto adenoneuroendocrino
4. Lesiones hiperplásicas y preneoplásicas

Clasificación

Name of tumor (syndrome)	Hormone causing syndrome	Signs or symptoms	Primary location	Malignant (%)
Gastrinoma (Zollinger–Ellison syndrome)	Gastrin	Abdominal pain Diarrhea Esophageal symptoms	Pancreas: 60% Duodenum: 30% Other: 10%	60–90
Insulinoma	Insulin	Hypoglycemic symptoms	Pancreas: 99%–100%	5–15
Glucagonoma	Glucagon	Rash, anemia Diabetes/glucose intolerance Weight loss Thromboembolic disease	Pancreas: 99%–100%	60
VIPoma (Verner–Morrison, pancreatic cholera, WDHA)	VIP	Severe watery diarrhea Hypokalemia	Pancreas: 90% Other: 10% (neural, adrenal, peri-ganglionic tissue)	80
Somatostatinoma	Somatostatin	Diabetes mellitus Cholelithiases Diarrhea Steatorrhea	Pancreas: 56% Duodenum/jejunum: 44%	60
GRFoma	Growth hormone releasing factor	Acromegaly	Pancreas: 30% Lung: 54% Jejunum: 7% Other: 13% (adrenal foregut, retro-peritoneum)	30
ACTHoma (Cushing's syndrome)	ACTH	Cushing's syndrome	Pancreas: 4%–16% all ectopic Cushing's	>90
PET causing the carcinoid syndrome (carcinoid syndrome)	Serotonin tachykinins prostaglandins	Diarrhea Flushing	Pancreas: 100%	68–88
PET causing hypercalcemia	PTH-RP	Symptoms due to increased calcium	Pancreas: 100%	80–90
Nonfunctioning (PPoma, nonfunctional)	None (PP, CgA, NSE, and so forth[a])	Weight loss, hepatomegaly Abdominal mass Occasionally asymptomatic	Pancreas: 100%	60–90

Metz D, Jensen R. Gastroenterology 2008;135:1469–1492

Table I. A comparison of PNET detection rates with several imaging techniques

Author	Year	N.º	% Insulinoma	Size	CT	EUS	MR	SRS	US	A	PET
Zimmer	1994	18				88		52			
Ueno	1996 (5)	7	71%		57	100			86	100	
Proye	1998	7				77					
Anderson	2000 (6)	54	58%	15 mm		93				44	
Thoeni	2000						80				
Rickes	2003 (23)	29						54	94 US-CE		
Gouya	2003 (24)	30	100%	20 mm	72	94					
Rappeport	2006 (8)	20	10%	18 mm	80	100					
Koopmans	2008 (29)	23			87			78			89
Alsohaibani	2008 (9)	14		4-25 mm	77	100	67	50			
						90 USE-PAAF					
Malagò	2009 (42)	38	0%						81.5 US-CE		
An	2010 (43)	31	100%						89 US-CE		
Ishikawa	2010 (21)	41			81	95			45		
Suzuki	2010 (15)	34		30 mm	62	65			32		
						90 USE-PAAF					
Druce	2010 (26)	30	100%		64	65	75	50			
Versari	2010 (33)	19			91	100					92
Khashab	2011 (34)	60	32%	32.7 mm	63	92					
Gornals	2011 (14)	9 y 16 casos	33%	19 mm		100 USEPAAF					
Varas	2011 (35)	19	10%	20 mm	88	100		80	83		100
Turuga	2011 (37)	Revisión			80		70	85			100
Tan	2011 (38)	Revisión			94	80-90		80-90	<70 sólo US 66%		90-100

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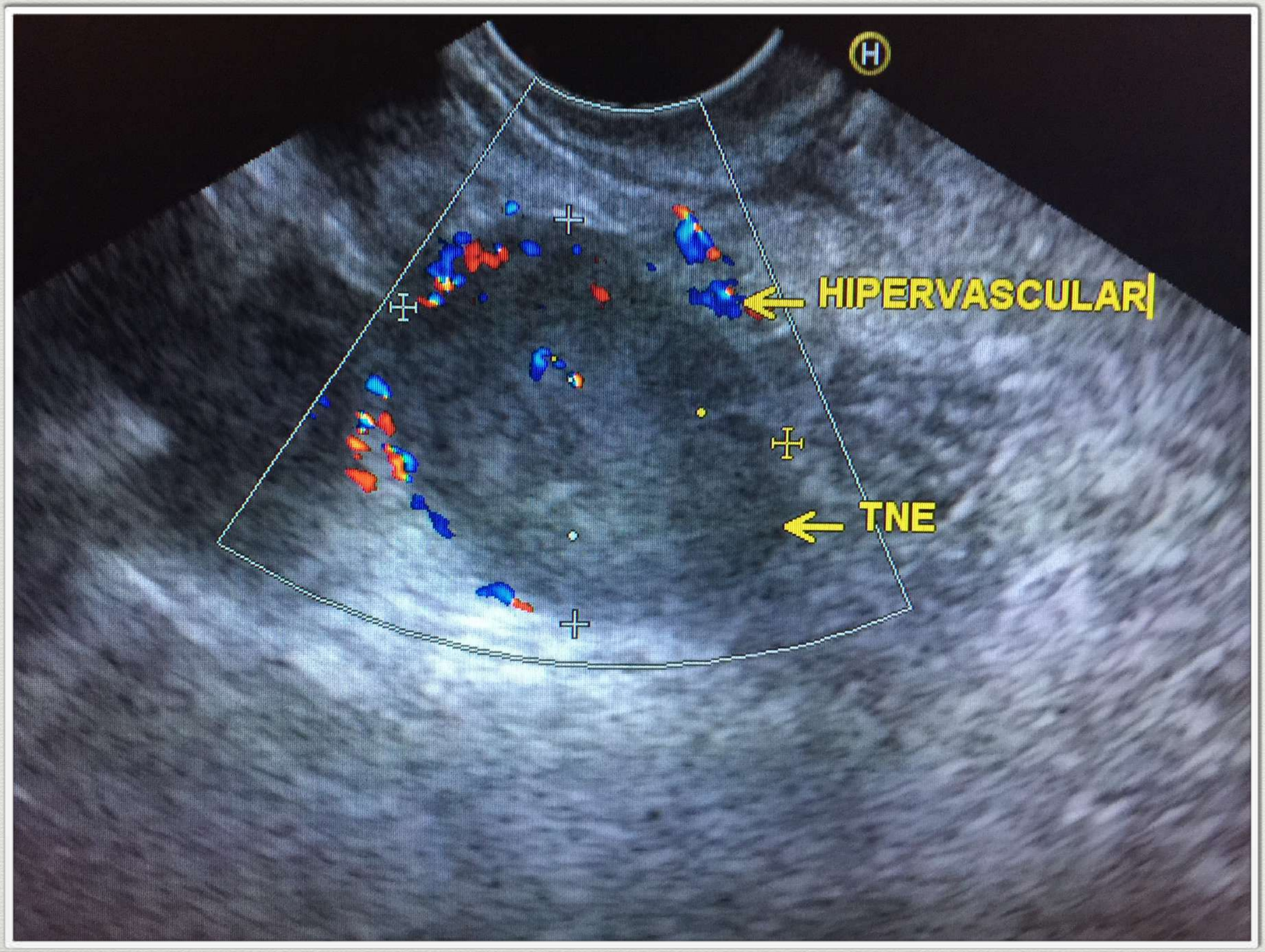

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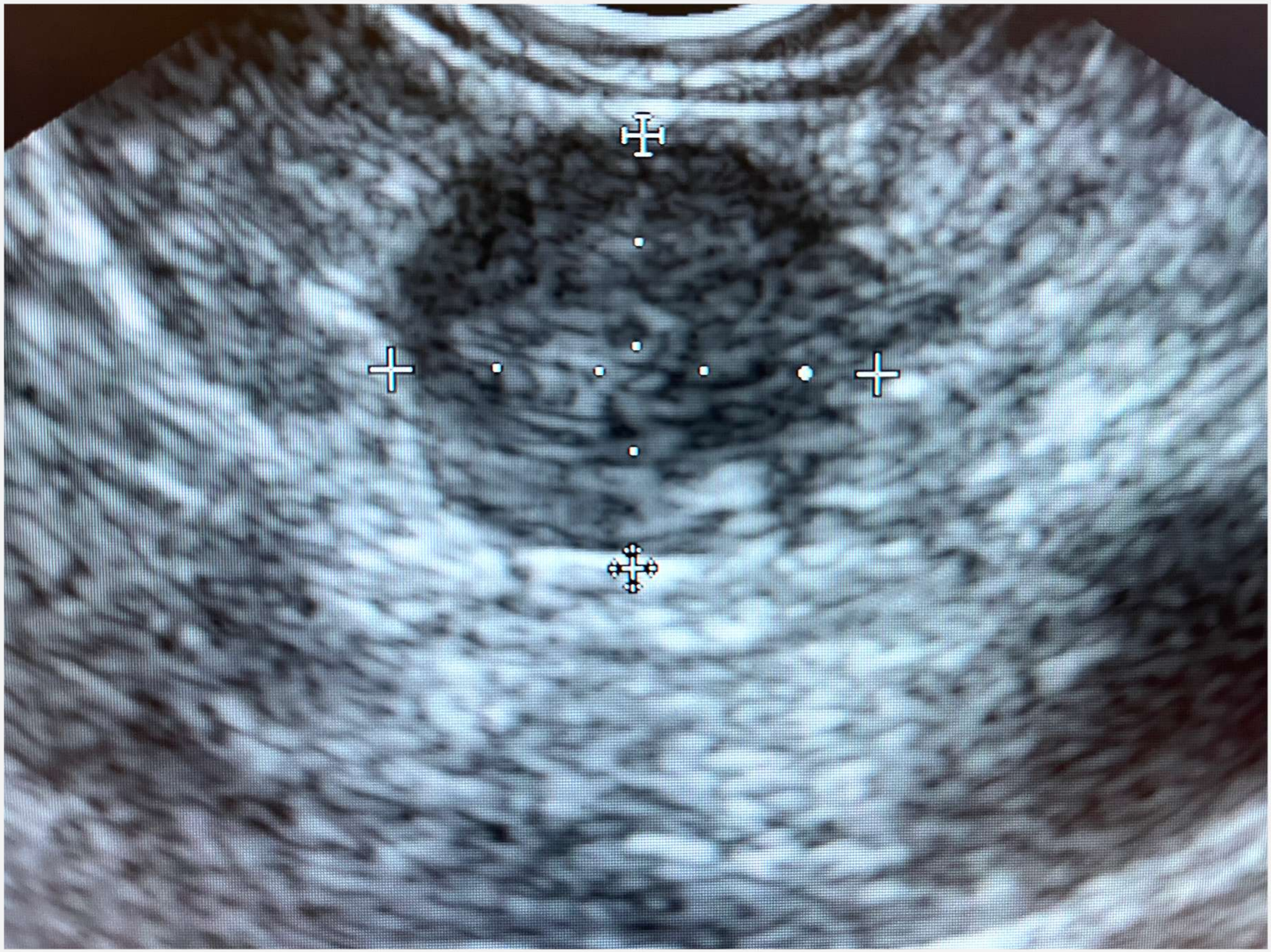


Técnica de Punción.

- Nunca sabes hasta que estás dentro- Tener previsto agujas de distinto tamaño.
- Siempre Hemograma y Coagulación reciente.
- Hx adecuada de terapia con anticoagulación (Ojo a los nuevos anti coagulantes).
- Plan de acción de cirugía o Oncología.
- Uso de antibióticos en lesiones quísticas o punciones rectales .

Guias de antiagregantes

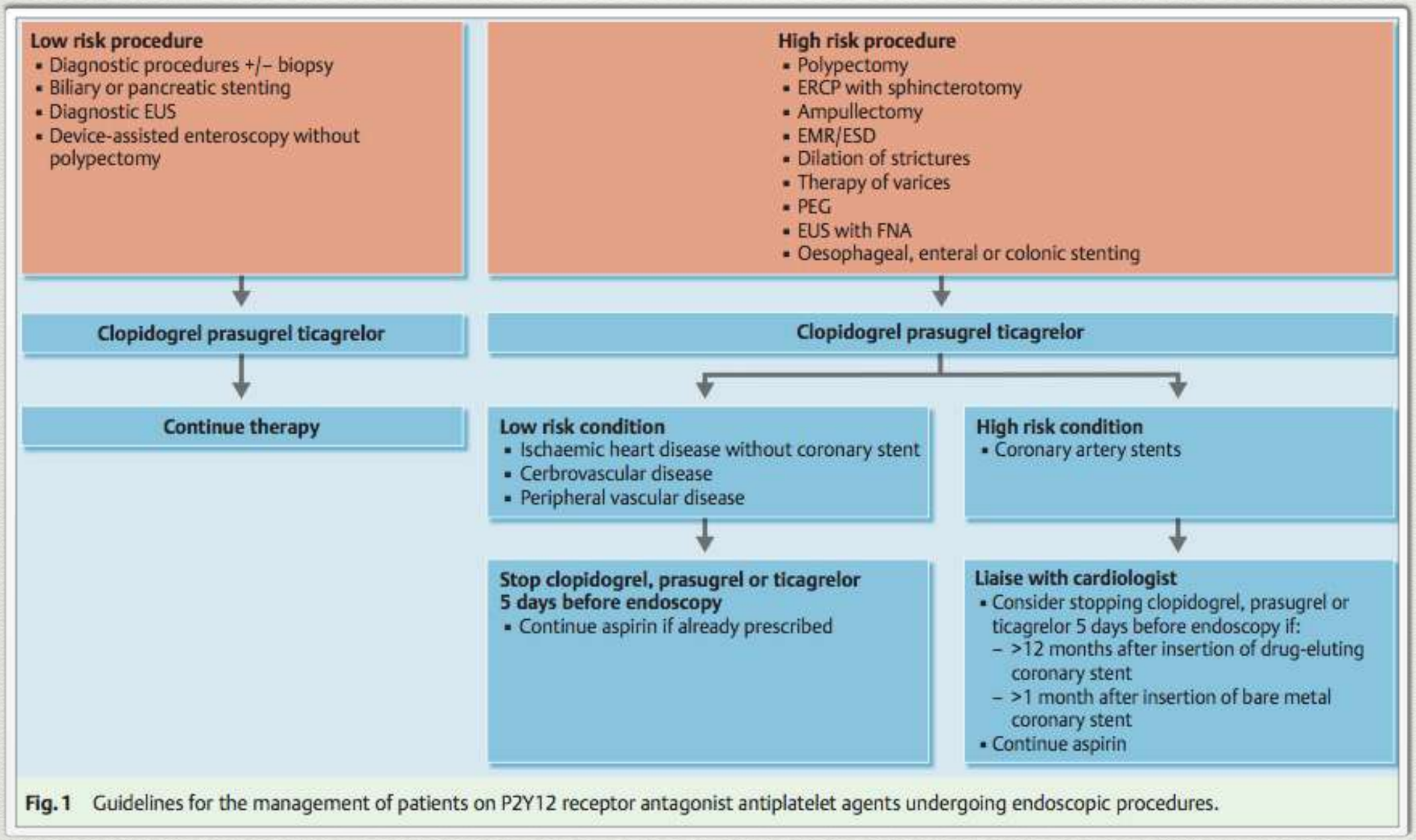


Fig. 1 Guidelines for the management of patients on P2Y12 receptor antagonist antiplatelet agents undergoing endoscopic procedures.

Low risk procedure
- Diagnostic procedures +/– biopsy
- Biliary or pancreatic stenting
- Device-assisted enteroscopy without polypectomy

High risk procedure
- Polypectomy
- ERCP with sphincterotomy
- Ampullectomy
- EMR/ESD
- Dilation of strictures
- Therapy of varices
- PEG
- EUS with FNA
- Oesophageal, enteral or colonic stenting

Warfarin

Continue warfarin
- Check INR during the week before endoscopy:
  - If INR within therapeutic range continue usual daily dose
  - If INR above therapeutic range but <5 reduce daily dose until INR returns to therapeutic range

DOAC
- Dabigatran
- Rivaroxaban
- Apixaban
- Edoxaban

Omit DOAC on morning of procedure

Warfarin

Low risk condition
- Prosthetic metal heart valve in aortic position
- Xenograft heart valve
- AF without valvular disease >3 months after VTE
- Thrombophilia syndromes (liaise with haematologist)

Stop warfarin 5 days before endoscopy
- Check INR prior to procedure to ensure INR < 1.5
- Restart warfarin evening of procedure with usual daily dose
- Check INR 1 week later to ensure adequate anticoagulation

High risk condition
- Prosthetic metal heart valve in mitral position
- Prosthetic heart valve and AF
- AF and mitral stenosis
- <3 months after VTE

Stop warfarin 5 days before endoscopy
- Start LMWH 2 days after stopping warfarin
- Give last dose of LMWH ≥24 hours before procedure
- Restart warfarin evening of procedure with usual daily dose
- Continue LMWH until INR adequate

DOAC
- Dabigatran
- Rivaroxaban
- Apixaban
- Edoxaban

Take last dose of drug ≥48 hours before procedure
- For dabigatran with CrCl (eGFR) 30–50 ml/min take last dose of drug 72 hours before procedure
- In any patient with rapidly deteriorating renal function a haematologist should be consulted

Fig. 2 Guidelines for the management of patients on warfarin or direct oral anticoagulants (DOAC) undergoing endoscopic procedures.

EUS-FNA: Adverse Events

- Meta-análysis de 40 estudios con 5.124 pacientes.
- Morbilidad 2,66%
- Pancreatitis 0,92%
- Hemorragia 0,69% elevándose hasta un 6% en lesiones quísticas.
- Dolor 0,49%
- Infección 0,44%
- Perforación 0,21%
- Mortalidad 0,19%.

List of needles used for endoscopic ultrasound-guided procedures.

Release Year	Needle	Size	Material of Needle
2000	Echo Tip Ultra (Cook Medical)	19, 22, 25	Stainless
2001	NA-11J-KB (Olympus Medical Systems)	22	Stainless
2003	EZ Shot (Olympus Medical Systems)	22	Stainless
2004	Quick-Core (Cook Medical)	19	Stainless
2011	Expect (Boston Scientific)	19, 22, 25	Cobalt-chromium
2011	EZ Shot 2(Olympus Medical Systems)	19, 22, 25	Stainless
2012	Echo Tip Procore (Cook Medical)	19, 22, 25	Stainless
2012	SONO tip Pro Control (Medi-Globe GmbH)	19, 22, 25	Stainless
2012	Expect 19 G Flex Needle (Boston Scientific)	19	Nitinol
2013	EUS Sonopsy CY (HAKKO)	21	Stainless
2016	EZ Shot 3 Plus (Olympus Medical Systems)	19, 22	Nitinol
2016	Echo Tip Procore 20 G (Cook Medical)	20	Stainless
2016	SharkCore (Medtronic)	19, 22, 25	Stainless
2016	Acquire (Boston)	22, 25	Cobalt-chromium
2017	Acquire 19 G Flex Needle (Boston Scientific)	19	Nitinol
2018	EZ Shot 3 Plus (Olympus Medical Systems)	25	Stainless
2020	SONO tip TopGain (Medi-Globe GmbH)	19, 22, 25	Stainless

Tipos de aguja de biopsia

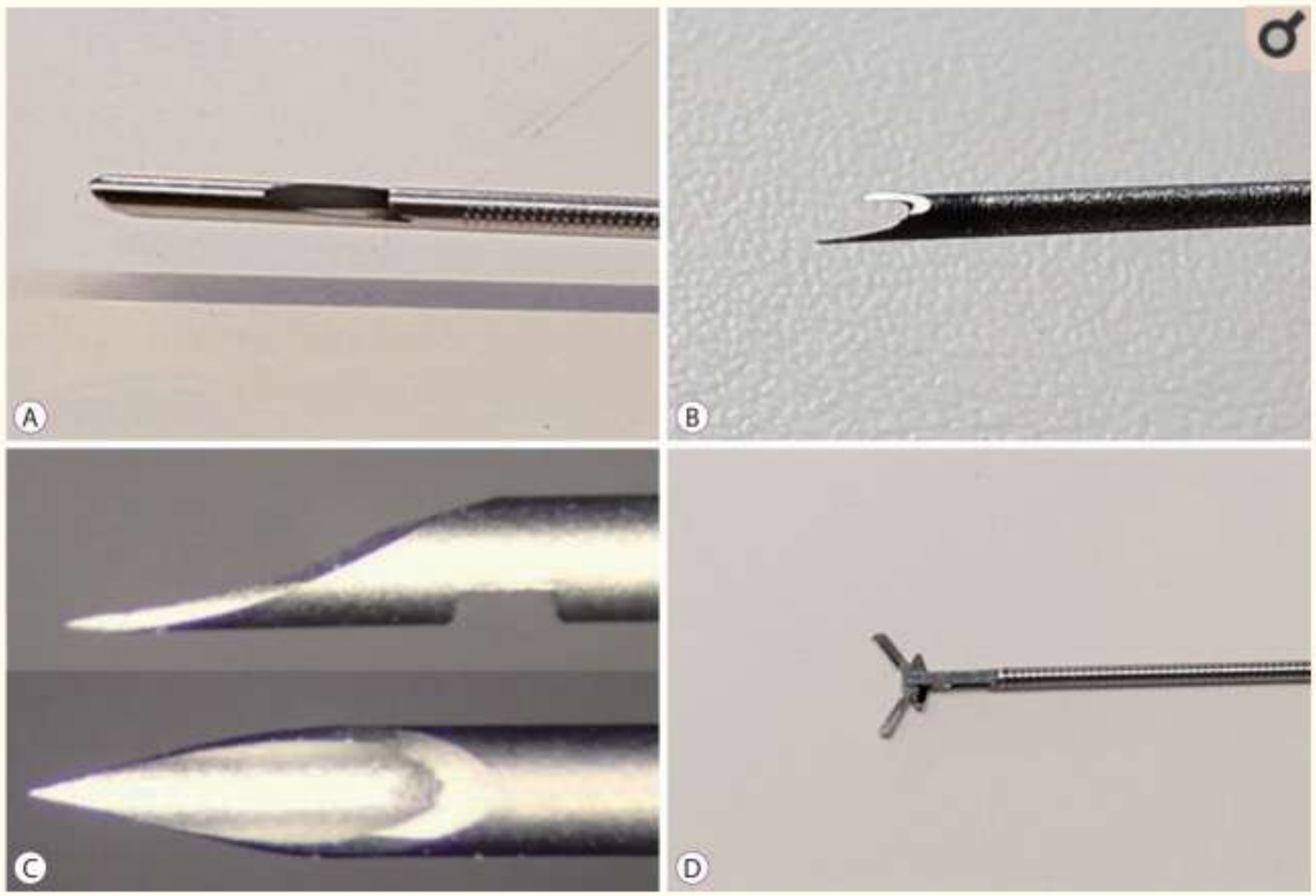


Fig. 2.

(A) EchoTip ProCore® HD endoscopic ultrasound biopsy device (Cook Medical, Bloomington, IN, USA). (B) Tip of the Sharkcore™ endoscopic ultrasound biopsy device (Medtronic Inc., Minneapolis, MN, USA). (C) EZ Shot 3 Plus endoscopic ultrasound needle (Olympus, Tokyo, Japan). (D) Moray^{TM} Micro Forceps (US endoscopy, Mentor, OH, USA).

Agujas en EUS

Randomized trial comparing fork-tip and side-fenestrated needles for EUS-guided fine-needle biopsy of solid pancreatic lesions.

Crinò SF, Le Grazie M, Manfrin E, Conti Bellocchi MC, Bernardoni L, Granato A, Locatelli F, Parisi A, Di Stefano S, Frulloni L, Larghi A, Gabbrielli A

Gastrointest Endosc. 2020 Sep; 92(3):648-658.e2.

Endoscopic ultrasound (EUS)-guided fine needle biopsy alone vs. EUS-guided fine needle aspiration with rapid onsite evaluation in pancreatic lesions: a multicenter randomized trial.

Chen YI, Chatterjee A, Berger R, Kanber Y, Wyse J, Lam E, Gan I, Auger M, Kenshil S, Telford J, Donnellan F, Quinlan J, Lutzak G, Alshamsi F, Parent J, Waschke K, Alghamdi A, Barkun J, Metrakos P, Chaudhury P, Martel M, Dorreen A, Candido K, Miller C, Adam V, Barkun A, Zogopoulos G, Wong C

Endoscopy. 2022 Jan; 54(1):4-12.

Review Current Status of Needles in the Optimization of Endoscopic Ultrasound-Guided Procedures.

Fujita A, Ryozawa S, Tanisaka Y, Ogawa T, Suzuki M, Noguchi T, Katsuda H, Mizuide M

Diagnostics (Basel). 2020 Jul 8; 10(7):.

Review A comparison of the efficiency of 22G versus 25G needles in EUS-FNA for solid pancreatic mass assessment: A systematic review and meta-analysis.

Guedes HG, Moura DTH, Duarte RB, Cordero MAC, Santos MELD, Cheng S, Matuguma SE, Chaves DM, Bernardo WM, Moura EGH

Clinics (Sao Paulo). 2018; 73():e261.

Fork-tip needle biopsy versus fine-needle aspiration in endoscopic ultrasound-guided sampling of solid pancreatic masses: a randomized crossover study.

Oppong KW, Bekkali NLH, Leeds JS, Johnson SJ, Nayar MK, Darné A, Egan M, Bassett P, Haugk B

Endoscopy. 2020 Jun; 52(6):454-461.

[PubMed] [Ref list]

Review Comparison of Franseen and fork-tip needles for EUS-guided fine-needle biopsy of solid mass lesions: A systematic review and meta-analysis.

Mohan BP, Shakhatreh M, Garg R, Asokkumar R, Jayaraj M, Ponnada S, Navaneethan U, Adler DG

Endosc Ultrasound. 2019 Nov-Dec; 8(6):382-391.

Published comparative studies regarding 22 G versus 25 G FNA-needles.

Reference	Study Design	Cases (n)	Lesion	Rose	Diagnostic Ability (25G vs. 22G)
Lee [44] 2009	RCT	12	Mainly pancreas	Yes	n.s
Siddiqui [45] 2009	RCT	131	Pancreas	Yes	Accuracy; 95.5% vs. 87.5%; $p = 0.18$; n.s
Camellini [46] 2011	RCT	127	Mainly pancreas	Yes	Accuracy; 78.1% vs. 77.8%; n.s
Fabbri [47] 2011	RCT	50	Pancreas	Yes	Accuracy; 94% vs. 86%; n.s
Lee [48] 2013	RCT	188	Pancreas	No	Accuracy; 88.3% vs. 89.4%; $p = 0.82$; n.s
Vilmann [49] 2013	RCT	135	Pancreas and LN	No	Sensitivity; 94.1% vs. 94.1%; n.s
Carrara [43] 2016	RCT	144	Mainly pancreas	Yes	Accuracy; 81% vs. 68%; $p = 0.09$; n.s
Affolter [41] 2013	MA (11 studies)	1452	Mainly pancreas	5/11	Sensitivity; 91% vs. 78%; $p = 0.97$; n.s
Madhoun [50] 2013	MA (8 studies)	1292	Pancreas	5/8	Sensitivity; 93% vs. 85%; $p = 0.0003$
Facciorusso [51] 2017	MA (7 studies)	732	Pancreas	5/7	Sensitivity; 93% vs. 89%; $p = 0.13$; n.s
Xu [52] 2017	MA (11 studies)	837	Pancreas	6/11	Sensitivity; 92% vs. 88%; $p = 0.046$

Randomized Controlled Trial > Dig Endosc. 2022 Mar;34(3):596-603. doi: 10.1111/den.14079. Epub 2021 Jul 30.

Randomized trial comparing the 25G and 22G Franseen needles in endoscopic ultrasound-guided tissue acquisition from solid pancreatic masses for adequate histological assessment

Comment > Gastroenterology. 2022 Feb;162(2):656-657. doi: 10.1053/j.gastro.2021.06.043. Epub 2021 Jun 24.

Rapid Onsite Evaluation in the Era of Endoscopic Ultrasound-Guided Fine-Needle Biopsy: Really Time to Say Goodbye?

Clinical Trial > Endoscopy. 2022 Jan;54(1):4-12. doi: 10.1055/a-1375-9775. Epub 2021 Apr 15.

Endoscopic ultrasound (EUS)-guided fine needle biopsy alone vs. EUS-guided fine needle aspiration with rapid onsite evaluation in pancreatic lesions: a multicenter randomized trial

Tipo de punción

- Con aspiración: Se pincha lesión y se aplica succión de 5 -10 . A menor tamaño de aguja menor presión.
- Sin aspiración o Seca : Se pincha se retira estilete pero no se aplica succión. Barrido de varios pases en función de tamaño y vascularización. Si la lesión hipervascular inicialmente no aplicar succión y evaluar muestra.
- Aspiración húmeda.
- Aspiración con " Funning"- Consiste en realizar barridos con movimiento de pestaña cambiando dirección de la aguja.

Authors	Year	Technique	Benefits
Bang *et al.*	2013	Fanning technique	Fewer number of passes required to establish diagnosis
Mukai *et al.*	2015	Door-knocking method	Obtaining large amount of tissue sample for histology
Attam *et al.*	2015	Wet suction technique	Obtaining the high quality and quantity of the FNA sample
Nakai *et al.*	2015	Using 0.75 mm biopsy forceps	Reliable way to obtain the tissue sample for histology
Villa *et al.*	2016	Wet suction technique	Obtaining the high-quality sample and improving the diagnostic accuracy
Yamabe *et al.*	2016	Best usage for ProCore	High negative pressure is best usage regardless of the specific shape of the needle tip

FNA: Fine-needle aspiration

- Técnica de fanning. Bang et al true positive rate de 96,4% vs 76,9%.
- Muestras mas grandes con técnica de “ Door Knocking”.
- Punción húmeda 85,5% vs 75,2% (P 0,035).
- Biopsia con forceps 0,75mm con aguja de 19g- 88%.
- Tipo de succión- 10-20ml.

	Year	Suction	Result
	2005	35-mL negative pressure	A tissue core adequate for histologic evaluation was yielded in 96% of solid masses
	2009	Nonsuction versus suction	Suction was associated with increased number of patholo slides, higher sensitivity, and negative predictive and no difference in the bloodiness of each sample
	2013	Nonsuction versus 10 mL negative pressure	10 mL negative pressure was superior to nonsuction in terms of accuracy and sensitivity
	2014	Nonsuction versus suction	EUS-FNA without suction uses the fine-needle capillary sampling technique to achieve the same result
	2014	Slow pull versus suction (using ProCore)	Slow-pull technique was associated with less blood conta increase in the diagnostic yield, especially when used wit
	2014	10 mL versus 50 mL negative pressure	50 mL negative pressure were significantly superior to th by 10 mL negative pressure for histopathological diagnosi
	2015	Slow pull versus suction	No difference between suction and slow pull in EUS-FNA solid pancreatic lesions using a standard 22-G needle
eh *et al.*	2015	Nonsuction versus 10 mL negative pressure	Nonsuction related with less contamination by blood and diagnostic yield

TIPOS DE ASPIRACIÓN

Contraste EUS. Estudios muestran incremento de sensibilidad de 78,4% a 86,5% .Favorece el menor número de pases .

Characterization of small solid tumors in the pancreas: the value of contrast-enhanced harmonic endoscopic ultrasonography.

Kitano M, Kudo M, Yamao K, Takagi T, Sakamoto H, Komaki T, Kamata K, Imai H, Chiba Y, Okada M, Murakami T, Takeyama Y

Am J Gastroenterol. 2012 Feb; 107(2):303-10.

[PubMed] [Ref list]

ROSE vs MOSE (macroscopic on site evaluation).

Endoscopic ultrasound (EUS)-guided fine needle biopsy alone vs. EUS-guided fine needle aspiration with rapid onsite evaluation in pancreatic lesions: a multicenter randomized trial.

Chen YI, Chatterjee A, Berger R, Kanber Y, Wyse J, Lam E, Gan I, Auger M, Kenshil S, Telford J, Donnellan F, Quinlan J, Lutzak G, Alshamsi F, Parent J, Waschke K, Alghamdi A, Barkun J, Metrakos P, Chaudhury P, Martel M, Dorreen A, Candido K, Miller C, Adam V, Barkun A, Zogopoulos G, Wong C

Endoscopy. 2022 Jan; 54(1):4-12.

- Localización de lesión lo más cercana al eco.
- Aplicar doppler para evitar vasos.
- Se saca la vaina apoyándose sobre la lesión y se pasa la aguja retirando o no el estilete dependiendo de la lesión.
- Se empuja el estilete para retirar restos de moco o pared intestinal (salvo en quistes) y se conecta jeringa de succión Si la lesión es hiper vascular primer pase sin succión hasta ver muestra. Métodos de aspiración seca, húmeda sin diferencias significativas. Fanning recomendable en lesiones muy duras (Neoplasias pancreáticas).
- Se saca muestra rápido para evitar secado y se pone en cristales (o medio alternativo- Thin pred si disponible)

Métodos de Mejorar la rentabilidad

- Lo más importante Patólogo experto- Sin esto nada vale! Coordinación y buen rollo- Sin ellos no tenemos diagnóstico.
- Tipo de Aguja- De menor tamaño (25g) .
- Técnica de punción . Fanning con succión
- Colección y procesado de las muestras en medios específicos

(Thin-prep, Cytolite, Formol, Bloque celular).

- Análisis molecular tipo GNAS, Kras,P53).
- Decidir si Paff o Punción o Ambas (nuevas agujas que permiten ambos procedimientos con la misma aguja).

The EFSUMB Guidelines and Recommendations on the Clinical Practice of Contrast Enhanced Ultrasound (CEUS): Update 2011 on non-hepatic applications

Authors

F. Piscaglia[1], C. Nolsøe[2], C. F. Dietrich[3], D. O. Cosgrove[4], O. H. Gilja[5], M. Bachmann Nielsen[6], T. Albrecht[7], L. Barozzi[8], M. Bertolotto[9], O. Catalano[10], M. Claudon[11], D. A. Clevert[12], J. M. Correas[13], M. D'Onofrio[14], F. M. Drudi[15], J. Eyding[16], M. Giovannini[17], M. Hocke[18], A. Ignee[19], E. M. Jung[20], A. S. Klauser[21], N. Lassau[22], E. Leen[23], G. Mathis[24], A. Saftoiu[25], G. Seidel[26], P. S. Sidhu[27], G. ter. Haar[28], D. Timmerman[29], H. P. Weskott[30]

Affiliations

Affiliation addresses are listed at the end of the article.

EFSUMB Guidelines and Recommendations on the Clinical Use of Ultrasound Elastography. Part 2: Clinical Applications

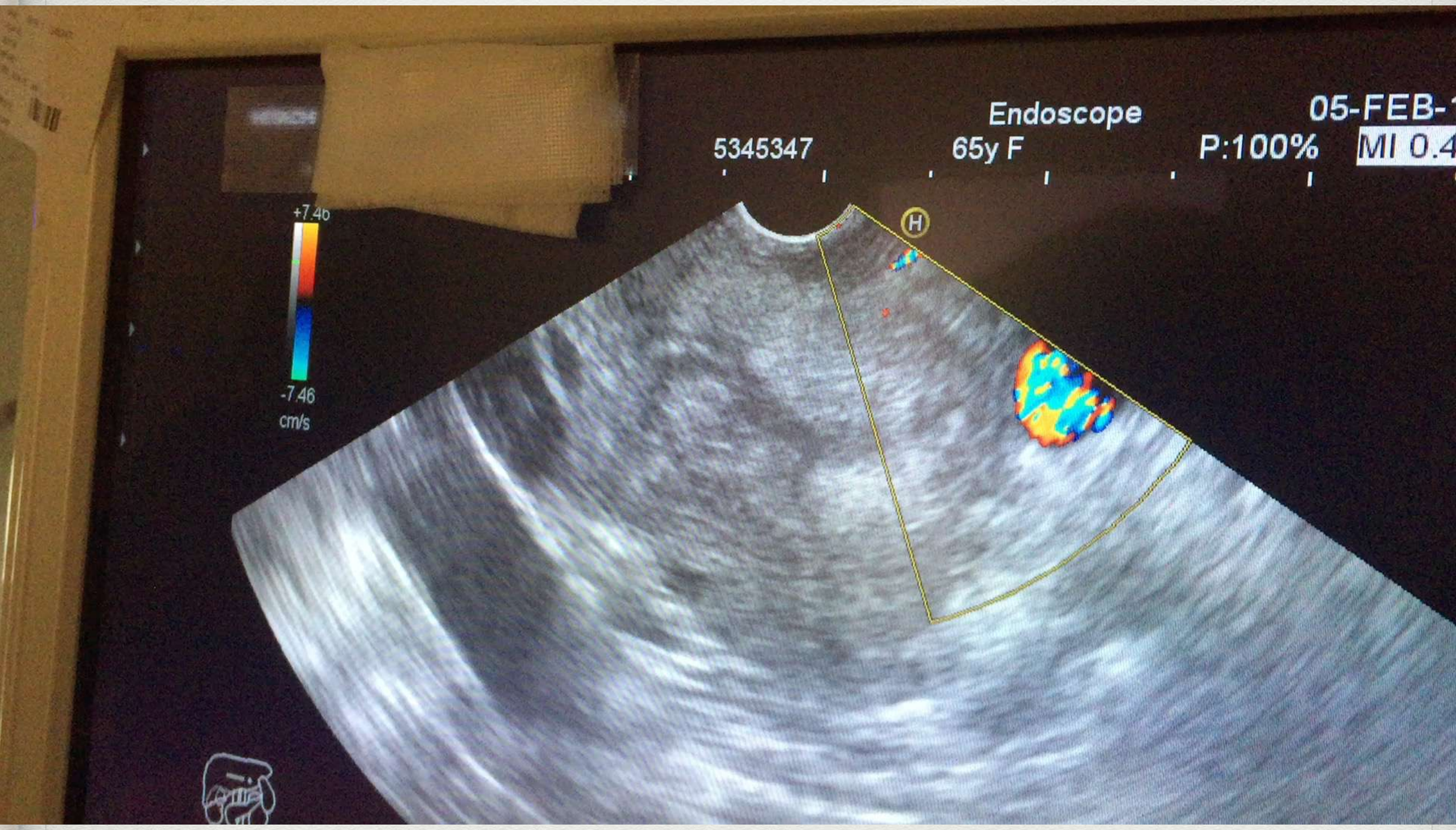
Cosgrove D et al. EFSUMB Guidelines and... Ultraschall in Med 2013; 34: 238–253

Authors

D. Cosgrove[1], F. Piscaglia[2], J. Bamber[3], J. Bojunga[4], J.-M. Correas[5], O. H. Gilja[6], A. S. Klauser[7], I. Sporea[8], F. Calliada[9], V. Cantisani[10], M. D'Onofrio[11], E. E. Drakonaki[12], M. Fink[13], M. Friedrich-Rust[14], J. Fromageau[3], R. F. Havre[15], C. Jenssen[16], R. Ohlinger[17], A. Săftoiu[18], F. Schaefer[19], C. F. Dietrich[20]

Focal pancreatic lesions identified with US can be studied with CEUS in order to improve:

1. Characterisation of ductal adenocarcinoma. (Recommendation Level: A;1b)
2. Differential diagnosis between pseudocysts and cystic tumours. (Recommendation Level: A;1b)
3. Differentiation of vascular (solid) from avascular (liquid/necrotic) components of a lesion. (Recommendation Level: A;1b)
4. Defining the dimensions and margins of a lesion, including its relationship with adjacent vessels. (Recommendation Level: B;2b)
5. Management of the lesion with a better distinction between solid and cystic lesions, thus providing information for the choice of the next imaging modality (i. e. MRI and/or Endoscopic US for cystic lesions). (Recommendation Level: C;5)
6. Diagnosis in cases that are indeterminate on CT (vascularisation of solid pancreatic lesions; differential diagnosis between pseudocysts and pancreatic cystic tumours, especially mucinous cystic tumour). (Recommendation Level: C;5).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+7.46
-7.46
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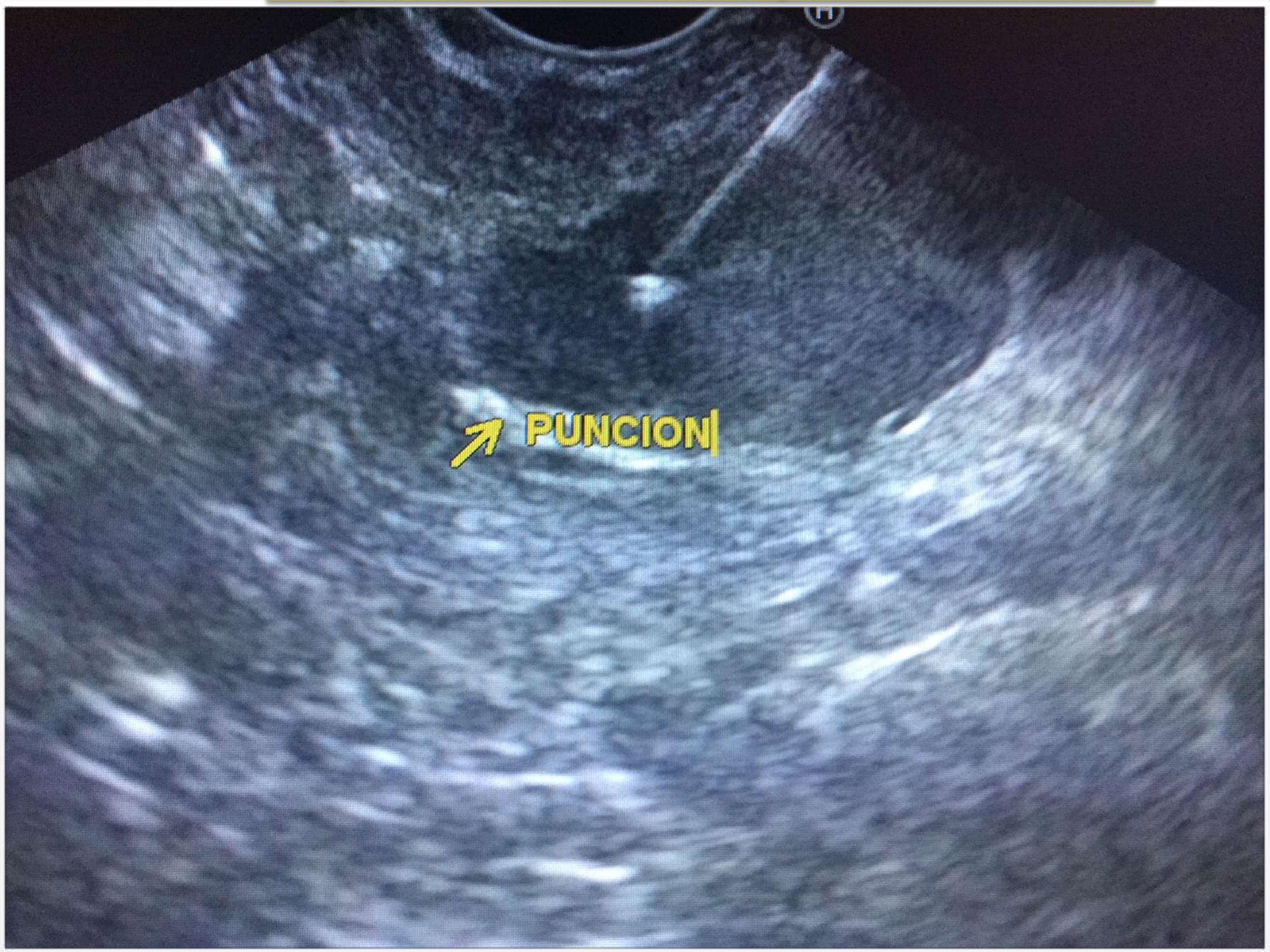

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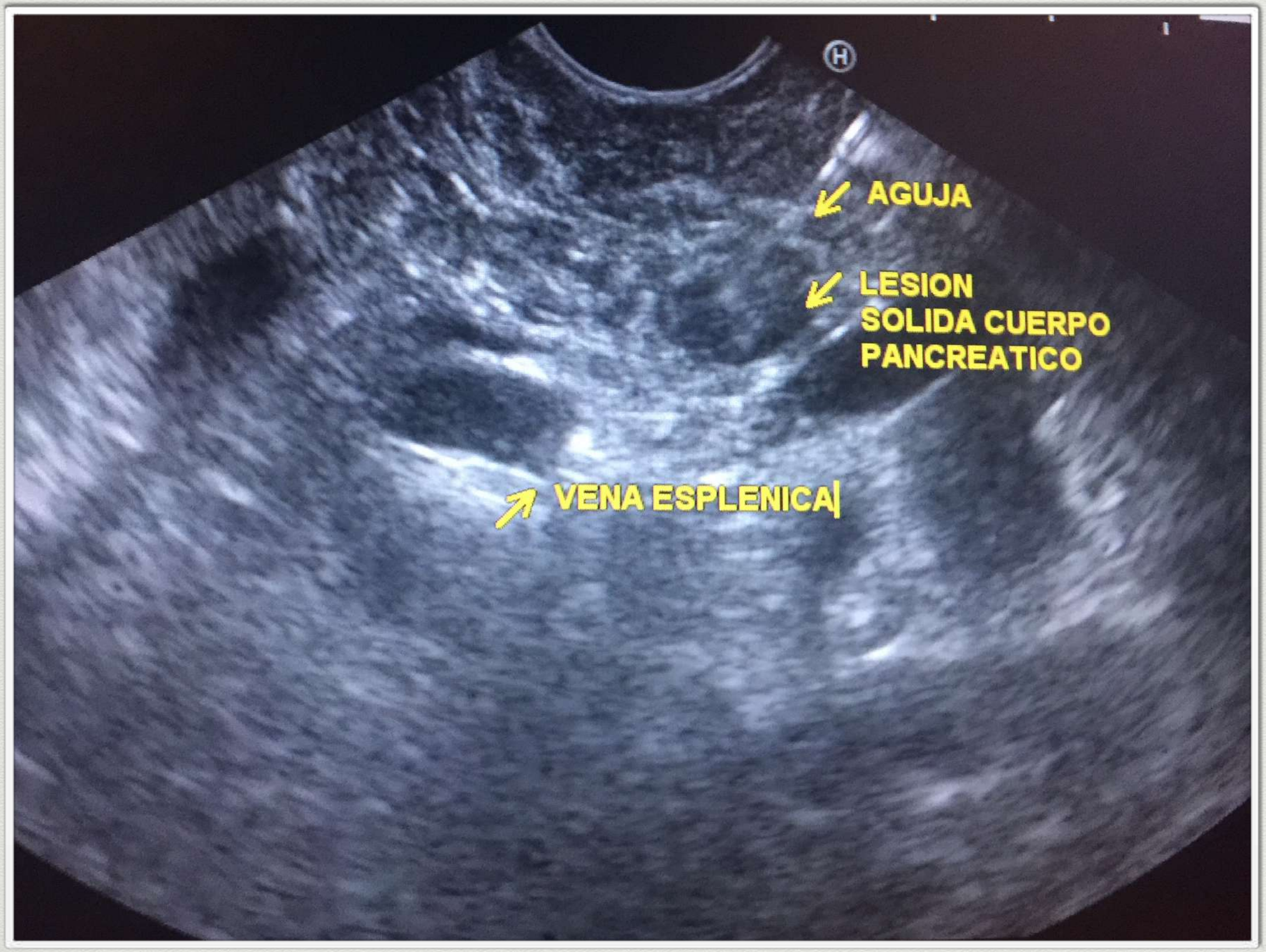


Técnicas" Forthcoming"en EUS Pancreas

- Inyección intratumoral de agentes víricos.

Proof of concept clinical study by intratumor injection of VCN-01, an oncolytic adenovirus expressing hyaluronidase in patients with pancreatic cancer

Hidalgo M.[1,†], Bazan-Peregrino M.[2*], Gil M./Laquente B.[3], Alvarez R.[1], Mato-Berciano A.[2], Gimenez-Alejandre M.[2], Morgado M.[2], Maliandi M.V.[2], Riesco M.C.[4], Moreno R.[7], Morell M.[6], Ecoendoscopista H12O[4], Gornals J.B.[5], Ecoendoscopista ClOCC[1], Capella G.[6], Alemany R.[7], Salazar R.[3], Blasi E.[2], Blasco C.[2], Cascallo M.[2], García-Carbonero R.[4]

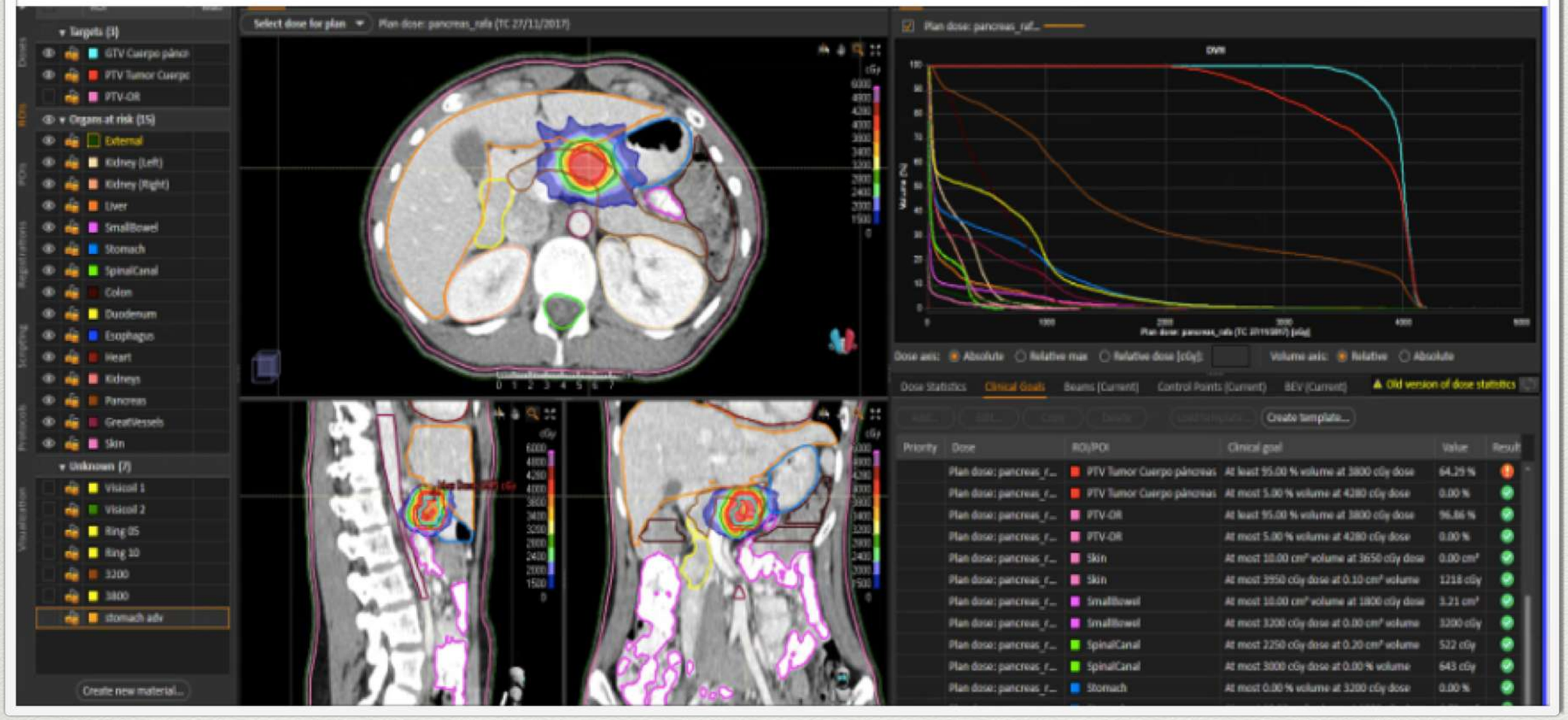
- Colocación de fiduciales para SBRT
- Radiofrecuencia .Colocación de semillas impregnadas en quimioterápicos.
- Micropartículas de fósforo 32 (OncoSil)

- Colocación de semillas impregnadas en quimioterápicos . Estudios animales.
- Ablación con laser Na-YAG
- Cryoterapia.
- Electropolirización.
- Terapia genética.

Gastrointestinal Malignancies including the current study

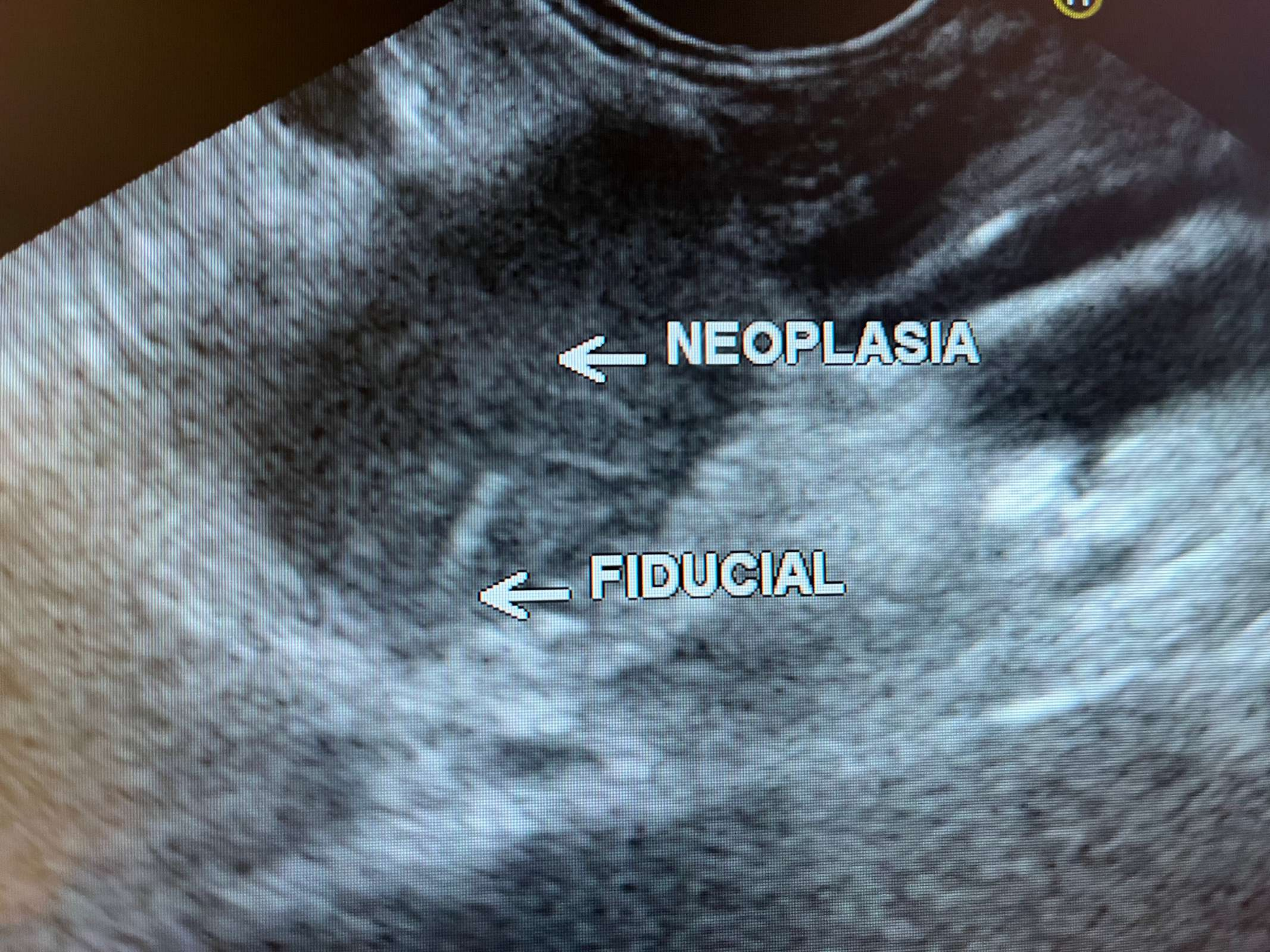
Study	Type of study	No. Of cases	Needle used, gauge	Type of fiducials (lengthxdiameter,mm)	Technical success (%)	Adverse events (no. of patients)
Pishvaian et al (2006)	P	13	19	Gold (3 or 5 x 0,8)	11 (85)	Cholangitis (1)
Varadarajulu et al (2010)	R	9	19	Gold (5 x 0,8)	9 (100)	None
Park et al (2010)	P	57	19	Visicoil (2.5 x 0,8)	56 (98)	Minor bleeding (1)
Sanders et al (2010)	P	51	19	Gold (5 x 0,8)	46 (90)	Mild pancreatitis (1)
DiMaio et al (2010)	R	30	22	Visicoil (10 x 0,35)	29 (97)	Fever (1)
Ammar et al (2010)	C	13	22	Visicoil (10 x 0,35)	13 (100)	None
Khashab et al (2012)	R	29 10	19 22	Gold (5 x 0,8) Visicoil (10 x 0,35)	39 (100)	None
Fernández et al (2013)	R	60	19 22	Visicoil (10 x 0,75) Visicoil (10 x 0,35 or 10 x 0,5)	60 (100)	None
Choi et al (2014)	R	32	19	Gold (3 x 0,8)	32 (100)	Mild pancreatitis
DavilaFajardoR et al (2014)		23	22	Visicoil (10 x 0,35)	23 (100)	Minor bleeding
Dhadham et al (2016)	R	188	19 22	Visicoil (10 x 0,75) Visicoil (10 x 0,35)	187(99,5)	Minor bleeding (7)
Current study	R	47	22	Visicoil (10 x 0,35)	47 (100)	Duodenal abscess (1) Mild pancreatitis (1)

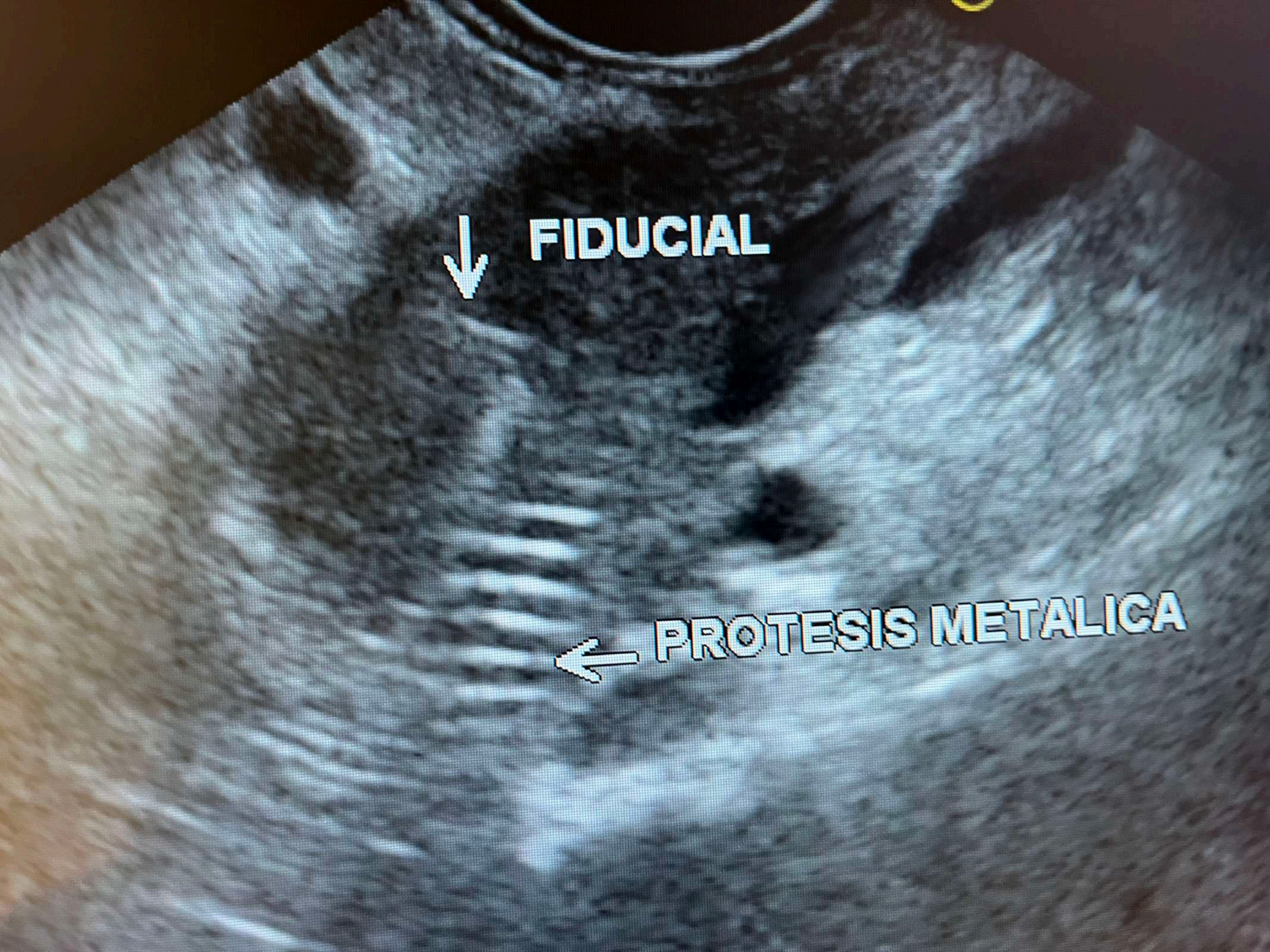
Dosis prescrita 40 Gy en 5 fracciones de 8 Gy



Unidad de Radioterapia Hospital Universitario Sanchinarro.

TAC de planificación
Cortesia del Departamento de Radioterapia del Hospital Universitario Sanchinarro


NEOPLASIA
FIDUCIAL


FIDUCIAL
PROTESIS METALICA

Introducing the IMMray® PanCan-d test

Now Available!

a blood test for the early detection of pancreatic ductal adenocarcinoma (PDAC) in individuals at high risk for familial or hereditary pancreatic cancer

immunovia, inc.

IMMray® PanCan-d	Stages I&II	All Stages
Sensitivity	89.0%	92.0%
Specificity	99.0%	99.0%
NPV 3% prevalence	99.7%	99.8%
PPV 3% prevalence	73.4%	74.0%
NPV 1% prevalence	99.9%	99.9%
PPV 1% prevalence	47.3%	48.2%

Table 1. IMMray PanCan-d performance excluding CA19-9 null individuals.

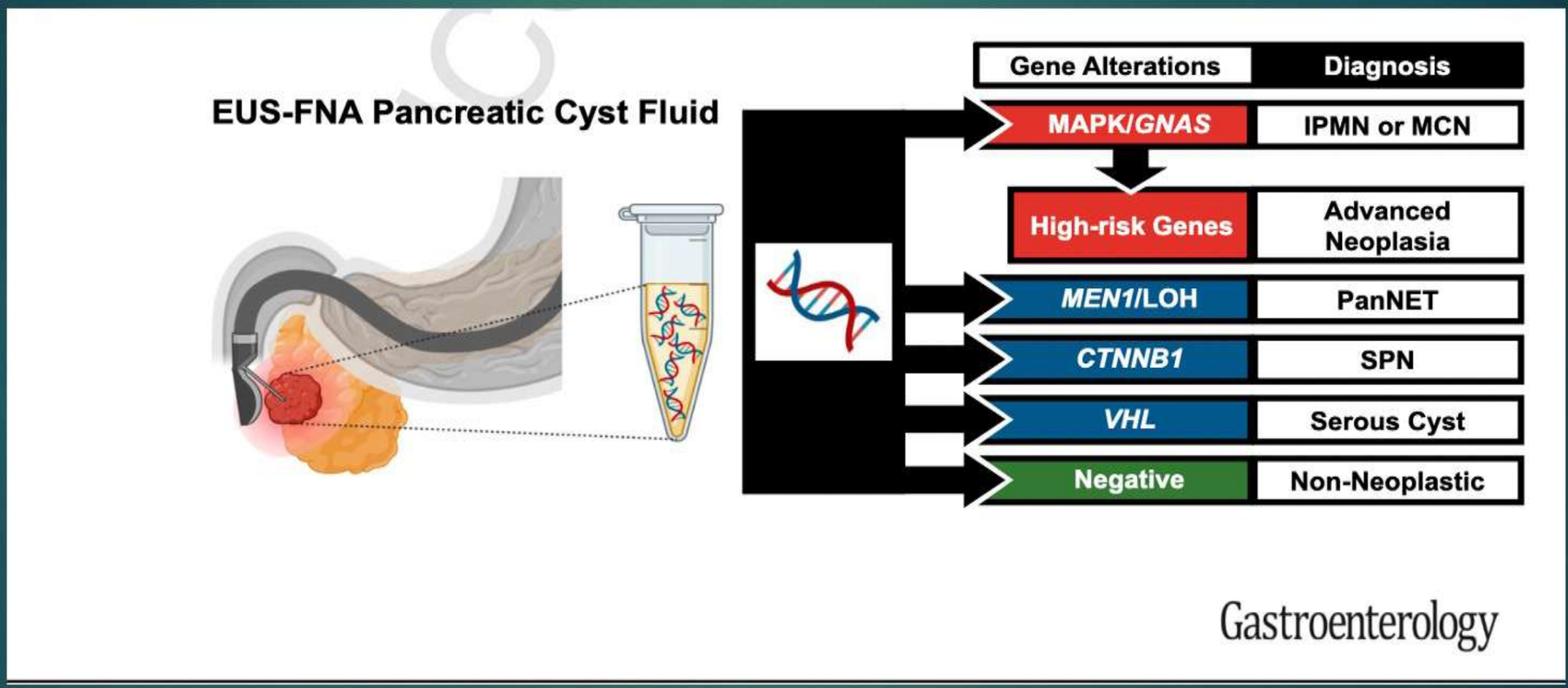
Conclusion

These results demonstrate the IMMray PanCan-d blood test can detect PDAC with high specificity (99%) and sensitivity (92%).

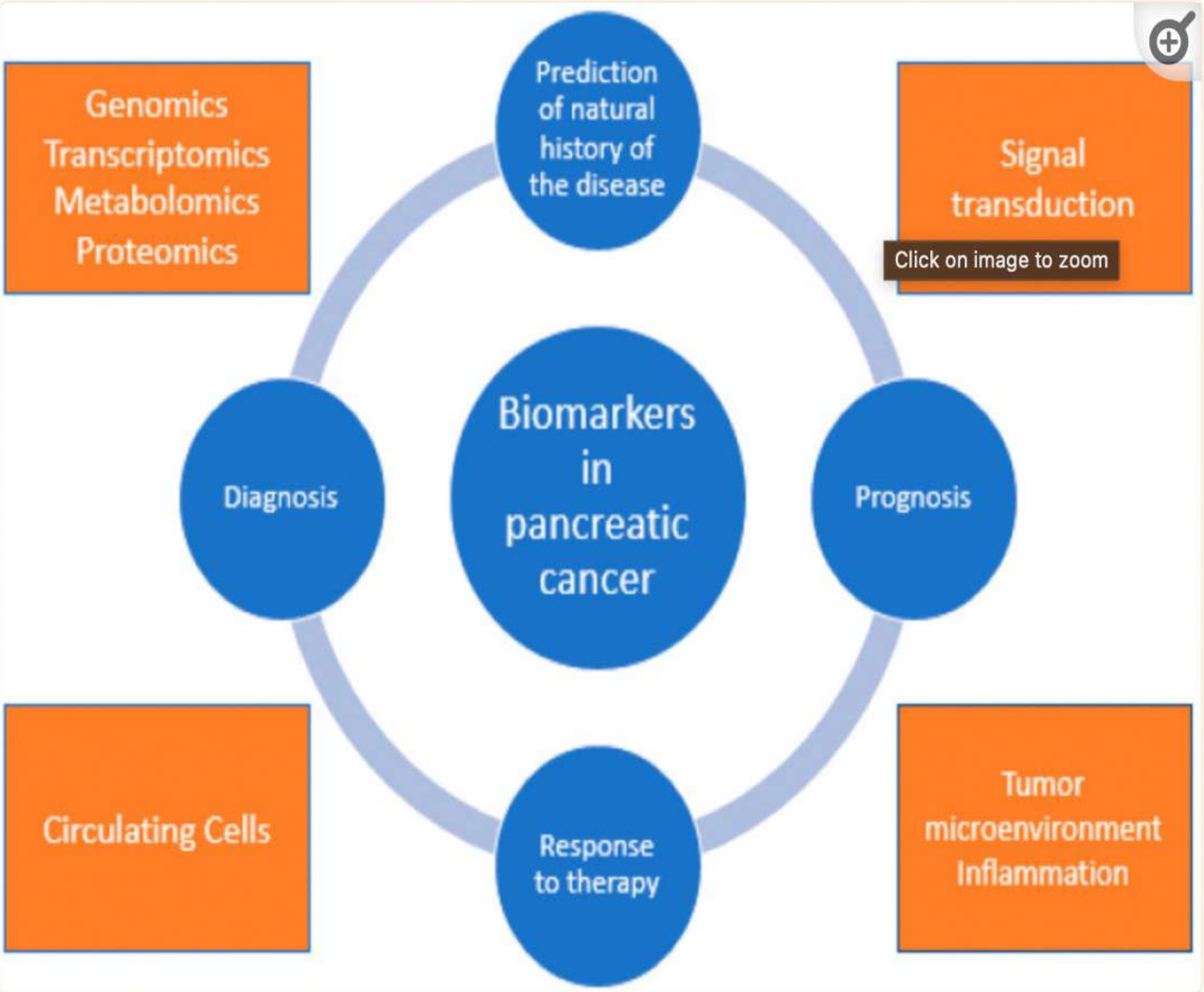
Brand RE et al. Detection of early stage pancreatic ductal adenocarcinoma using blood samples: Results from the IMMray PanCan-d

Prospective, Multi-Institutional, Real-Time Next-Generation Sequencing of Pancreatic Cyst Fluid Reveals Diverse Genomic Alterations That Improve the Clinical Management of Pancreatic Cysts

Alessandro Paniccia,[1,*] Patricio M. Polanco,[2,*] Brian A. Boone,[3,*] Abigail I. Wald,[4,*]



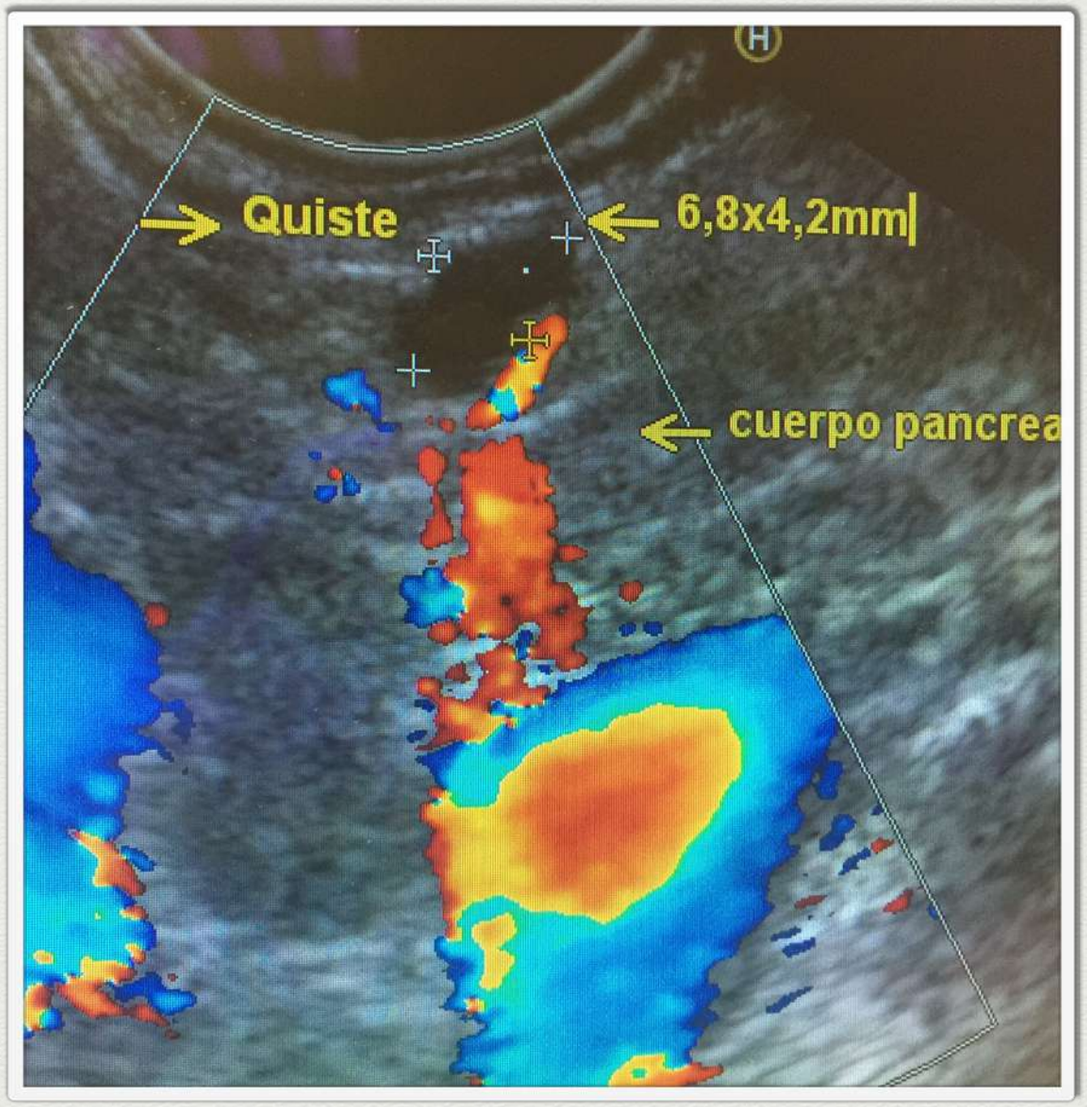
Gastroenterology


Genomics
Transcriptomics
Metabolomics
Proteomics
Prediction of natural history of the disease
Signal transduction
Click on image to zoom
Diagnosis
Biomarkers in pancreatic cancer
Prognosis
Circulating Cells
Response to therapy
Tumor microenvironment
Inflammation

Caso clínico 1.

- Paciente de 40 años que en control ginecológico se observa en Eco abdominal algo en pancreas.

- Se solicita RMN abdominal- Quiste pancreático. Ginecólogo la manda a EUS.

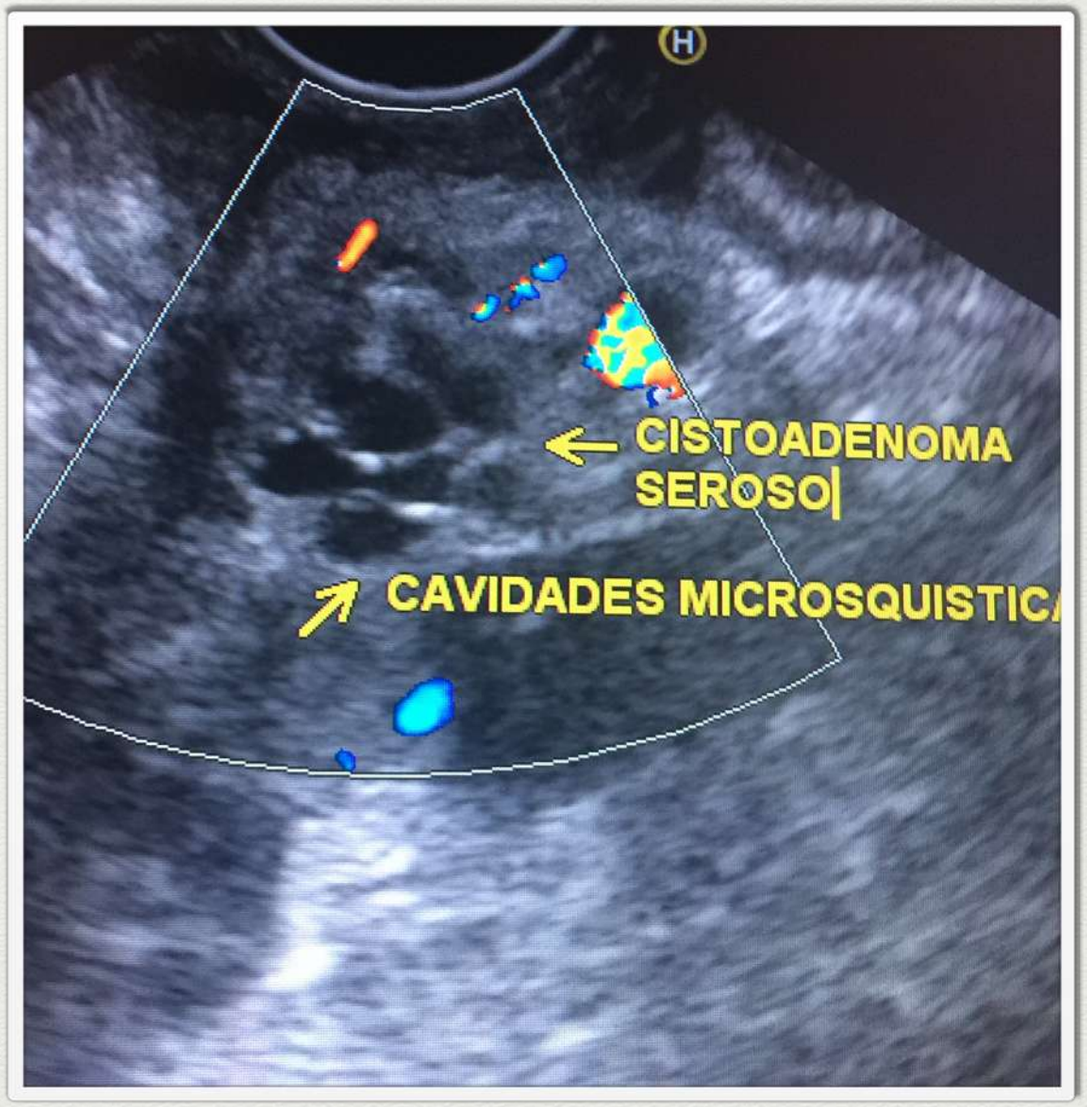


CASO 2

- Mujer de 60 años con estreñimiento y múltiples síntomas funcionales con terapia anti depresiva y Xarelto.

- TAC muestra lesión sólido Quística en Pancreas.

- Internista le pide EUS .



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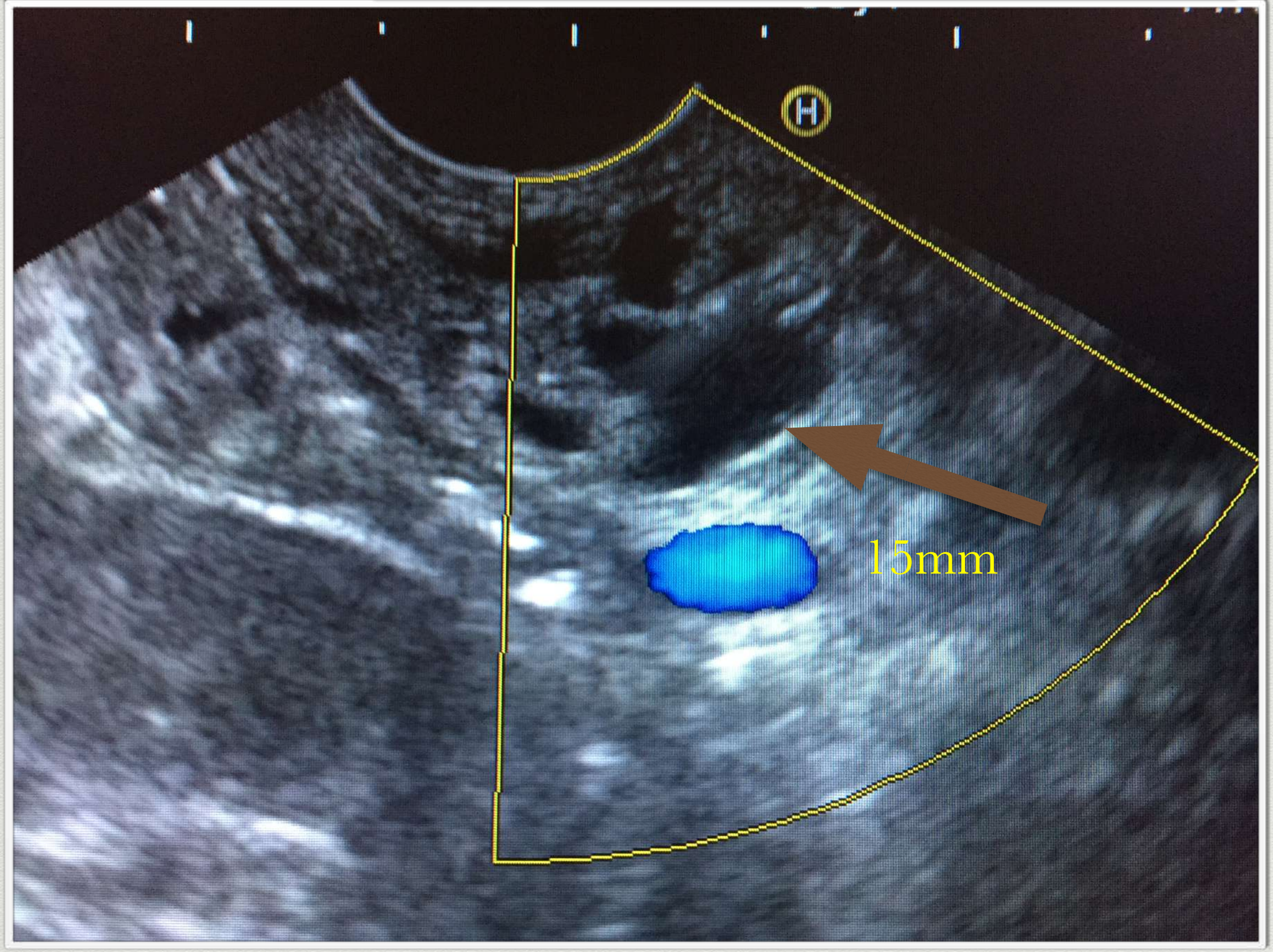

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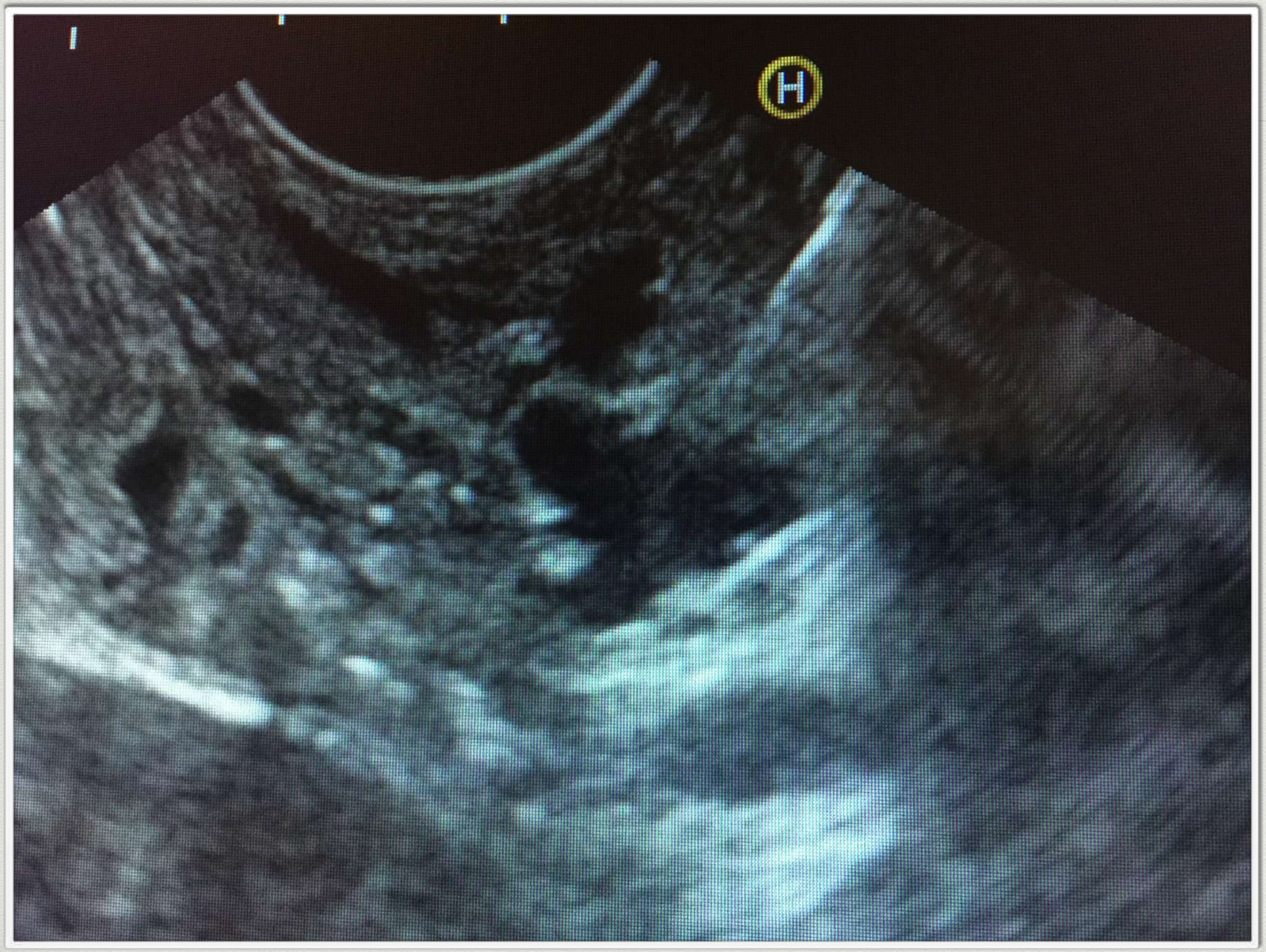

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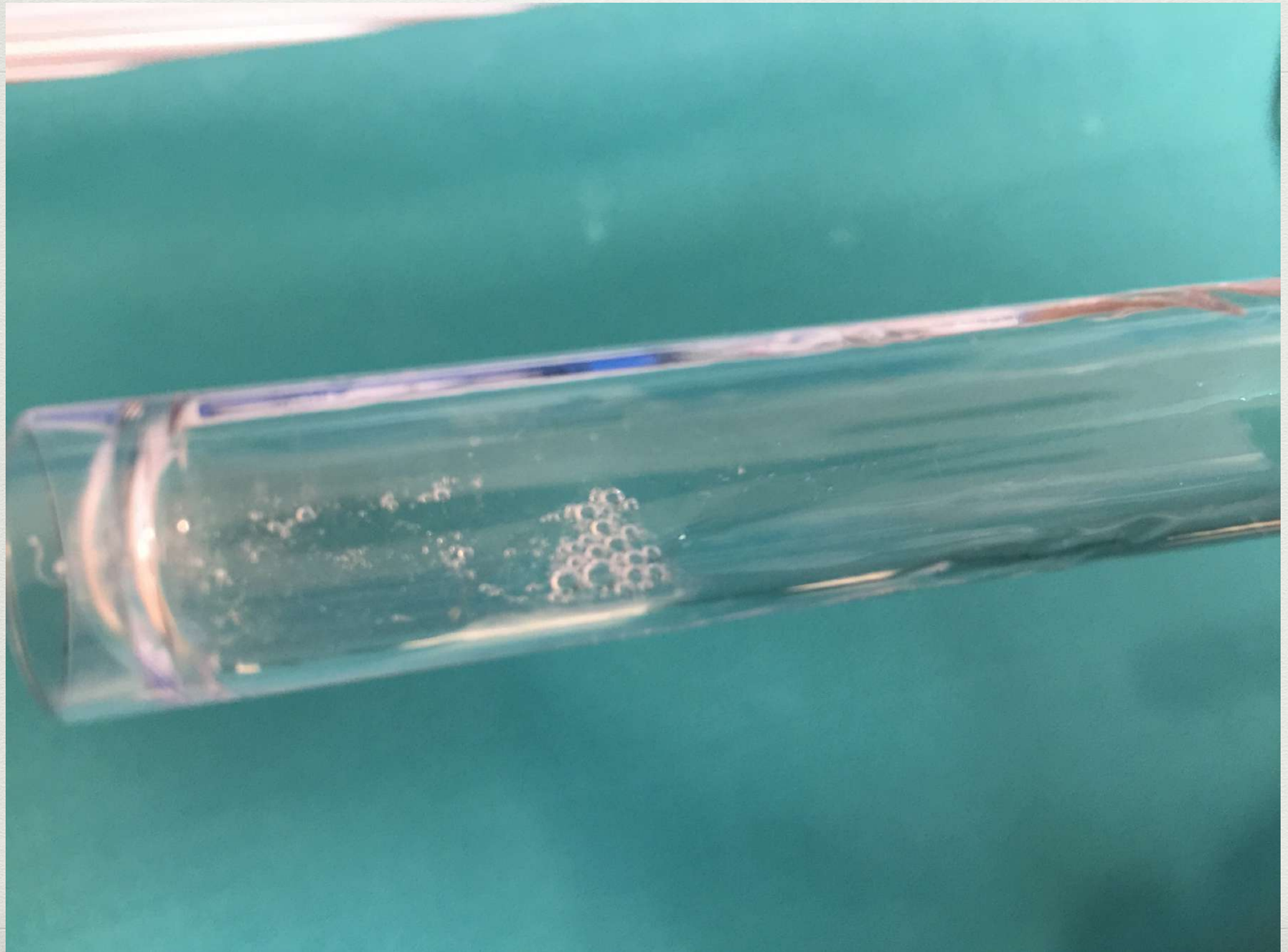
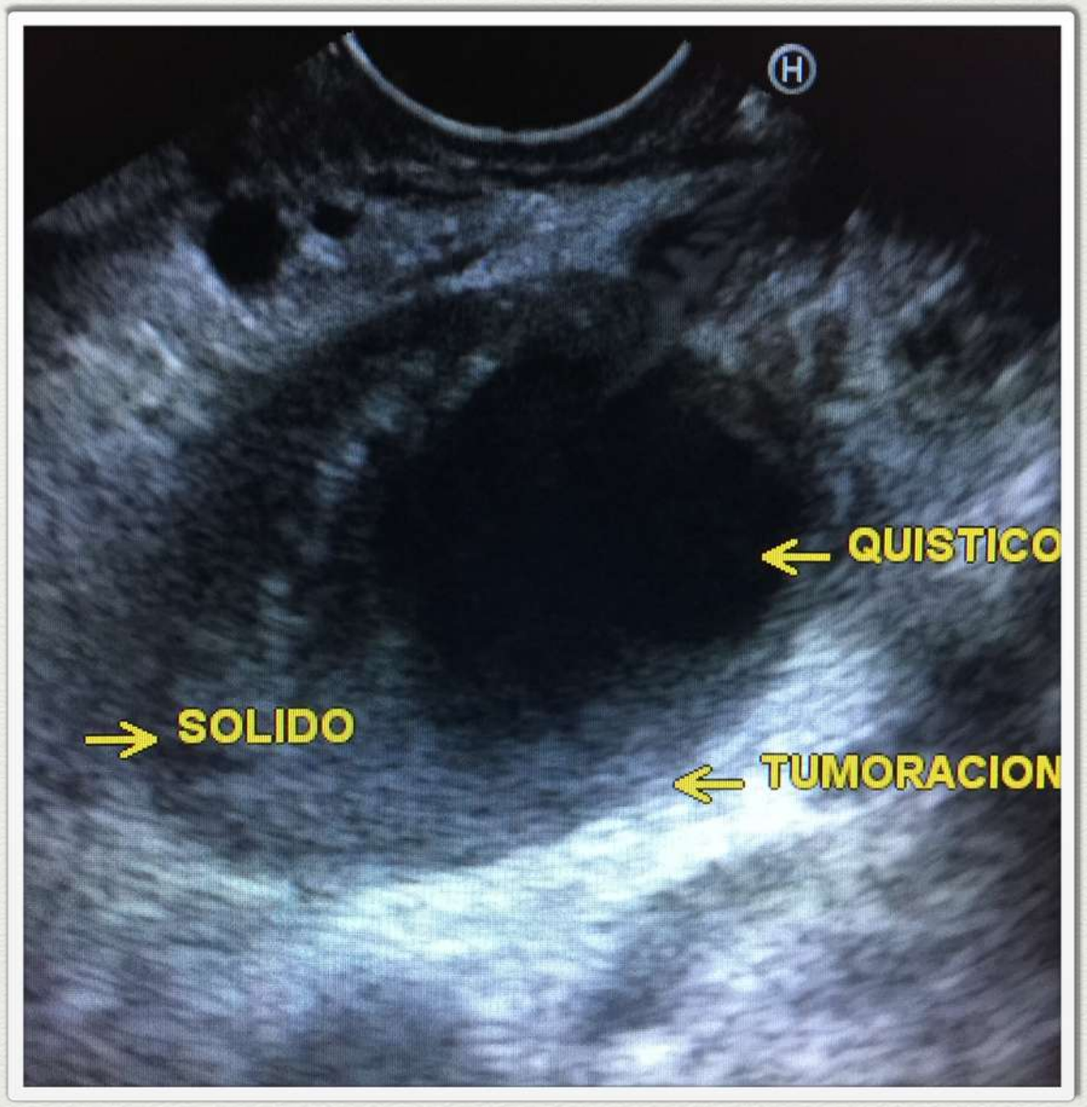


Caso 3.

- Hombre de 45 años con pancreatitis.

- TAC lesión sólido-Quística.

- Elevación del Ca19.9.

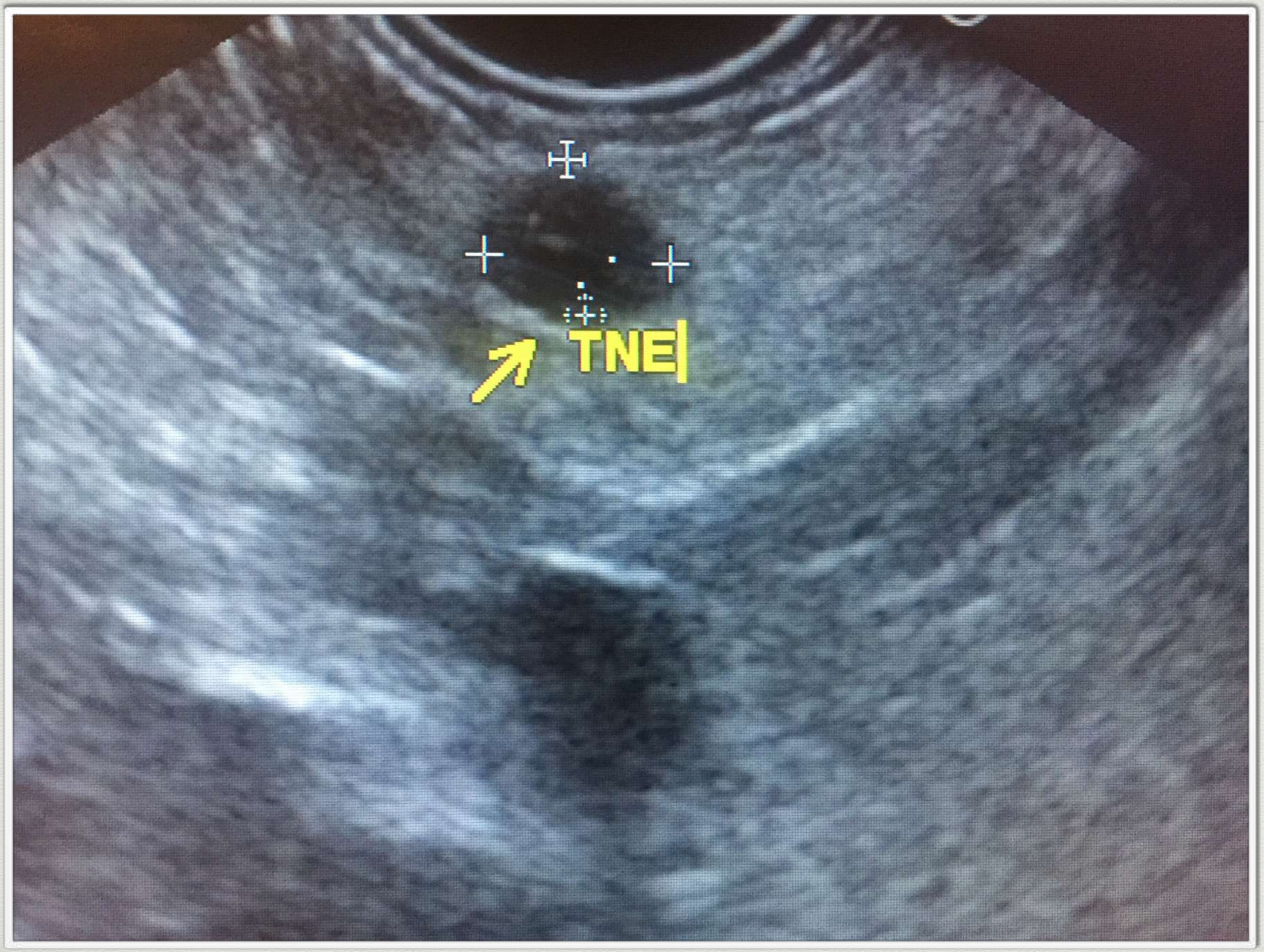


Departamento Endo. Sanchinarro

CASO 4

- Paciente de 45 años en seguimiento por urología por prostatitis de repetición.
- Se le pide TAC abomino -pélvico .
- Lesión sólida de 9mm en cuerpo pancreático.
- Petición para USE con punción.

Departamento Endoscopias Sanchinarro.



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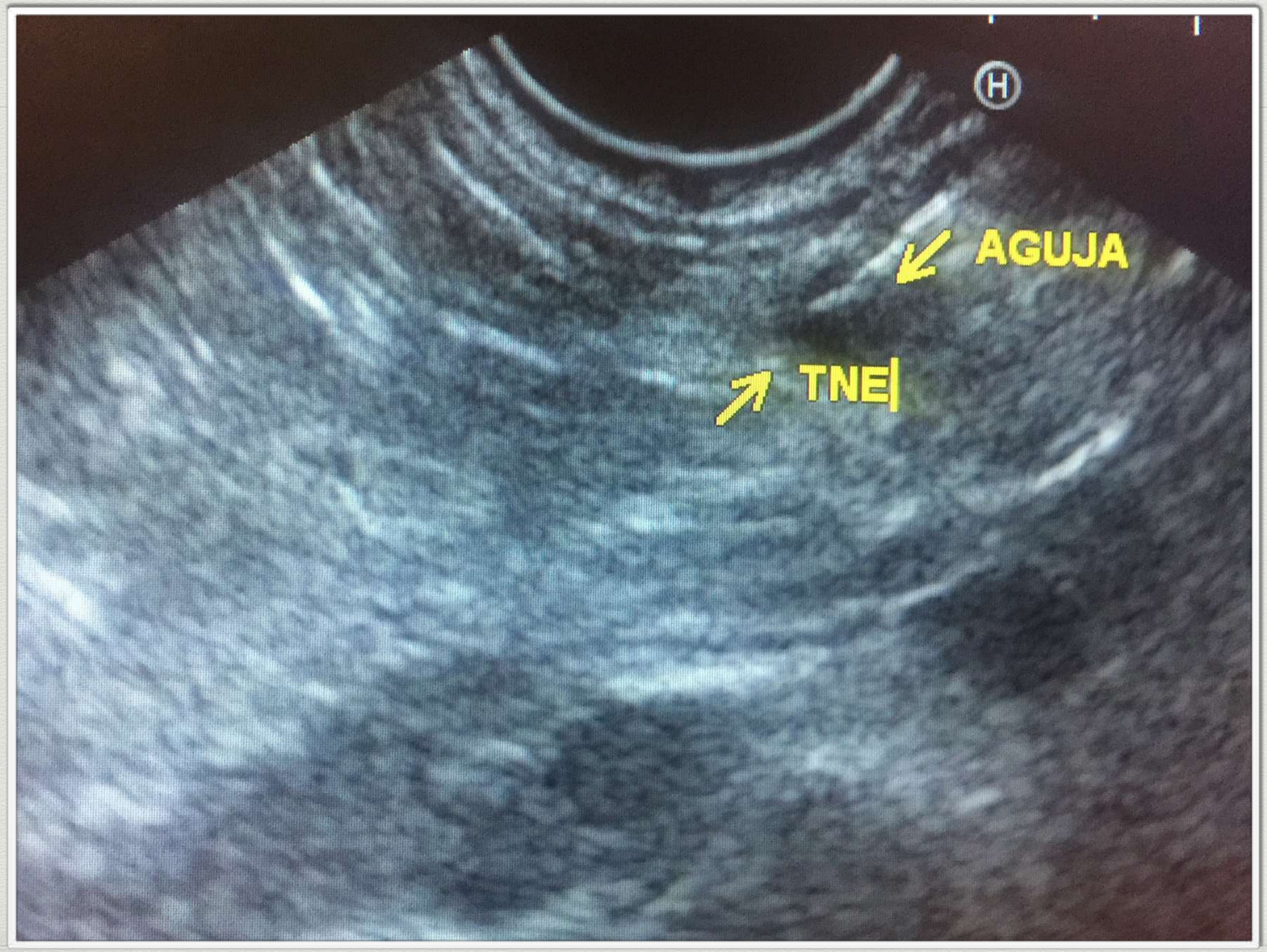

Caso clinico 5

- Paciente de 40 años de edad sin Hx clínica relevante.
- Se le realiza TAC abdominal en el contexto de dolor abdominal inespecífico.
- Se identifica lesión sólida de cola de páncreas compatible con TNE.
- Estudio de Análogos de la somato estatina negativo.
- Estudio Hormonal negativo.
- Estudio PET.RM sin captación.
- Paff- TNE y Muestra insuficiente (Se realizan 2 punciones - se ven 2 lesiones una hiperecoica y otra hipoecoica. Citologia - Displasia de alto grado.
- Se plantea cirugía dada la localización y edad del paciente.

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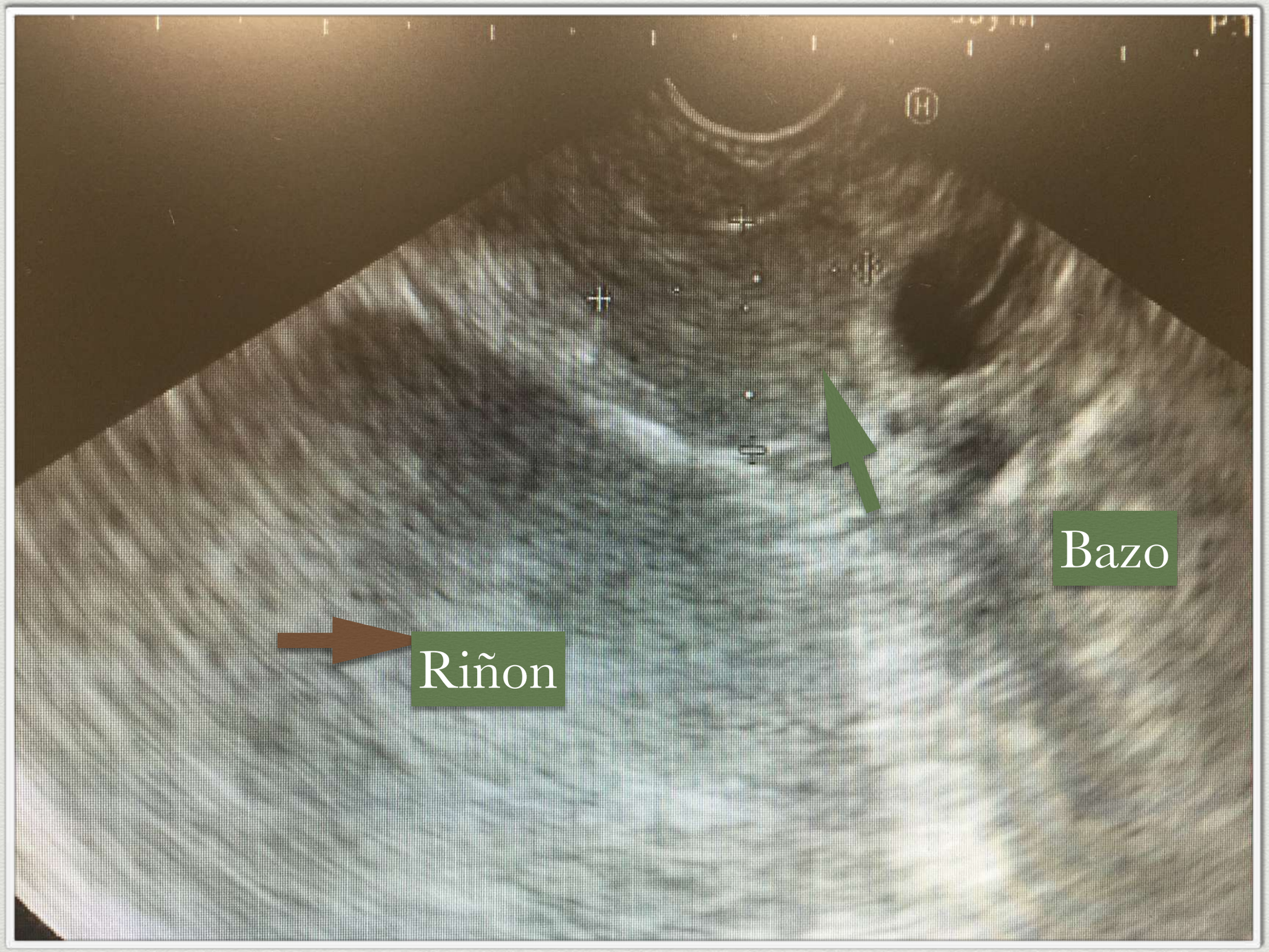

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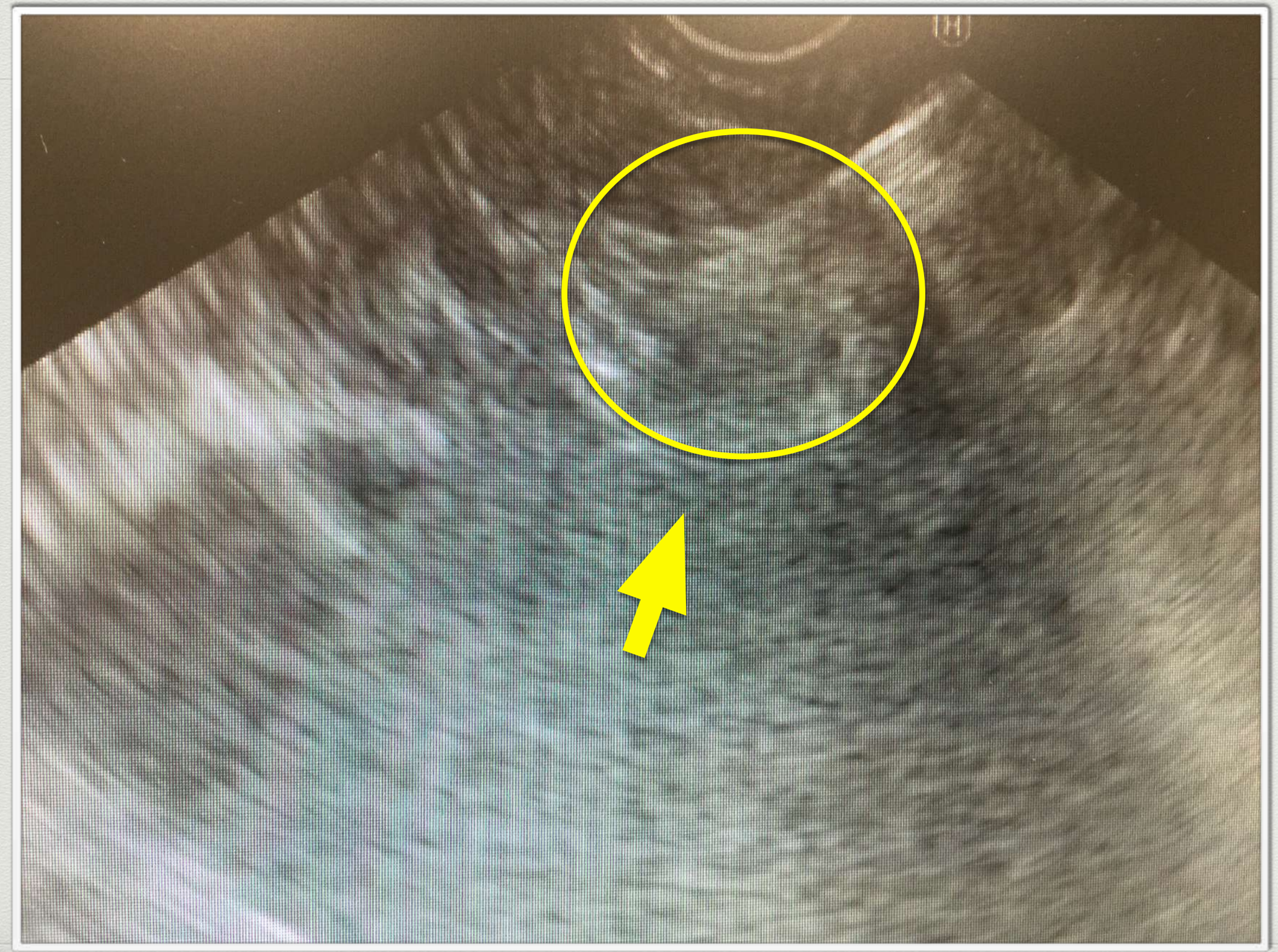

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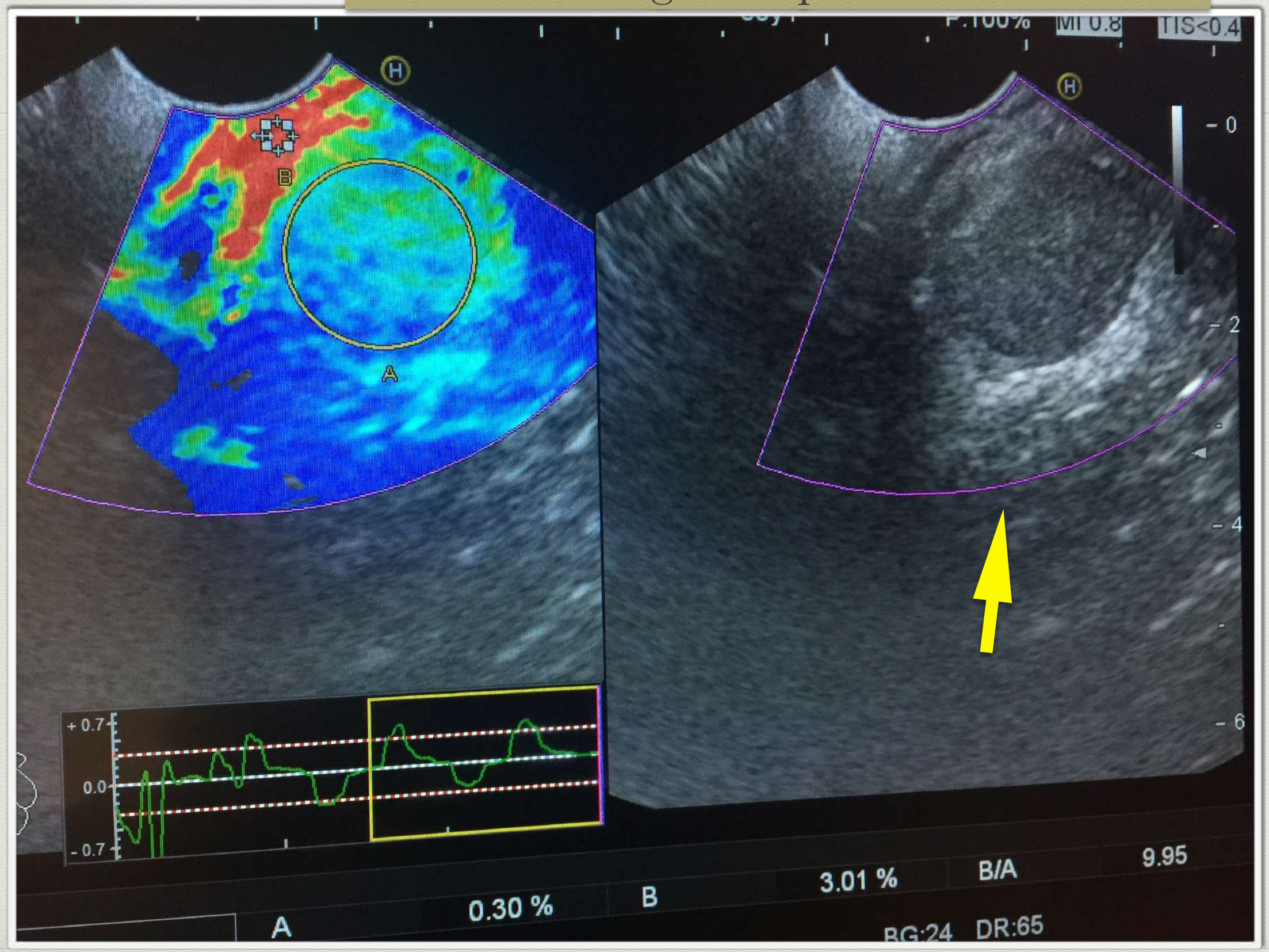
Elastografia quantitativa

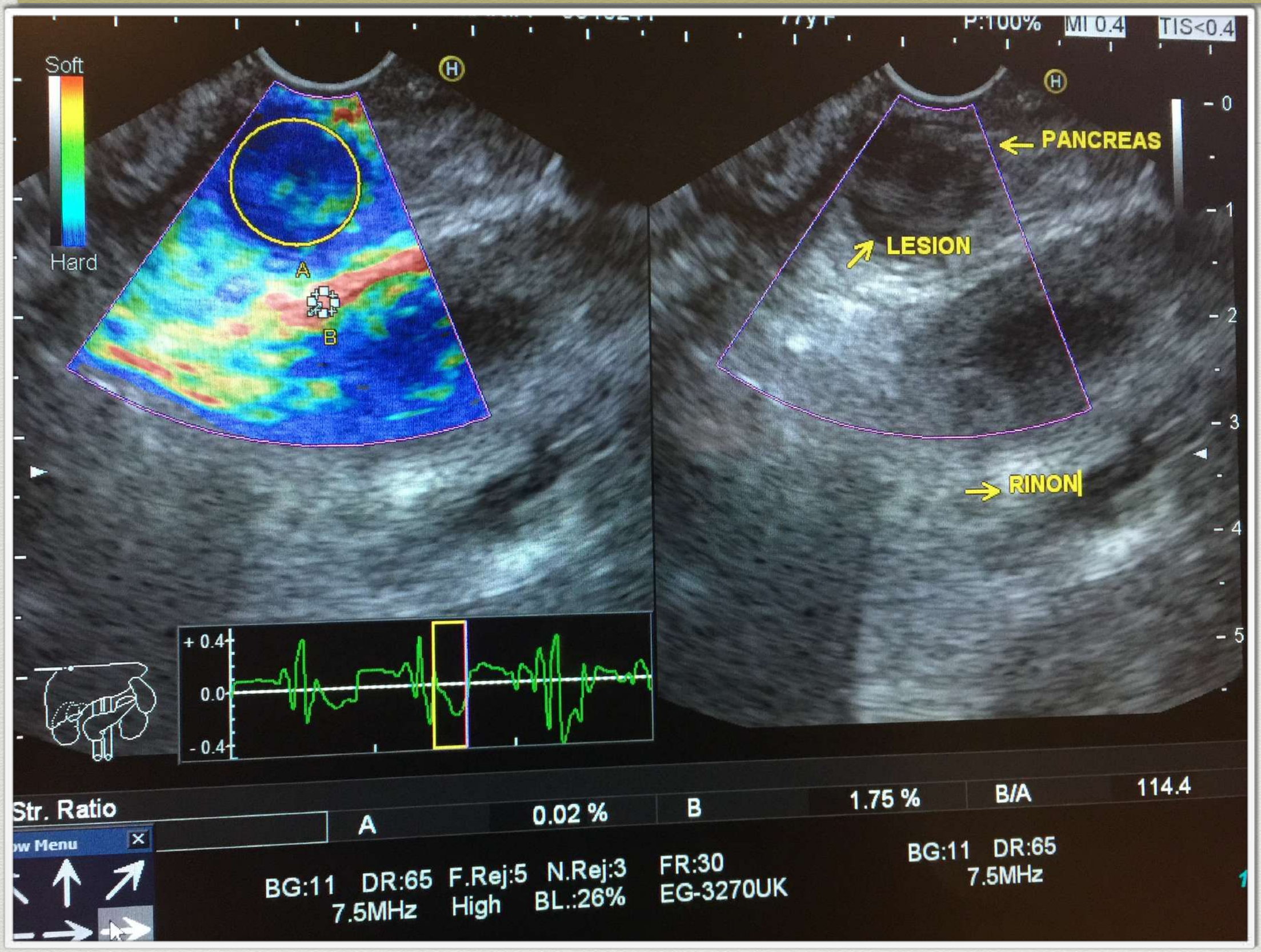


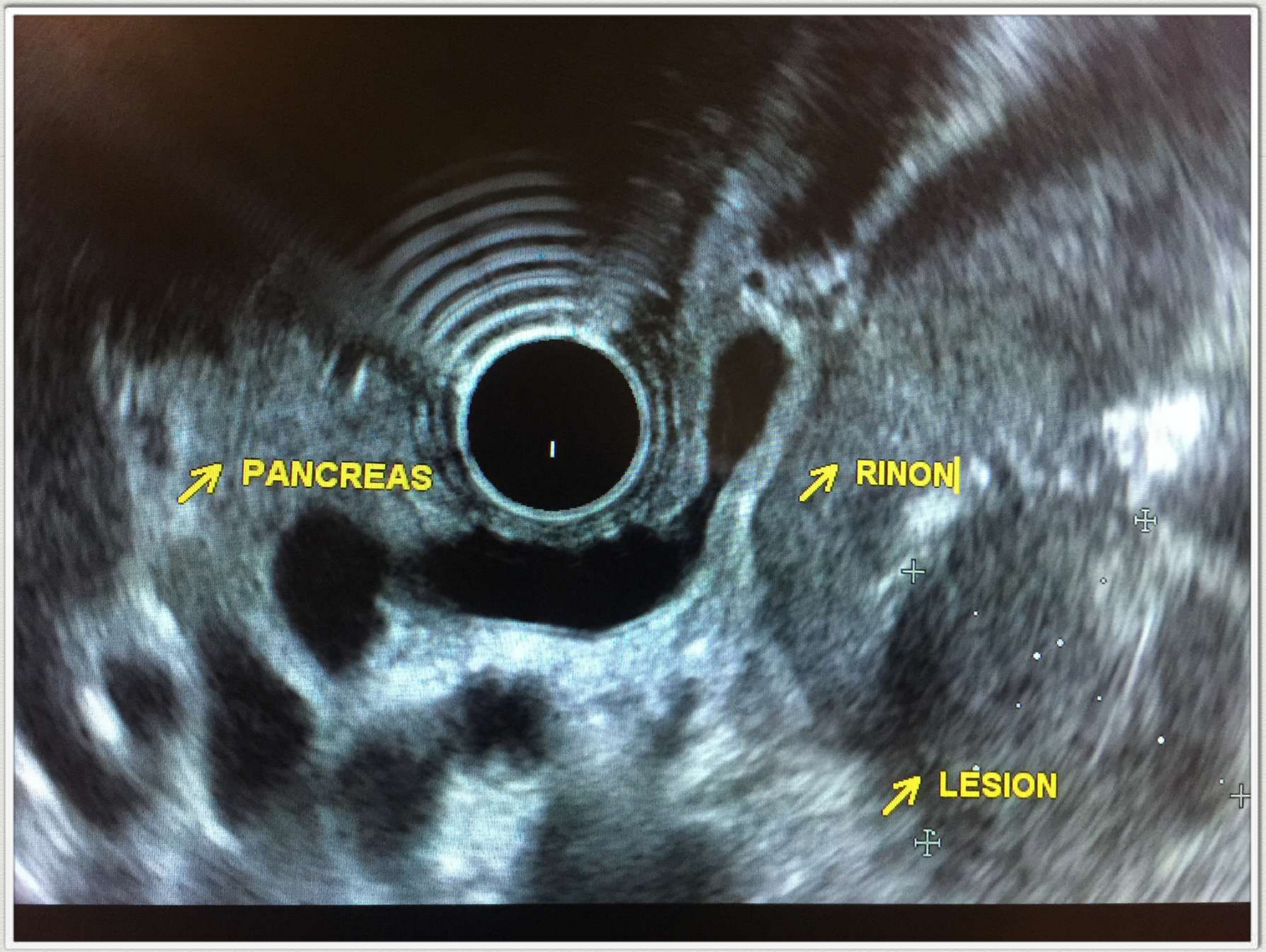
Caso clínico 6

- Paciente de 70 años -Anemia ferropénica
- Gastroscopia - múltiples lesiones ulcerosas en estómago con histología inespecífica no maligna.
- Tac lesiones renales y engrosamiento de capas gástricas.
- Se solicita estudio de Ecoendoscopia.

Lesión en pancreas/ Riñón.

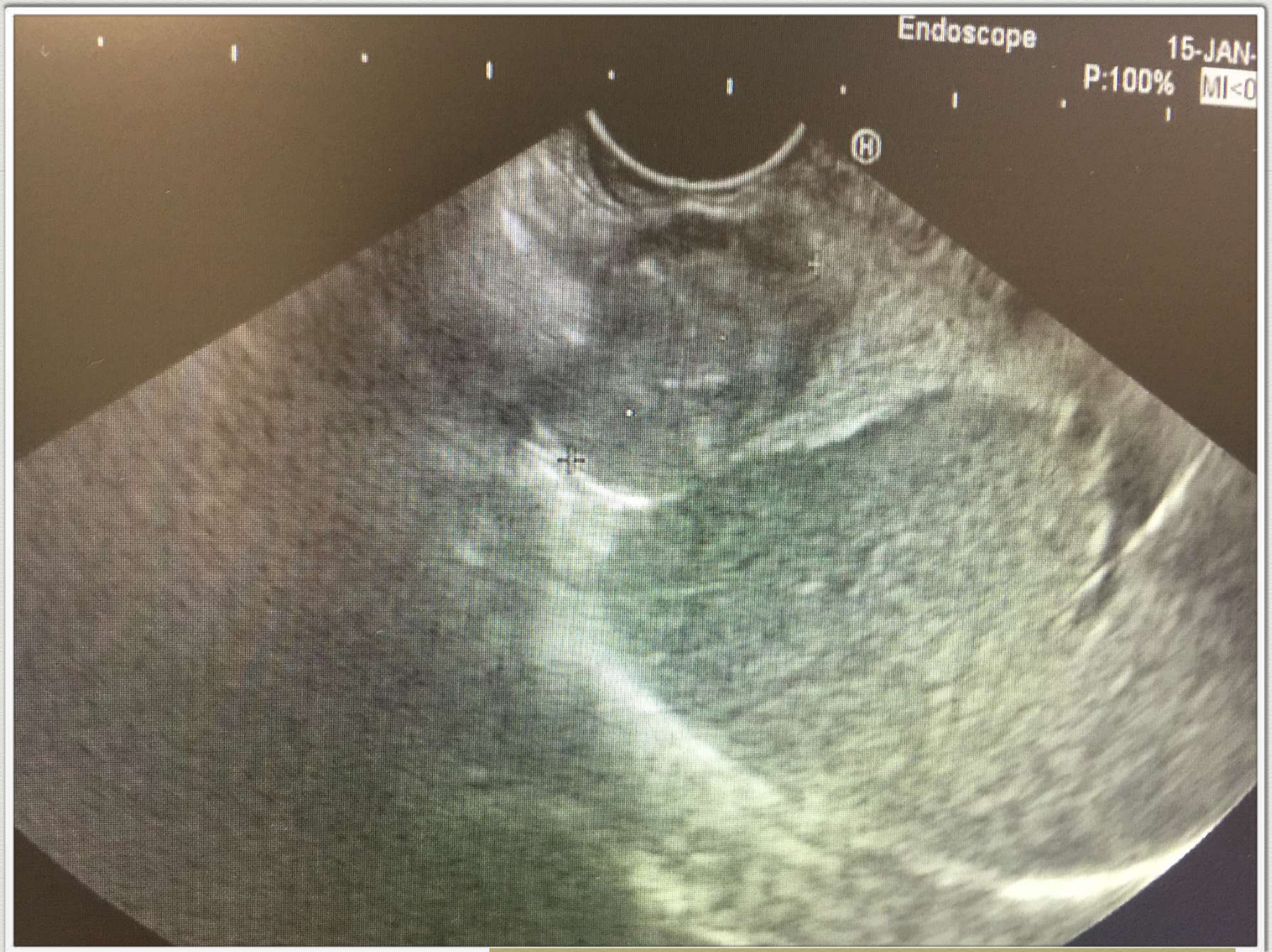
Elastografia




PANCREAS
RINON
LESION

Caso 7.Cuadro de Dispepsia en paciente con 34 años de edad.

Fuente :Drª Prados



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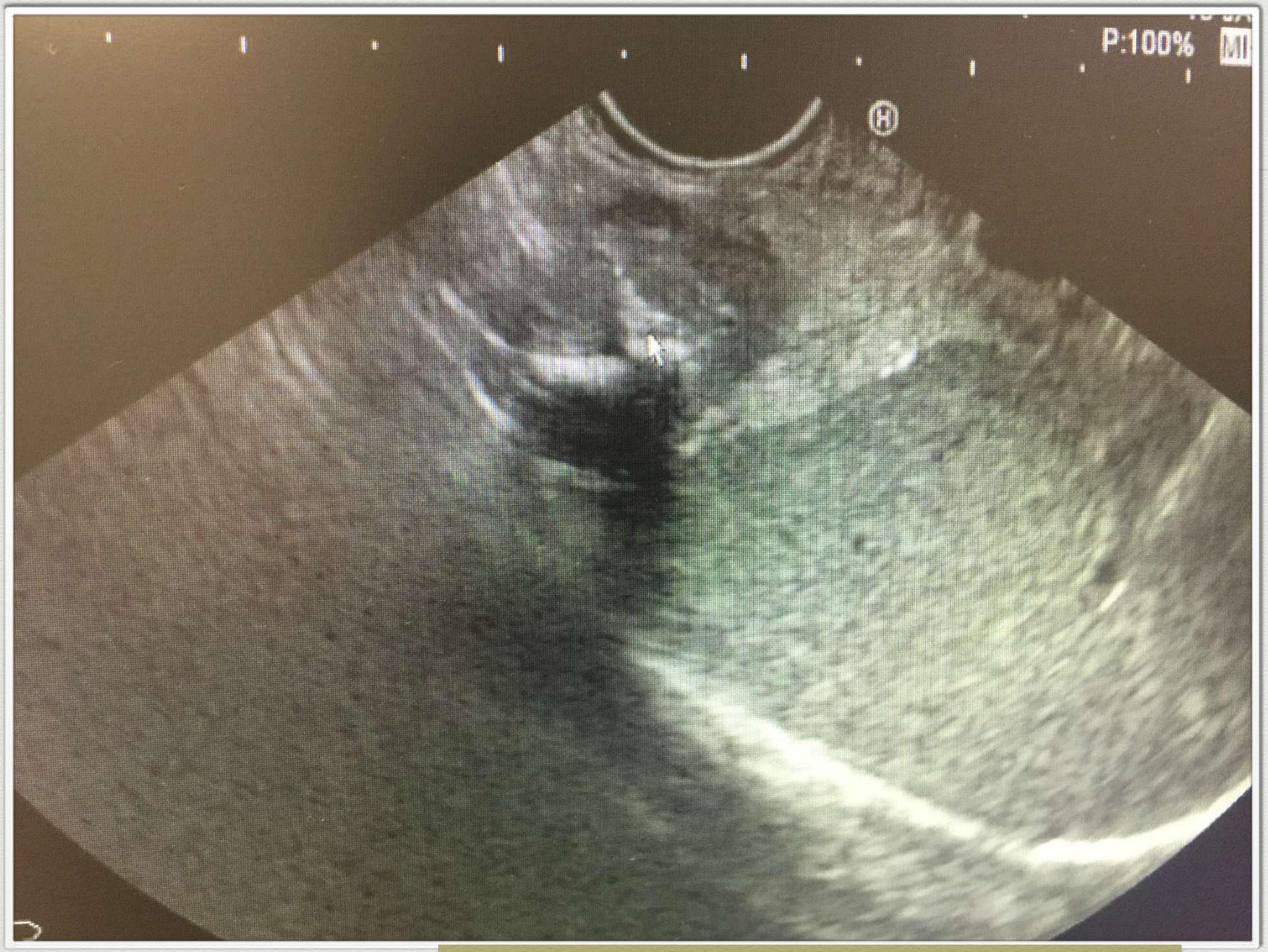
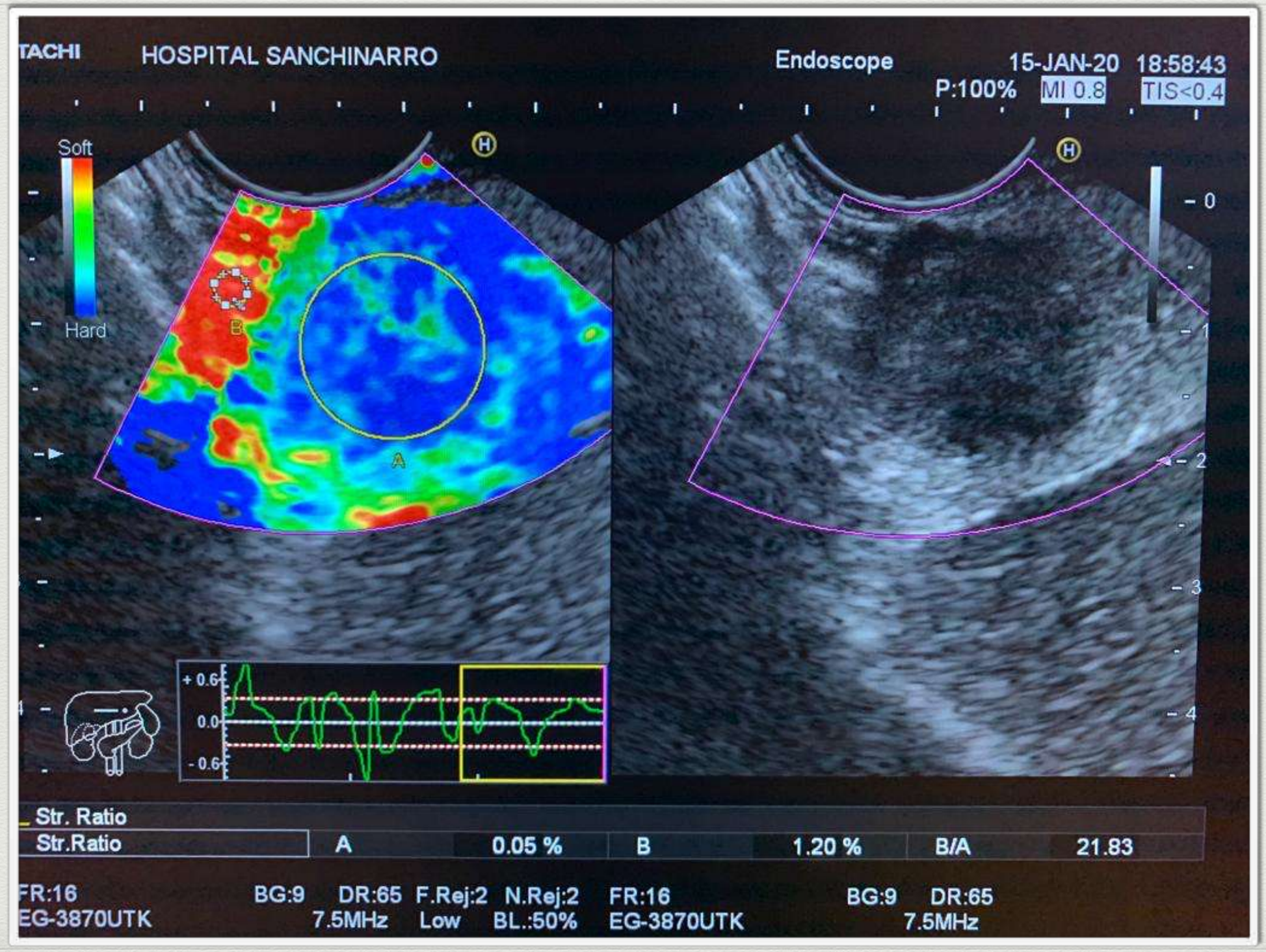
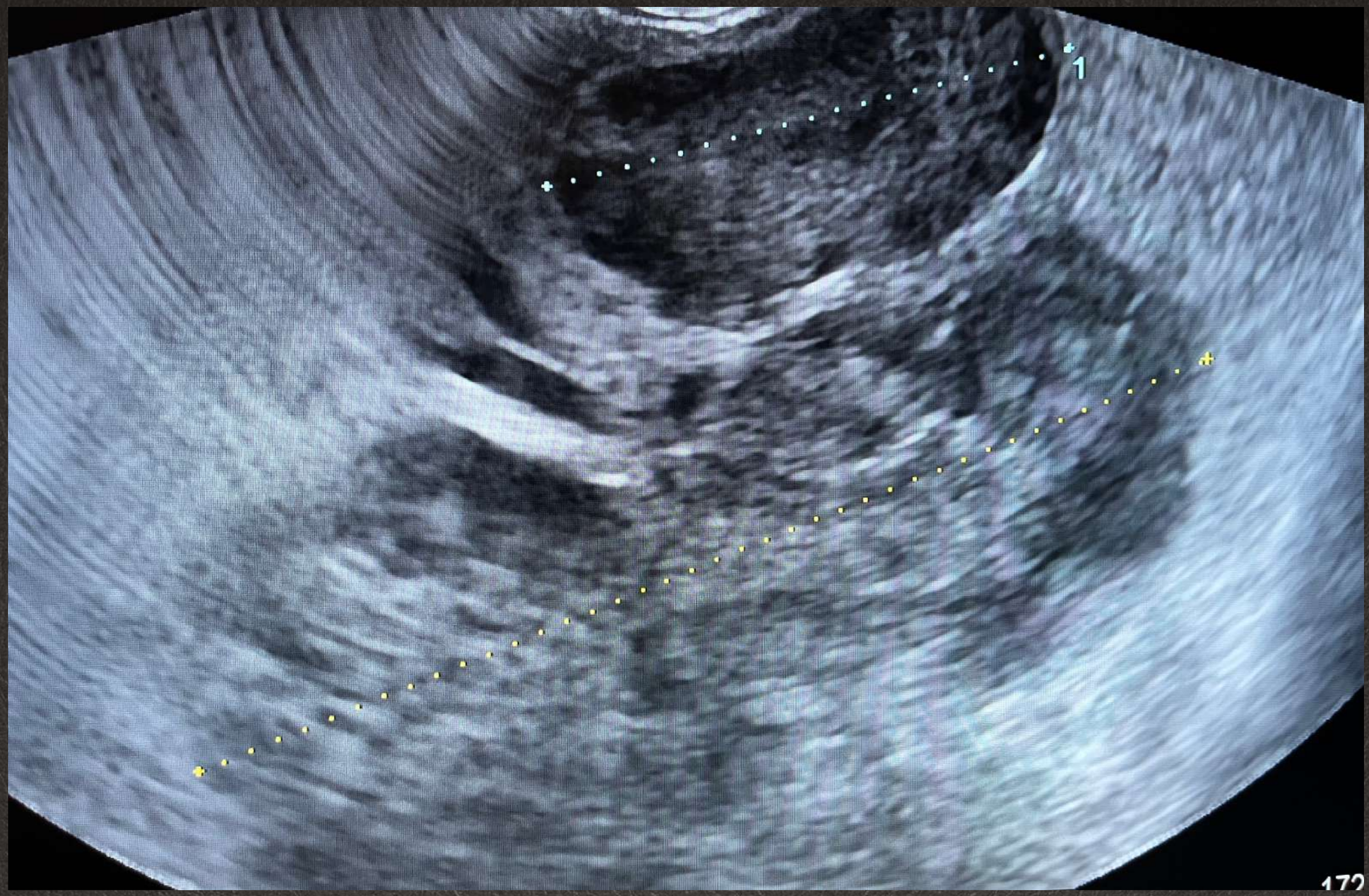


Servicio Endoscopias Sanchinarro

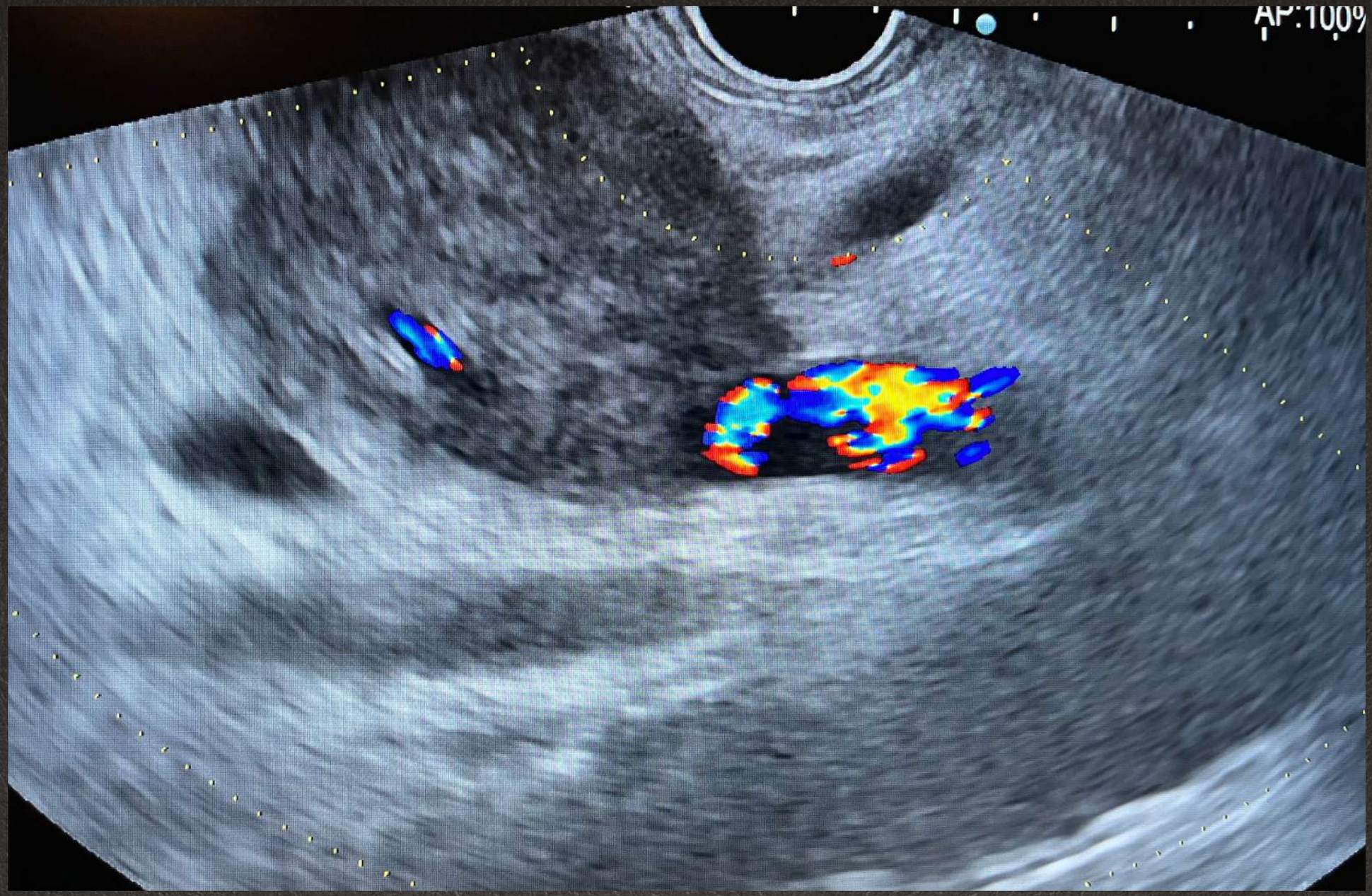
Elastografia



Paciente de 30 años operada de TMPI lateral
Se solicita USE para posible drenaje . 2 años de evolución.



Sarcoma uterino con elevación de ca19.9



Neurolisis del plexo en neoplasia pancreatica

Conclusiones

- 1- Lesiones sólidas puncionar con 25g en lesiones hipervasculares o bien 22g, desde Uncinado preferentemente agujas de 25g.
- 2-Todos los métodos de obtención de muestra son similares pero se sugiere método de fanning con succión en lesiones de aspecto fibroso.
- 3-Lesiones quísticas agujas de 19g o 22 g ,mandar para CEA si líquido superior a 1ml y restante para citologia.(a tener en cuenta la ausencia de células en quistes). Buscar signos “worrisome” como predictores de malignidad.
- 4-Intentar usar evidencia basada en la medicina disponible a nuestro alcance.
- 5-Aunque efectos adversos bajos existen y deben ser comunicados.

- 6-Consensuar con Médico referente estudio a realizar. Cada vez más se solicita biopsia para estudio de Bio-marcadores- “Oncología individualizada”.

- 7-Auditar resultados de la unidad y buscar opciones para optimizar éxito. (Esfuerzo de equipo multidisciplinar- Si no hay comunicación fallo asegurado.

- 8-Nuevas técnicas para tratamiento local dada las características del tumor.

Therapeutic Advances in Gastrointestinal Endoscopy

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Management of pancreatic cysts and guidelines: what the gastroenterologist needs to know

Ross C.D. Buerlein and Vanessa M. Shami

Pancreatic Adenocarcinoma, Version 2.2021, NCCN Clinical Practice Guidelines in Oncology

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Fujita A, Ryozawa S, Tanisaka Y, Ogawa T, Suzuki M, Noguchi T, Katsuda H, Mizuide M

Diagnostics (Basel). 2020 Jul 8; 10(7):.

GRACIAS