NEOPLASIA MUCINOSA PAPILAR INTRADUCTAL – IPMN

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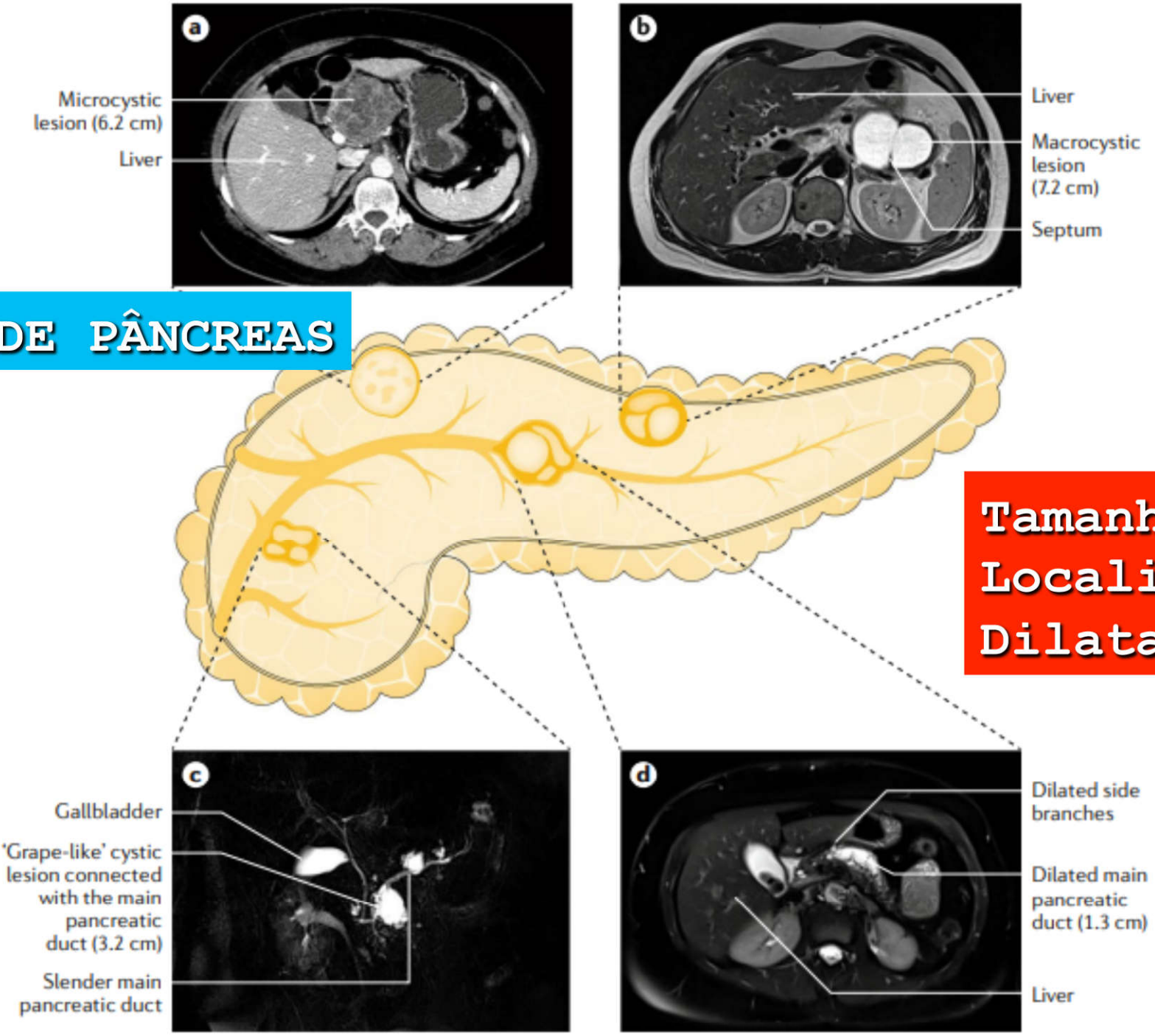
CISTO DE PÂNCREAS



Tamanho
Localização
Dilatação

van Huijgevoort NCM, et al. Nat Rev 2019

NEOPLASIAS CÍSTICAS DO PÂNCREAS

IPMN

	Serous cystic neoplasm	Mucinous cystic neoplasm	Intraductal papillary mucinous neoplasm	Solid-pseudopapillary neoplasm
Mean age (years)	65	45	63	28
Gender (male:female)	30:70	10:90	60:40	10:90
Location within the pancreas	Evenly distributed	Body and tail	Head	Evenly distributed
Cyst contents	Watery straw colored fluid	Thick tenacious mucin	Thick tenacious mucin	Hemorrhagic
Connectivity to larger pancreatic ducts	No	No	Yes	No
Epithelial lining	Cuboidal, glycogen rich	Columnar, mucinous	Columnar, mucinous	Noncohesive uniform cells
Stroma	Nonspecific	Ovarian-type	Nonspecific	Delicate capillaries

Beger HG, Matsuno S, Cameron JL, 2010

NEOPLASIAS DO PÂNCREAS

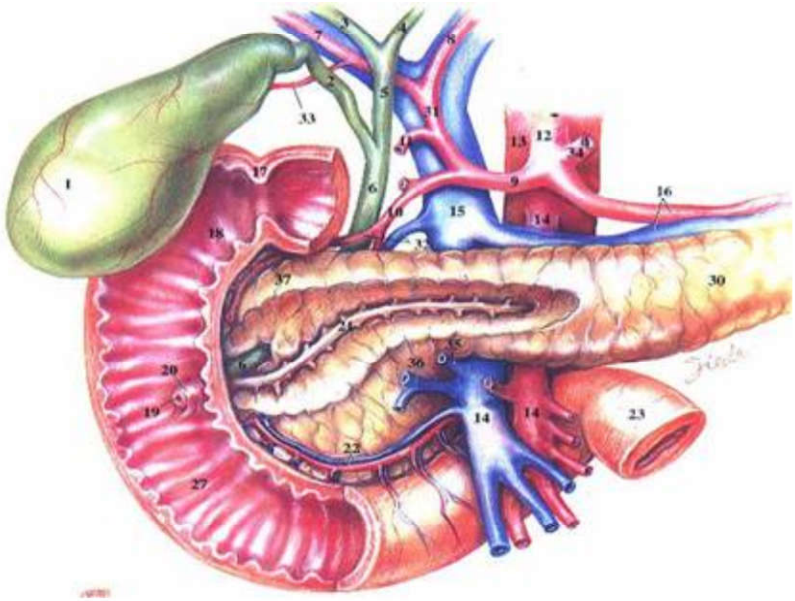
Table 3. Pathologic Examination of Lesions Resected Within 6 Months of Initial Visit (n = 422)

	1995–2010 (n = 422)	1995–2005 (n = 199)	2005–2010 (n = 223)
Noninvasive IPMN, n (%)	114 (27)	33 (17)	81 (36)
Serous cystadenoma, n (%)	98 (23)	68 (34)	30 (13)
Adenocarcinoma, n (%)	60 (14)	25 (13)	35 (16)
Mucinous cystadenoma, n (%)	45 (11)	25 (13)	20 (9)
Pancreatic endocrine tumor, n (%)	27 (7)	11 (5)	16 (8)
Pseudocyst, n (%)	18 (4)	16 (8)	2 (1)
Solid pseudopapillary tumor, n (%)	8 (2)	4 (2)	4 (2)
Simple cyst, n (%)	28 (7)	11 (5)	18 (8)
Other, n (%)	24 (6)	7 (3)	17 (7)
Lesion at risk of malignant progression, yes, n (%)†	169 (52)	66 (40)	103 (64)
Carcinoma including CIS, yes, n (%)	94 (23)	33 (17)	61 (28)

Brennan MF, J Am Coll Surg 2011

CISTO DE PÂNCREAS

Existe comunicação com o sistema ductal?



Sim

IPMN

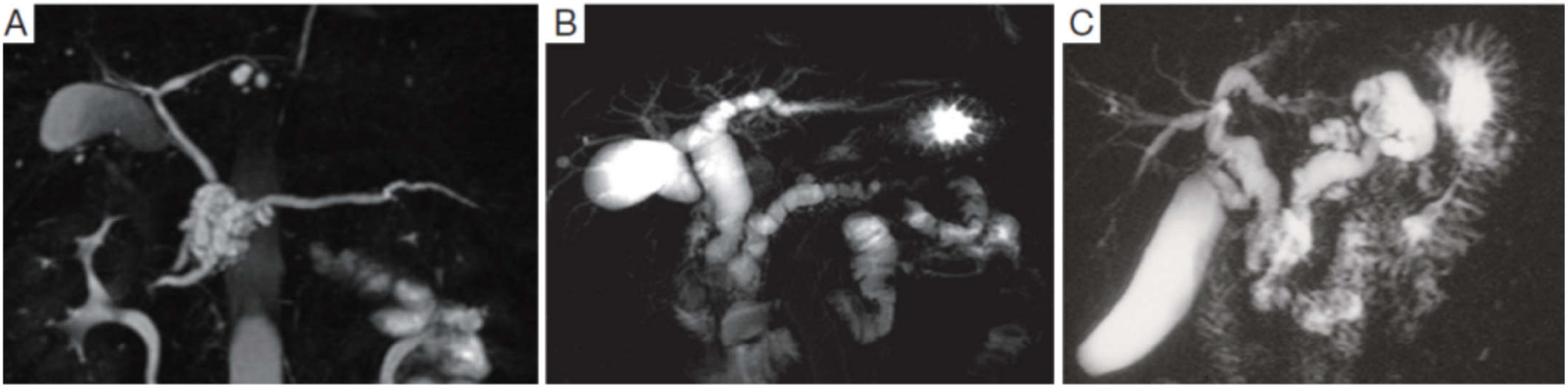
Principal

Misto

Secundário

Cortesia: Dr. Paulo Amaral (BA)

IPMN Neoplasia mucinosa papilar intraductal



PRINCIPAL **SECUNDÁRIO** **MISTO**

Beger HG, et al. The pancreas, 2° edition - 2008

IPMN Malignidade

Table 2. Typical epidemiological features and malignancy rates of PCNs

PCN	Age (decade)	Gender, female, %	Location (body/tail), %	Malignancy rate (from surgical series), %
MCN	4th–5th	>95	95	10–15
SCN	6th	70	50	0.1
SPT	3th	80	60	10–16
BD-IPMN	6th–7th	55	30	3–25
Mix-IPMN	6th–7th	55	–	33–60
MD-IPMN	6th–7th	55	–	33–60

MCN, mucinous cystic neoplasm; SCN, serous cystic neoplasm; BD-IPMN, branch duct intraductal papillary mucinous neplasm; MD-IPMN, main duct intraductal papillary mucinous neplasm; SPT, solid pseudopapillary tumor; Mix-IPMN, mixed type intraductal papillary mucinous neplasm; PCNs, pancreatic cystic neoplasms.

Perri G, et al. Dig Surg 2019

Malignidade

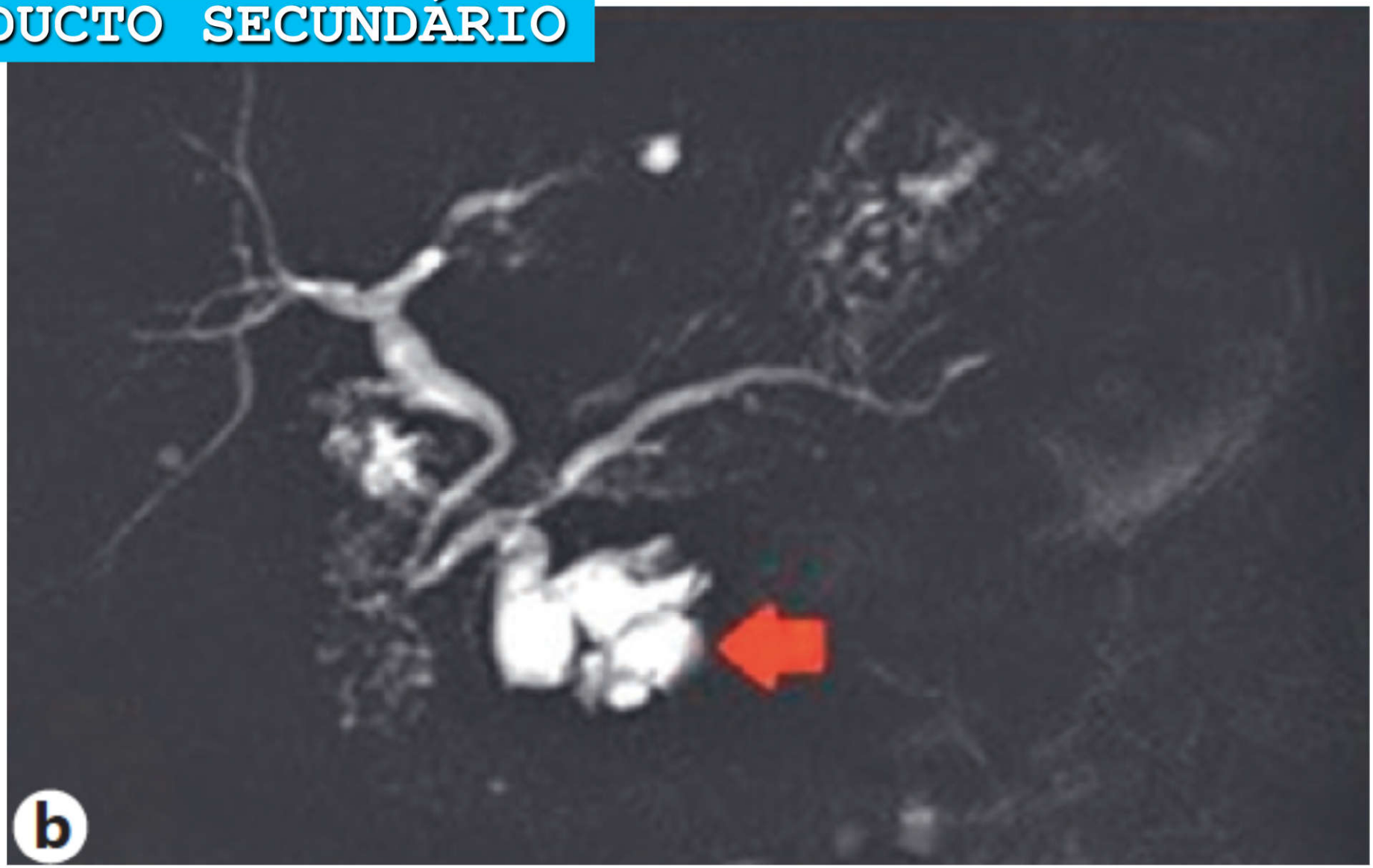
Table 1 | **Key demographic and clinical features of PCN**

Characteristics	SCN	MCN	MD/MT-IPMN	SB-IPMN	SPN	cNET
Age of presentation	Variable, usually 5th to 7th decade	Variable, usually 5th to 7th decade	Variable, usually 5th to 7th decade	Variable, usually 5th to 7th decade	2nd to 3rd decade	Variable, usually 5th to 6th decade
Gender distribution	70% female	90–95% female	Equal	Equal	90% female	Equal
Clinical presentation	Incidental finding, abdominal pain, mass effect	Incidental finding, abdominal pain or malignancy-related	Incidental finding, jaundice, pancreatitis, exocrine insufficiency, malignancy-related	Incidental finding, jaundice, pancreatitis, malignancy-related	Incidental finding, abdominal pain, mass effect	Incidental finding (usually nonfunctioning), abdominal pain, mass effect
Typical imaging characteristics	Microcystic (honeycomb appearance)	Unilocular, macrocystic	Dilated pancreatic duct or dilated pancreatic duct with dilated side branches	Dilated side branches	Solid and cystic mass	Solid and cystic mass, hypervascular
Connection or involvement with main pancreatic duct	No	No	Yes	Yes	No	No
Solitary or multifocal	Solitary	Solitary	Solitary/multifocal	Solitary/multifocal	Solitary	Solitary
Malignant potential[a]	Negligible	10–39%	36–100%	11–30%	10–15%	10%

cNET, cystic neuroendocrine tumour; IPMN, intraductal papillary mucinous neoplasm; MCN, mucinous cystic neoplasm; MD, main duct; MT, mixed type; PCN, pancreatic cystic neoplasms; SB, side branch; SCN, serous cystic neoplasm; SPN, solid pseudopapillary neoplasm. [a] Percentage with advanced neoplasia in resected specimen[14–19,22–32,37–44].

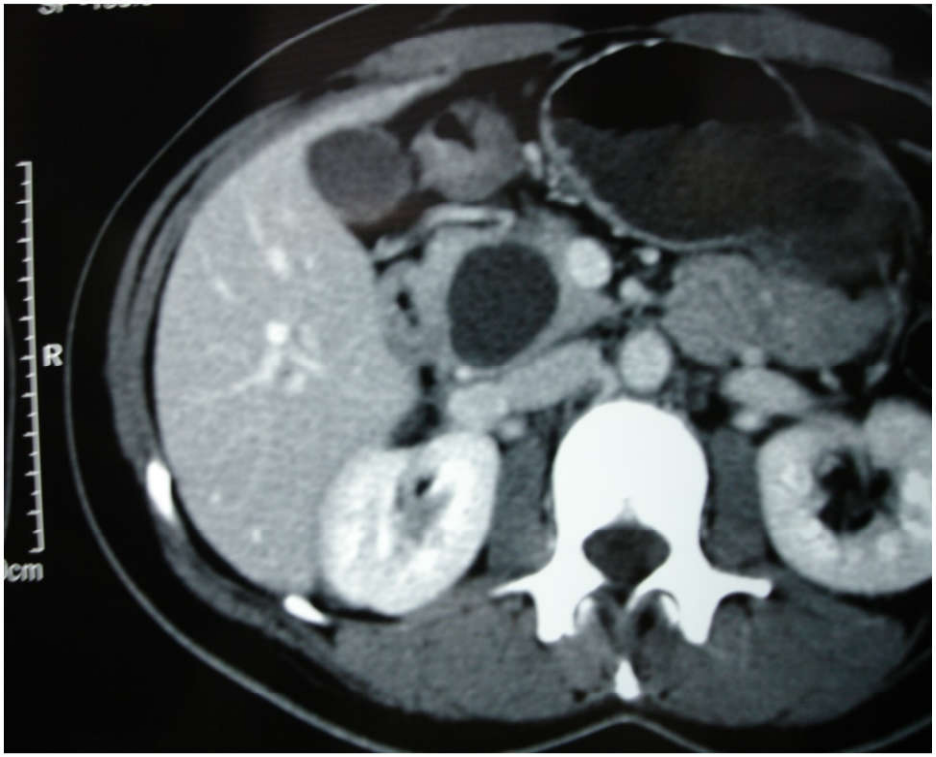
van Huijgevoort NCM, et al. Nat Rev 2019

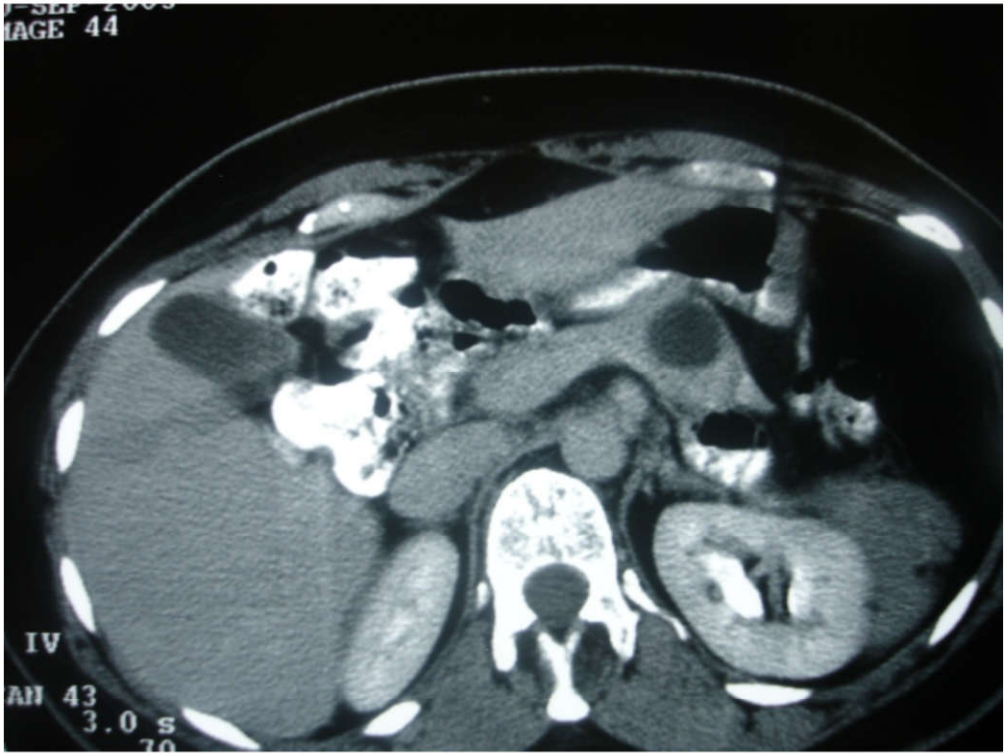
DUCTO SECUNDÁRIO



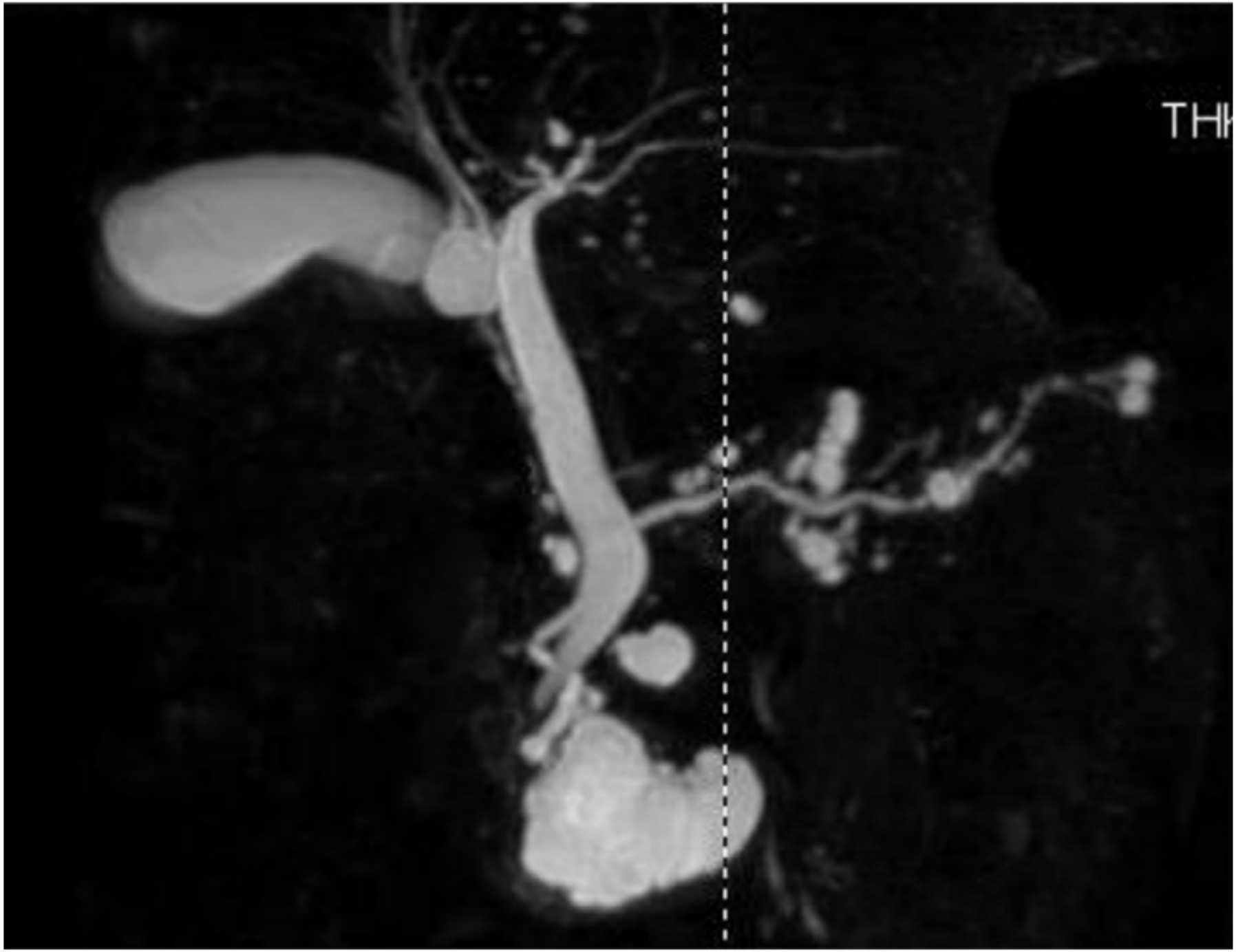
Perri G, et al. Dig Surg 2019

TAMANHO DA LESÃO





> 3 cm



Tanaka M, et al. Pancreatology 2017;17:738-53

Contents lists available at ScienceDirect

Pancreatology

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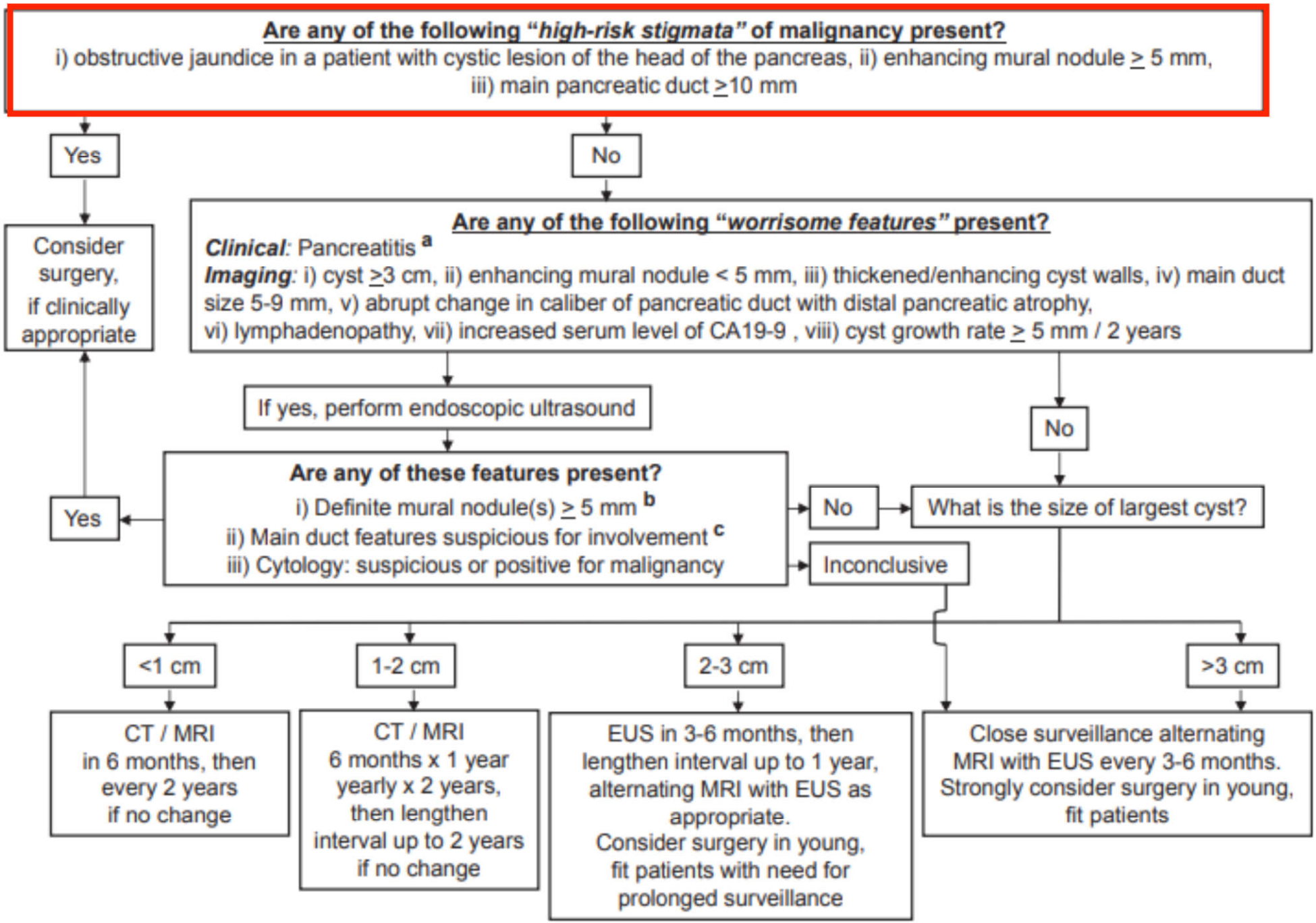
Revisions of international consensus Fukuoka guidelines for the management of IPMN of the pancreas

REVISÃO DO CONSENSO 2012

Tanaka M, et al. Pancreatology 2017;17:738-53



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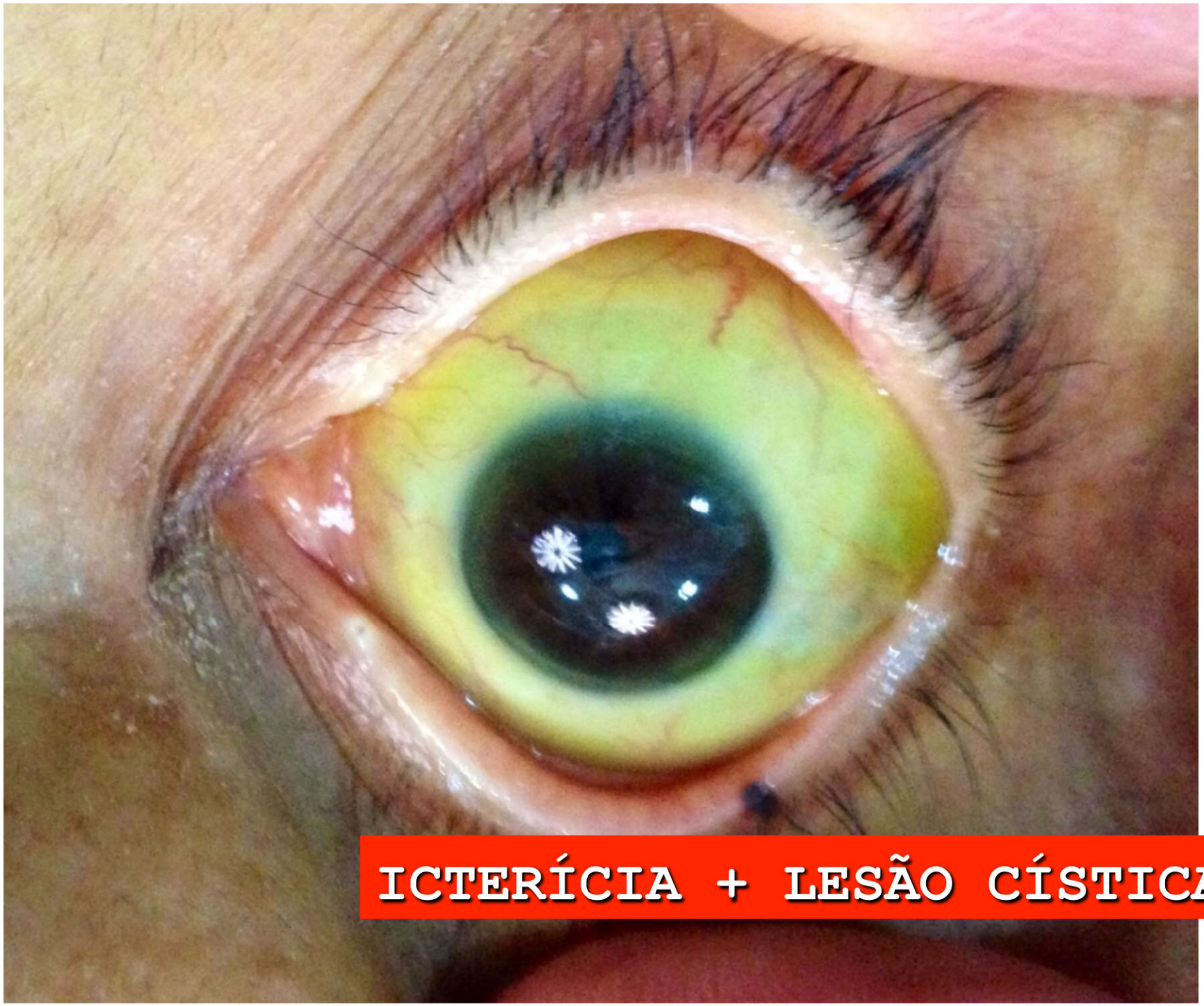
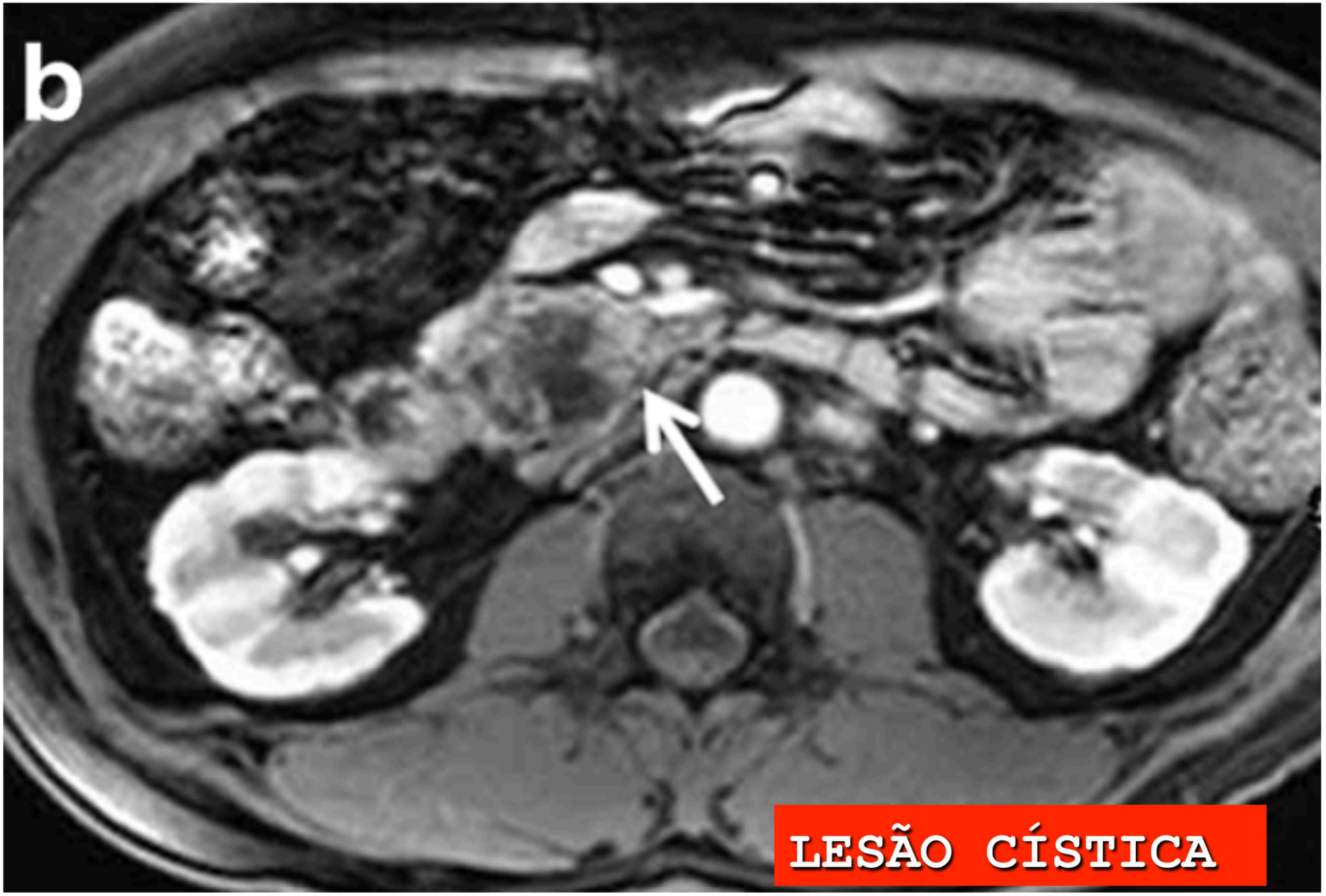
ESTIGMAS DE ALTO RISCO

High-risk stigmata
Obstructive jaundice in a patient with cystic lesion of the head of the pancreas
Enhancing mural nodule ≥ 5 mm
Main pancreatic duct ≥ 10 mm

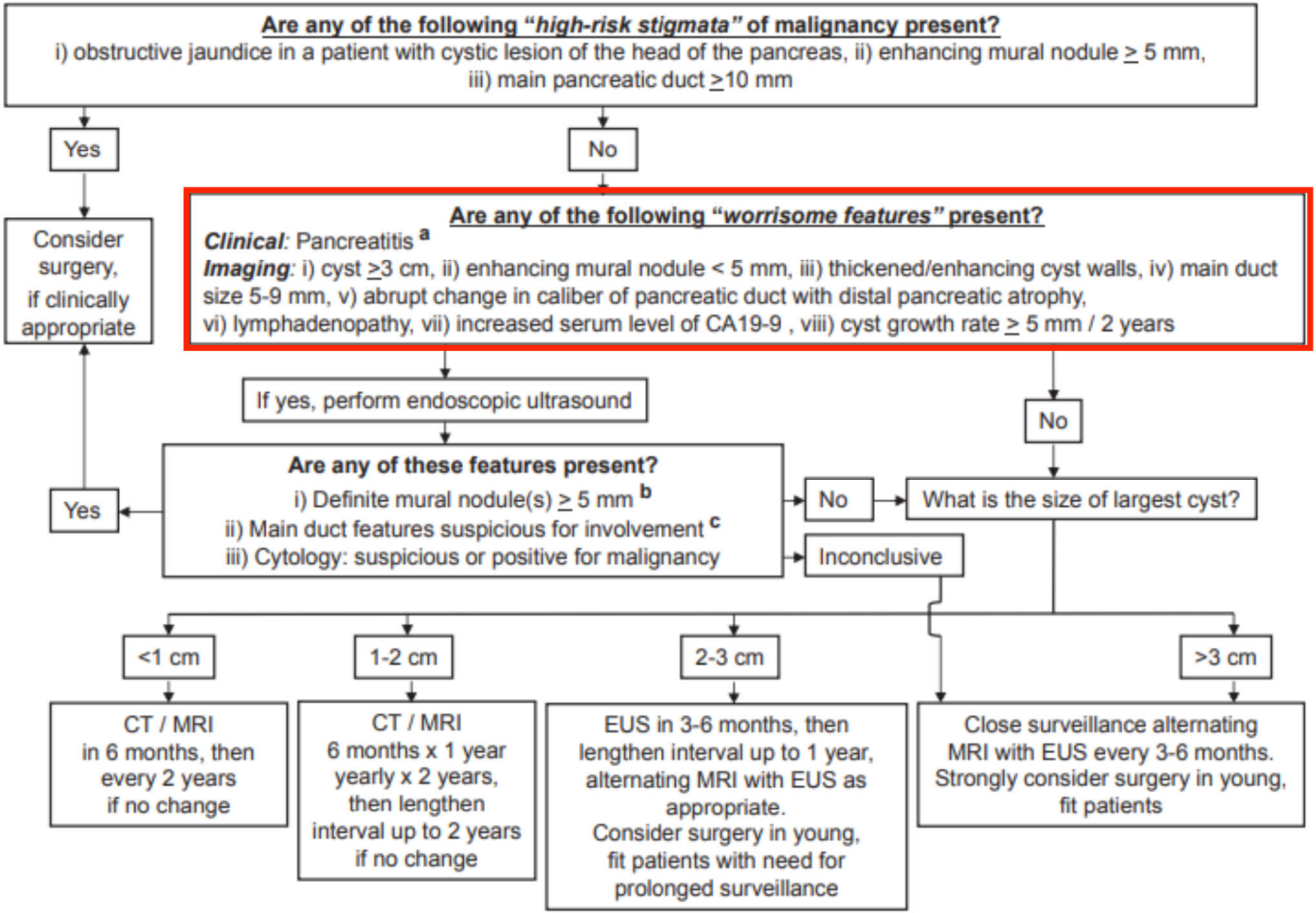
CIRURGIA

Hipp J, et al. Br J Surg 2019


ICTERÍCIA + LESÃO CÍSTICA



Hwang J, et al. Eur Radiol 2017



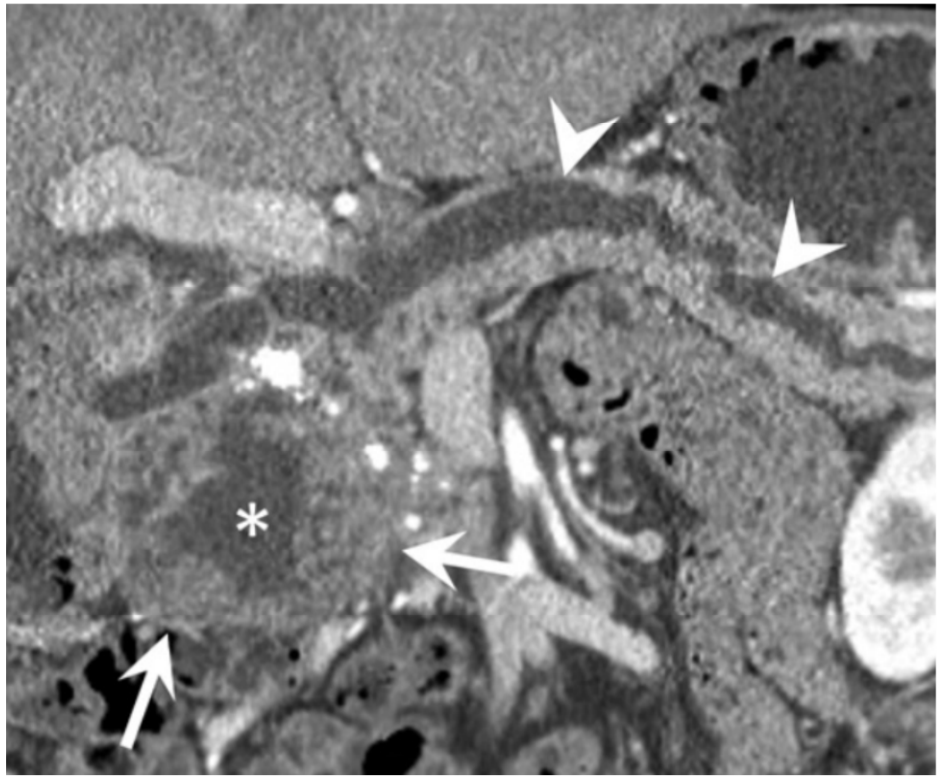
Tanaka M, et al. Pancreatology 2017;17:738-53

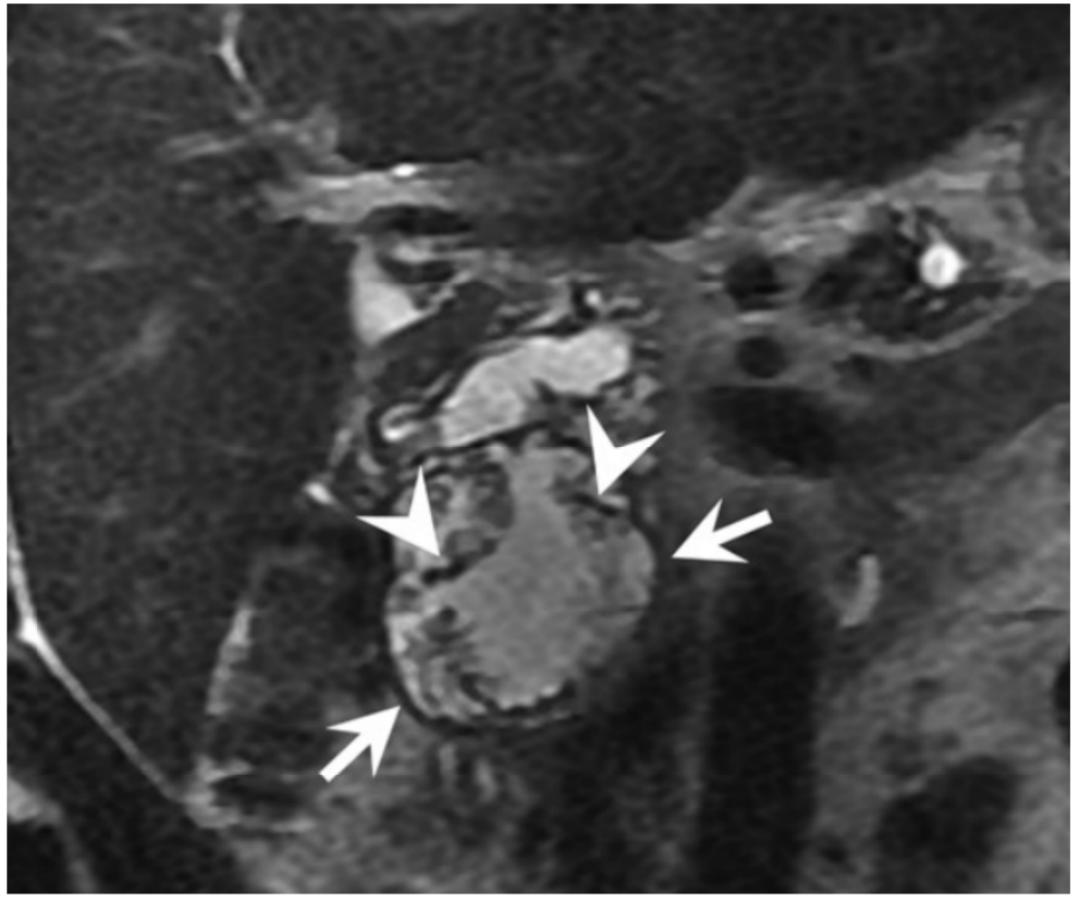
CARACTERÍSTICAS PREOCUPANTES

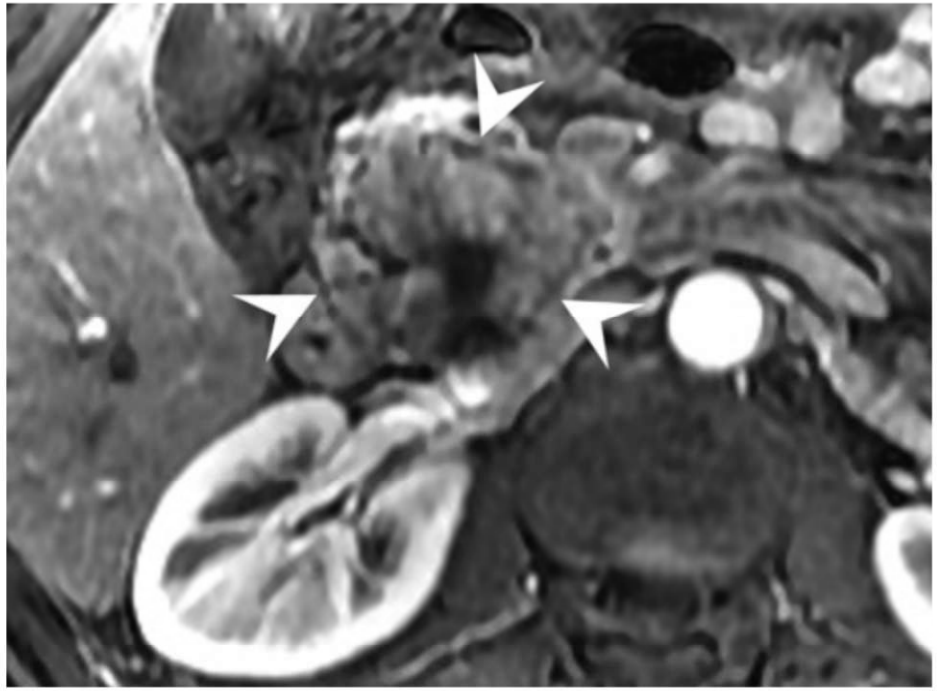
Worrisome features
Pancreatitis
Cyst ≥ 30 mm
Thickened/enhancing cystic walls
Enhancing mural nodule < 5 mm
Main pancreatic duct 5–9 mm
Abrupt change in calibre of pancreatic duct with distal pancreatic atrophy
Lymphadenopathy
Increased serum level of carbohydrate antigen 19-9
Cyst growth rate ≥ 5 mm/2 years

ECOENDOSCOPIA

Hipp J, et al. Br J Surg 2019



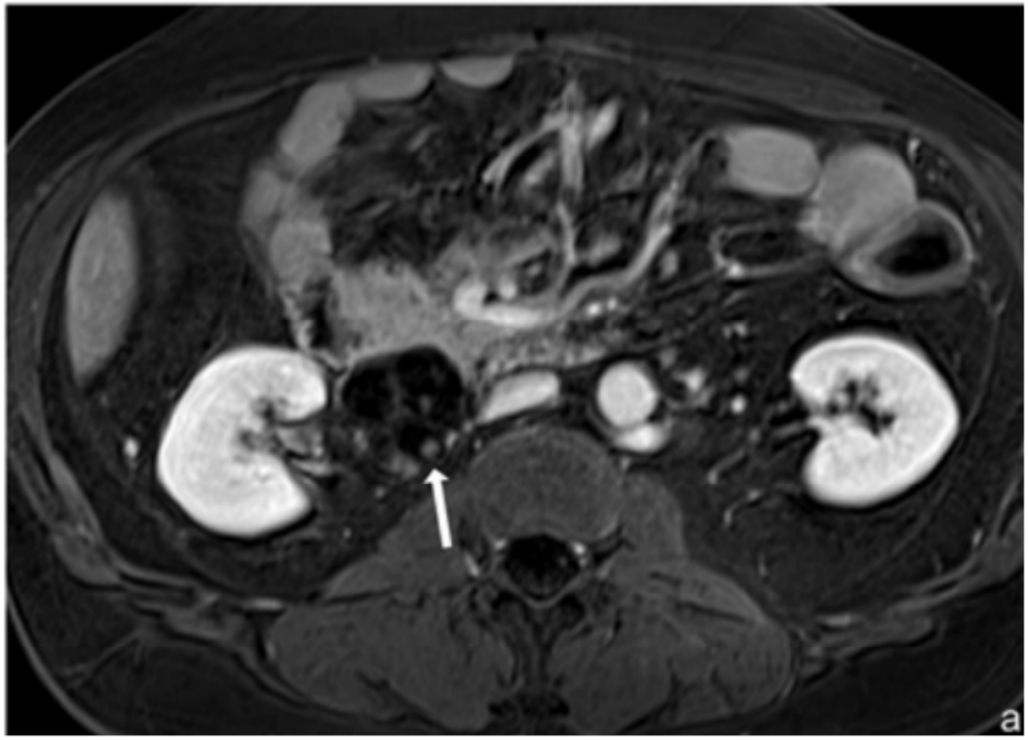




- Estigma de alto risco
  - Nódulo mural de 5 mm
  - Ducto principal de 13 mm
- Características preocupantes
  - Cisto de 4,4 cm (cabeça)
  - Cisto de parede espessada
  - Presença de septo

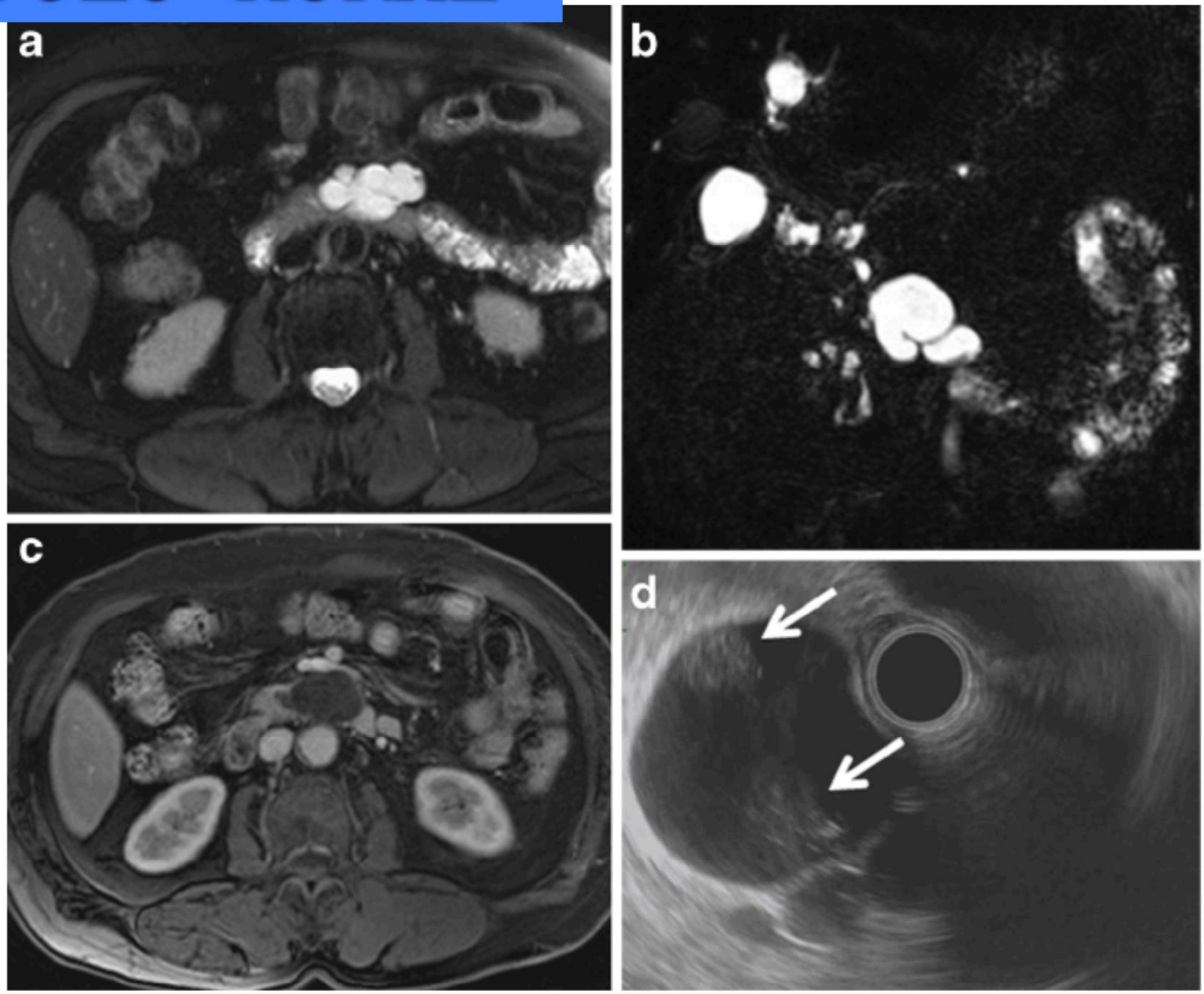
Lee JE et al. Radiology 2019

NÓDULO MURAL



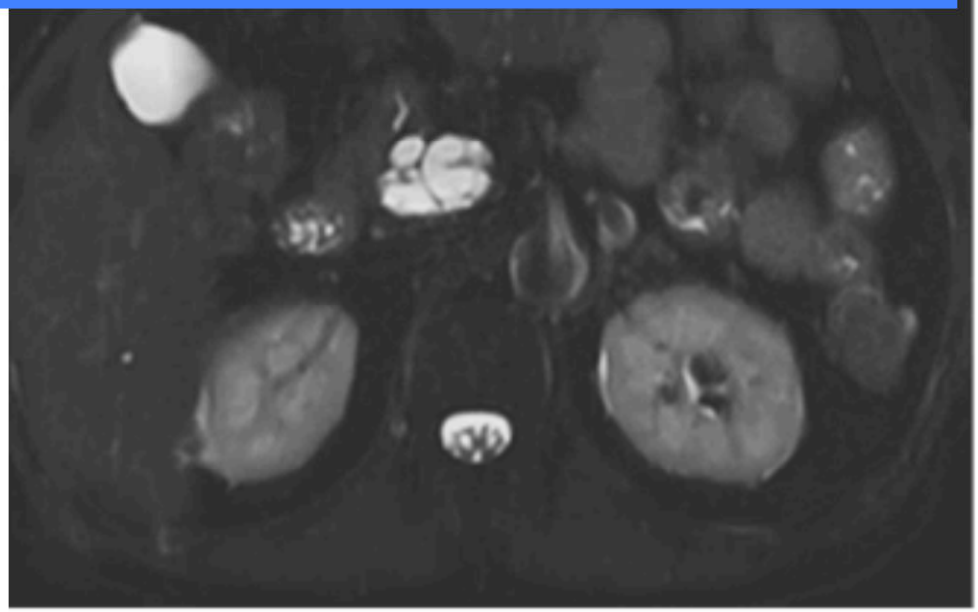
Strauss A, et al. Br J Radiol 2016

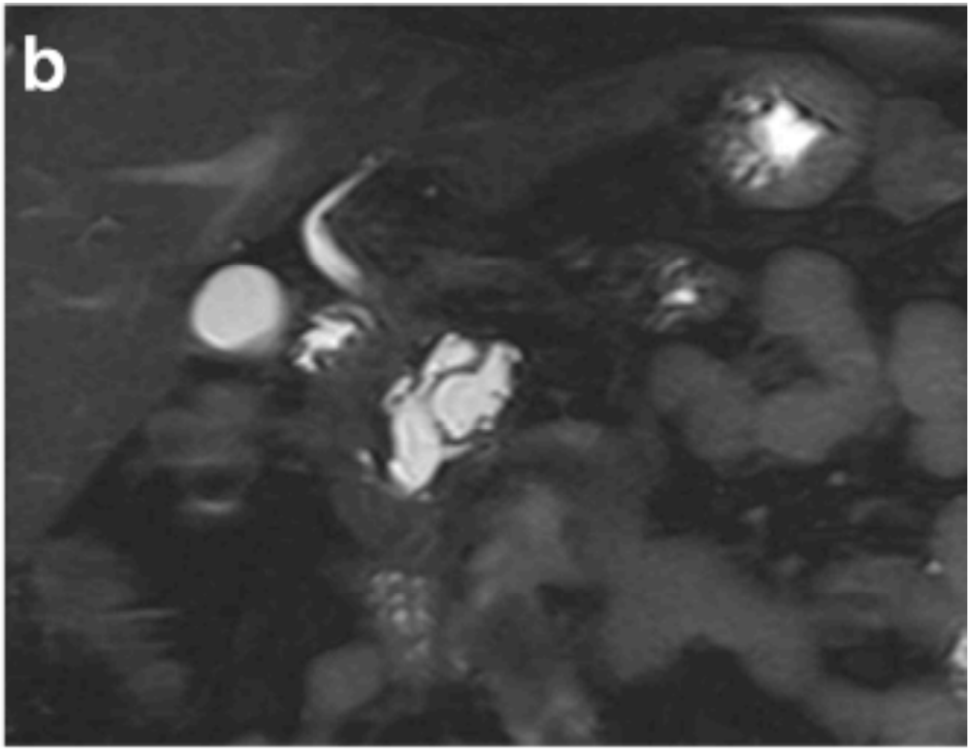
NÓDULO MURAL

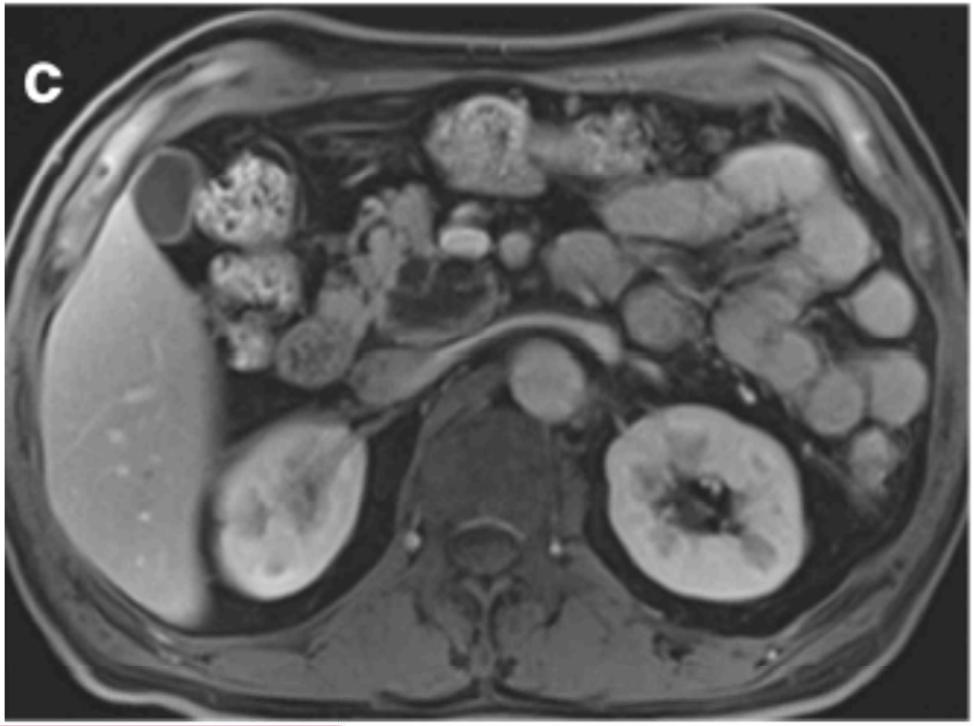


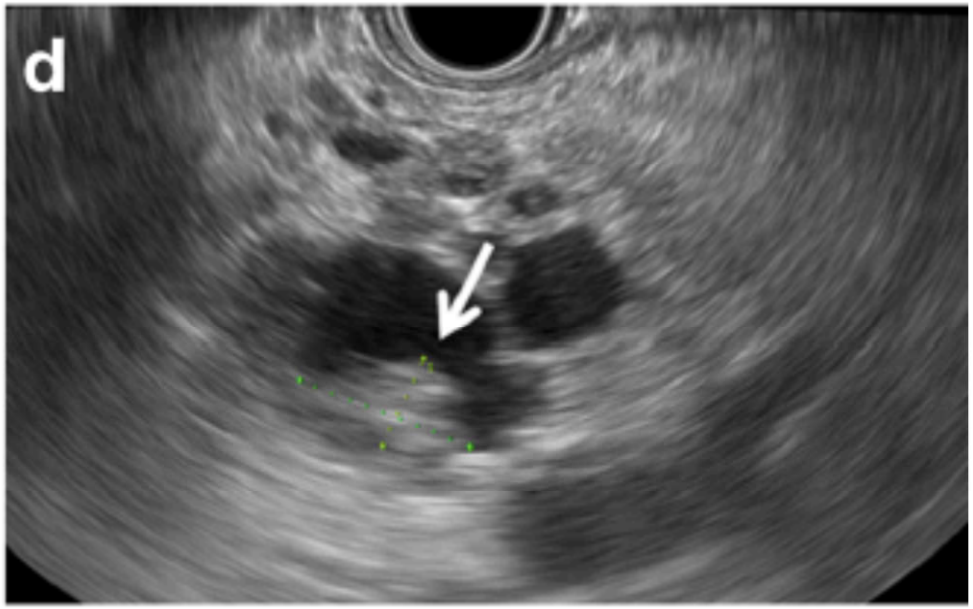
Hwang J, et al. Eur Radiol 2017

NÓDULO MURAL









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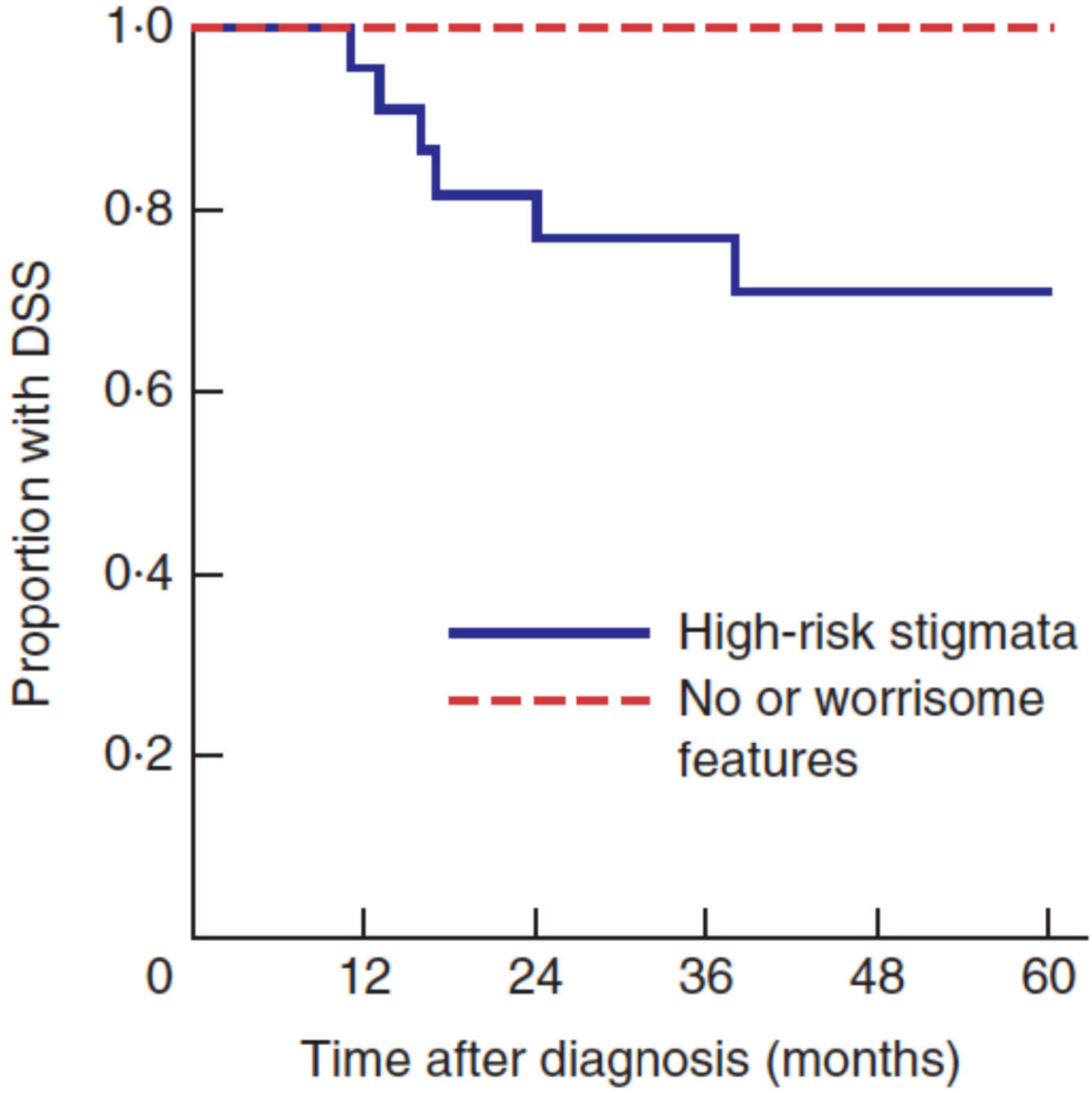

ESTIGMAS DE ALTO RISCO

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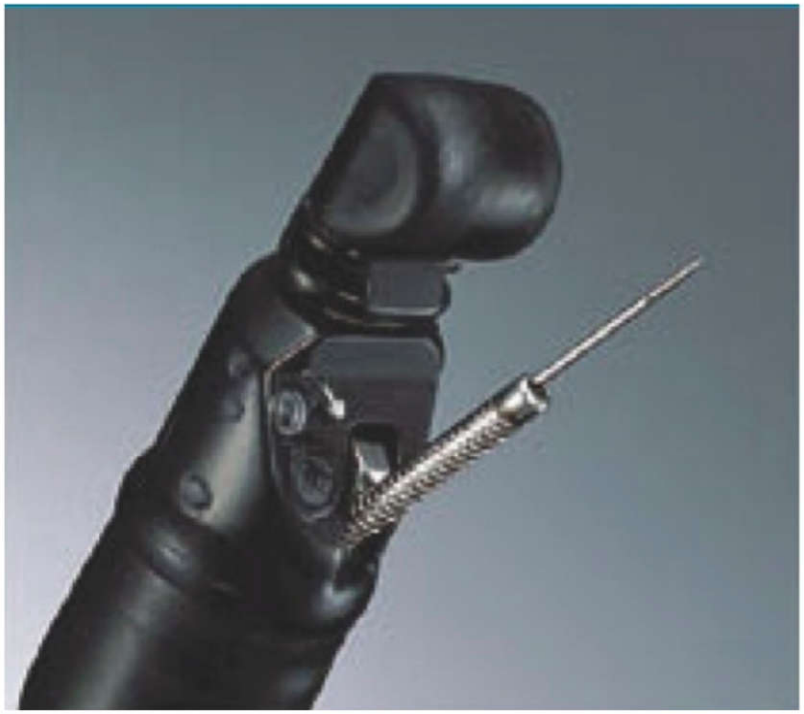

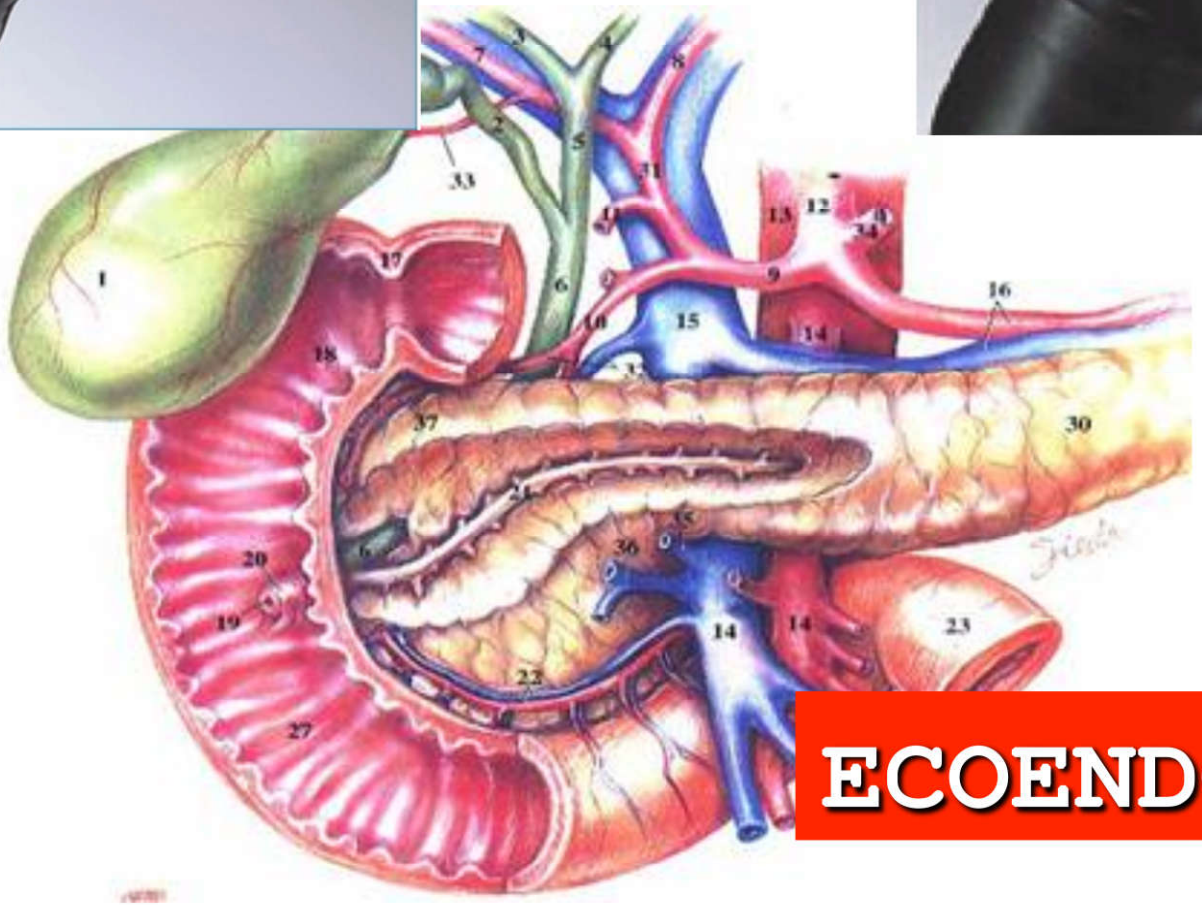

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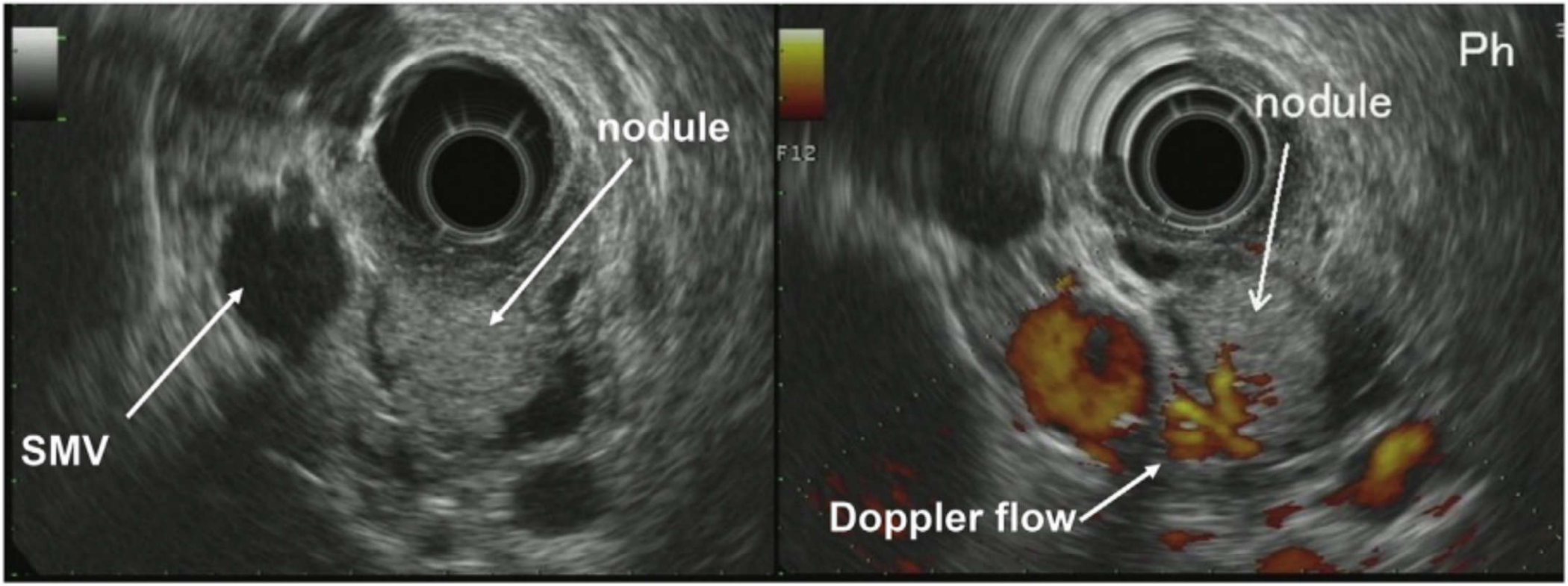

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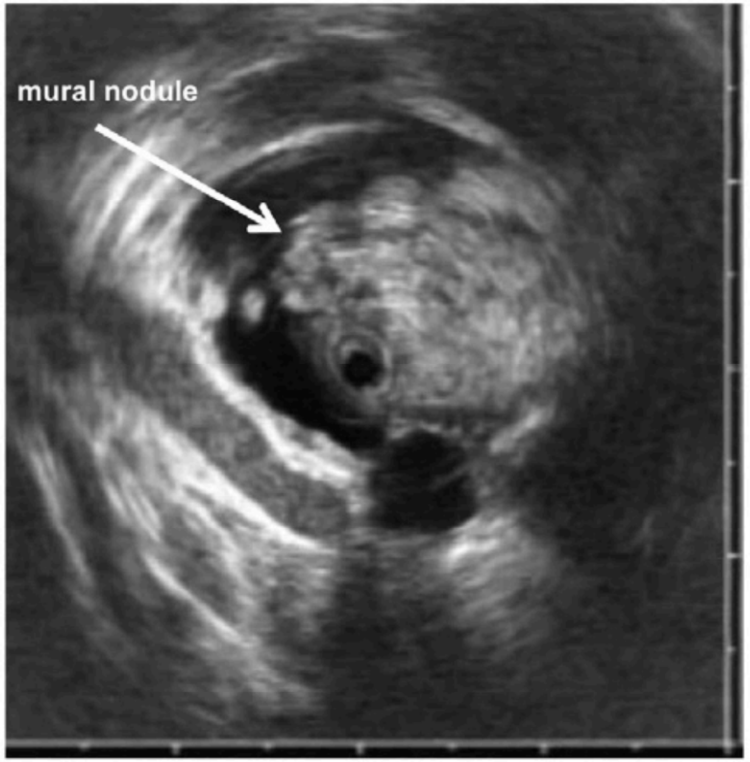
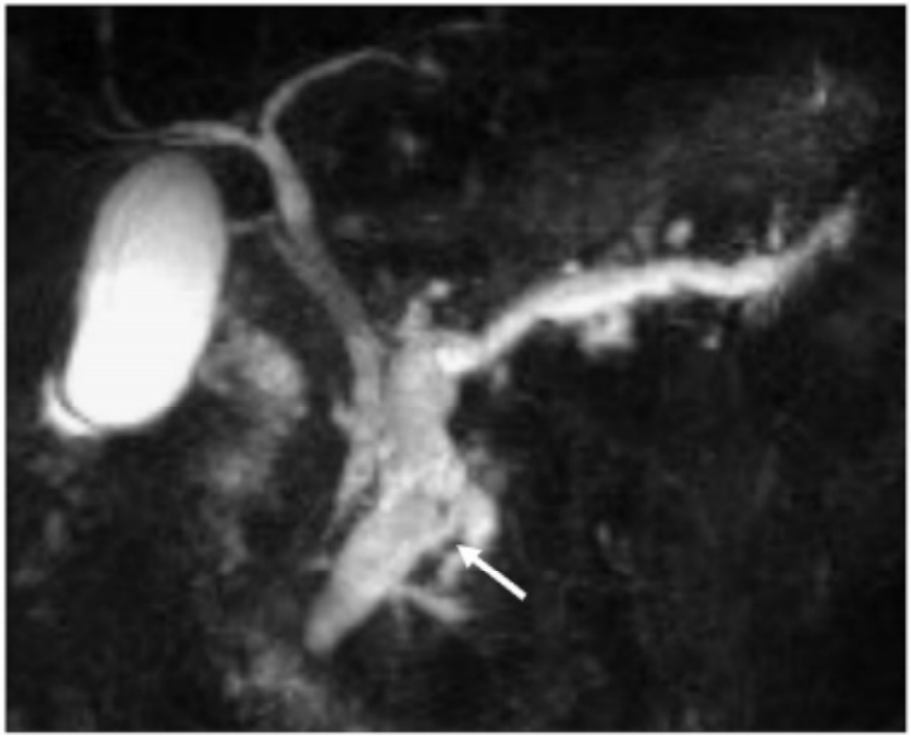


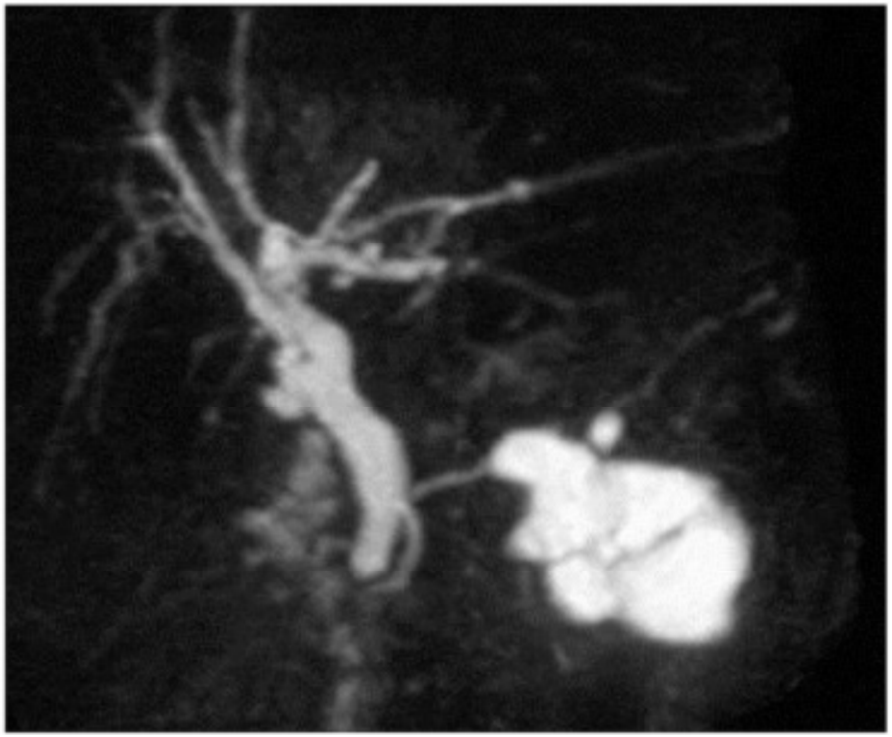
- visualizar o sistema ductal
- parênquima pancreático
- detectar lesões pequenas
- características dos cistos
  - presença de septo
  - Nódulos
  - Debris
  - espessura da parede
  - **coleta do fluido para estudo citológico e bioquímico**
  - **linfadenopatia e envolvimento vascular**

FNA

- Amilase elevada e CEA baixo = Pseudocisto
- Amilase elevada e CEA alto = IPMN
- Amilase < 250 e CEA < 5 = Cisto seroso
- Amilase alta = Conecção com sistema ductal
- Amilase alta afasta CAS e CAM
- CEA > 192 (Mucinoso X não mucinoso)
  - Sensibilidade – 75%
  - Especificidade – 84%
  - Acurácia – 79%
- CEA > 800 - 98% especificidade lesão mucinosa

CEA





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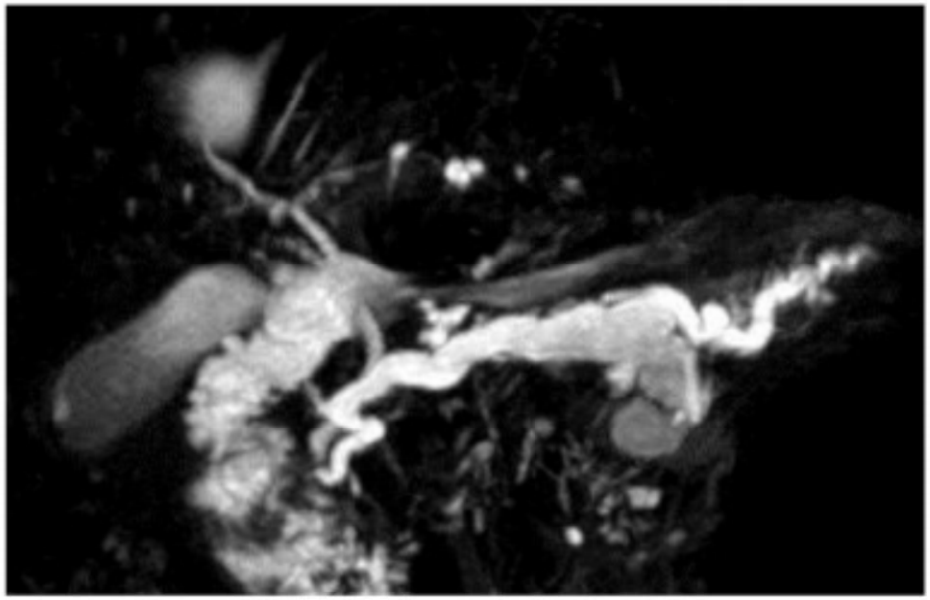

IPMN

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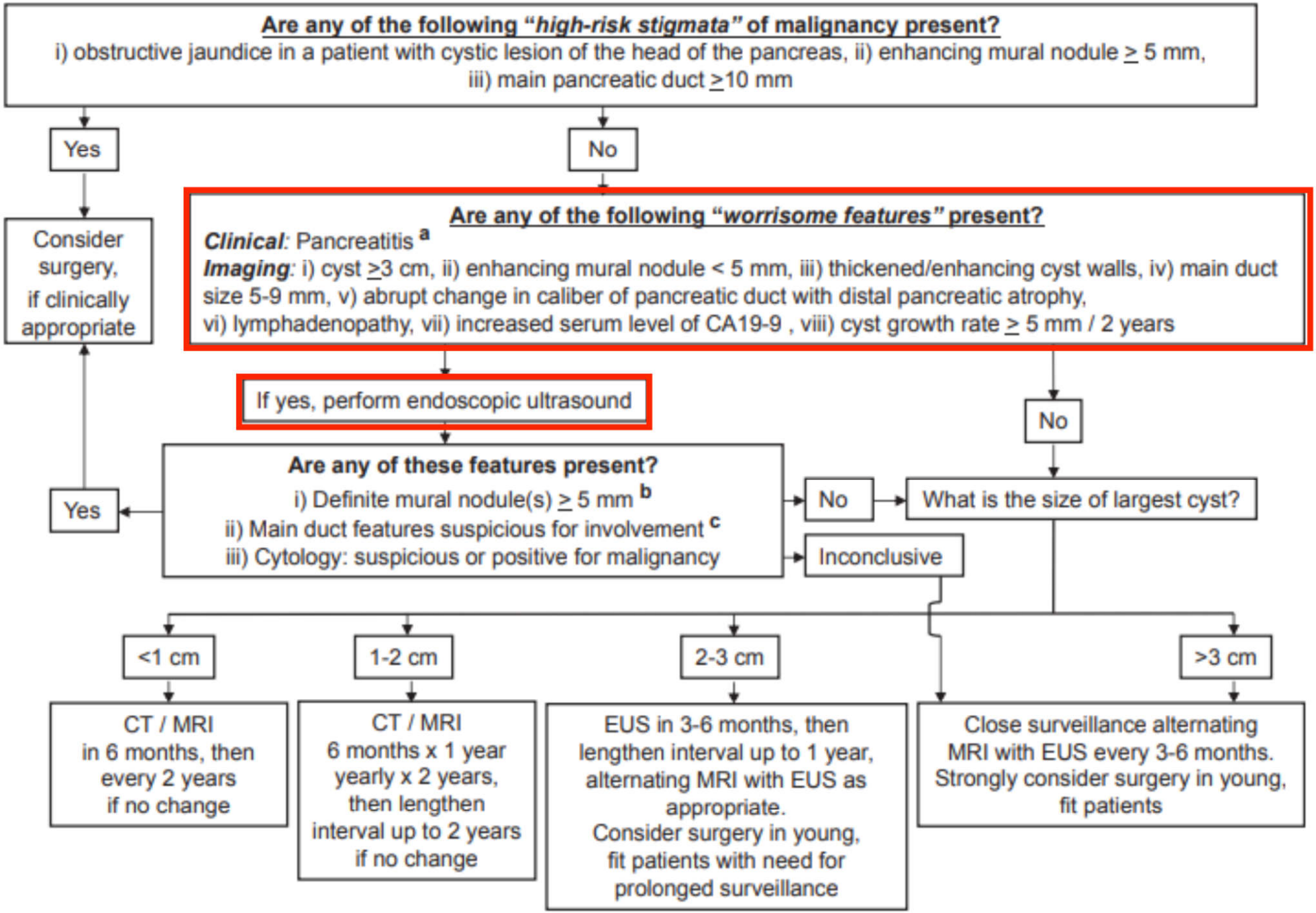

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DUCTO PRINCIPAL

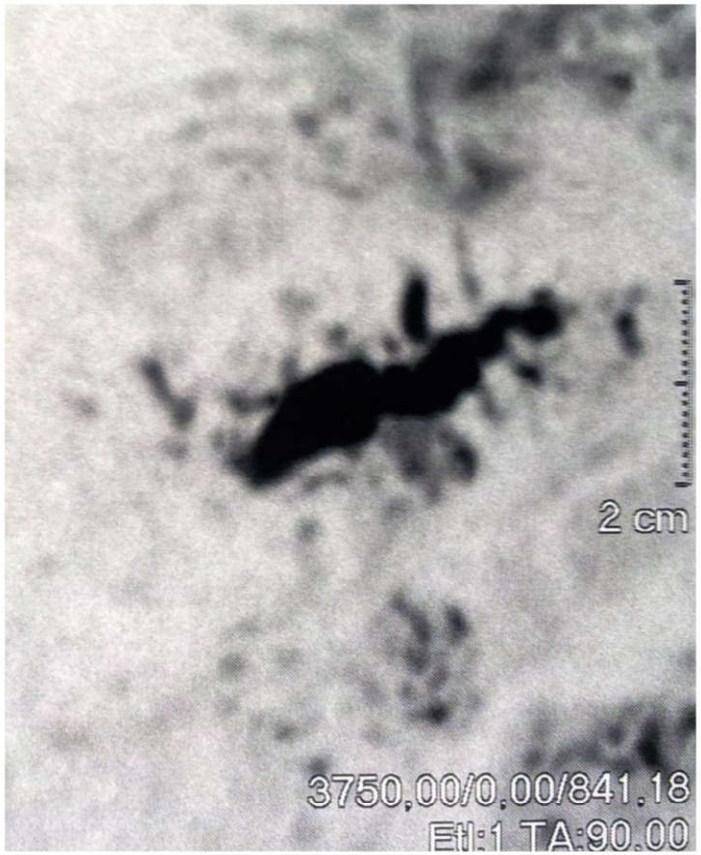
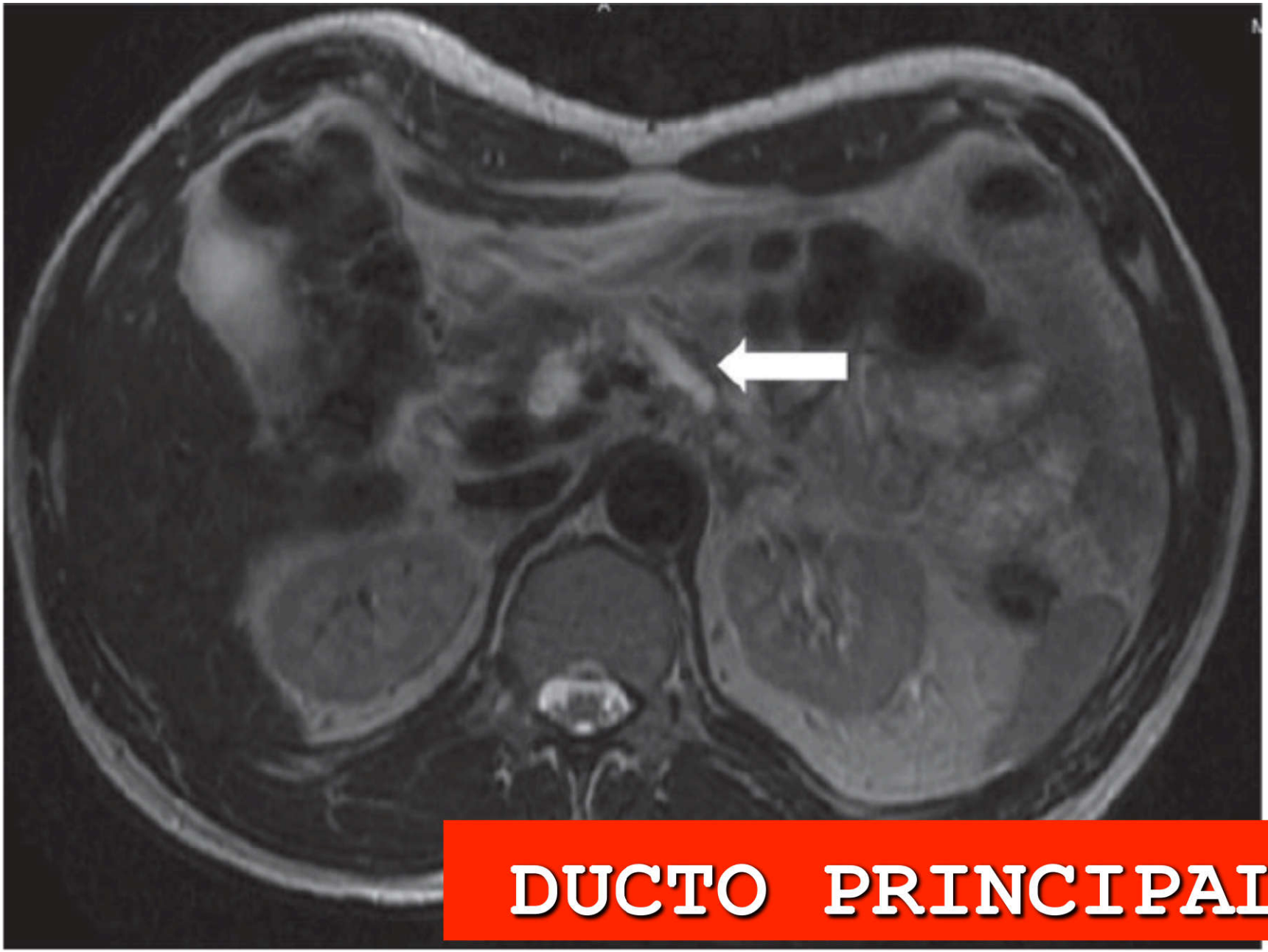


Table 2
Frequencies of malignancy in IPMNs accor

Total IPMNs			Main duct type		
First author	Year	Total	Number	Malignant	Invasive
Su					.7%)
So					.0%)
Sa					.4%)
Su					.7%)
Lee [15]	2005	67	27 (40.3%)	12 (44.4%)	3 (11.1%)
Serikawa [2]	2006	103	47 (45.6%)	30 (63.8%)	21 (44.7%)
Schmidt [3]	2007	156	53 (34.0%)	30 (56.6%)	15 (28.3%)
Rodriguez [20]	2007	145			
Schnelldorfer [16]	2008	208	76 (36.5%)	49 (64.5%)	
Kim [17]	2008	118	70 (59.3%)	25 (35.7%)	23 (32.9%)
N					)
Ja					)
C					)
N					)
B					
Hwang [5]	2010	187	28 (15.0%)	20 (71.4%)	17 (60.7%)
Mimura [6]	2010	82	39 (47.6%)	34 (87.2%)	19 (48.7%)
Sadakari [22]	2010	73			
Kanno [23]	2010	159			
Crippa [10]	2010	389	81 (20.8%)	55 (68%)	39 (48%)
Total		3568	883 (24.7%)	>549 (>62.2%)	385 (43.6%)

Frequencia de malignidade = 61.6%
36 a 100%

Frequencia de IPMN Invasivo = 43.1%
11 a 81%



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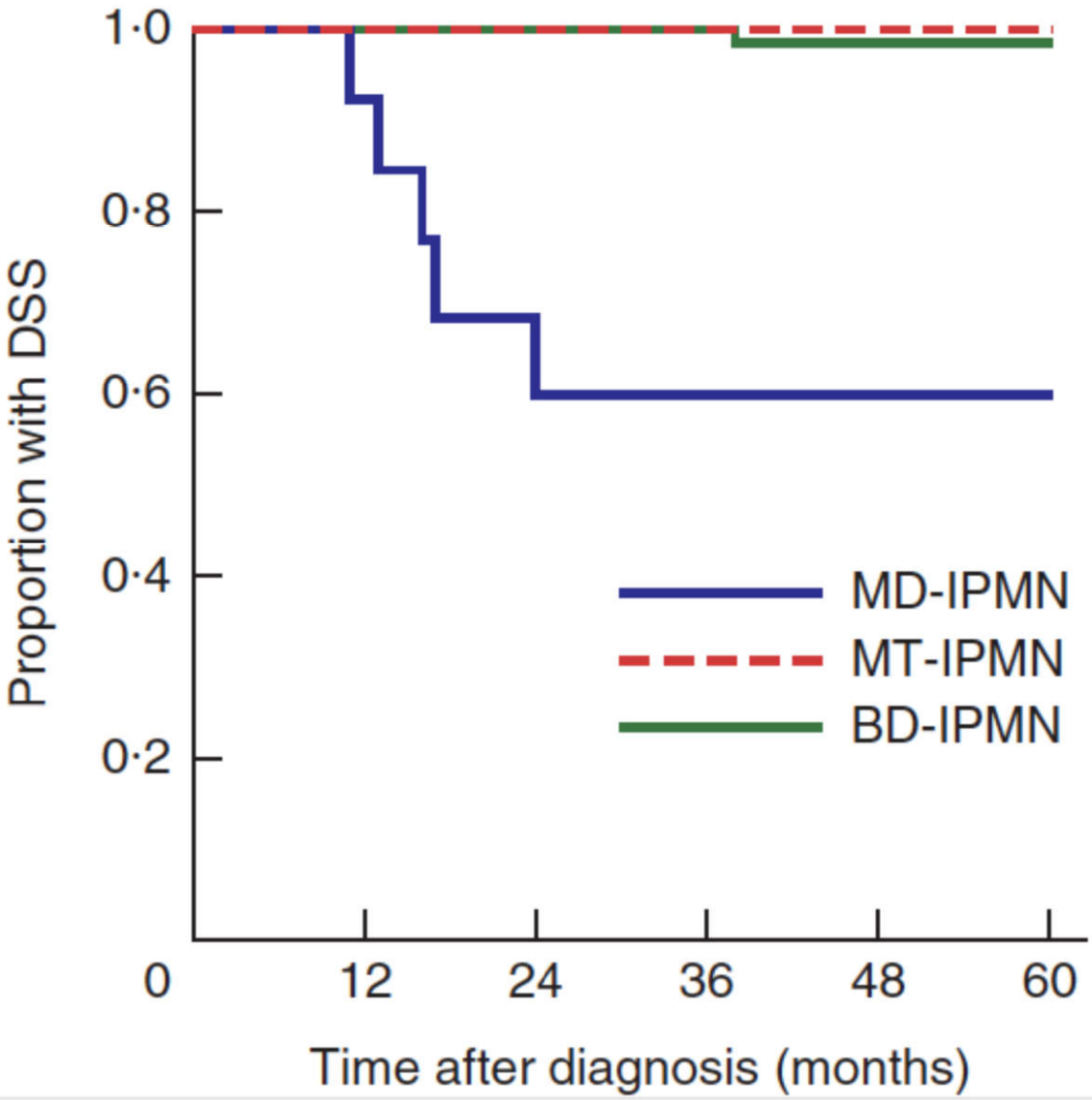
MD- *versus* MT- *versus* BD-IPMN



DUCTO PRINCIPAL

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DUCTO SECUNDÁRIO

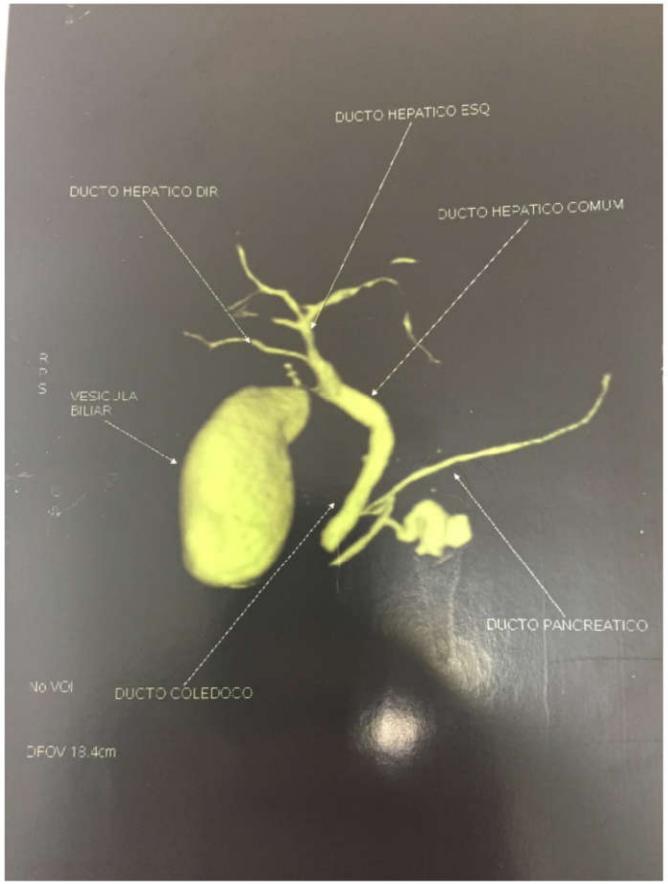

Table 2
Frequencies of malignancy in IPMNs acc

Total IPMNs			Branch duct type		
First author	Year	Total number	Number *n* (%)	Malignant *n* (%)	Invasive *n* (%)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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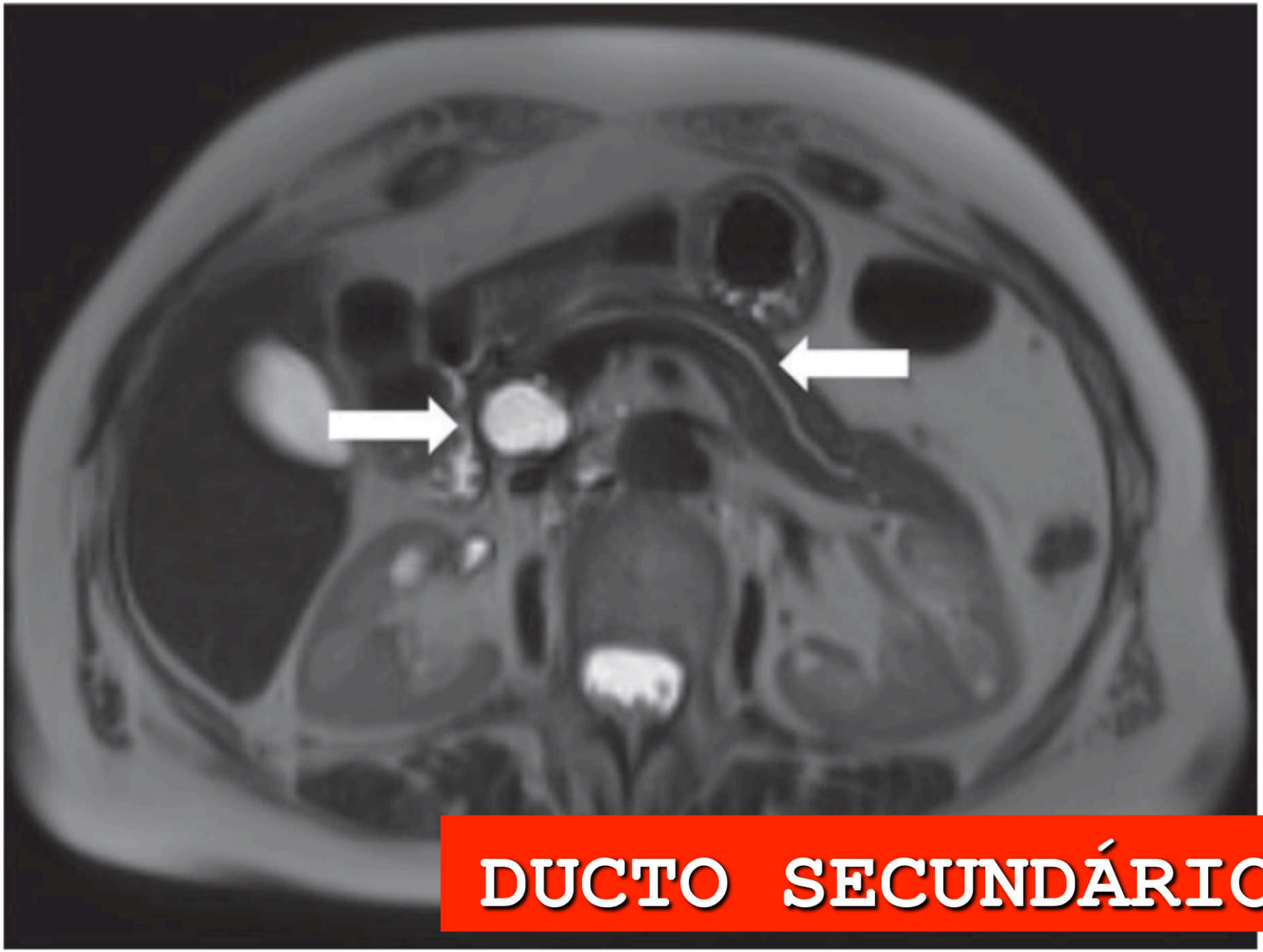
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Serikawa [2]	2006	103	56 (54.4%)	11 (19.6%)	7 (12.5%)
Schmidt [3]	2007	156	103 (66.0%)	20 (19.4%)	14 (13.6%)
Rodriguez [20]	2007	145	145 (100%)	32 (22.1%)	16 (11.0%)
Schnelldorfer [16]	2008	208	84 (40.4%)	15 (17.9%)	
Kim [17]	2008	118	48 (40.7%)	>3 (6.3%)	3 (6.3%)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Hwang [5]	2010	187	118 (63.1%)	19 (16.1%)	14 (11.9%)
Mimura [6]	2010	82	43 (52.4%)	20 (46.5%)	10 (23.3%)
Sadakari [22]	2010	73	73 (100%)	6 (8.2%)	1 (1.4%)
Kanno [23]	2010	159	159 (100%)	40 (25.2%)	19 (11.9%)
Crippa [10]	2010	389	159 (40.9%)	34 (22%)	17 (11%)
Total		3568	2027 (56.8%)	>494 (>24.4%)	337 (16.6%)

Frequencia de malignidade = 25.5%
6.3 a 46.5%

Frequencia de IPMN Invasivo = 17.7%
1.4 a 36.7%



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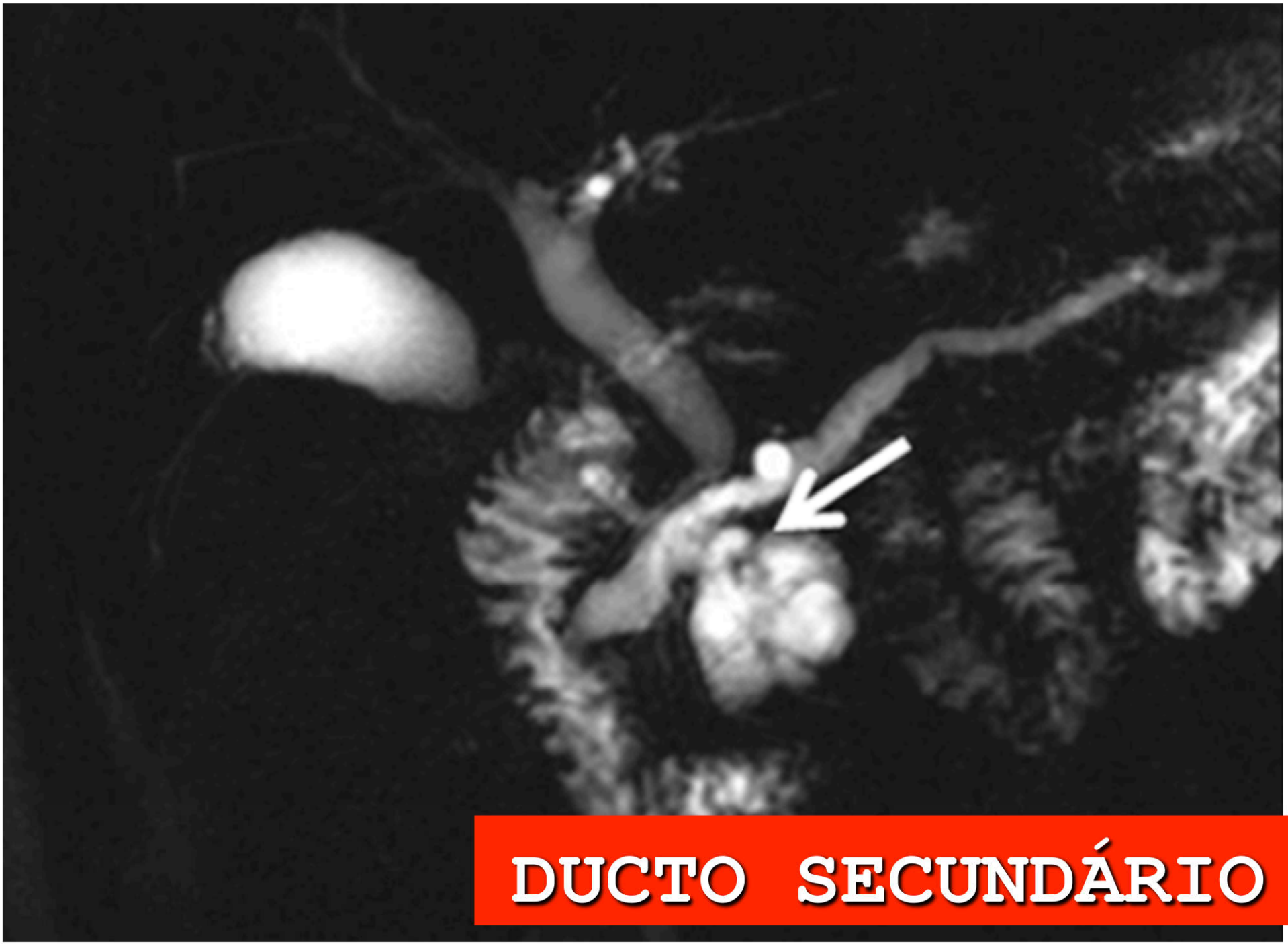

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IPMN Imagens

Table 1
Typical clinical and imaging features of common pancreatic cysts (Cited and modified from reference#2 with permission).

Characteristic	MCN	BD-IPMN	SCN	Pseudocyst
Sex (% female)	>95%	~55%	~70%	<25%
Age (decade)	4th, 5th	6th, 7th	6th, 7th	4th, 5th
Asymptomatic	~50%	mostly when small	~50%	nearly zero
Location (% body/tail)	95%	30%	50%	65%
Common capsule	yes	no	yes	N/A
Calcification	rare, curvilinear in the cyst wall	no	30–40%, central	no
Gross appearance	orange-like	grape-like	spongy or honeycomb-like	variable
Multifocality	no	yes	no	rare
Internal structure	cysts in cyst	cyst by cyst	microcystic and/or macrocystic	unilocular
Main pancreatic duct communication	infrequent	yes (though not always demonstrable)	no	common
Main pancreatic duct	normal or deviated	normal, or dilated to >5 mm, suggesting mixed type	normal or deviated	normal or irregularly dilated, may contain stones
Cyst fluid analysis	mucin, high CEA, *GNAS* wild, *RNF43* mutated	mucin, high CEA, *GNAS* frequently mutated, *RNF43* mutated	serous, very low CEA, VHL gene mutated, *RNF43* wild	nonmucinous, high amylase

Abbreviations: MCN, mucinous cystic neoplasm; BD-IPMN, branch duct intraductal papillary mucinous neoplasm; SCN, serous cystic neoplasm; N/A, not applicable; CEA, carcinoembryonic antigen.

Tanaka M, et al. Pancreatology 2017;17:738-53

MISTO

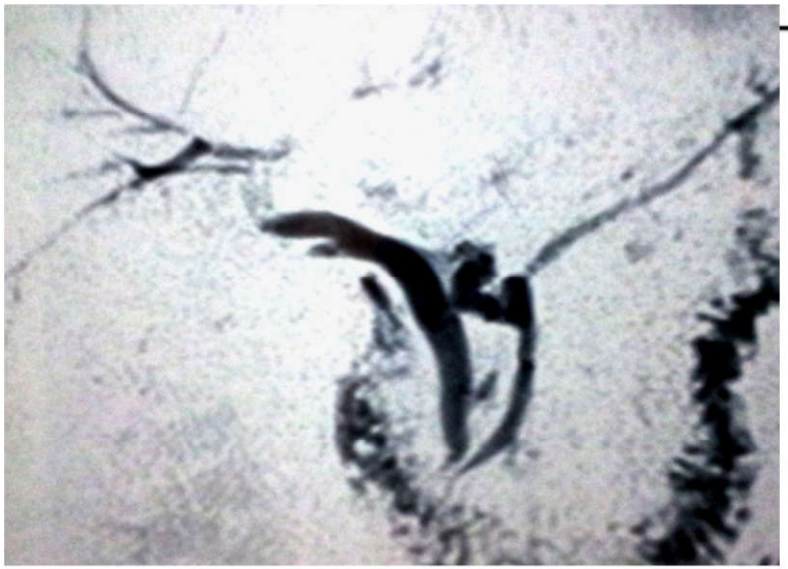
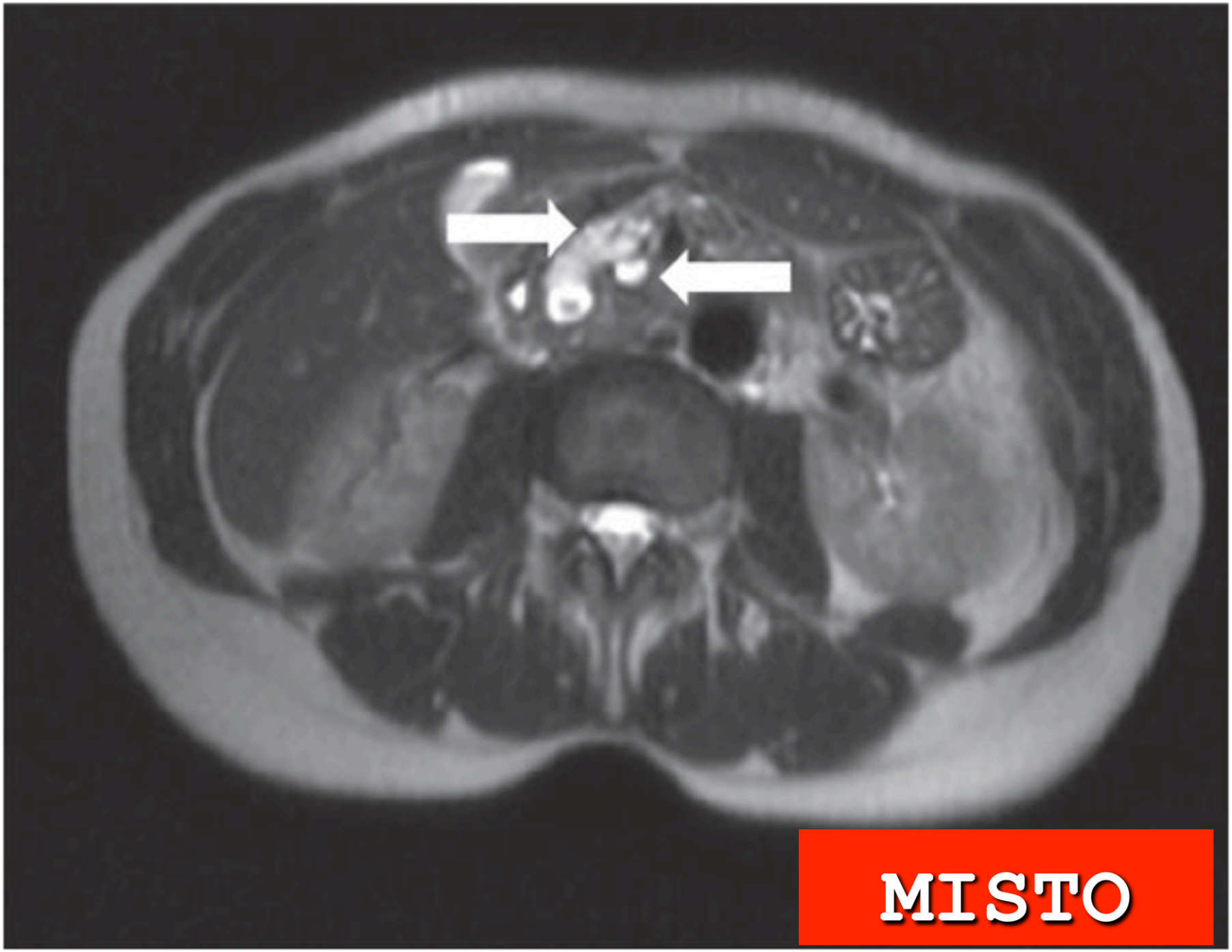


Table 2
Frequencies of malignancy in IPMNs acco

Total IPMNs			Mixed type		
First author	Year	Total	Number	Malignant	Invasive
Su					
Sol					
Sal					
Suzuki [14]	2004	1024	228 (22.3%)	148 (64.9%)	148 (64.9%)
Lee [15]	2005	67	5 (7.5%)	2 (40.0%)	2 (40.0%)
Serikawa [2]	2006	103			
Schmidt [3]	2007	156			
Rodriguez [20]	2007	145			
Schnelldorfer [16]	2008	208	48 (23.1%)	18 (37.5%)	
Kim [17]	2008	118			
Nagai [4]	2008	72	8 (11.1%)	4 (50.0%)	2 (25.0%)
Hwang [5]	2010	197	11 (5.6%)	10 (90.9%)	12 (109.1%)
Mimura [6]	2010	82			
Sadakari [22]	2010	73			
Kanno [23]	2010	159			
Crippa [10]	2010	389	149 (38.3%)	92 (62%)	62 (42%)
Total		3568	627 (17.6%)	>361 (>57.6%)	284 (45.3%)

Frequencia de malignidade = 57.6%
34.6 a 78.9%

Frequencia de IPMN Invasivo = 45.3%
19.2 a 68.4%



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LOCALIZAÇÃO

Table 3 Pathological characteristics of the 124 IPMNs classified according to their anatomical localization

Variables	Branch duct IPMN (*n* = 33–26.5%)	Main duct and mixed IPMN (*n* = 91–73.5%)	*p**
Histology *(%)*			
Low grade dysplasia	21 *(63)*	41 *(45)*	0.21
High grade dysplasia	5 *(15)*	20 *(22)*	0.45
Invasive carcinoma	7 *(21)*	30 *(33)*	0.26
Total benign	21 *(63.5)*	41 *(45)*	
Total malignant	12 *(36.5)*	50 *(55)*	0.10
Cytological subtypes *(%)*			
Gastric	6 *(5)*	9 *(7)*	0.22
Intestinal	6 *(5)*	28 *(22.5)*	0.35
Hepatobiliary	19 *(15)*	37 *(30)*	0.10
Oncocytic	0	5 *(4)*	0.52
Other	2 *(1.5)*	12 *(9.5)*	0.34

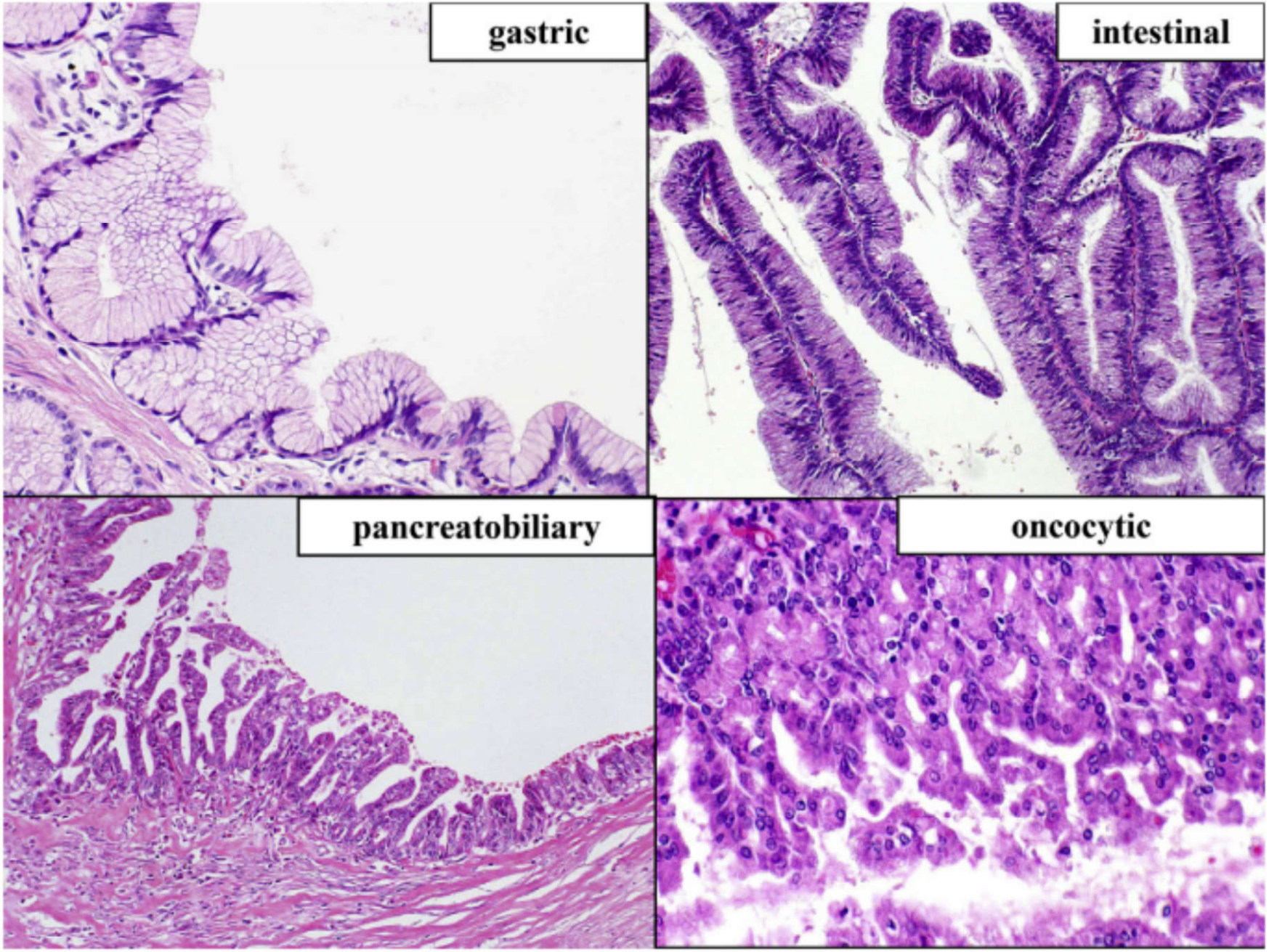
Buscail E et al. BMC Surgery 2019; 19:115

SUBTIPO HISTOPATOLÓGICO

	Histologic sub-type			
	Gastric	Intestinal	Pancreatobiliary	Oncocytic
Frequency (%)	60–70	30–40	< 10	< 5
Morphologic sub-type	BD > MD	MD > BD	MD or BD	MD or BD
Atypia	Low grade	High grade	High grade	High grade
Progression	Indolent	Indolent	Rapid	Rapid
Type of carcinoma	Tubular	Colloid	Tubular	Oncocytic
5, 10 years survival rate	0.937, 0.937	0.886, 0.685	0.520	0.839, 0.734
KRAS (%)	53-87	40-46	45-60	±
GNAS (%)	39-65	48-83	30	±
MUC1	−	−	+	±
MUC2	−	+	−	±
MUC5AC	+	+	+	+
MUC6	+	−	+	+

Lim J, Allen PJ. Updates Surg 2019; 71:209–16

SUBTIPO HISTOPATOLÓGICO



Tanaka M, et al. Pancreatology 2017;17:738-53

SUBTIPO HISTOPATOLÓGICO

Table 2 | **Classification of subtypes of IPMN according to morphology**

		Immunohistochemical expression								
Subtype	**Morphology**	**MUC1**	**MUC2**	**MUC5AC**	**MUC6**	**CDX2 or CK20**	**HEPAR**	**Percentage of IPMN**	**Percentage invasive progression**	**Type of adenocarcinoma**
Gastric	Thick finger-like papillae	–	–	+	+	–	–	46–63	10	Tubular (79%)
Intestinal	Villous papillae	–	+	+	–	+	–	18–36	40	Colloid > tubular
Pancreato-biliary	Complex thin branching papillae	+	–	+	+	–	–	7–18	68	Tubular (82%)
Oncocytic	Complex thick branching papillae with intracellular and intraepithelial lumina	+	–	+	+	–	+	1–8	50	Tubular > colloid

CDX2, homeobox protein CDX-2; CK, cytokeratin; HEPAR, hepatocyte paraffin; IPMN, intraductal papillary mucinous neoplasm; MUC, mucin. Data from REFS[52–55,200].

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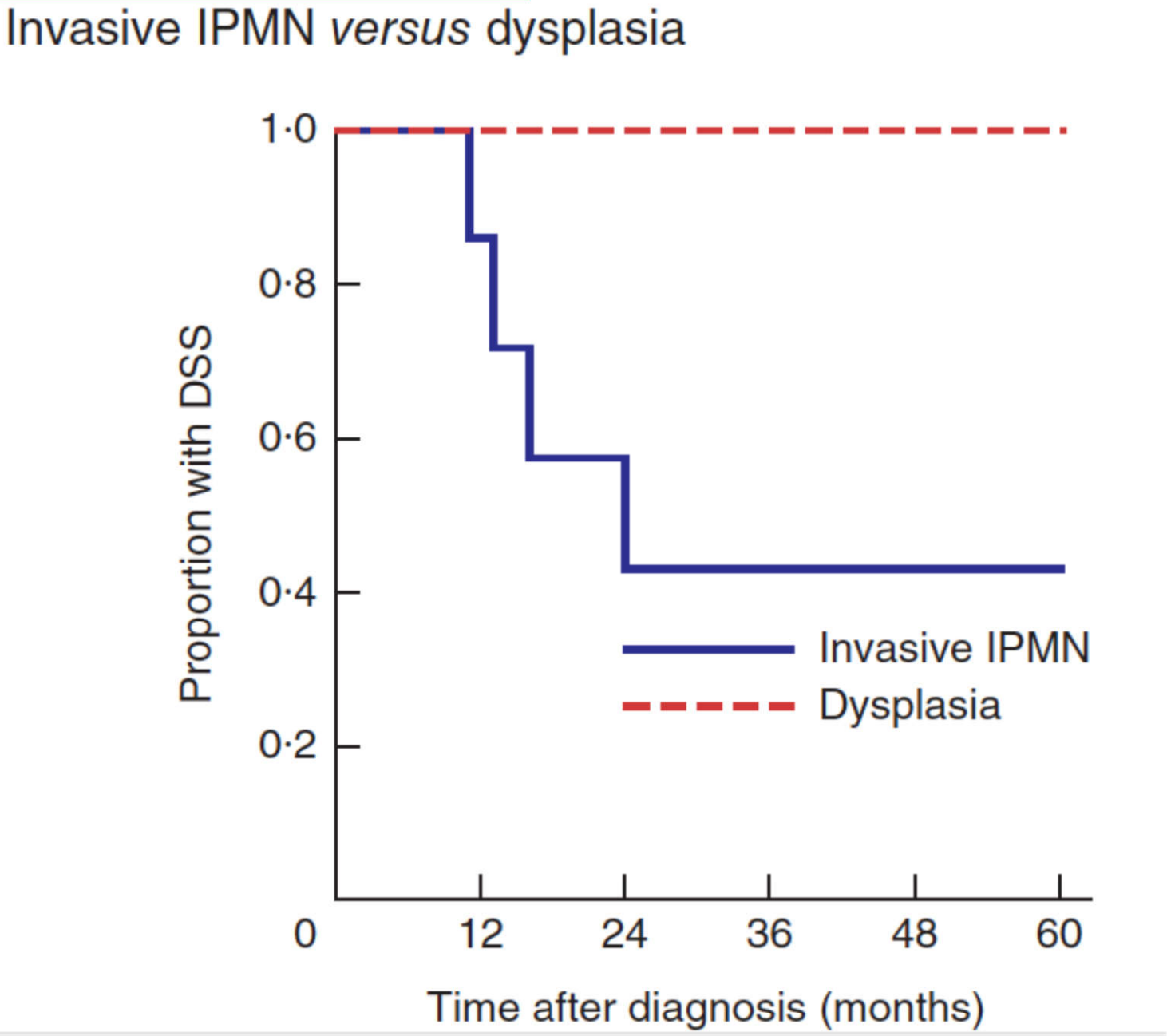
IPMN INVASIVO



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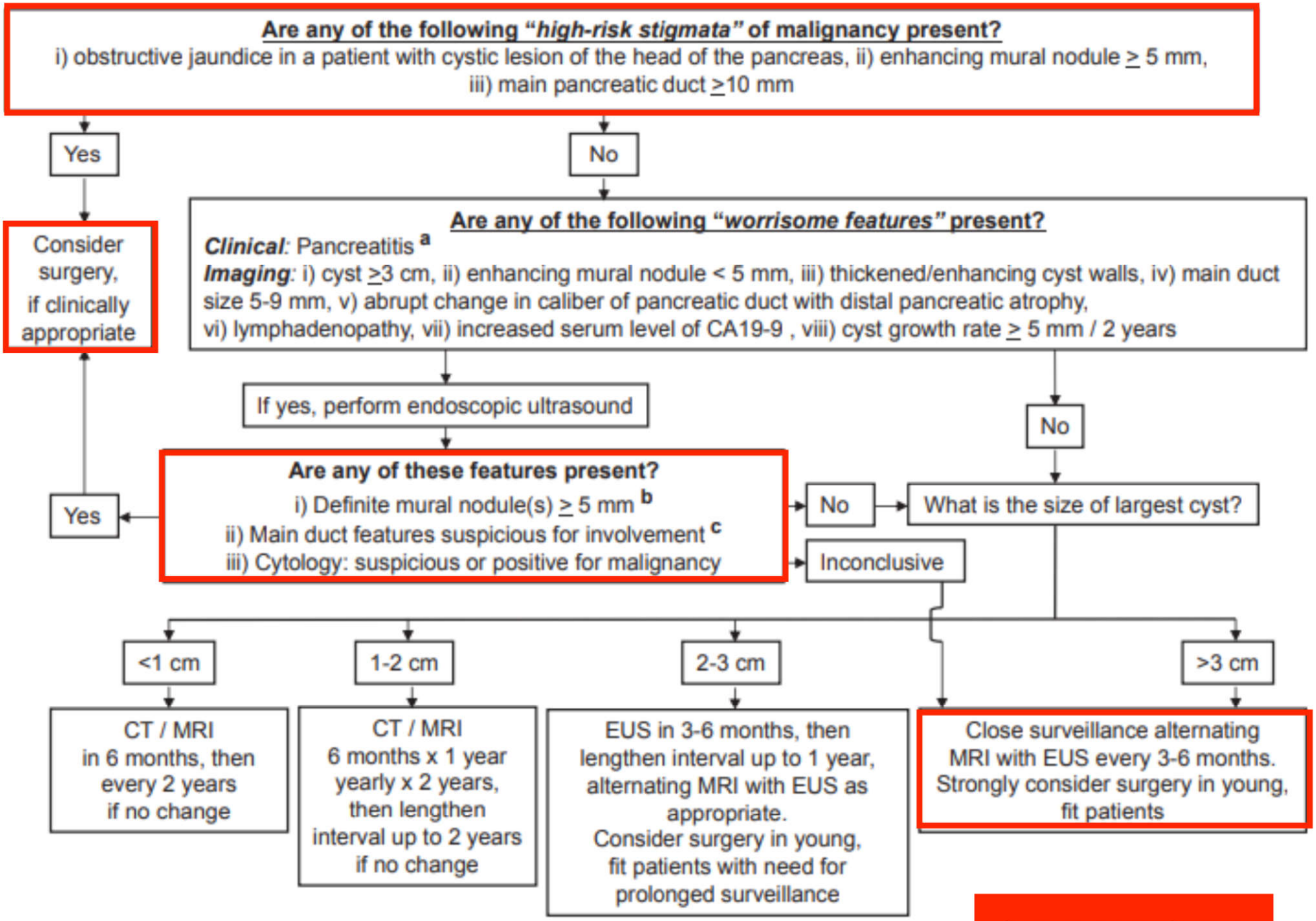
TRATAMENTO CIRÚRGICO

Table 1 Clinical parameters used to recommend resection of IPMN

	International Association of Pancreatology Guidelines, 2012 (revised 2017) [19, 25]	European Experts Consensus Statement, 2013 (revised, 2018) [20, 21]	American Gastroenterological Association Guidelines, 2015 [22]
Age	–	–	–
Obstructive jaundice	Presence	Presence	–
Abdominal pain/history of pancreatitis	Not definitive	Presence	–
Main duct size	> 10 mm	≥ 10 mm	Dilated[a]
Mural nodule	Enhancement	Enhancement, ≥ 5 mm	Presence[a]
Cyst size	Not definitive	Not definitive	≥ 3 cm[a]
Cytology	Suspicious or positive	Positive	Positive
Serum CA19-9	–	Not definitive	–

Lim J, Allen PJ. Updates Surg 2019; 71:209–16



CIRURGIA

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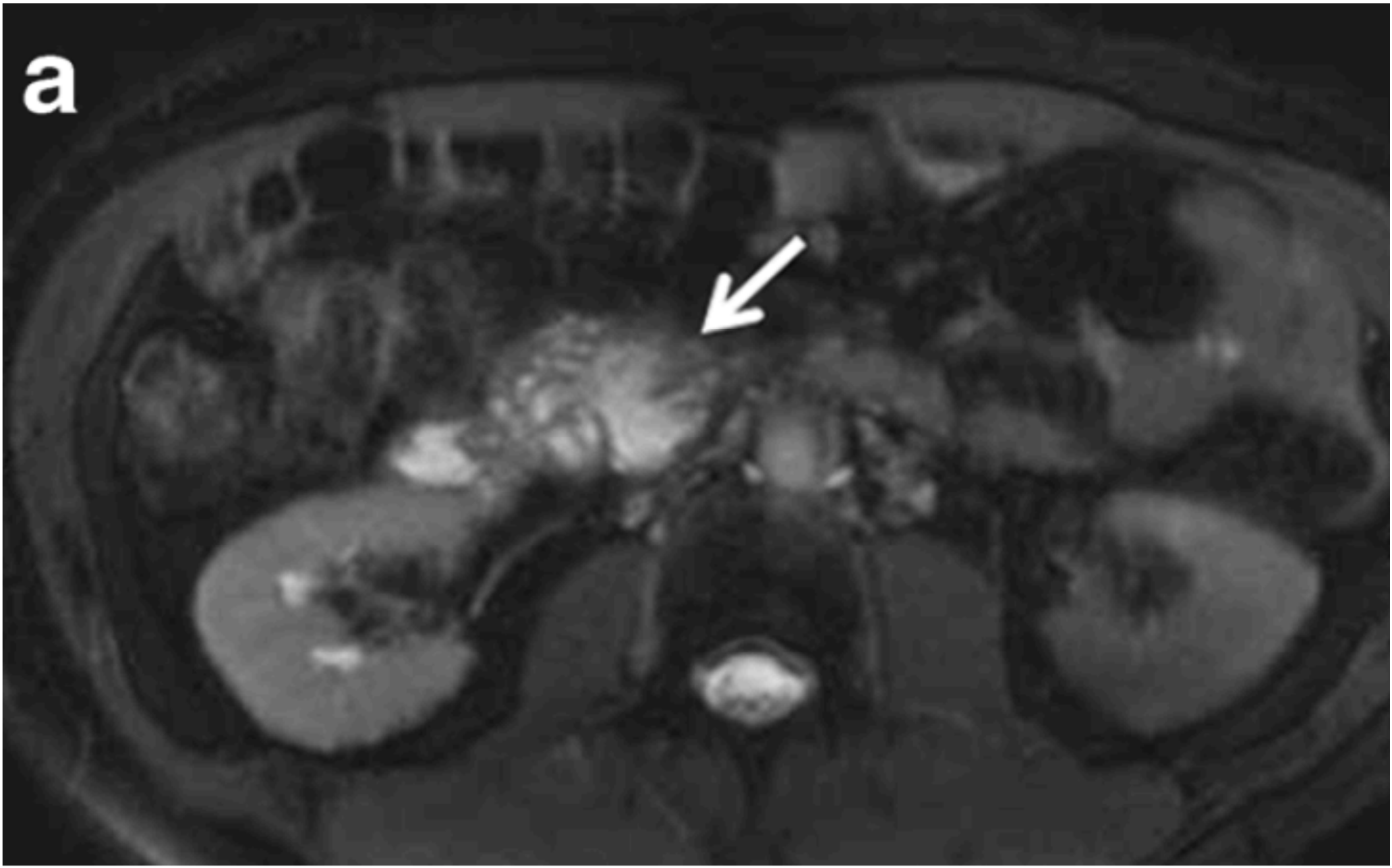
TRATAMENTO CIRÚRGICO

Variables	All resection types *N* = 124 *N (%)*
Procedures	
Pancreatoduodenectomy	56 *(45)*
Distal pancreatectomy	45 *(36)*
Enucleation	3 *(2.5)*
Total pancreatectomy	19 *(15)*
Central pancreatectomy	1 *(0.5)*

Buscail E et al. BMC Surgery 2019; 19:115



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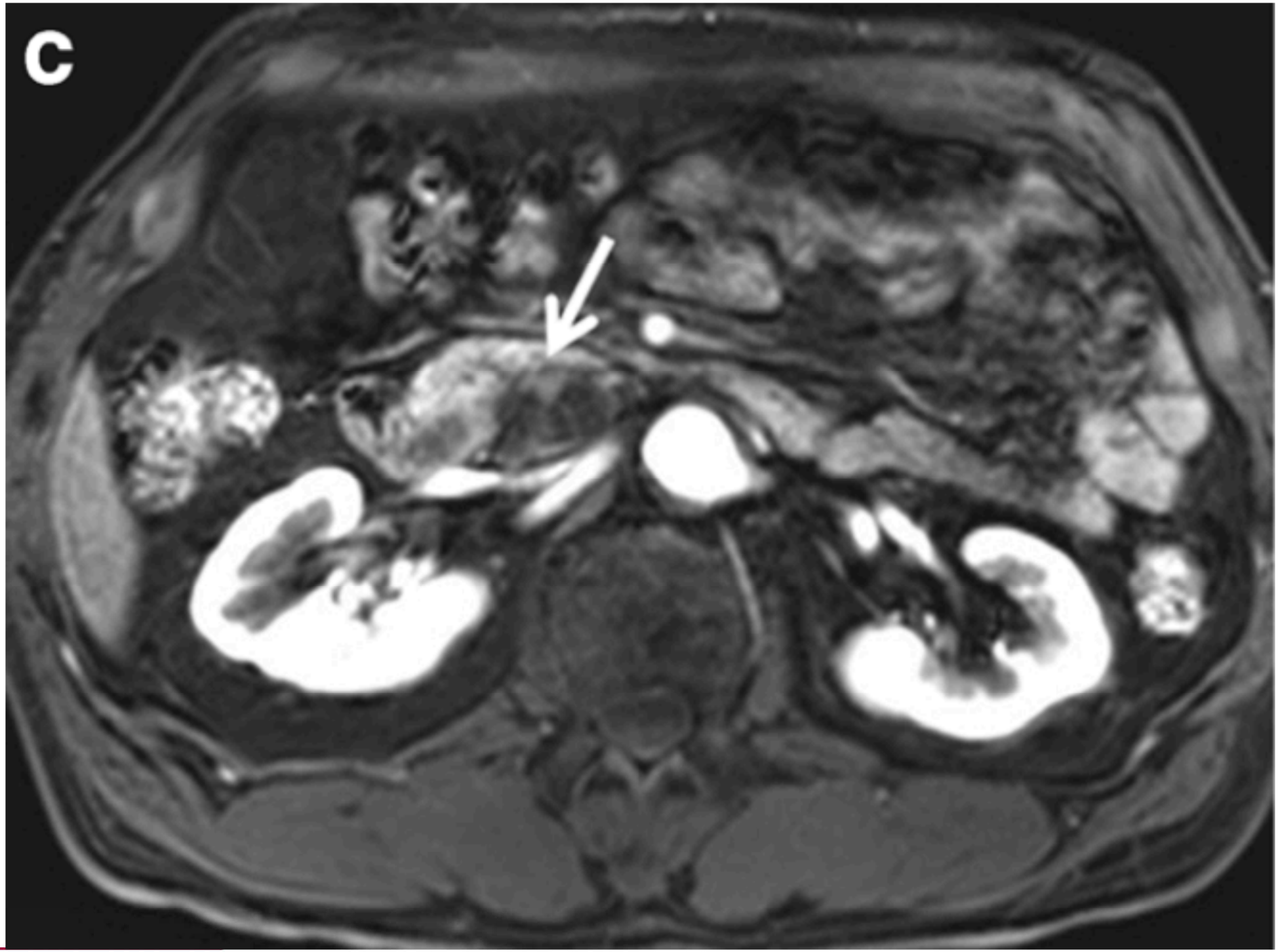

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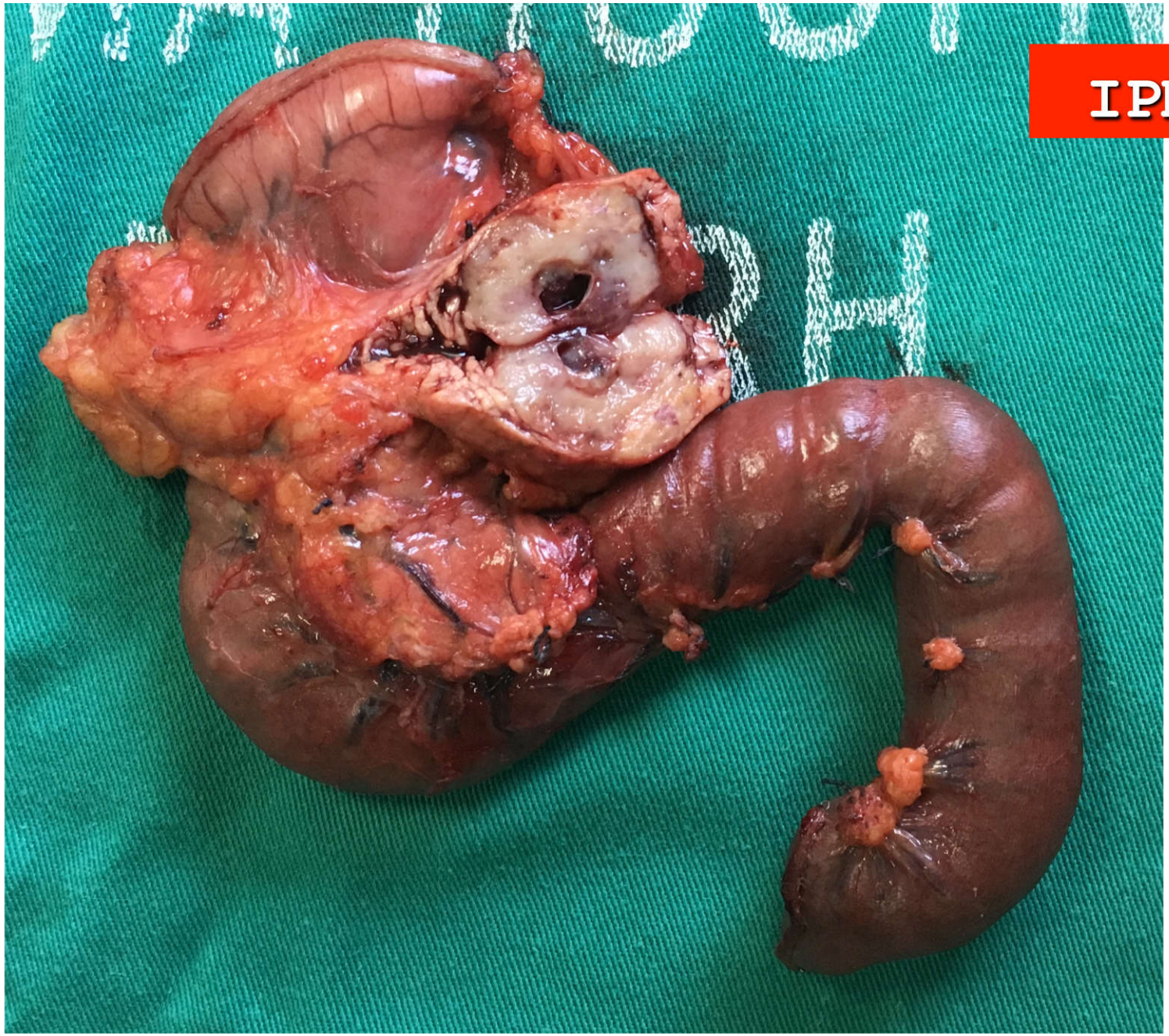
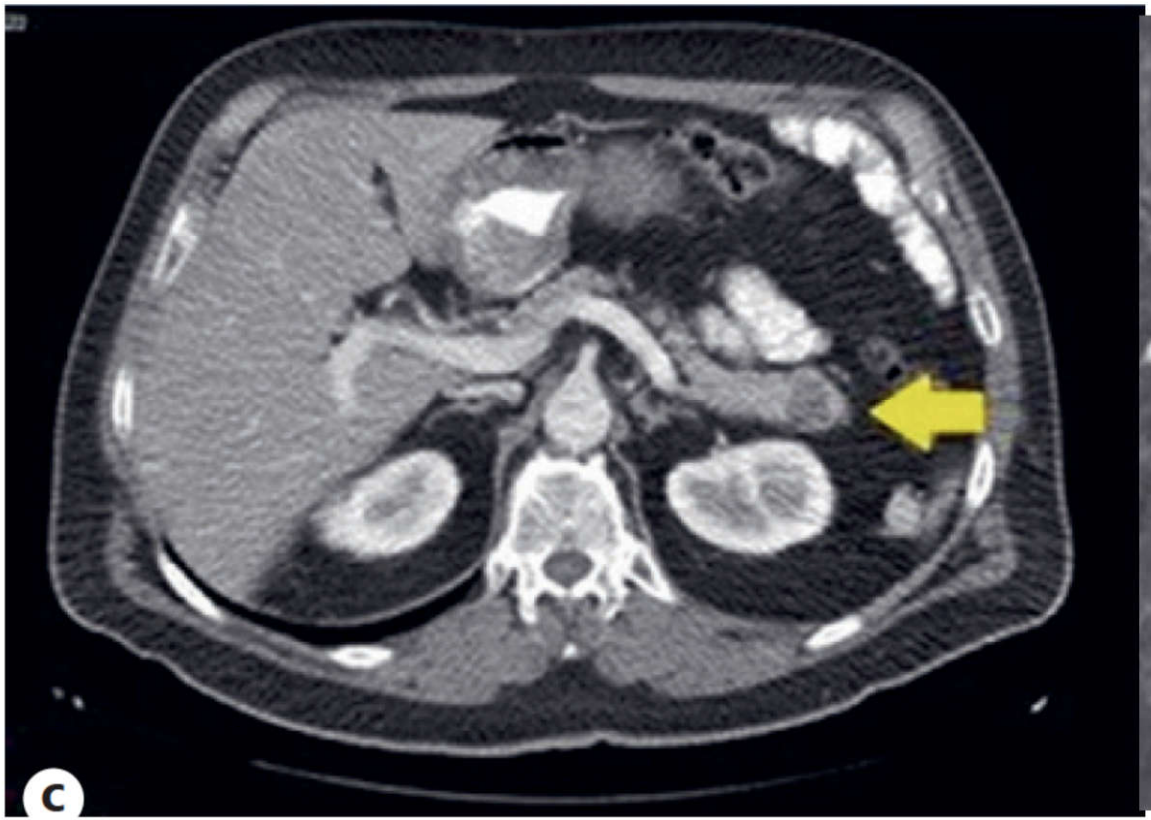
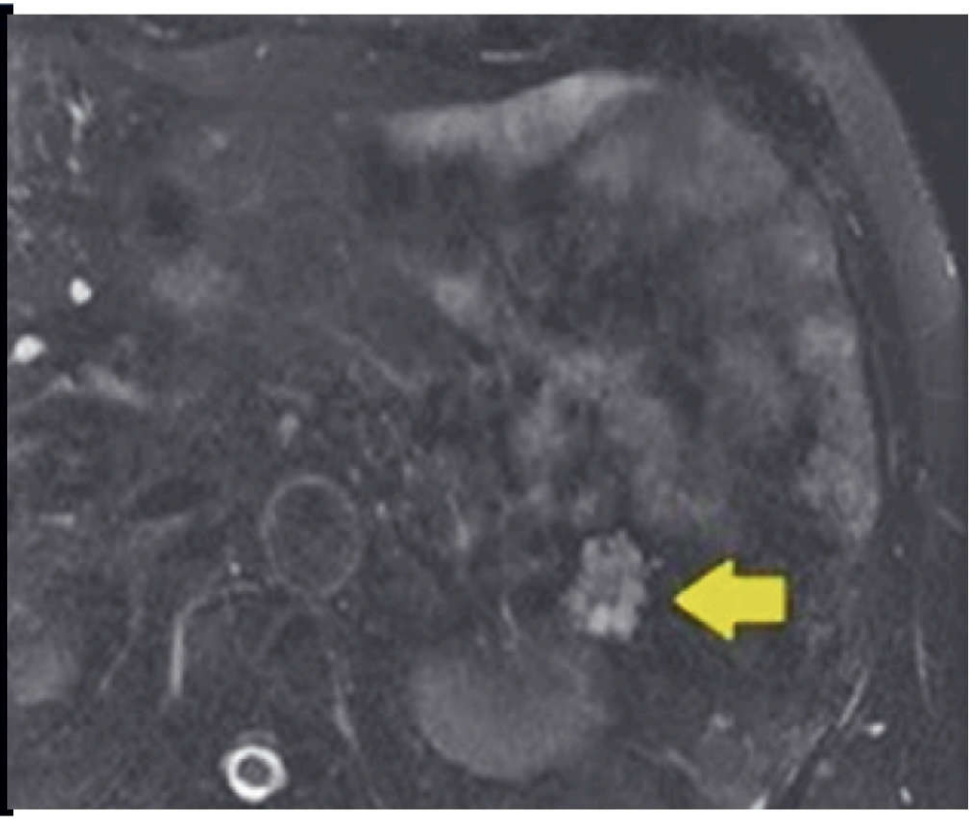
DUODENOPANCREATECTOMIA



IPMN





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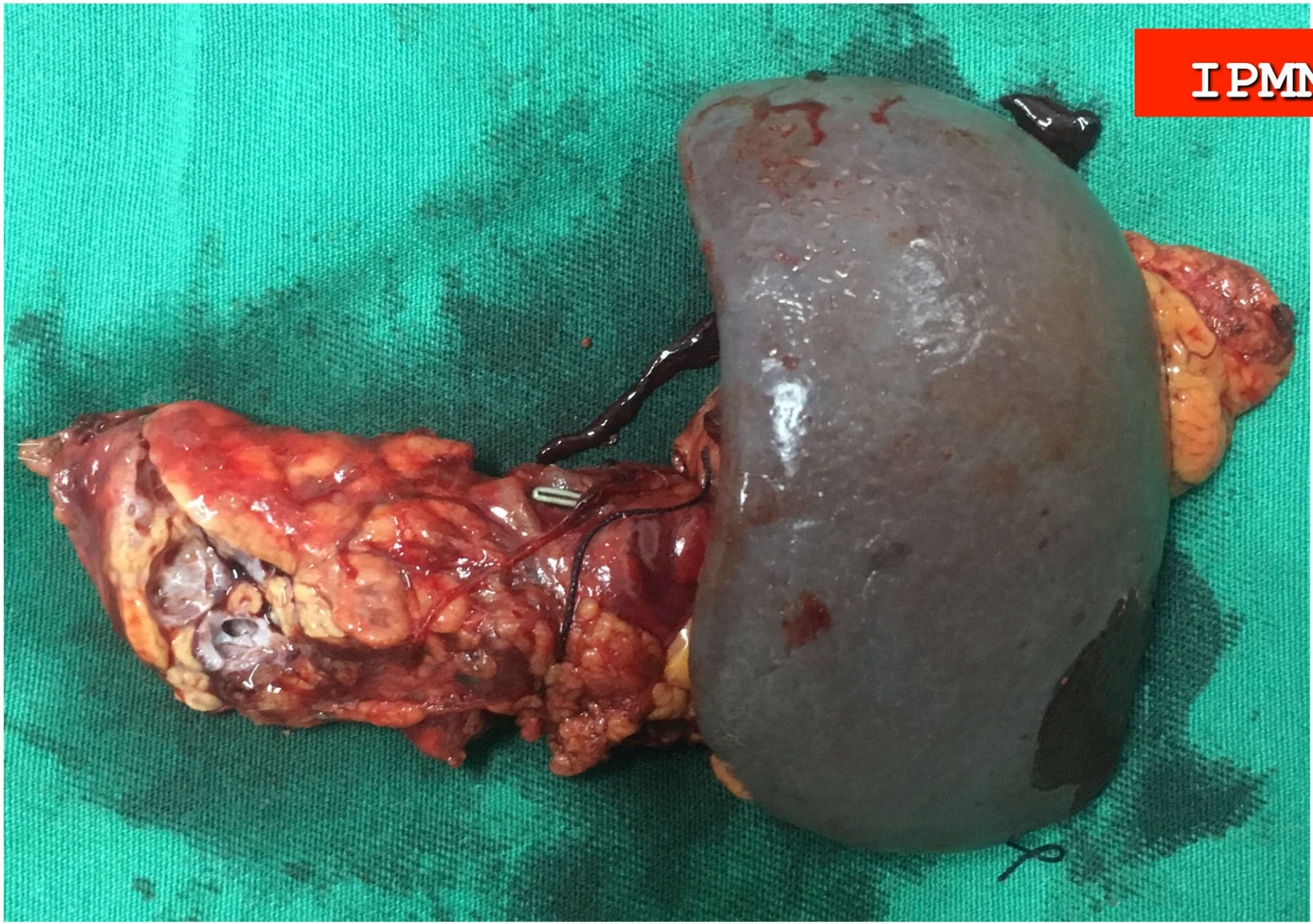
PANCREATECTOMIA DISTAL



Review Article

Digestive Surgery

Dig Surg 2016;33:335–342
DOI: 10.1159/000445019

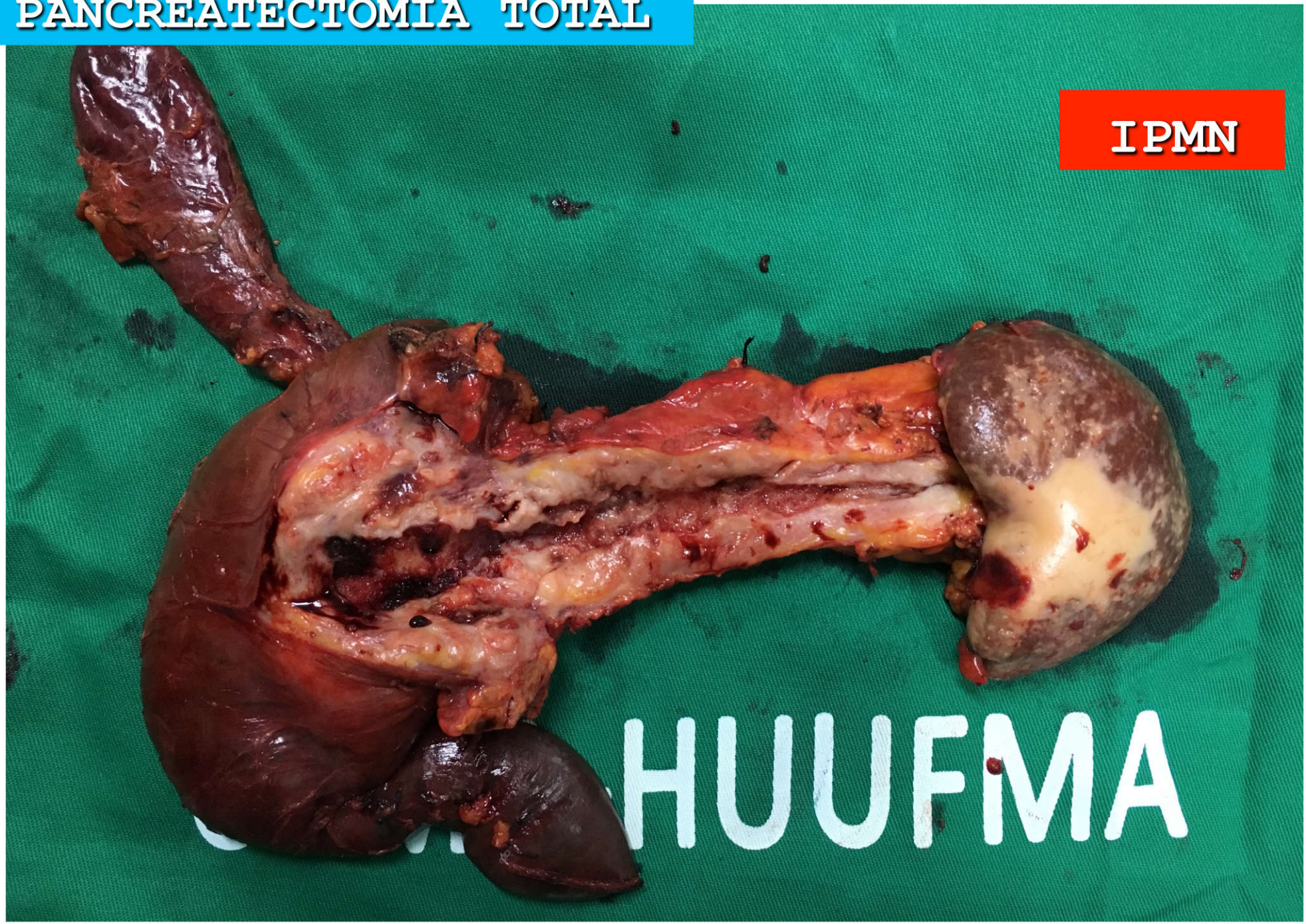
Published online: May 25, 2016

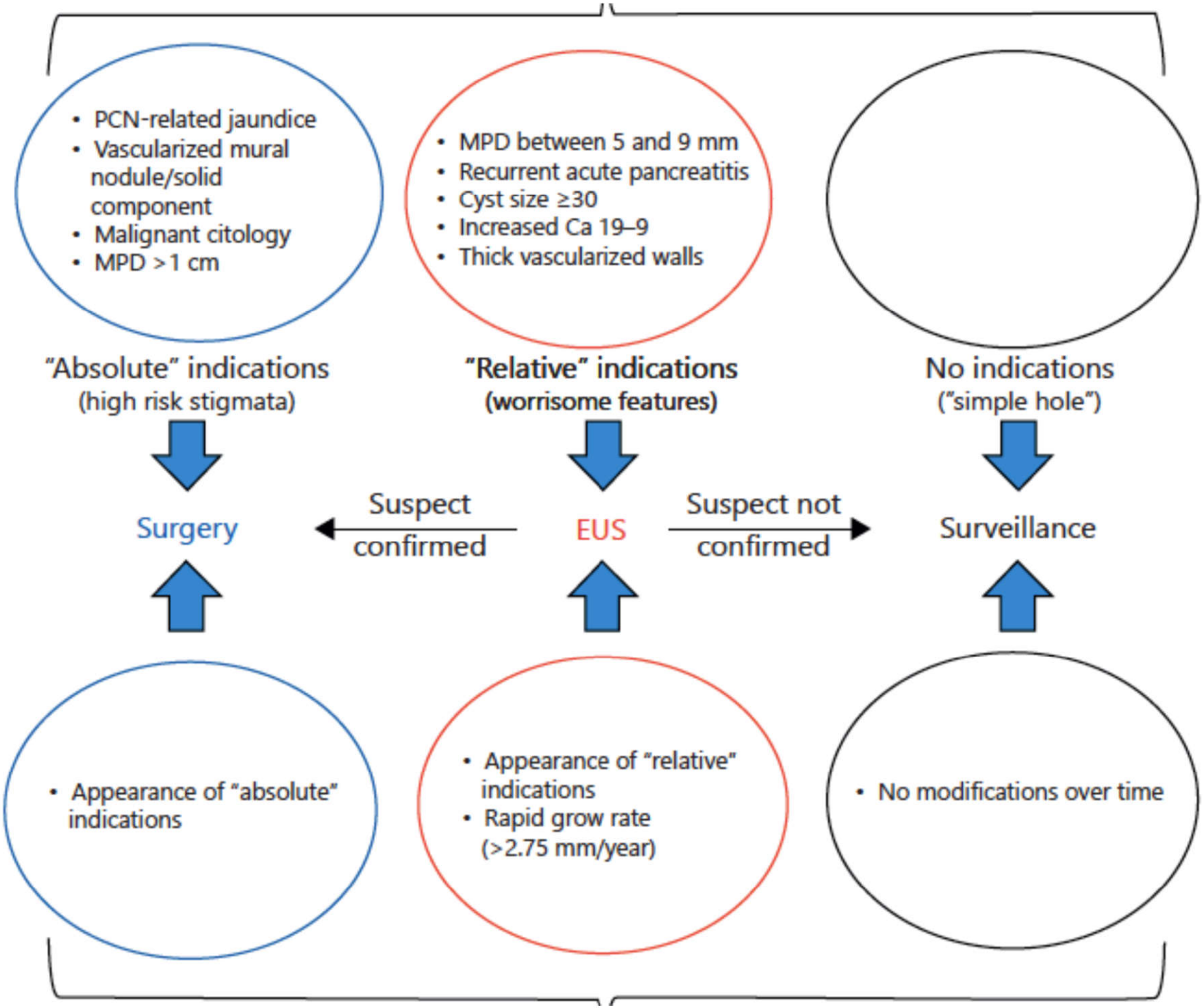
Is It Time to Expand the Role of Total Pancreatectomy for IPMN?

- ❑ Envolvimento difuso do ducto principal
- ❑ Doença multifocal em paciente de alto risco
- ❑ Persistente alto grau de displasia na margem de ressecção

Griffin JF, et al. Dig Surg 2016;33:335-42

PANCREATECTOMIA TOTAL





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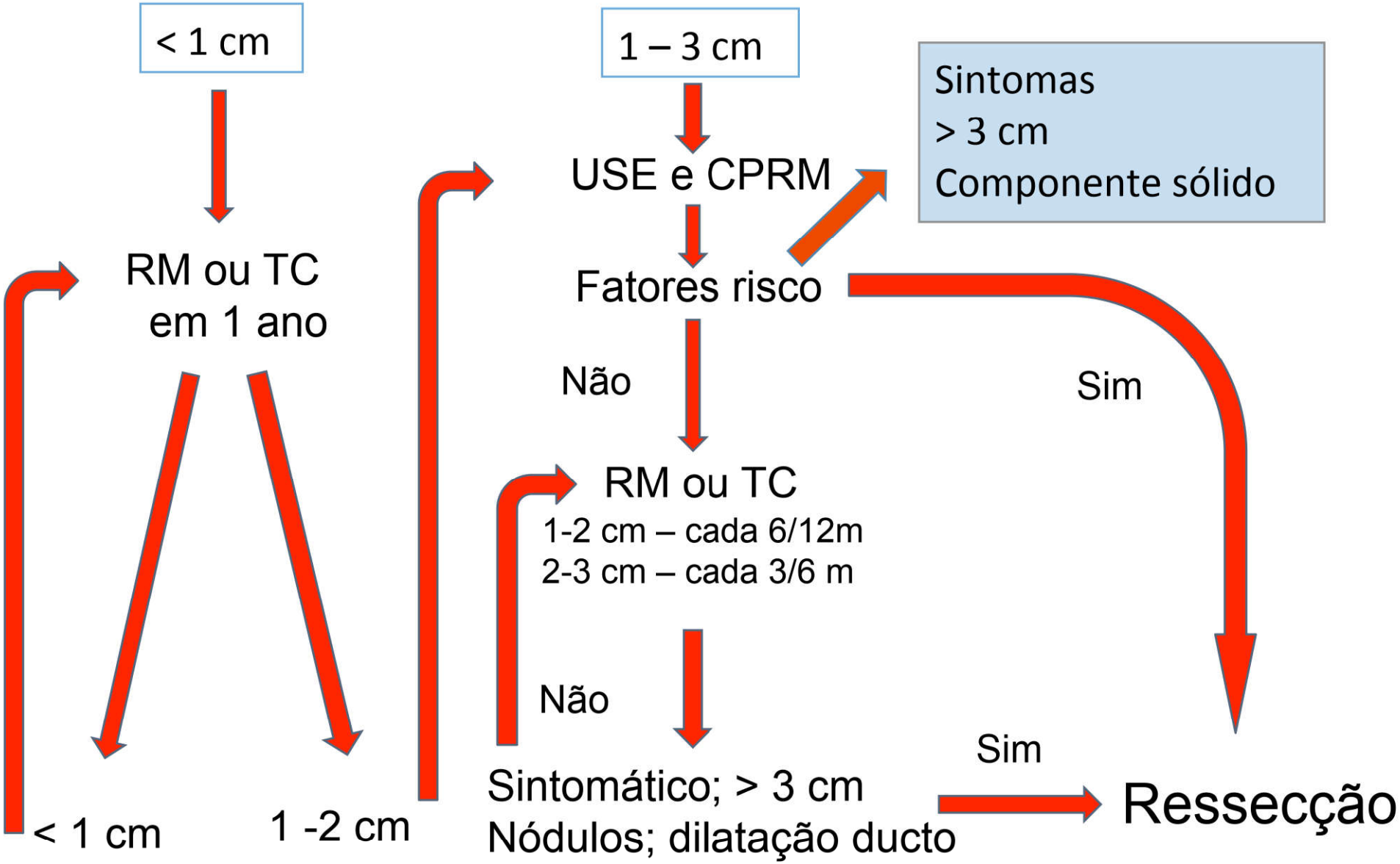
IPMN INCIDENTAL



CONTROLE

Table 4 | **Surveillance interval of nonresected pancreatic cysts as stratified by different guidelines**

Guideline	Cyst type	Cyst size	Surveillance interval	Surveillance modalities
2015 AGA[48]	IPMN	<30 mm	Yearly for 1 year then every 2 years[a]	MRI with MRCP
2017 IAP[3]	IPMN	<10 mm	Within 6 months then every 2 years	CT or MRI with MRCP
		10–20 mm	Every 6 months for 1 year then yearly for 2 years, then every 2 years	CT or MRI with MRCP
		20–30 mm	3–6 months then yearly	EUS, alternating MRI with EUS
2018 European[4]	IPMN	<40 mm	Every 6 months for 1 year then yearly	CA19-9, EUS and/or MRI
	MCN	<40 mm	Every 6 months for 1 year then yearly	CA 19-9, EUS and/or MRI

AGA, American Gastroenterological Association; CA19-9, cancer antigen 19-9; European, European Study Group on Cystic Tumours of the Pancreas; EUS, endoscopic ultrasound; IAP, International Association of Pancreatology; IPMN, intraductal papillary mucinous neoplasm; MCN, mucinous cystic neoplasm; MRCP, magnetic resonance cholangiopancreatography. [a] The 2015 AGA guideline suggests discontinuing the follow-up after 5 years if there is no change in size or characteristics of the cyst.

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