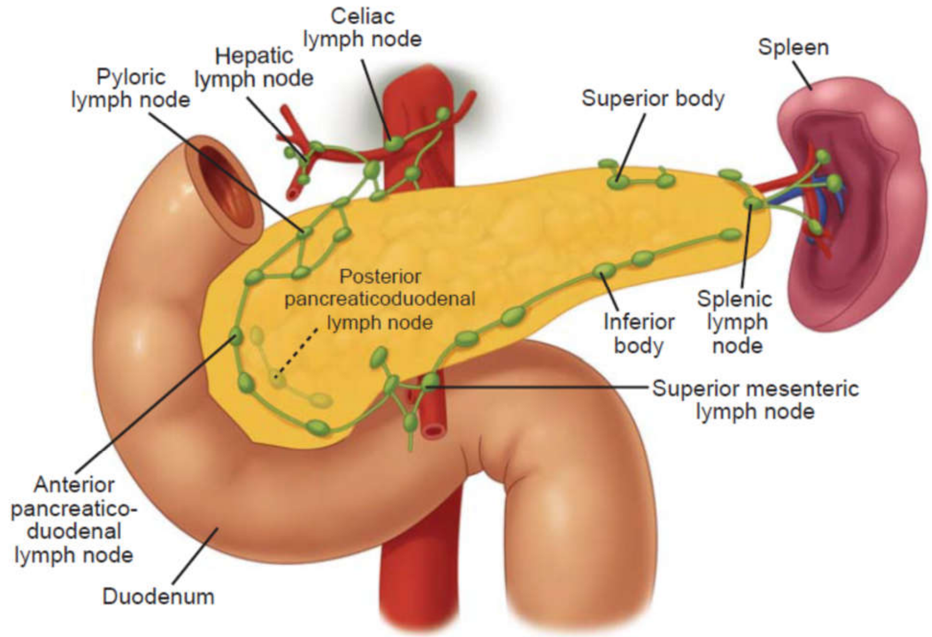
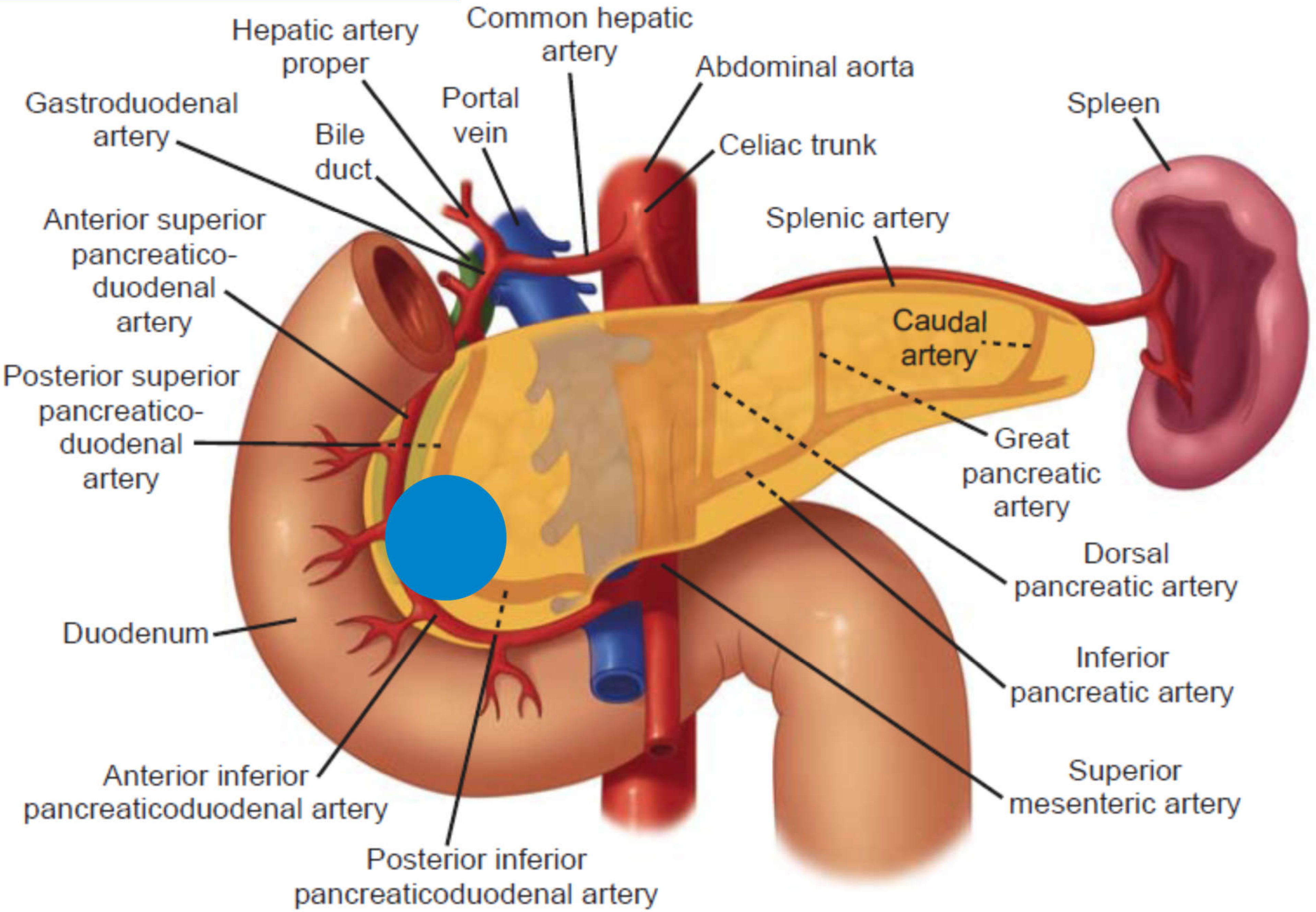
DUODENOPANCREATECTOMIA PARA NEOPLASIA DO PÂNCREAS



Orlando Jorge M. Torres
Professor Titular e Chefe do Serviço de Cirurgia do Aparelho Digestivo
Unidade Hepatopancreatobiliar
Universidade Federal do Maranhão - Brasil

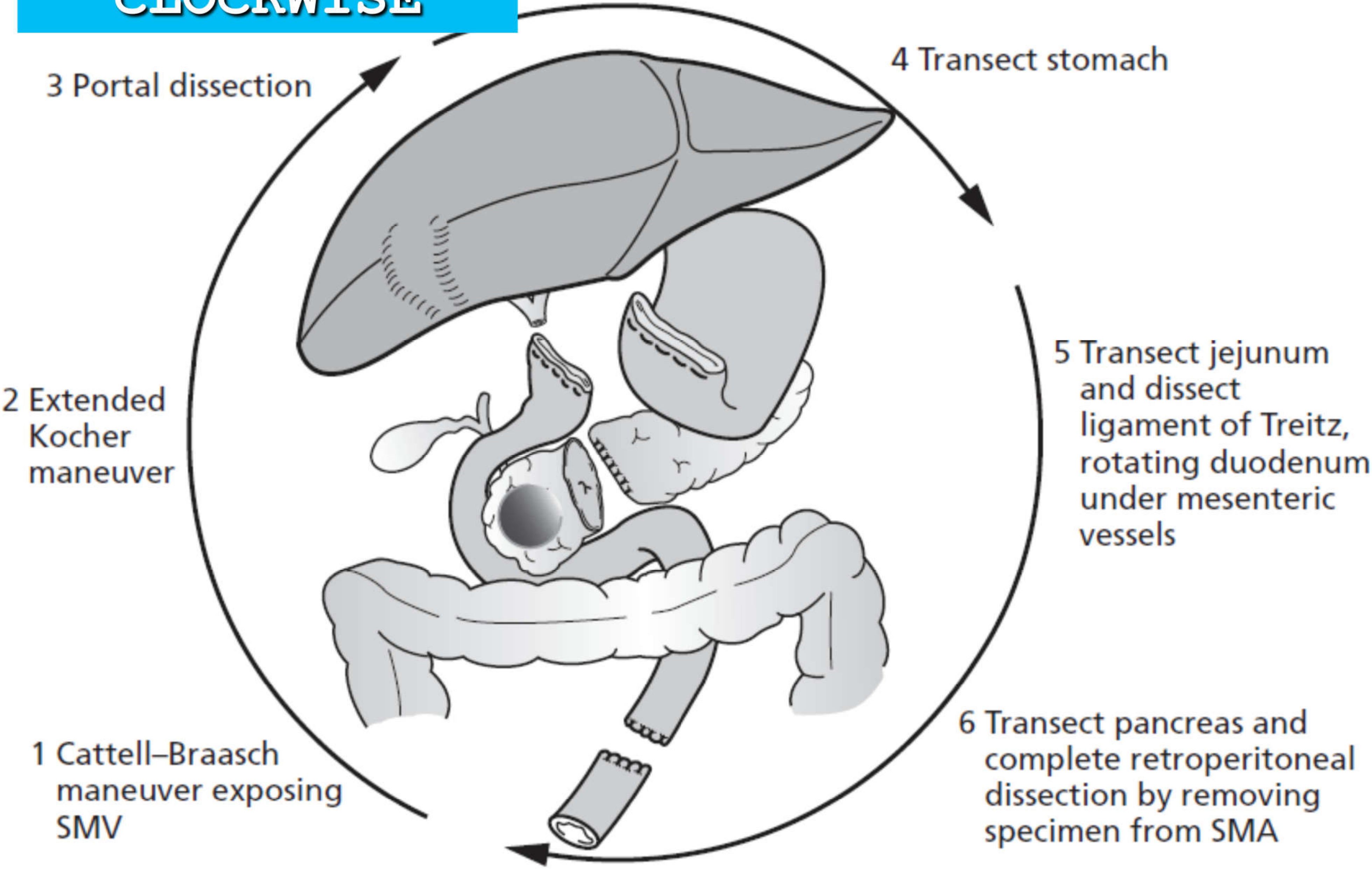
ANATOMIA


Hepatic artery proper
Common hepatic artery
Abdominal aorta
Spleen
Gastroduodenal artery
Bile duct
Portal vein
Celiac trunk
Splenic artery
Anterior superior pancreatico-duodenal artery
Caudal artery
Posterior superior pancreatico-duodenal artery
Great pancreatic artery
Dorsal pancreatic artery
Duodenum
Inferior pancreatic artery
Superior mesenteric artery
Anterior inferior pancreaticoduodenal artery
Posterior inferior pancreaticoduodenal artery

DUODENOPANCREATECTOMIA

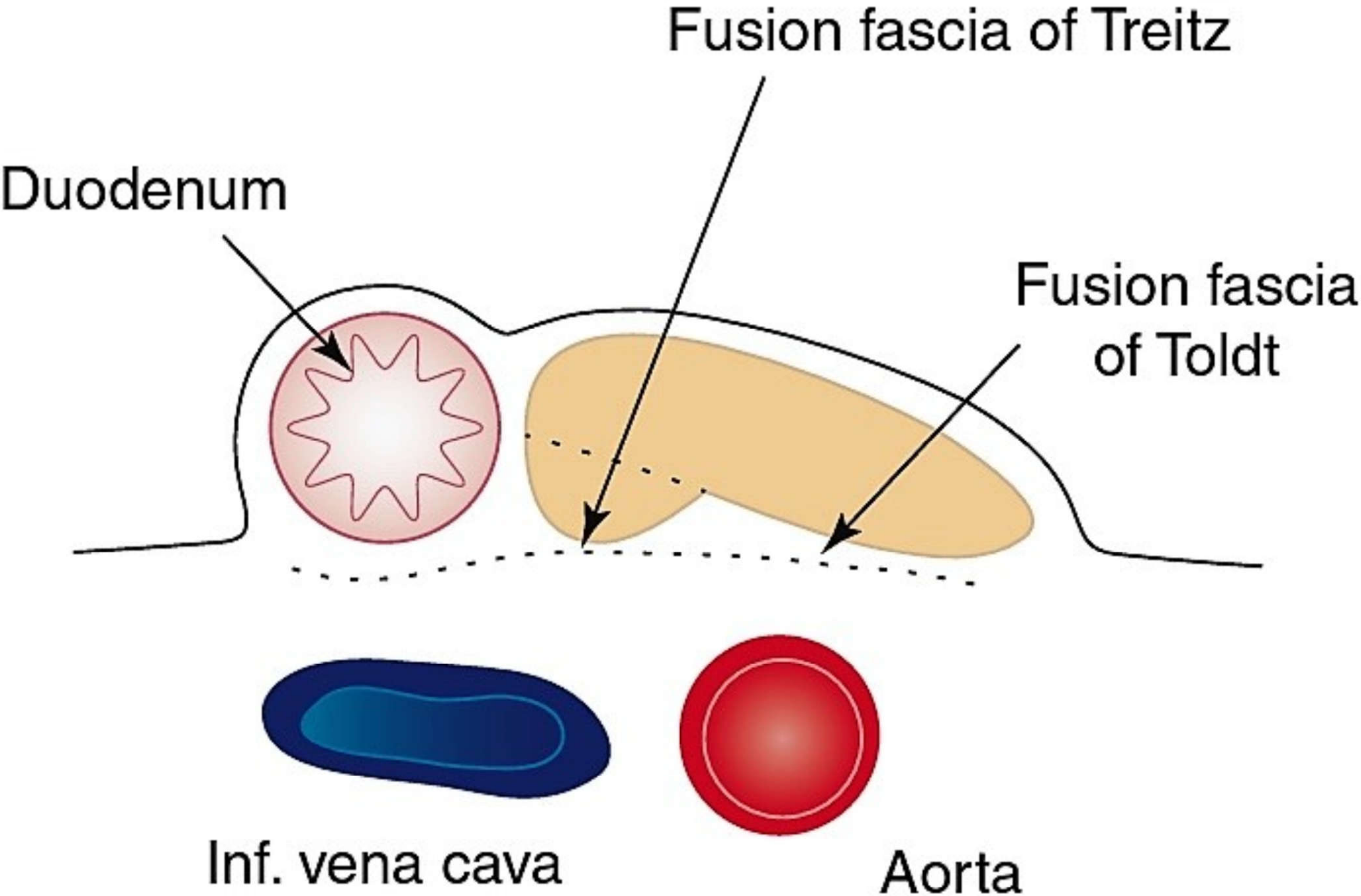
- Sangramento
- Fístula pancreática
- Gastroparesia
- Padrão oncológico

CLOCKWISE

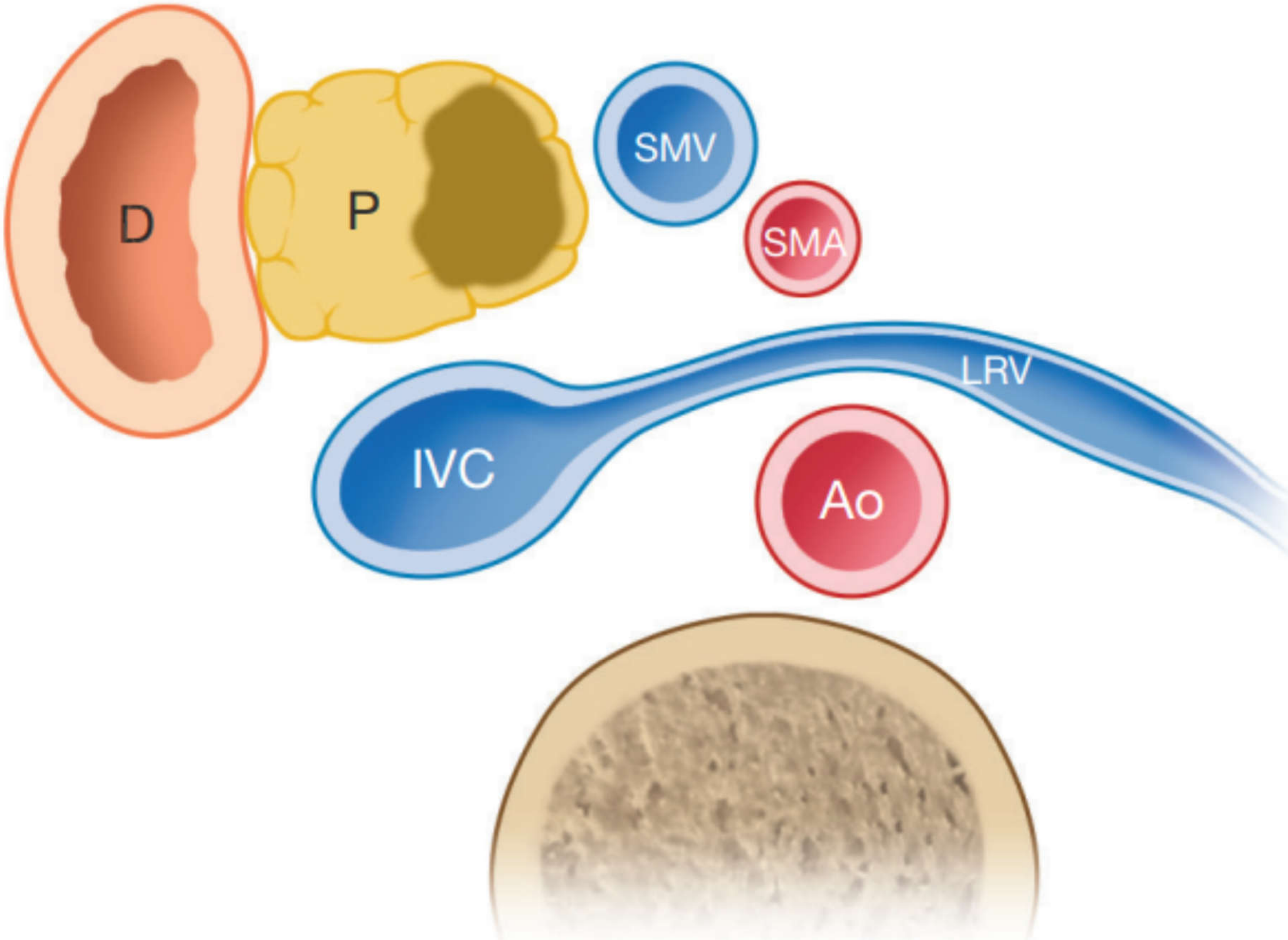


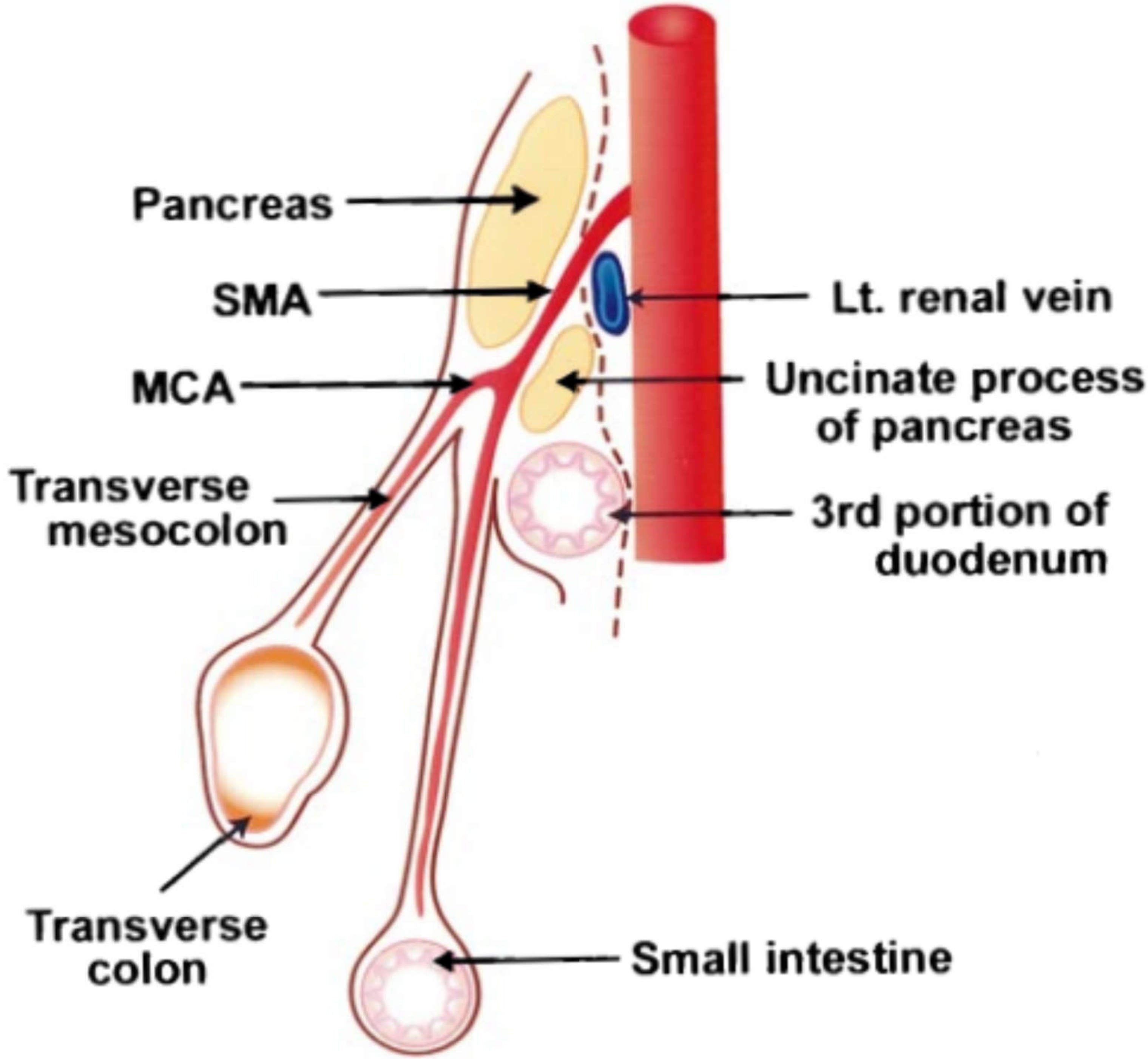
3 Portal dissection
4 Transect stomach
2 Extended Kocher maneuver
5 Transect jejunum and dissect ligament of Treitz, rotating duodenum under mesenteric vessels
1 Cattell–Braasch maneuver exposing SMV
6 Transect pancreas and complete retroperitoneal dissection by removing specimen from SMA

Manobra de Kocher ampliada (3)

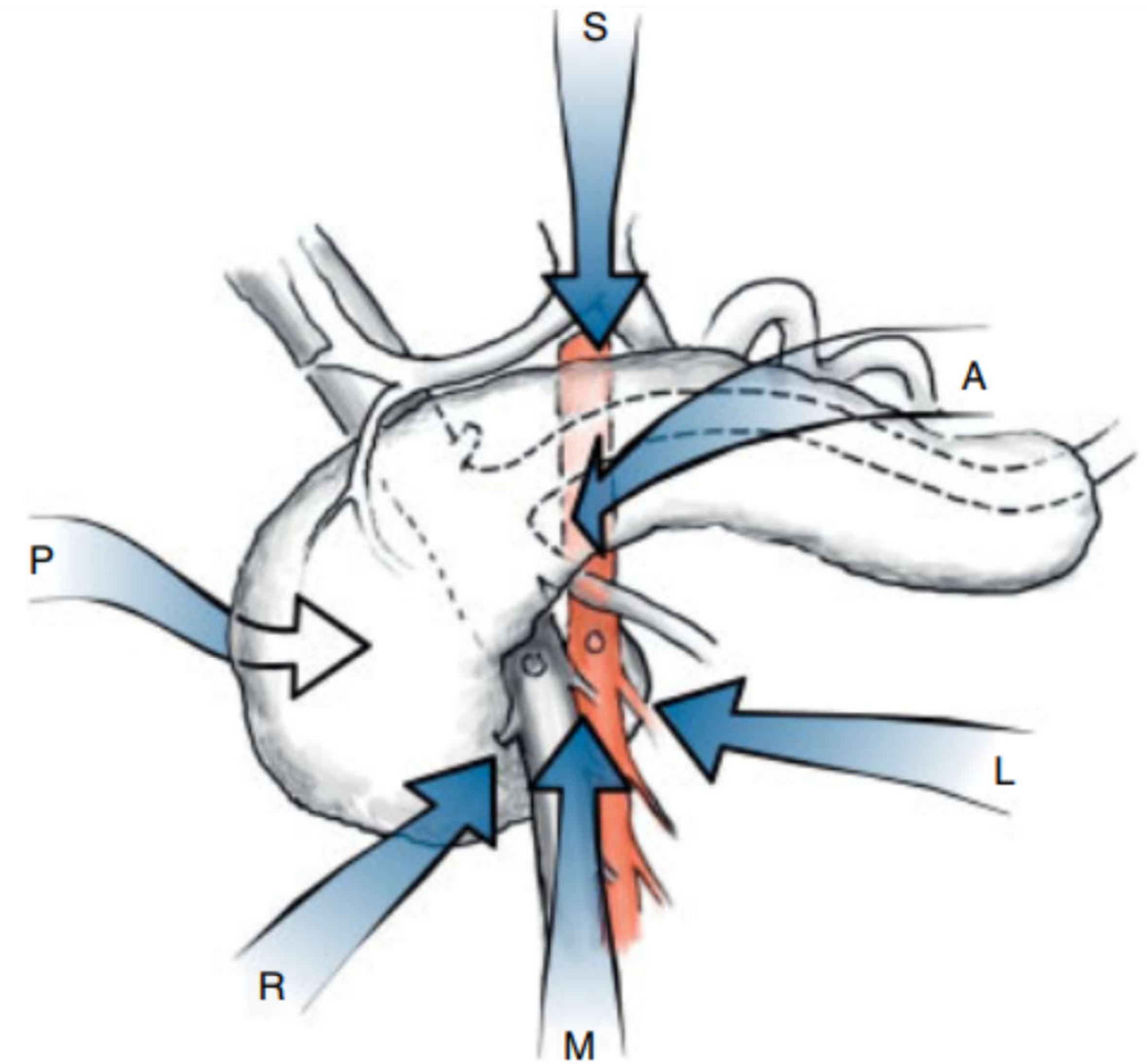


Manobra de Kocher



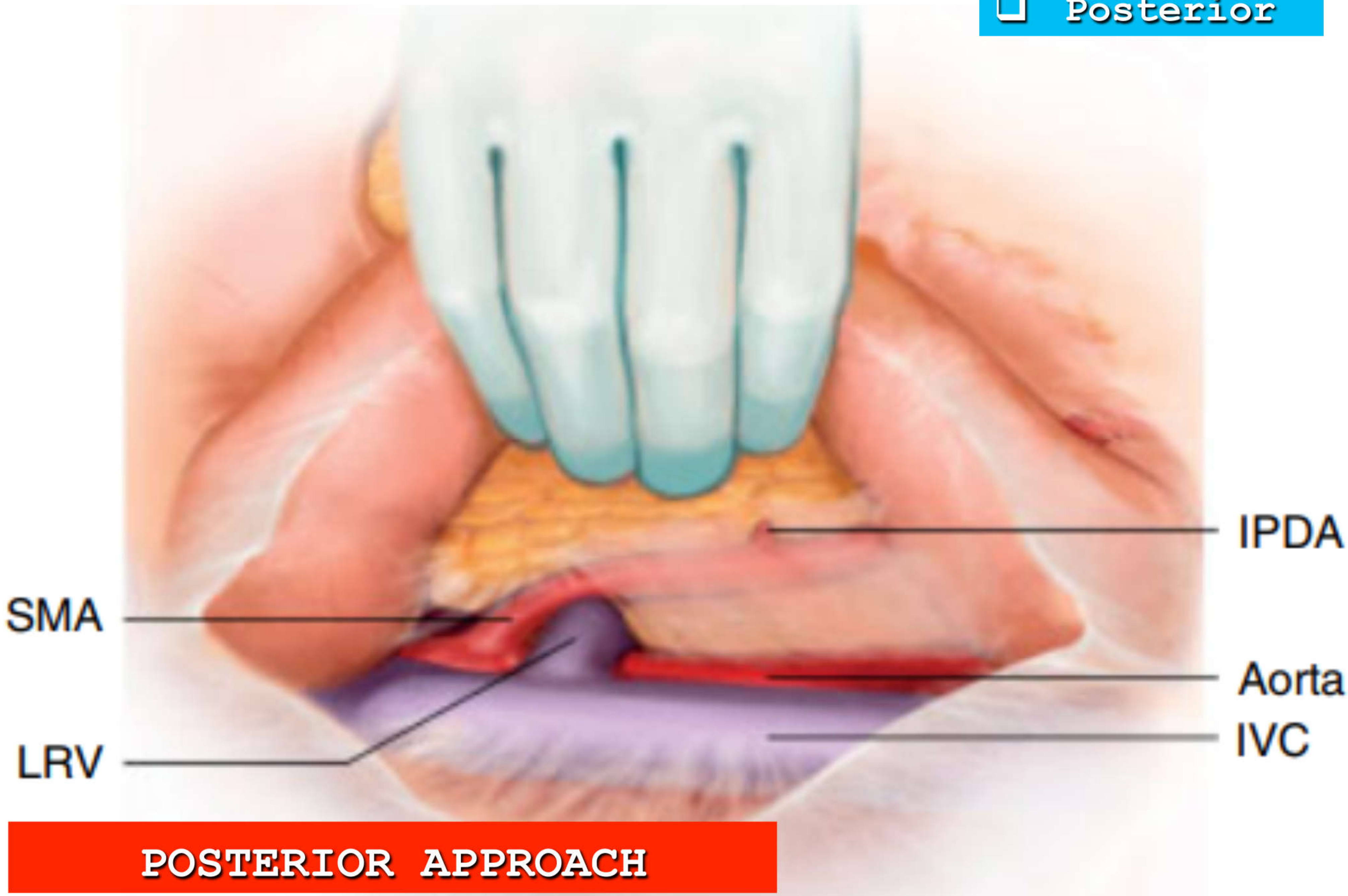

Pancreas
SMA
MCA
Transverse mesocolon
Transverse colon
Lt. renal vein
Uncinate process of pancreas
3rd portion of duodenum
Small intestine

ARTERY FIRST

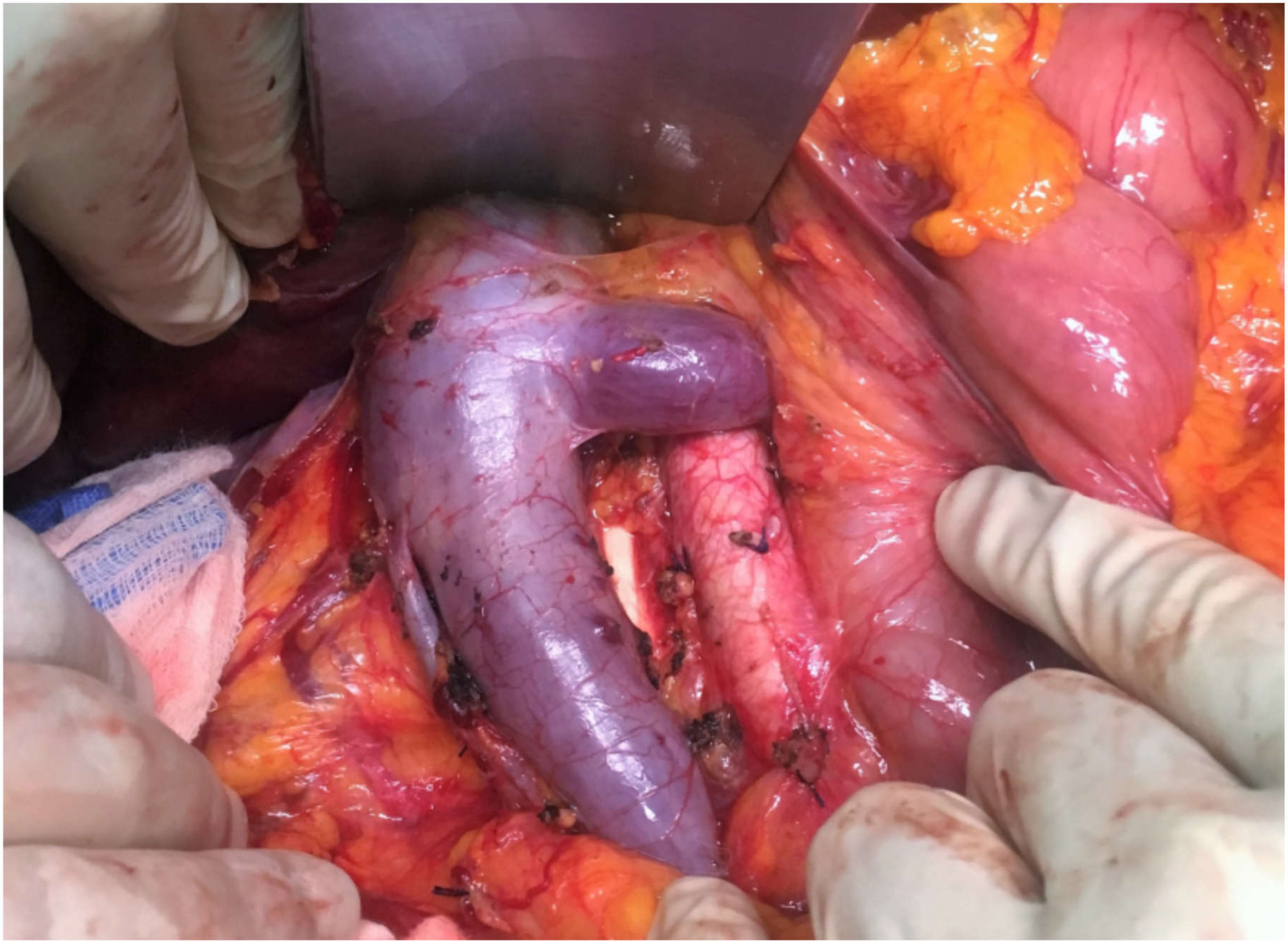


- ❑ Superior
- ❑ Anterior
- ❑ Posterior
- ❑ Posterior esquerdo
- ❑ Uncinado
- ❑ Mesentérica

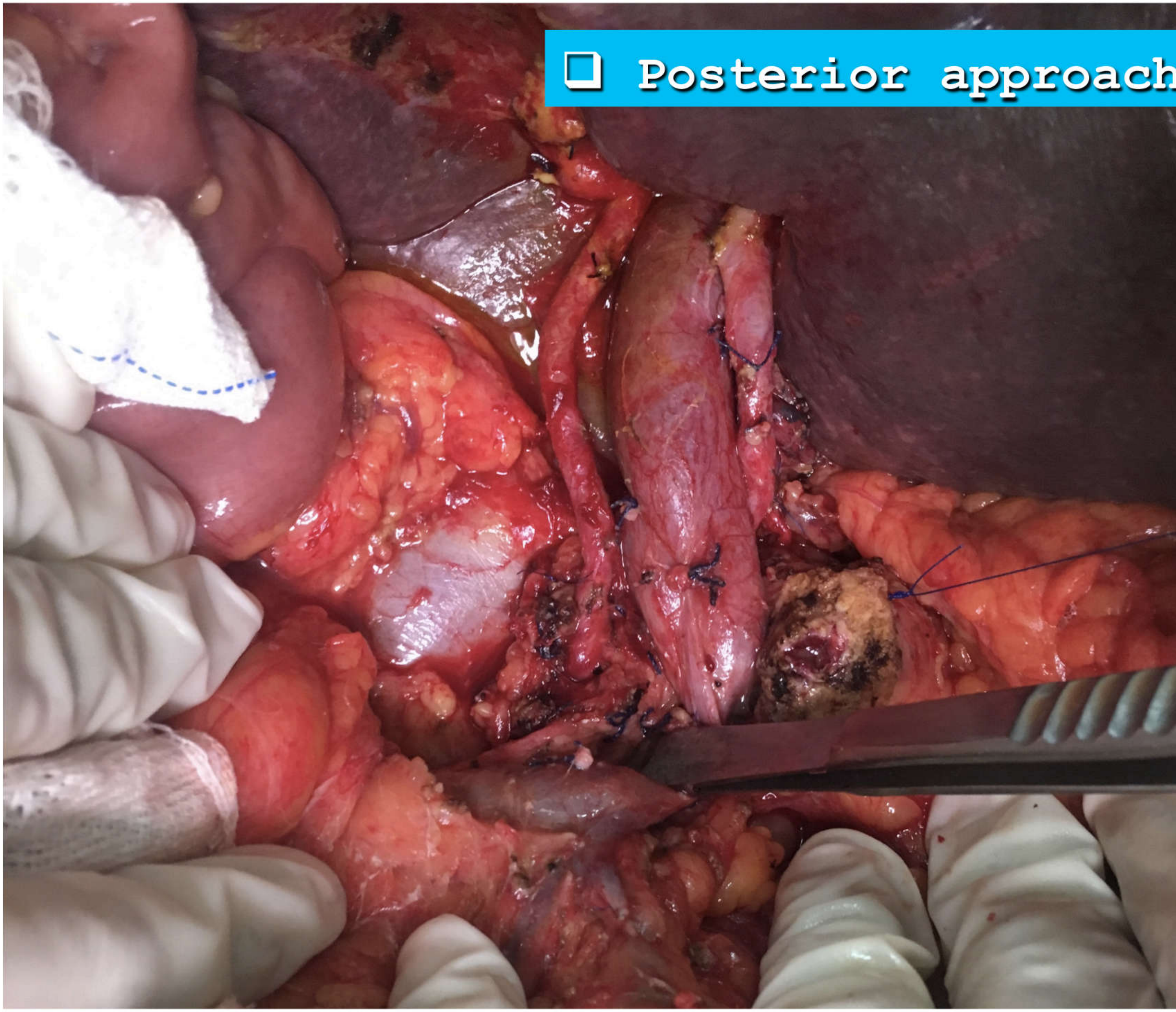
❑ Posterior



POSTERIOR APPROACH



❑ Posterior approach

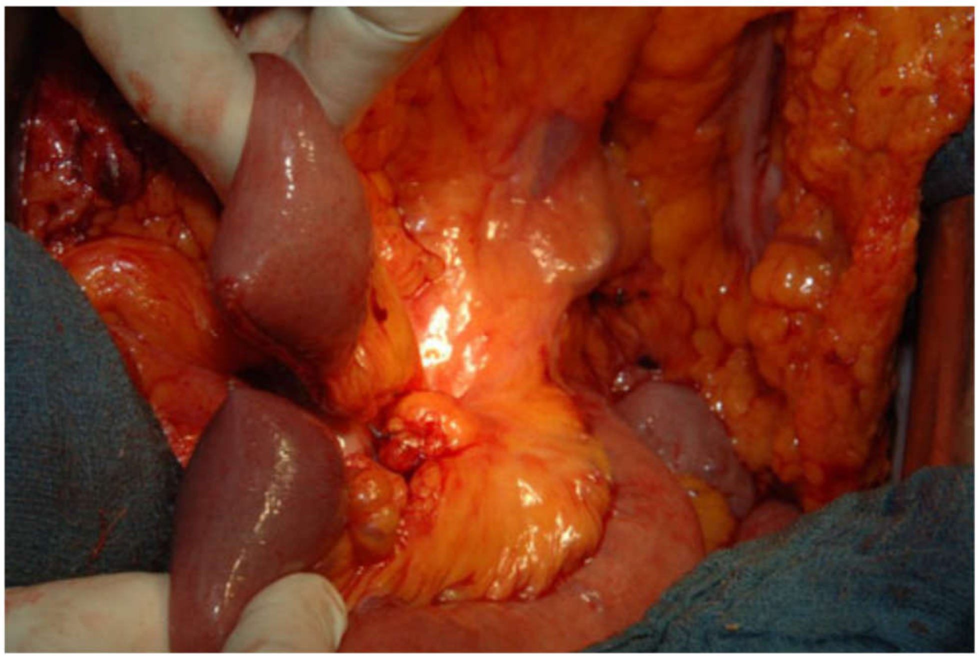


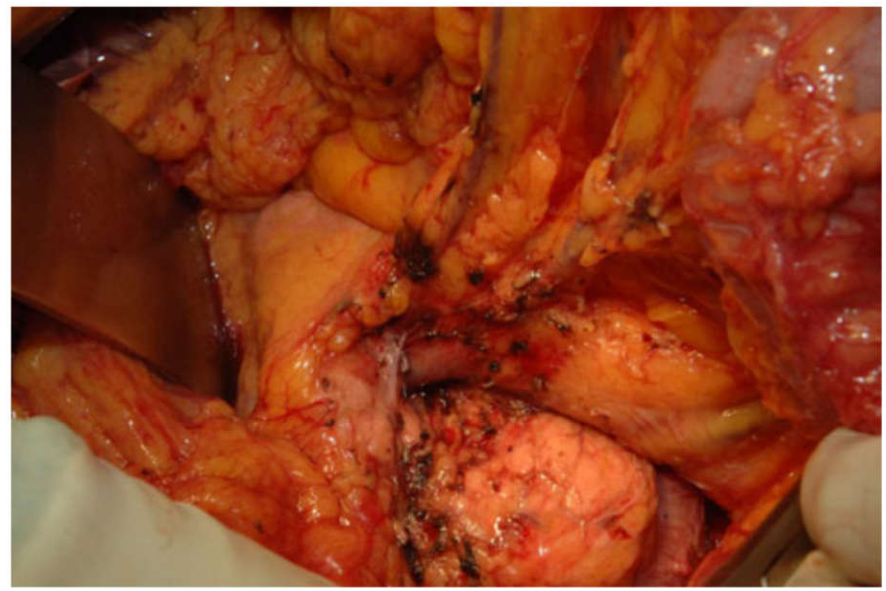
Langenbecks Arch Surg (2010) 395:1161–1164
DOI 10.1007/s00423-010-0663-9

HOW TO DO IT

Uncinate process first—a novel approach for pancreatic head resection

Thilo Hackert · Jens Werner · Jürgen Weitz ·
Jan Schmidt · Markus W. Büchler





Hackert T, et al. Langembecks Arch Surg 2010;395:1161-4

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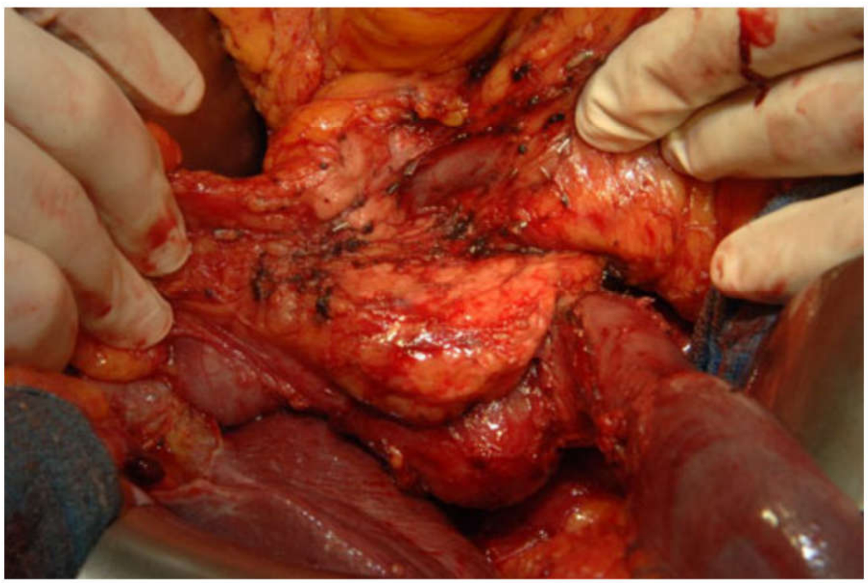

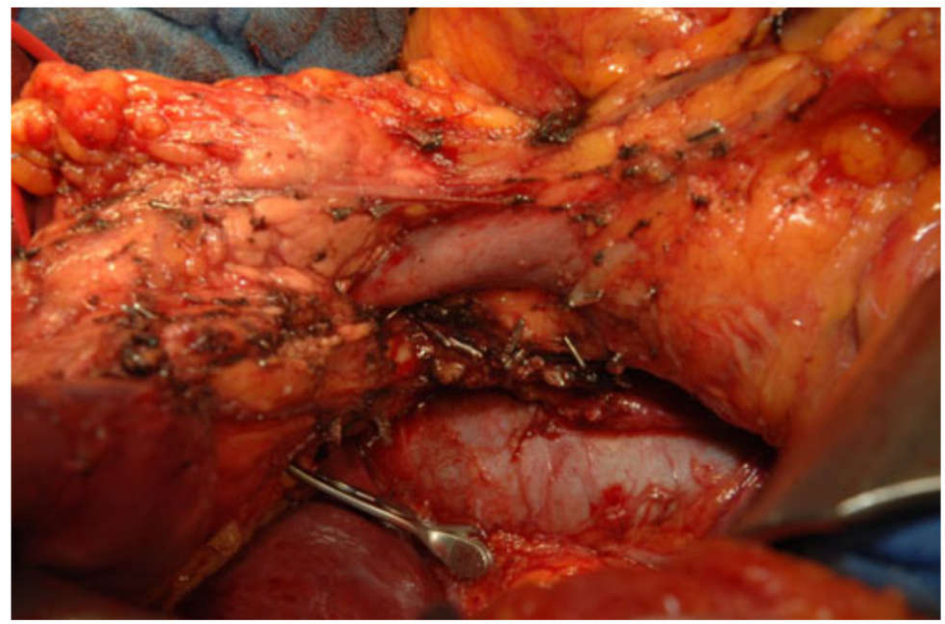

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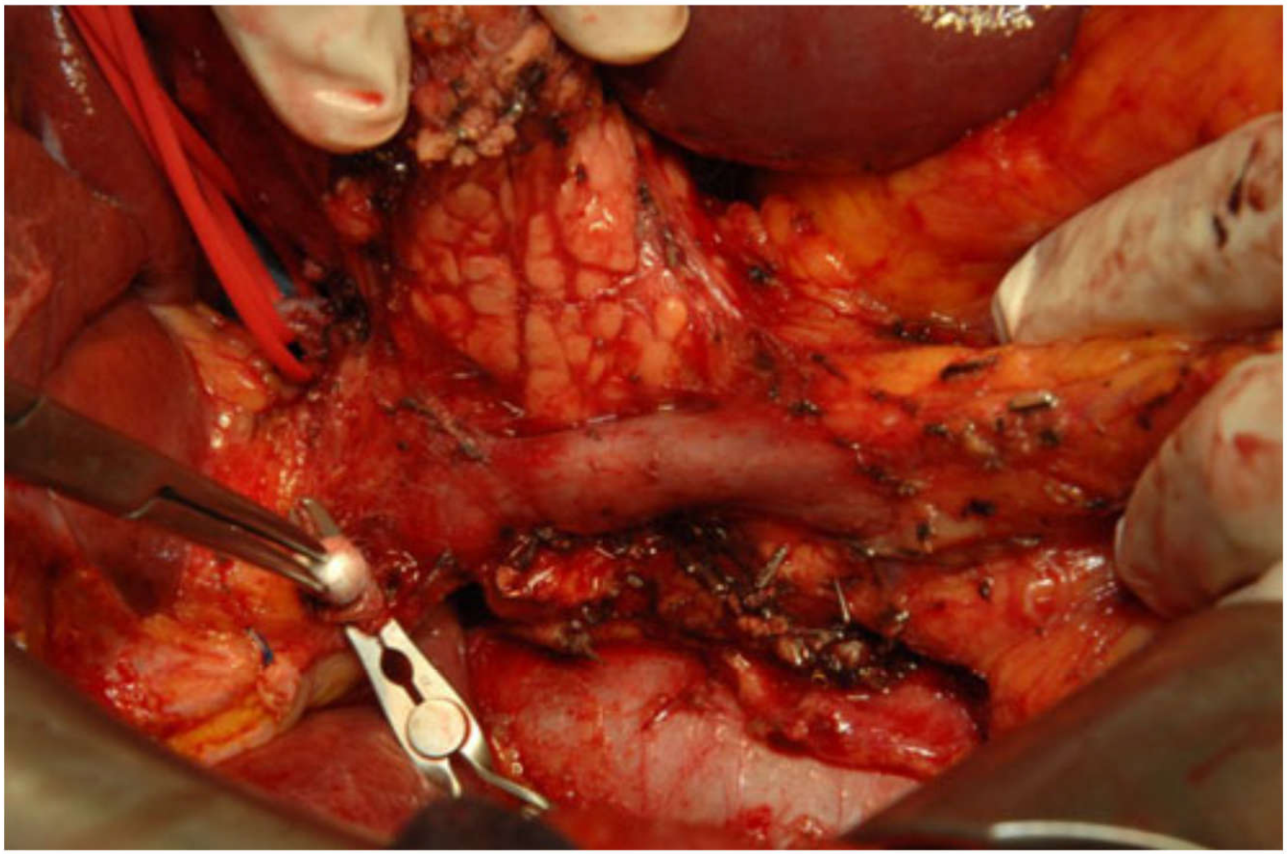
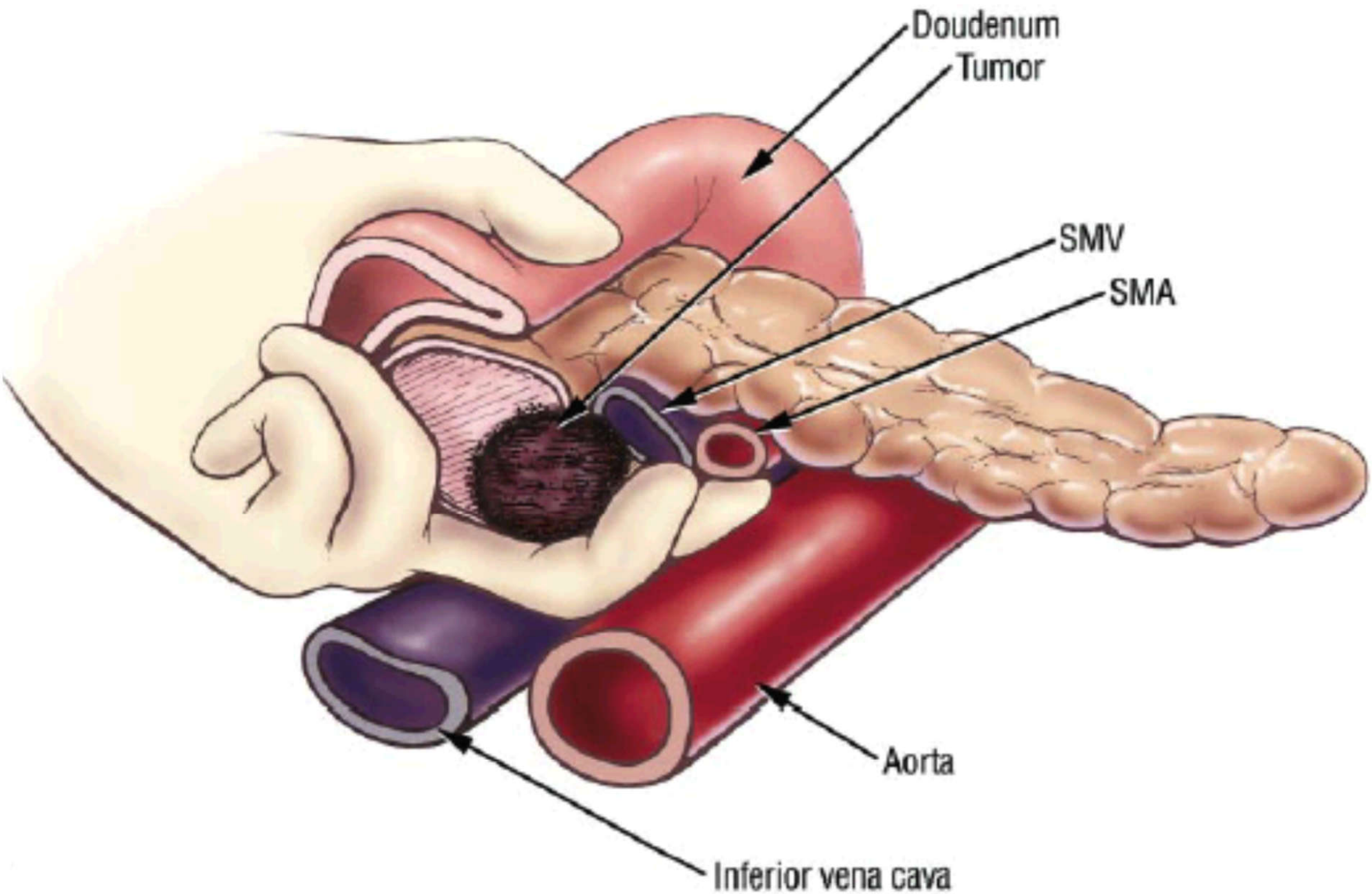
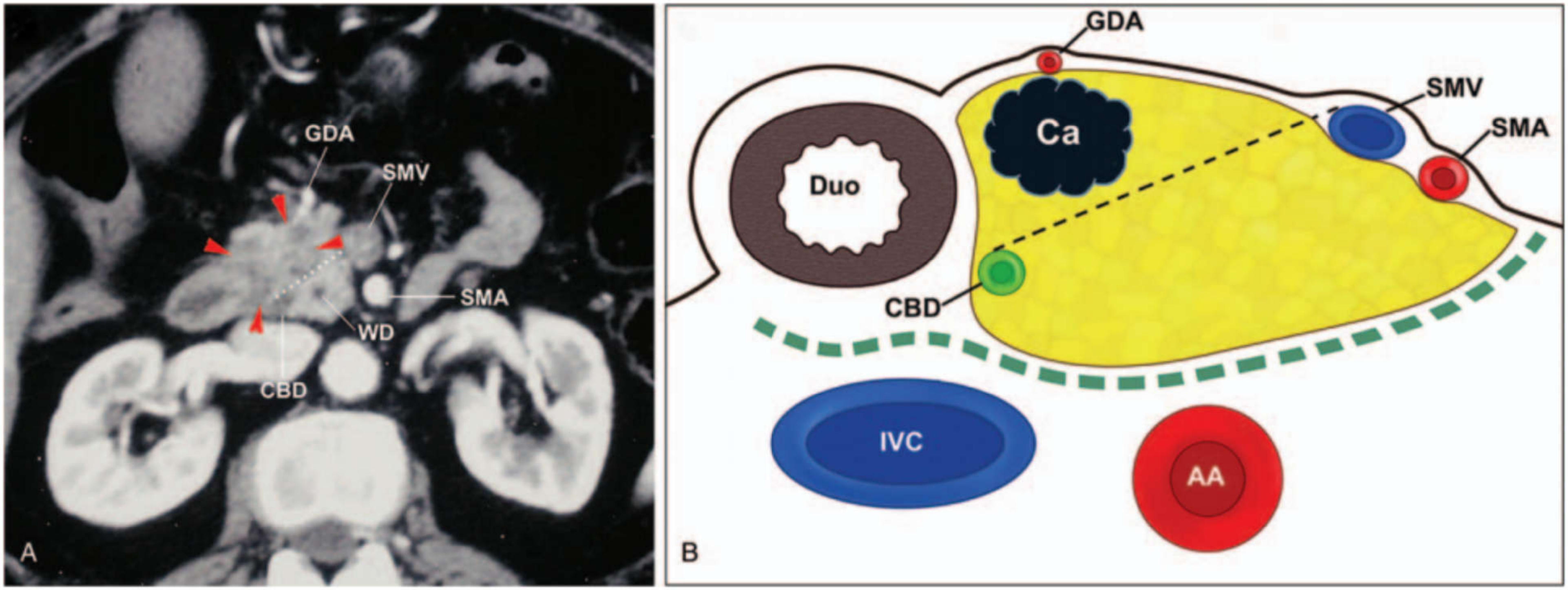


Hackert T, et al. Langembecks Arch Surg 2010;395:1161-4

Manobra de Kocher

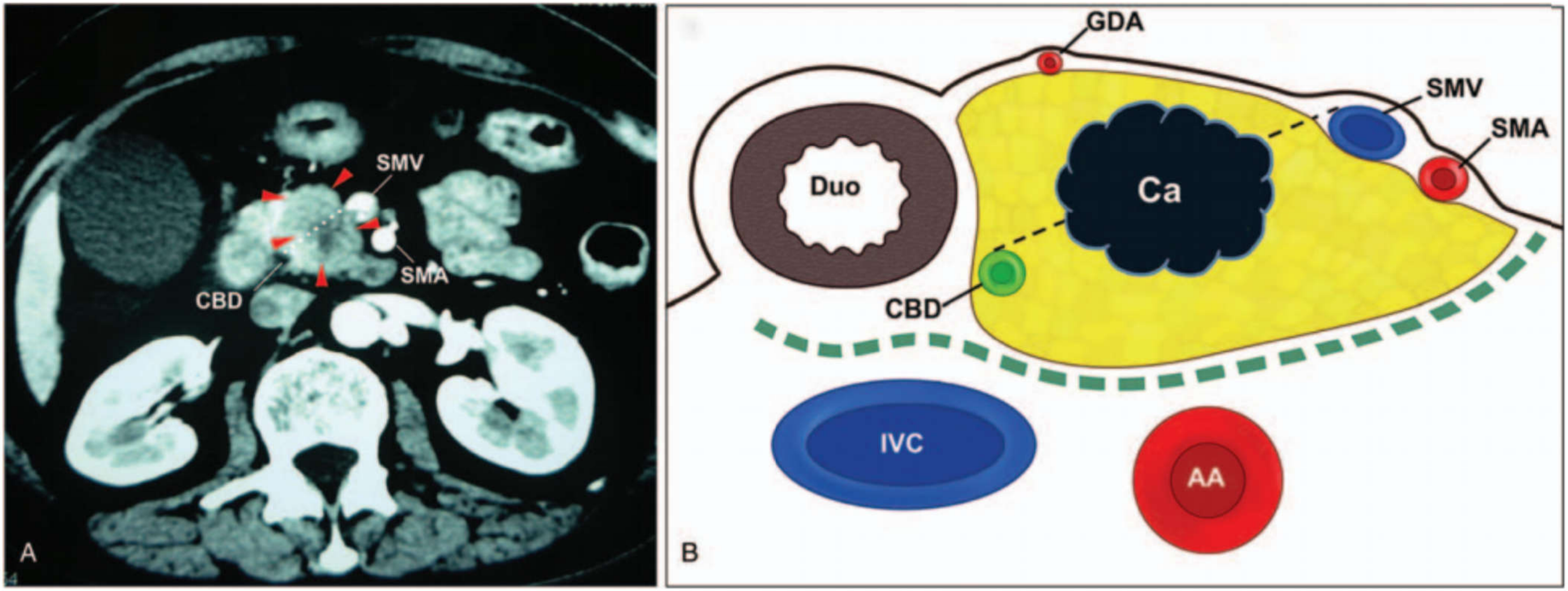


Manobra de Kocher



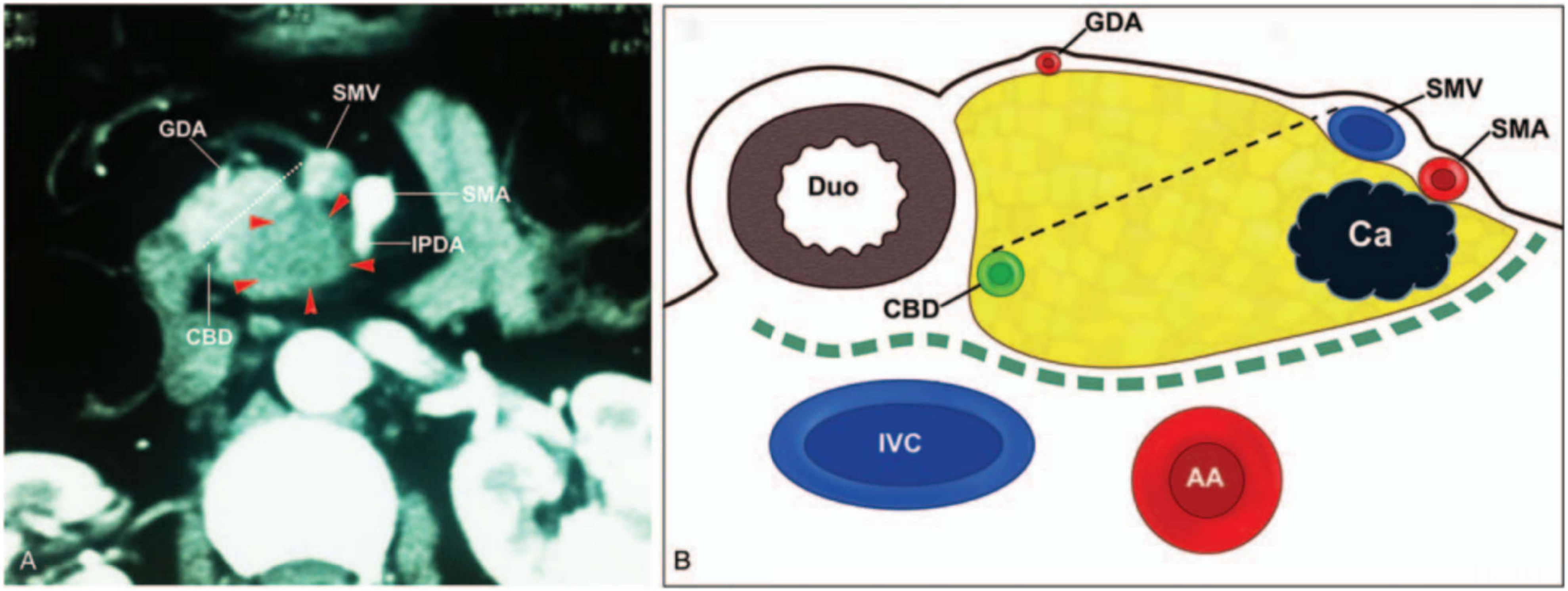
Localização do tumor: anterior

Manobra de Kocher



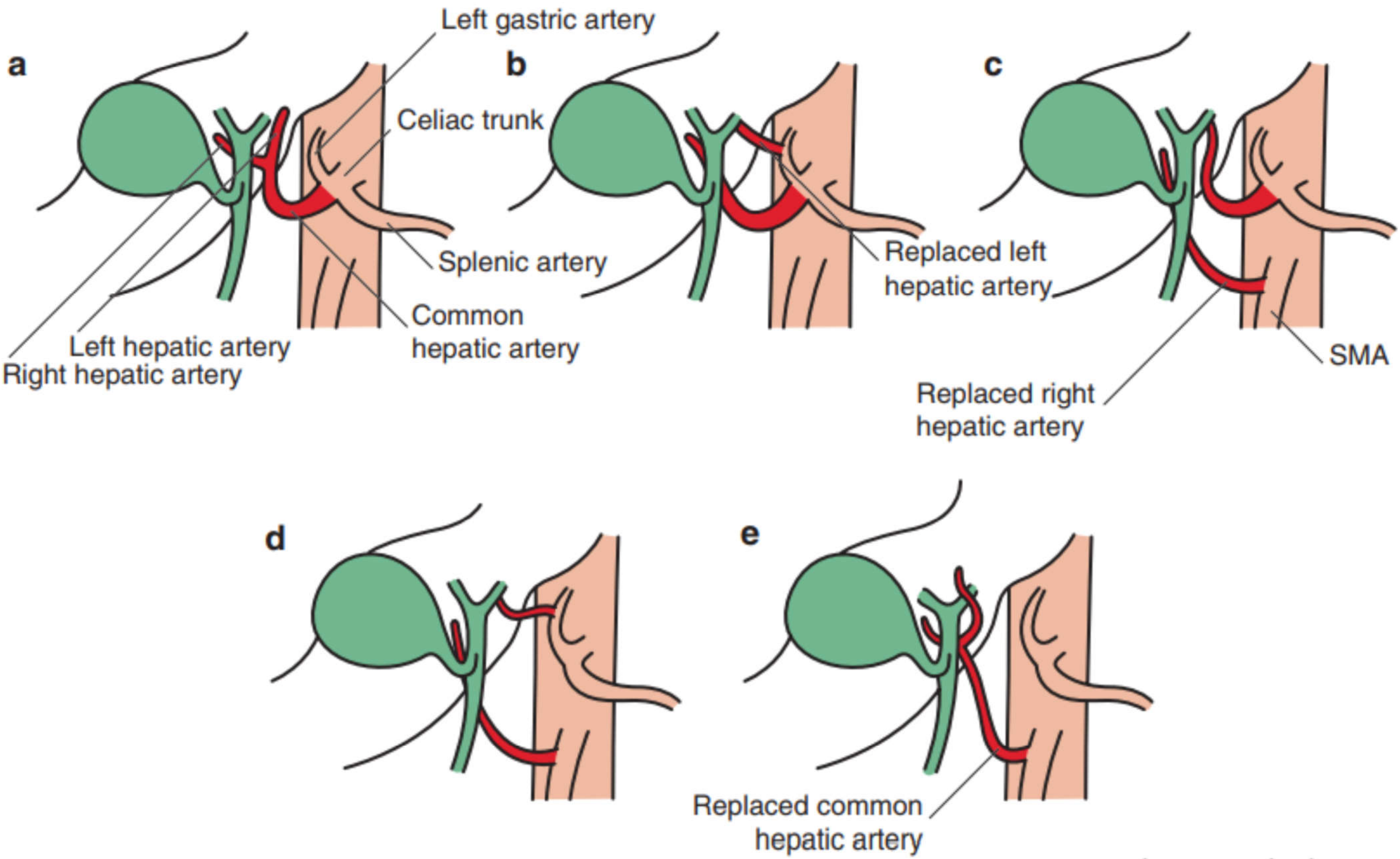
Localização do tumor: central

Manobra de Kocher

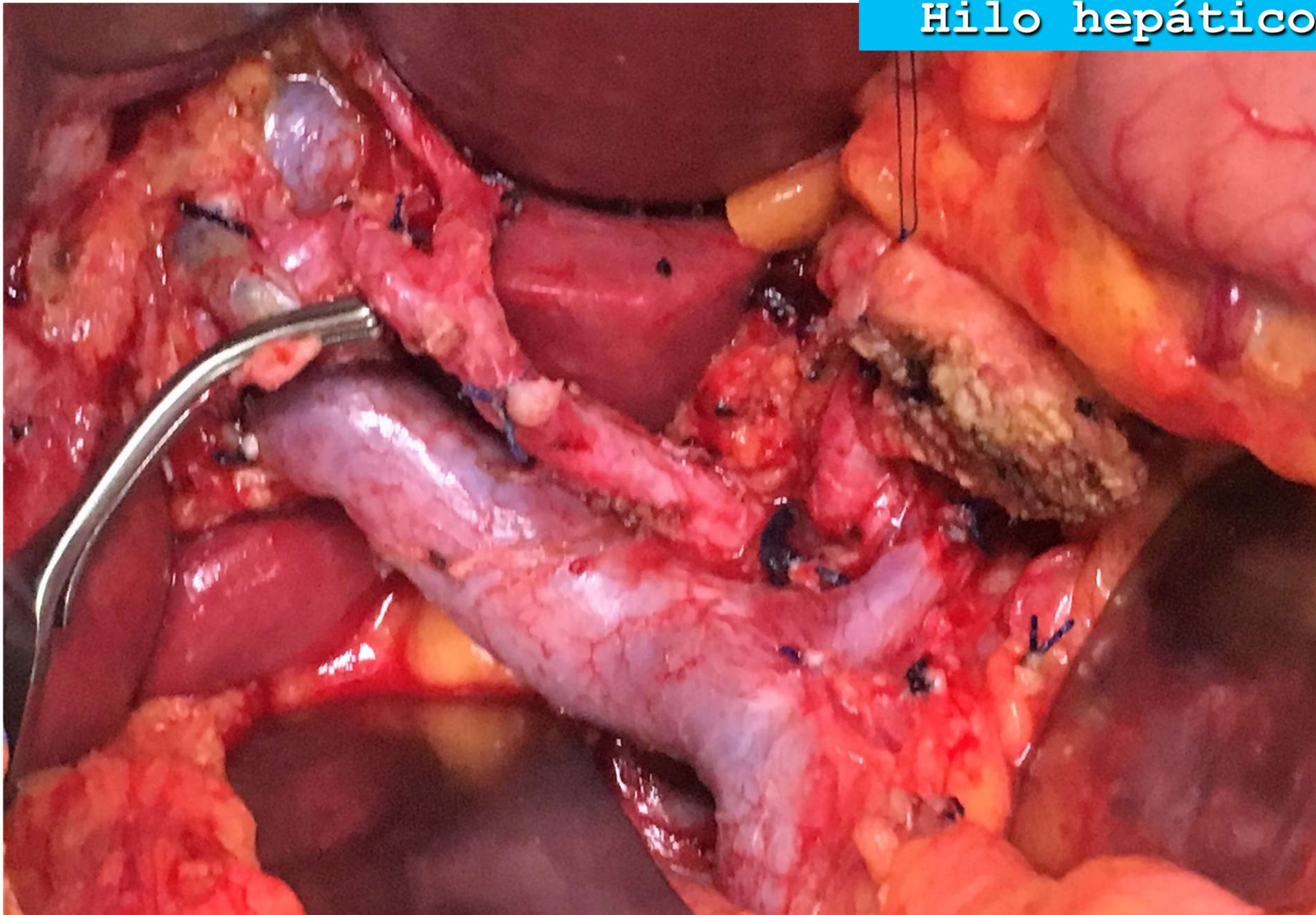


Localização do tumor: uncinado

Hilo hepático



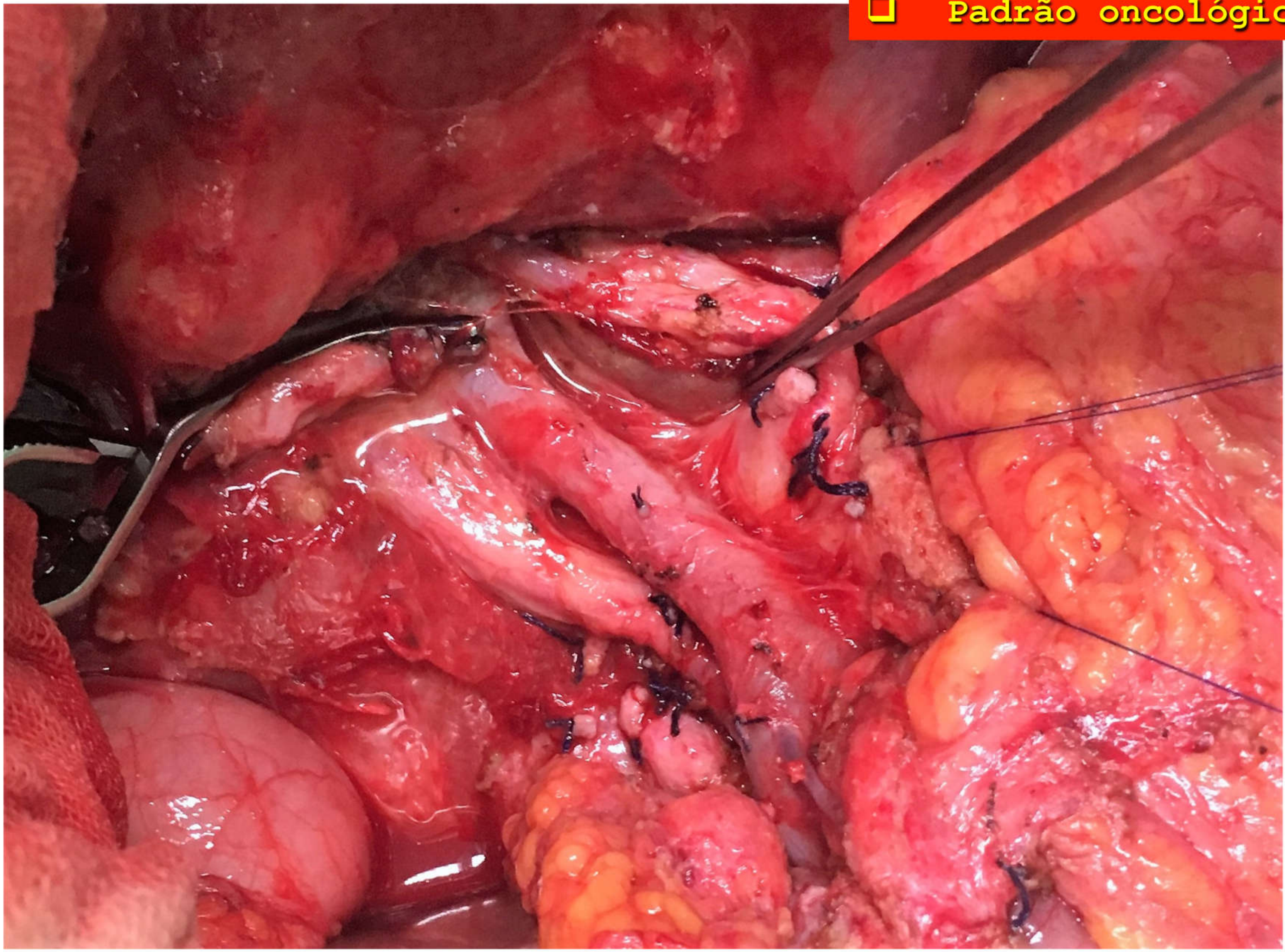
Hilo hepático



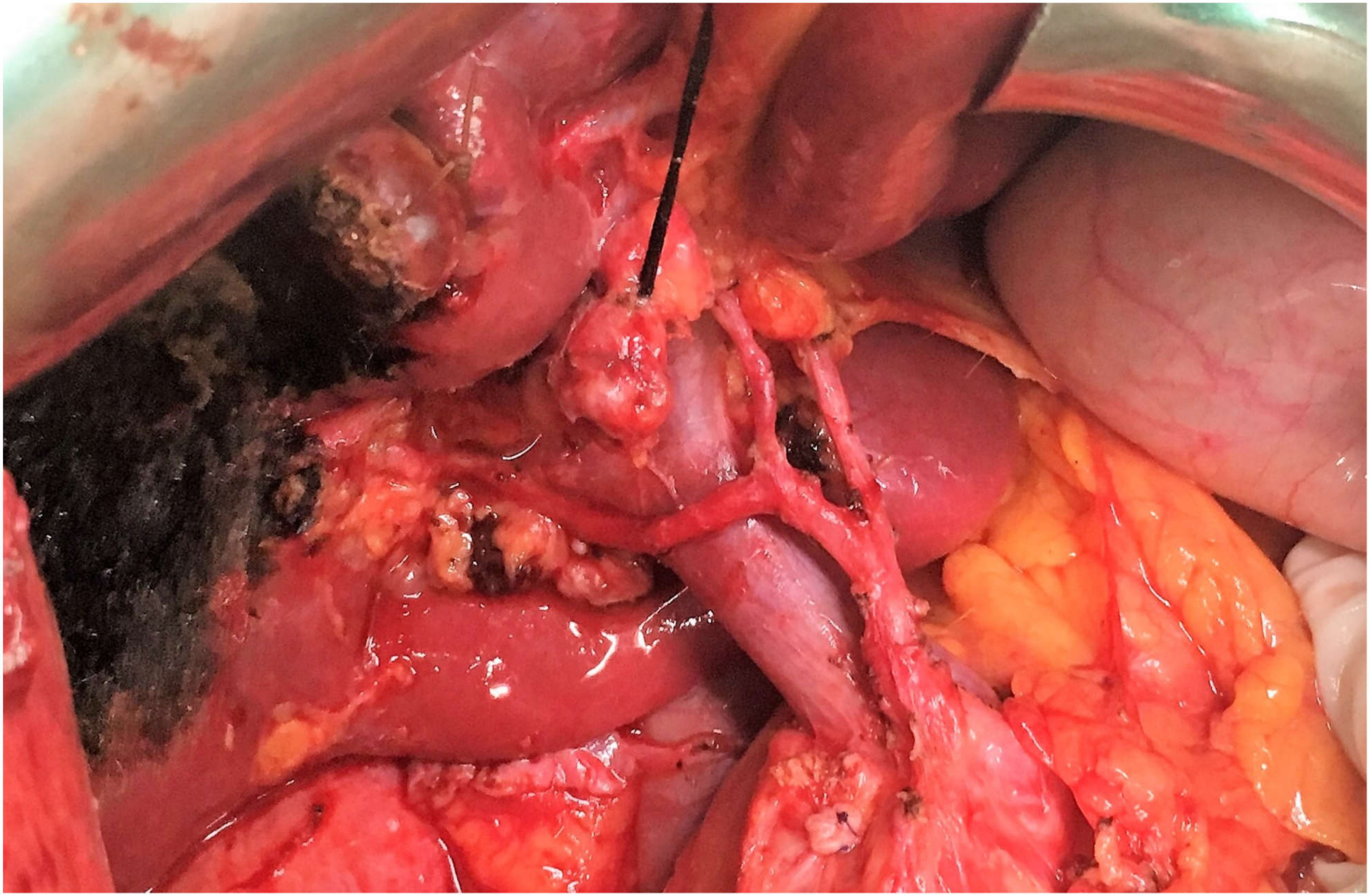
Dissecção do ligamento hepatoduodenal (2)

Hilo hepático

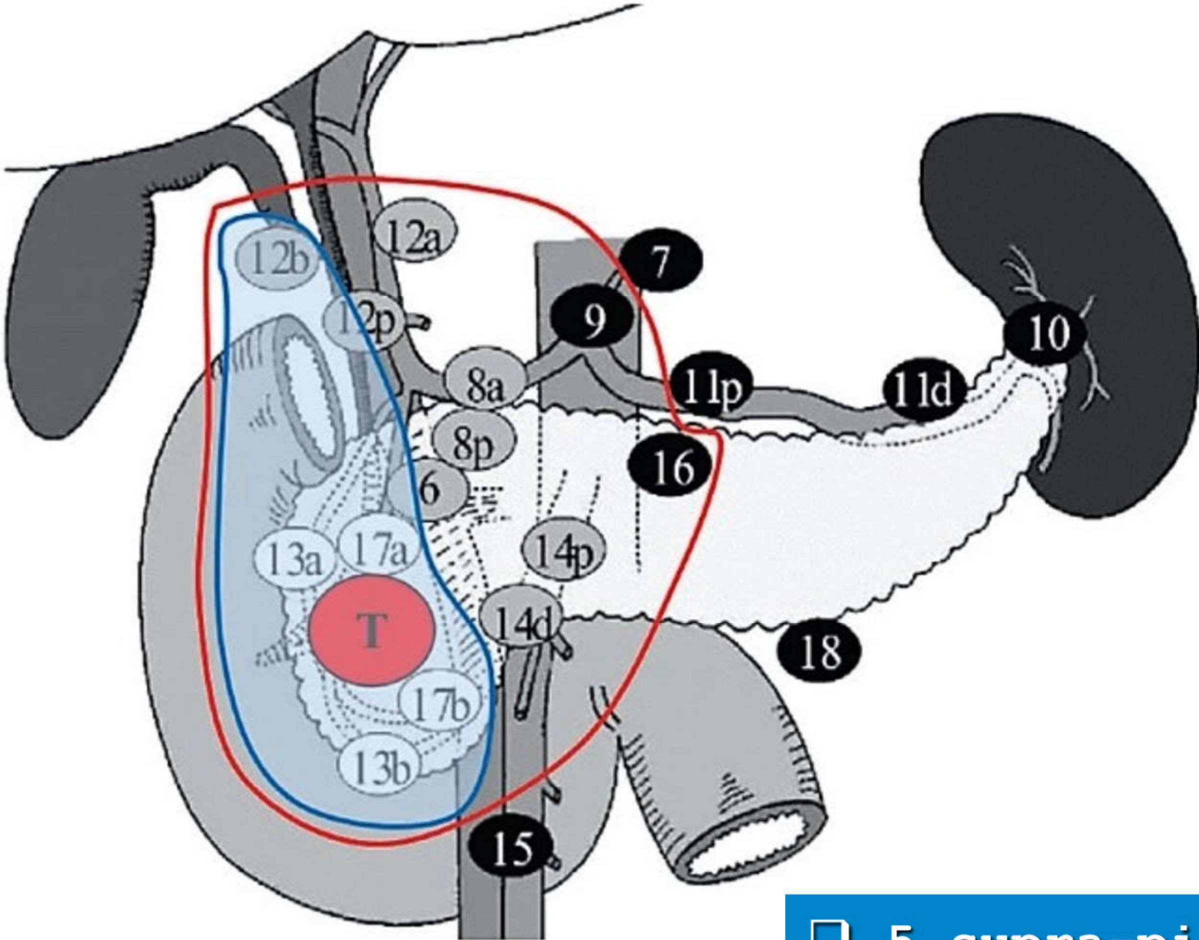
- Sangramento
- Fístula pancreática
- Gastroparesia
- Padrão oncológico



Hilo hepático

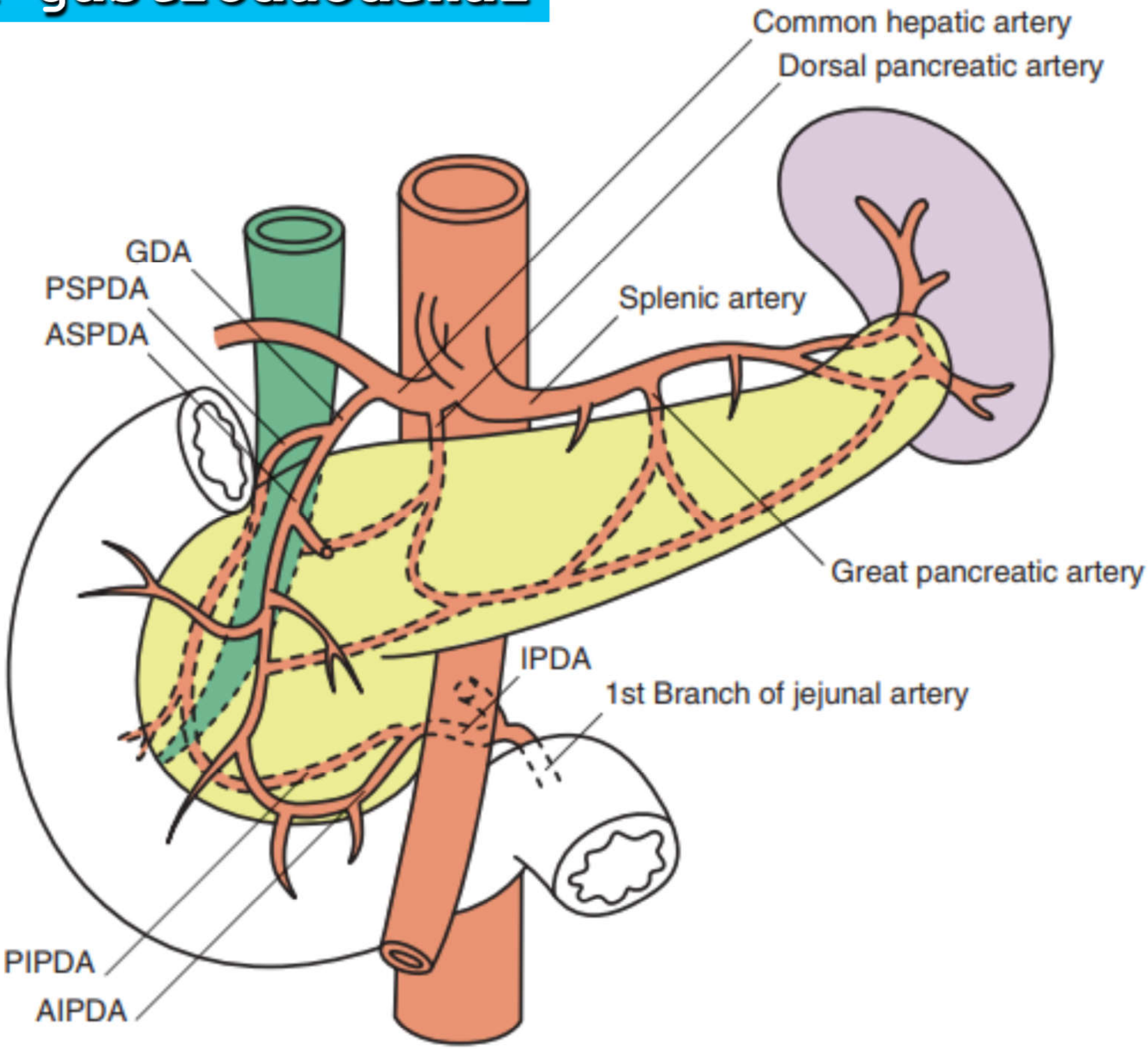


Linfadenectomia



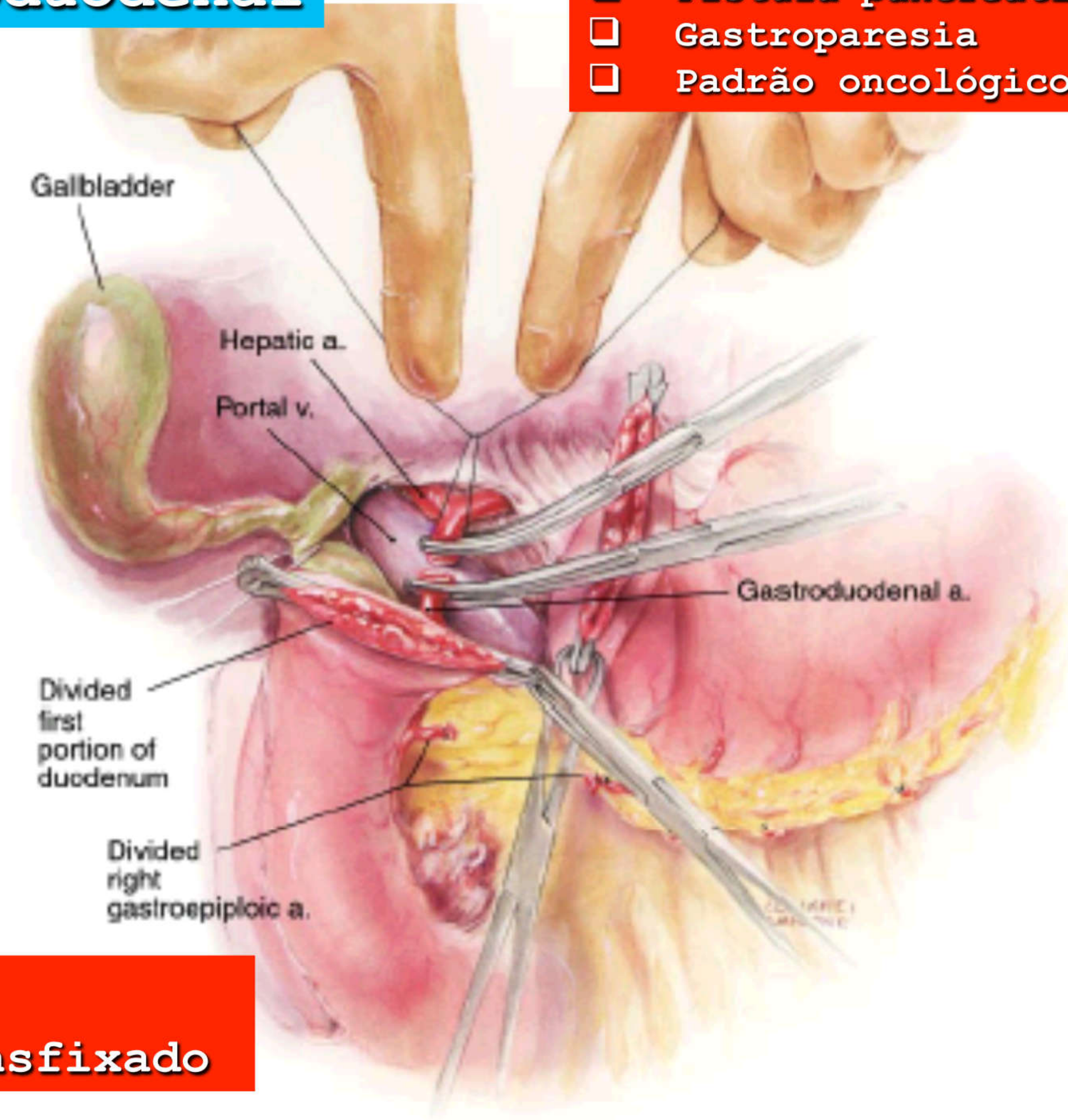
- 5 supra-pilórico
- 6 infra-pilórico
- 8a A. hepática comum
- 12b1, 12b2 ducto biliar
- 12c ducto cístico
- 13a cab. pâncreas (postero-superior)
- 13b cab. pâncreas (postero-inferior)
- 14a,14b lateral D da AMS
- 17a cab. pâncreas (antero-superior)
- 17b cab. pâncreas (antero-inferior)

Artéria gastroduodenal



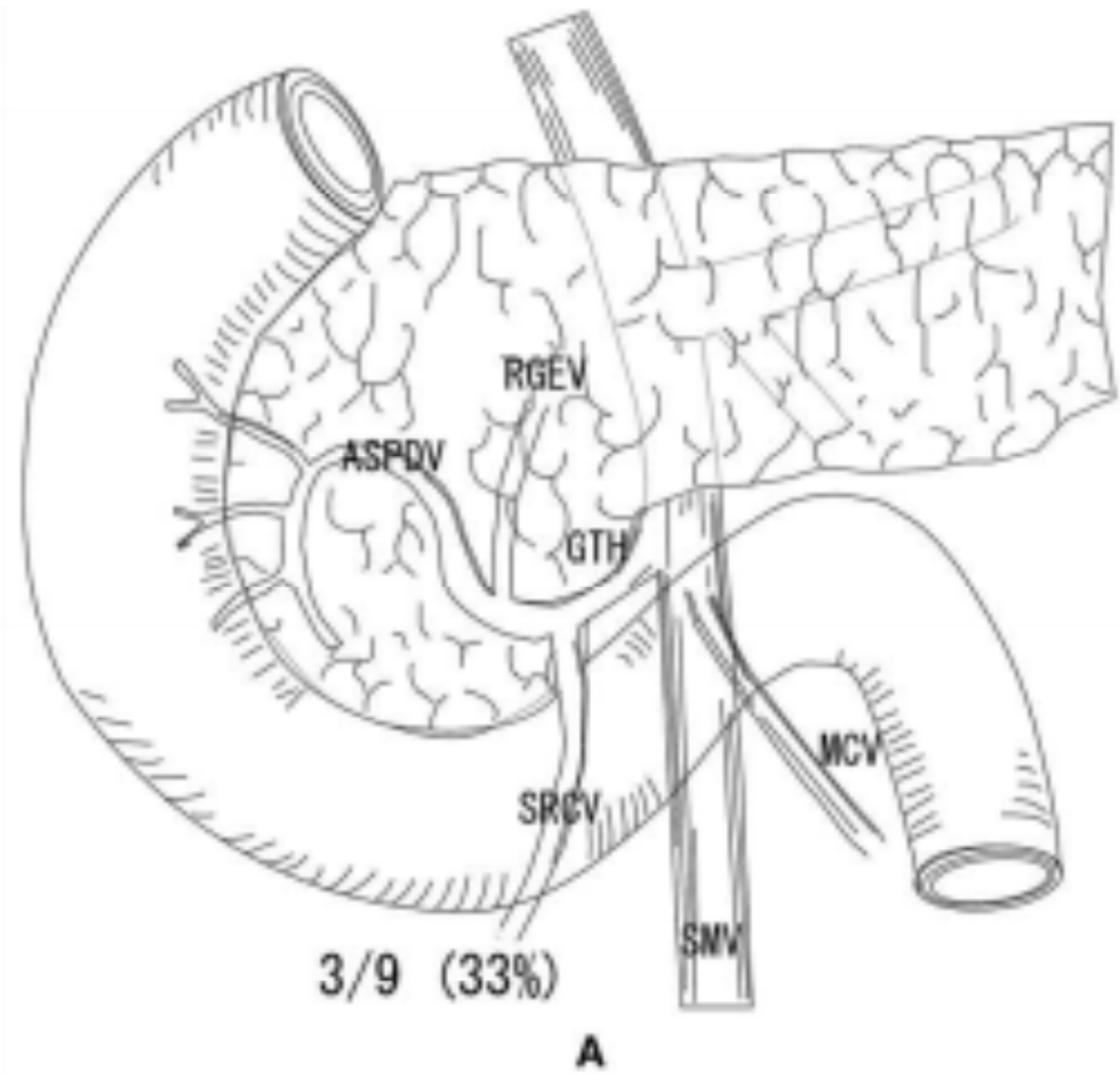
Artéria gastroduodenal

- ❑ Sangramento
- ❑ Fístula pancreática
- ❑ Gastroparesia
- ❑ Padrão oncológico



- ❑ Dupla
- ❑ Prolene 4.0 transfixado

Exposição da veia porta suprapancreática

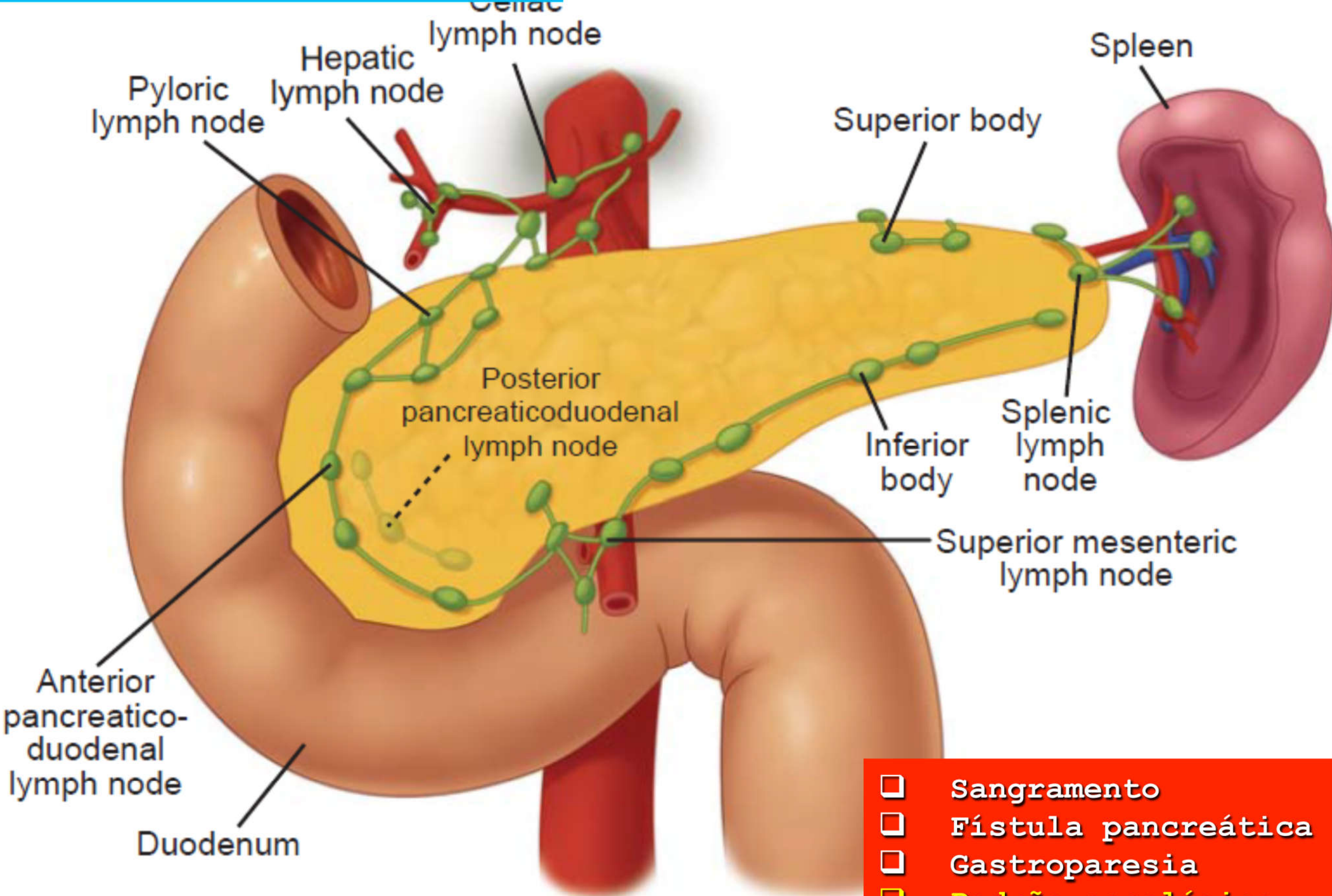


Consensus

Definition of a standard lymphadenectomy in surgery for pancreatic ductal adenocarcinoma: A consensus statement by the International Study Group on Pancreatic Surgery (ISGPS)

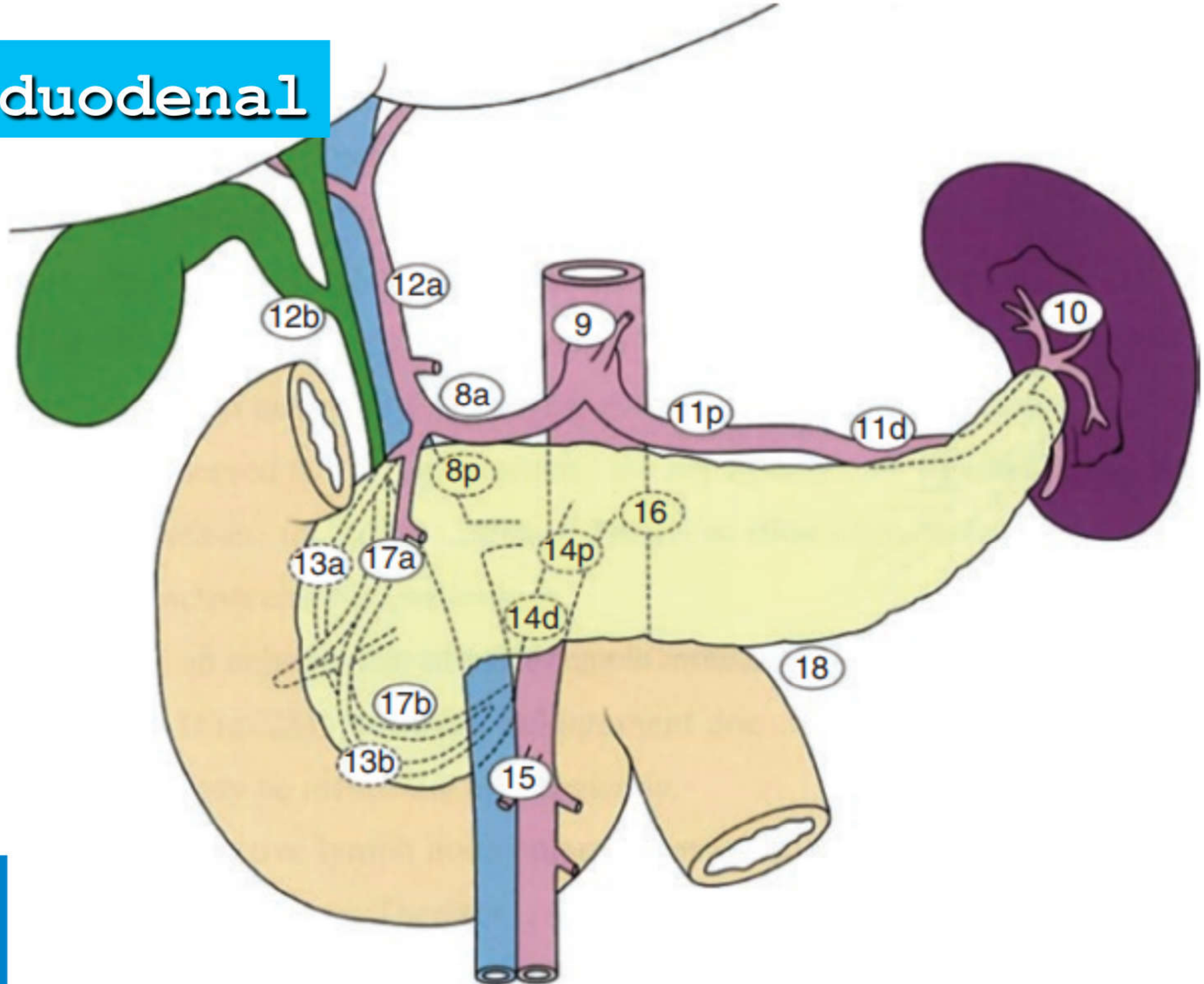
Tol JAMG, et al. Surgery 2014;156:591-600.

LINFADENECTOMIA



- ❑ Sangramento
- ❑ Fístula pancreática
- ❑ Gastroparesia
- ❑ Padrão oncológico

Artéria gastroduodenal



- 5 supra-pilórico
- 6 infra-pilórico
- 8a A. hep. comum
- 12b1/2 ducto biliar
- 12c ducto cístico
- 13a cab. pâncreas (postero-superior)
- 13b cab. pâncreas (postero-inferior)
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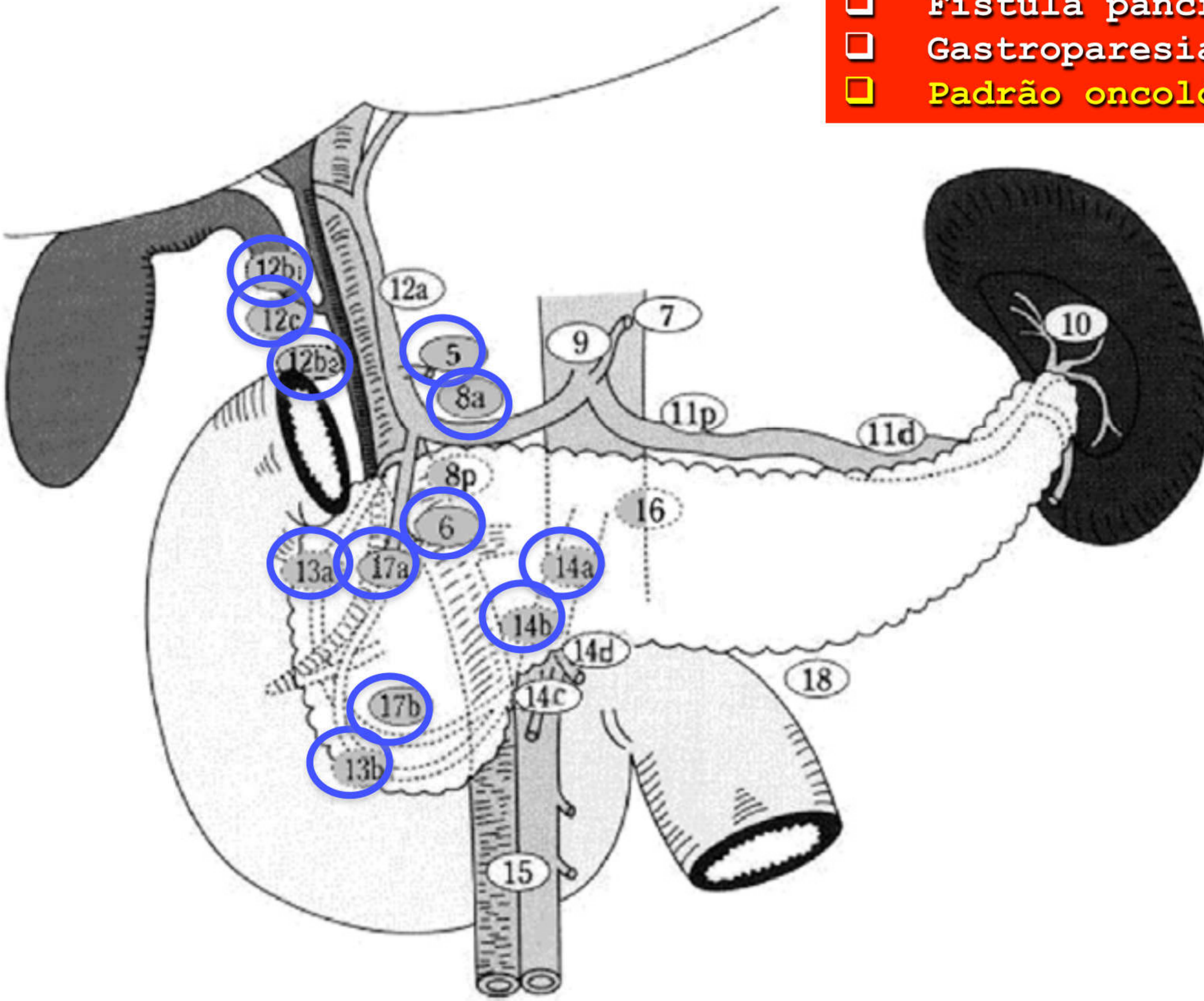
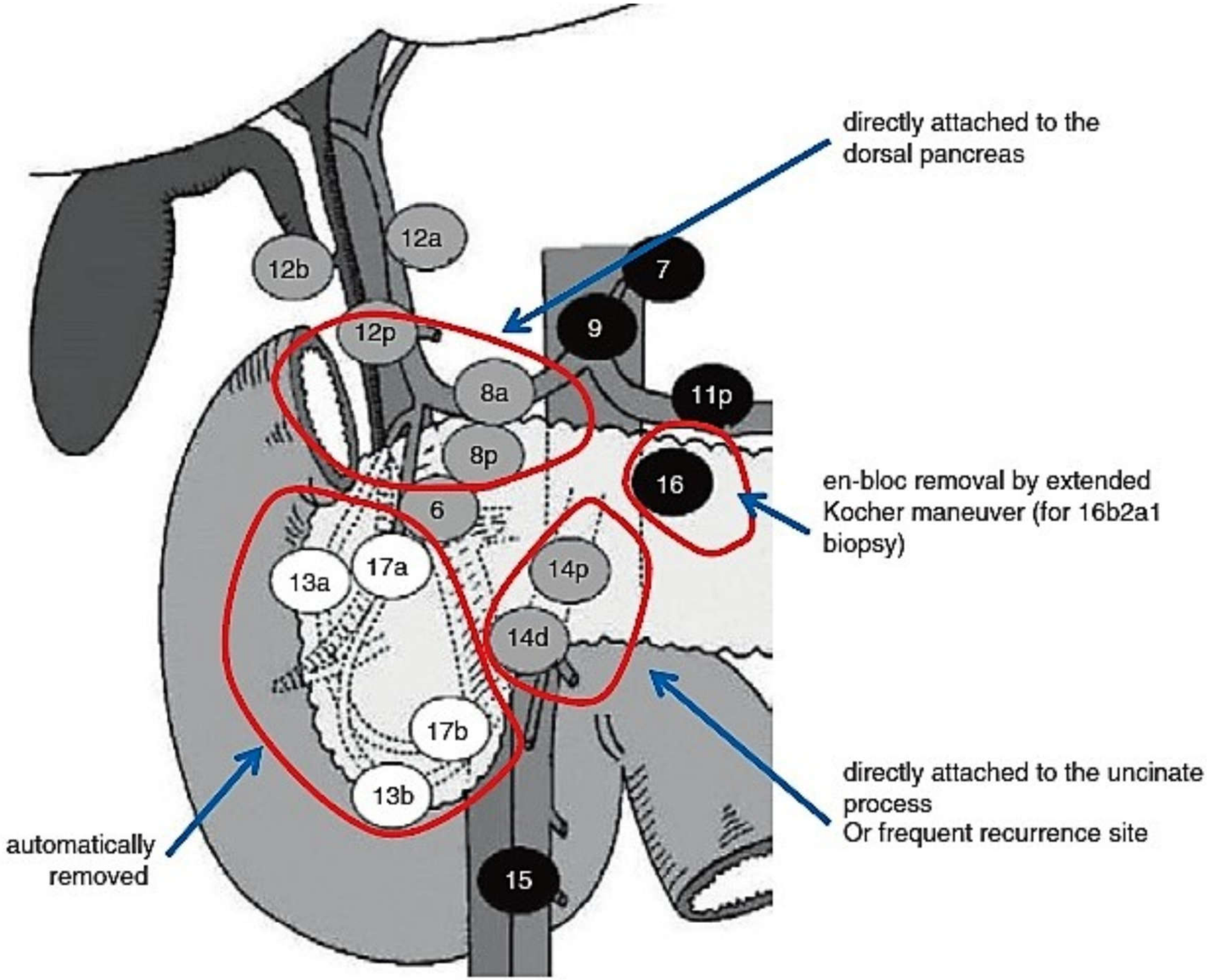
- 17a cab. pâncreas (antero-superior)
- 17b cab. pâncreas (antero-inferior)

- Sangramento
- Fístula pancreática
- Gastroparesia
- Padrão oncológico



- 5, 6, 8a, 12b1, 12b2, 12c, 13a, 13b,14a,14b,17a, e 17b.

Tol JAMG, et al. Surgery 2014;156:591-600.

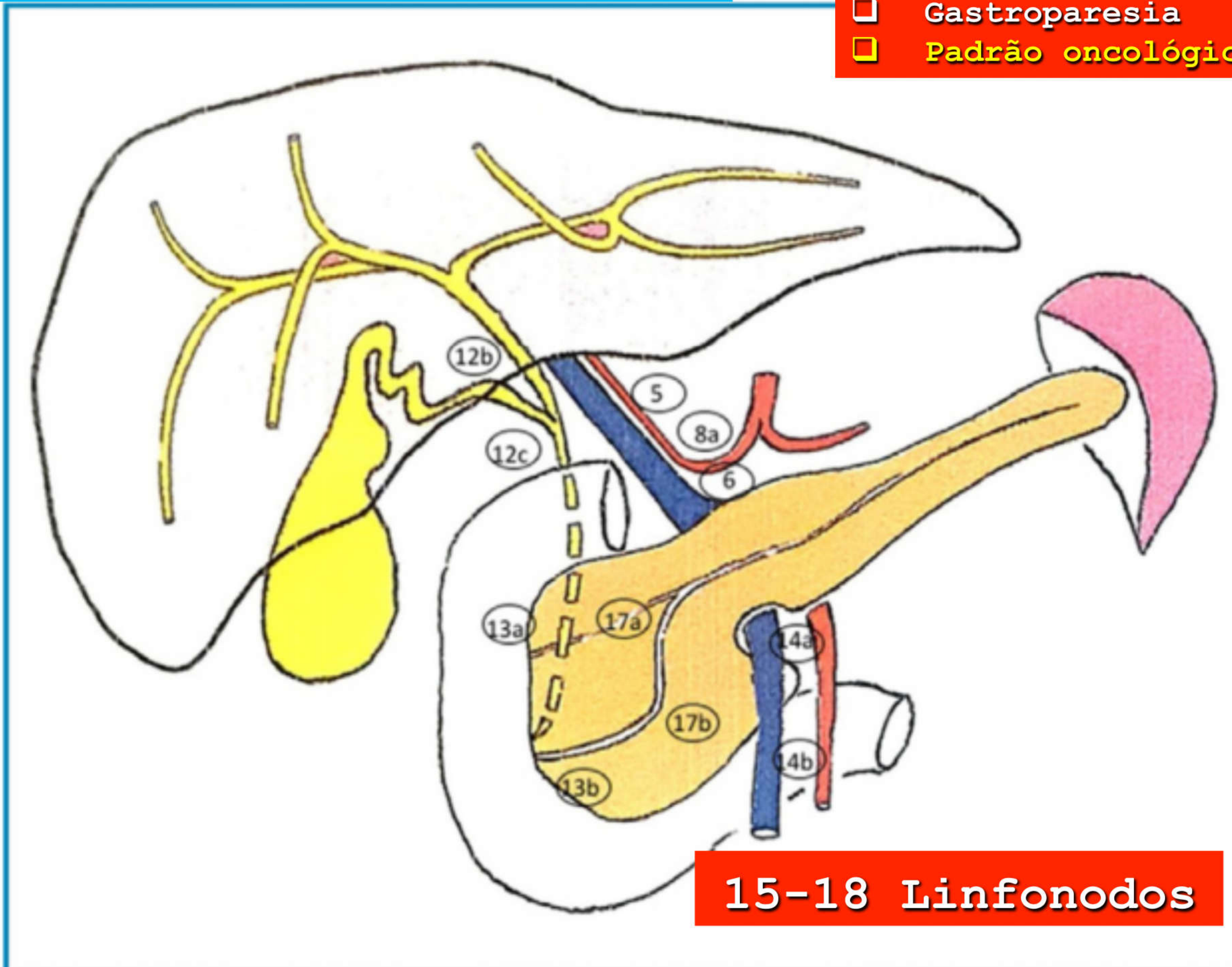


- 5,6,8a,12b1,12b2,12c,13a,13b,14a,14b,17a e 17b

Tol JAMG, et al. Surgery 2014;156:591-600.

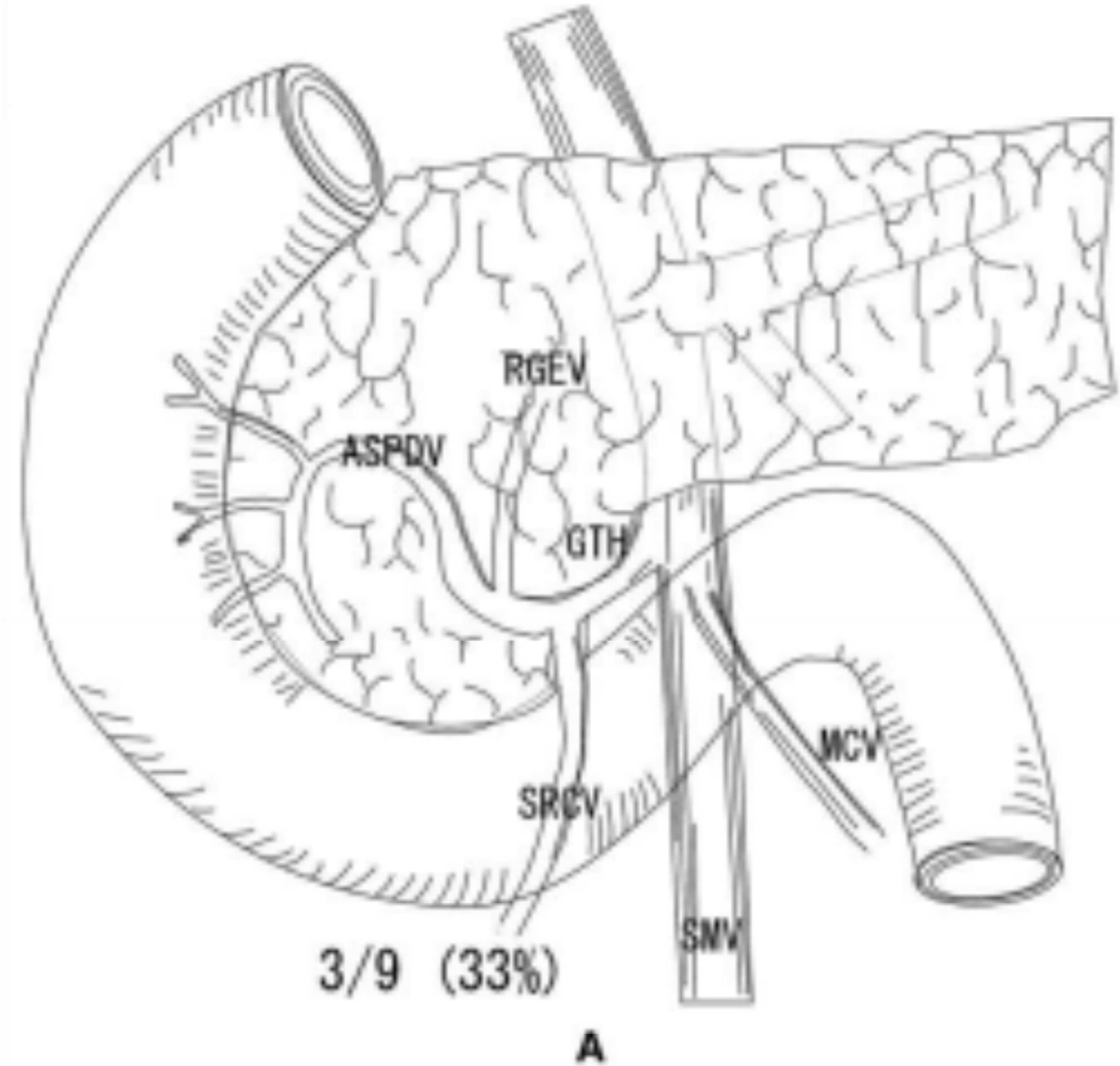
LINFADENECTOMIA MÍNIMA

- Sangramento
- Fístula pancreática
- Gastroparesia
- Padrão oncológico

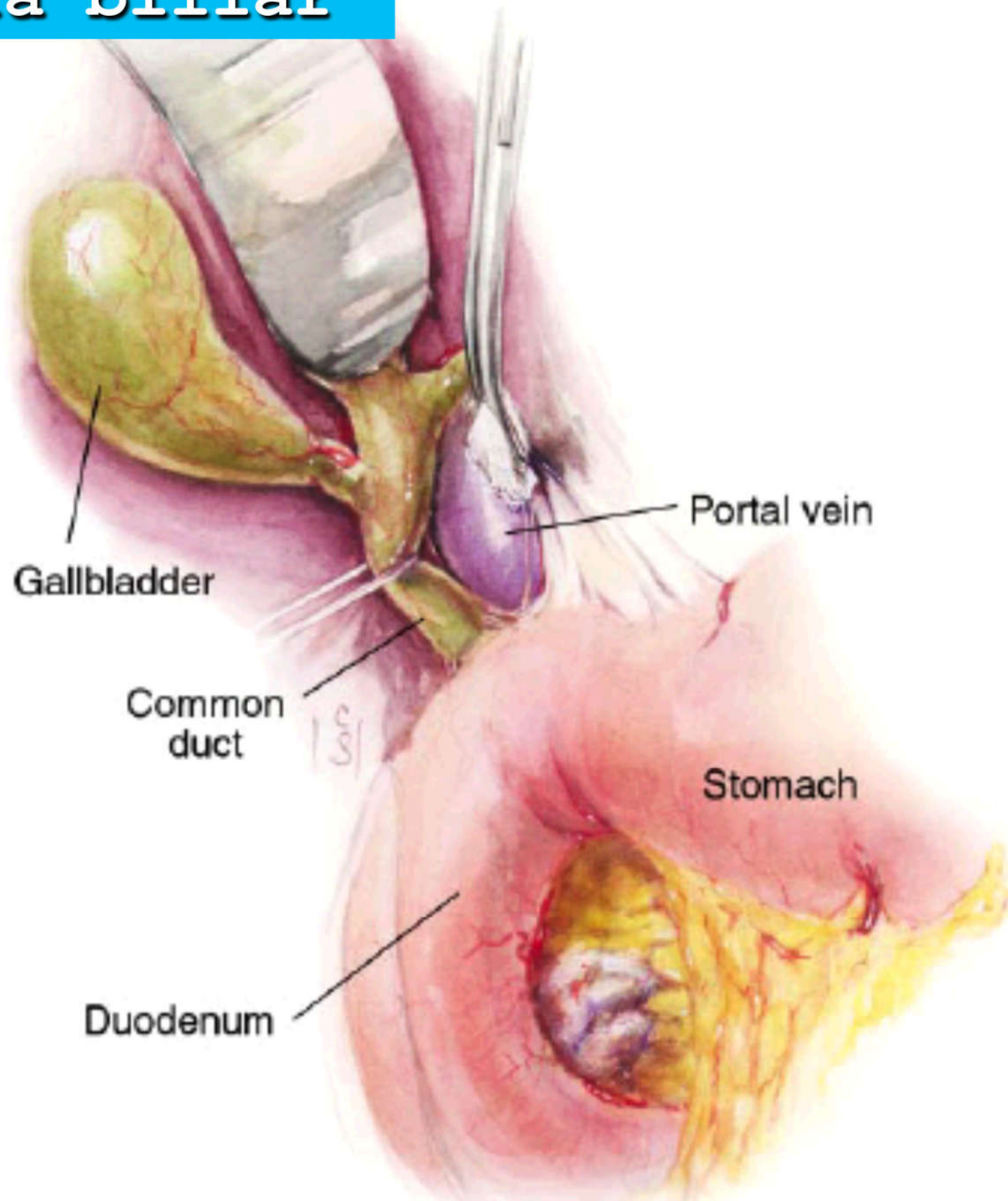


15-18 Linfonodos

Exposição da VMS infrapancreática (1)

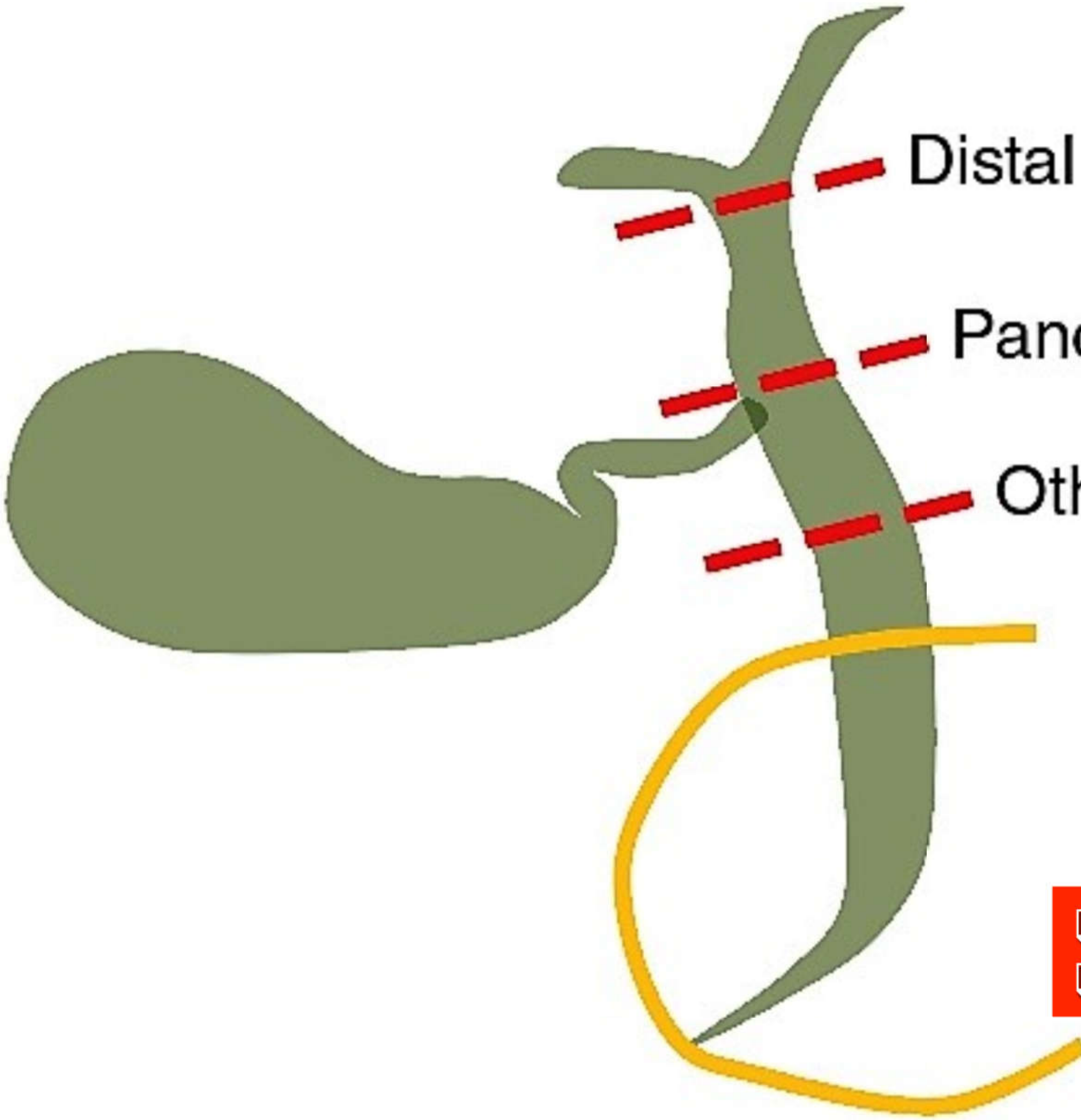


Ressecção da via biliar



- Em bloco com a vesícula biliar

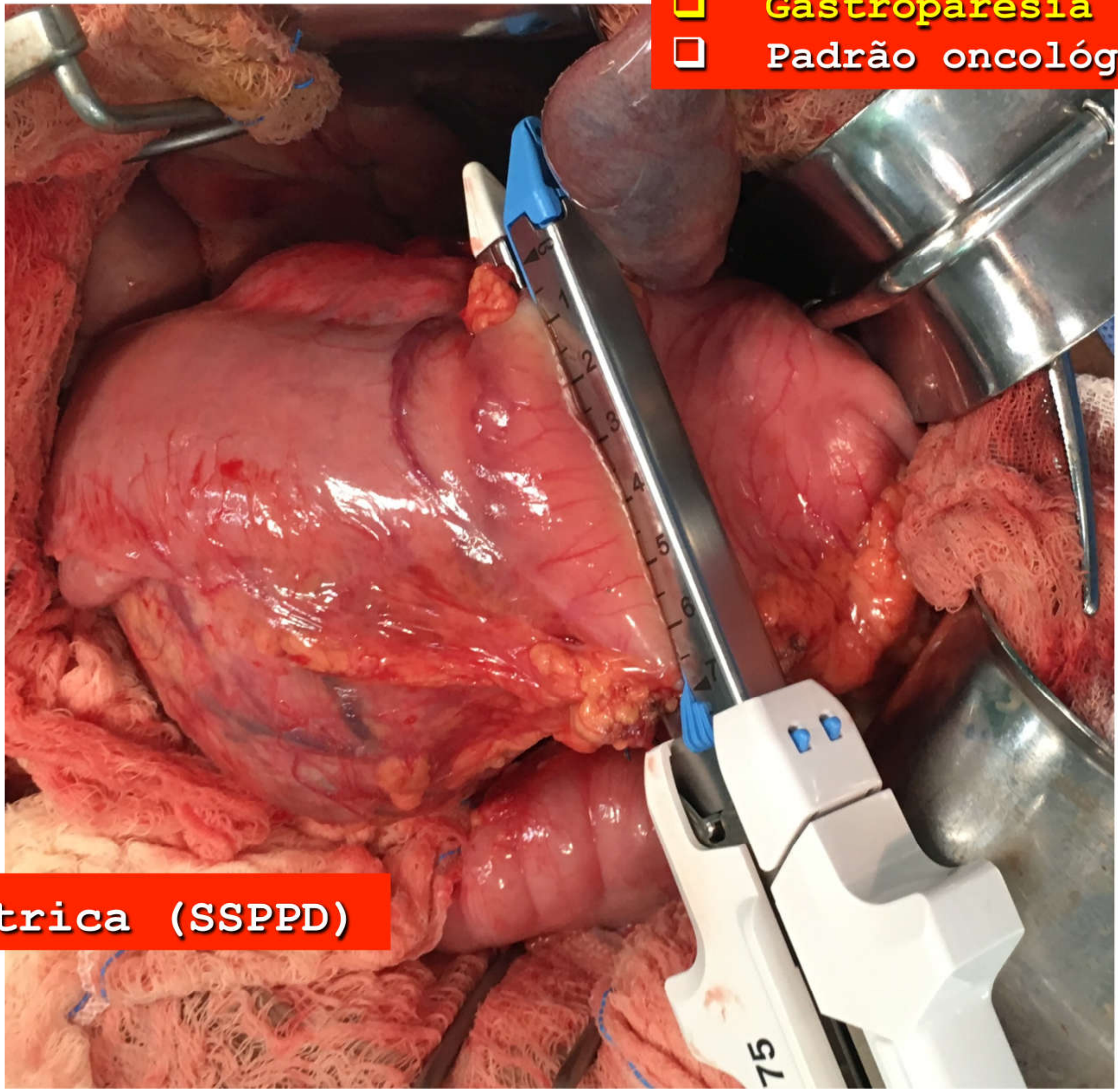
Ressecção da via biliar



- Acima do ducto cístico
- < 2 cm da bifurcação

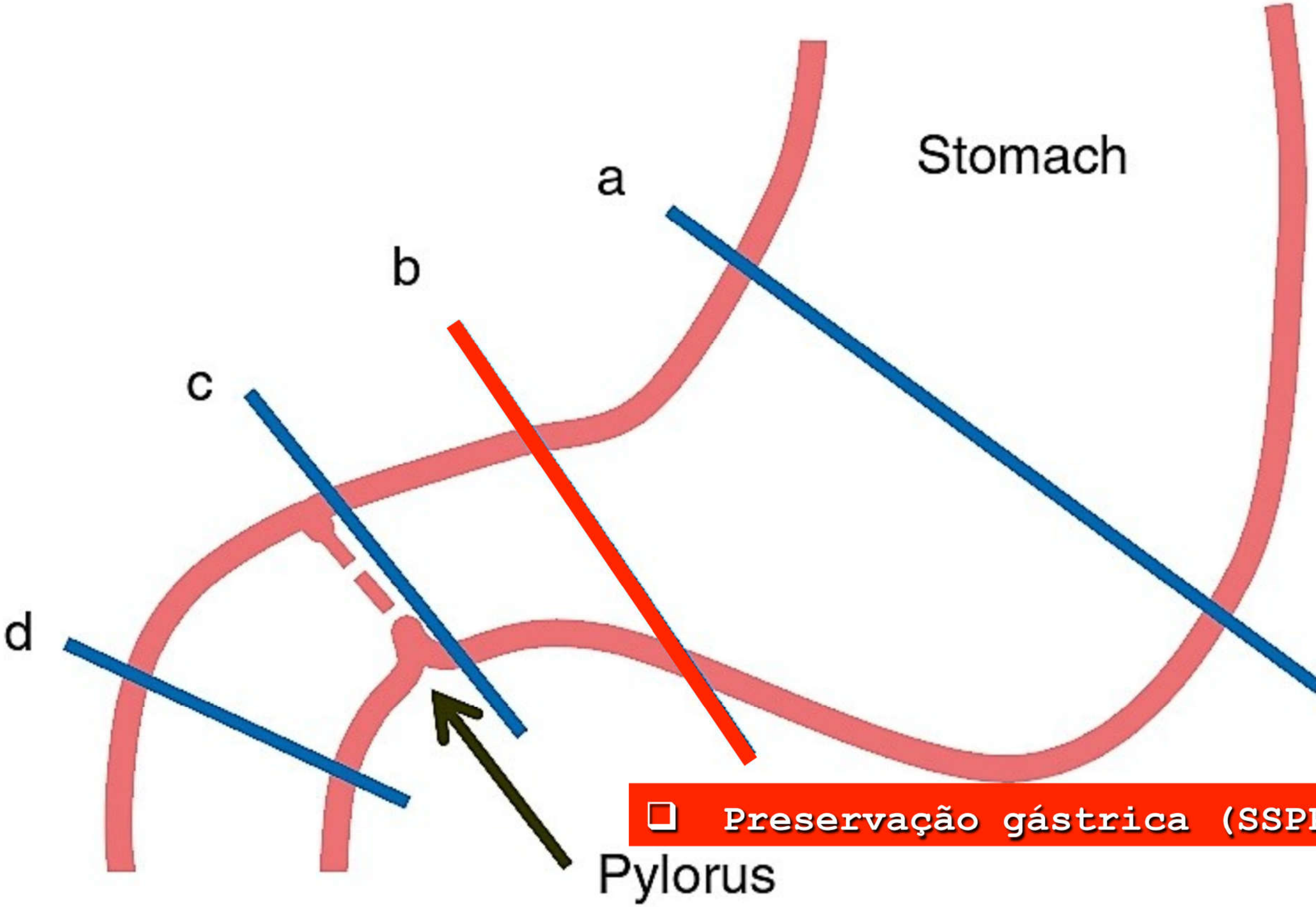
Transecção do estômago

- ❑ Sangramento
- ❑ Fístula pancreática
- ❑ Gastroparesia
- ❑ Padrão oncológico



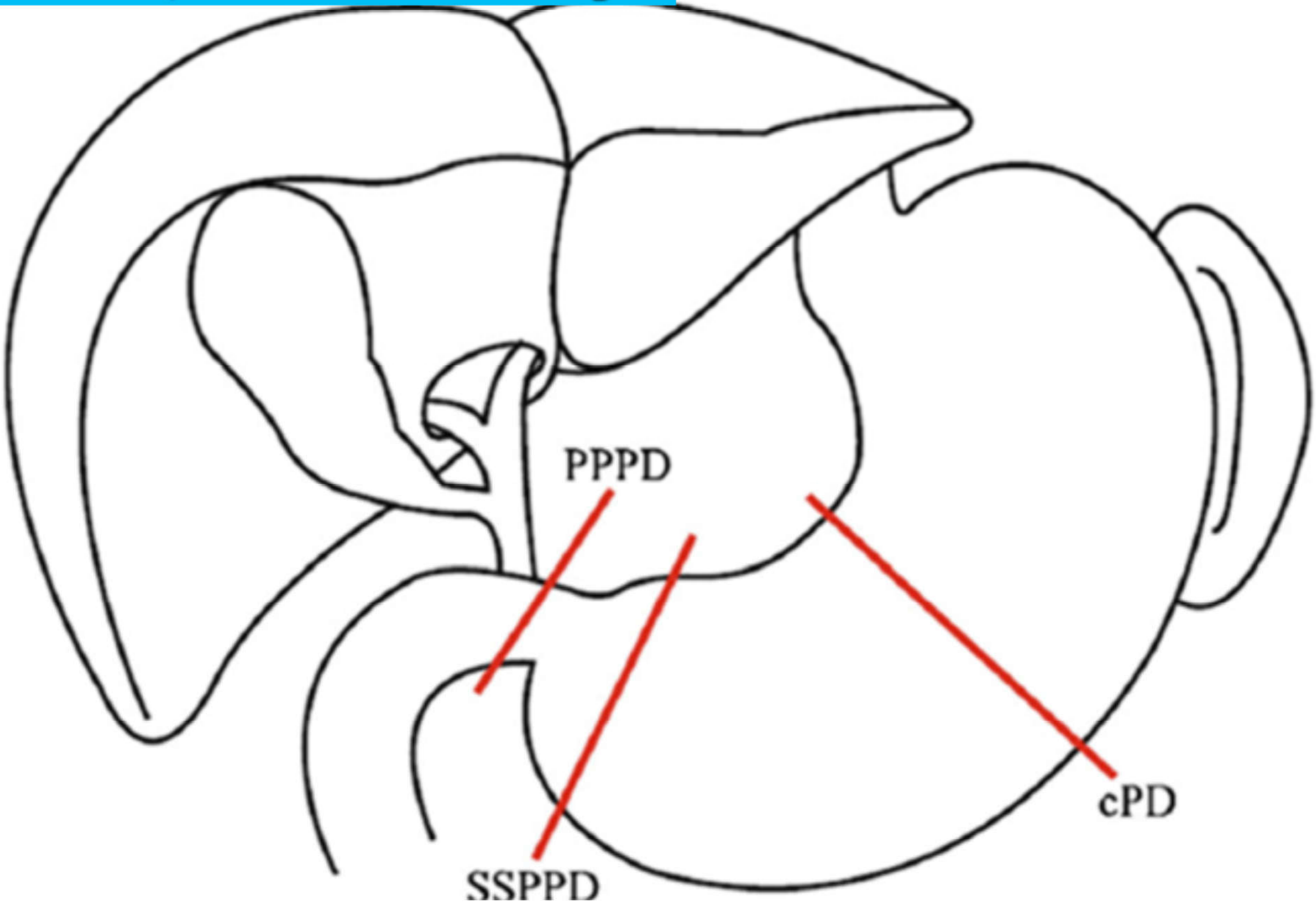
- ❑ Preservação gástrica (SSPPD)

Transecção do estômago (6)



- ❑ **Preservação gástrica (SSPPD)**

Transecção do estômago



- Preservação gástrica (SSPPD)

ORIGINAL ARTICLE

Pylorus Ring Resection Reduces Delayed Gastric Emptying in Patients Undergoing Pancreatoduodenectomy

A Prospective, Randomized, Controlled Trial of Pylorus-Resecting Versus Pylorus-Preserving Pancreatoduodenectomy

Manabu Kawai, MD, Masaji Tani, MD, Seiko Hirono, MD, Motoki Miyazawa, MD, Atsushi Shimizu, MD, Kazuhisa Uchiyama, MD, and Hiroki Yamaue, MD

Prospectivo randomizado e controlado

Kawai M, et al. Ann Surg 2011;253:495-501

TABLE 2. Delayed Gastric Emptying and Postoperative Course

	PpPD (n = 64)	PrPD (n = 66)	*P*
Delayed gastric emptying*	11 (17.2%)	3 (4.5%)	0.0244
Grade A	6 (9.4%)	1 (1.5%)	
Grade B	5 (7.8%)	1 (1.5%)	
Grade C	0 (0%)	1 (1.5%)	
Removal of nasogastric catheter, d	0.6 ± 0.9	0.6 ± 1.0	0.9410
Reinsertion of nasogastric catheter	8 (12.5%)	2 (3.0%)	0.0527
Start of solid diet, d	6.3 ± 3.7	5.6 ± 3.3	0.1138
Postoperative hospital stay, d	24.1 ± 14.8	24.3 ± 15.5	0.9305

*Delayed gastric emptying is defined according to the International Study Group of Pancreatic Surgeons.

Kawai M, et al. Ann Surg 2011;253:495-501

Ann Surg Oncol (2012) 19:176–183
DOI 10.1245/s10434-011-1901-2

Annals of
SURGICAL ONCOLOGY
OFFICIAL JOURNAL OF THE SOCIETY OF SURGICAL ONCOLOGY

ORIGINAL ARTICLE – PANCREATIC TUMORS

Preservation of the Pyloric Ring Has Little Value in Surgery for Pancreatic Head Cancer: A Comparative Study Comparing Three Surgical Procedures

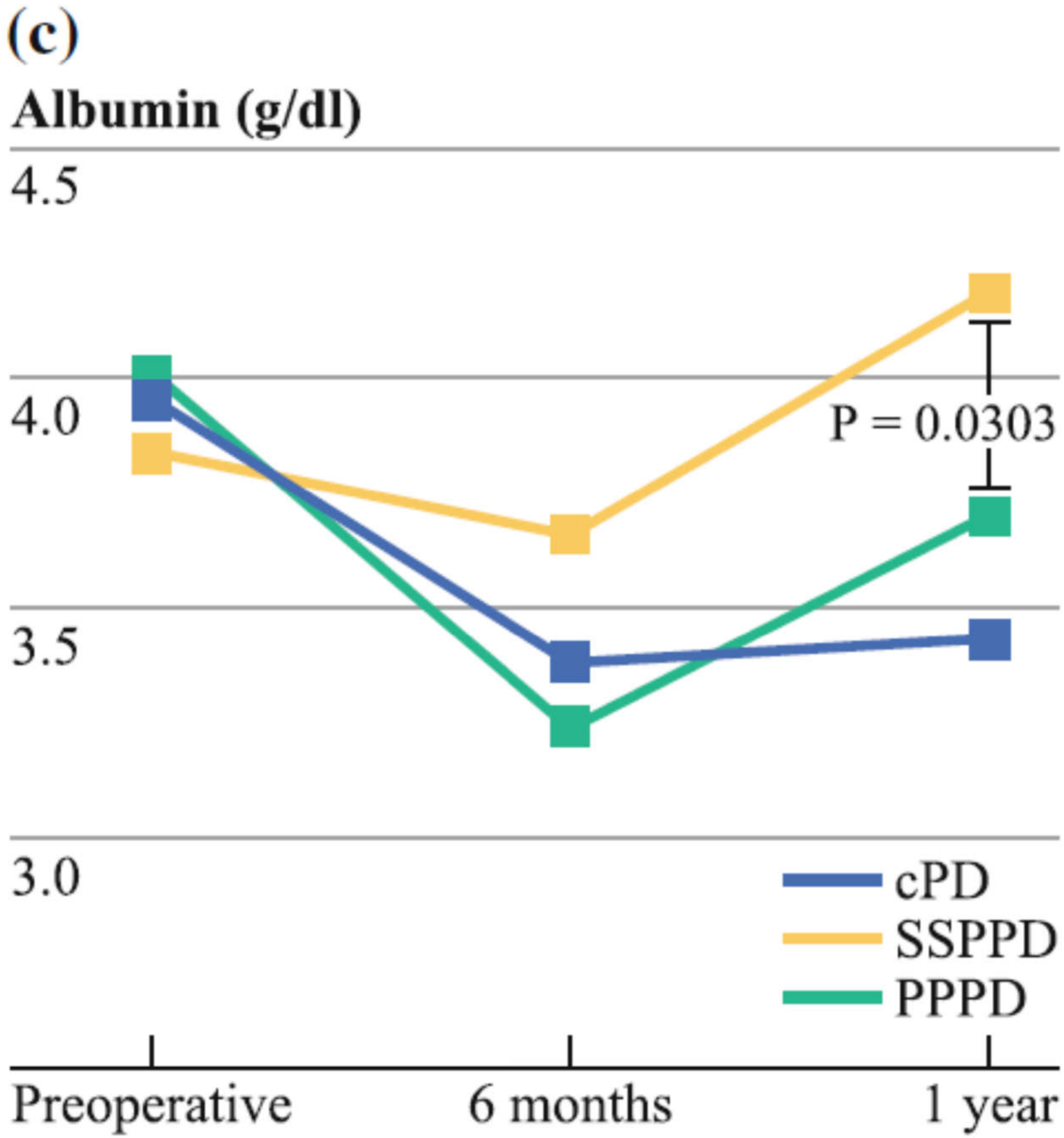
Tsutomu Fujii, MD, PhD, FACS[1], Mitsuro Kanda, MD, PhD[1], Yasuhiro Kodera, MD, PhD, FACS[1], Shunji Nagai, MD, PhD[1], Tevfik T. Sahin, MD[1], Masamichi Hayashi, MD[1], Akiyuki Kanzaki, MD[1], Suguru Yamada, MD, PhD[1], Hiroyuki Sugimoto, MD, PhD[1], Shuji Nomoto, MD, PhD[1], Shin Takeda, MD, PhD[1], Satoshi Morita, PhD[2], and Akimasa Nakao, MD, PhD, FACS[1]

Fujii T, et al. Ann Surg Oncol 2012;19:176-83.

TABLE 2 Comparisons of perioperative and short-term follow-up

Characteristic	cPD ($n = 69$)	SSPPD ($n = 56$)	PPPD ($n = 33$)	P value
Mortality	0	0	0	
Overall morbidity (Clavien grade III or more)	25 (36.2%)	21 (37.5%)	13 (39.4%)	0.932
Pancreatic fistula (ISGPF grade B or more)	16 (23.2%)	17 (30.4%)	7 (21.2%)	0.592
DGE (ISGPS grade B or more)	4 (5.8%)	3 (5.4%)	9 (27.3%)	0.0012
Grade B/C	3/1	2/1	7/2	
Length of the nasogastric tube (days)	2.1 ± 1.6	1.3 ± 0.7	2.7 ± 6.1	0.0006
Days to start oral intake (days)	9.7 ± 5.7	8.6 ± 4.7	15.2 ± 7.8	<0.0001
Use of gastroprokinetic agent	13 (18.8%)	6 (10.7%)	9 (27.3%)	0.135
Use of antiulcer agent	45 (65.2%)	39 (69.6%)	23 (69.7%)	0.839
Postoperative peptic ulcer	2 (2.9%)	3 (5.4%)	2 (6.1%)	0.704
Gastric dumping syndrome	0	0	0	
Postoperative adjuvant chemotherapy	50 (72.5%)	36 (64.3%)	18 (54.5%)	0.194
Length of the hospital stay (days)	41.5 ± 21.6	39.4 ± 16.9	49.1 ± 46.6	0.926

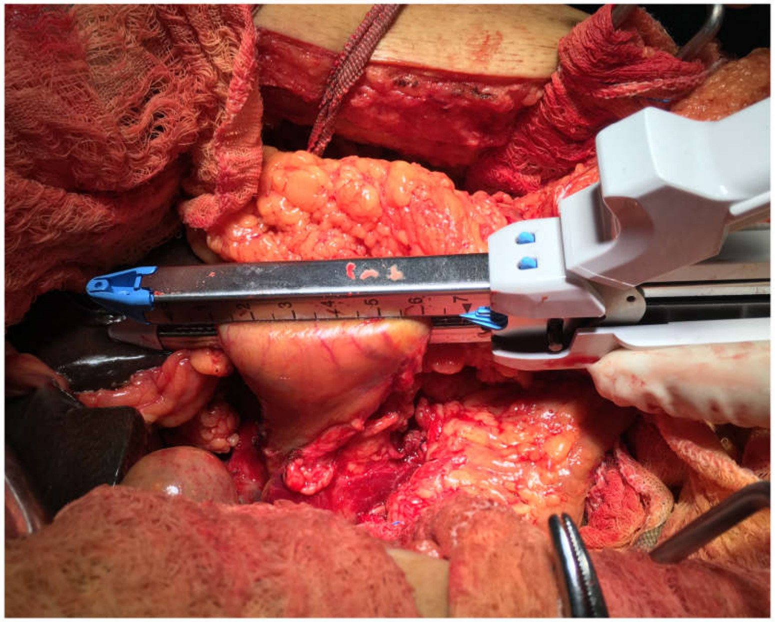
Fujii T, et al. Ann Surg Oncol 2012;19:176-83.

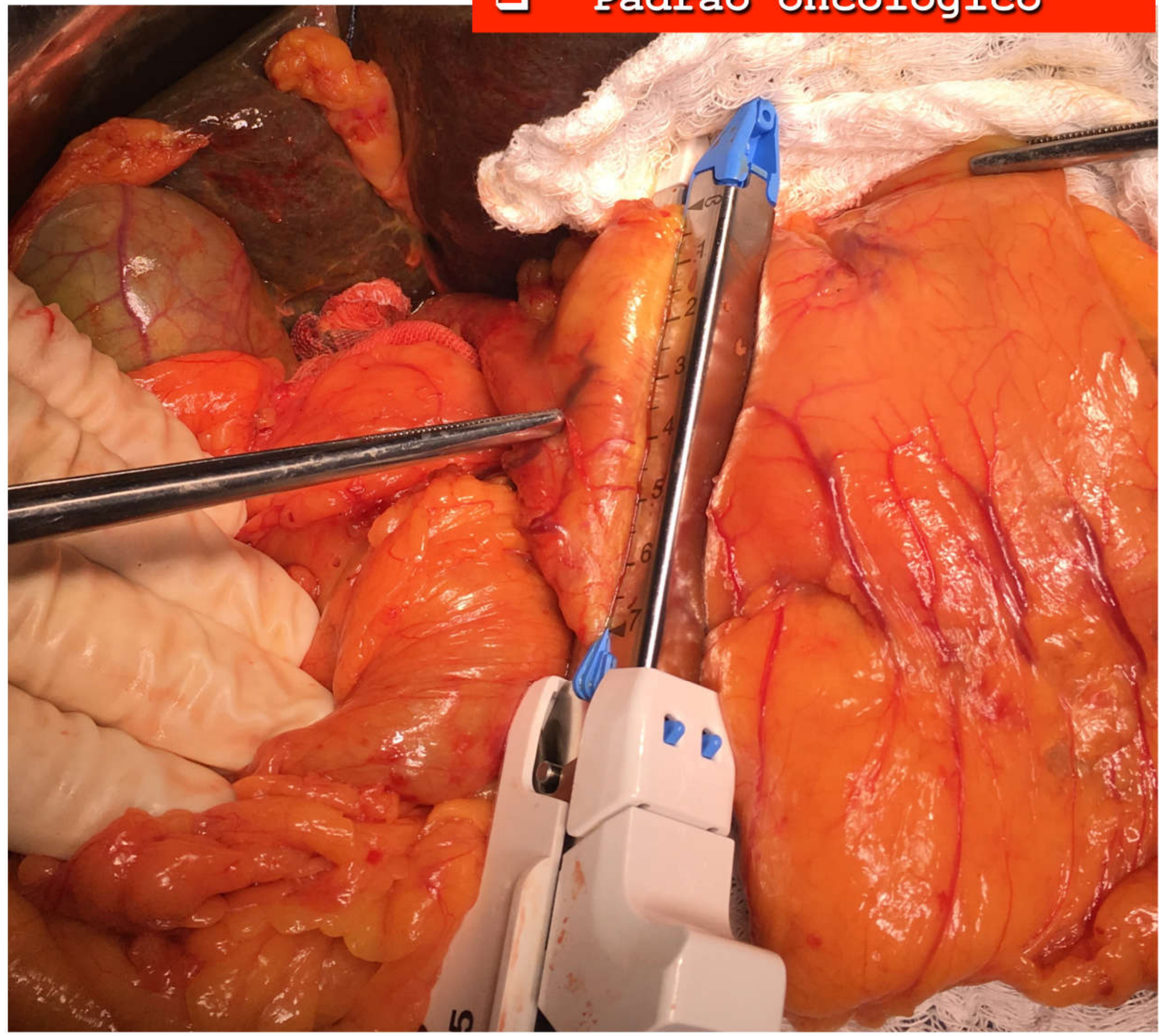


Fujii T, et al. Ann Surg Oncol 2012;19:176-83.

Transecção do estômago

- Sangramento
- Fístula pancreática
- Gastroparesia
- Padrão oncológico





RETARDO NO ESVAZIAMENTO GÁSTRICO

ABCDDV/1175

ABCD Arq Bras Cir Dig
2016;29(2):71-72
DOI: /10.1590/0102-6720201600020001

Editorial

THE OBITUARY OF THE PYLORUS-PRESERVING PANCREATODUODENECTOMY

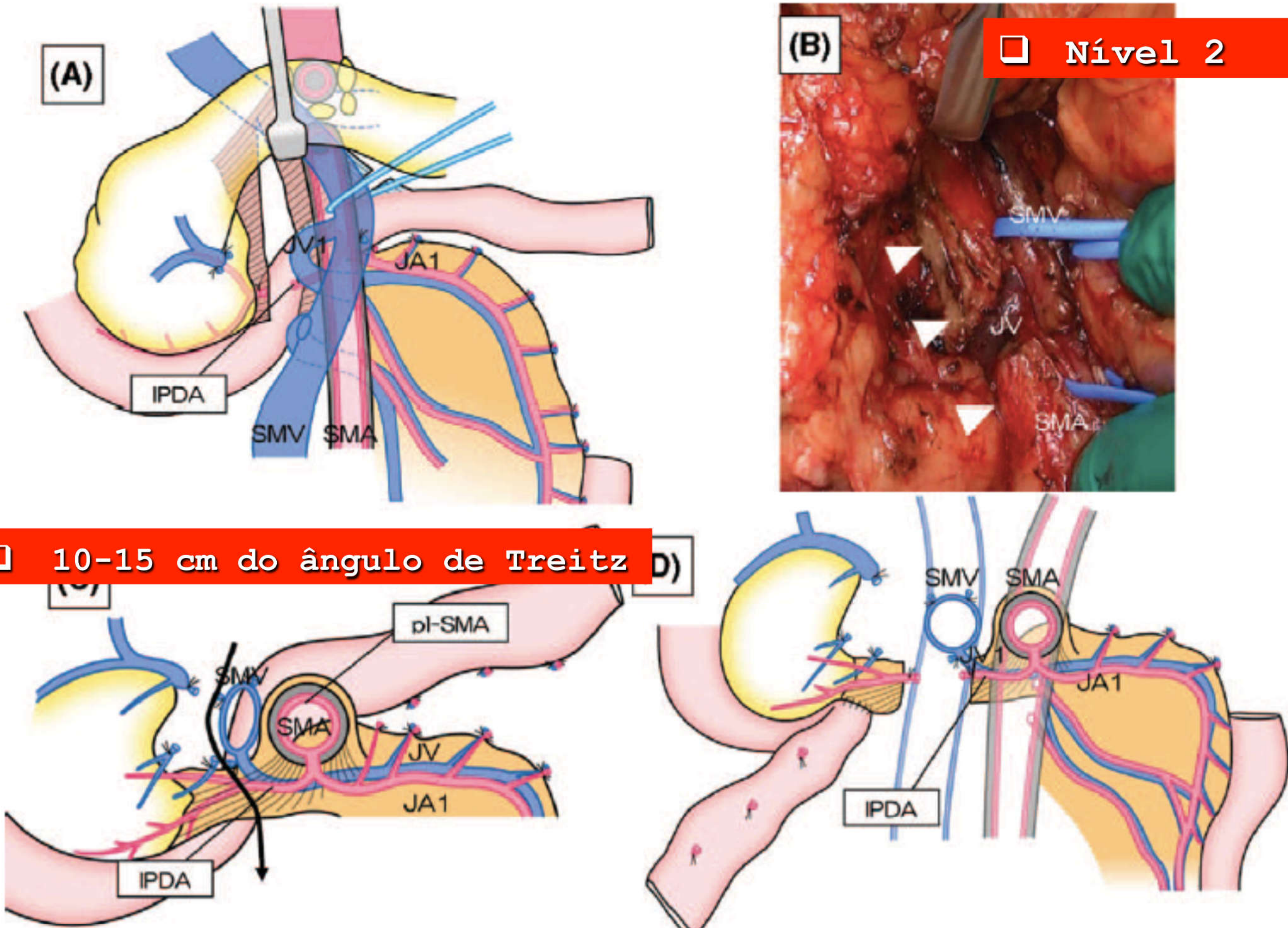
O obituário da duodenopancreatectomia com preservação pilórica

Orlando Jorge Martins **TORRES**, Rodrigo Rodrigues **VASQUES**, Camila Cristina S. **TORRES**
From the Department of Surgery, Federal University of Maranhão, São Luiz, MA, Brazil

Pancreatoduodenectomy is the treatment of choice for patients with benign and malignant disease of pancreatic head. Classic pancreatoduodenectomy was described by Whipple originally and included distal hemigastrectomy. Pylorus-preserving pancreatoduodenectomy (pylorus-preserving) was popularized in the late 1970s for benign disease and it included full preservation of the pylorus. However, delayed gastric emptying after pylorus-preserving is a frustrating complication. Its incidence varying from 19% to 61% in previous series and it results in discomfort, prolonged length of stay and increases the risk of respiratory complications. Delayed gastric emptying contributes to increased hospital costs and decreased quality of life. There has been no evidence from prospective studies and meta-analyses to indicate the superiority of pylorus preserving in terms of quality of life or delayed gastric emptying[2,4,5,7].

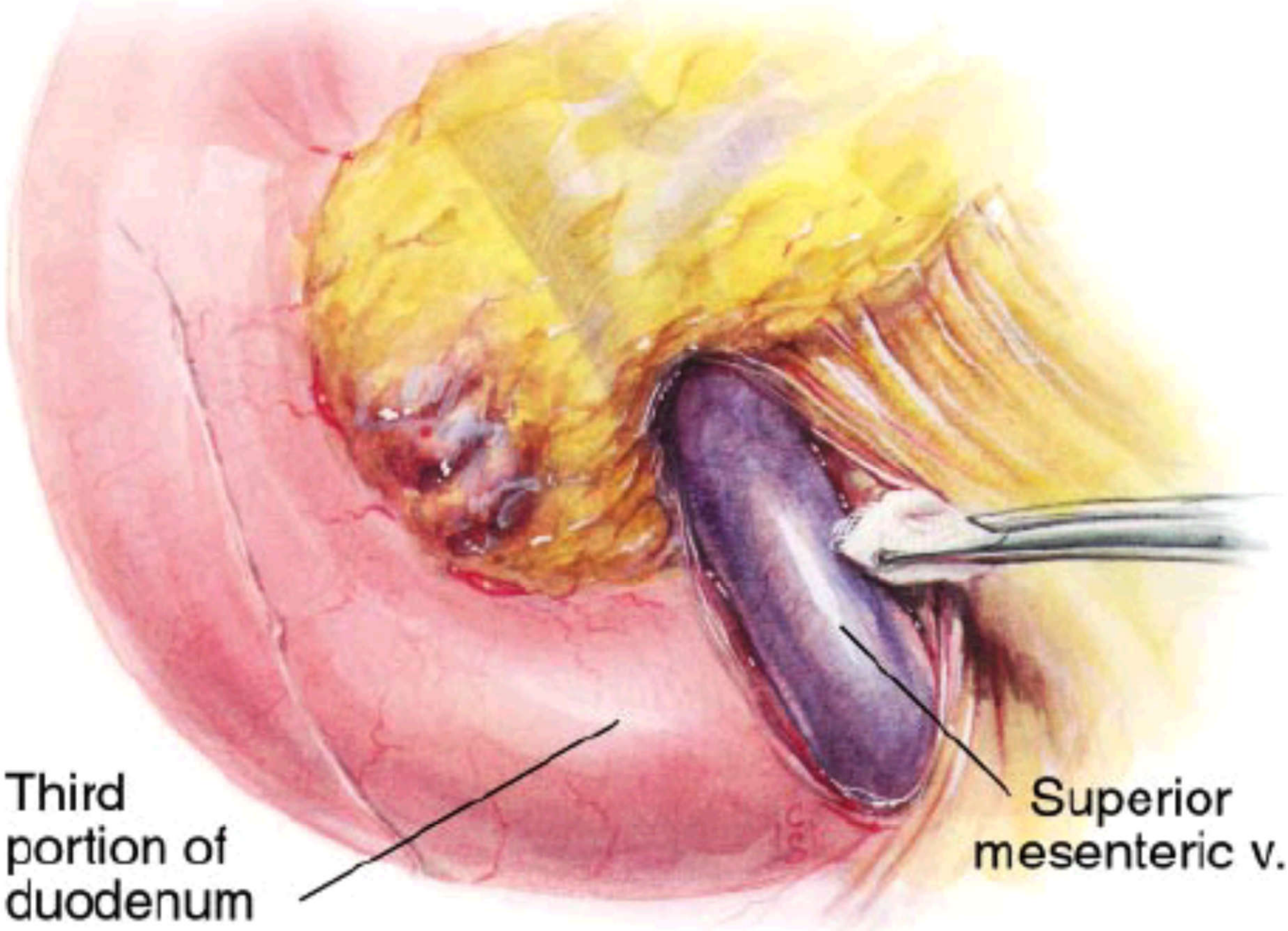
More recently, and mostly in Japan since the late 1990s, subtotal stomach-preserving pancreatoduodenectomy (stomach-preserving) in which the pyloric ring and 2 cm of the distal stomach only is removed with preservation of about 90% of the

- Nível 2
- 10-15 cm do ângulo de Treitz

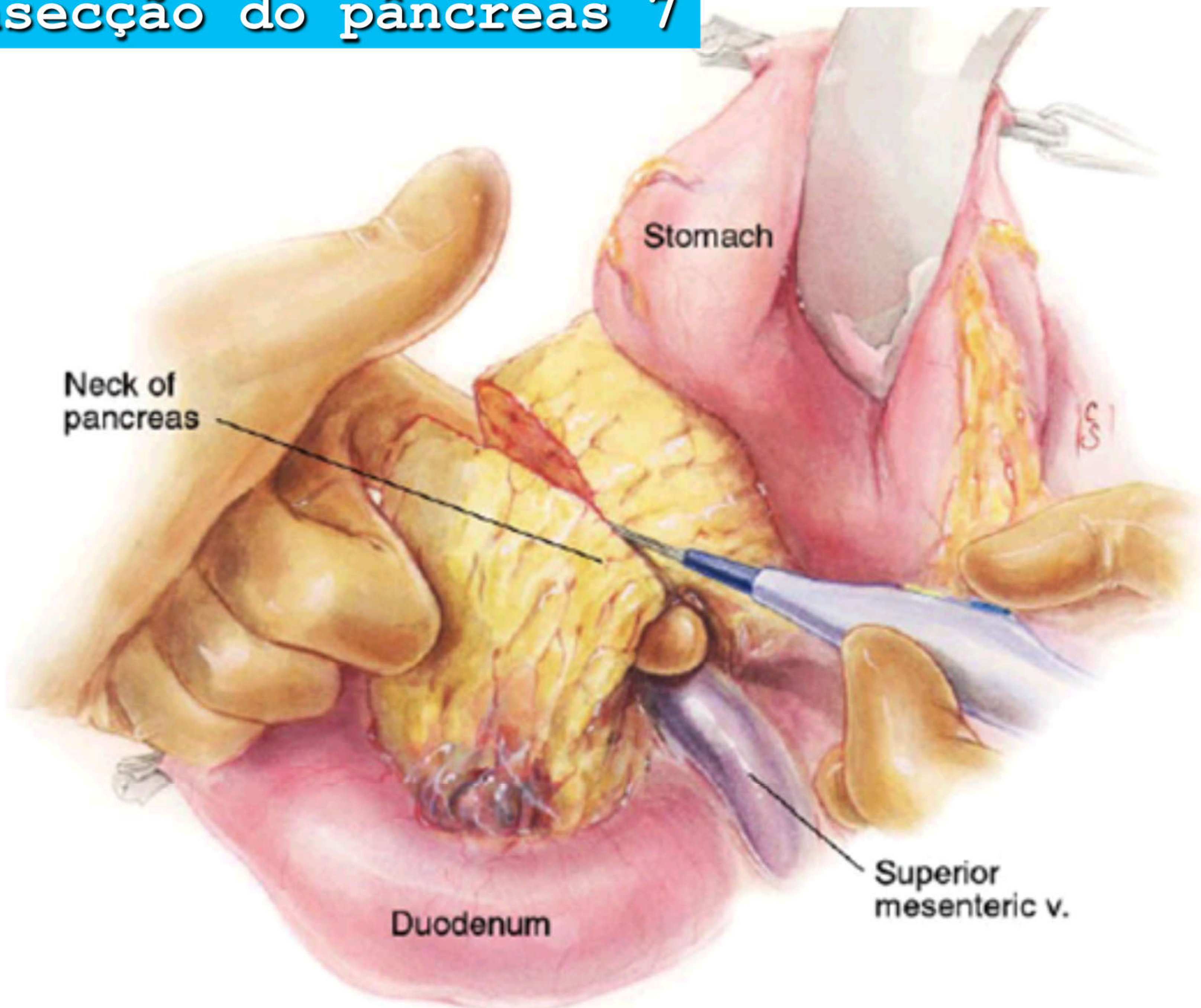


Transecção do jejuno e ligamento de Treitz (4)

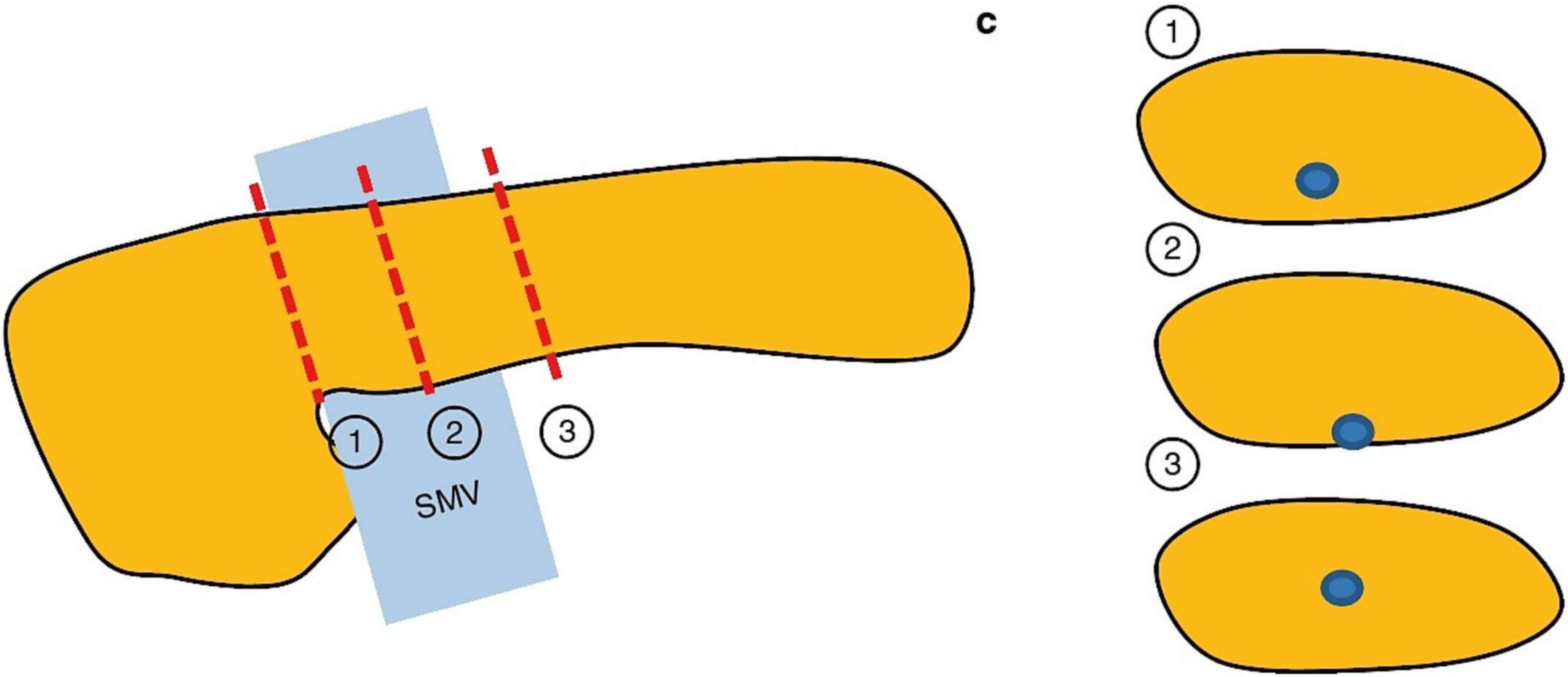
Transecção do pâncreas



Transecção do pâncreas 7

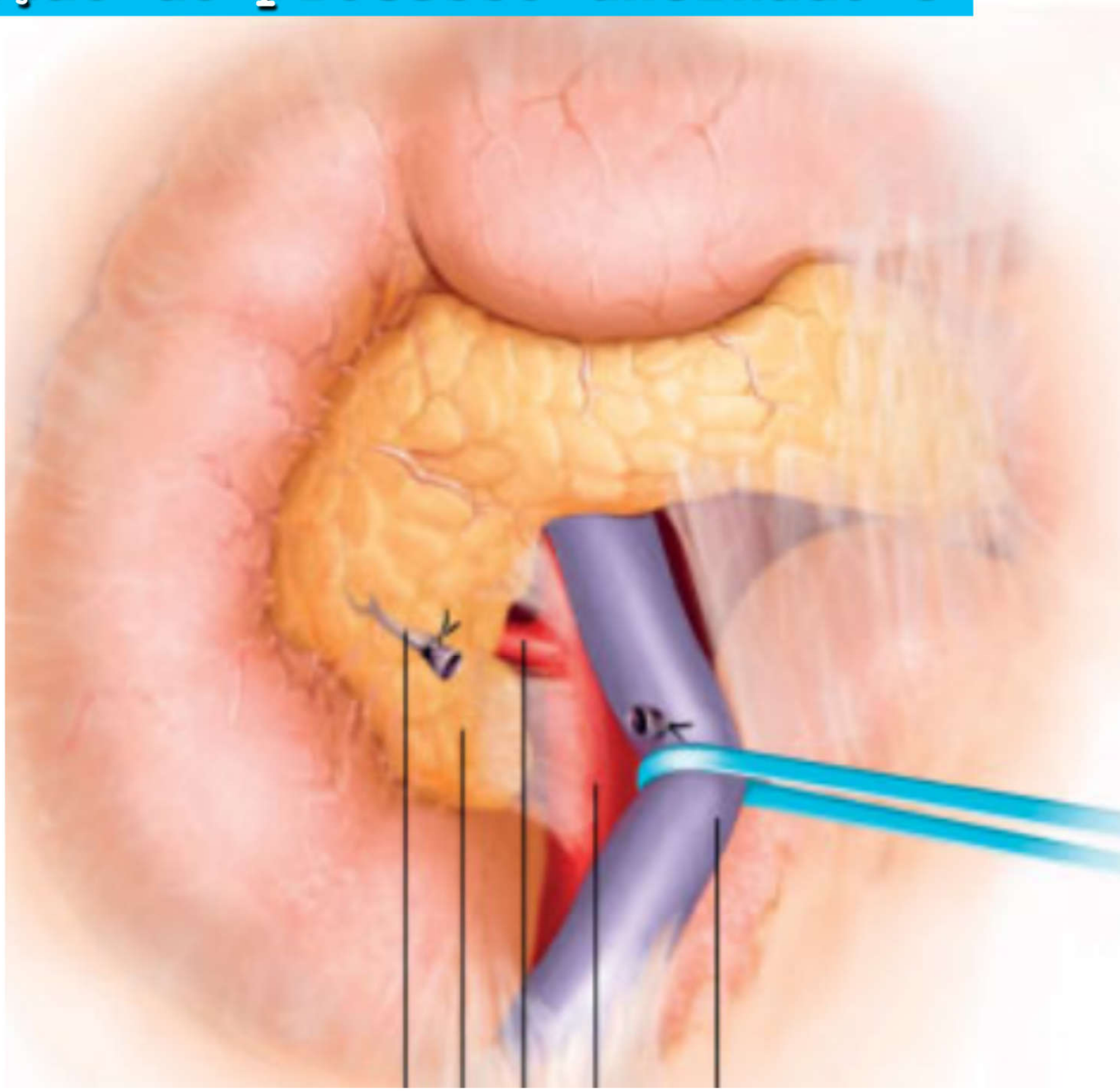


Transecção do pâncreas

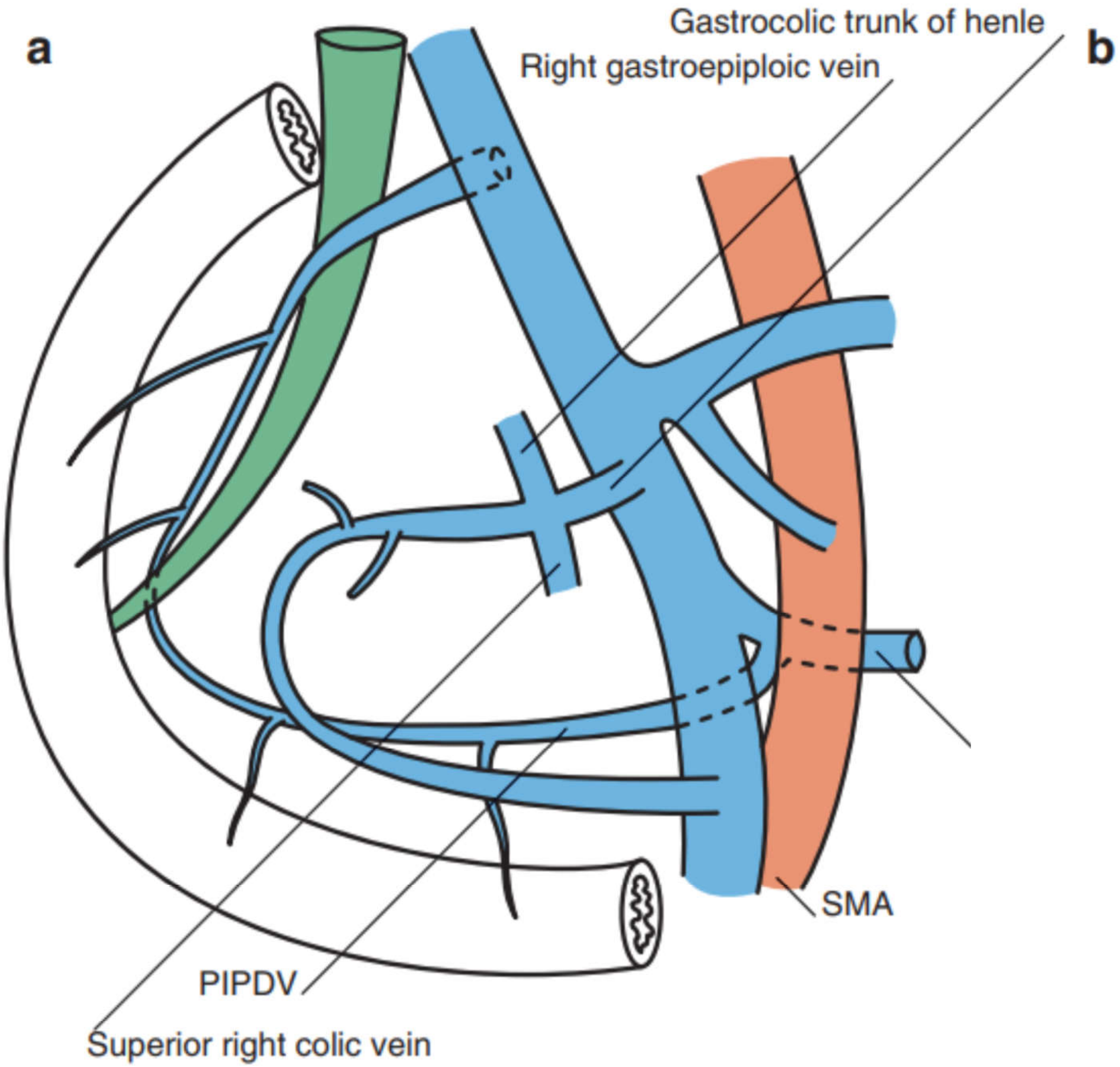


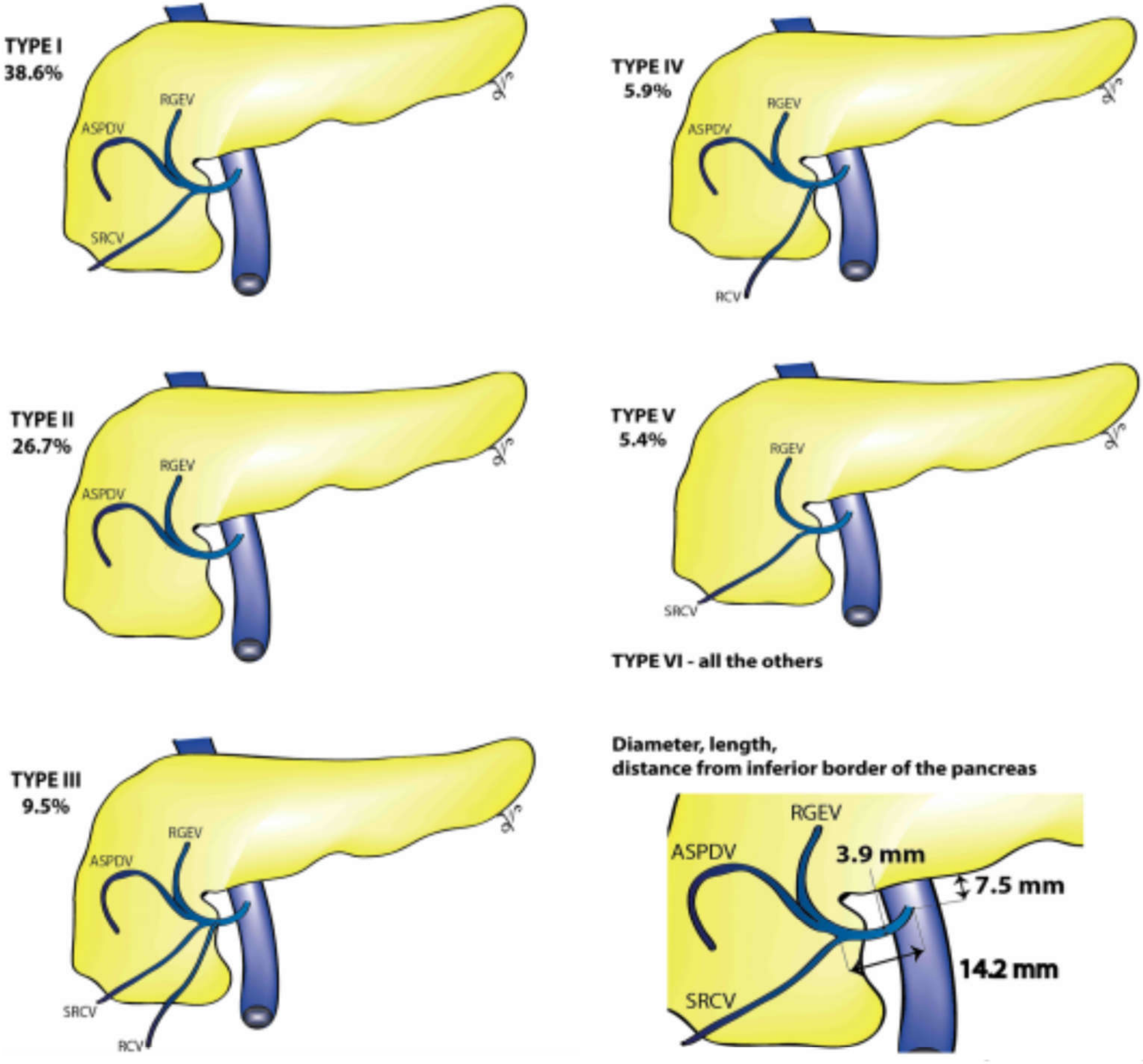
- À esquerda da margem da veia porta

Dissecção do processo uncinado 5

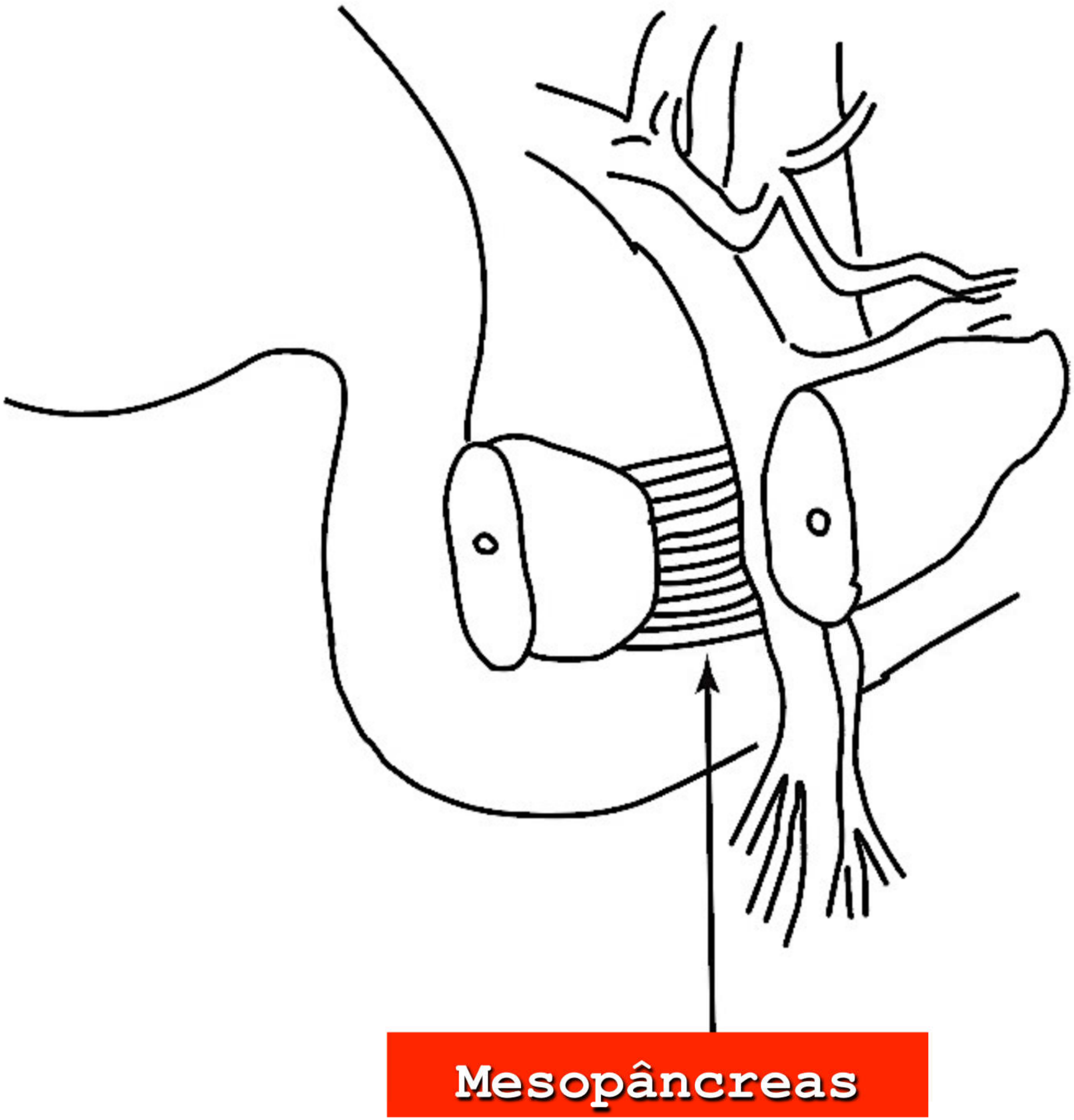


Tronco gastrocólico de Henle



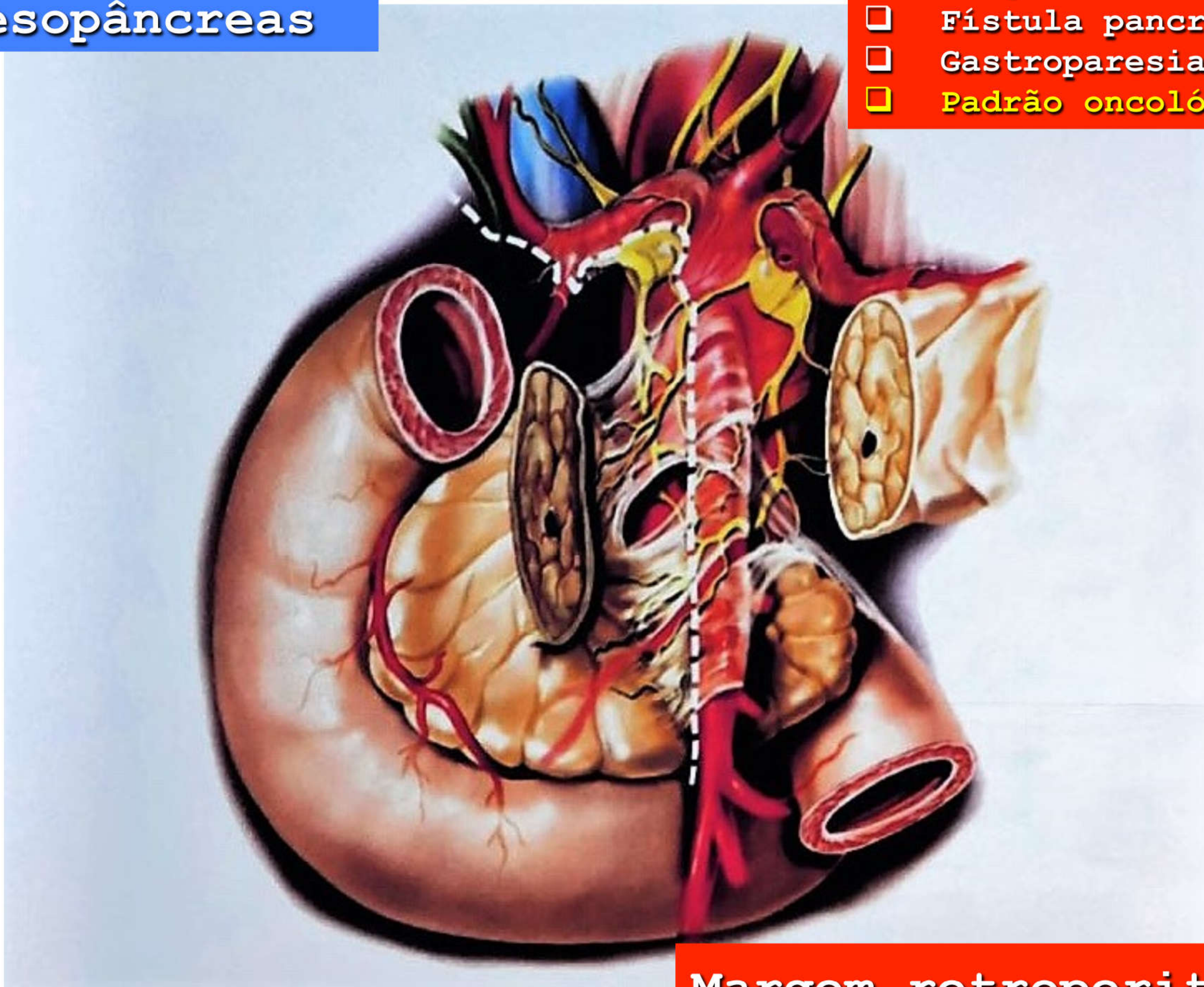


TYPE I
38.6%
RGEV
ASPDV
SRCV
TYPE IV
5.9%
RGEV
ASPDV
RCV
TYPE II
26.7%
RGEV
ASPDV
TYPE V
5.4%
RGEV
SRCV
TYPE VI - all the others
TYPE III
9.5%
RGEV
ASPDV
SRCV
RCV
Diameter, length,
distance from inferior border of the pancreas
RGEV
ASPDV
3.9 mm
7.5 mm
14.2 mm
SRCV

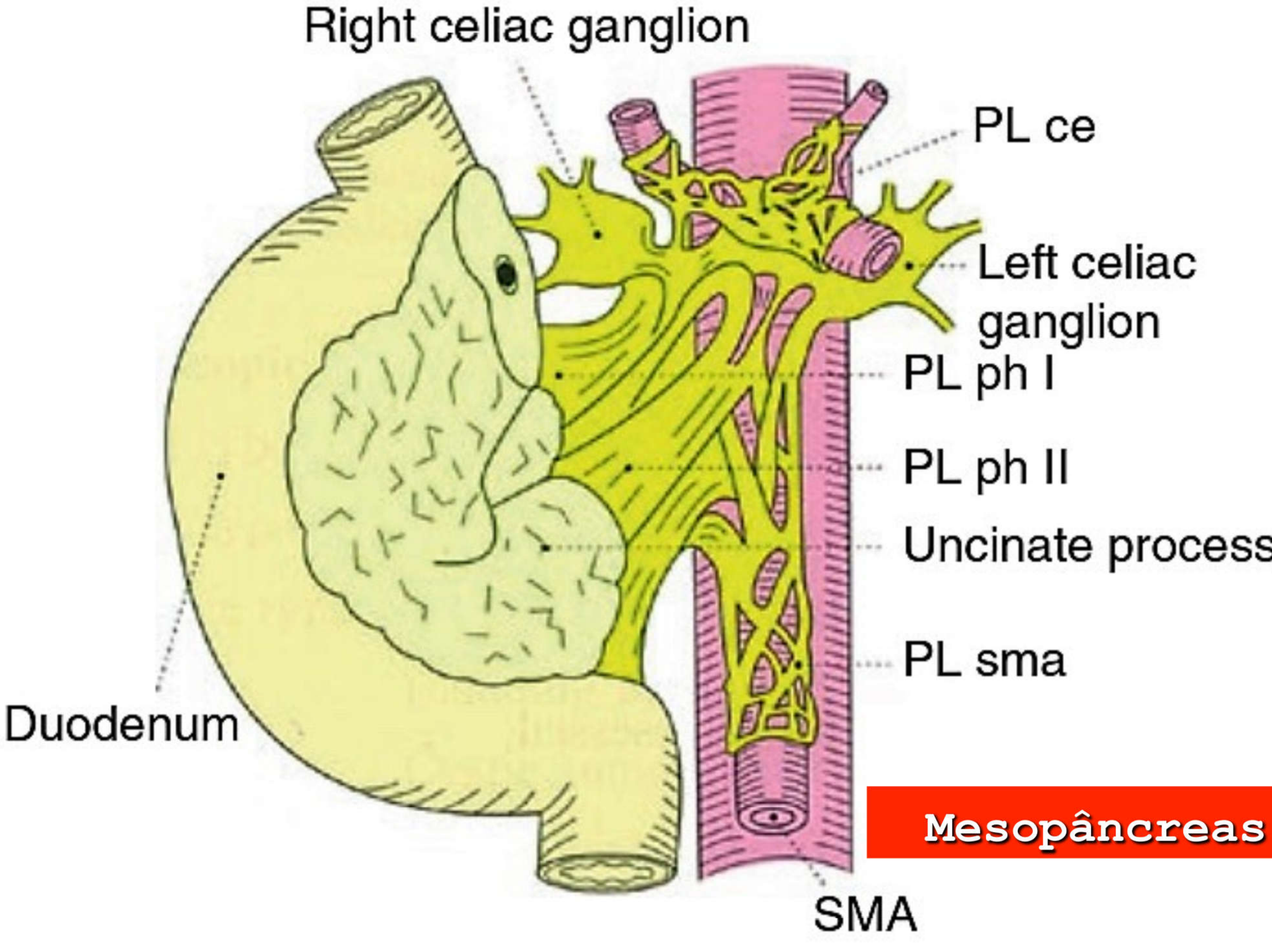

Mesopâncreas

Mesopâncreas

- ❑ Sangramento
- ❑ Fístula pancreática
- ❑ Gastroparesia
- ❑ Padrão oncológico

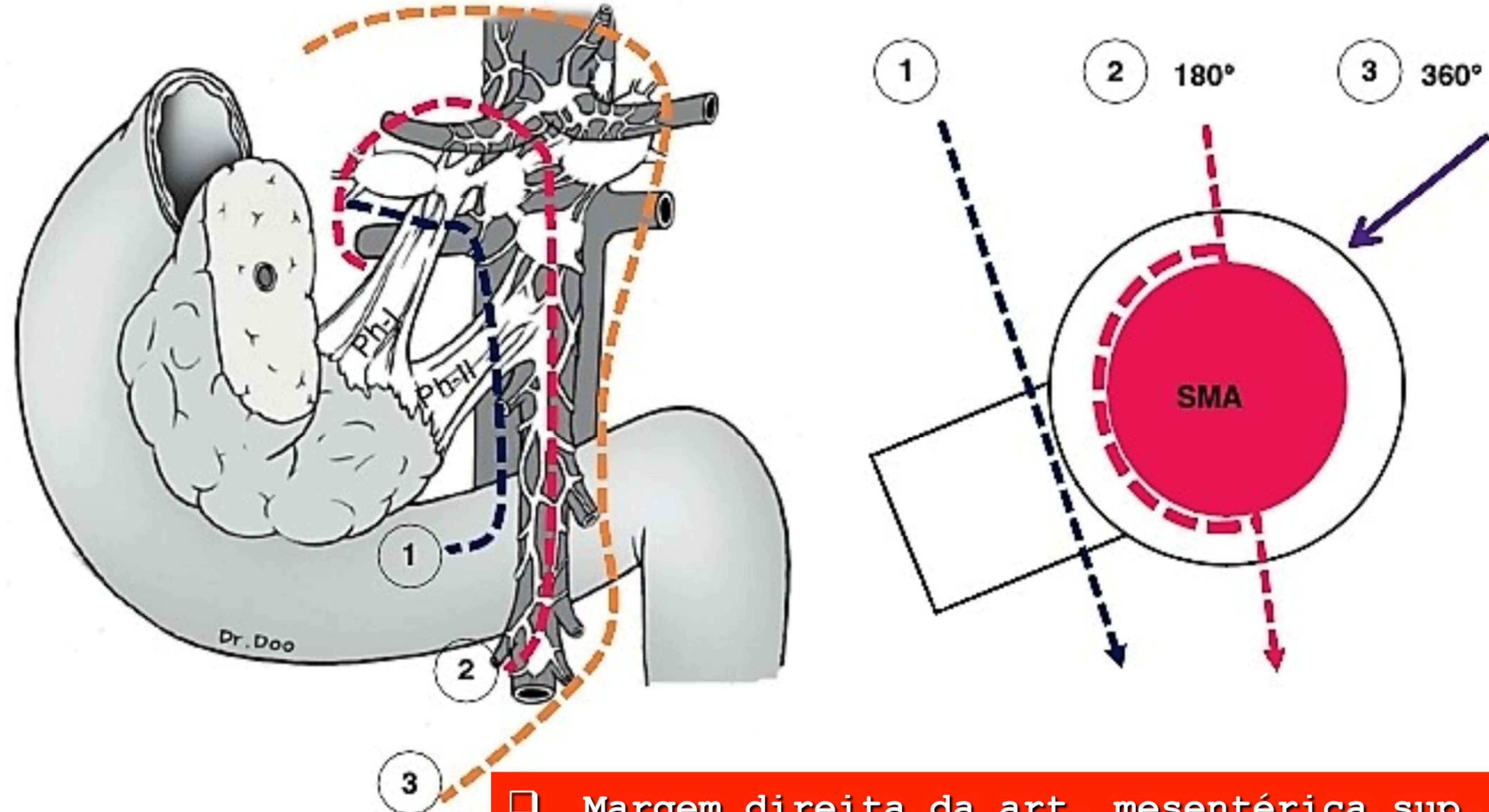


Margem retroperitoneal



Mesopâncreas

Liberação do processo uncinado

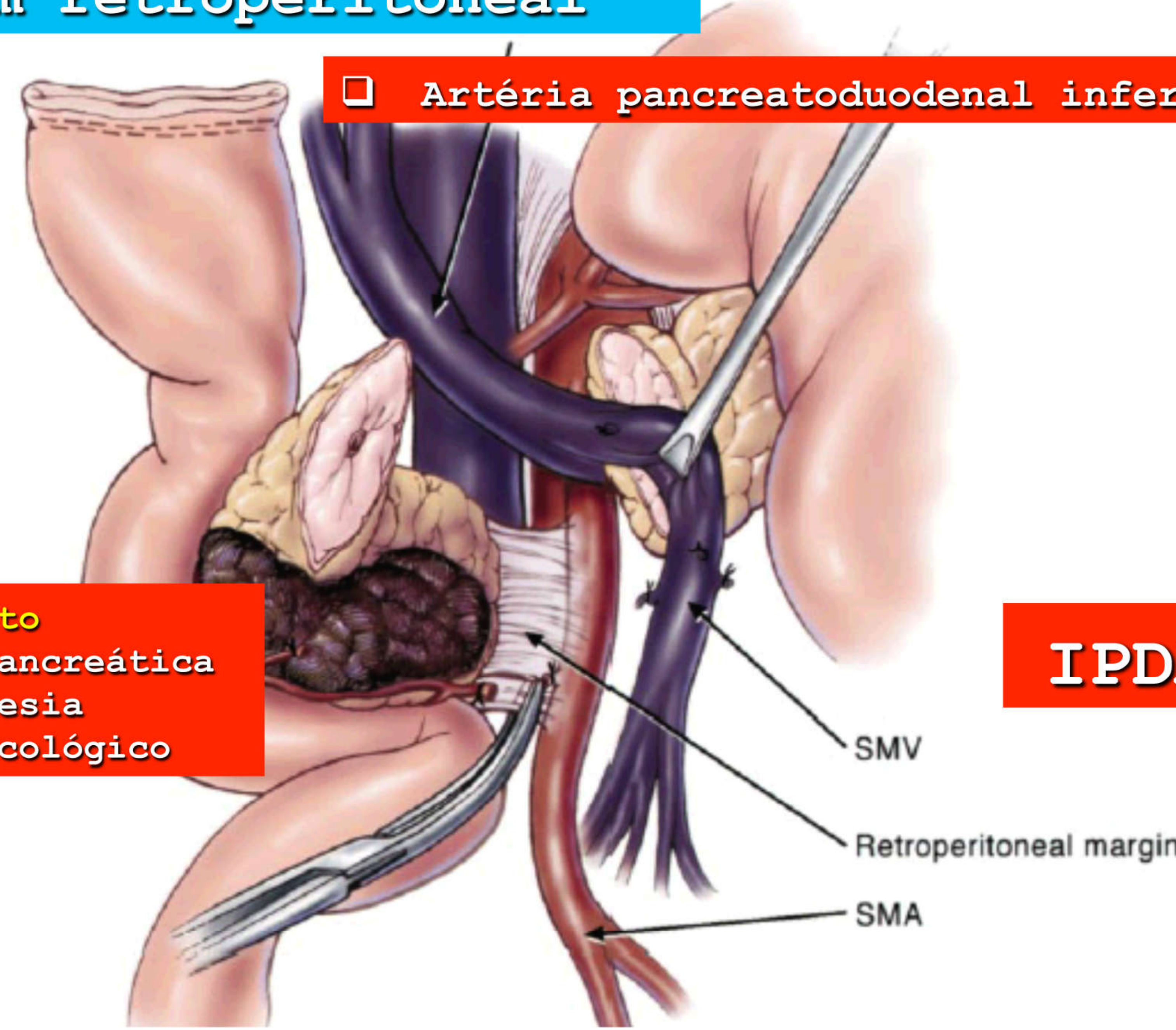


❑ Margem direita da art. mesentérica sup.

Fig. 23.14 Extent of nerve plexus dissection. There are three options for nerve plexus dissection. (1) Cutting nerve plexus at the level of pancreatic head plexus, (2) a right half removal, (3) a whole circumferential dissection

Margem retroperitoneal

- ❑ Artéria pancreatoduodenal inferior

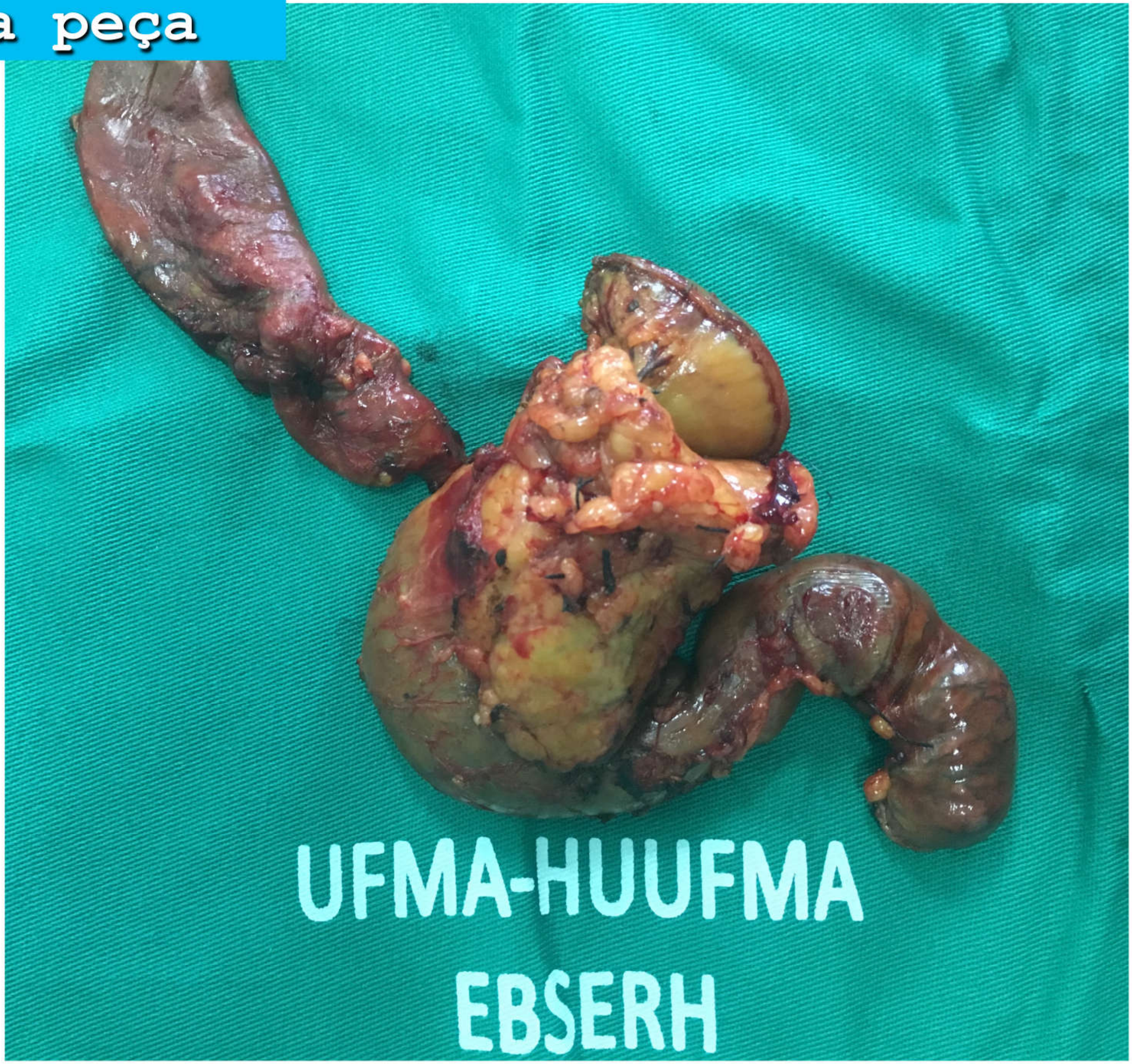


- ❑ Sangramento
- ❑ Fístula pancreática
- ❑ Gastroparesia
- ❑ Padrão oncológico

IPDA

- ❑ Margem direita da artéria mesentérica superior

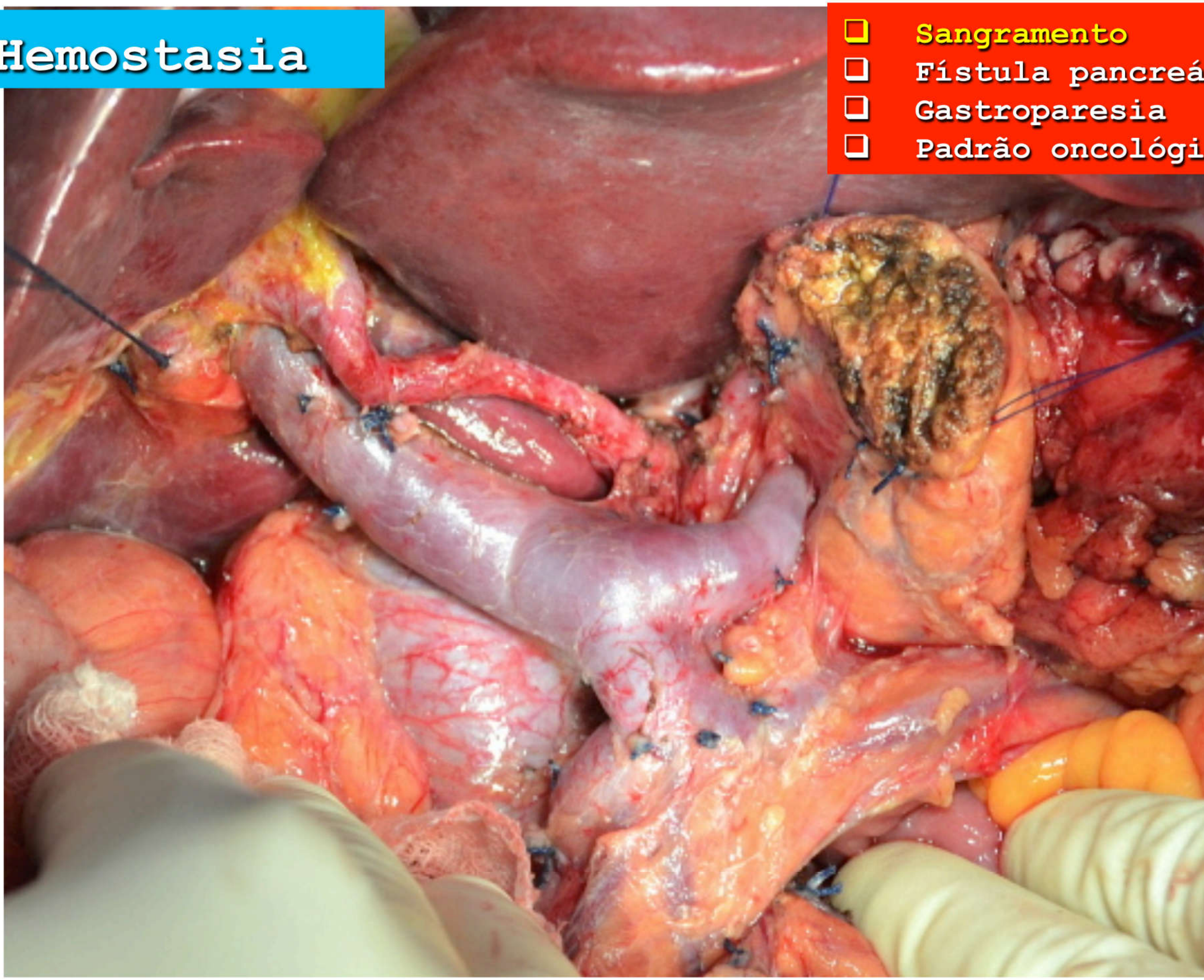
Retirada da peça



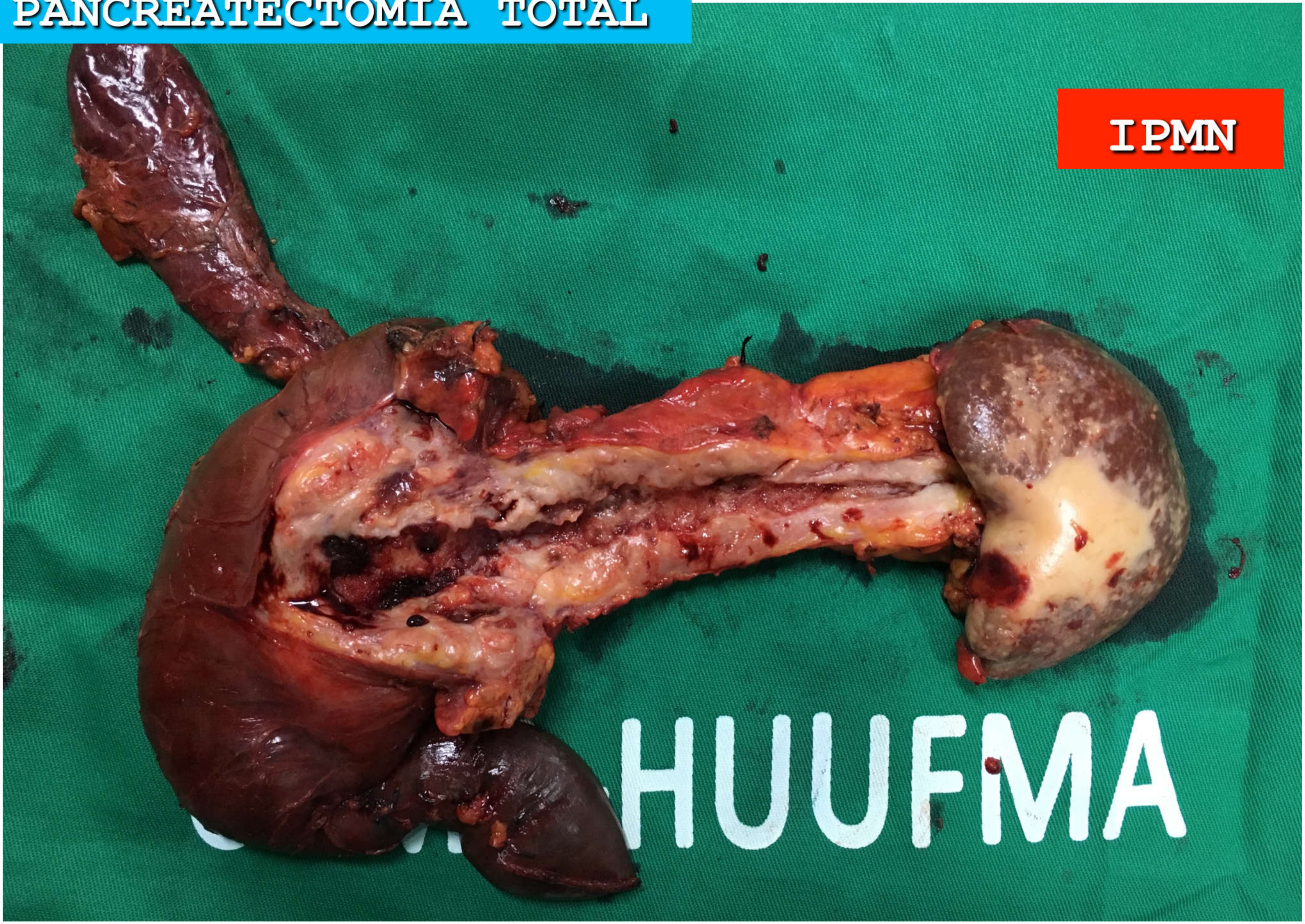
SSPPD

Hemostasia

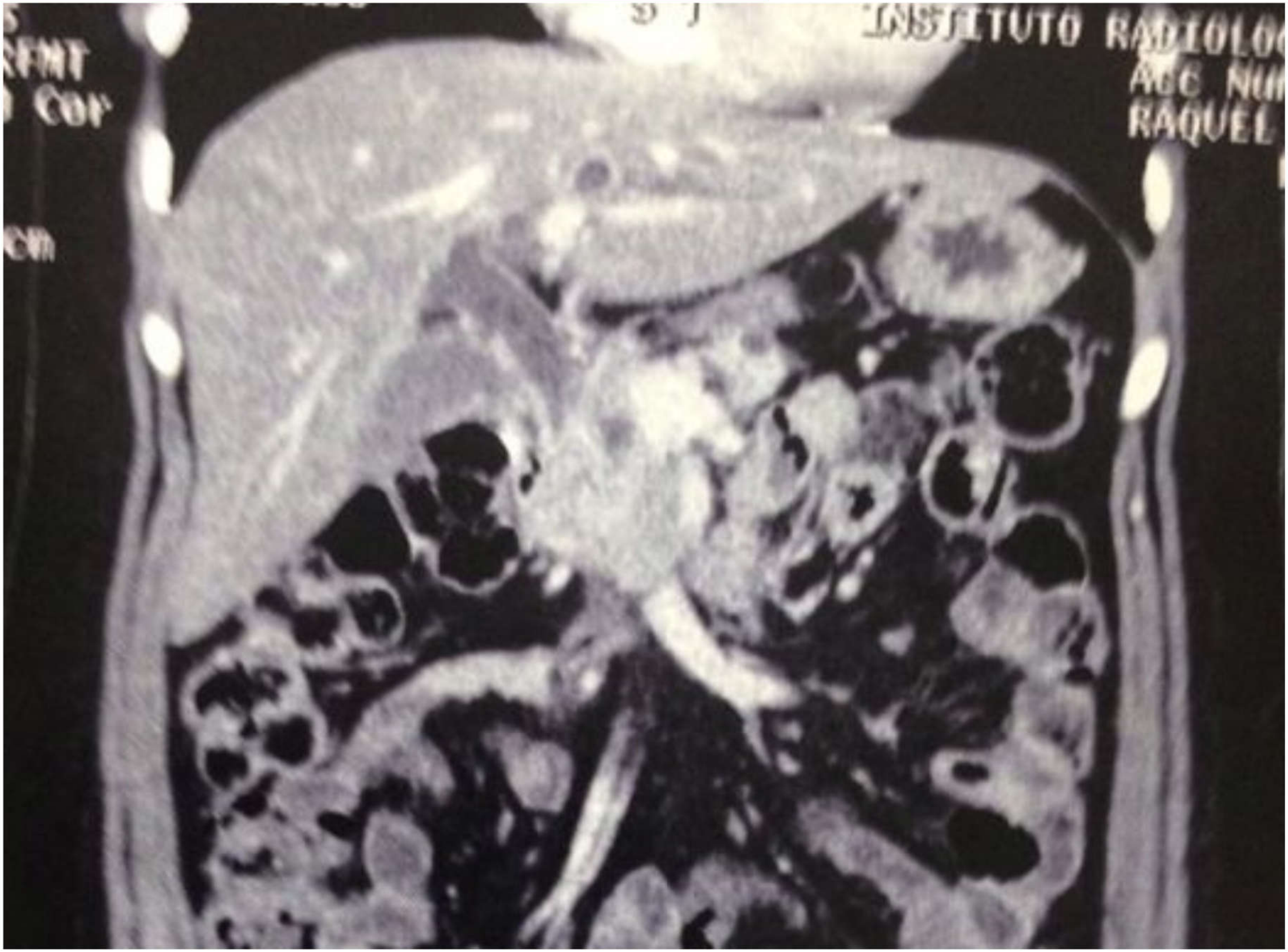
- ❑ Sangramento
- ❑ Fístula pancreática
- ❑ Gastroparesia
- ❑ Padrão oncológico



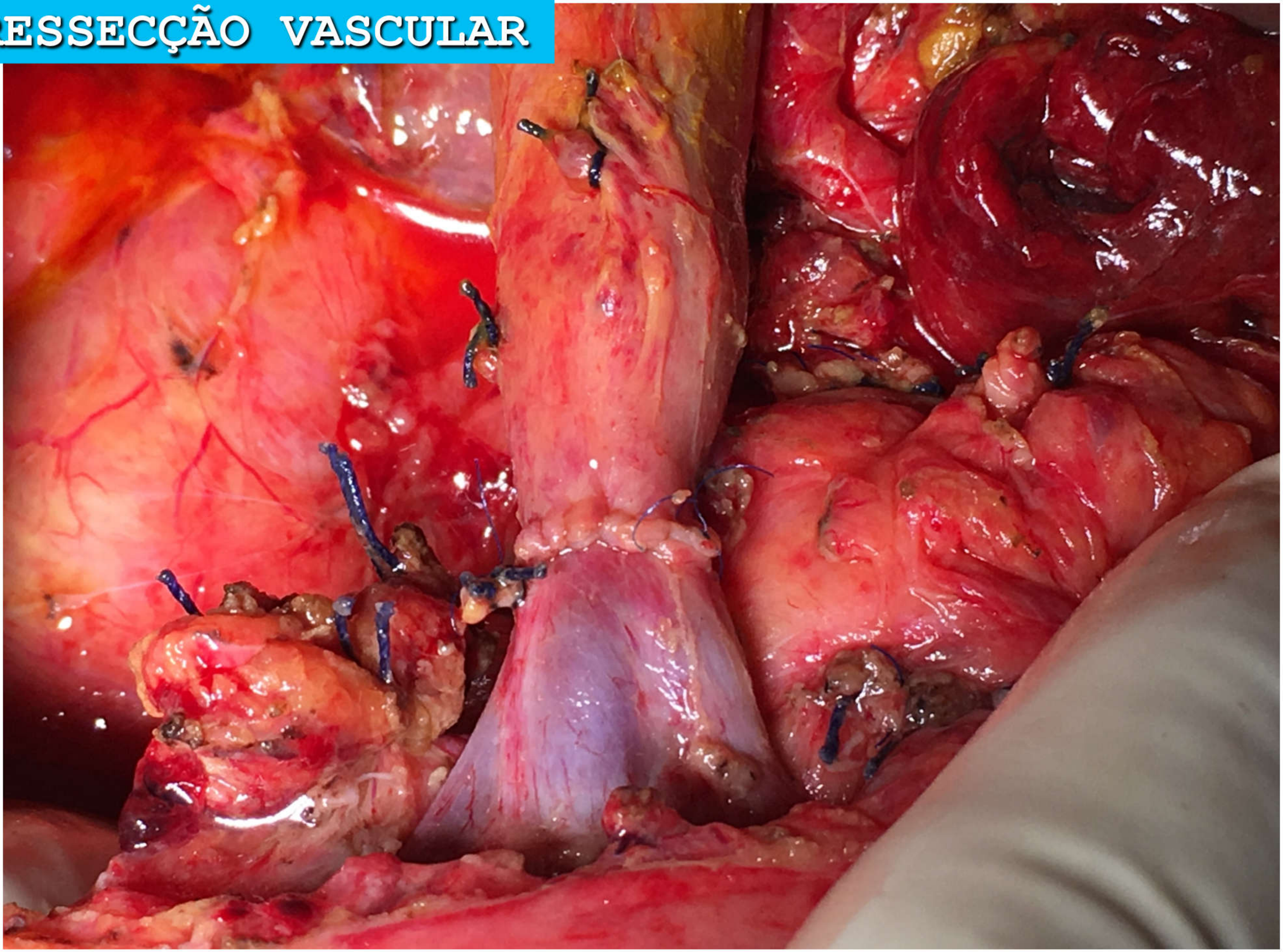
PANCREATECTOMIA TOTAL

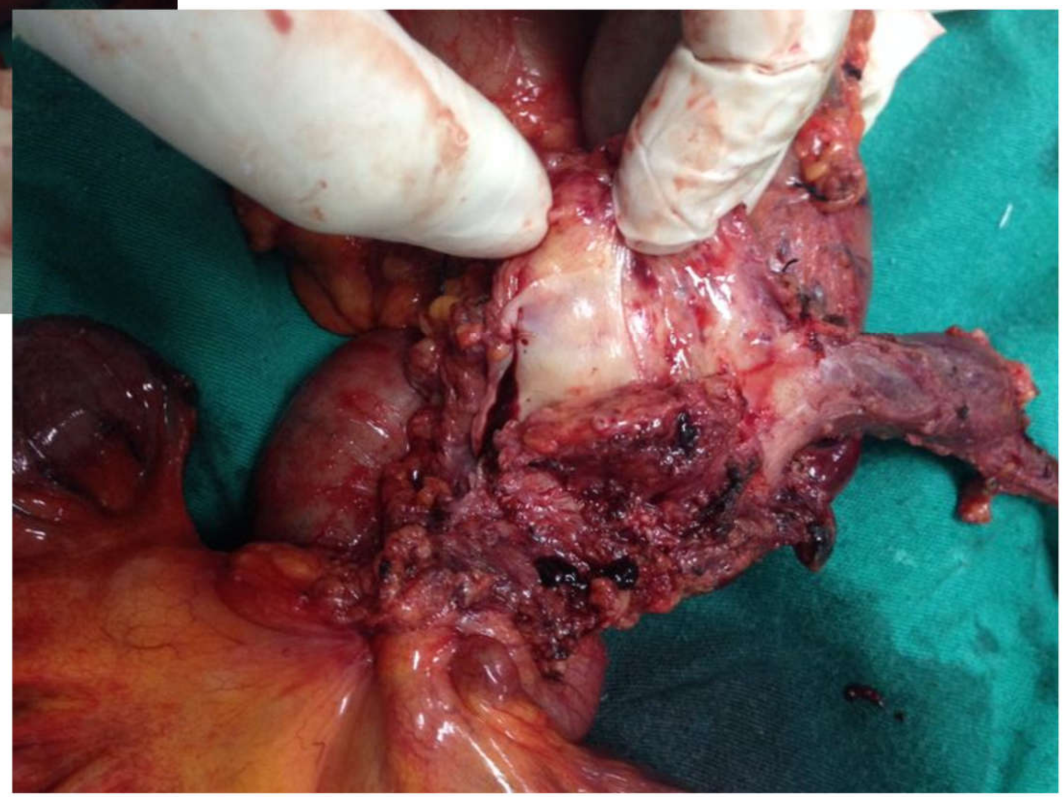


RESSECÇÃO VASCULAR



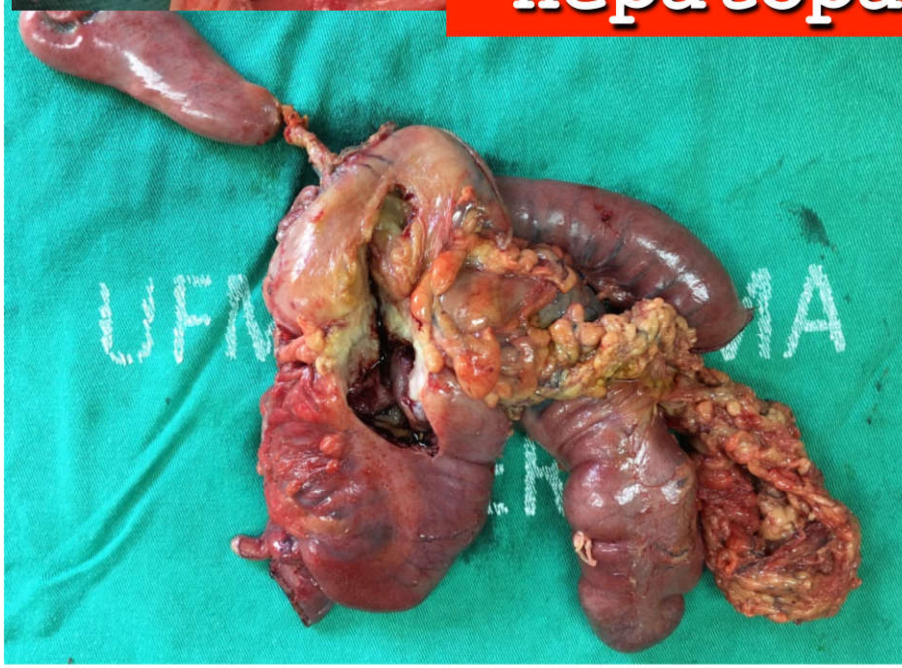
RESSECÇÃO VASCULAR

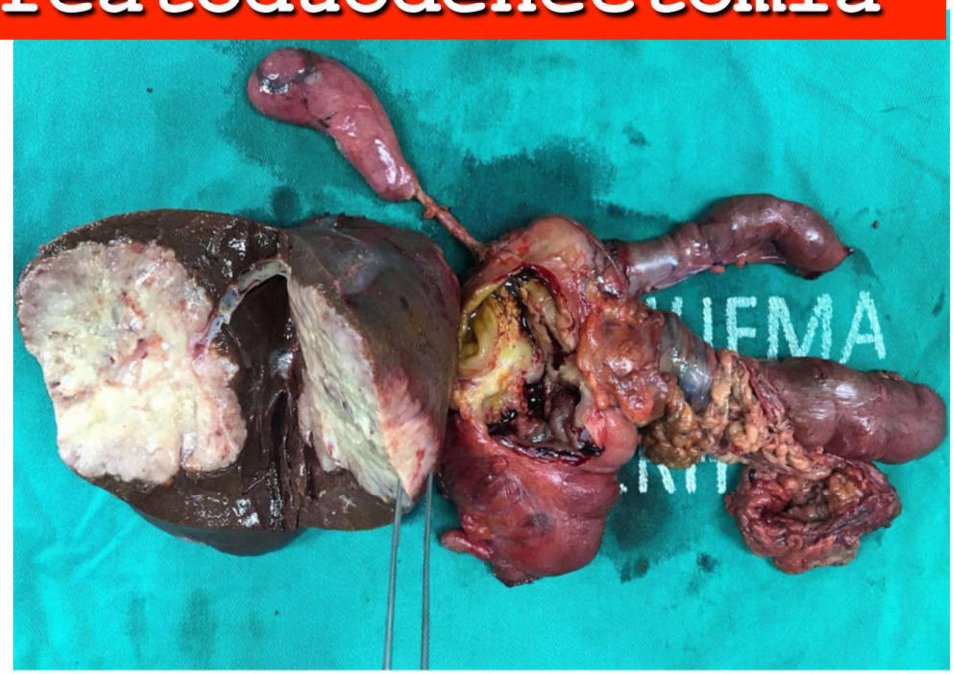




RESSECÇÃO MULTIVISCERAL

Hepatopancreatoduodenectomia





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Performance of Laparoscopic Pancreatoduodenectomy for Solid Pseudopapillary Tumor of Pancreas

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

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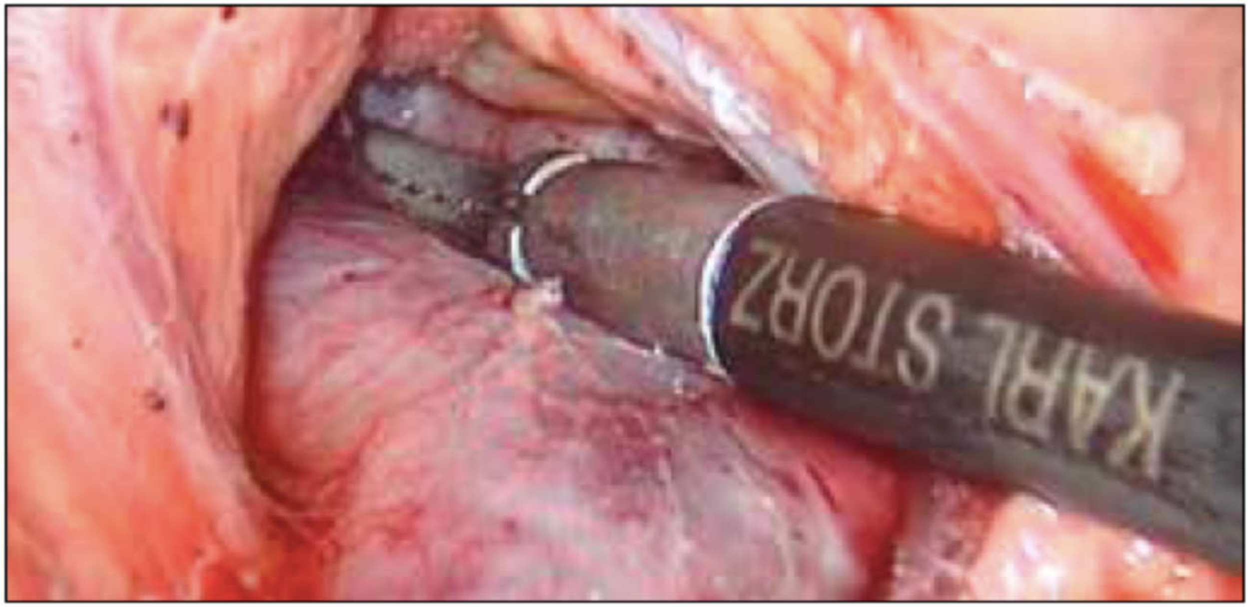


Figure 5. Dissection of superior mesenteric vein and portal vein.

Figure 6. Specimen with tumor in the head of the pancreas.

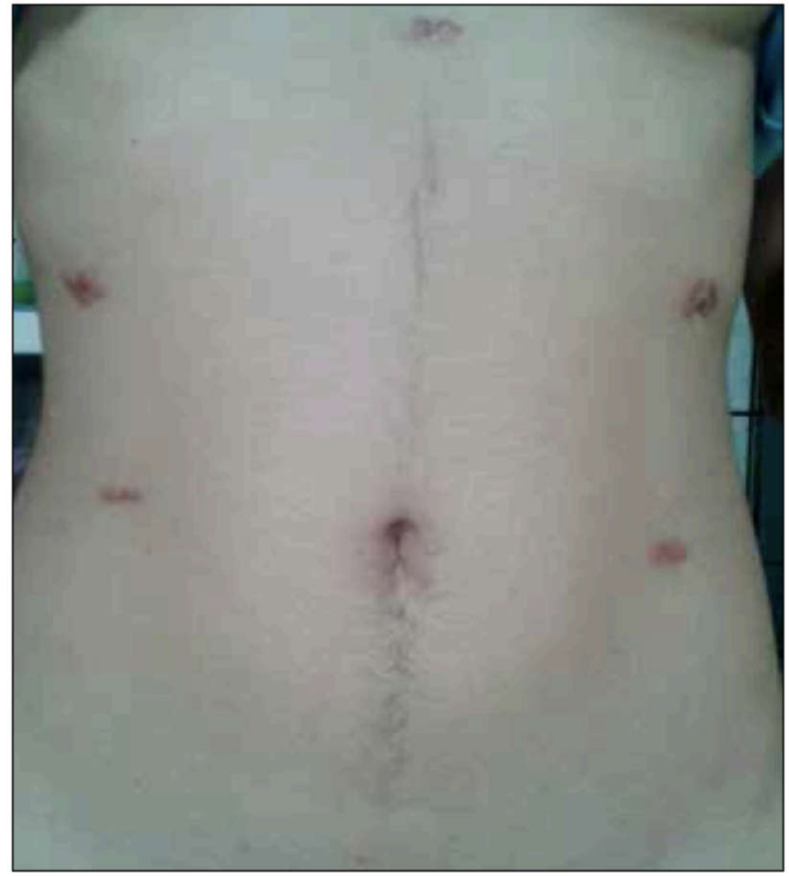
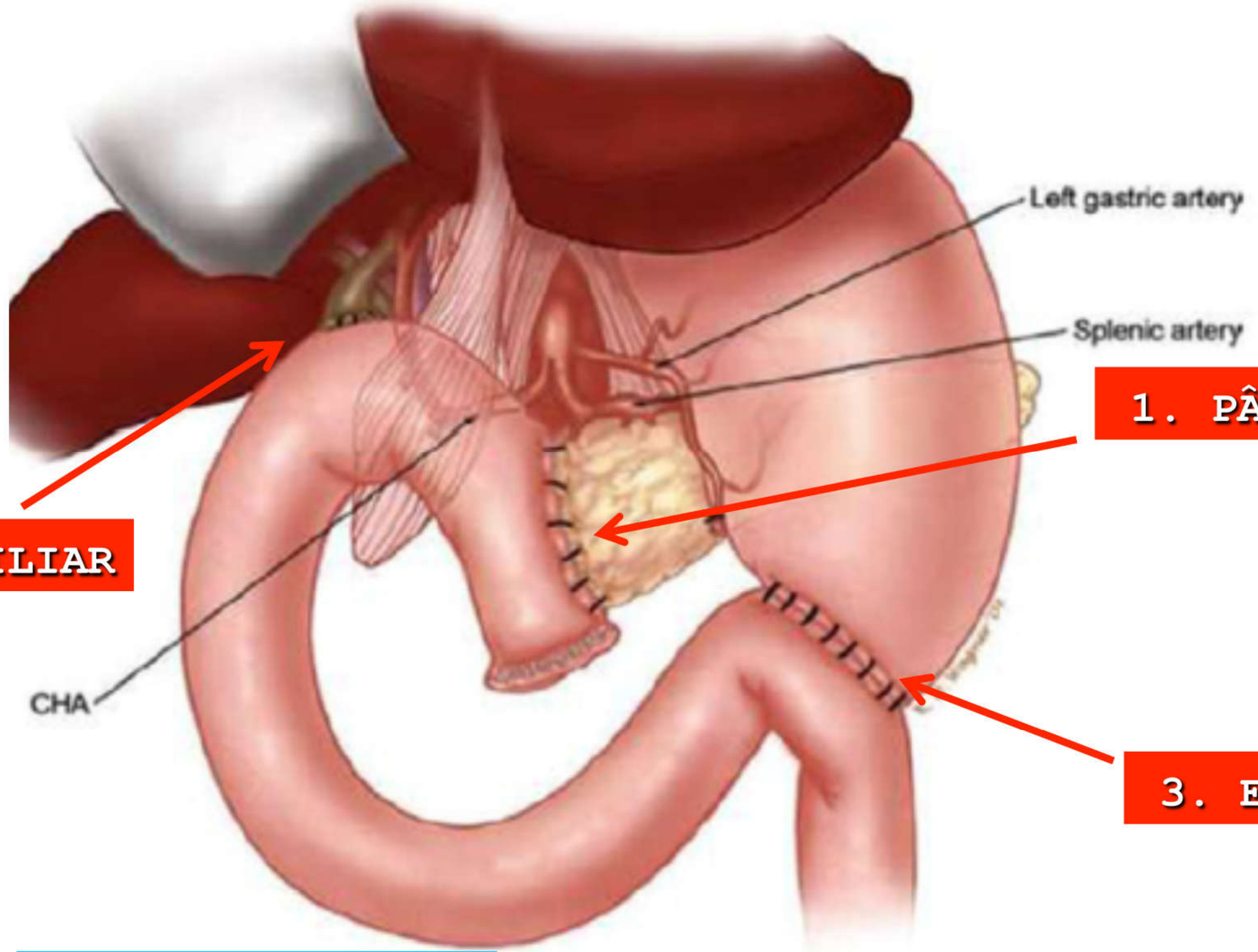


Figure 8. Final aspect of the abdomen five months after the procedure.

Torres OJM, et al. Am J Case Rep 2016;17:894-8

RECONSTRUÇÃO

❑ Alça única



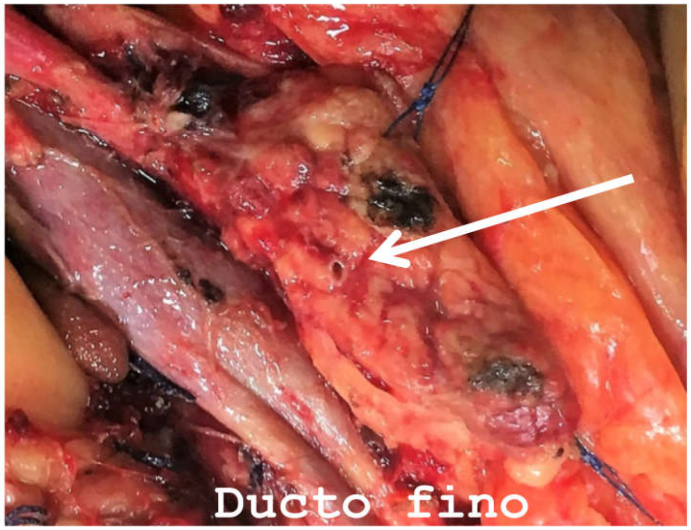
1. PÂNCREAS

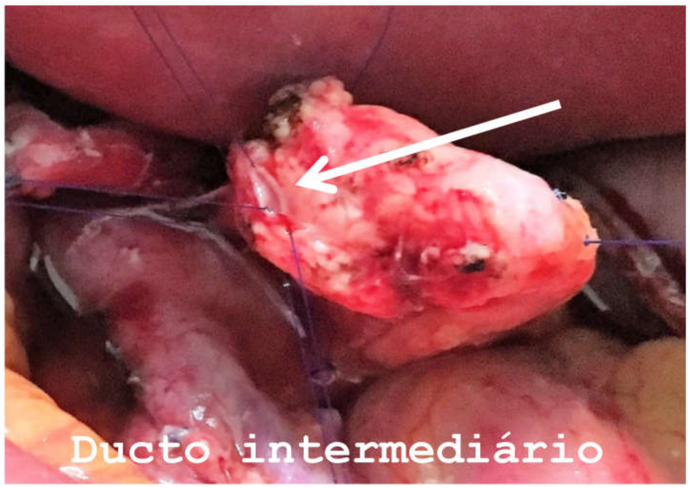
2. VIA BILIAR

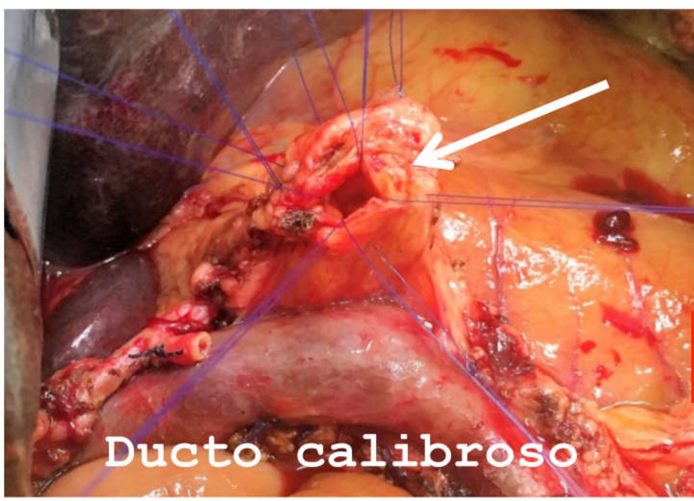
3. ESTÔMAGO

ANASTOMOSES

ANASTOMOSE PANCREÁTICA







- ❑ Envolve o ducto
- ❑ Envolve o parênquima
- ❑ Stent
- ❑ 4 camadas

Heidelberg Modificada (Torres, et al)

7

PONTOS

Table 2. Fistula Risk Score for Prediction of Clinically Relevant Pancreatic Fistula after Pancreatoduodenectomy (Model III)

Risk factor	Parameter	Points*
Gland texture	Firm	0
	Soft	2
Pathology	Pancreatic adenocarcinoma or pancreatitis	0
	Ampullary, duodenal, cystic, islet cell	1
Pancreatic duct diameter, mm	≥5	0
	4	1
	3	2
	2	3
	≤1	4
Intraoperative blood loss, mL	≤400	0
	401–700	1
	701–1,000	2
	>1,000	3

*Total 0 to 10 points.

- Desprezível 0
- Baixo 1-3
- Moderado 4-6
- Alto 7-10

Anastomose

Callery MP, et al. J Am Coll Surg 2013;2016-1-14

Mumbai 2016

ABCDDV/1330

ABCD Arq Bras Cir Dig
2017;30(4):260-263
DOI: /10.1590/0102-6720201700040008

Original Article - Technique

MODIFIED HEIDELBERG TECHNIQUE FOR PANCREATIC ANASTOMOSIS

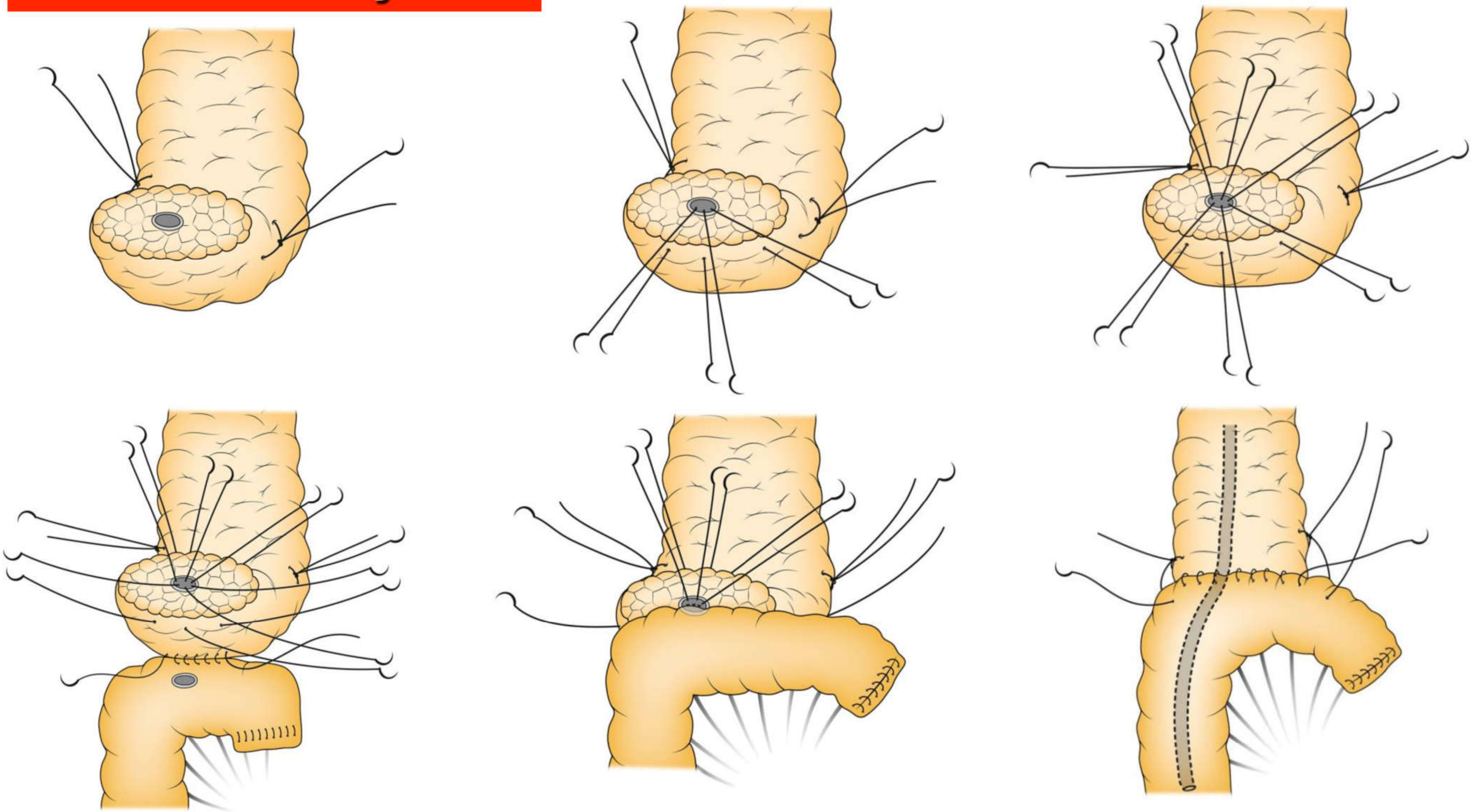
Anastomose pancreática pela técnica de Heidelberg modificada

Orlando Jorge M **TORRES**[1], Roberto C N da Cunha **COSTA**[1], Felipe F Macatrão **COSTA**[1], Romerito Fonseca **NEIVA**[1], Tarik Soares **SULEIMAN**[1], Yglésio L Moyses S **SOUZA**[1], Shailesh V **SHRIKHANDE**[2]

Torres OJM, et al. Arq Bras Cir Dig 2017;30:260-3

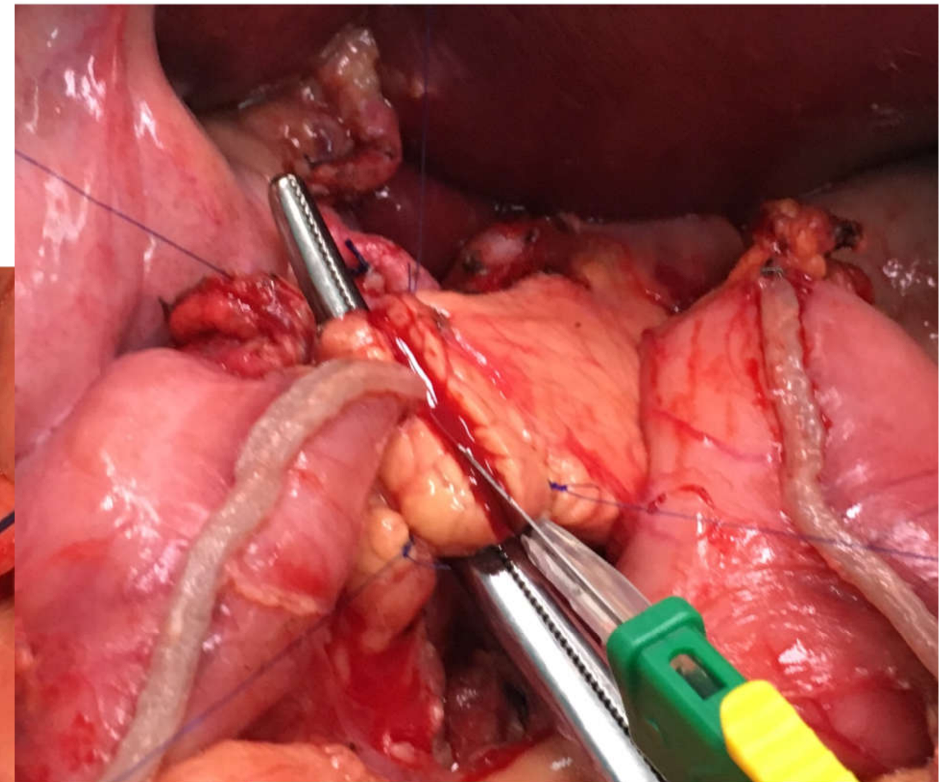
Anastomose pancreática

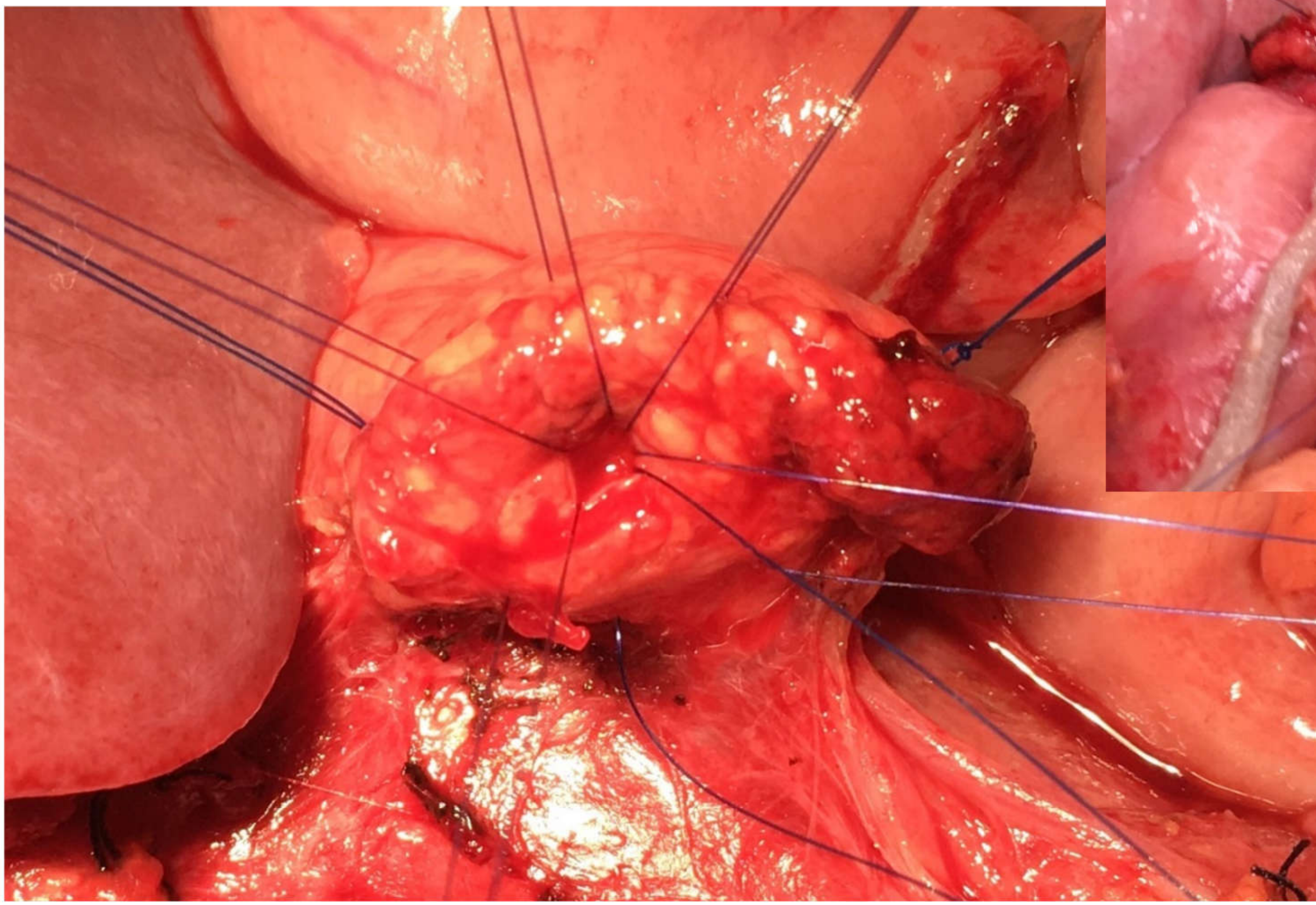
- ❑ Sangramento
- ❑ Fístula pancreática
- ❑ Gastroparesia
- ❑ Padrão oncológico



Torres OJM, et al. Arq Bras Cir Dig 2017;30:260-3

SUPRIMENTO SANGUÍNEO

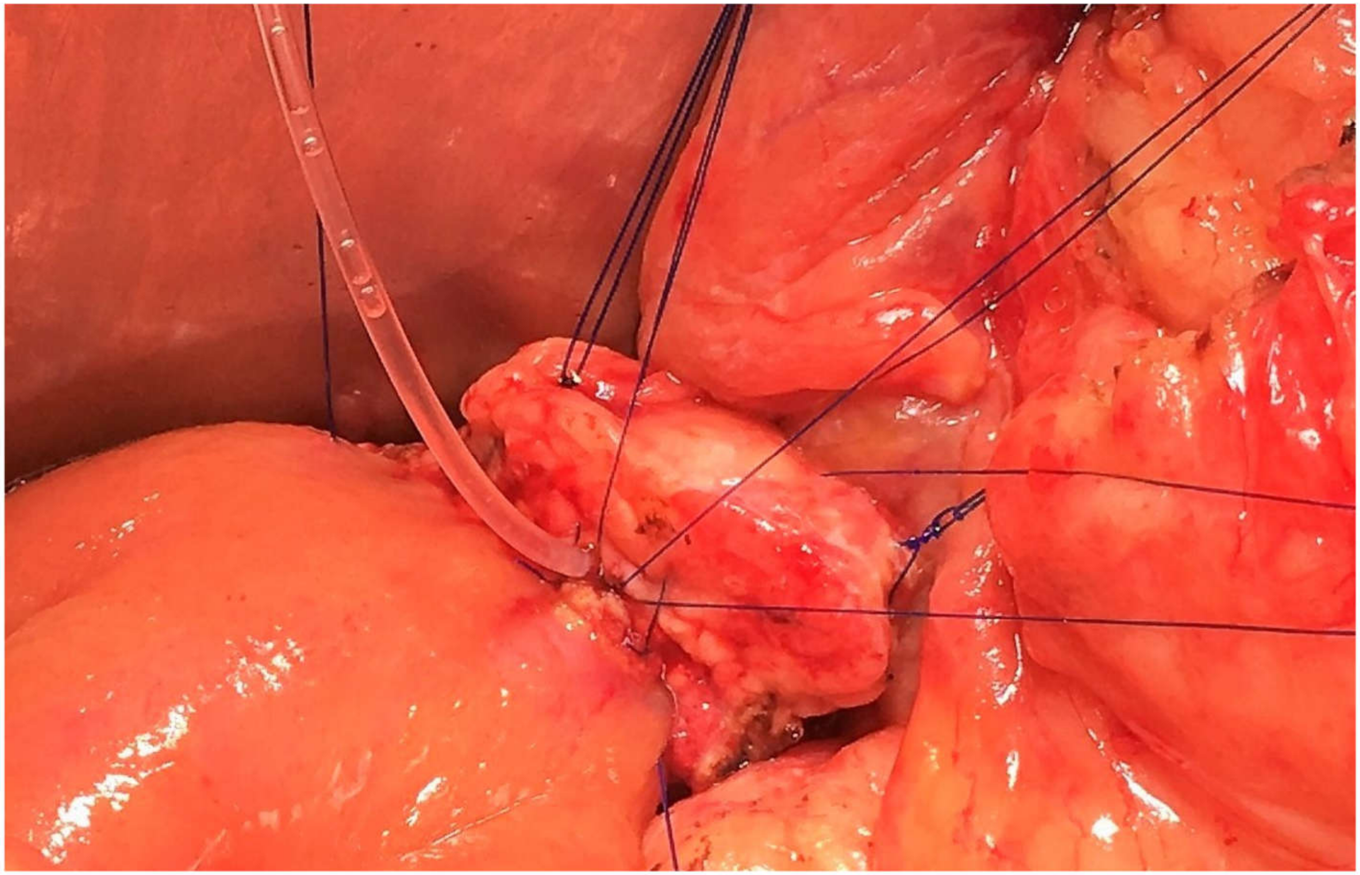




- ❑ Incisão do pâncreas com lâmina fria
- ❑ Promover bom suprimento sanguíneo do pâncreas e intestino

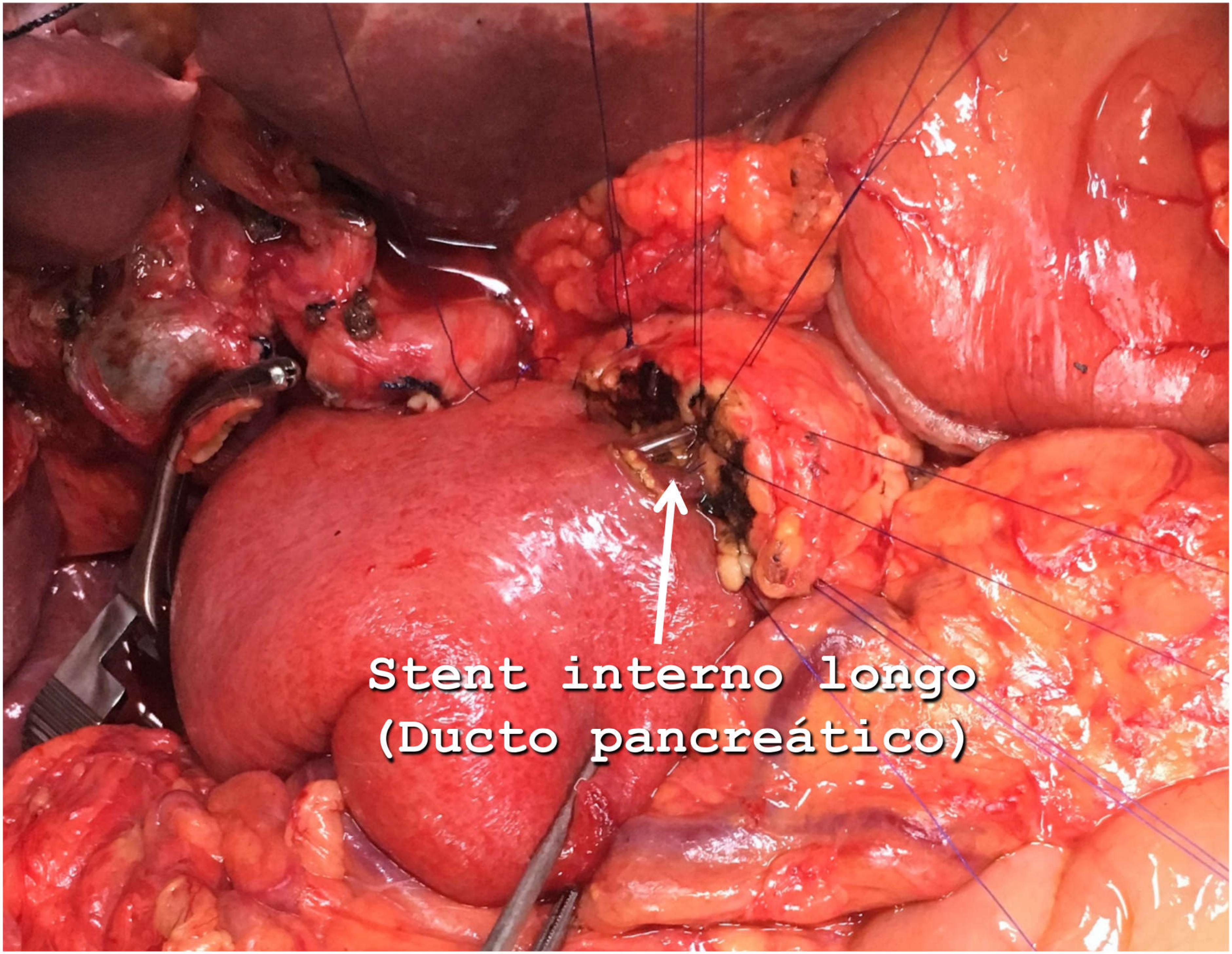
INTESTINO SECCIONADO

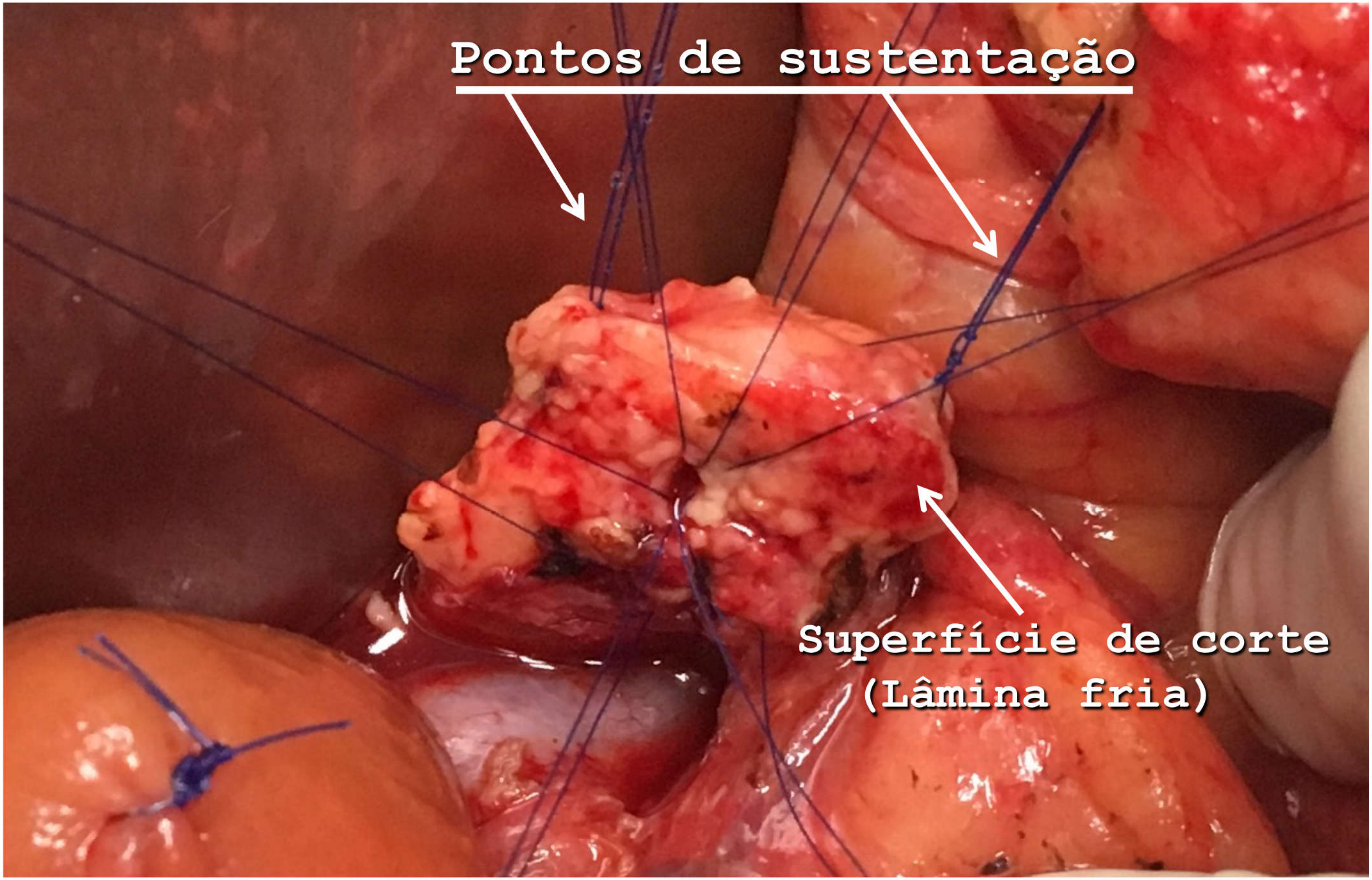
- Desorganização da transmissão nervosa
- Secção e manipulação excessiva
- Maior paresia nas primeiras horas
- Estase subsequente

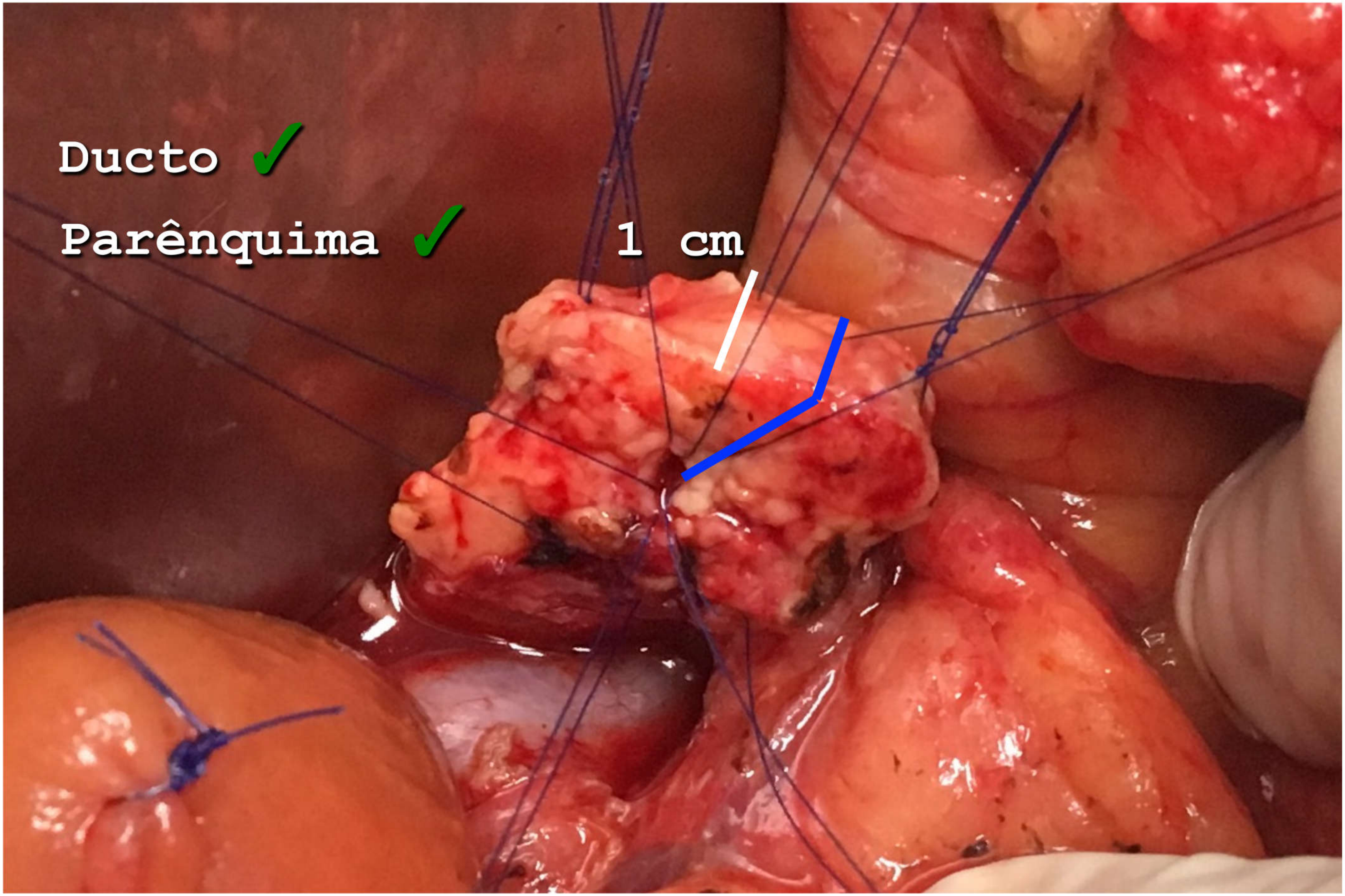


STENT

- Facilita a colocação precisa da sutura
- Deriva o suco pancreático longe do local da anastomose.
- Evita ou reduz a retenção de secreção pancreática no segmento inicial do jejuno enquanto a peristalse não está restaurada.
- Diminui o risco de oclusão inadvertida do ducto pancreático.
- Melhora a integridade da anastomose, reduzindo o risco de formação de estenose do ducto.
- Melhora a drenagem do pâncreas para a luz intestinal


Stent interno longo
(Ducto pancreático)


Pontos de sustentação
Superfície de corte
(Lâmina fria)


Ducto ✓
Parênquima ✓
1 cm

ABCDDV/1330

ABCD Arq Bras Cir Dig
2017;30(4):260-263
DOI: /10.1590/0102-6720201700040008

Original Article - Technique

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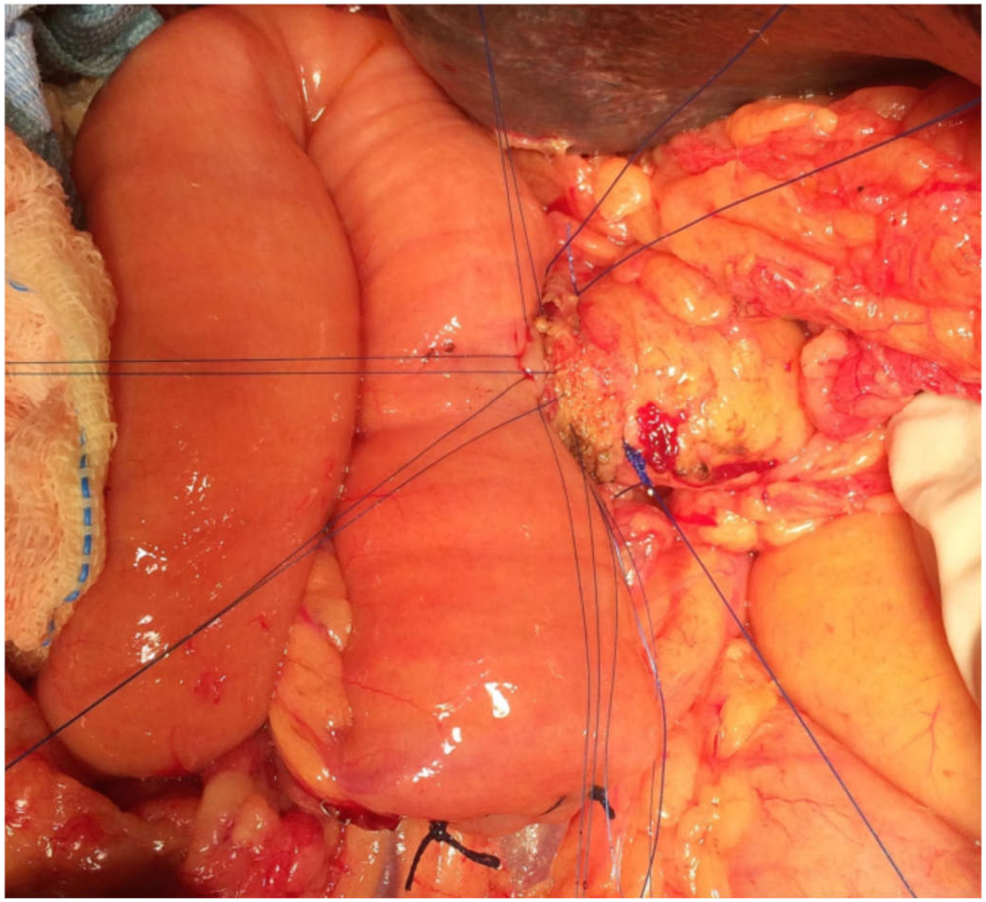
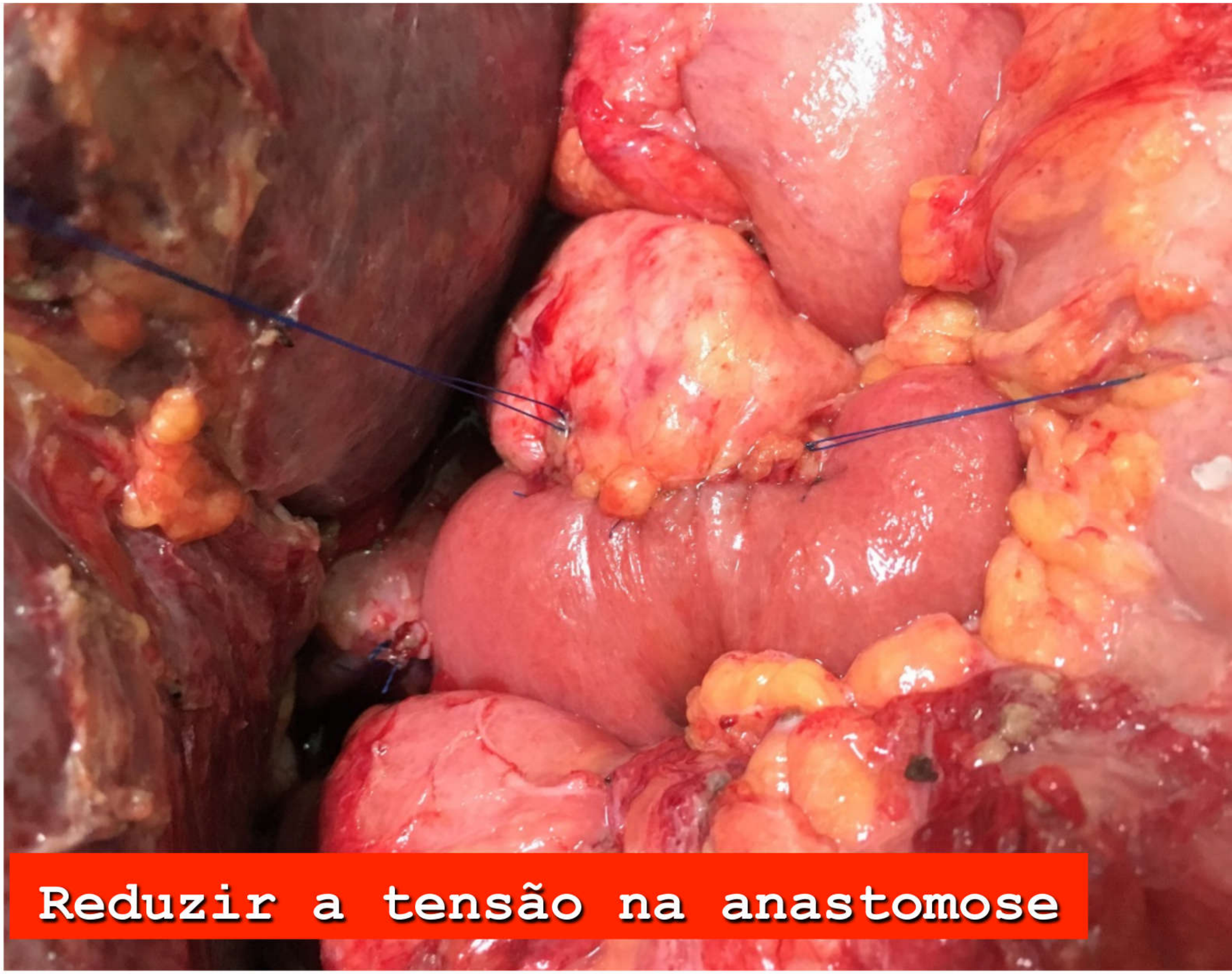
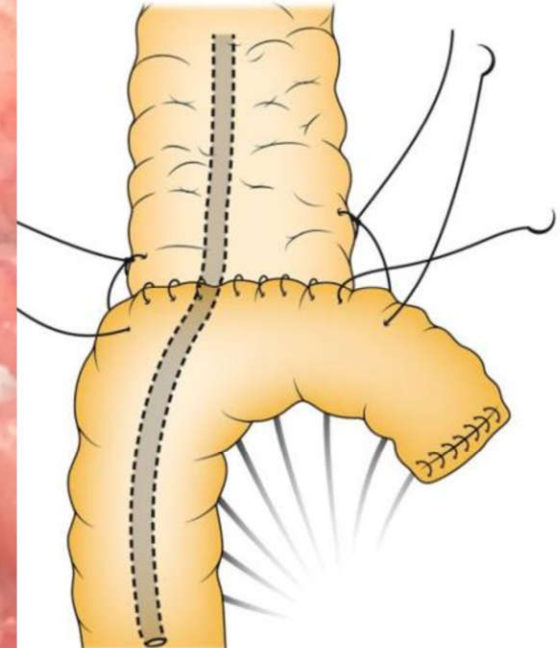


Torres OJM, et al. Arq Bras Cir Dig 2017;30:260-3

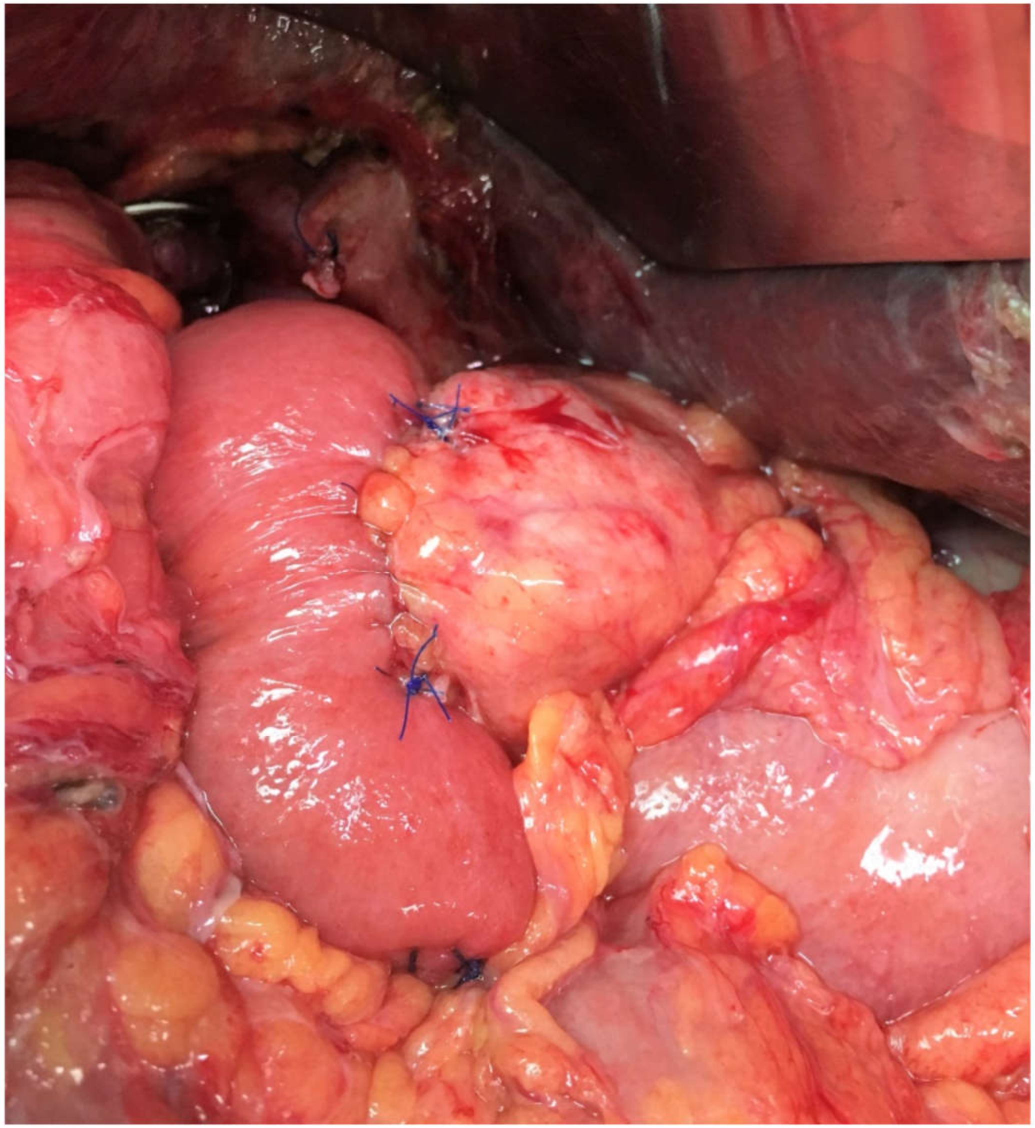
Sutura de sustentação

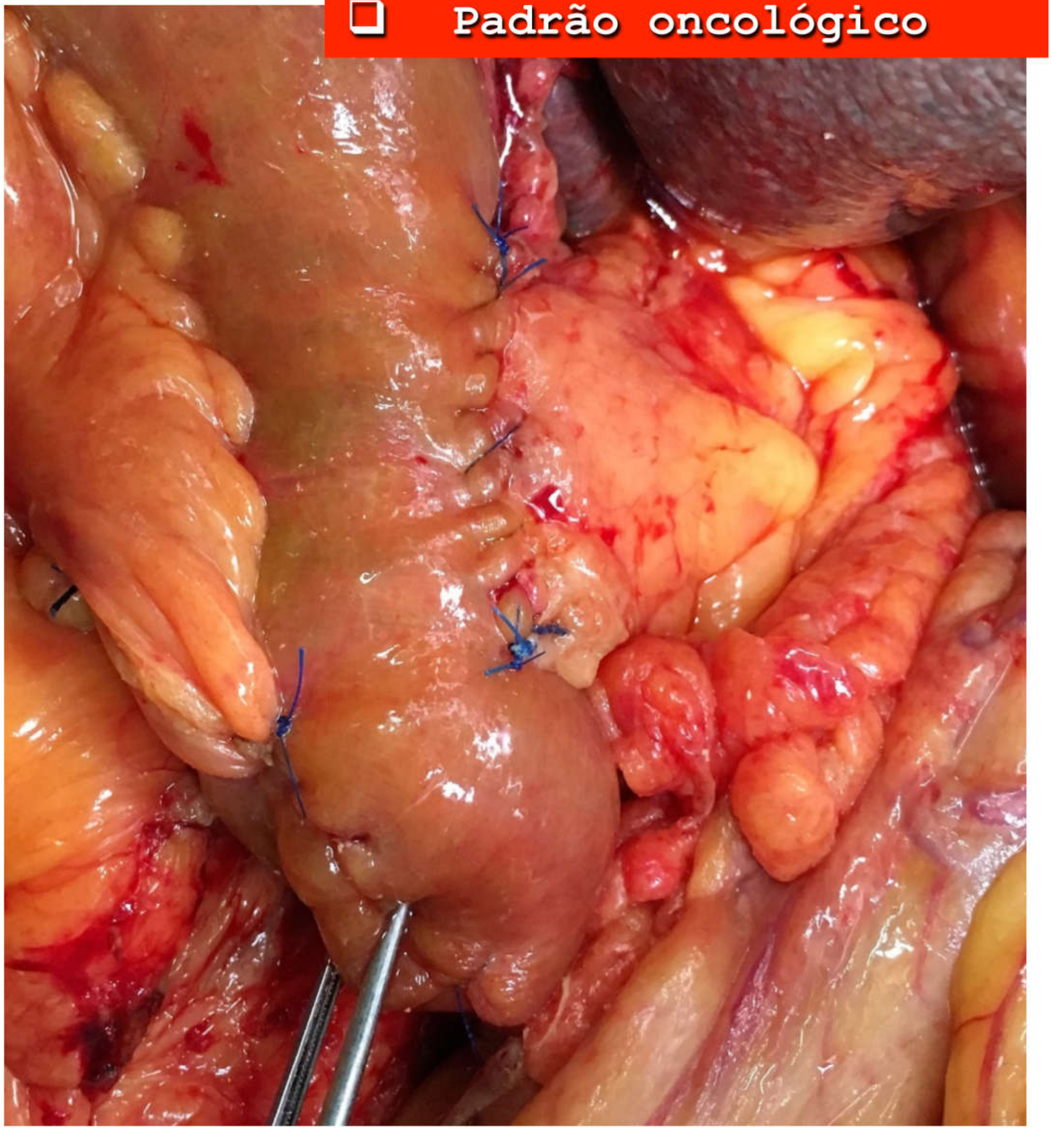




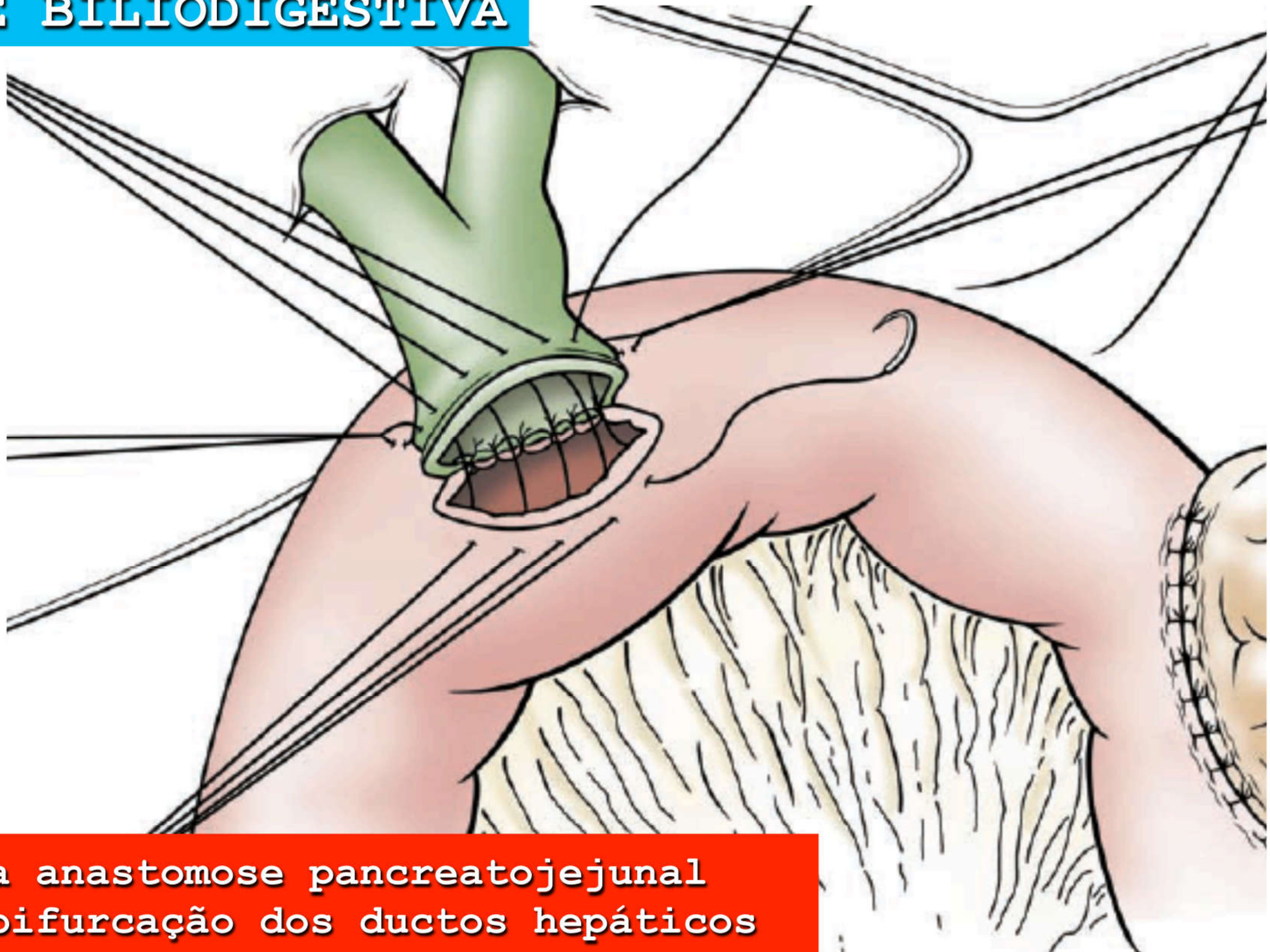
ASPECTO FINAL

- ❑ Sangramento
- ❑ Fístula pancreática
- ❑ Gastroparesia
- ❑ Padrão oncológico



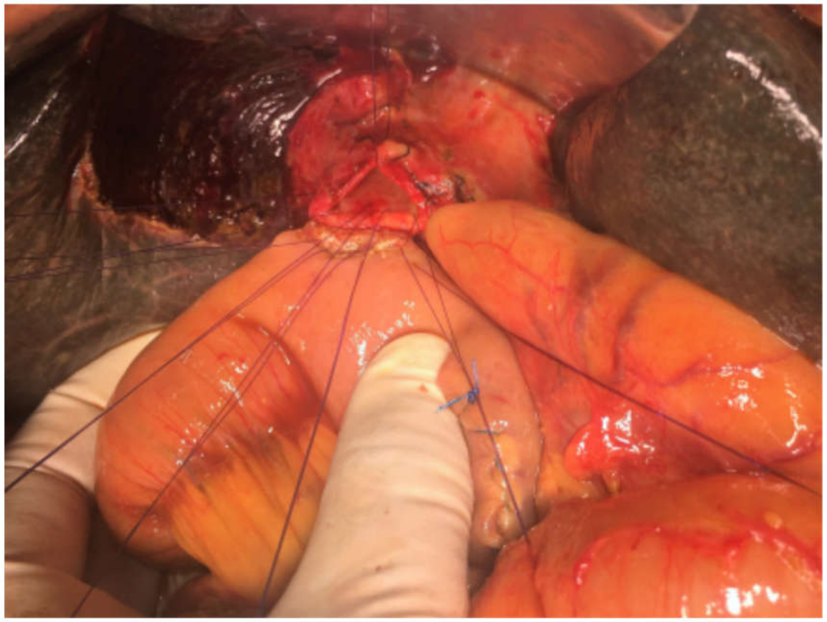


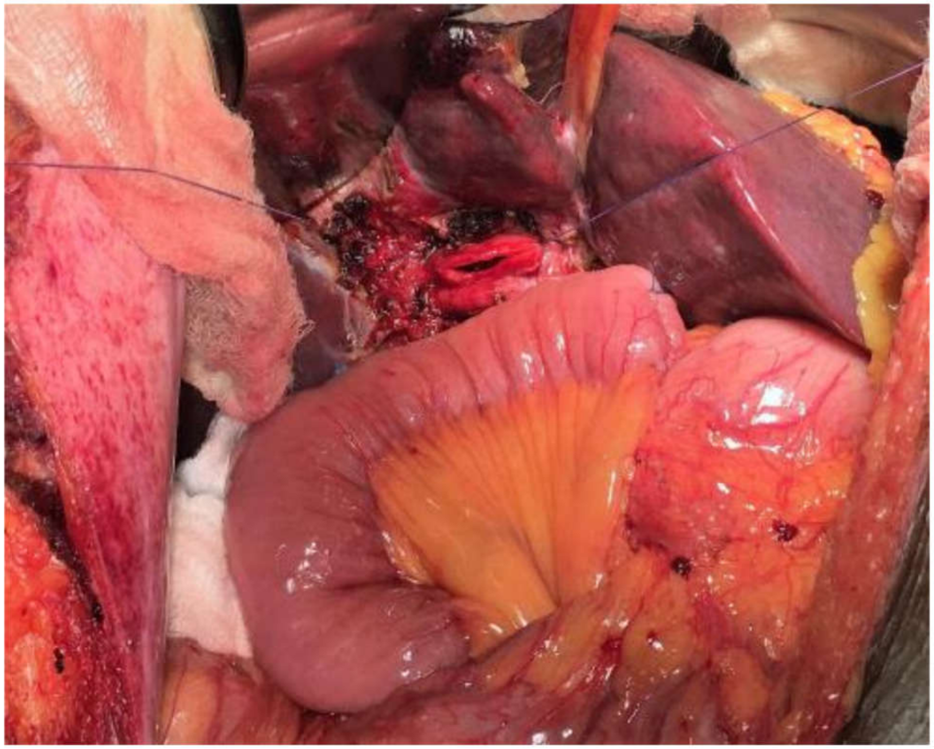
ANASTOMOSE BILIODIGESTIVA

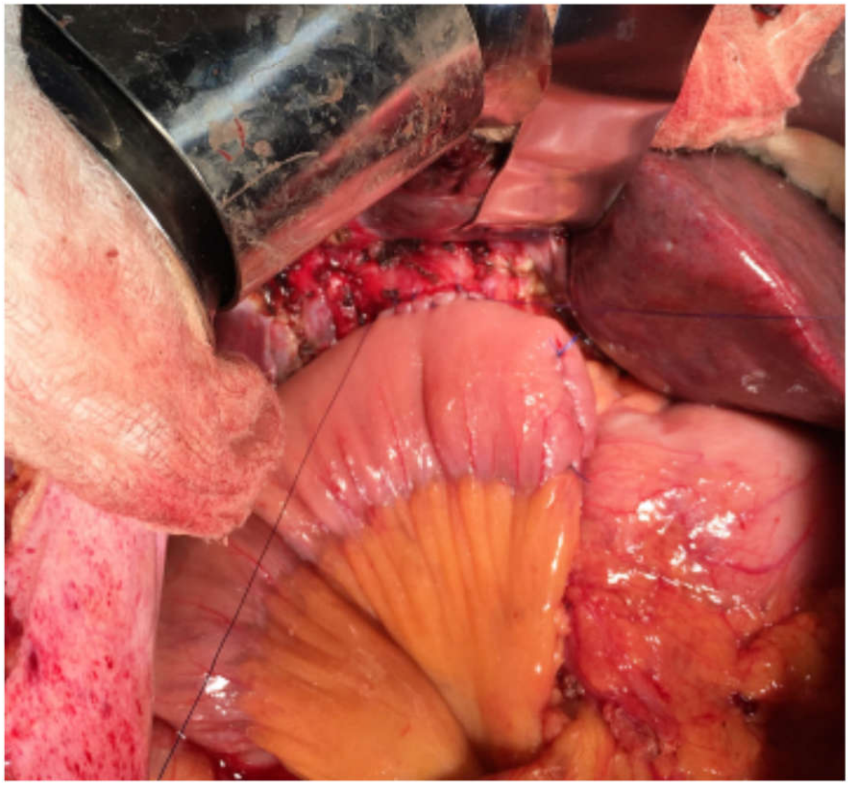


- 10-15 cm da anastomose pancreatojejunal
- < 2 cm da bifurcação dos ductos hepáticos
- Pontos separados
    - Via biliar < 20 mm
- Pontos contínuos/separados
    - Via biliar ≥ 20 mm

ANASTOMOSE BILIODIGESTIVA





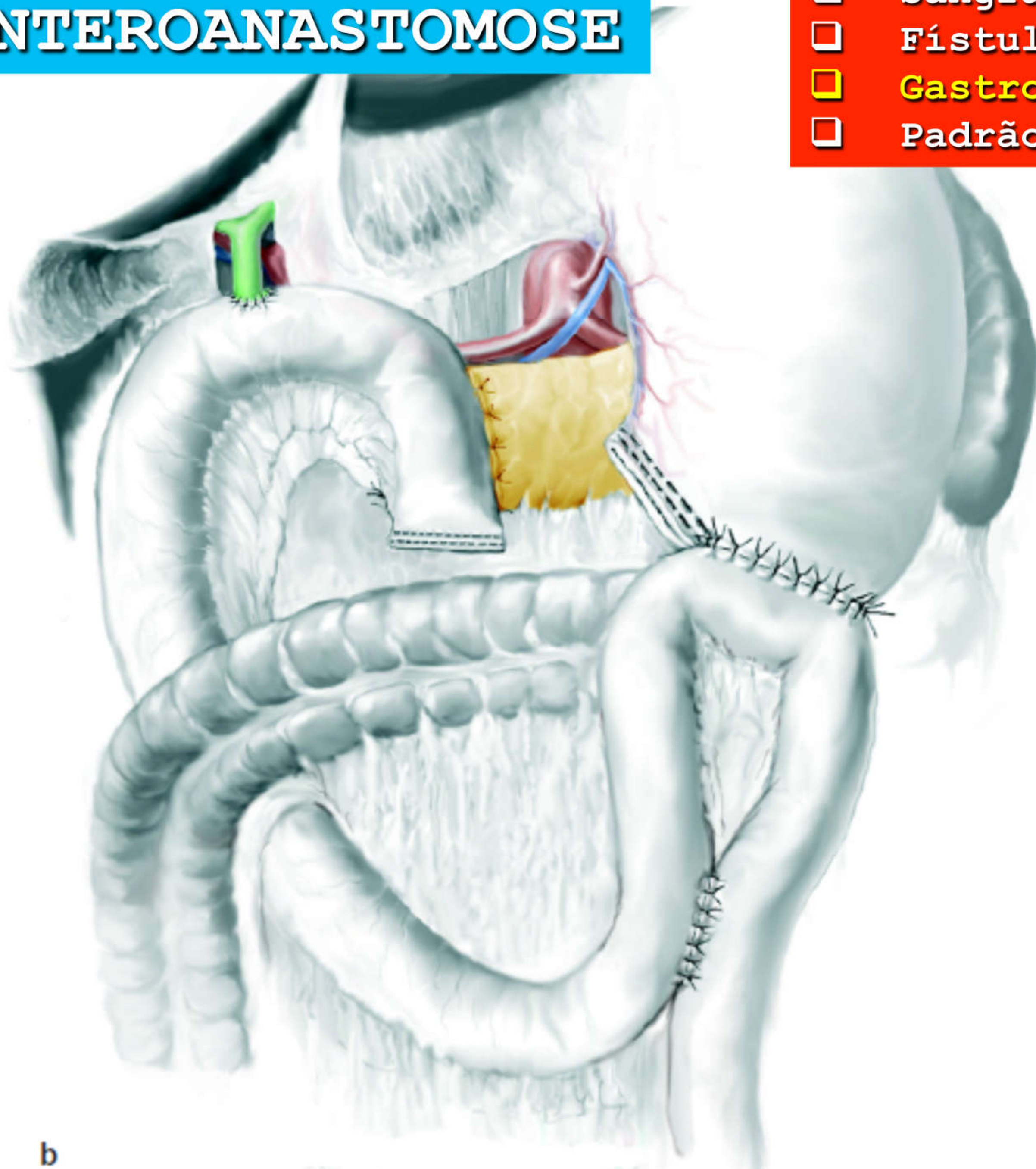


GASTROENTEROANASTOMOSE

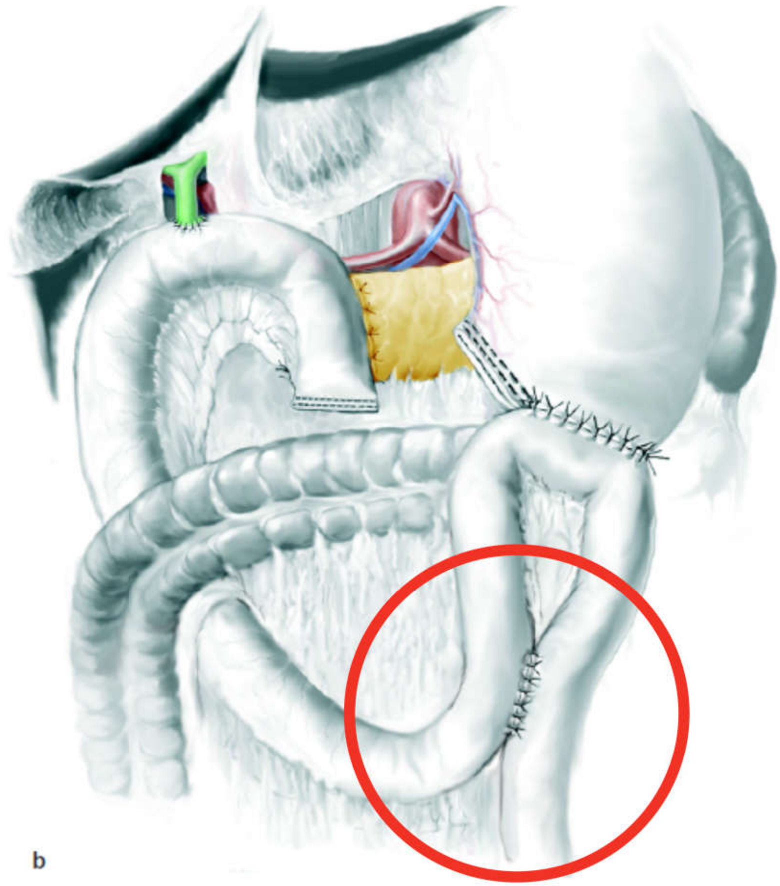
- Posição antecólica
- 50-60 cm da anastomose bilio-digestiva
- Alça eferente acompanha a grande curvatura
- Pontos separados
  - Via biliar $\leq$ 20 mm
  - Via biliar > 20 mm
- Pontos contínuos
  - Via biliar > 20 mm

GASTROENTEROANASTOMOSE

- ❑ Sangramento
- ❑ Fístula pancreática
- ❑ Gastroparesia
- ❑ Padrão oncológico


b

ENTEROANASTOMOSE A BRAUN



b

- Mantem o estômago retificado
- Reduz o retardo no esvaziamento gástrico
- Diminui a pressão na anastomose pancreática?

JOURNAL OF SURGICAL RESEARCH 184 (2013) 925–930

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SciVerse ScienceDirect

journal homepage: www.JournalofSurgicalResearch.com

JSR

Research review

Intraperitoneal drainage after pancreatic resection: a review of the evidence

2013

Paul M. Kaminsky, BA, and James J. Mezhir, MD[*]

Division of Surgical Oncology and Endocrine Surgery, Department of Surgery, University of Iowa Hospitals and Clinics, Iowa City, Iowa

Table 4 – Postoperative intraperitoneal drain amylase values in predicting PF after pancreatectomy.

First author	Year	N	PF	Drain amylase value	POD	P	95% Confidence interval	Odds ratio	Positive predictive value (%)	Negative predictive value (%)
Yamaguchi [35]	2003	26	12[*]	10,000	1	<0.01	—	—	—	—
Molinari [22]	2007	137	27	5000	1	<0.001	3.6–8.7	5.66	59	98
Kawai [26]	2009	244	69	5000	1	NS	—	—	—	—
Moskovic [36]	2010	121	52	None	—	—	—	—	—	—
Okano [28]	2011	54	30	Persisting ratio	1/3	0.029	—	—	—	—
Kawai [24]	2011	1239	374	4000	1	<0.001	0.81–0.87	8.6	51	92.7
Noji [33]	2012	107	31	3000						
Sutcliffe [37]	2012	70	9	350						
Tsujie [38]	2012	114	18[†]	3 × normal						

Amilase > 5000 no 1°/ 3° DPO

Table 5 – Trials evaluating early drain removal in pancreatectomy.

First author	Year	Study design	N	PD/DP	Early/late drain removal	Fistula, *n* (%)	
						Late removal	Early removal
Kawai [39]	2006	Prospective time cohort	104	104/—	52/52	12 (23)[*]	2 (3.8)[*]
Bassi [40]	2010	Prospective randomized	114	75/[illegible]	[illegible]	[illegible]	[illegible]

PF defined by ISGPF [11].

[*] P < 0.05.

Retirada precoce é melhor

ABCD Arq Bras Cir Dig
2017; xx(x):xx-xx

Original Article

PANCREATODUODENECTOMY: BRAZILIAN PRACTICE PATTERNS*

Orlando Jorge M **TORRES**[1], Eduardo de Souza M **FERNANDES**[2], Rodrigo Rodrigues **VASQUES**[1], Fabio Luís **WAECHTER**[3], Paulo Cezar G. **AMARAL**[4], Marcelo Bruno de **REZENDE**[5], Roland Montenegro **COSTA**[6], André Luís **MONTAGNINI**[7]

*Supported by the Brazilian Chapter of the International Hepato-Pancreato Biliary Association (CB-IHPBA).

From the [1]Department of Surgery, Federal University of Maranhão, São Luís, MA; [2]Federal University of Rio de Janeiro, Rio de Janeiro, RJ; [3]Santa Casa Hospital, Porto Alegre, RS; [4]São Rafael Hospital, Salvador, BA; [5]Santa Marcelina Hospital, São Paulo,SP; [6]Santa Lucia Hospital, Brasília, DF; [7]University of São Paulo Medical School, São Paulo, Brazil.

ABDOMINAL DRAINAGE

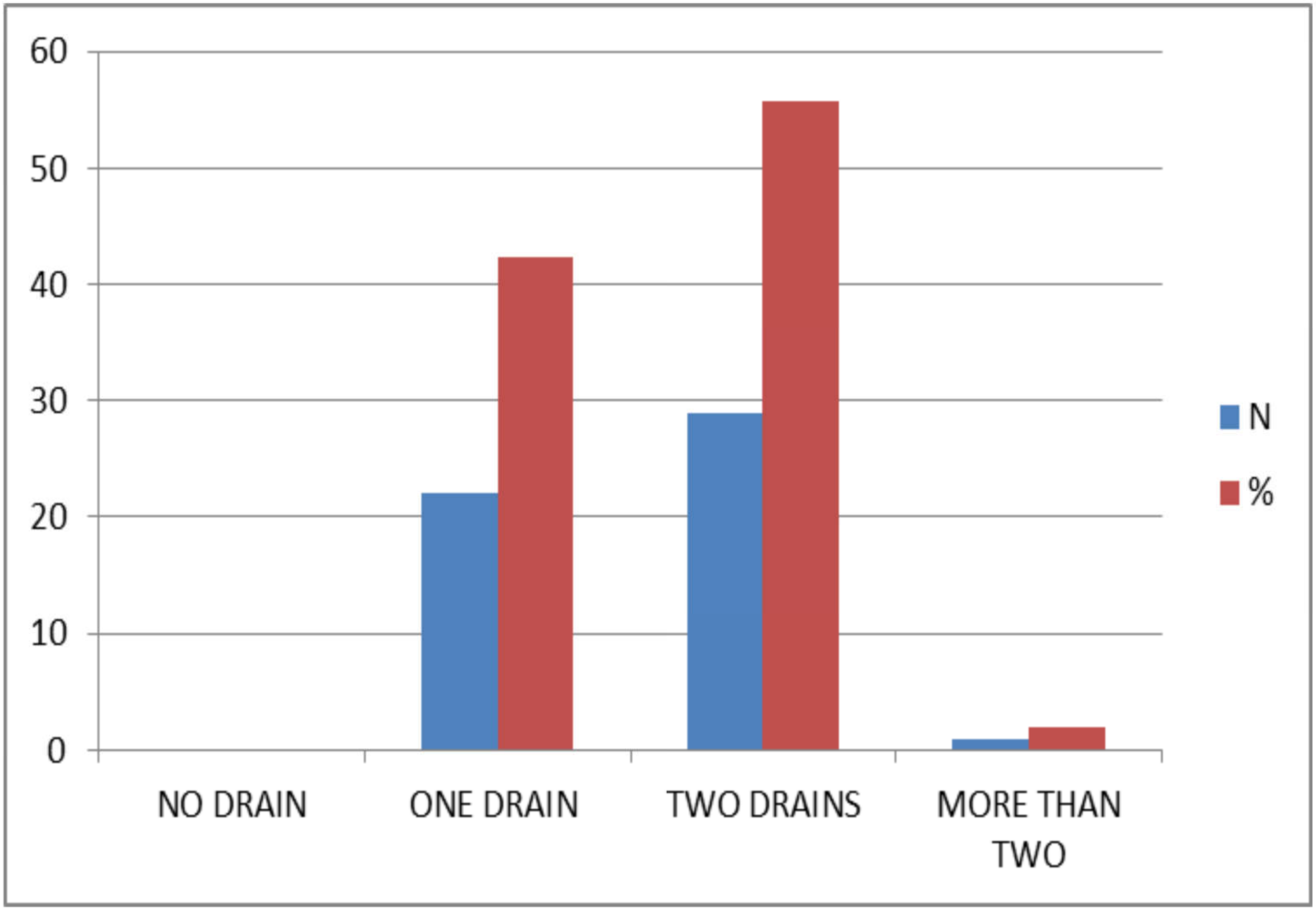

FIGURE 9 – Prophylactic abdominal drainage (%)

EARLY FEEDING

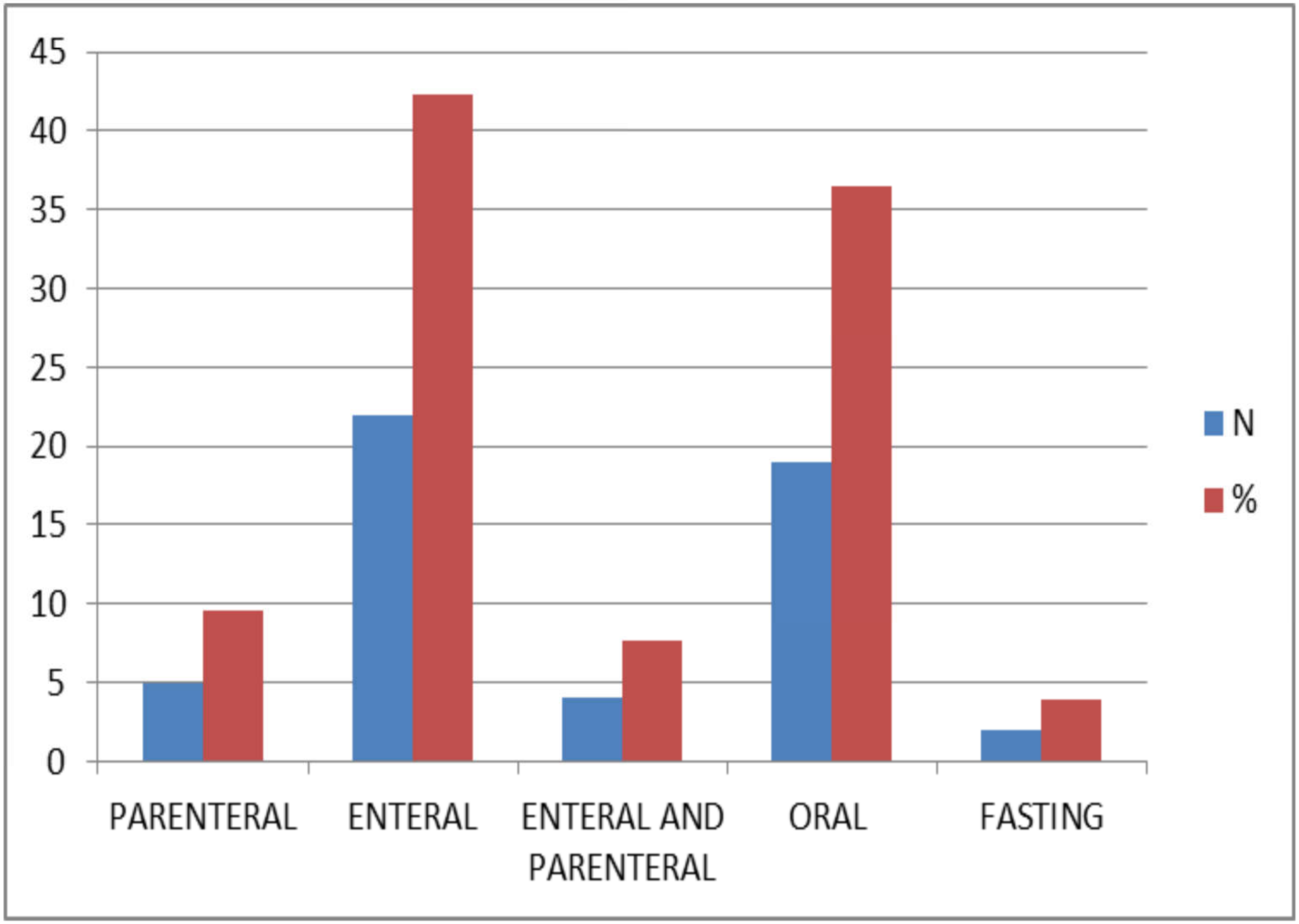

FIGURE 10 – Early feeding (%)

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