XXIX JOPADDI 2024

Jornada Paulista de Atualização em Doenças Digestivas

Hotel Mont Blanc Premium - Ribeirão Preto/SP
09 a 11 de maio de 2024

RESSECÇÃO VASCULAR NA DUODENOPANCREATECTOMIA

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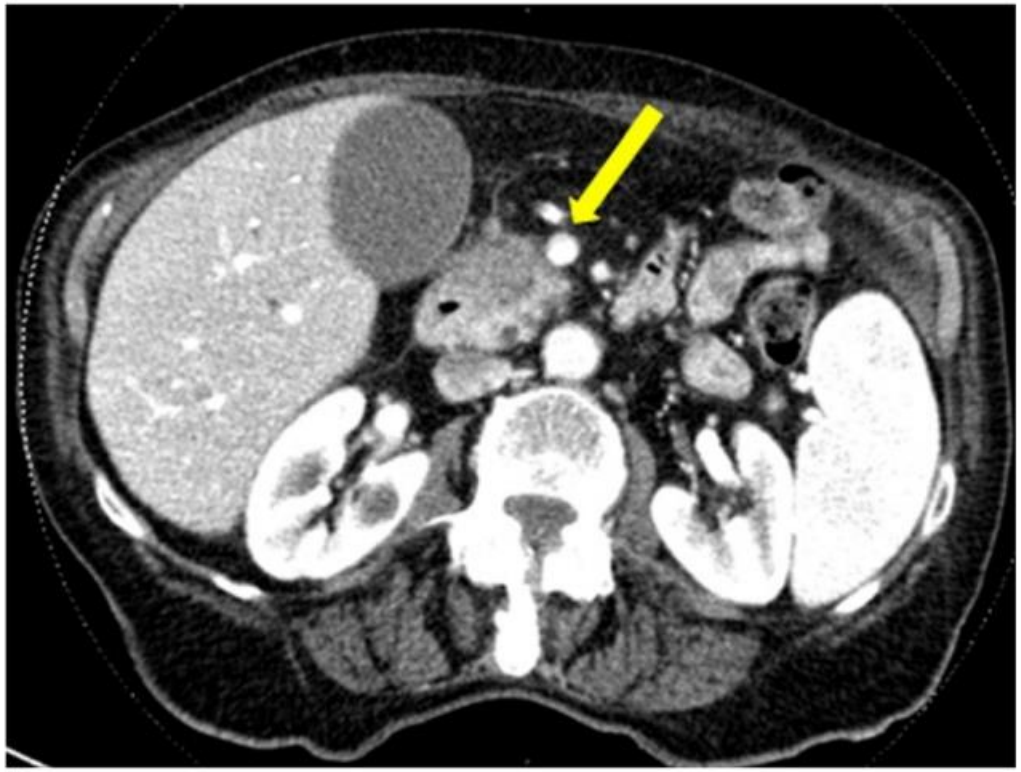
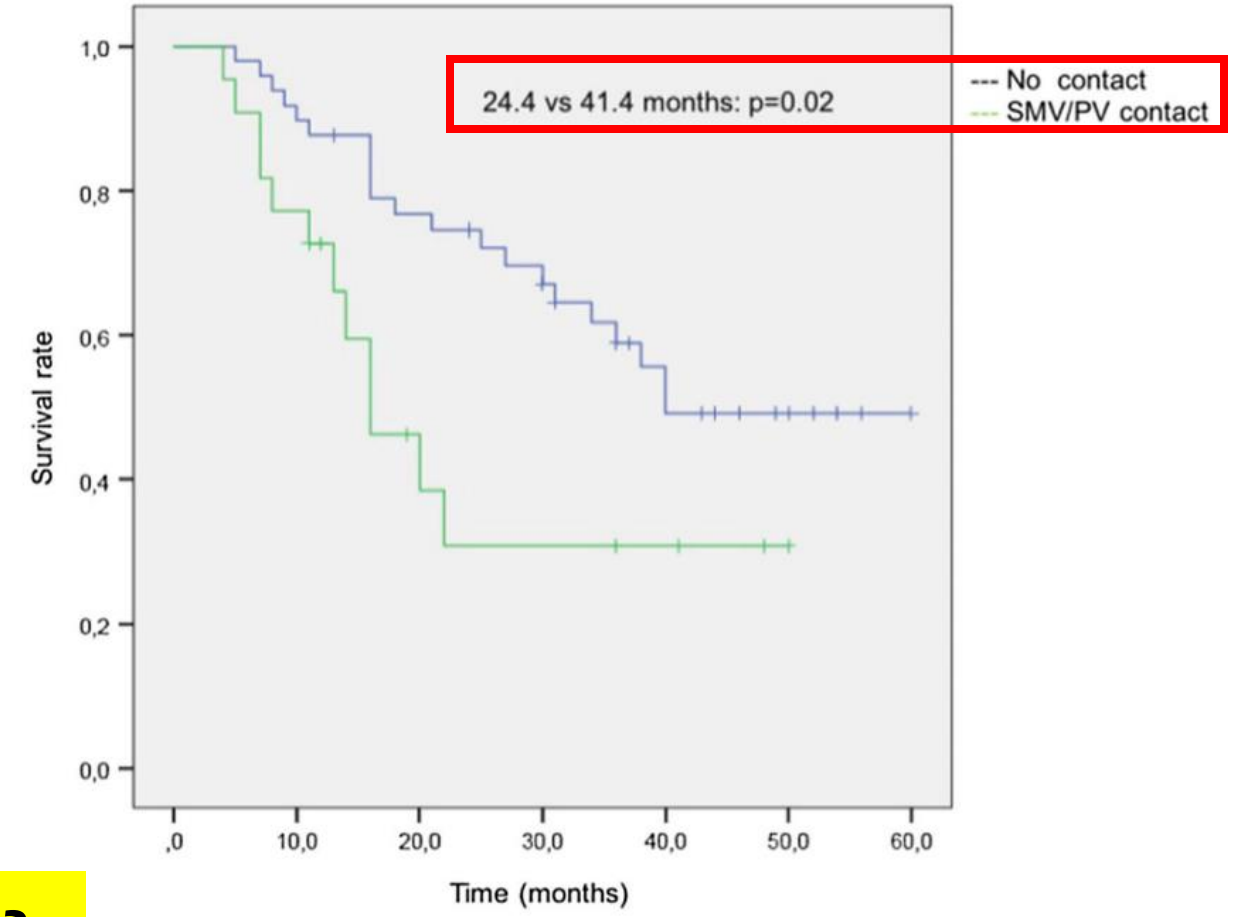
Langenbeck's Archives of Surgery
https://doi.org/10.1007/s00423-020-02065-w

ORIGINAL ARTICLE

Clinical impact of preoperative tumour contact with superior mesenteric-portal vein in patients with resectable pancreatic head cancer





p=0.02

Ausania F, et al. Langenbecks Arch Surg 2021

RESSECÇÃO VENOSA

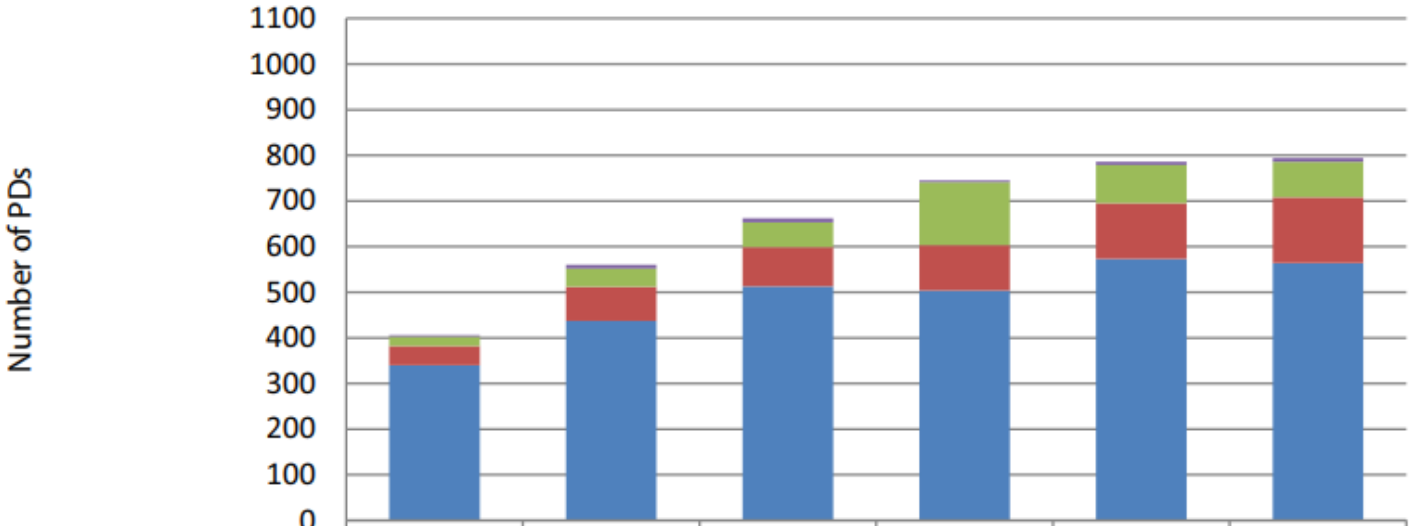
Surgery xxx (2020) 1–7

Contents lists available at ScienceDirect

Surgery

journal homepage: www.elsevier.com/locate/surg

Not all Whipple procedures are equal: Proposal for a classification of pancreatoduodenectomies



	10/2001-2004	2005-2007	2008-2010	2011-2013	2014-2016	2017-2019
PD + artery	3	8	9	4	7	8
PD + additional organ	21	40	54	138	84	78
PD + portal vein	42	75	86	99	122	144
Standard PD	340	437	513	504	573	564

Tipo 1 Ressecção Padrão (74,1%)
Tipo 2 Ressecção porta-mesentérica (14,4%)
Tipo 3 Ressecção multivisceral (10,5%)
Tipo 4 Ressecção arterial (1,0%)

Mihaljevic AL, et al. Surgery 2020

Surgery xxx (2020) 1–7

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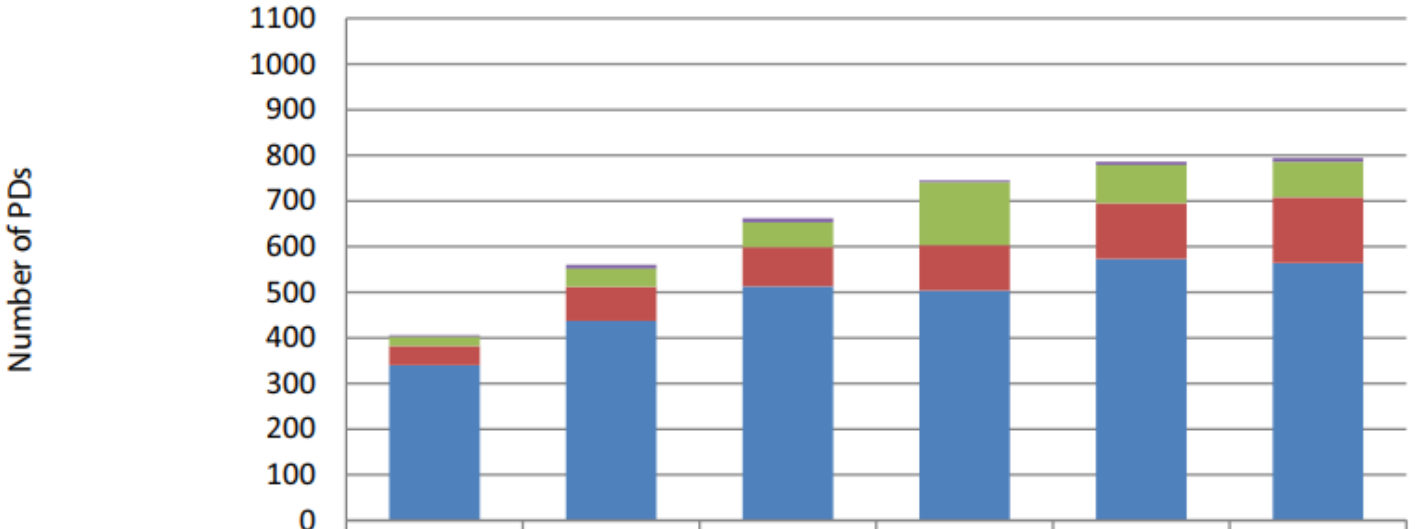

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Tipo 4 Ressecção arterial (1,0%)

Mihaljevic AL, et al. Surgery 2020

Caso clínico

Paciente do sexo feminino, 60 anos, apresentando icterícia, astenia, perda de peso, dor abdominal.

Exames laboratoriais alterados: Hb 10,5; Albumina 3,4; BT 11,3; BD 9,1, GGT 700, Fosfatase alcalina 238; CA 19-9 480; AST 110; ALT 120.

Realizou tomografia de abdome que evidenciou lesão infiltrativa em cabeça do pâncreas (processo uncinado). A lesão se apresentava em intimo contato com a veia mesentérica superior/veia porta.

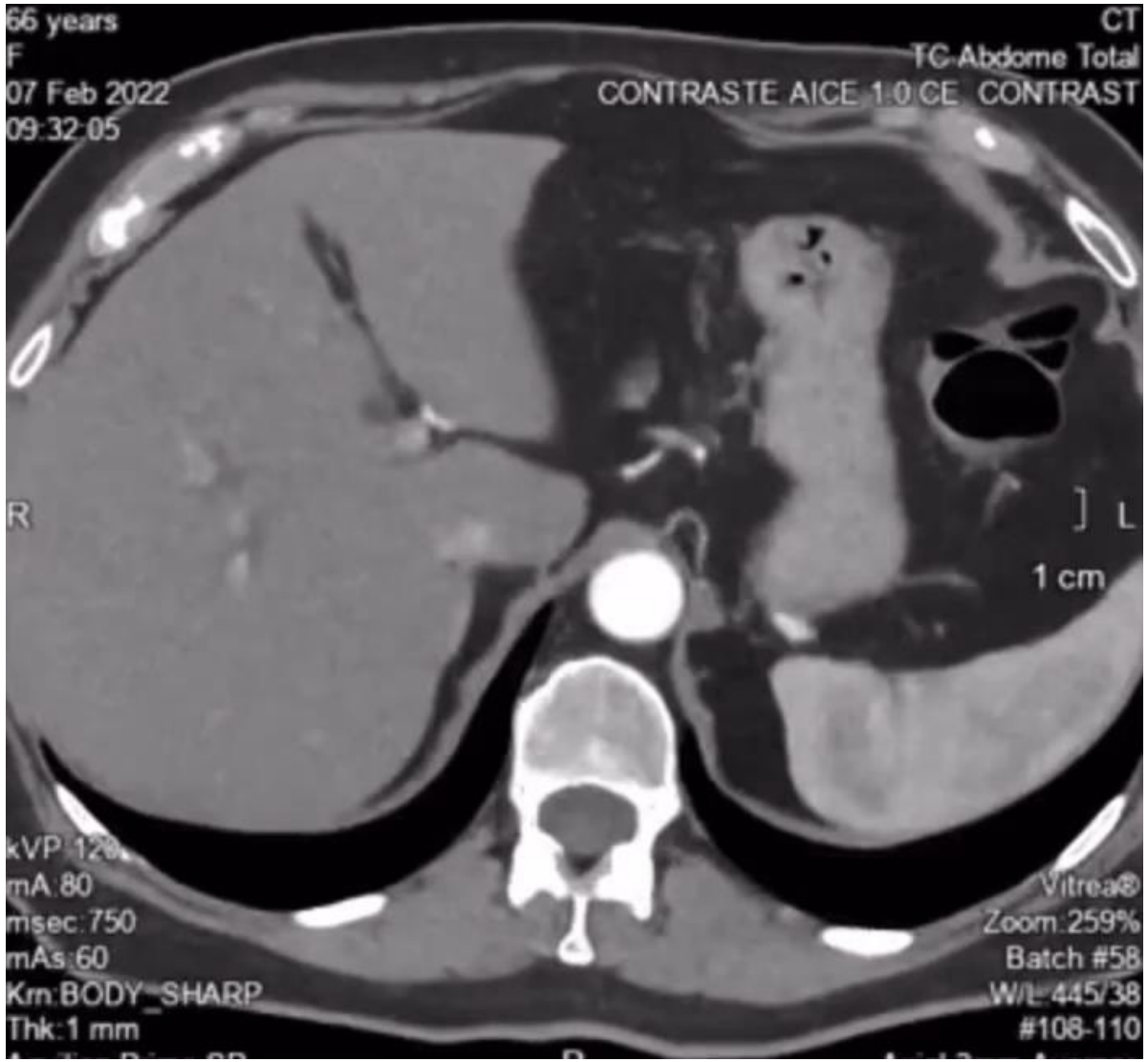
EXAME DE IMAGEM

Caso clínico

Tomografia

Fase arterial

Fase portal



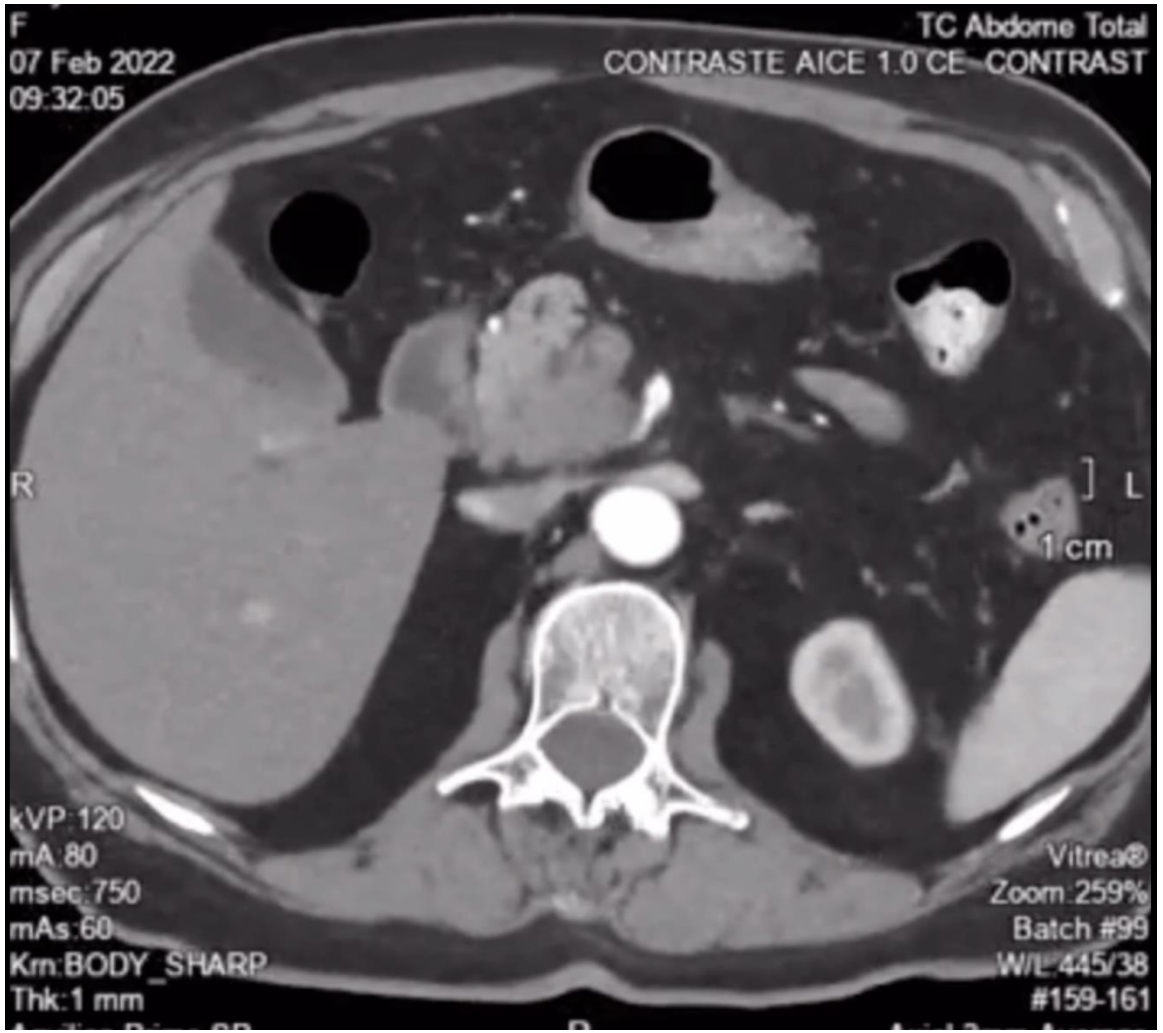
Caso clínico

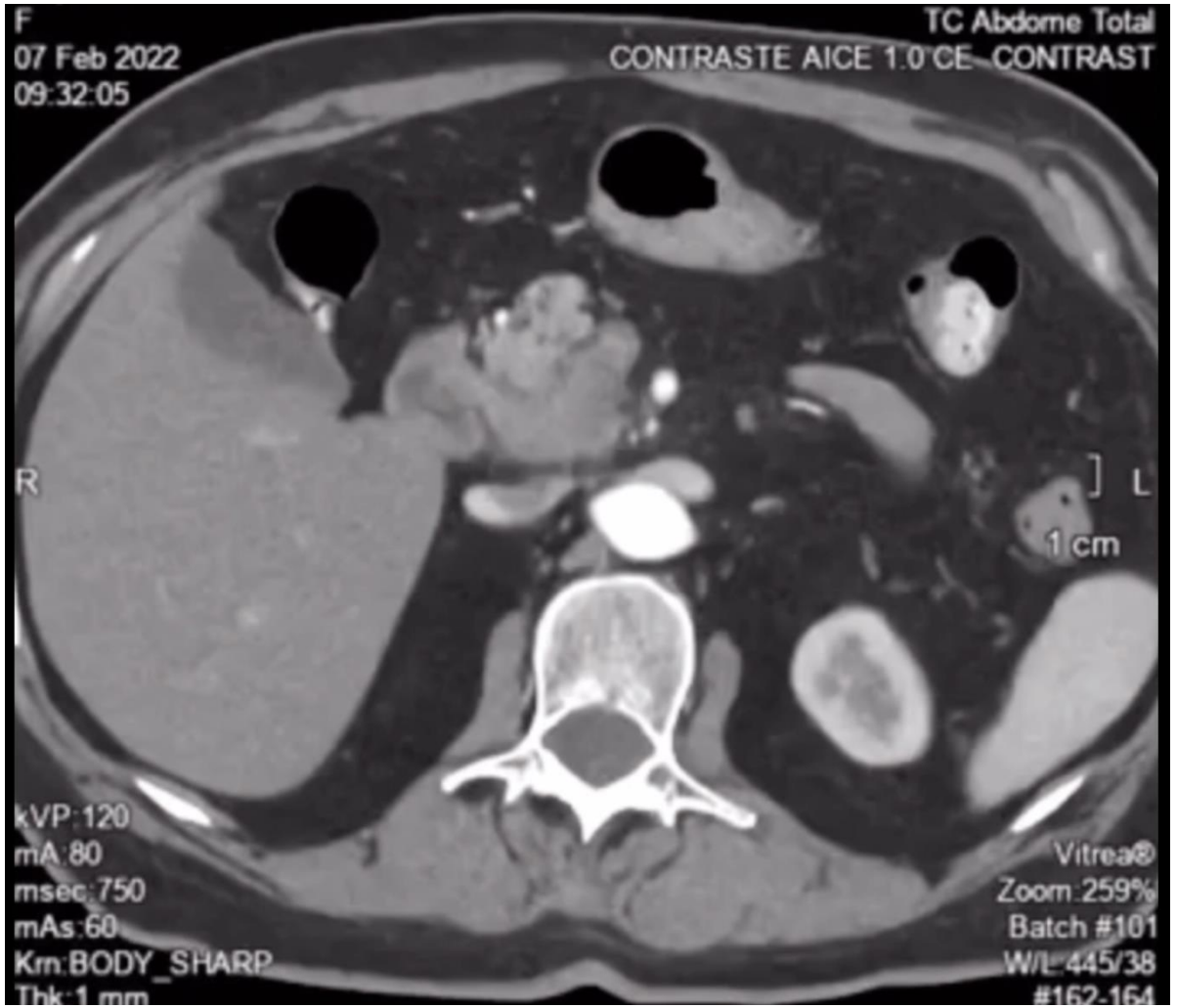
EXAME DE IMAGEM

Tomografia

Fase arterial

Fase portal





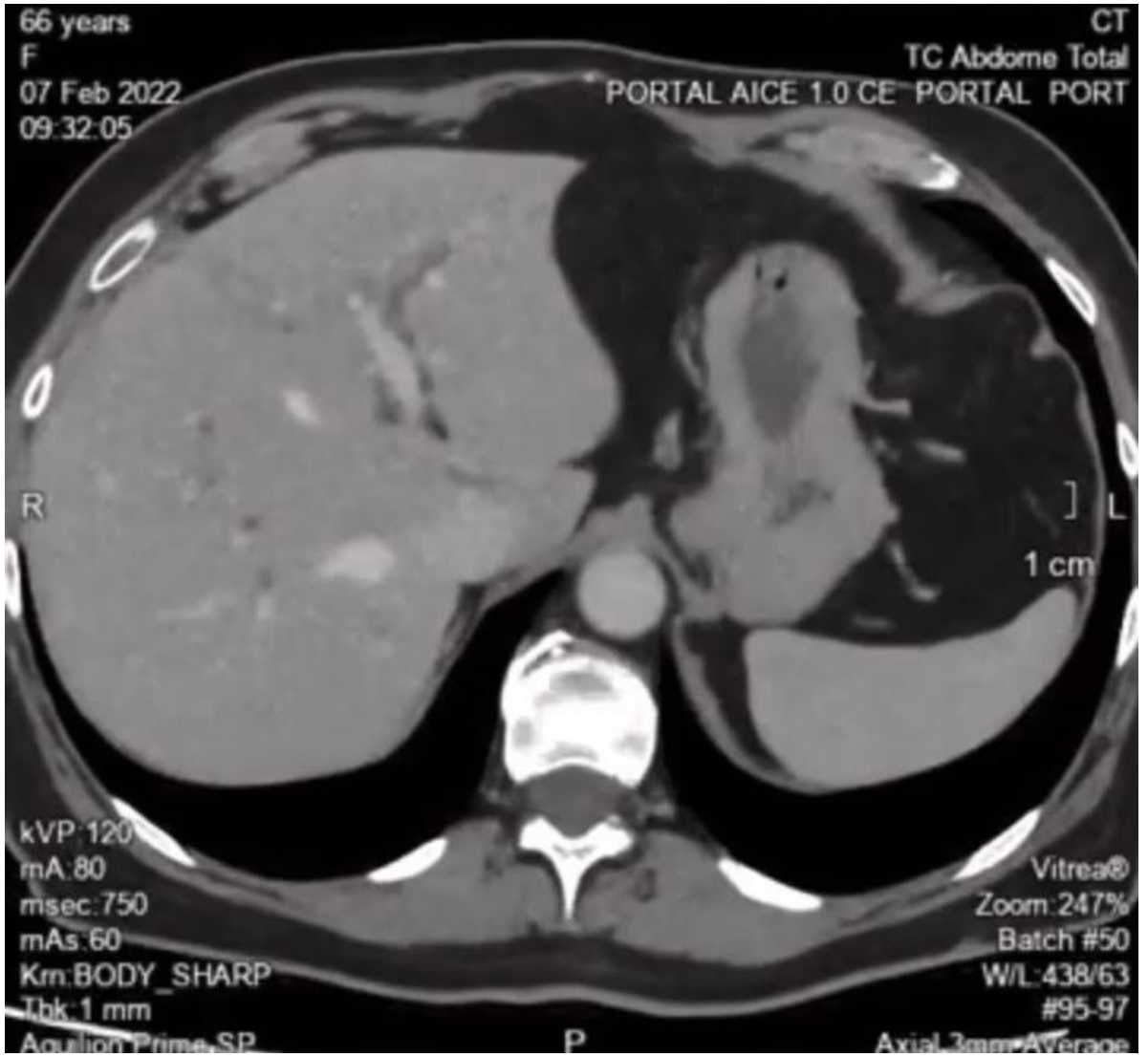
Caso clínico

EXAME DE IMAGEM

Tomografia

Fase arterial

Fase portal



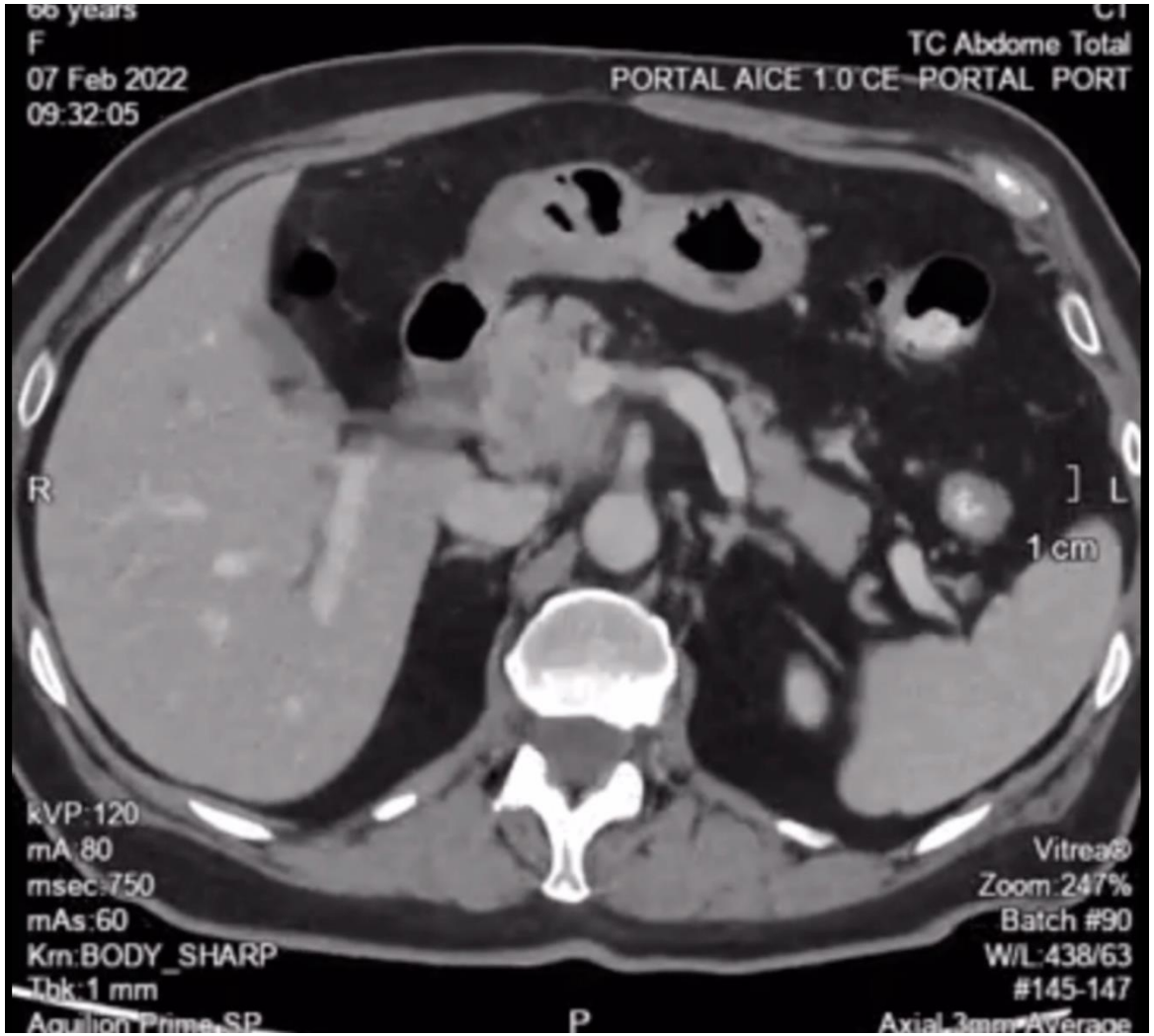
EXAME DE IMAGEM

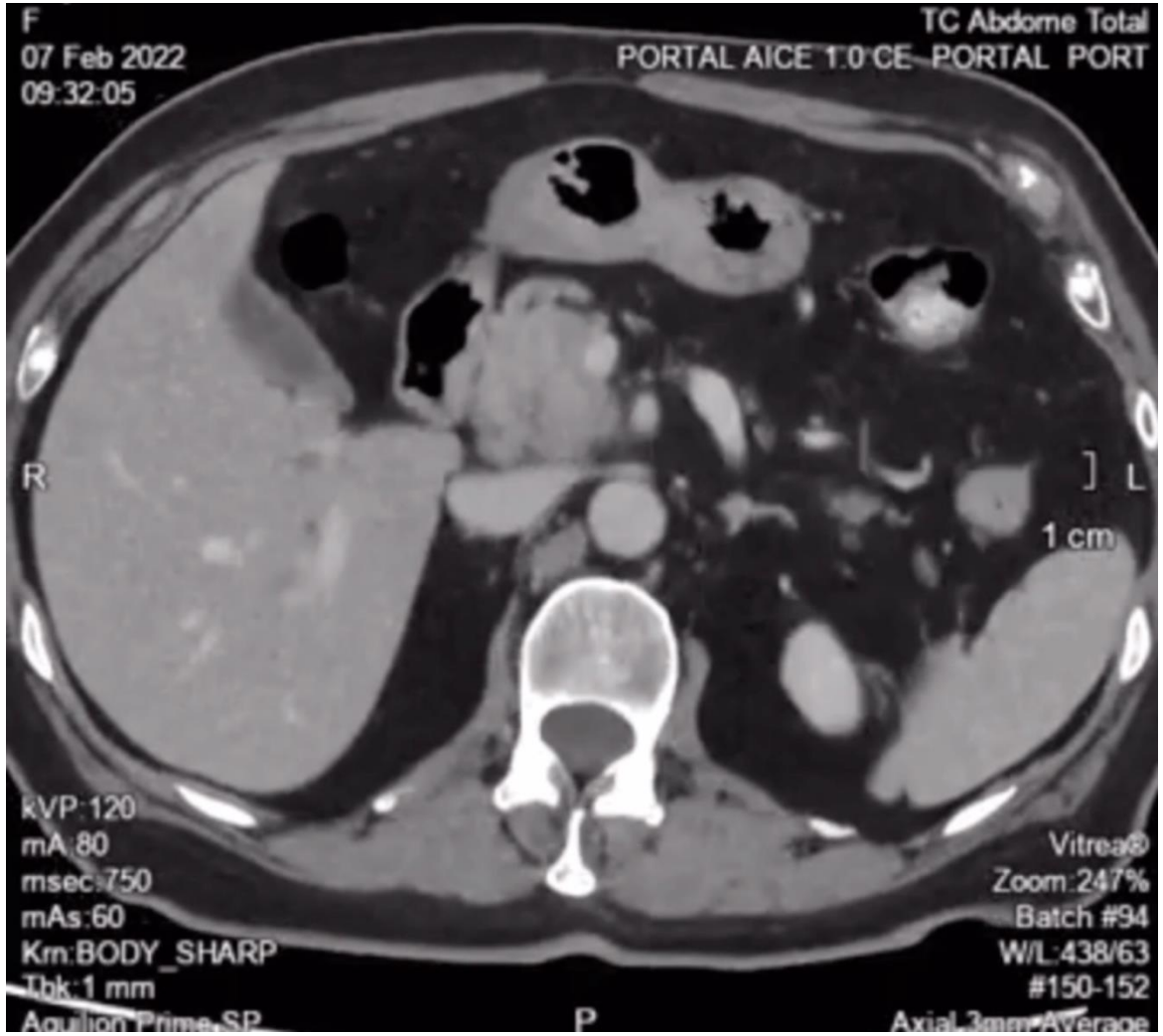
Tomografia

Fase arterial

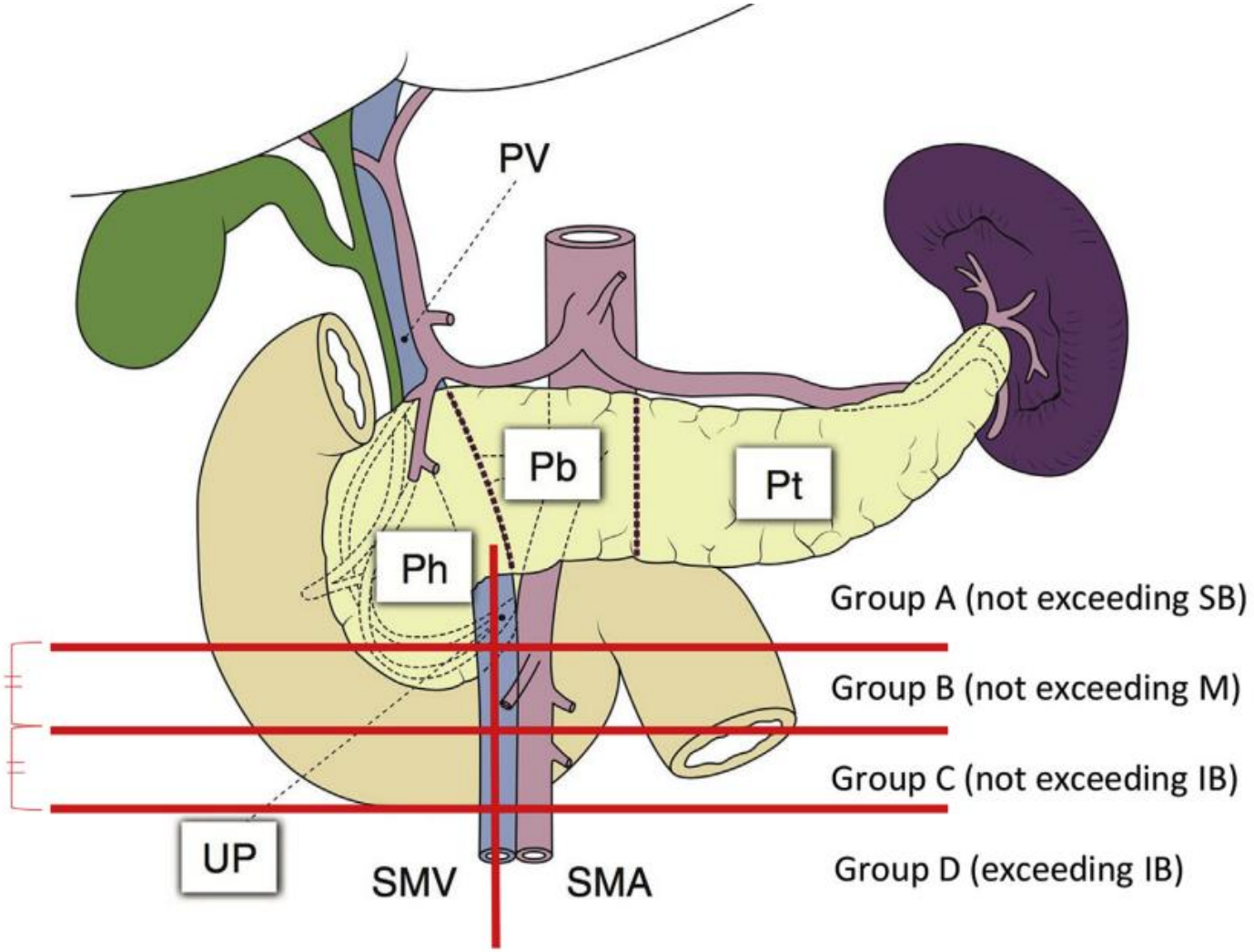
Fase portal

Caso clínico





AVALIAR A EXTENSÃO DO ENVOLVIMENTO



SB Borda superior do duodeno
M Meio do duodeno
IB Borda inferior do duodeno

Veia mesentérica superior

Isaji S, et al. Pancreatology 2018

QUIMIOTERAPIA NEOADJUVANTE

Table 2
International consensus of classification of BR PDAC based on anatomical definition using CT imagings including coronal and sagittal sections.

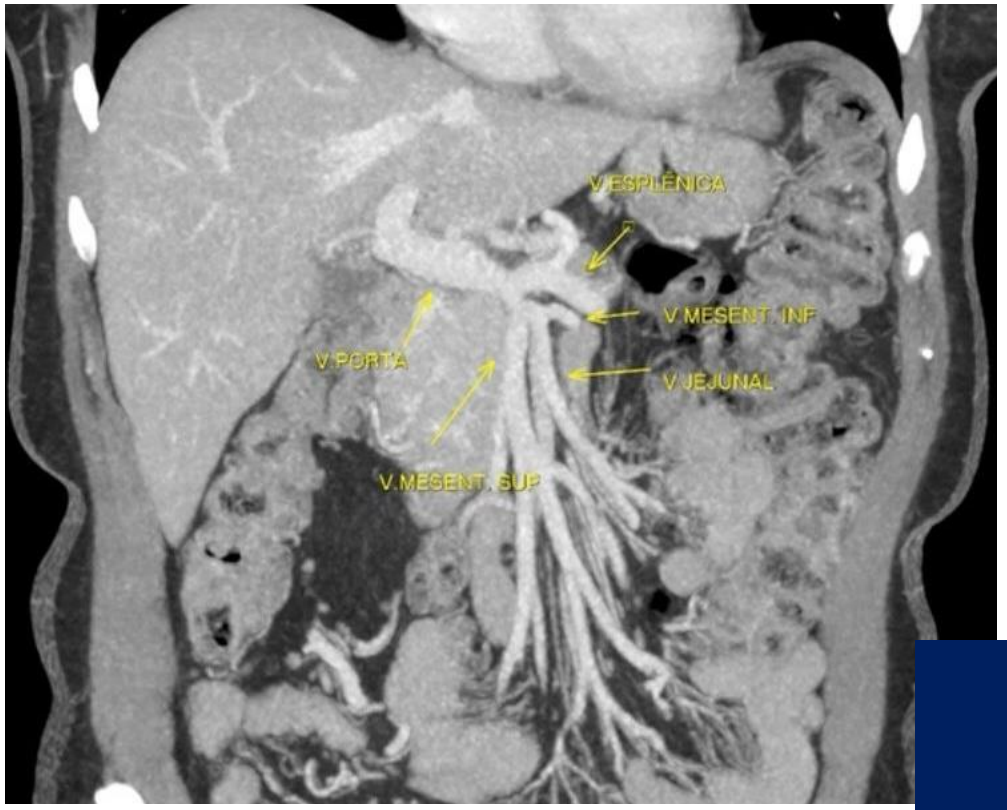
Resectable: R	• SMV/PV: no tumor contact or unilateral narrowing • SMA, CA, CHA: no tumor contact
Borderline resectable: BR	Subclassified according to SMV/PV involvement alone or arterial invasion.
BR-PV (SMV/PV involvement alone)	• SMV/PV: tumor contact 180° or greater or bilateral narrowing/occlusion, not exceeding the inferior border of the duodenum. • SMA, CA, CHA: no tumor contact/invasion
BR-A (arterial involvement)	• SMA, CA: tumor contact of less than 180° without showing deformity/stenosis. • CHA: tumor contact without showing tumor contact of the PHA and/or CA. (The involvement of the aorta is categorized as unresectable. Presence of variant arterial anatomy is not taken into consideration)
Unresectable: UR	Subclassified according to the status of distant metastasis
Locally advanced: LA	• SMV/PV: bilateral narrowing/occlusion, exceeding the inferior border of the duodenum. • SMA, CA: tumor contact/invasion of 180 or more degree[#]. • CHA: tumor contact/invasion showing tumor contact/invasion of the PHA and/or CA. • AO: tumor contact or invasion
Metastatic: M	• Distant metastasis $.

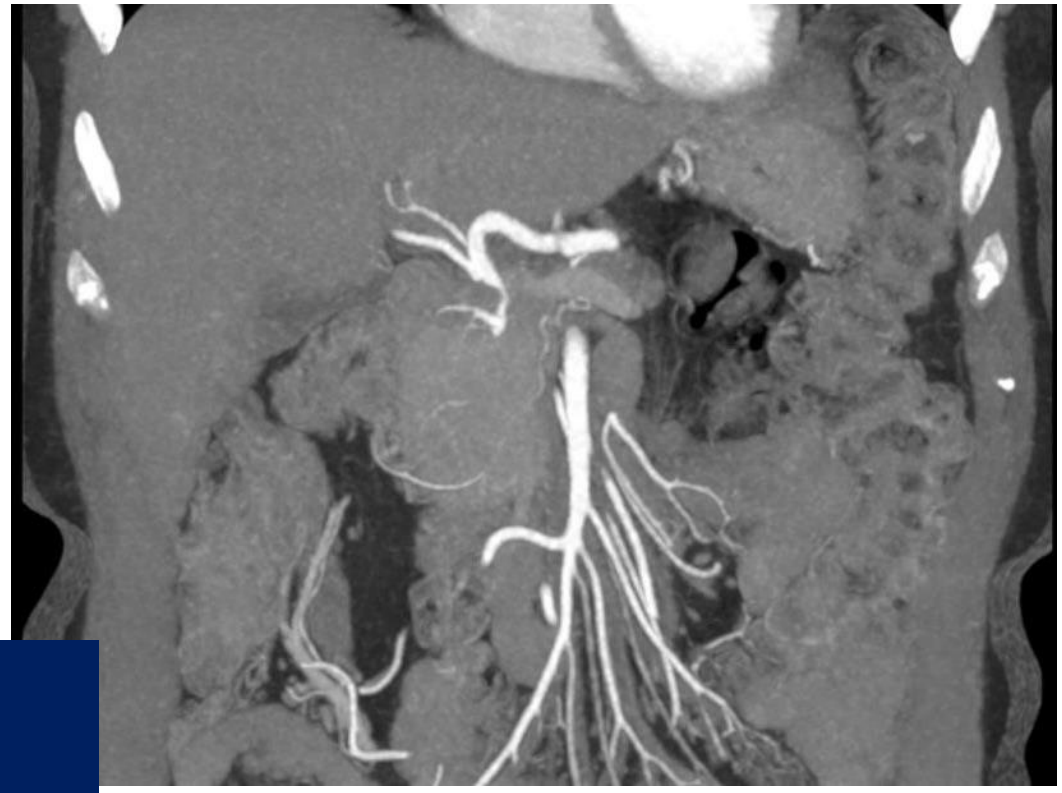
SMV: superior mesenteric vein, PV: portal vein, SMA: superior mesenteric artery, CA: celiac artery, CHA: common hepatic artery, PHA: proper hepatic artery, #: In the cases with CA invasion of 180° or more without involvement of the aorta and with intact and uninvolved gastroduodenal artery thereby permitting a distal pancreatectomy with enbloc celiac axis resection (DP-CAR) [21], some members prefer this criteria to be in the BR-A category. $: including macroscopic para aortic and extra abdominal lymph node metastasis.

CIRUGIA

Isaji S, et al. Pancreatology 2018

COMPLETA AVALIAÇÃO PRÉ-OPERATÓRIA

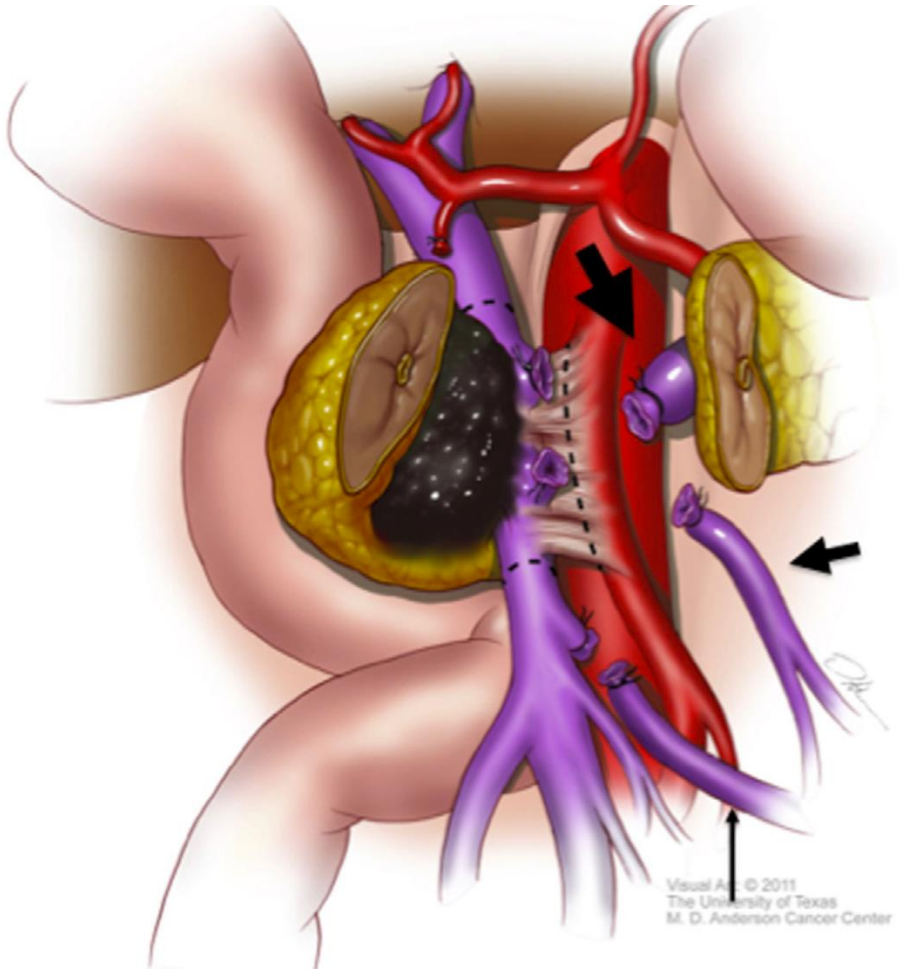


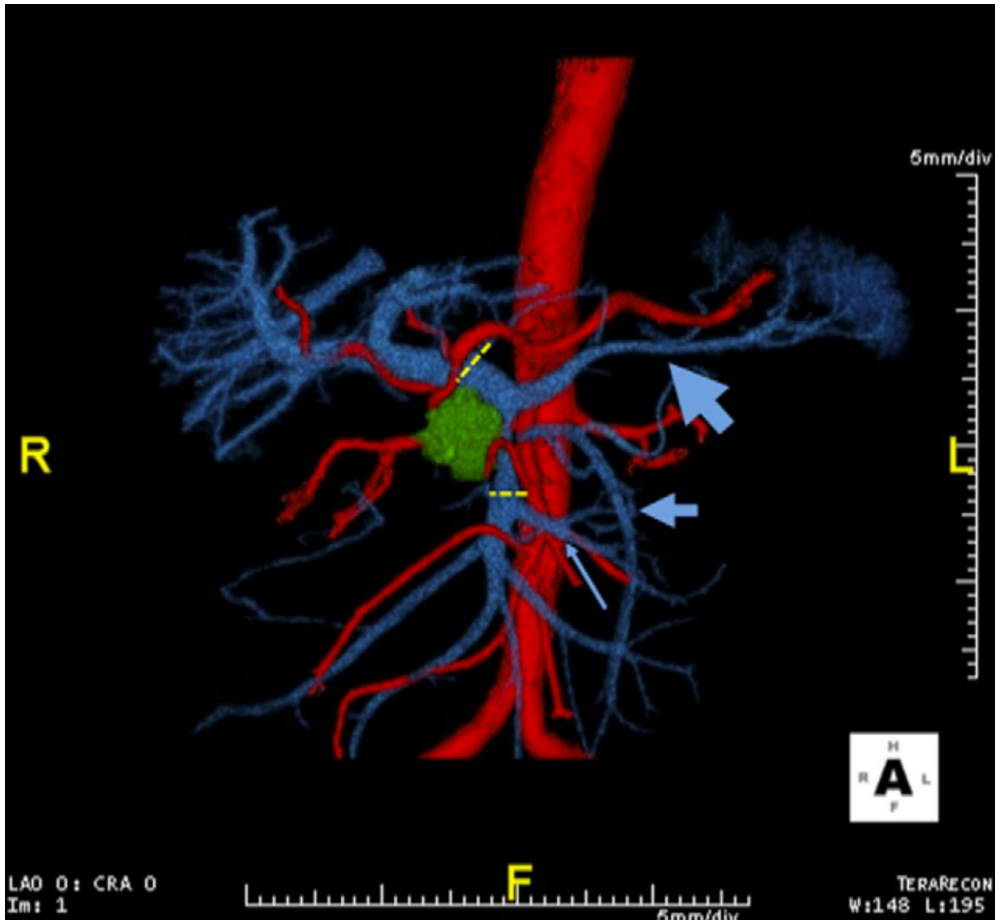


Proximal
Distal
Extensão
Confluência esplênica
Circunferência
Ramos jejunais

AVALIAR A EXTENSÃO DO ENVOLVIMENTO

Veia mesentérica superior





SB Borda superior do duodeno
M Meio do duodeno
IB Borda inferior do duodeno

Isaji S, et al. Pancreatology 2018

- ❑ Os diâmetros dos cotos da veia (após a ressecção)são apropriados para a anastomose, permitindo fluxo do intestino para o fígado?
- ❑ A veia esplênica pode ser preservada?
- ❑ Existe possibilidade da veia esplênica não ser reconstruída?
- ❑ Há necessidade de interposição de enxerto (ou patch),ou é possível fazer término-terminal sem interposição?
- ❑ Qual enxerto (ou patch), se necessário, é o mais apropriado nessa situação individual?

QUESTÕES

Ulrich A, et al. 2018

Caso clínico

Após reunião multidisciplinar (Tumor board gastrointestinal), a paciente realizou quimioterapia neoadjuvante (FOLFIRINOX, 4 ciclos).

Indicado o tratamento cirúrgico:

Duodenopancreatectomia

"Artery first"[1]

Dissecção nível 3[2]

"Triangle operation"[3,4]

Ressecção estendida[5]

Incluindo veia porta/VMS

1.Fernandes ES, et al. Langenbecks Arch Surg 2021
2.Inoue Y, et al. J Gastrointest Surg 2018
3.Niesen W, et al. Ann Gastroenterol Surg. 2019
4.Hackert T, et al. HPB 2017
5.Fernandes ES, et al. J Gastrointest Oncol 2023

Quimioterapia neoadjuvante

- Resposta tumoral radiológica em 1/3 dos pacientes
- Imagens radiológicas convencionais falham em mostrar resposta
- Resposta com FOLFIRINOX melhor que Gencitabina + radioterapia
- Sobrevida após ressecção melhor que após exploração
- Heidelberg
  - Exploração em todos os pacientes
    - Doença estável
    - Remissão
- Congelação pode não mostrar tumor viável

COLLATERAL VESSELS

World Journal of Gastroenterology

Submit a Manuscript: http://www.wjgnet.com/esps/
Help Desk: http://www.wjgnet.com/esps/helpdesk.aspx
DOI: 10.3748/wjg.v21.i24.7604

World J Gastroenterol 2015 June 28; 21(24): 7604-7607
ISSN 1007-9327 (print) ISSN 2219-2840 (online)

CASE REPORT

Resection of the main trunk of the superior mesenteric vein without reconstruction during surgery for giant pancreatic mucinous cystadenoma: A case report

Chen YT, et al. World J Gastroenterol 2015

World Journal of Clinical Cases

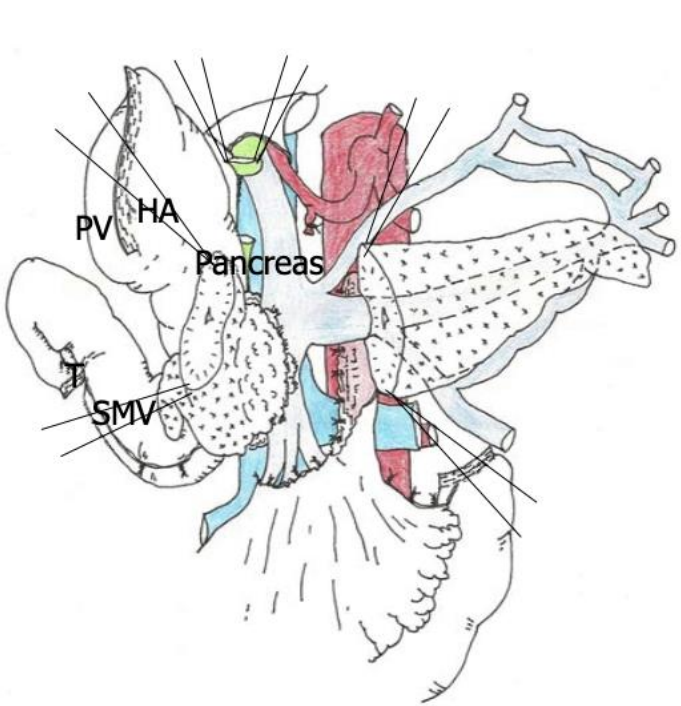
Submit a Manuscript: http://www.f6publishing.com
DOI: 10.12998/wjcc.v6.i8.214

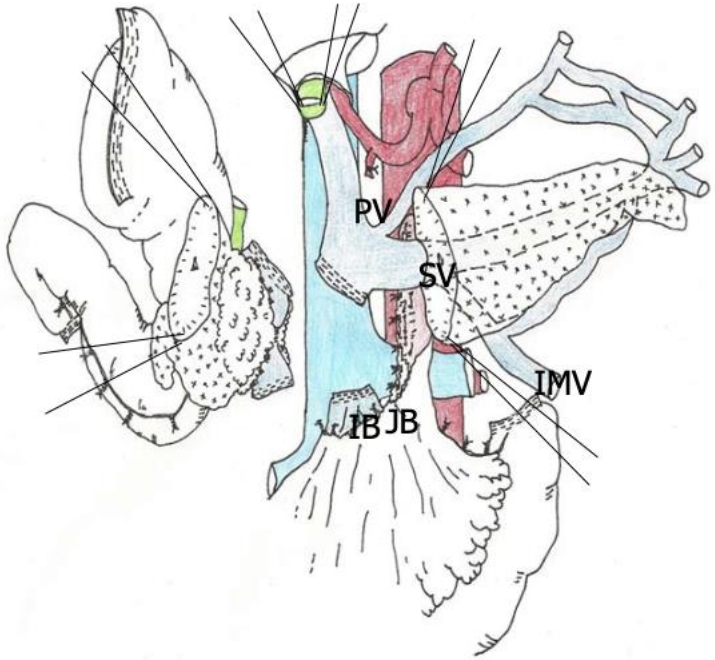
World J Clin Cases 2018 August 16; 6(8): 214-218
ISSN 2307-8960 (online)

CASE REPORT

Pancreaticoduodenectomy with combined superior mesenteric vein resection without reconstruction is possible: A case report and review of the literature

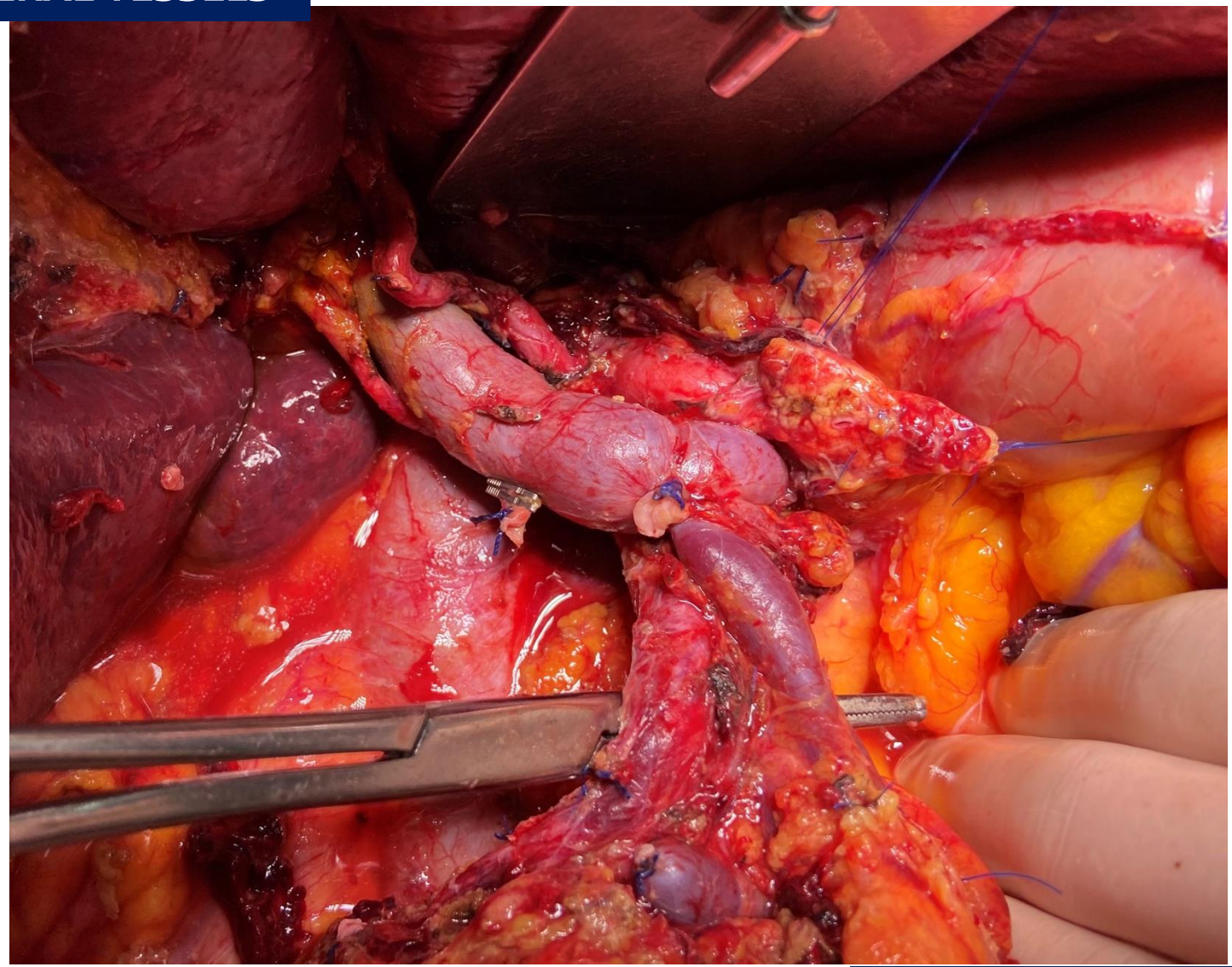
Jouffret L, et al. World J Clin Cases 2018





RESSECÇÃO SEM RECONSTRUÇÃO DA VMS

COLLATERAL VESSELS

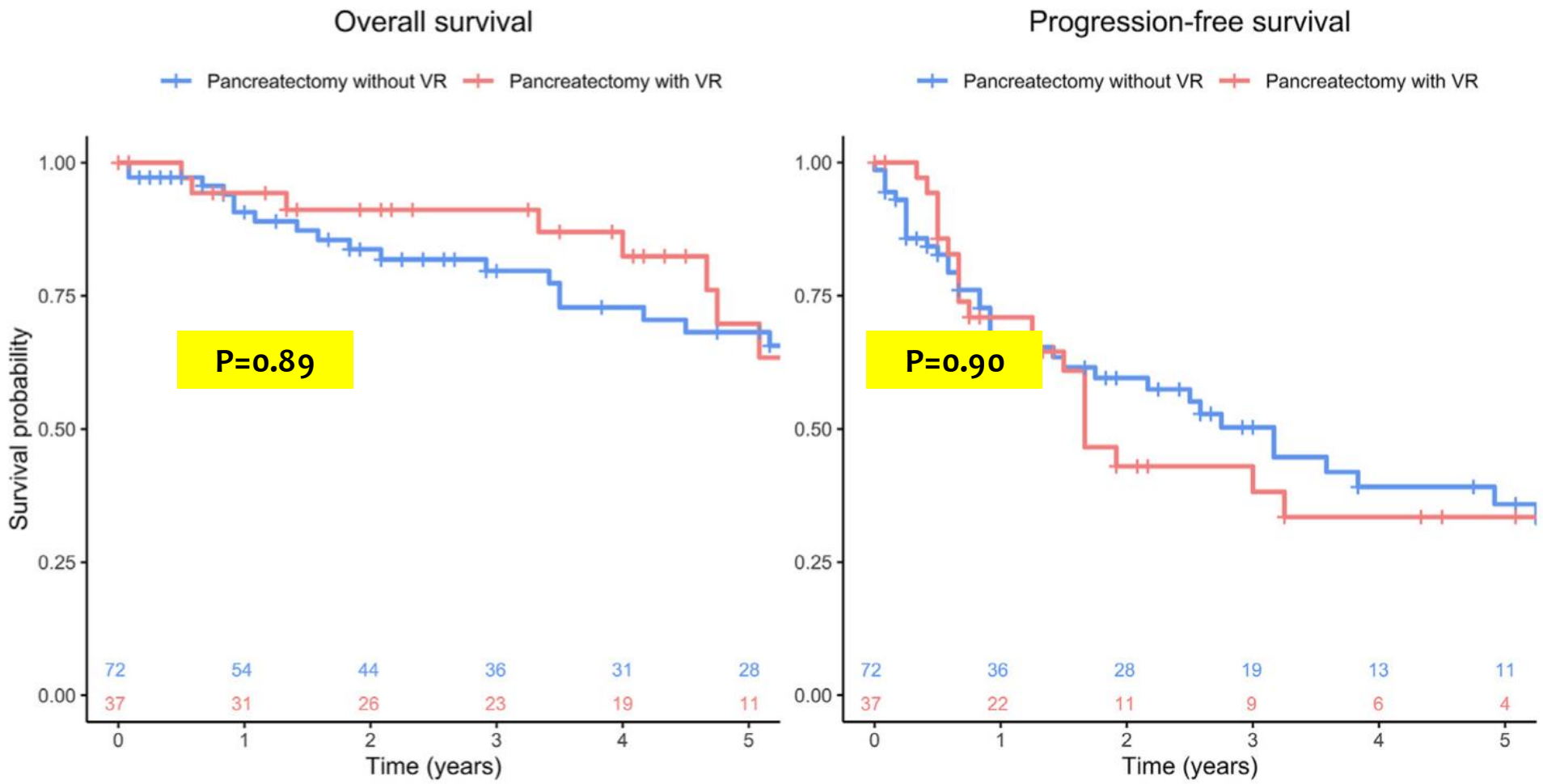


RESSECÇÃO SEM RECONSTRUÇÃO DA VMS

https://doi.org/10.1016/j.hpb.2021.12.016 HPB

ORIGINAL ARTICLE

Outcomes of pancreatectomy with portomesenteric venous resection and reconstruction for locally advanced pancreatic neuroendocrine neoplasms



Gudmundsdottir H, et al. HPB 2022;21:1186-93

Langenbeck's Archives of Surgery
https://doi.org/10.1007/s00423-021-02211-y

REVIEW ARTICLE

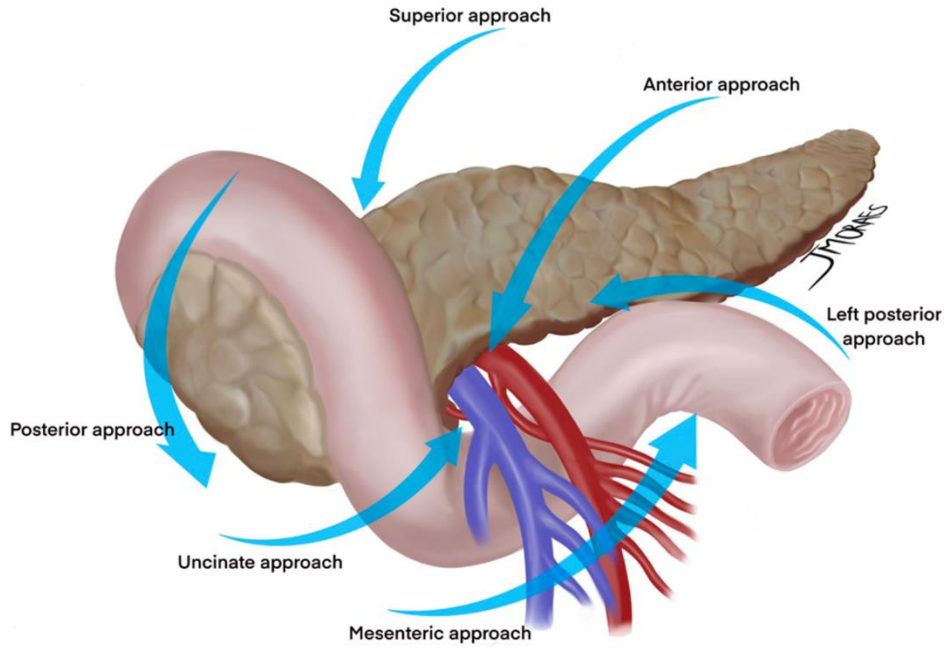
What do surgeons need to know about the mesopancreas

Eduardo de Souza M. Fernandes [1,2] · Oliver Strobel [3,4] · Camila Girão [1,2] · Jose Maria A. Moraes-Junior [5,6] · Orlando Jorge M. Torres [5,6]

Table 3 Advantages of the artery-first approach (SHARMA) [35]

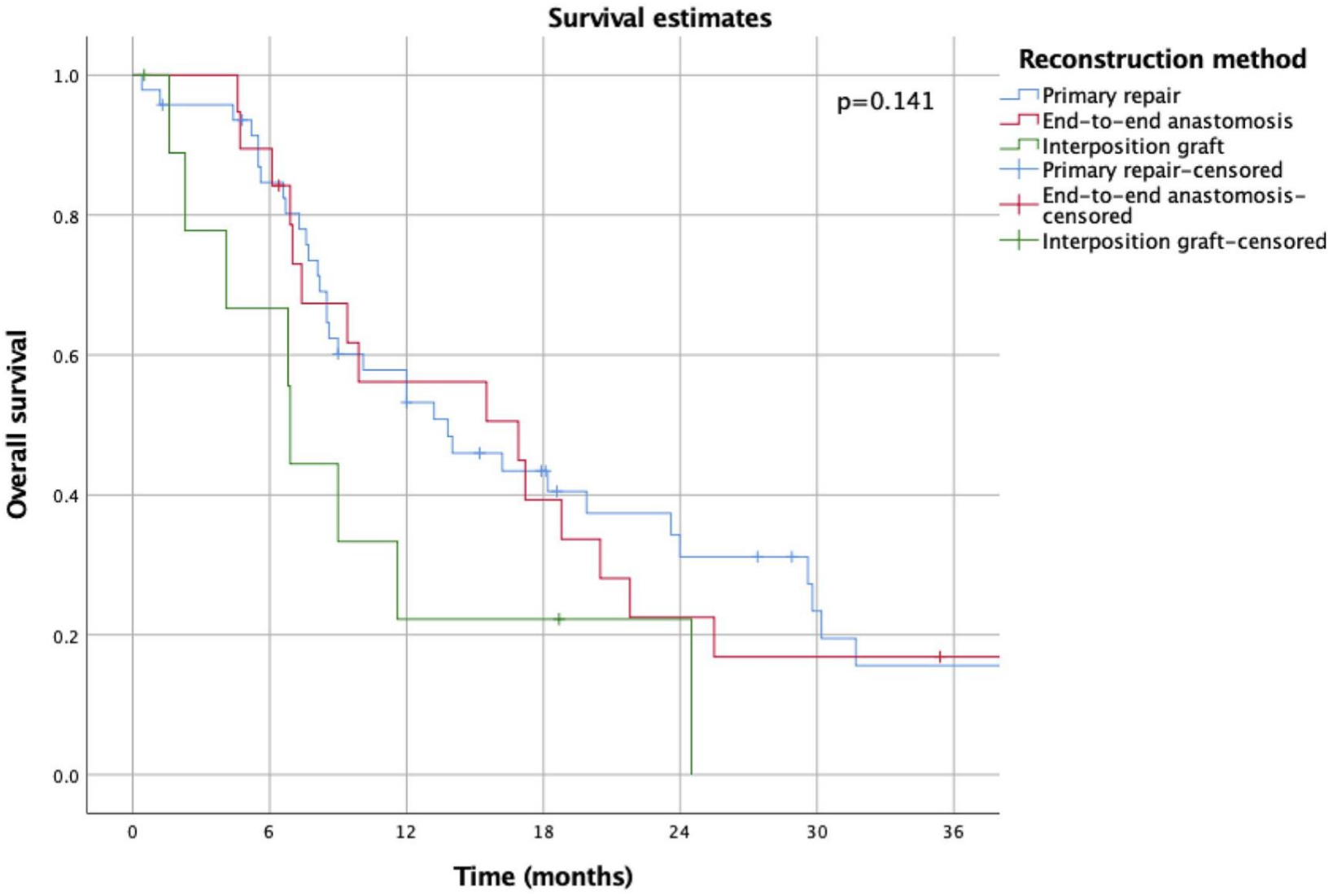
1. Resection without breaching the tumor extension plane, thereby minimizing cell spillage
2. Increases curative (R0) resection, decreases local recurrence
3. Complete resection of peripancreatic retroperitoneal tissue around the plexuses
4. Increased lymph nodal clearance
5. Early assessment of non-resectability (SMA involvement), avoiding useless R2 resections
6. Better delineation of SMA and identification of RHA anomalies
7. Easier en bloc resection and reconstruction of SMV-PV by "no touch" technique
8. Reduced need for graft substitutions
9. Reduced operative time and blood loss (early ligation of IPDA/JA1)

Fernandes ESM, et al. Langenbeck's Arch Surg 2021



Fernandes ESM, et al. J Gastrointest Oncol 2023

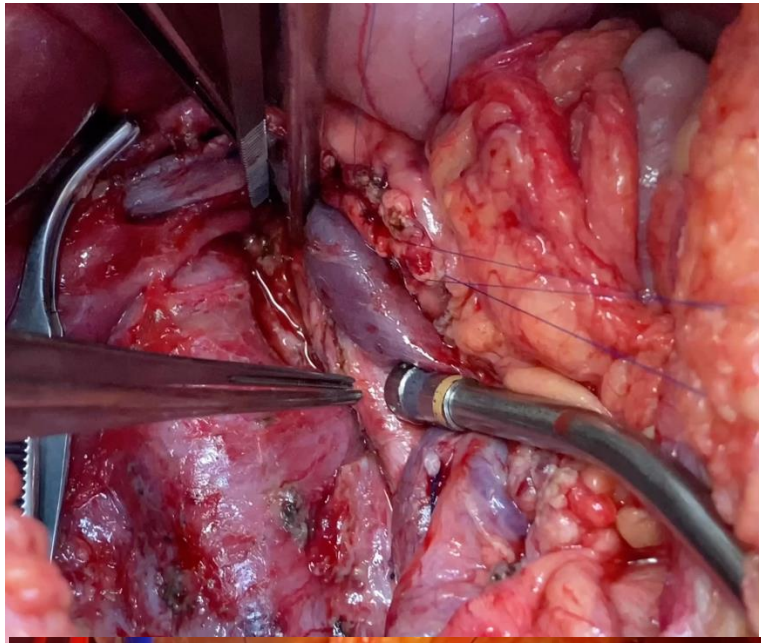
ARTERY FIRST

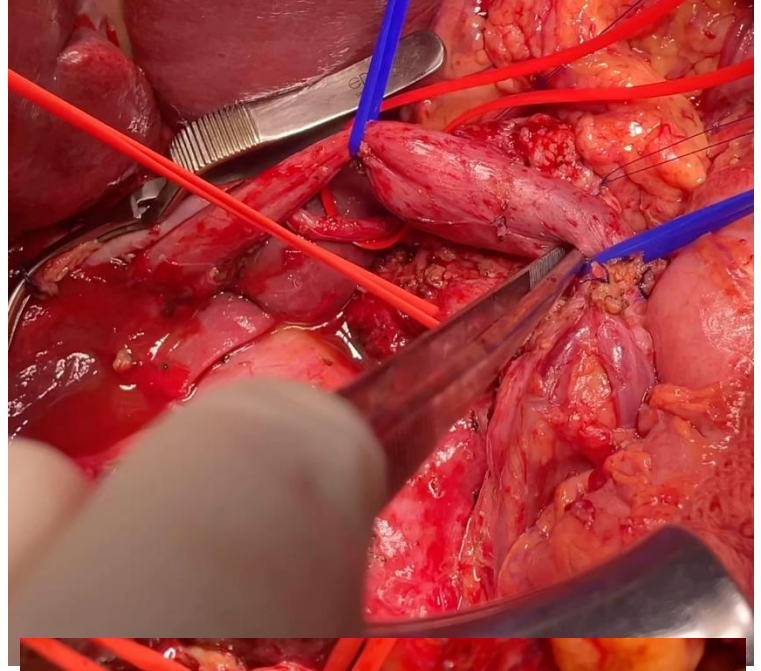


ARTERY FIRST

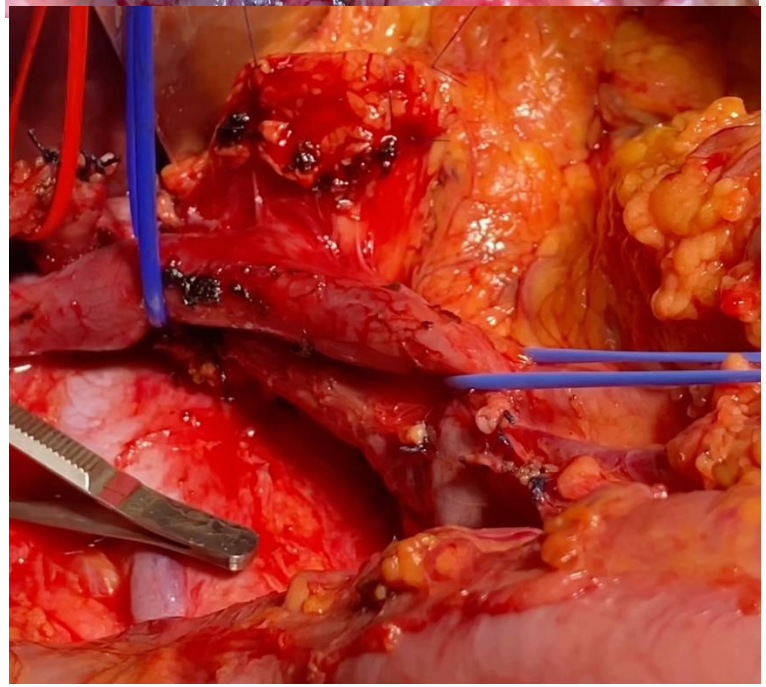
Chan KS, et al. PLOS one 2020

ARTERY FIRST

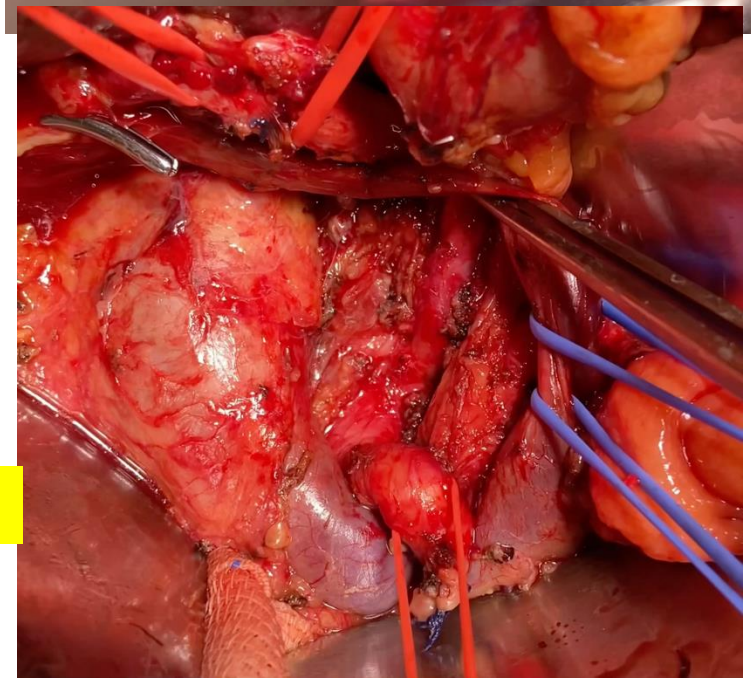




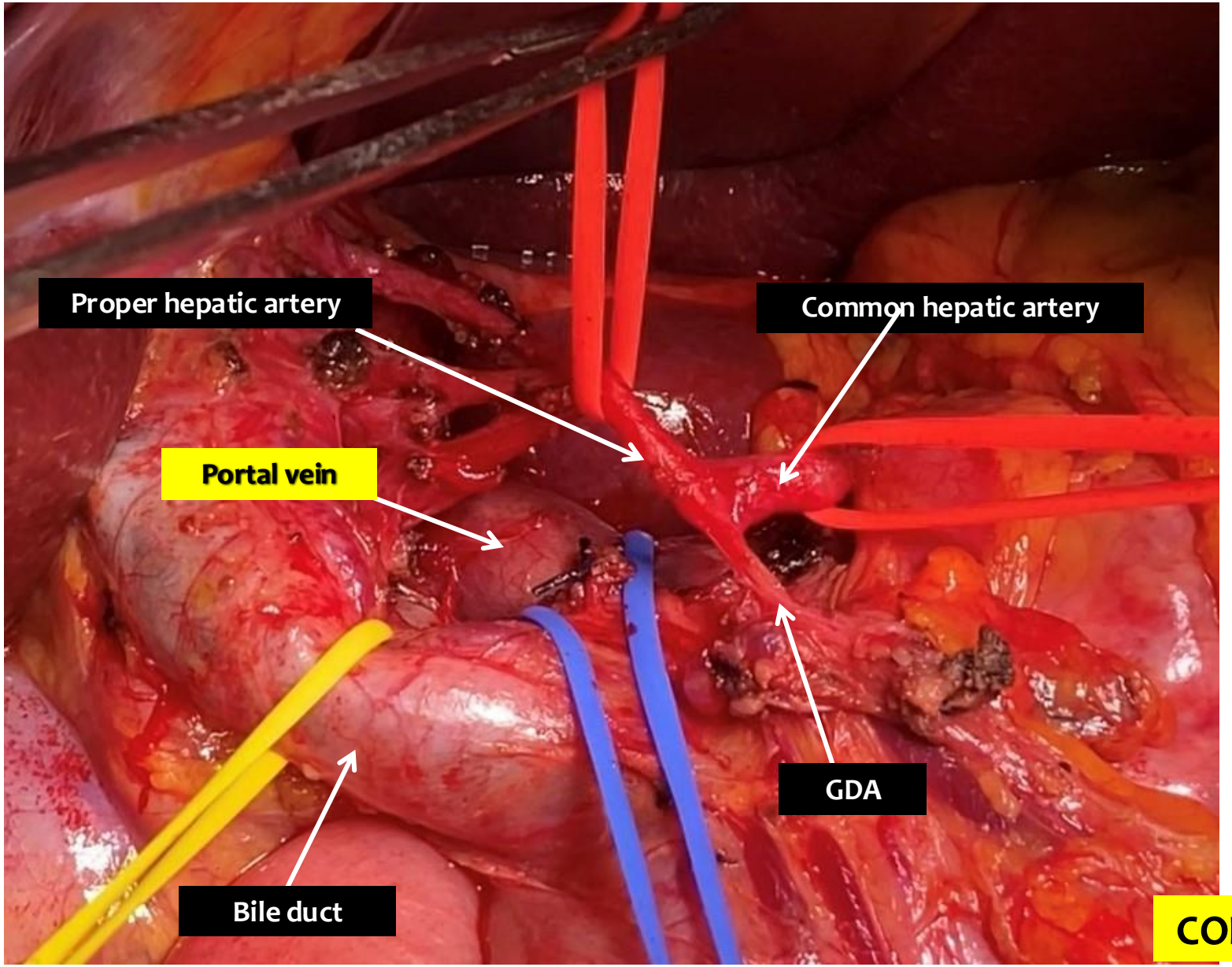
AVALIA ENVOLVIMENTO ARTERIAL



FACILITAR A RESSECÇÃO EM BLOCO VMS/VP



CONTROLE DA VEIA PORTA



CONTROLE SUPERIOR DA VEIA PORTA

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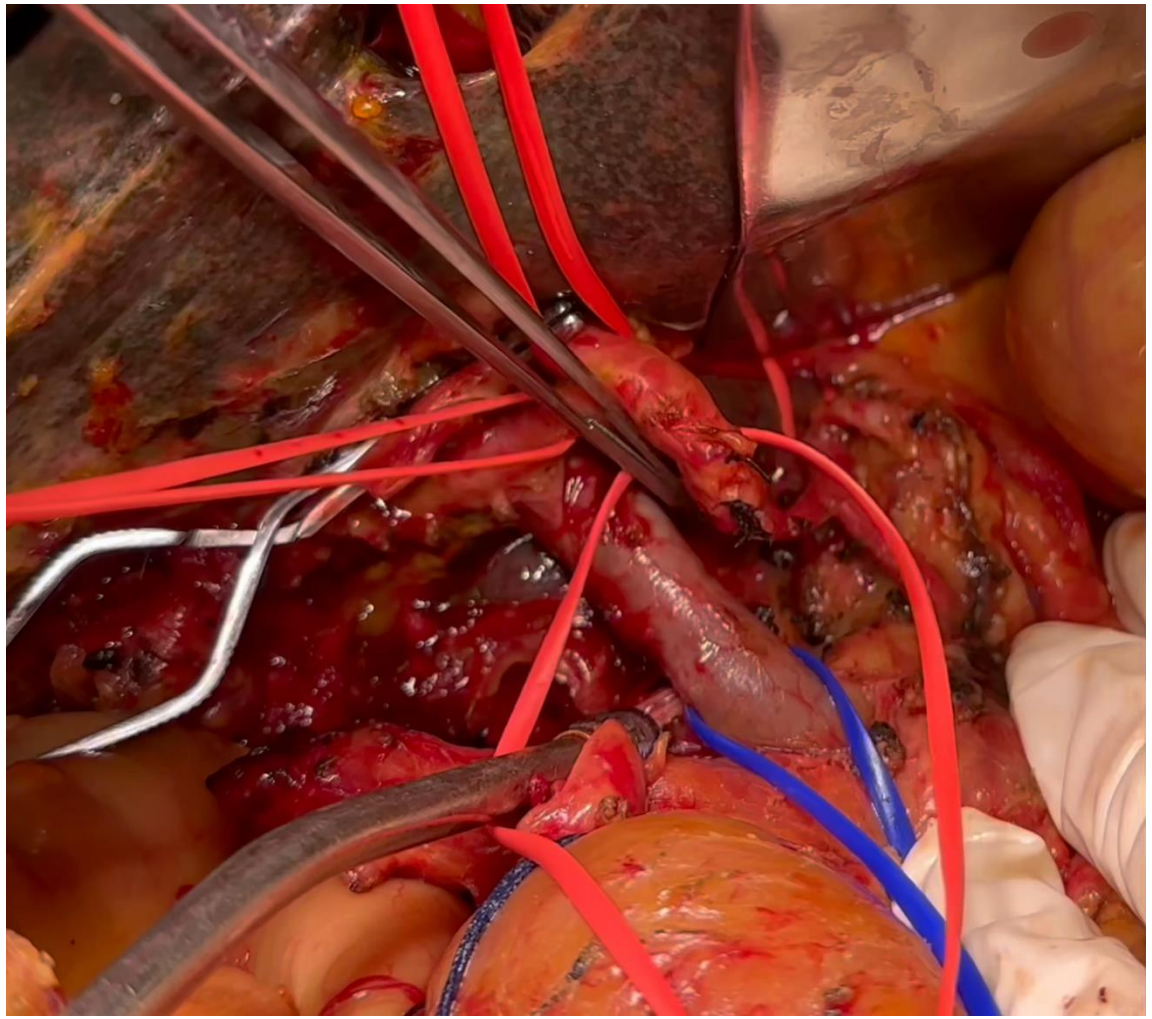
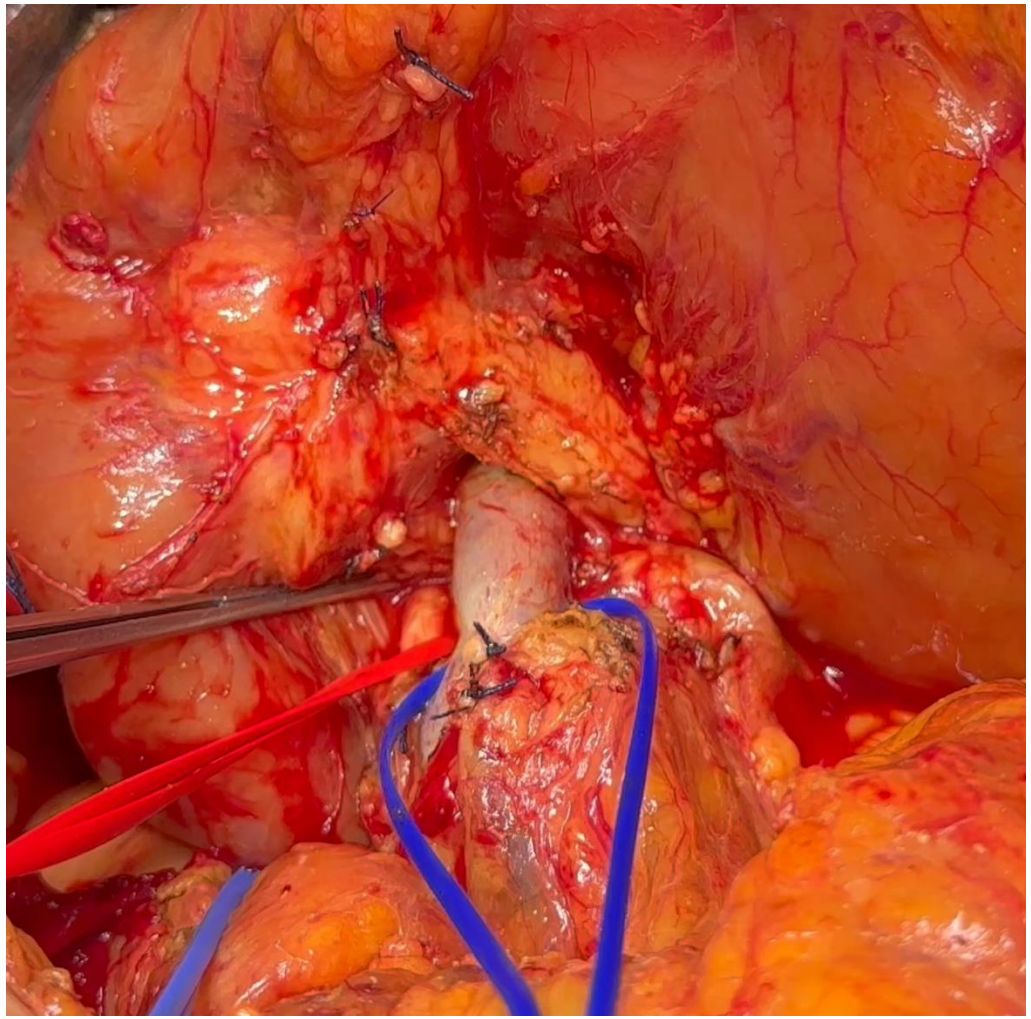


CONTROLE SUPERIOR DA VEIA PORTA



CONTROLE INFERIOR DA VEIA MESENTÉRICA

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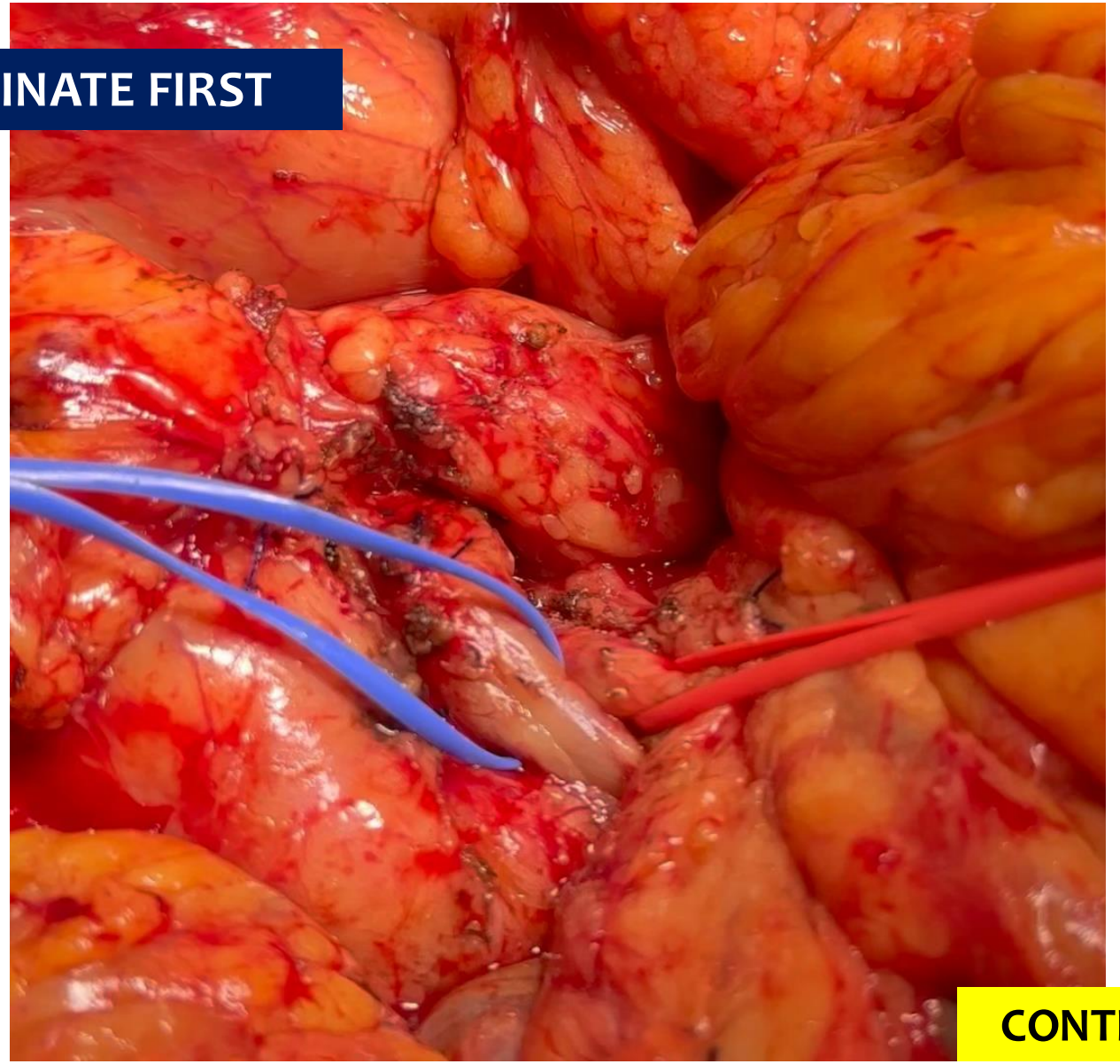

VMS/VP ENVOLVIDA

NÃO FAZER TÚNEL

CONTROLE INFERIOR DA VEIA MESENTÉRICA

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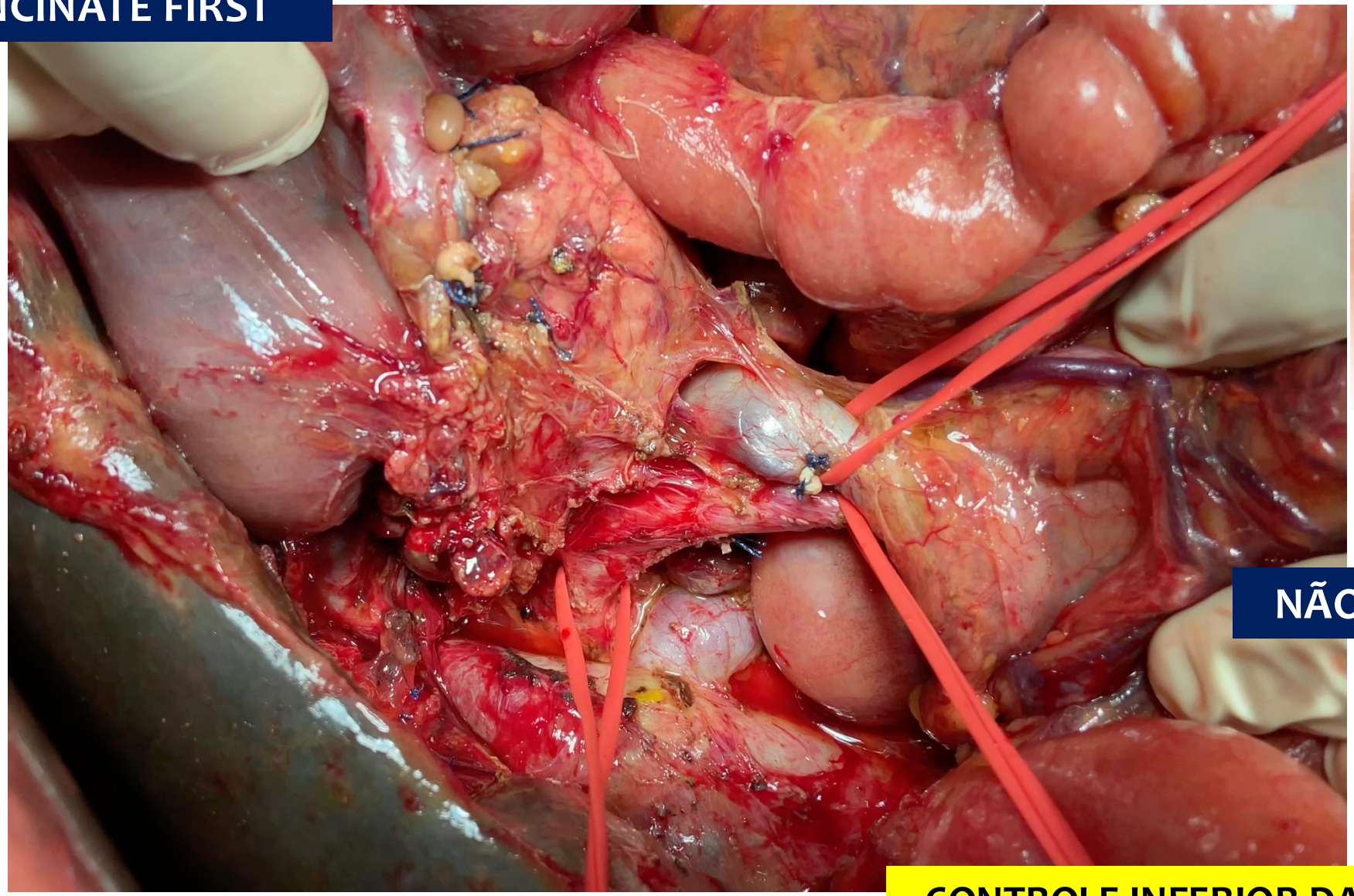
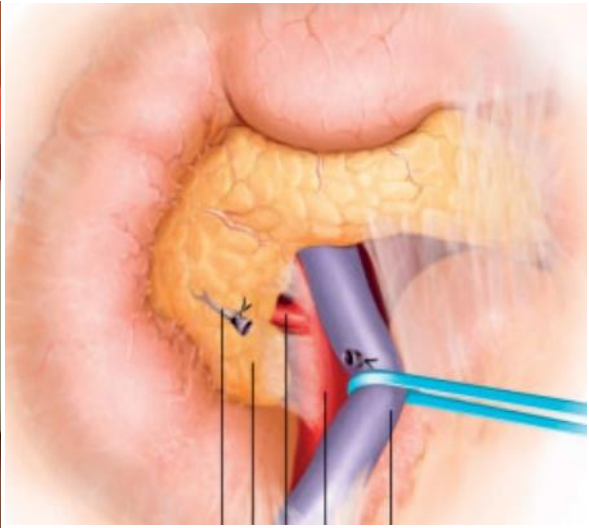


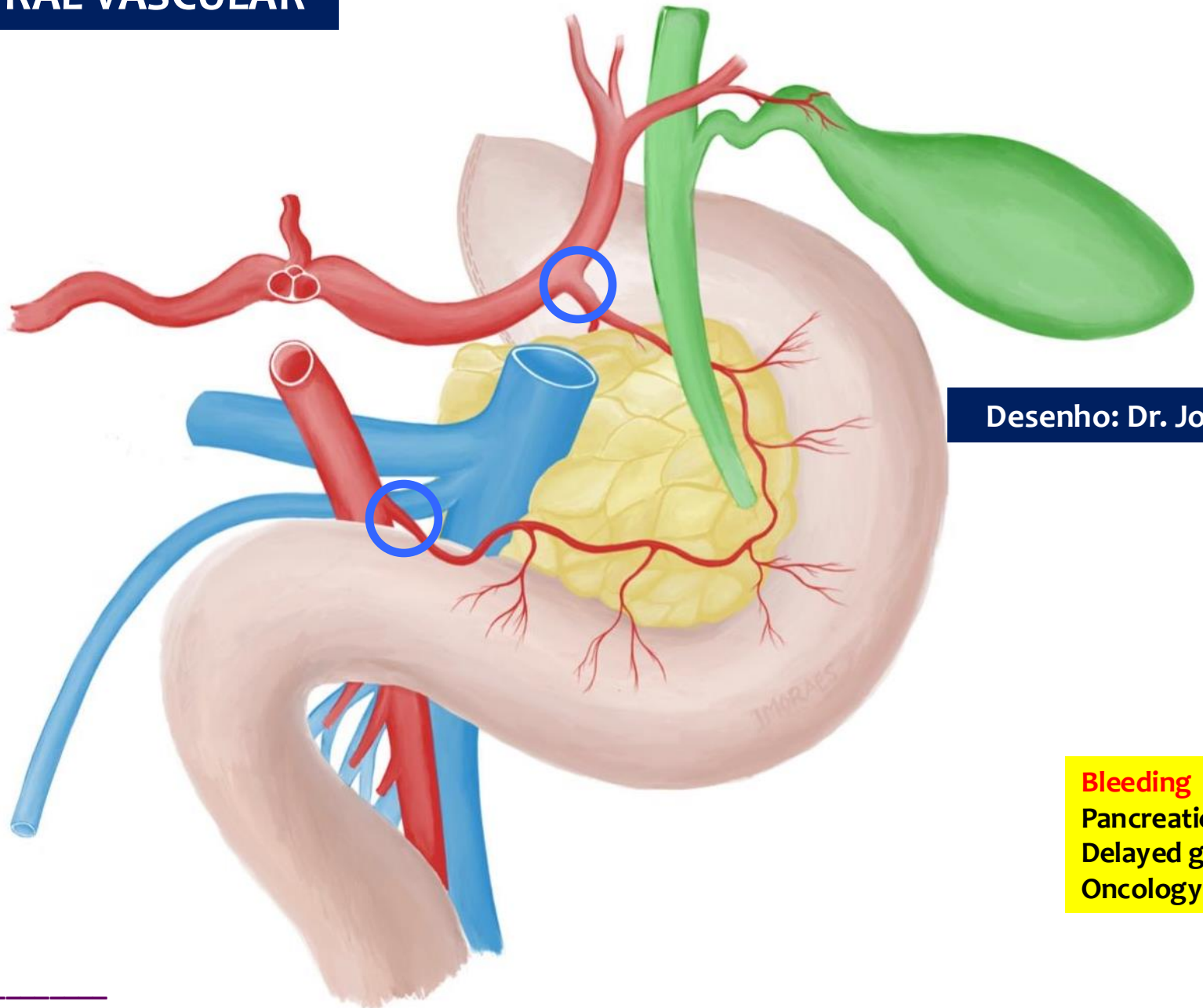


Pandanaboyana S, et al. Br J Surg 2012;99:1027–35

NÃO FAZER TÚNEL

CONTROLE INFERIOR DA VEIA MESENTÉRICA

LIGADURA CENTRAL VASCULAR

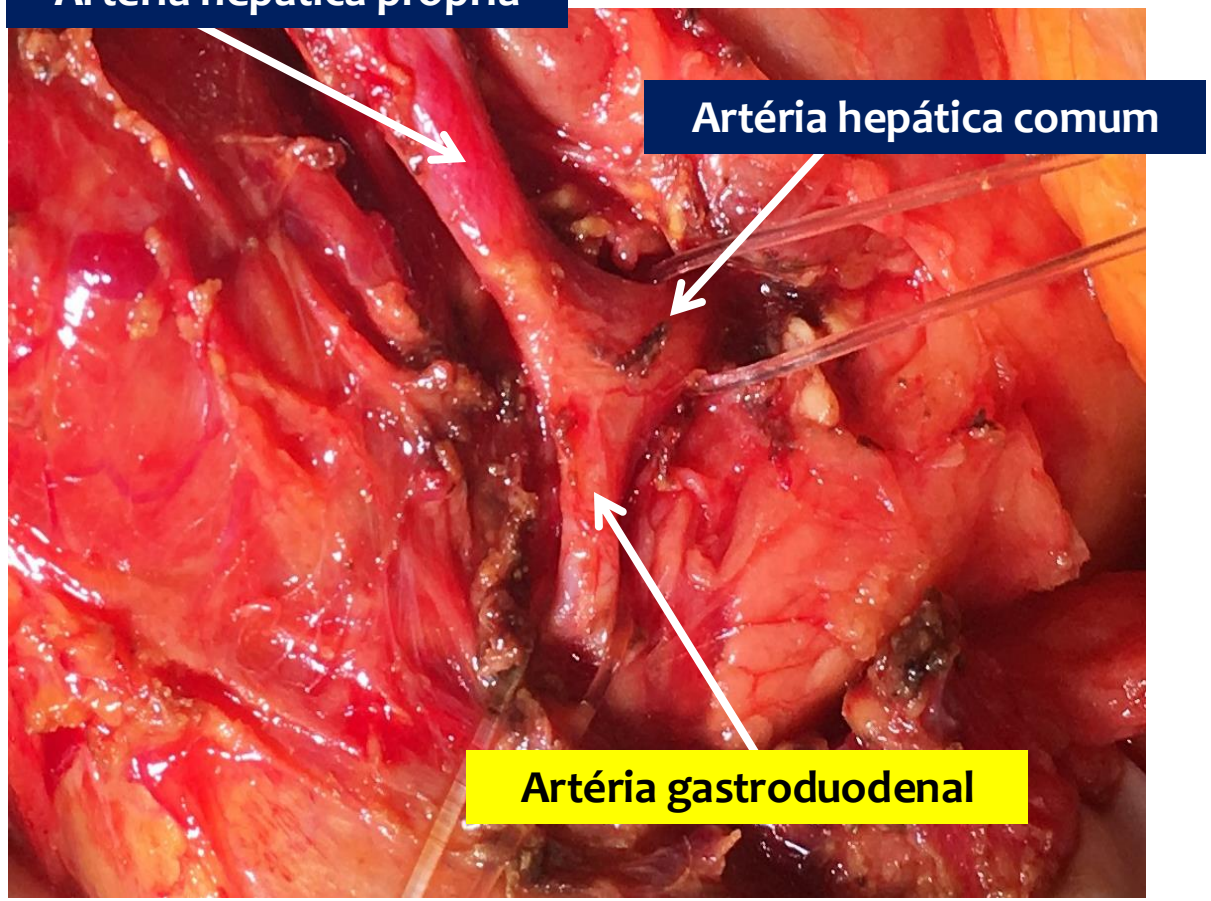


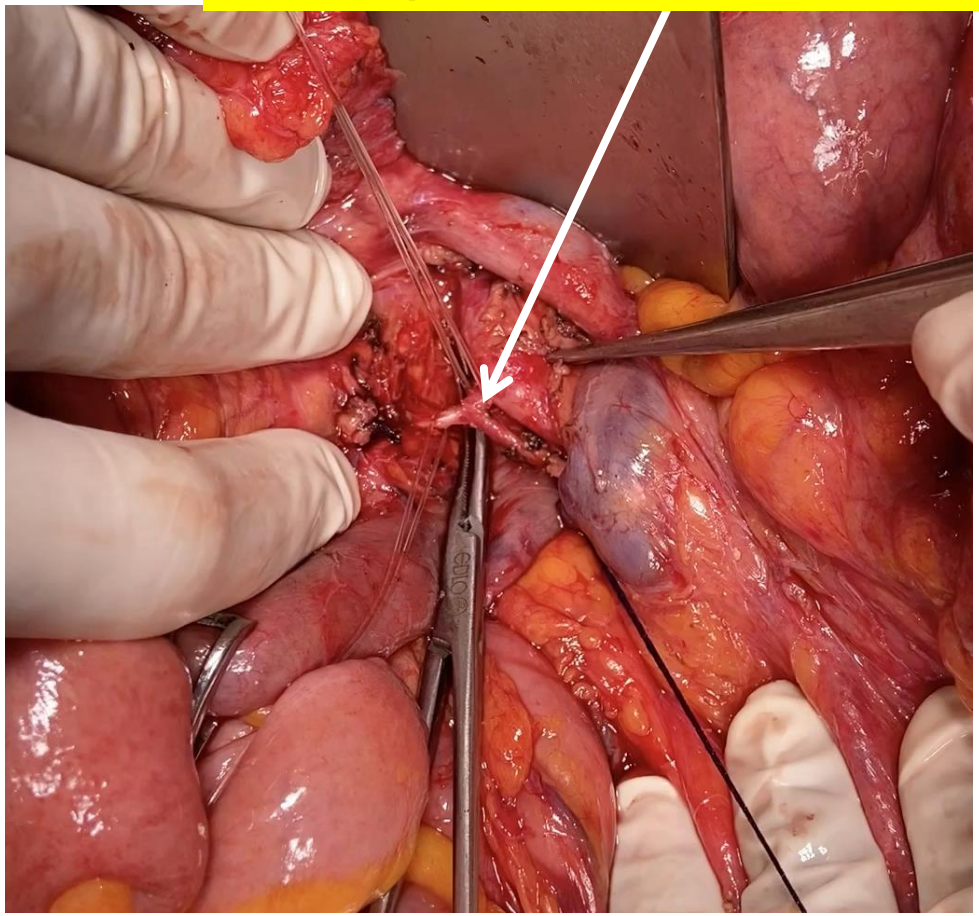
Desenho: Dr. José Maria

Bleeding
Pancreatic fistula
Delayed gastric emptying
Oncology

Fernandes ES, et al. Langenbeck's Arch Surg 2021

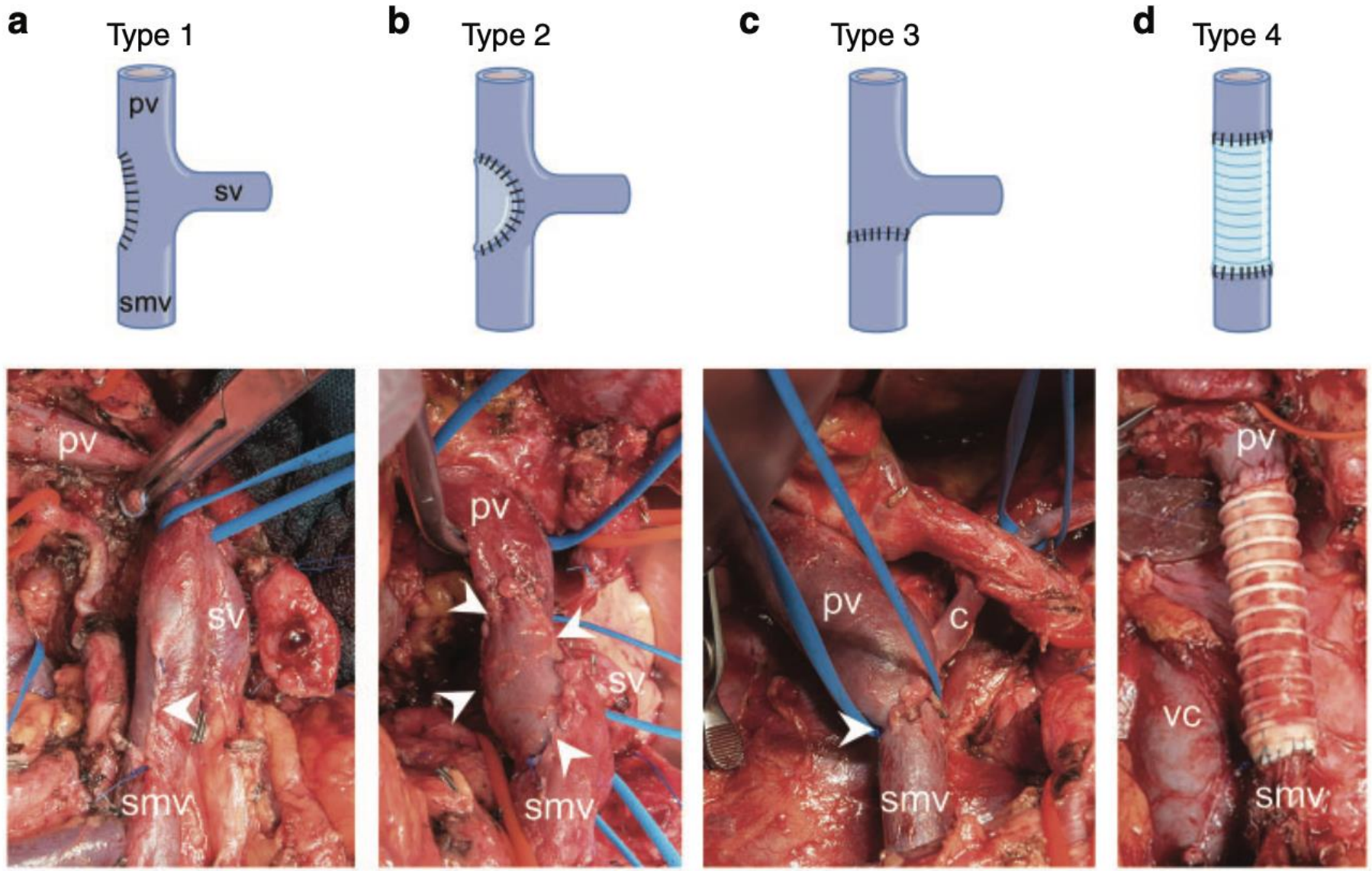
LIGADURA CENTRAL VASCULAR





Controlar sangramento

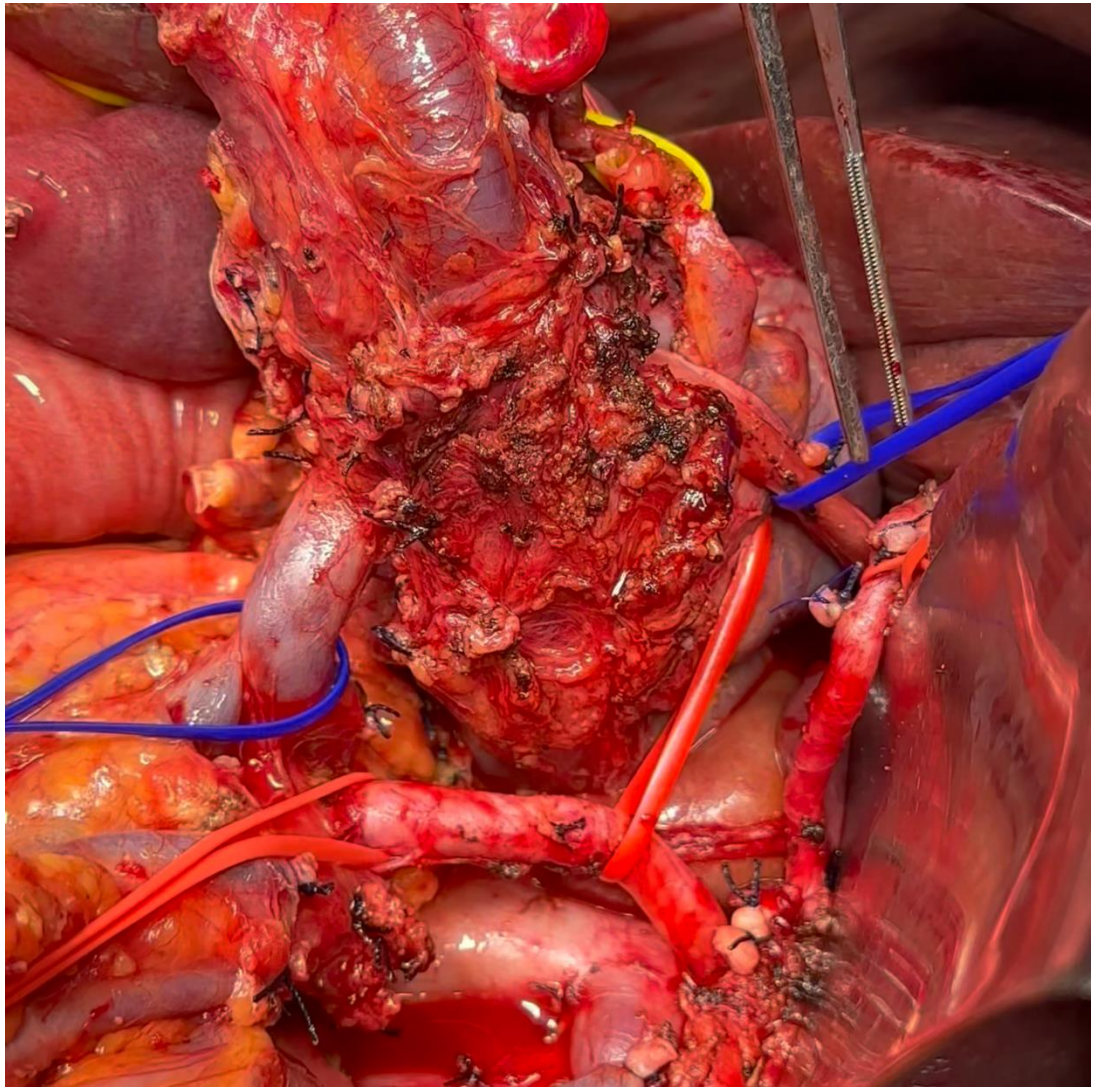
RESSECÇÃO COMO ÚLTIMO PROCEDIMENTO



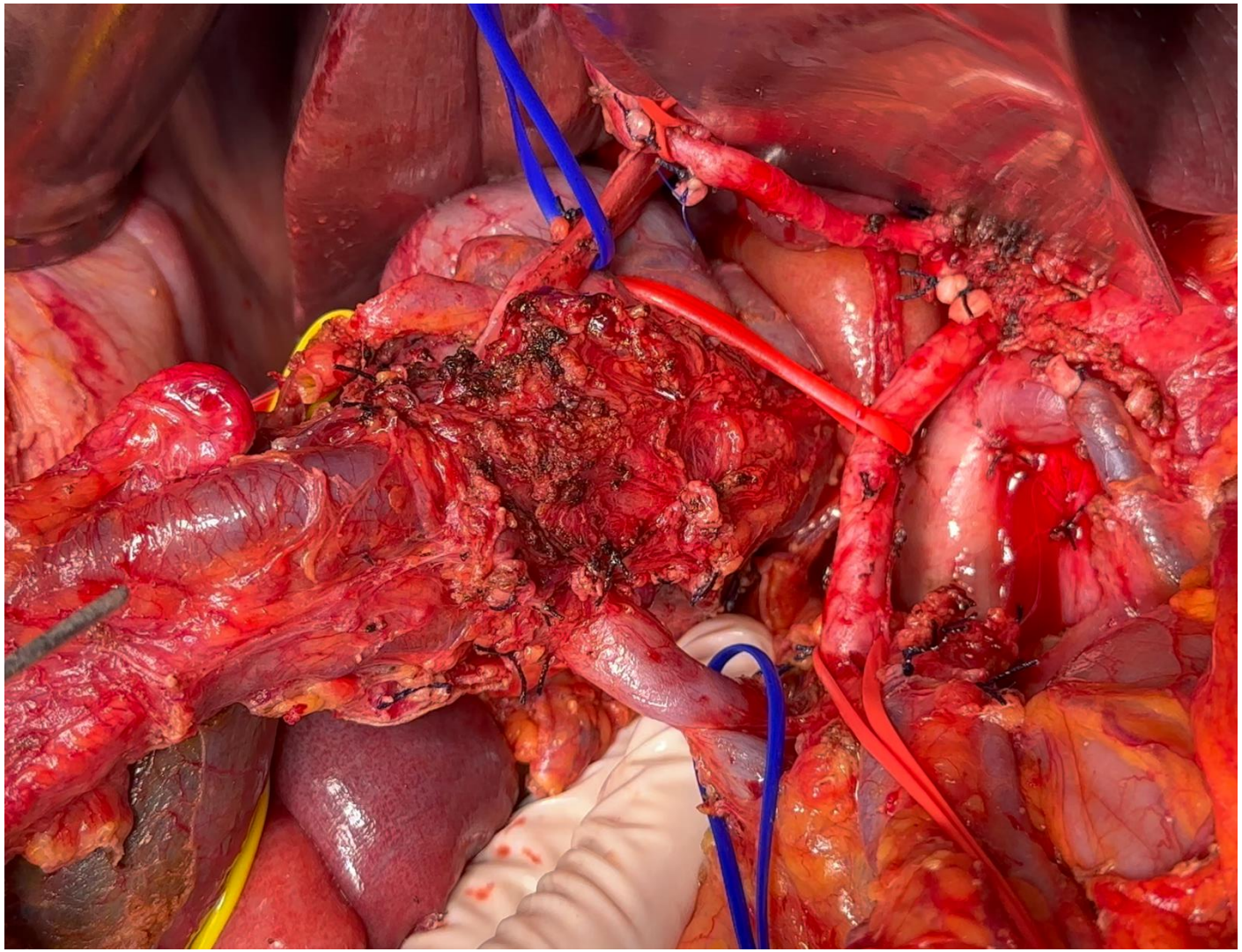
Schneider M, et al. BJS, 2021, 108, 777–85

RESSECÇÃO COMO ÚLTIMO PROCEDIMENTO

RESSECÇÃO COMO ÚLTIMO PROCEDIMENTO



RESSECÇÃO COMO ÚLTIMO PROCEDIMENTO



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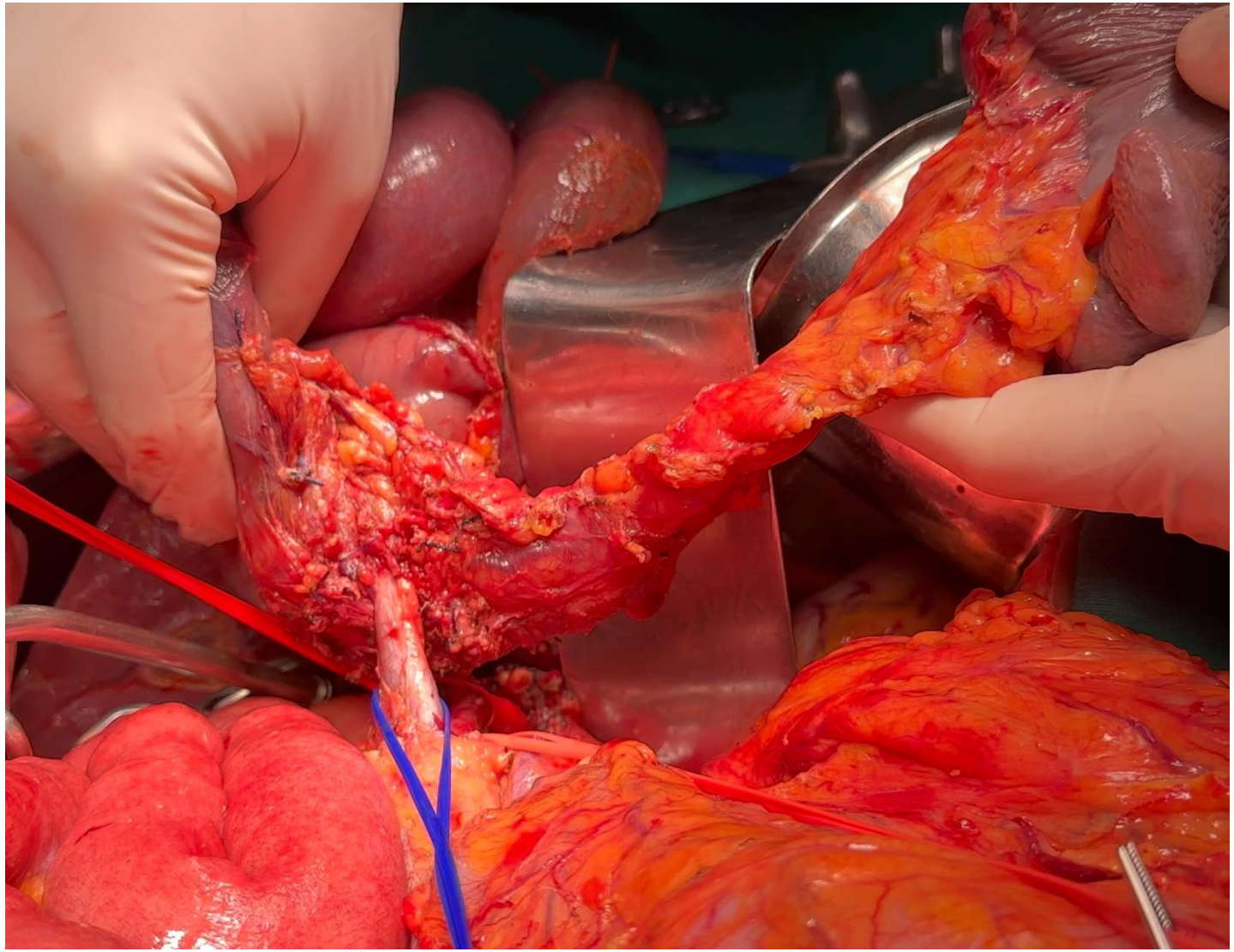
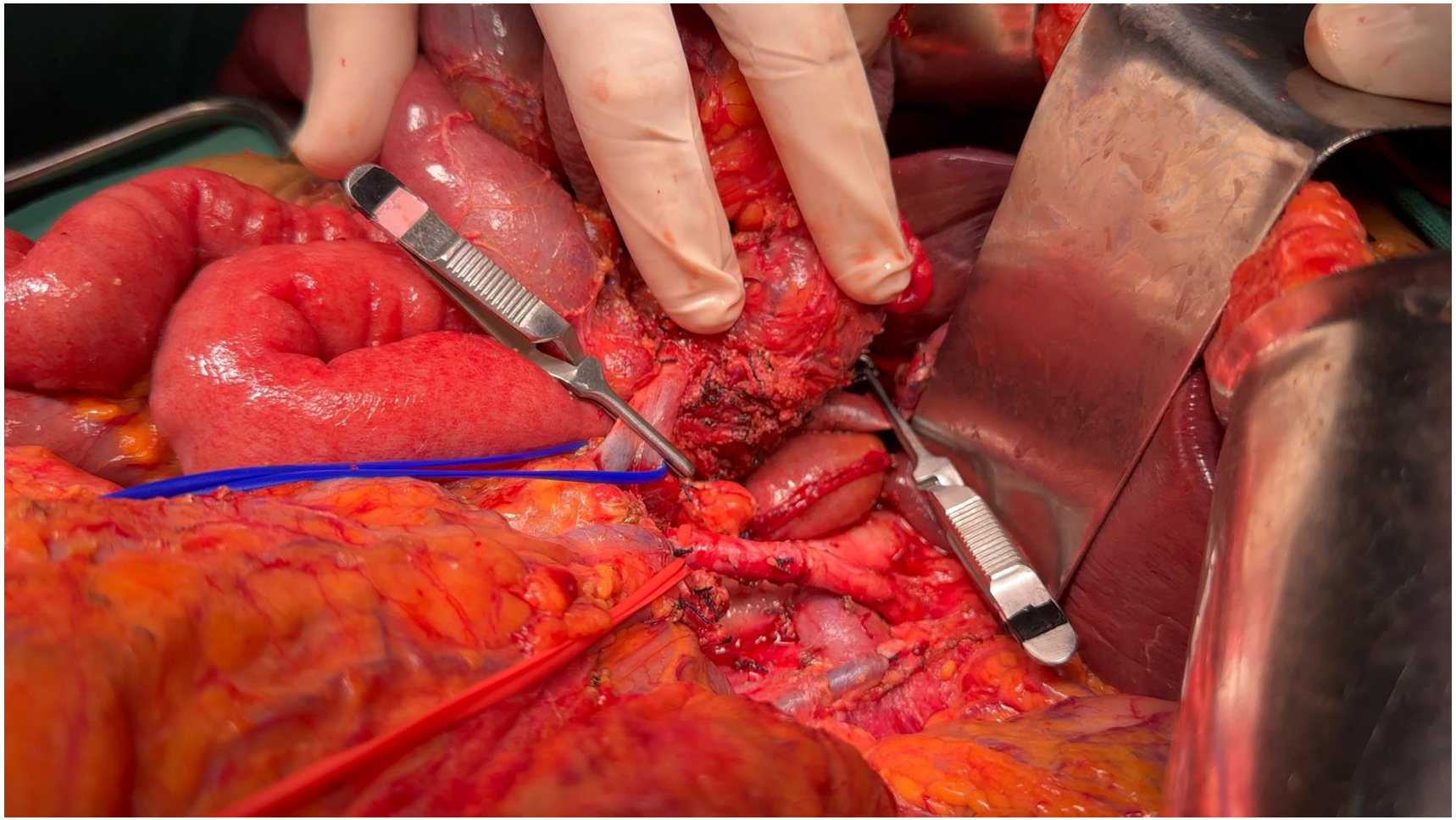
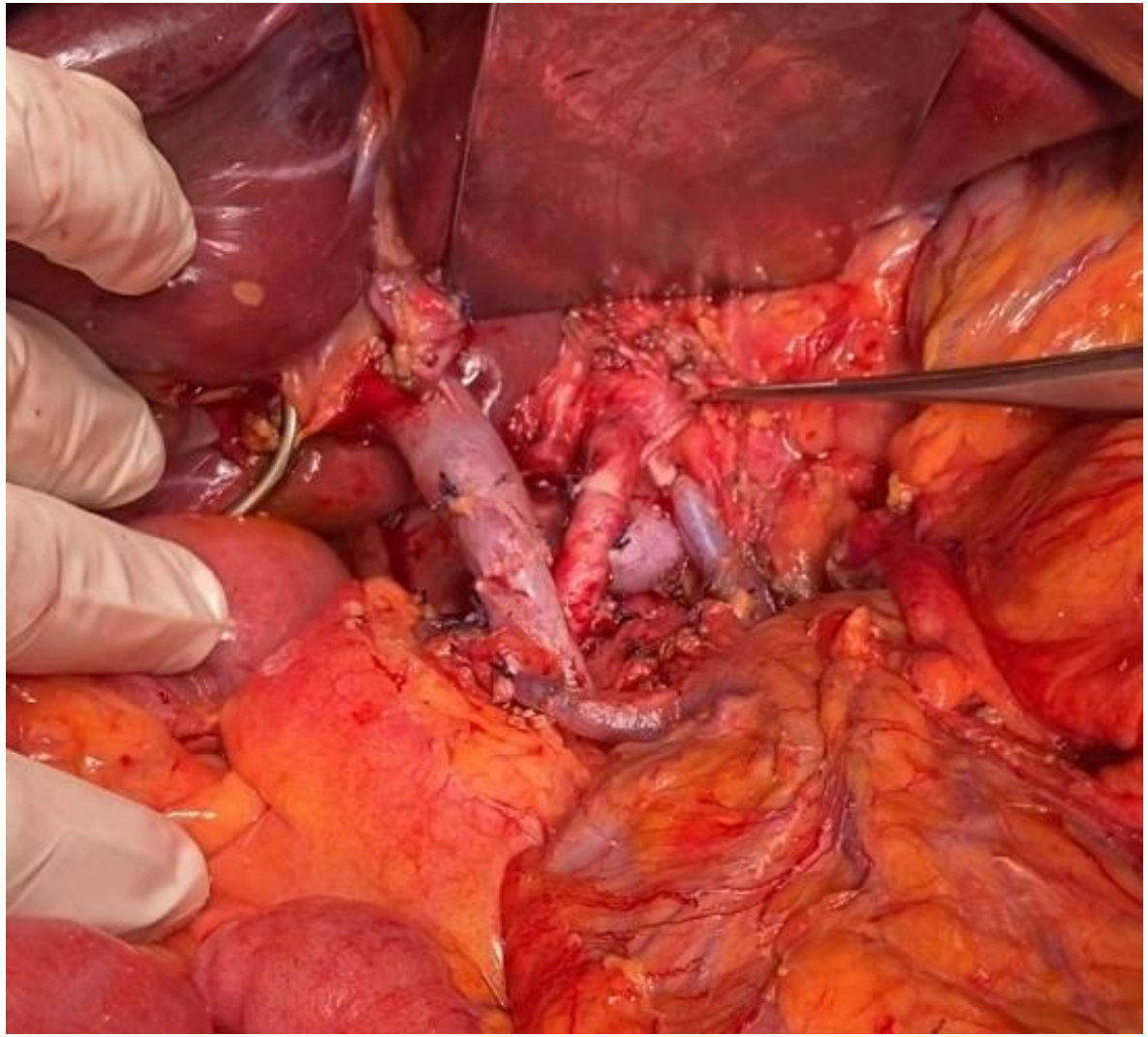


RESSECÇÃO COMO ÚLTIMO PROCEDIMENTO



RECONSTRUÇÃO



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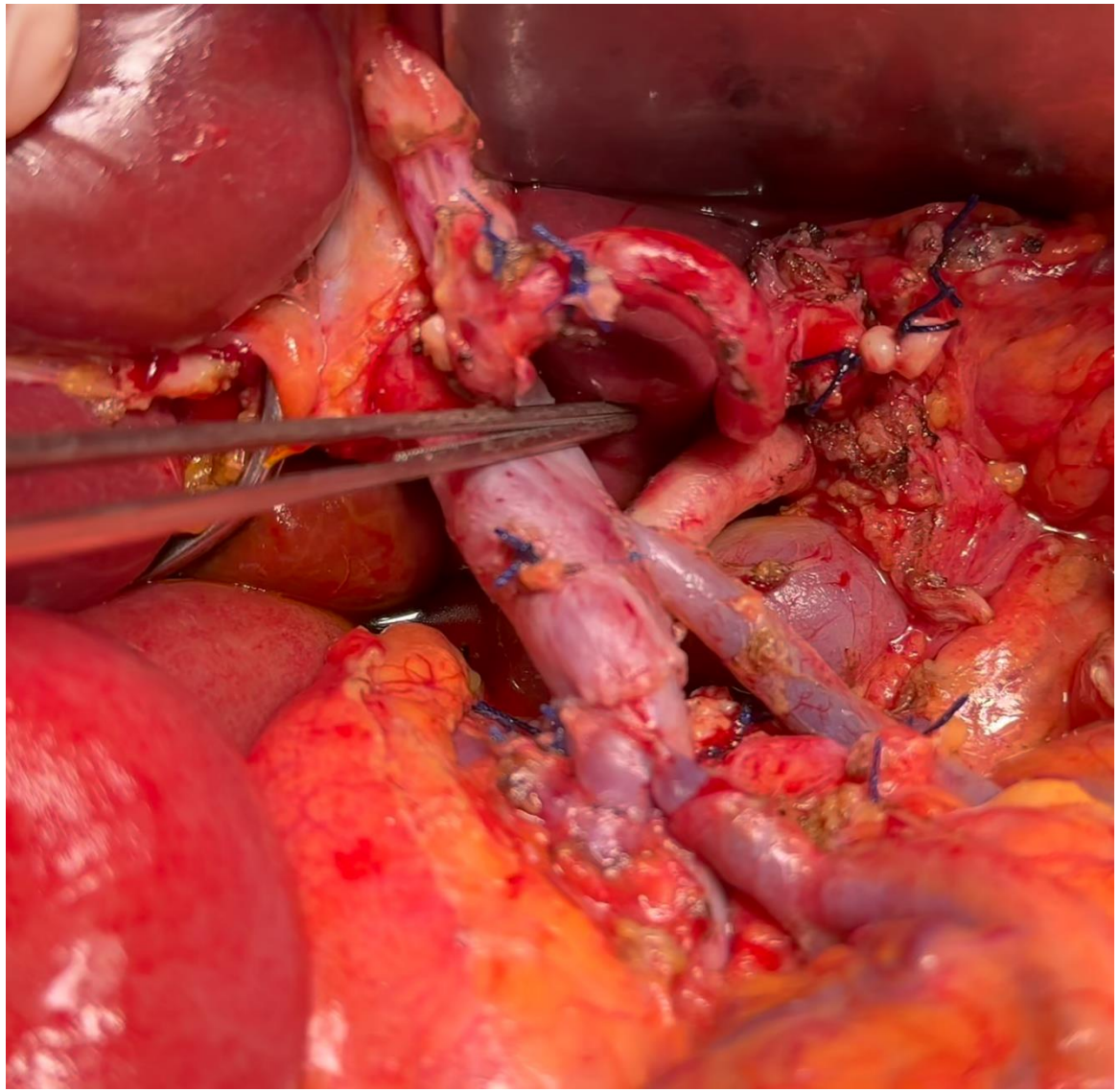

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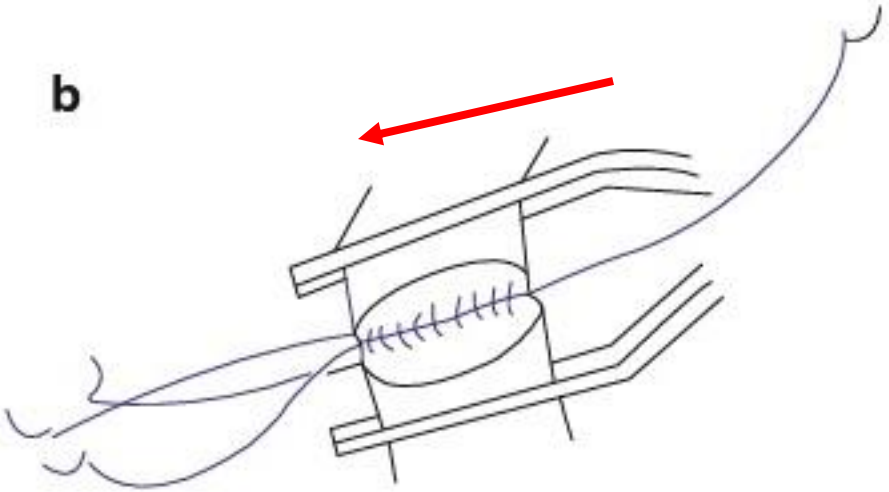
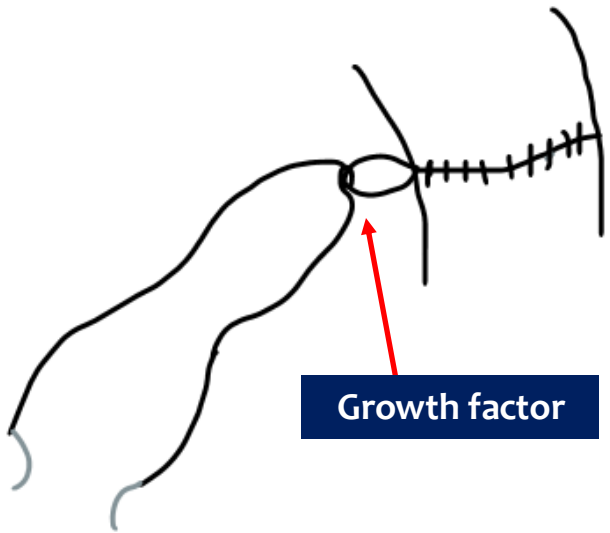
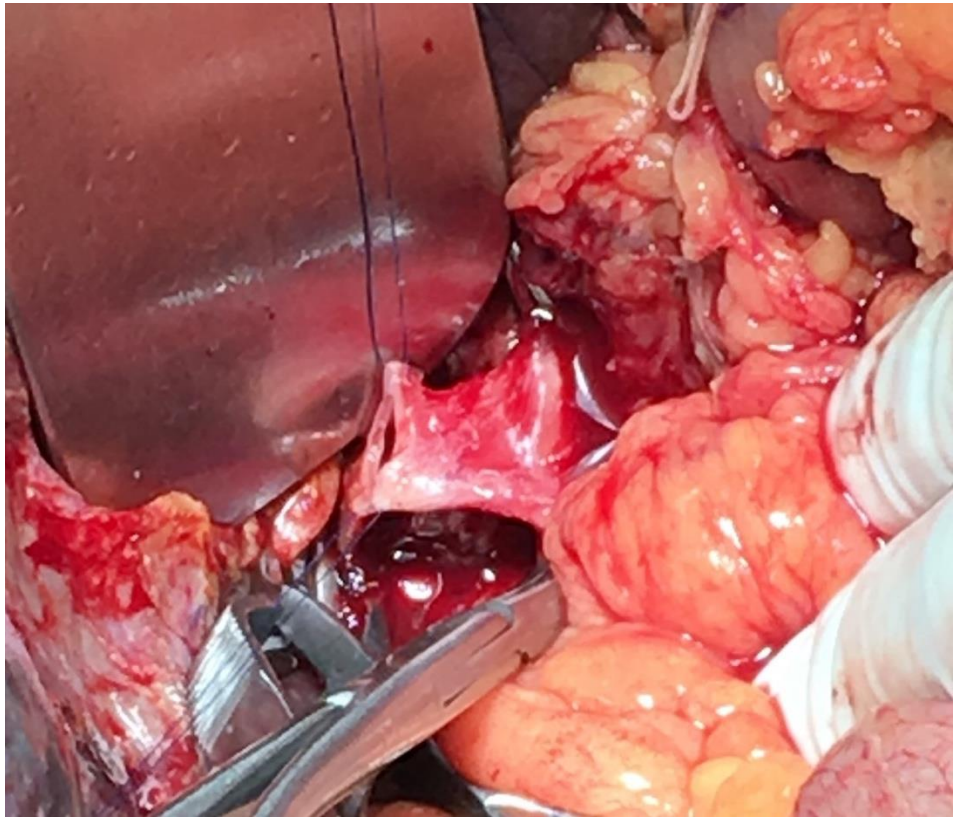
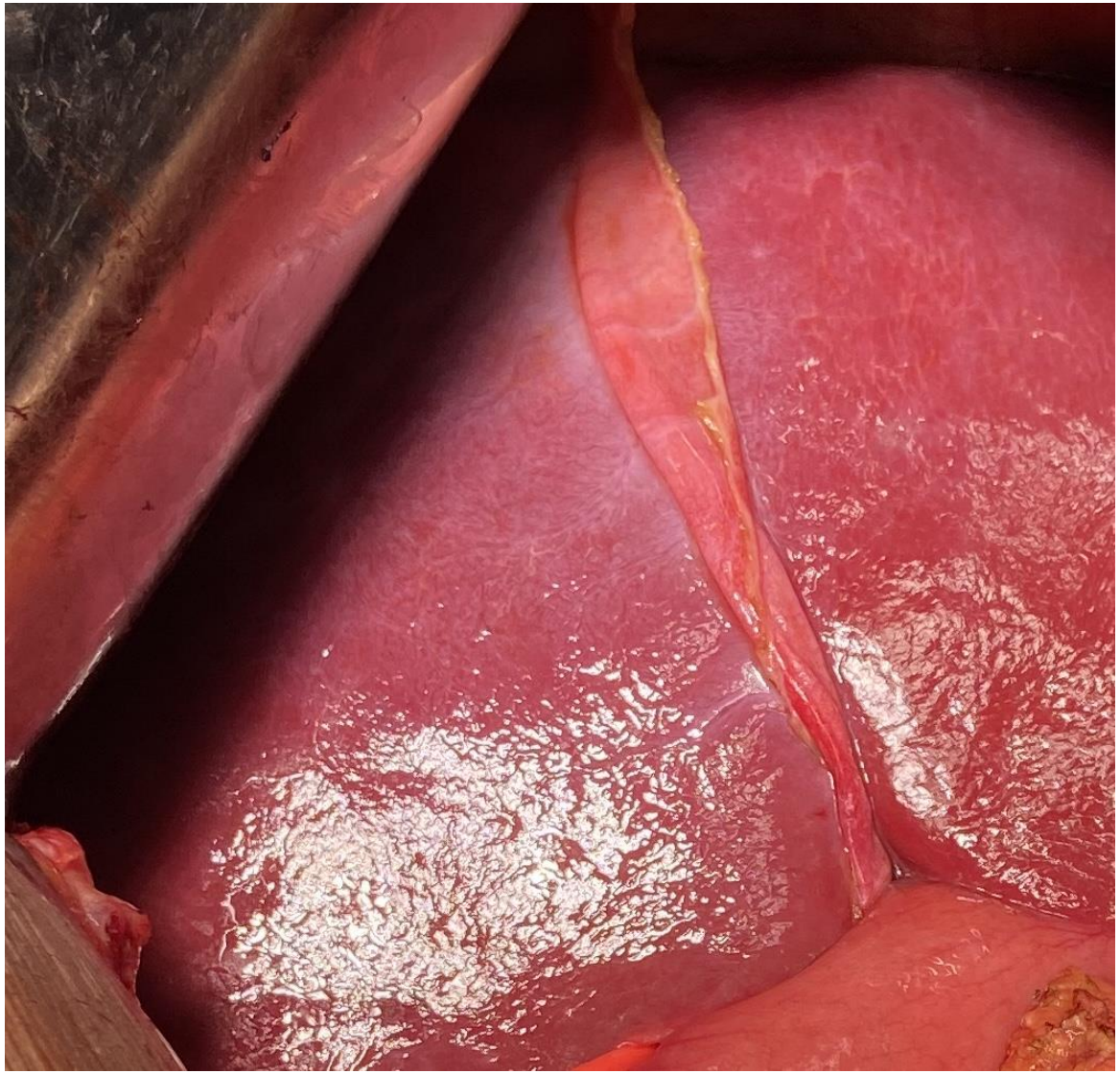






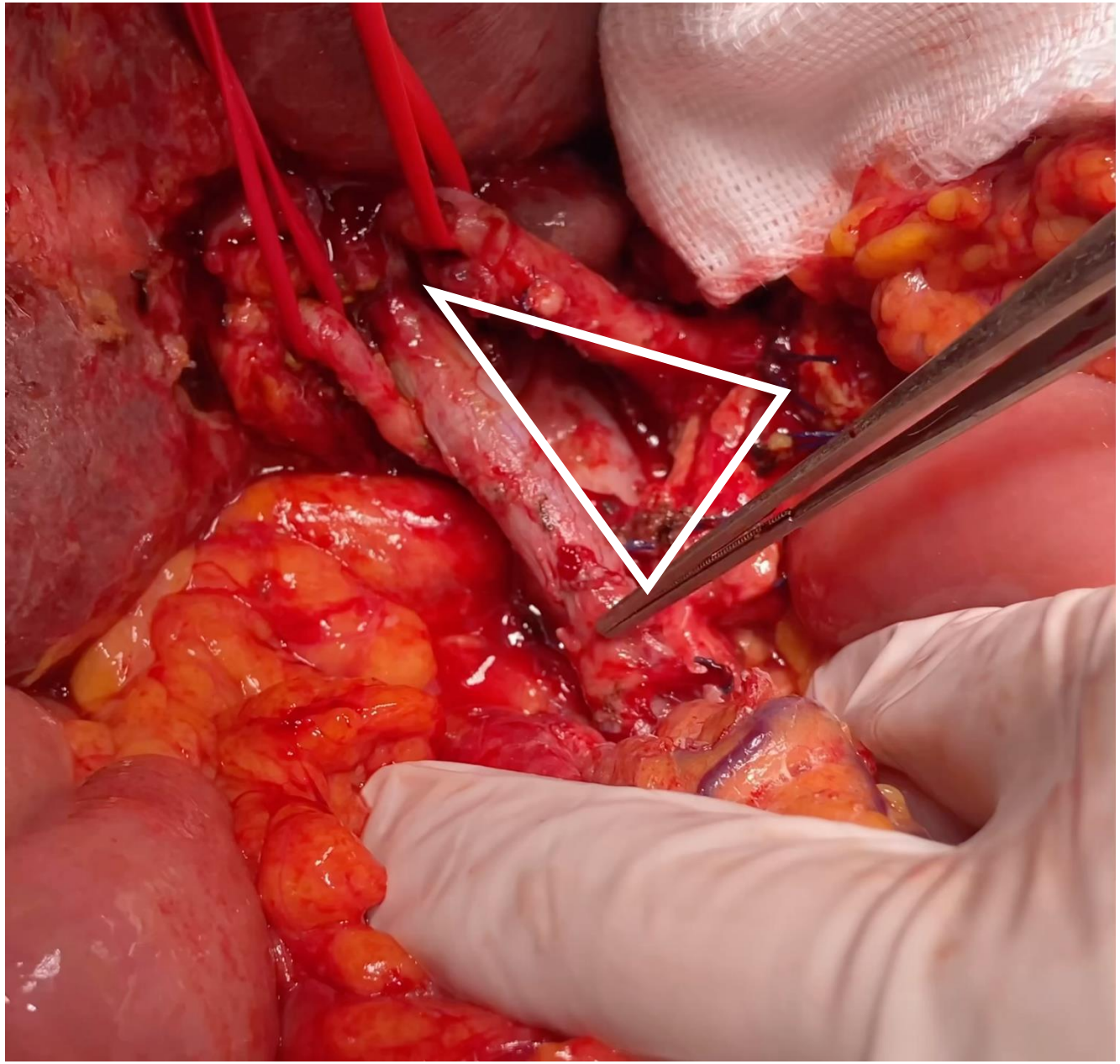
- ❑ Prolene 6.0
- ❑ Duas agulhas
- ❑ Duplo reparo
- ❑ Sutura contínua
- ❑ Início posterior
- ❑ Longe para perto
- ❑ Flushing
- ❑ Heparina
- ❑ Growth factor

MOBILIZAR O FÍGADO



- ❑ Liberação de ligamentos
- ❑ Compressas no subfrênico

TRIANGLE OPERATION



REDUZIR A NECESSIDADE DE ENXERTOS

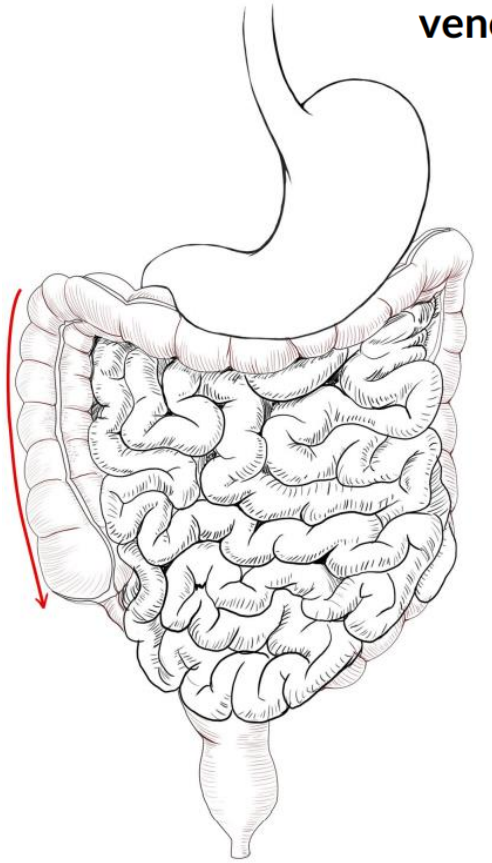
Received: 29 July 2020 | Accepted: 10 August 2020
DOI: 10.1002/jso.26180

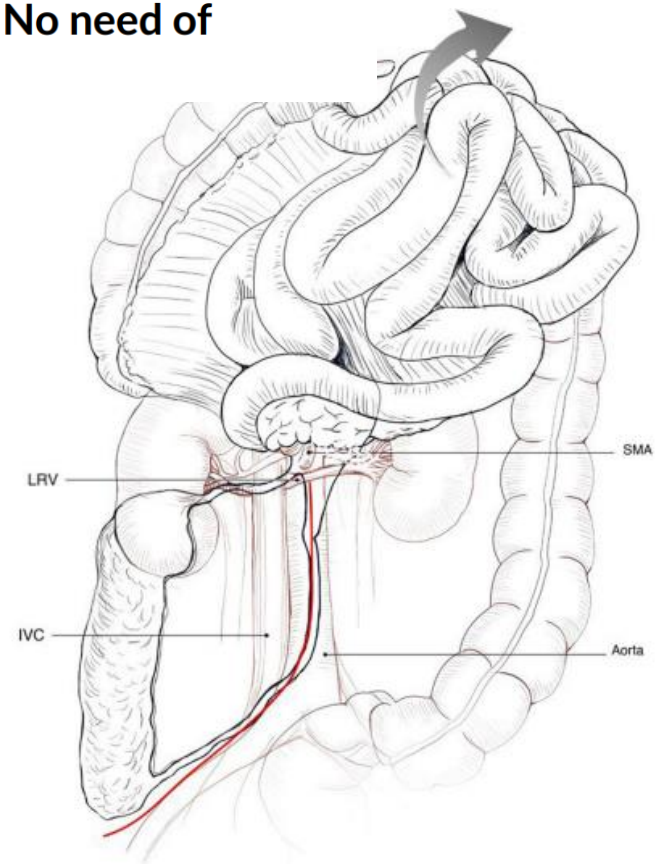
Check for updates

Journal of SURGICAL ONCOLOGY WILEY

HOW I DO IT

Cattell-Braasch maneuver in pancreatic surgery. No need of venous graft for vascular resection





CATTELL-BRAASCH MANEUVER

Muttillo EM, et al. J Surg Oncol 2020

REDUZIR A NECESSIDADE DE ENXERTOS

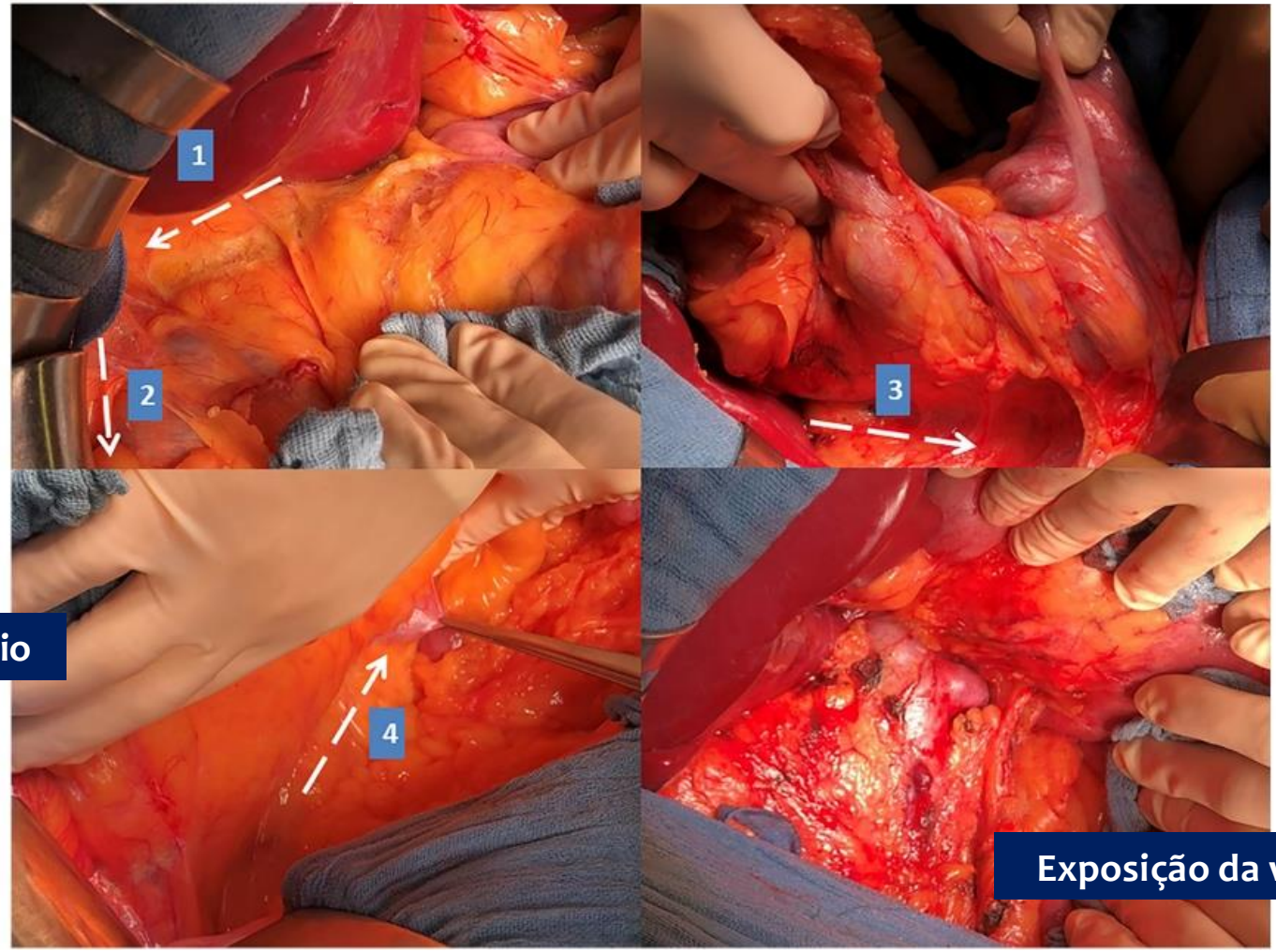
Journal of Gastrointestinal Surgery
https://doi.org/10.1007/s11605-021-05012-2

HOW I DO IT

Cattel-Braasch

Pancreaticoduodenectomy with Segmental Venous Resection: a Standardized Technique Avoiding Graft Interposition

Counter-clockwise



Raiz do mesentério

Exposição da veia renal esquerda

Addeo P, Bachellier P. J Gastrointest Surg 2021

Langenbeck's Archives of Surgery
https://doi.org/10.1007/s00423-021-02211-y

REDUZIR A NECESSIDADE DE ENXERTOS

REVIEW ARTICLE

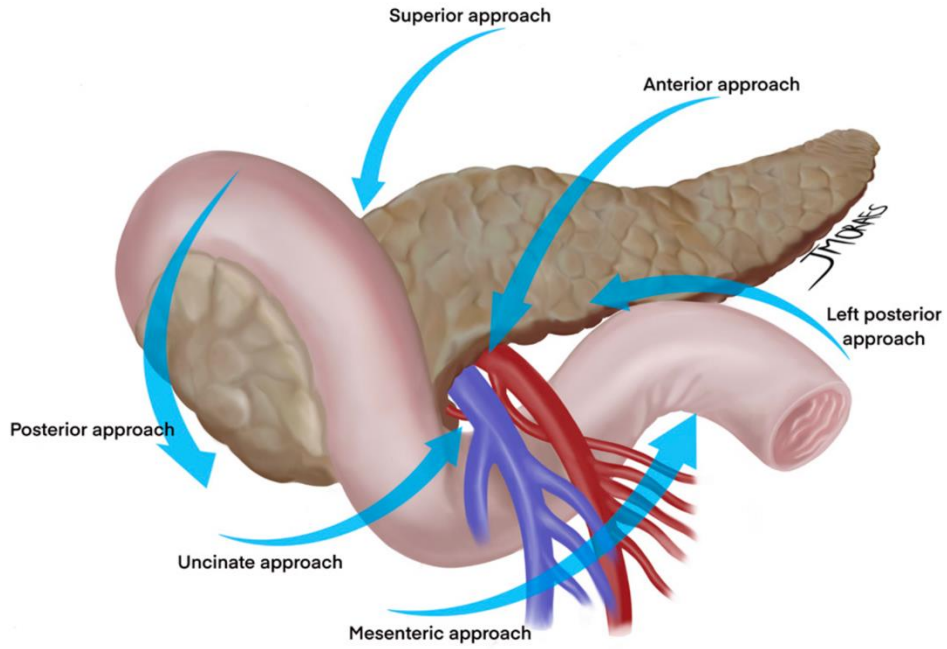
What do surgeons need to know about the mesopancreas

Eduardo de Souza M. Fernandes [1,2] · Oliver Strobel [3,4] · Camila Girão [1,2] · Jose Maria A. Moraes-Junior [5,6] · Orlando Jorge M. Torres [5,6]

Table 3 Advantages of the artery-first approach (SHARMA) [35]

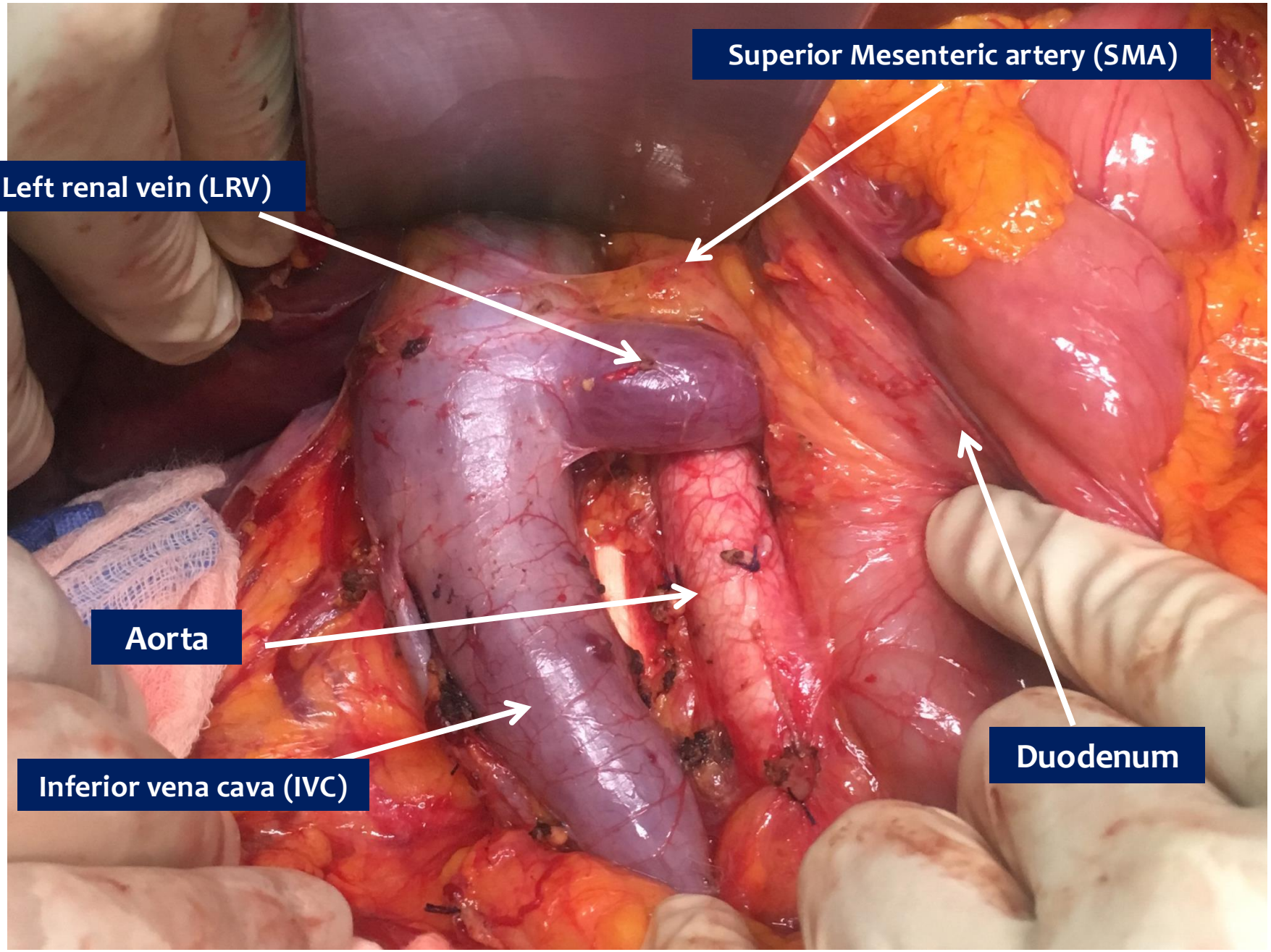
1. Resection without breaching the tumor extension plane, thereby minimizing cell spillage
2. Increases curative (R0) resection, decreases local recurrence
3. Complete resection of peripancreatic retroperitoneal tissue around the plexuses
4. Increased lymph nodal clearance
5. Early assessment of non-resectability (SMA involvement), avoiding useless R2 resections
6. Better delineation of SMA and identification of RHA anomalies
7. Easier en bloc resection and reconstruction of SMV-PV by "no touch" technique
8. Reduced need for graft substitutions
9. Reduced operative time and blood loss (early ligation of IPDA/JA1)

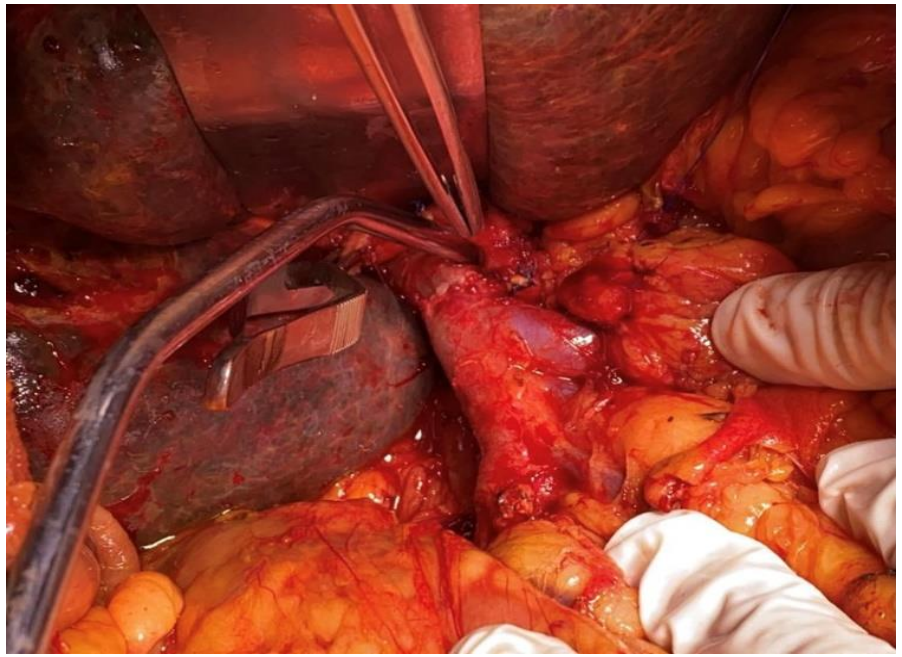
Fernandes ESM, et al. Langenbeck's Arch Surg 2021

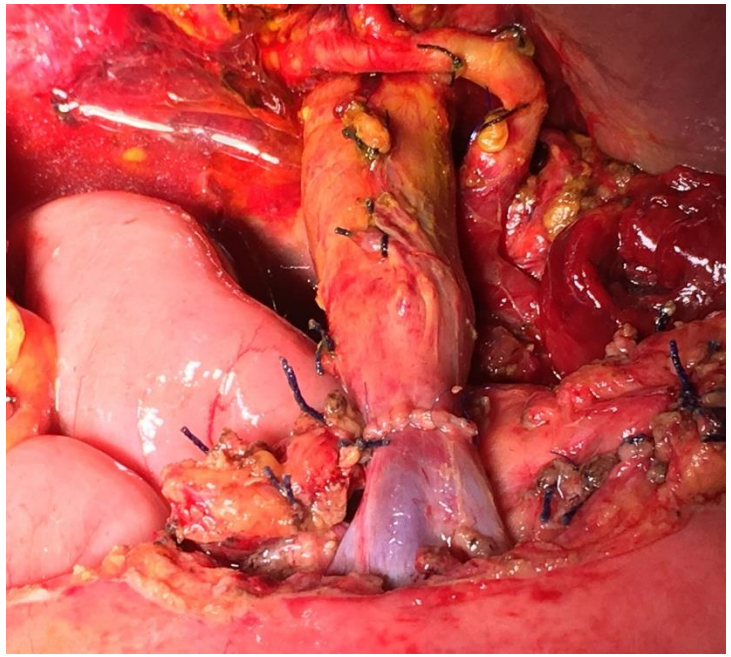


Fernandes ESM, et al. J Gastrointest Oncol 2023

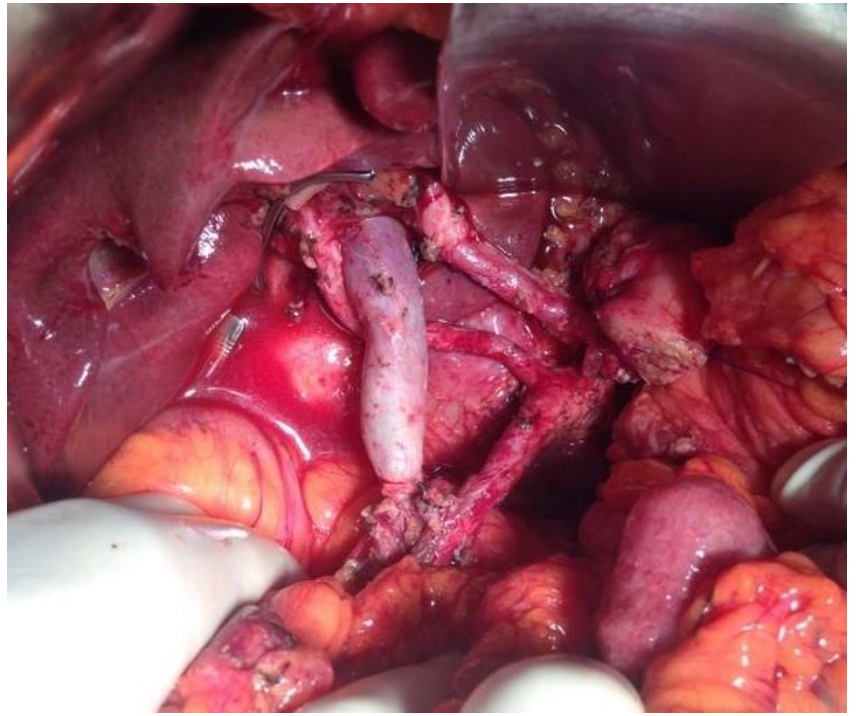
ARTERY FIRST

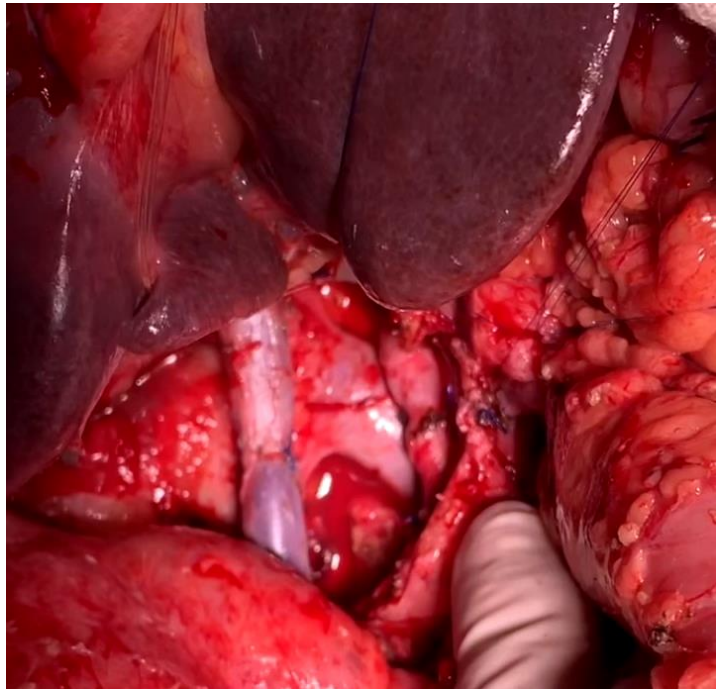

Superior Mesenteric artery (SMA)
Left renal vein (LRV)
Aorta
Inferior vena cava (IVC)
Duodenum

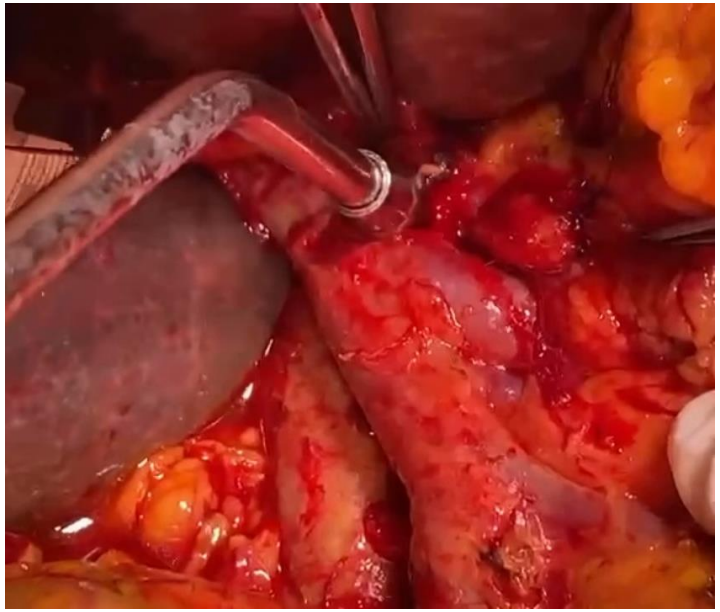


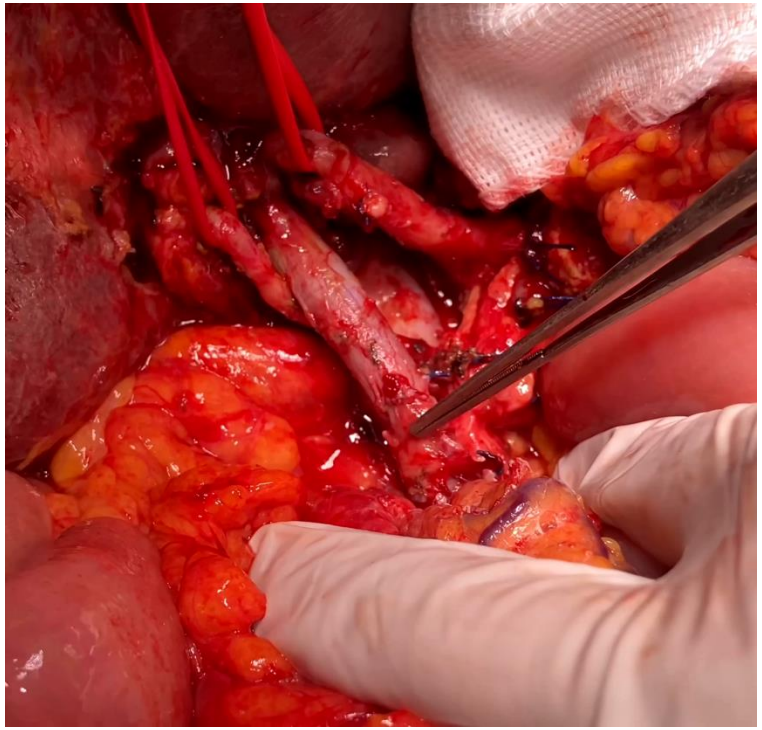


NO GRAFT









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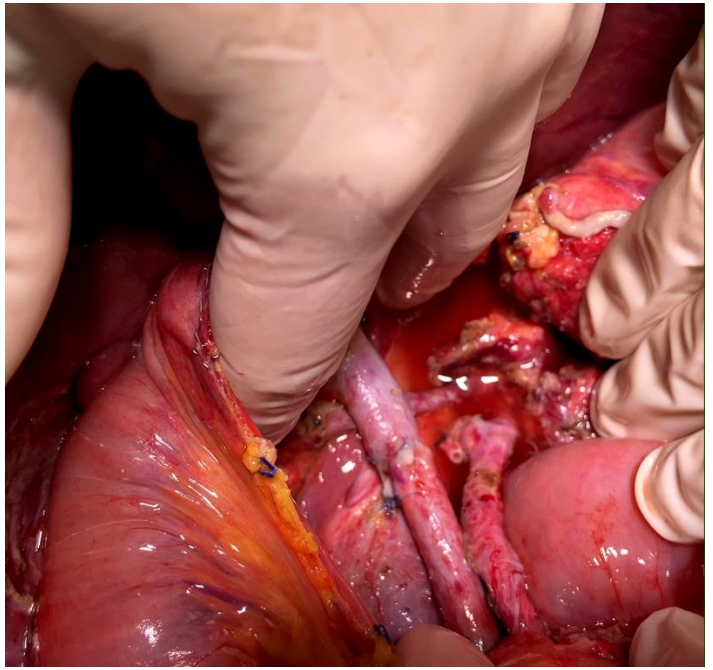
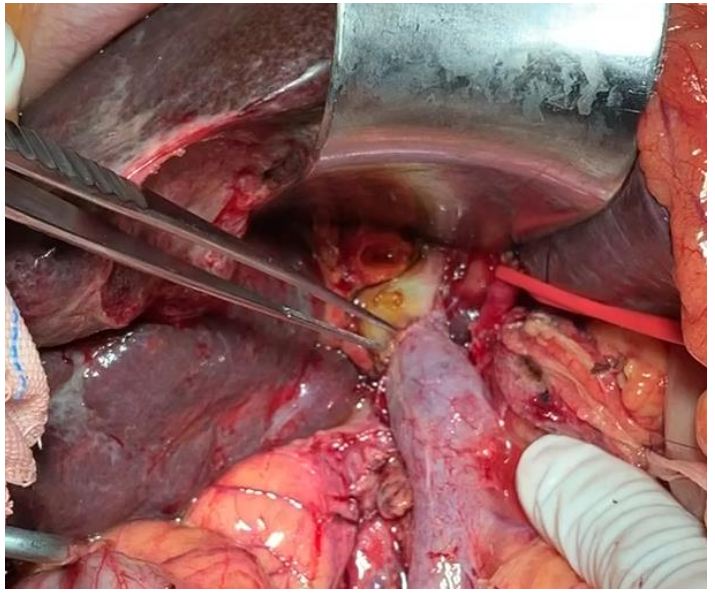
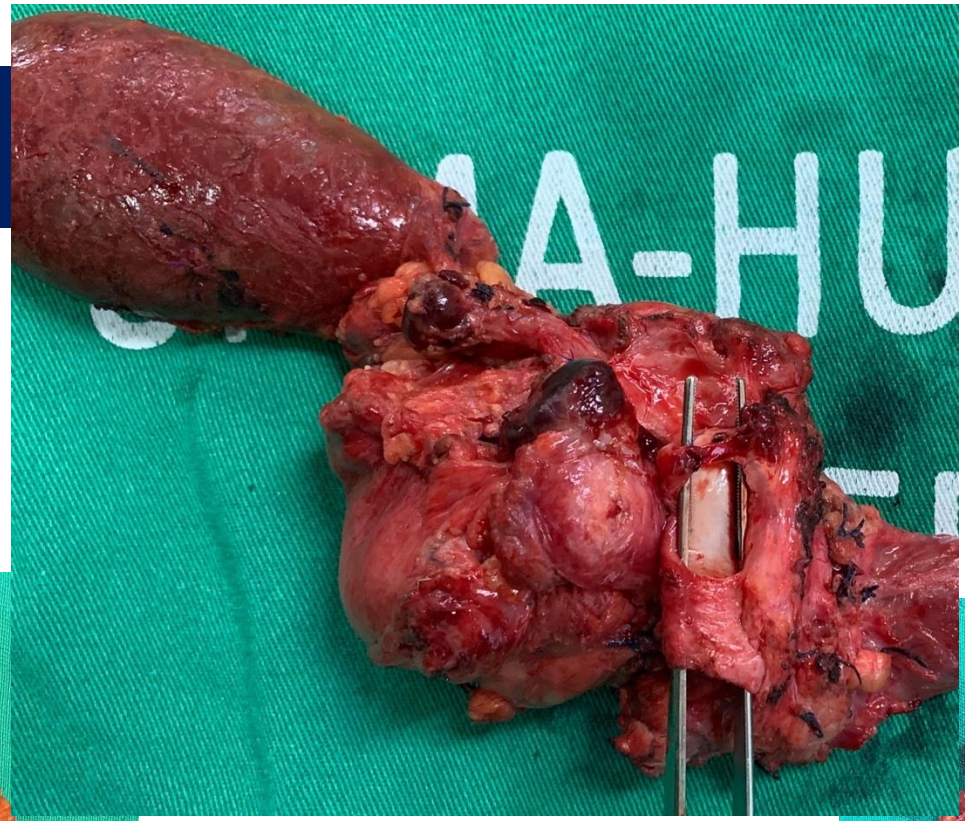
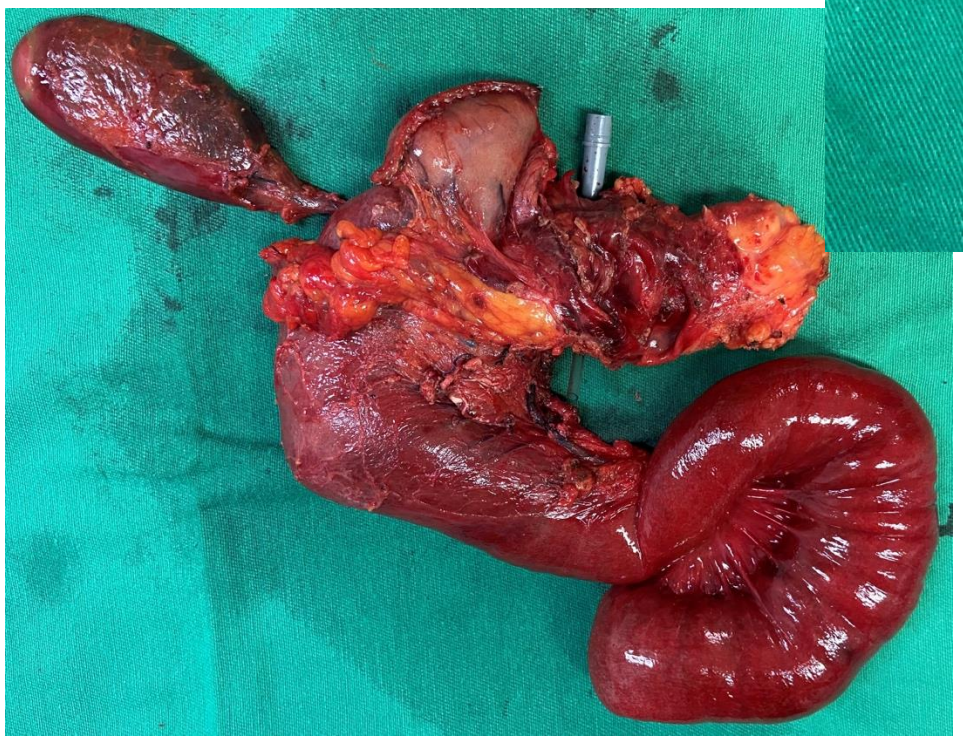
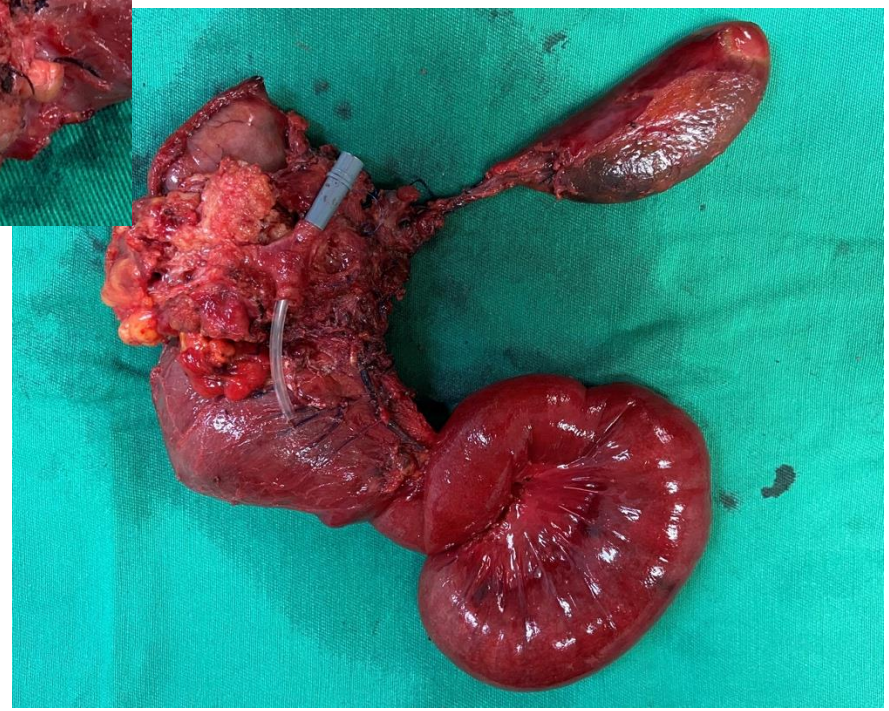


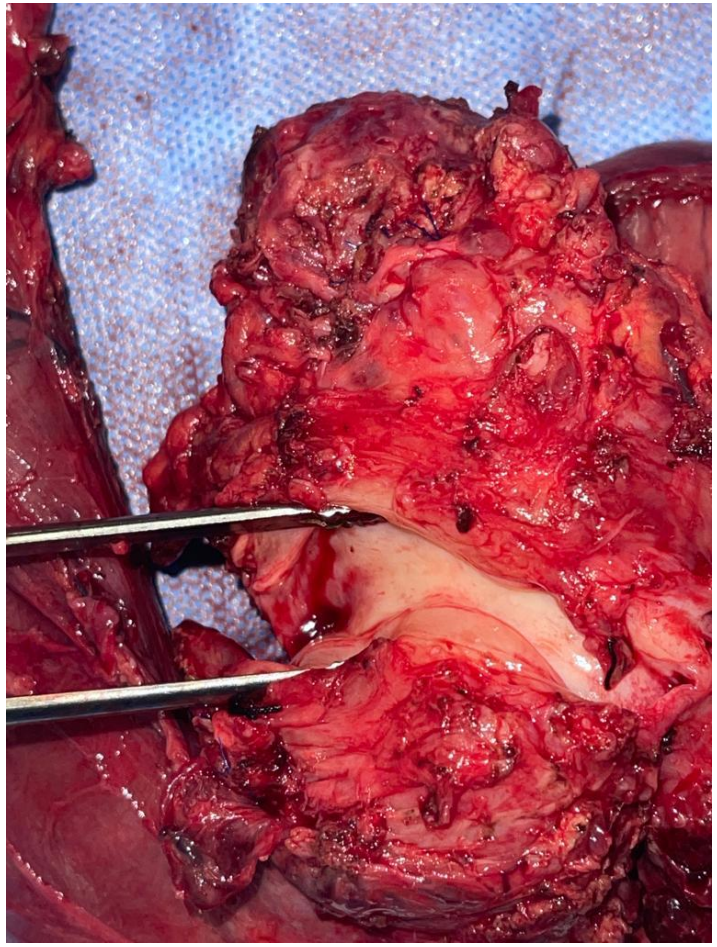


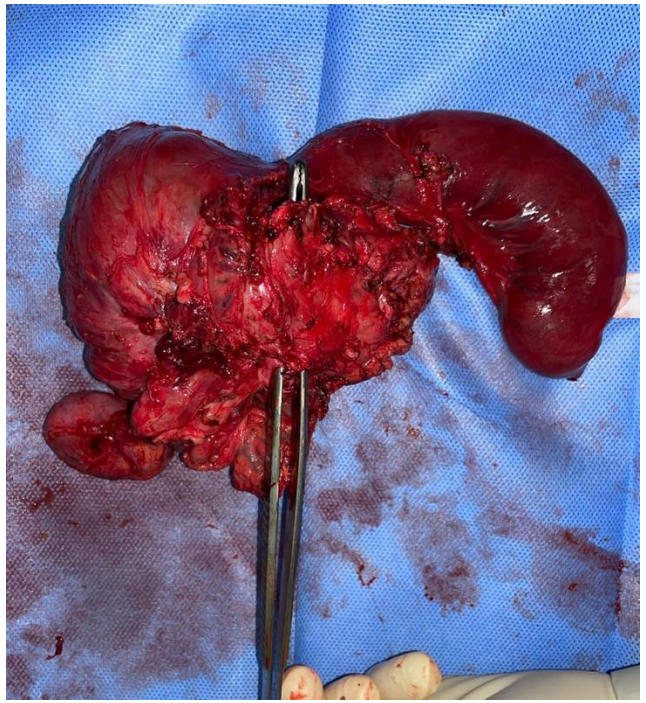
LIMITE PARA RECONSTRUÇÃO SEM ENXERTO



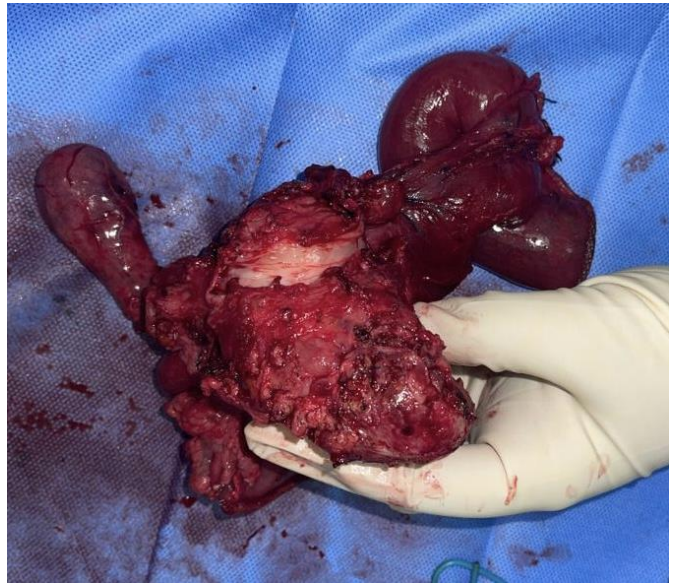








Sem enxerto



Jakarta (Indonesia)

ENXERTOS

- ❑ Veia safena
- ❑ Veia jugular interna esquerda
- ❑ Veia renal esquerda
- ❑ Veia ilíaca externa
- ❑ Veia gonadal
- ❑ Veia femoral
- ❑ Veia de cadáver
- ❑ Patch peritoneal
- ❑ Ligamento falciforme
- ❑ Pericárdio bovino
- ❑ Enxerto de PTFE

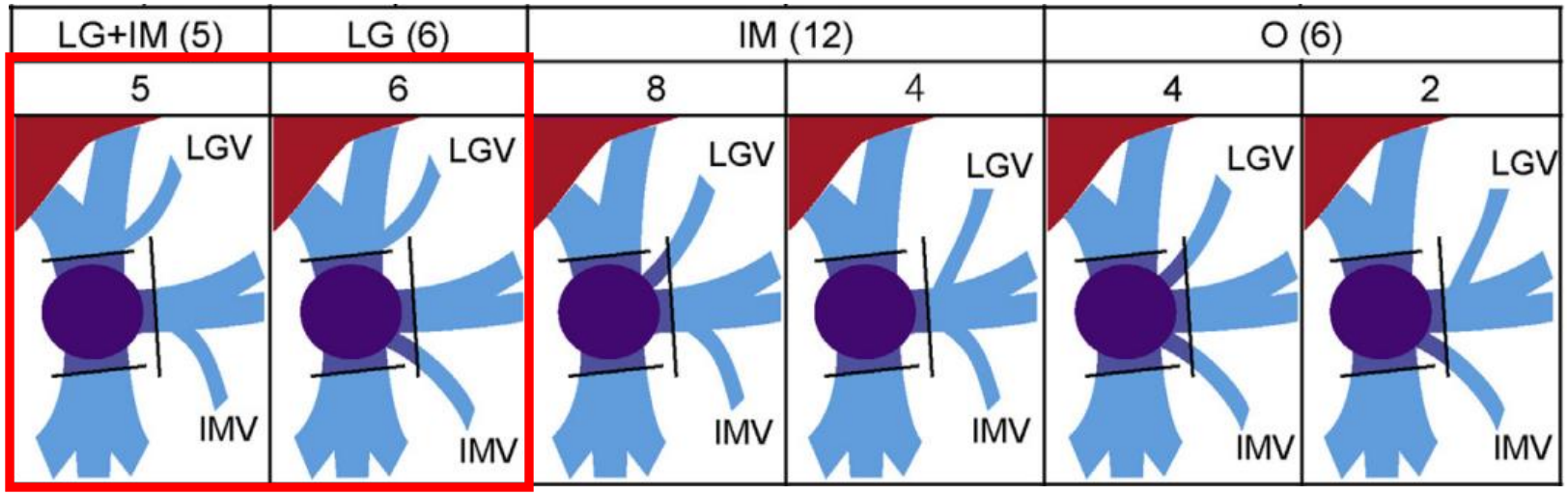
REMANESCENTE DA VEIA ESPLÊNICA

http://dx.doi.org/10.1016/j.hpb.2017.02.438 HPB

ORIGINAL ARTICLE

Splenic vein reconstruction is unnecessary in pancreatoduodenectomy combined with resection of the superior mesenteric vein–portal vein confluence according to short-term outcomes

Hipertensão porta esquerda



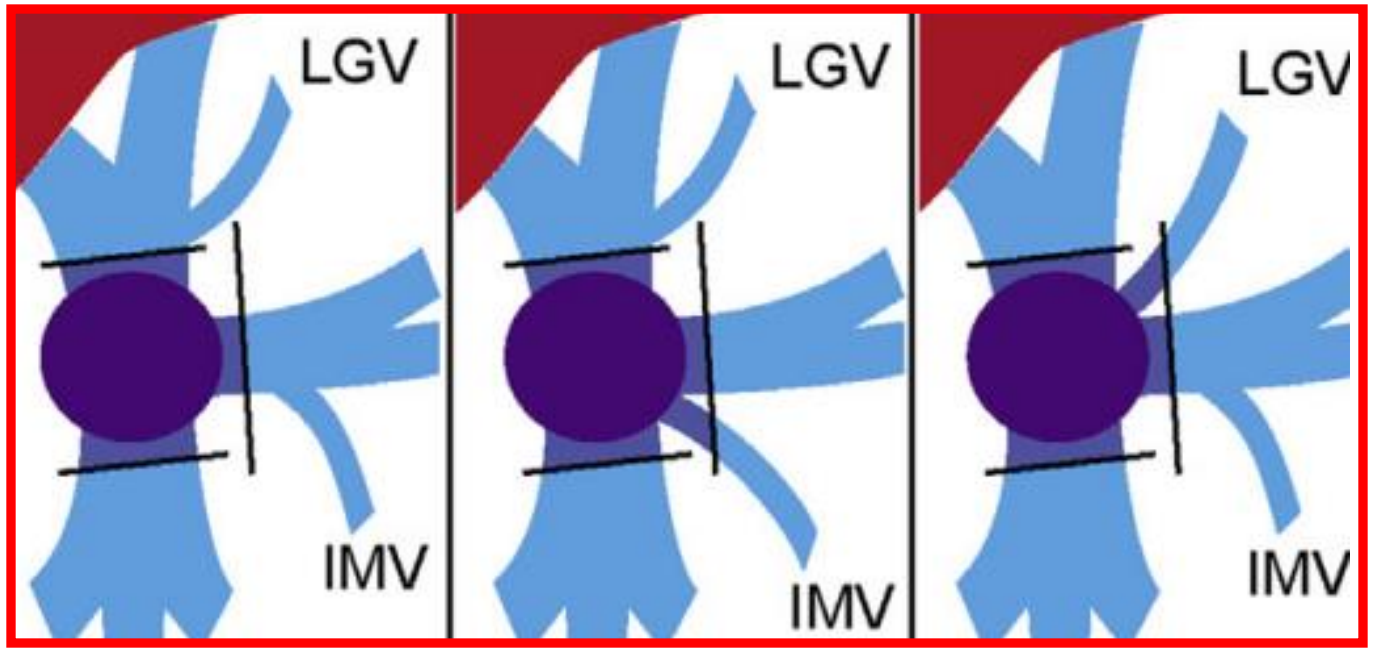
Veia gástrica esquerda
Veia mesentérica inferior

- **Veia gástrica esquerda – Veia porta**
- **Veia mesentérica inferior – Veia esplênica**

Tanaka H, et al. HPB 2017

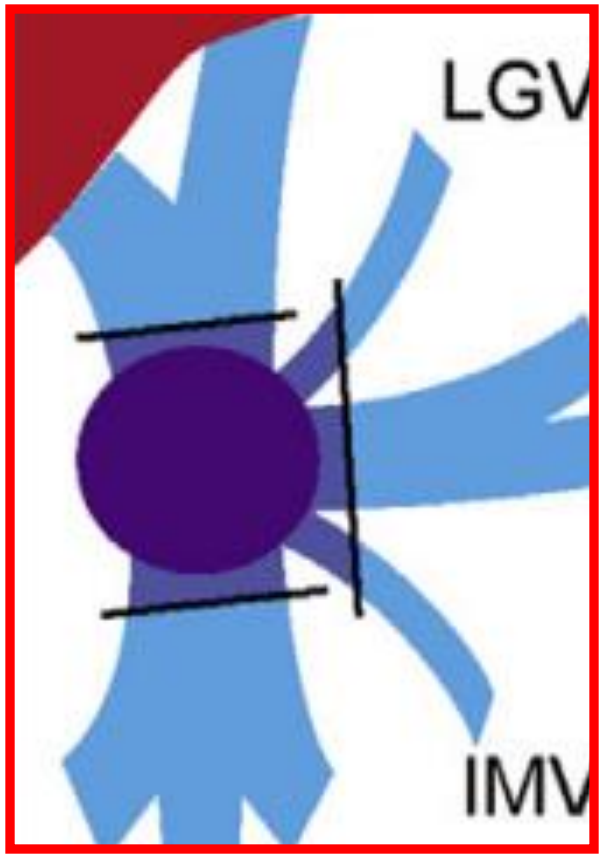
REMANESCENTE DA VEIA ESPLÊNICA

Reconstrução desnecessária



Veia gástrica esquerda
Veia mesentérica inferior

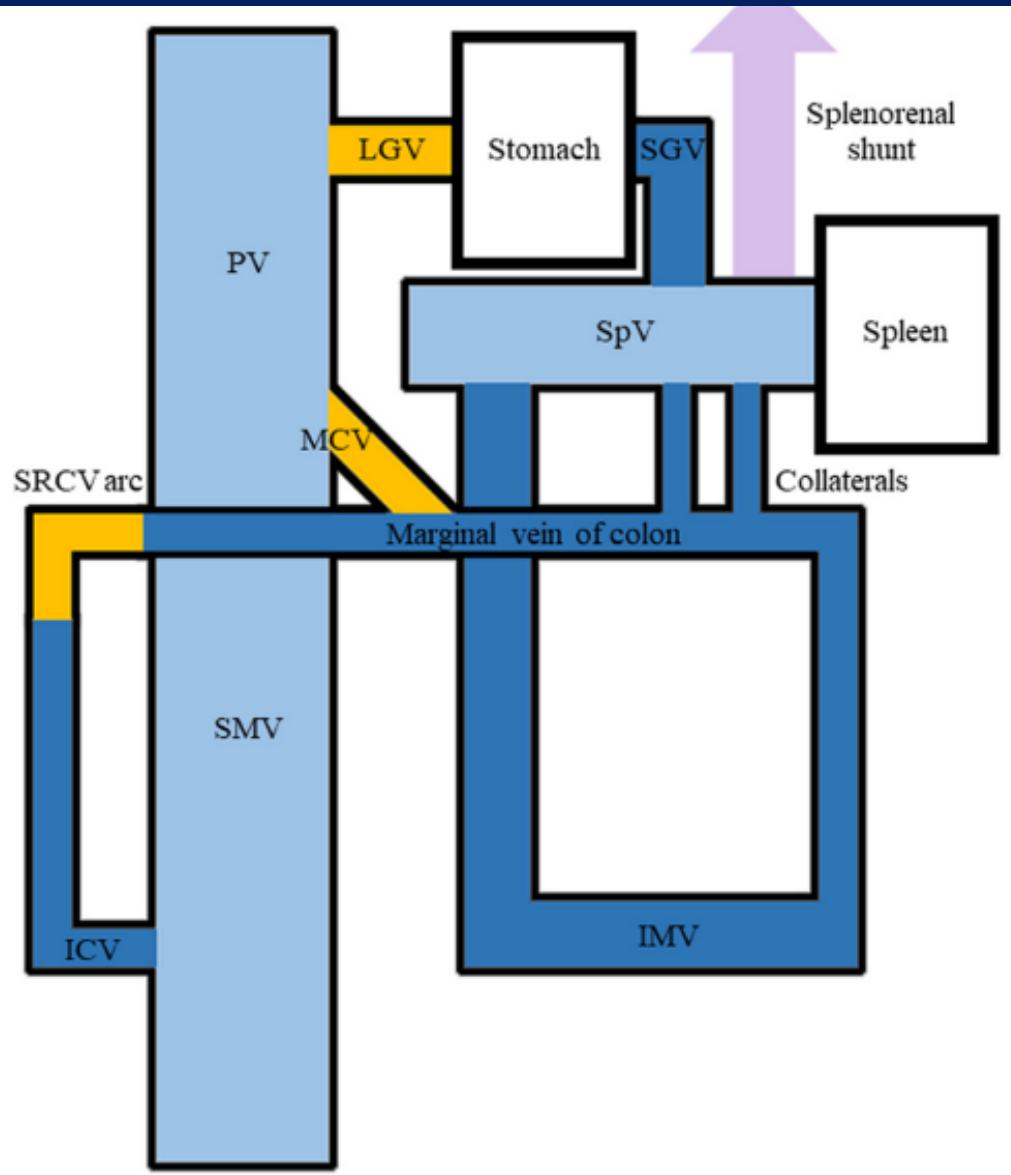
Reconstruir



- ❑ Veia gástrica esquerda – Veia porta
- ❑ Veia mesentérica inferior – Veia esplênica

Tanaka H, et al. HPB 2017

REMANESCENTE DA VEIA ESPLÊNICA

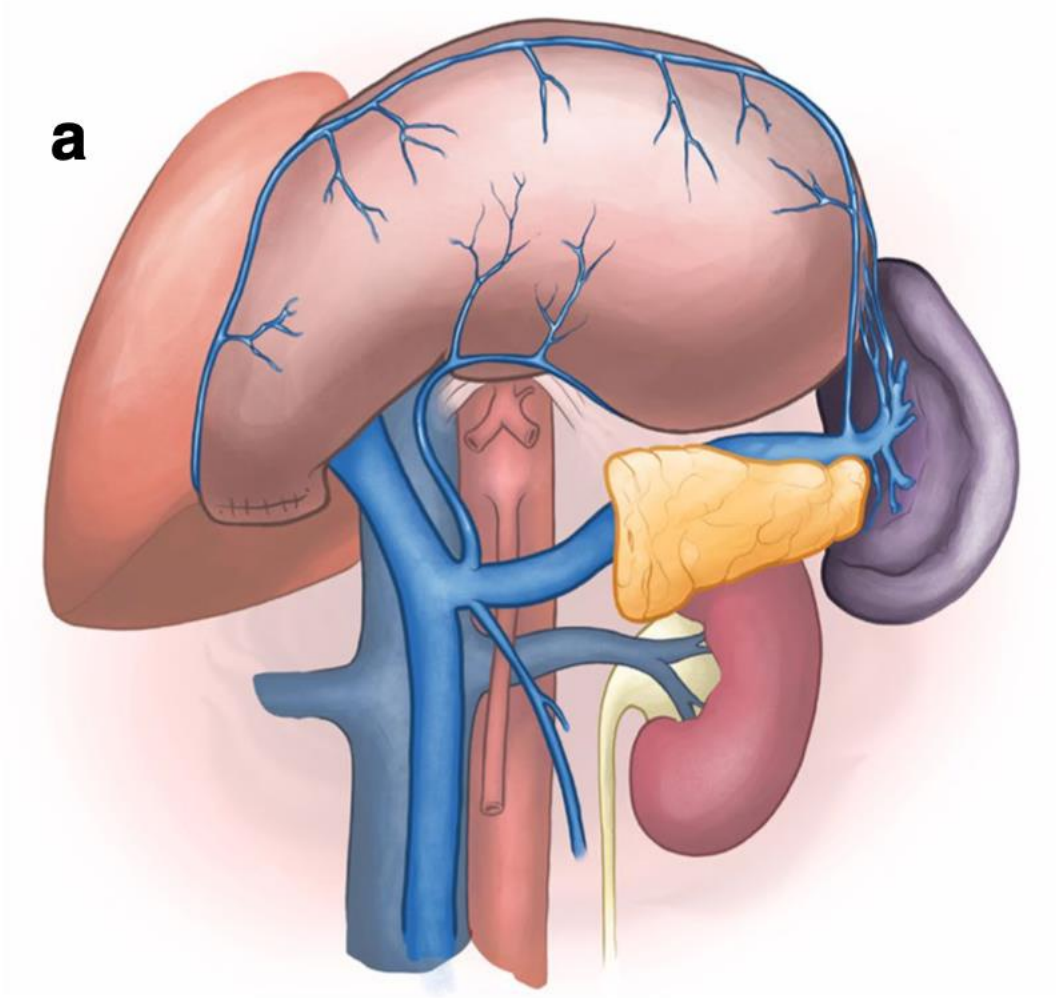


Hipertensão porta esquerda

Veia cólica direita superior
Veia cólica média
Veia gástrica esquerda

Tanaka M, et al. Surgery 2018

REMANESCENTE DA VEIA ESPLÊNICA

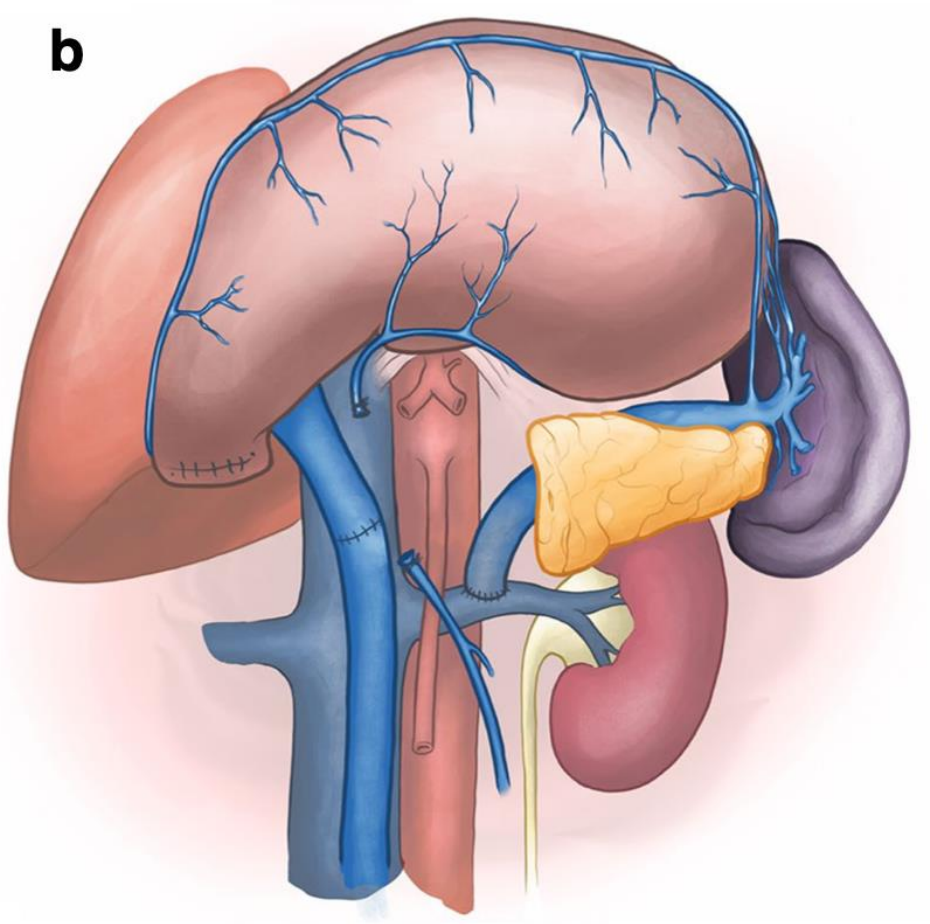


Hipertensão porta esquerda

Veia gástrica esquerda
Veia mesentérica inferior

Al-Saeedi M, et al. Langenbeck Arch Surg 2021

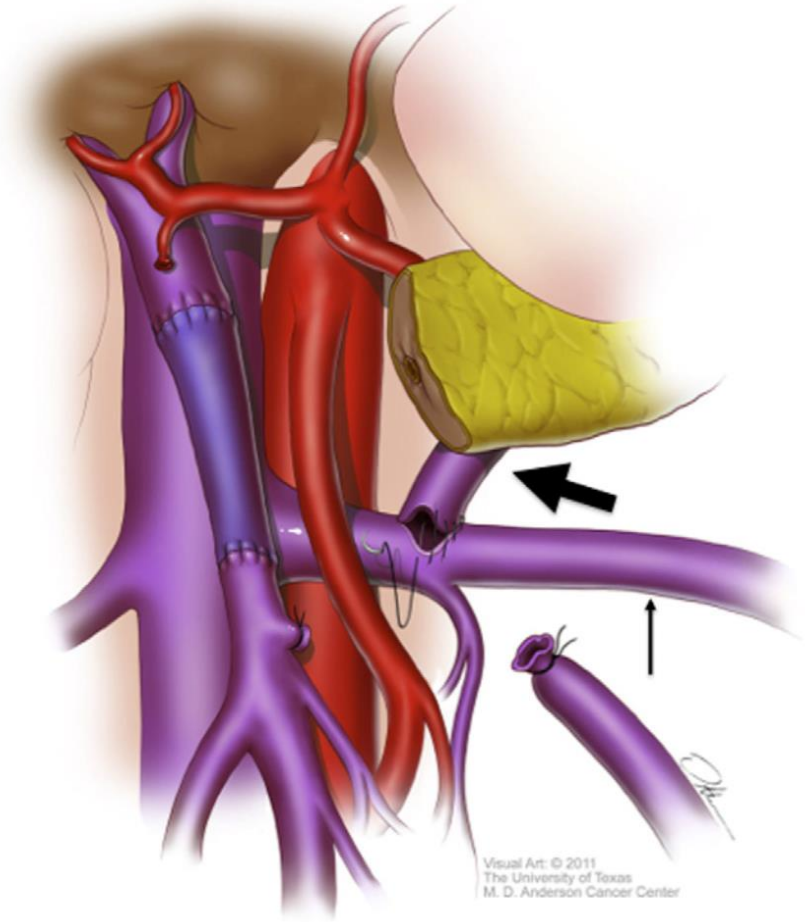
REMANESCENTE DA VEIA ESPLÊNICA



Hipertensão porta esquerda

Al-Saeedi M, et al. Langenbeck Arch Surg 2021

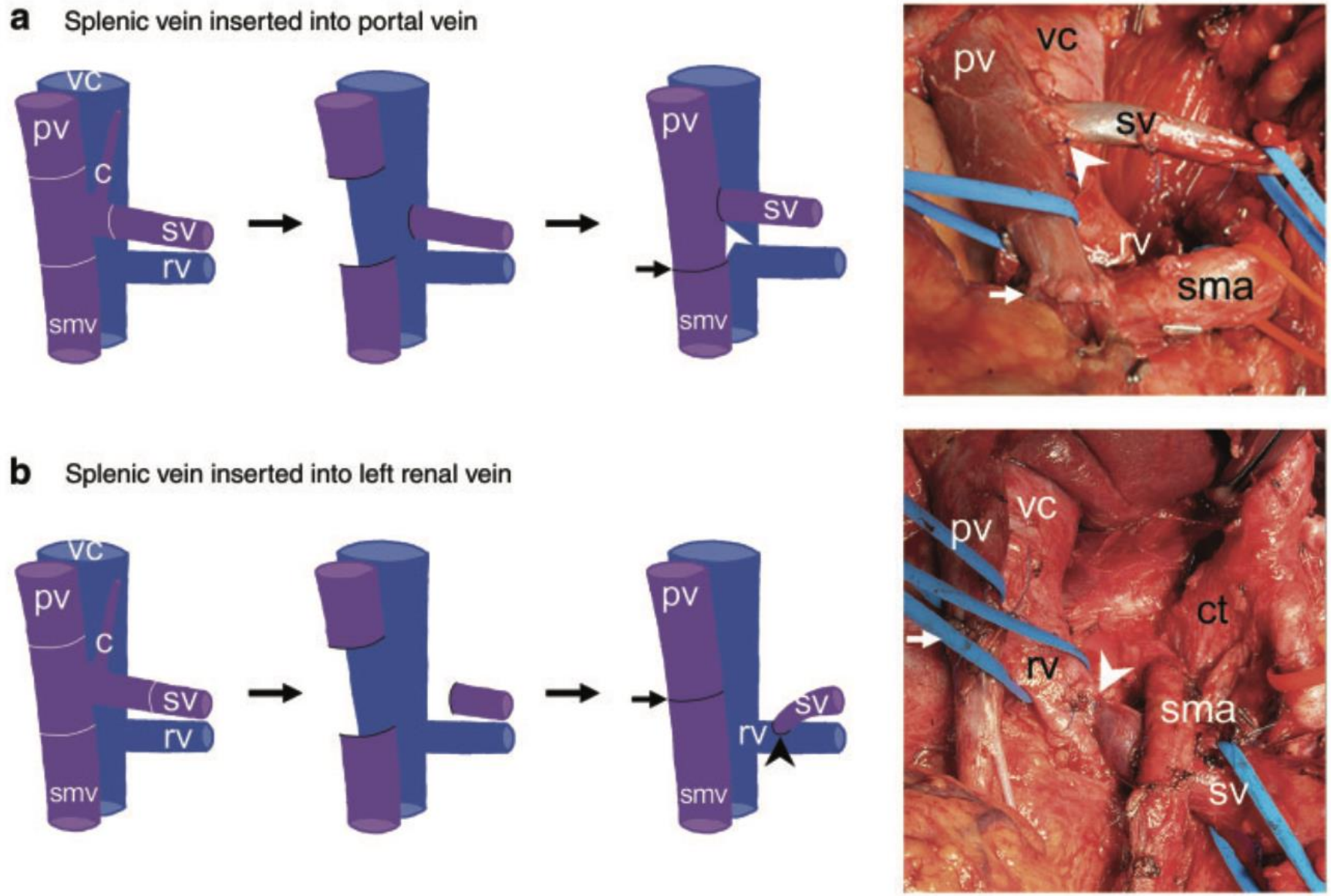
REMANESCENTE DA VEIA ESPLÊNICA



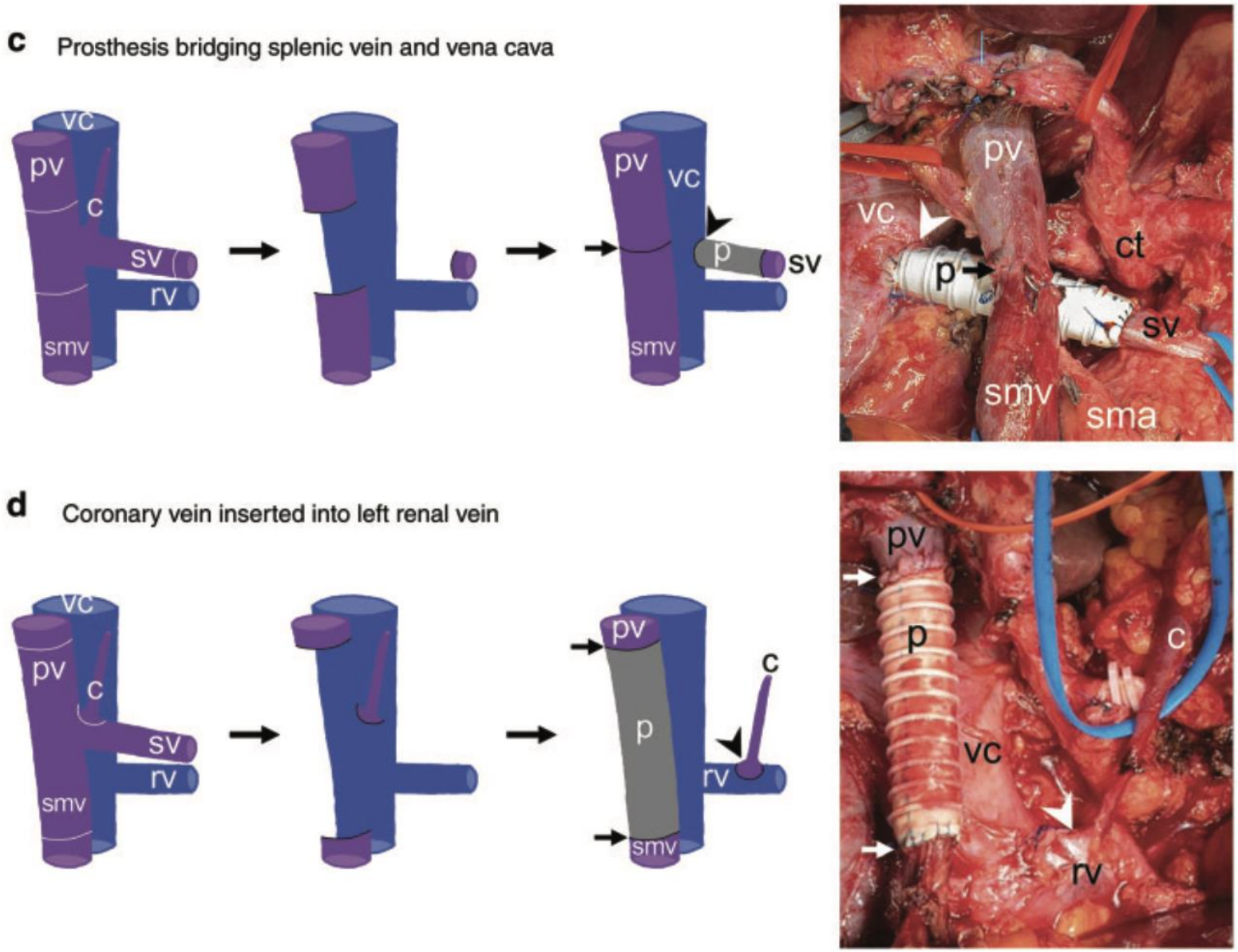
Hipertensão porta esquerda

Veia gástrica esquerda
Veia mesentérica inferior
Veia esplênica
Veia gastro-omental direita

Katz MHG, et al. J Am Coll Surg 2012



Schneider M, et al. BJS, 2021, 108, 777–85



Schneider M, et al. BJS, 2021, 108, 777–85

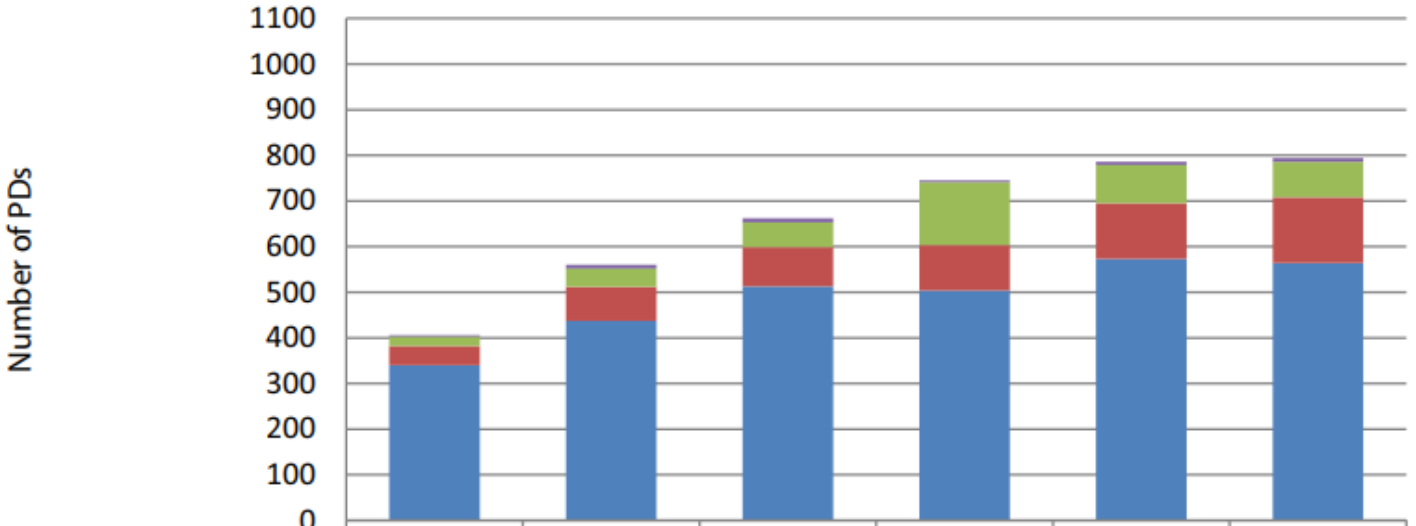
Surgery xxx (2020) 1–7

Contents lists available at ScienceDirect

Surgery

journal homepage: www.elsevier.com/locate/surg

Not all Whipple procedures are equal: Proposal for a classification of pancreatoduodenectomies



	10/2001-2004	2005-2007	2008-2010	2011-2013	2014-2016	2017-2019
PD + artery	3	8	9	4	7	8
PD + additional organ	21	40	54	138	84	78
PD + portal vein	42	75	86	99	122	144
Standard PD	340	437	513	504	573	564

Tipo 1 Ressecção Padrão (74,1%)
Tipo 2 Ressecção porta-mesentérica (14,4%)
Tipo 3 Ressecção multivisceral (10,5%)
Tipo 4 Ressecção arterial (1,0%)

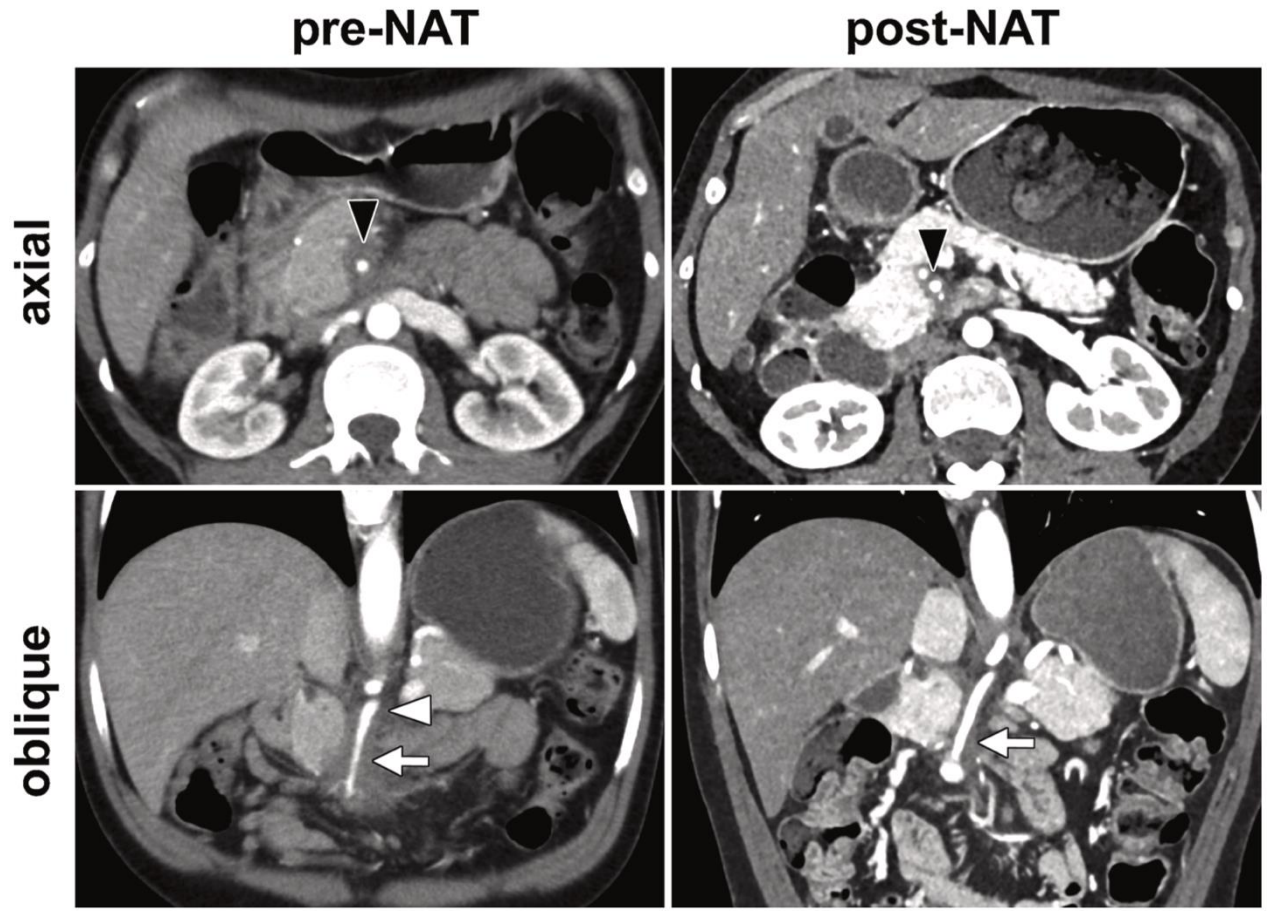
Mihaljevic AL, et al. Surgery 2020

Contents lists available at ScienceDirect

European Journal of Radiology

journal homepage: www.elsevier.com/locate/ejrad

Radiological evaluation of pancreatic cancer: What is the significance of arterial encasement >180° after neoadjuvant treatment?



Mayer P, et al. Eur J Radiol 2021

Contents lists available at ScienceDirect

European Journal of Radiology

journal homepage: www.elsevier.com/locate/ejrad

Radiological evaluation of pancreatic cancer: What is the significance of arterial encasement >180° after neoadjuvant treatment?

5. Conclusions

In conclusion, our study identifies radiological parameters that are helpful in predicting tumor invasion of arteries that exhibit > 180° contiguity by solid soft tissue after NAT. In particular, arteries with post-NAT contiguity by solid soft tissue >180° and ≤ 270°, in common with arteries exhibiting ≤ 26 mm length of solid soft tissue contact, are unlikely to be invaded, which has possible implications for surgical planning. However, even in conjunction with serum tumor markers, post-NAT discrimination of invaded from non-invaded arteries remains difficult, and the indications for surgical exploration should be interpreted liberally after completion of NAT.

Mayer P, et al. Eur J Radiol 2021

Contents lists available at ScienceDirect

Surgery

journal homepage: www.elsevier.com/locate/surg

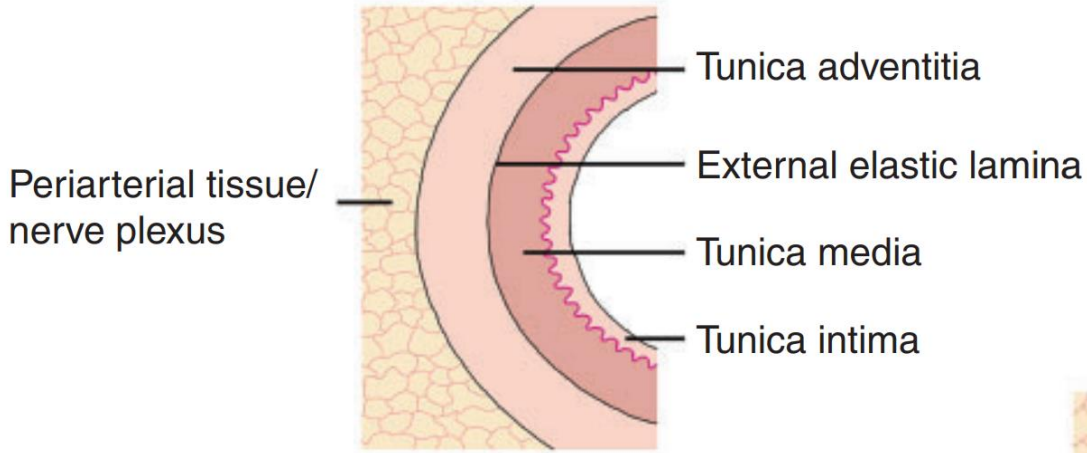
Periarterial divestment in pancreatic cancer surgery

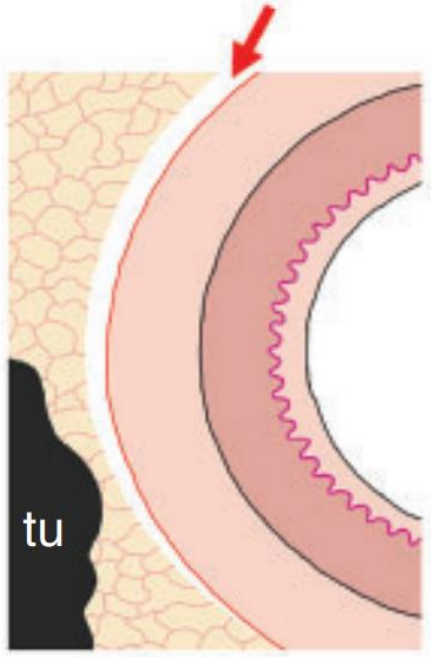
Markus K. Diener, MD[a], André L. Mihaljevic, MD[a], Oliver Strobel, MD[a], Martin Loos, MD[a], Thomas Schmidt, MD[a], Martin Schneider, MD[a], Christoph Berchtold, MD[a], Arianeb Mehrabi, MD[a], Beat P. Müller-Stich, MD[a], Kuirong Jiang, MD[b], John P. Neoptolemos, MD[a], Thilo Hackert, MD[a], Yi Miao, MD[b], Markus W. Büchler, MD[a,*]

Resultados promissores LAPC após quimioterapia neoadjuvante[2]
Ressecção arterial com resultados animadores[3]
Difícil interpretação radiológica (>180) de tumor e fibrose após QTNeo[4]
Critérios radiológicos de invasão vascular superestimam envolvimento após QTNeo[5]
Envolvimento radiológico arterial >180° e ≤ 270°, não estava invadida em 89,3% das vezes[6]
Duodenopancreatectomia + ressecção arterial é superior ao tratamento paliativo[7]

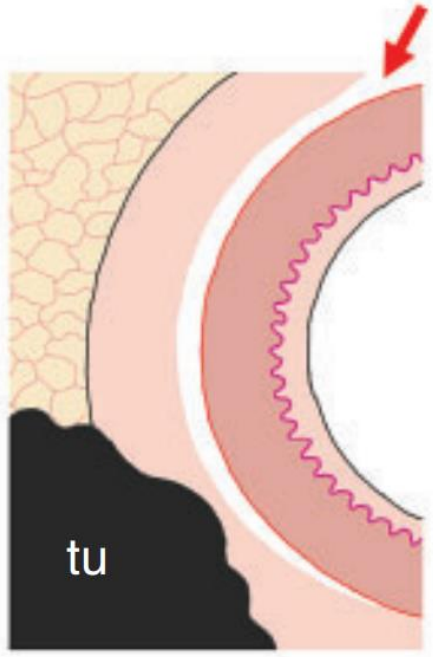
1. Diener MK, et al. Surgery 2020
2. Hackert T, et al. Ann. Surg. 2016;264: 457–63
3. Loos M et al, Ann Surg 2022;275:759-68
4. Sasson AR, et al. Cancer 2003;34:121–8
5. Clanton J, et al. HPB 2018;20:925–31
6. Mayer P, et al. Eur J Radiol 2021;137
7. Del Chiaro M, et al. HPB 2019; 21:219–25

DIVESTMENT





Periarterial divestment



Subadventitial divestment

Schneider M, et al. BJS 2021; 108: 777–85

DIVESTMENT

A) Grade 0 (No tumor)

B) Grade I (Invasion of the tunica adventitia). Tumor free distance from external elastic lamina ≥ 1mm.

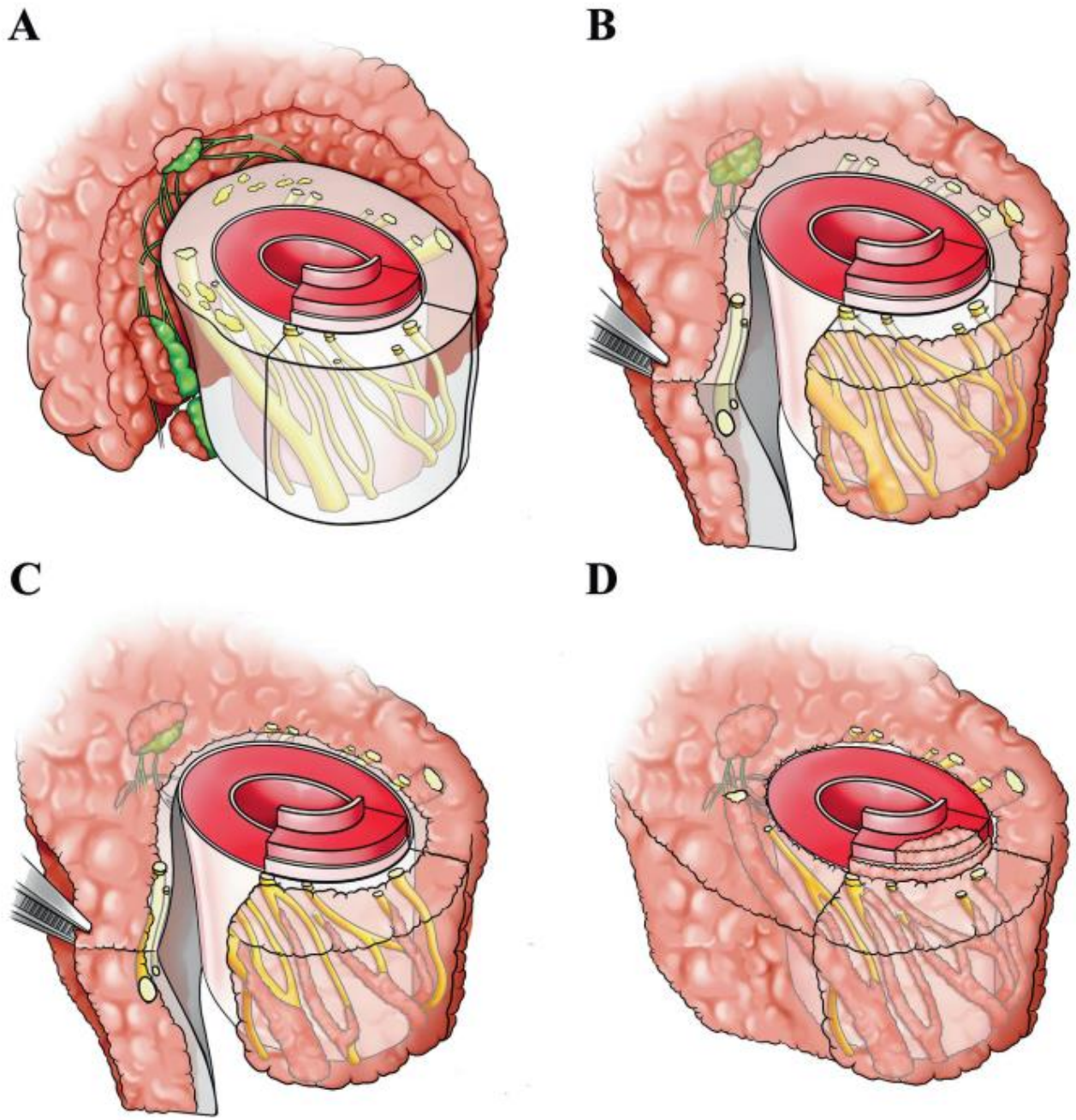
R0 – Periarterial divestment

C) Grade II (Tumor invasion of the tunica adventitia < 1mm of the external elastic lamina.

R1 – Sub-adventitial divestment
Or
Arterial resection

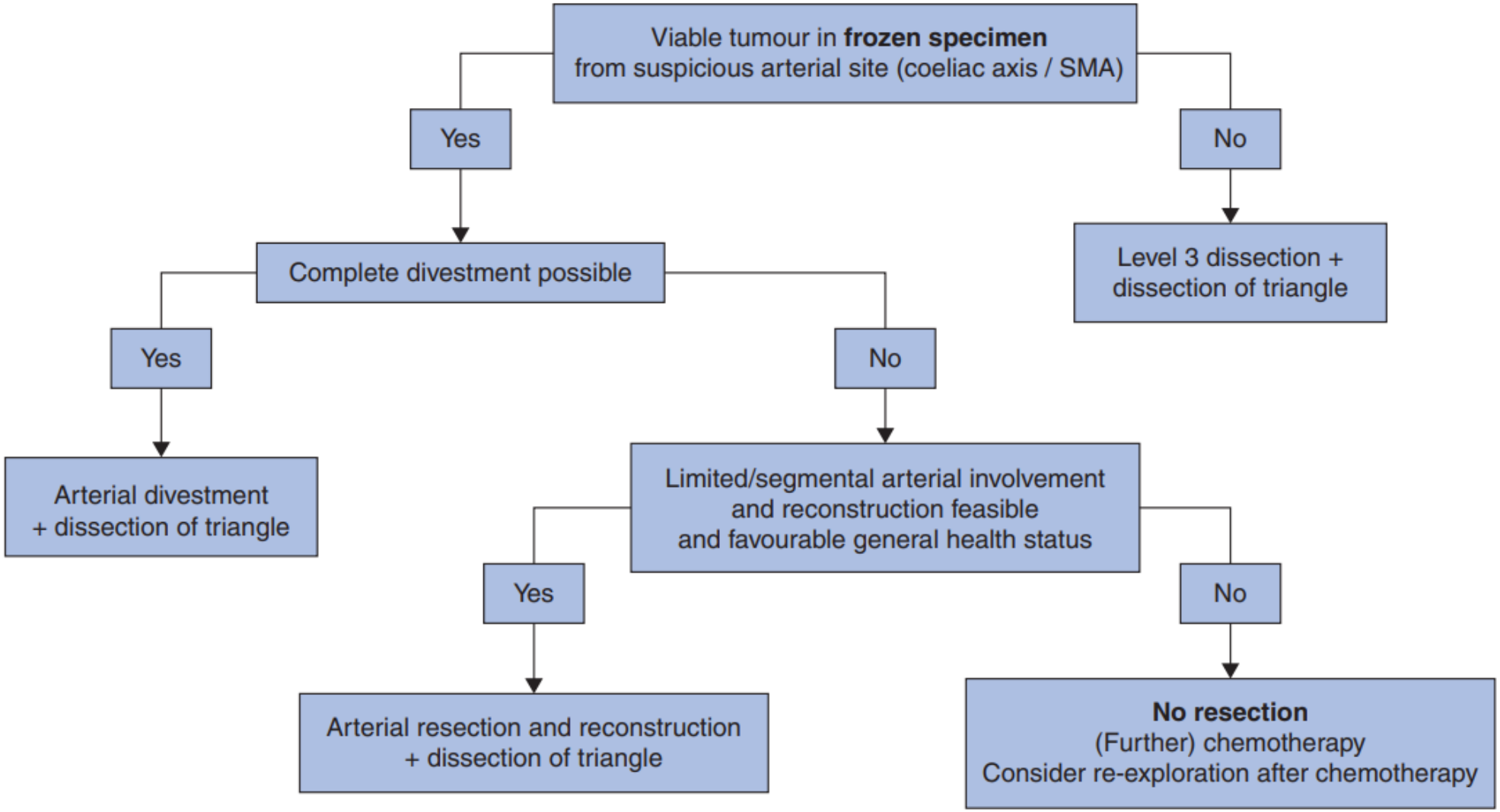
D) Grade III (Tumor invasion of the external elastic lamina).

Arterial resection
Or
Case unresectable



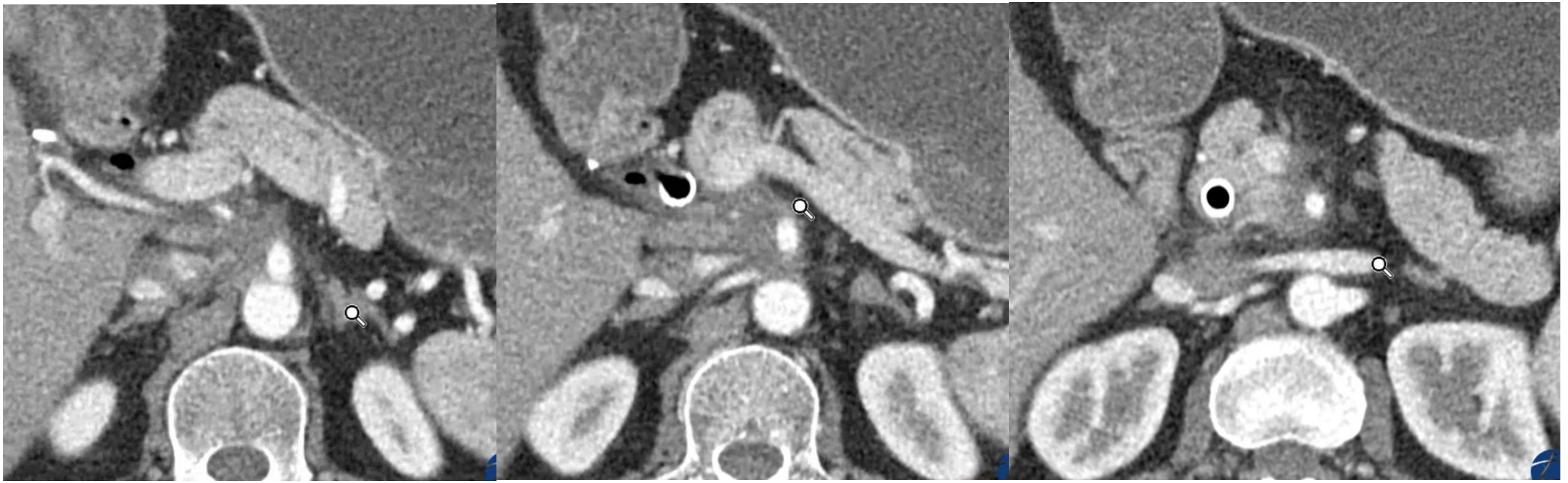
Miao Y, et al. Surg Open Sci 2023

PERIARTERIAL DIVESTMENT

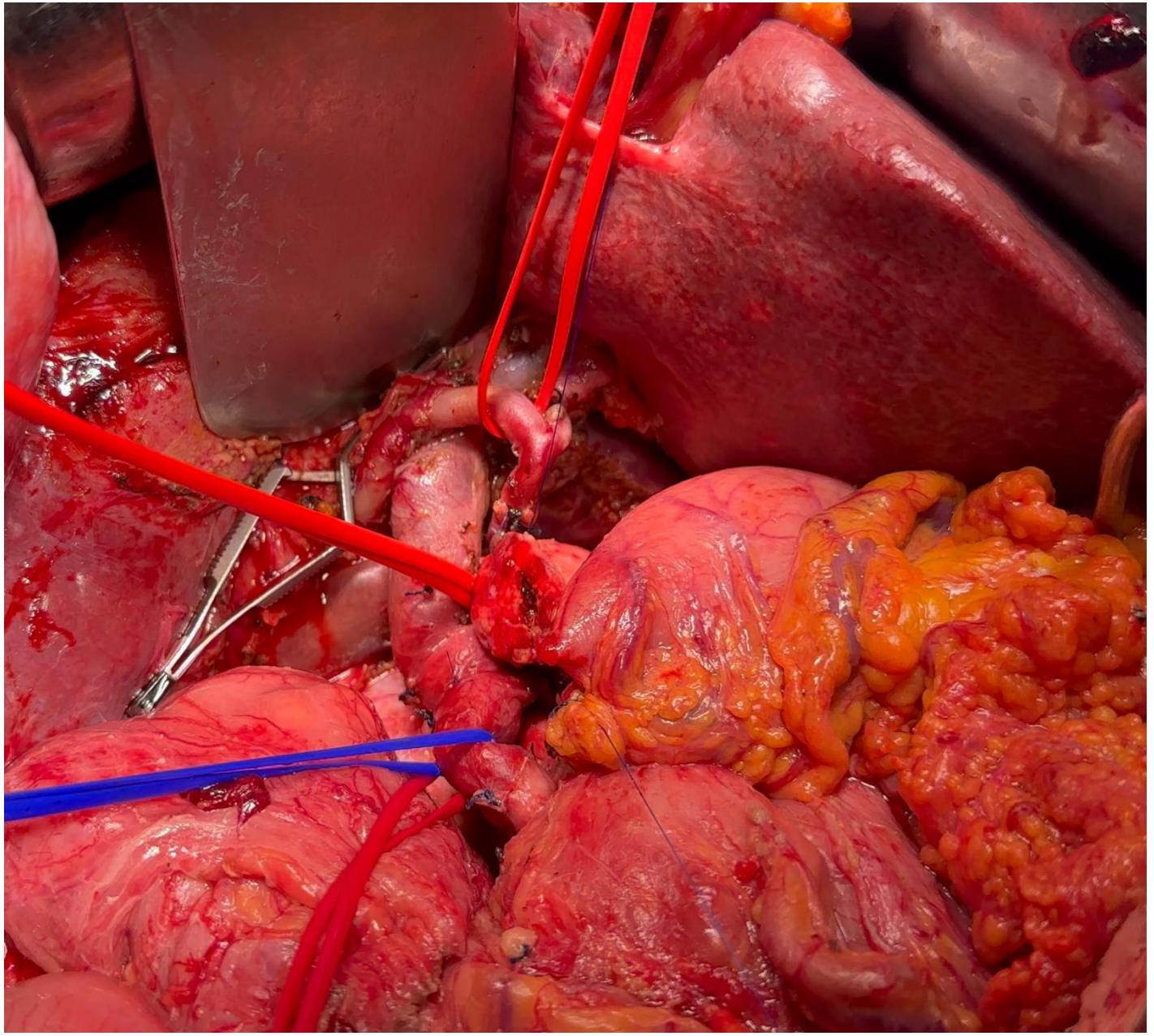


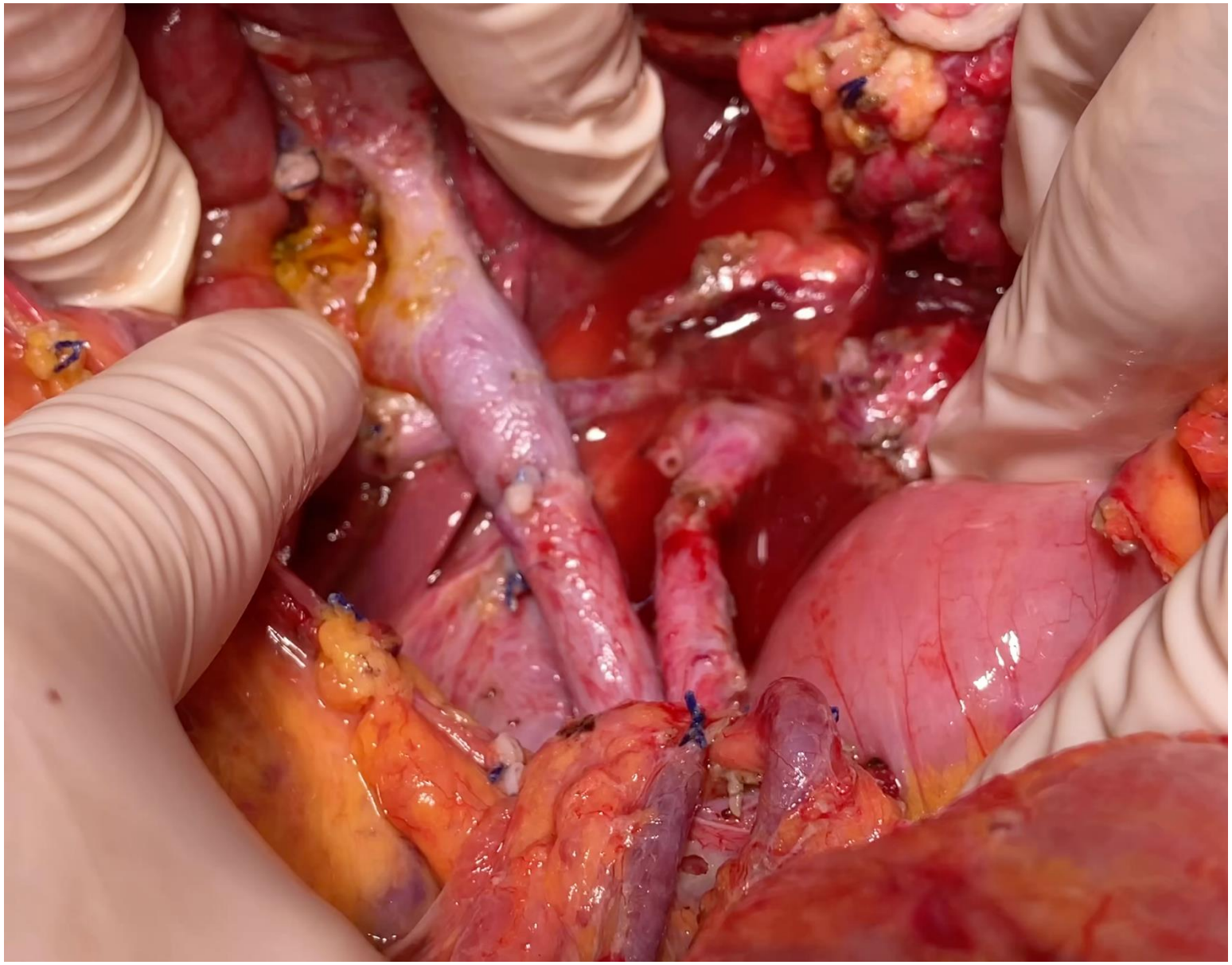
Schneider M, et al. BJS 2021; 108: 777–85

PERIARTERIAL DIVESTMENT



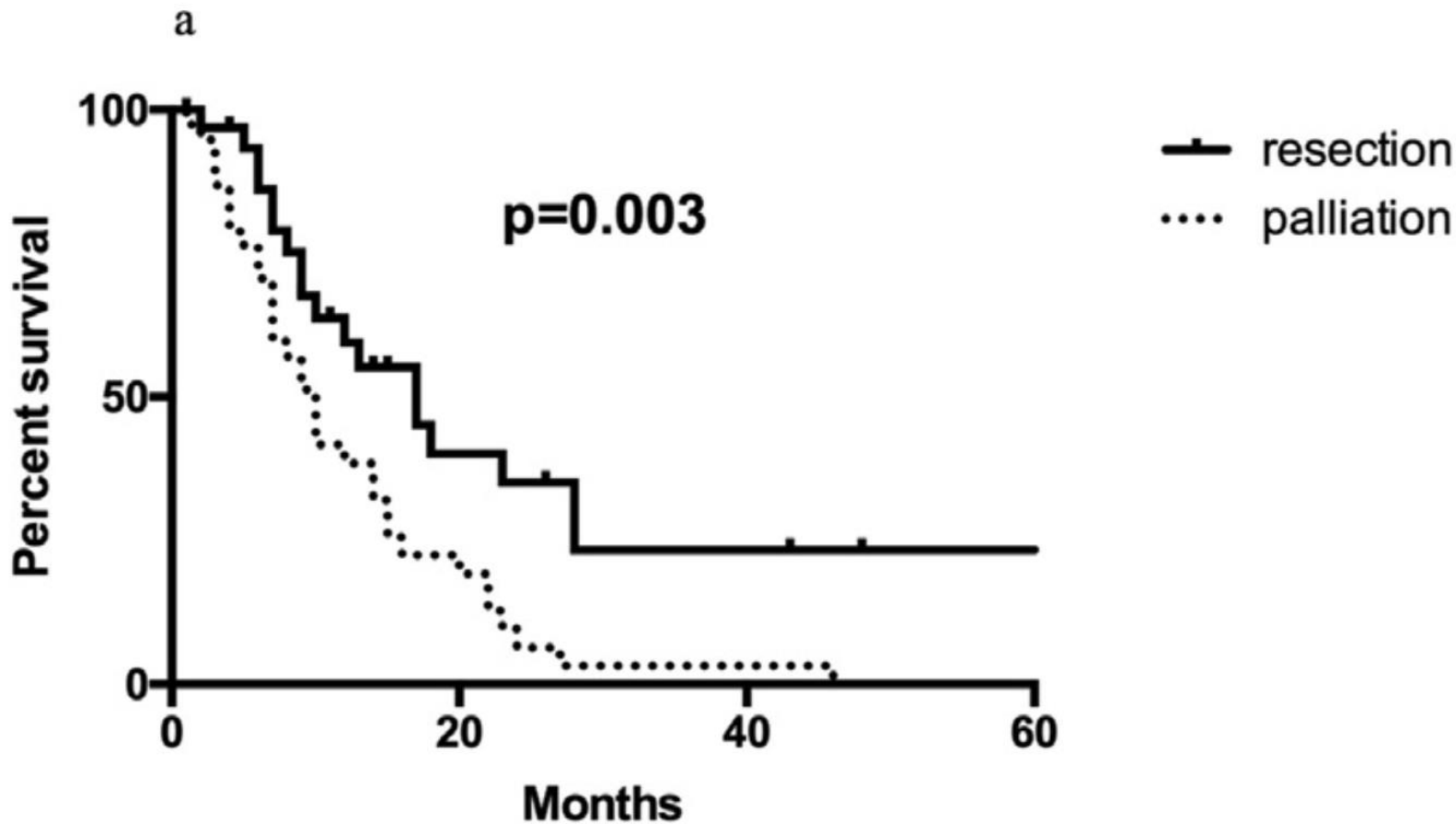
DIVESTMENT

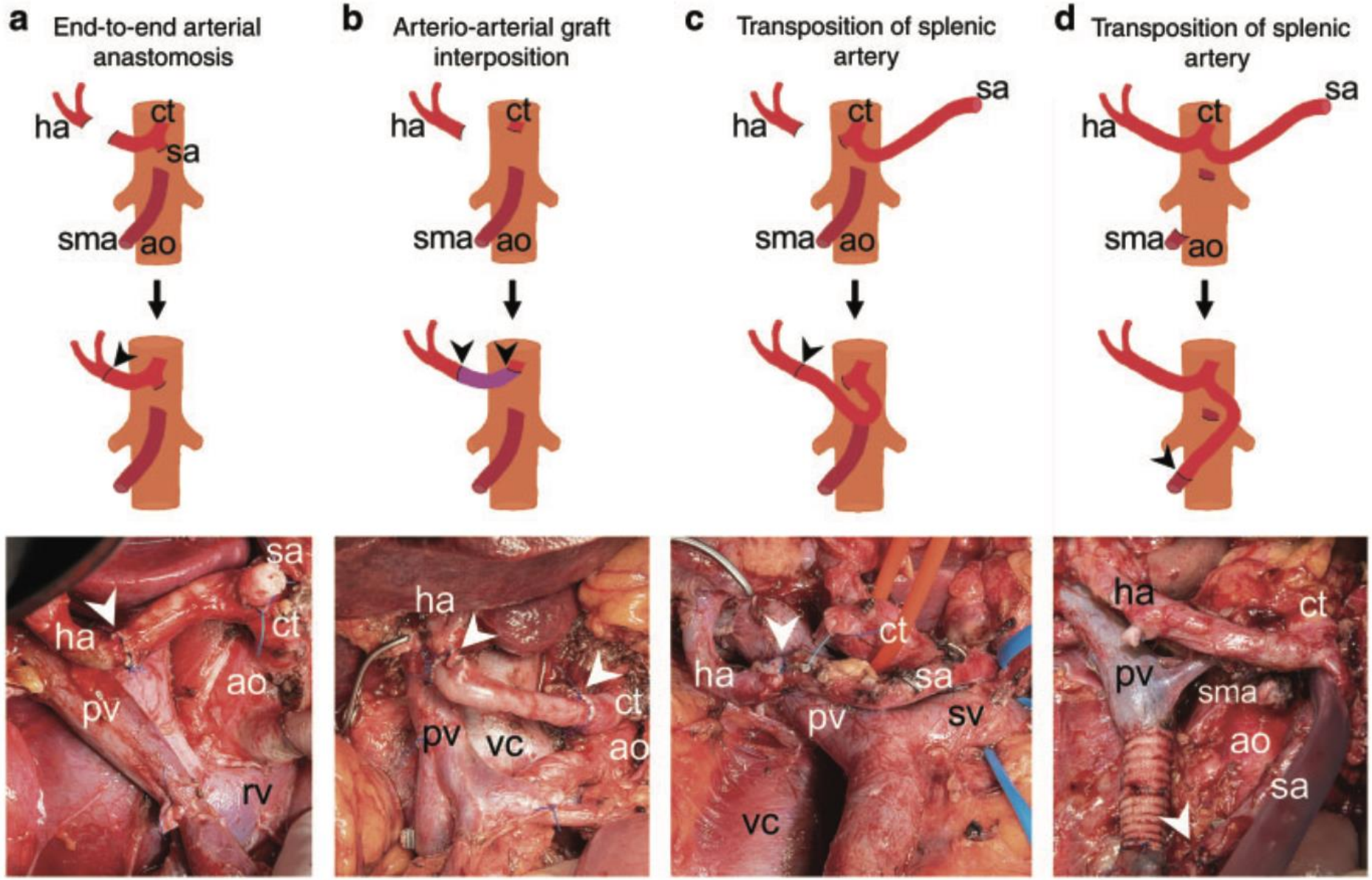




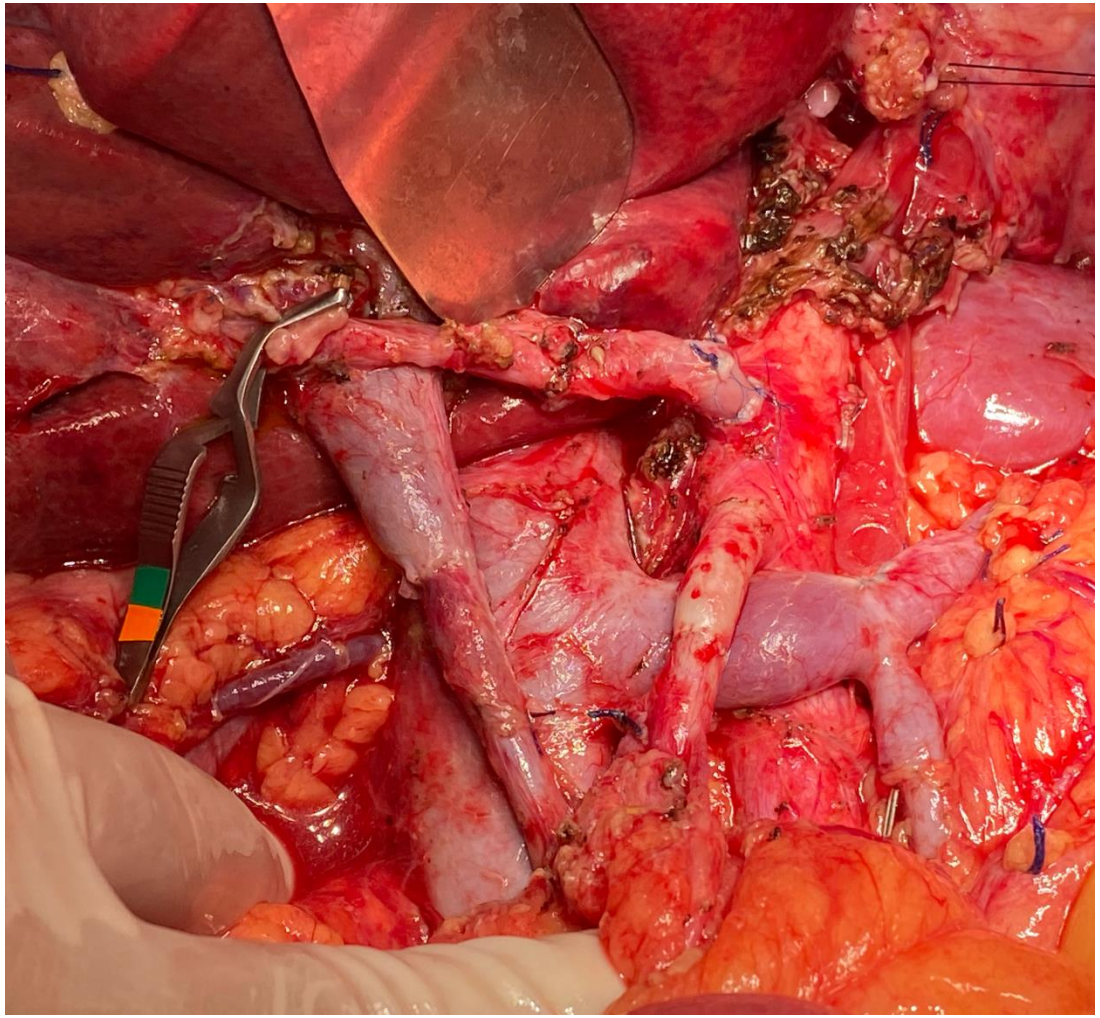
ORIGINAL ARTICLE

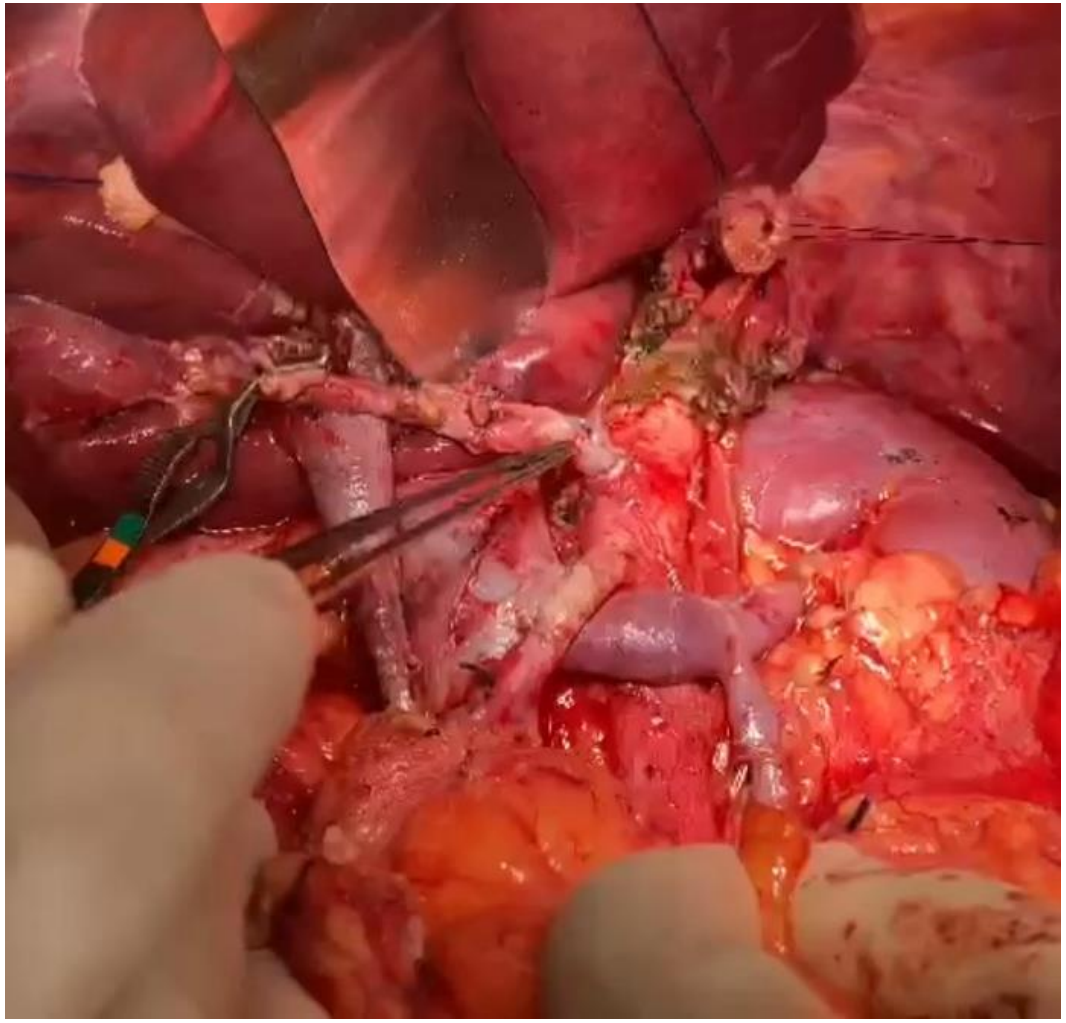
Pancreatectomy with arterial resection is superior to palliation in patients with borderline resectable or locally advanced pancreatic cancer



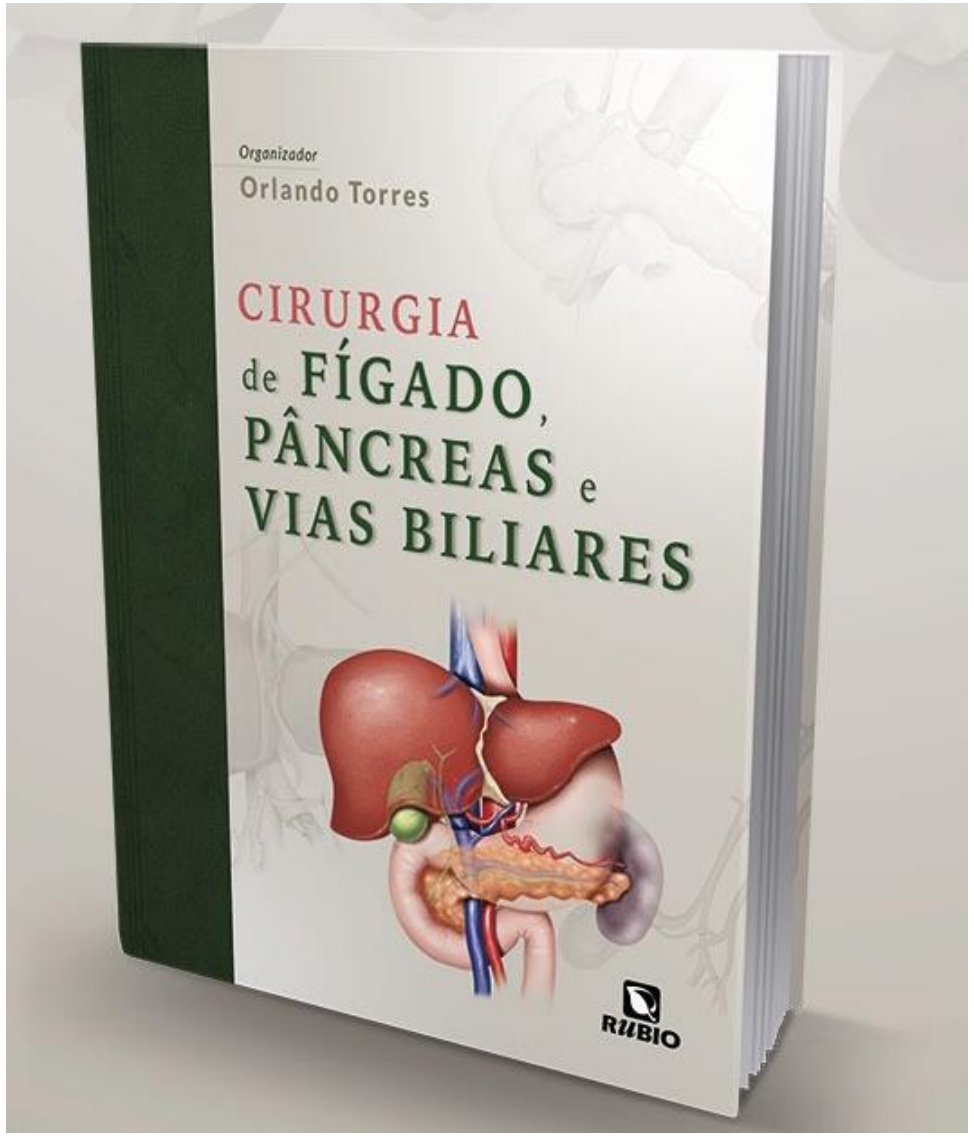


Schneider M, et al. BJS 2021; 108: 777–85





Veia porta, artéria mesentérica superior e tronco celíaco



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Lençóis Maranhenses

Obrigado!