



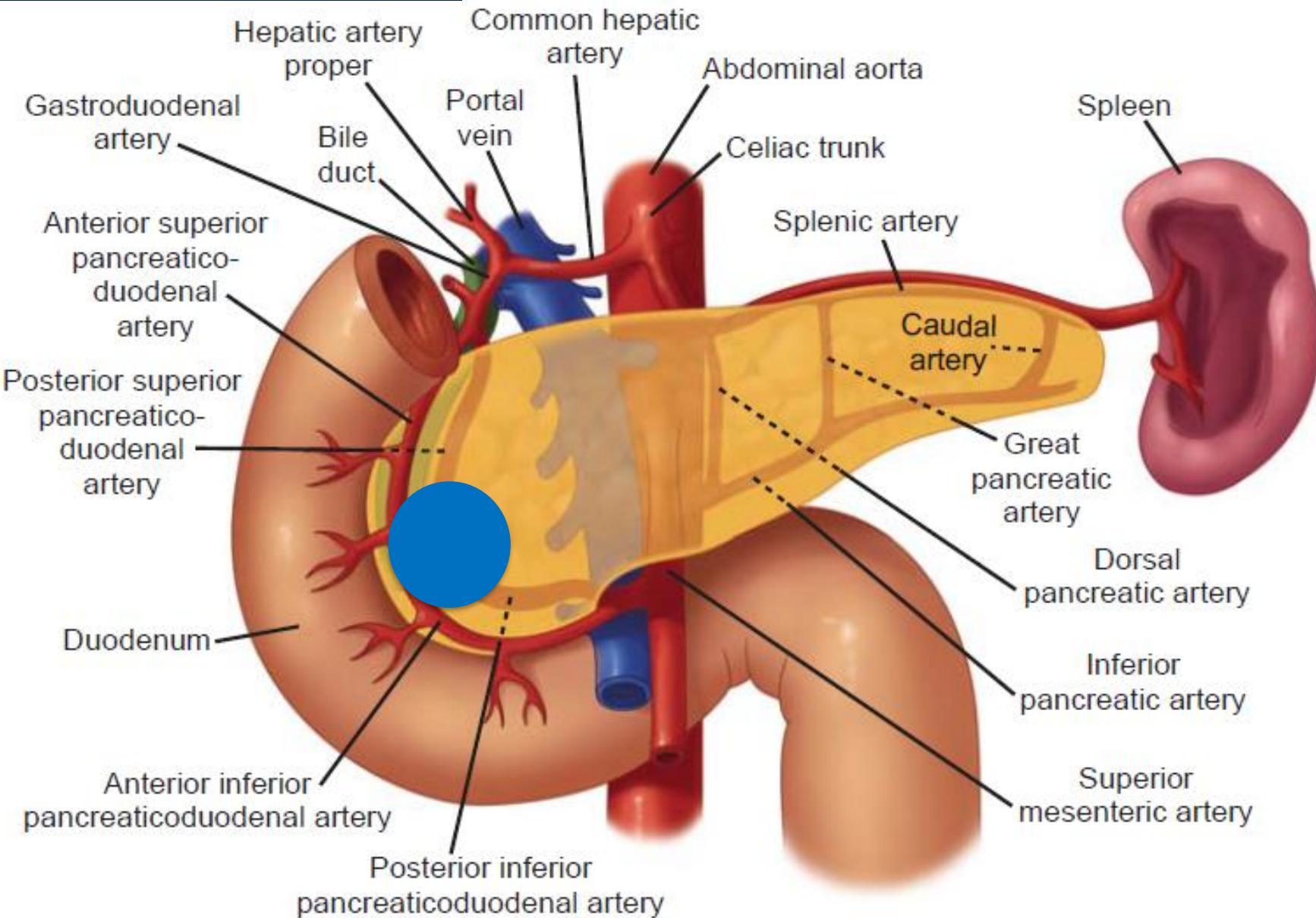
EBSERH
HOSPITAIS UNIVERSITÁRIOS FEDERAIS

PANCREATODUODENECTOMY : PERIOPERATIVE MANAGEMENT



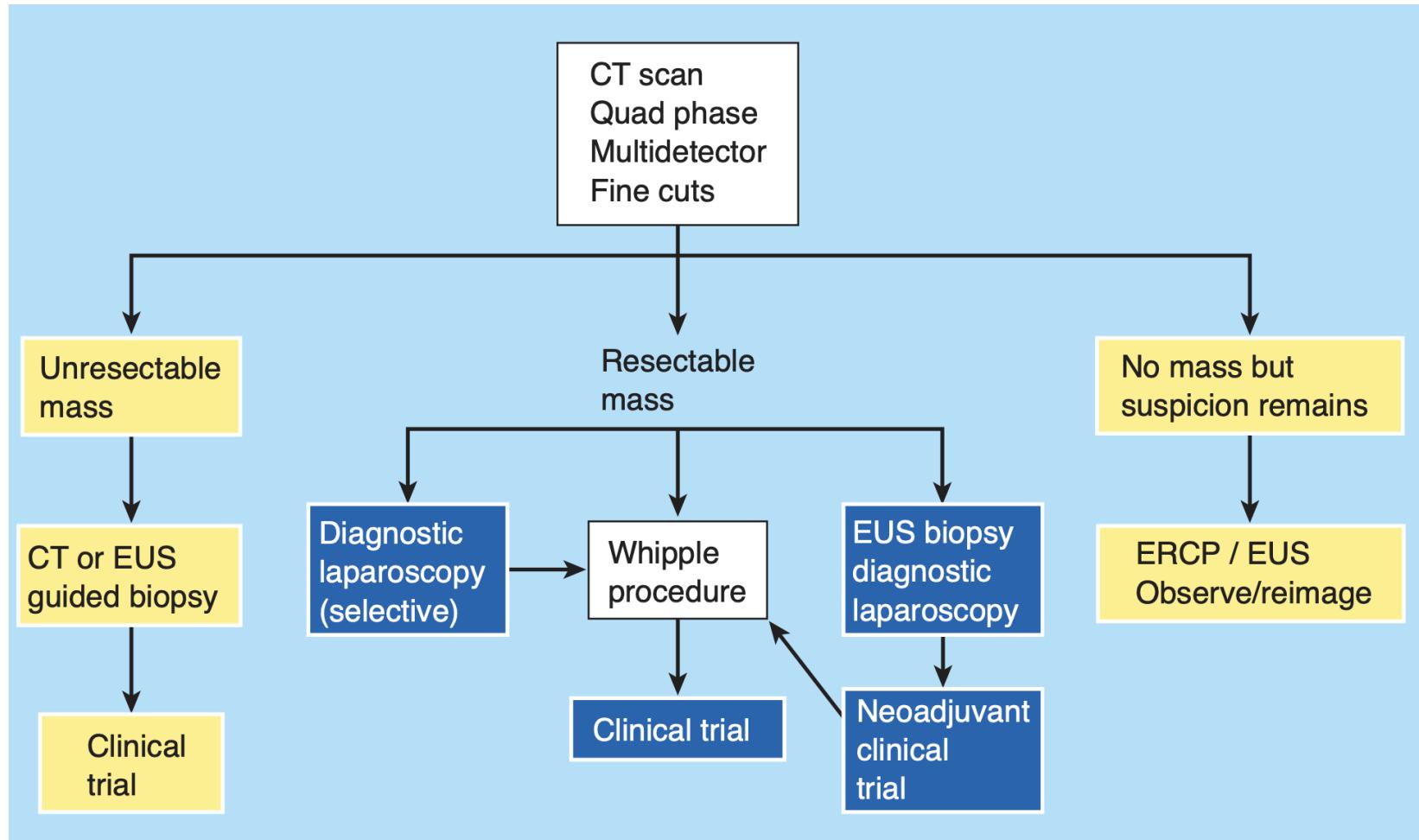
Orlando Jorge M. Torres MD, PhD
Full Professor and Chairman
Department of Gastrointestinal Surgery
Hepatopancreatobiliary Unit
Universidade Federal do Maranhão - Brazil

ANATOMY



Consensus statements

- In the presence of a solid mass in the head of the pancreas that is suspicious for malignancy, biopsy proof is not required before proceeding with PD when AIP is not suspected (strong recommendation).
 - AIP – Autoimmune pancreatitis
 - PD – Pancreatoduodenectomy



PANCREATODUODENECTOMY

NUTRITIONAL SUPPORT

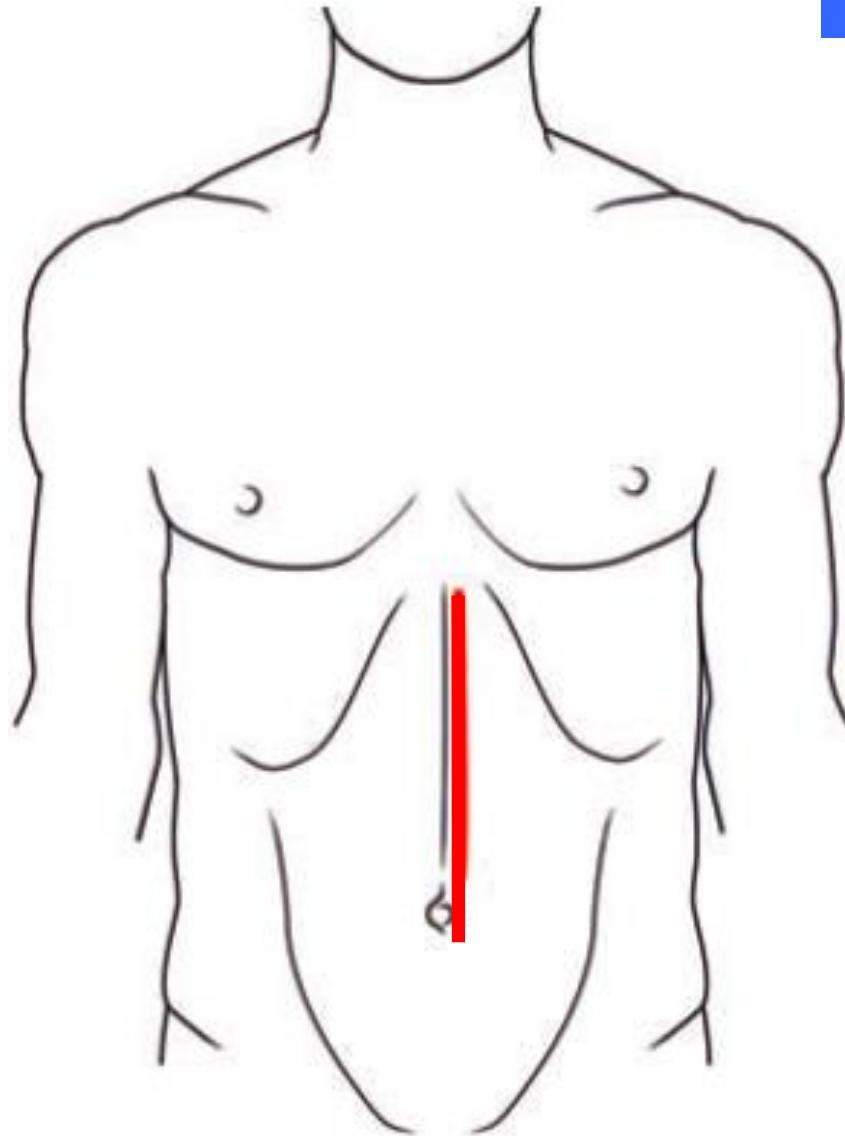
- IMPACT
- 7-10 days before
- Twice a day

PANCREATODUODENECTOMY

PREOPERATIVE BILIARY DRAINAGE

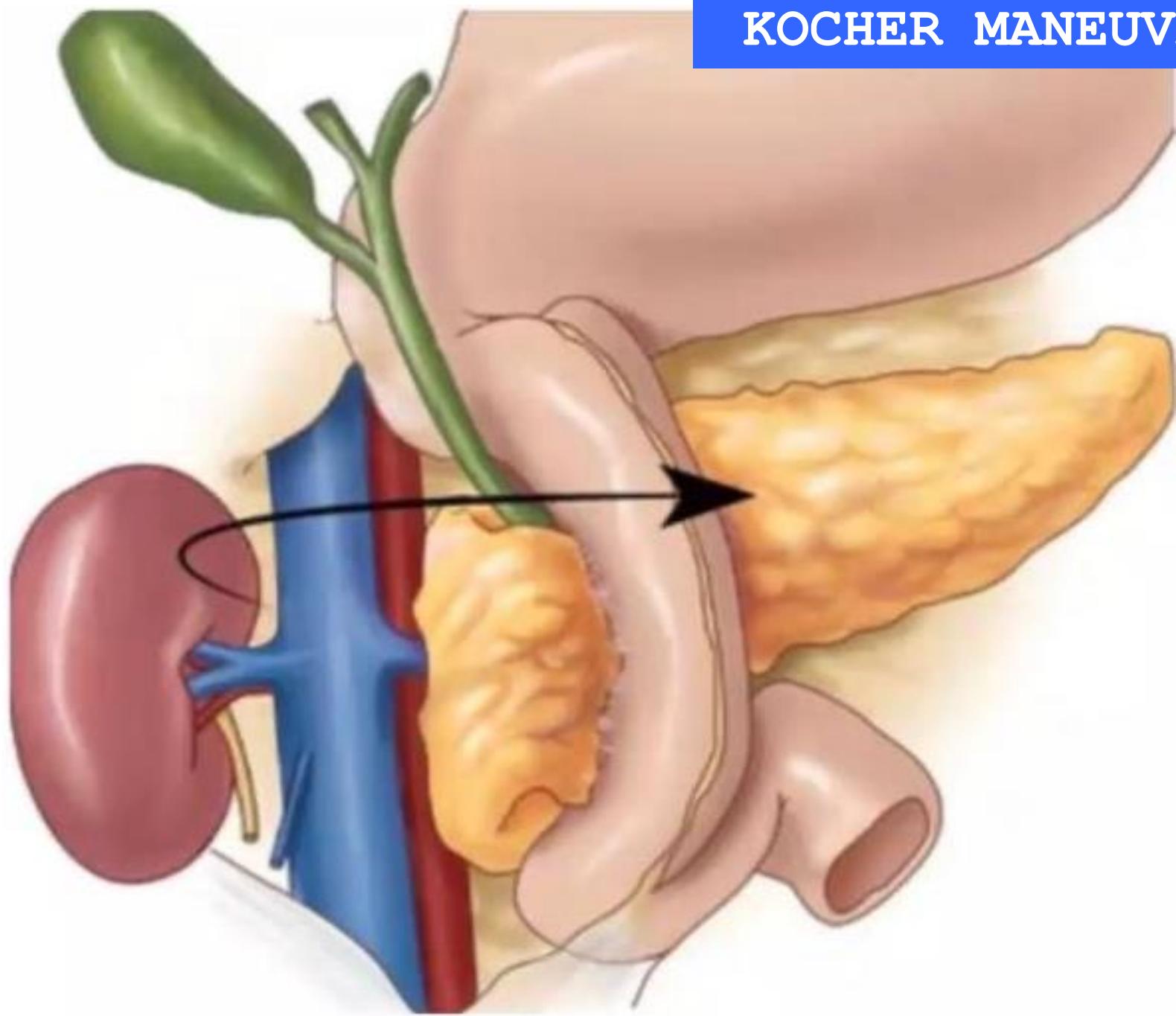
- Total bilirubin > 15mg/dL
- Malnutrition
- Neoadjuvant chemotherapy
- Cholangitis

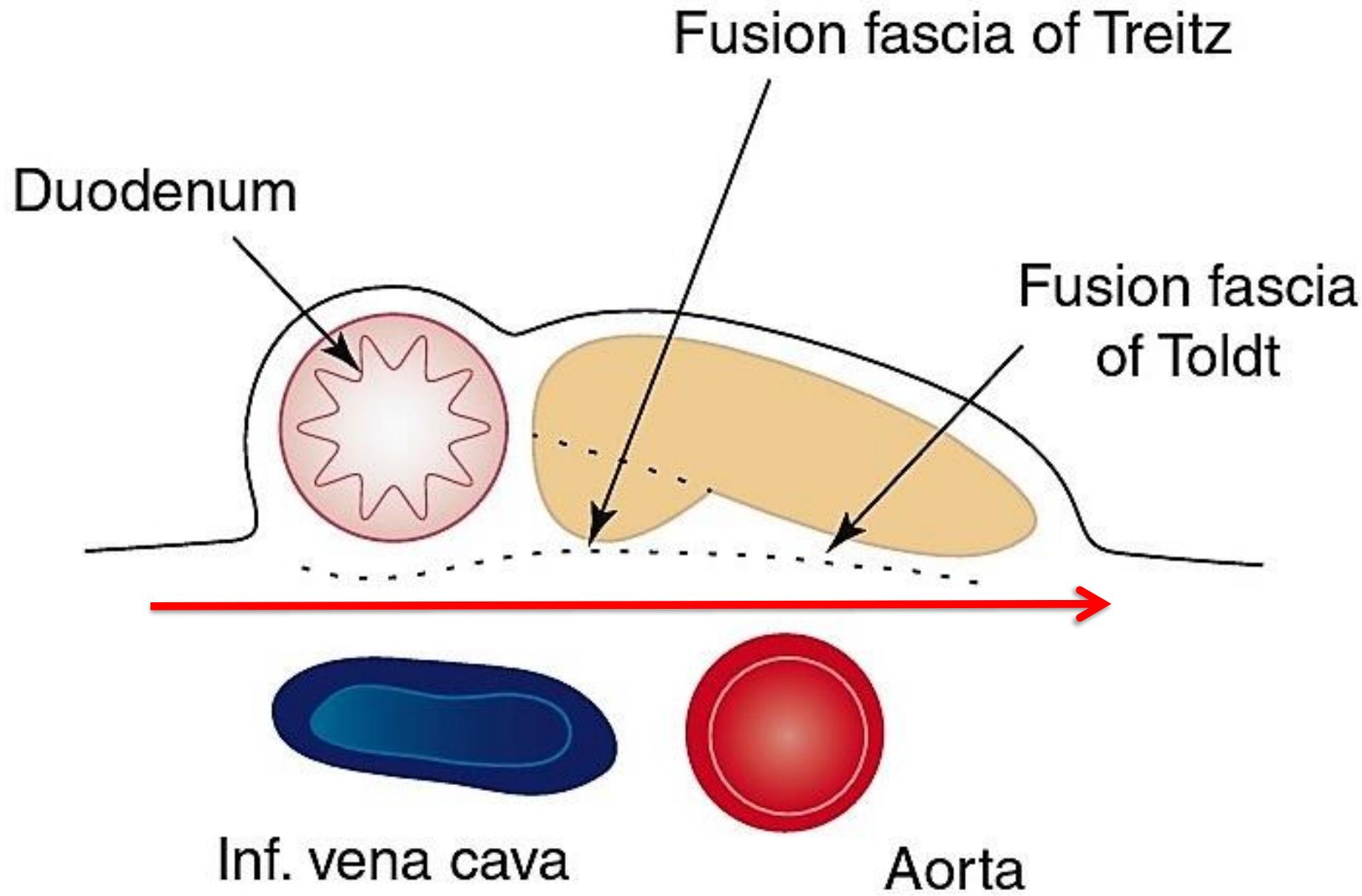
INCISION



Midline

KOCHER MANEUVER





KOCHER MANEUVER

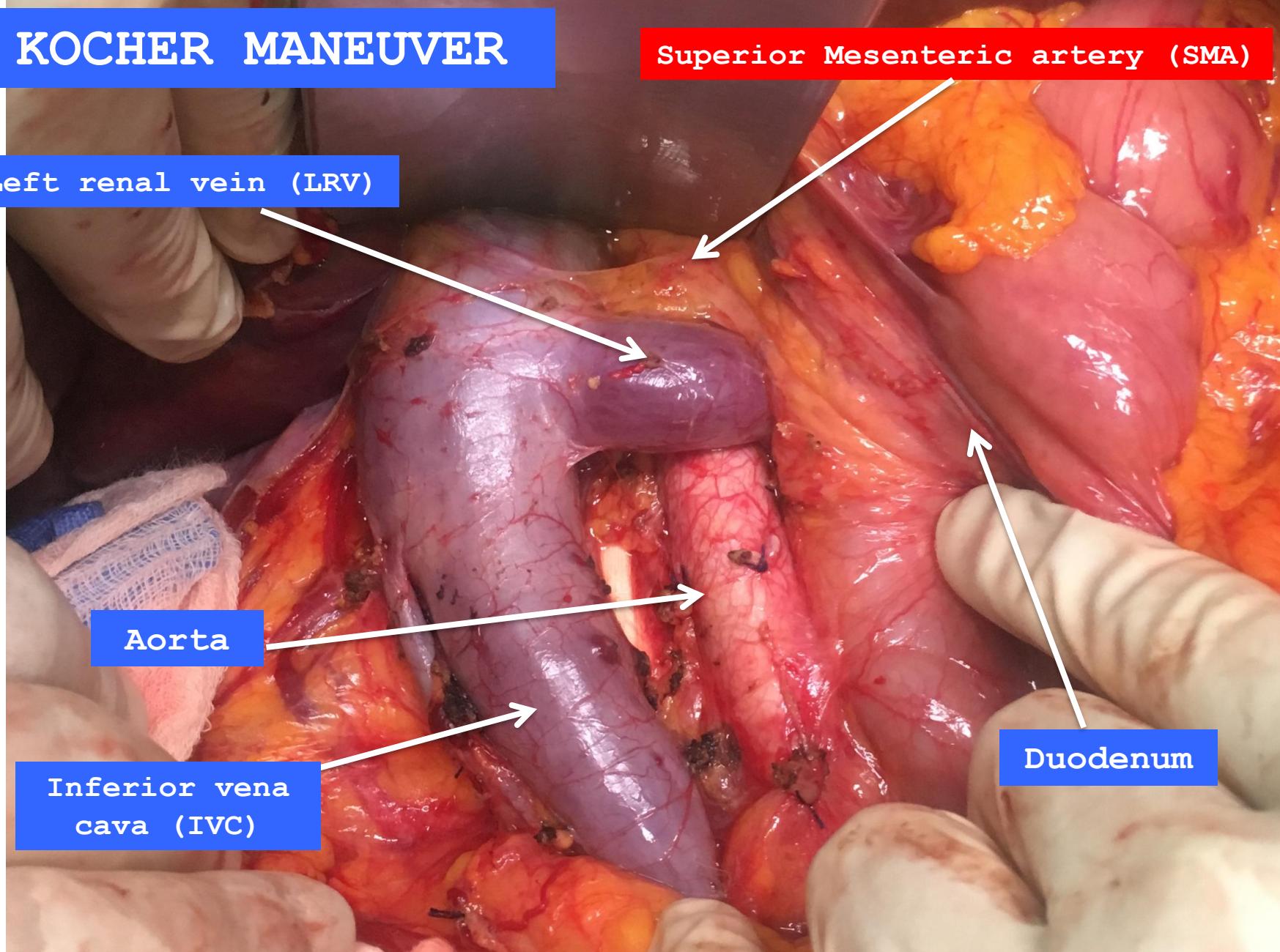
Superior Mesenteric artery (SMA)

Left renal vein (LRV)

Aorta

Inferior vena
cava (IVC)

Duodenum



ARTERY FIRST

POSTERIOR
APPROACH

(Pessaux et al, 2006)

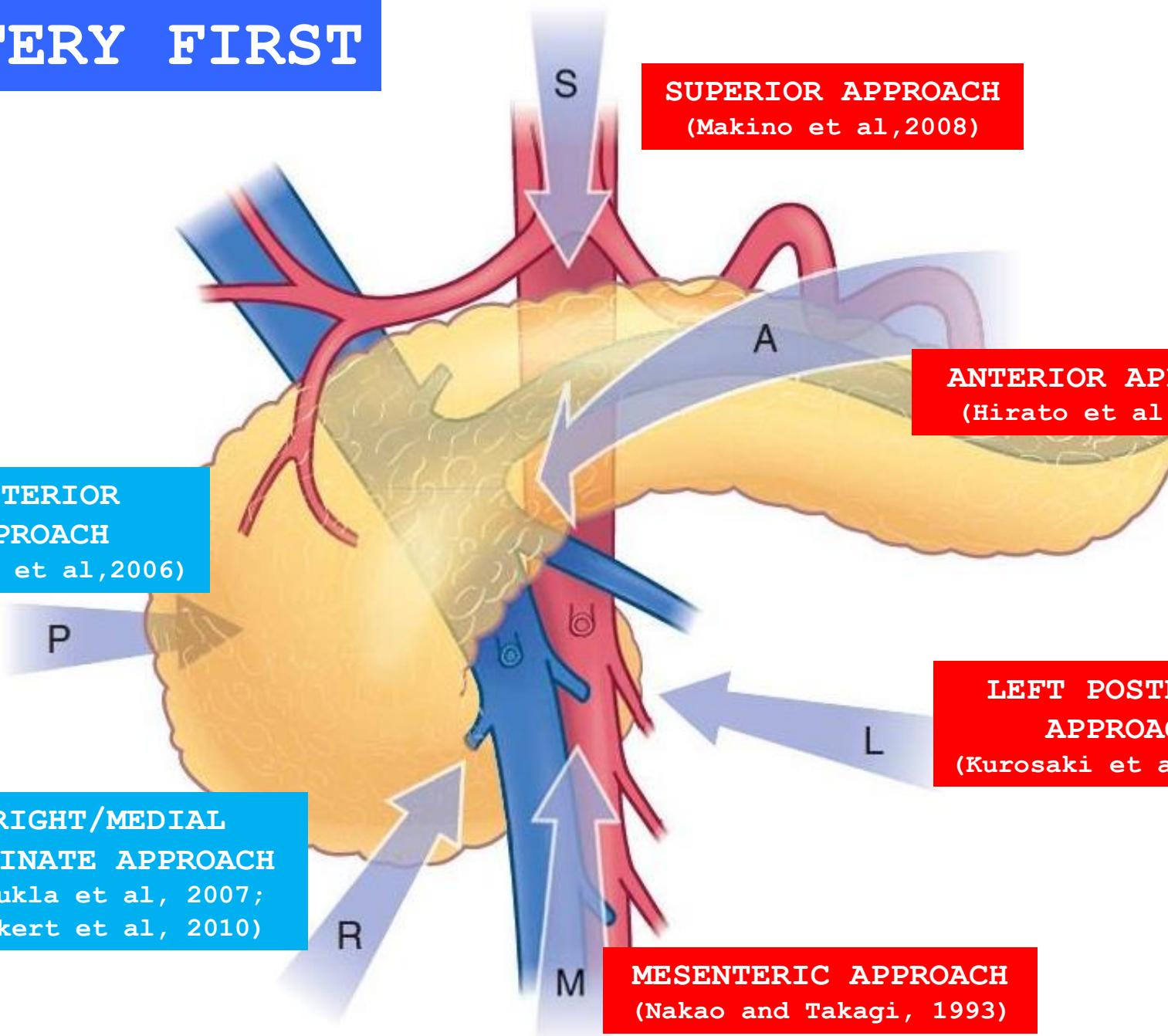
RIGHT/MEDIAL
UNCINATE APPROACH
(Shukla et al, 2007;
Hackert et al, 2010)

SUPERIOR APPROACH
(Makino et al, 2008)

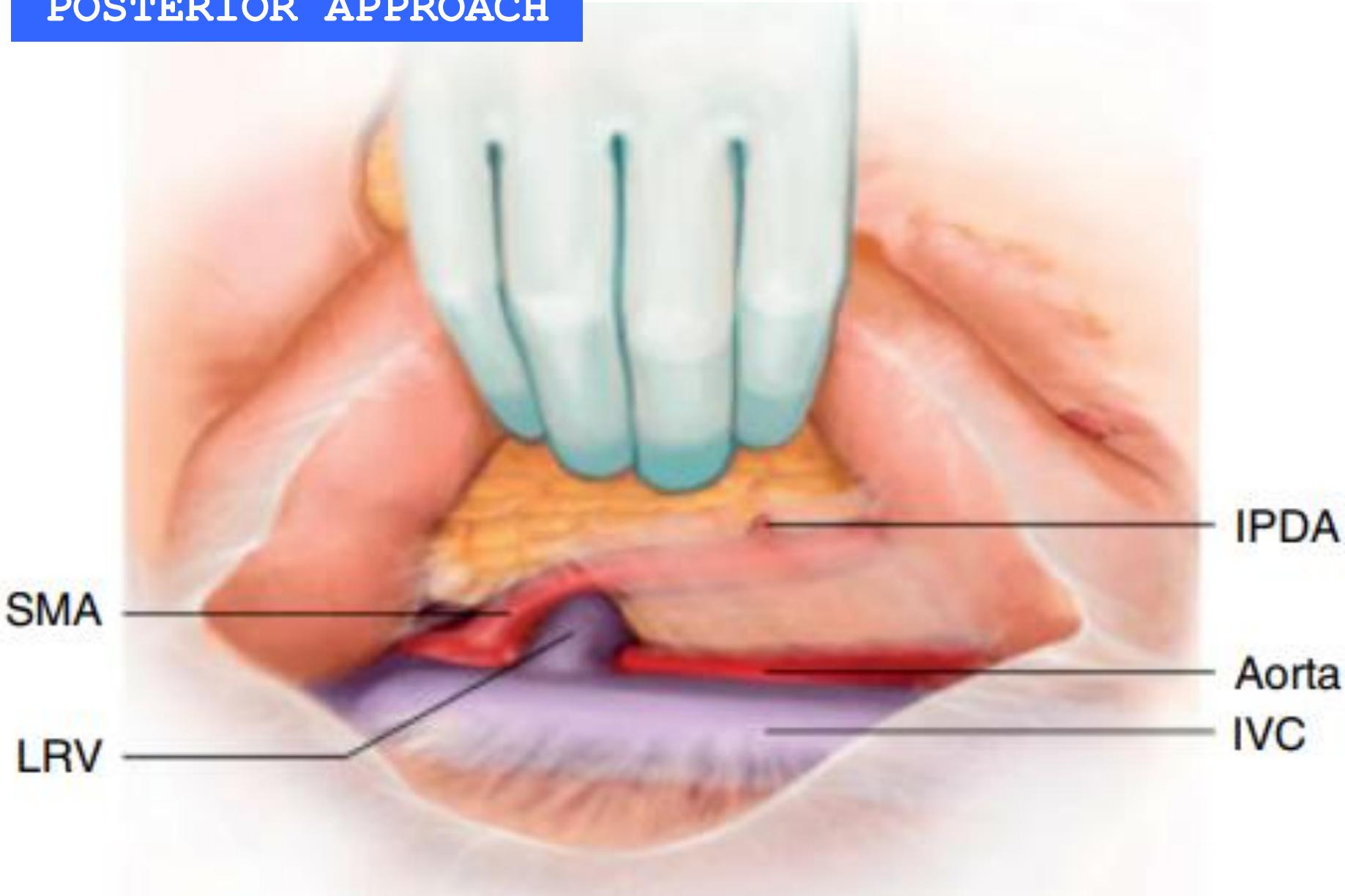
ANTERIOR APPROACH
(Hirato et al, 2010)

LEFT POSTERIOR
APPROACH
(Kuroasaki et al, 2011)

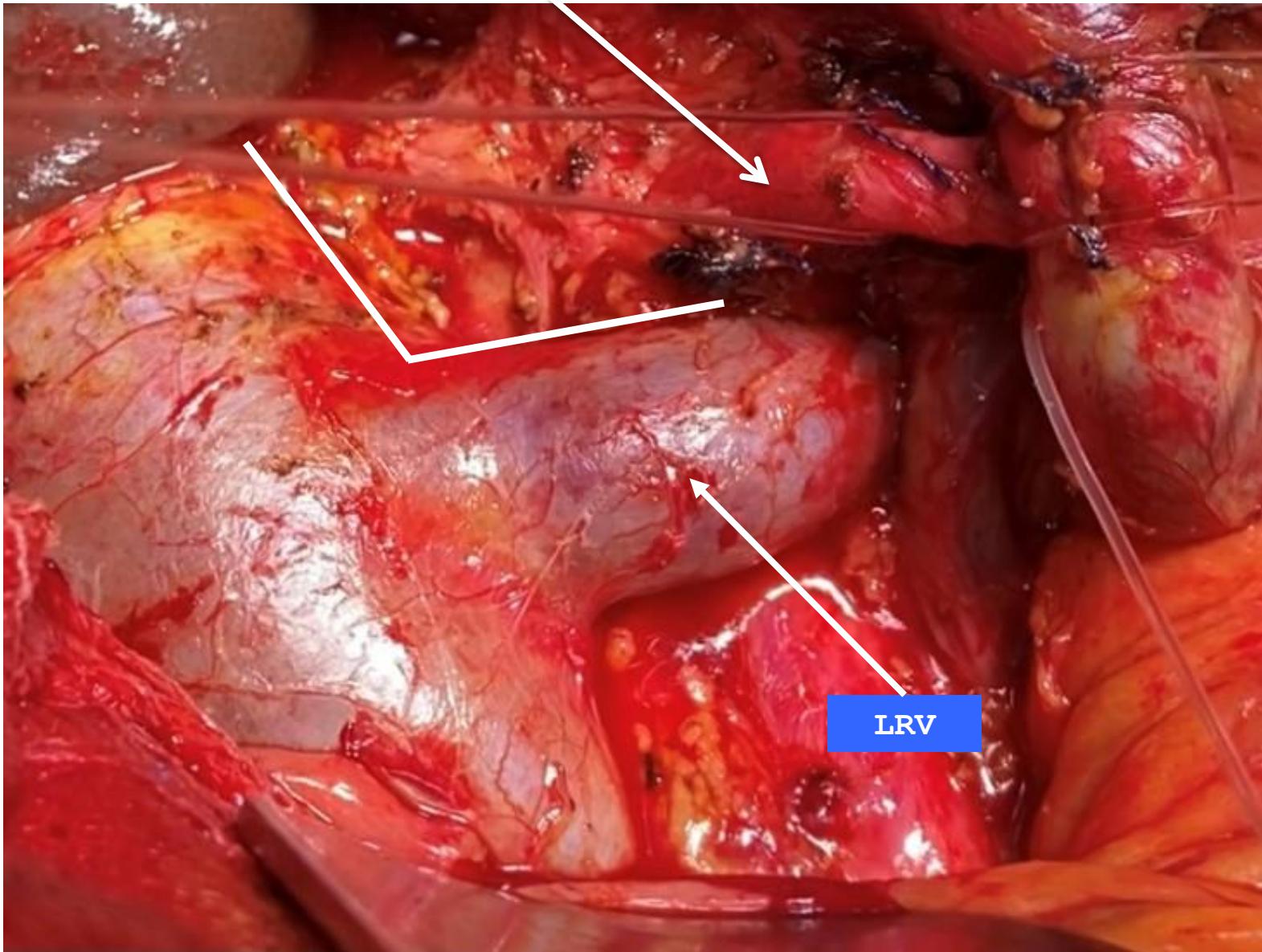
MESENTERIC APPROACH
(Nakao and Takagi, 1993)



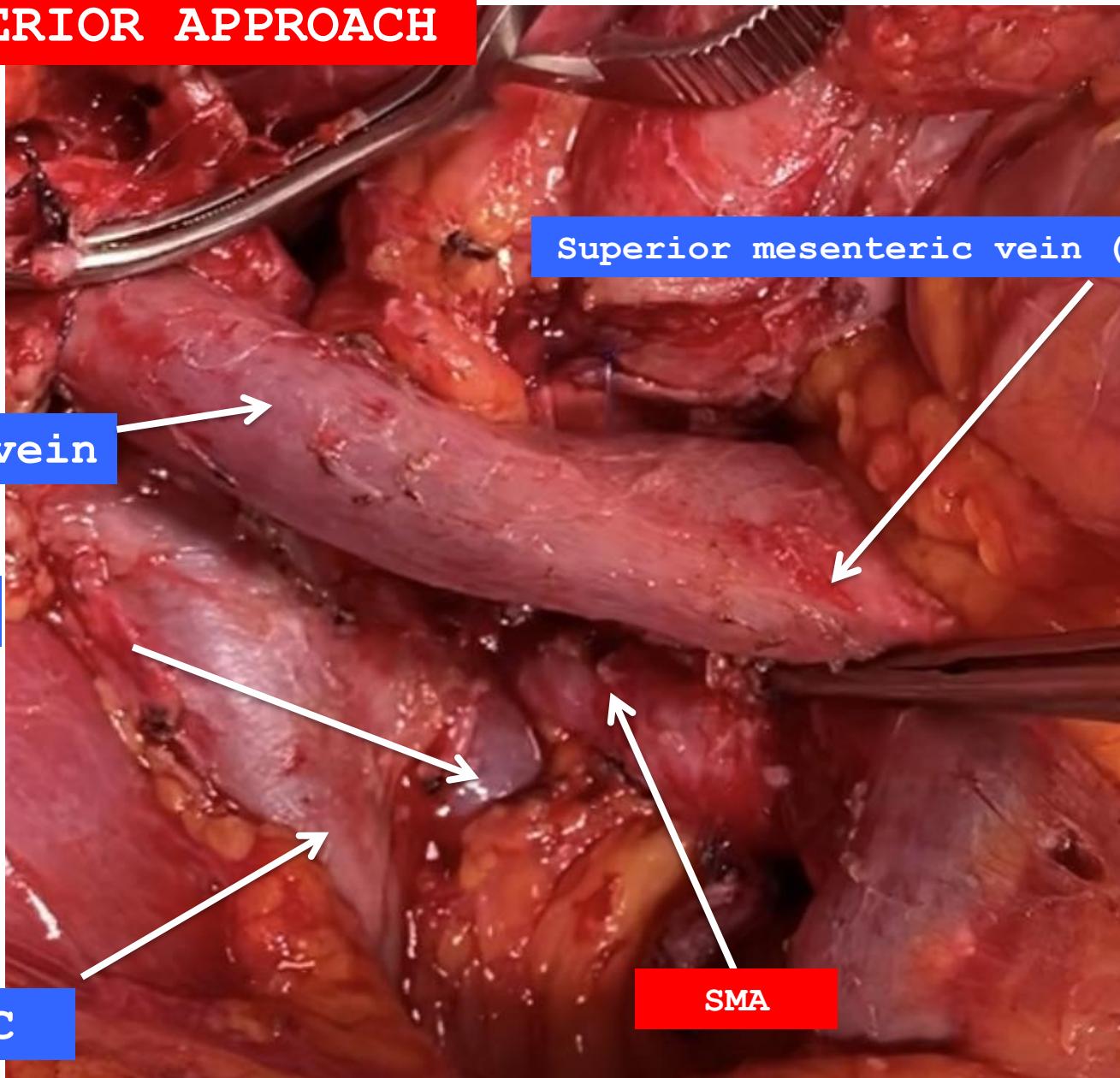
POSTERIOR APPROACH



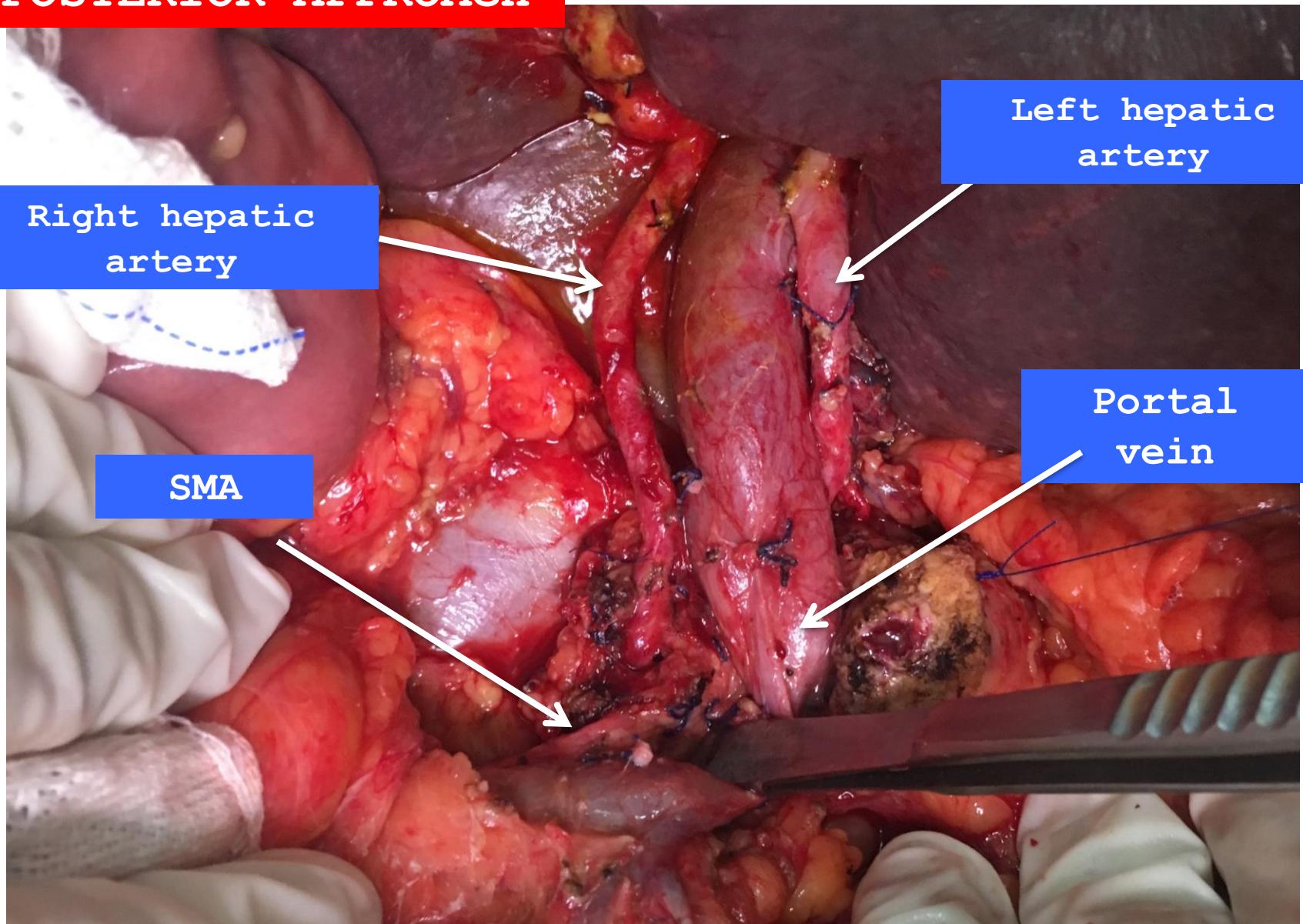
Identification of the SMA



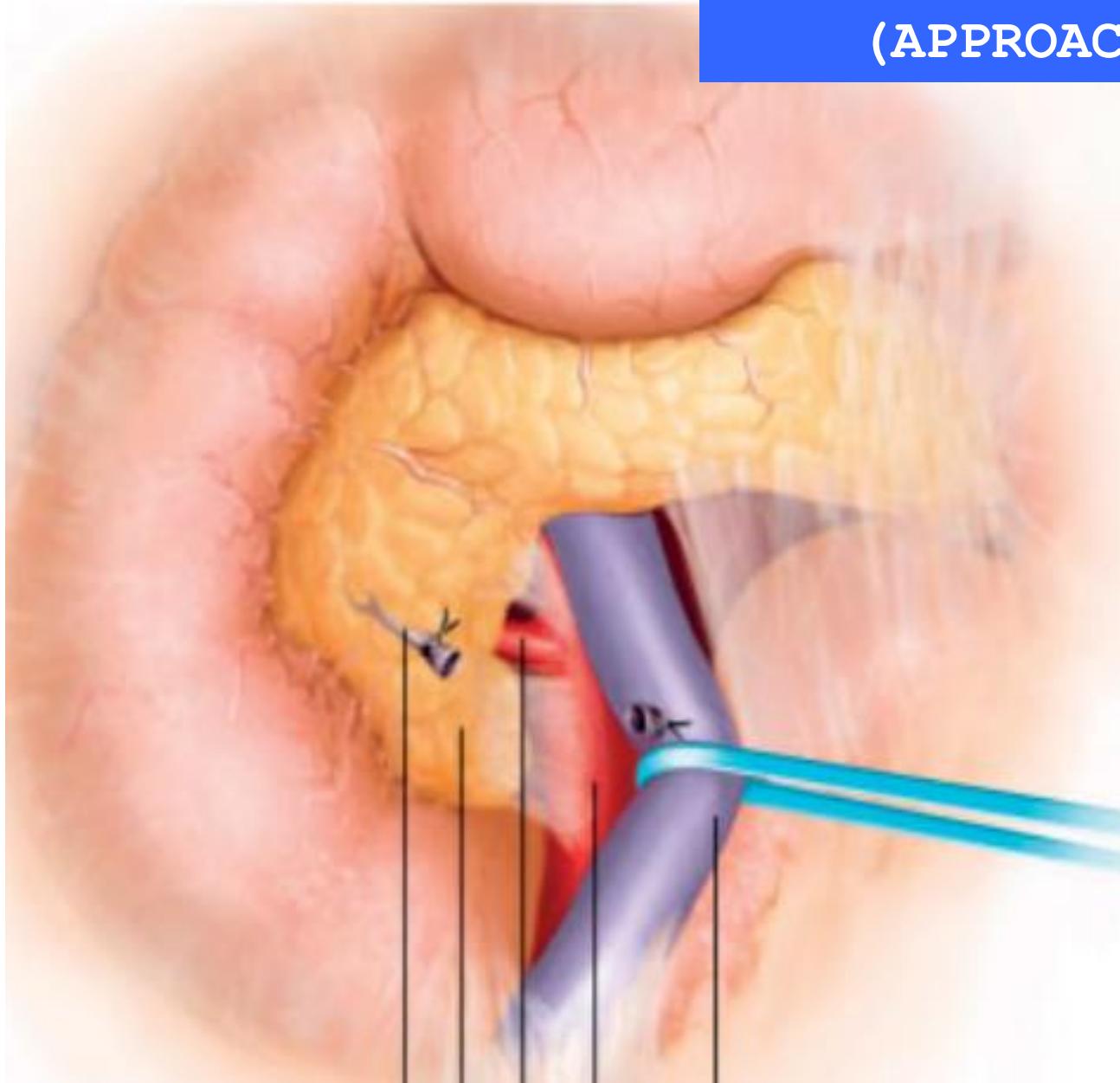
POSTERIOR APPROACH



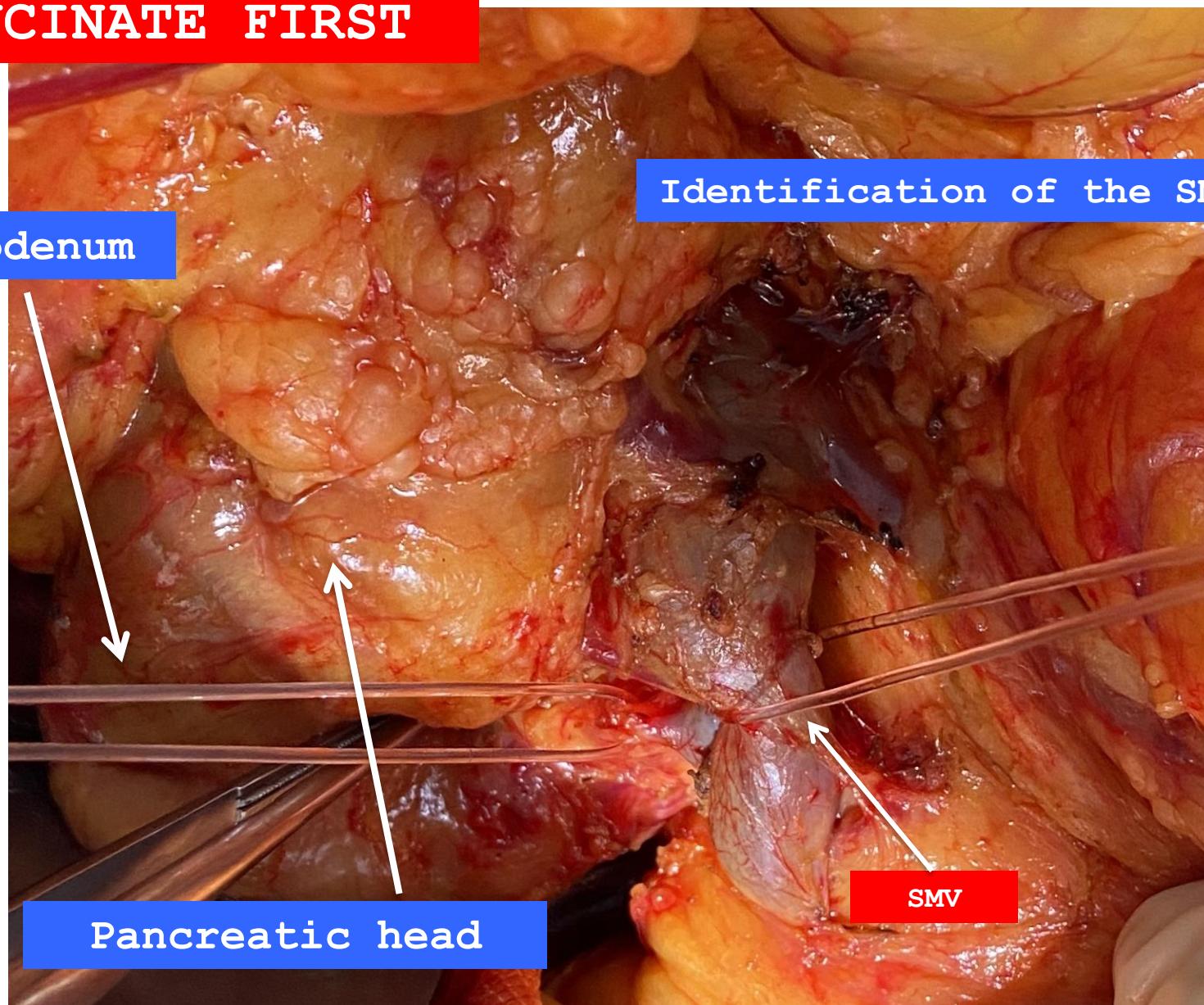
POSTERIOR APPROACH



**UNCINATE FIRST
(APPROACH)**



UNCINATE FIRST



Identification of the SMV

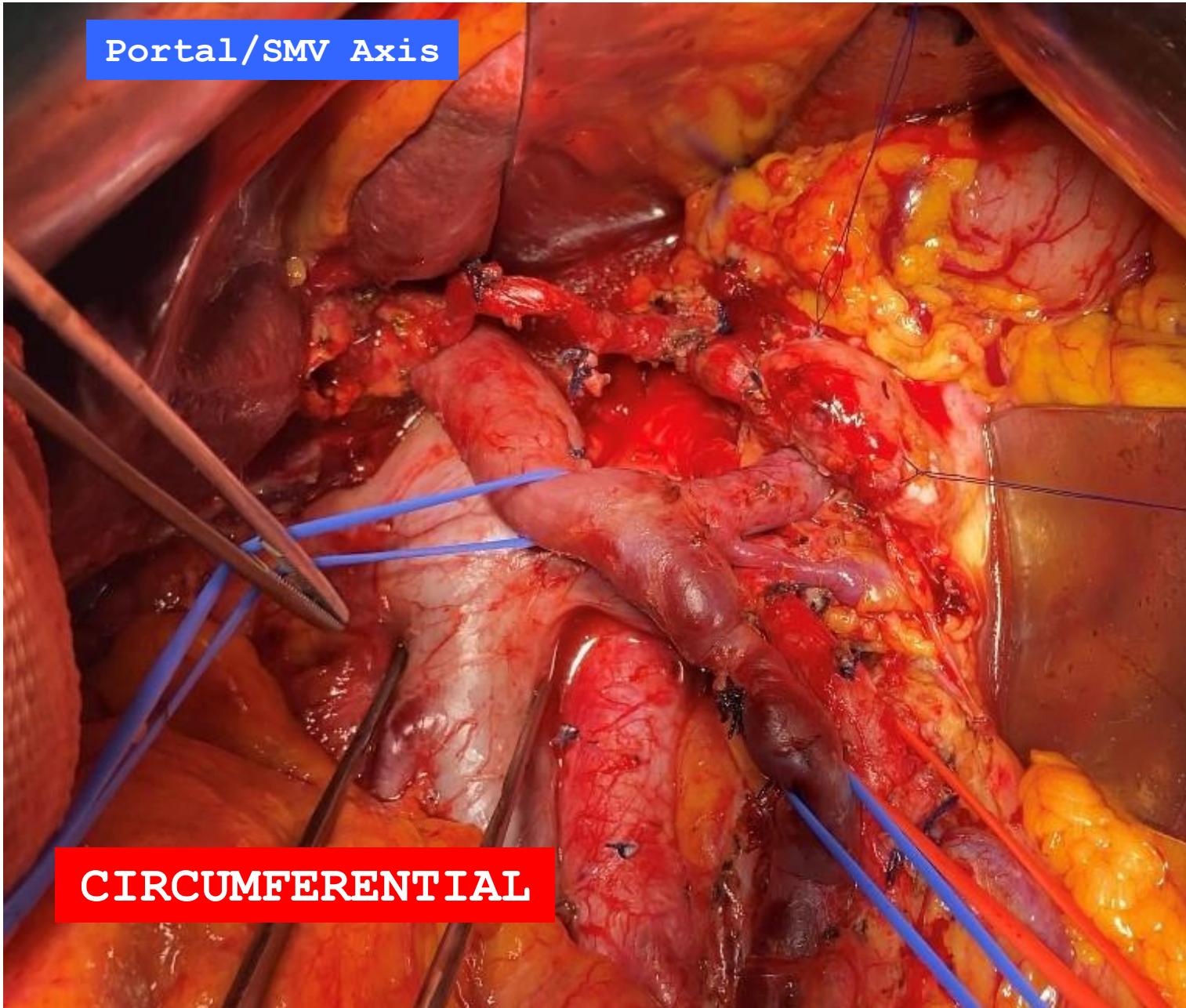
Duodenum

Pancreatic head

SMV

Portal/SMV Axis

CIRCUMFERENTIAL



CENTRAL VASCULAR LIGATION

CELIAC AXIS
SYSTEM

GDA

SMA SYSTEM

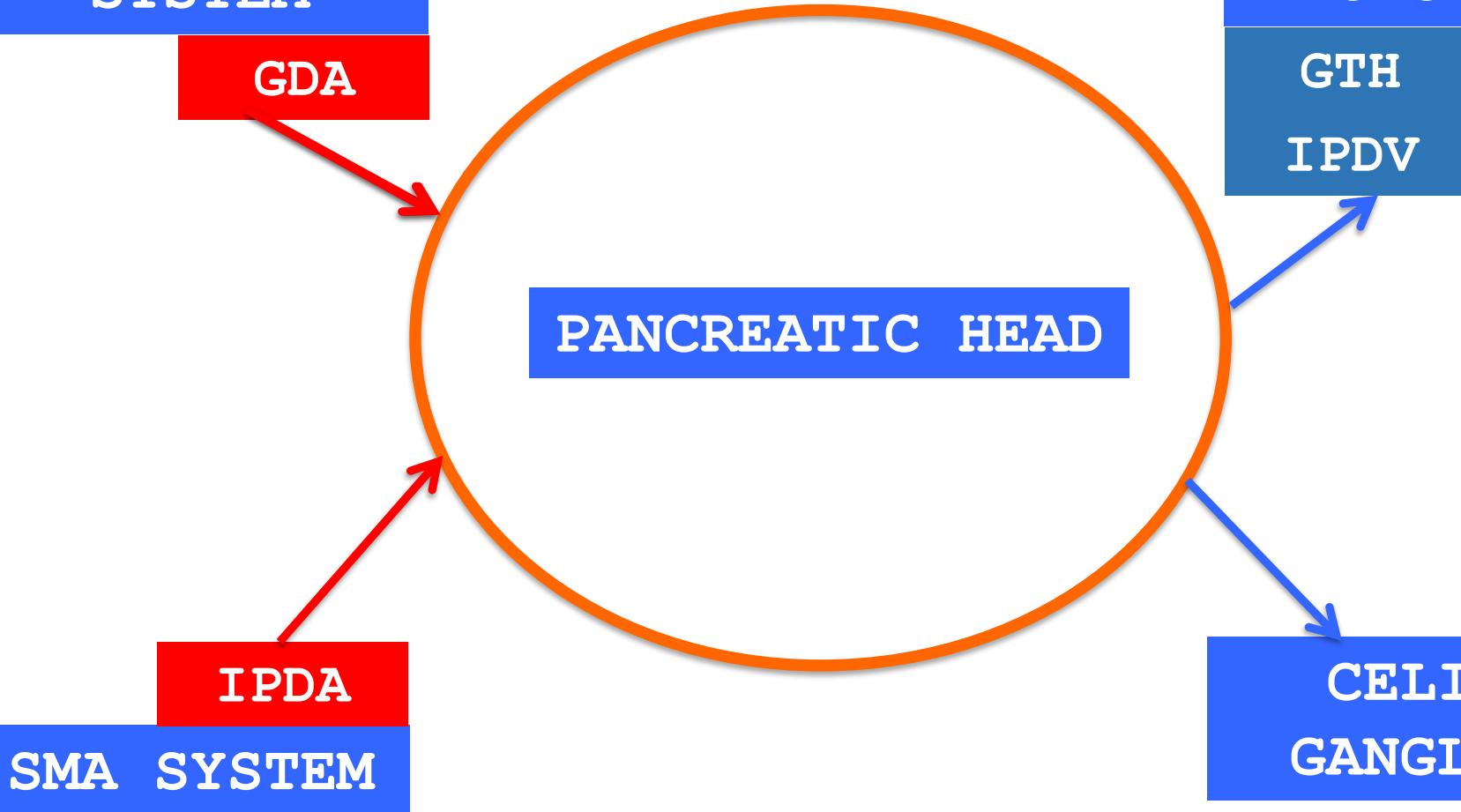
IPDA

PANCREATIC HEAD

PORTAL/SMV
SYSTEM

GTH
IPDV

CELIAC
GANGLION

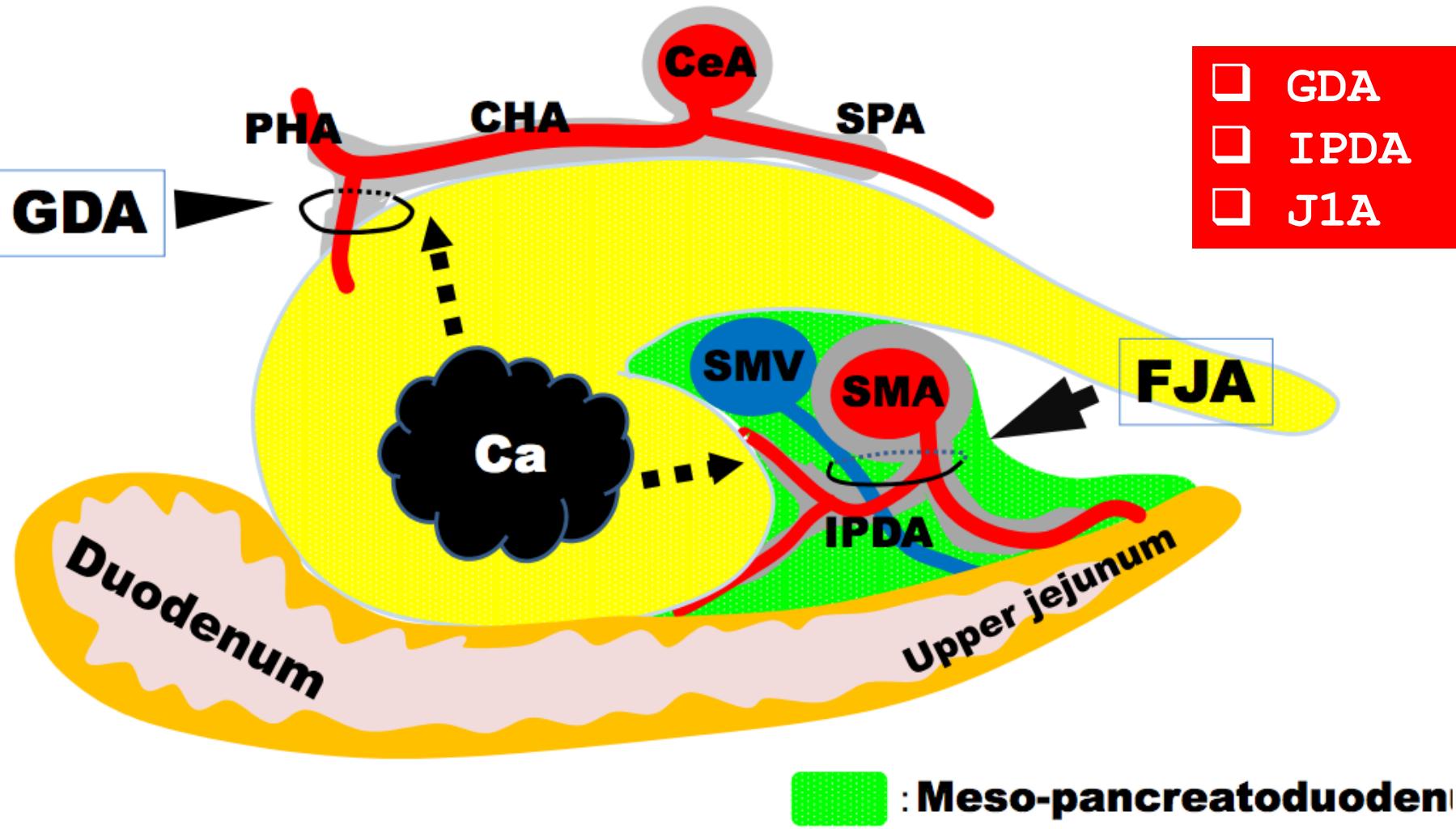


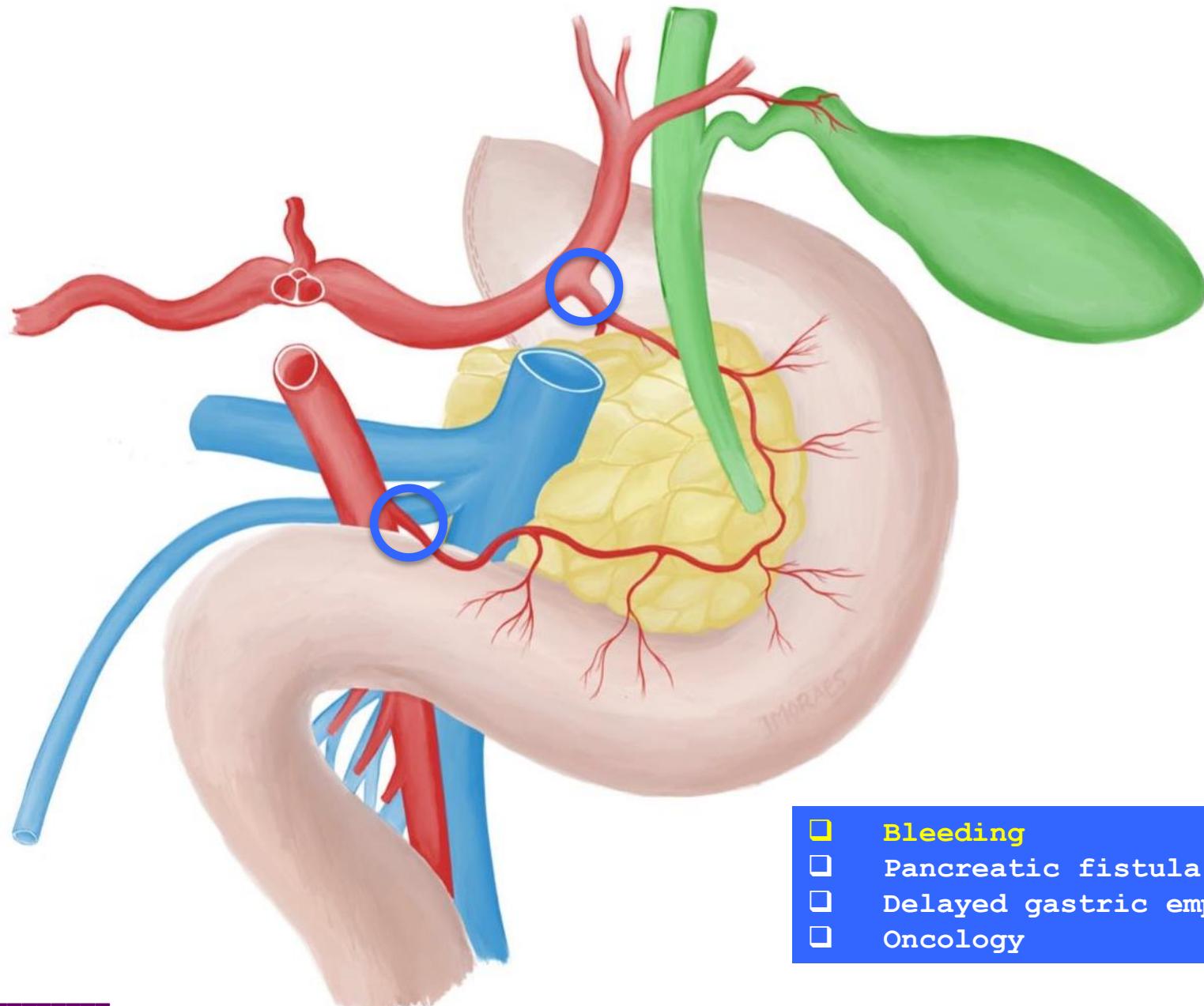
CENTRAL VASCULAR LIGATION

- Bleeding
- Pancreatic fistula
- Delayed gastric emptying
- Oncology

- Gastroduodenal artery (GDA)
- Inferior pancreaticoduodenal artery (IPDA)
- First jejunal artery (J1A)

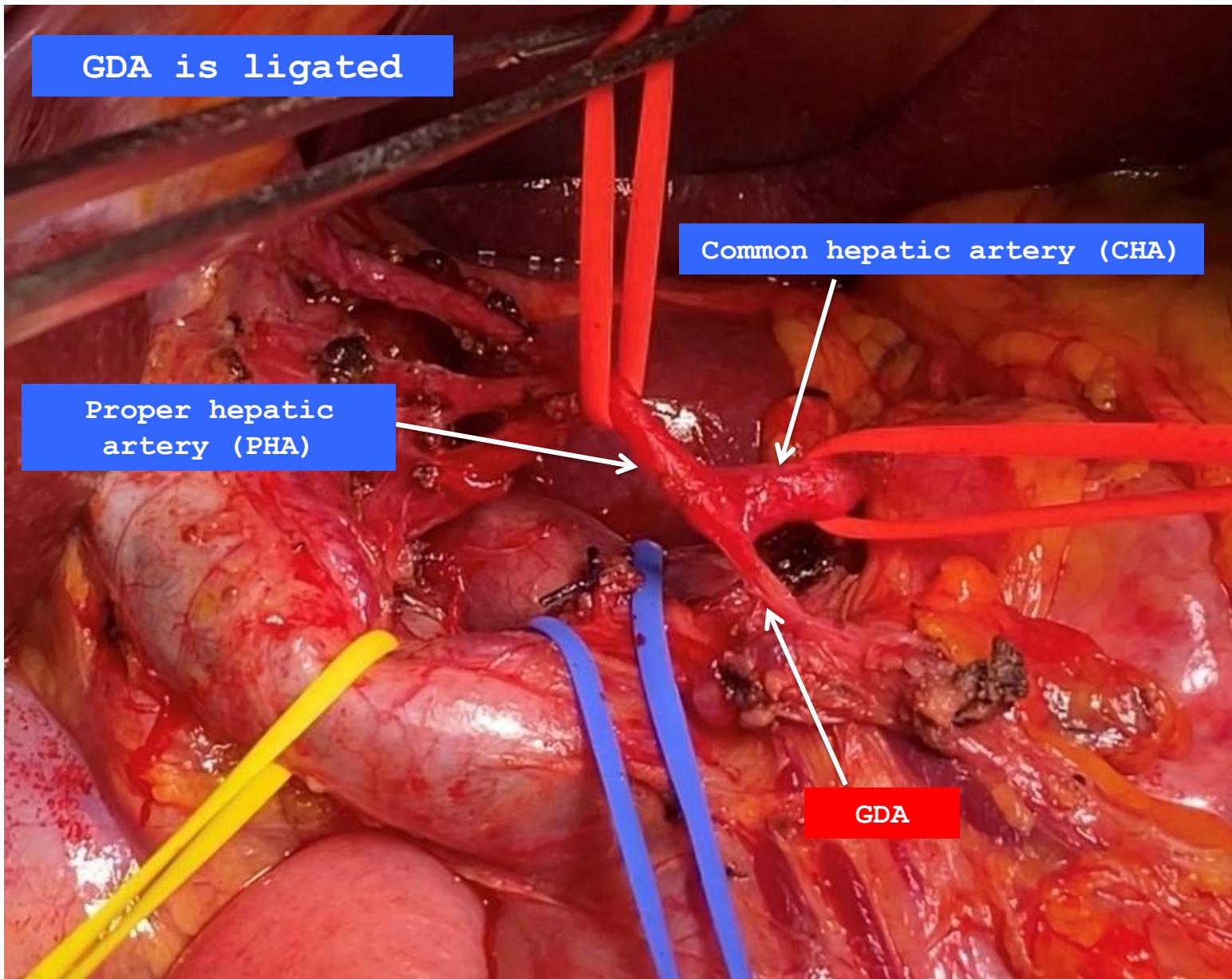
CENTRAL VASCULAR LIGATION



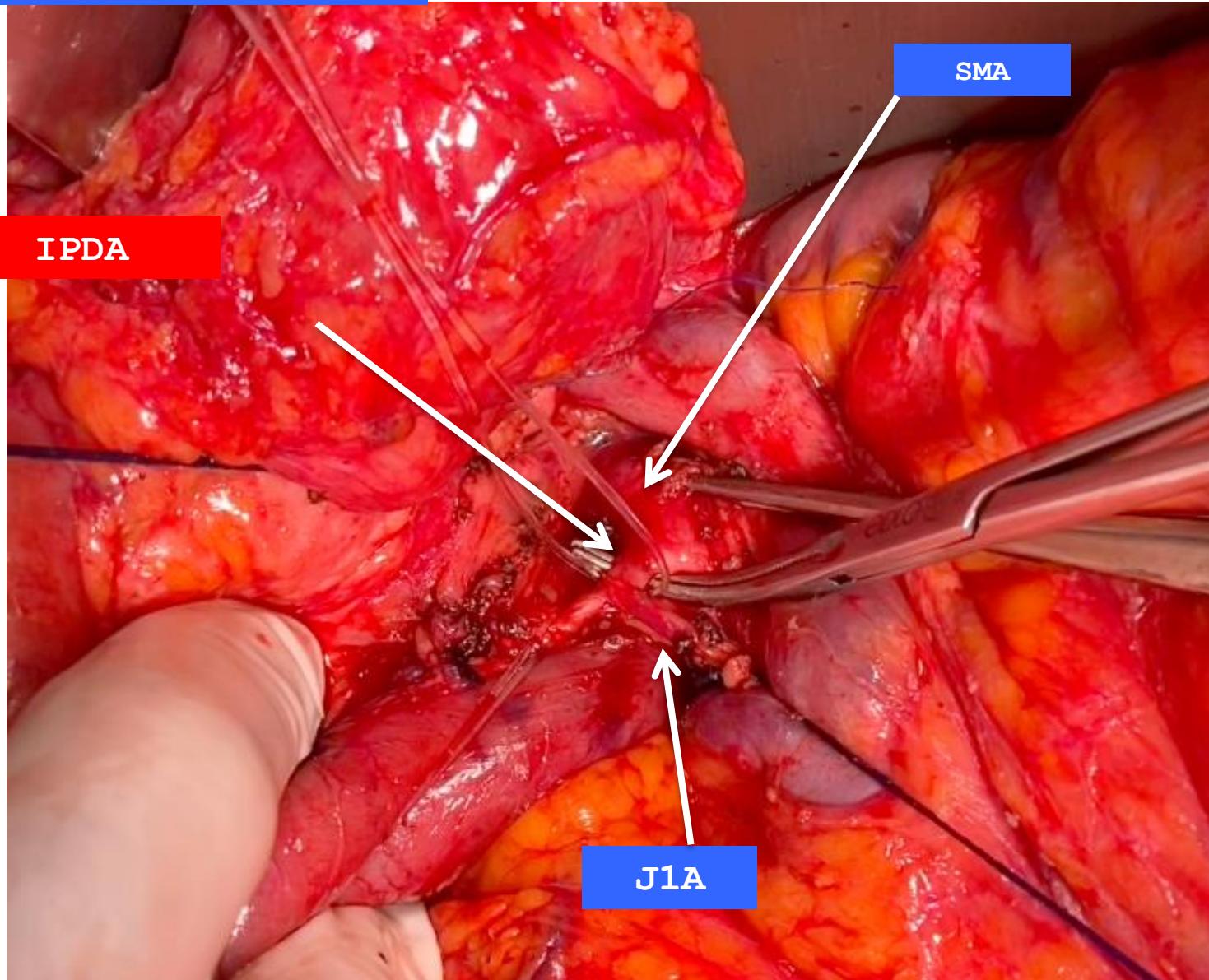


- Bleeding
- Pancreatic fistula
- Delayed gastric emptying
- Oncology

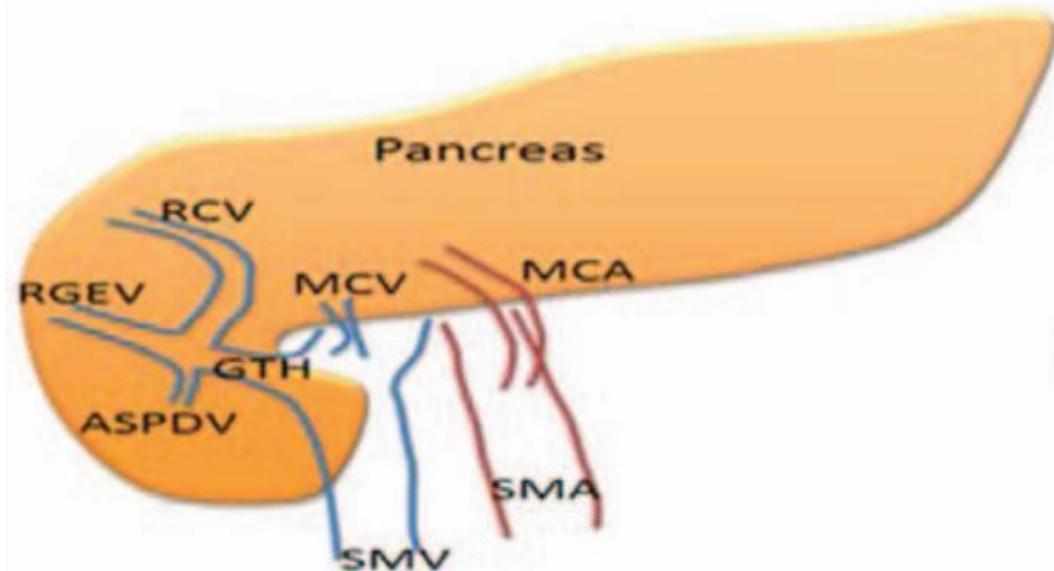
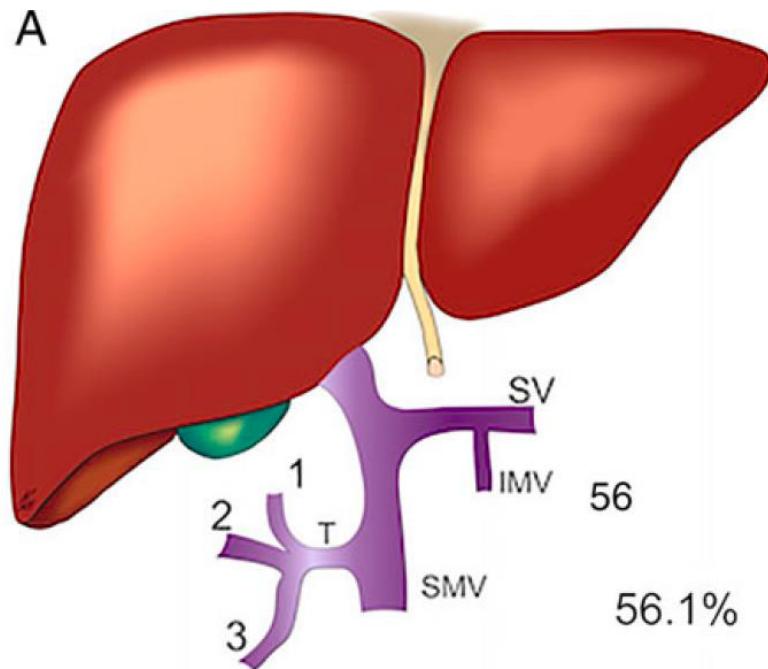
GDA is ligated



UNCINATE FIRST

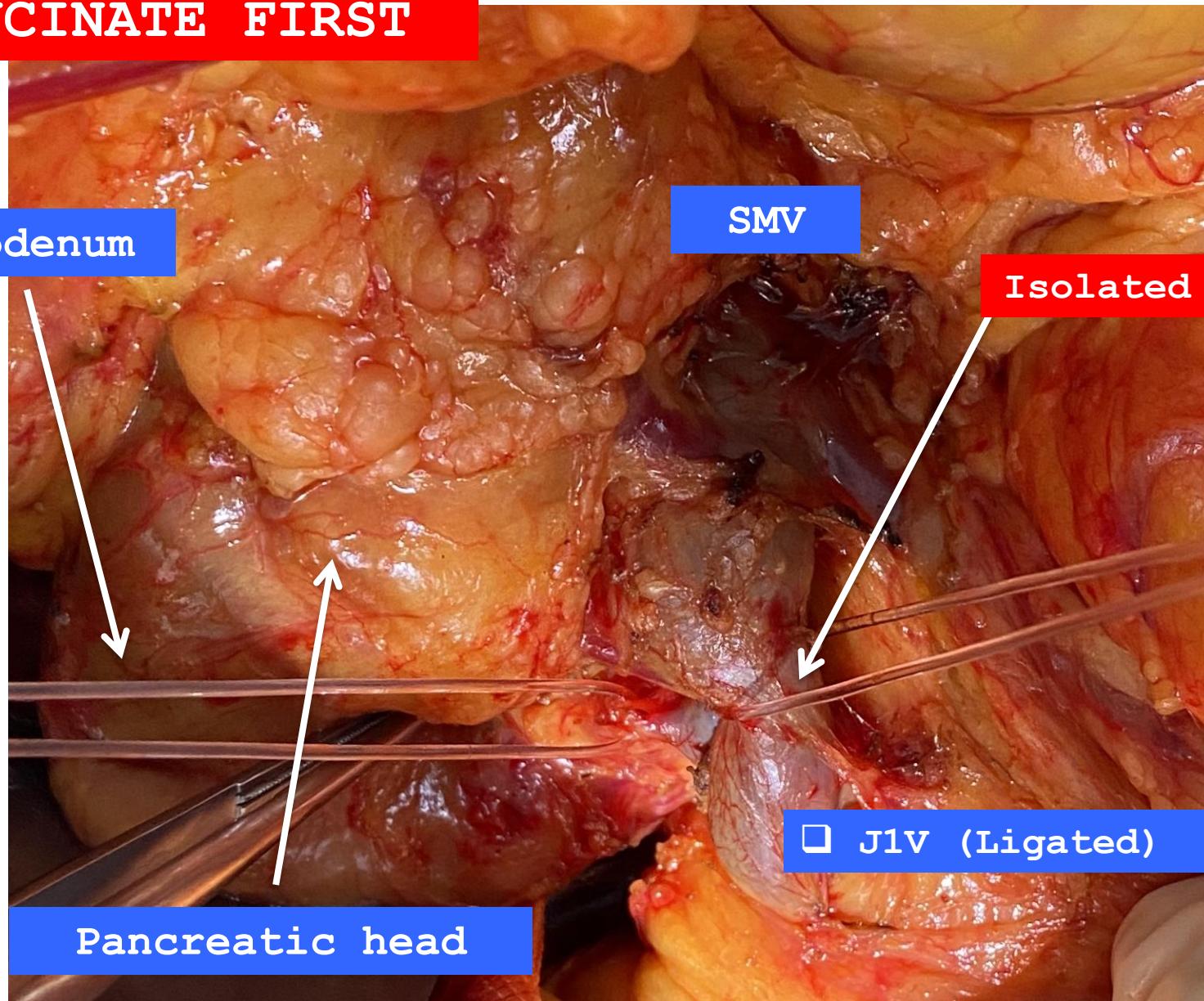


GASTROCOLIC TRUNK OF HENLE



- RIGHT GASTROEPITHELIOIC VEIN (RGEV)
- ANTERIOR SUPERIOR PANCREATODUODENAL VEIN (ASPDV)
- RIGHT COLIC VEIN RCV(Should be ligated)

UNCINATE FIRST

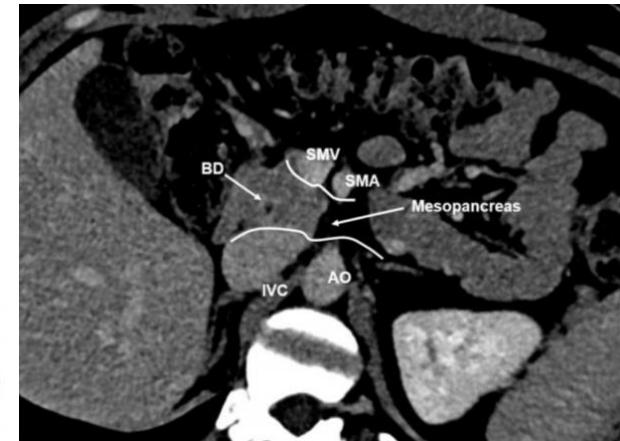
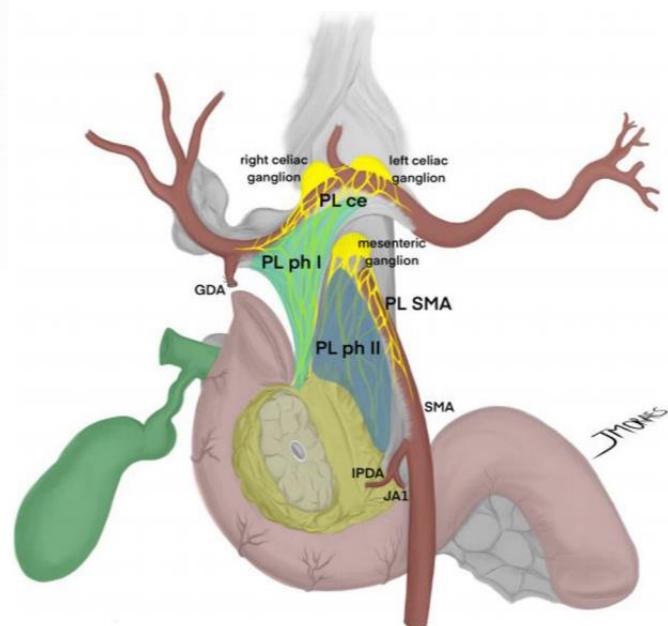
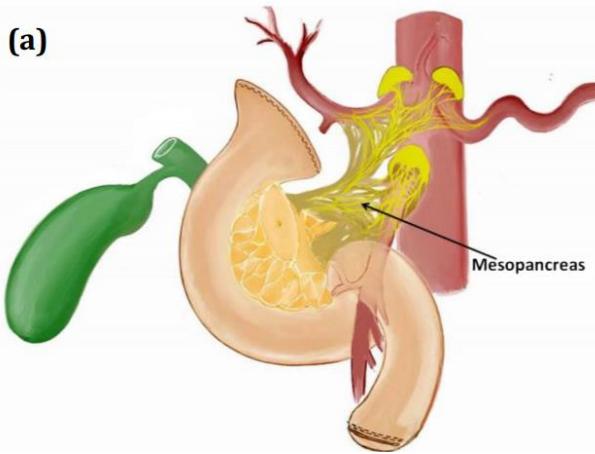




What do surgeons need to know about the mesopancreas

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}

(a)



TOTAL MESOPANCREAS EXCISION

- Bleeding
- Pancreatic fistula
- Delayed gastric emptying
- Oncology

MESOPANCREAS

- plPh-I
- plPh-II
- IPDA inferior
- Jejunal arteries
- Jejunal veins
- Lymph nodes

Right celiac ganglion

Pl-ce

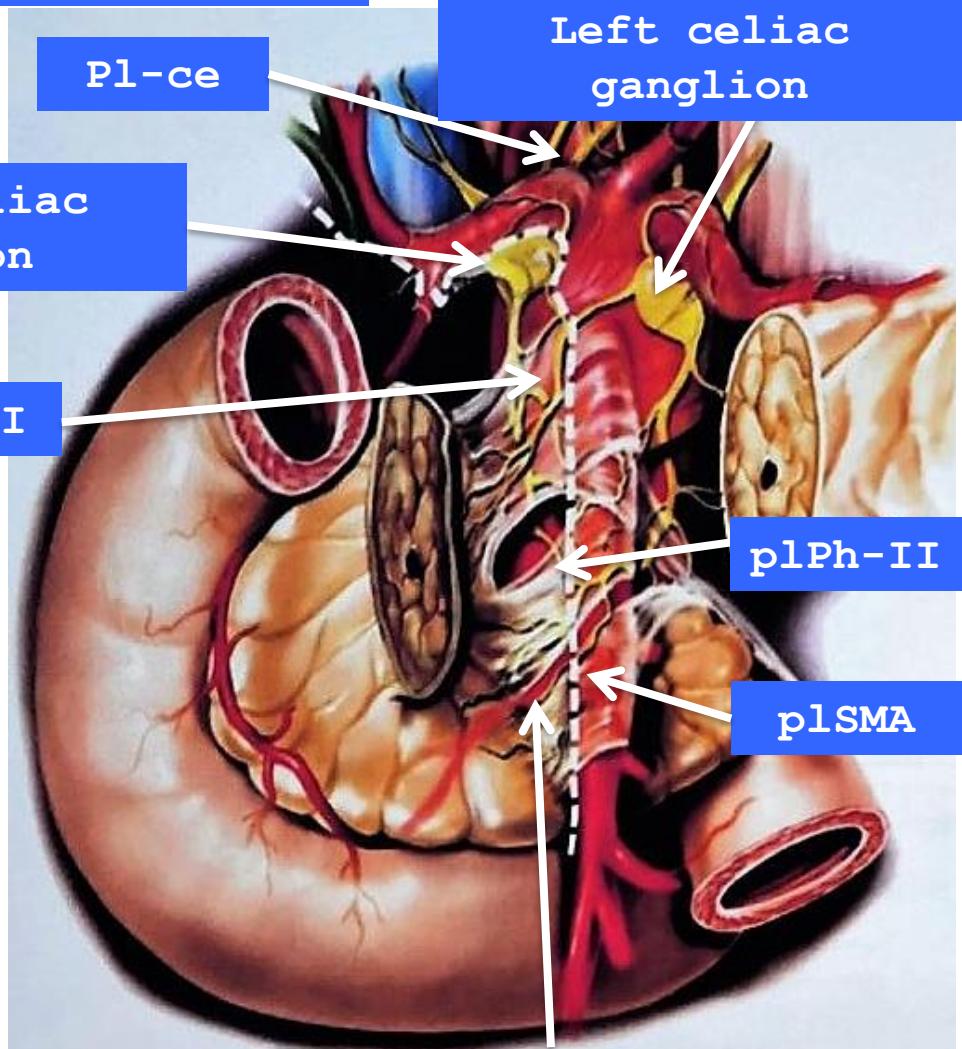
Left celiac ganglion

plPh-I

plPh-II

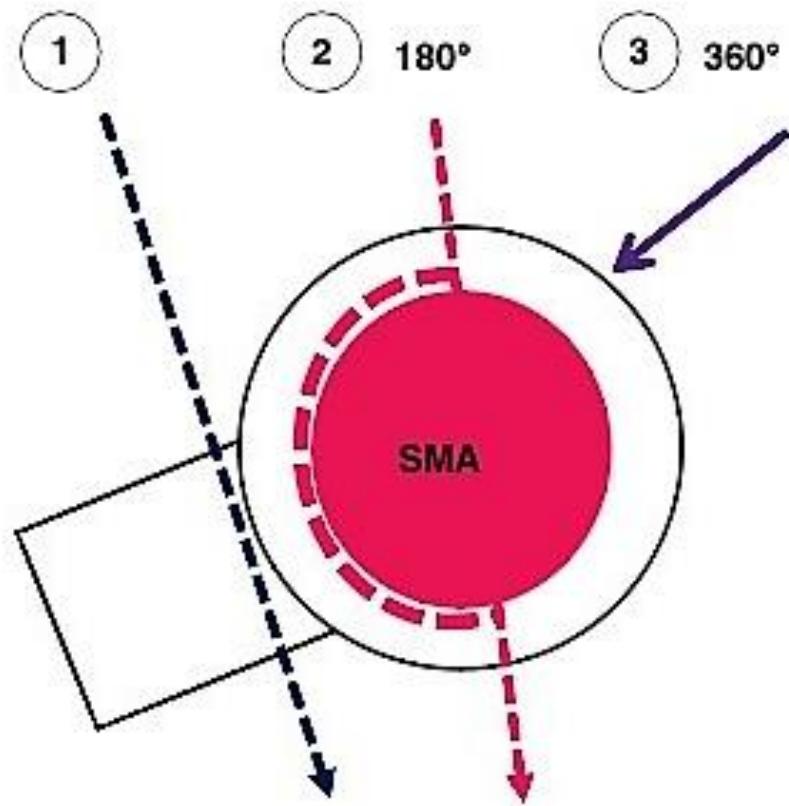
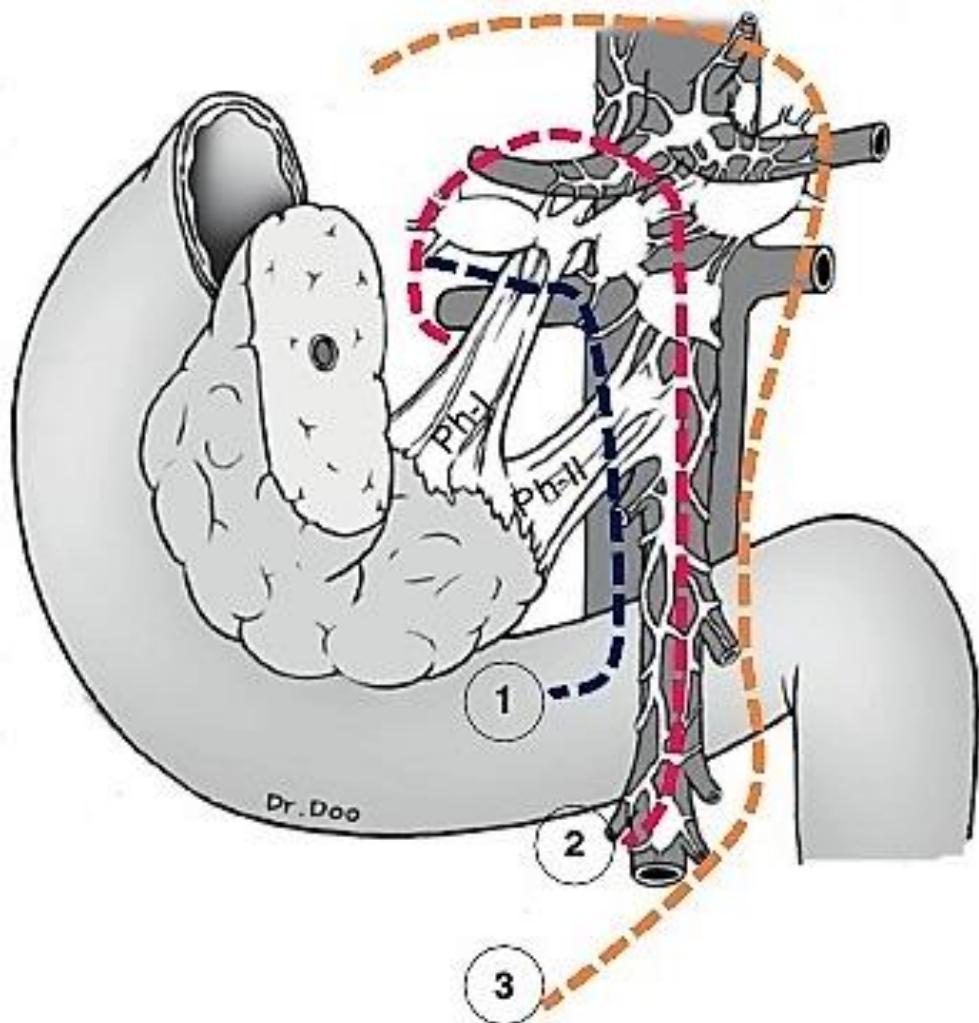
plsMA

IPDA

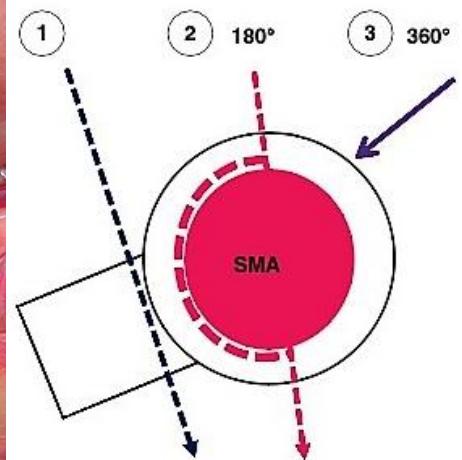
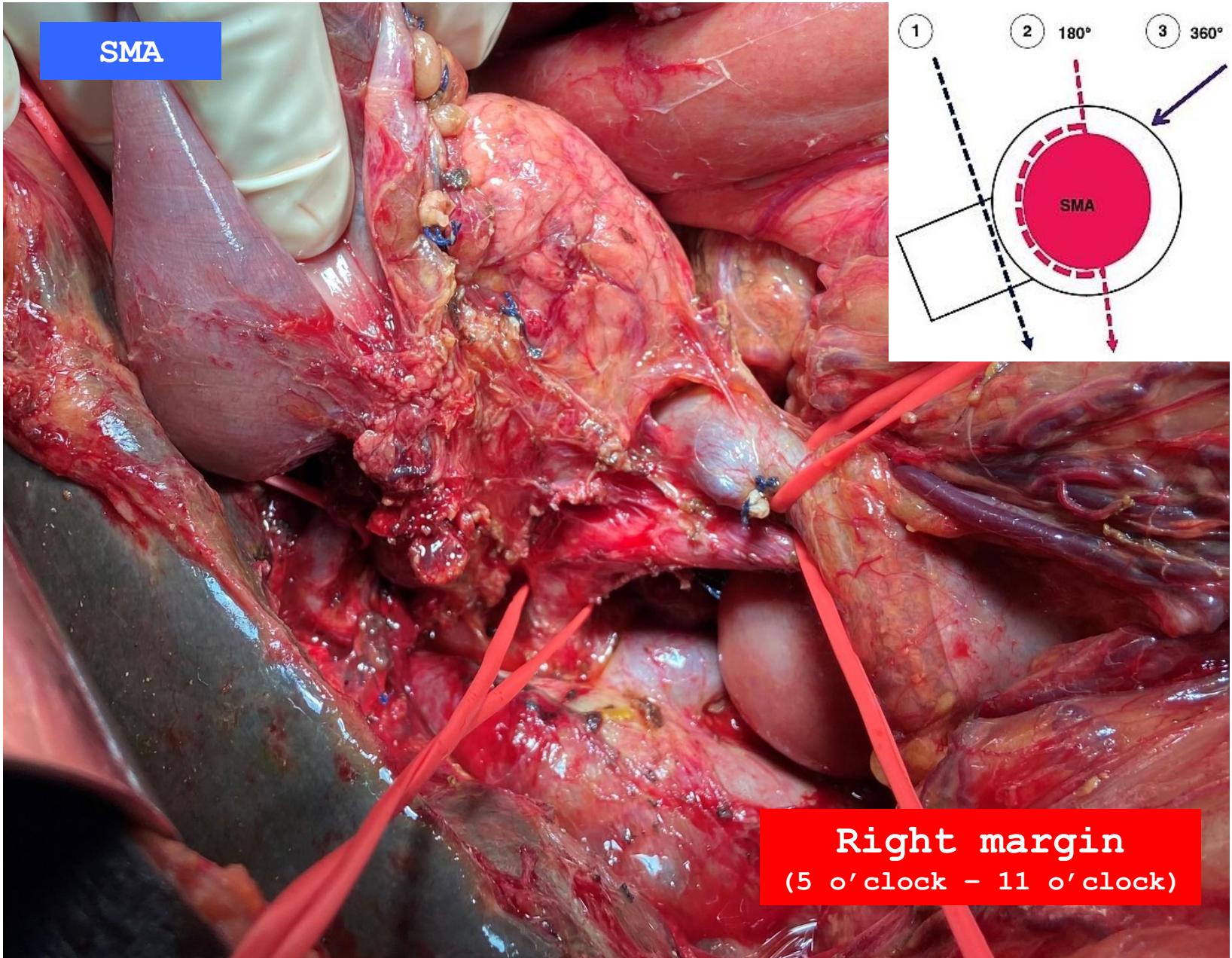


Mesopancreas

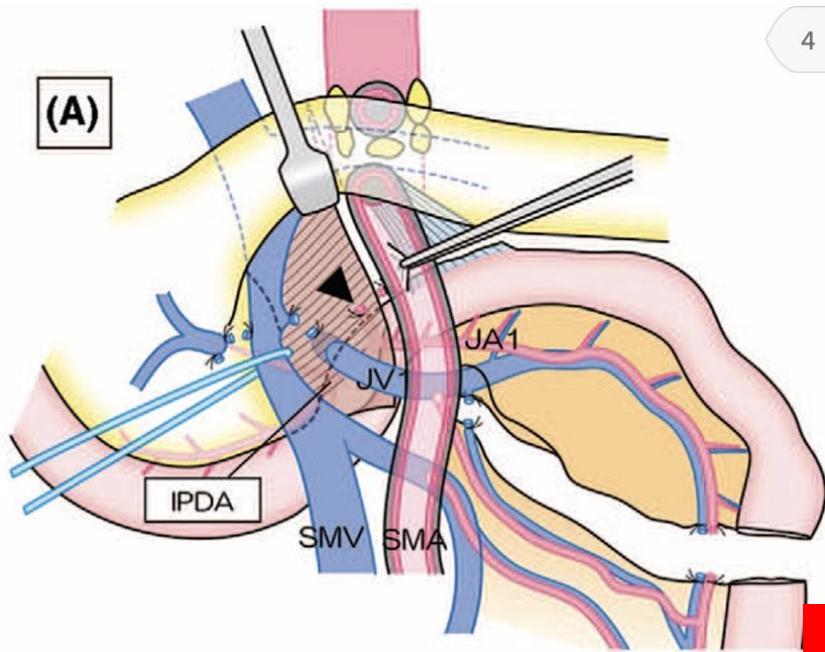
Level 2



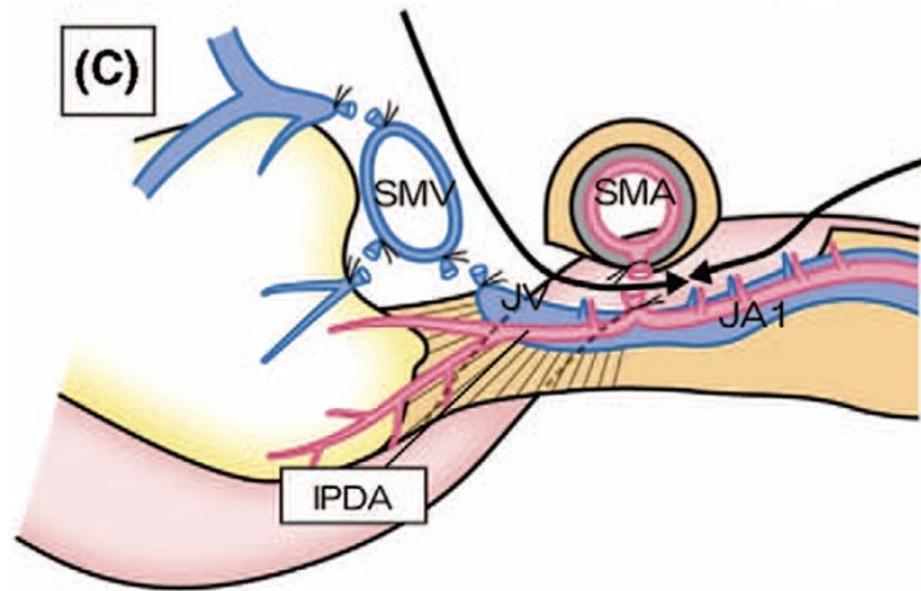
Right margin of the SMA



(A)

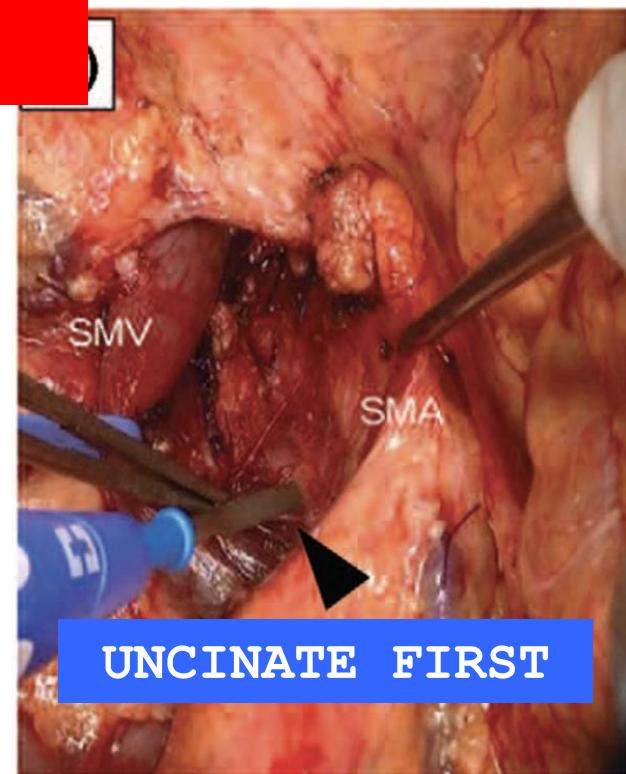
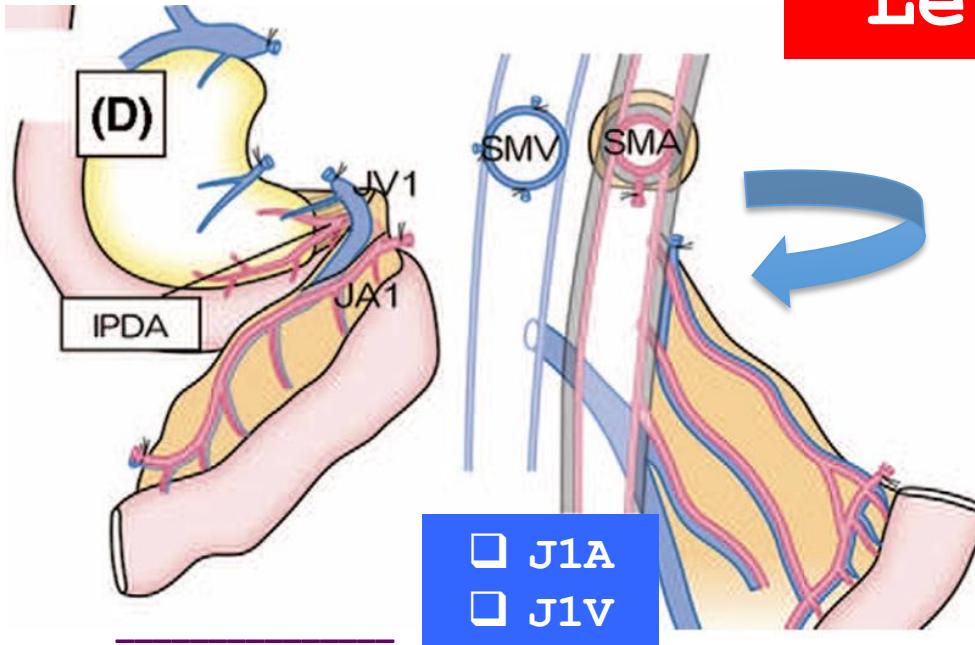


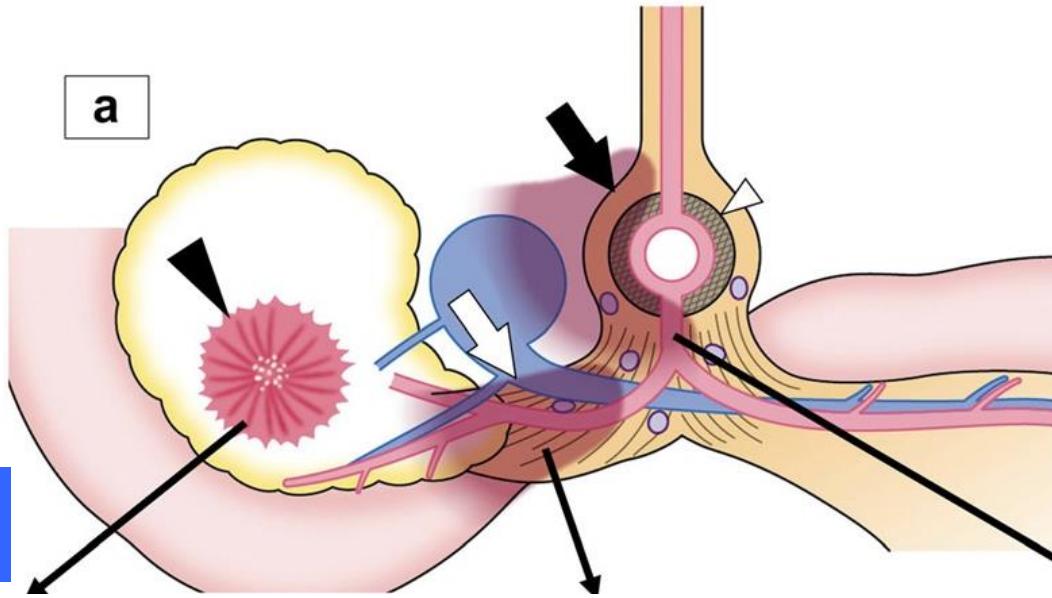
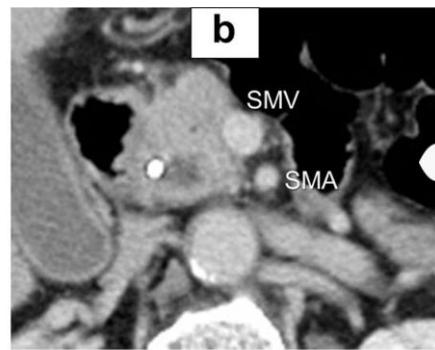
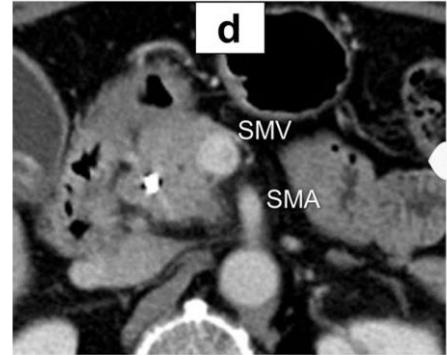
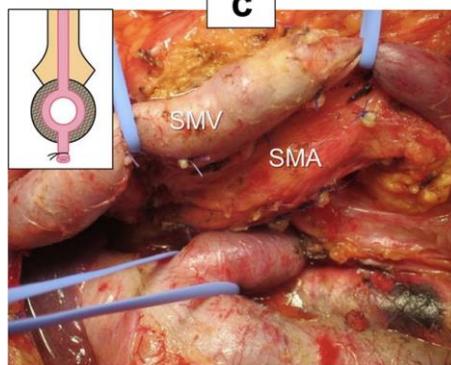
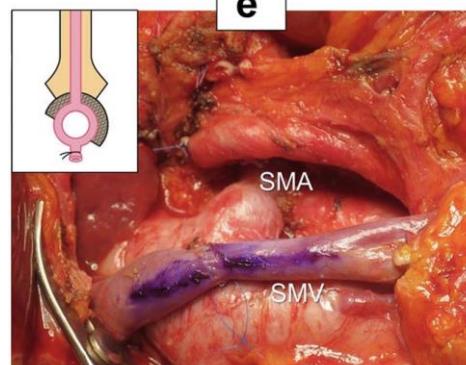
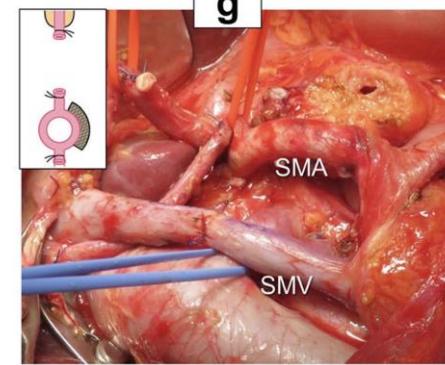
(C)



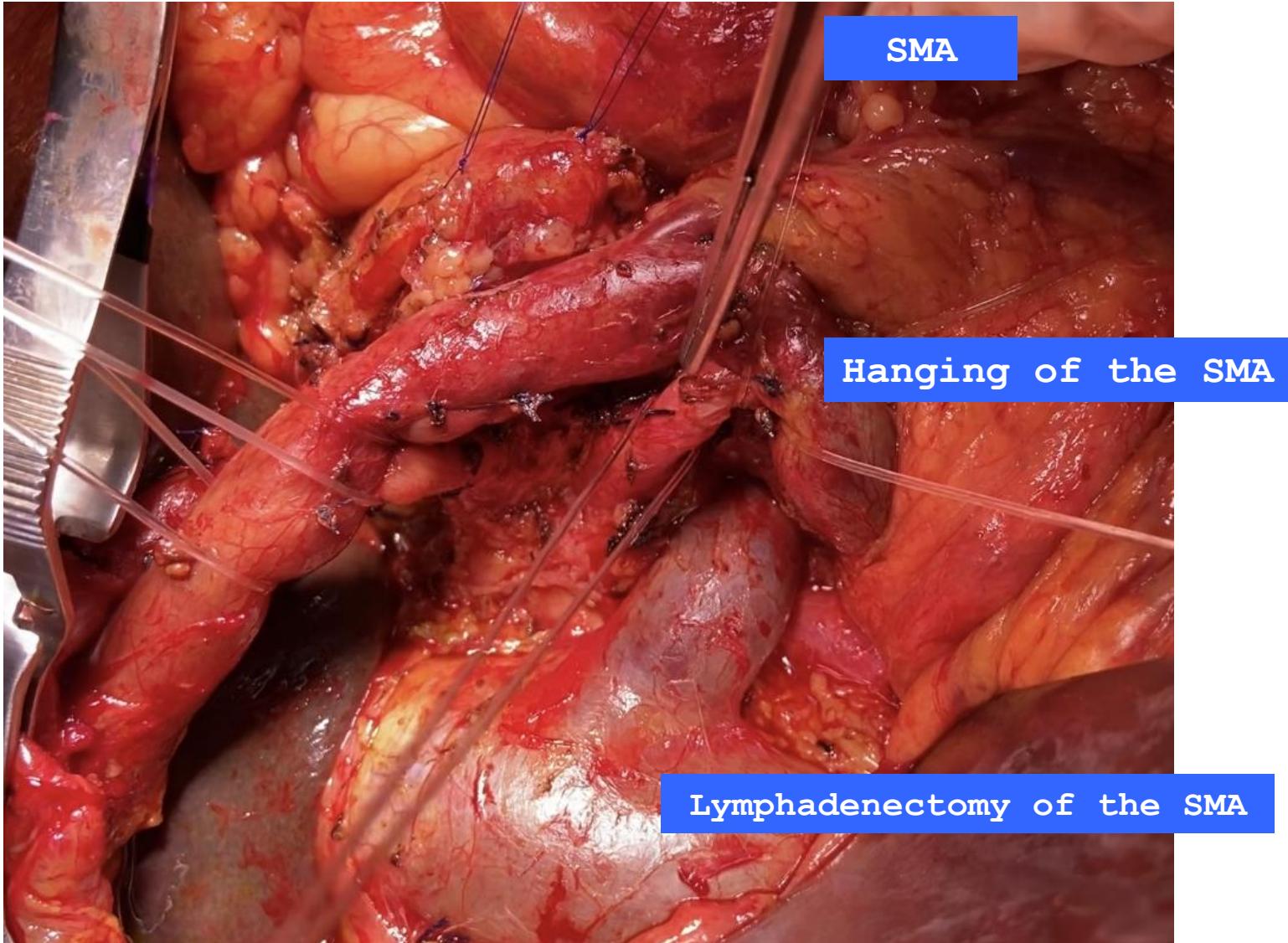
Level 2

(D)



a**Level 2****b****d****f****c****e****g**

MESOPANCREAS

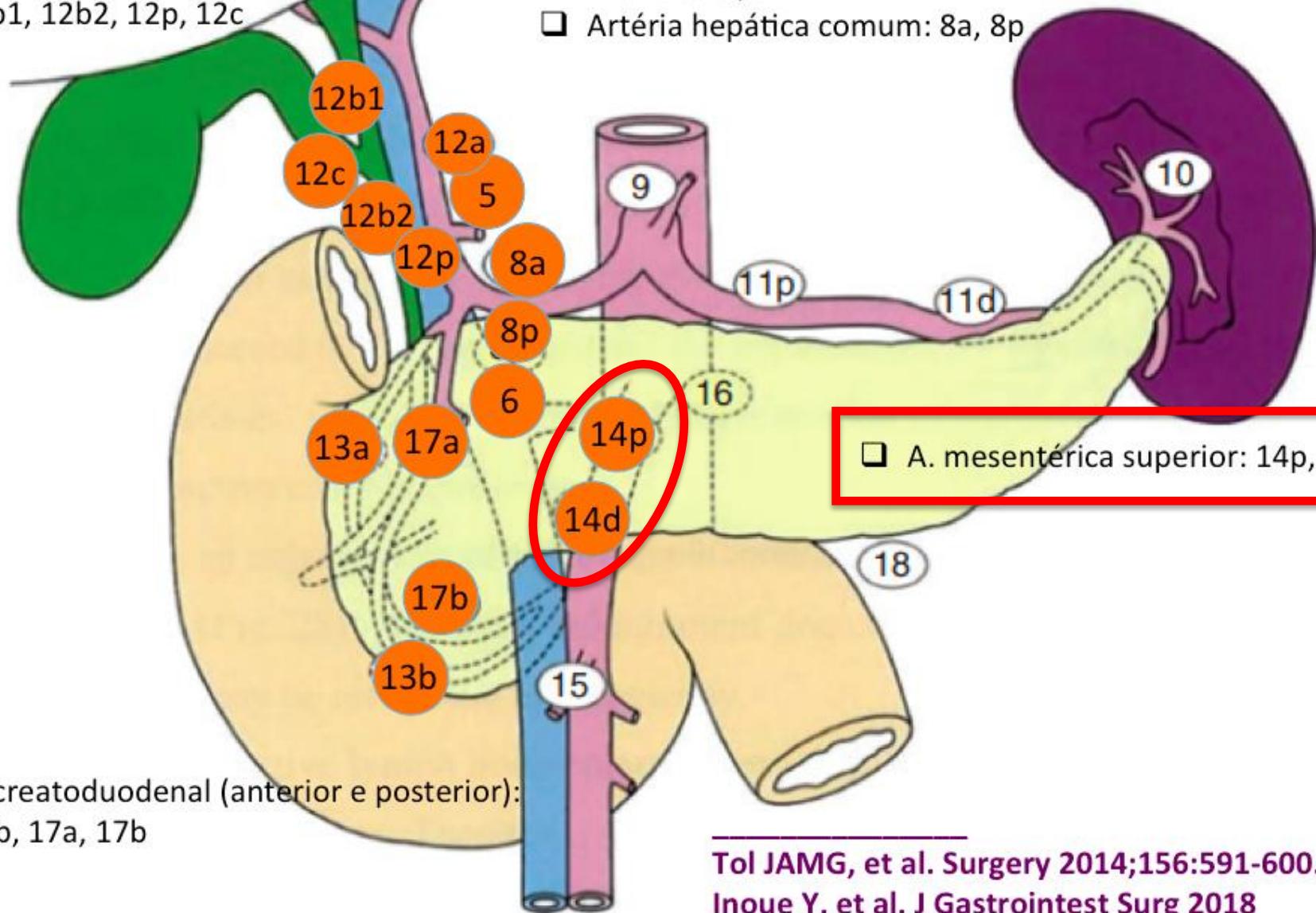


Linfadenectomia

Nivel 2

Ligamento hepatoduodenal:
12a, 12b1, 12b2, 12p, 12c

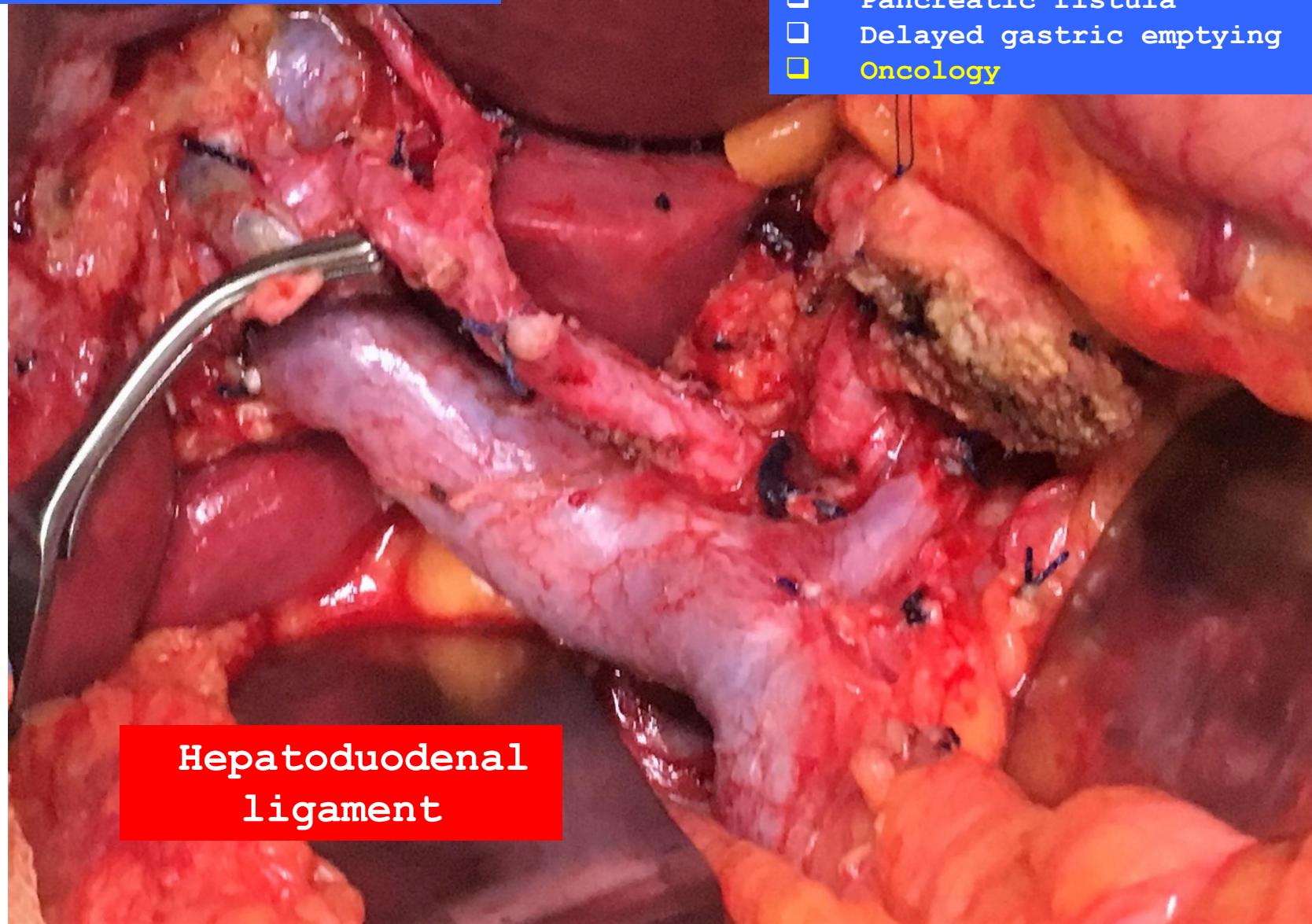
Pilóricos: 5, 6
 Artéria hepática comum: 8a, 8p



Pancreatoduodenal (anterior e posterior):
13a, 13b, 17a, 17b

Tol JAMG, et al. Surgery 2014;156:591-600.
Inoue Y, et al. J Gastrointest Surg 2018

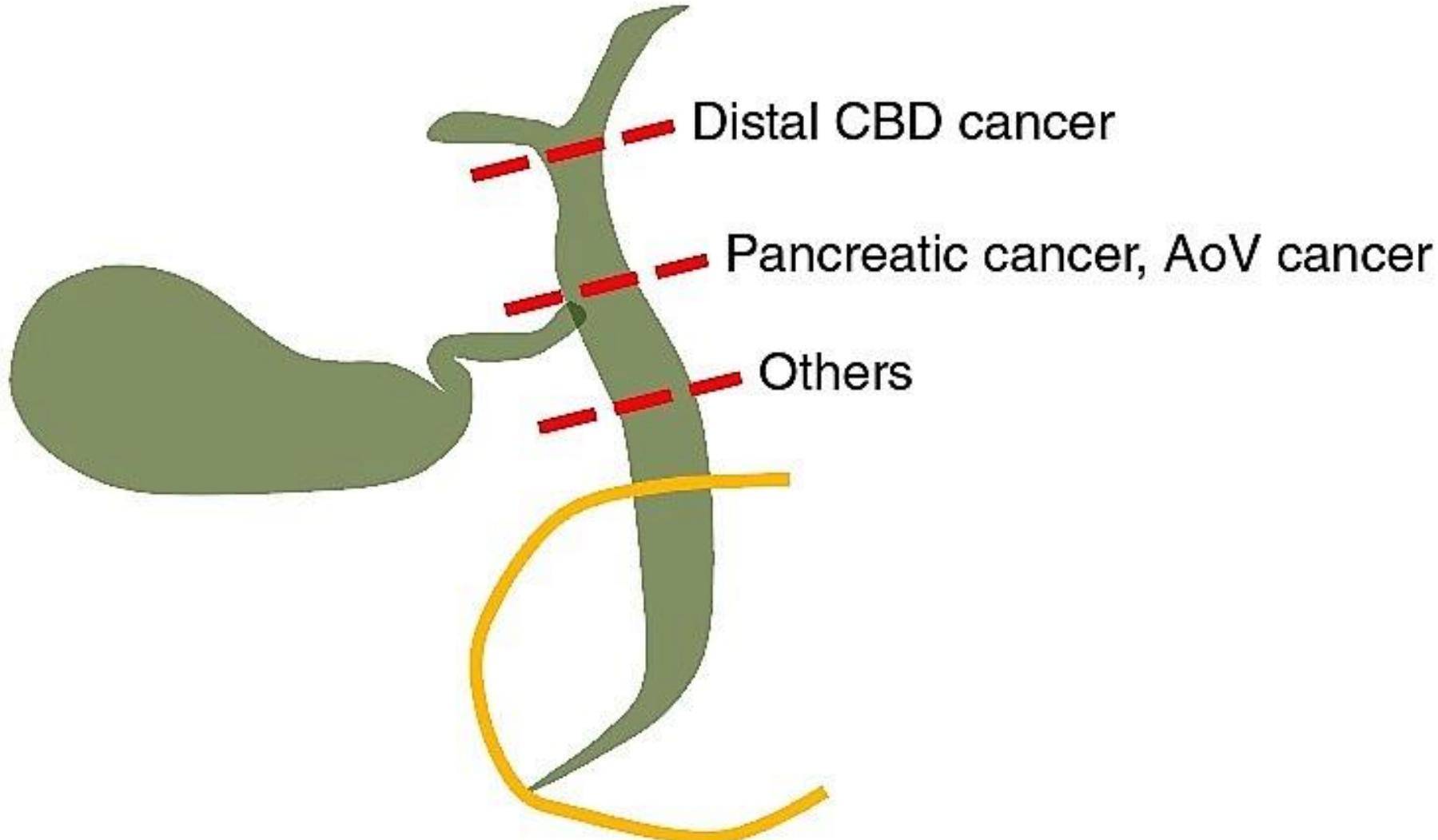
LYMPHADENECTION



- Bleeding
- Pancreatic fistula
- Delayed gastric emptying
- Oncology

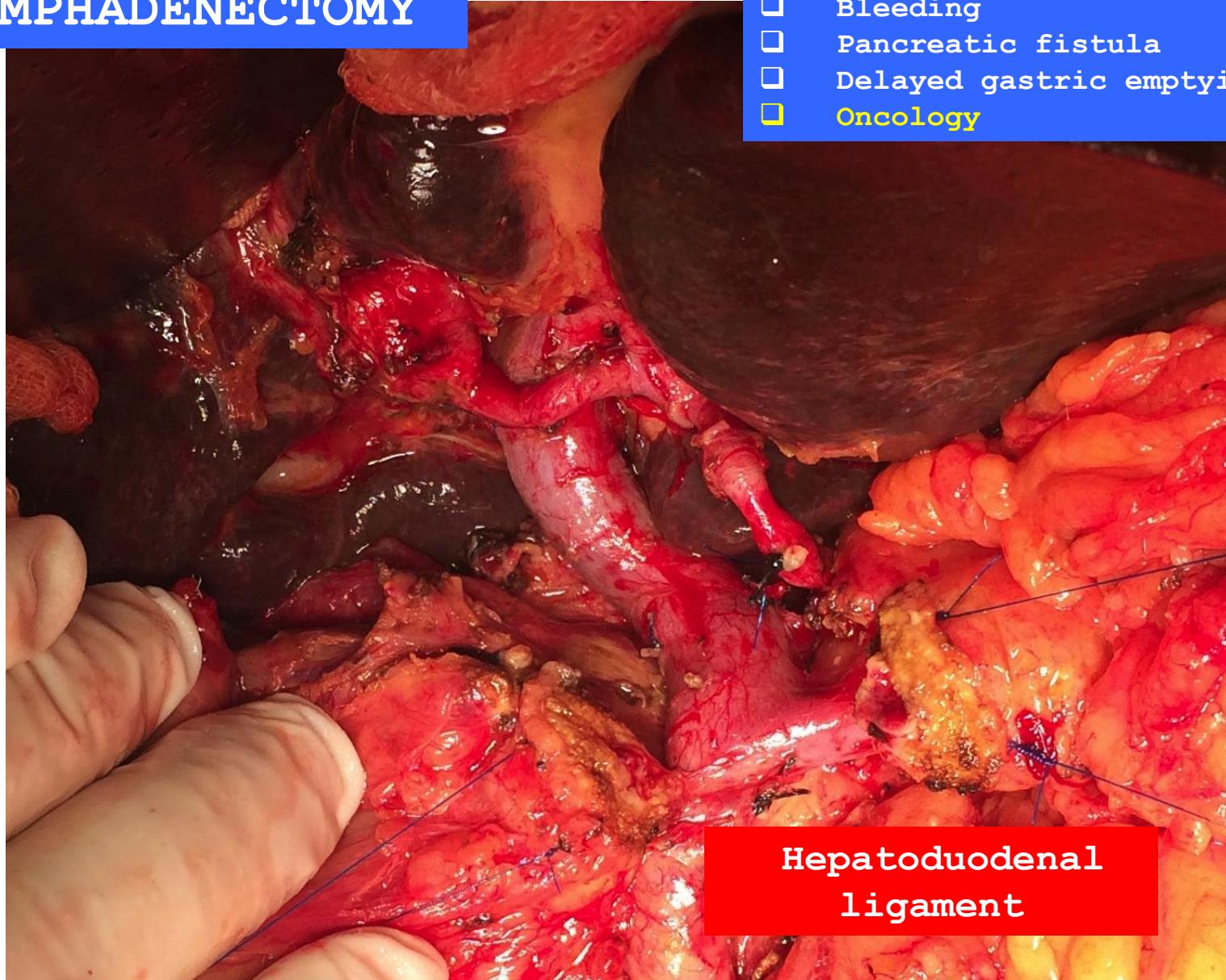


Bile duct resection



- Above the cystic duct
- < 2cm of the bifurcation

LYMPHADENECTOMY



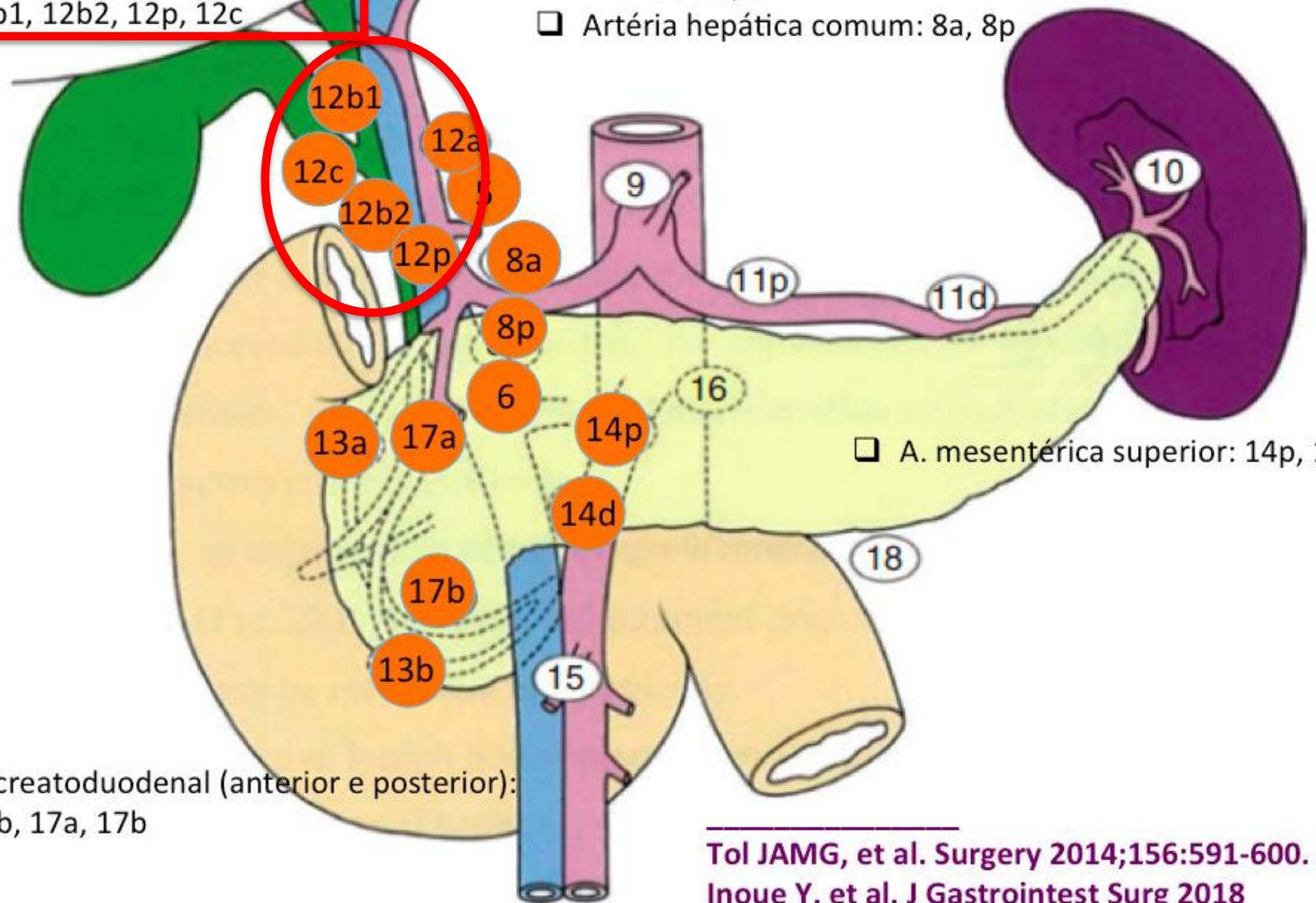
- Bleeding
- Pancreatic fistula
- Delayed gastric emptying
- Oncology

Linfadenectomia

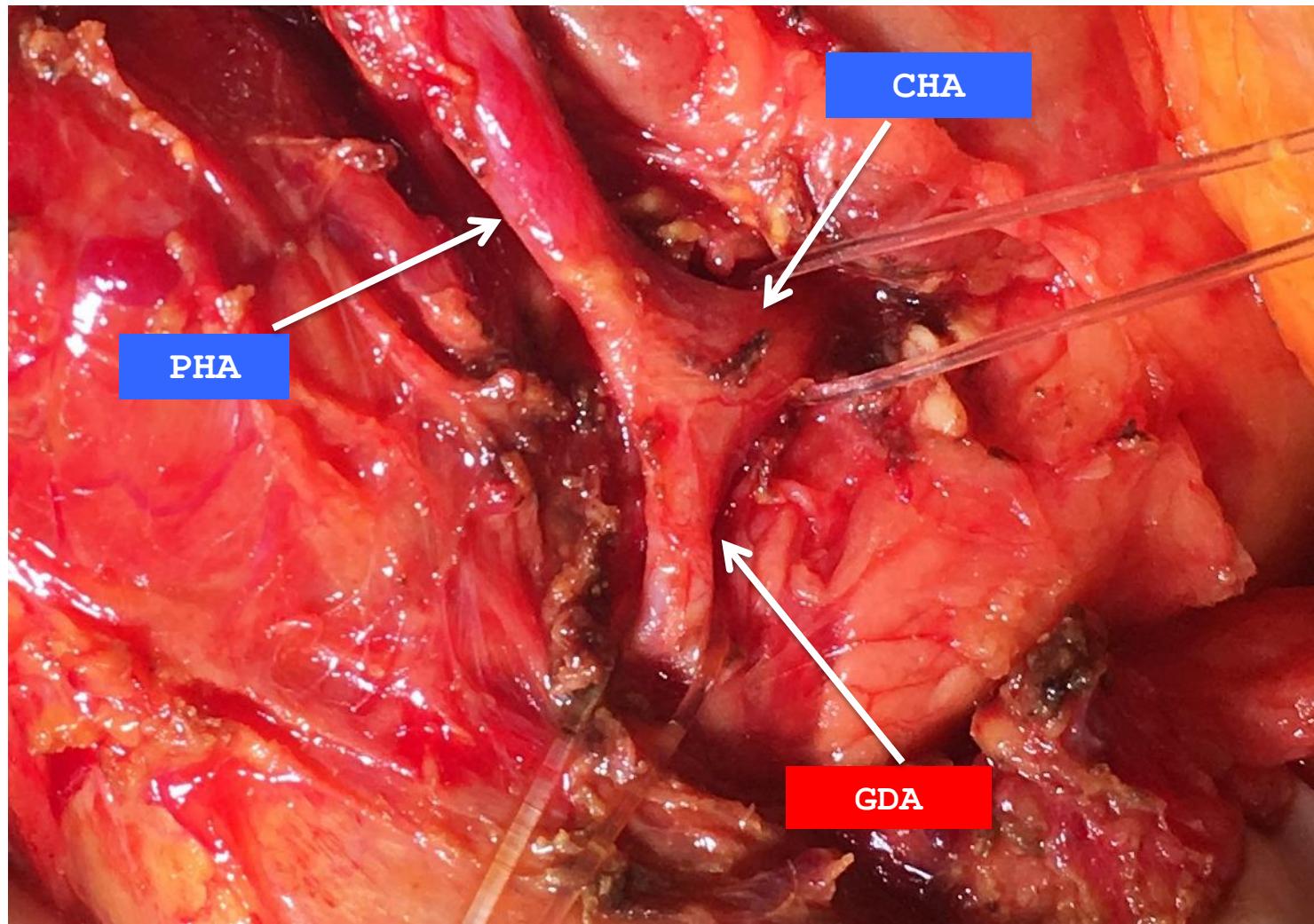
Nivel 2

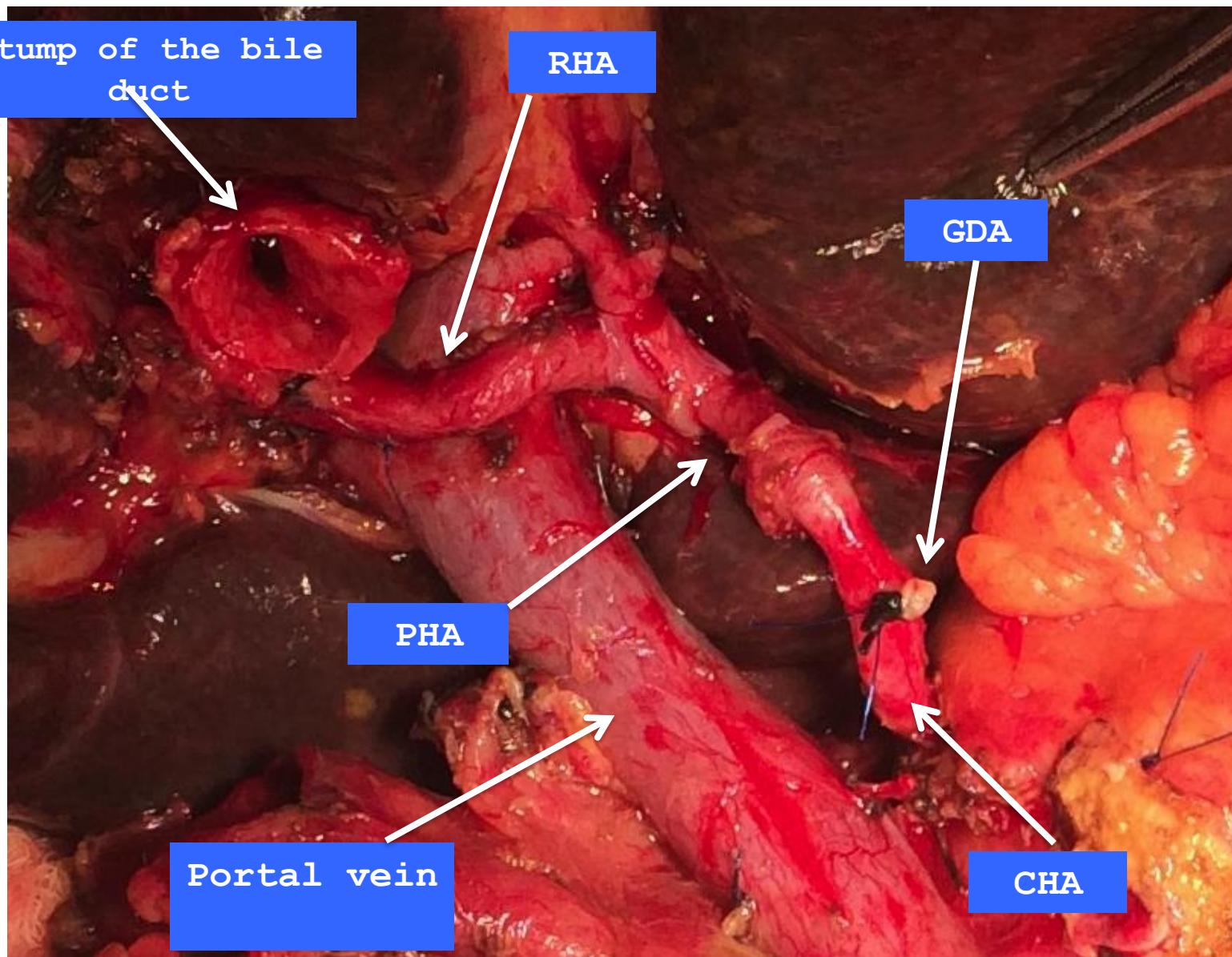
Ligamento hepatoduodenal:
12a, 12b1, 12b2, 12p, 12c

Pilóricos: 5, 6
 Artéria hepática comum: 8a, 8p



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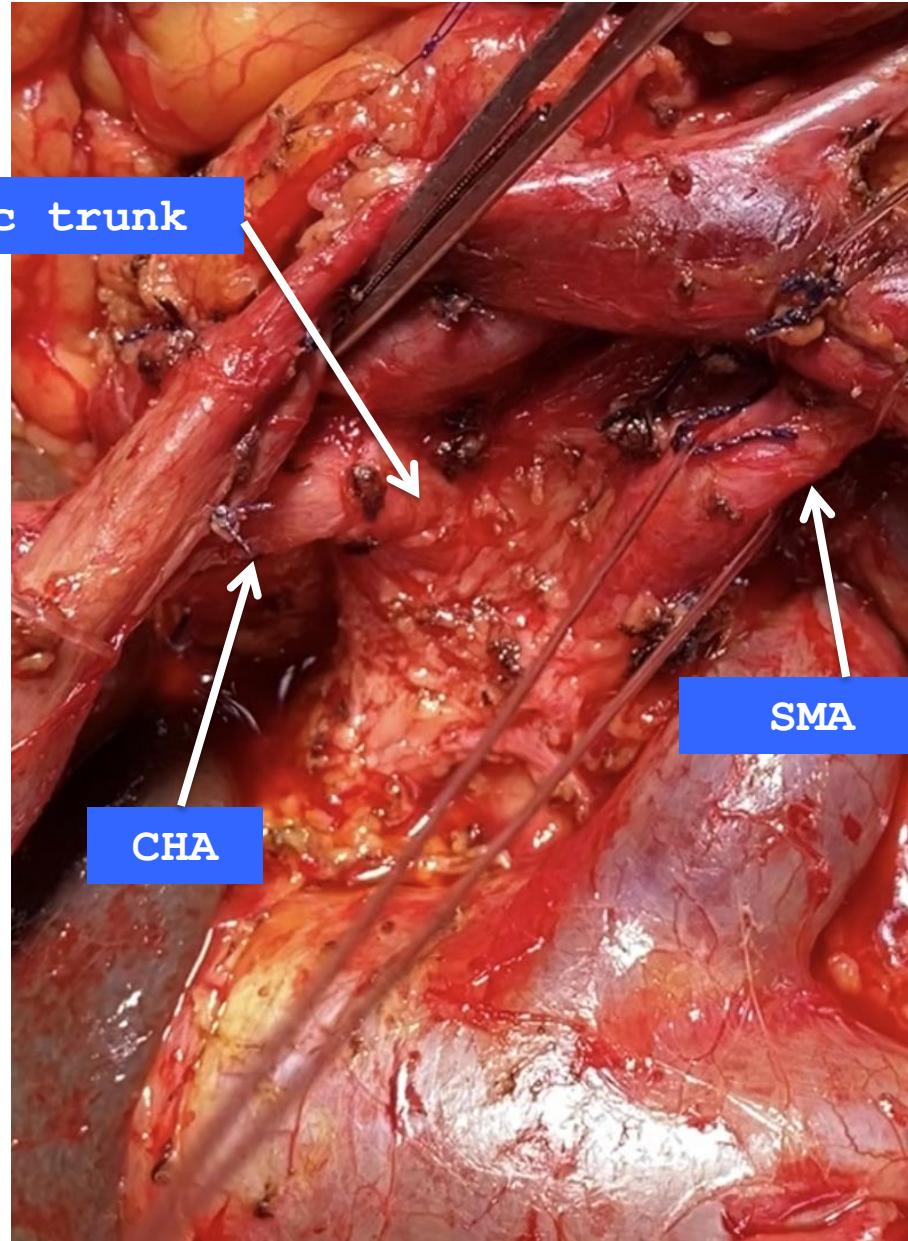




Celiac trunk

CHA

SMA



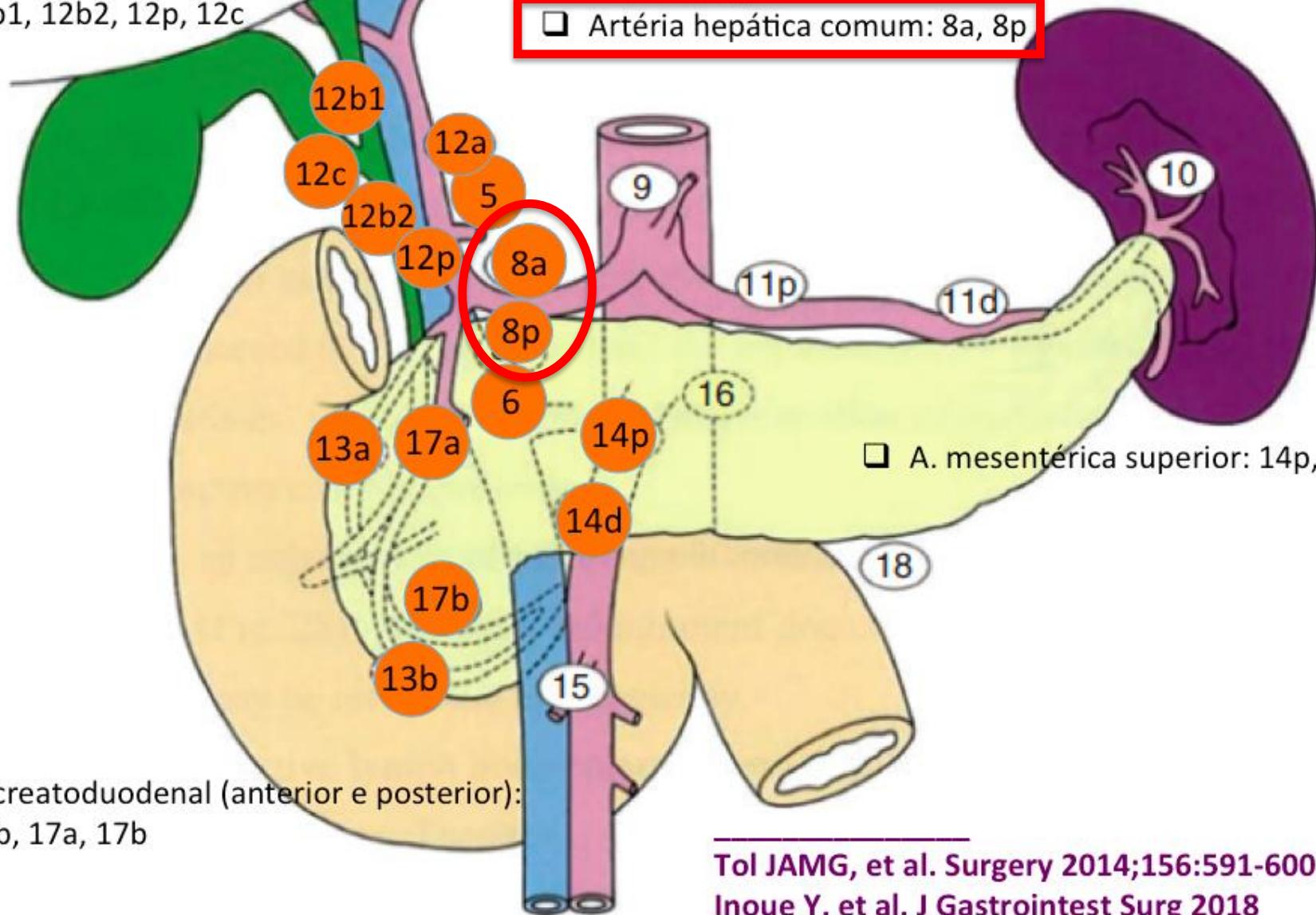
Linfadenectomia

Nível 2

Ligamento hepatoduodenal:
12a, 12b1, 12b2, 12p, 12c

Pilóricos: 5, 6

Artéria hepática comum: 8a, 8p



Pancreatoduodenal (anterior e posterior):
13a, 13b, 17a, 17b

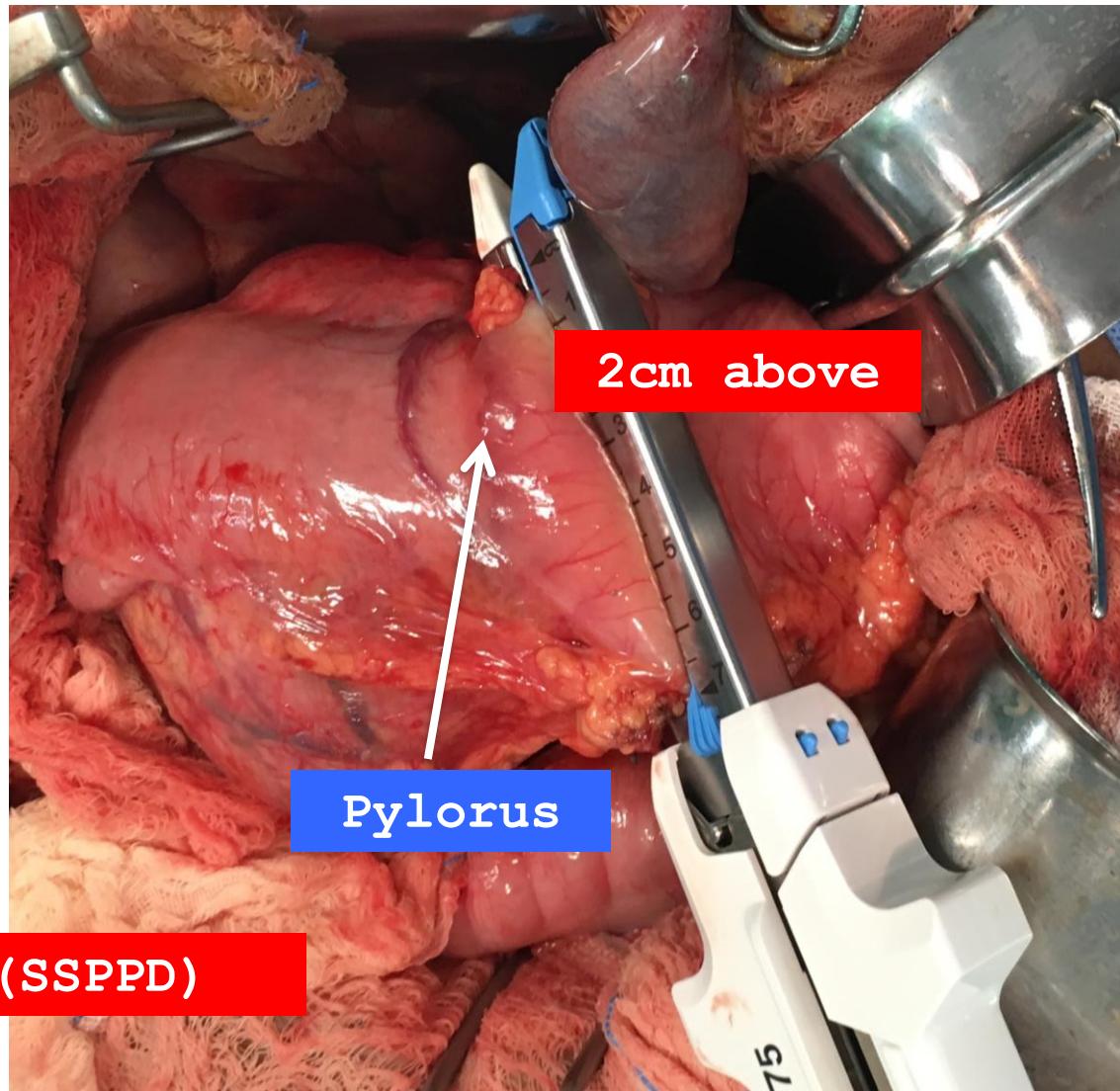
A. mesentérica superior: 14p, 14d

Tol JAMG, et al. Surgery 2014;156:591-600.
Inoue Y, et al. J Gastrointest Surg 2018

Gastric transection



- Bleeding
- Pancreatic fistula
- Delayed gastric emptying
- Oncology



Stomach preserving (SSPPD)

PANCREATODUODENECTOMY: BRAZILIAN PRACTICE PATTERNS*

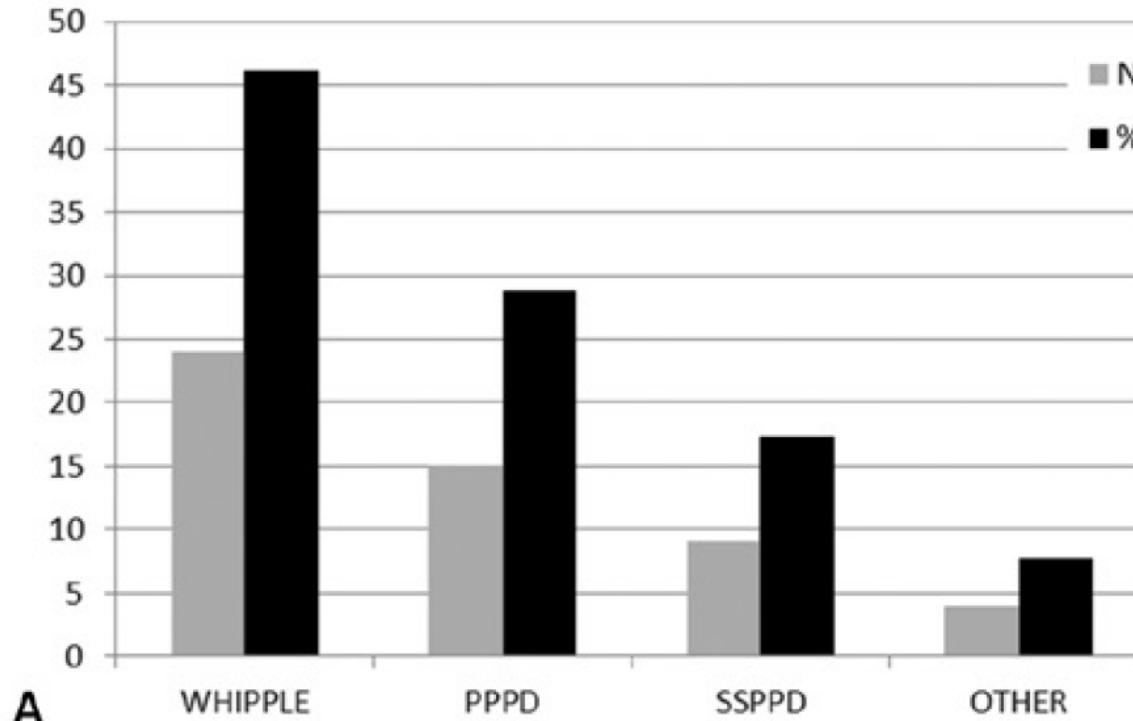
*Duodenopancreatectomia: prática padrão do Brasil**

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

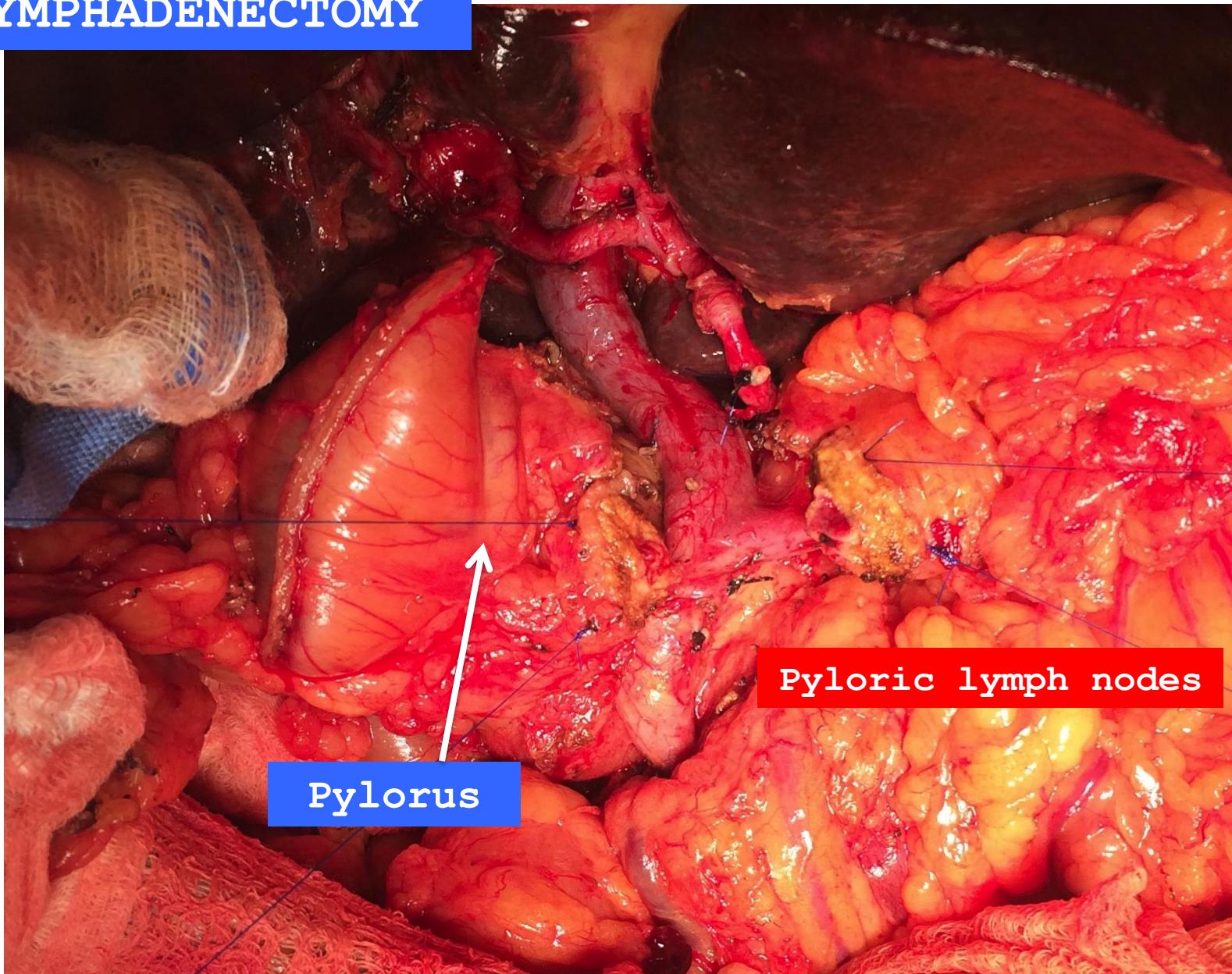
From the ¹Departamento de Cirurgia, Universidade Federal do Maranhão, São Luís, MA; ²Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ; ³Santa Casa de Misericórdia de Porto Alegre, Porto Alegre, RS; ⁴Hospital São Rafael, Salvador, BA; ⁵Hospital Santa Marcelina, São Paulo, SP; ⁶Hospital Santa Lucia,

ABSTRACT - Background: Pancreatoduodenectomy is a technically challenging surgical procedure with an incidence of postoperative complications ranging from 30% to 61%. The procedure requires a high level of experience, and to minimize surgery-related complications and mortality, a high-quality standard surgery is imperative. **Aim:** To understand the Brazilian practice patterns for pancreateoduodenectomy. **Method:** A questionnaire was designed

RESECTION



LYMPHADENECTOMY



Pylorus

Pyloric lymph nodes

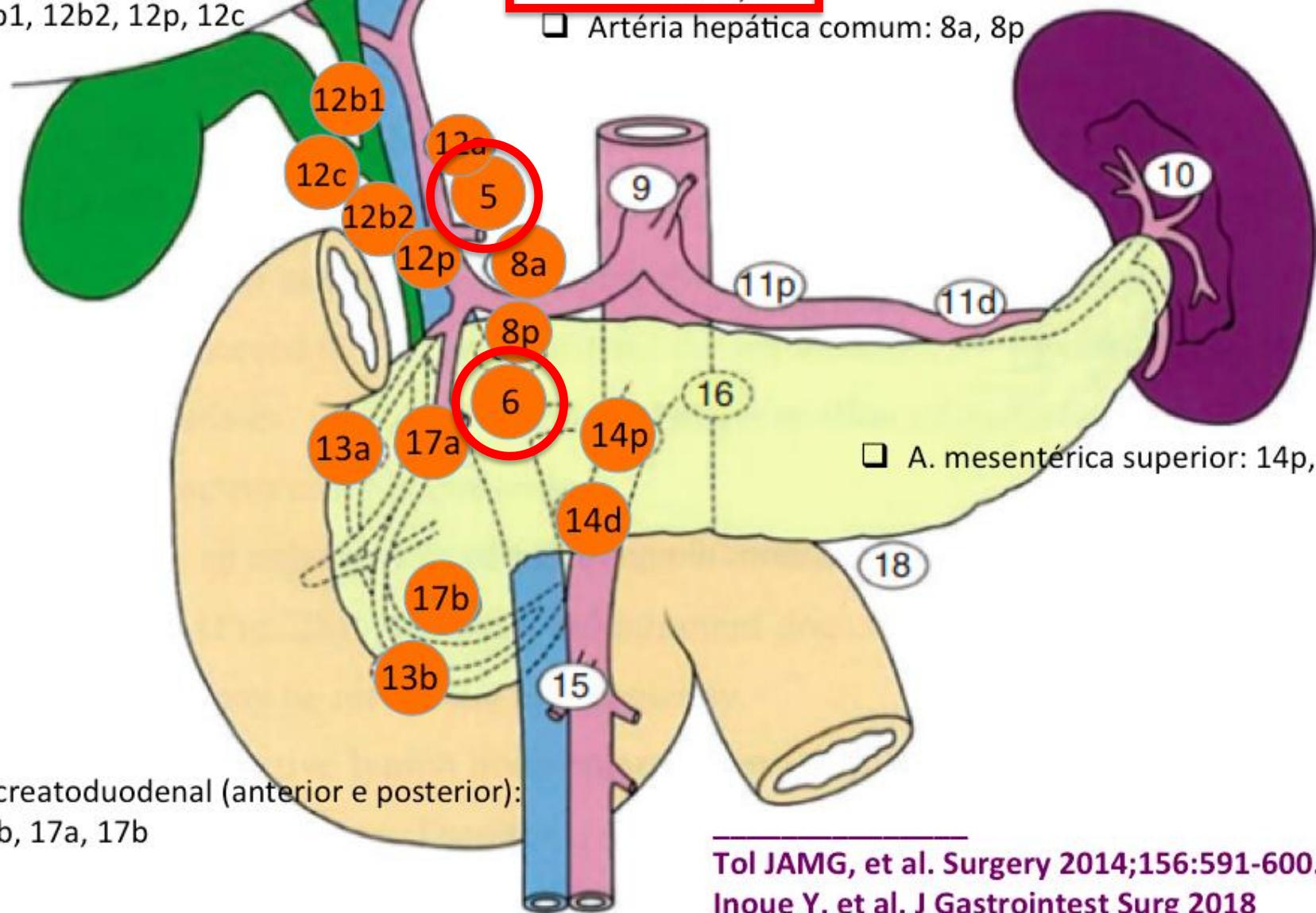
Linfadenectomia

Nivel 2

Ligamento hepatoduodenal:
12a, 12b1, 12b2, 12p, 12c

Pilóricos: 5, 6

Artéria hepática comum: 8a, 8p



Pancreatoduodenal (anterior e posterior):
13a, 13b, 17a, 17b

Tol JAMG, et al. Surgery 2014;156:591-600.
Inoue Y, et al. J Gastrointest Surg 2018

THE OBITUARY OF THE PYLORUS-PRESERVING PANCREATODUODENECTOMY

O obituário da duodenopancreatectomia com preservação pilórica

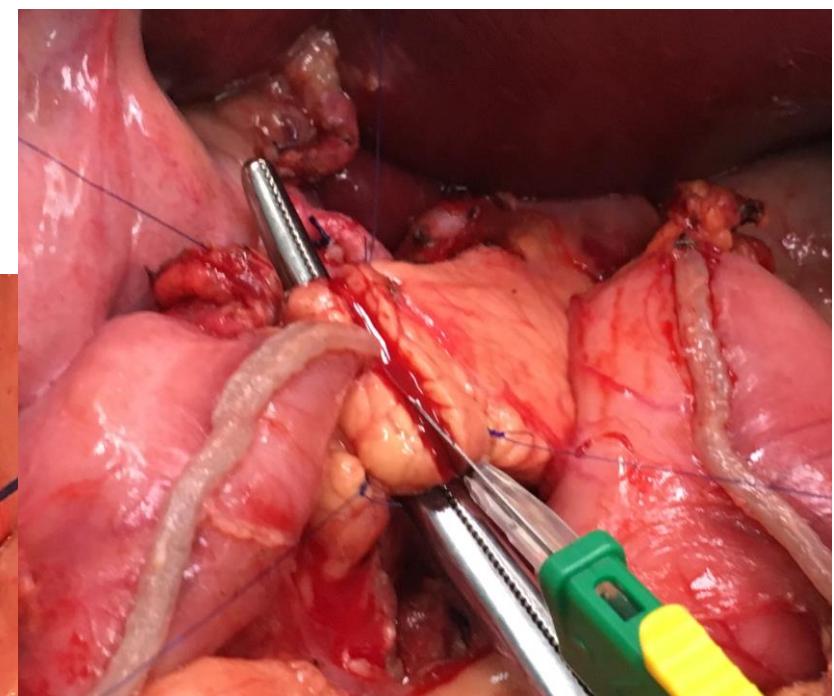
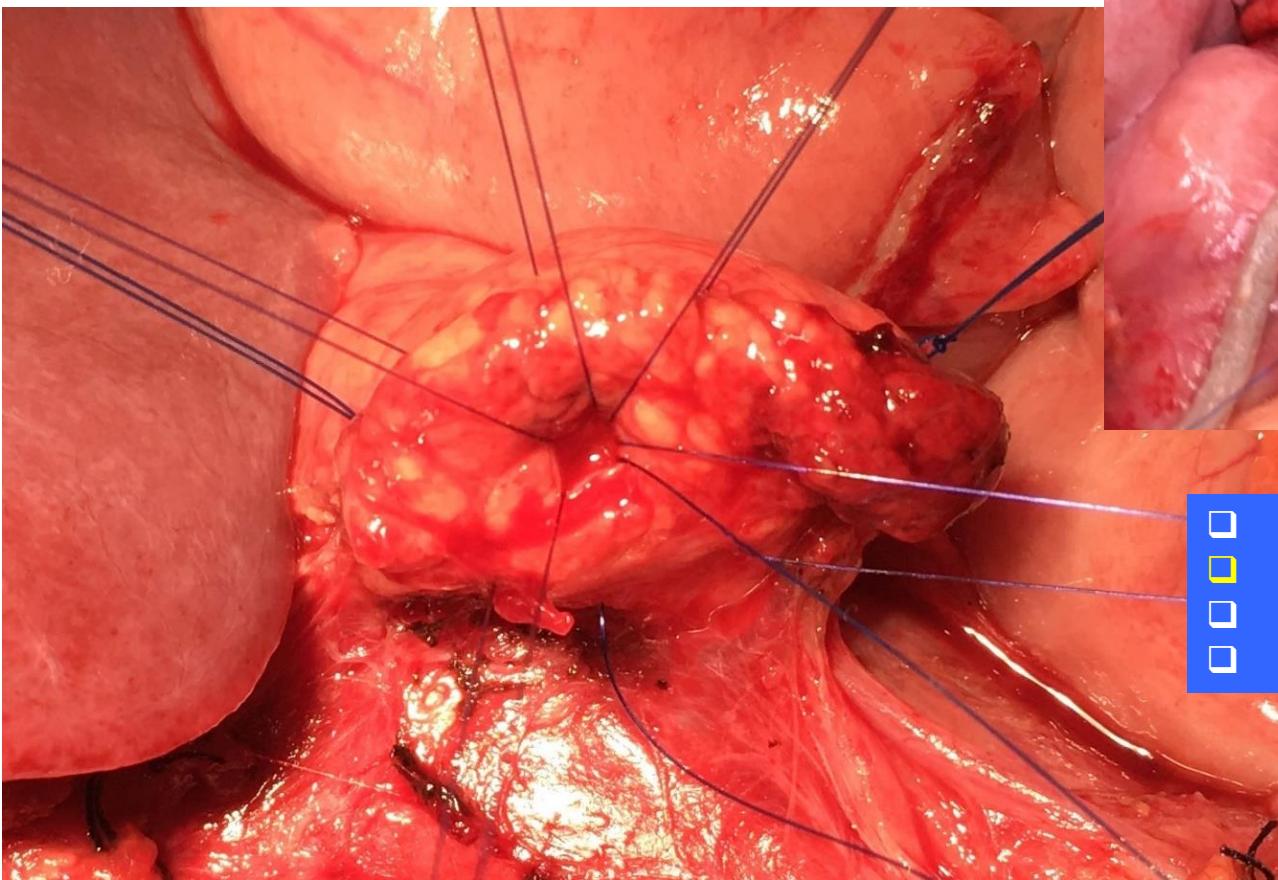
Orlando Jorge Martins **TORRES**, Rodrigo Rodrigues **VASQUES**, Camila Cristina S. **TORRES**

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-

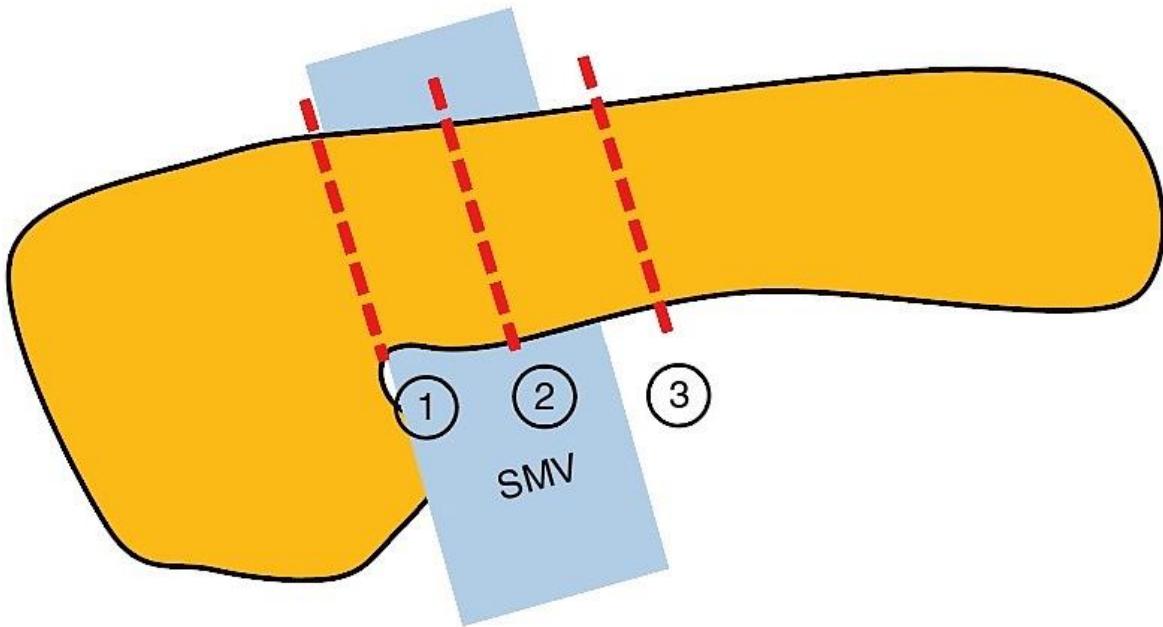
PANCREAS TRANSECTION



- Bleeding
- Pancreatic fistula
- Delayed gastric emptying
- Oncology

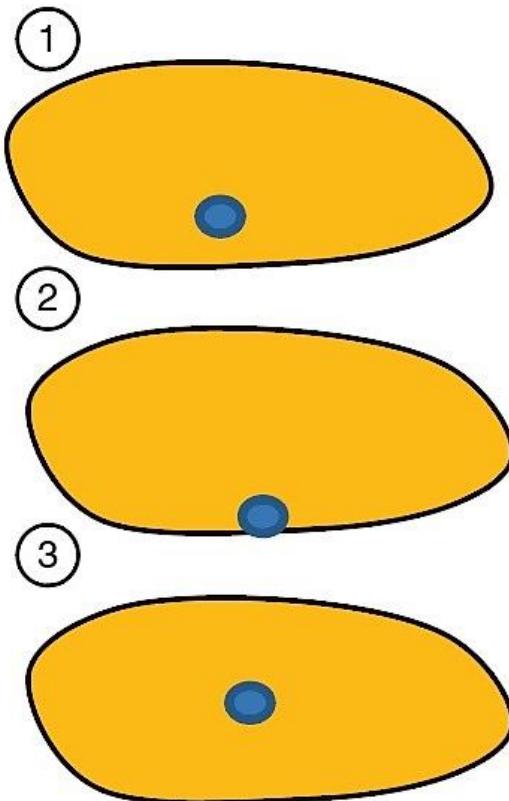
PANCREAS TRANSECTION

- Bleeding
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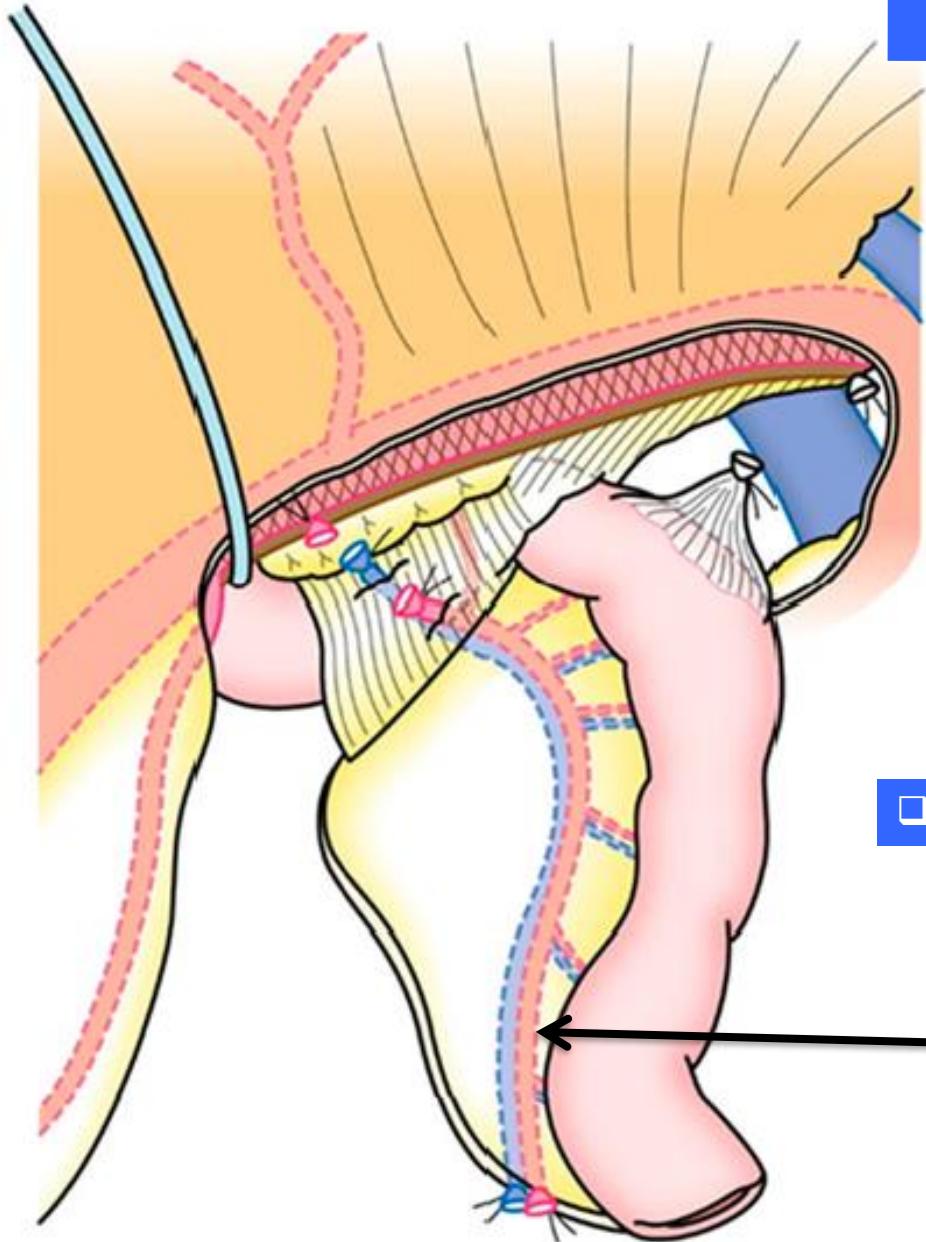


Left side of the portal vein

C



TREITZ LIGAMENT

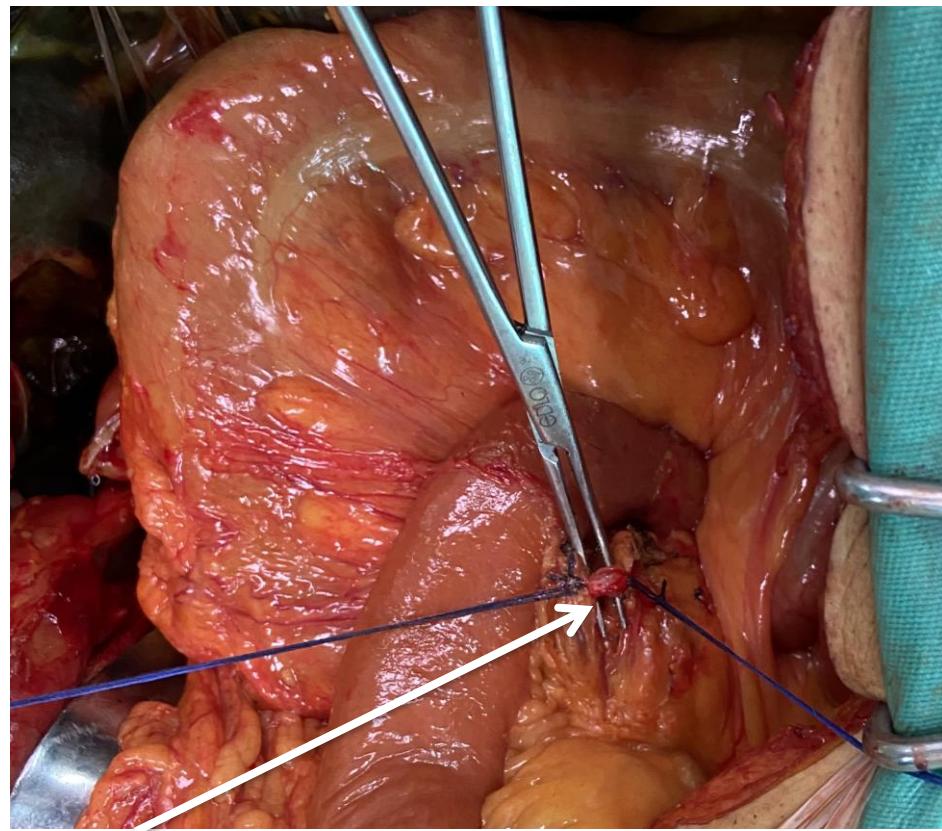
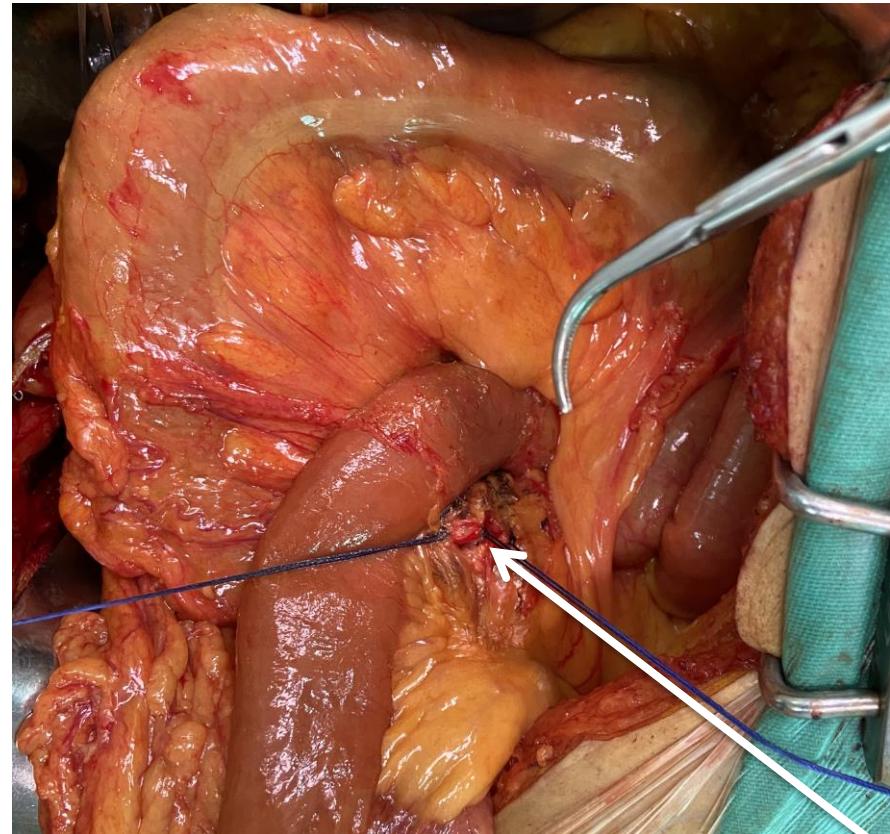


□ 15-25 cm from the Treitz ligament

J1A

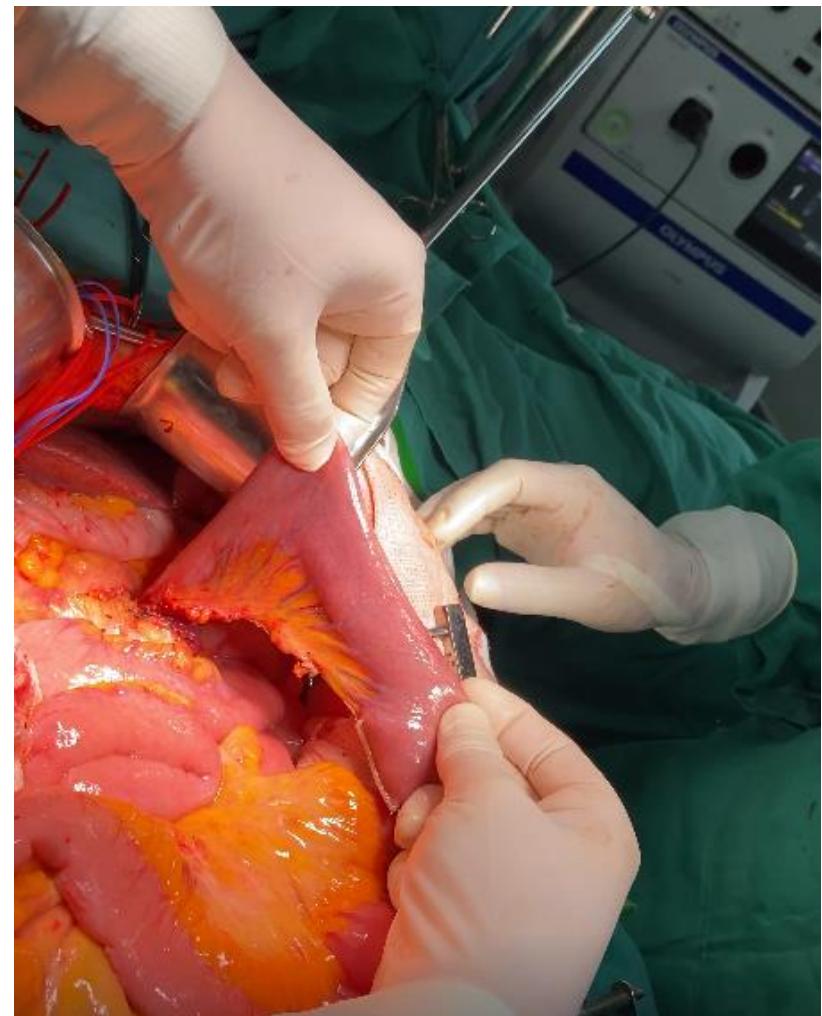
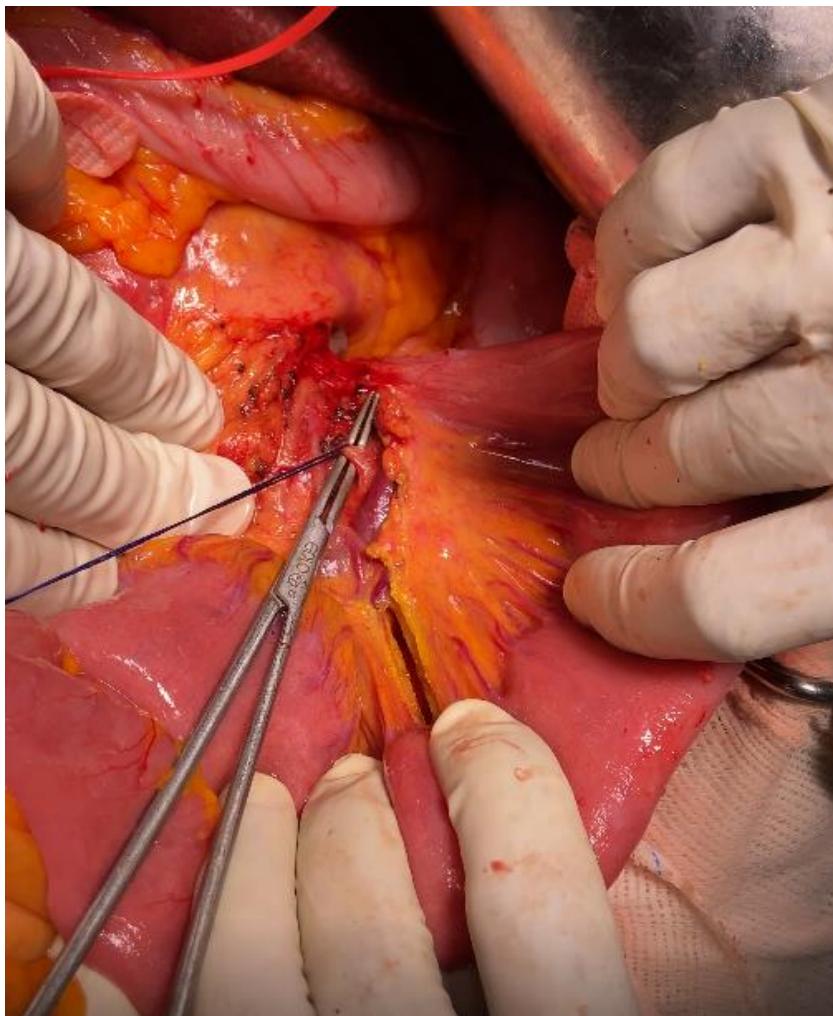
TREITZ LIGAMENT

- Bleeding
- Pancreatic fistula
- Delayed gastric emptying
- Oncology

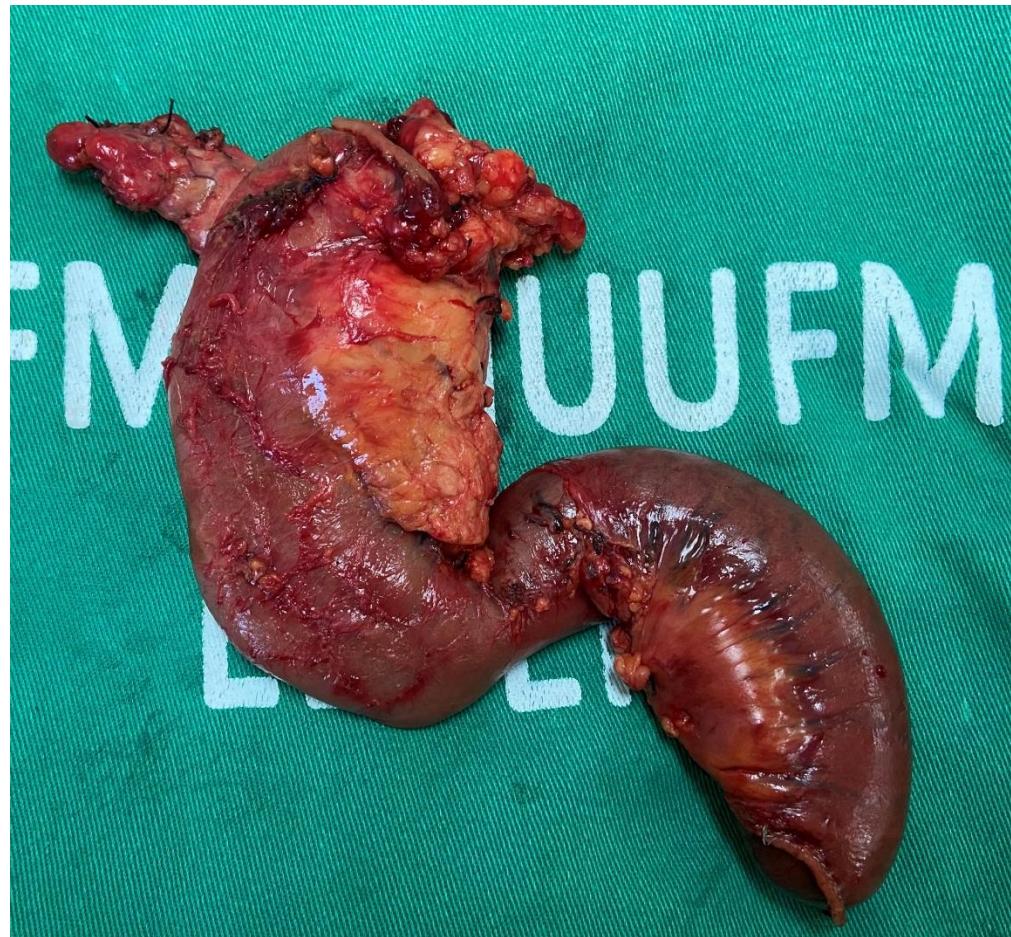
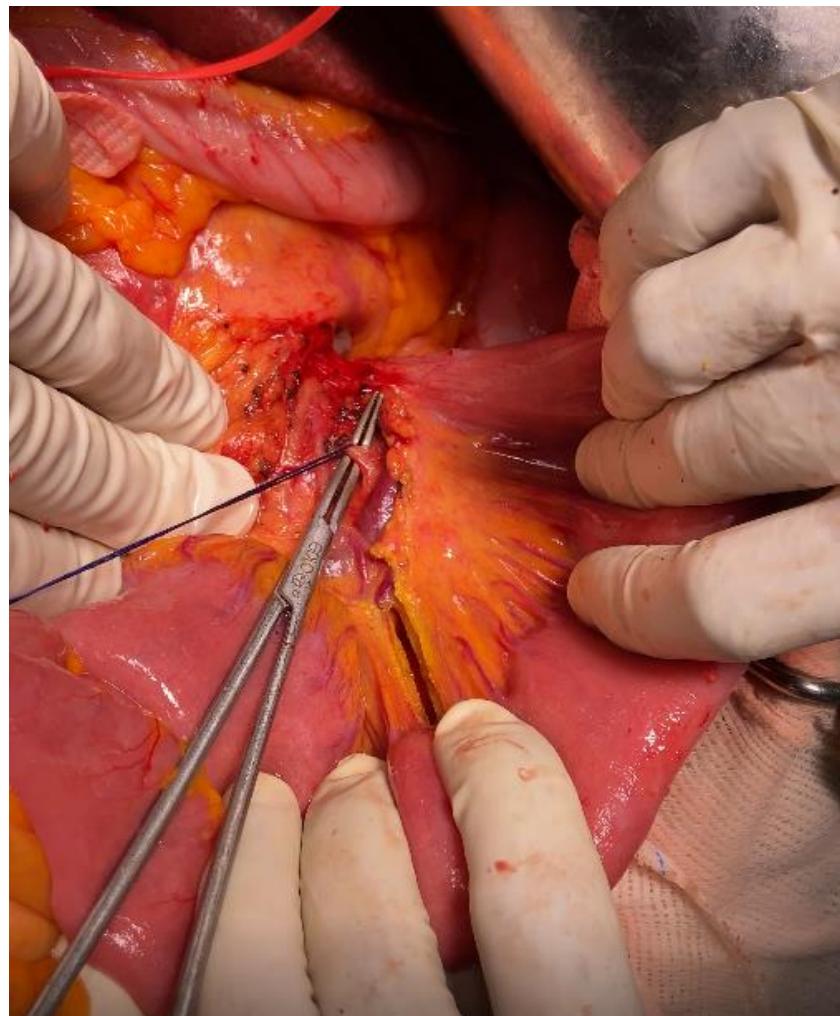


J1A

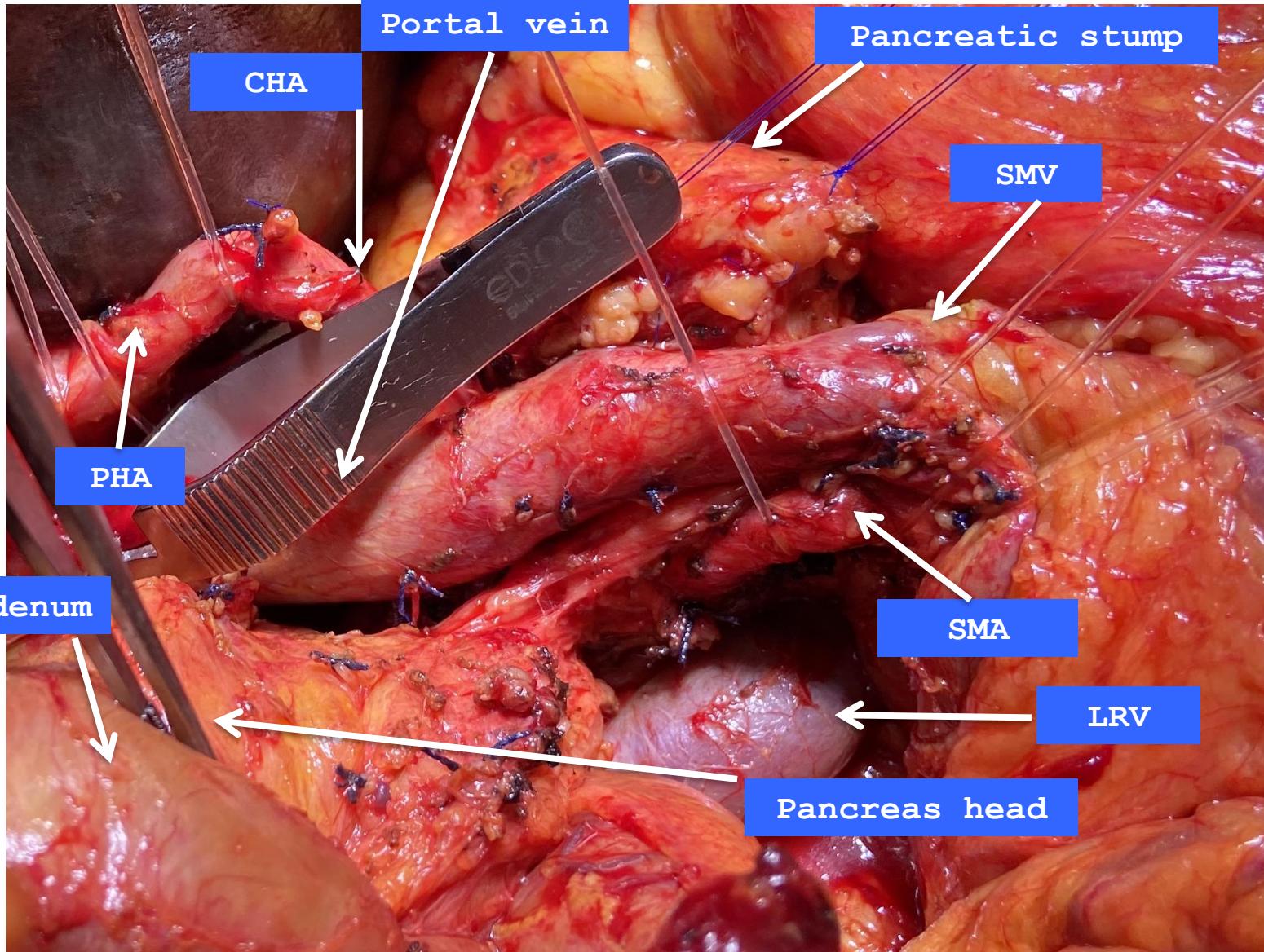
Level 2



Level 2



RESECTION

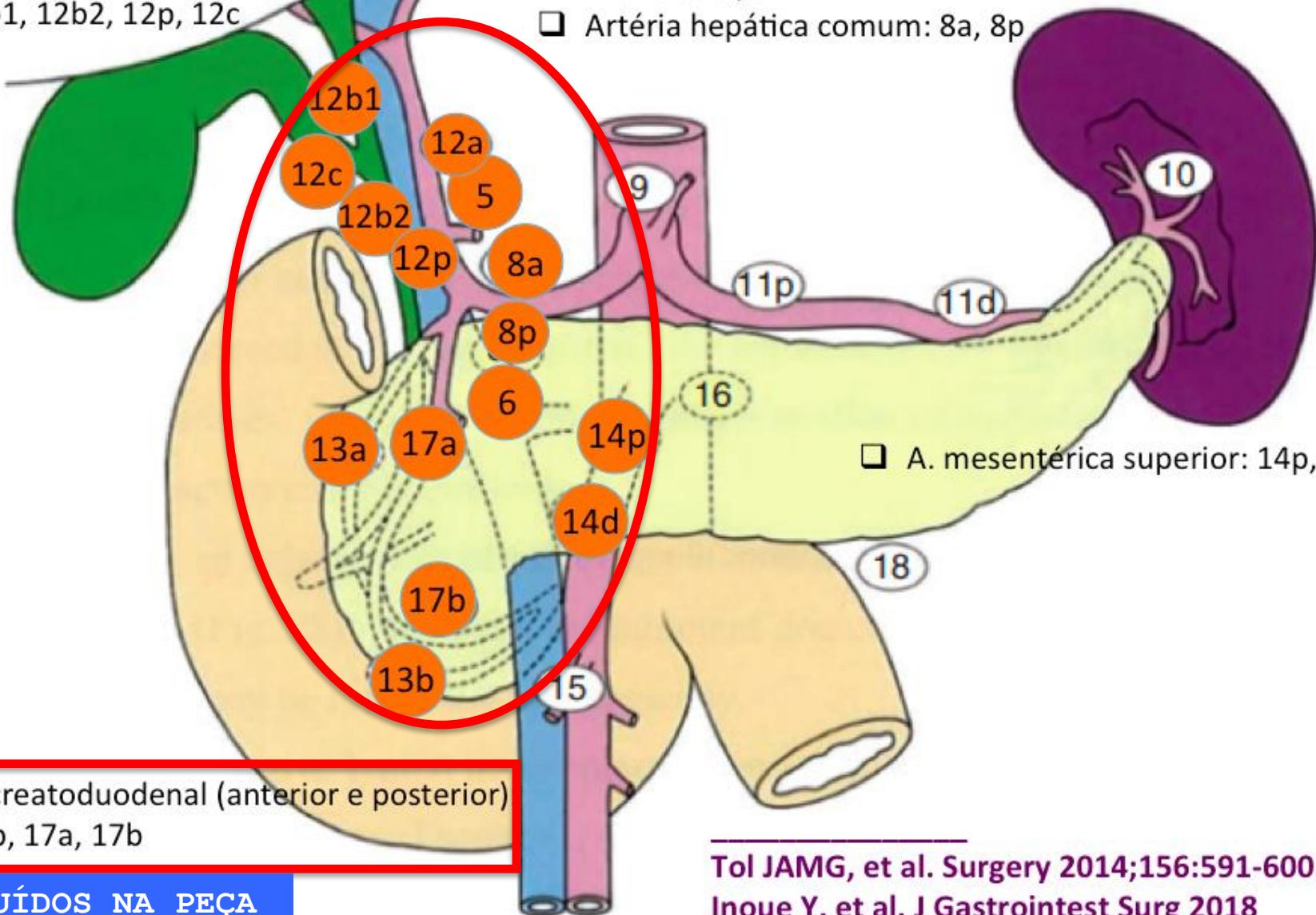


Linfadenectomia

Nível 2

Ligamento hepatoduodenal:
12a, 12b1, 12b2, 12p, 12c

Pilóricos: 5, 6
 Artéria hepática comum: 8a, 8p



Pancreatoduodenal (anterior e posterior)
13a, 13b, 17a, 17b

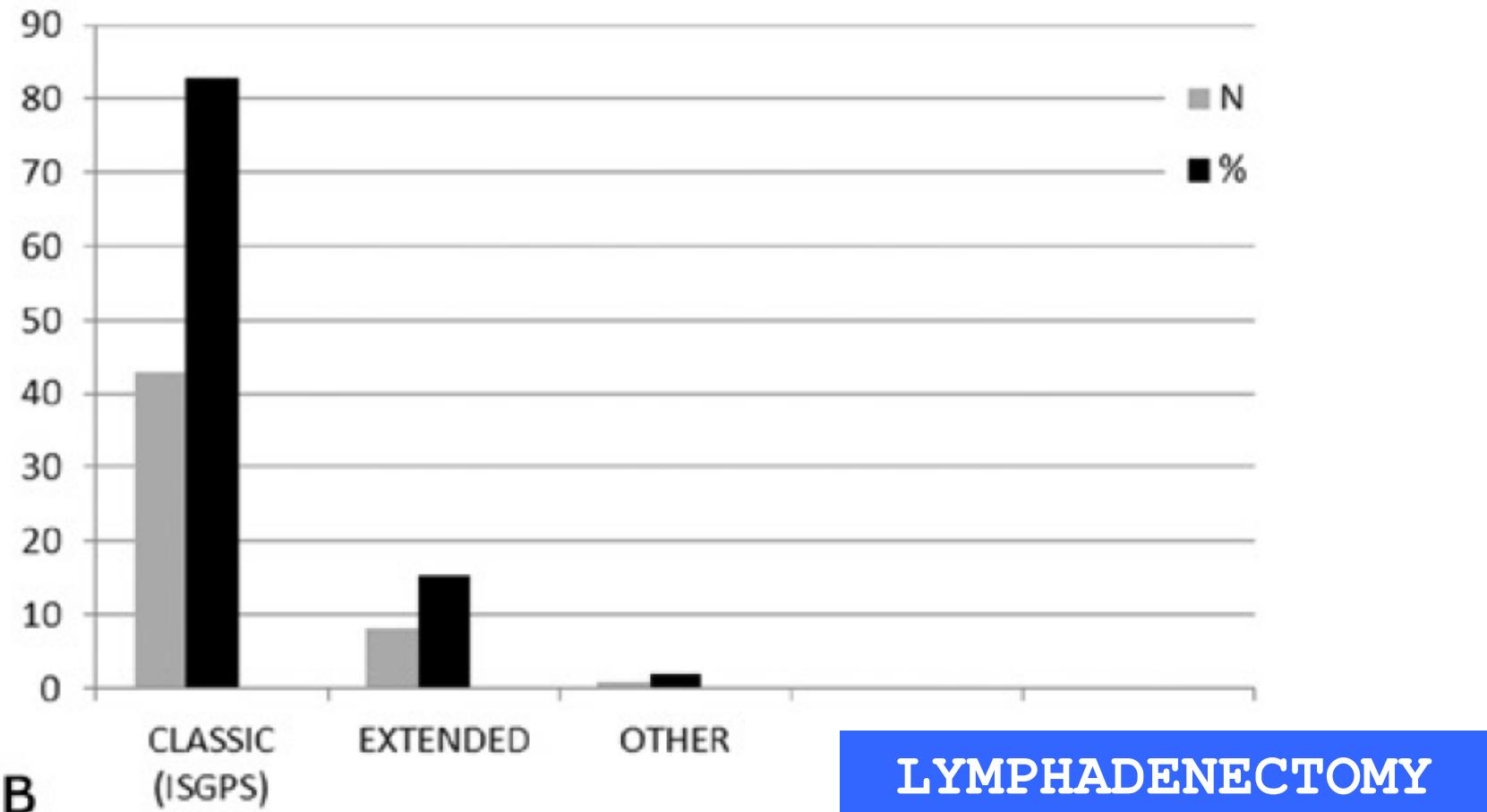
INCLUÍDOS NA PEÇA

Tol JAMG, et al. Surgery 2014;156:591-600.
Inoue Y, et al. J Gastrointest Surg 2018

PANCREATODUODENECTOMY: BRAZILIAN PRACTICE PATTERNS*

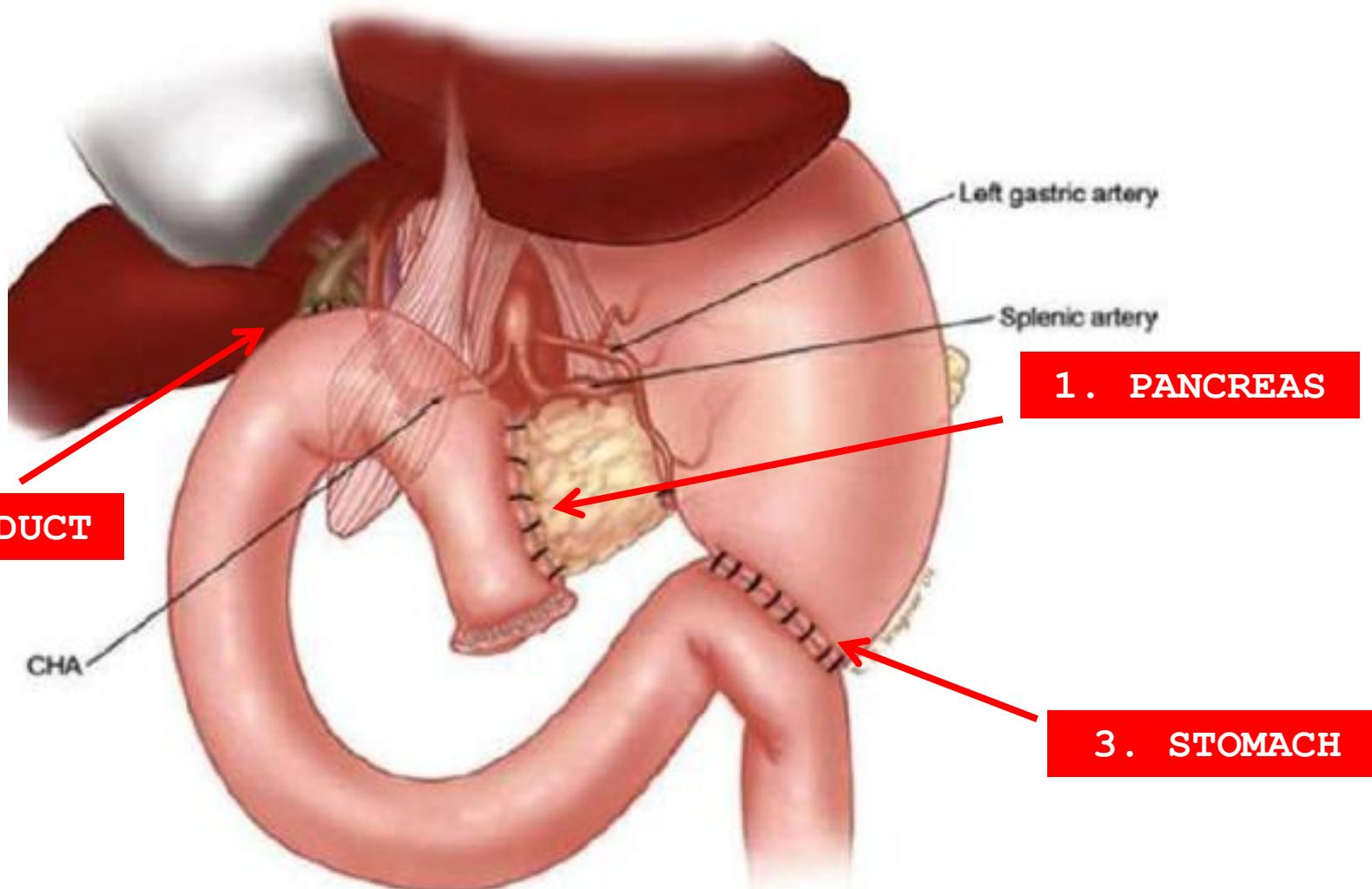
*Duodenopancreatectomia: prática padrão do Brasil**

Orlando Jorge M TORRES¹, Eduardo de Souza M FERNANDES², Rodrigo Rodrigues VASQUES¹, Fabio Luís WAECHTER³,
Paulo Cesar G. AMARAL⁴, Marcelo Bruno de REZENDE⁵, Roland Montenegro COSTA⁶, André Luís MONTAGNINI⁷



RECONSTRUCTION

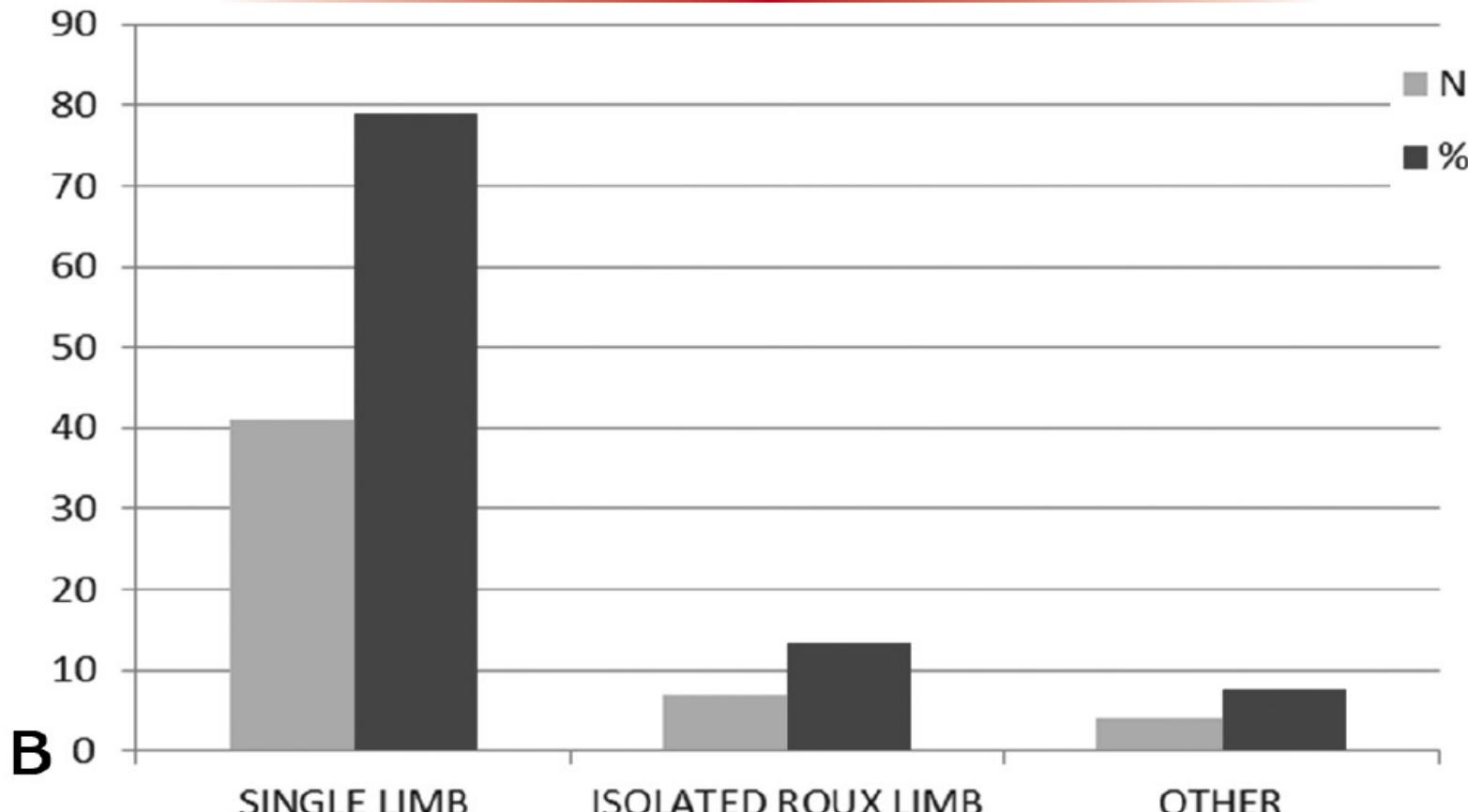
Single limb



PANCREATODUODENECTOMY: BRAZILIAN PRACTICE PATTERNS*

*Duodenopancreatectomia: prática padrão do Brasil**

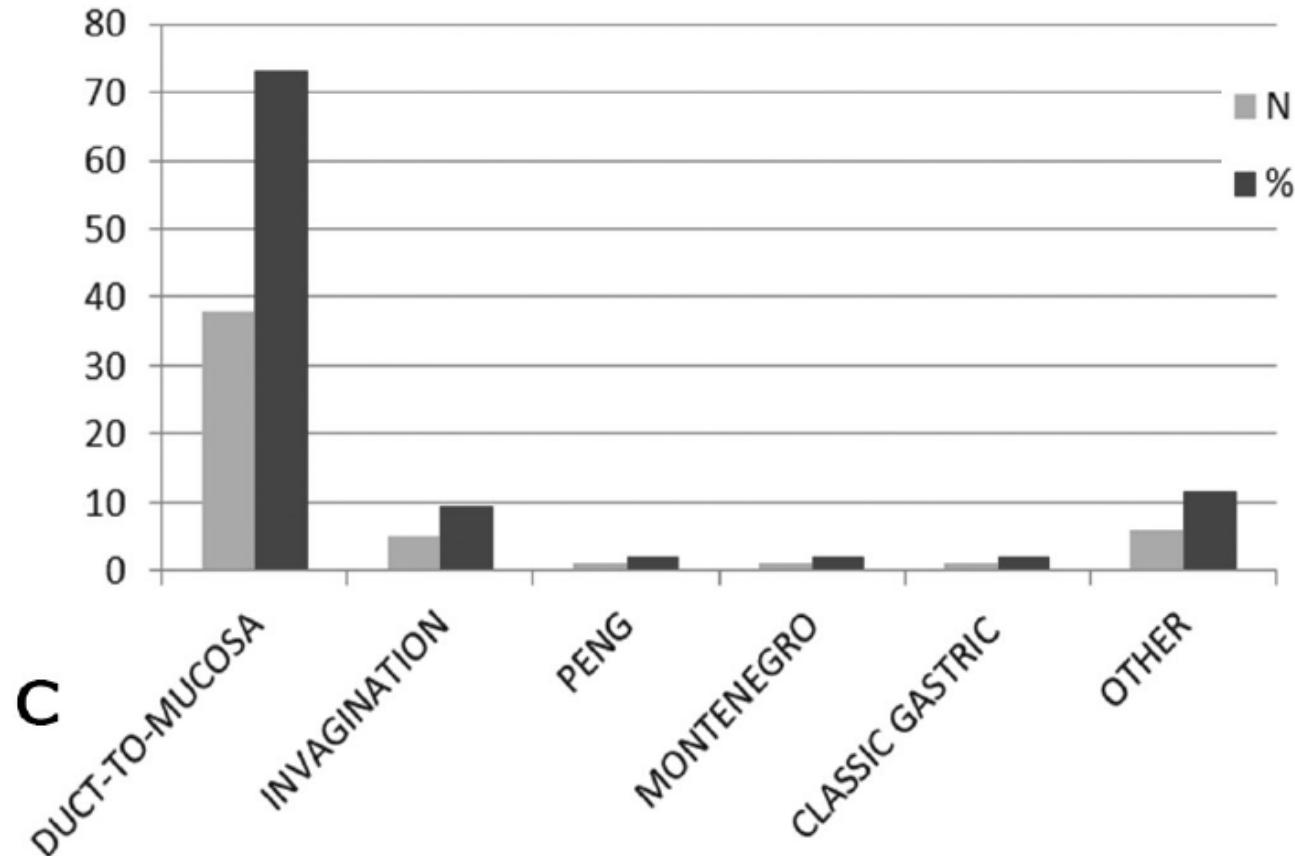
Orlando Jorge M TORRES¹, Eduardo de Souza M FERNANDES², Rodrigo Rodrigues VASQUES¹, Fabio Luís WAECHTER³,
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Hangzhou, China - 2017



Pancreatoduodenectomy, Brazilian practice patterns

Orlando Jorge Martins Torres

Universidade Federal do Maranhão, Centro de Ciências da Saúde, Departamento de Medicina II
São Luís, Maranhão, Brazil

Torres教授来自巴西的马拉尼昂州联邦大学医学院，担任消化道手术部中心主任，致力于消化道肿瘤外科以及肝胆胰外科。

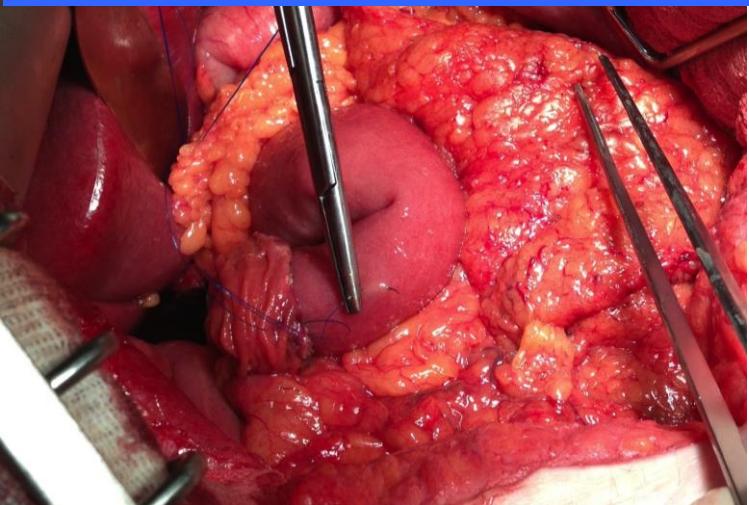
曾在多个国际医学中心进修和培训，如Shouldice疝研究所（加拿大，1999年）、斯隆凯特林癌症中心（纽约，2000年）、匹兹堡大学医学中心（美国，2005年）、MD安德森癌症中心（休斯敦，2010）、伦敦帝国学院（伦敦，2012年）、挪威奥斯陆大学医院（2015年）、孟买的塔塔纪念医院（2016年，印度）等。

讲座时间：2017-5-31 上午 7点30分

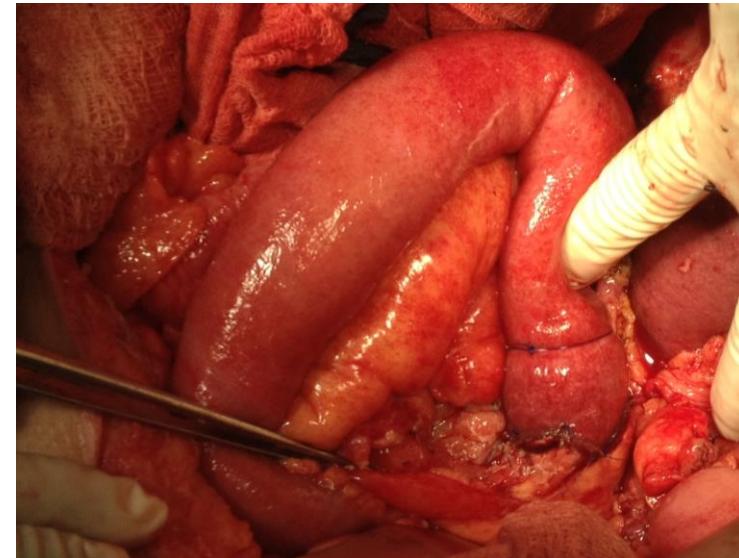
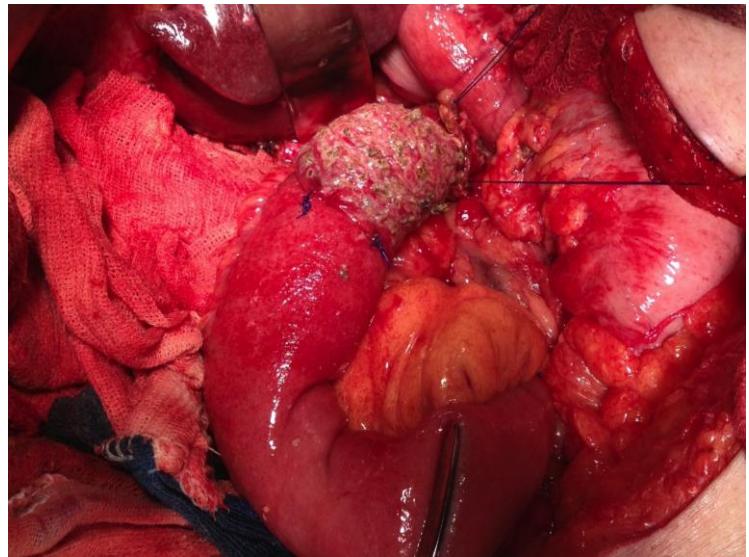
地点：浙二医院滨江院区中心楼20楼西示教室（视屏会议转播）



PENG'S TECHNIQUE



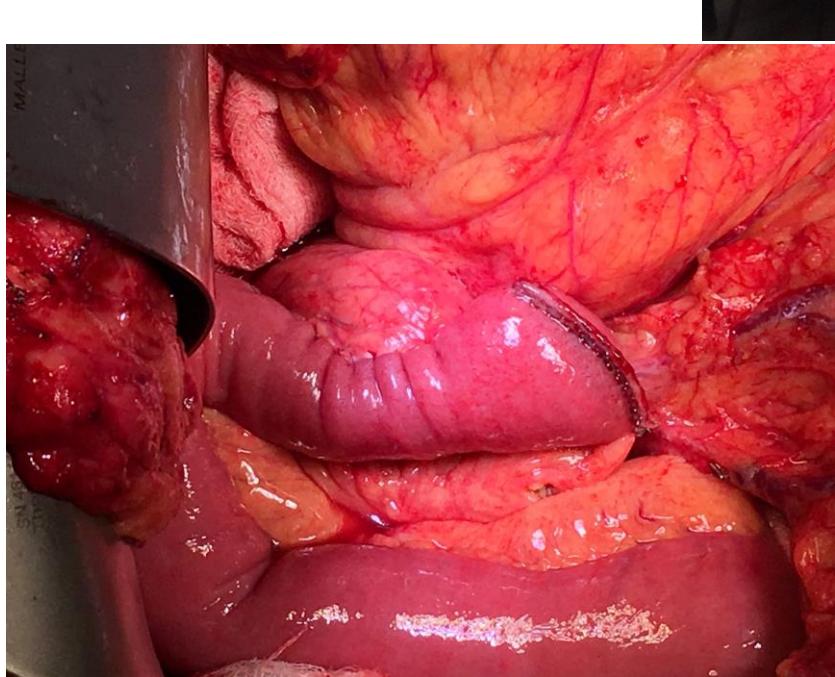
2013



Mumbai 2016



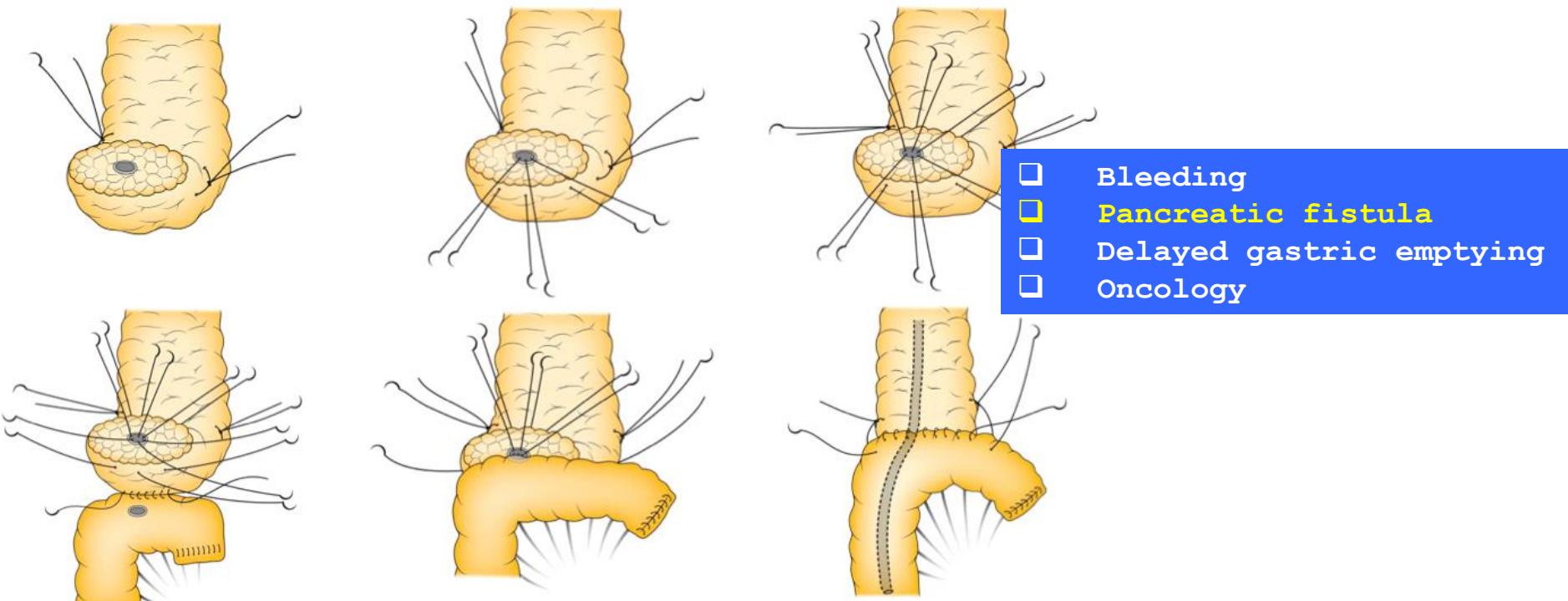
Shailesh Shrikhande

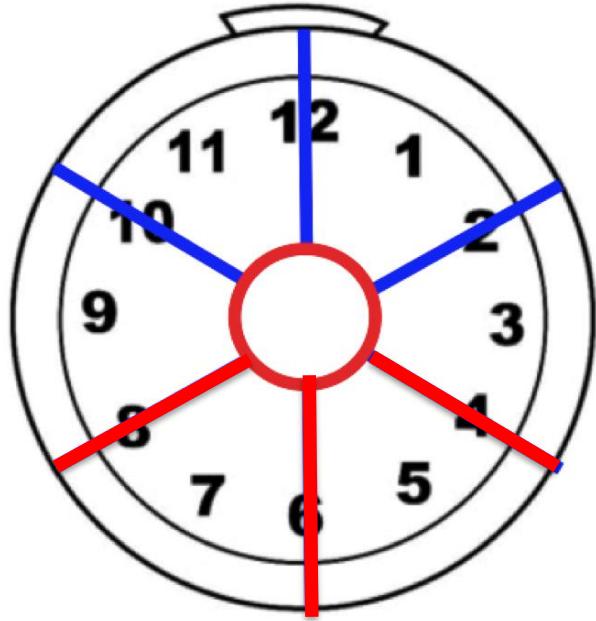
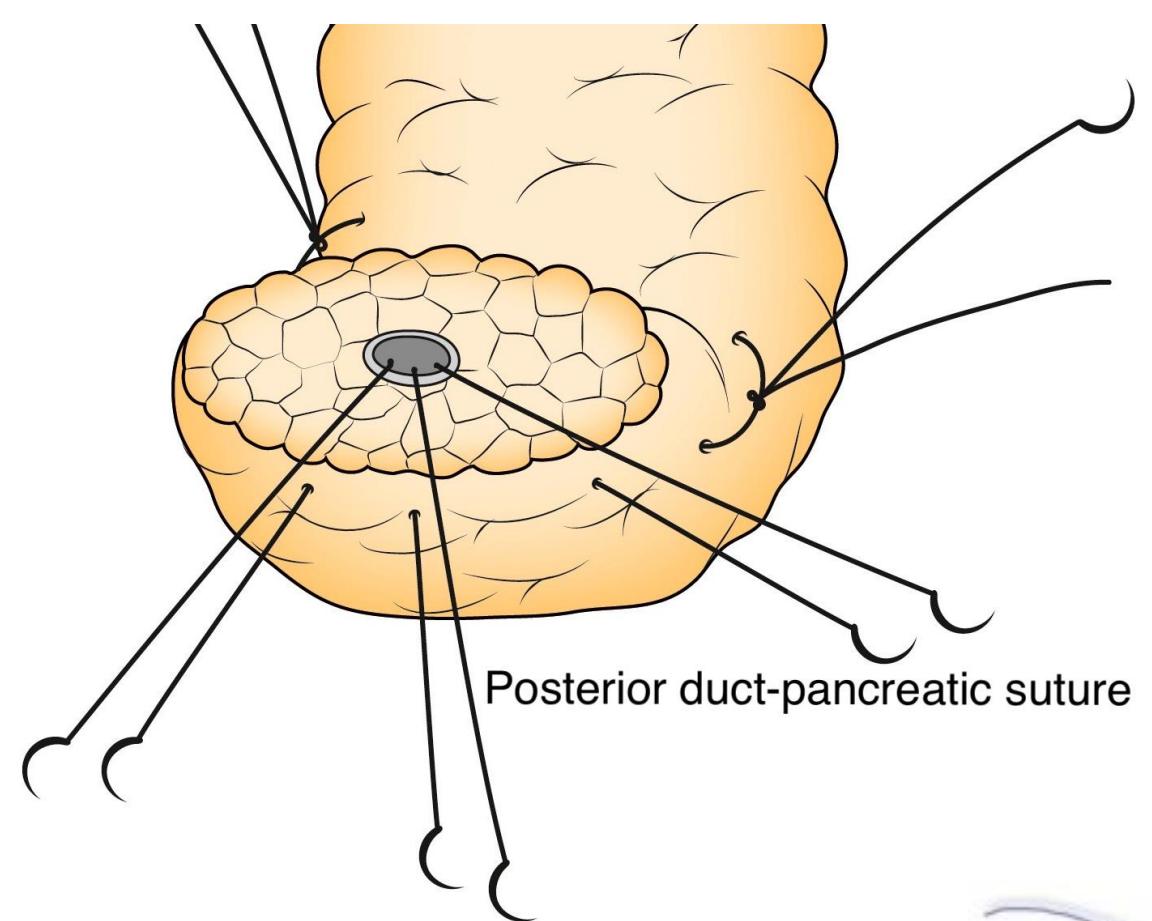


MODIFIED HEIDELBERG TECHNIQUE FOR PANCREATIC ANASTOMOSIS

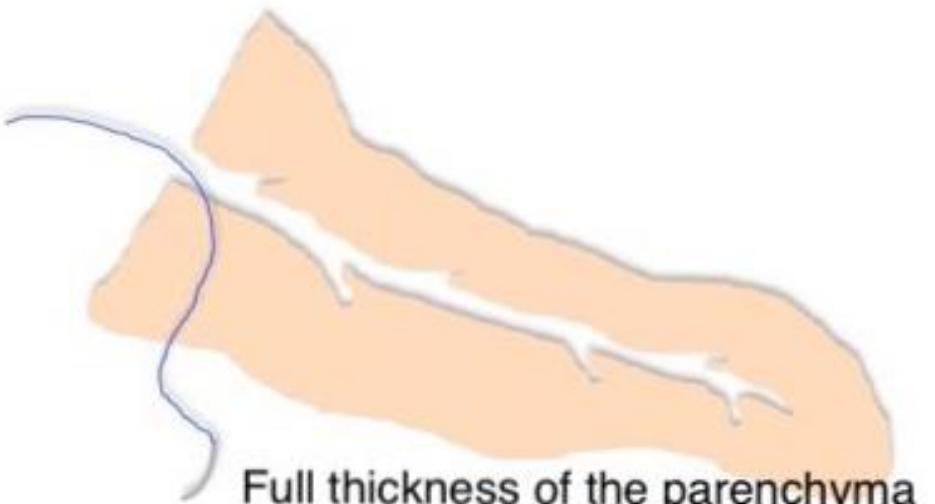
Anastomose pancreática pela técnica de Heidelberg modificada

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



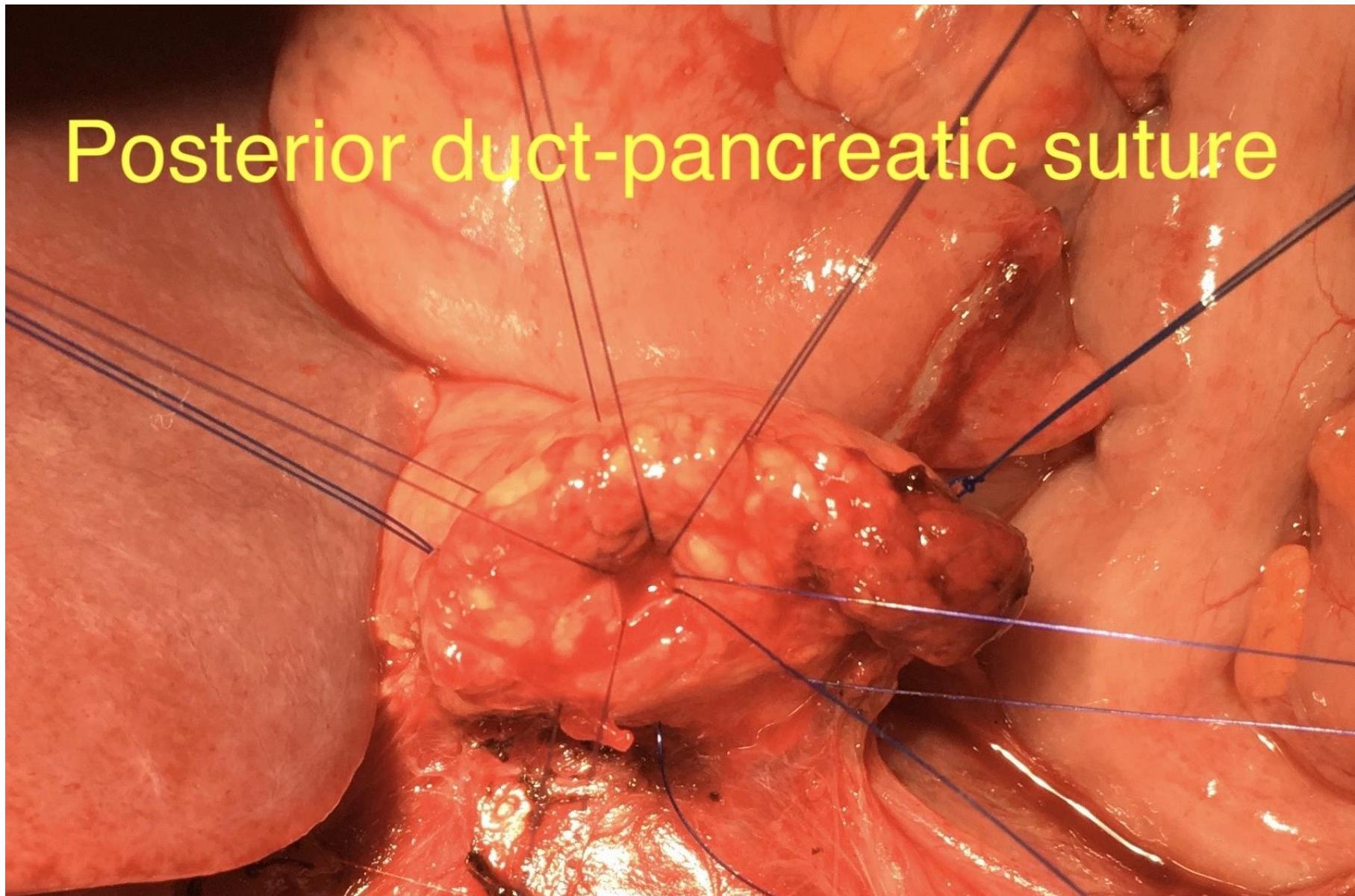


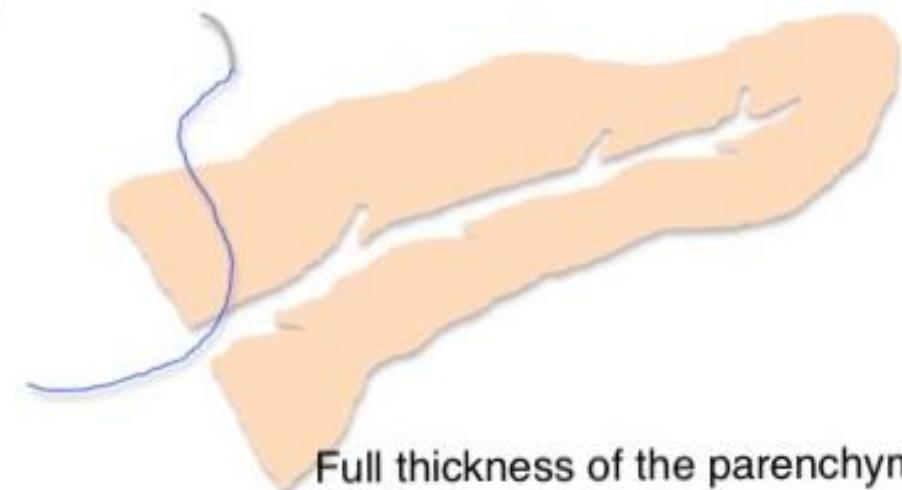
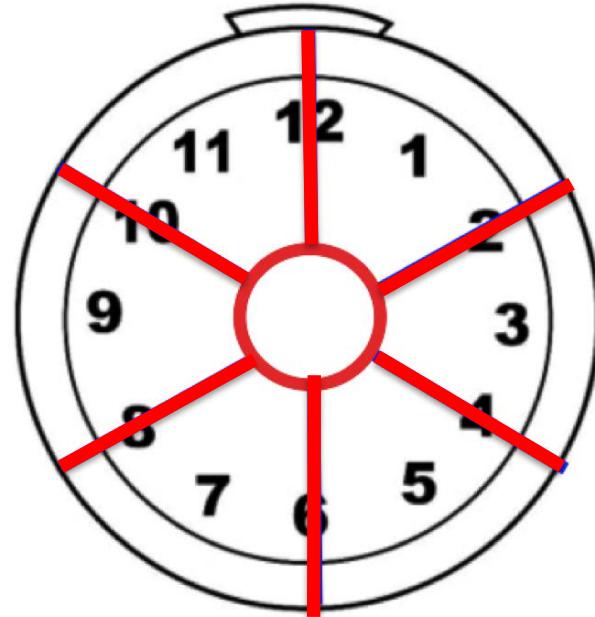
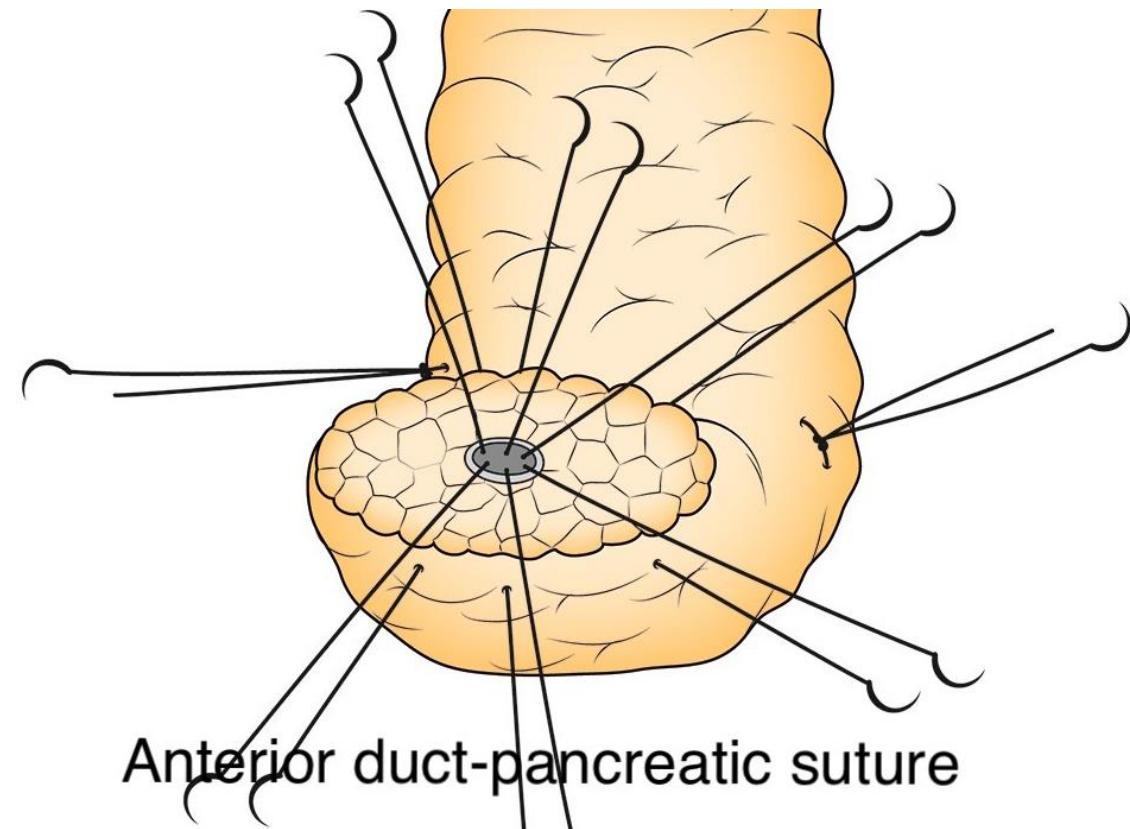
Technique



Full thickness of the parenchyma

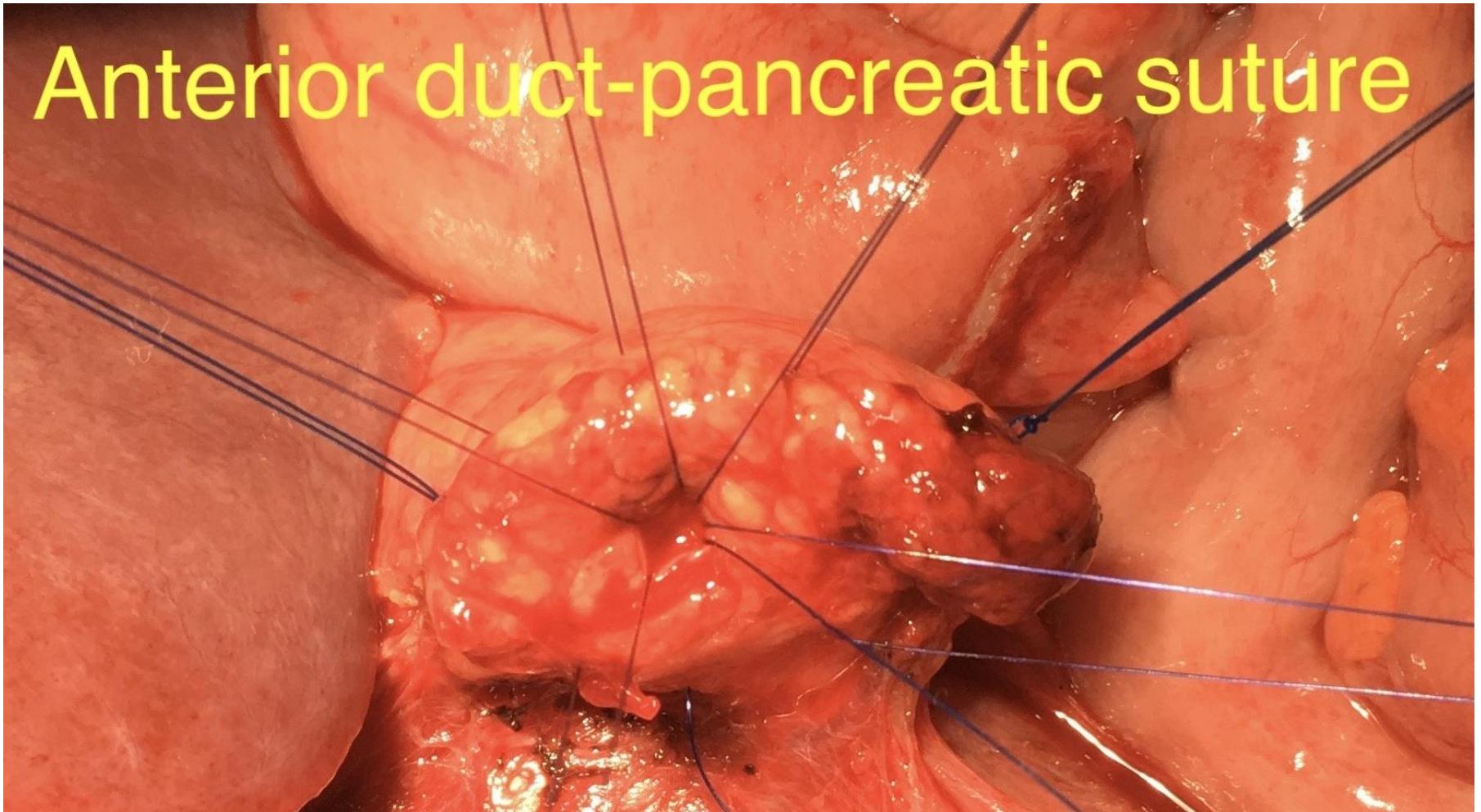
Posterior duct-pancreatic suture





Technique

Anterior duct-pancreatic suture



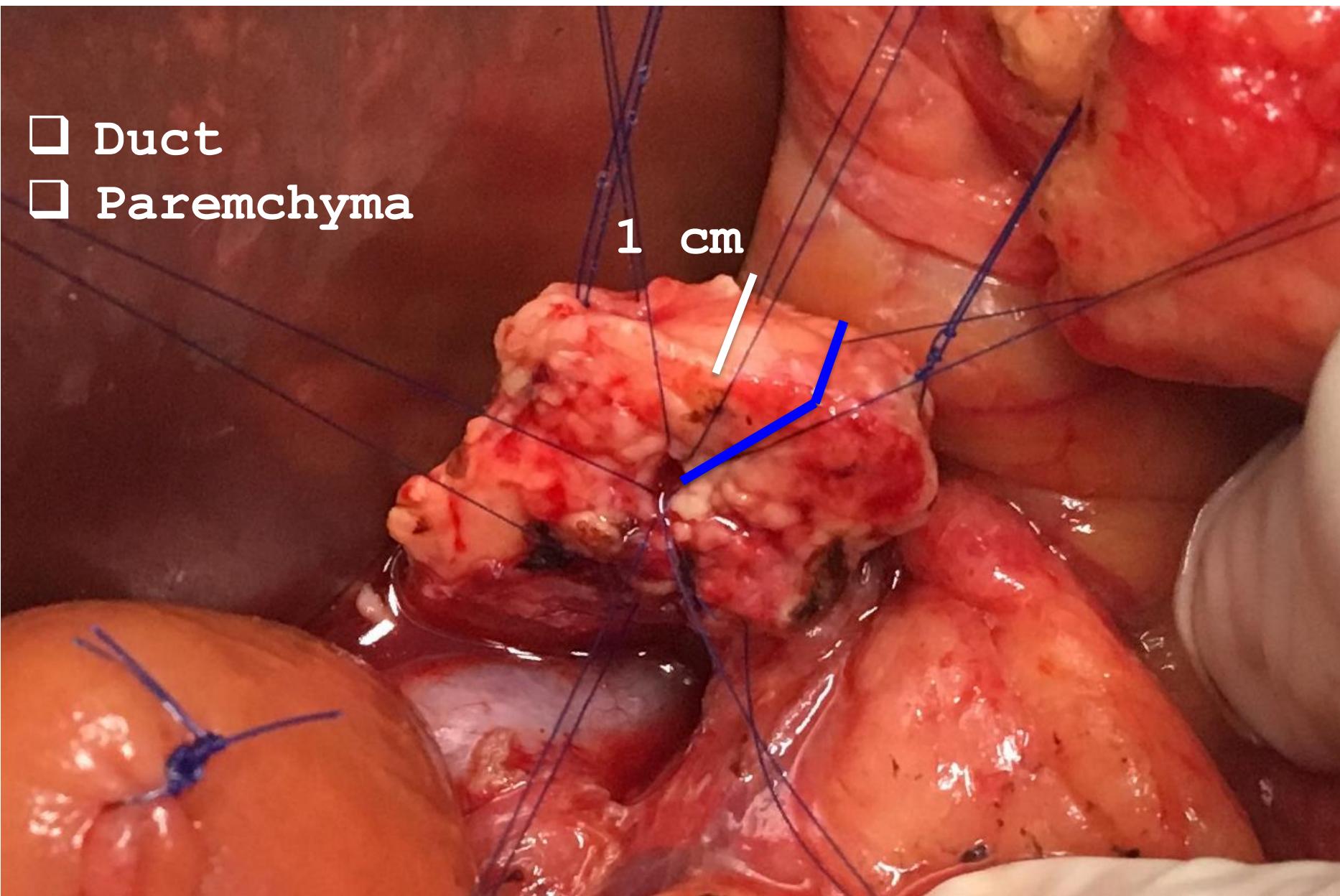
Stay suture

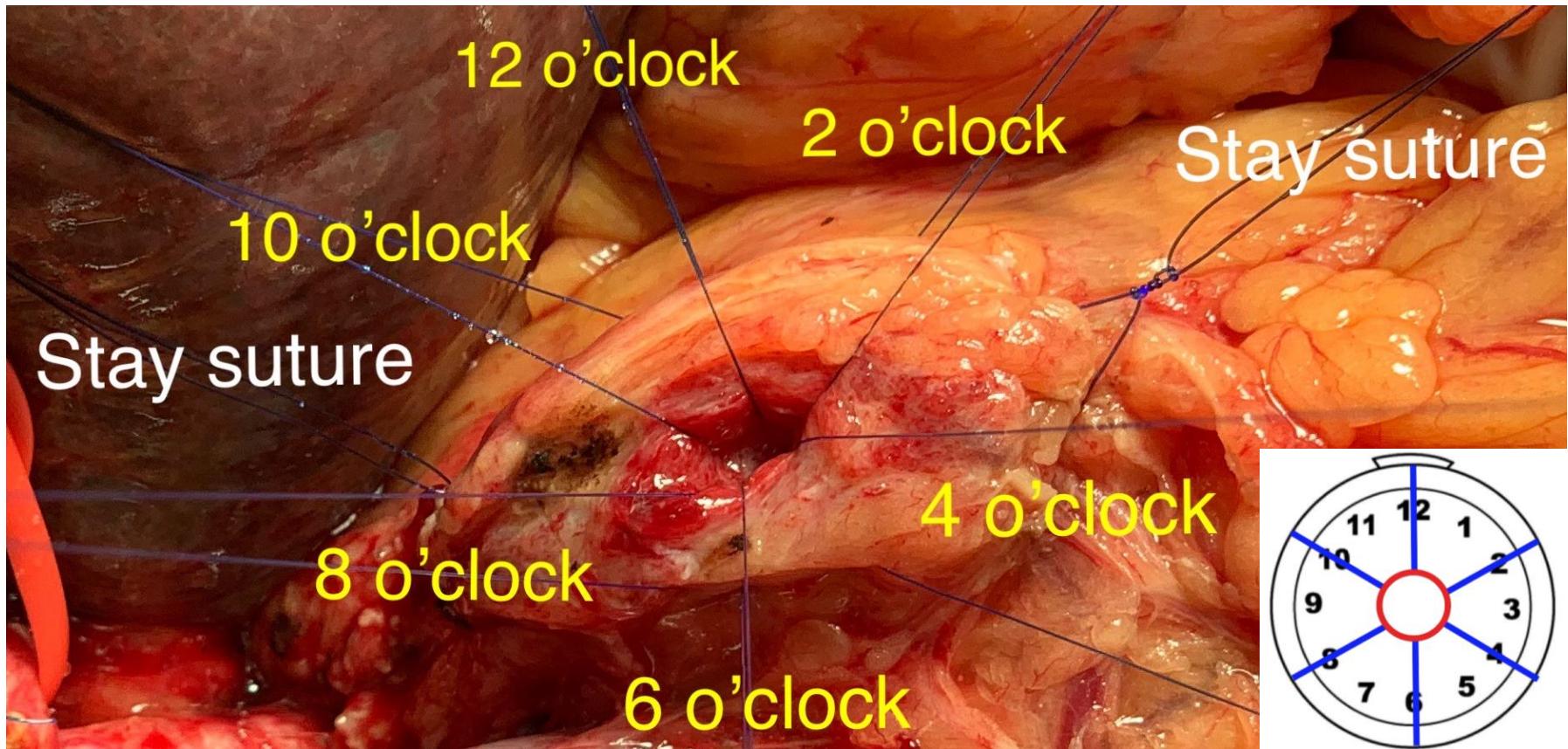
Stump



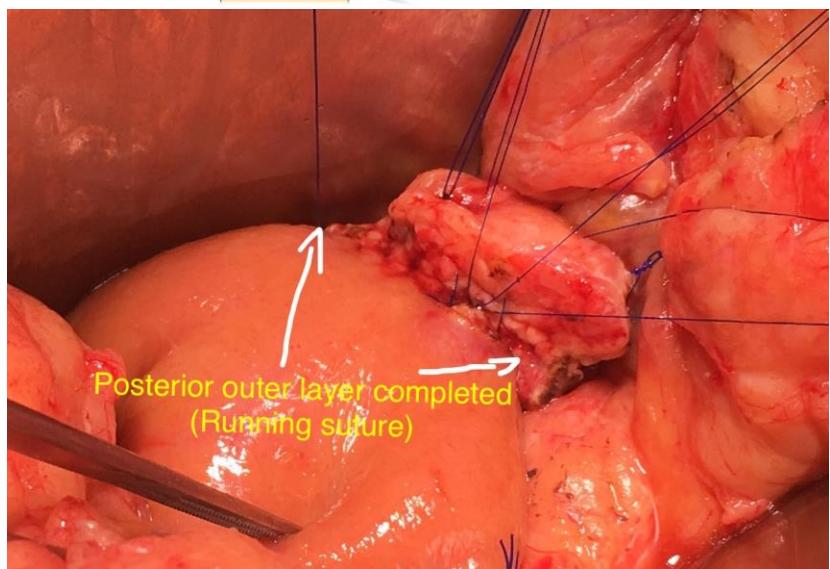
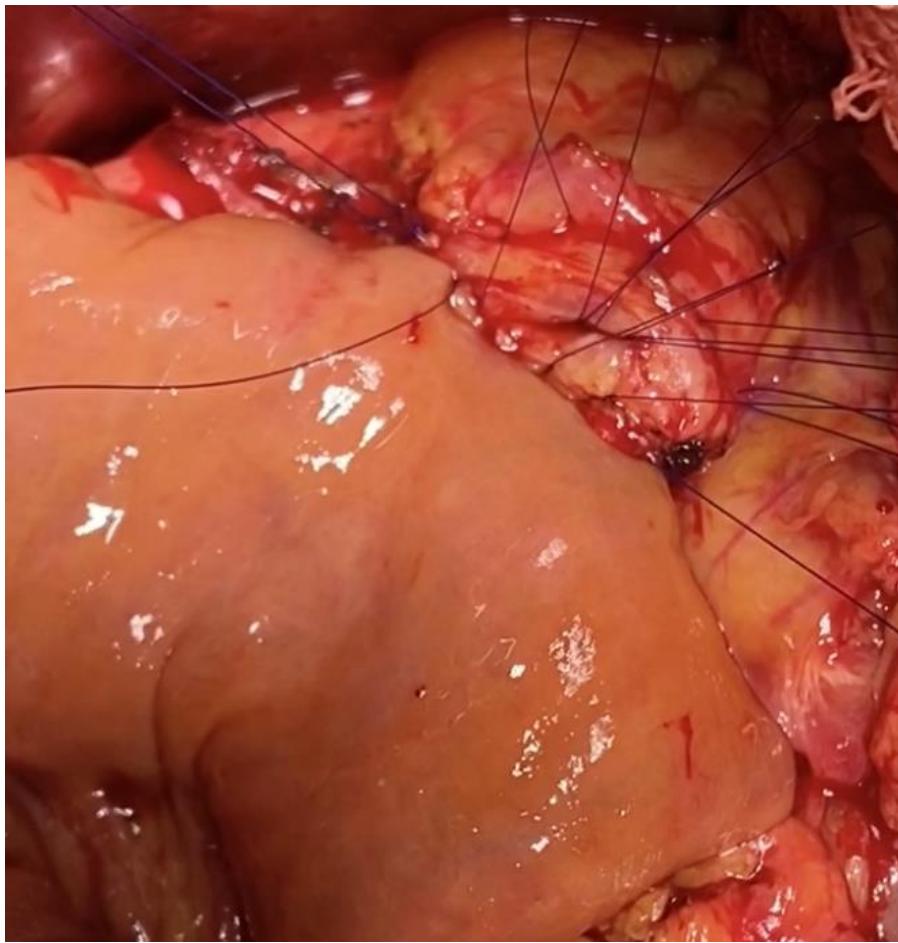
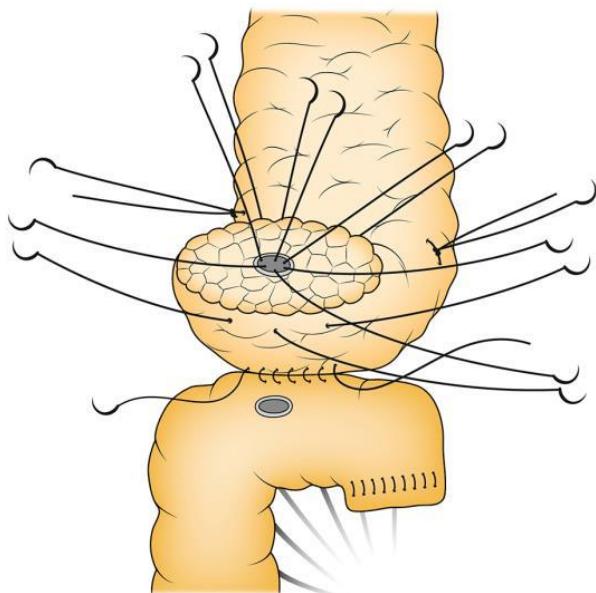
- Duct
- Parenchyma

1 cm

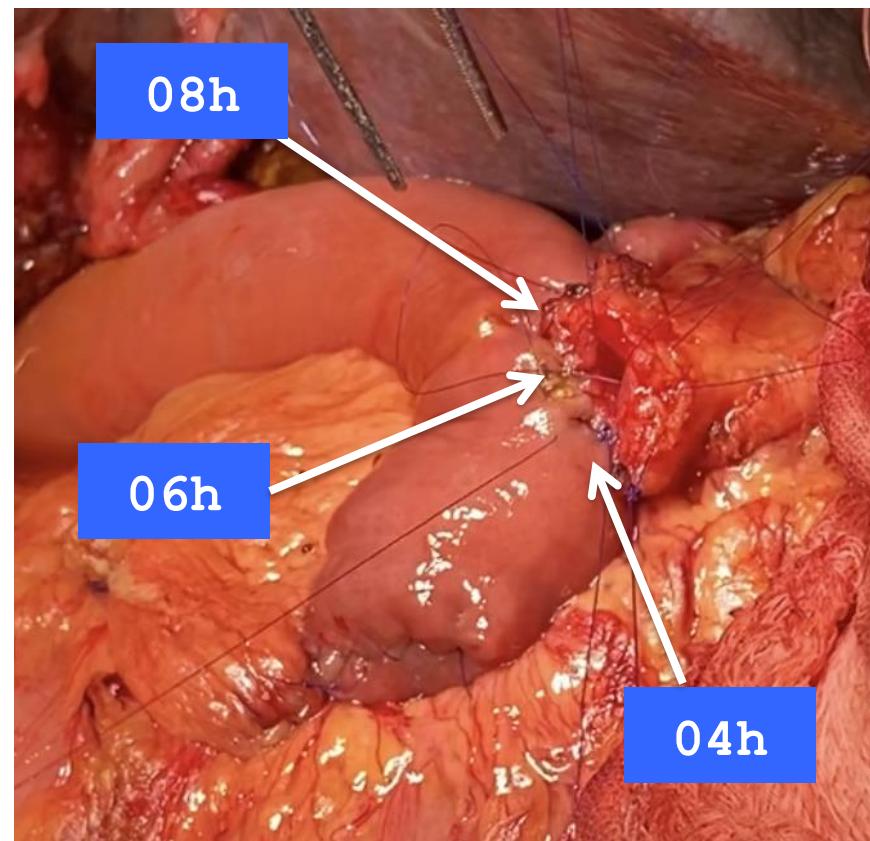
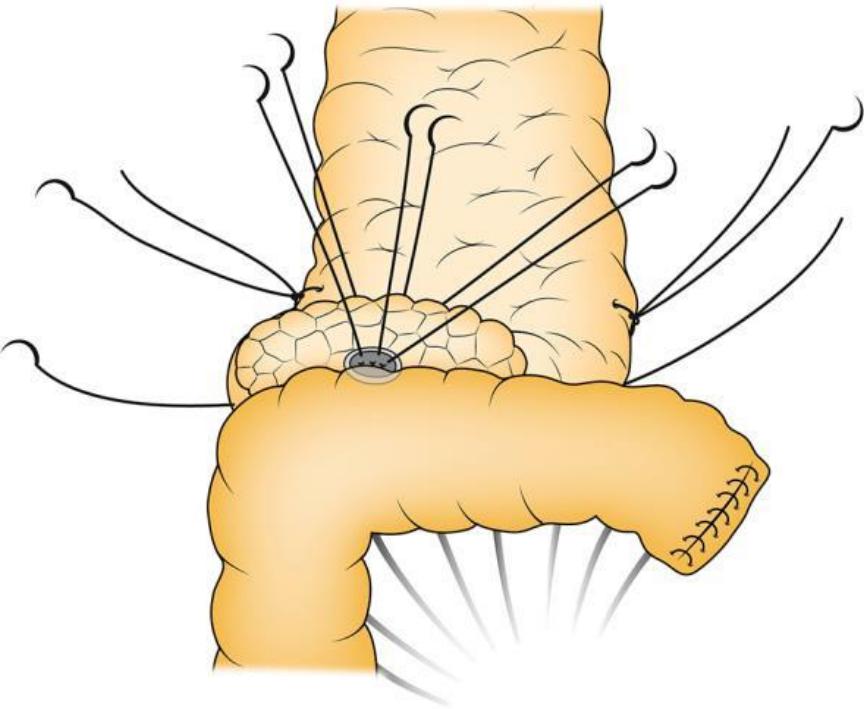




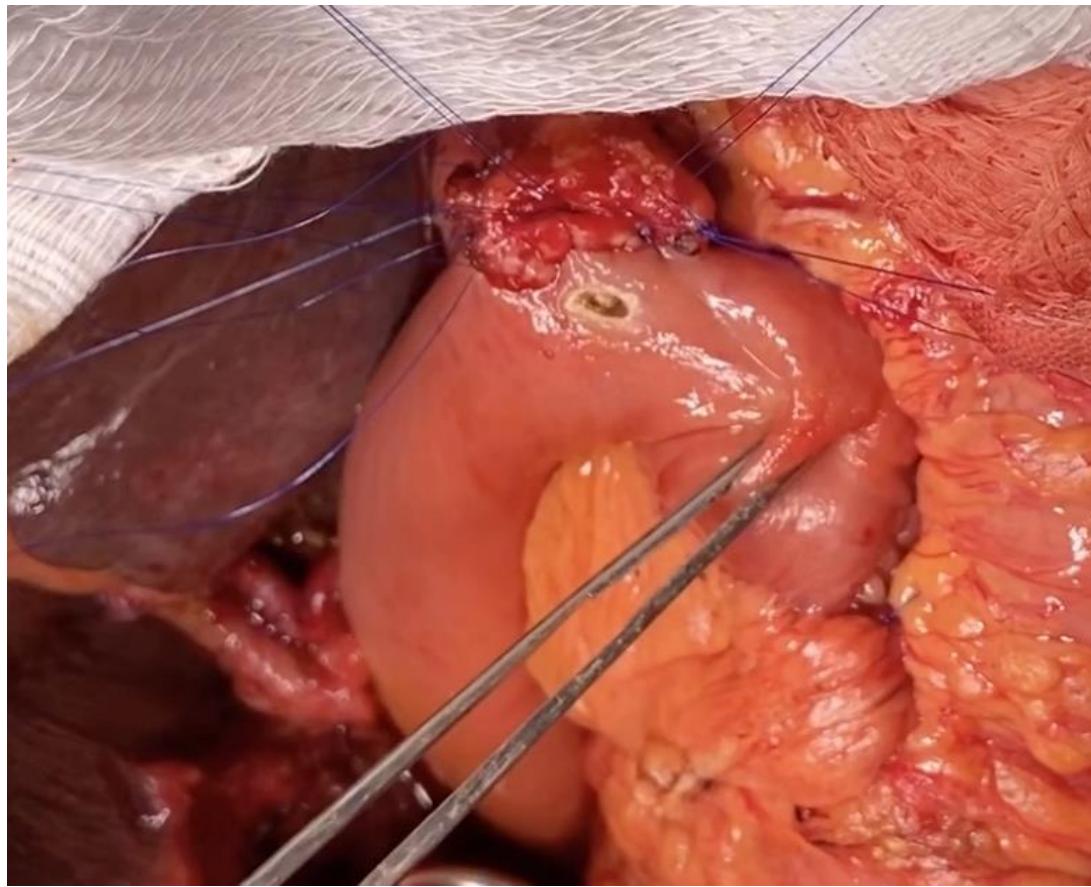
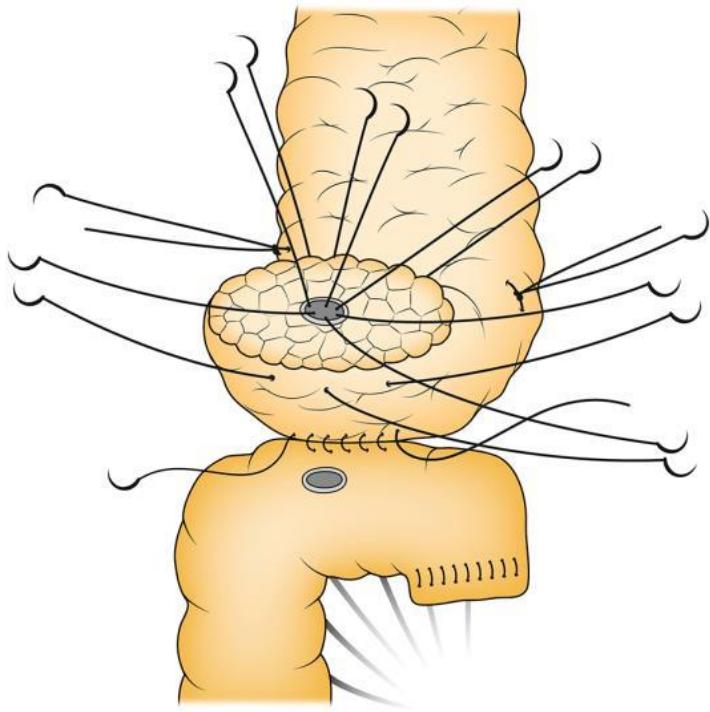
1. Running suture (posterior outer)



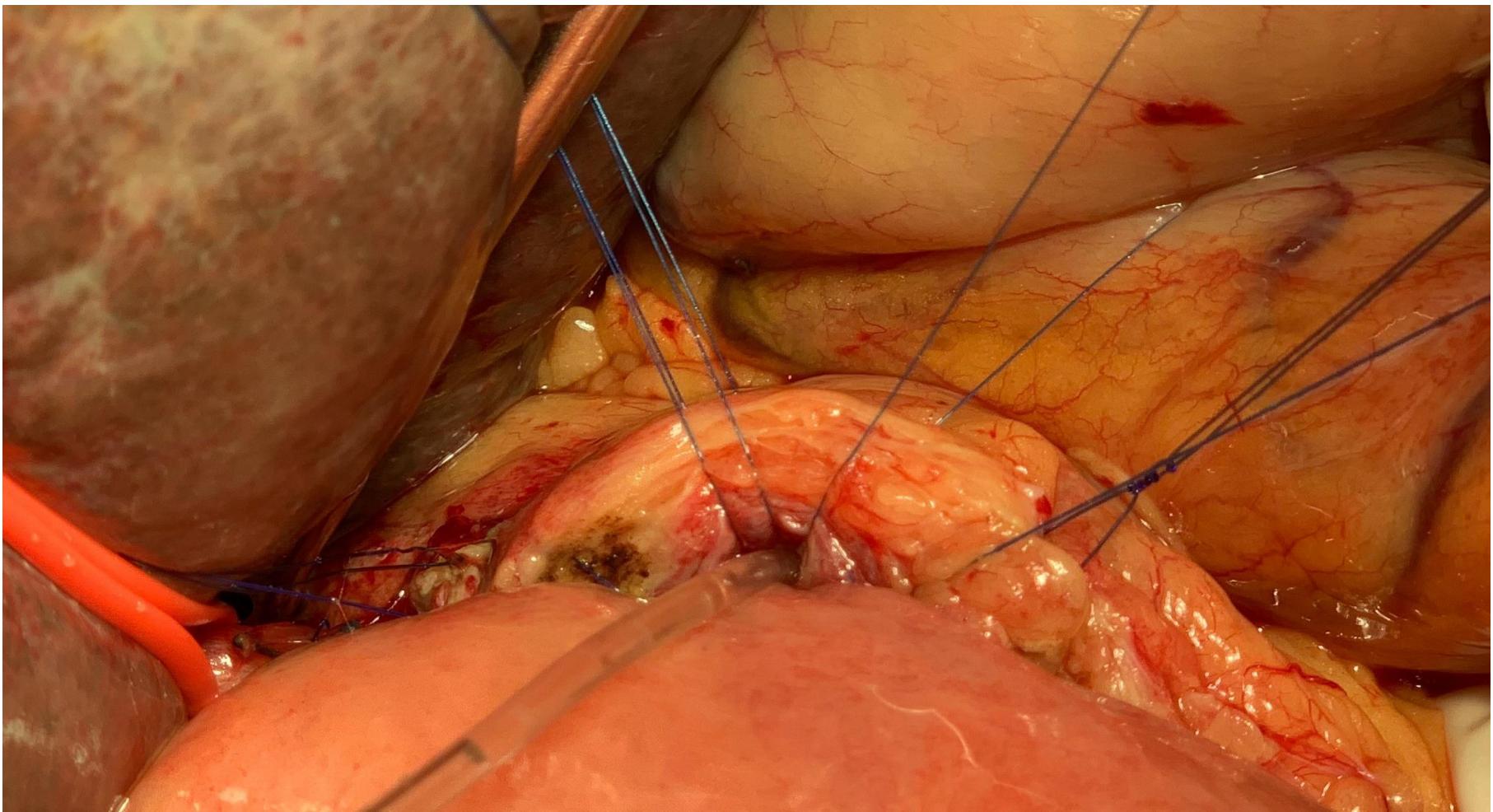
2. POSTERIOR INNER



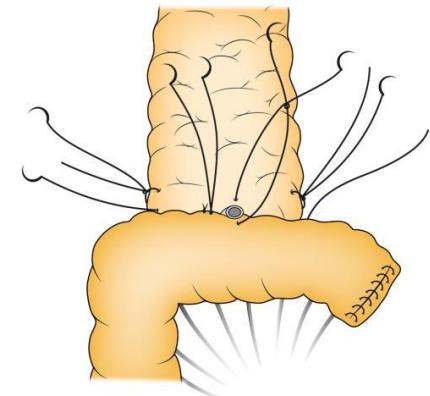
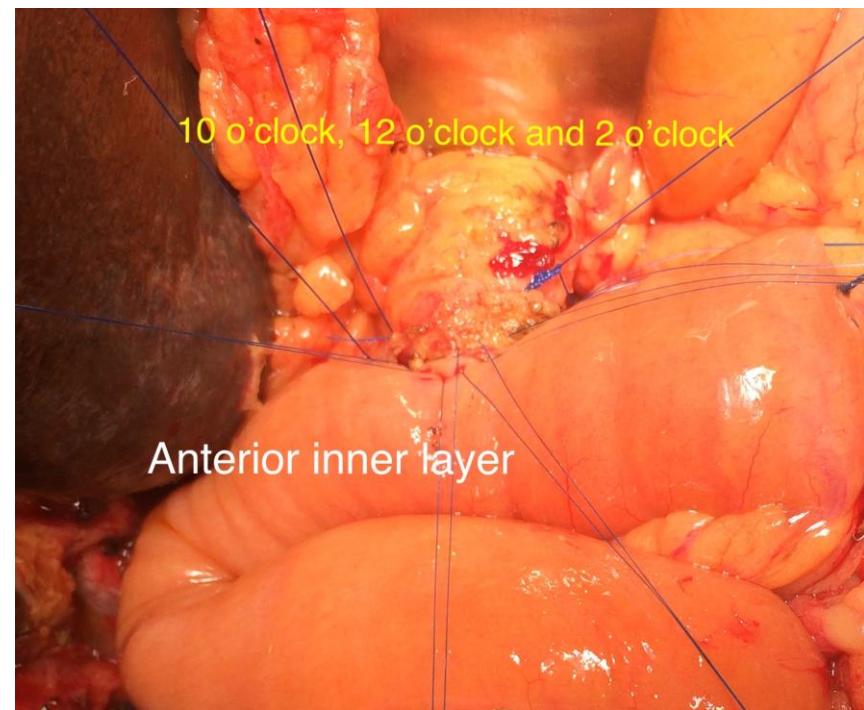
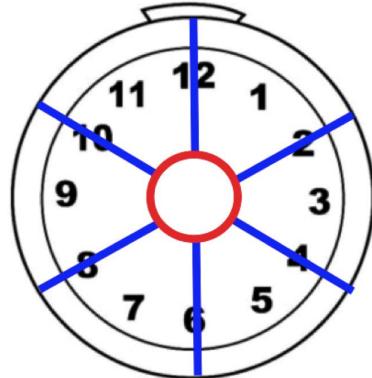
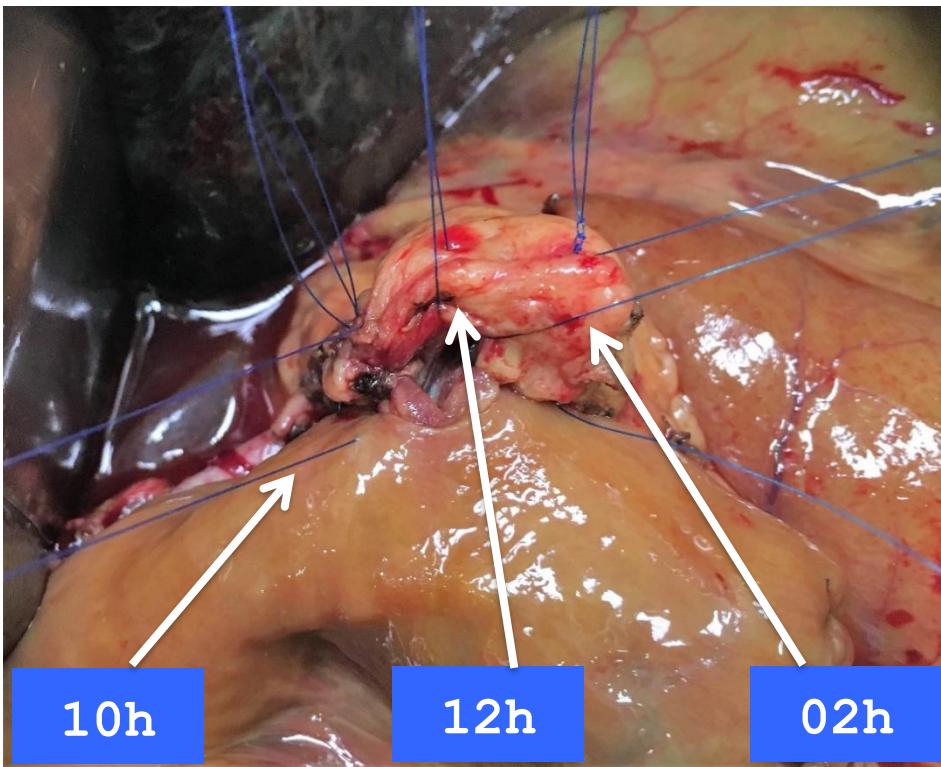
Small bowel is opened



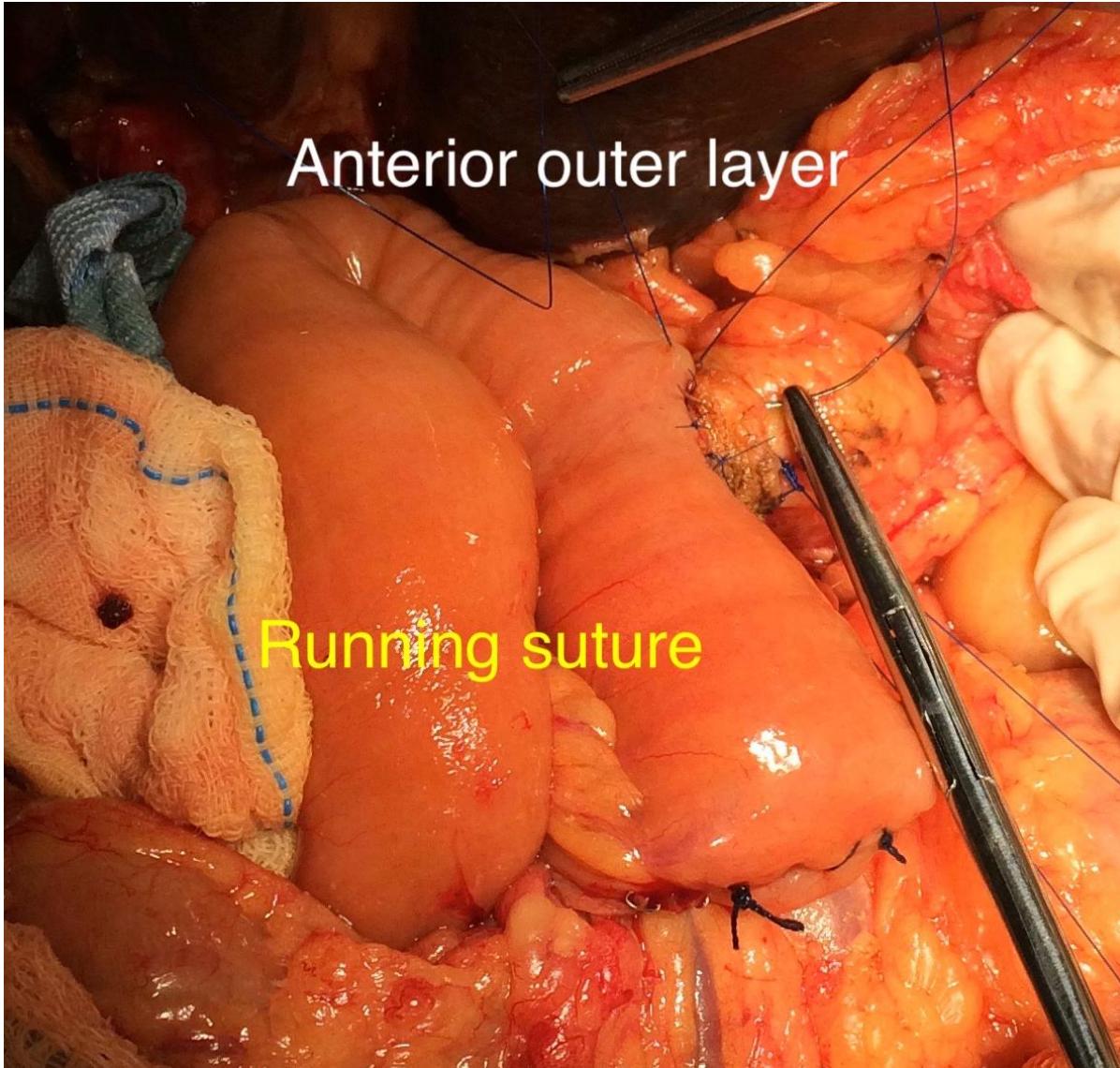
STENT INTO THE PANCREATIC DUCT



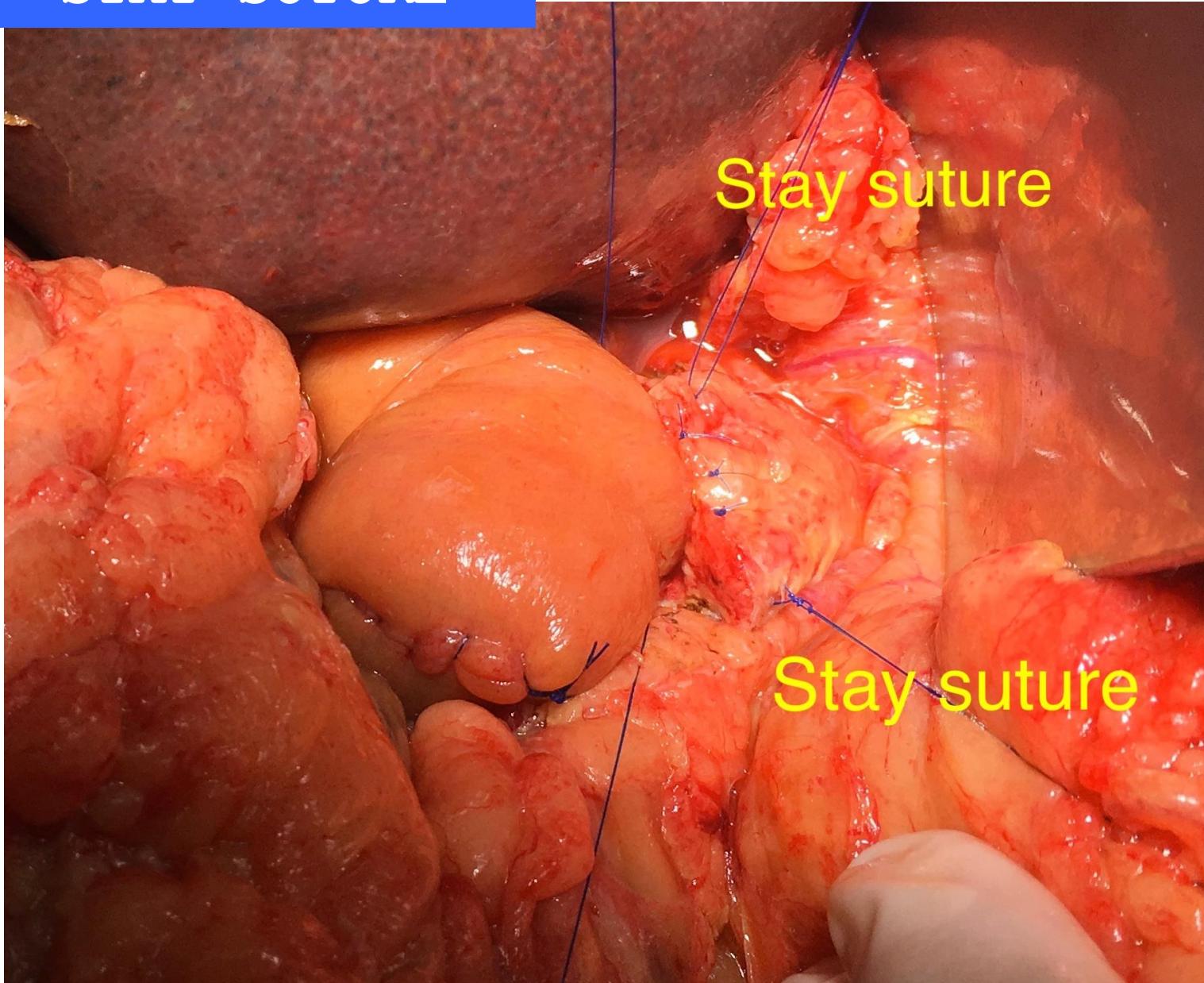
3. ANTERIOR INNER



4 . ANTERIOR OUTER

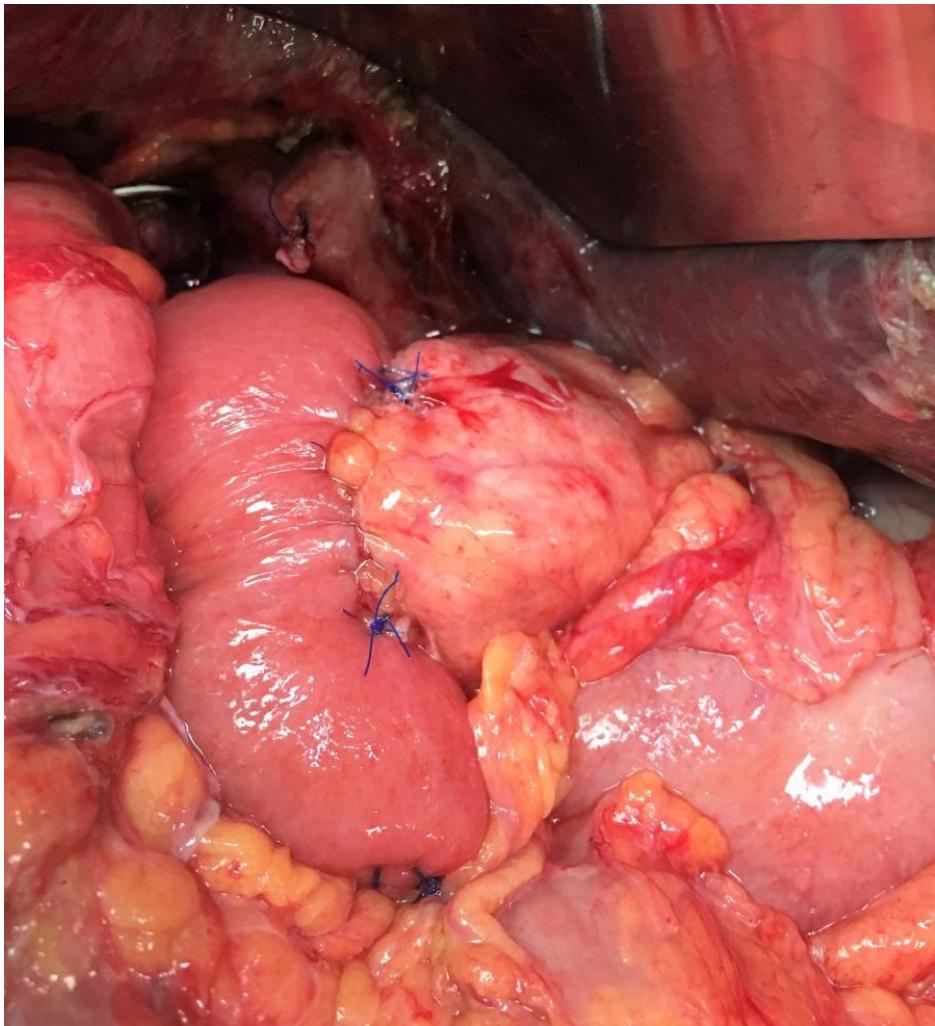


STAY SUTURE

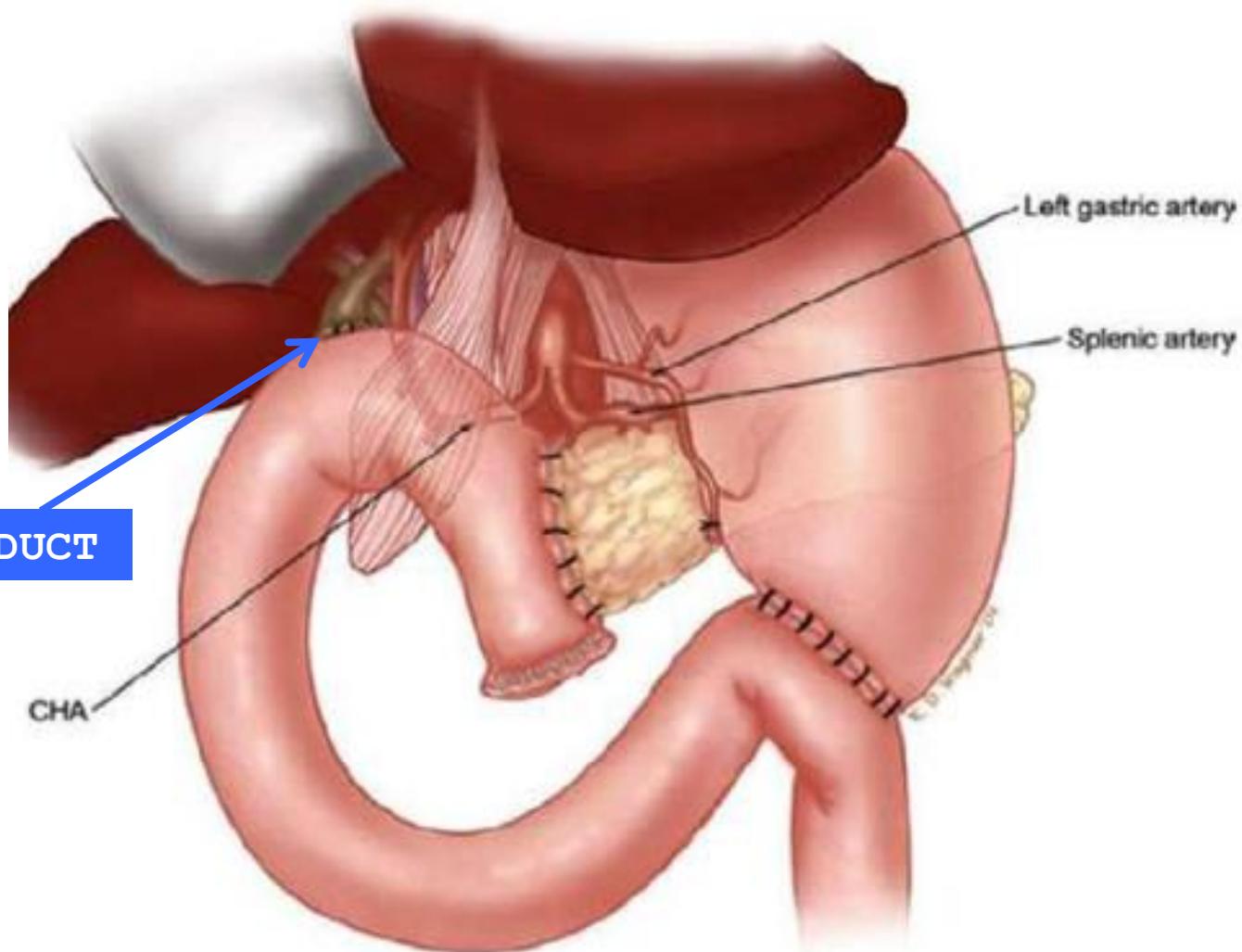


FINAL ASPECT

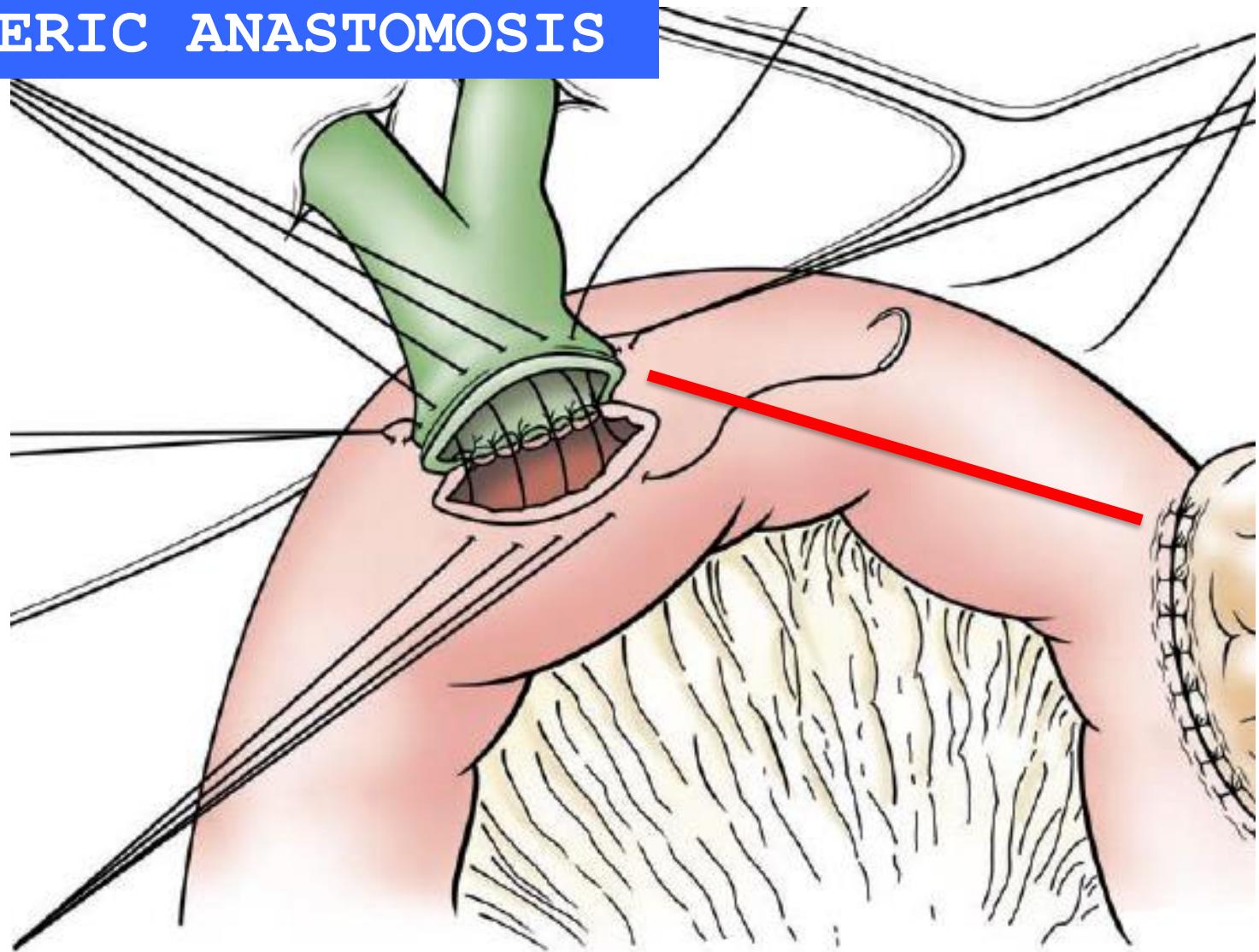
- Bleeding
- Pancreatic fistula
- Delayed gastric emptying
- Oncology



BILE ENTERIC ANASTOMOSIS

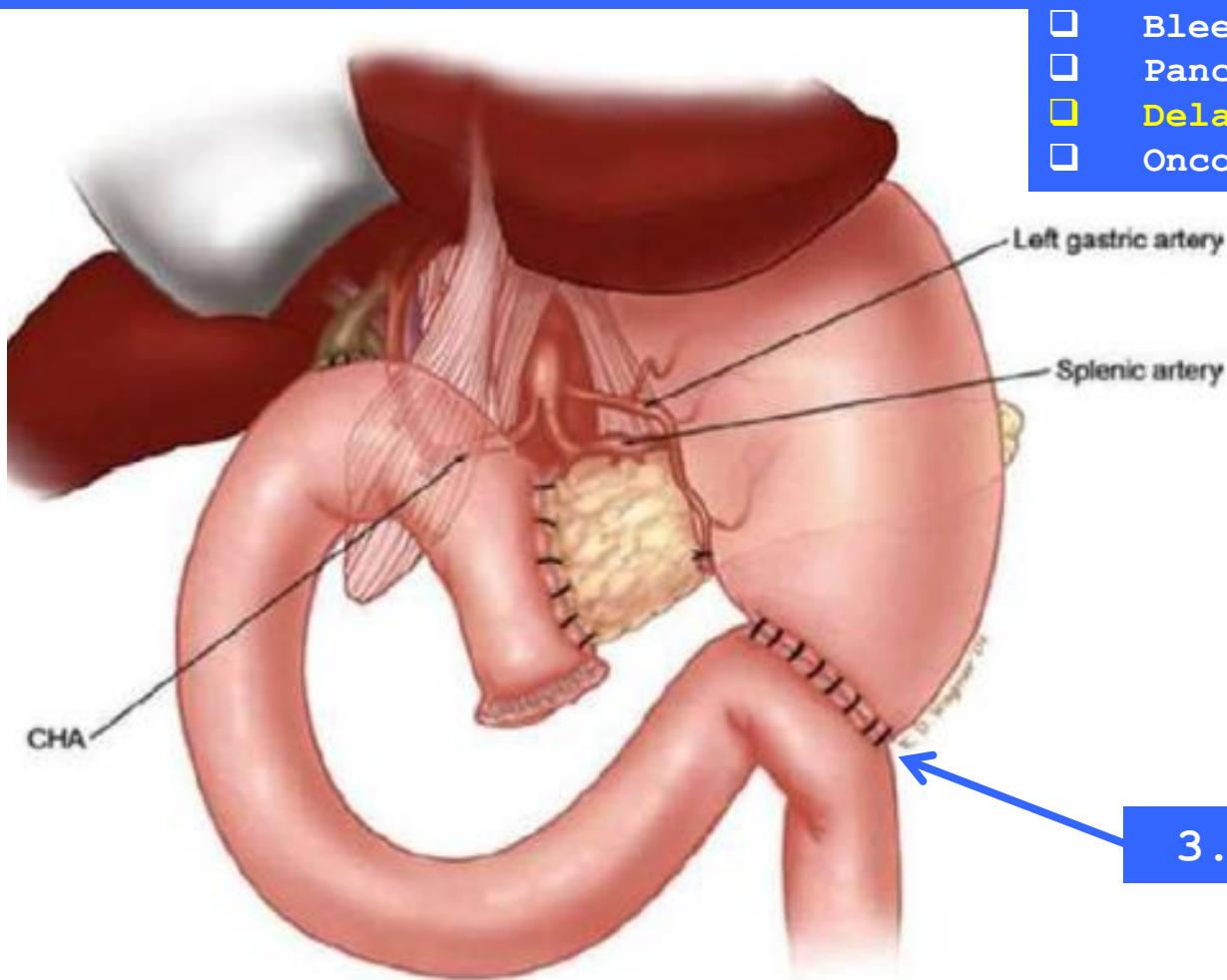


BILE ENTERIC ANASTOMOSIS



GASTRIC ANASTOMOSIS

- Bleeding
- Pancreatic fistula
- Delayed gastric emptying
- Oncology

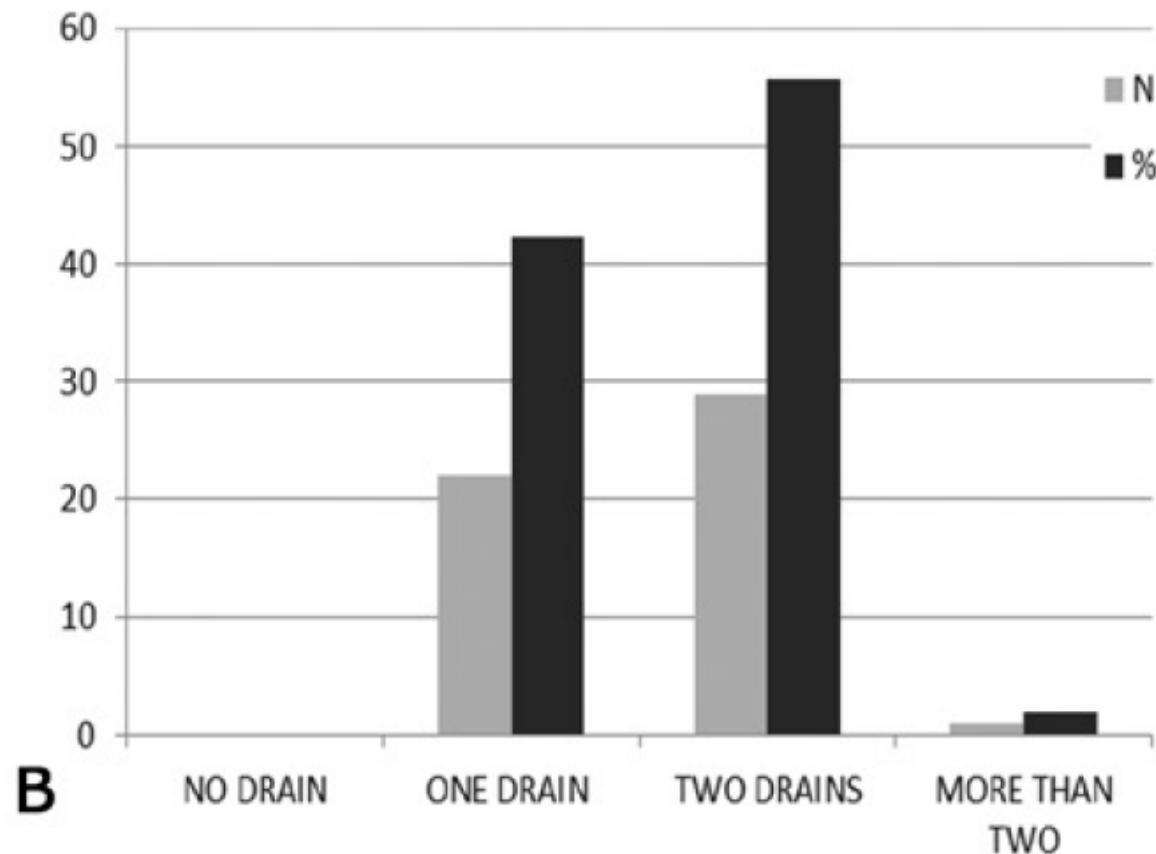


- Antecolic position

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PANCREATODUODENECTOMY

ABDOMINAL DRAINAGE

- Two drains (in the flank)
- Amilase 3 and 5 POD
- Low risk for POPF
- Remove 5 POD

PANCREATODUODENECTOMY

NASOGASTRIC TUBE

- No
- Intraoperatively
 - Gastric distension
 - Remove in the OR
- Exceptionally
 - Remove POD1
- Delayed gastric emptying

PANCREATODUODENECTOMY

FEEDING TUBE

- No
- Severe malnutrition
 - Preoperatively (7 days)
 - Postoperatively (7 days)
 - Liquid by mouth (2nd POD)
- Exceptionally

TPN

- No
- Severe malnutrition
 - Preoperatively (10 days)
 - Feeding tube in the OR
- Grade C pancreatic fistula

PANCREATODUODENECTOMY

Heparin profilactic

- Enoxaparin
- Severe malnutrition
 - Preoperatively (7 days)
 - Postoperatively (7 days)
 - Liquid by mouth (2nd POD)
- Exceptionaly



Thanks!

www.drorlandotorres.com.br