



CIRURGIA  
IN  
SIDE  
RSBR



1 E 2  
SETEMBRO  
DE 2023

Santa Cruz do Sul - RS



**EBSERH**  
HOSPITAIS UNIVERSITÁRIOS FEDERAIS

1º Simpósio de Cirurgia Hepato Pancreato Biliar

5º Evento do Colégio Brasileiro de Cirurgiões

4º Simpósio de Cirurgia Digestiva

4º Simpósio de Trauma e Cirurgia de Emergência

## PANCREATODUODECENECTOMY

Artery first approach: when and how to do it



**Orlando Jorge M. Torres**

Full Professor and Chairman

Department of Gastrointestinal Surgery

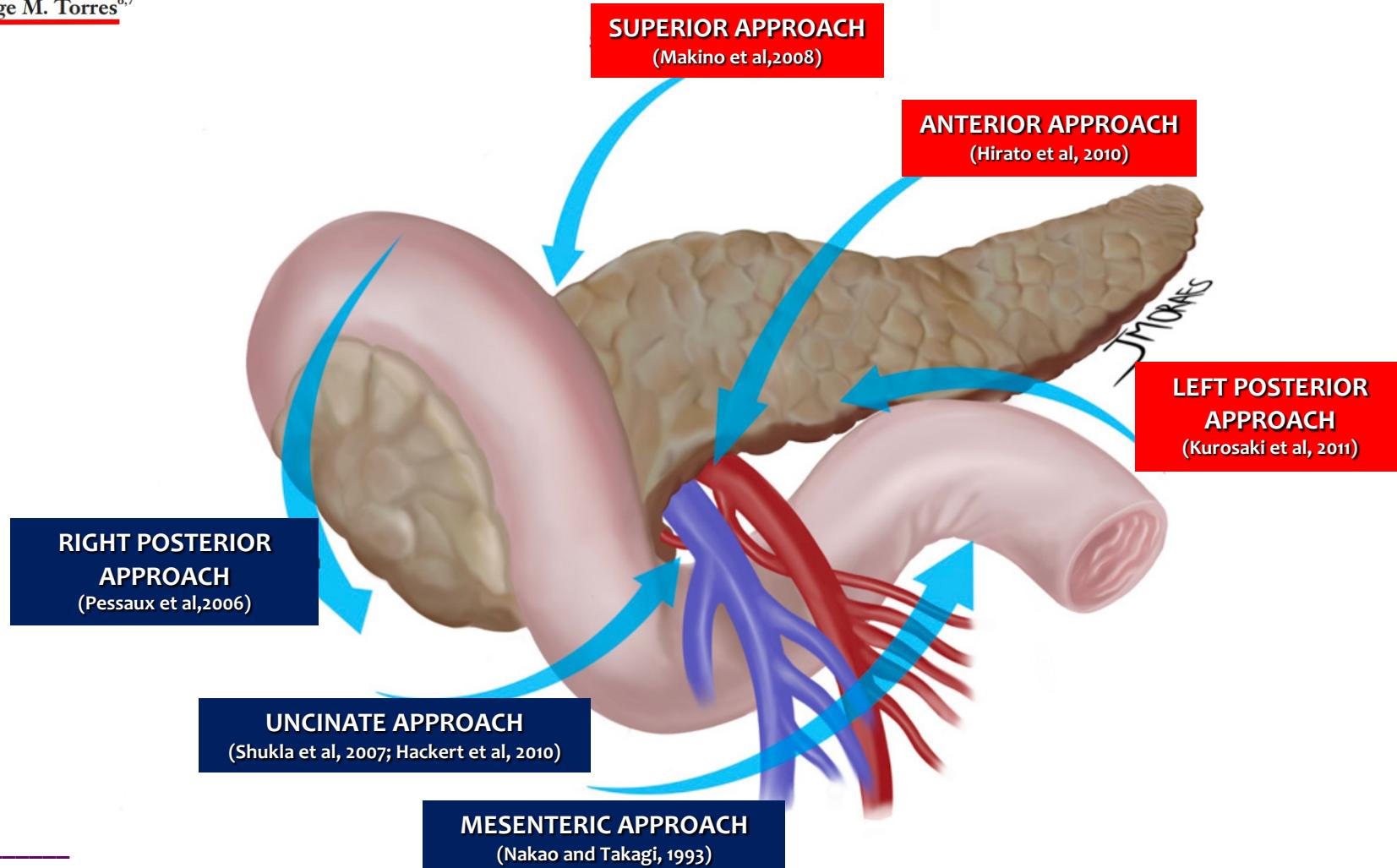
Hepatopancreatobiliary Unit

Federal University of Maranhão - Brazil

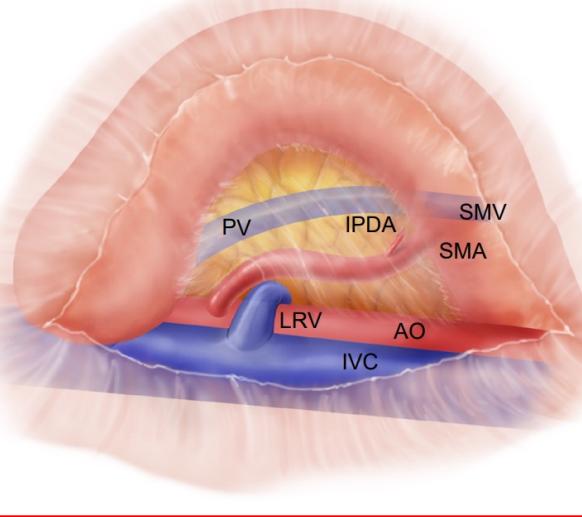
# A more radical perspective on surgical approach and outcomes in pancreatic cancer—a narrative review

**ARTERY FIRST**

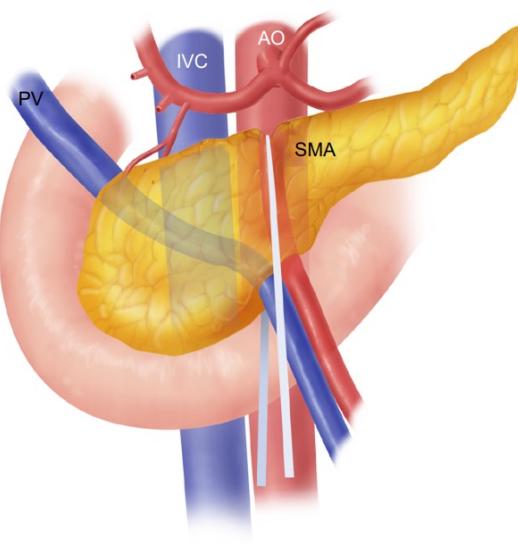
Eduardo de Souza M. Fernandes<sup>1,2,3</sup>, Felipe Pedreira T. de Mello<sup>1,2</sup>, Eduardo Pinho Braga<sup>1</sup>, Gabrielle Oliveira de Souza<sup>1</sup>, Ronaldo Andrade<sup>1,2</sup>, Leandro Savattone Pimentel<sup>1,2</sup>, Camila Liberato Girão<sup>1,2</sup>, Munique Siqueira<sup>1,2</sup>, José Maria A. Moraes-Junior<sup>6,7</sup>, Romulo Varella de Oliveira<sup>4</sup>, Nicolas Goldaracena<sup>5</sup>, Orlando Jorge M. Torres<sup>6,7</sup>



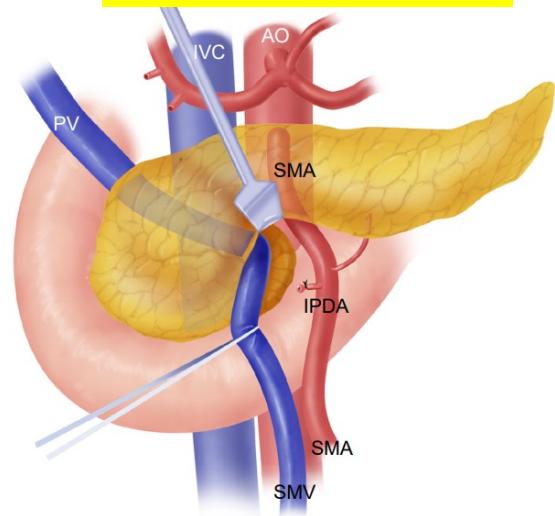
### RIGHT POSTERIOR APPROACH



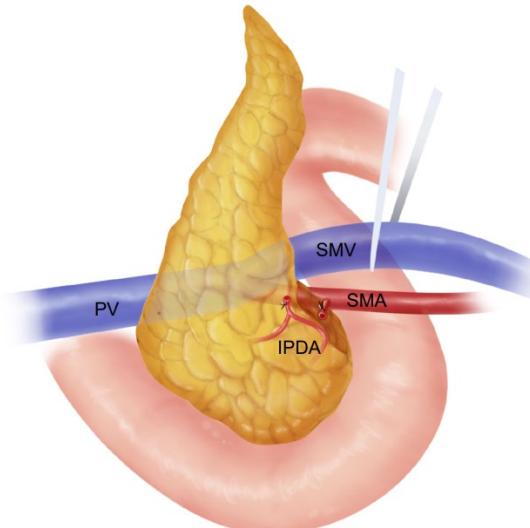
### SUPERIOR APPROACH



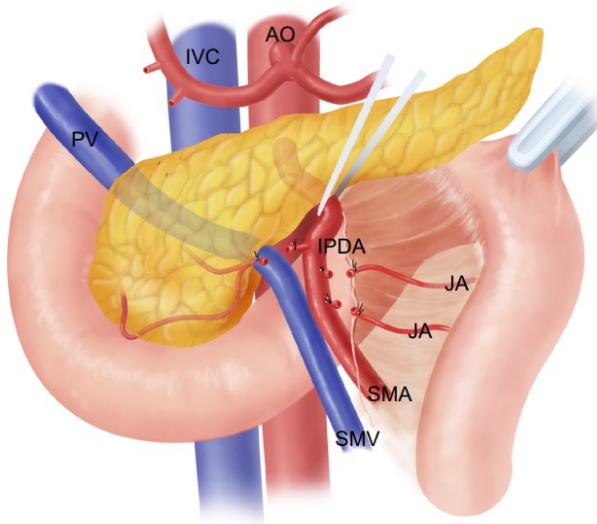
### ANTERIOR APPROACH



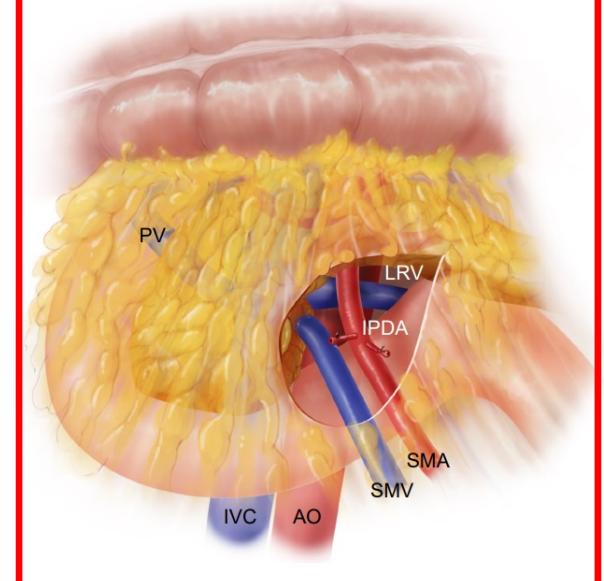
### UNCINATE APPROACH



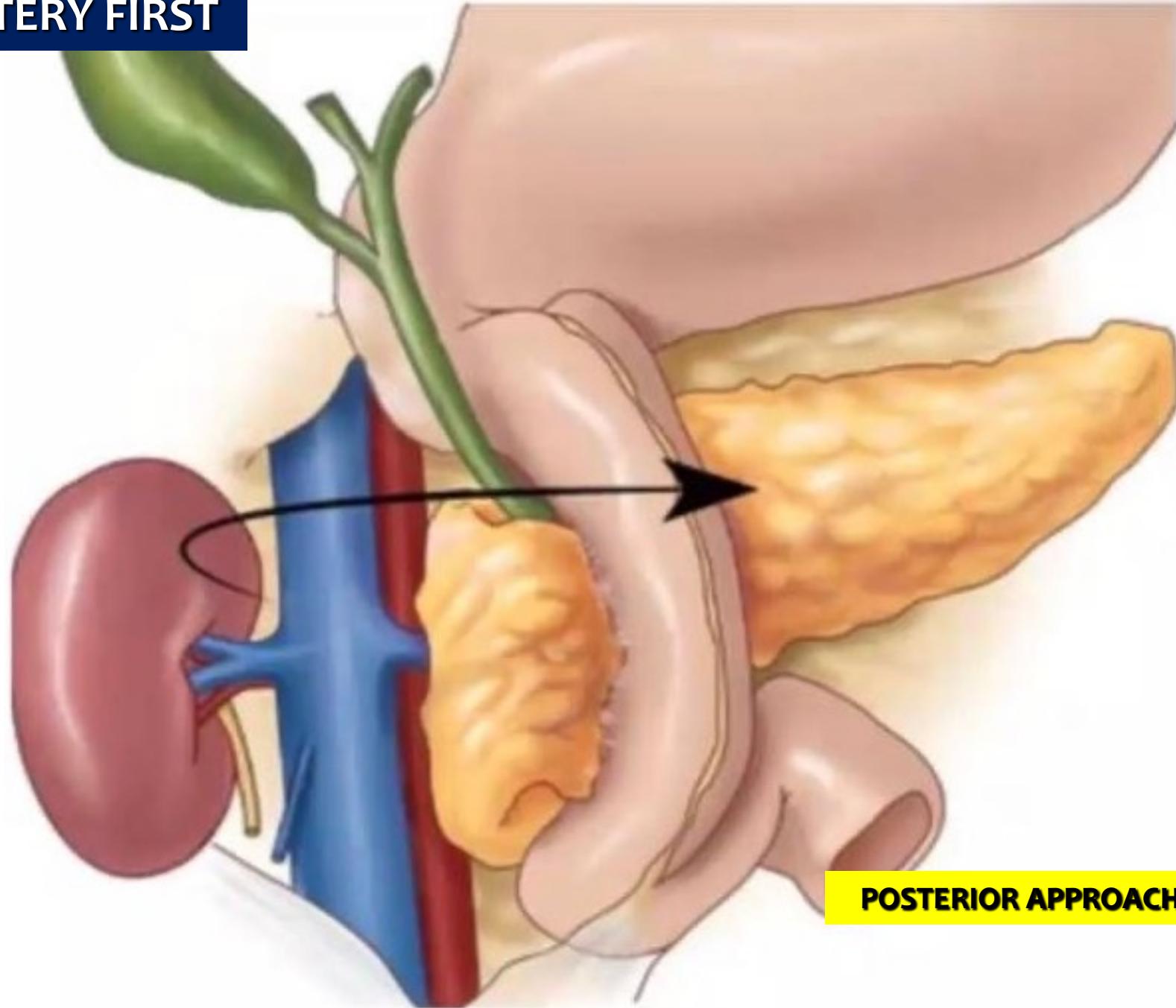
### LEFT POSTERIOR APPROACH



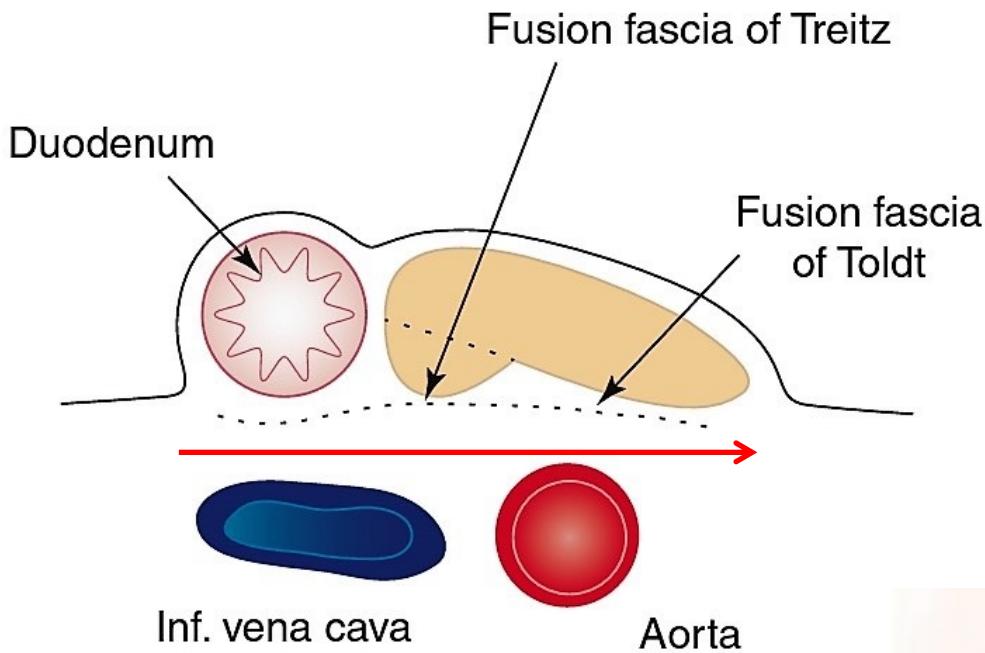
### MESENTERIC APPROACH



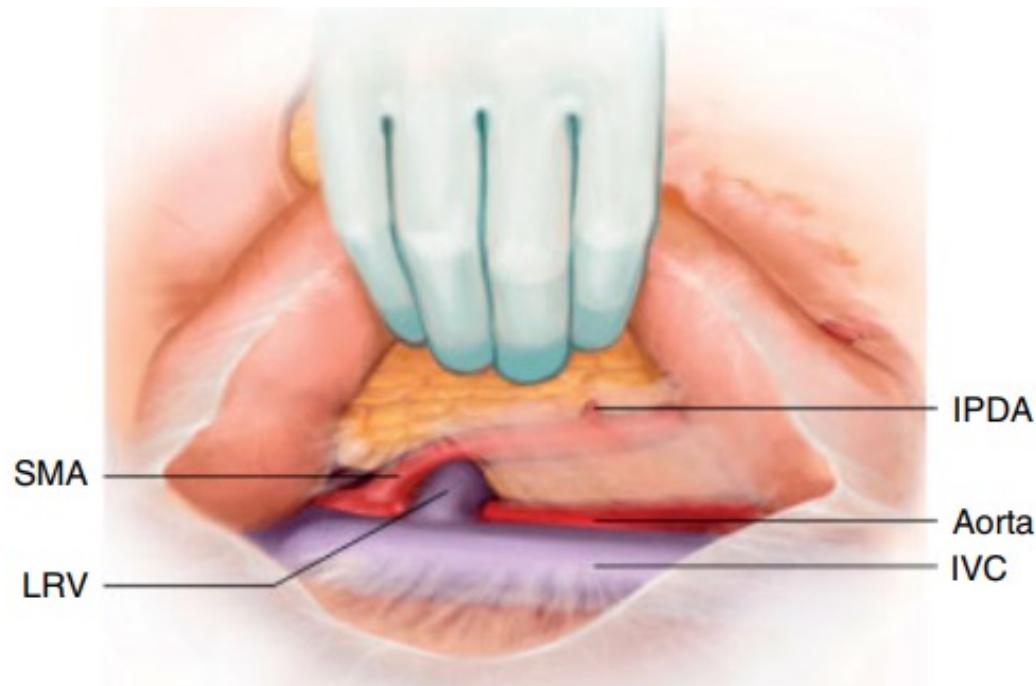
**ARTERY FIRST**



**POSTERIOR APPROACH**



## POSTERIOR APPROACH



# ARTERY FIRST

Superior mesenteric artery

Left renal vein

Aorta

Inferior vena cava (IVC)

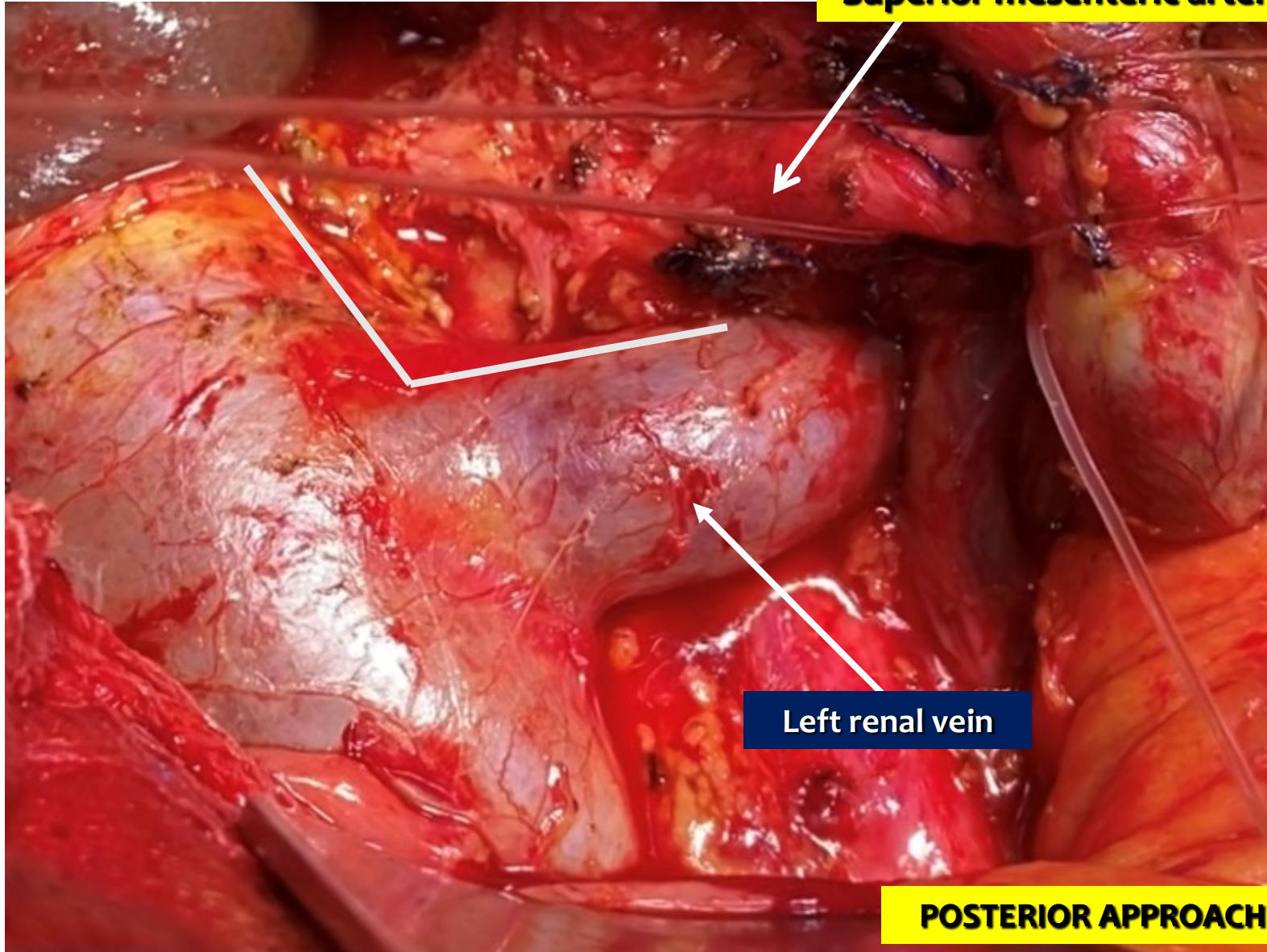
Duodenum

POSTERIOR APPROACH



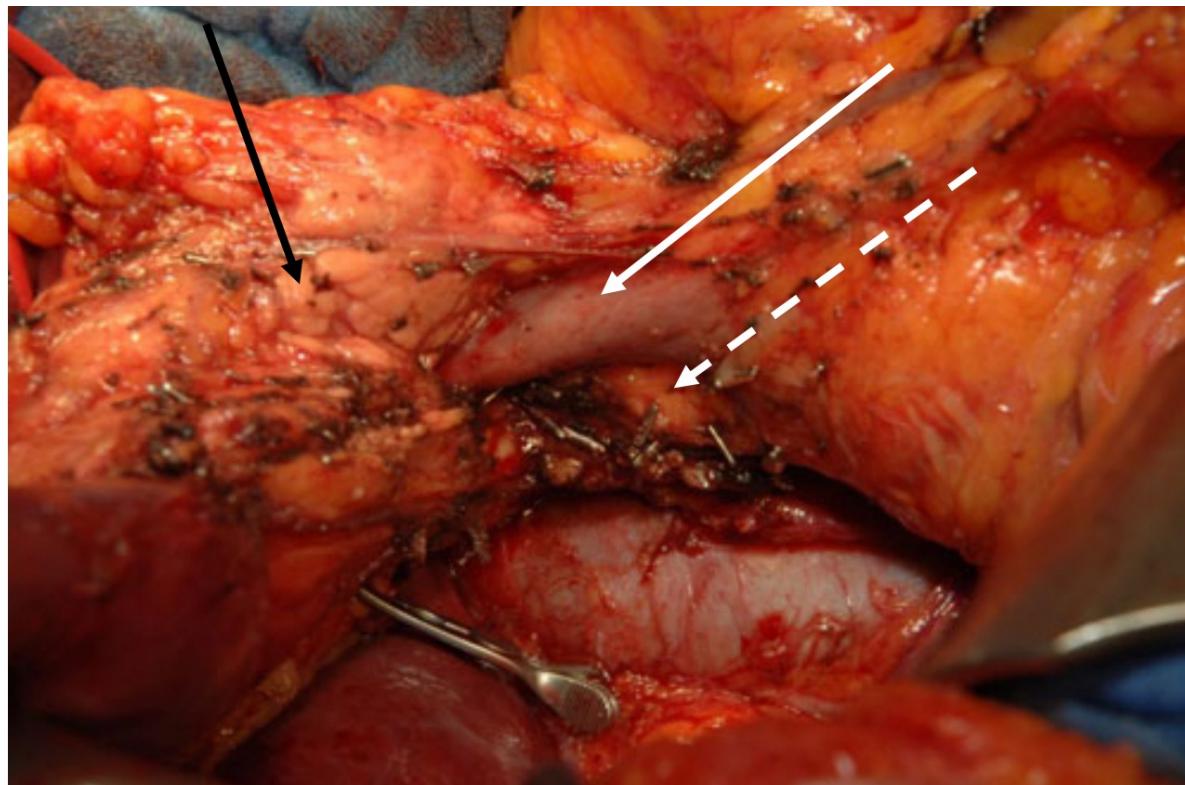
**ARTERY FIRST**

**Superior mesenteric artery**



HOW TO DO IT

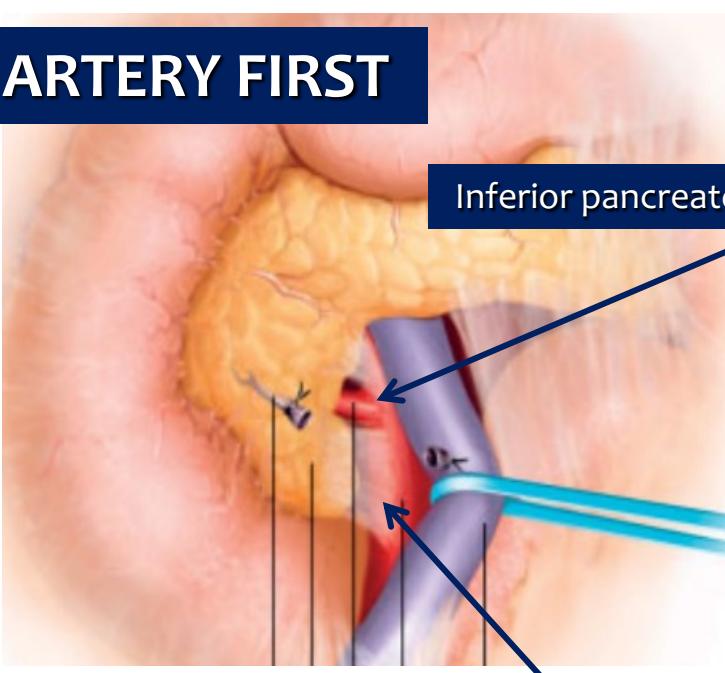
## Uncinate process first—a novel approach for pancreatic head resection



Shailesh Shrikhande (India)  
Thilo Hackert (Germany)

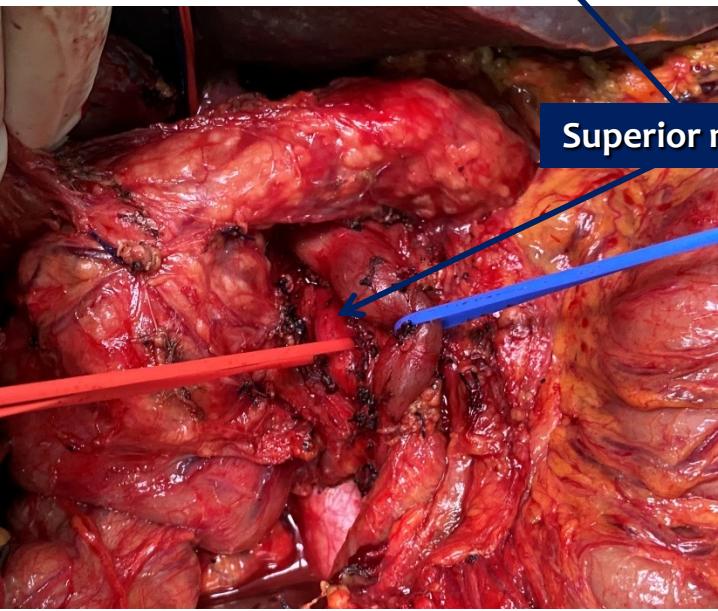
UNCINATE FIRST

# ARTERY FIRST

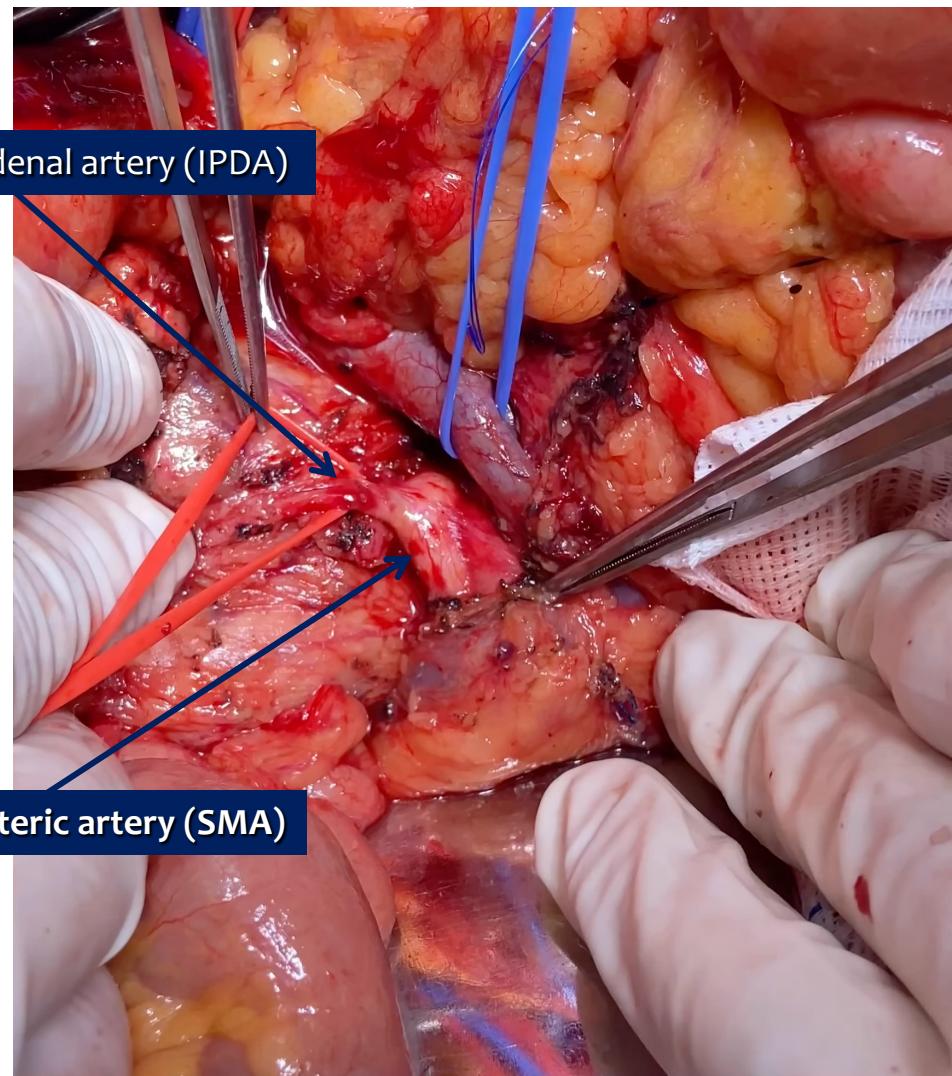


Inferior pancreateoduodenal artery (IPDA)

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



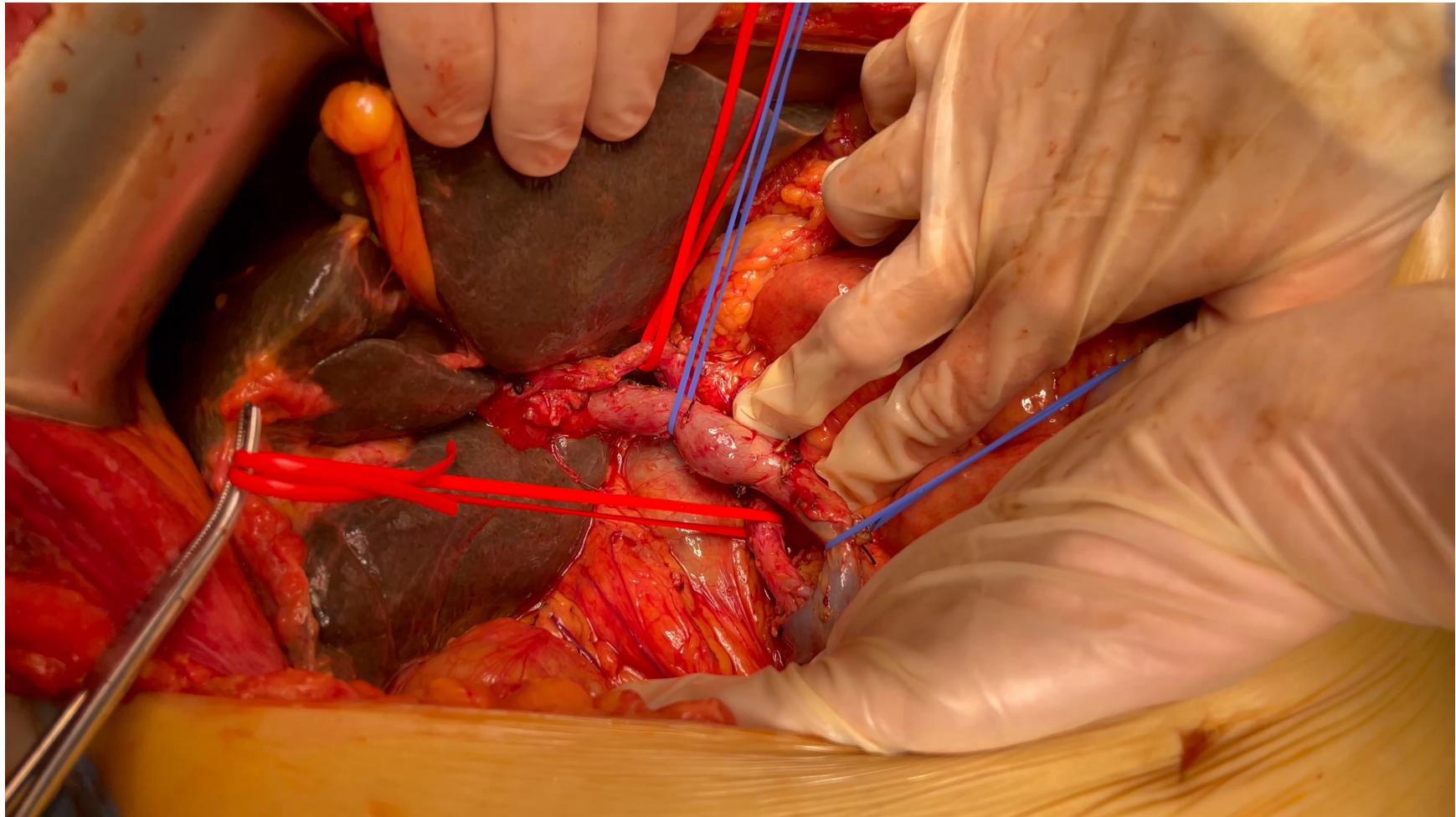
Superior mesenteric artery (SMA)



UNCINATE FIRST



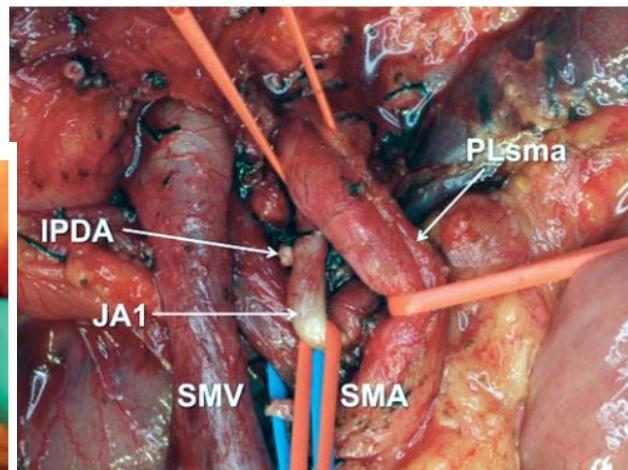
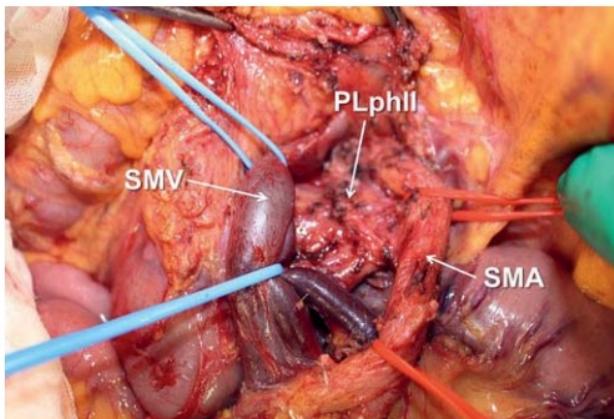
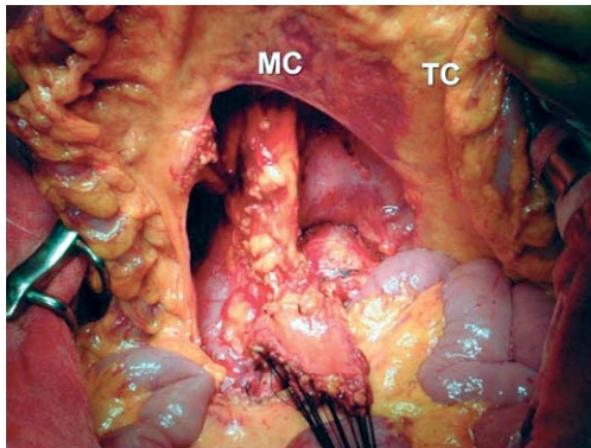
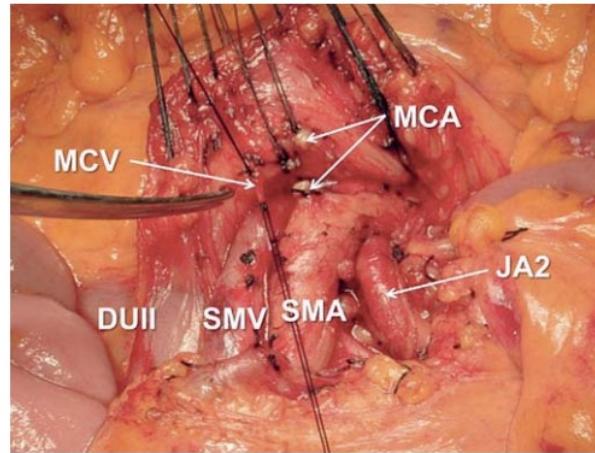
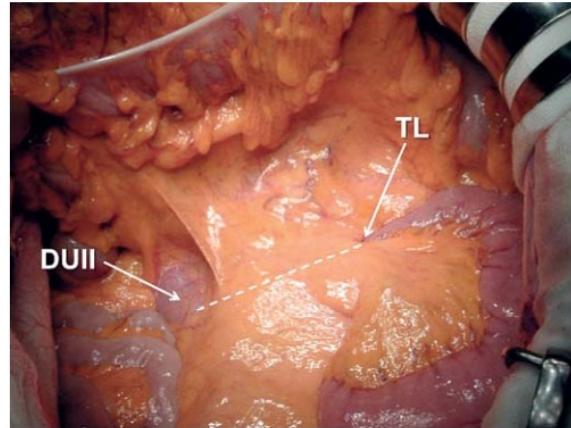
# ARTERY FIRST



# UNCINATE FIRST



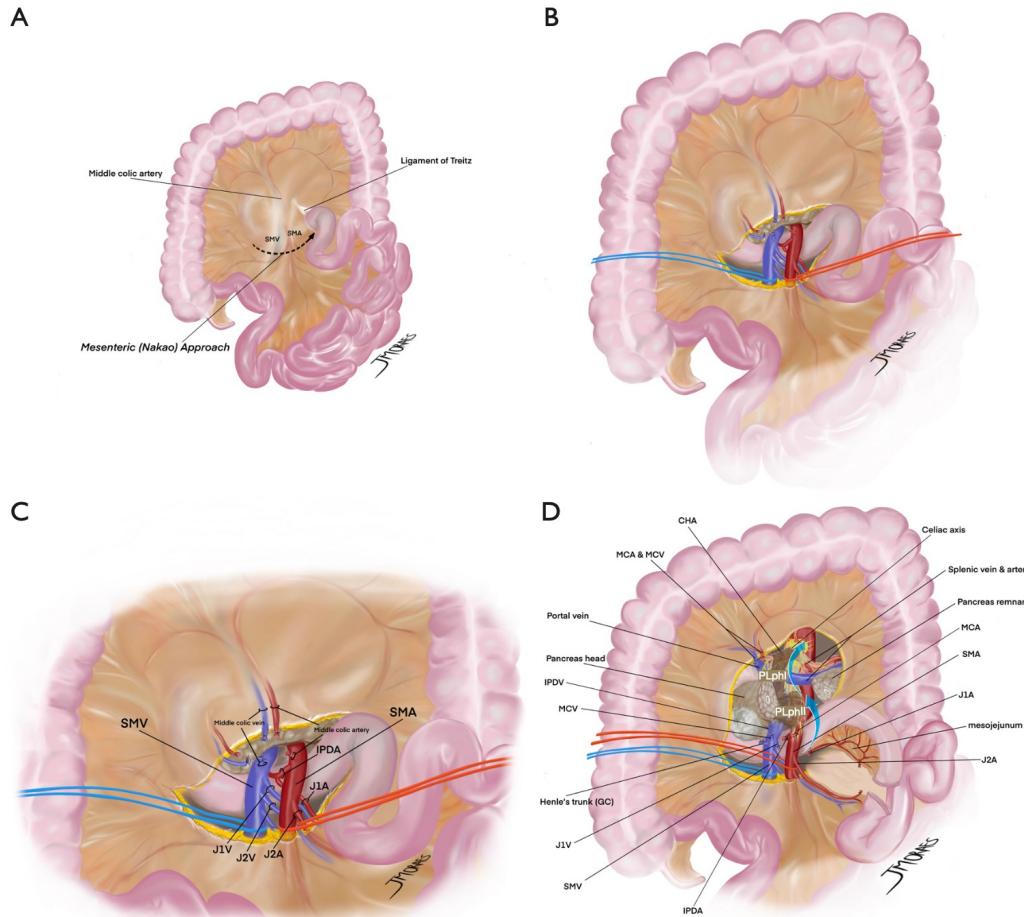
## The Mesenteric Approach in Pancreatoduodenectomy



**MESENTERIC APPROACH**

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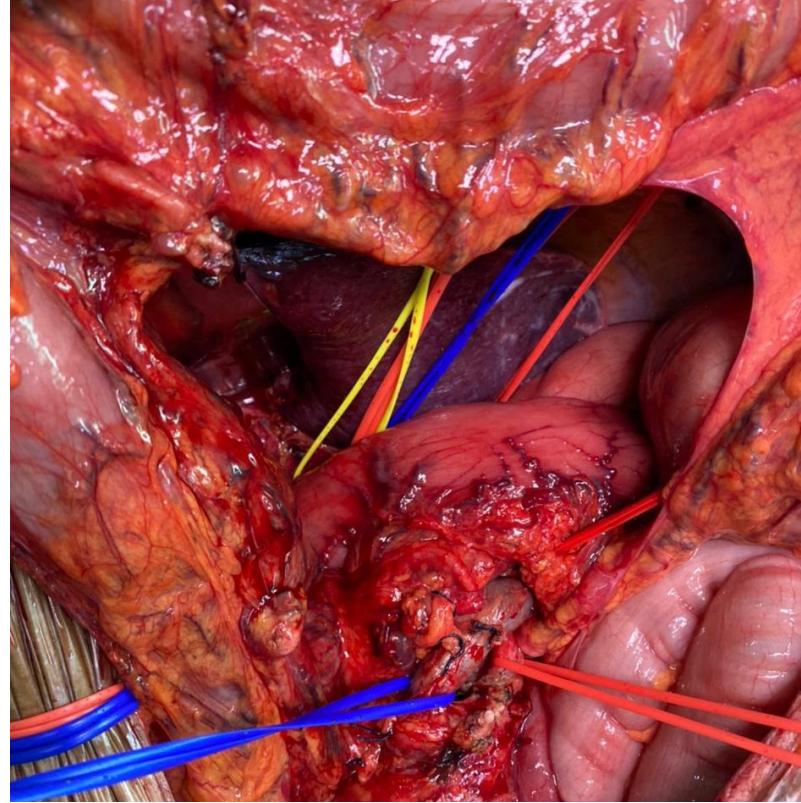
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## MESENTERIC APPROACH



Infracolic approach



**MESENTERIC APPROACH**

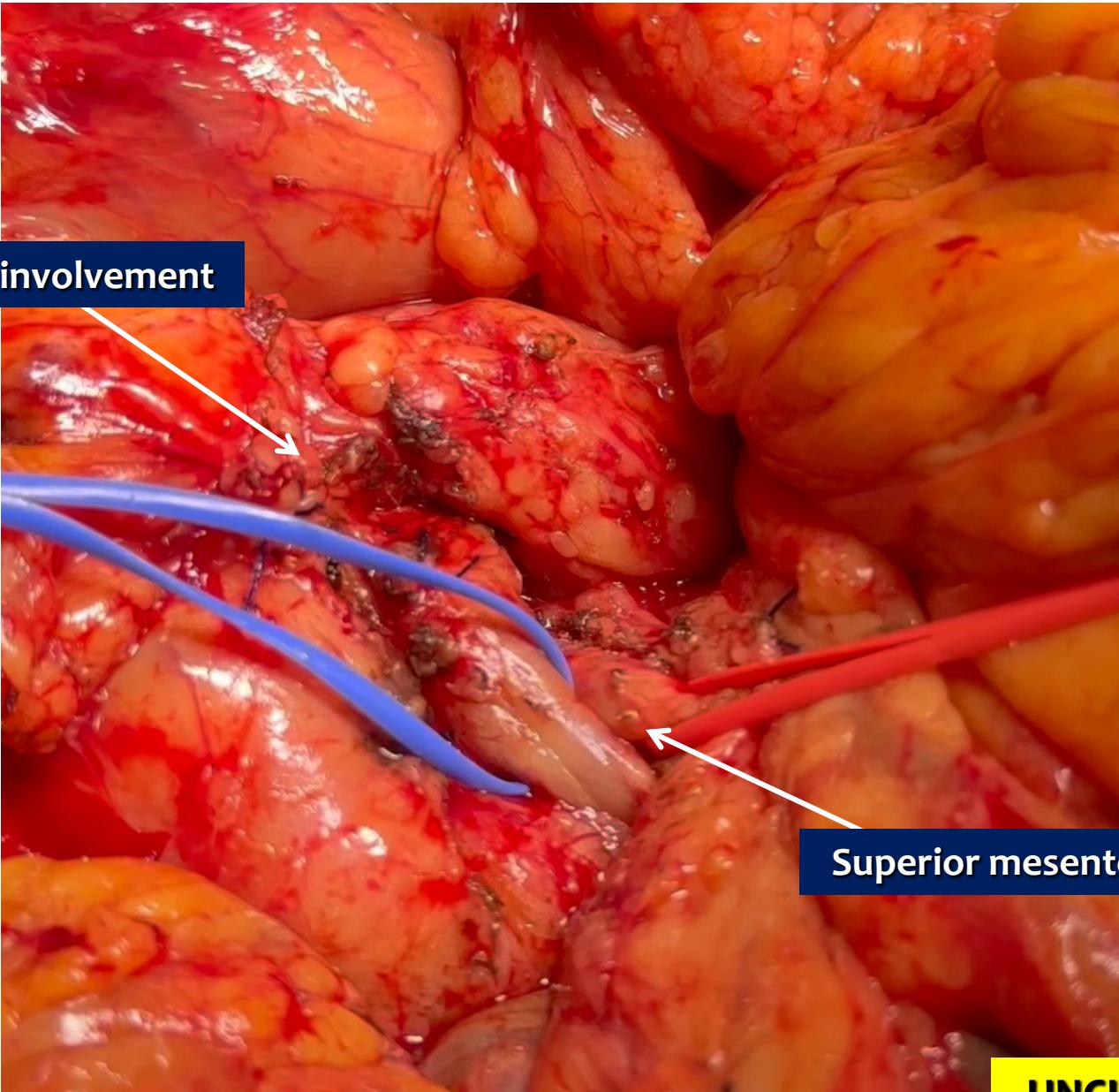


## ADVANTAGES OF ARTERY FIRST APPROACH

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

1. Resection without breaching the tumor extension plane, thereby minimizing cell spillage
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**ARTERY FIRST**



**UNCINATE FIRST**

# ARTERY FIRST



UNCINATE FIRST



## ADVANTAGES OF ARTERY FIRST APPROACH

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**ARTERY FIRST**



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Review

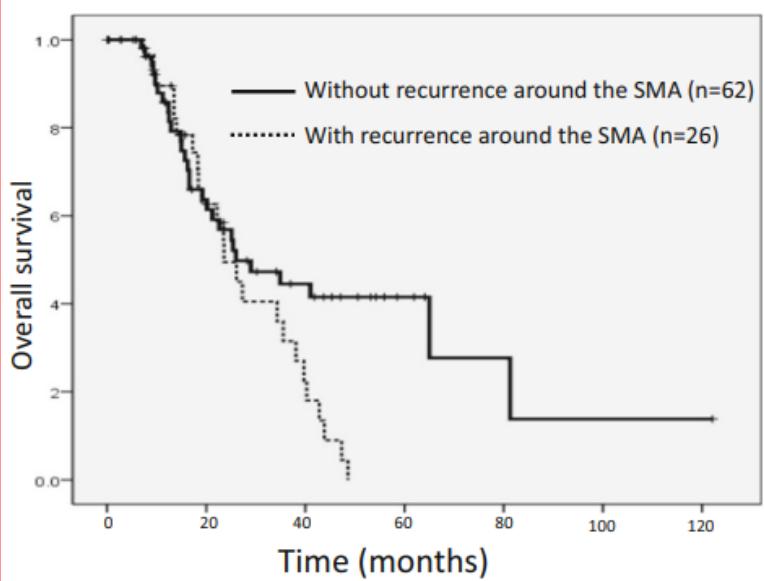
Superior mesenteric artery first approach can improve the clinical outcomes of pancreaticoduodenectomy: A meta-analysis



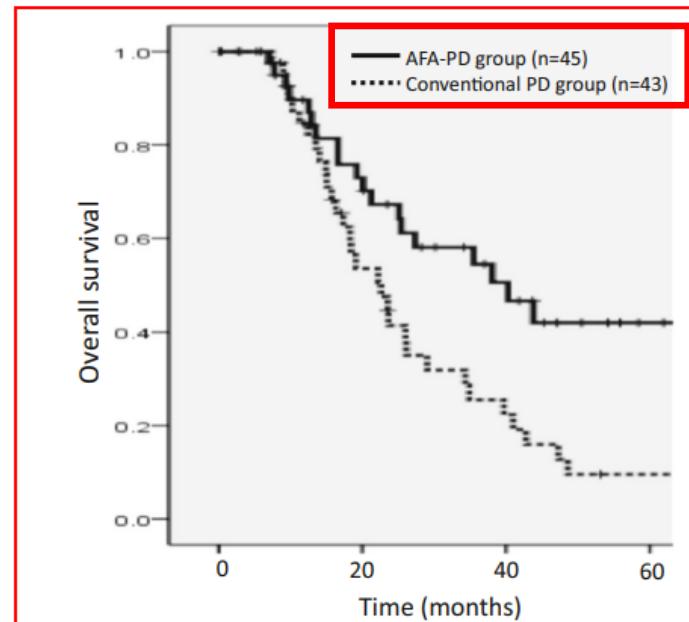
- Higher R0 resection rate ( $p < 0.001$ )**
- Lower local recurrence rate ( $p < 0.0001$ )**
- Higher overall survival:**
  - 1-year  $p=0.015$**
  - 2-year  $p=0.005$**
  - 3-year  $p=0.001$**

Meta-analysis - 18 studies

## Complete Lymphadenectomy Around the Entire Superior Mesenteric Artery Improves Survival in Artery-First Approach Pancreatoduodenectomy for T3 Pancreatic Ductal Adenocarcinoma



**Fig. 1** Overall survival according to recurrence around the SMA. The median survival was 23.6 months in patients with recurrence around the SMA and 26 months in patients without recurrence around the SMA ( $p = 0.0367$ ) SMA: superior mesenteric artery



**Fig. 2** Overall survival according to the type of surgery. The median survival was 40.3 months in the AFA-PD group and 22.6 months in the conventional PD group ( $p = 0.005$ ) AFA-PD: artery-first approach pancreatoduodenectomy

40.3 months vs 22.6 months ( $p= 0.005$ )

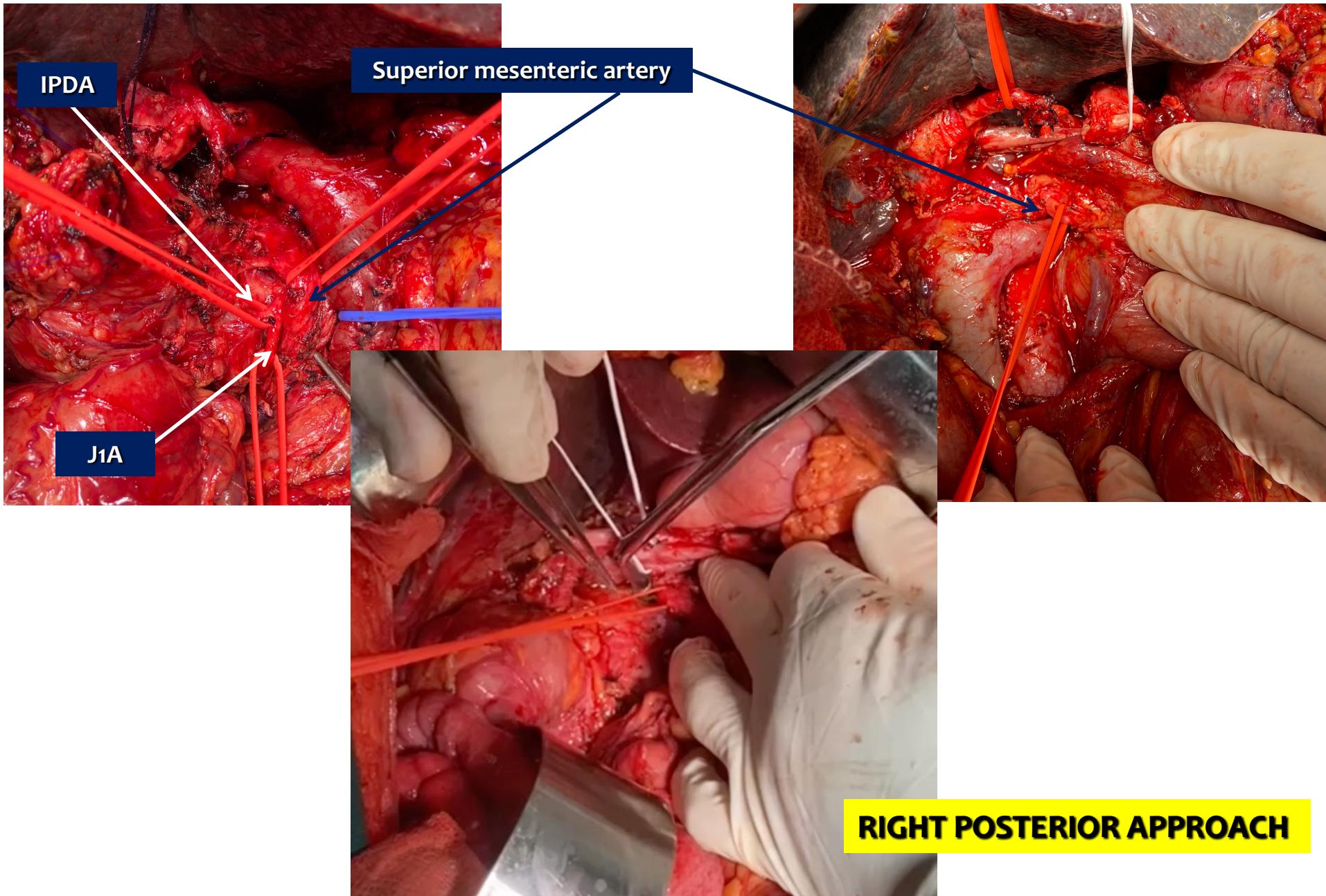
## OVERALL SURVIVAL

## ADVANTAGES OF ARTERY FIRST APPROACH

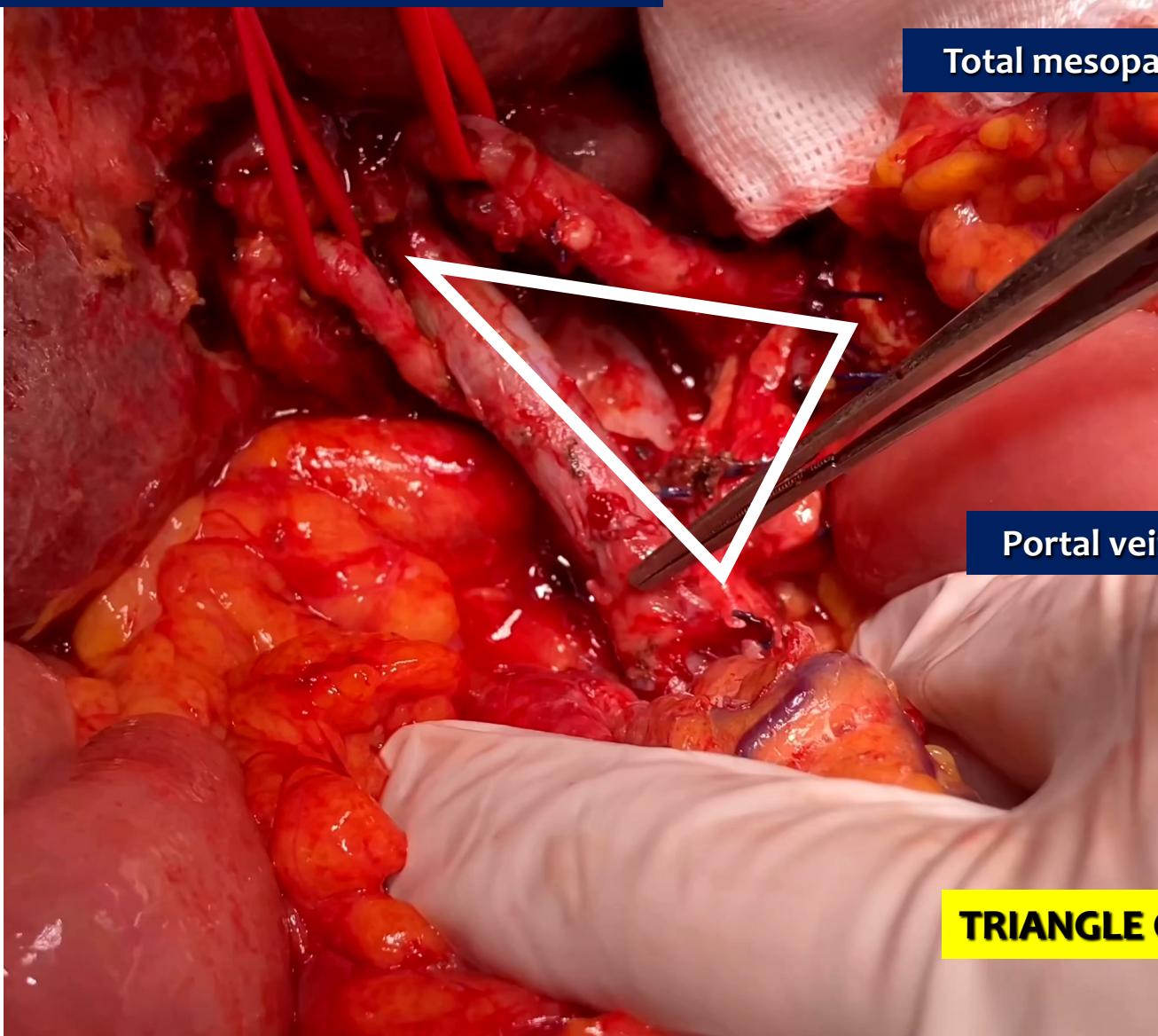
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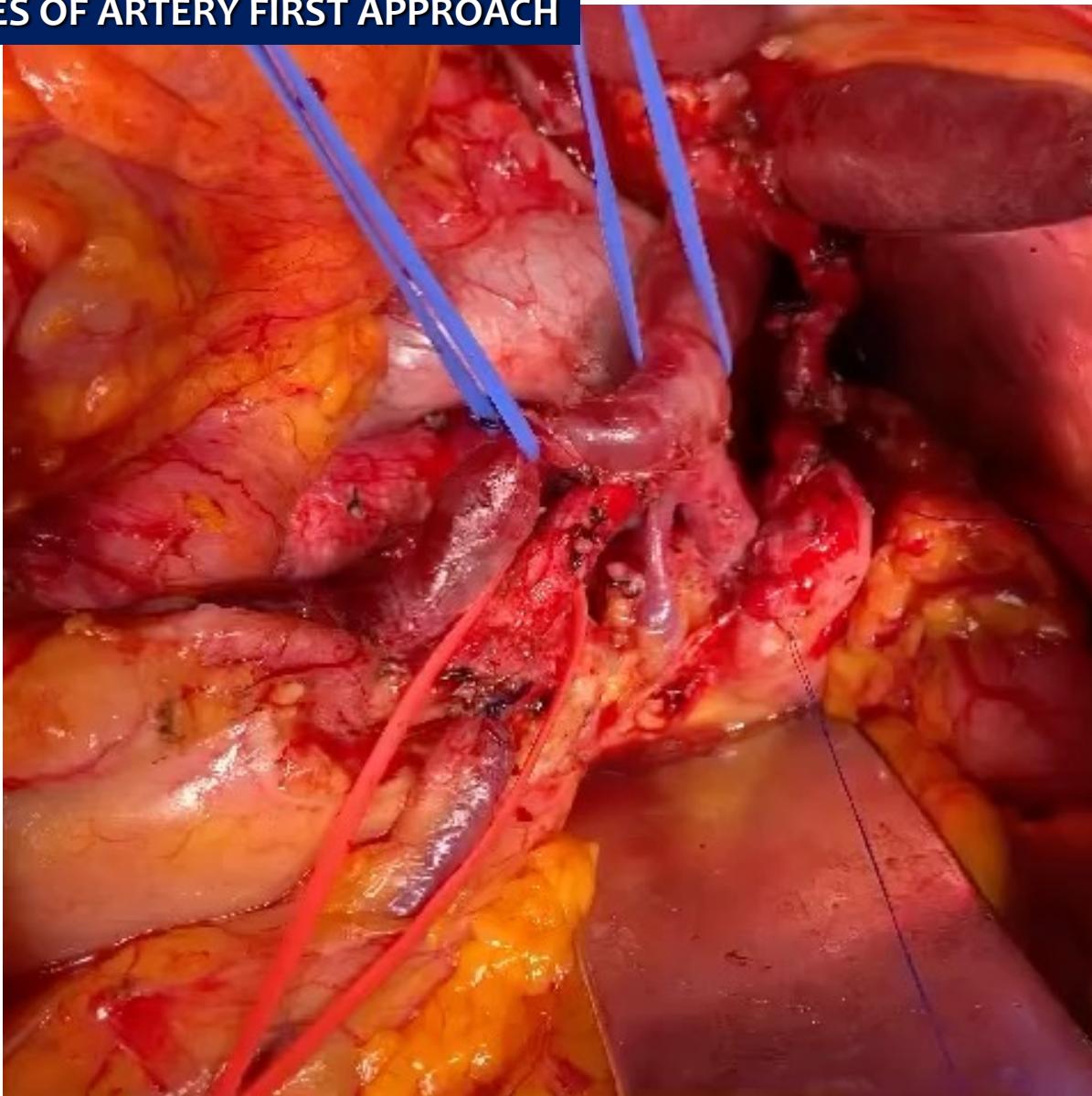
**ARTERY FIRST**



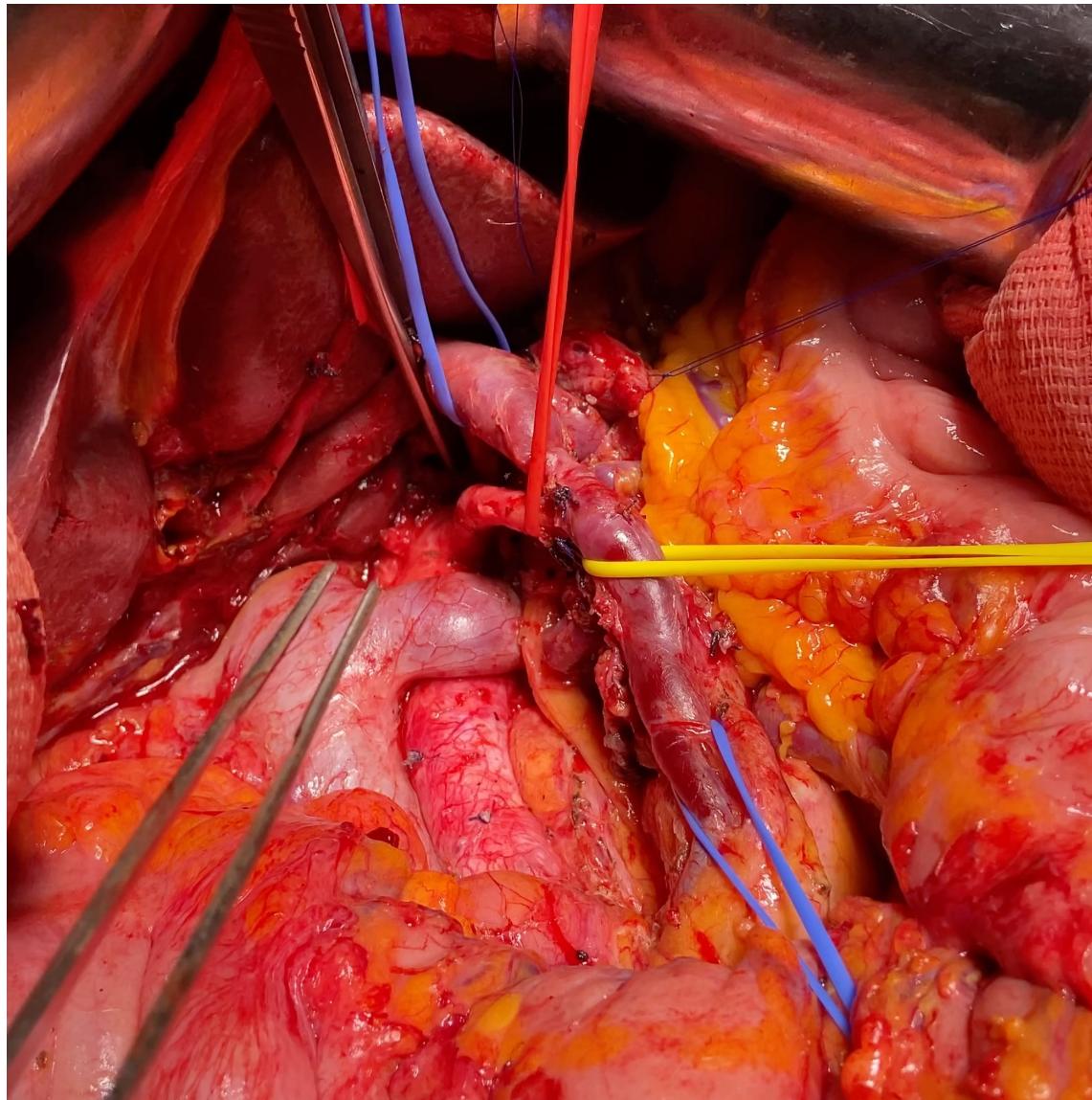
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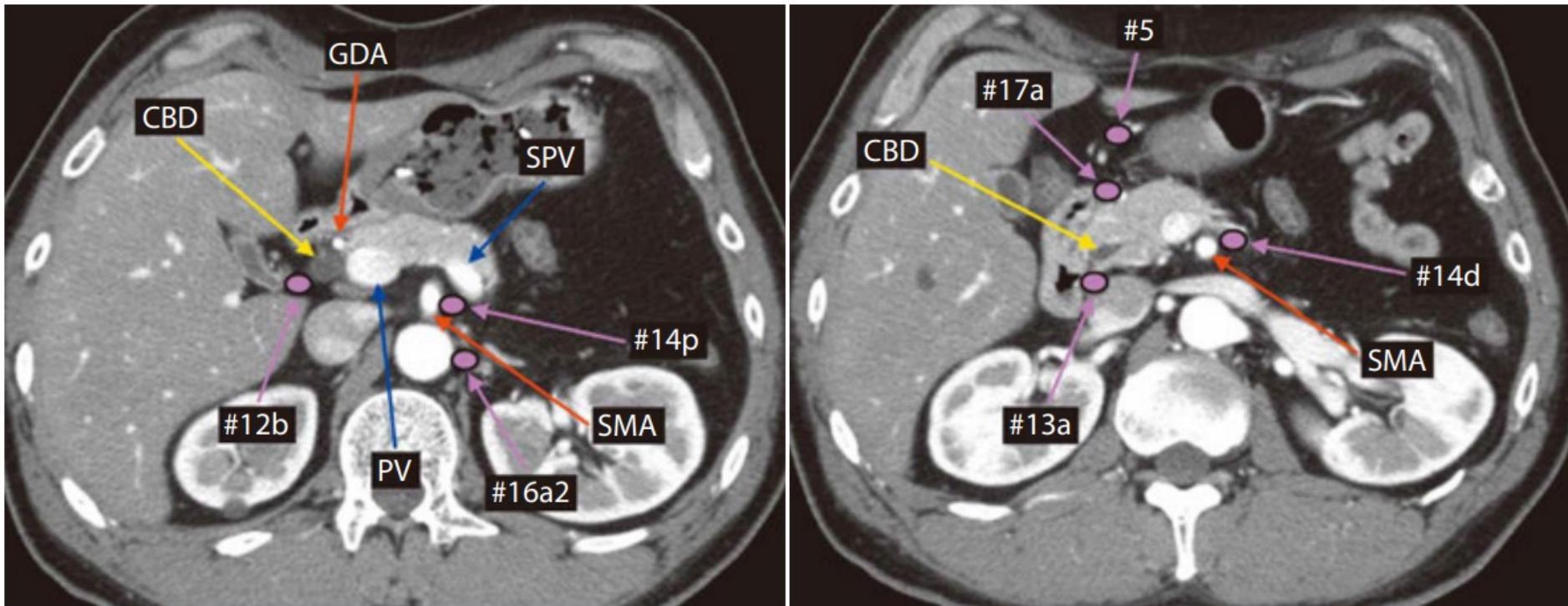
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**ARTERY FIRST**

# LYMPHADENECTOMY



14p, 14d

**Complete Lymphadenectomy Around the Entire Superior Mesenteric Artery Improves Survival in Artery-First Approach Pancreatoduodenectomy for T3 Pancreatic Ductal Adenocarcinoma**

**ARTERY FIRST**

**Table 2** Comparison of perioperative and oncological outcomes between the AFA-PD group and the conventional PD group

	AFA-PD group	Conventional PD group	P
Operative time, median (range), min	n = 45	n = 43	0.1312
Intraoperative blood loss, median (range), mL	443 (390–497)	467 (414–530)	<b>0.0210</b>
Transfusion, n (%)	811 (520–1150)	22 (51.2)	0.5178
Portal vein resection, n (%)	19 (42.2)	13 (30.2)	0.8147
Postoperative complications, ≥ grade IIIa, n (%)	12 (26.7)	5 (11.6)	0.4794
Curative resection R0, n (%)	3 (6.7)	28 (65.1)	0.3423
No. harvested lymph nodes, median (range)	35 (77.8)	19 (12–22)	<b>0.0165</b>
No. harvested lymph nodes of #14p, median (range)	4 (2–5)	2 (0–3)	< 0.001
No. harvested lymph nodes of #14d, median (range)	4 (2–5)	2 (0–3)	<b>0.0146</b>
Lymph node metastasis, n (%)	27 (60)	30 (69.8)	0.3376

Bold values are statistically significant ( $p < 0.05$ )

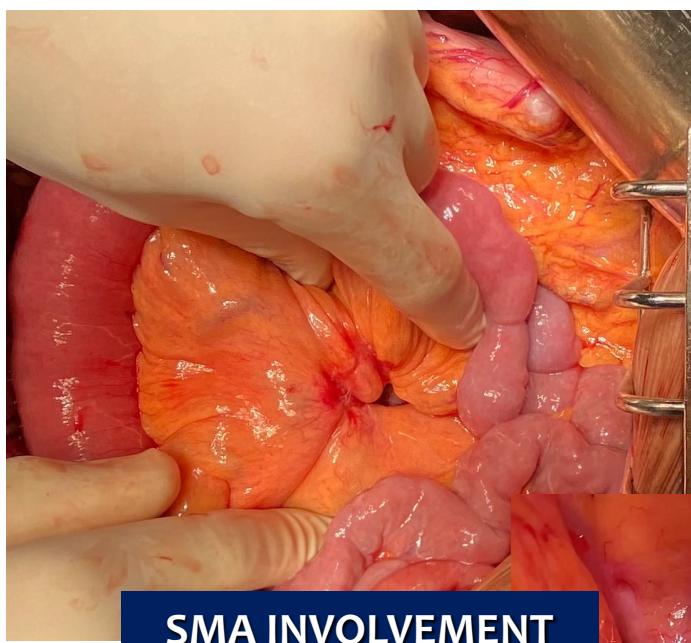
**AFA-PD - Artery first approach pancreatoduodenectomy**

## ADVANTAGES OF ARTERY FIRST APPROACH

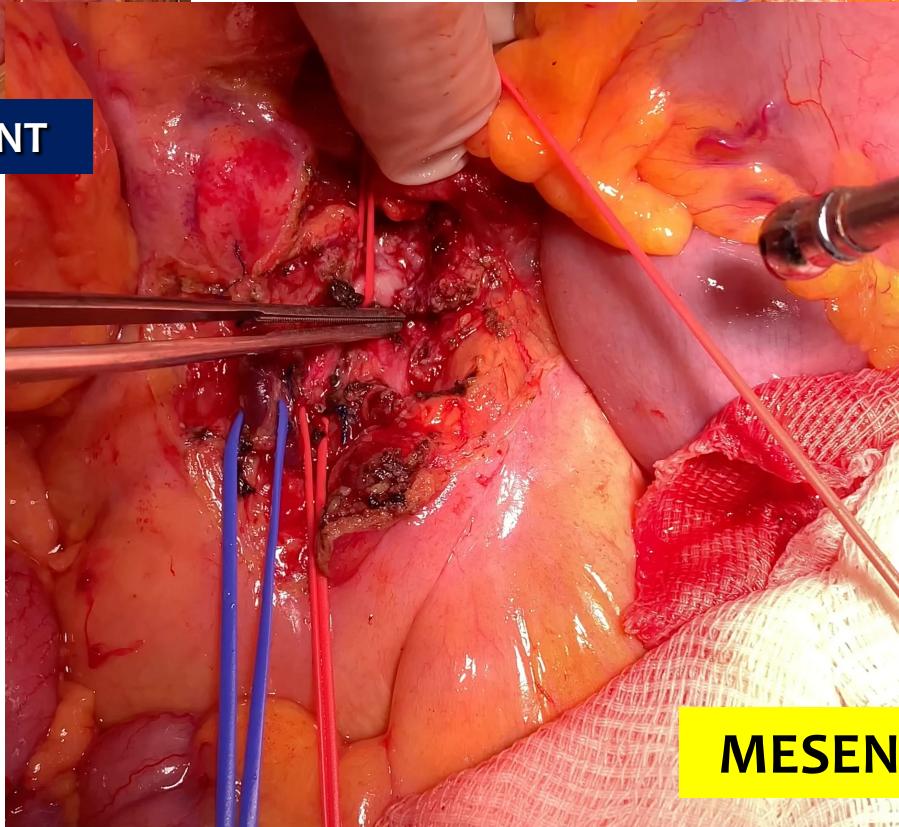
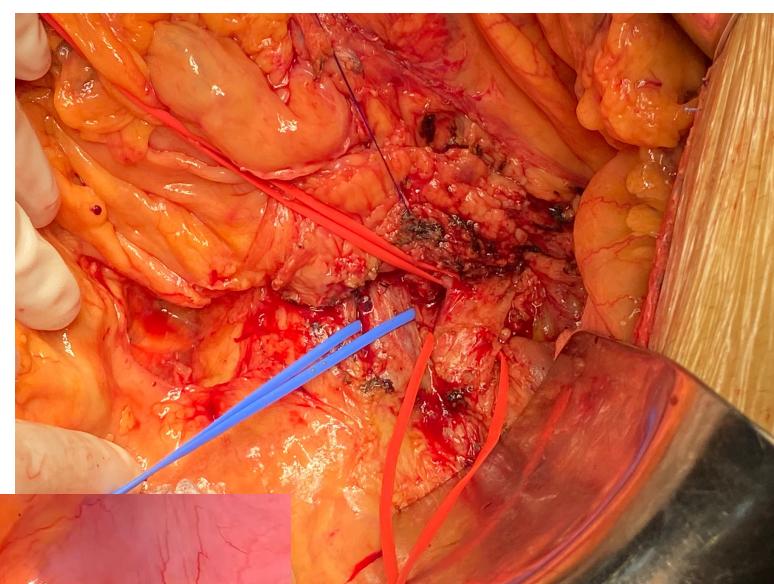
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**ARTERY FIRST**



SMA INVOLVEMENT



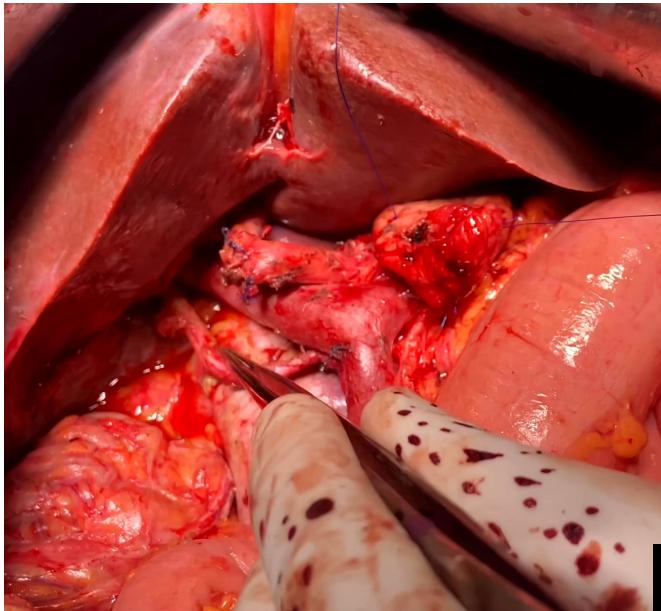
MESENTERIC APPROACH

## ADVANTAGES OF ARTERY FIRST APPROACH

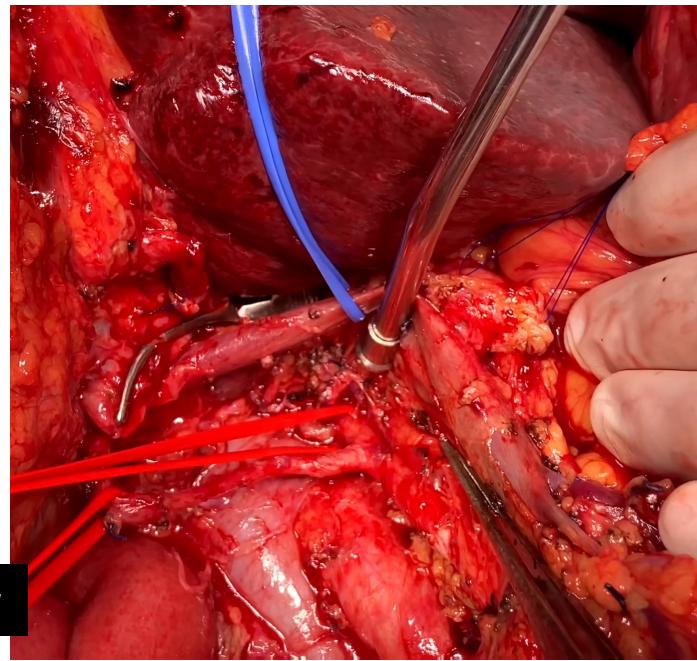
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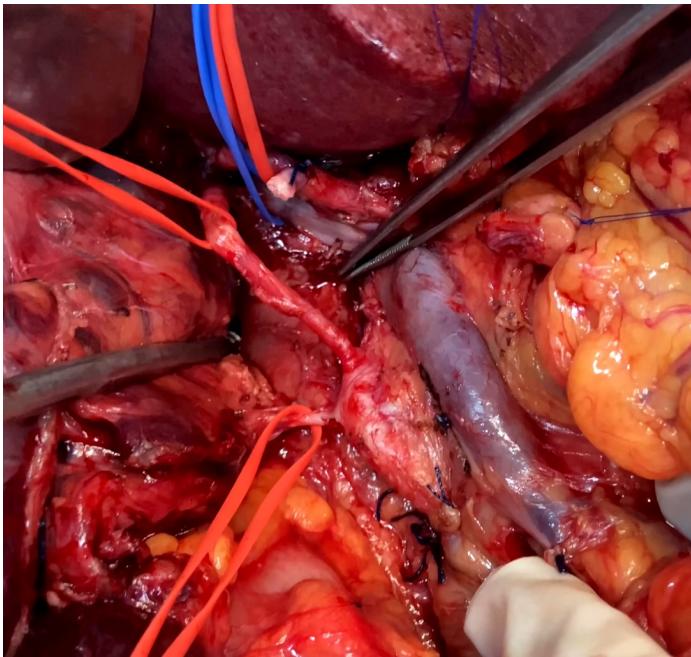
**ARTERY FIRST**



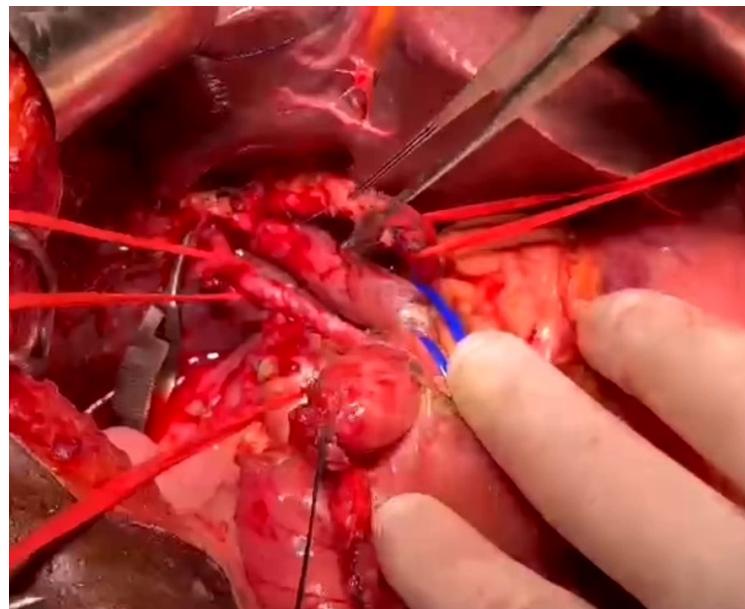
Right hepatic artery

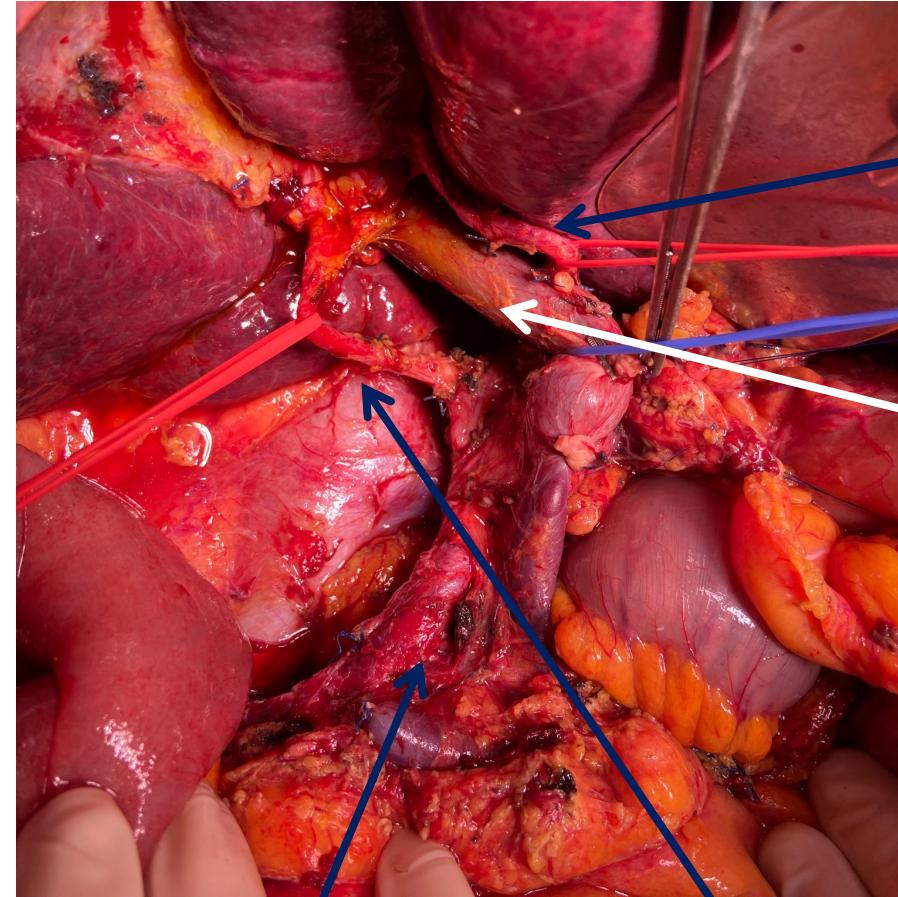


Superior mesenteric artery



ARTERY FIRST



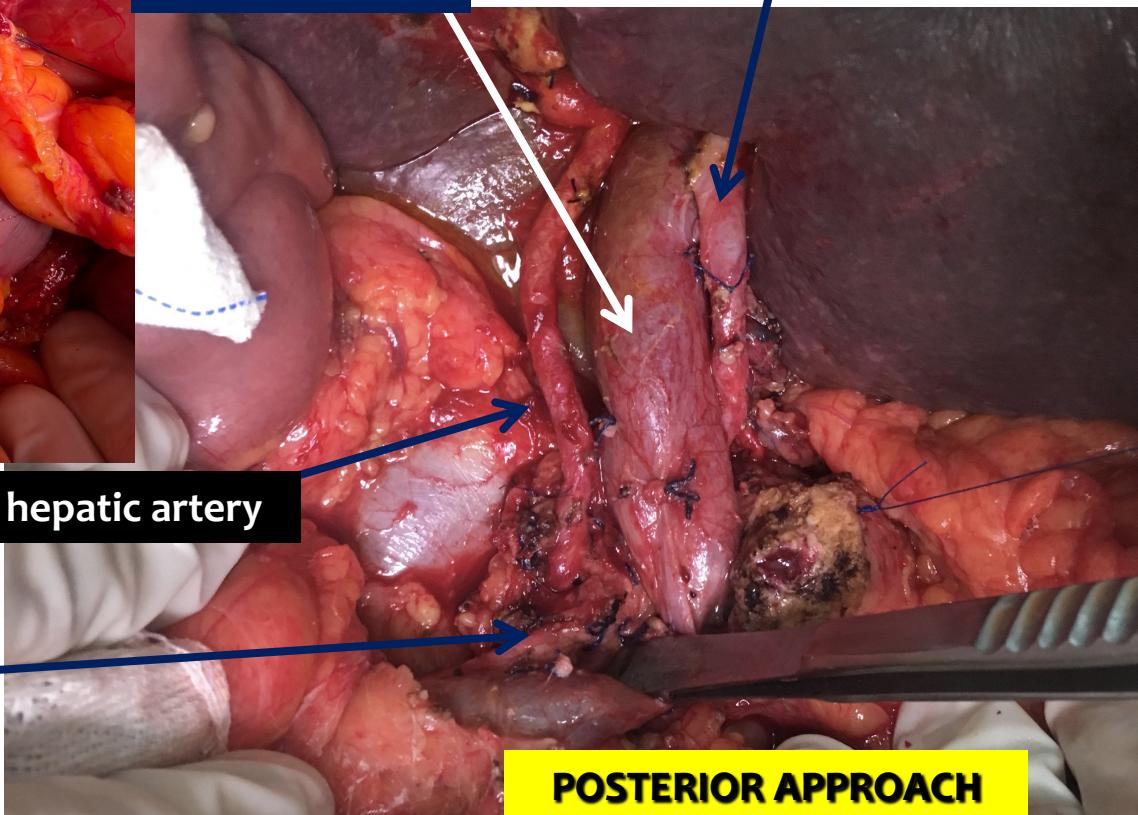


Left hepatic artery

Portal vein

Right hepatic artery

Superior mesenteric artery



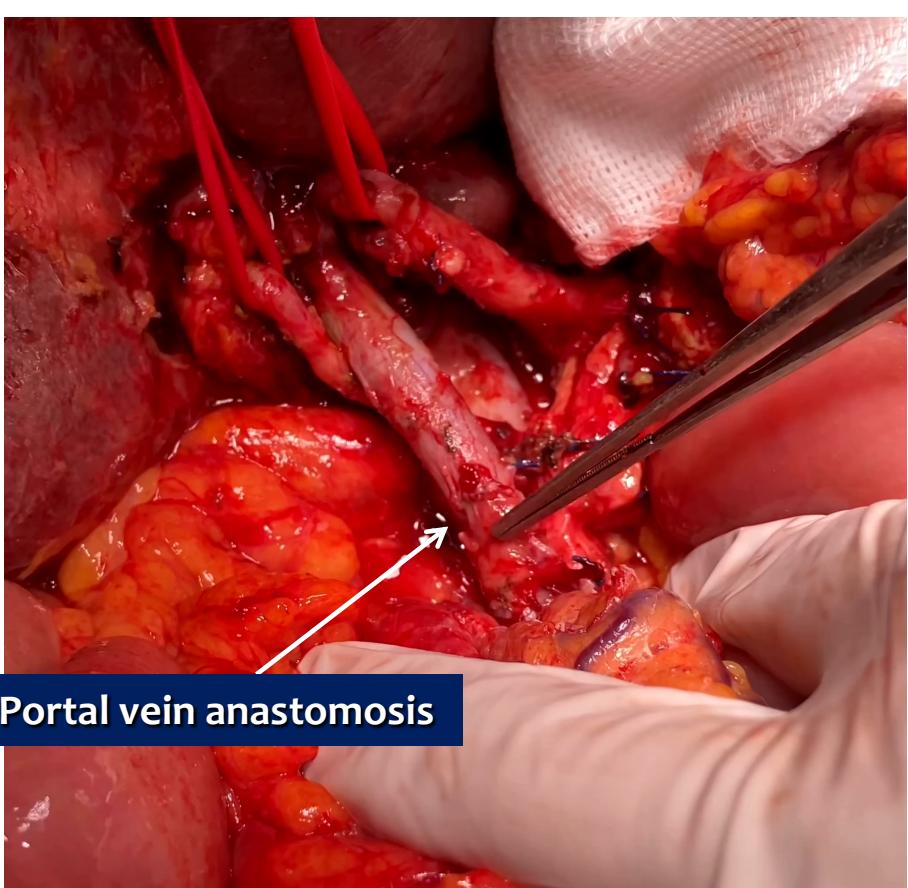
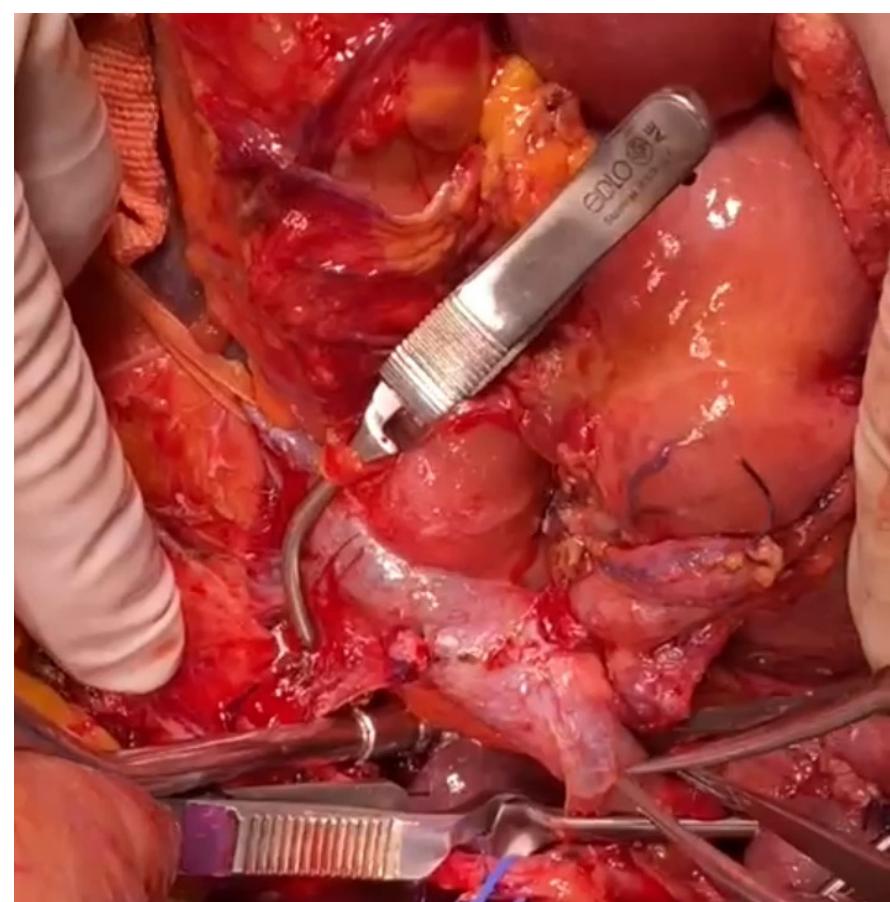
POSTERIOR APPROACH

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**ARTERY FIRST**

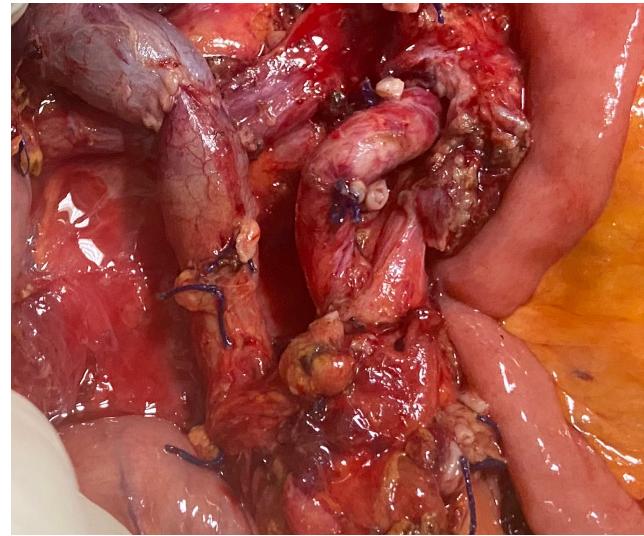


## Portal vein/superior mesenteric vein resection/reconstruction

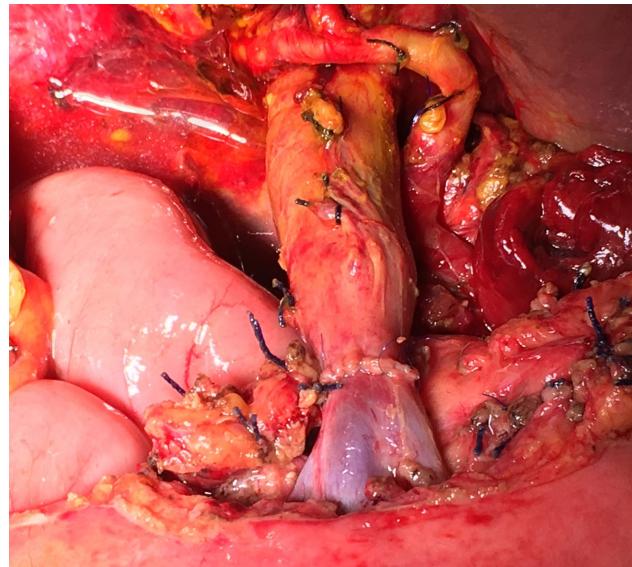
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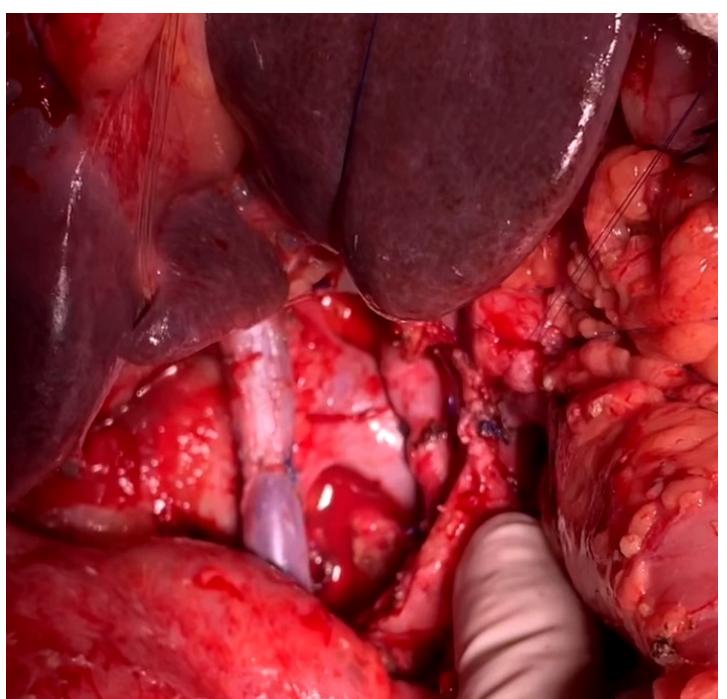
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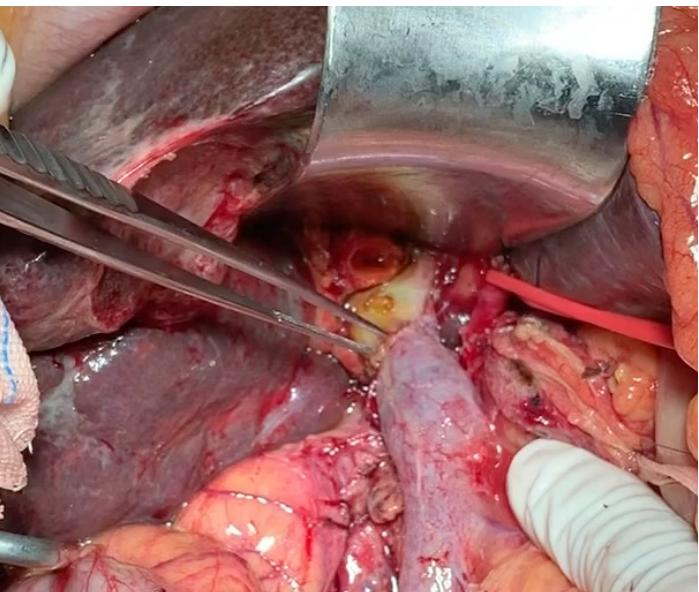
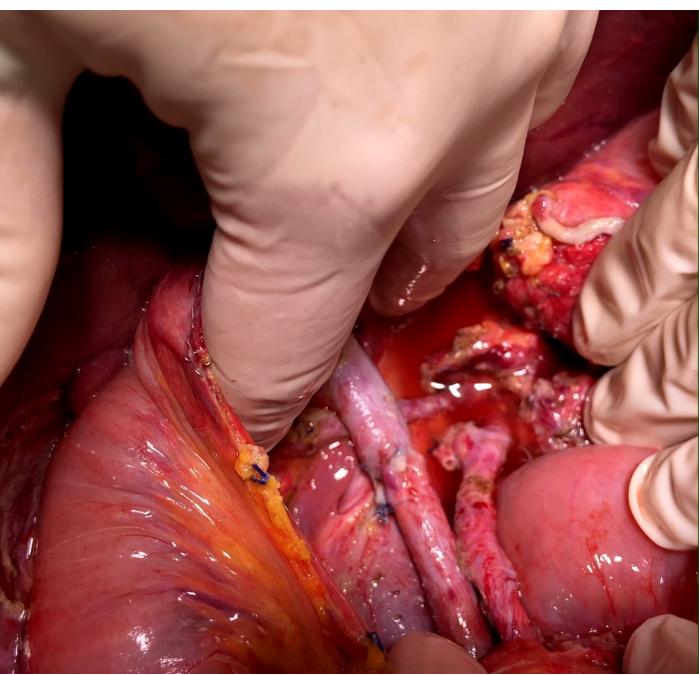
NO GRAFT

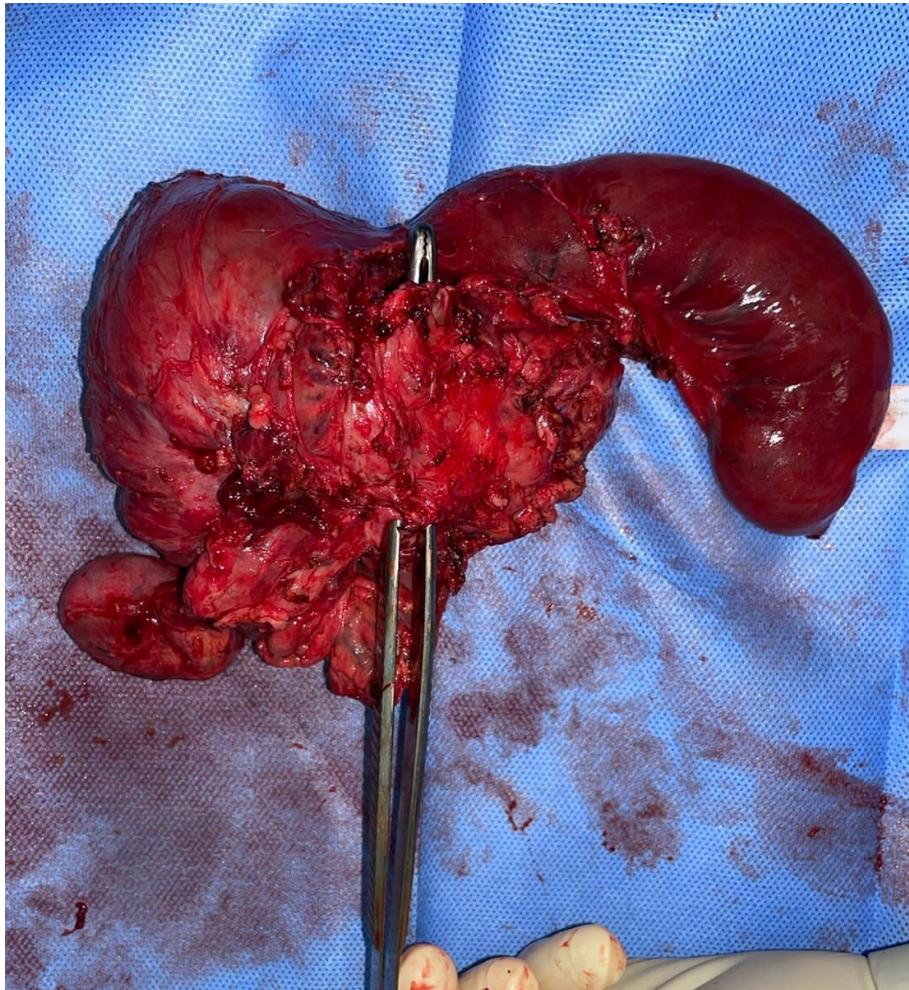


ARTERY FIRST



NO GRAFT





Portal vein resection



Jakarta - Indonesia

September 2022

ARTERY FIRST

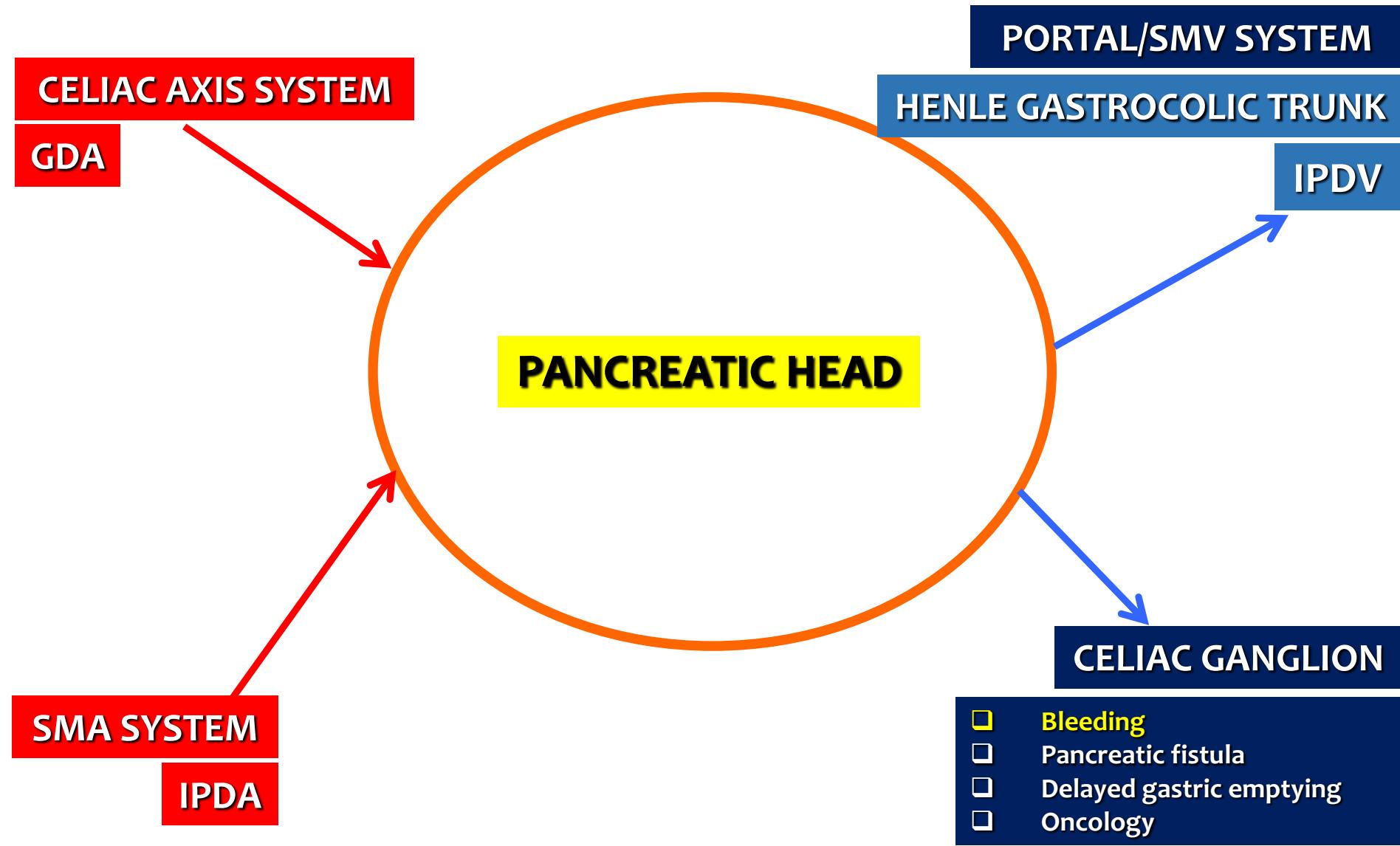
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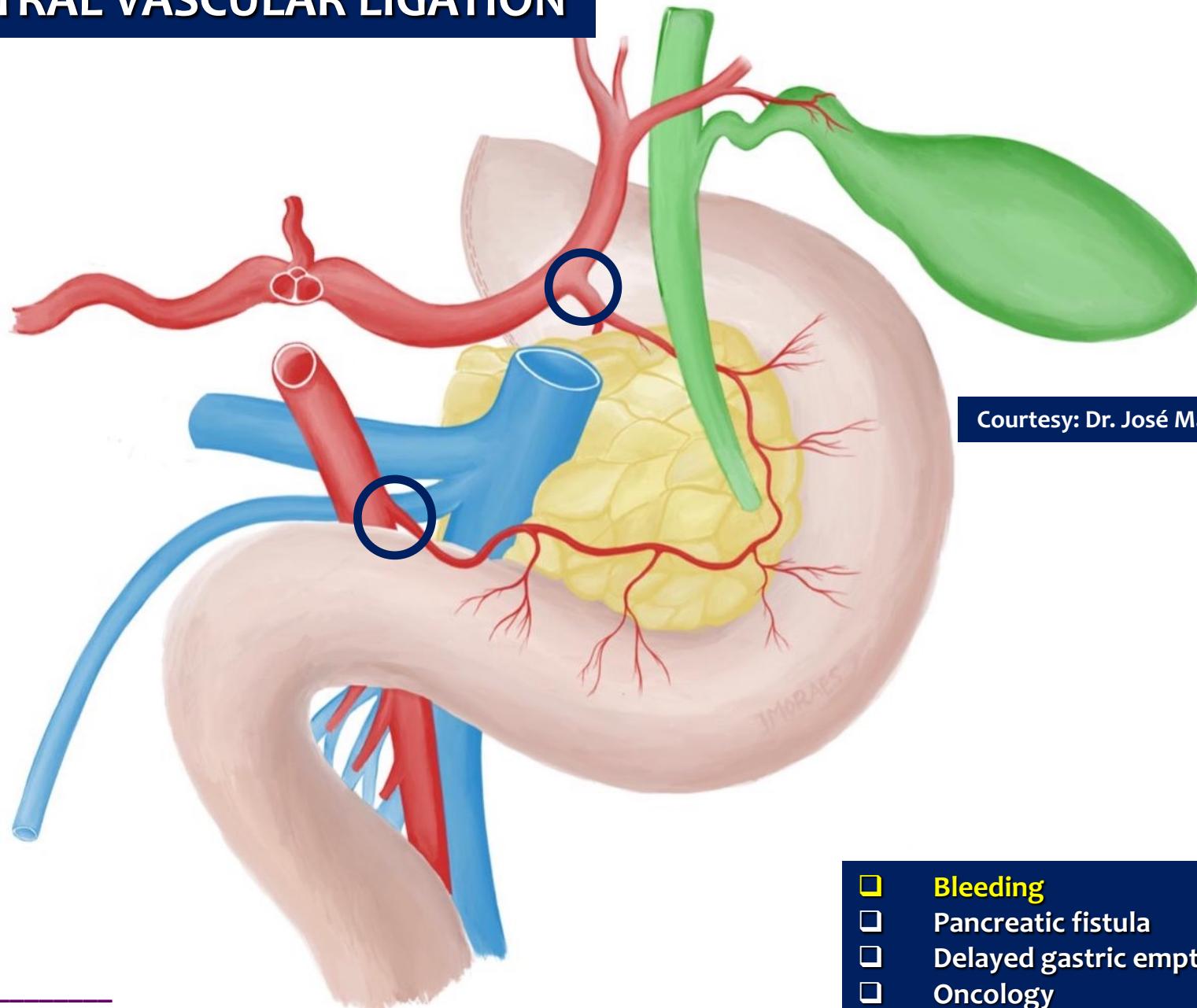
1. Resection without breaching the tumor extension plane, thereby minimizing cell spillage
2. Increases curative (R0) resection, decreases local recurrence
3. Complete resection of peripancreatic retroperitoneal tissue around the plexuses
4. Increased lymph nodal clearance
5. Early assessment of non-resectability (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)

**ARTERY FIRST**

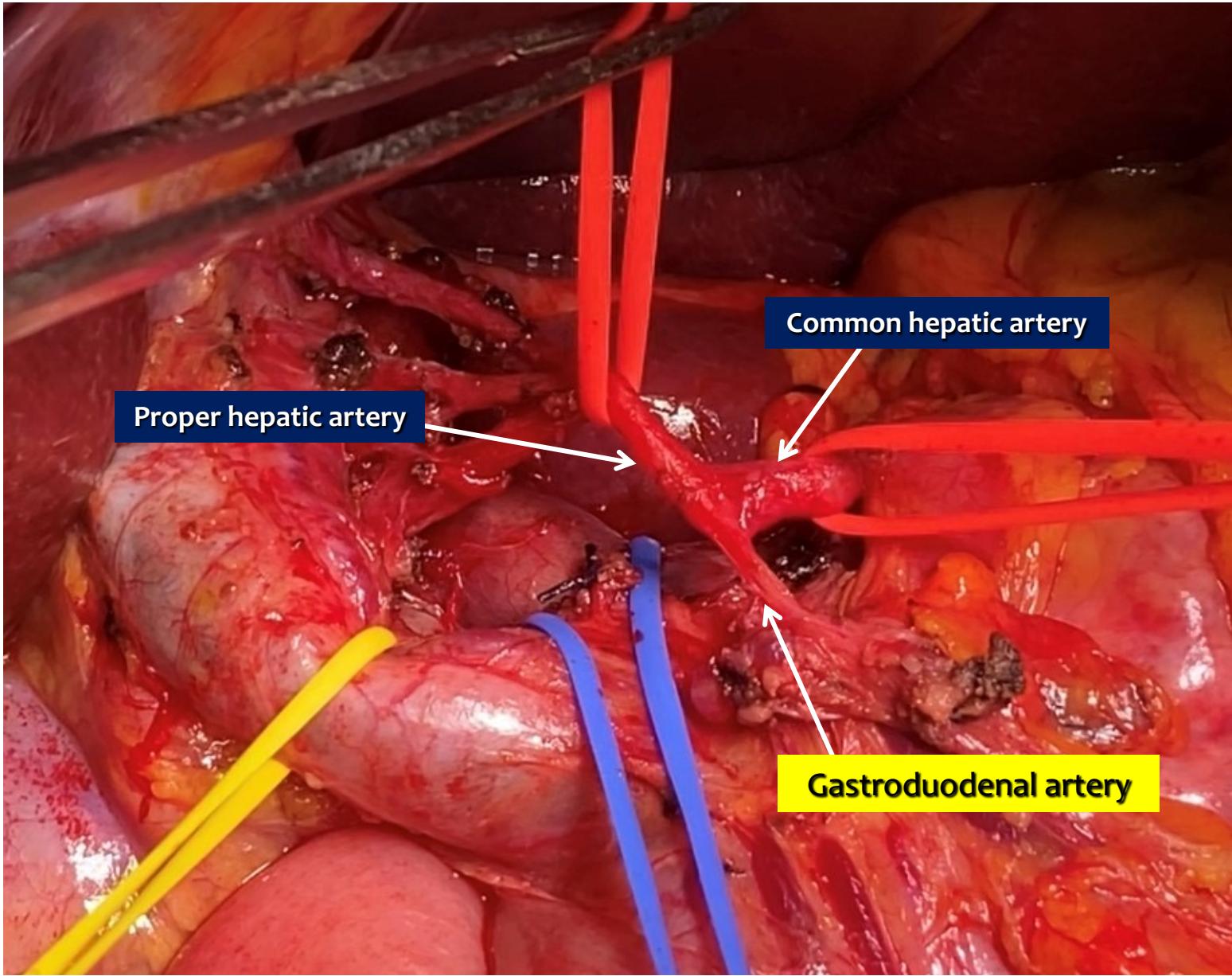
# CENTRAL VASCULAR LIGATION

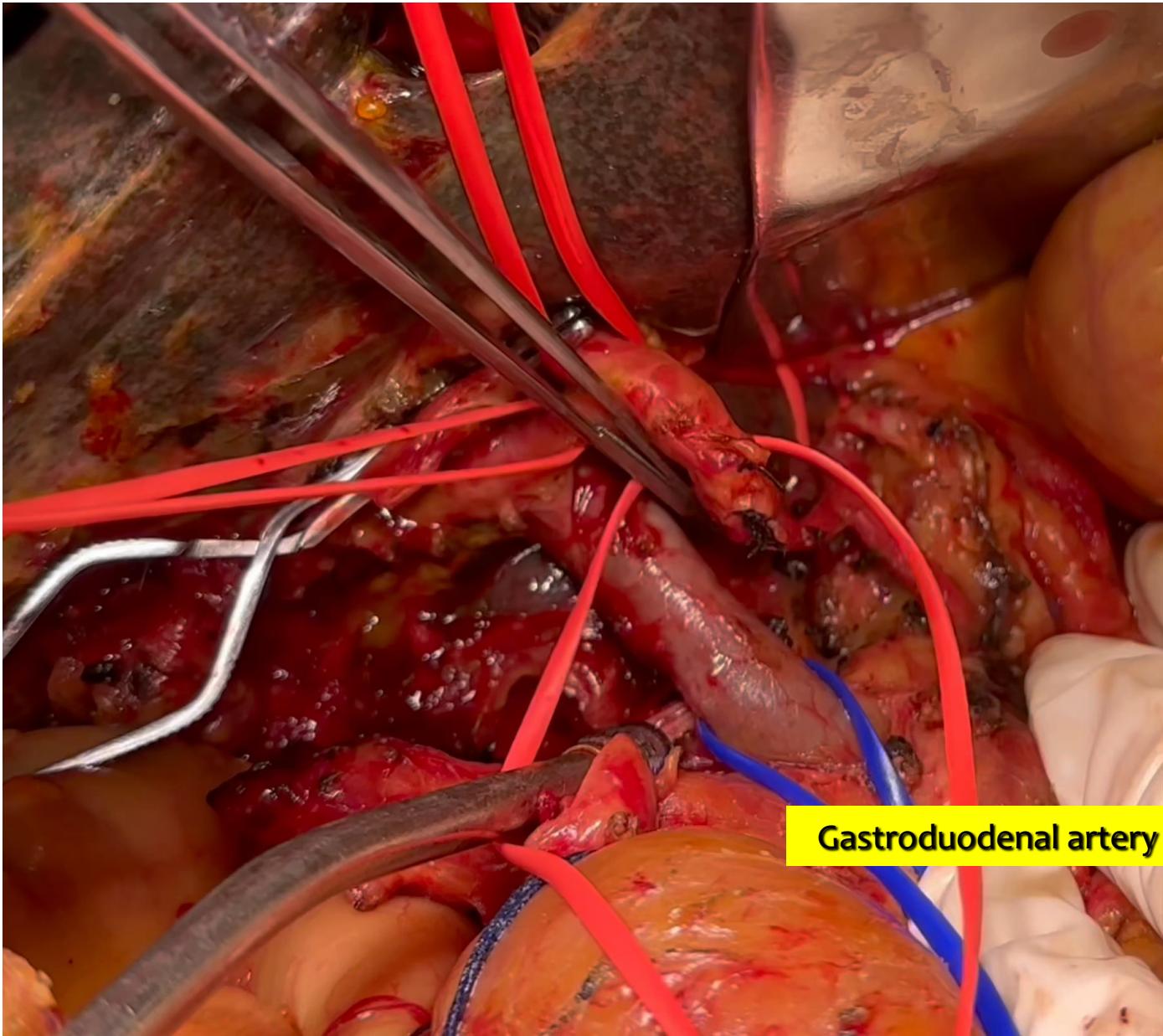


# CENTRAL VASCULAR LIGATION

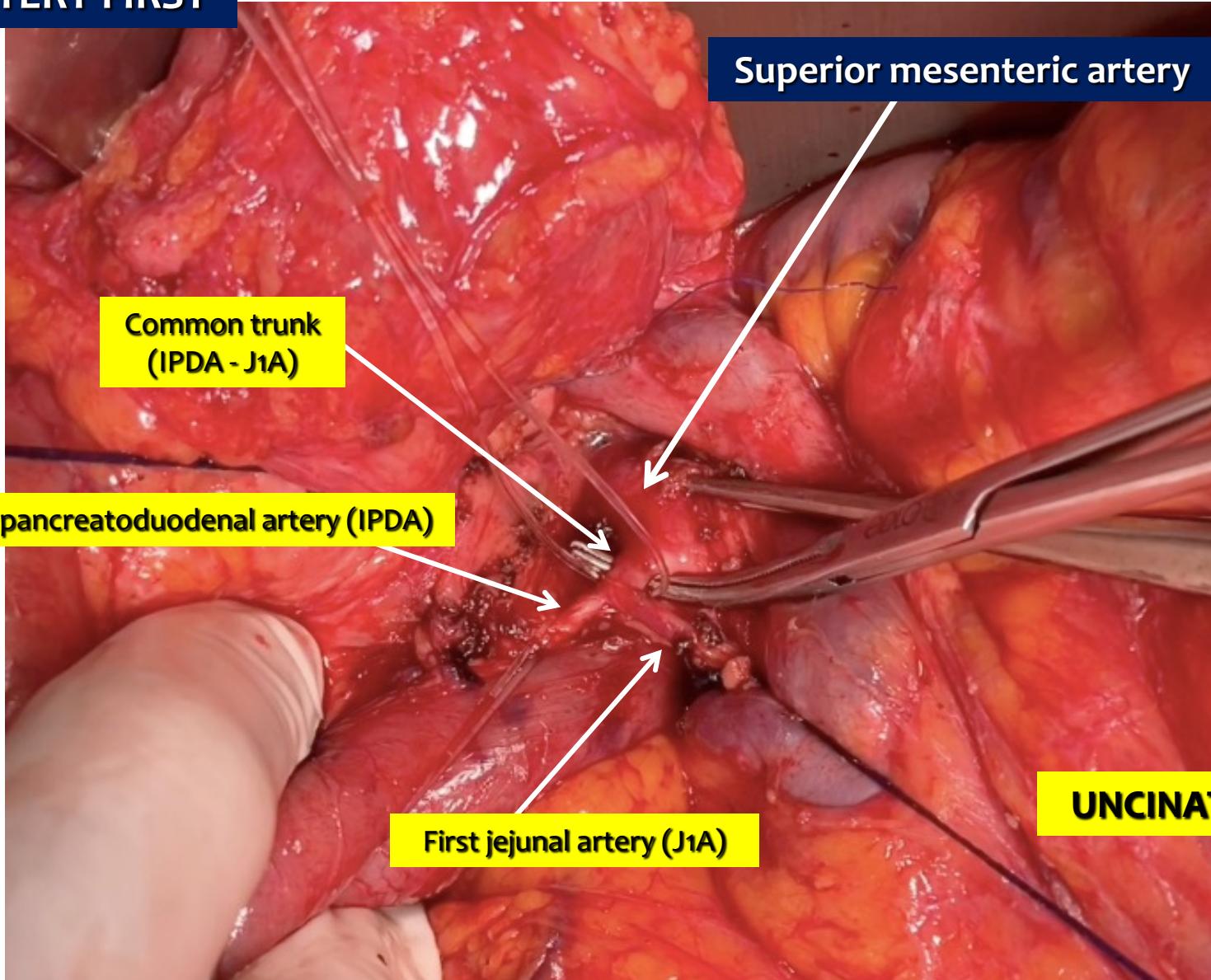


- Bleeding
- Pancreatic fistula
- Delayed gastric emptying
- Oncology

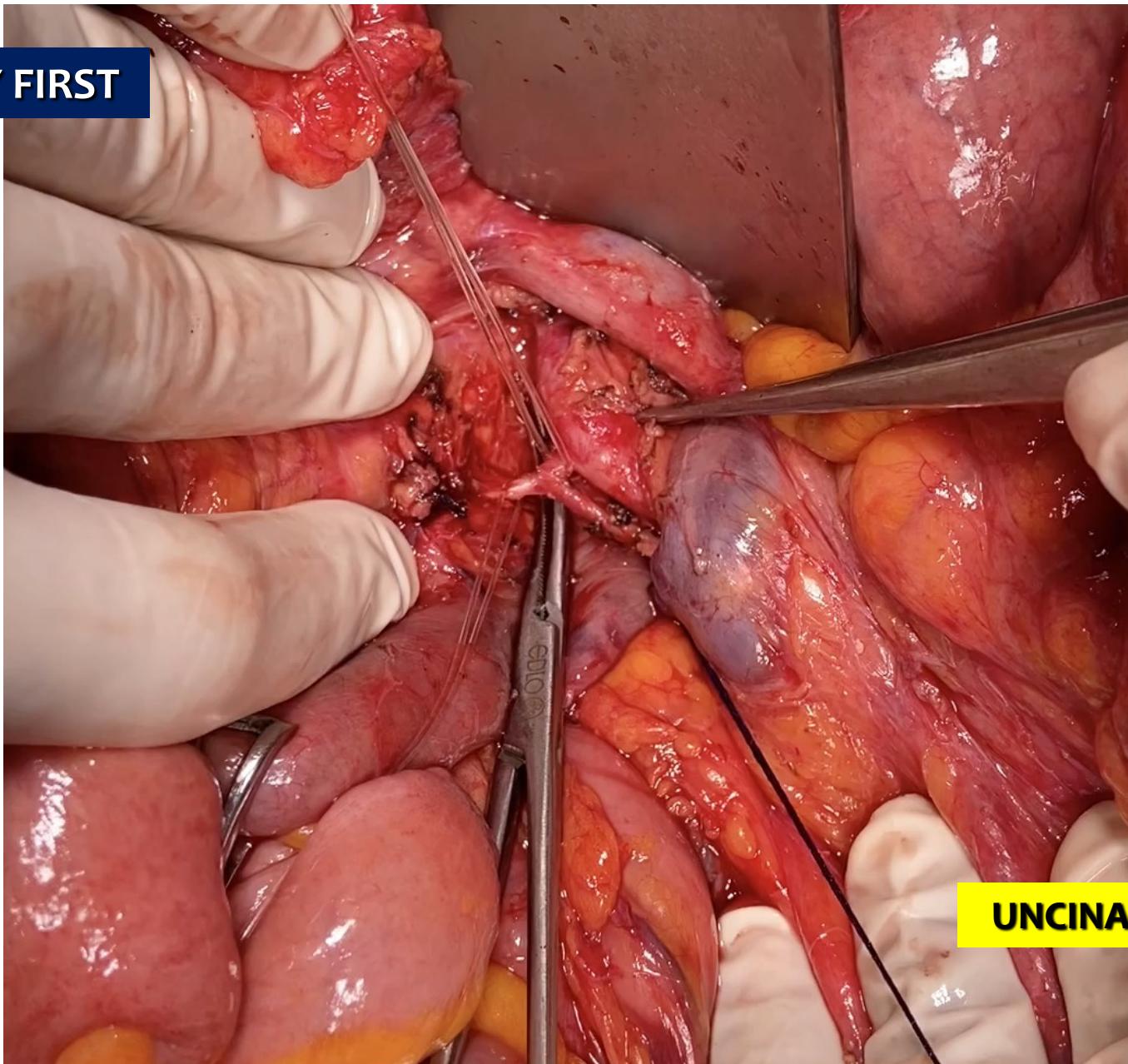




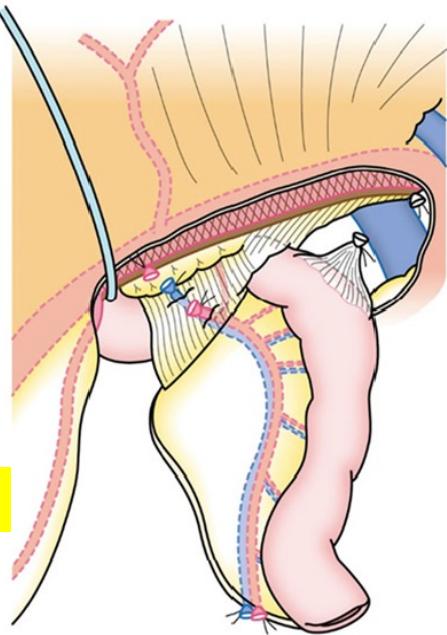
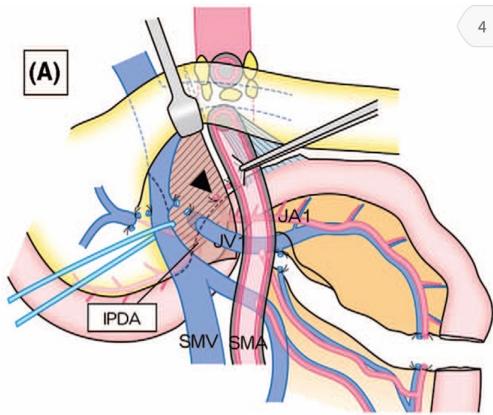
**ARTERY FIRST**



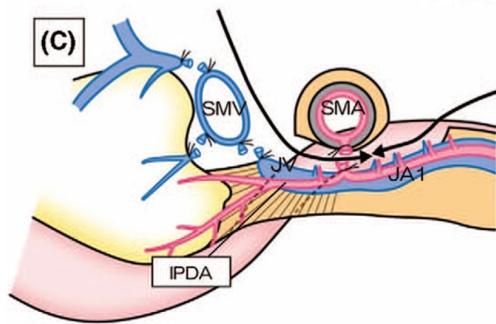
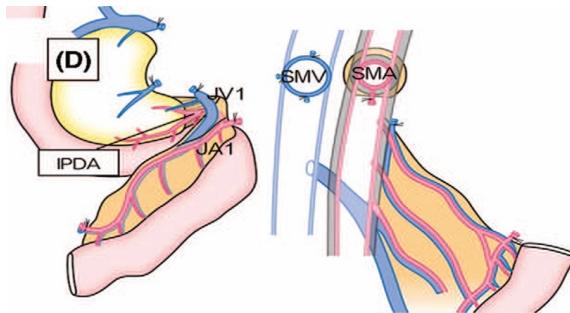
**ARTERY FIRST**



# FIRST JEJUNAL ARTERY



First jejunal artery (J1A)



Mesojejunio

Level 3

Inoue Y, et al. J Gastrintest Surg 2016



Review

Superior mesenteric artery first approach can improve the clinical outcomes of pancreaticoduodenectomy: A meta-analysis



## Conclusion

In conclusion, better clinical outcomes were found in patients treated with SMA-PD. Particularly in pancreatic cancer patients, SMA-PD significantly contributed to long-term survival. Furthermore, different operative efficacy was observed in six SMA approaches, and the posterior approach exerted the optimal effect on clinical outcomes of SMA-PD.

Meta-analysis - 18 studies



1 E 2  
SETEMBRO  
DE 2023

Santa Cruz do Sul - RS

- 1º** Simpósio de Cirurgia Hepato Pancreato Biliar
- 5º** Evento do Colégio Brasileiro de Cirurgiões
- 4º** Simpósio de Cirurgia Digestiva
- 4º** Simpósio de Trauma e Cirurgia de Emergência

## PANCREATODUOENTERECTOMY

### Artery first approach: when and how to do it

- Pancreatic ductal adenocarcinoma (head of the pancreas)**
- After neoadjuvant chemotherapy**

**LEFT POSTERIOR  
APPROACH**  
(Kuroski et al, 2011)

**ANTERIOR APPROACH**  
(Hirato et al, 2010)

**SUPERIOR APPROACH**  
(Makino et al, 2008)

**RIGHT POSTERIOR  
APPROACH**  
(Pessaux et al, 2006)

**UNCINATE APPROACH**  
(Shukla et al, 2007; Hackert et al, 2010)

**MESENTERIC APPROACH**  
(Nakao and Takagi, 1993)



Obrigado!

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