



27-29 NOV 2020
Virtual Congress ▶

14th World Congress of the International
Hepato-Pancreato-Biliary Association

PANCREAS ANASTOMOSIS AND MANAGEMENT OF POPF



A large, abstract graphic in the background consists of a network of white lines connecting numerous small, glowing blue dots against a dark blue background. This represents a complex system or global connectivity. In the lower right corner, there is a yellow rectangular box containing text about a speaker.

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



14th World Congress of the International
Hepato-Pancreato-Biliary Association

Disclosure Statement of Financial Interest

Torres, Orlando JM

"I, Orlando Jorge M Torres DO NOT have a financial interest/arrangement or affiliation with one or more organization which could be perceived as a real or apparent conflict of interest in the context of the subject of this presentation"

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

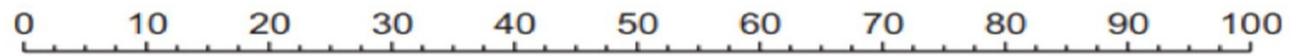
Risk factor	Parameter	Points*
Gland texture	Firm	0
	Soft	2
Pathology	Pancreatic adenocarcinoma or pancreatitis	0
	Ampullary, duodenal, cystic, islet cell	1
Pancreatic duct diameter, mm	≥ 5	0
	4	1
	3	2
	2	3
	≤ 1	4
Intraoperative blood loss, mL	≤ 400	0
	401–700	1
	701–1,000	2
	$>1,000$	3

*Total 0 to 10 points.

- Negligible 0
- Low 1-3
- Moderate 4-6
- High 7-10

Risk for POPE – Nomogram

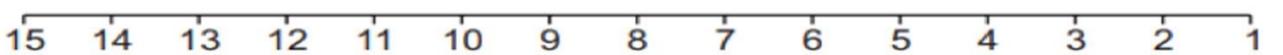
Points



Portal vein invasion



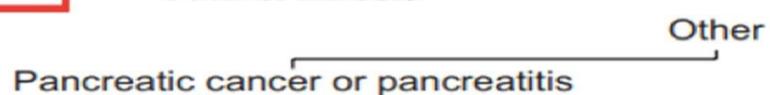
Duct diameter in mm



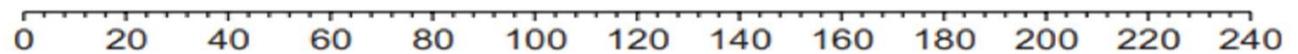
Texture of pancreas



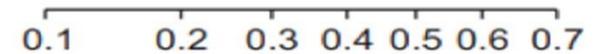
Pathology



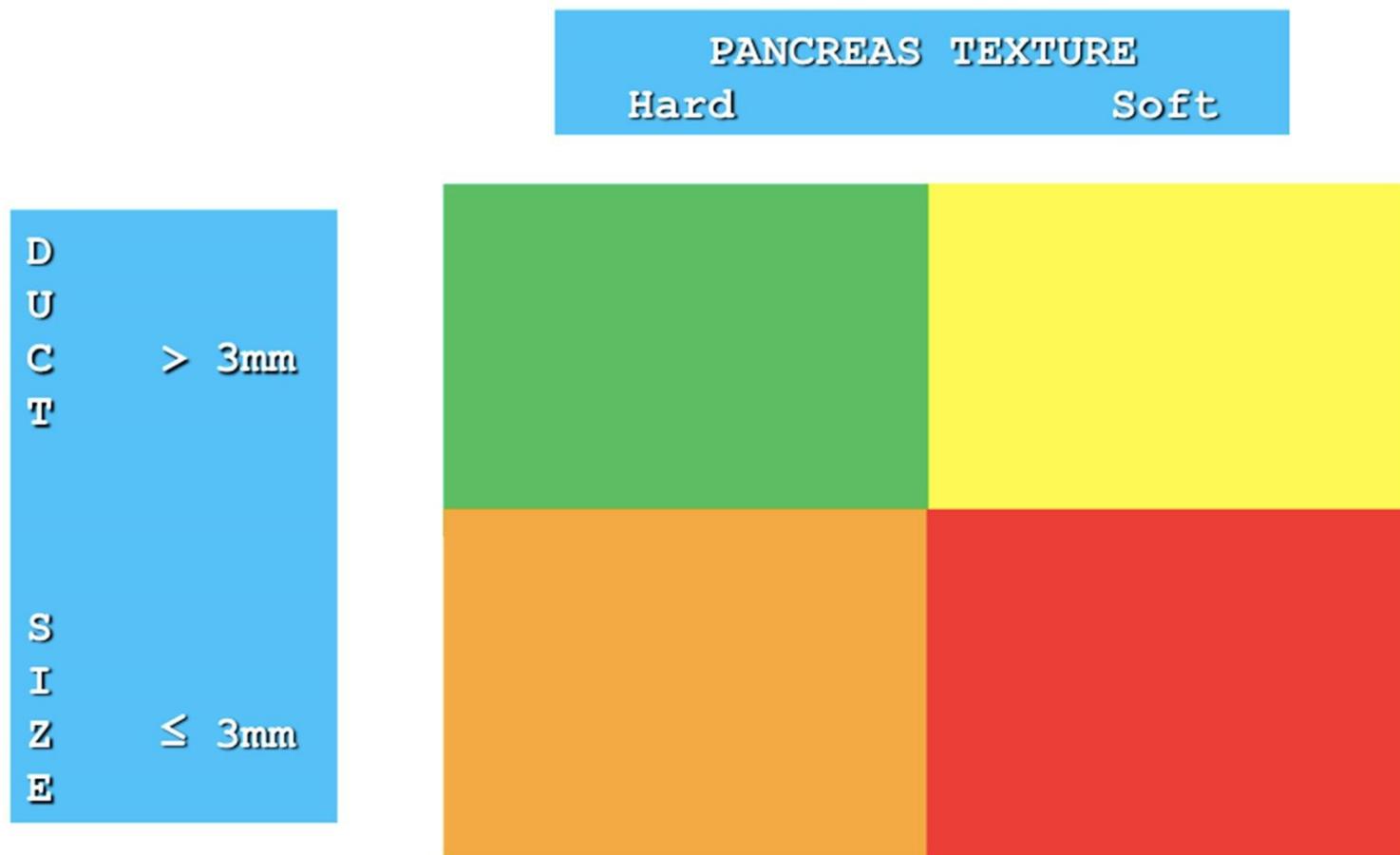
Total points

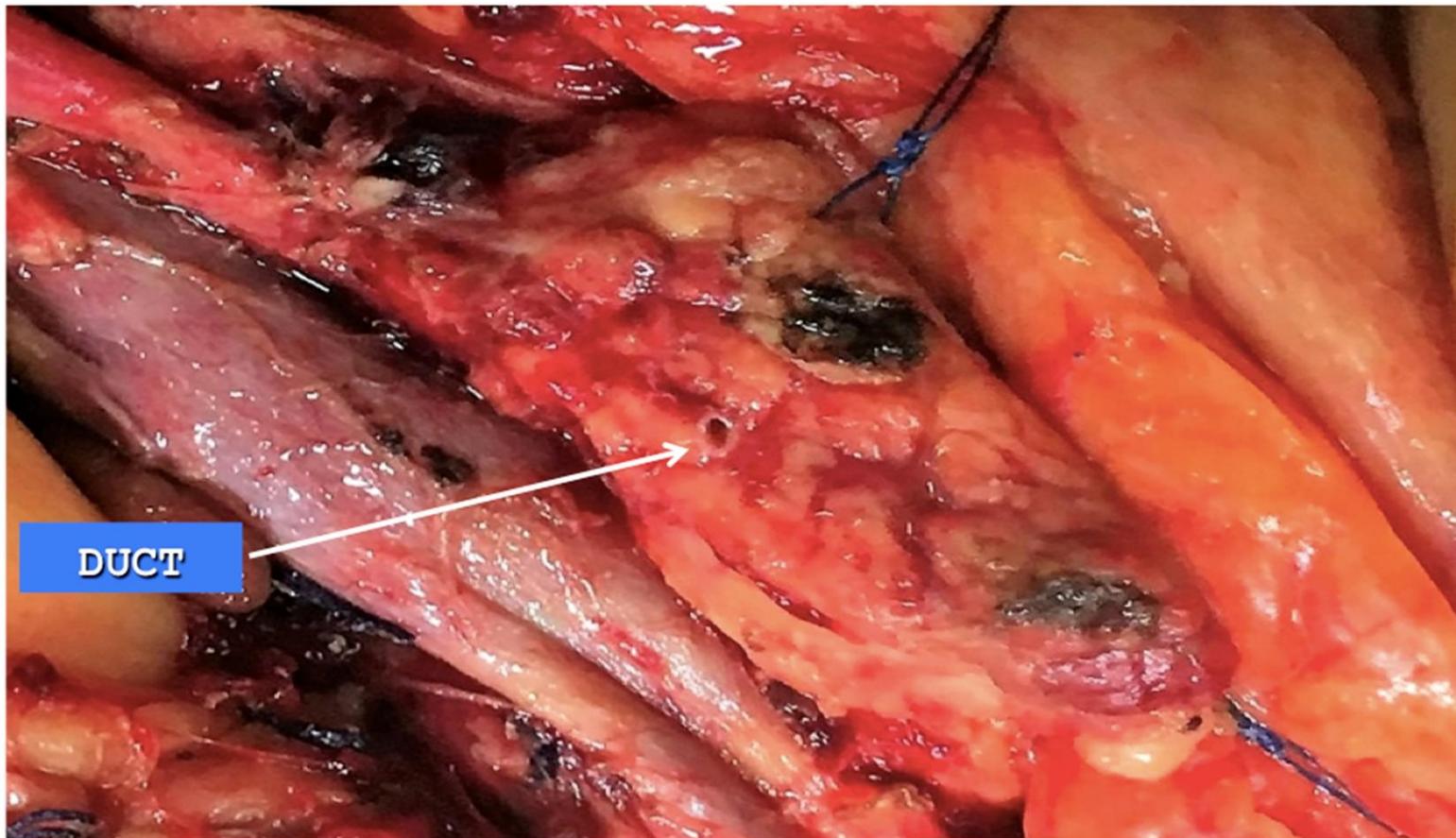


Probability



PANCREATIC FISTULA





- No PDAC
- Small pancreatic duct
- Soft pancreatic parenchyma



The quality of the anastomosis

PG versus PJ

9 RCTs

Author	Year	Number of cases		Pancreatic fistula	Mortality %
RECOPANC	2014	320	PG 171	20% (B, C)	5.6
			PJ 149	22% (B, C)	
El Nakeeb	2014	90	PG 45	20%	7.8
			PJ 45	22%	
Figuera	2013	123	PG 65	15%	4.9
			PJ 58	34%	
Topal	2013	329	PG 162	8% (B,C)	3.6
			PJ 167	20% (B, C)	
Wellner	2012	116	PG 59	10%	1.7
			PJ 57	12%	
Fernández-Cruz	2008	108	PG 53	6%	0.0
			PJ 55	18%	
Bassi	2005	151	PG 69	13%	0.7
			PJ 82	16%	
Duffas	2005	149	PG 81	20%	11.4
			PJ 68	16%	
Yeo	1995	145	PG 73	12%	0.0
			PJ 72	11%	

P<0.05

RANDOMIZED CONTROLLED TRIAL

OPEN

Pancreatogastrostomy Versus Pancreatojejunostomy for
 RECOstruction After PANCreatoduodenectomy
 (RECOPANC, DRKS 00000767)

Perioperative and Long-term Results of a Multicenter Randomized Controlled Trial

TABLE 2. Primary Endpoint Analysis

Parameter	Total n	Univariate Analysis			P
		No/POPF A n (%)	POPF B/C n (%)		
All patients	320	253 (79%)	67 (21%)		—
PJ	149	116 (78%)	33 (22%)		
PG	171	137 (80%)	34 (20%)		0.617

NO DIFFERENCE

PG – more postoperative bleeding

JAMA Surgery | Original Investigation

**Pancreaticojejunostomy With Externalized Stent
vs Pancreaticogastrostomy With Externalized Stent
for Patients With High-Risk Pancreatic Anastomosis
A Single-Center, Phase 3, Randomized Clinical Trial**

Stefano Andrianello, MD; Giovanni Marchegiani, MD, PhD; Giuseppe Malleo, MD, PhD; Gaia Masini, MD; Alberto Balduzzi, MD; Salvatore Paiella, MD, PhD; Alessandro Esposito, MD; Luca Landoni, MD; Luca Casetti, MD, PhD; Massimiliano Tuveri, MD; Roberto Salvia, MD, PhD; Claudio Bassi, MD

High risk for POPE

- PJ vs PG – Similar rates of POPF
- Clavien-Dindo ≥ 3 – PG
- PJ + externalized stent + octreotide omission
Most appropriate technical strategy

PANCREAS ANASTOMOSIS

ISGPS

Table II. Suggested recommendations in diverse intraoperative situations

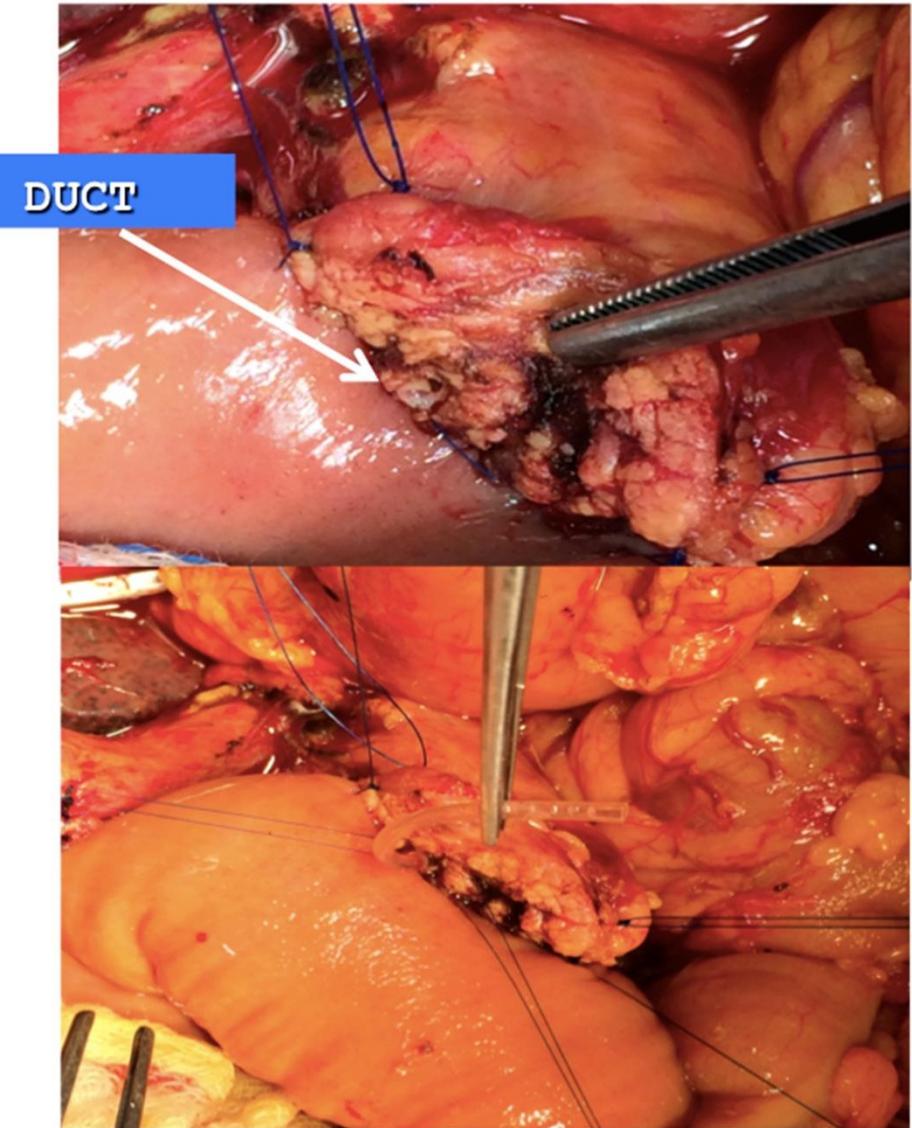
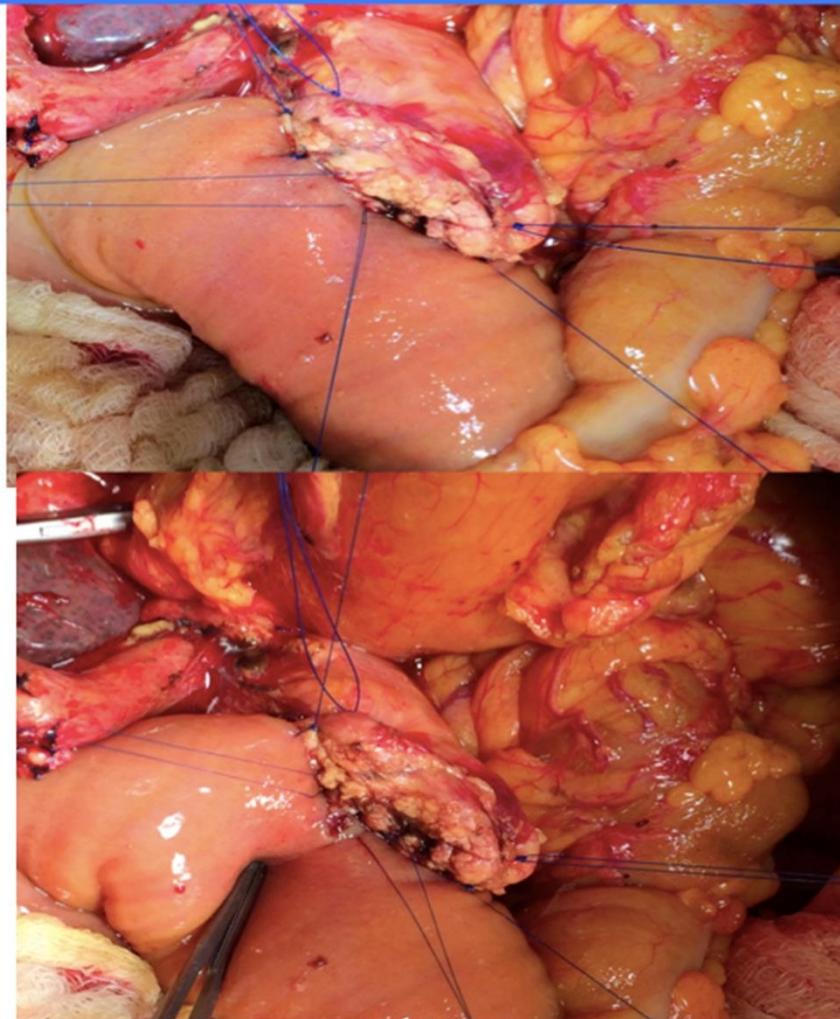
No	Scenario	Recommended strategy	ISGPS concurrence
1	Preferred method of PA following PD (PPPD/cW)	PJ with duct-mucosa advised as anastomotic technique	Moderate
2	Preferred method of PA in the presence of <u>high risk features for POPF</u> – soft gland, small duct (<3 mm), fatty pancreas and posteriorly located duct etc.	PJ with duct-mucosa advised as anastomotic technique	Moderate

Table III. Levels of evidence and ISGPS recommendation

Variables	Literature review summary data	Level of evidence (1 to 5) and evidence-based recommendation	ISGPS recommendation (Strong, Moderate, Weak)	Justification
		(A to D)		
PG vs PJ	PG apparently seems advantageous over PJ although varied heterogeneity seen in existing RCTs	Level 1B Grade B	Moderate	High level of heterogeneity observed in evidence.

DUCT-MUCOSA PANCREATOJEJUNOSTOMY

DUCT-TO-MUCOSA



INVAGINATION TECHNIQUE

ISGPS

- Soft pancreas
- Duct ≤ 3mm

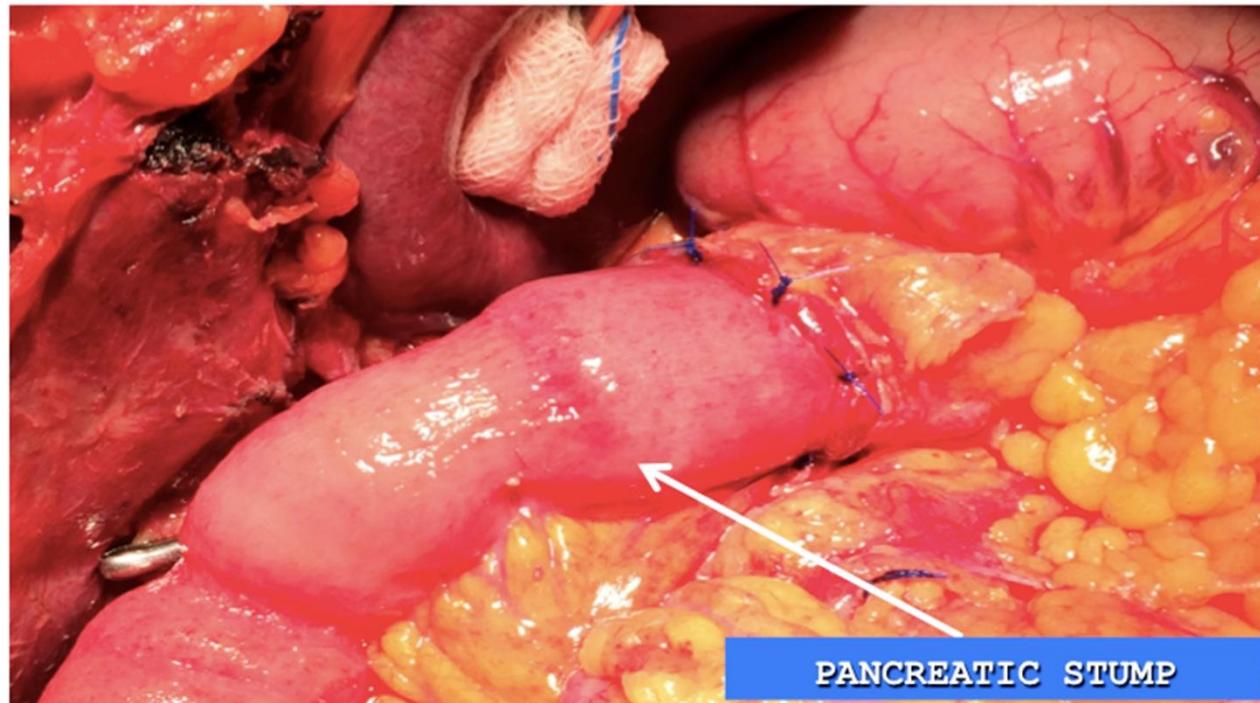


Table III. Levels of evidence and ISGPS recommendation

Variables	Literature review summary data	Level of evidence (1 to 5) and evidence-based recommendation (A to D)	ISGPS recommendation (Strong, Moderate, Weak)	Justification
Invagination technique	Safe technique and can be preferred in soft glands with narrow duct	Level 1B Grade B	Moderate	Adequate evidence observed.



Contents lists available at ScienceDirect

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

Review Article

Pancreaticojejunostomy for Pancreatico-enteric Anastomosis after Pancreaticoduodenectomy: one procedure with multiple techniques.



Rajesh S Shinde ^{a,*}, Rajgopal Acharya ^b, Vikram A Chaudhari ^c, Manish S Bhandare ^c, Shailesh V Shrikhande ^c

Table 1
Studies describing PJ techniques.

PJ technique	Study	POPF grade B or C (%)	Overall mortality (%)
Blumgart	Kleespies et al [12]	4	3.26
	Grobmyer et al [13]	6.9	1.6
	Mishra et al [14]	7.1	3.06
Modified Blumgart	Fuji et al [4]	2.5	0
Heidelberg	Buchler et al [15]	-	0
Modified Heidelberg	Torres et al [6]	0	0
Peng's binding technique	Peng et al [7]	-	2.2
Pair-watch technique	Yoshinori et al [8]	0	0
Invagination technique	Lampe et al [11]	-	1.9
Cattell Warren	Warren et al [10]	-	
	Bassi C et al [16]	-	2

PJ- Pancreatico-jejunostomy, POPF- Postoperative pancrea

PANCREATOJEJUNOSTOMY

DIFFERENT

Studies comparing various PJ techniques.

Study Arms	Author	Type of study	Year	Results	p value
Duct to mucosa v/s Invagination	Berger et al [17]	RCT	2009	Higher PF rate with duct-to-mucosa technique	0.04
	Bai et al [18]	RCT	2016	Similar overall POPF but higher rate of clinically relevant POPF in invagination group	0.004
	Zhang et al [19]	Meta-analysis	2017	No significant difference	0.13
Cattell-Warren v/s Blumgart Binding versus Invagination	Lee et al [20]	Before-after	2018	No significant difference in POPF rates	0.11
	Peng et al [21]	RCT	2007	POPF rate lower with binding technique	0.014
	Maggiori et al [22]	Case-Control	2010	No significant difference	0.33

PJ- Pancreatico-jejunostomy, POPF- Postoperative pancreatic fistula, RCT- Randomised control trial.

"The pancreatic surgeon should be wise enough and aware of the various surgical techniques which can be appropriately applied in cases where high-risk anastomoses is anticipated."



Pancreaticojejunostomy—a review of modern techniques

Invagination techniques

- [10] Yang et al., 2017
- [13] Peng et al., 2003
- [14] Casadei et al., 2013
- [15] Buc et al., 2010
- [16] Kim et al., 2014
- [17] Kim et al., 2016
- [18] Li et al., 2015
- [19] Kelemen et al., 2016
- [20] Li et al., 2018
- [21] Hashimoto et al., 2013
- [22] Kuśnierz et al., 2015
- [23] Gupta et al., 2018
- [24] Chen et al., 2014
- [25] Cho et al., 2014
- [26] Kwon et al., 2015
- [27] Yang et al., 2018
- [28] Yao et al., 2016
- [29] Katoh et al., 2013
- [30] Liu et al., 2018
- [31] Morelli et al., 2017

Duct-to-mucosa techniques

- [35] Torres et al., 2017
- [36] Palampros et al., 2016
- [37] Su et al., 2014
- [38] Zhang et al., 2015
- [41] Kim et al., 2017
- [42] Chen et al., 2014
- [43] Ji et al., 2015
- [44] Grobmyer et al., 2010
- [51] Kojima et al., 2018
- [52] Wang et al., 2017

"No surgical technique gives any advantage in eliminating the risk of pancreatic fistula."



Review

**The optimal choice for pancreatic anastomosis after
pancreaticoduodenectomy: A network meta-analysis of randomized control
trials**

**Table 2**

Outcome	Name	Direct effect	Indirect effect	Overall	P-value
PF	PJ-DtoM, PJ-Inv	0.09 (-0.52, 0.79)	-0.42 (-1.61, 0.62)	-0.05 (-0.56, 0.50)	0.42
	PG-Inv, PJ-DtoM	0.62 (-0.13, 1.43)	0.10 (-1.02, 1.09)	0.42 (-0.17, 1.00)	0.4
	PG-Inv, PJ-Inv	0.19 (-0.65, 0.95)	0.70 (-0.27, 1.85)	0.37 (-0.20, 0.97)	0.38
	PG-Inv, PJ-DtoM	0.61 (-0.17, 1.51)	0.38 (-0.95, 1.59)	0.55 (-0.10, 1.20)	0.74
PF (ISGPS definition)	PG-Inv, PJ-Inv	0.28 (-0.70, 1.15)	0.47 (-0.61, 1.74)	0.35 (-0.33, 1.04)	0.78
	PJ-DtoM, PJ-Inv	-0.13 (-0.92, 0.76)	-0.35 (-1.70, 0.82)	-0.19 (-0.85, 0.46)	0.75
	PG-Inv, PJ-DtoM	0.51 (-0.50, 1.63)	1.02 (-0.78, 2.63)	0.67 (-0.19, 1.59)	0.58
	PG-Inv, PJ-Inv	1.06 (-0.44, 2.63)	0.54 (-0.75, 2.00)	0.78 (-0.13, 1.83)	0.56
PF (soft pancreatic texture)	PJ-DtoM, PJ-Inv	0.08 (-0.76, 0.90)	0.65 (-1.34, 2.28)	0.12 (-0.61, 0.87)	0.5
	PG-Inv, PJ-DtoM	0.51 (-0.18, 1.25)	-0.31 (-0.92, 0.25)	0.02 (-0.46, 0.48)	0.07
	PG-Inv, PJ-Inv	-0.24 (-0.71, 0.16)	0.56 (-0.19, 1.39)	-0.05 (-0.45, 0.36)	0.08
Overall morbidity	PJ-DtoM, PJ-Inv	0.08 (-0.29, 0.44)	-0.75 (-1.58, 0.10)	-0.07 (-0.41, 0.28)	0.07
	PG-Inv, PJ-DtoM	-0.03 (-1.17, 1.13)	0.07 (-1.56, 1.63)	-0.02 (-0.86, 0.89)	0.93
	PG-Inv, PJ-Inv	0.09 (-1.12, 1.24)	-0.02 (-1.60, 1.53)	0.04 (-0.85, 0.94)	0.96
Overall mortality	PJ-DtoM, PJ-Inv	0.00 (-1.13, 1.06)	0.08 (-1.65, 1.70)	0.07 (-0.88, 0.94)	0.96
	PG-Inv, PJ-DtoM	0.09 (-0.65, 0.90)	-0.39 (-1.71, 0.84)	-0.02 (-0.62, 0.57)	0.43
Delayed gastric emptying	PG-Inv, PJ-Inv	-0.50 (-1.48, 0.31)	-0.08 (-1.14, 1.16)	-0.37 (-0.99, 0.30)	0.53
	PJ-DtoM, PJ-Inv	-0.18 (-1.01, 0.78)	-0.60 (-1.86, 0.47)	-0.35 (-0.97, 0.36)	0.51

"No significant differences."



REVIEW



Pancreatic reconstruction techniques after pancreaticoduodenectomy: a review of the literature

Yien Xiang ^a, Jiacheng Wu^a, Chao Lin^b, Yongsheng Yang^a, Dan Zhang^a, Yingjun Xie^a, Xiaoxiao Yao^a and Xuewen Zhang^a

<https://doi.org/10.1016/j.hpb.2020.01.002>

HPB

ORIGINAL ARTICLE

A propensity score analysis of over 12,000 pancreaticojejunal anastomoses after pancreaticoduodenectomy: does technique impact the clinically relevant fistula rate?

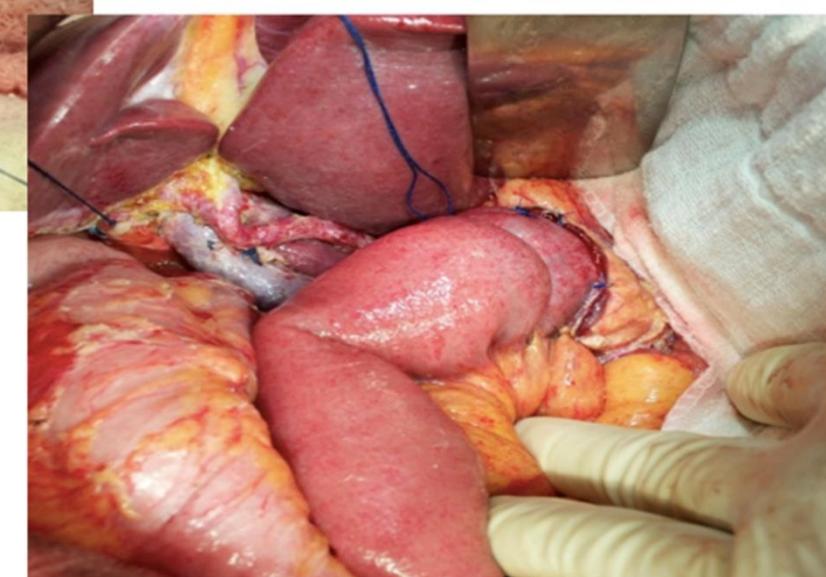
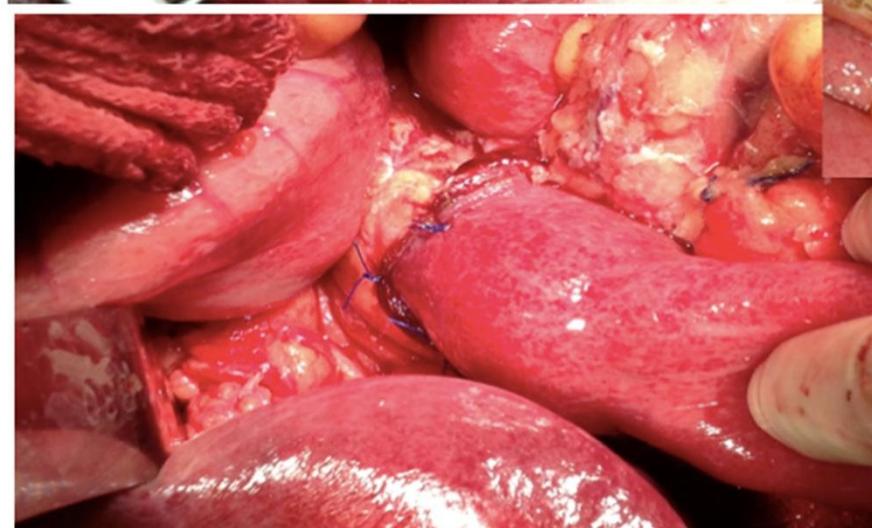
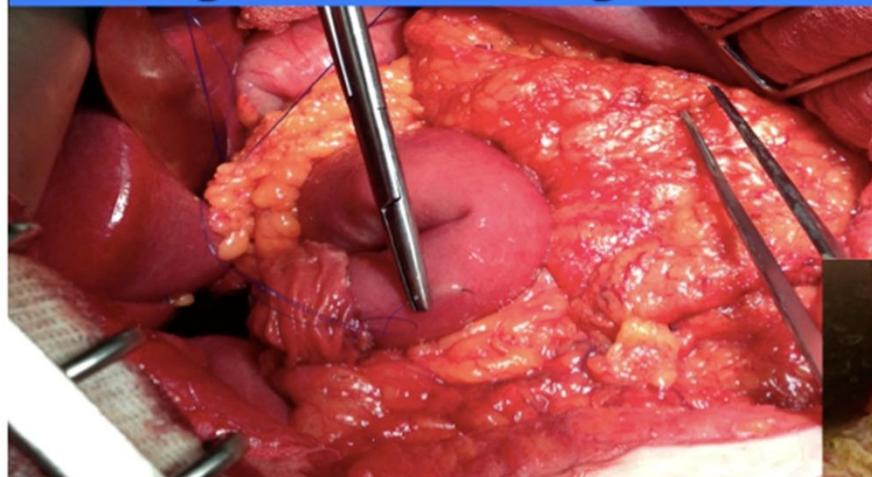
Lyonell B. Kone^{1,2}, Vijay K. Maker^{1,2}, Mihaela Banulescu² & Ajay V. Maker^{1,2}

"No individual anastomotic method can completely avoid postoperative pancreatic fistula."

Xiang Y, et al. Exp Ver Gastroenterol Hepatol 2020

Kone LB, et al. HPB 2020

Peng's binding technique



Peng's binding technique

Table III. Levels of evidence and ISGPS recommendation

<i>Variables</i>	<i>Literature review summary data</i>	<i>Level of evidence (1 to 5) and evidence-based recommendation (A to D)</i>	<i>ISGPS recommendation (Strong, Moderate, Weak)</i>	<i>Justification</i>
Duct to mucosa technique	Safe and common technique of PJ	Level 1B Grade A	Strong	Adequate evidence observed.
Binding PJ	Safe but not associated with lower frequency of CR-POPF, morbidity, and mortality.	Level 1B Grade B	Weak	Consistent evidence is lacking.

Not associated with:

Lower rate of POPF B and C

Lower morbidity

Lower mortality

ISGPS



Comparison of Blumgart Anastomosis with Duct-to-Mucosa Anastomosis and Invagination Pancreaticojejunostomy After Pancreaticoduodenectomy: A Single-Center Propensity Score Matching Analysis

- Blumgart
- Duct-to-mucosa
- Invagination

Riccardo Casadei^{1,2} · Claudio Ricci¹ · Carlo Ingaldì¹ · Laura Alberici¹ · Emilio De Raffele¹ · Francesco Minni¹

J Gastrointest Surg

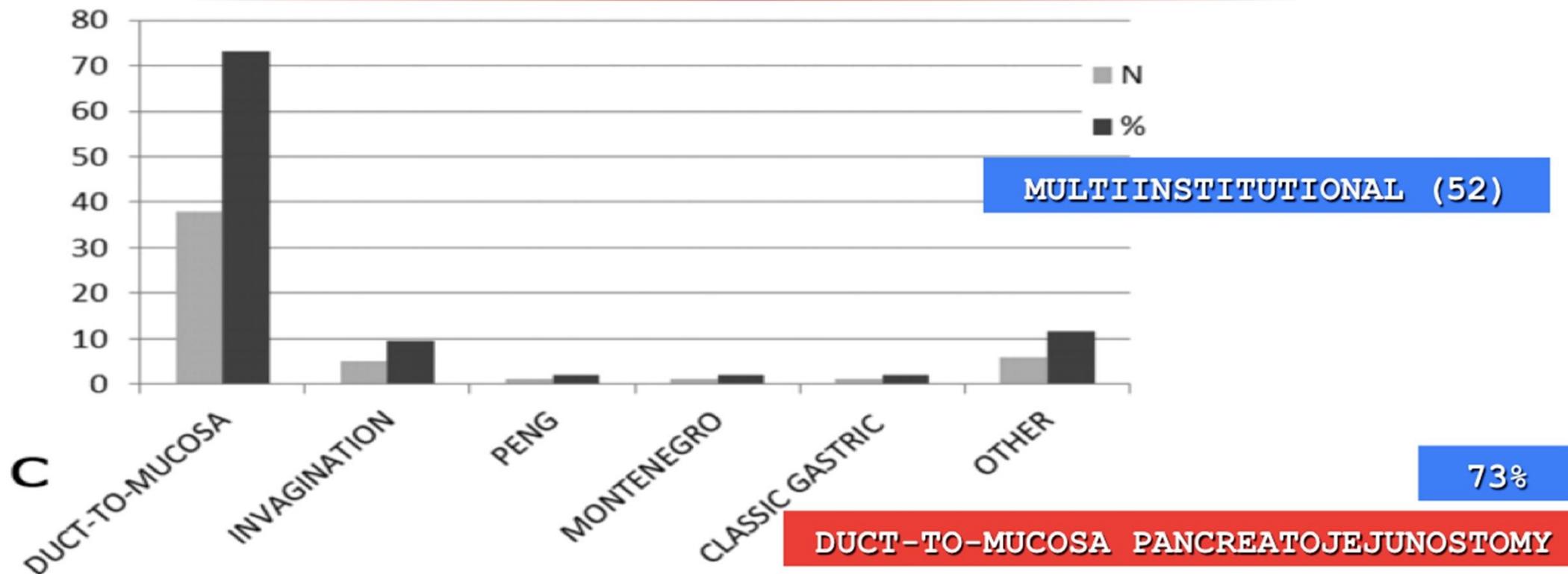
Table 2 Unmatched population: comparison of the different types of pancreatic anastomosis after pancreaticoduodenectomy regarding postoperative outcomes

Factors	Type of anastomosis				Comparison					
	BA (n = 37)	All (n = 187)	DtOM (n = 77)	PJ (n = 110)	P value (BA vs. All)	SMD	P value (BA vs. DtOM)	SMD	P value (BA vs. PJ)	SMD
<i>CR-POPF</i>					0.681		0.807			
No	29(78.4)	137(73.3)	62(80.5)	75(68.2)		0.15		0.07	0.298	0.26
Yes	8(21.6)	50(26.7)	15(19.5)	35(31.8)						
<i>POPF grade C</i>					0.140					
No	37(100)	172(92)	69(89.6)	103(93.6)		—	0.052	—	0.041	—
Yes	0(0)	15(8)	8(10.4)	7(6.4)						
<i>Severe complication (C-D ≥ 3)</i>					< 0.001	—	< 0.001	—	< 0.001	—
No	37(100)	130(69.5)	69(89.6)	74(67.3)						
Yes	0(0)	57(30.5)	8(10.4)	36(32.7)						
<i>90-days mortality</i>					0.081	—			0.066	—
No	37(100)	171(91.4)	72(92.2)	99(90)			0.172			
Yes	0(0)	16(8.6)	6(6.5)	11(10)						

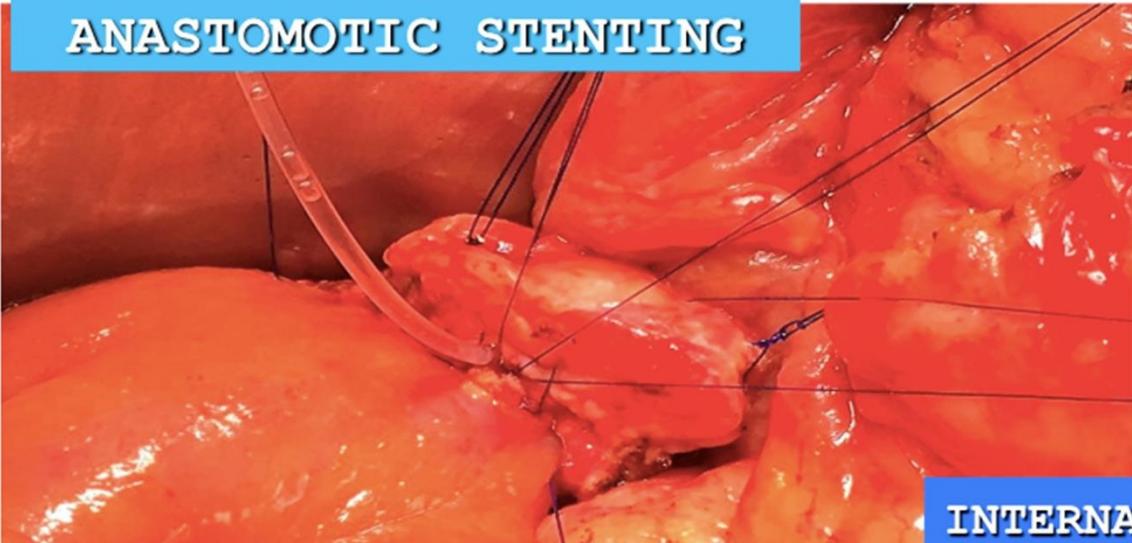
PANCREATODUODENECTOMY: BRAZILIAN PRACTICE PATTERNS*

*Duodenopancreatectomia: prática padrão do Brasil**

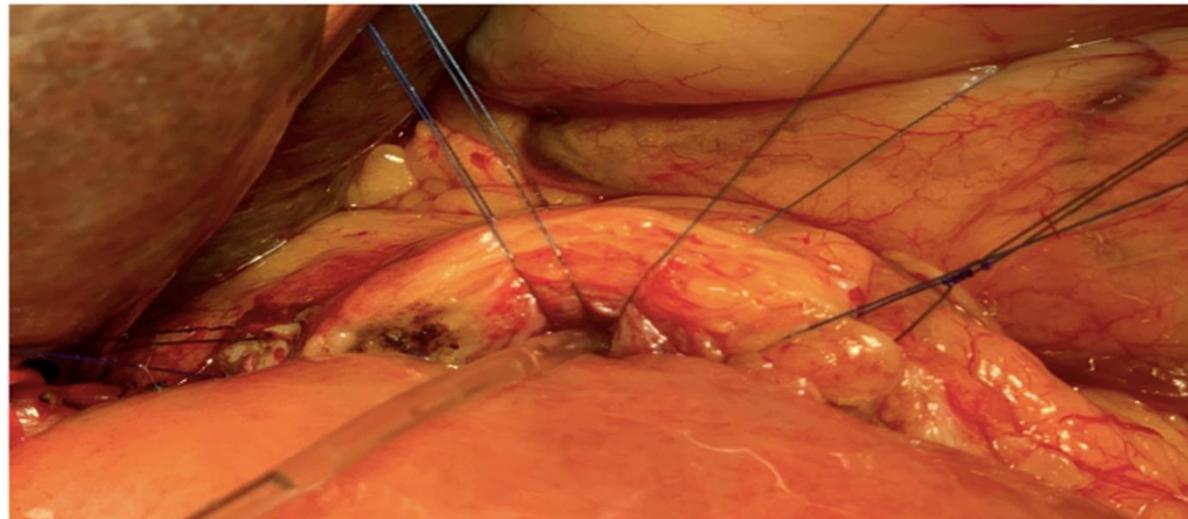
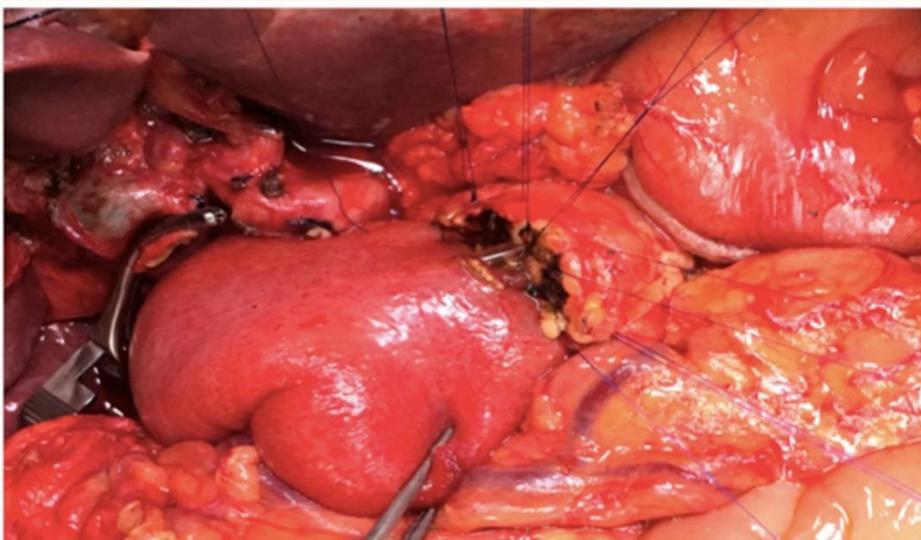
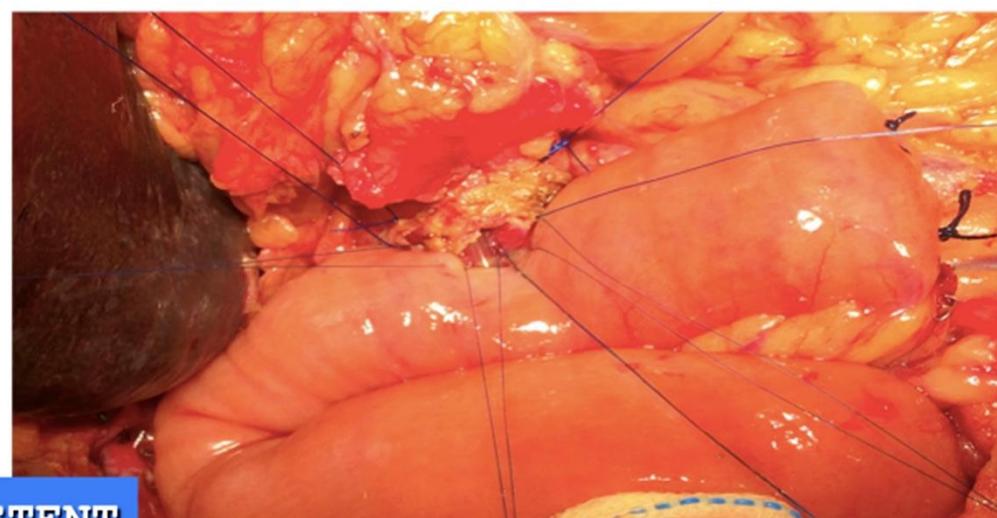
Orlando Jorge M **TORRES**¹, Eduardo de Souza M **FERNANDES**², Rodrigo Rodrigues **VASQUES**¹, Fabio Luís **WAECHTER**³,
Paulo Cesar G. **AMARAL**⁴, Marcelo Bruno de **REZENDE**⁵, Roland Montenegro **COSTA**⁶, André Luís **MONTAGNINI**⁷



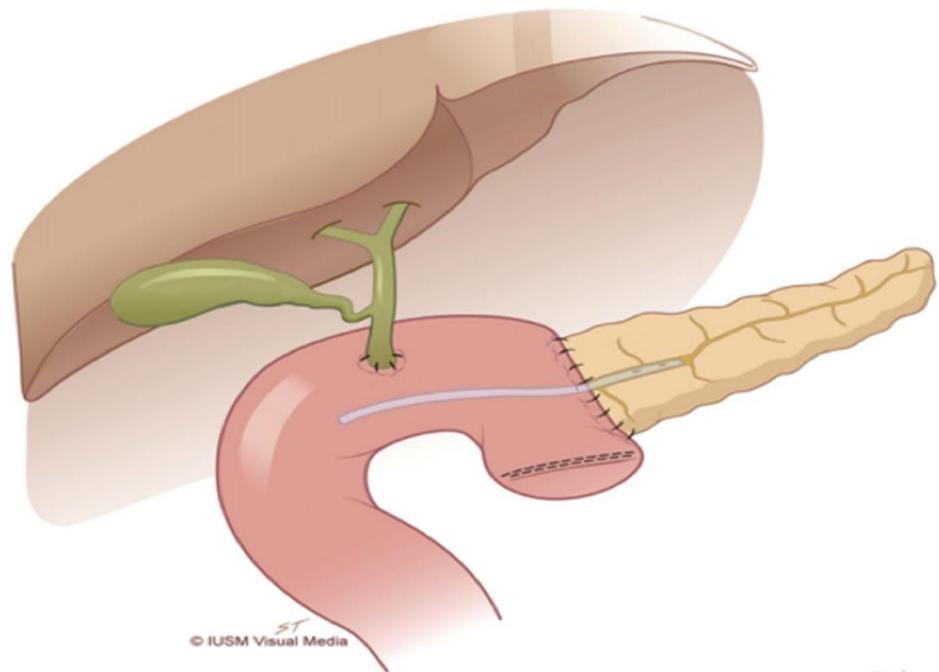
ANASTOMOTIC STENTING



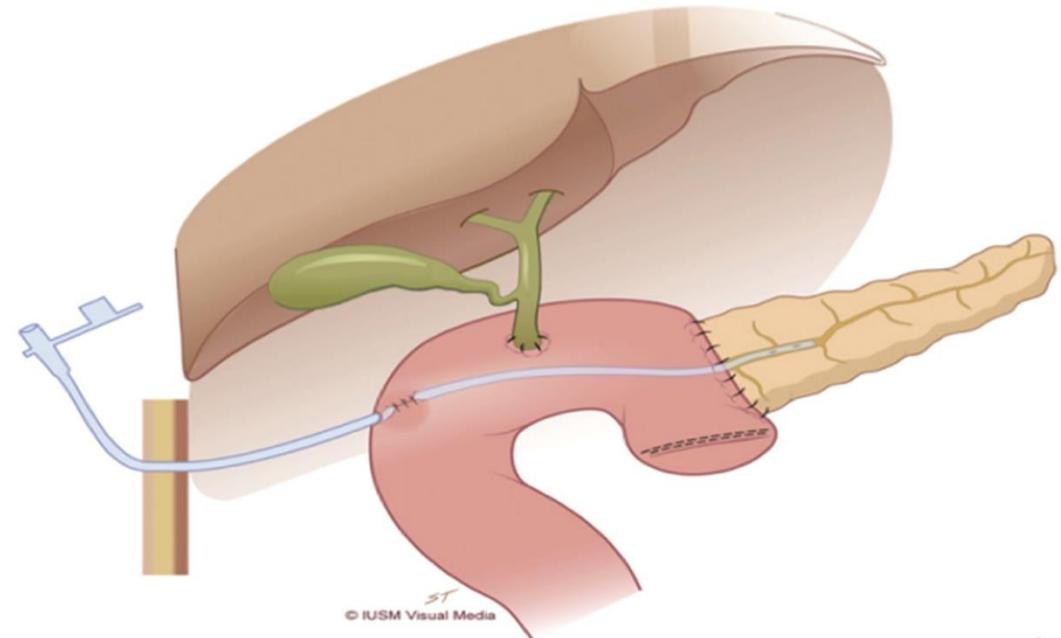
INTERNAL STENT



ANASTOMOTIC STENTING



Internal



External

ANASTOMOTIC STENTING

ISGPS

Table II. Suggested recommendations in diverse intraoperative situations

No	Scenario	Recommended strategy	ISGPS concurrence
	Preferential practice of anastomotic stenting	Stent (external/internal) based on high risk features for POPF	Weak

Table III. Levels of evidence and ISGPS recommendation

Variables	Literature review summary data	Level of evidence (1 to 5) and evidence-based recommendation (A to D)	ISGPS recommendation (Strong, Moderate, Weak)	Justification
PA stenting	Benefit of stenting PA is not well supported by evidence. No advantage of external over internal stenting	Level 1A Grade B	Moderate	Moderate level evidence observed.

NO STENT



Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.JournalofSurgicalResearch.com



Internal Versus External Drainage With a Pancreatic Duct Stent For Pancreaticojejunostomy During Pancreaticoduodenectomy for Patients at High Risk for Pancreatic Fistula: A Comparative Study

Check for updates

INTERNAL STENTING

Guo-qiang Zhang, MD, Xiao-Hua Li, MD, PhD, Xiao-Jian Ye, MD,
Hai-Bin Chen, MD, Nan-Tao Fu, MD, An-Tao Wu, MD, and Yong Li, MD*

JOURNAL OF INVESTIGATIVE SURGERY
<https://doi.org/10.1080/08941939.2019.1691687>



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REVIEW ARTICLE

Check for updates

The Prognostic Value of External vs Internal Pancreatic Duct Stents in CR-POPF after Pancreaticoduodenectomy: A Systematic Review and Meta-analysis

Yuancong Jiang^{a*} , Qin Chen^{b*} , Zhize Wang^c , Yi Shao^d, Chen Hu^d, Yuan Ding^a, Zhenhua Shen^d, Ming Jin^a, and Sheng Yan^a

Zhang GG, et al. J Surg Res 2016

EXTERNAL STENTING

Jiang Y, et al. J Invest Surg 2019

STENT

RCT

		Anastomosis	Number of patients			POPF		
			No stent	Internal stent	External stent	No stent	Internal stent	External stent
Poon	2007	DTM-PJ	60		60	20%		6.7%
Pessaux	2011	DTM-PG or PJ	81		77	42.0%		26.0%
Motoi	2012	DTM-PJ	46		47	22%		6%
Kuroki	2011	DTM-PJ	22		23	40.9%		34.5%
Winter	2006	IN or DTM-PJ	119	115		7.6%	11.3%	
Kamoda	2008	IN or DTM-PJ		21	22		33.3%	36.4%
Tani	2010	DTM-PJ		50	50		26%	20%
Chang	2015	DTM-PJ		164	164		18.9% (B, C)	24.4% (B,C)

DTM duct-to-mucosa, IN invagination, POPF postoperative pancreatic fistula

- NO STENT
- INTERNAL STENT
- EXTERNAL STENT

STENT

ABCD DV/314

ABCD Arq Bras Cir Dig
2017;30(3):190-196
DOI: /10.1590/0102-6720201700030007

Original Article

PANCREATODUODENECTOMY: BRAZILIAN PRACTICE PATTERNS*

*Duodenopancreatectomia: prática padrão do Brasil**

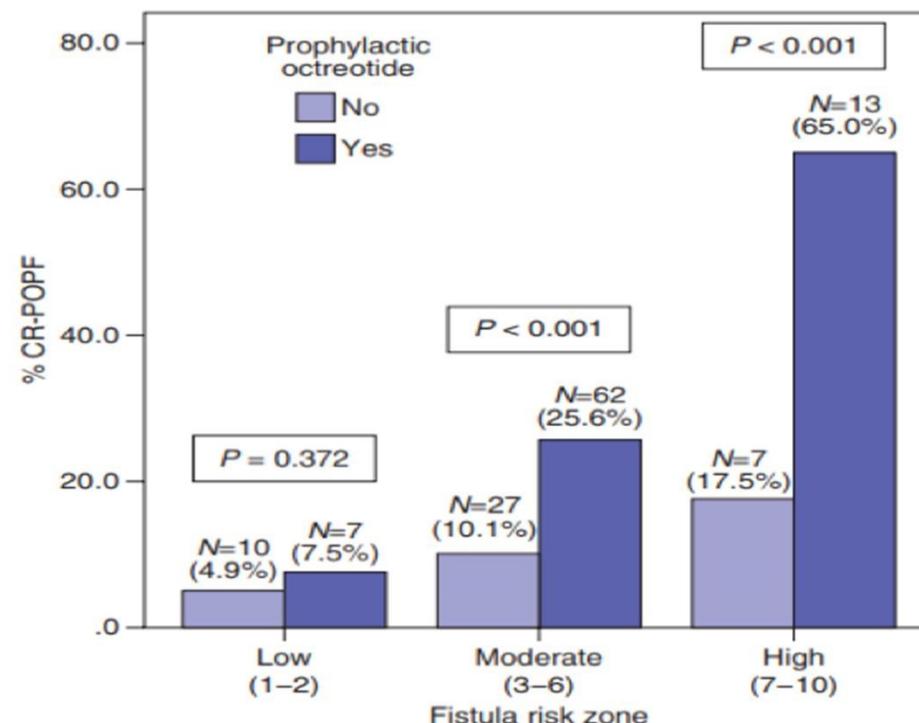
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Paulo Cezar G. **AMARAL**⁴, Marcelo Bruno de **REZENDE**⁵, Roland Montenegro **COSTA**⁶, André Luís **MONTAGNINI**⁷

<input type="checkbox"/> Internal stent	50%
<input type="checkbox"/> No stent	46.1%
<input type="checkbox"/> External stent	3.9%

ORIGINAL ARTICLE

Prophylactic octreotide for pancreatoduodenectomy: more harm than good?

Matthew T. McMillan¹, John D. Christein², Mark P. Callery³, Stephen W. Behrman⁴, Jeffrey A. Drebin¹, Tara S. Kent³, Benjamin C. Miller¹, Russell S. Lewis Jr¹ & Charles M. Vollmer Jr¹



OCTREOTIDE

p < 0.001

NO OCTREOTIDE



ORIGINAL ARTICLE

Randomized controlled study of the effect of octreotide on pancreatic exocrine secretion and pancreatic fistula after pancreateoduodenectomy



External stent

No difference

Table 5 Progress of patients and POPF.

	Octreotide (n = 29)	Placebo (n = 30)	P value
POD of gas out	3 (2–5)	3.5 (2–5)	0.13
POD for sips	5 (4–6)	5 (3–8)	0.45
POD for soft diet	7 (5–8)	7 (4–11)	0.79
POPF			
None	22 (76)	15 (50)	0.16
Grade A	6 (21)	10 (33)	
Grade B	0	2 (7)	
Grade C	1 (3)	3 (10)	
Complication			
Present	7 (24)	5 (16)	0.33
Absent	22 (76)	26 (84)	
Hospital stay	13 (4–50)	13 (9–85)	0.68



Efficacy of Pasireotide for Prevention of Postoperative Pancreatic Fistula in Pancreatic Surgery: a Systematic Review and Meta-analysis

- Four Studies 919 patients
 - 418 Pasireotide
 - 501 Controls
- CR-POPF 131 (14.3%)
 - Pasireotide 50/418 (12.0%)
 - Control group 81/501 (16.2%)
- Mortality - no difference

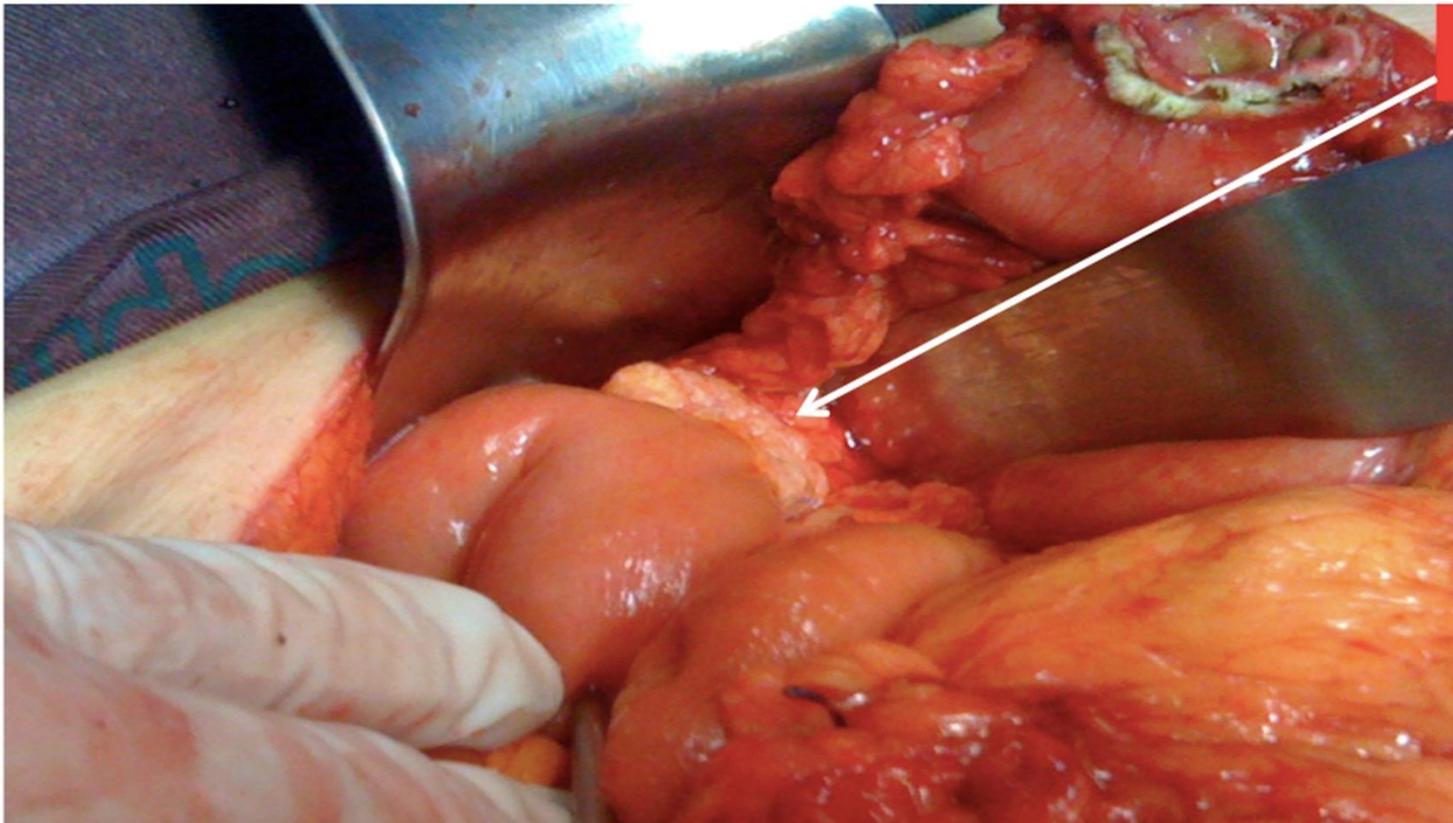
p = 0.29

p = 0.64

NO DIFFERENCE

NO PASIREOTIDE

TISSUE SEALANT



TachoSil®

REVIEW ARTICLE

Systematic review and meta-analysis of fibrin sealants for patients undergoing pancreatic resection

Table 2 Characteristics of fibrin sealant preparation used in the included studies

	D'Andrea 1994 ³¹	Suzuki 1995 ³⁴	Suc 2003 ³³	Lillemoe 2004 ³²	Carter 2012 ³⁰	Montorsi 2012 ²⁷	Martin 2012 ²⁶
Commercial name	Unknown	Tissucol/Tisseel®	Tissucol/tisseel®	Hemaseel APR®	Vitagel®	TachoSil® patch	Tissucol/Tisseel®
Fibrinogen	Human-derived Unknown concentration	Human-derived 90 mg/ml	Human-derived 90 mg/ml	Human-derived 75–115 mg/ml	Autologous plasma	Human-derived 5.5 mg/cm ²	Human-derived 90 mg/ml
Factor XIII	None	10–50 kIU/ml	10–50 kIU/ml	None	None	None	10–50 kIU/ml
Thrombin	Unknown origin	Human-derived 500 IU/ml	Human-derived 500 IU/ml	Human derived 500 IU/ml	Bovine-derived 300 UI/ml	Human-derived 2 IU/cm ²	Human-derived 500 IU/ml
Aprotinin	Bovine-derived 5 000–20 000 kIU/ml	Bovine-derived 3 000 kIU/ml	Bovine-derived 30 000 kIU/ml (added separately to the preparation)	Bovine-derived 3000 kIU/ml	None	None	Bovine-derived 3000 kIU/ml
Price	Unknown	\$160 ^b	\$160 ^b	\$164 ^a	\$470 ^a	\$395 ^a	\$160 ^b

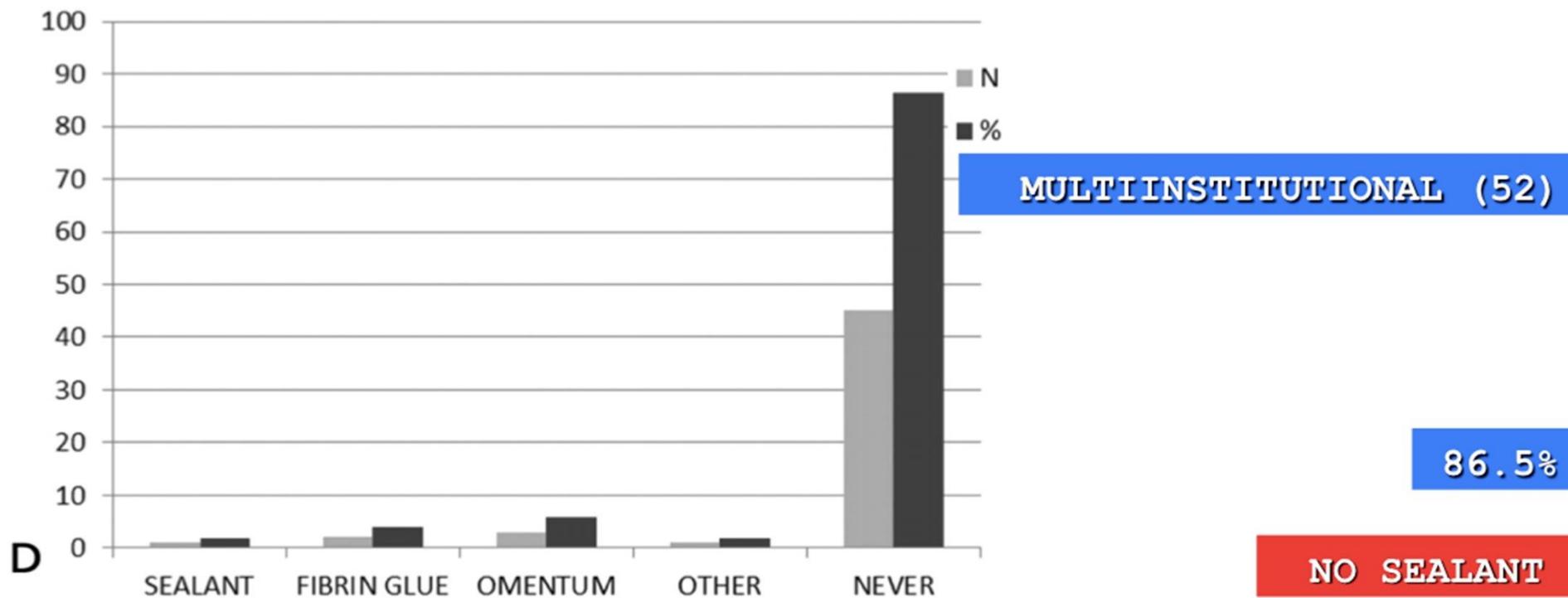
NO DIFFERENCE

No Sealants

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 Cesar G. **AMARAL**⁴, Marcelo Bruno de **REZENDE**⁵, Roland Montenegro **COSTA**⁶, André Luís **MONTAGNINI**⁷



IDEAL PANCREATIC ANASTOMOSIS

- Good blood supply to the pancreatic stump
- Pancreatic juice flow into the intestinal or gastric lumen
- Suitable for:
 - all pancreatic parenchyma
 - all pancreatic ducts
- Easy to perform
- Easy to learn
- Low rate of pancreatic fistula

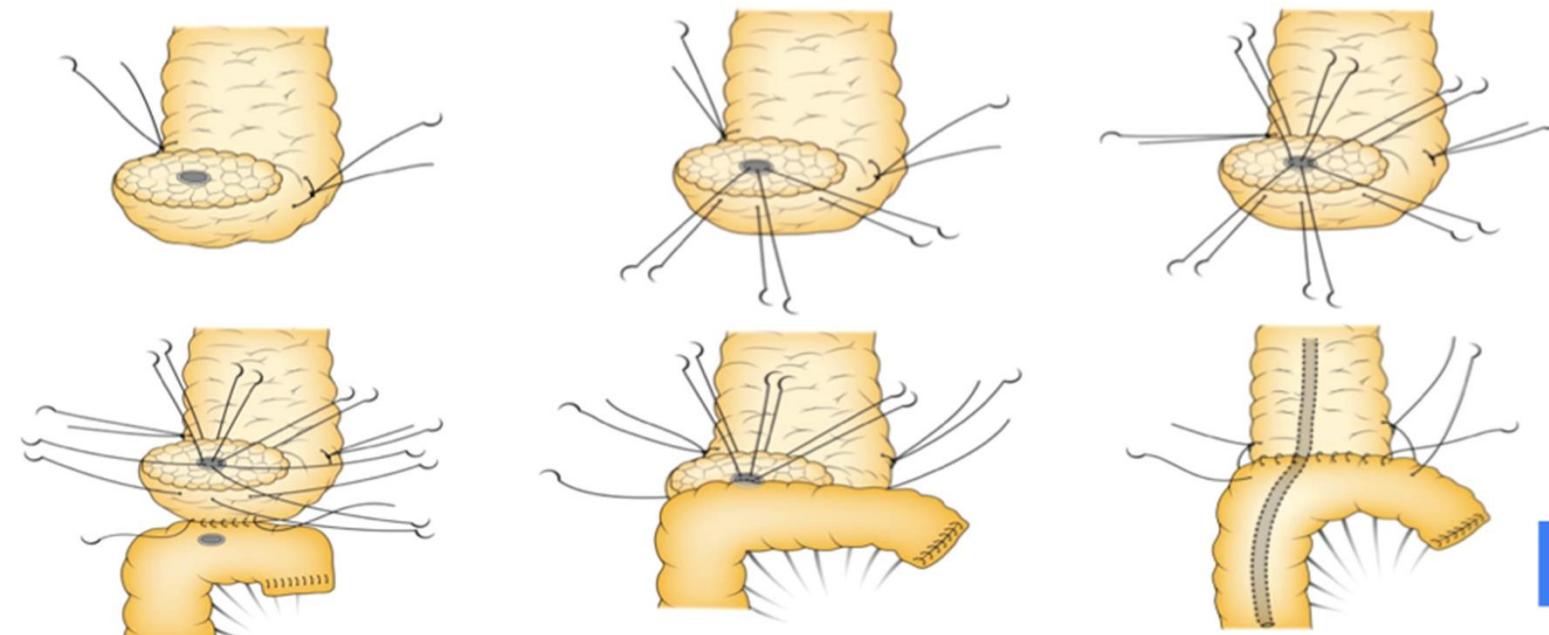
SUGGESTION



MODIFIED HEIDELBERG TECHNIQUE FOR PANCREATIC ANASTOMOSIS

Anastomose pancreática pela técnica de Heidelberg modificada

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



SUGGESTION

HEIDELBERG UNIVERSITY HOSPITAL
Heidelberg - Germany

TATA MEMORIAL CANCER CENTER
Mumbai - India

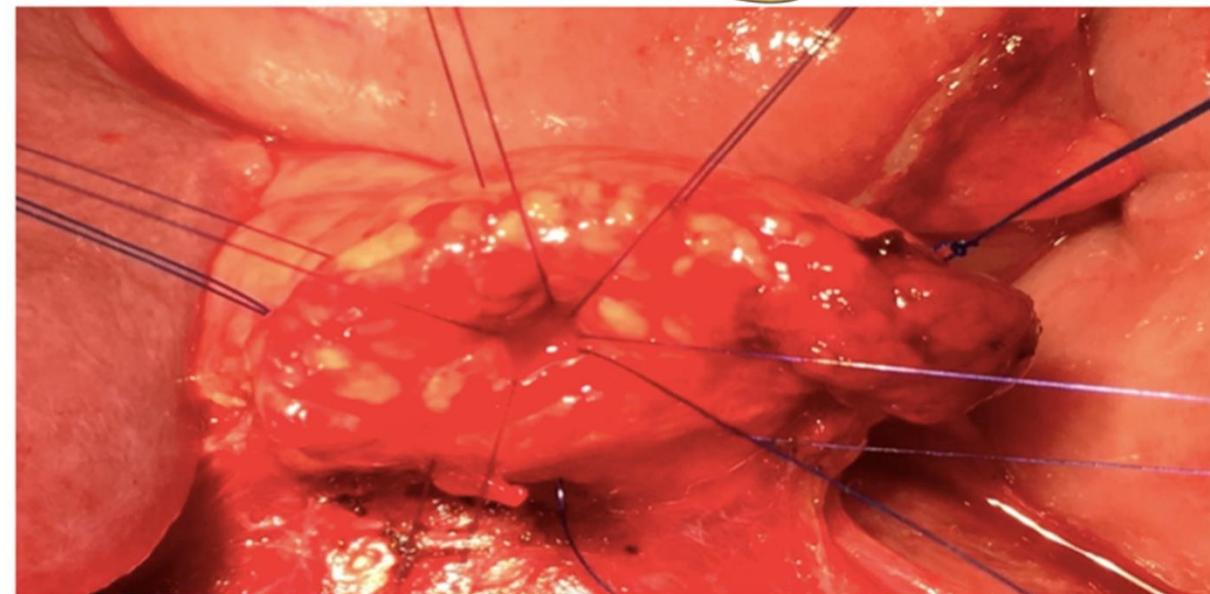
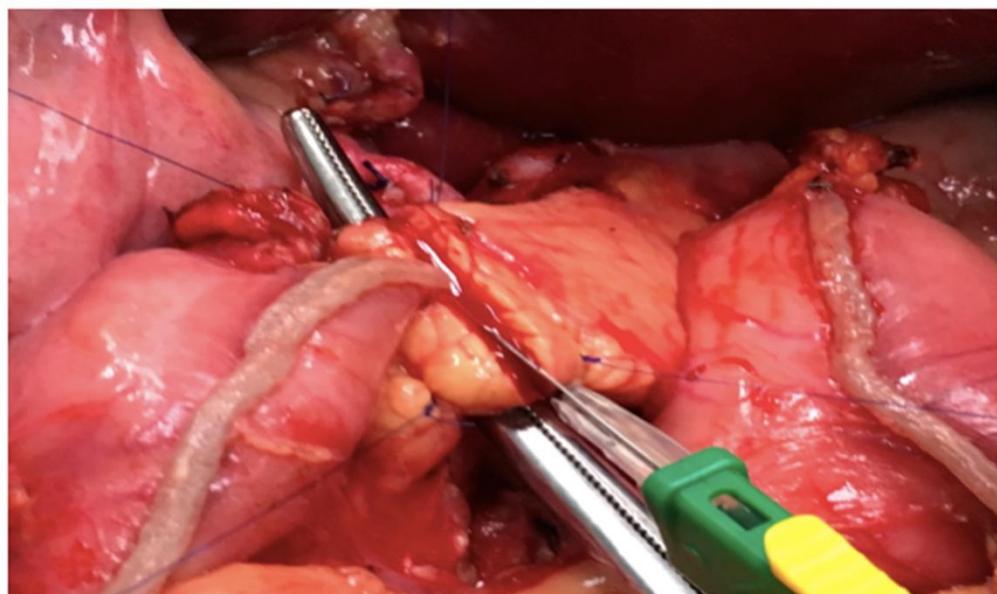
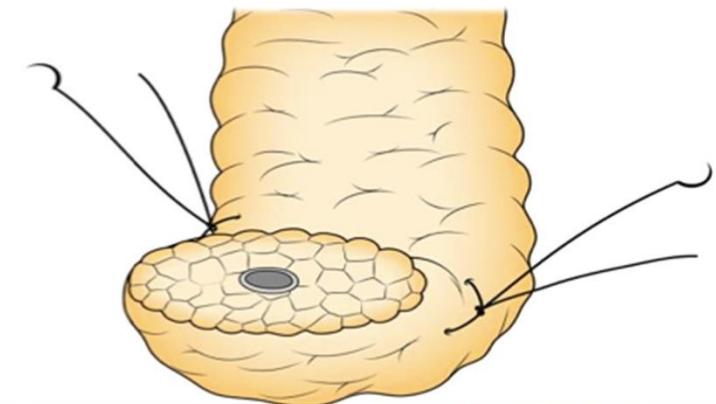
PANCREATECTOMIES PER YEAR

900

APPROXIMATELY

300

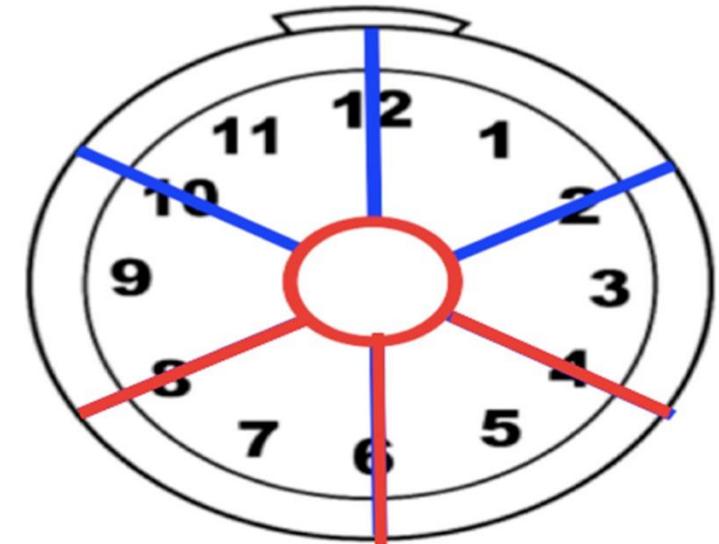
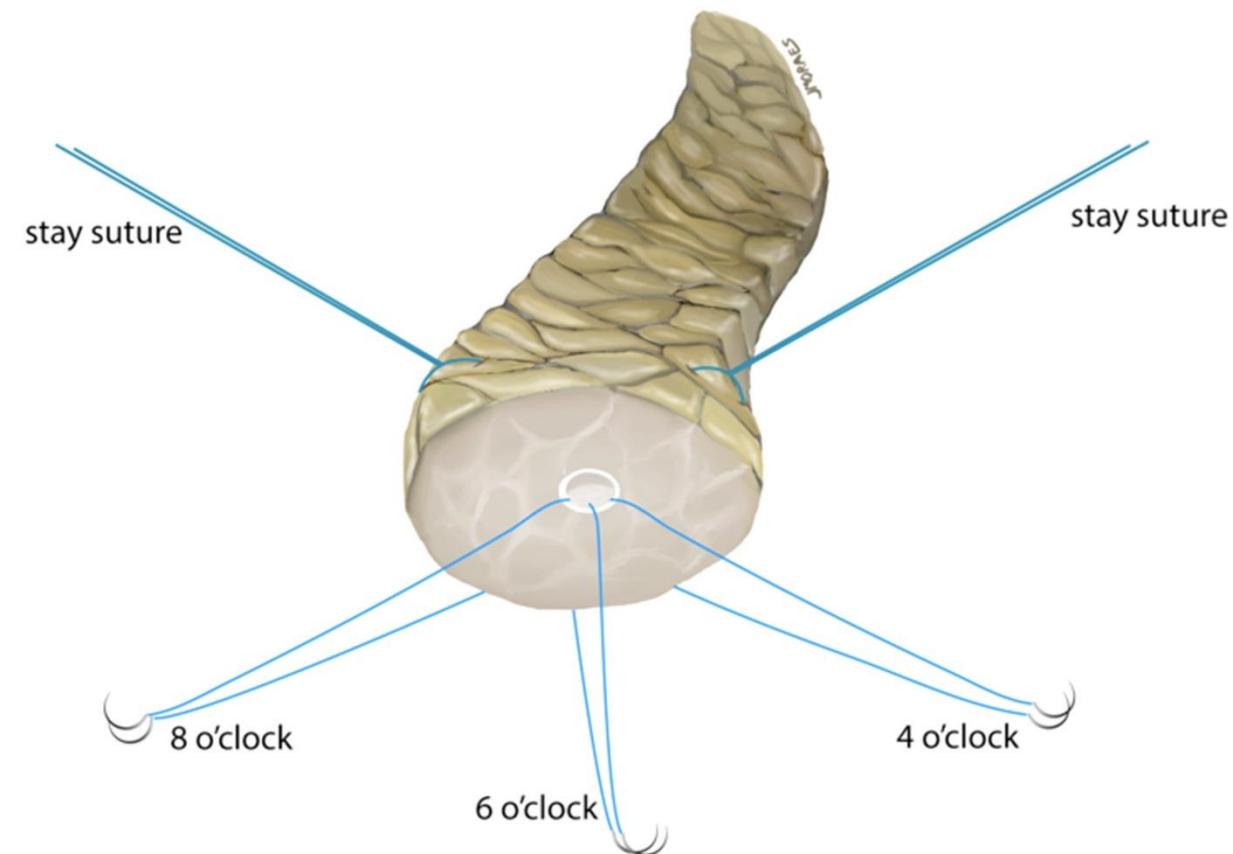
STAY SUTURE



- The pancreatic parenchyma is transected with sharp knife.
- Hemostasis is performed with electrocautery.



POSTERIOR DUCT-PANCREATIC SUTURE

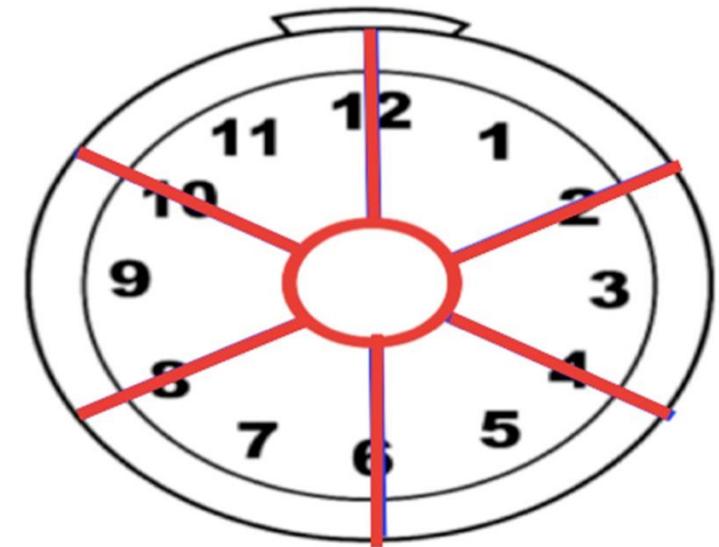
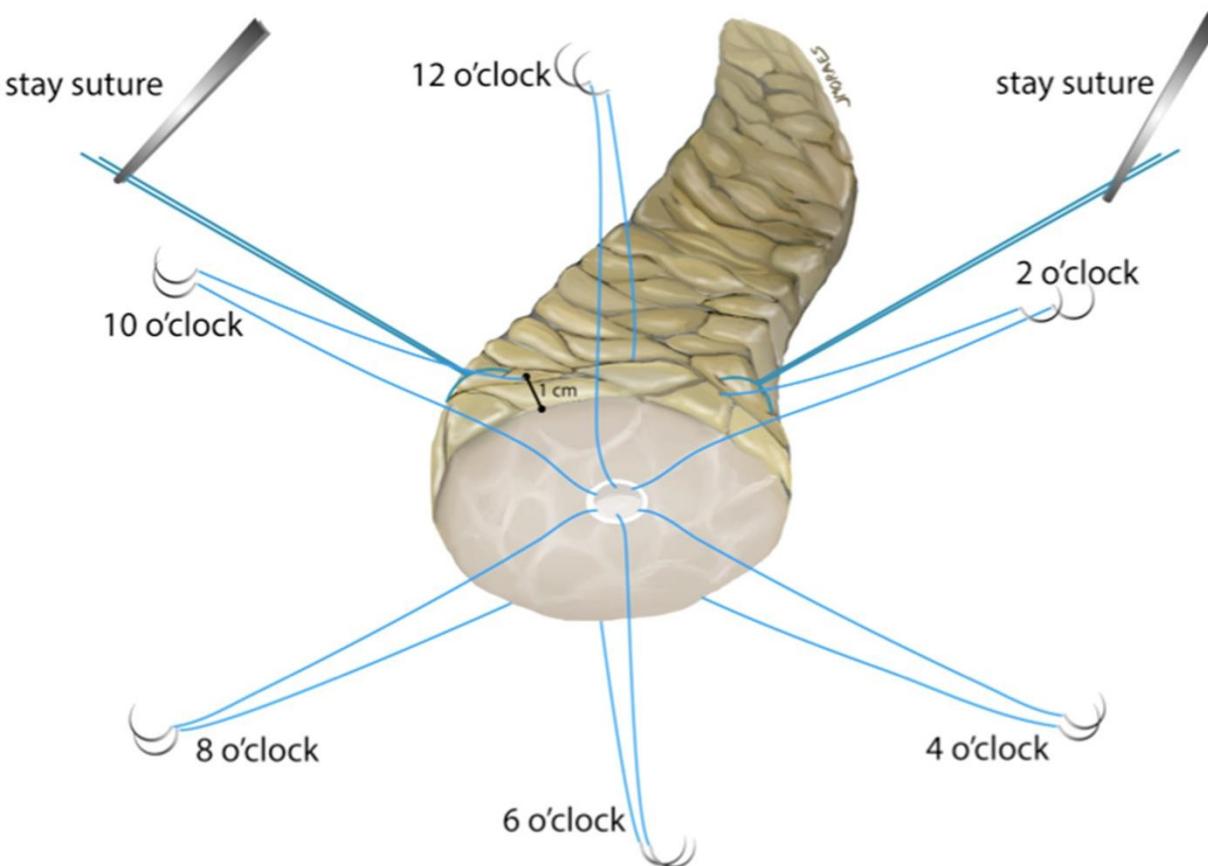


TECHNIQUE

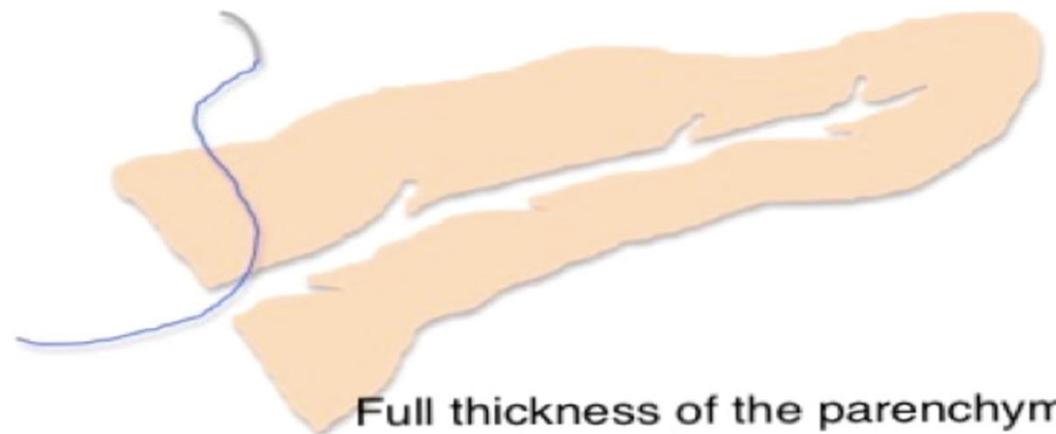


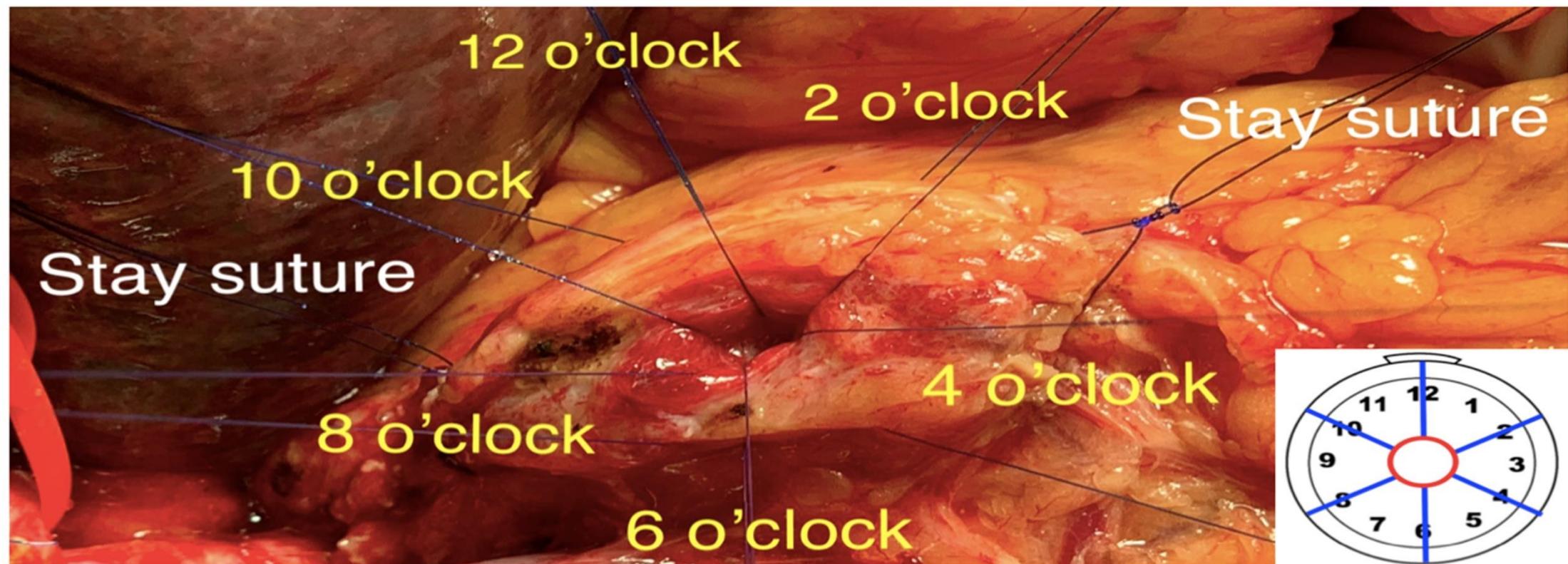
Full thickness of the parenchyma

ANTERIOR DUCT-PANCREATIC SUTURE



TECHNIQUE



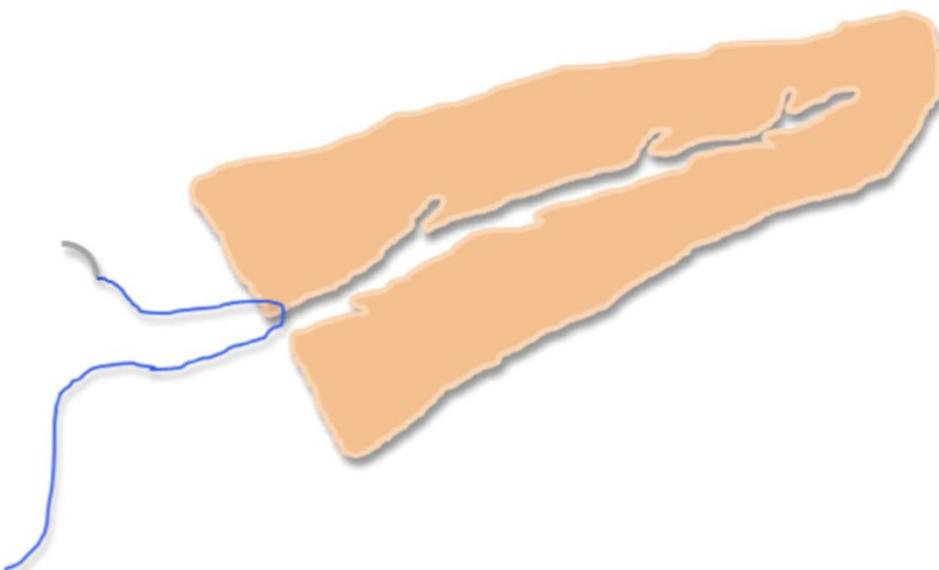


DUCT-TO-MUCOSA

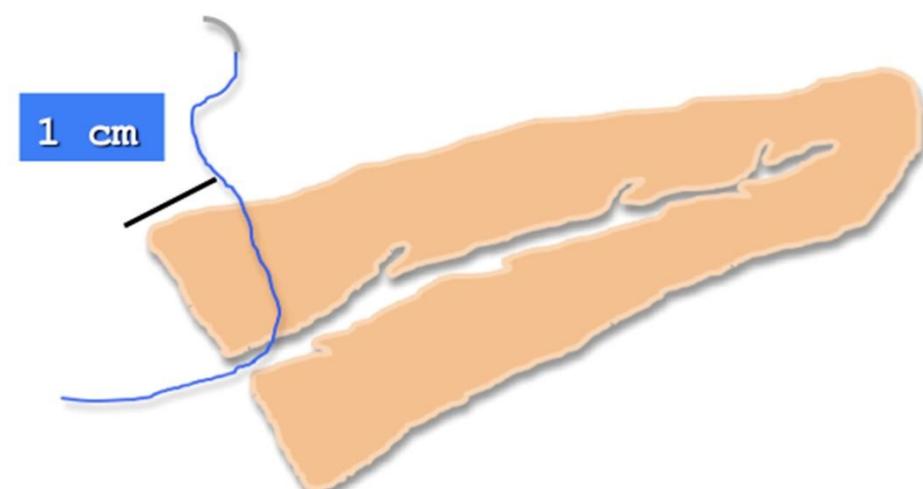
VS

MODIFIED HEIDELBERG

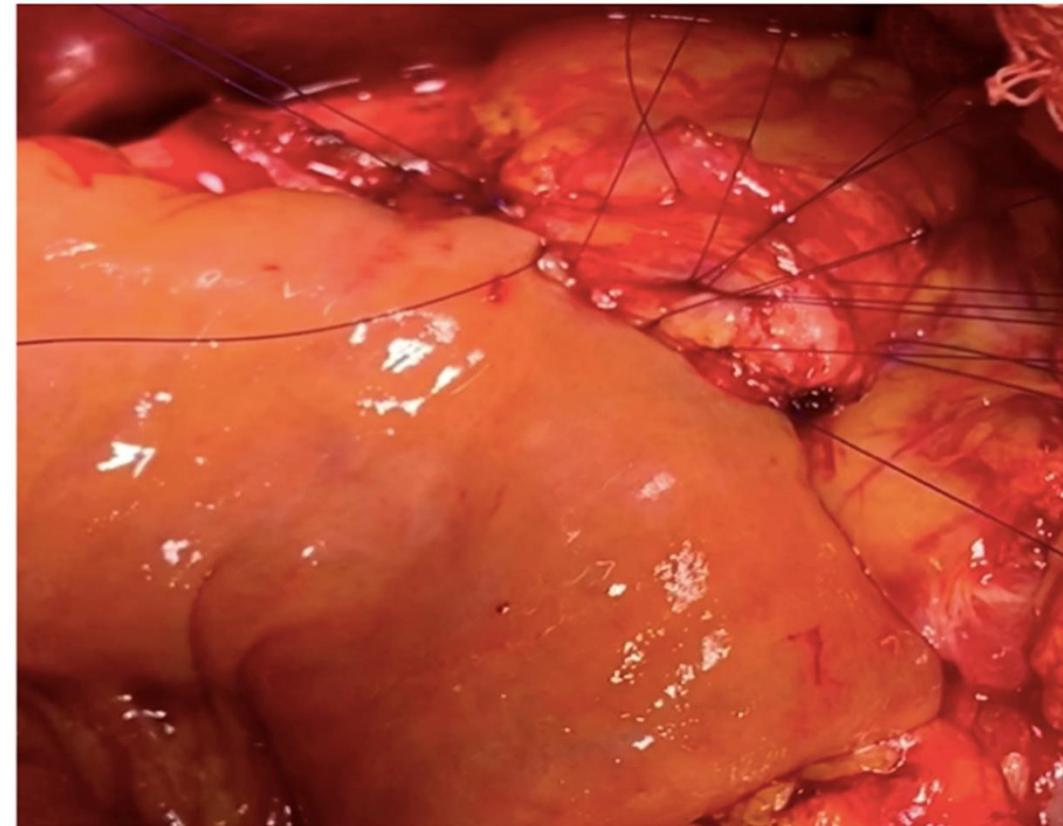
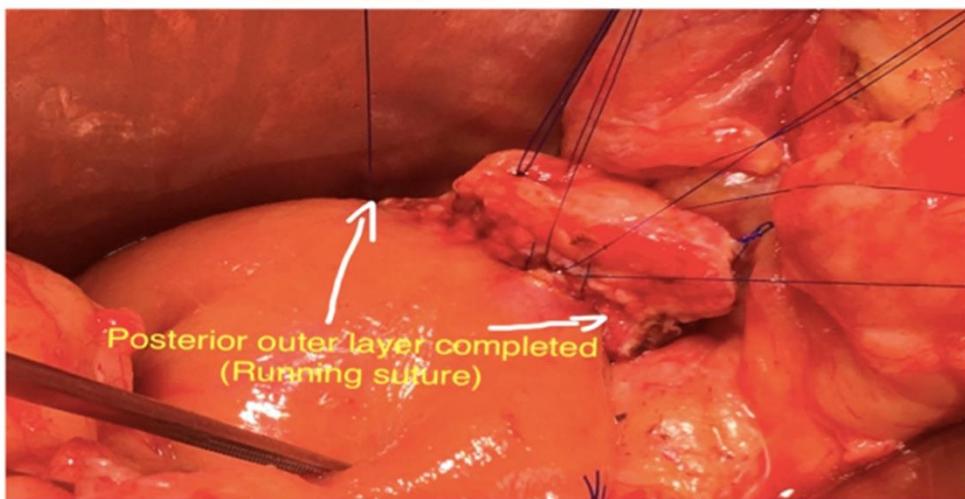
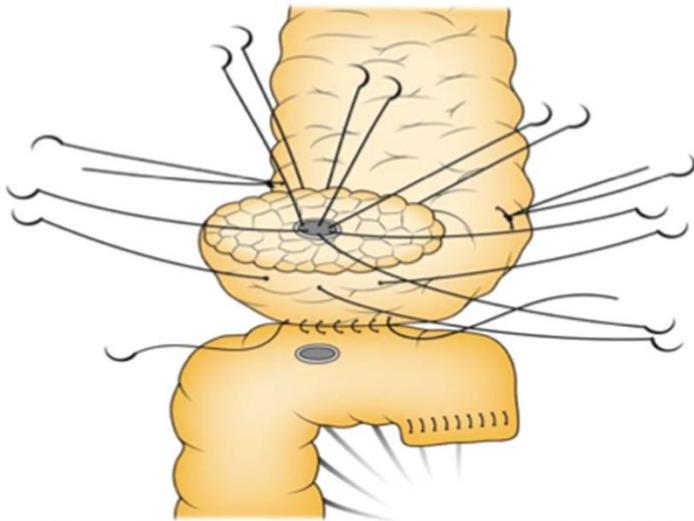
- Less duct
- No parenchyma
- Small area
- Less than 3mm deep



- More duct
- Parenchyma
- Full thickness
- 1 cm deep

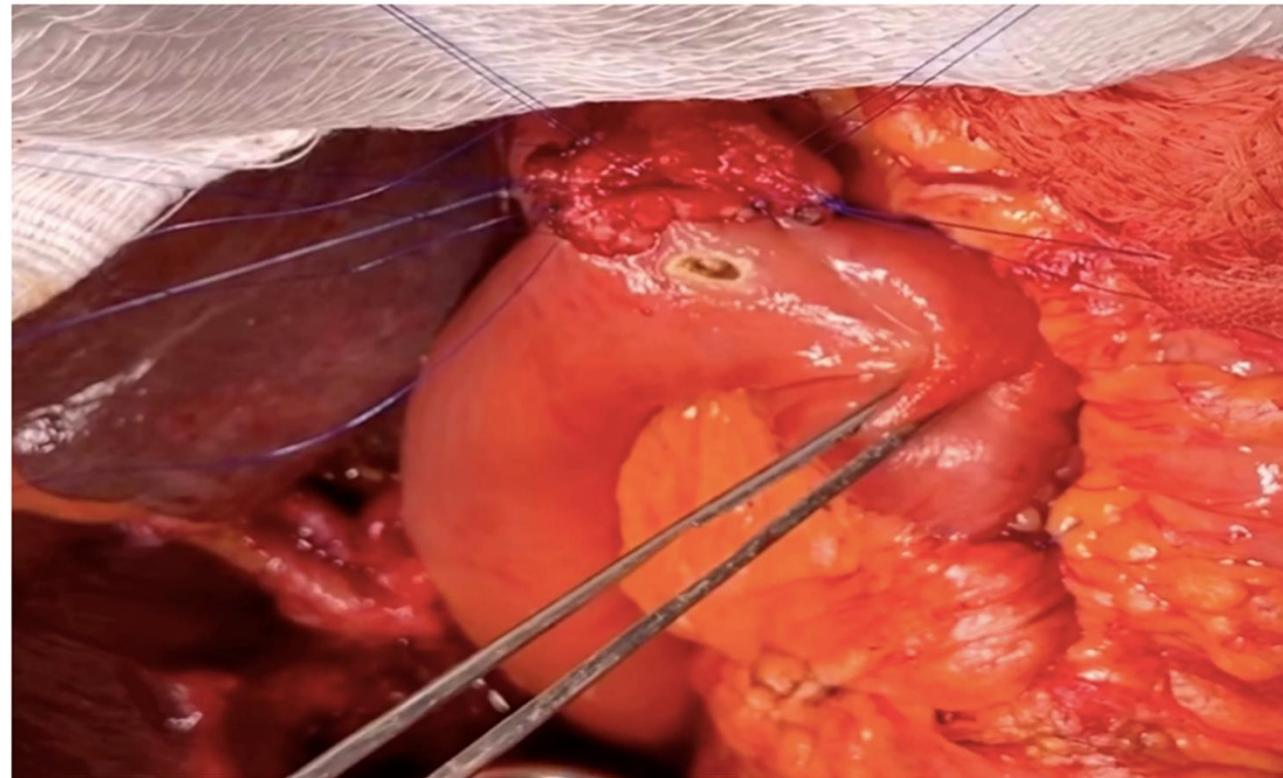
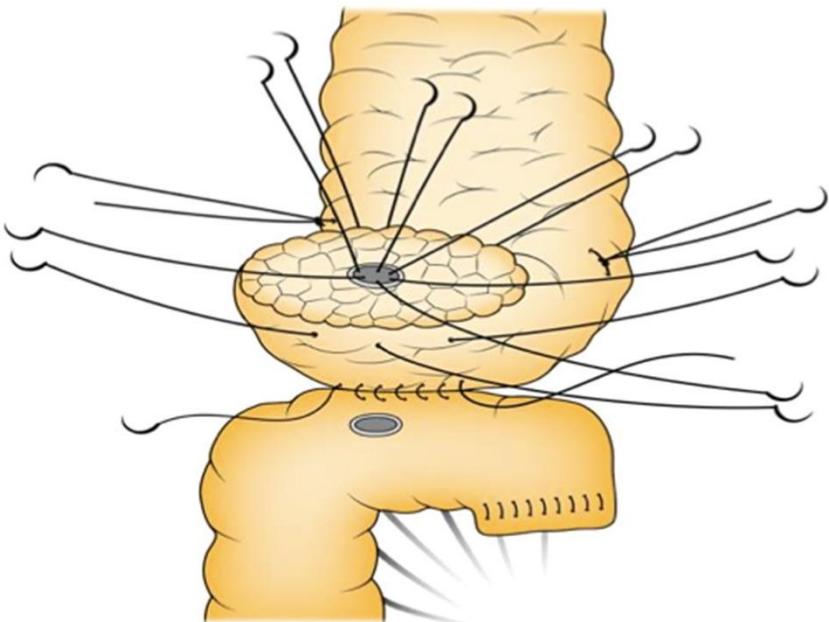


1. POSTERIOR OUTER LAYER



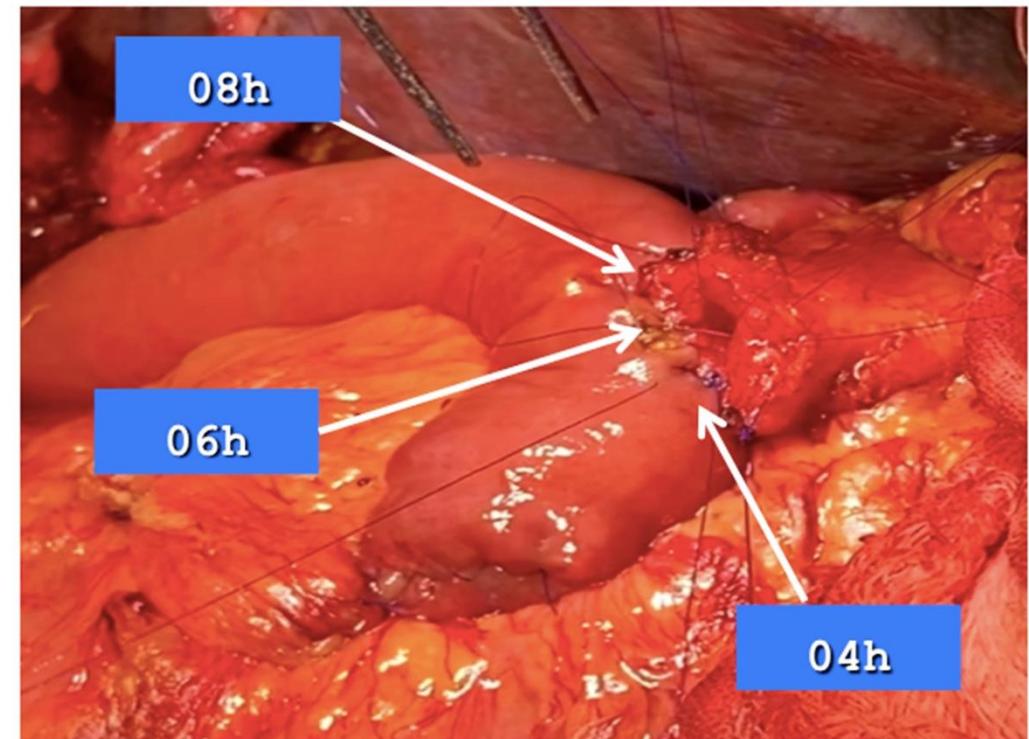
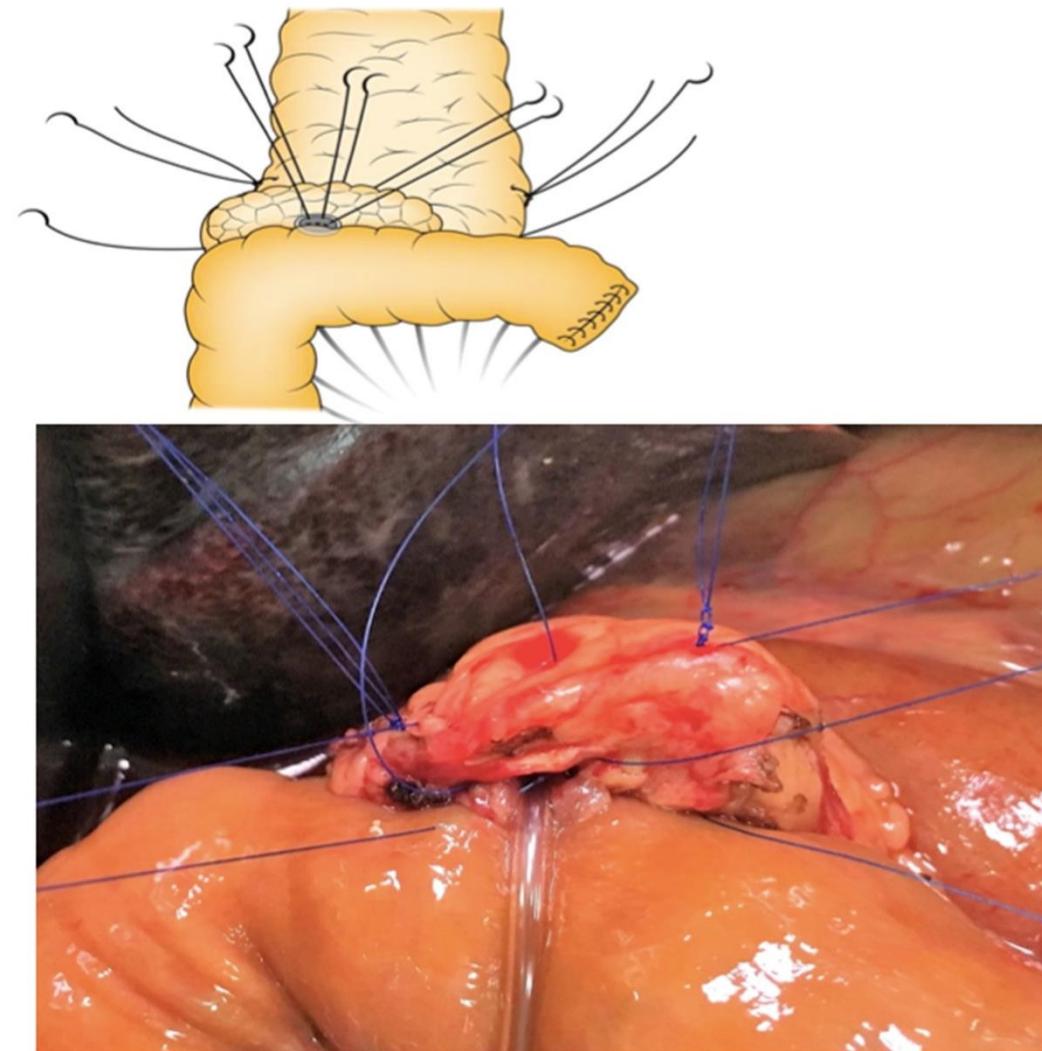
Running suture

THE JEJUNUM IS OPENED



- Anti-mesenteric side
- 0.5 cm long
- Near the pancreatic duct

2. POSTERIOR (duct-jejunum) INNER LAYER

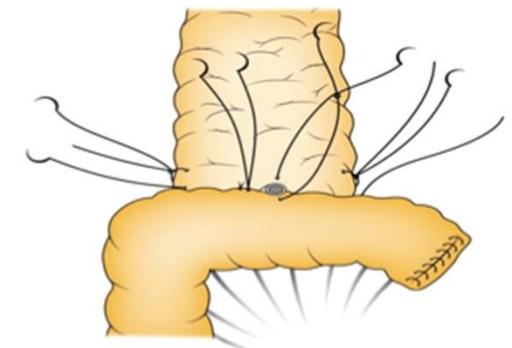
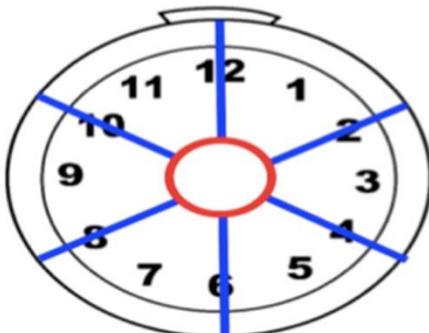
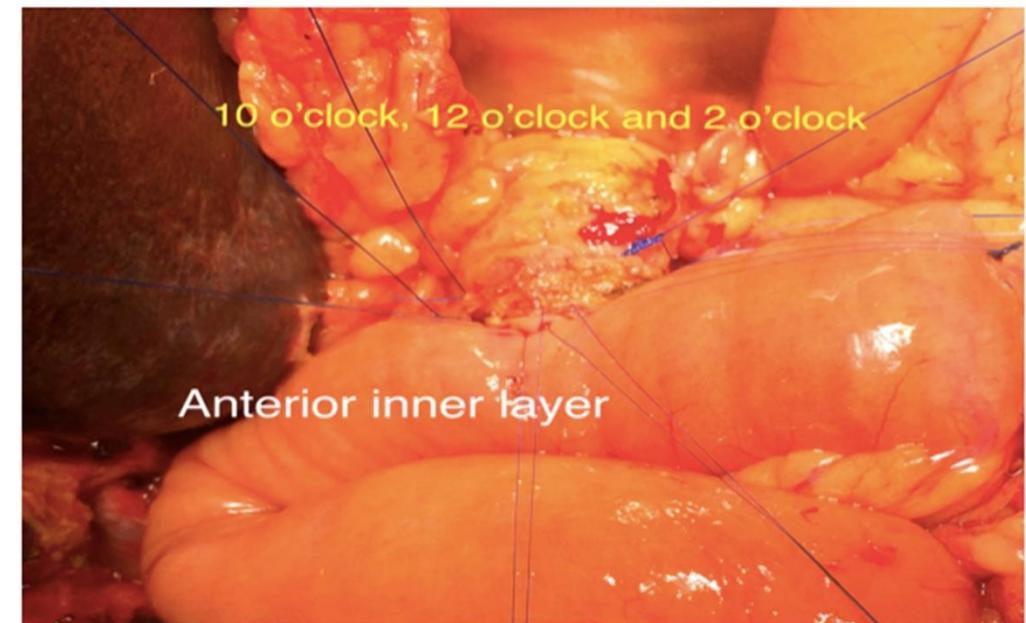
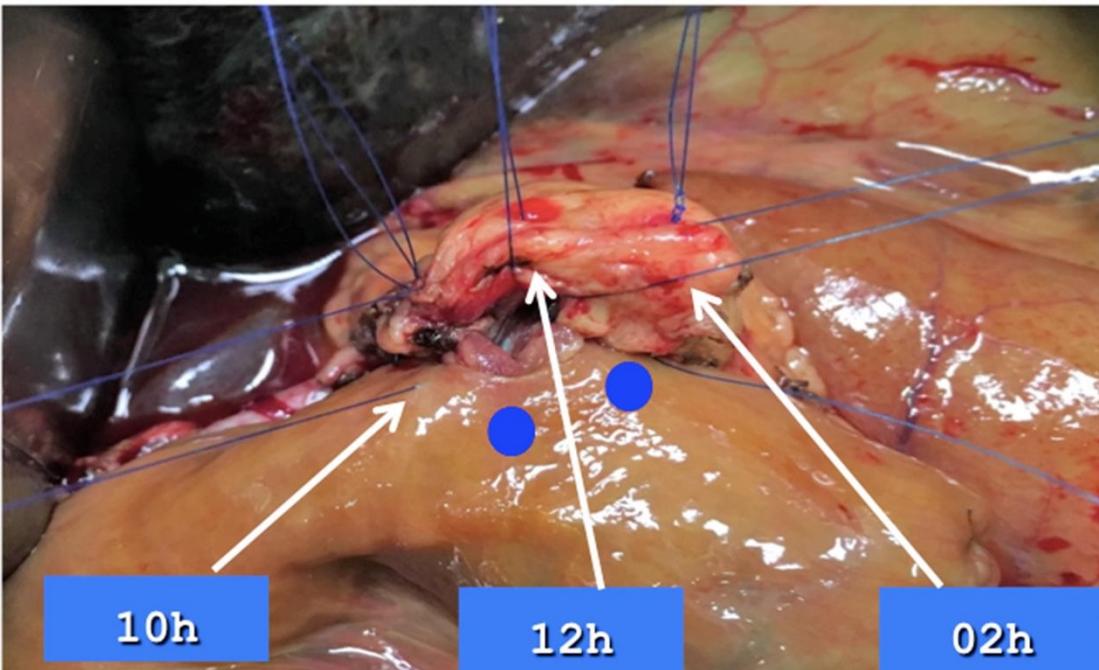


ANASTOMOTIC STENTING

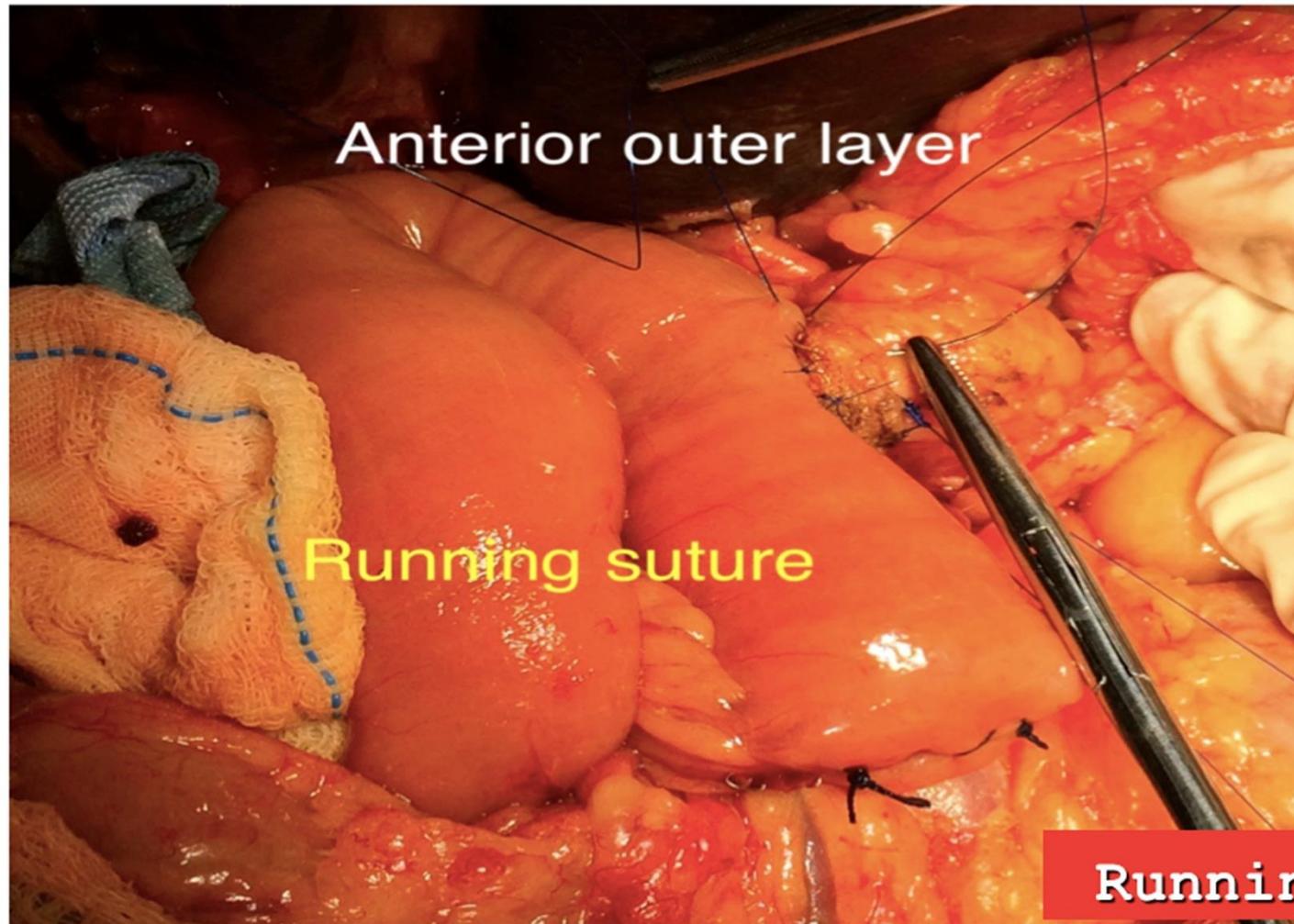
WHY NOT?

- Keep pancreatin away from the anastomosis
- Easy placement of sutures on the anterior wall of the duct
- Avoid occlusion of the small pancreatic duct
- Sufficient drainage prevent postoperative pancreatitis
- Helpful for duct-to-mucosa anastomosis on small ducts

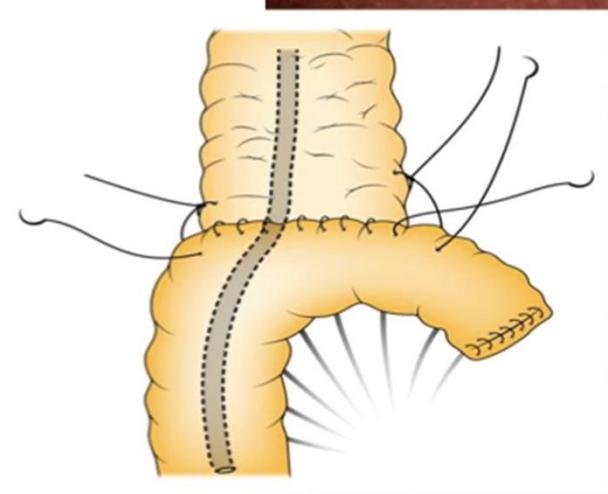
3 .ANTERIOR (duct-jejunum) INNER LAYER



4 . ANTERIOR OUTER LAYER



STAY SUTURE



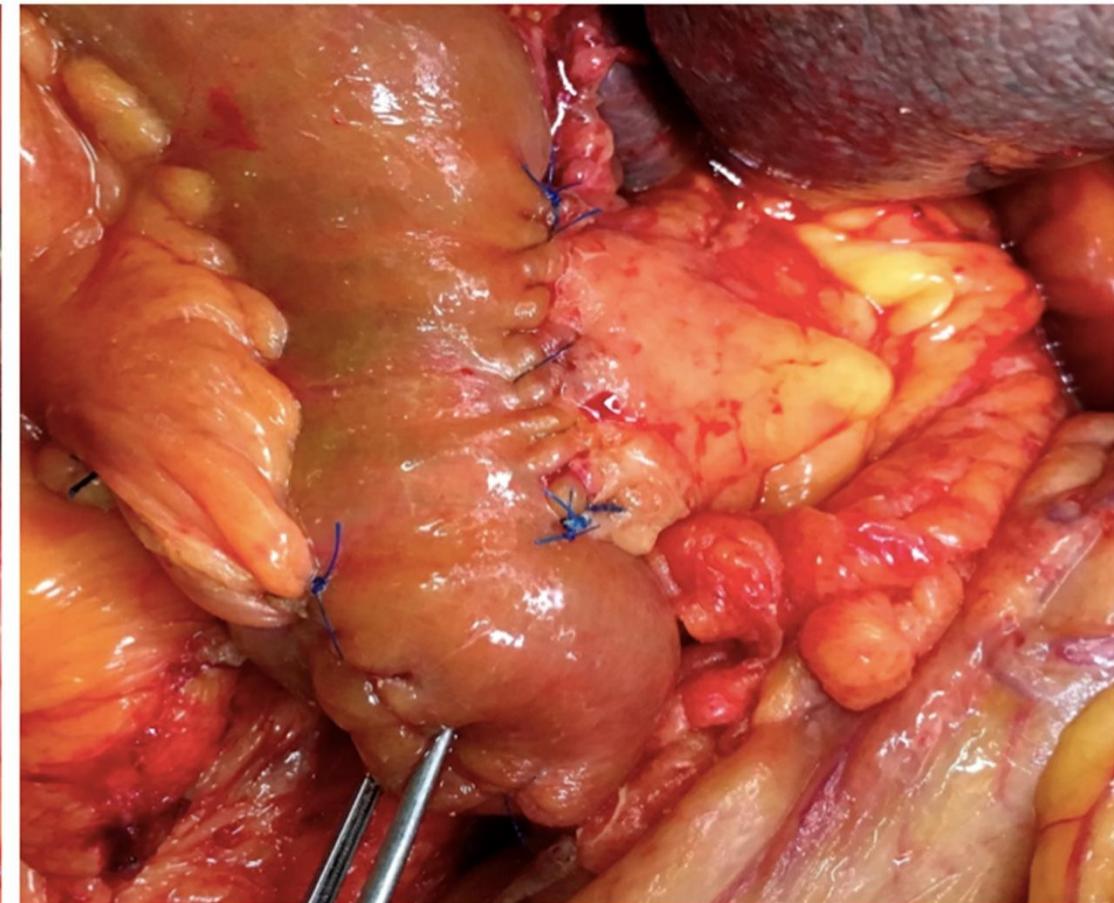
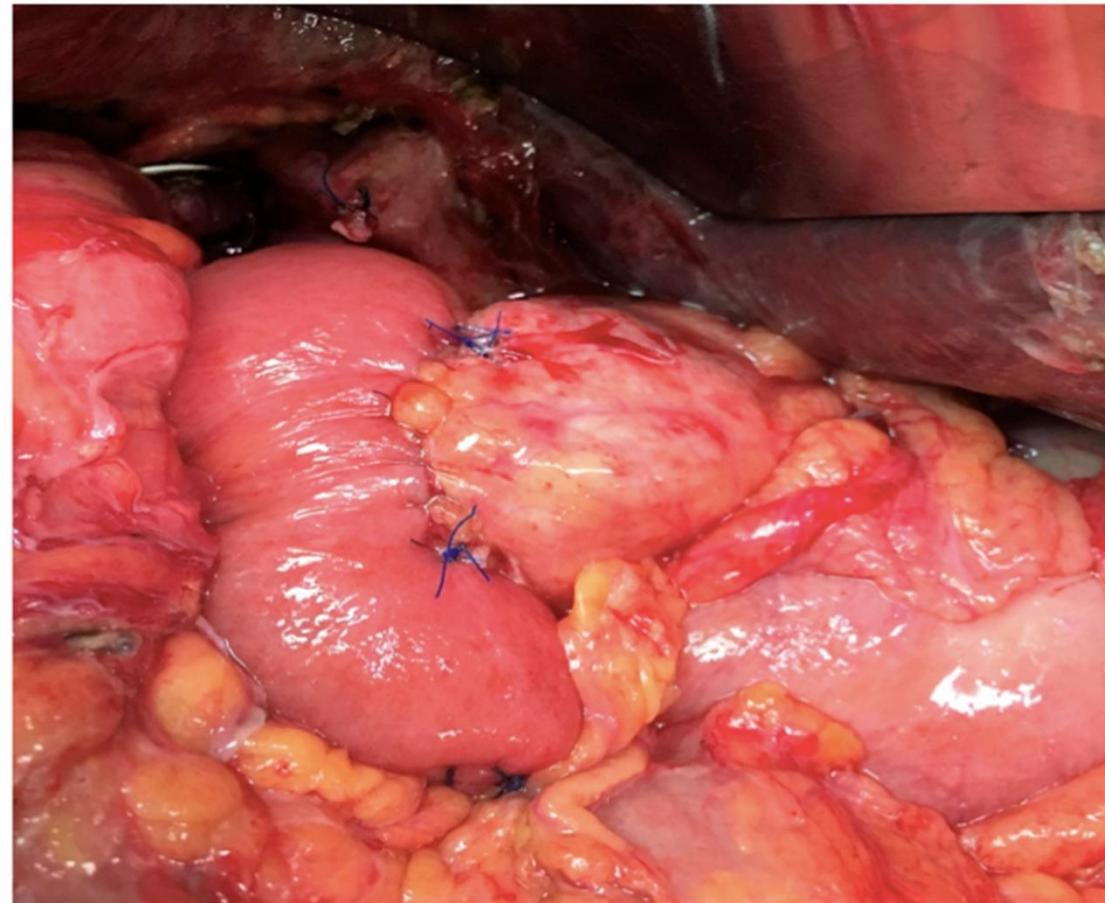
Included in the anastomosis

Stay suture

Stay suture

Minimize tension

FINAL ASPECT





Obrigado !

Thanks !