

XXII Semana Brasileira do Aparelho Digestivo



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## Estase gástrica pós-duodenopancreatectomia: há como evitar? como tratar?

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## **Conflitos de interesse:**

*\*De acordo com a RDC 96/2008 da ANVISA*

# Position statement

## Delayed gastric emptying (DGE) after pancreatic surgery: A suggested definition by the International Study Group of Pancreatic Surgery (ISGPS)

**Table II.** Consensus definition of DGE after pancreatic surgery

DGE grade	NGT required	Unable to tolerate solid oral intake by POD	Vomiting/gastric distension	Use of prokinetics
A	4–7 days or reinsertion > POD 3	7	±	±
B	8–14 days or reinsertion > POD 7	14	+	+
C	>14 days or reinsertion > POD 14	21	+	+

DGE, Delayed gastric emptying; POD, Postoperative day, NGT, Nasogastric tube.

To exclude mechanical causes of abnormal gastric emptying, the patency of either the gastrojejunostomy or the duodenojejunostomy should be confirmed by endoscopy or upper gastrointestinal gastrographin series.

# Position statement

## Delayed gastric emptying (DGE) after pancreatic surgery: A suggested definition by the International Study Group of Pancreatic Surgery (ISGPS)

**Table III.** Parameters for grading of DGE

DGE	Grade A	Grade B	Grade C
Clinical condition	Well	Often well/minor discomfort	Ill/bad/severe discomfort (increased overall risk owing to complications and procedures)
Comorbidities	No	Possibly yes (pancreatic leak or fistula, intraabdominal abscess)	Possibly yes (pancreatic leak or fistula, intraabdominal abscess)
Specific treatment	Possibly yes (prokinetic drugs)	Yes (prokinetic drugs, potential reinsertion of NGT)	Yes (prokinetic drugs, NGT)
Nutritional support (enteral or parenteral)	Possibly yes (slower return to solid food intake)	Yes (partial parenteral nutrition)	Yes (total parenteral or enteral nutrition via NGT, prolonged, i.e., >3 weeks postoperatively)
Diagnostic evaluation	No	Possibly yes (endoscopy, upper GI contrast study, CT)	Yes (endoscopy, upper GI contrast study, CT)
Interventional treatment	No	No	Possibly yes (e.g., abscess drainage, relaparotomy for complication, relaparotomy for DGE)
Prolongation of hospital stay	Possibly yes	Yes	Yes
Delay of potential adjuvant therapy	No	No	Yes

CT, Computed tomography; DGE, Delayed gastric emptying; GI, Gastrointestinal; NGT, nasogastric tube.

RESEARCH

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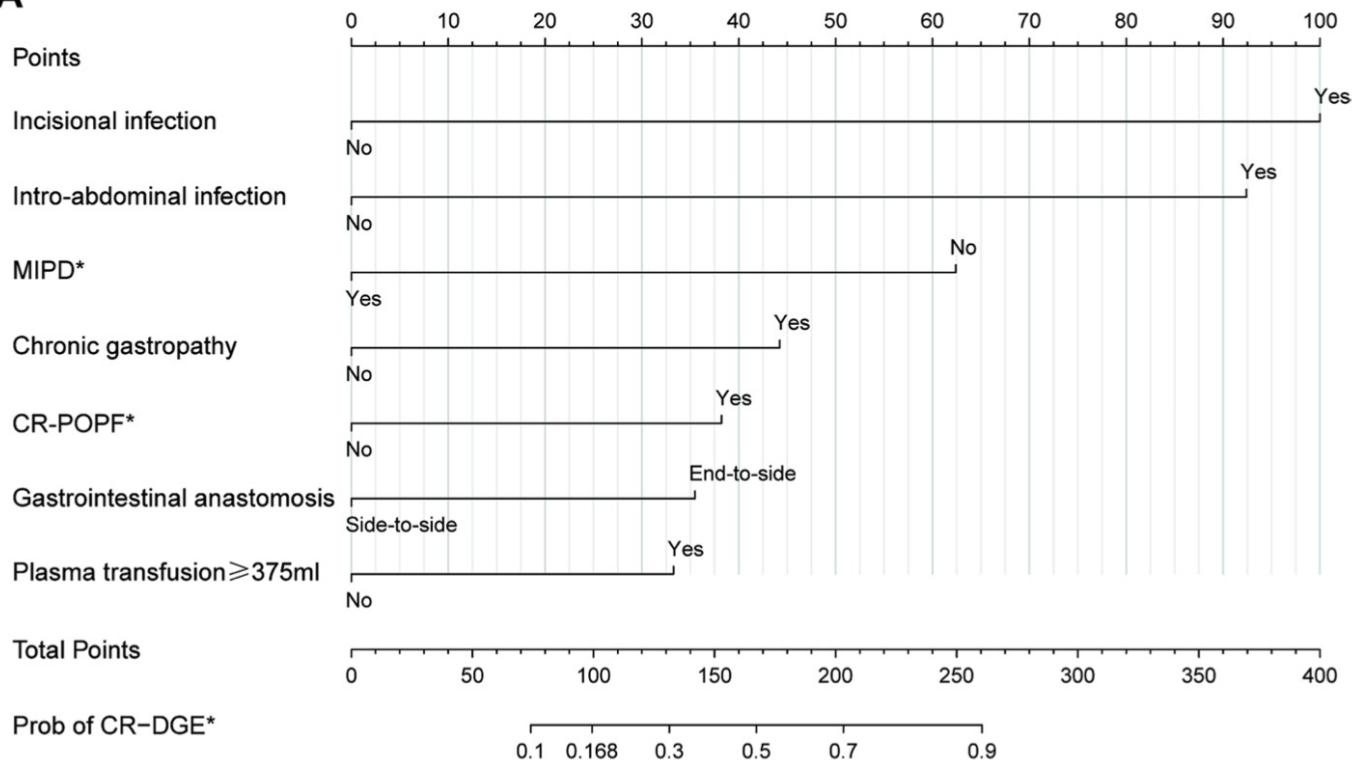


## Risk stratification of clinically relevant delayed gastric emptying after pancreaticoduodenectomy

**Table 2** Multivariate logistic regression

	Estimate	SE	Wald	P-value	OR	95% confidence interval	
						Lower	Upper
Intro-abdominal infection	2.178	0.541	16.242	0.000	8.831	3.062	25.475
Incisional infection	2.357	1.003	5.520	0.019	10.563	1.478	75.487
CR-POPF	0.901	0.378	5.685	0.017	2.462	1.174	5.164
MIPD	-1.471	0.549	7.176	0.007	0.230	0.078	0.674
End-to-side anastomosis	0.836	0.334	6.277	0.012	2.307	1.200	4.438
History of chronic gastropathy	1.043	0.429	5.910	0.015	2.837	1.224	6.576
Plasma transfusion ≥ 400 ml	0.784	0.316	6.147	0.013	2.191	1.179	4.072

SE standard error, OR odds ratio, MIPD minimally invasive pancreaticoduodenectomy, CR-POPF clinically relevant postoperative pancreatic fistula

**A**

**Table 4** Recently reported studies in predicting risk factors and protective factors for DGE

Author, year	Country	Type	Research period	Sample size	Outcome variable	Risk factors	Protective factors
Herrera, 2019 [19]	Spain	RCT	2013–2016	64	Grade A-C	Male gender, Intro-abdominal complications, Preoperative malnutrition, Hemorrhage	NA
Watanabe, 2020 [20]	Japan	Retrospective	2009–2018	281	Grade B-C	POPF, TACC > 110 mm	NA
Cai, 2020 [2]	China	Retrospective	2009–2018	308	Grade B-C	PPPD, Biliary leak- age, Intra-abdom- inal infection, Diabetes	NA
Lee, 2020 [21]	South Korea	Retrospective	2010–2016	115	Grade A-C	PPPD, POPF grade B-C	NA
Snyder, 2020 [22]	USA	ACS-NSQIP database	2014–2016	10,249	Grade B-C	Age > 65 years, Male sex, BMI > 30, ASA ≥ 3, PPPD, Longer operative time (> 356 min)	Preoperative chemotherapy

**PPPD: preservação pilórica**

**Table 4** Recently reported studies in predicting risk factors and protective factors for DGE

Author, year	Country	Type	Research period	Sample size	Outcome variable	Risk factors	Protective factors
Varghese, 2021 [24]	New Zealand	Meta-Analysis on 24 RCTs	1999–2020	2526	Grade B-C	PPPD	Antecolic gastrojejunostomy, Braun's anastomosis
Arango, 2021 [18]	USA	Prospective	2011–2019	724	Grade A-C	PPPD, intra-abdominal abscess, Non-white patient	Implementation of RSPCPs
Fahlbusch, 2022 [25]	Germany	StuDoQ Pancreas database	2014–2018	5,080	Grade A-C	Higher age, Longer operative time, Pancreaticogastrostomy, POPF	NA
Werba 2022 [1]	USA	ACS-NSQIP database	2014–2018	15,154	Grade B-C	Age > 70 years, COPD, Smoker, ASA ≥ 3, Male sex and Preoperative RBC transfusion, PPPD, Pancreaticogastrostomy, Adhesiolysis, Jejunostomy, Vascular reconstruction	Biliary stent placement, Active smoking

POPF postoperative pancreatic fistula, TACC thickness of the abdominal cavity at the level of the celiac axis, PPPD pylorus-preserving pancreaticoduodenectomy, BMI body mass index, RSPCPs risk-stratified pancreatectomy clinical pathways, COPD chronic obstructive pulmonary disease, RBC red blood cell, RCT randomized controlled trial

## PPPD: preservação pilórica



# Risk factors of delayed gastric emptying in patients after pancreaticoduodenectomy: a comprehensive systematic review and meta-analysis

FATORES DE RISCO NÃO OPERATÓRIOS

Table 2

Pooled data about nonoperation-related risk factors.

	Number of articles	Participants	Statistical method	OR	95% CI	P	I <sup>2</sup> (%)	P <sub>H</sub>
Gender	26	8035	Odds ratio (M-H, Random, 95% CI)	1.15	[0.95–1.39]	0.14	56	0.0003
Age	8	2626	Odds ratio (M-H, Fixed, 95% CI)	1.37	[1.10–1.69]	0.005	0	0.8
BMI	11	4074	Odds ratio (M-H, Random, 95% CI)	1.32	[1.00–1.75]	0.05	48	0.04
Malignant pathology	22	6447	Odds ratio (M-H, Fixed, 95% CI)	0.92	[0.79–1.07]	0.26	24	0.15
Tobacco use	5	2079	Odds ratio (M-H, Fixed, 95% CI)	1.13	[0.88–1.45]	0.35	26	0.25
Cardiovascular disease	5	1782	Odds ratio (M-H, Random, 95% CI)	1.3	[0.59–2.84]	0.52	76	0.002
Hypertension	5	1337	Odds ratio (M-H, Fixed, 95% CI)	0.88	[0.64–1.22]	0.45	0	0.55
Diabetes mellitus	24	7044	Odds ratio (M-H, Random, 95% CI)	1.15	[0.85–1.56]	0.35	72	<0.00001
History of pancreatitis	7	2224	Odds ratio (M-H, Random, 95% CI)	1.42	[0.81–2.51]	0.22	61	0.02
Preoperative serum albumin levels	5	1685	Odds ratio (M-H, Fixed, 95% CI)	0.97	[0.72–1.32]	0.87	15	0.32
Preoperative biliary drainage	12	3552	Odds ratio (M-H, Fixed, 95% CI)	1.34	[1.09–1.66]	0.006	0	0.61
Jaundice	6	1741	Odds ratio (M-H, Fixed, 95% CI)	1.12	[0.87–1.45]	0.38	5	0.38
Preoperative biliary stenting	6	1520	Odds ratio (M-H, Fixed, 95% CI)	0.84	[0.64–1.11]	0.22	40	0.14
Pancreas texture	9	2654	Odds ratio (M-H, Fixed, 95% CI)	1.23	[1.01–1.51]	0.04	32	0.16
Neoadjuvant treatment	5	1439	Odds ratio (M-H, Fixed, 95% CI)	1.19	[0.73–1.95]	0.49	0	0.67
Pancreatic duct size	6	1947	Odds ratio (M-H, Random, 95% CI)	0.59	[0.40–0.85]	0.005	54.00	0.05

DGE, delayed gastric emptying; M-H, Mantel-Haenszel; OR, odds ratio.

# FATORES DE RISCO OPERATÓRIOS

**Table 3**

Pooled data about operation-related risk factors.

	Number of articles	Participants	Statistical method	OR	95% CI	P	I <sup>2</sup> (%)	P <sub>H</sub>
Portal vein resection	4	1342	Odds ratio (M-H, Fixed, 95% CI)	1.24	[0.83–1.87]	0.3	29	0.24
Pylorus-preserving	13	1599	Odds ratio (M-H, Random, 95% CI)	1.33	[0.98–1.81]	0.07	53	0.01
Transfusion	11	3483	Odds ratio (M-H, Random, 95% CI)	1.43	[0.99–2.06]	0.06	51	0.03
Intraoperative bleeding	9	4132	Odds ratio (M-H, Fixed, 95% CI)	1.44	[1.15–1.80]	0.001	14	0.32
Digestive reconstruction	4	1379	Odds ratio (M-H, Random, 95% CI)	2.22	[0.66–7.38]	0.2	89	<0.00001
Gastrojejunostomy method	8	2714	Odds ratio (M-H, Random, 95% CI)	3.43	[1.17–10.08]	0.02	94	<0.00001
PV/SMV resection	6	1645	Odds ratio (M-H, Fixed, 95% CI)	1.06	[0.71–1.59]	0.78	0	0.62
Surgical site infection	4	1108	Odds ratio (M-H, Fixed, 95% CI)	1.03	[0.64–1.66]	0.9	18	0.3
Bile leakage	6	1435	Odds ratio (M-H, Random, 95% CI)	2.18	[0.87–5.45]	0.1	67	0.009
POPF	19	5780	Odds ratio (M-H, Random, 95% CI)	2.09	[1.47–2.95]	<0.0001	76	<0.00001
Intra-abdominal collection	6	1273	Odds ratio (M-H, Random, 95% CI)	3.58	[1.64–7.85]	0.001	69	0.007
Intra-abdominal abscess	7	3249	Odds ratio (M-H, Fixed, 95% CI)	3.06	[2.30–4.06]	<0.00001	0	0.62

M-H, Mantel-Haenszel; POPF, postoperative pancreatic fistula; PV, portal vein; SMV, superior mesenteric vein.

## FATORES DE RISCO NÃO OPERATÓRIOS

Older age  
Preoperative biliary drainage  
Soft pancreas texture  
Pancreatic duct size 3 mm or less

## FATORES DE RISCO OPERATÓRIOS

Pylorus-preserving  
Retrocolic gastrojejunostomy  
Blood loss  
POPF  
Intra-abdominal collection  
Intra-abdominal abscess



## RESEARCH ARTICLE

# Risk factors for post-pancreaticoduodenectomy delayed gastric emptying in the absence of pancreatic fistula or intra-abdominal infection

**TABLE 3** Bivariate associations between operative characteristics and isolated delayed gastric emptying (N = 10502)

Operative characteristics	With DGE n (%)	P values
Resection type		0.001
Traditional Whipple	697 (10.8)	
Pylorus-sparing Whipple	526 (13.0)	
Surgical approach		0.159
Open	1129 (11.7)	
Minimally invasive <sup>a</sup>	94 (11.1)	
Reconstruction technique		0.631
Pancreaticojejunal invagination	102 (12.5)	
Pancreaticojejunal duct-to-mucosa	993 (11.4)	
Other/unknown	128 (13.3)	
Reconstruction path		0.149
Antecolic	298 (10.9)	
Retrocolic	144 (12.1)	
Unknown	781 (11.9)	
Vascular reconstruction		0.299
No	975 (11.4)	
Yes	236 (12.7)	
Unknown	12 (12.4)	

Pylorus preserving p= 0.001



## ORIGINAL ARTICLE

## Is delayed gastric emptying associated with pylorus ring preservation in patients undergoing pancreaticoduodenectomy?

**Table 2**

The incidence of delayed gastric emptying and postoperative course.

Variables	PpPD (n = 51)	PrPD (n = 57)	P
Delayed gastric emptying	20 (39.2%)	5 (8.8%)	<0.001
Grade A	3 (5.9%)	0 (0.0%)	0.204
Grade B	6 (11.8%)	0 (0.0%)	0.025
Grade C	11 (21.6%)	5 (8.8%)	0.110
Removal of NGT (day)	2.5 ±1.3	1.1 ±0.5	<0.001
Reinsertion of NGT	10 (19.6%)	5 (8.8%)	0.178
Reinsertion day of NGT	1.9 ±4.9	0.9 ±3.1	0.100
Start of Solid diet (day)	5 ±1.7	4.1 ±0.7	0.001
Postoperative hospital stay (day)	26.6 ±17.2	21.7 ±12.7	0.103
Requirement of total parenteral nutrition	17 (33.3%)	5 (8.8%)	0.003
Re-operation	1 (2.0%)	0 (0.0%)	0.955

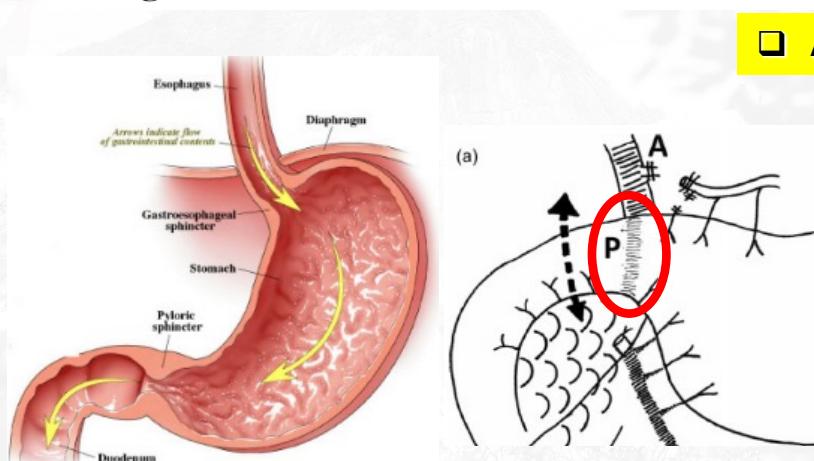
NGT, nasogastric tube; PpPD, pylorus-preserving pancreaticoduodenectomy; PrPD, pylorus-resecting pancreaticoduodenectomy.

PpPD: preservação pilórica

Pylorus preserving p&lt; 0.001

ORIGINAL ARTICLE – PANCREATIC TUMORS

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



□ Adjust the diameter of the gastric outlet is possible

Gastric outlet diameter

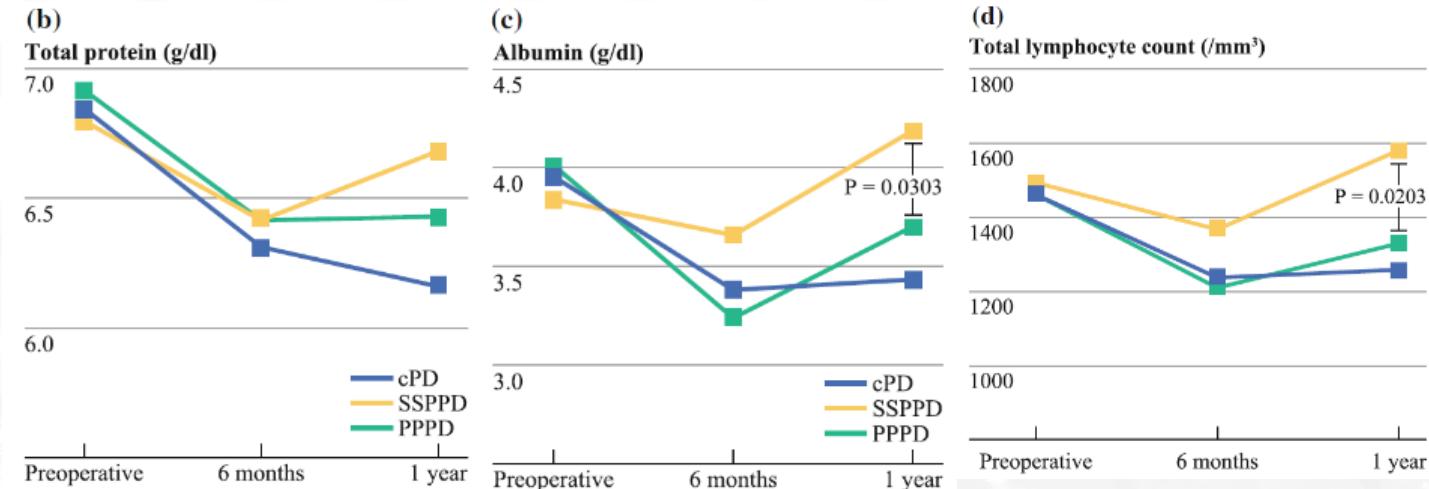
PPPD  $33 \pm 5\text{mm}$   
SSPPD  $47 \pm 7\text{mm}$   
 $p < 0,0001$

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

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

- DGE grade B or more      p=0.0012
- Length of the nasogastric tube    p=0.0006
- Days to start oral intake      p=<0.0001

PPPD: preservação pilórica



**Conclusions.** Our results suggest that preservation of the pyloric ring without vagal innervation has little significance, and that SSPPD with better perioperative and long-term outcomes is more suitable as a standard procedure for patients with pancreatic head cancer.

# Pylorus Ring Resection Reduces Delayed Gastric Emptying in Patients Undergoing Pancreatoduodenectomy

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

**TABLE 2.** Delayed Gastric Emptying and Postoperative Course

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

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

**Conclusion:** Pylorus-resecting pancreateoduodenectomy significantly reduces of the incidence of DGE compared with PpPD.

**PpPD: preservação pilórica**

# Total mesopancreas excision

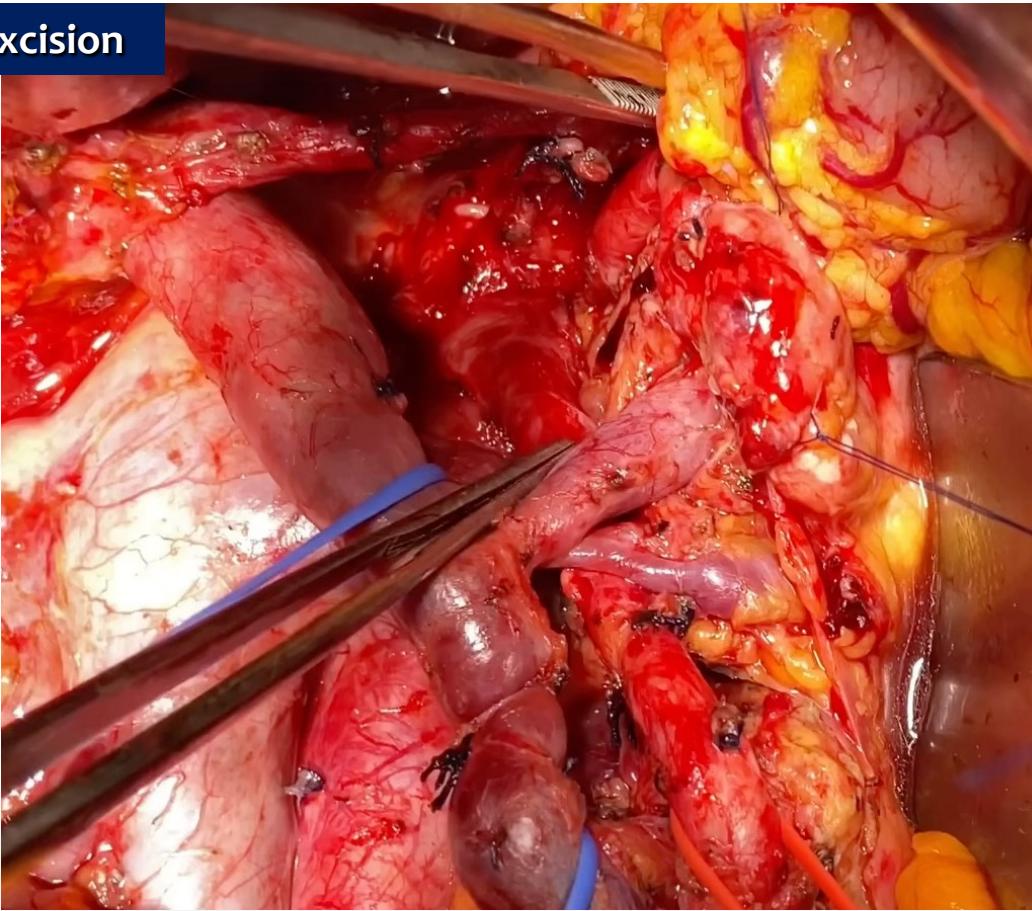
**Shailesh Shrikhande**  
(Mumbai)



**Markus Buchler**  
(Heidelberg)



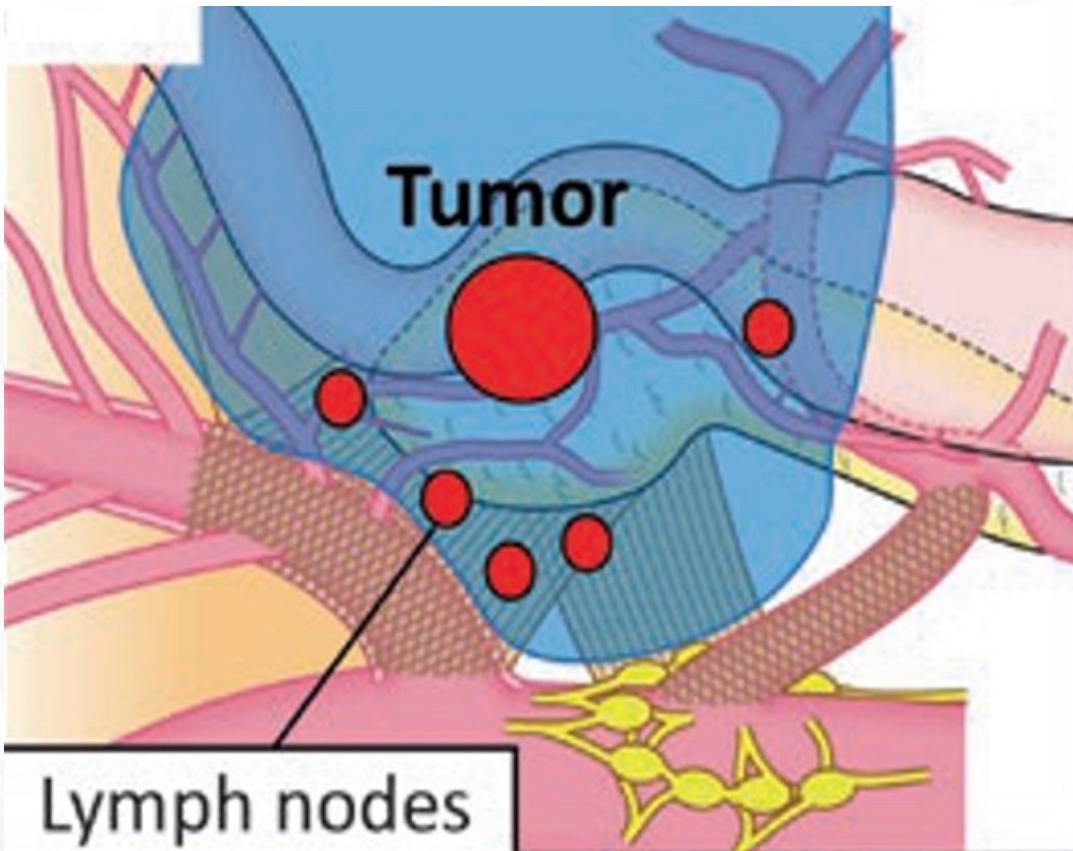
## Total mesopancreas excision



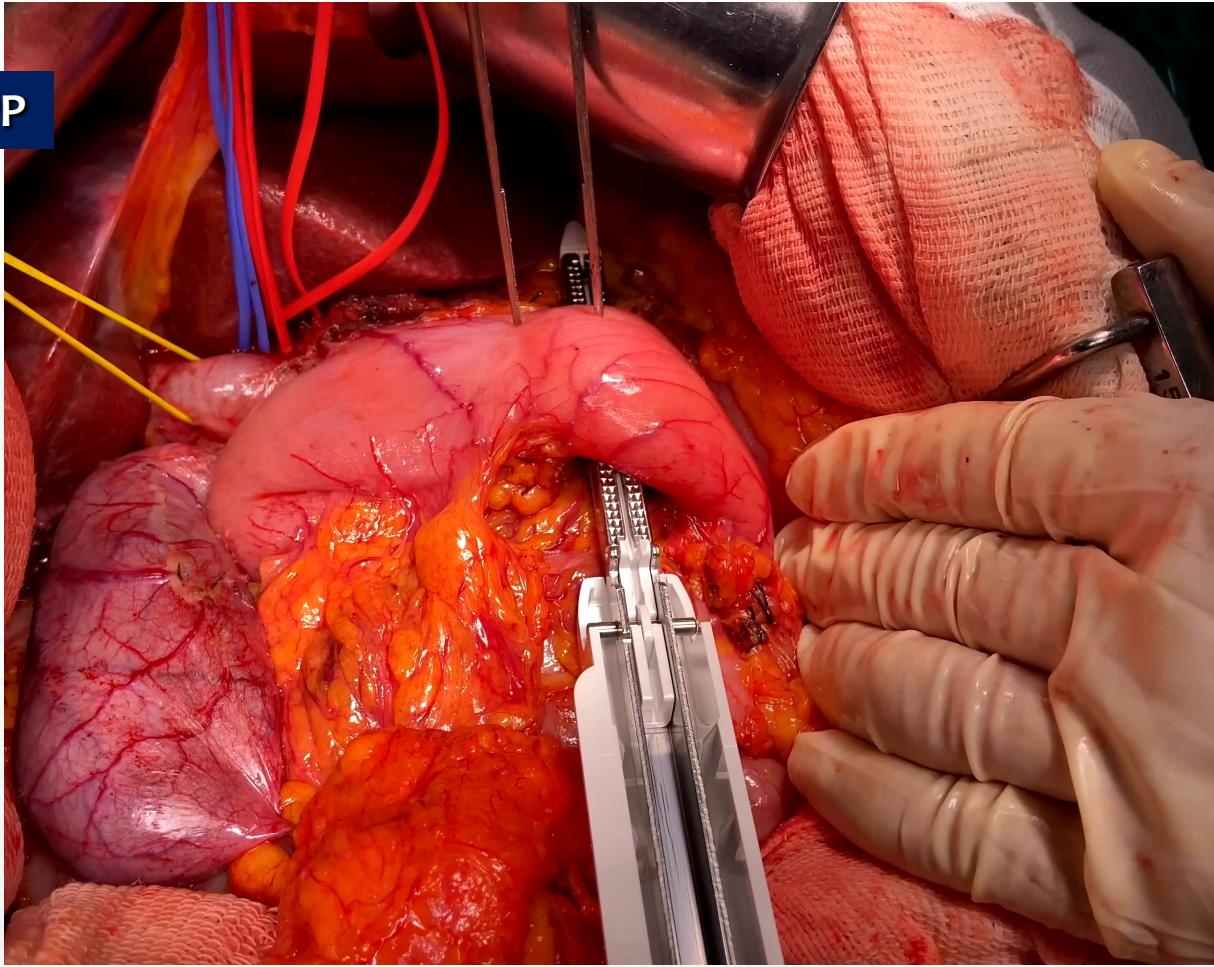
## Lymph node dissection

### Peripyloric lymph node metastasis

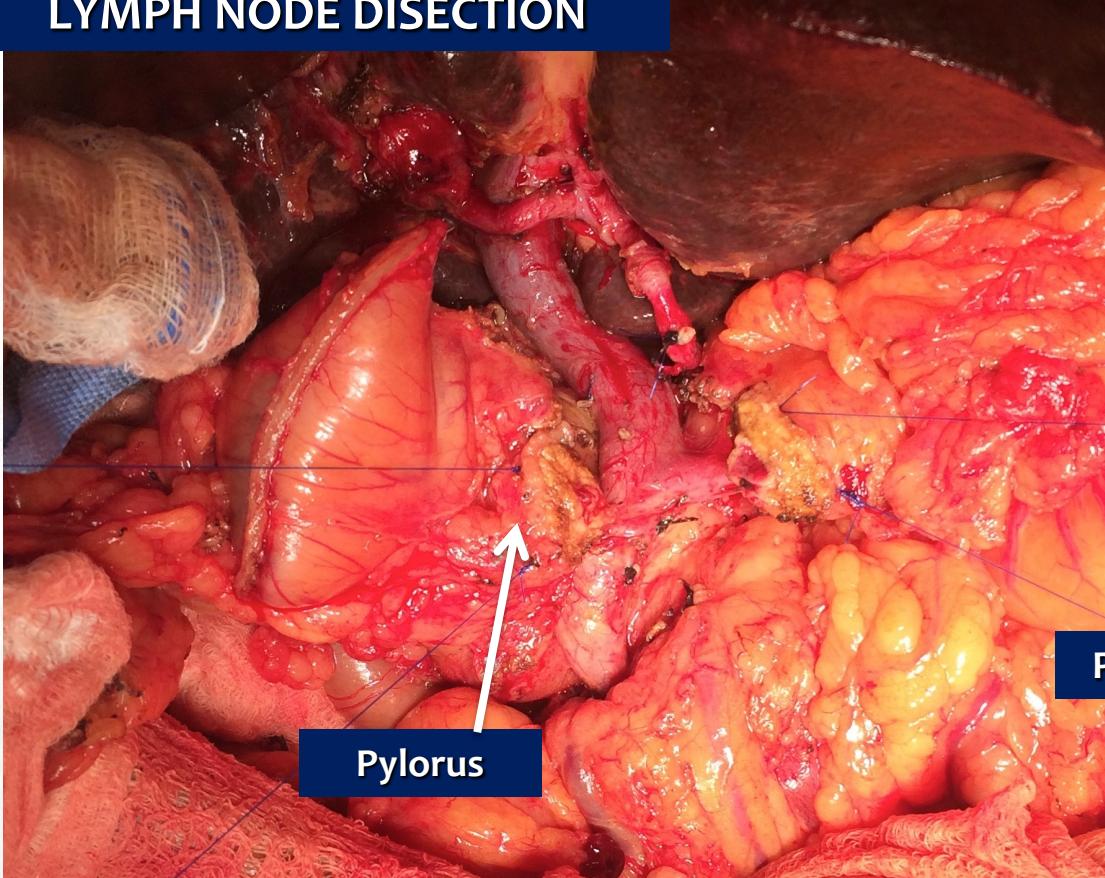
Lesser curvature	0	0%
Greater curvature	1	0,3%
Suprapyloric	3	0,8%
Infrapyloric	34	9,5%



**SSPP**



## LYMPH NODE DISECTION



Pyloric lymph nodes

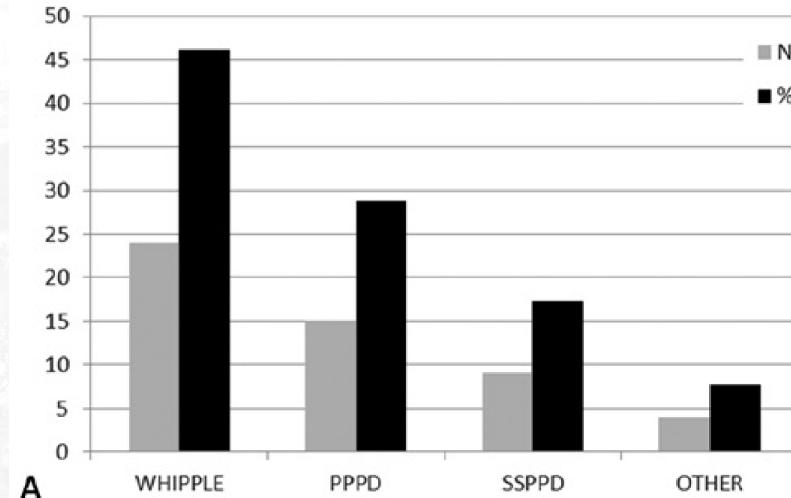
Pylorus

## PANCREATODUODENECTOMY: BRAZILIAN PRACTICE PATTERNS\*

*Duodenopancreatectomia: prática padrão do Brasil\**

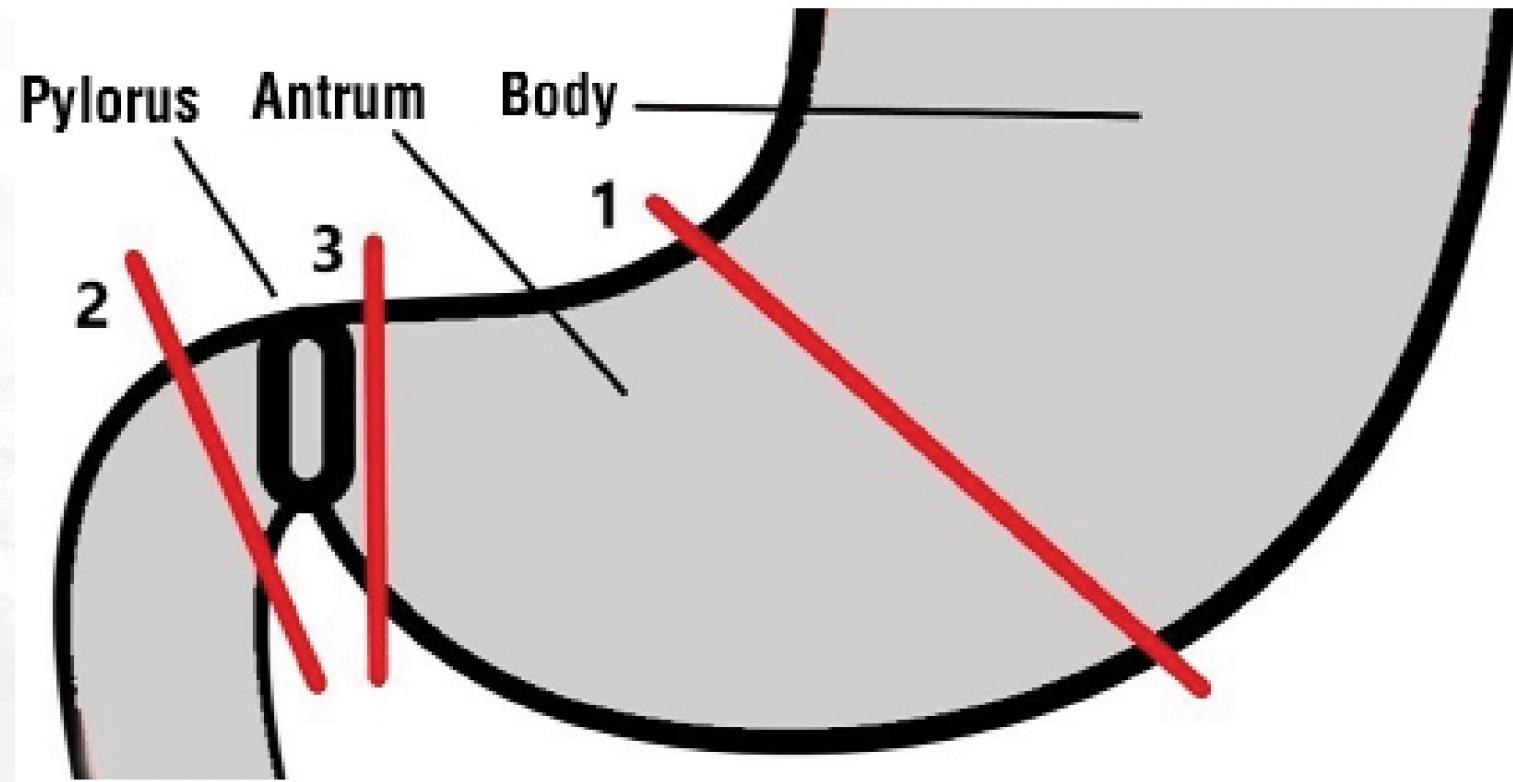
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**PRESERVAÇÃO PILÓRICA**



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**From Classic Whipple to Pylorus Preserving  
Pancreaticoduodenectomy and Ultimately to Pylorus Resecting  
– Stomach Preserving Pancreaticoduodenectomy: A Review**



**Table 1.** Randomized control trials comparing the classic Whipple with the Pylorus Preserving Pancreaticoduodenectomy

Author	Year of publication	Study type	No of patients (Whipple vs. PPPD)	Follow up	No Differences	PPPD Superior	Whipple Superior
Paquet et al. (53)	1998	RCT	23 vs. 17	Up to 12 years	Morbidity Hospital Mortality Long term Survival	Digestive and exocrine function restoration Nutritional recovery	
Lin et al. (55)	1999	RCT	15 vs. 16	During hospital stay	Operative mortality – morbidity Operation time Blood loss		DGE (Non SS)
Srinarmwong et al. (58)	2008	RCT	13 vs. 14	Up to 60 months	Operation time Blood loss Operative mortality and morbidity Hospital stay Survival		DGE
Taher et al. (59)	2015	RCT	8 vs. 12	During hospital stay	Morbidity	Blood loss Blood transfusions Hospital stay	
Burquets et al. (62)	2022	RCT	42 vs. 42	6 Months	DGE Postoperative morbidity Hospital stay	Anthropometric measurements (Triceps fold, upper arm circumference) at 6 months	

RCT: Randomized control trial, PPPD: Pylorus preserving pancreaticoduodenectomy

**PPPD: preservação pilórica**

**Table 2.** Randomized control trials (RCT) comparing Pylorus Preserving Pancreaticoduodenectomy (PPPD) with Pylorus Resecting Pancreaticoduodenectomy (PRPD)

Author	Year of publication	Study type	No of patients (PPPD vs. PRPD)	Follow up	No Differences	PRPD Superior	PPPD Superior
Kawai et al. (64 - 65)	2011 2014	RCT	64 vs. 66	6 months – 24 months	Postoperative morbidity and mortality Quality of life Weight loss Nutritional status Long term outcomes	DGE	
Matsumoto et al. (66)	2014	RCT	50 vs. 50	3 years	DGE Postoperative serum albumin levels Serum total cholesterol levels Body mass index		
Hackert et al. (67)	2018	RCT	95 vs. 93	30 days	DGE		
Klaiber et al. (68)	2020	RCT	45 vs. 51	Up to 57 months (median: 36,2 months)	Endocrine / exocrine pancreatic function Receipt of chemotherapy Cancer recurrence Reoperations Readmissions Quality of life	Late cholangitis	

RCT: Randomized control trial, DGE: Delayed gastric emptying, PPPD: Pylorus preserving pancreaticoduodenectomy,  
PRPD: Pylorus resecting pancreaticoduodenectomy

**PPPD: preservação pilórica**

there is a notable trend in the literature highlighting the increasing incidence of DGE following PPPD.

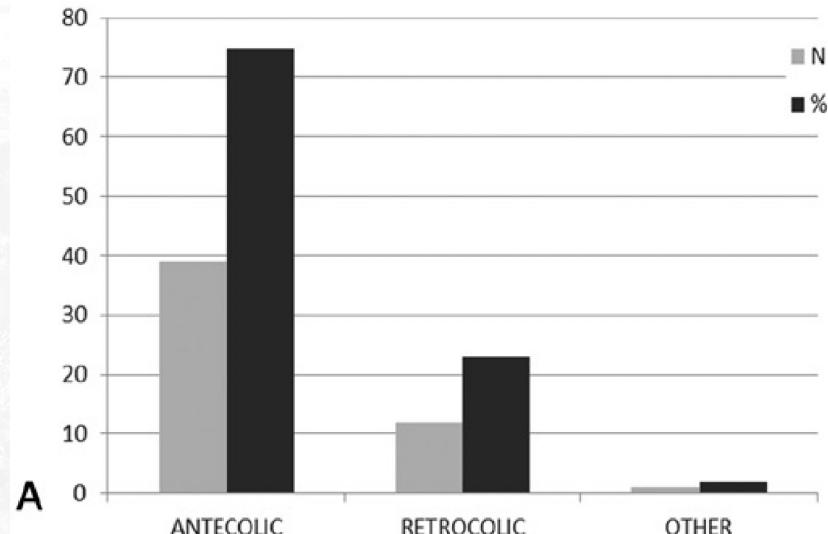
PPPD: preservação pilórica

## PANCREATODUODENECTOMY: BRAZILIAN PRACTICE PATTERNS\*

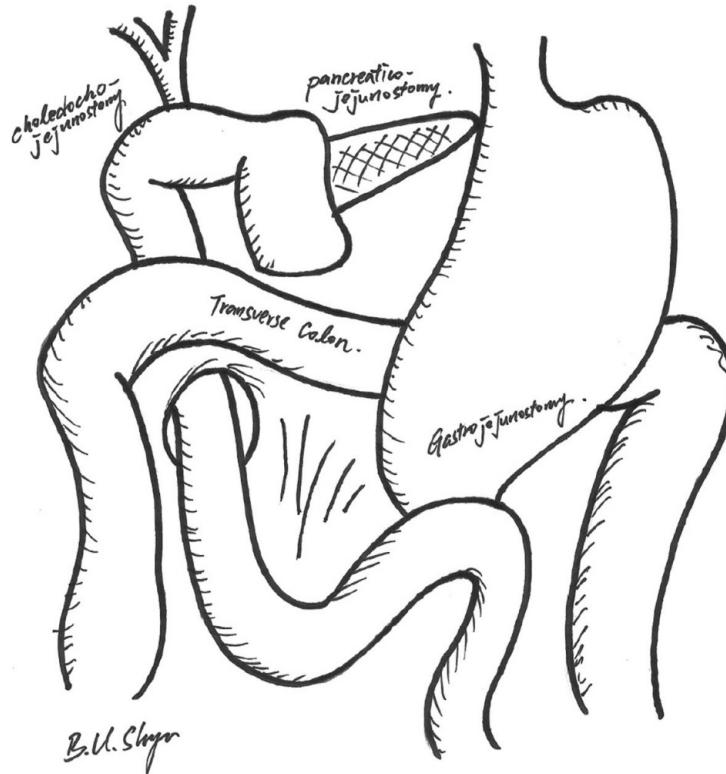
*Duodenopancreatectomia: prática padrão do Brasil\**

Orlando Jorge M **TORRES**<sup>1</sup>, Eduardo de Souza M **FERNANDES**<sup>2</sup>, Rodrigo Rodrigues **VASQUES**<sup>1</sup>, Fabio Luís **WAECHTER**<sup>3</sup>,  
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### RECONSTRUÇÃO GÁSTRICA

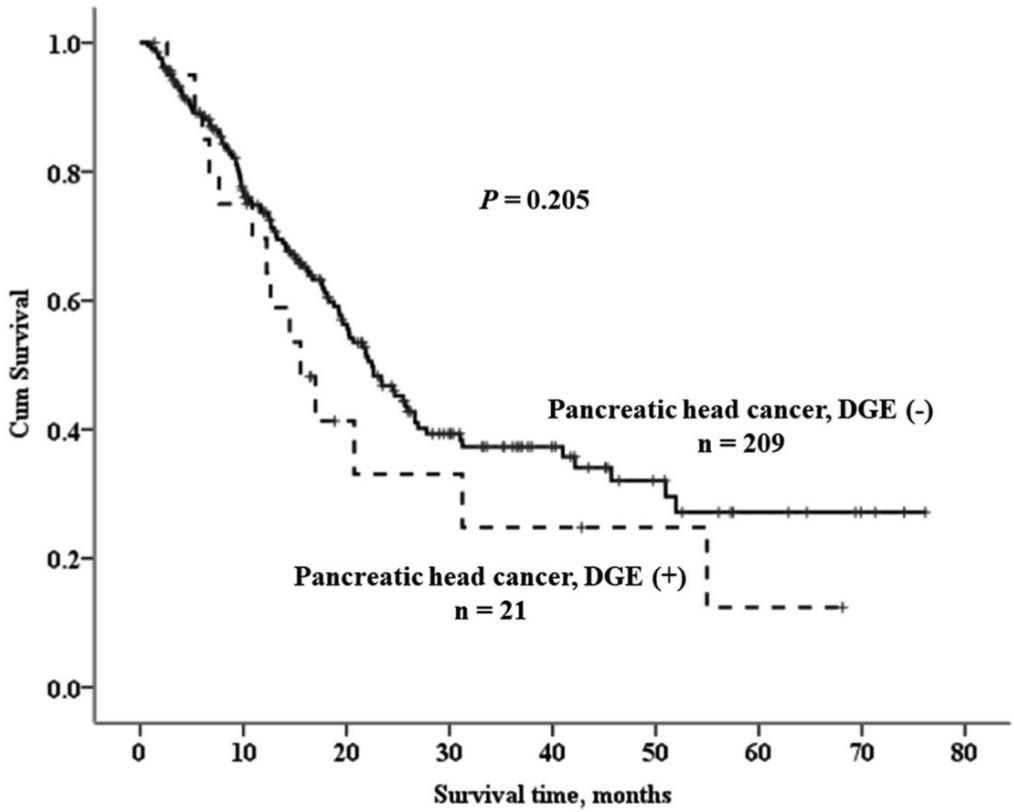


# RECONSTRUÇÃO GÁSTRICA



**Figure 1.** Sketch illustration of surgical technique in RPD with antecolic, antiperistaltic, and inframesocolic gastrojejunostomy. The influence of inflammation created after pancreaticoduodenal resection or related to the pancreatic fistula on the gastrojejunral anastomosis could be avoided or minimized.

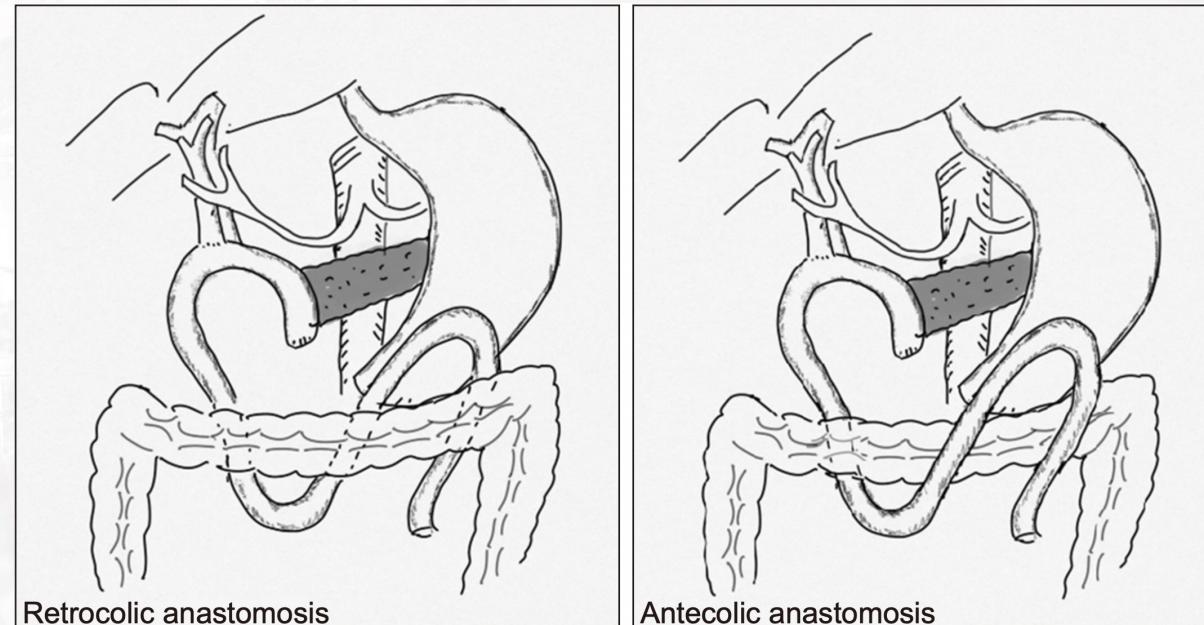
# SOBREVIDA





Original Article

**Impact of route of reconstruction of  
gastrojejunostomy on delayed gastric emptying after  
pancreaticoduodenectomy:  
A prospective randomized study**



**Table 2.** Delayed gastric emptying

	Anastomosis						<i>p</i> -value	
	Antecolic			Retrocolic				
	Mean ± SD	Min–max	Median (IQR)	Mean ± SD	Min–max	Median (IQR)		
Day of NGT removal	6.42 ± 3.99	2–19	6.00 (3.00–8.00)	5.32 ± 5.97	2–23	3.00 (2.00–5.25)	0.006	
Liquid diet tolerance (day)	7.94 ± 3.50	4–19	7.00 (6.00–9.00)	5.59 ± 4.47	3–21	4.00 (3.00–5.00)	< 0.001	
Solid diet tolerance (day)	9.84 ± 3.54	3–20	9.00 (7.00–12.00)	8.04 ± 4.42	5–23	7.00 (6.00–7.00)	< 0.001	

SD, standard deviation; IQR, interquartile range; NGT, nasogastric tube.

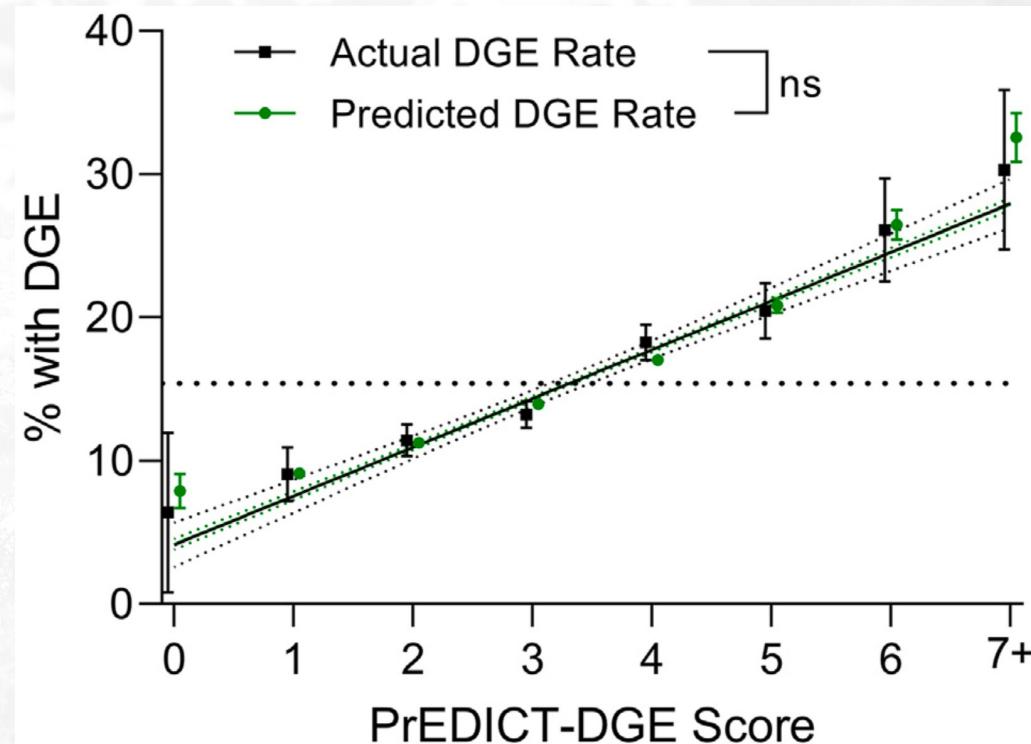
## ORIGINAL ARTICLE

**The PrEDICT-DGE score as a simple preoperative screening tool identifies patients at increased risk for delayed gastric emptying after pancreaticoduodenectomy**

**Table 4** PrEDICT-DGE scoring system

Acronym	Predictor Variable	Points	
Pr	Procedures	Lysis of Adhesion Vascular Reconstruction with Vein Graft Feeding Jejunostomy	2 (each)
E	Erythrocytes	Preoperative RBC Transfusion	2
D	Duct Stent	No Biliary Stent	1
I	Invagination (Pancreatic Reconstruction Technique)	Invagination	1
PPW w/ PG	PPW w/ PG	2	
	COPD	2	
T	Tobacco	Non-smoker	1
D	Disease, systemic	ASA $\geq$ 3	1
G	Gender	Male	1
E	Elderly	Age $>$ 70	1

COPD, Chronic Obstructive Pulmonary Disease; RBC, Red Blood Cells;  
 ASA, American Society of Anesthesiologists; PPW, Pylorus Preserving  
Whipple; PG, Pancreaticogastrostomy; DTM, Duct-to-Mucosa.



## 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 pancreatectomy was described by Whipple originally and included distal hemigastrectomy. Pylorus-preserving pancreatectomy (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<sup>2,4,5,7</sup>.

More recently, and mostly in Japan since the late 1990s, subtotal stomach-preserving pancreatectomy (stomach-preserving) in which the pyloric ring and 2 cm of the distal stomach only is removed with preservation of about 90% of the stomach has been performed for pancreatic head disease. This surgical procedure was associated with fewer postoperative complications. After stomach-preserving, many recent studies have been carried out comparing the two techniques<sup>2,6,8</sup>. Subtotal stomach-preserving pancreatectomy was adopted in 2011 at the Department of Hepato-pancreatobiliary Surgery, Federal University of Maranhão, Brazil.

NÃO PRESERVAR O PILORO



**Auditório:** Professor. Alexandre, o Sr. preserva o piloro em suas duodenopancreatectomias?

**Dr. Alexandre:** SIM, eu preservo em formalina tamponada à 10%

**Dr. Alexandre Prado de Resende**  
Hospital Mater Dei (Belo Horizonte – MG)

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