



Reconstrução pancreática após duodenopancreatectomia

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International Hepato-Pancreato-Biliary Association

Capítulo Brasileiro

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**23 e 24 de
Outubro de 2015
Auditório da
Intermed
(Rua São João, 1300.
Ao lado da Unimed)**

V JORNADA DO COLÉGIO BRASILEIRO DE CIRURGIA DIGESTIVA PIAUÍ



**II JORNADA DO
CB-IHPBA PIAUÍ**

One Thousand Consecutive Pancreaticoduodenectomies

TABLE 5. One Thousand Pancreaticoduodenectomies

	No.	%
Mortality	10	1
Morbidity	41	
Delayed gastric emptying		18
Pancreatic fistula		12
Wound infection		7
Intraabdominal abscess		6
Cardiac event		3
Pancreatitis		2
Bile leak		2
Pneumonia		2
Hemobilia		2
Lymphatic leak		1
Ulcer		1
Reoperation	27	2.7
Bleeding	9	
Abscess	7	
Wound	4	
Negative lap	3	
SBO	2	
Ulcer	1	
PA rupture	1	

Cameron JL, et al. Ann Surg 2006;244:10-15

Fatores de risco

☐ Pâncreas

Textura

Diâmetro do ducto

Suprimento sanguíneo do coto

Débito do suco pancreático

Características da doença

☐ Paciente

Idade

Sexo

Níveis de bilirrubina

Co-morbidades

☐ Operação

Tempo operatório

Perda sanguínea

Tipo de anastomose

Uso de Stent

Textura

Diâmetro do ducto

Risco de fístula pancreática

Table 3 Intraoperative Classification of Pancreatic Parenchyma Density in 218 Consecutive Patients Undergoing Partial Duodenopancreatectomy

Parameters	<i>n</i>	Percentage
Pancreatic density	218	100
Soft	83	38.0
Intermediate	57	26.2
Hard	78	35.8

Fatores de risco

- ❑ Textura do pâncreas e fístula (%)
 - Consistente 0%
 - Frágil (amolecido) 25%
- ❑ Fatores (pâncreas amolecido):
 1. Função exócrina normal
 - Débito elevado do suco pancreático
 2. Associação com ducto fino
 3. Laceração da margem na sutura

Fatores de risco

Table 4 Multivariate logistic regression for pancreatic leakage

Parameters	<i>P</i>	Odds ratio	CI
Anastomotic technique			
Duct-to-mucosa	-	1	
Invagination	0.128	9.967	0.514-193.15
Pancreatic size (mm)			
≥3	-	1	
<3	0.007	11.867	1.96-71.86
Pancreatic texture			
Hard	-	1	
Soft	0.017	15.445	1.629-146.46

Intervenções técnicas

- ❑ Oclusão do ducto pancreático

- ❑ Pancreatogastrostomia

 - Convencional

 - Técnica de Montenegro

- ❑ Pancreatojejunostomia

 - Ducto-mucosa

 - Invaginação

 - Peng

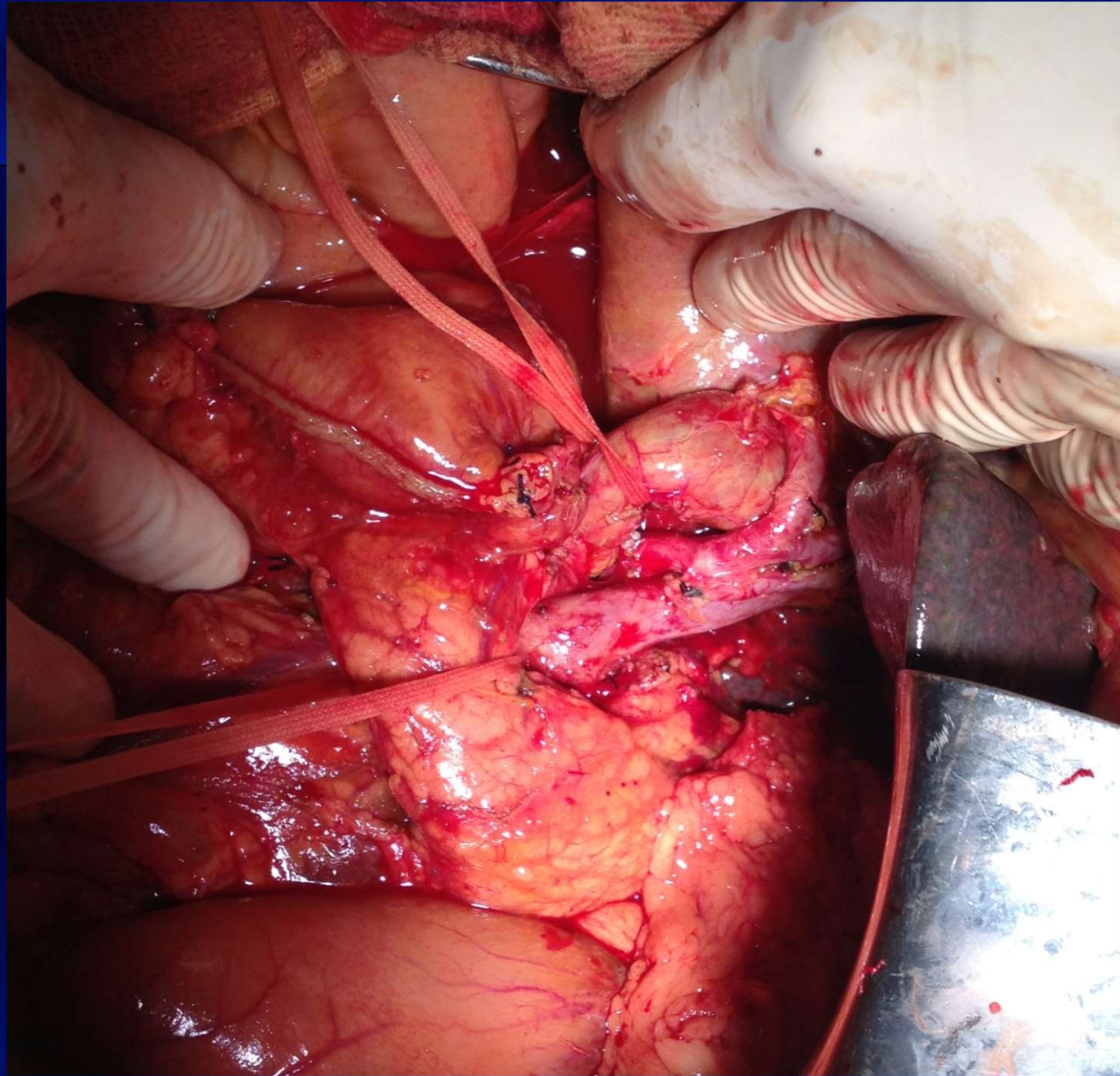
 - Alça isolada em Y de Roux

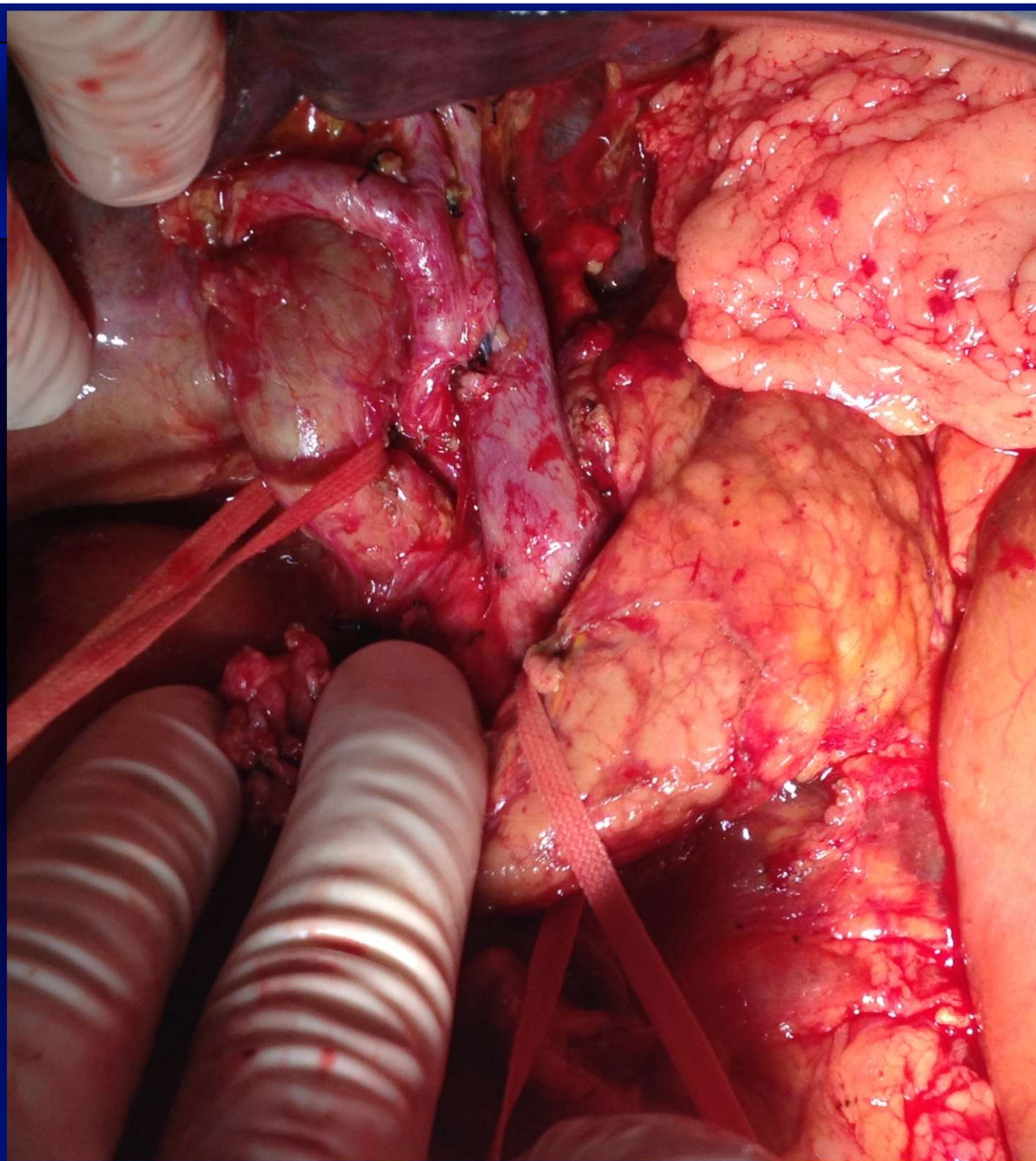
 - Convencional (Alça única)

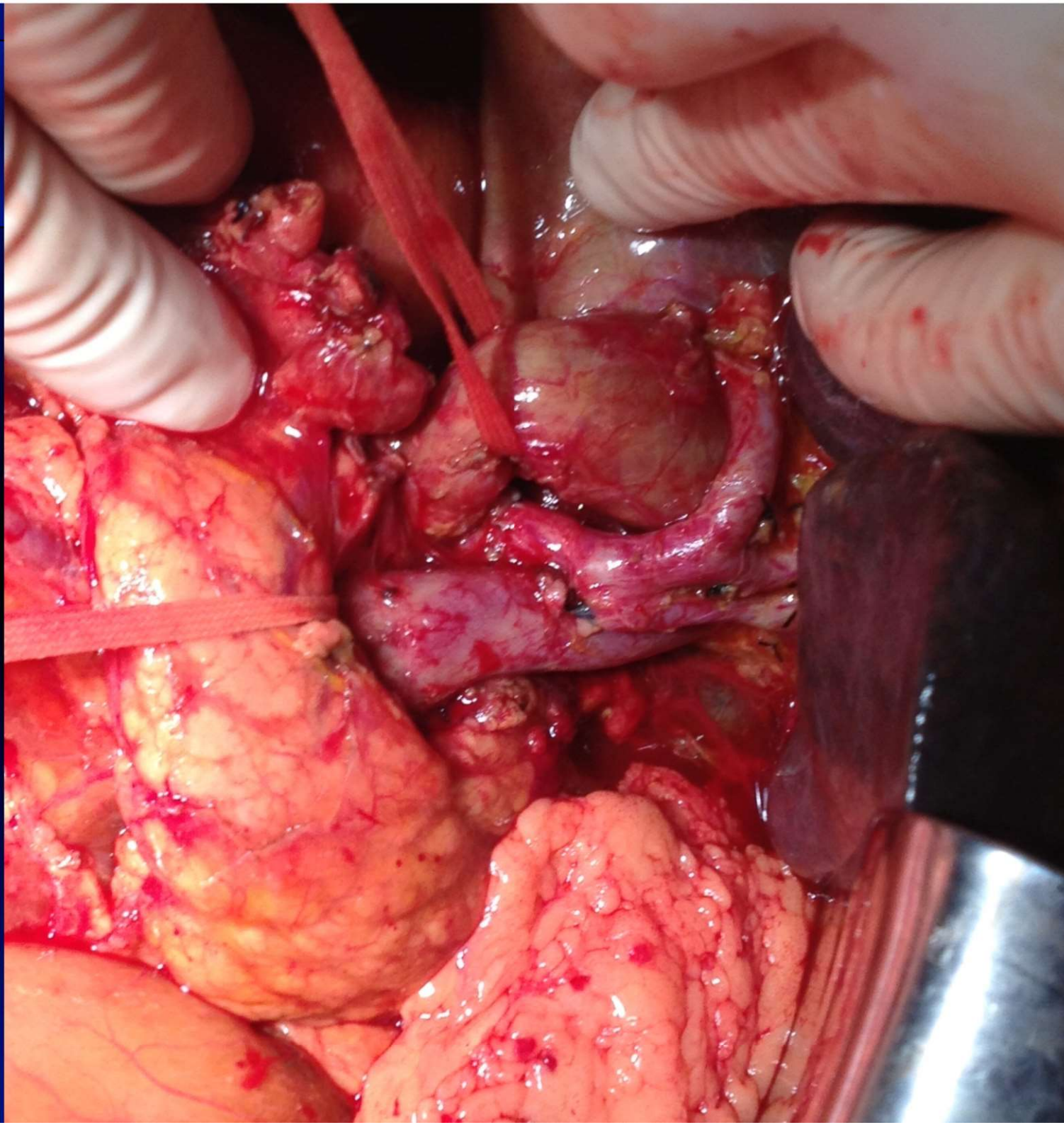
- ❑ Stent no ducto pancreático

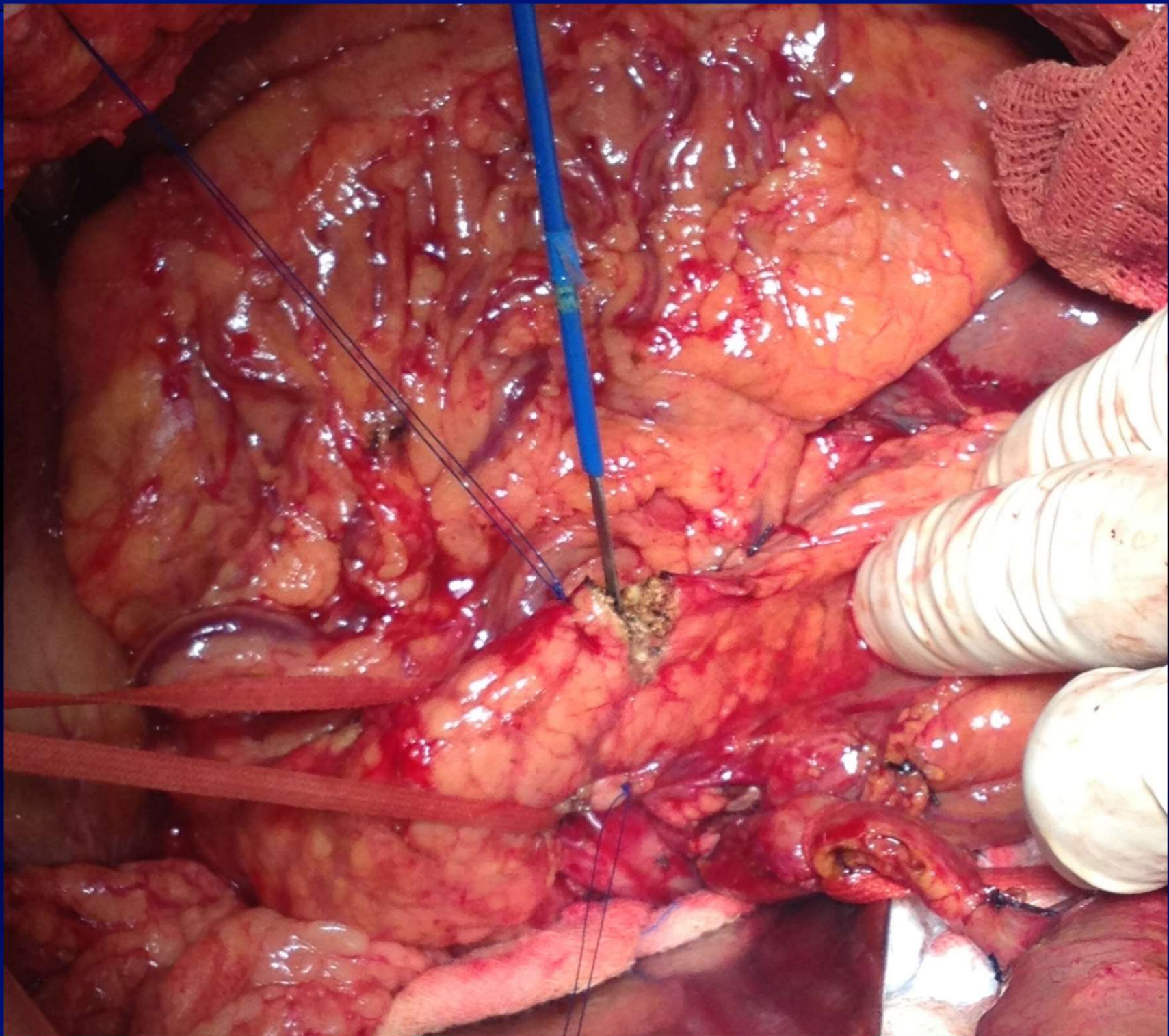
- ❑ Pancreatectomia total

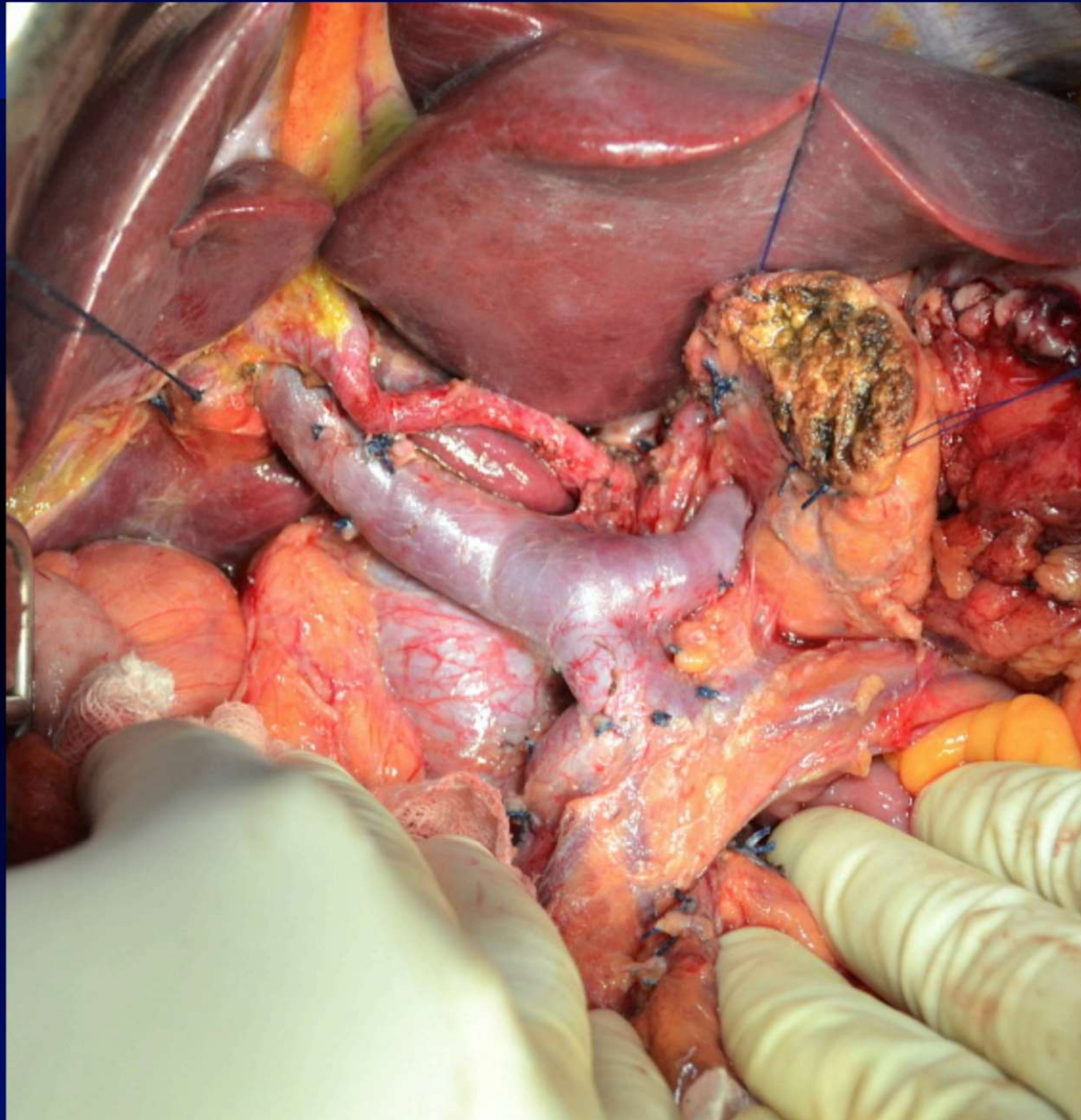
PENG

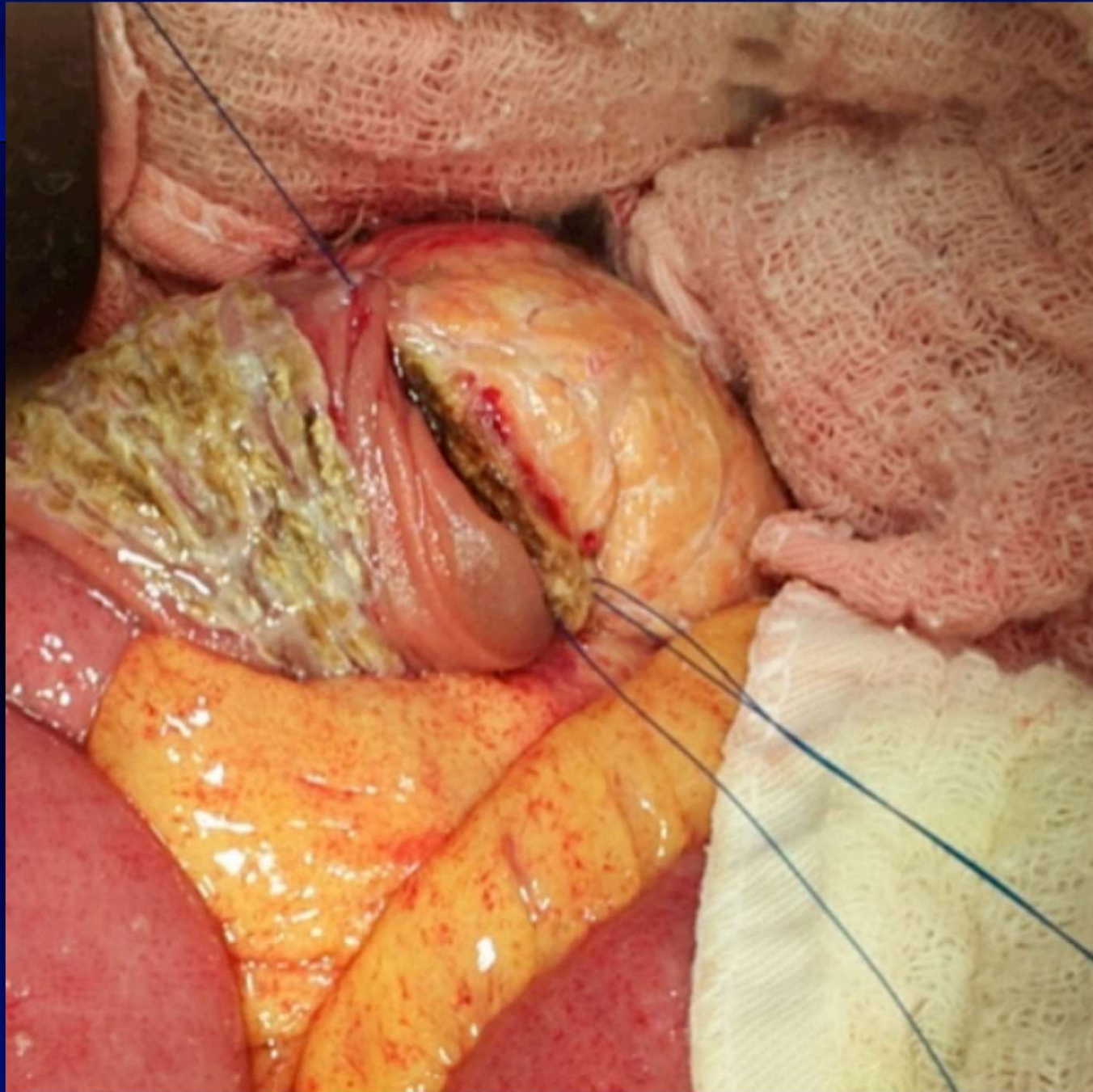


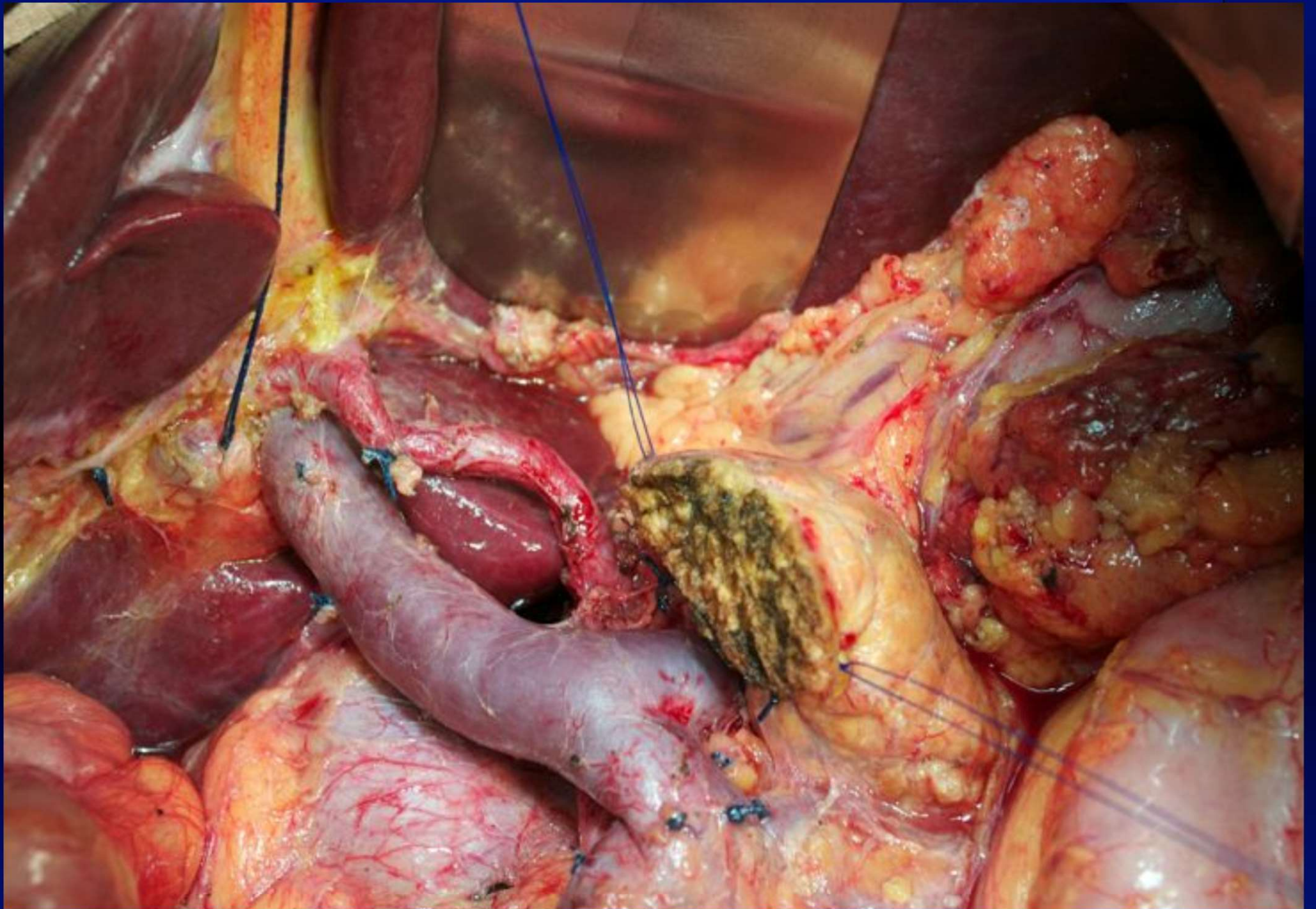


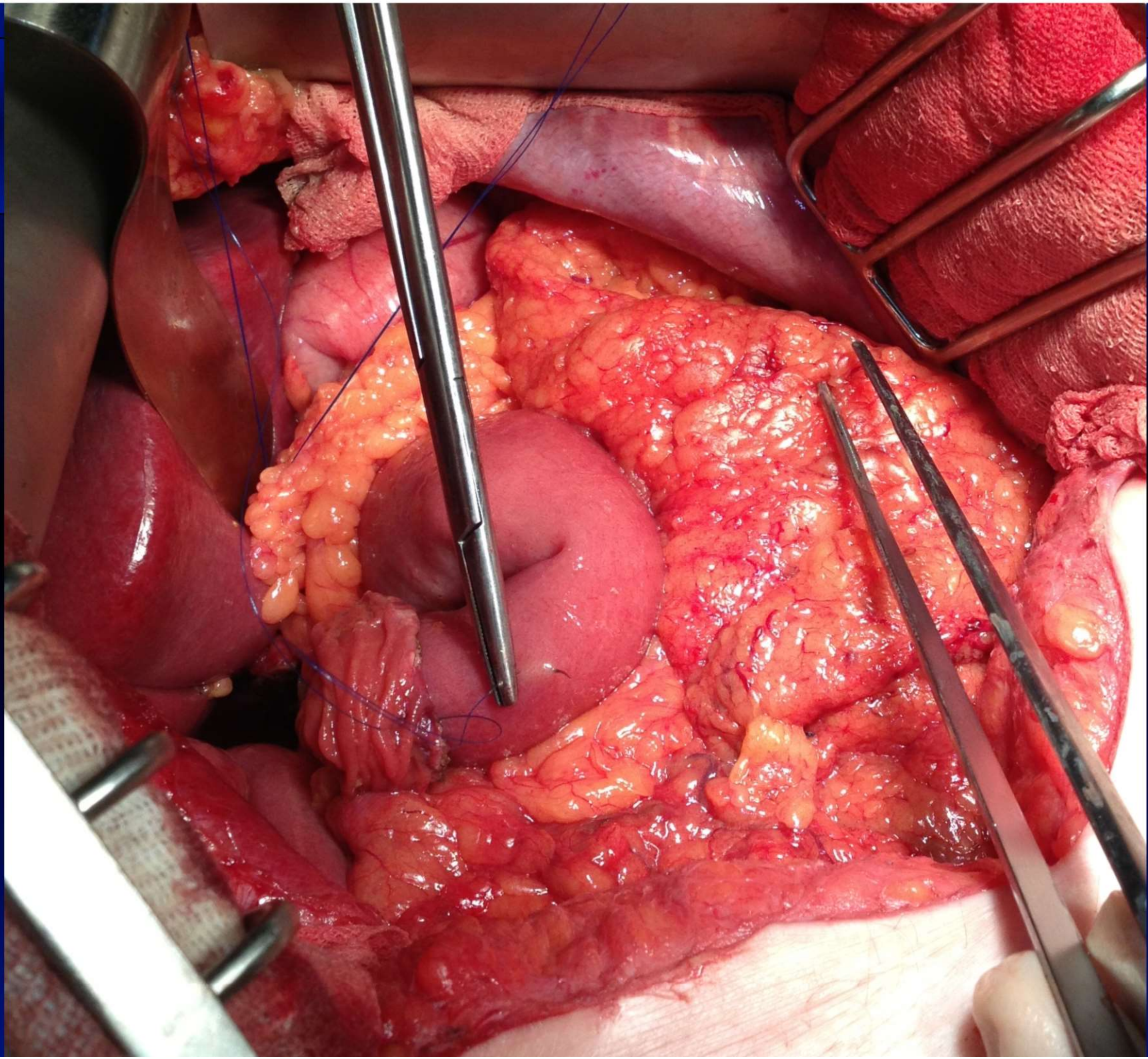


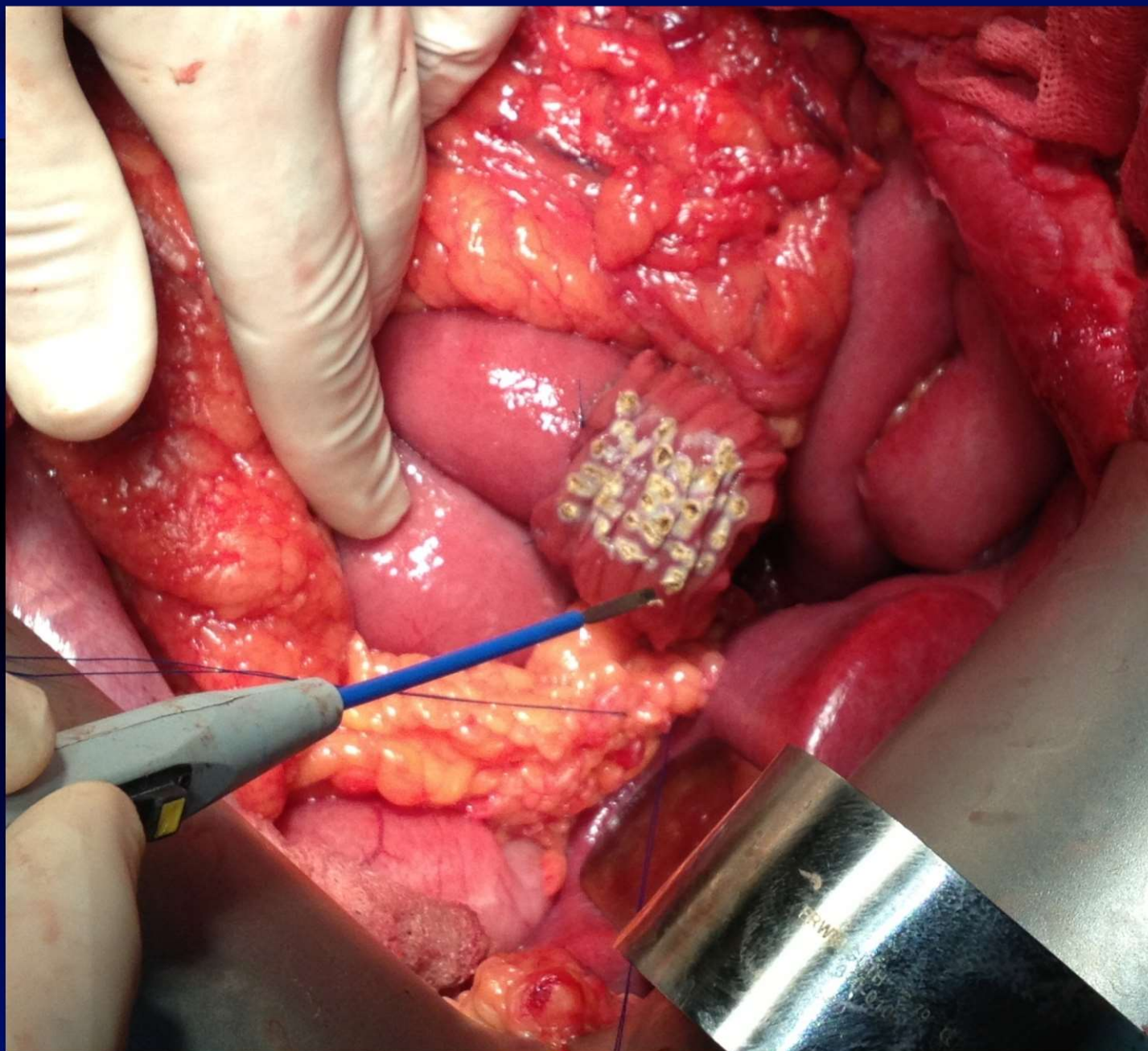


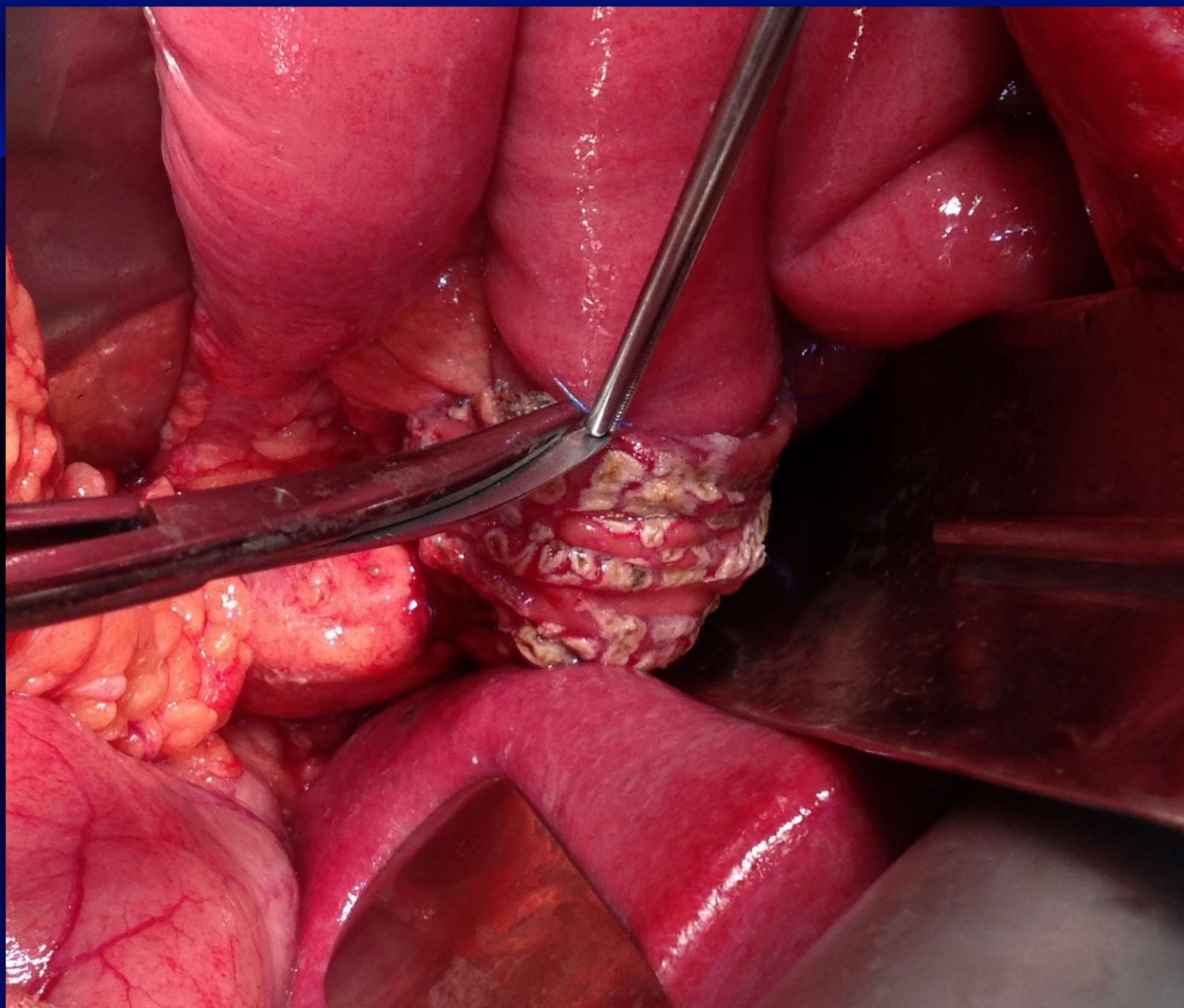






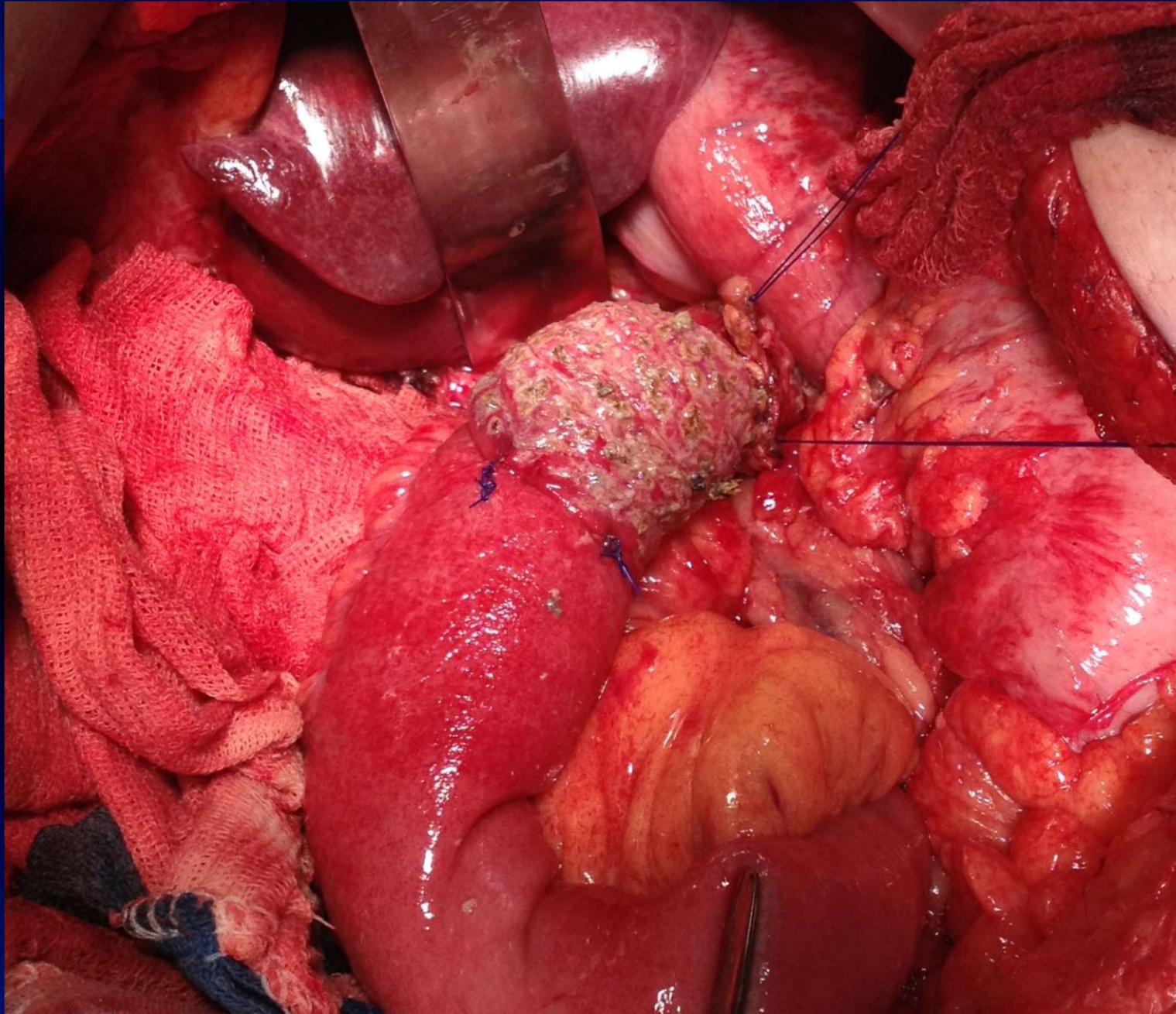


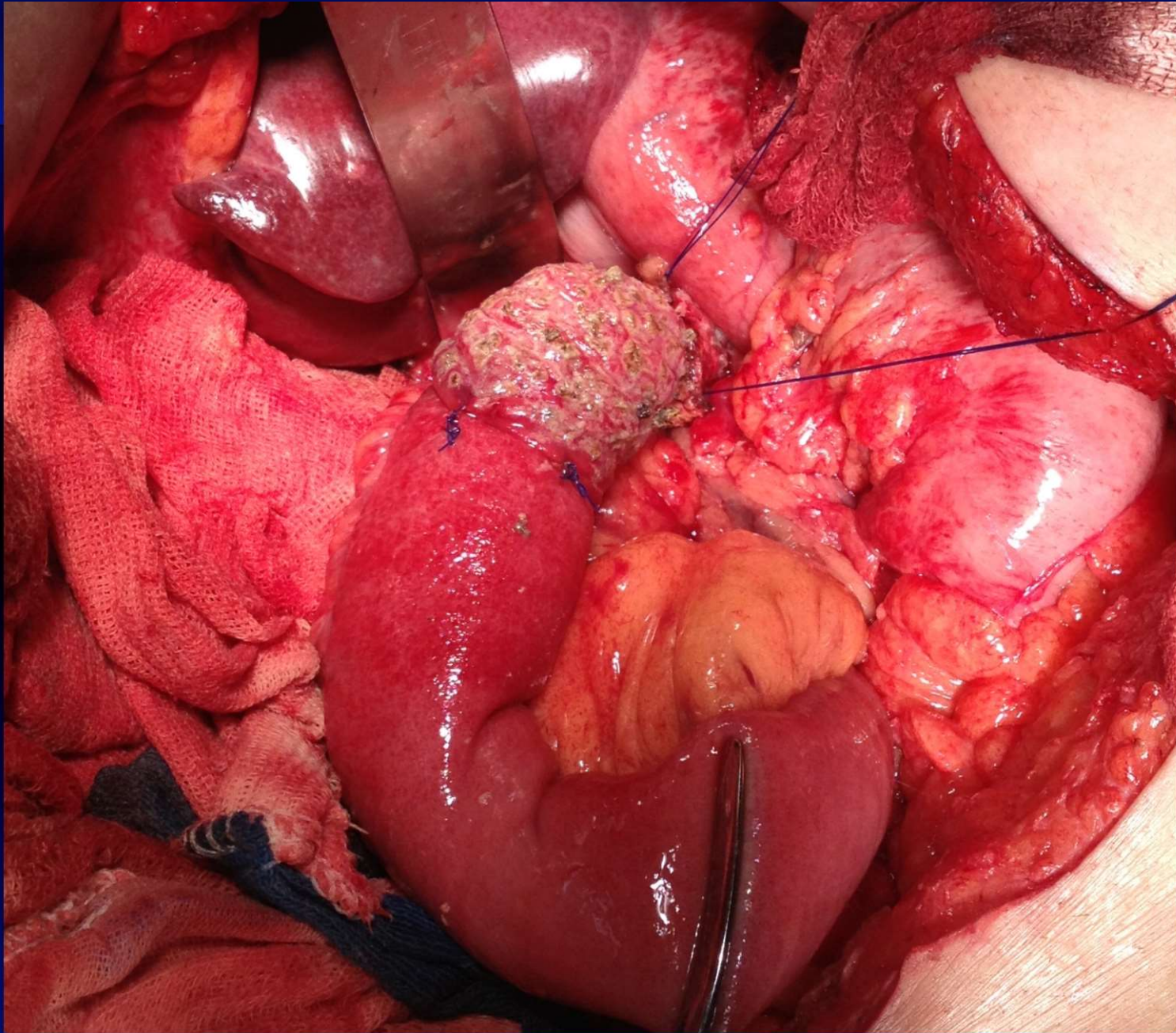


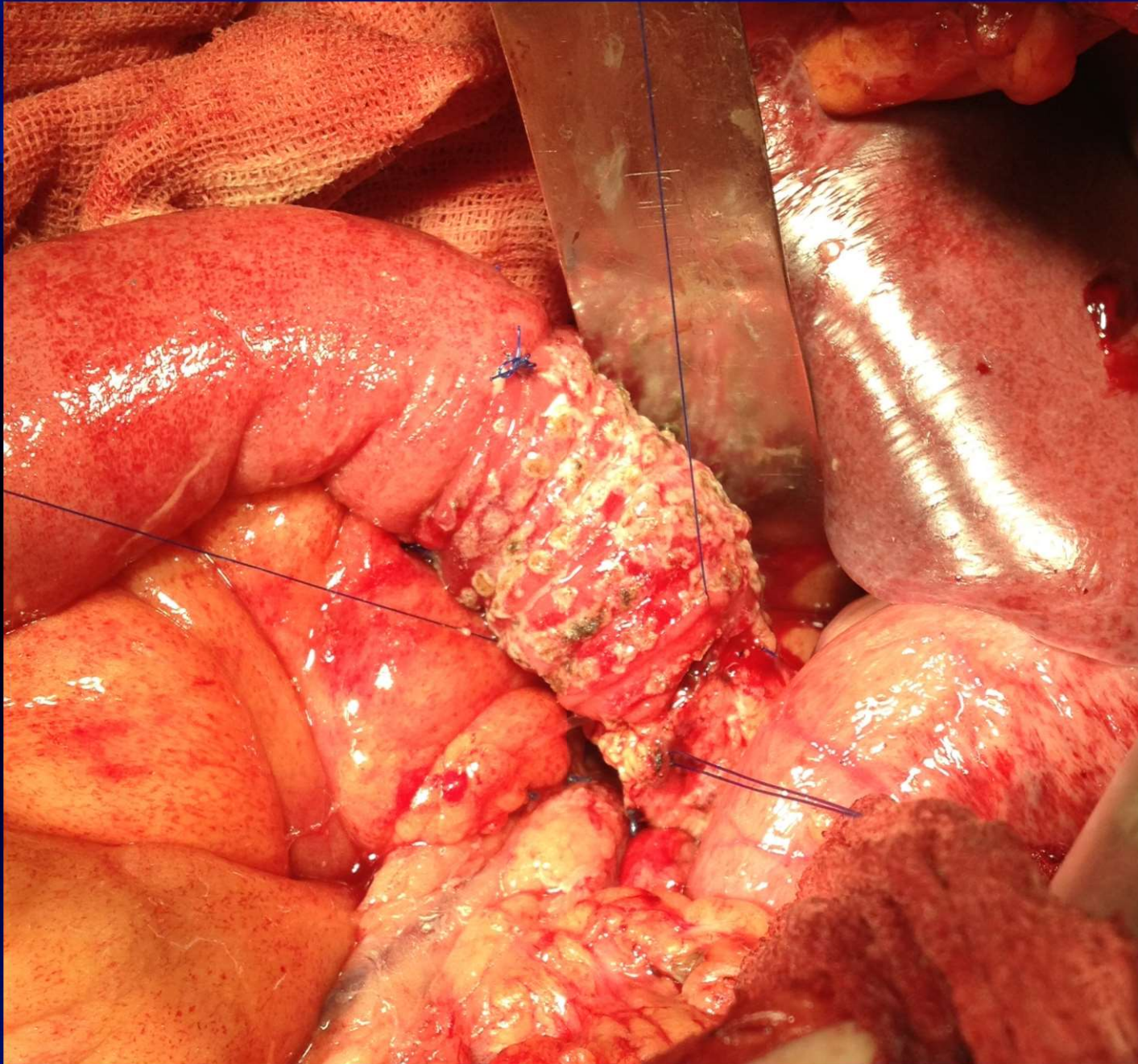


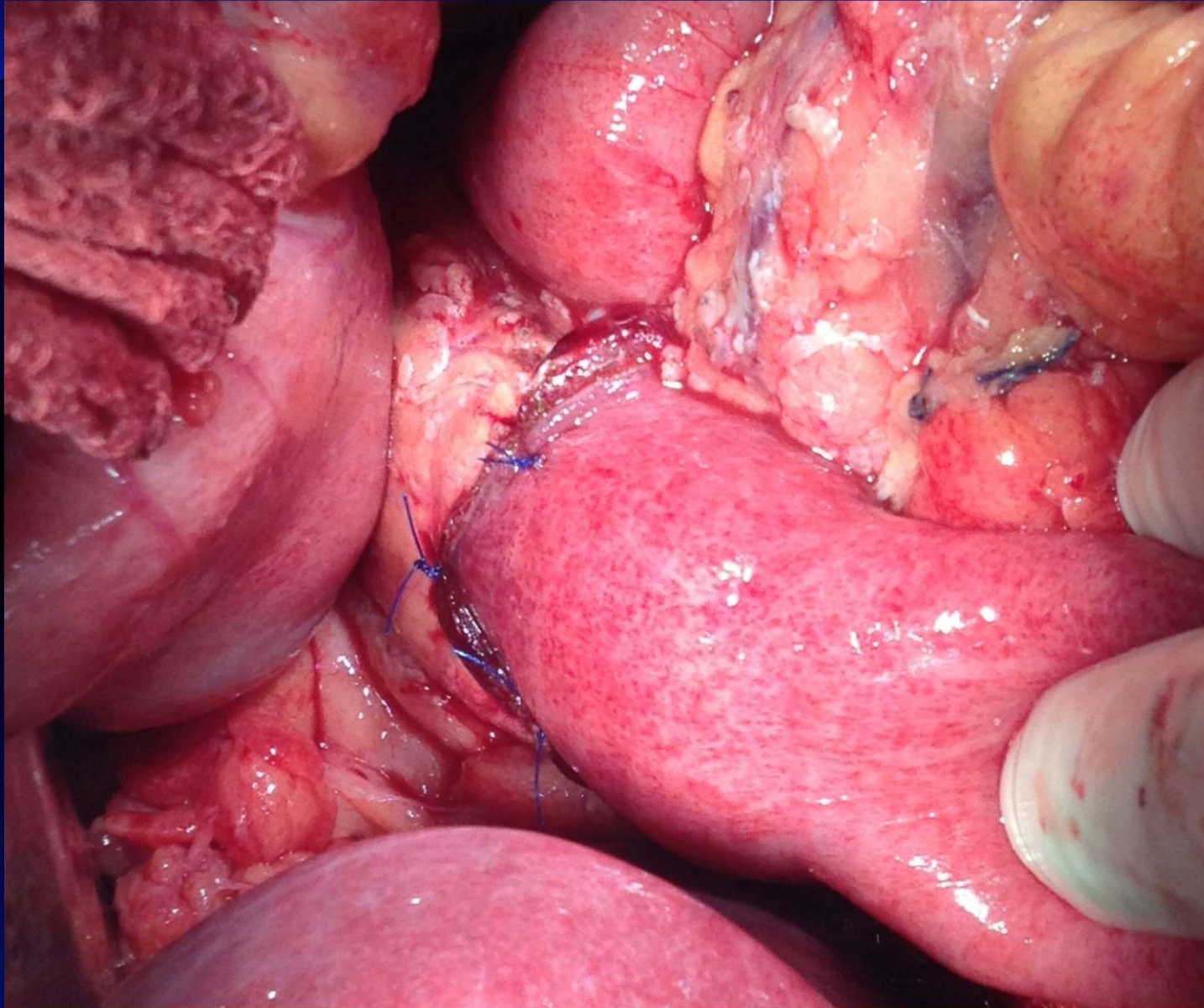




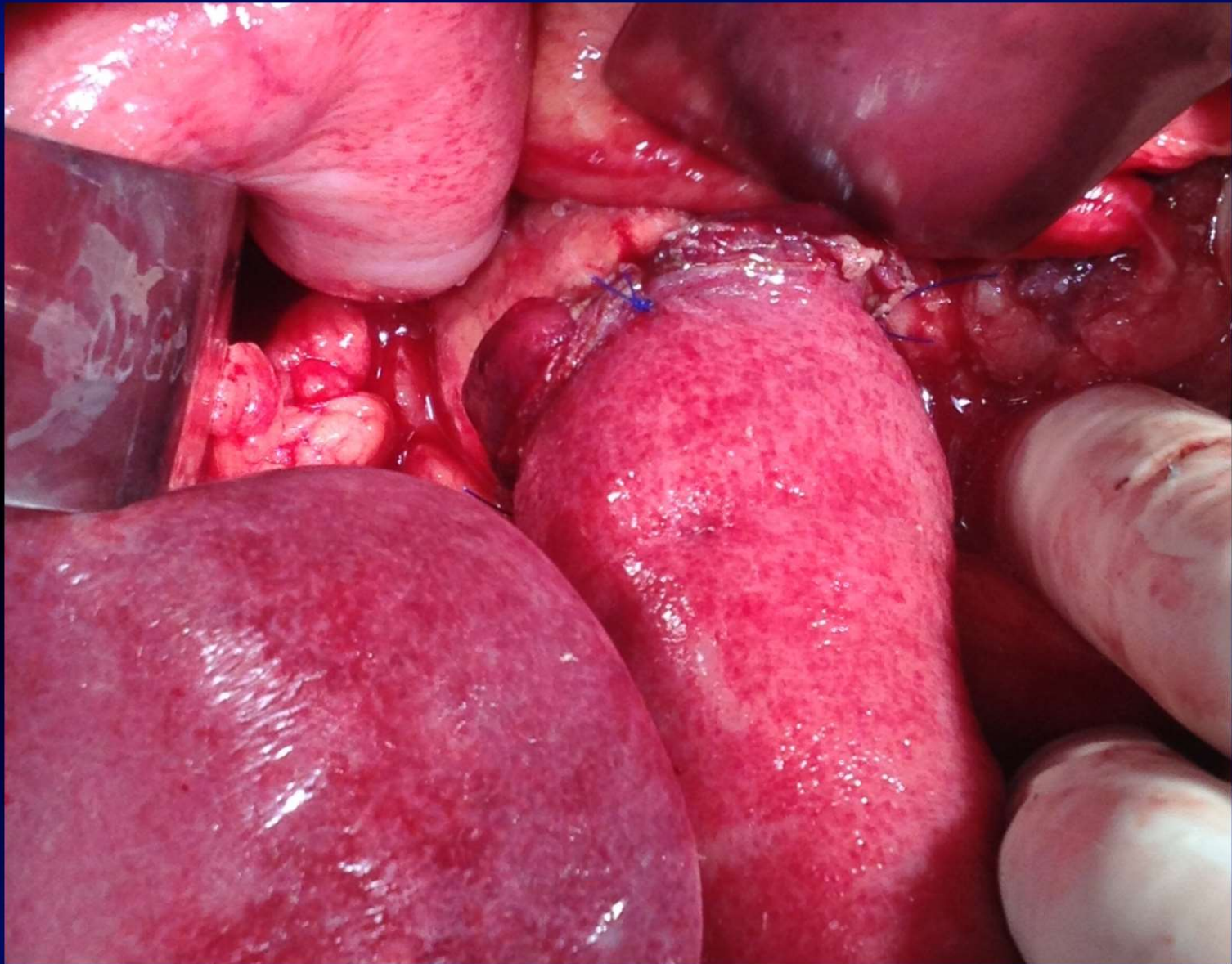


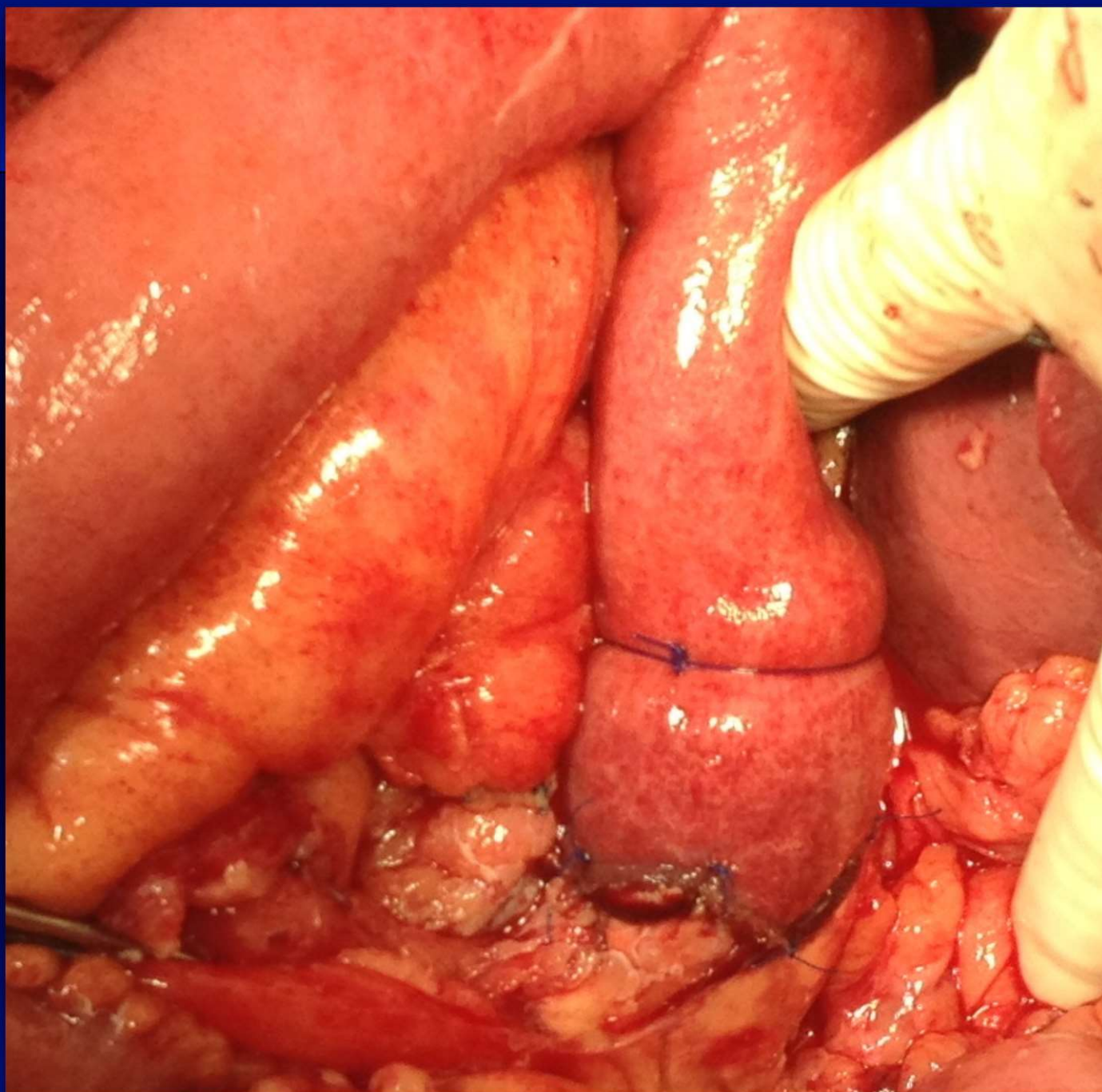










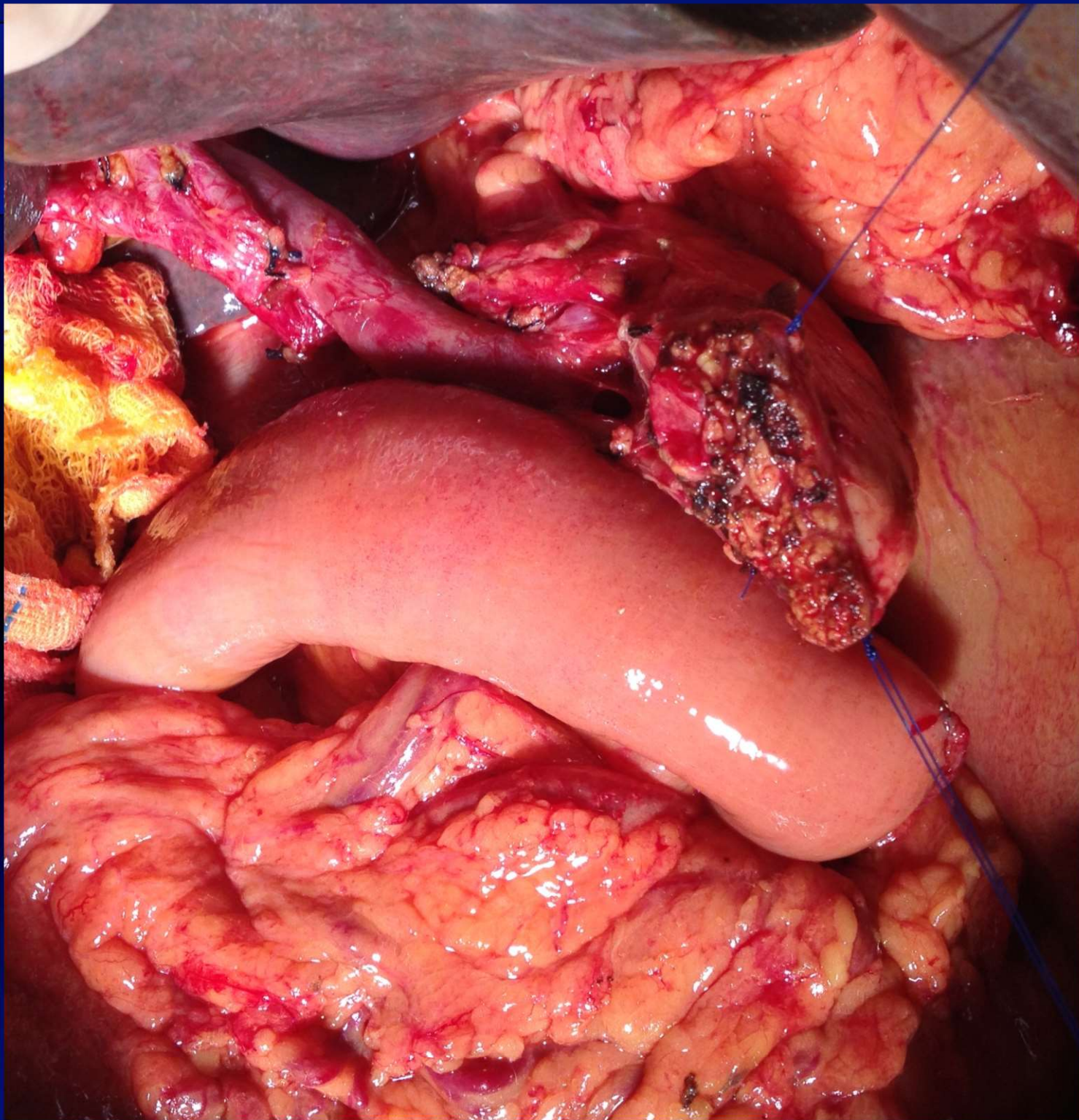


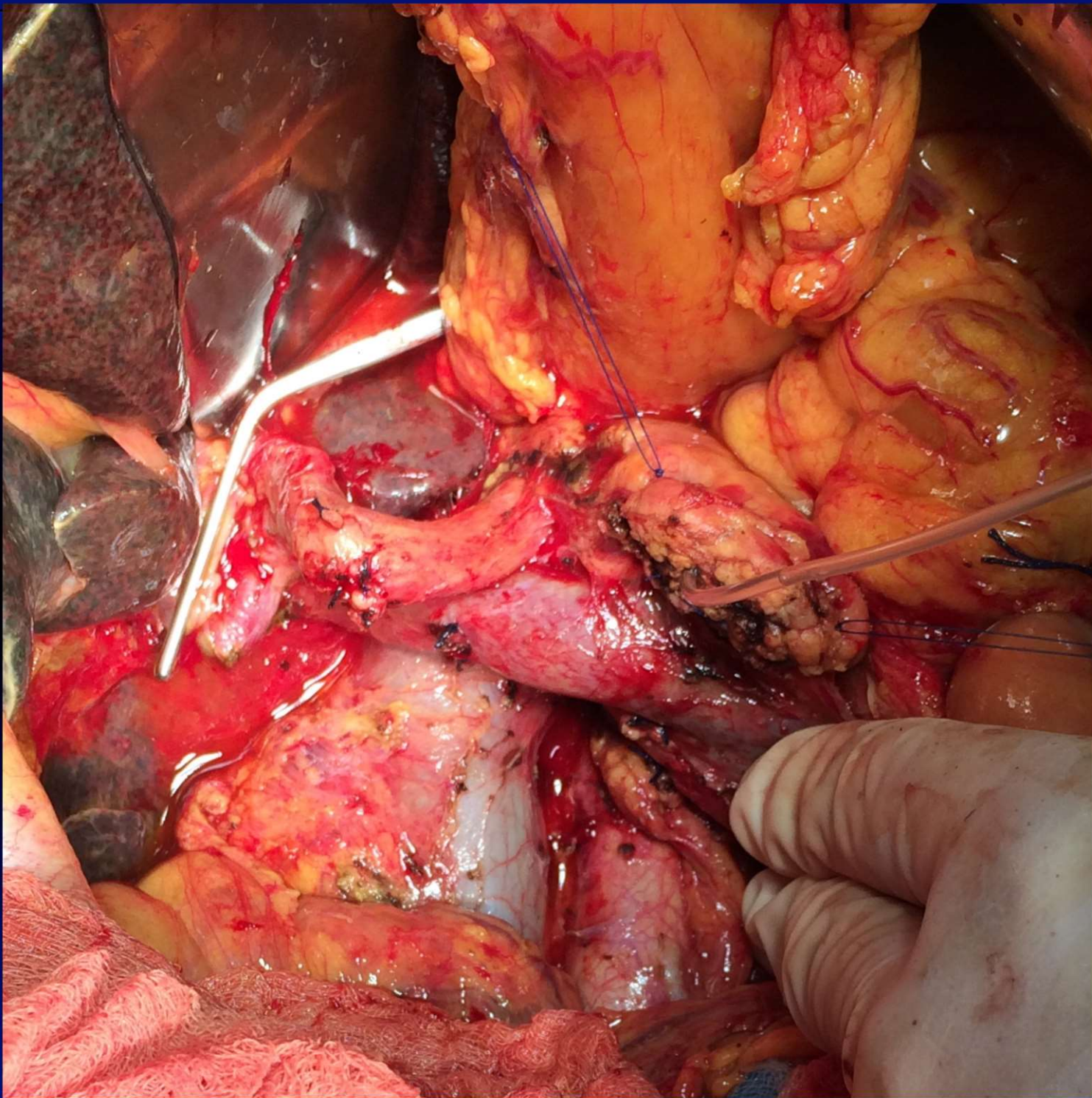


Ducto-mucosa

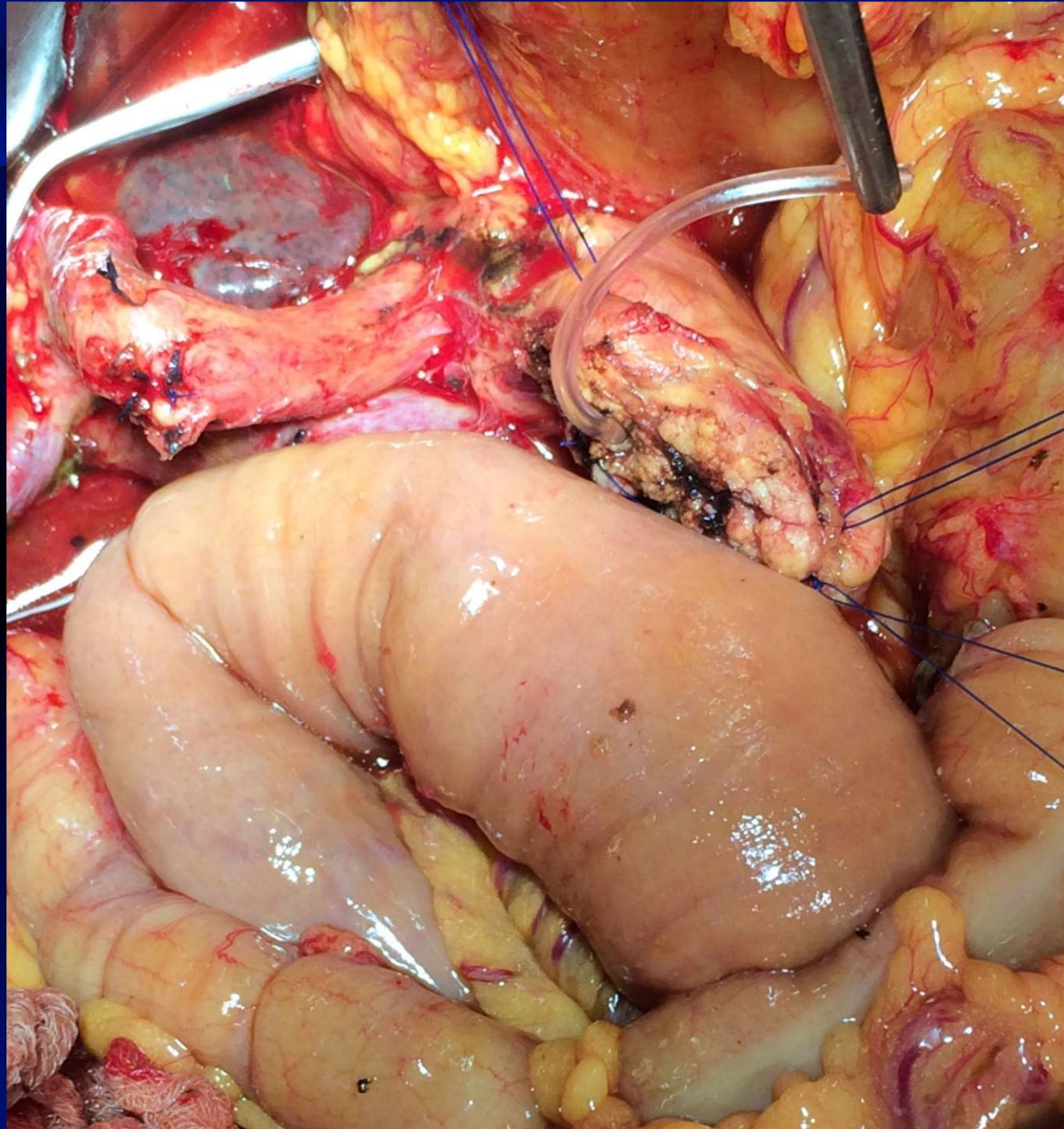


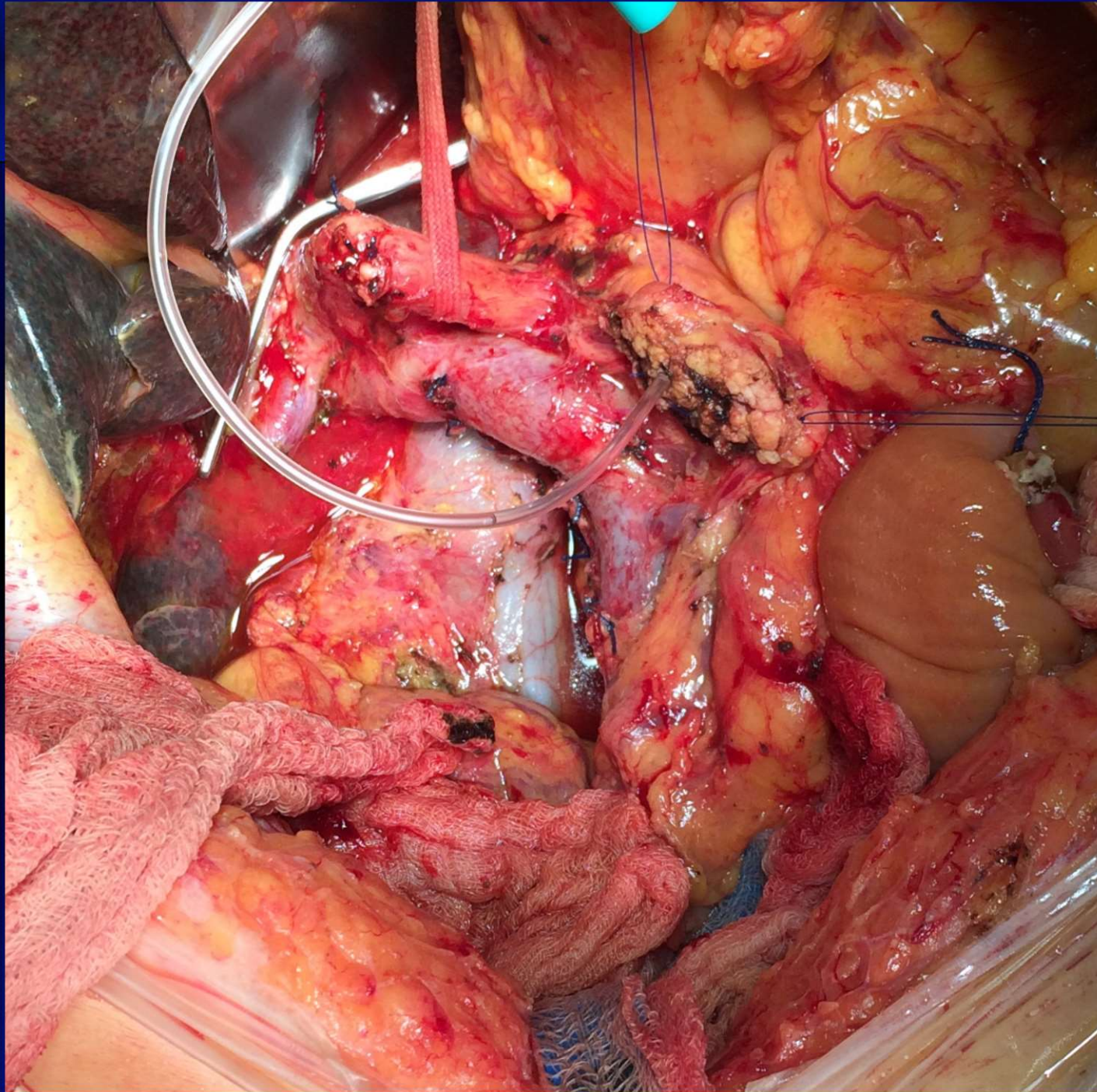


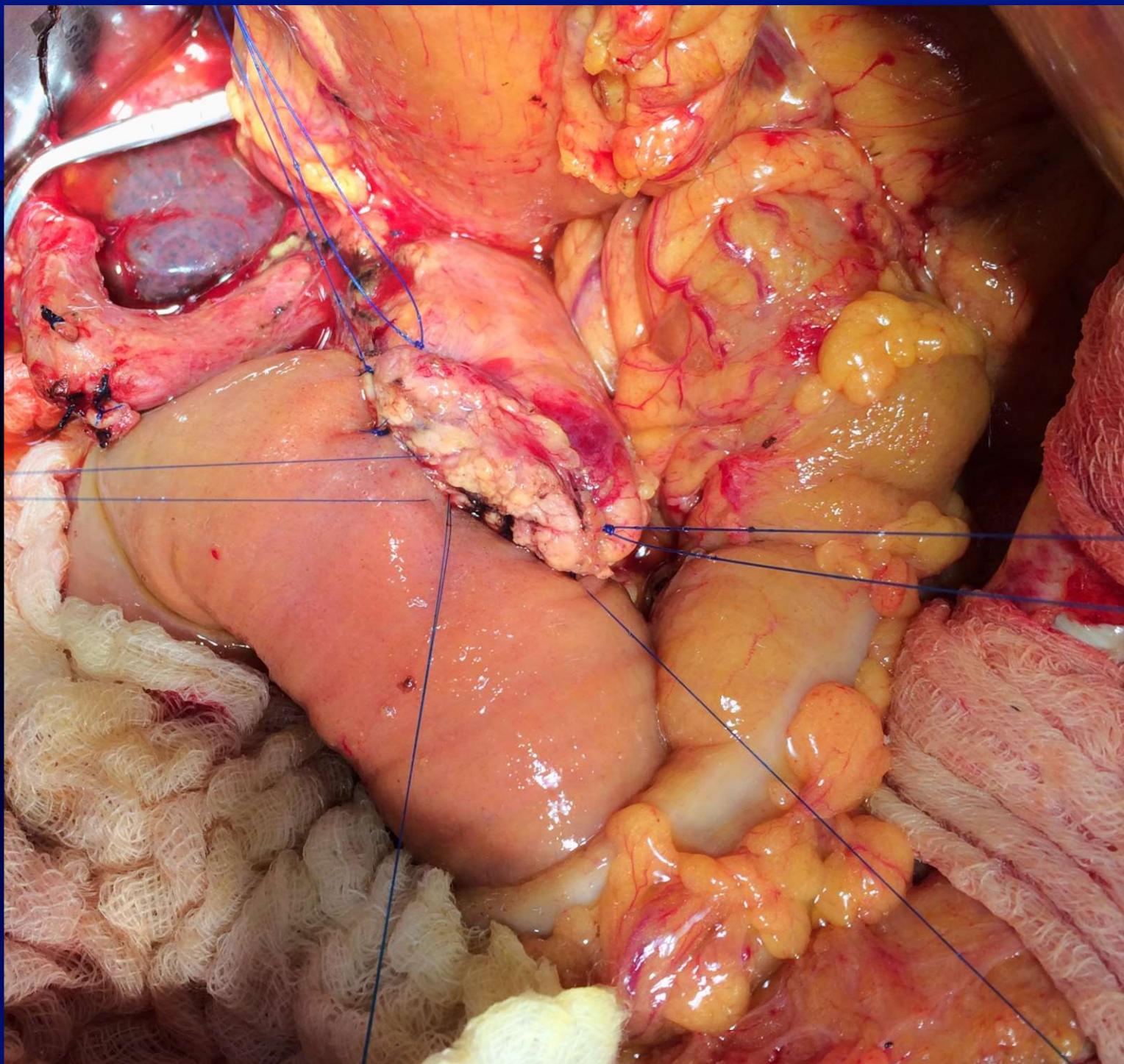


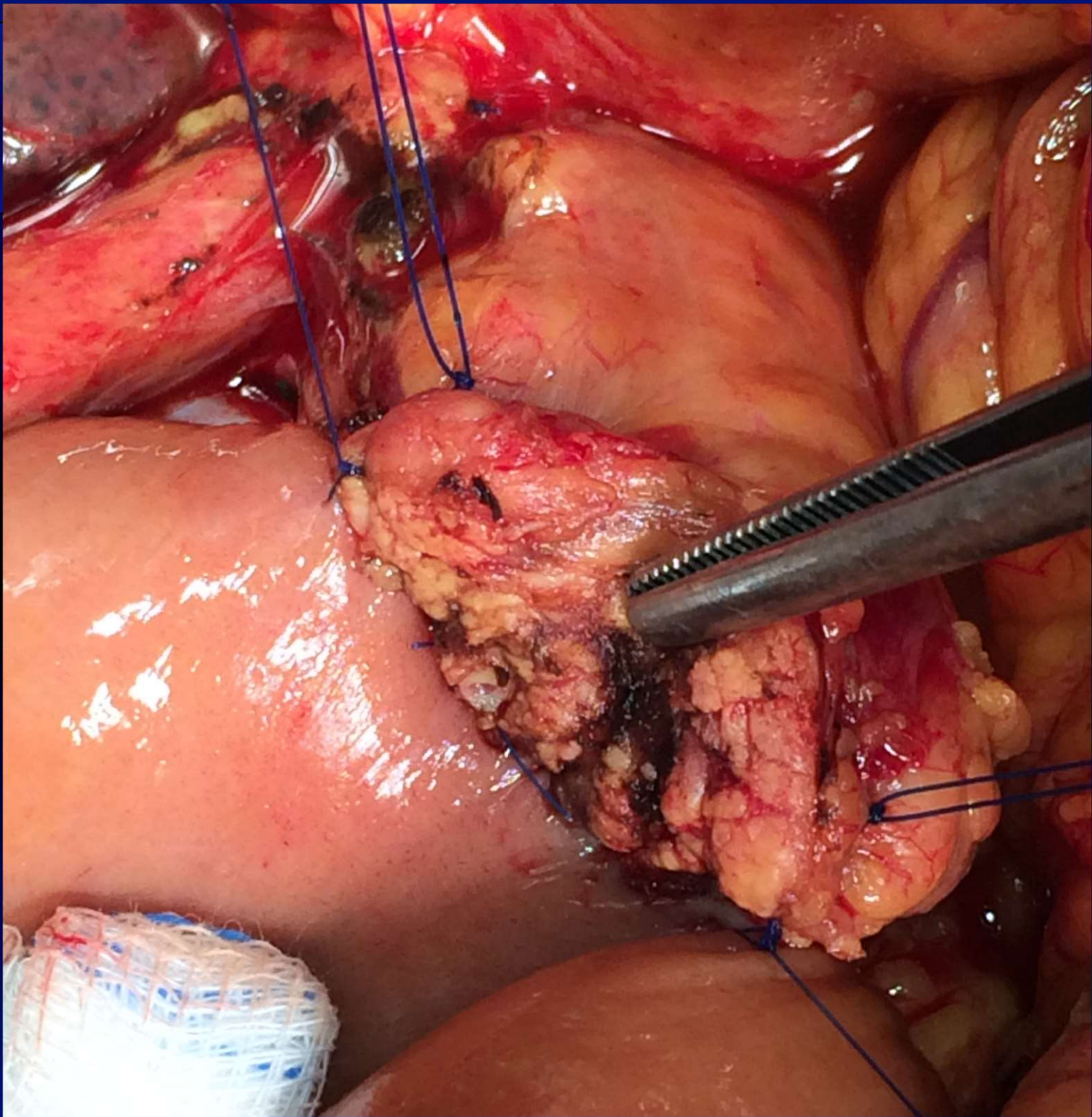


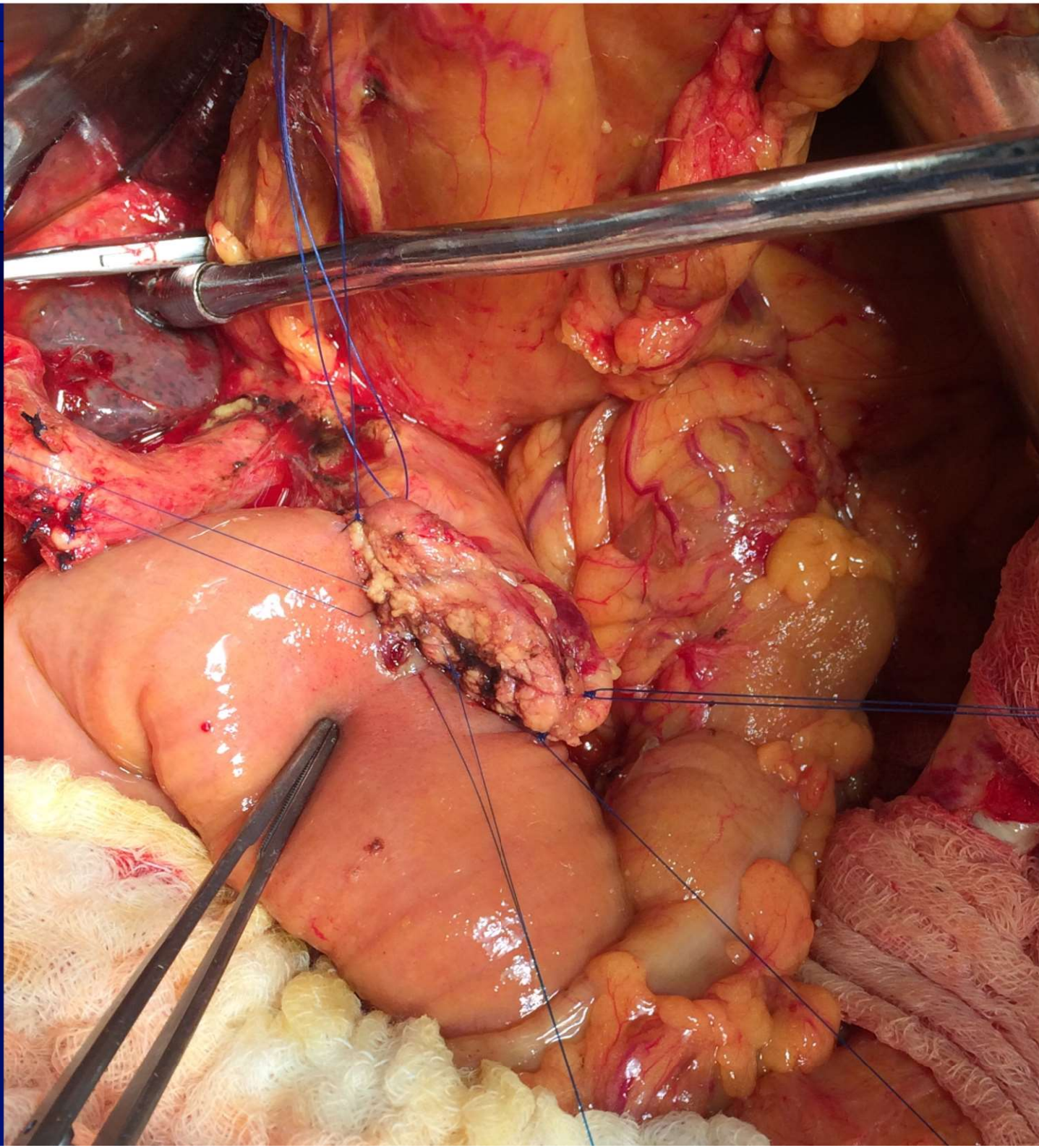


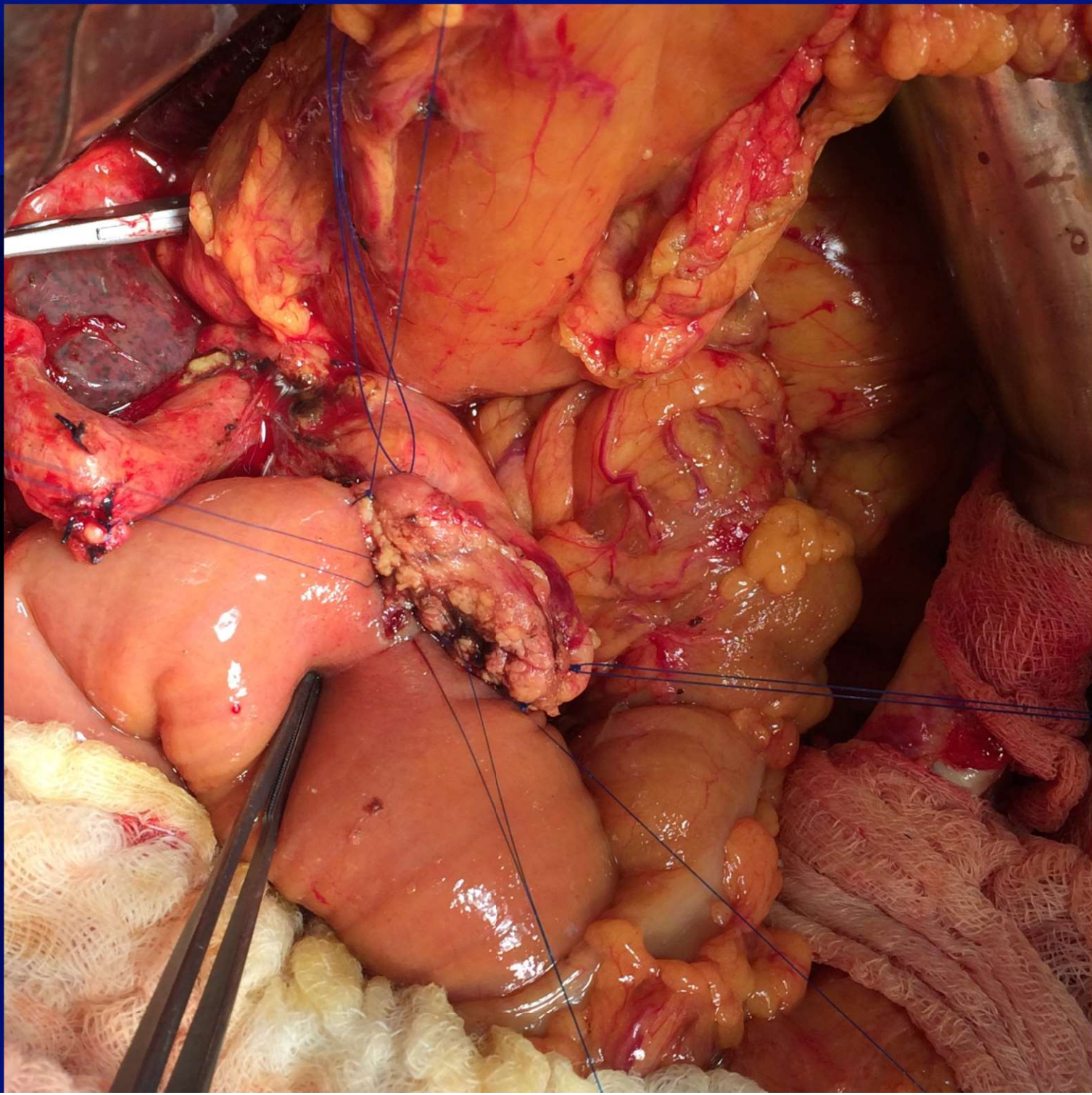


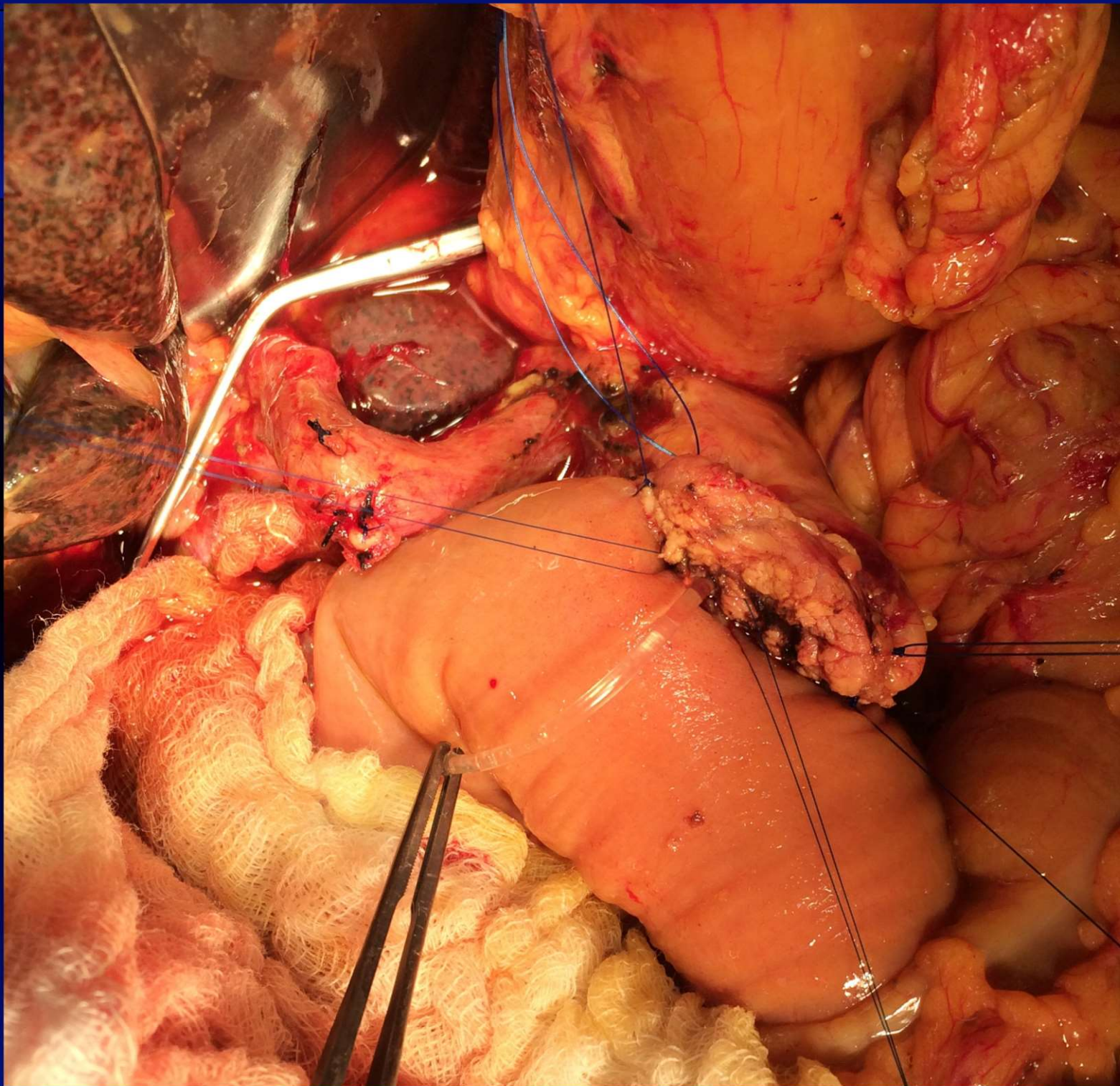


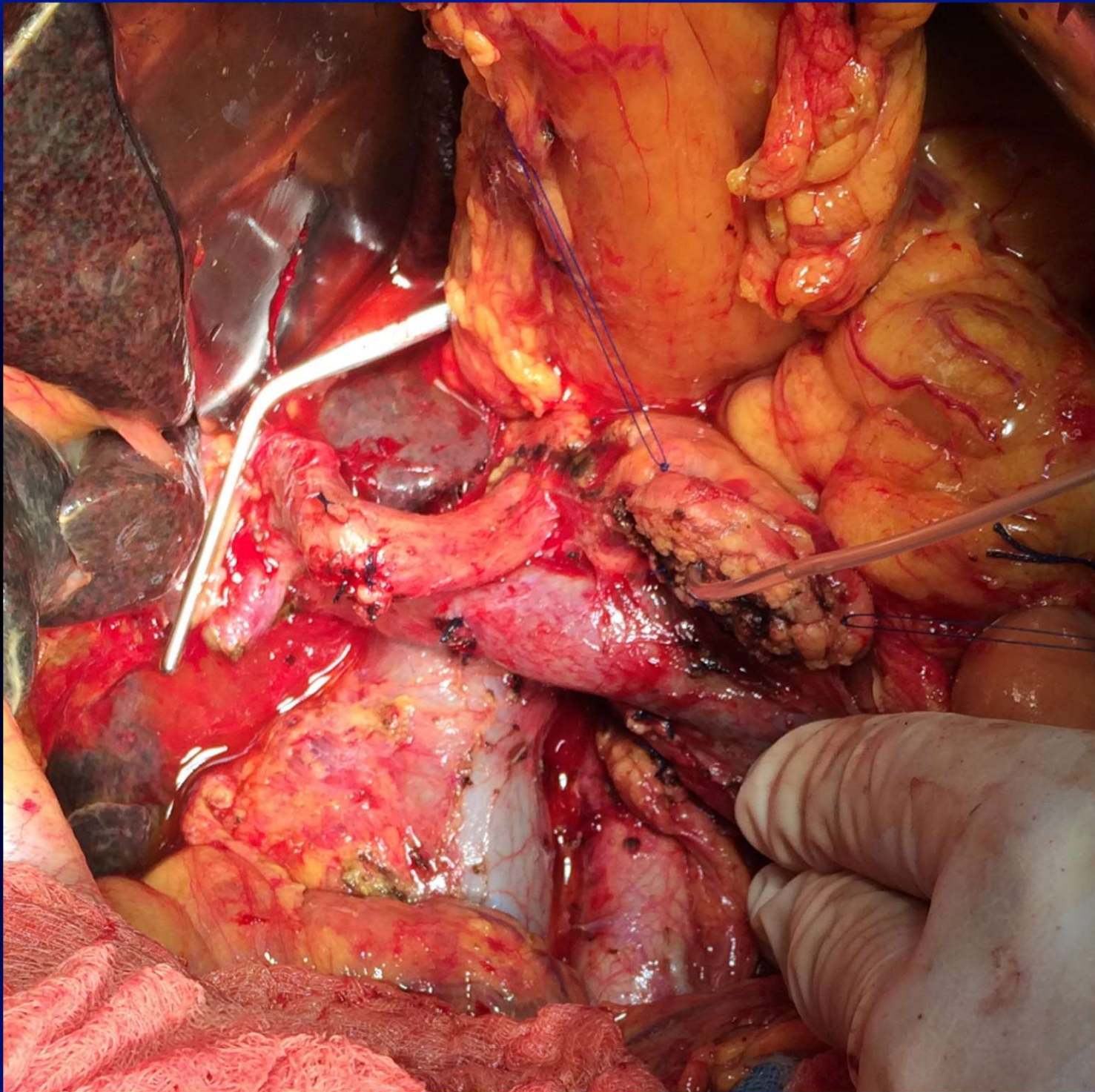


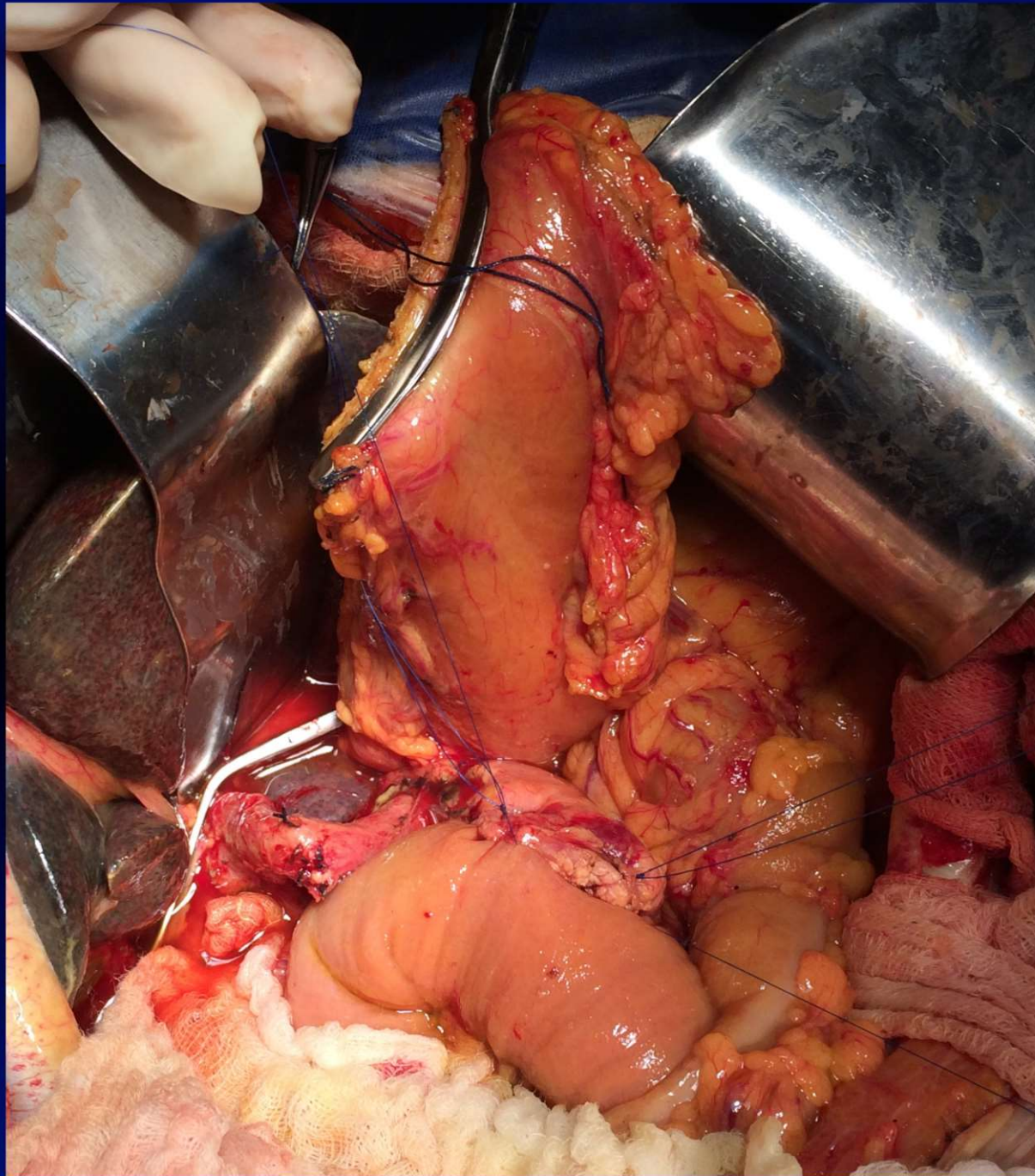


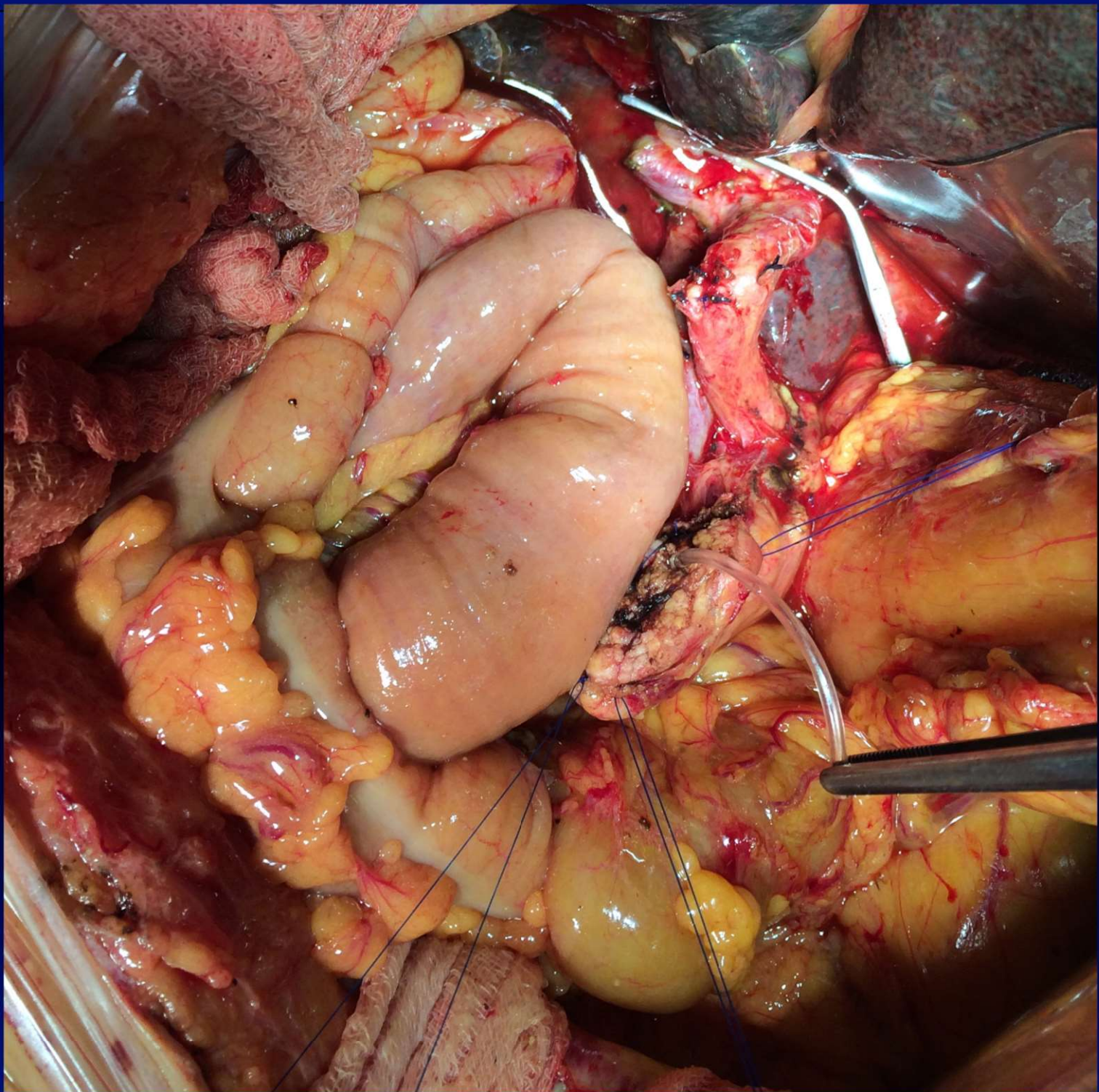


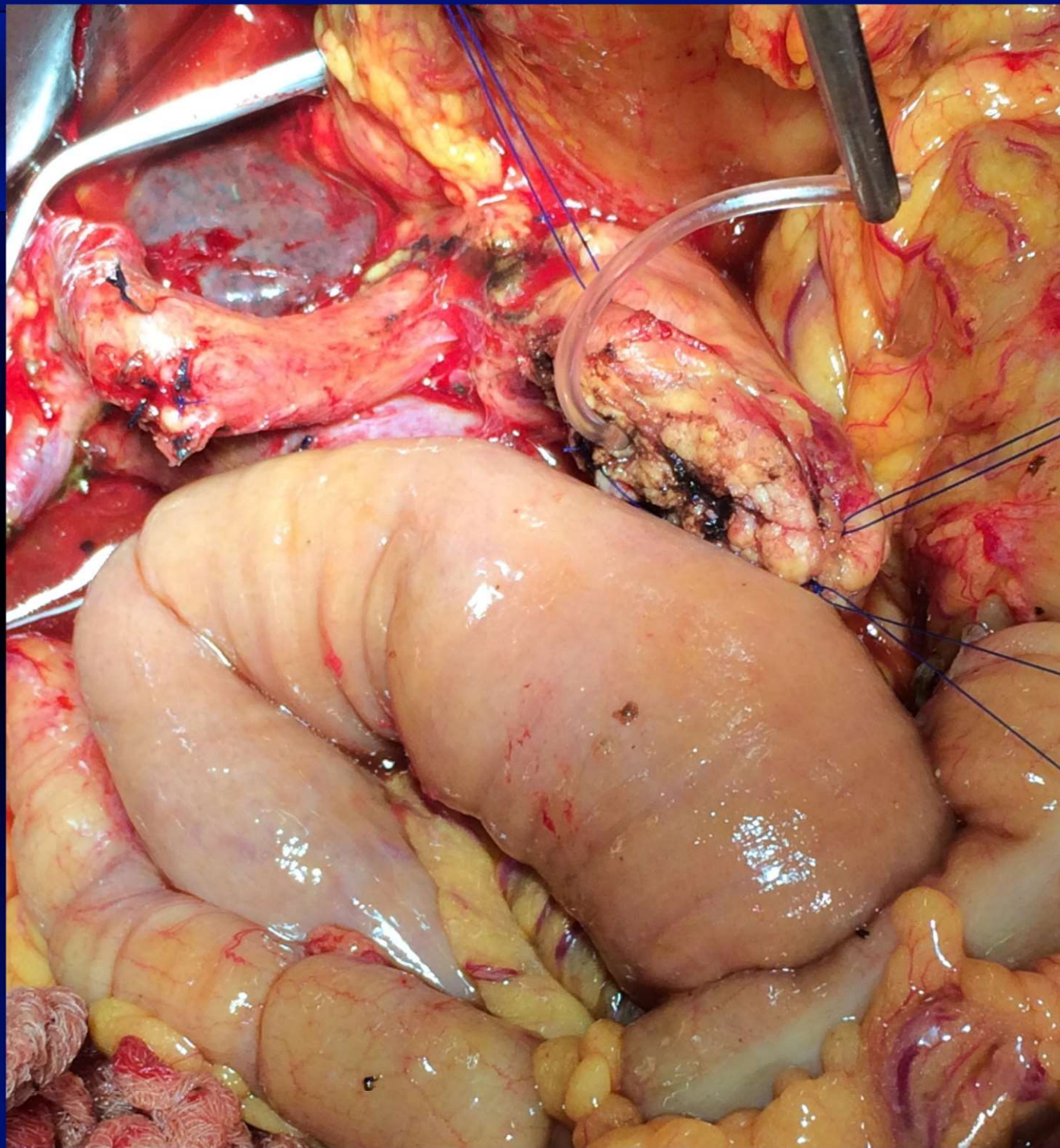


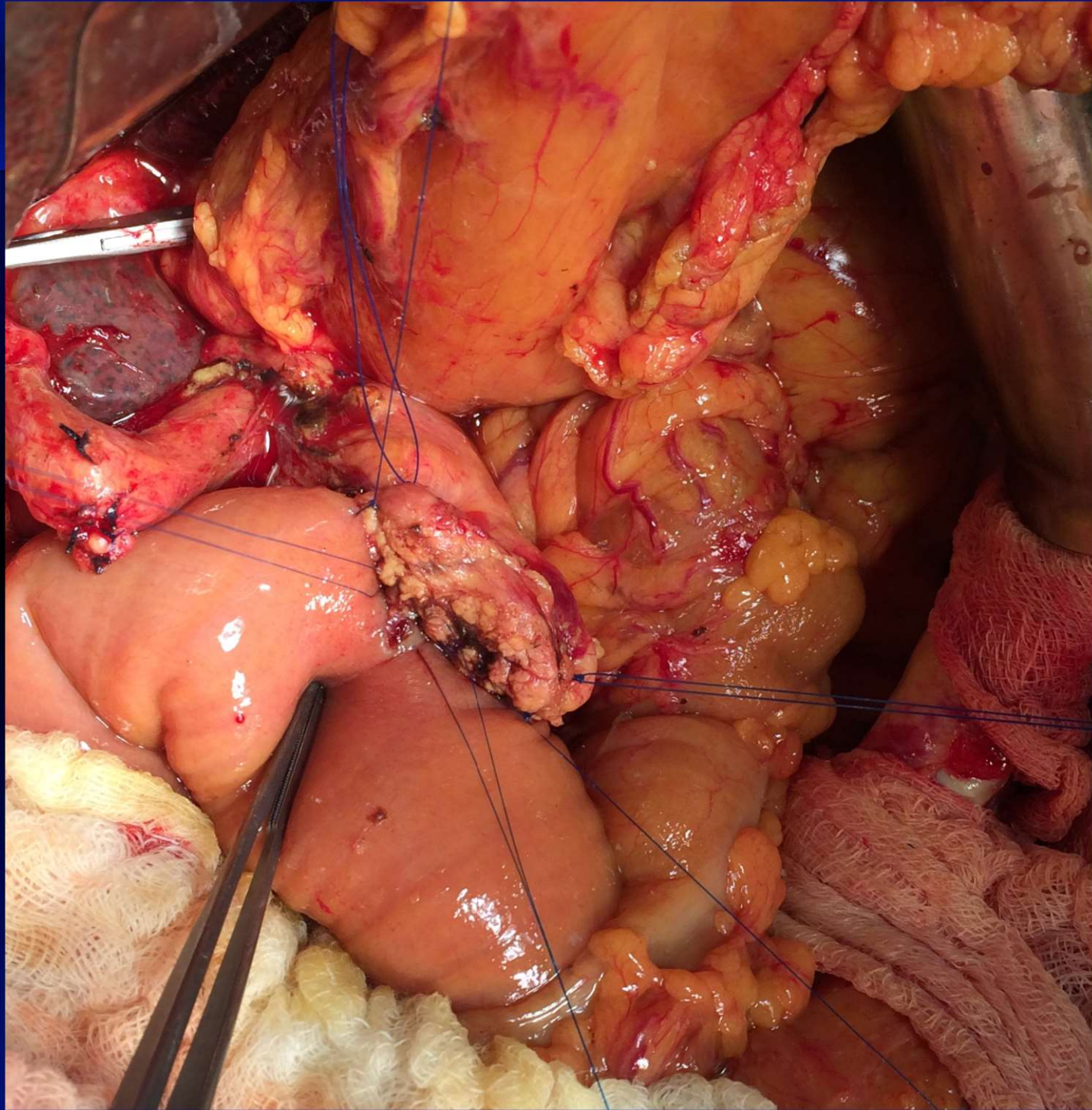


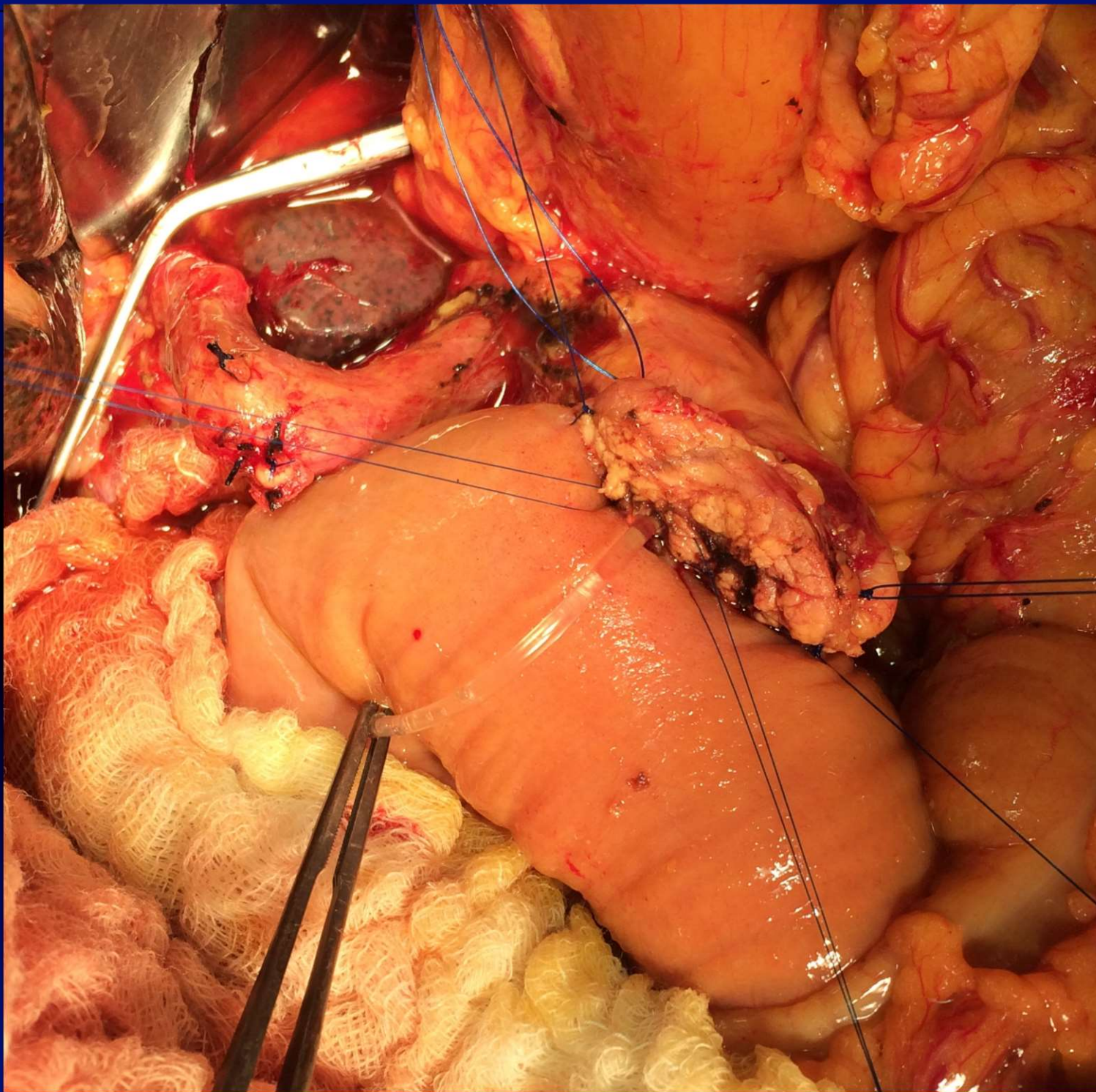


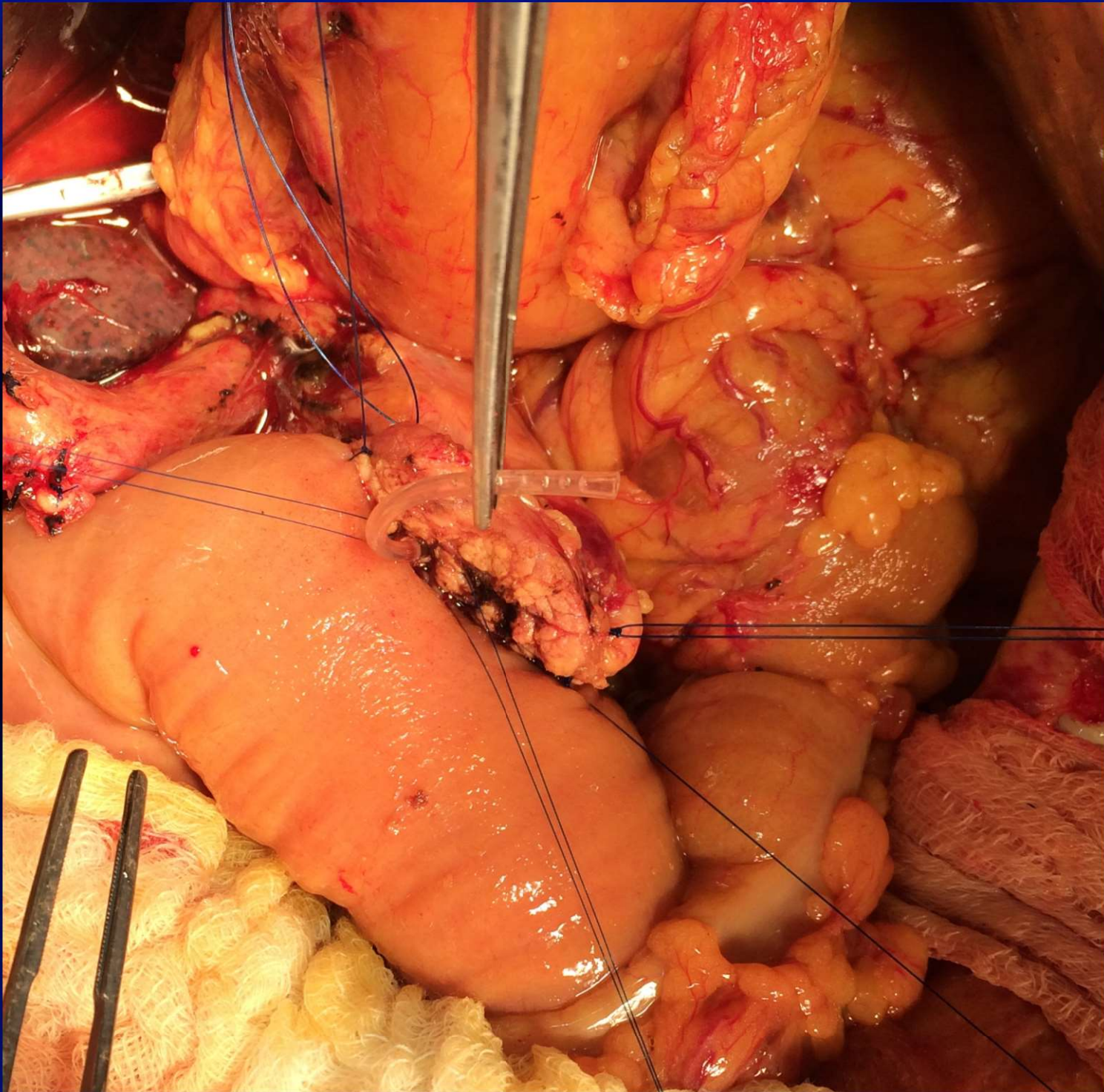


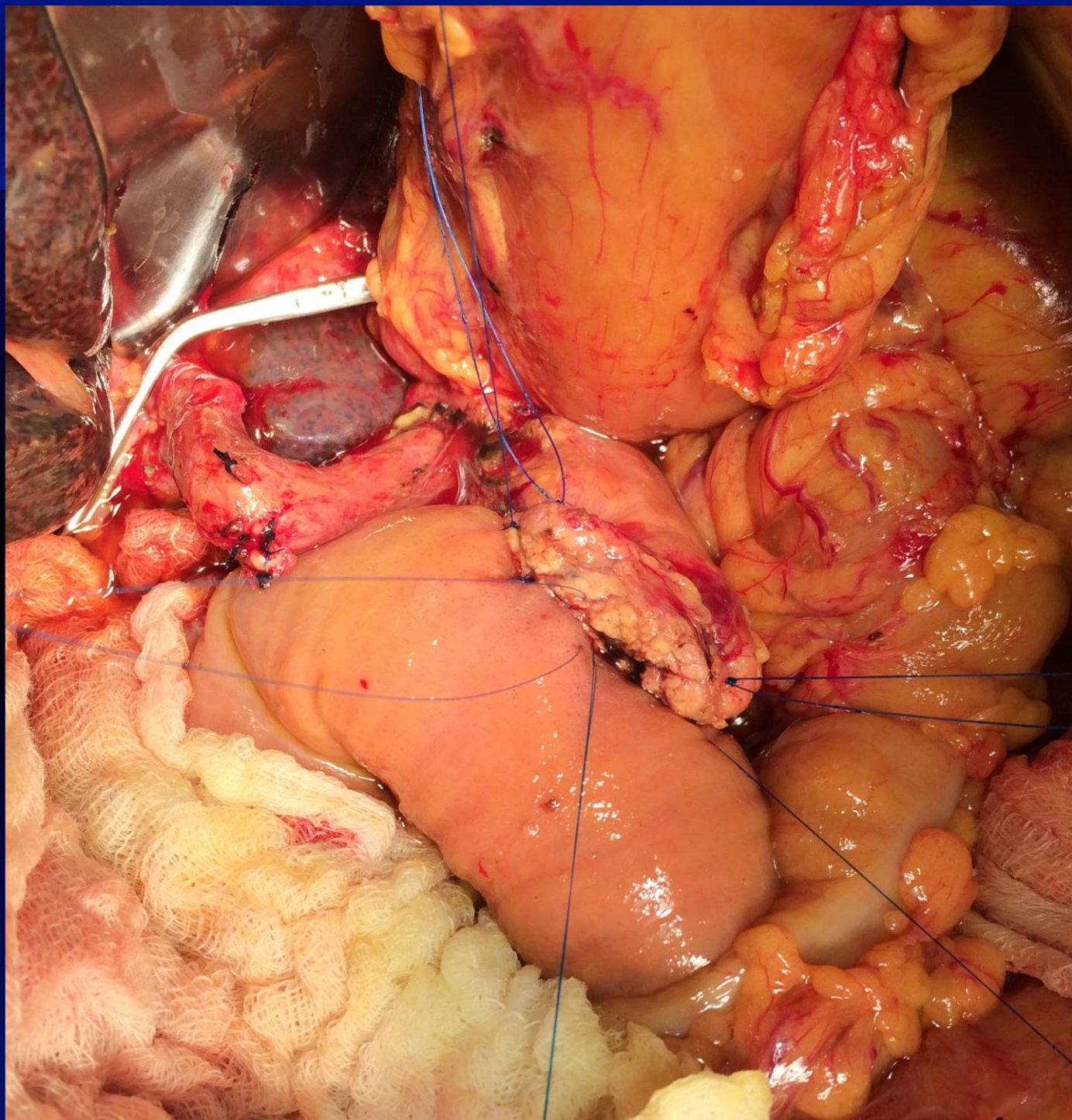


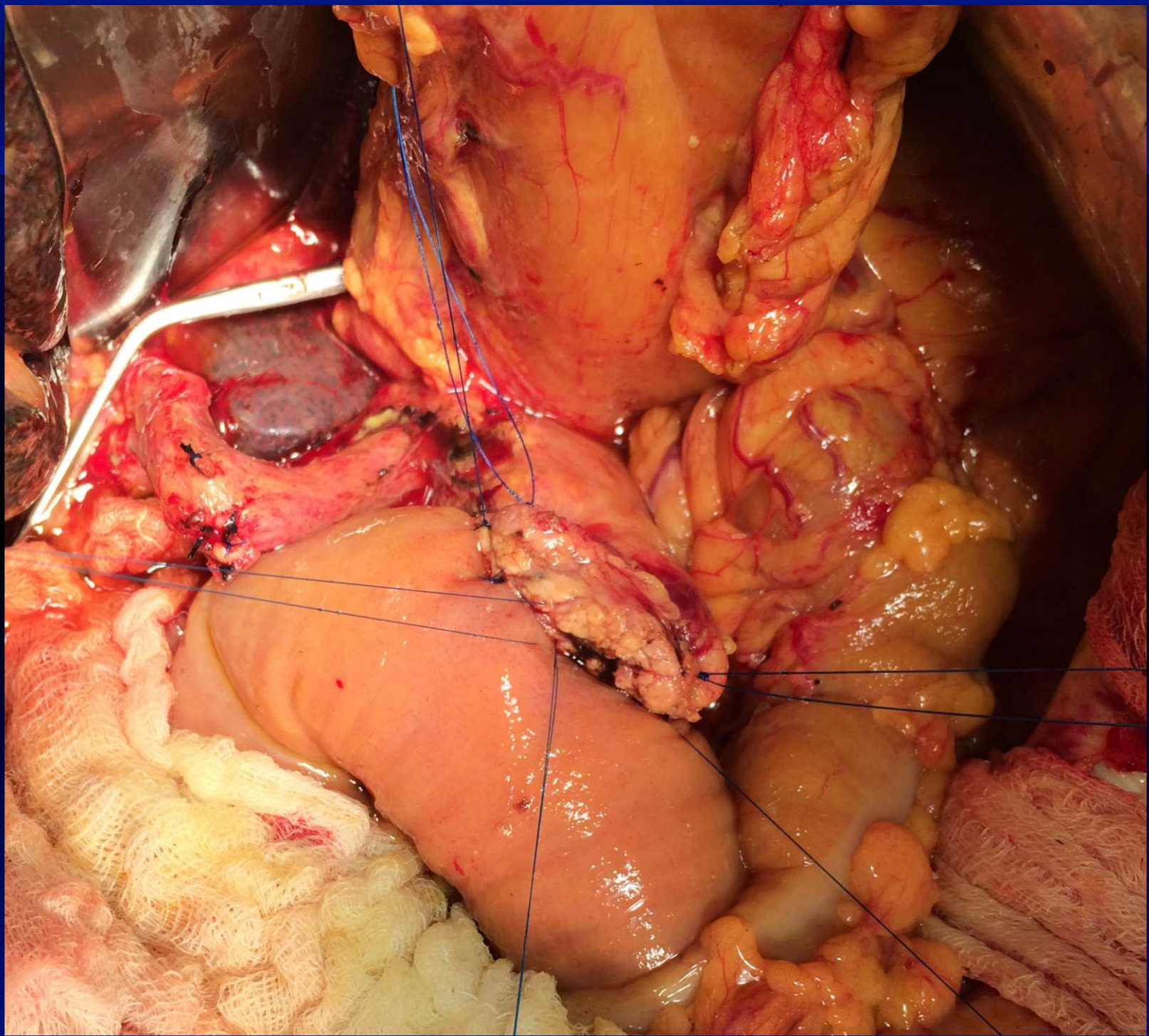


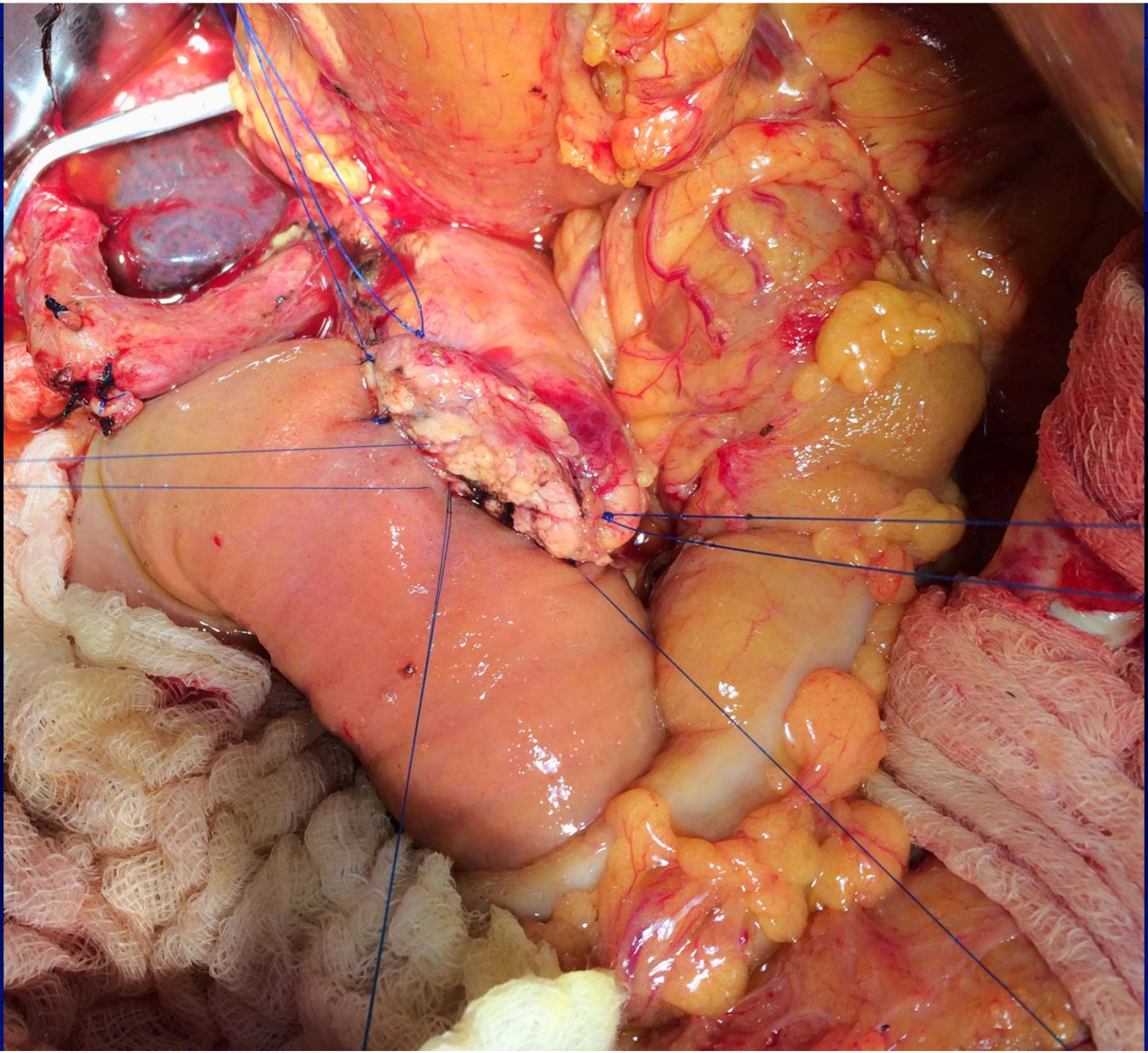


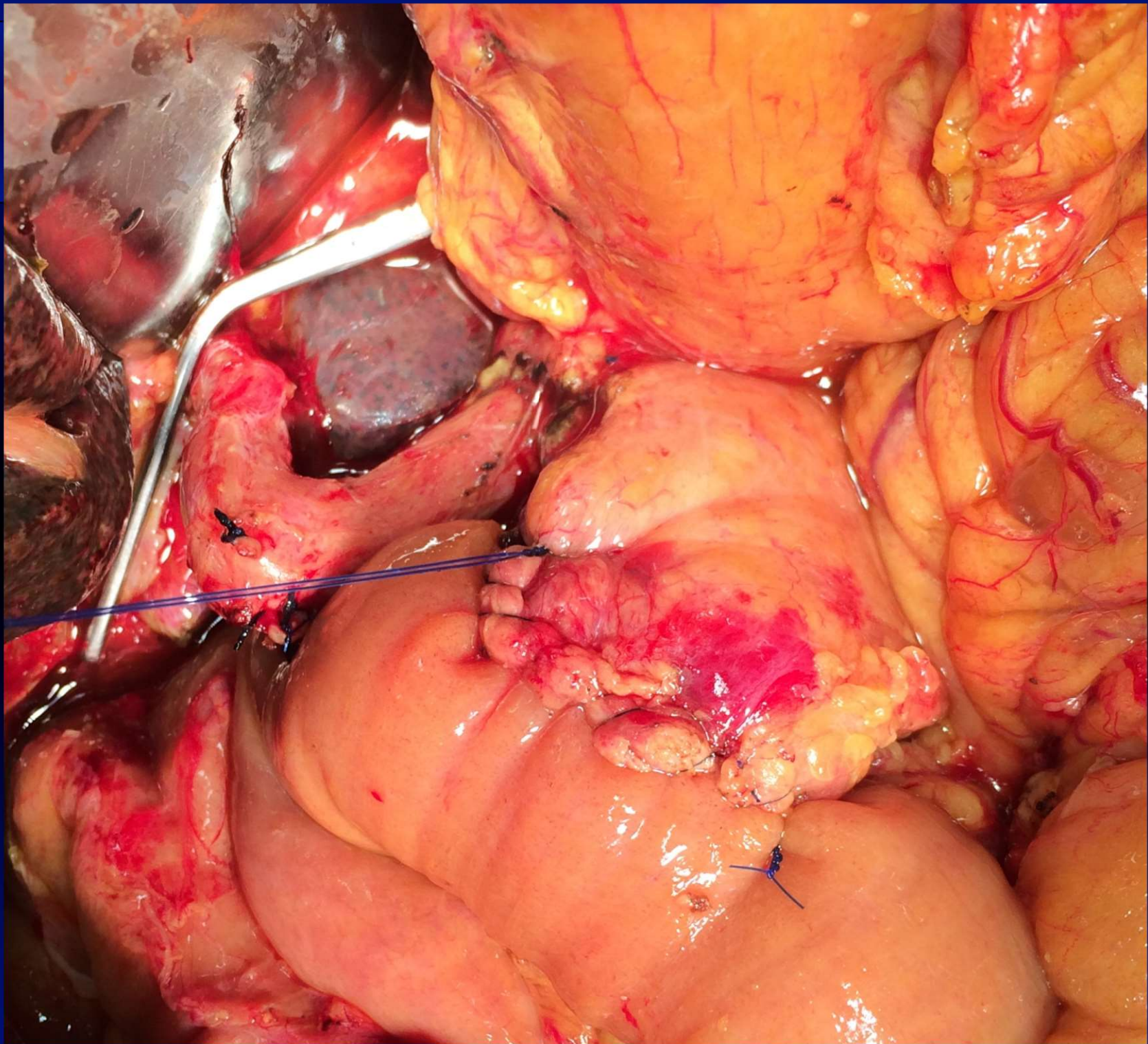






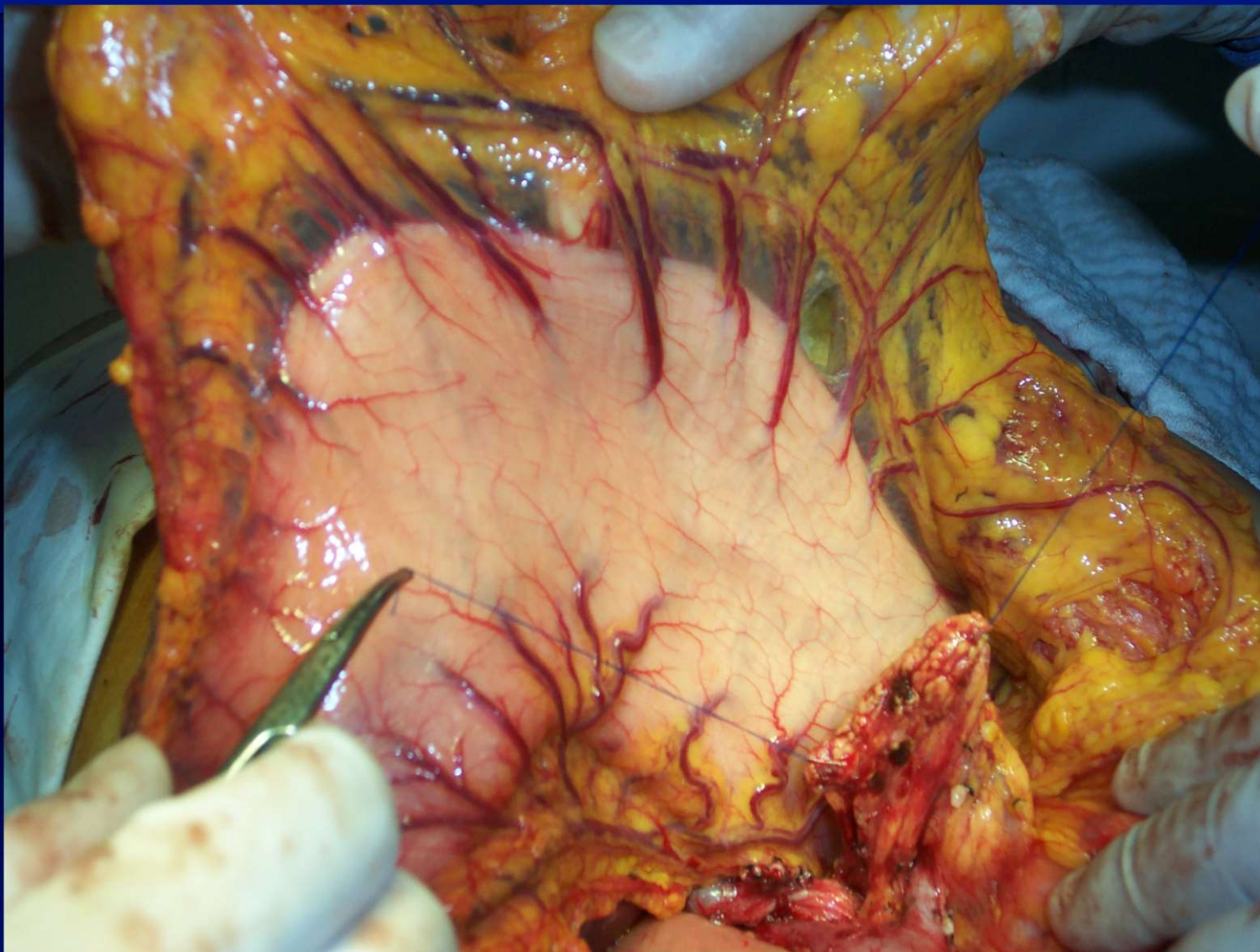






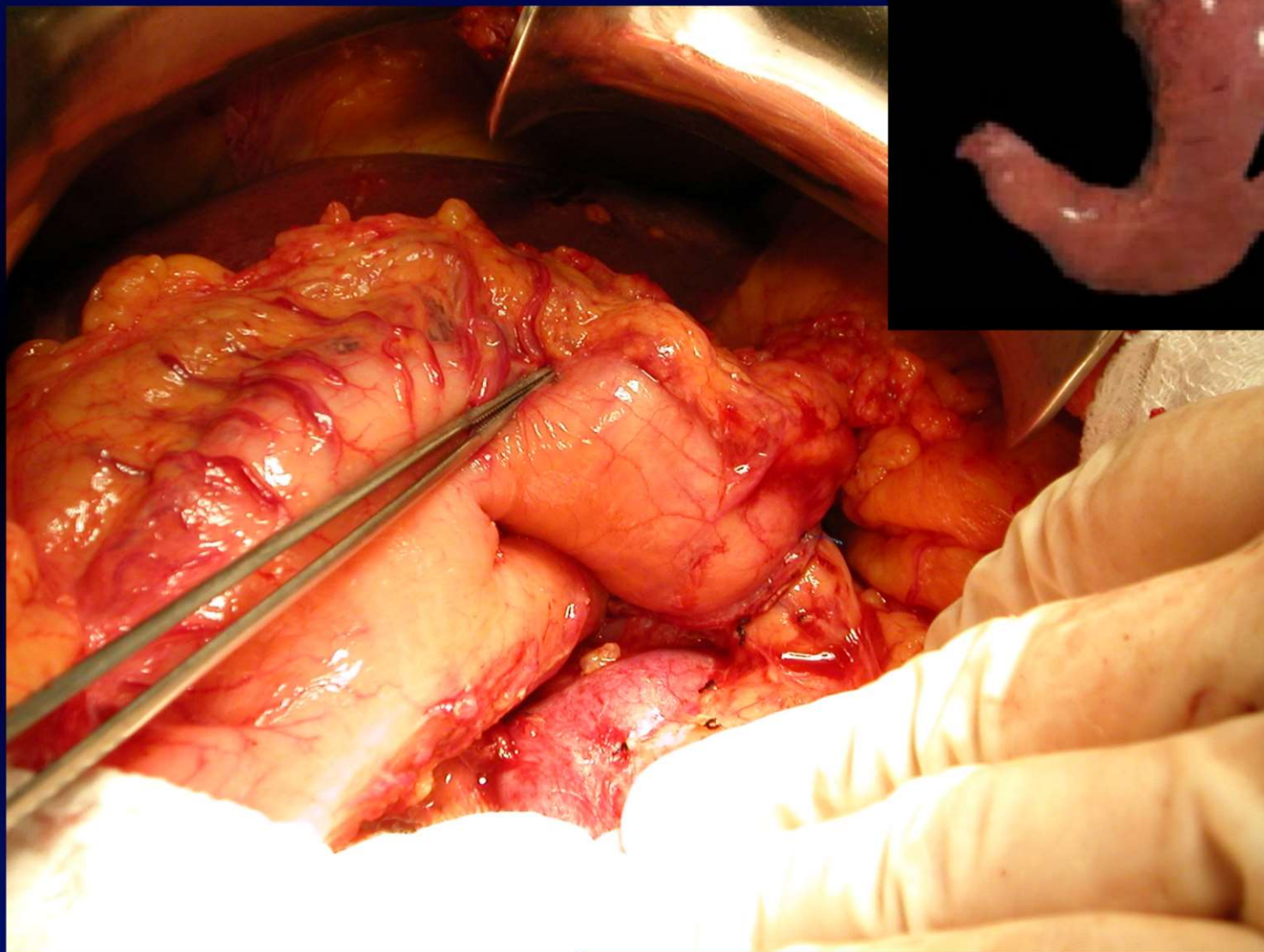
Pancreatogastro

Pancreatogastrostomia Técnica de Montenegro



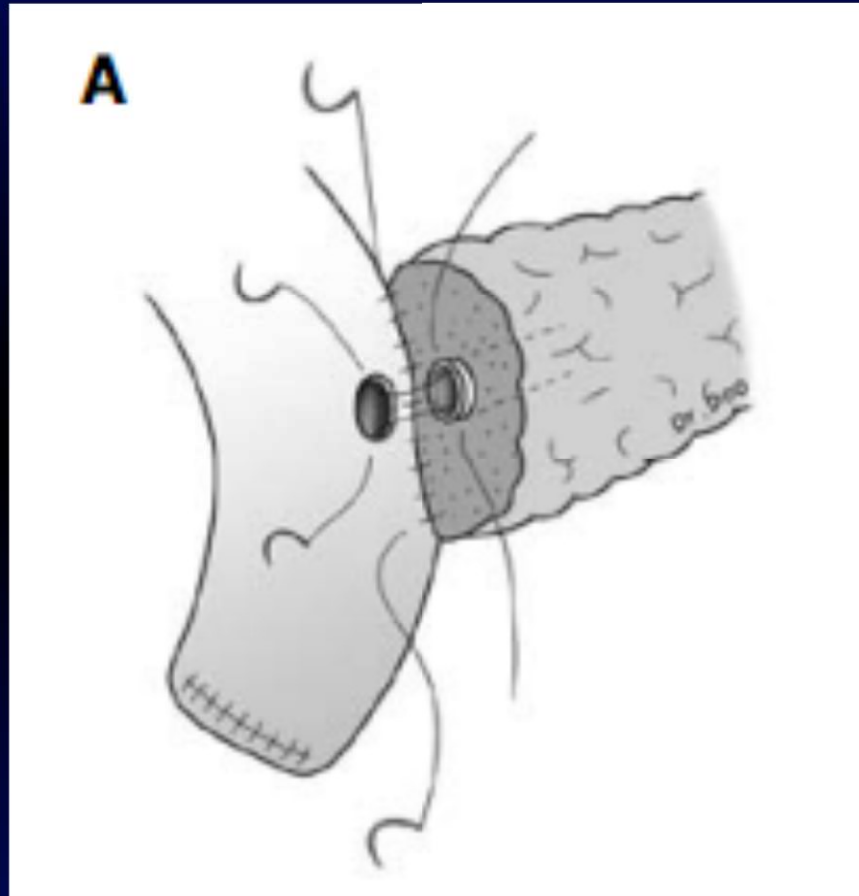
Cortesia do Dr. Roland Montenegro Costa

Pancreatogastrostomia Técnica de Montenegro

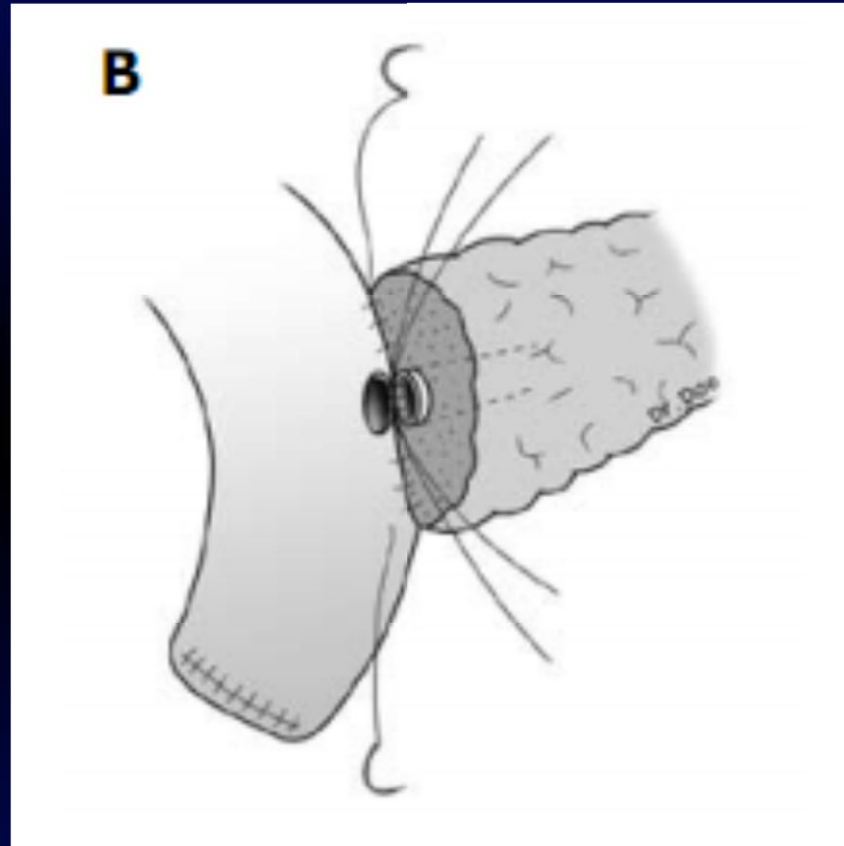


Cortesia do Dr. Roland Montenegro Costa

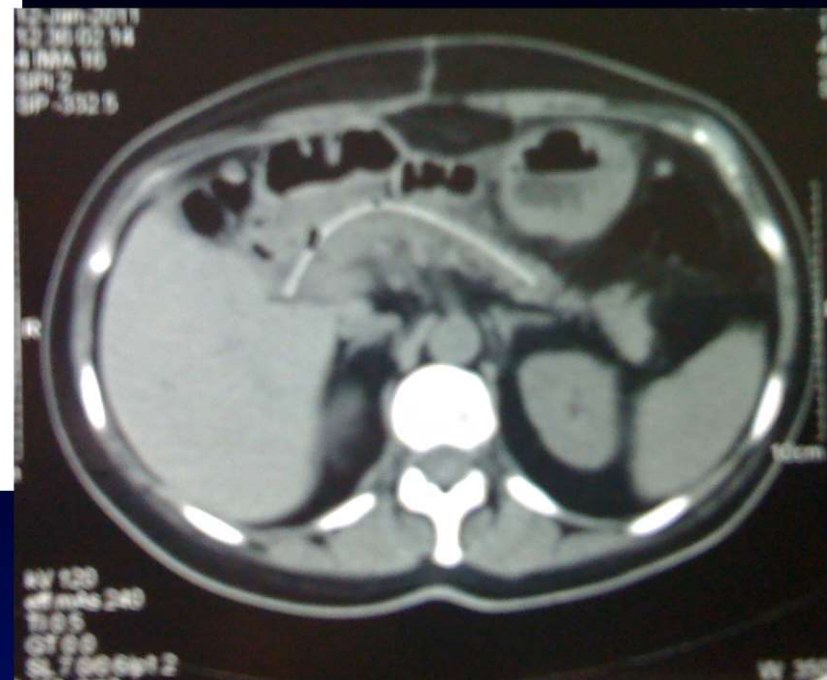
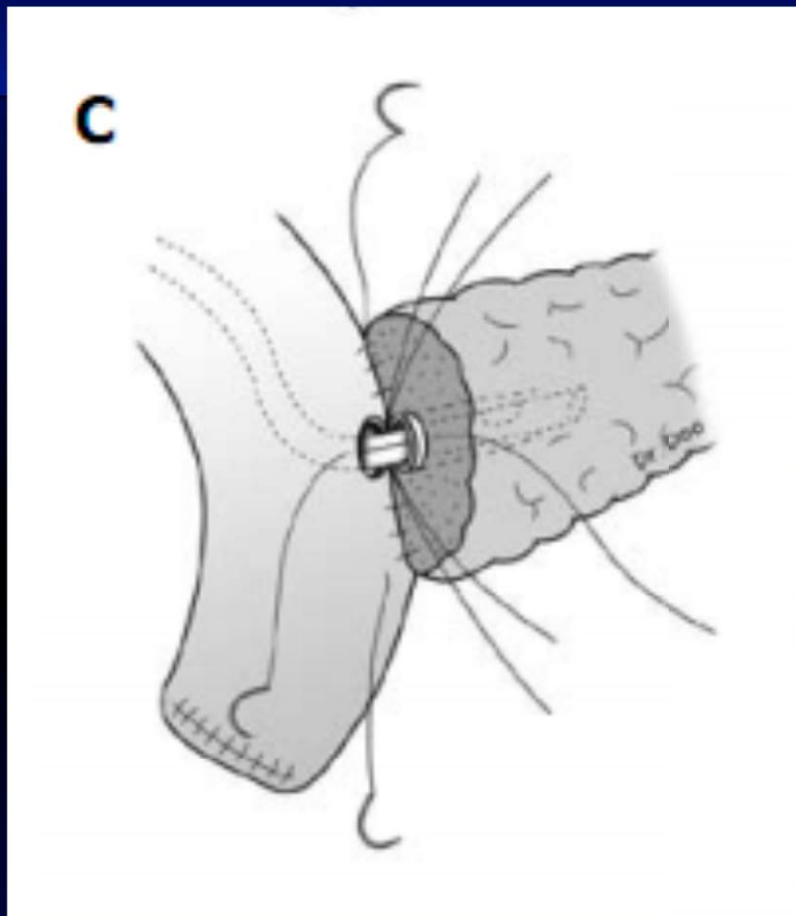
Pancreatojejunostomy



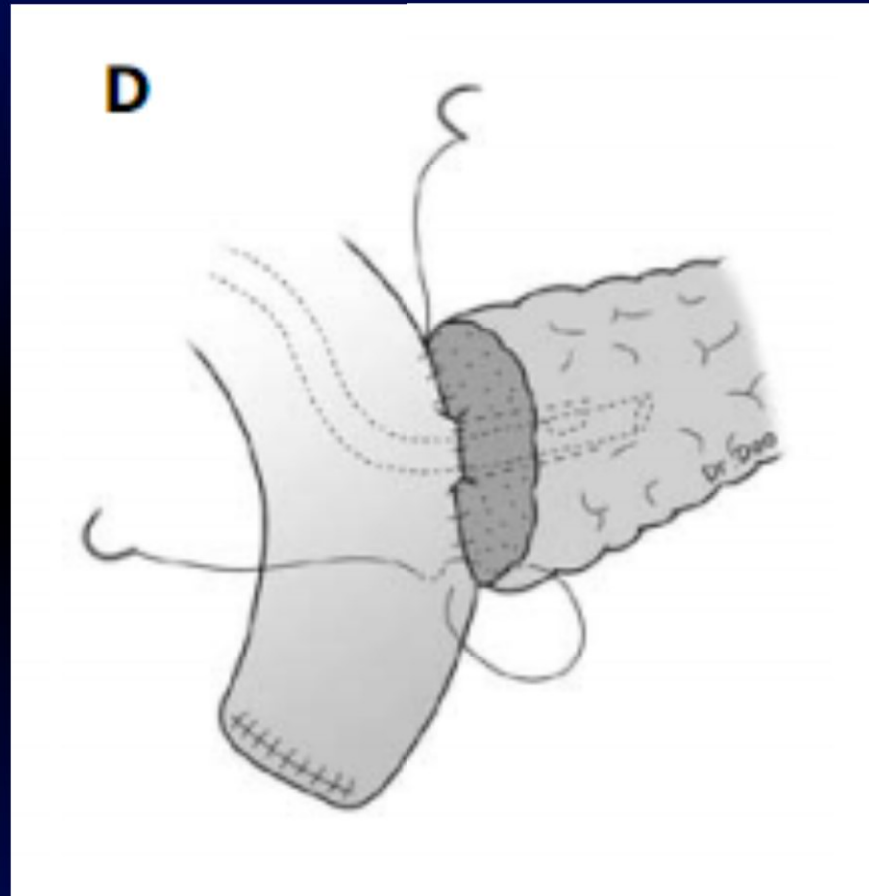
Pancreatojejunostomy



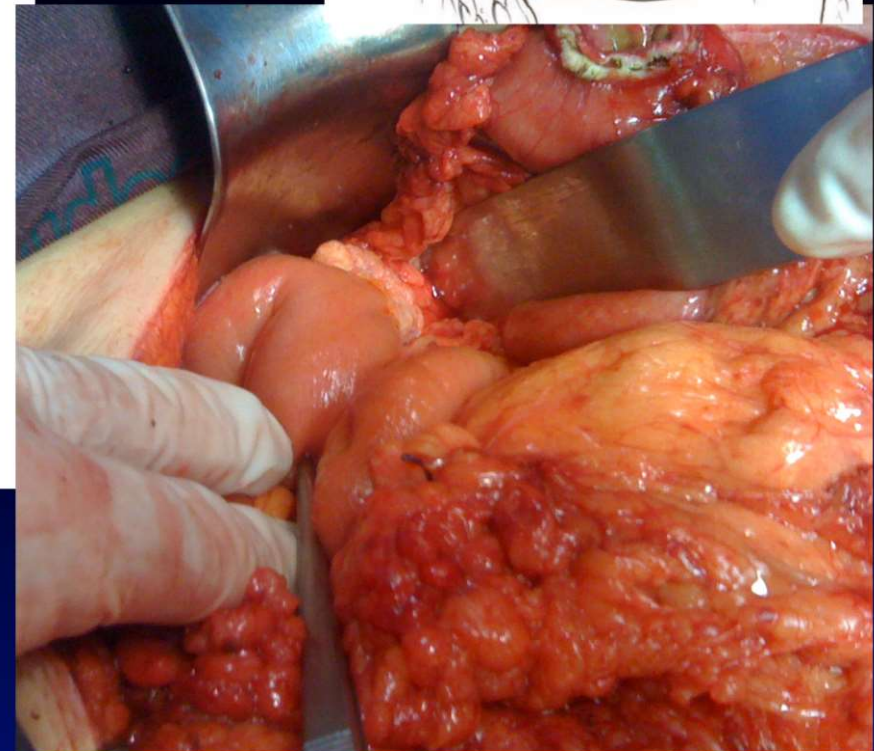
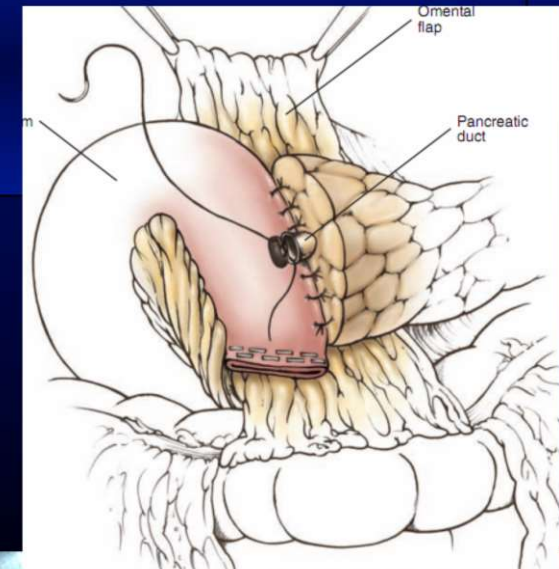
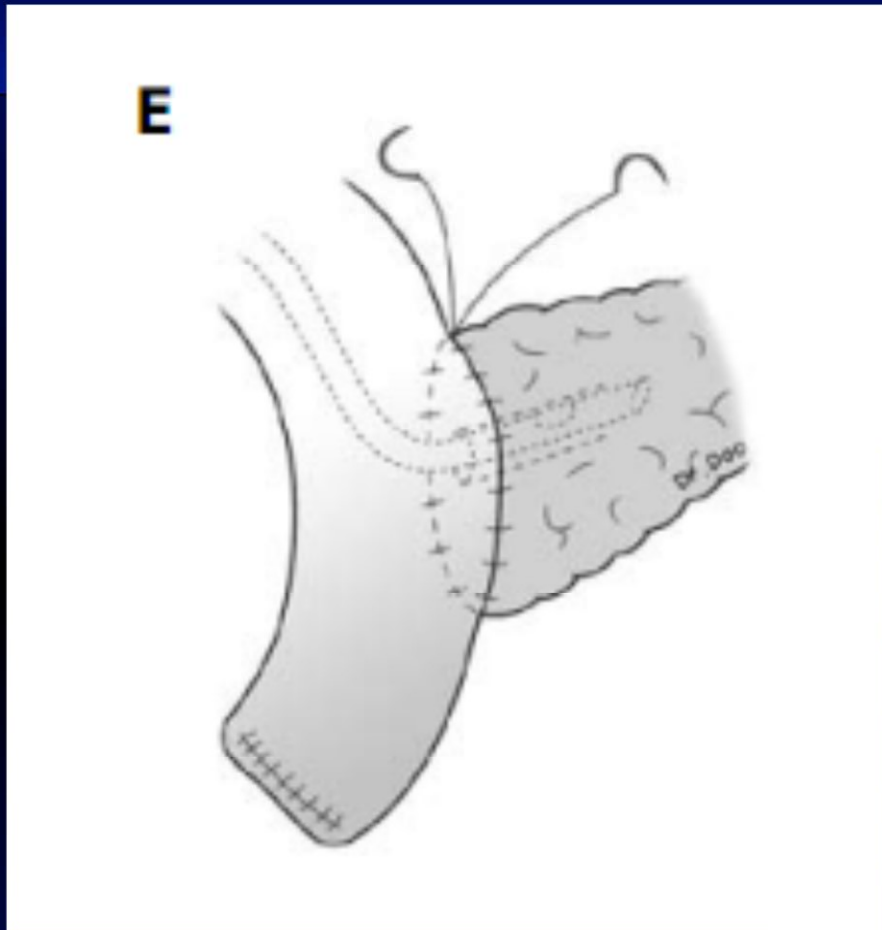
Pancreatojejunostomy



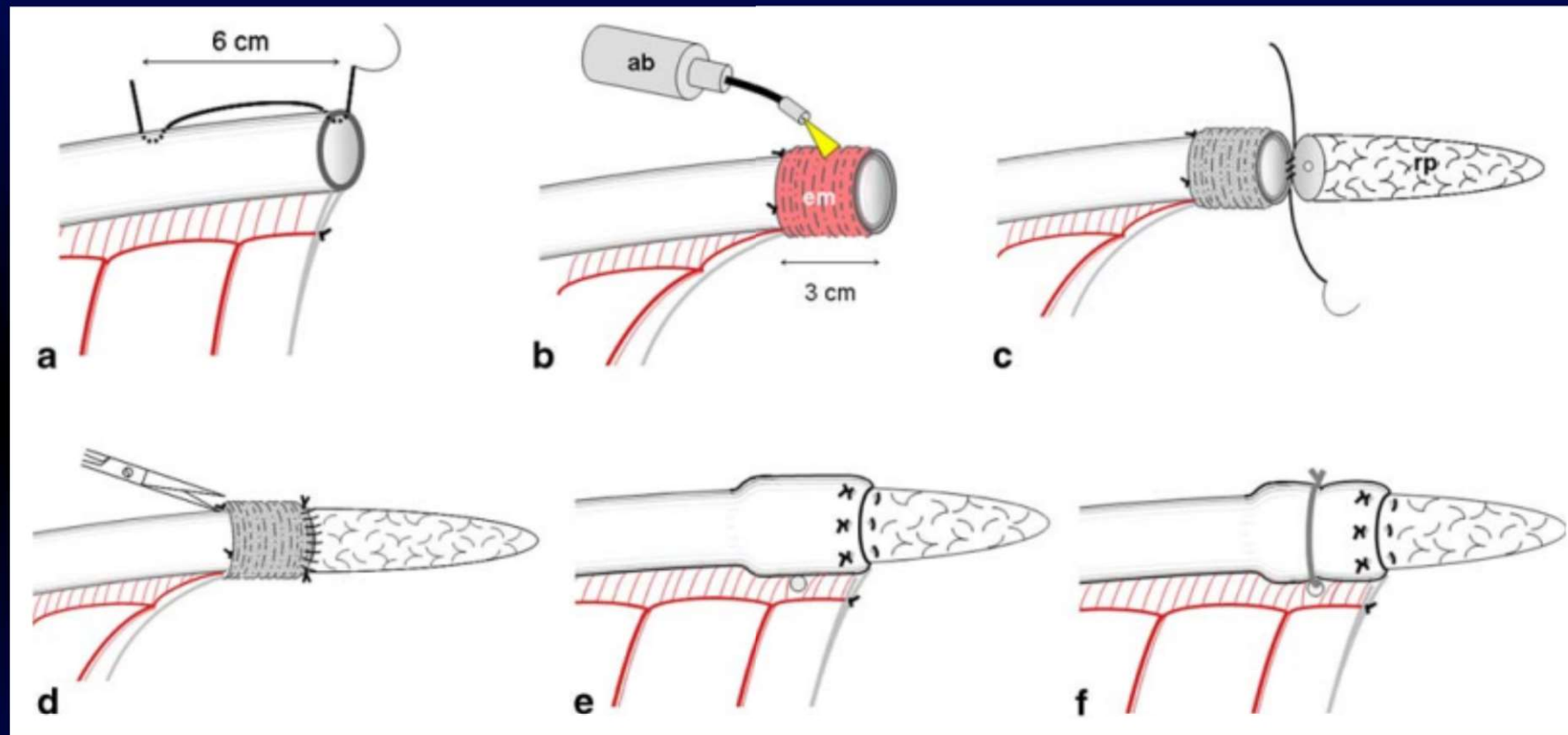
Pancreatojejunostomy



Pancreatojejunostomy



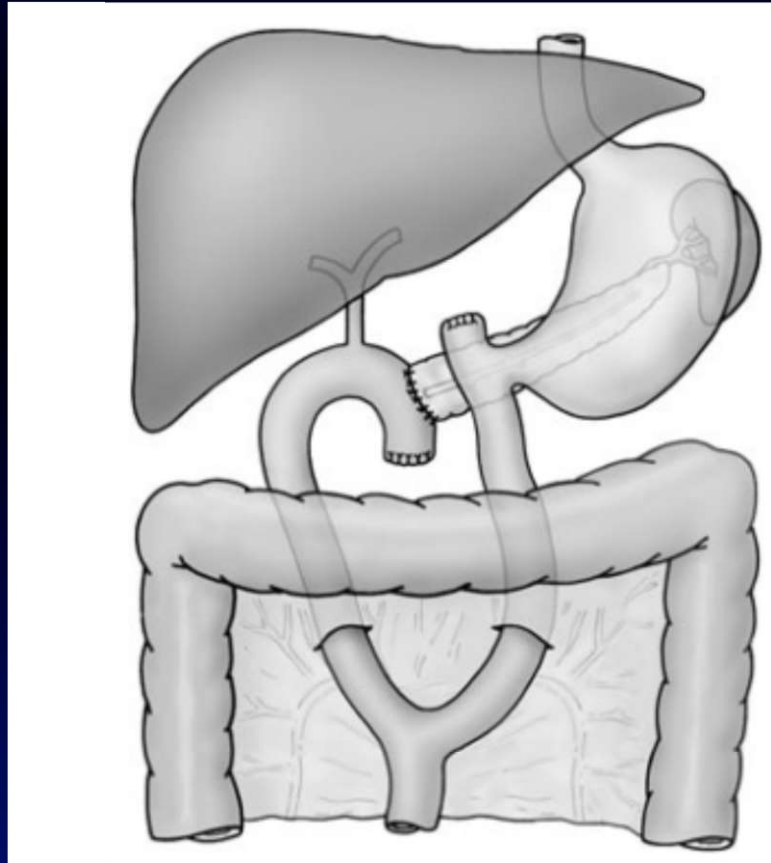
Técnica de Peng



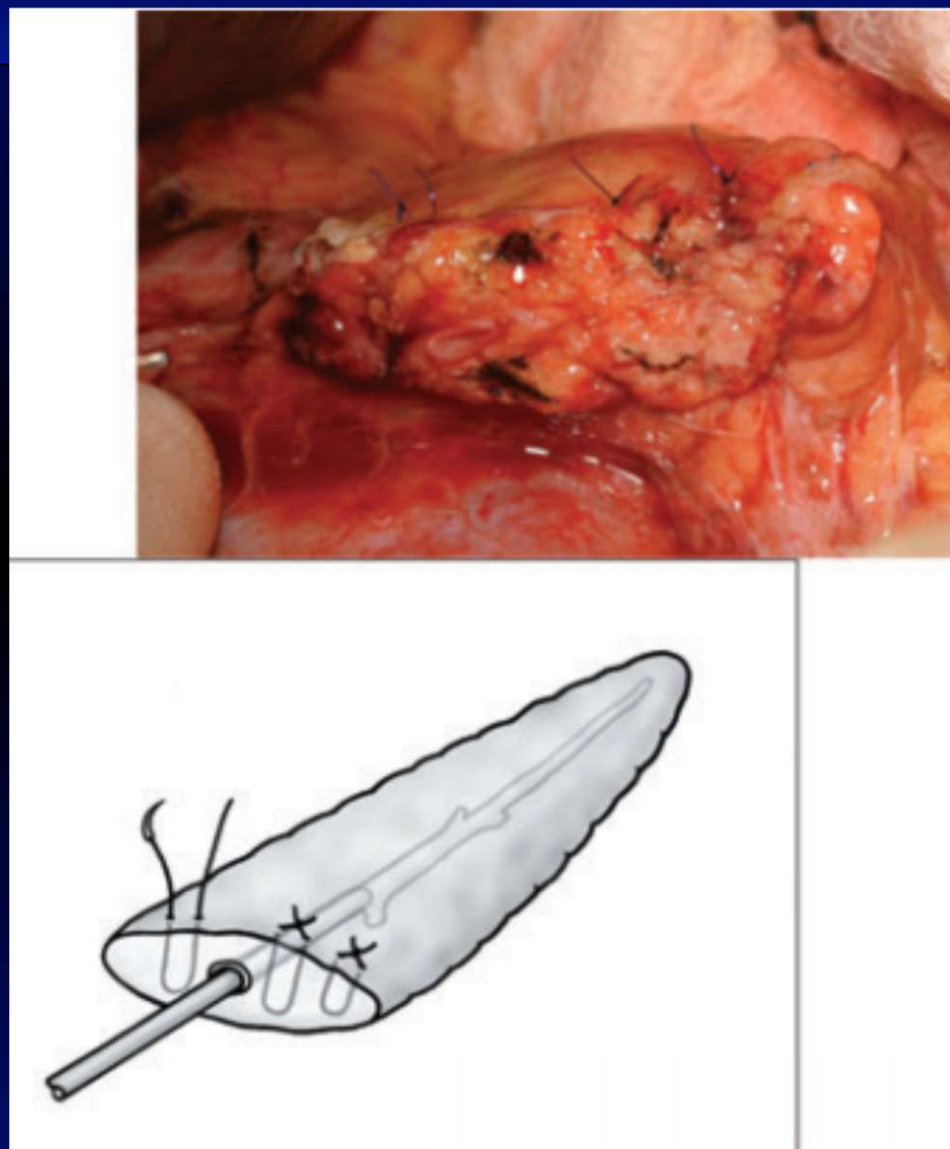
Pancreatojejunostomia

ORIGINAL ARTICLE

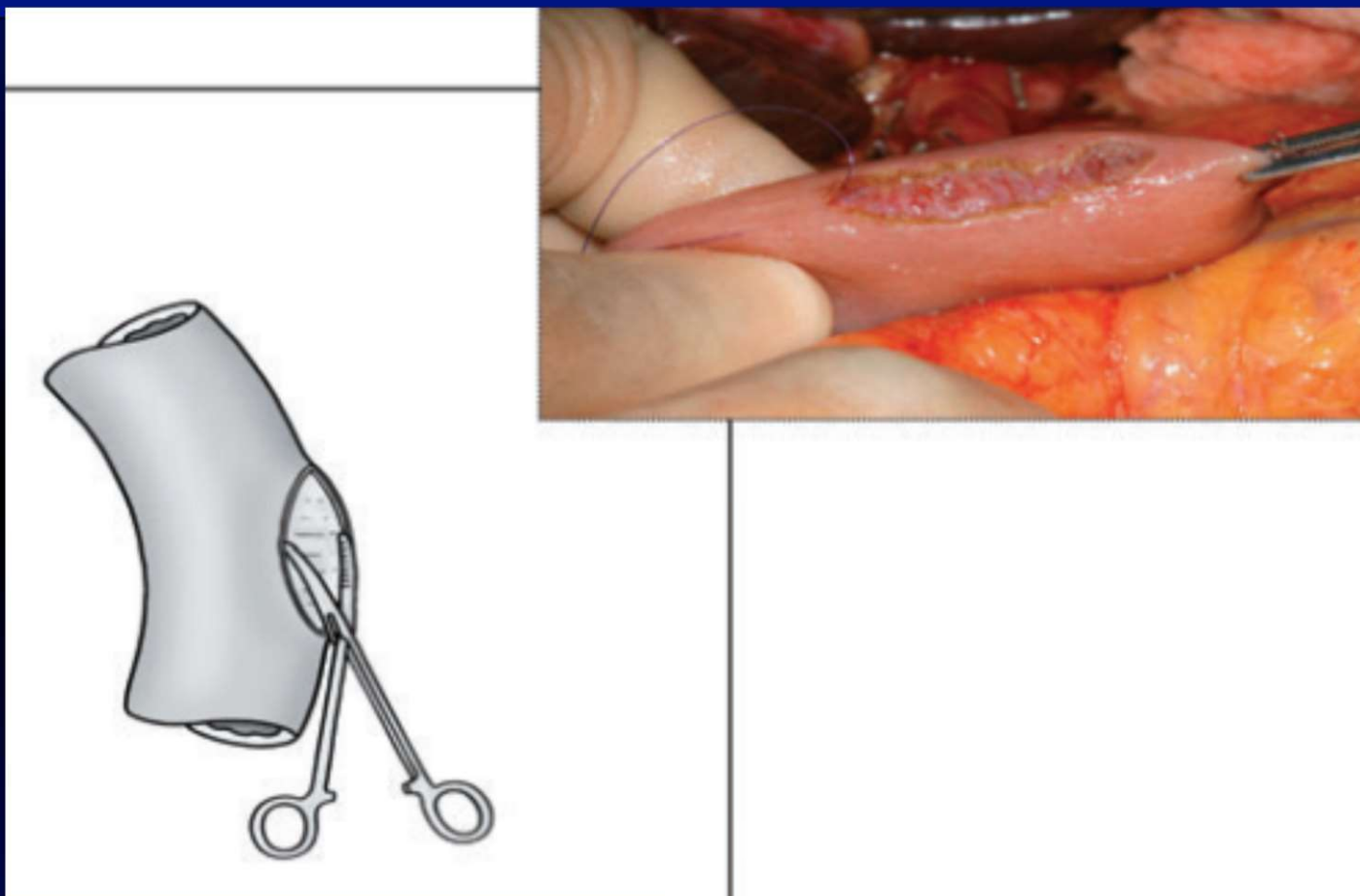
Modified Cattell's pancreaticojejunostomy, buttressing for soft pancreases and an isolated biliopancreatic loop are safety measurements that improve outcome after pancreaticoduodenectomy: a pilot study



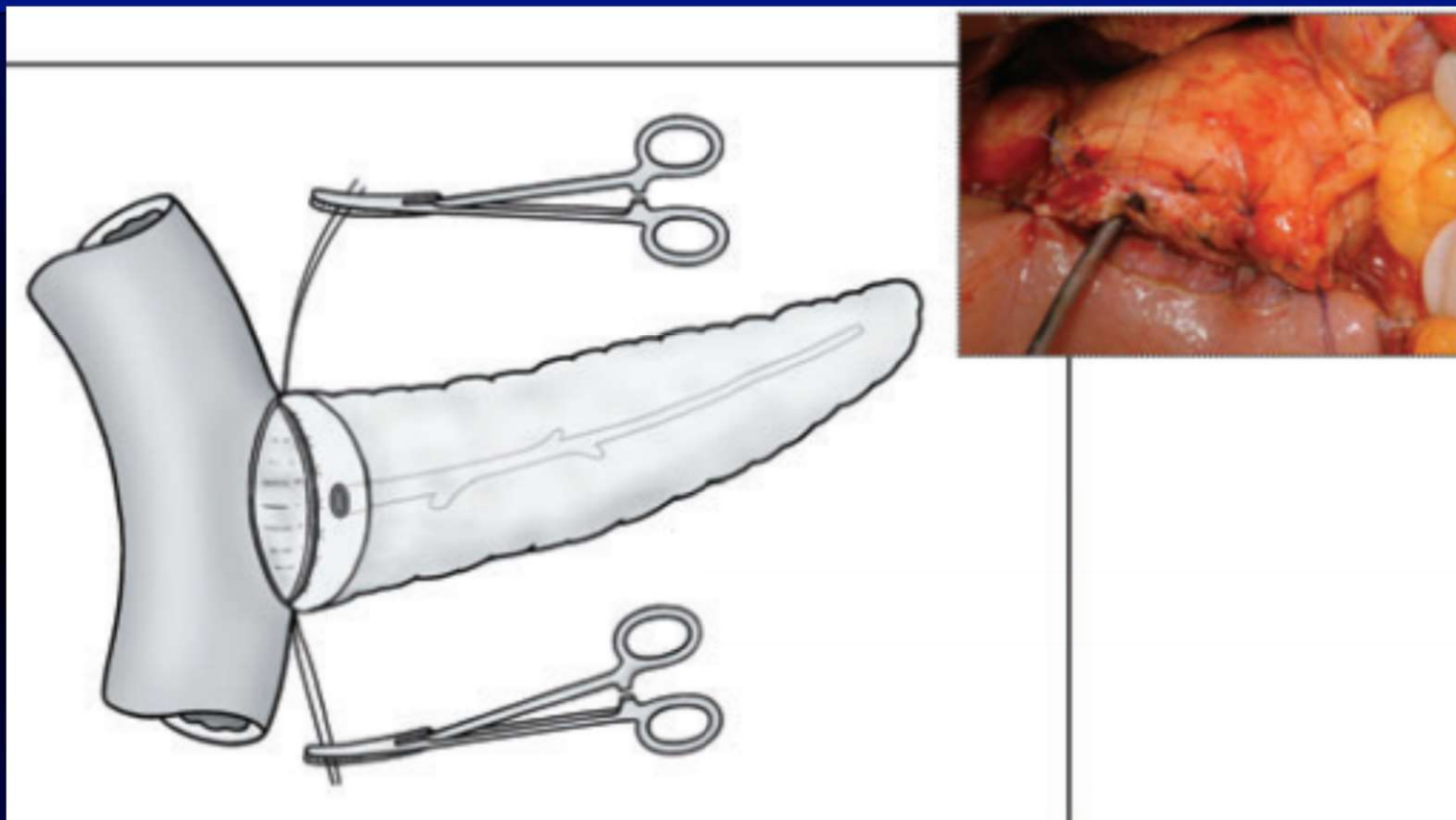
Pâncreas consistência amolecida



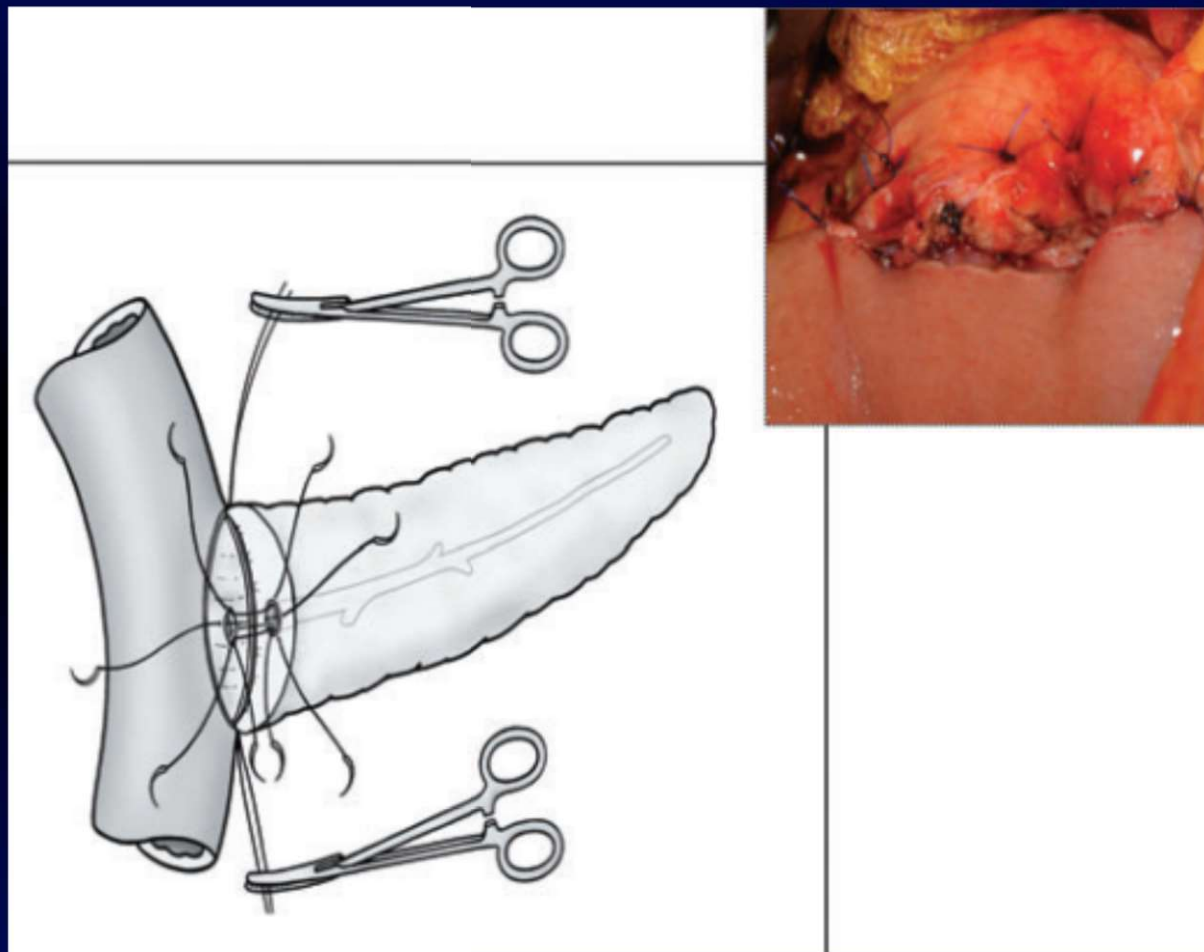
Pâncreas consistência amolecida



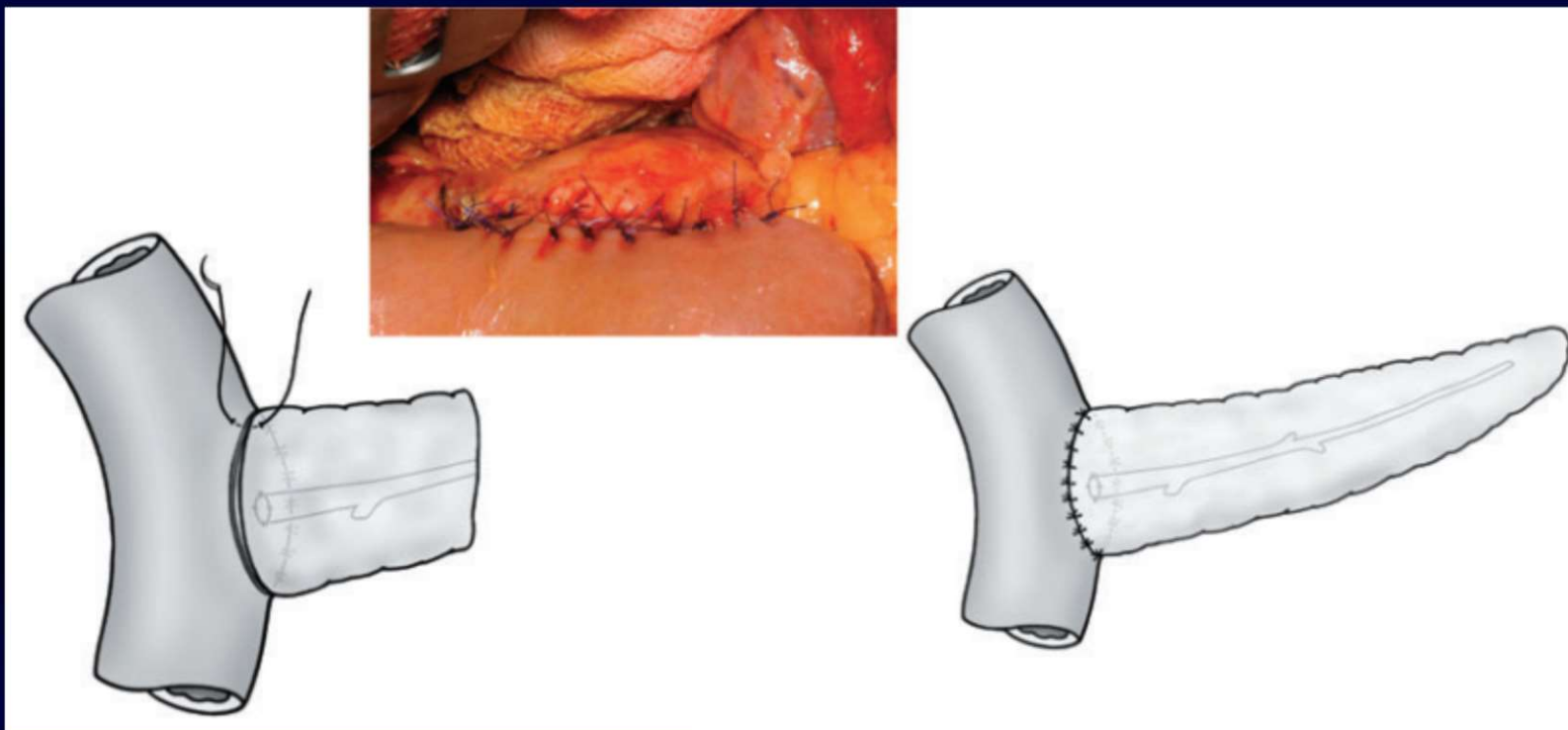
Pâncreas consistência amolecida



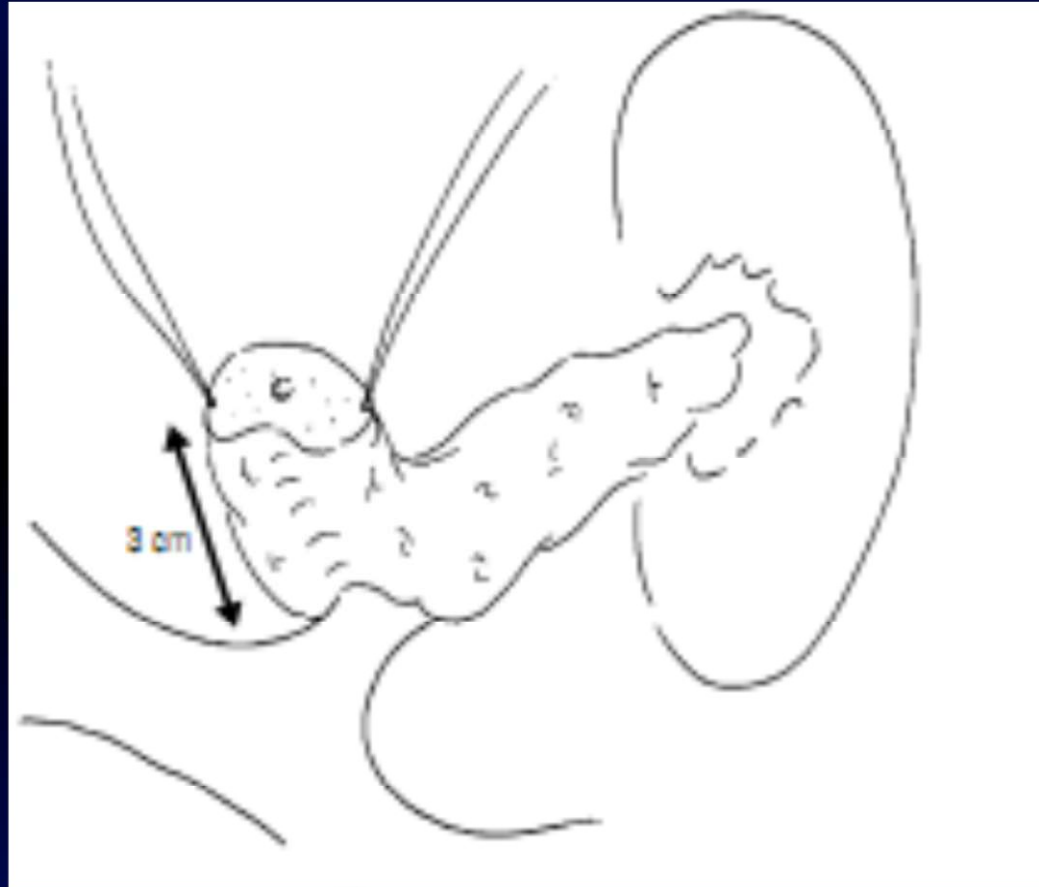
Pâncreas consistência amolecida



Pâncreas consistência amolecida

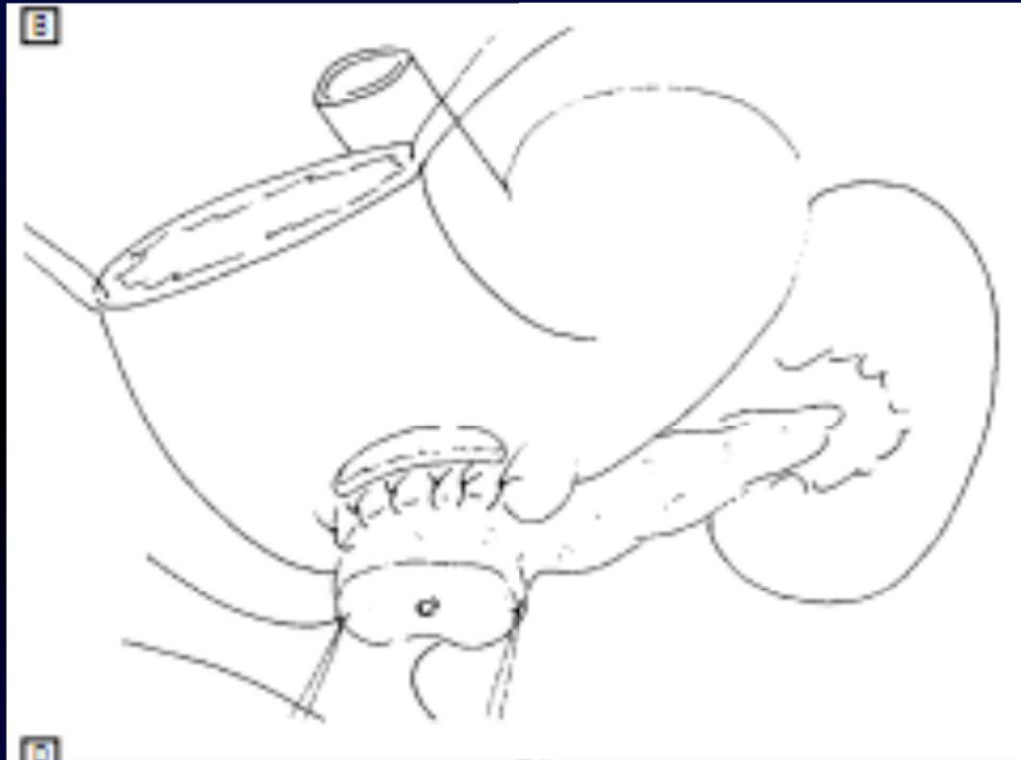


Pancreatogastrostomy



Oussoultzoglou E, et al. Arch Surg 2004; 139:327-35

Pancreatogastrostomy



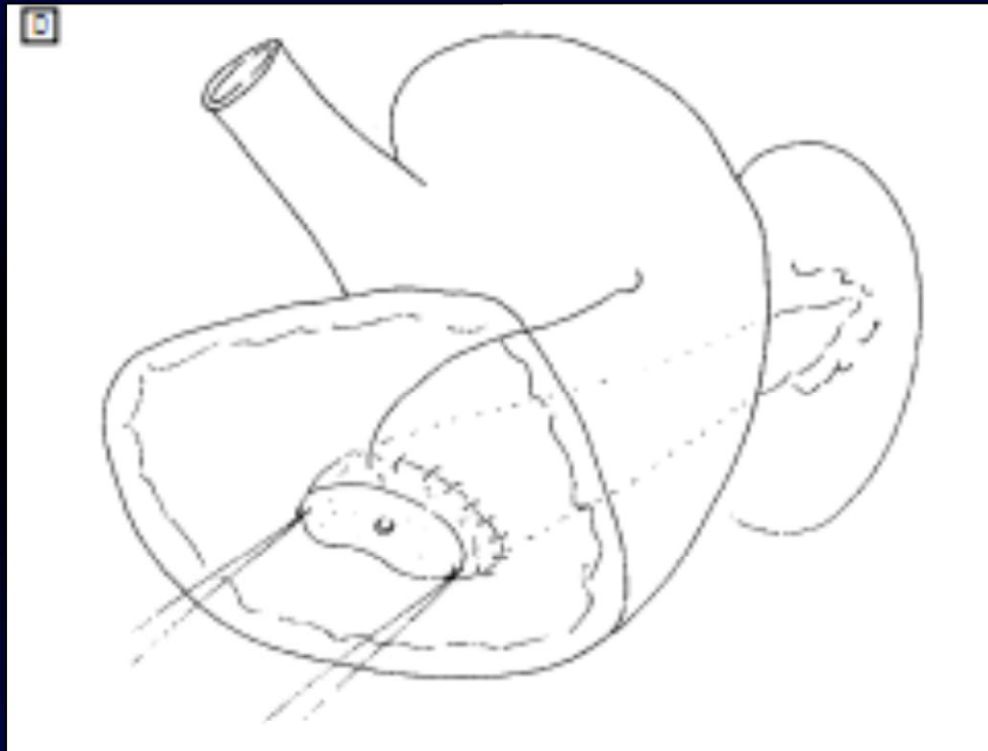
Oussoultzoglou E, et al. Arch Surg 2004; 139:327-35

Pancreatogastrostomy



Oussoultzoglou E, et al. Arch Surg 2004; 139:327-35

Pancreatogastrostomy



Oussoultzoglou E, et al. Arch Surg 2004; 139:327-35

Pancreatogastro ou pancreatojejunum?

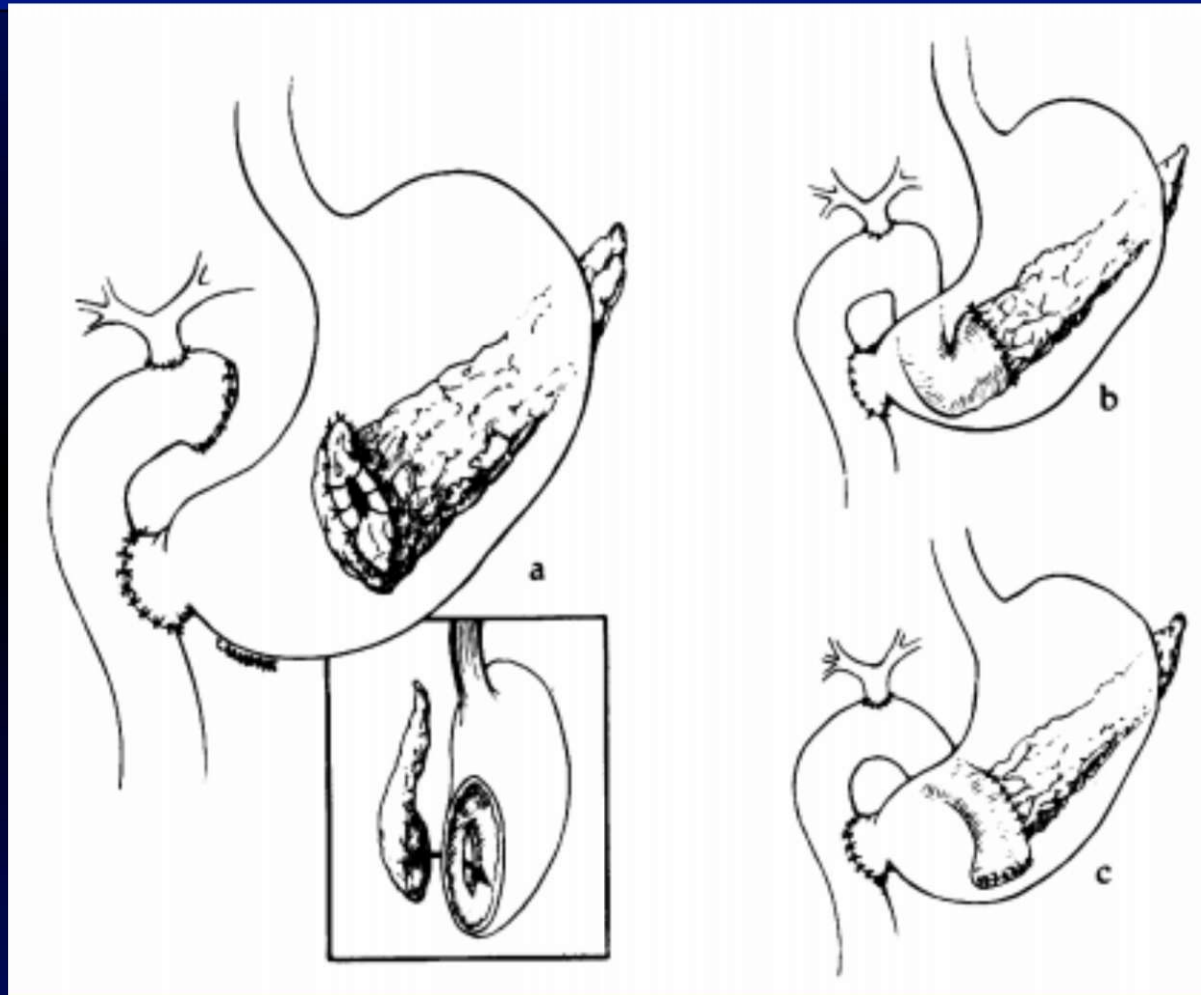


TABLE 3. One Thousand Pancreaticoduodenectomies

	No.	%
Pylorus preserving pancreaticoduodenectomy	787	79
Classic pancreaticoduodenectomy	213	21
Head resection	955	95
Total pancreatectomy	45	5
Gland texture	200	
Normal	78	39
Moderate	72	36
Firm	50	25
Pancreaticojejunostomy		87
Pancreaticogastrostomy		13

Pancreatogastro ou pancreatojejuno?

Table 3. POSTOPERATIVE FACTORS AND COMPLICATIONS

	PG (n = 73)	PJ (n = 72)	p Value
Delayed gastric emptying*	16 (22)	16 (22)	NS
Wound infection	14 (19)	11 (15)	NS
Pancreatic fistula†	9 (12)	8 (11)	NS
Cholangitis	4 (5)	6 (8)	NS
Pneumonia	5 (7)	2 (3)	NS
Intra-abdominal abscess	4 (5)	2 (3)	NS
Cardiac arrhythmia	3 (4)	2 (3)	NS
Bile leak	1 (1)	3 (4)	NS
Urinary tract infection	2 (3)	1 (1)	NS
Postoperative pancreatitis	1 (1)	1 (1)	NS
Peptic ulcer	2 (3)	0 (0)	NS
Duodenojejunostomy leak	0 (0)	2 (3)	NS
No. of patients with above complications	36 (49)	31 (43)	NS
No. of patients commencing total parenteral nutrition postoperatively	21 (29)	31 (43)	NS
Total output from pancreatic drains (mL)	1224 ± 166	1200 ± 177	NS
Postoperative hospital stay (days)	17.1 ± 1.6	17.7 ± 1.5	NS

Pancreatogastro ou pancreatojejuno?

TABLE 3. Specific Complications Observed in 151 Cases of Pancreaticoduodenectomy

	Group PG (n = 69)	Group PJ (n = 82)	<i>P</i>
Complicated patients	20 (29%)	32 (39%)	NS
Single complication	15 (75%)	10 (31%)	0.002
Multiple complications	5 (25%)	22 (68%)	
Pancreatic fistula	9 (13%)	13 (16%)	NS
Biliary fistula	0	7 (8.5%)	0.01
Enteric fistula	4 (6%)	7 (8.5%)	NS
Pancreatitis of the cuff	1 (1.5%)	4 (5%)	NS
Intra-abdominal fluid collection	7 (10%)	22 (27%)	0.01
Abdominal bleeding	3 (4%)	6 (7%)	NS
Delayed gastric emptying	2 (3%)	10 (12%)	0.03
Reoperations	5 (7%)	5 (6%)	NS
Mortality	0	1 (1%)	NS

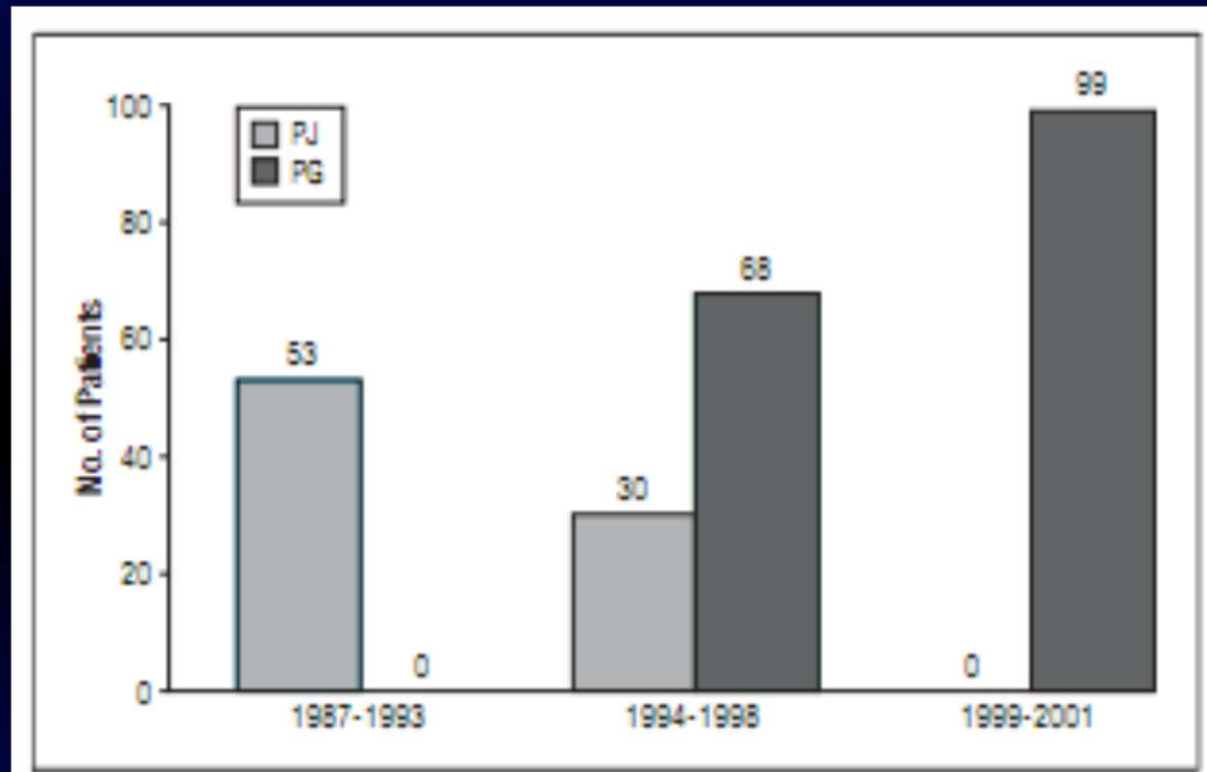
Pancreatogastro ou pancreatojejuno?

Table 3. Comparison of Postoperative Outcomes in Patients Undergoing Pancreaticogastrostomy (PG) and Pancreatojejunostomy (PJ)*

Outcome	PG Group (n = 167)	PJ Group (n = 83)	P Value
Major complications			
Pancreatic fistula†	4 (2.3)	17 (20.4)	<.001
Delayed gastric emptying	6	6	.20
Postoperative erosive hemorrhage due to pancreatic fistula	0	3	.03
Postoperative hemorrhage from the operative field	1	1	.61
Gastrointestinal bleeding from pancreatic cut edge	3	1	.72
Other gastrointestinal bleeding	1	0	.47
Wound infection	5	2	.49
Sepsis	16	14	.09
Intra-abdominal collection	7	6	.30
Biliary leakage	1	2	.21
Leakage of gastrojejunostomy	0	2	.10
Obstruction of the hepaticojejunostomy	1	0	.47
Liver necrosis	1	0	.47
Portal vein thrombosis	1	0	.47

Oussoultzoglou E, et al. Arch Surg 2004; 139:327-35

Pancreatogastro ou pancreatojejuno?



Oussoultzoglou E, et al. Arch Surg 2004; 139:327-35

Critical Analysis of a Large Series of **Pancreaticogastrostomy** After Pancreaticoduodenectomy

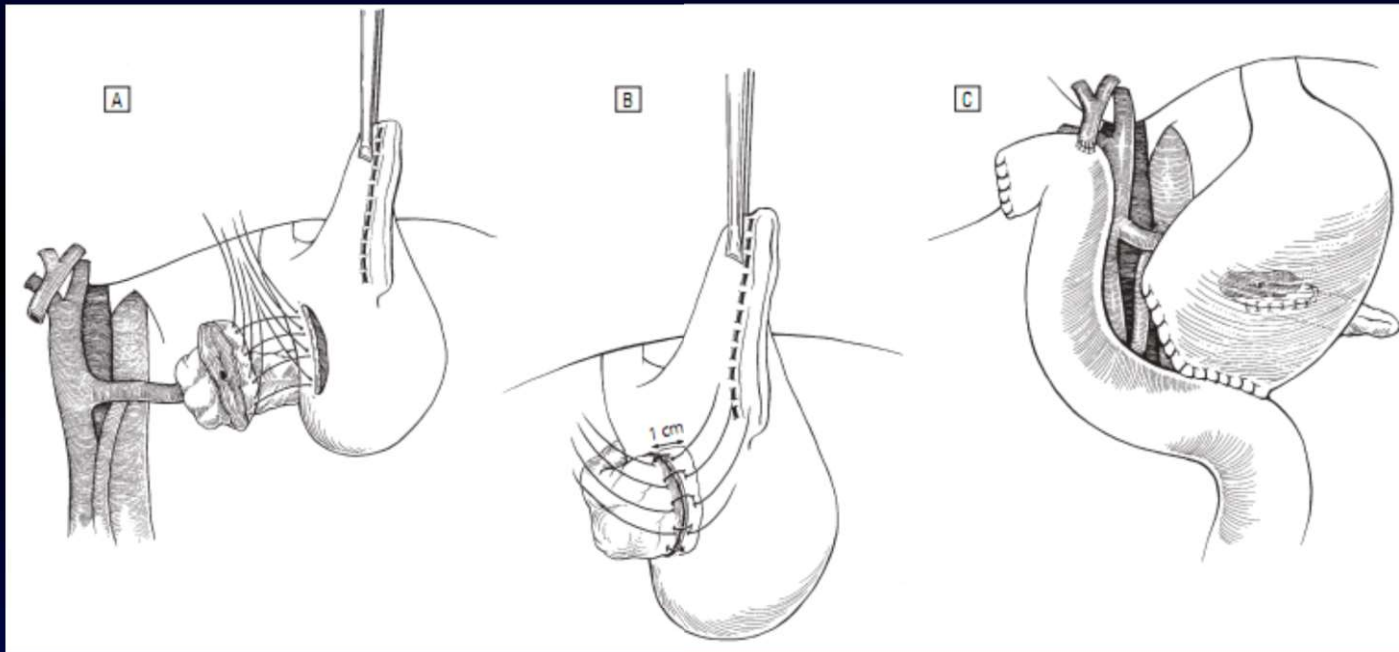


Table 3. Postoperative Complications

Complication	Patients, No. (%)
Mortality	2 (0.9)
Pancreatic leak	32 (13.6)
Intra-abdominal abscess	14 (6)
Delayed gastric emptying	14 (6)
Wound infection	13 (5.5)
Cardiac complications	8 (3.4)
Small intestinal obstruction	5 (2.1)
Pulmonary complications	5 (2.1)
Hemorrhage	4 (1.7)
Gastric leak	3 (1.3)
Bile leak	2 (0.9)
Reexploration	3 (1.3)
Miscellaneous	18 (7.7)

Pancreatojejunostomose

(a) Multivariate analysis of factors predictive of pancreatic fistula.

Predictive factor	Odds ratio	P-value
Invaginated pancreaticojejunostomy	3.30	.01
Closed suction drainage	2.24	.05
Diagnosis of pancreatitis	0.22	.05
Pre-op endoscopic biliary stent	0.34	.05

(c) Multivariate analysis of factors predicting pancreatic fistula in 294 patients with periampullary adenocarcinoma subgroup.

Predictive factor	Odds ratio	Stats
Invaginated pancreaticojejunostomy	11.78	.0002
Pre-op endoscopic biliary stent	0.194	.04
Gender (Female)	0.238	.03
Pre-op diabetes	0.146	.07

Schmidt CM, et al. HPB 2009;11:1-8

Pancreatogastrostomia pós DP com tubo gástrico?

- ❑ Maior proximidade com o pâncreas
- ❑ Melhor riqueza vascular do estômago
- ❑ Melhor espessura da parede muscular
- ❑ Ajustabilidade para qualquer diâmetro pancreático
- ❑ Não há exclusão de segmento intestinal jejunal
- ❑ Pode ser realizada com preservação do piloro ou com gastrectomia parcial
- ❑ Facilidade de acesso através de endoscopia (sangramento/stent/estenose ductal)

Pancreatogastrostomia pós DP com tubo gástrico?

- ❑ Economiza tempo cirúrgico
- ❑ A desconexão pancreatogástrica é quase impossível
- ❑ O esvaziamento gástrico não fica prejudicado
- ❑ Bloqueio da ativação de enzimas pancreáticas pelo suco gástrico.
- ❑ Facilidade de descompressão do estômago por uma sonda nasogástrica.
- ❑ Fácil acessibilidade à anastomose hepático-jejunal
- ❑ A anastomose é segura mesmo em pâncreas normais e com ductos < 3mm.
- ❑ Diminui relaparotomia para drenagem de coleções ou abscessos.
- ❑ A incidência de sangramento gastrointestinal é igual entre os dois grupos.

Anastomose com o estômago

Table I. Technical advantages of the pancreogastric anastomosis after PD.

- The stomach and the pancreas are closed, facilitating a tension-free anastomosis.
- The stomach wall has a good blood supply, enhancing anastomotic healing.
- In the absence of enterokinase activity and thanks to the gastric acid pH, pancreatic enzymes are not activated, thus reducing the risk of leakage.
- The pancreatic anastomosis can be controlled in the postoperative course through endoscopy, possible anastomotic bleeding can be treated easily.

Conventional Versus Binding **Pancreaticojejunostomy** After Pancreaticoduodenectomy

A Prospective Randomized Trial

TABLE 3. Postoperative Course and Complications

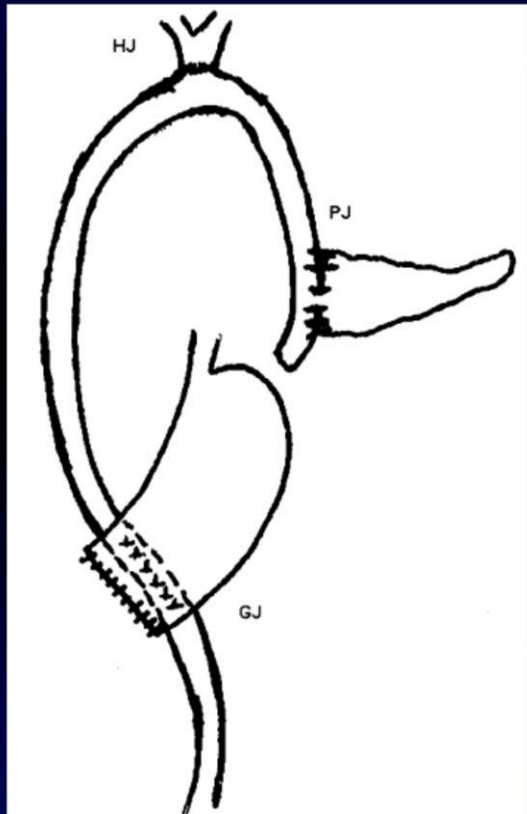
	Binding Group (n = 106)	Conventional Group (n = 111)	P
Drain outputs (mL)	86.7 ± 36.3	83.8 ± 46.3	NS
Amylase (U/L) [mean (range)]	38.0 (0–762.5)	63.8 (8.6–1654.0)	0.0005
Abdominal complications [no. (%)]			
Pancreatic anastomotic leakage	0 (0)	8 (7.2)	0.014
Biliary leakage	7 (6.6)	6 (5.4)	NS
Gastric-enteric anastomotic leakage	1 (0.9)	1 (0.9)	NS
Delayed gastric emptying	4	3	NS
Pancreatitis	1	1	NS
Intraperitoneal hemorrhage	2	3	NS
Intraperitoneal abscess	0	3	NS
Ascites	1	2	NS
Wound infection	6	7	NS
Incision wound dehiscence	1	3	NS

Pancreatojejunoanastomose

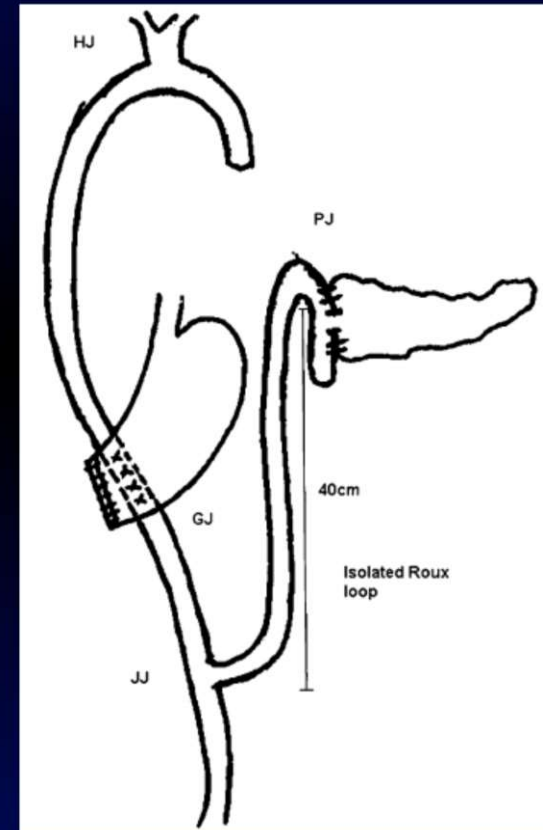
TABLE 4. Pancreatic Anastomotic Leakage in the Different Risk Categories

	Binding Group	Conventional Group	<i>P</i>
High risk			
Leakage	0	6	0.039
No leakage	37	33	
Low risk			
Leakage	0	2	NS
No leakage	69	70	
Total	106	111	

Convencional ou Y de Roux?



X

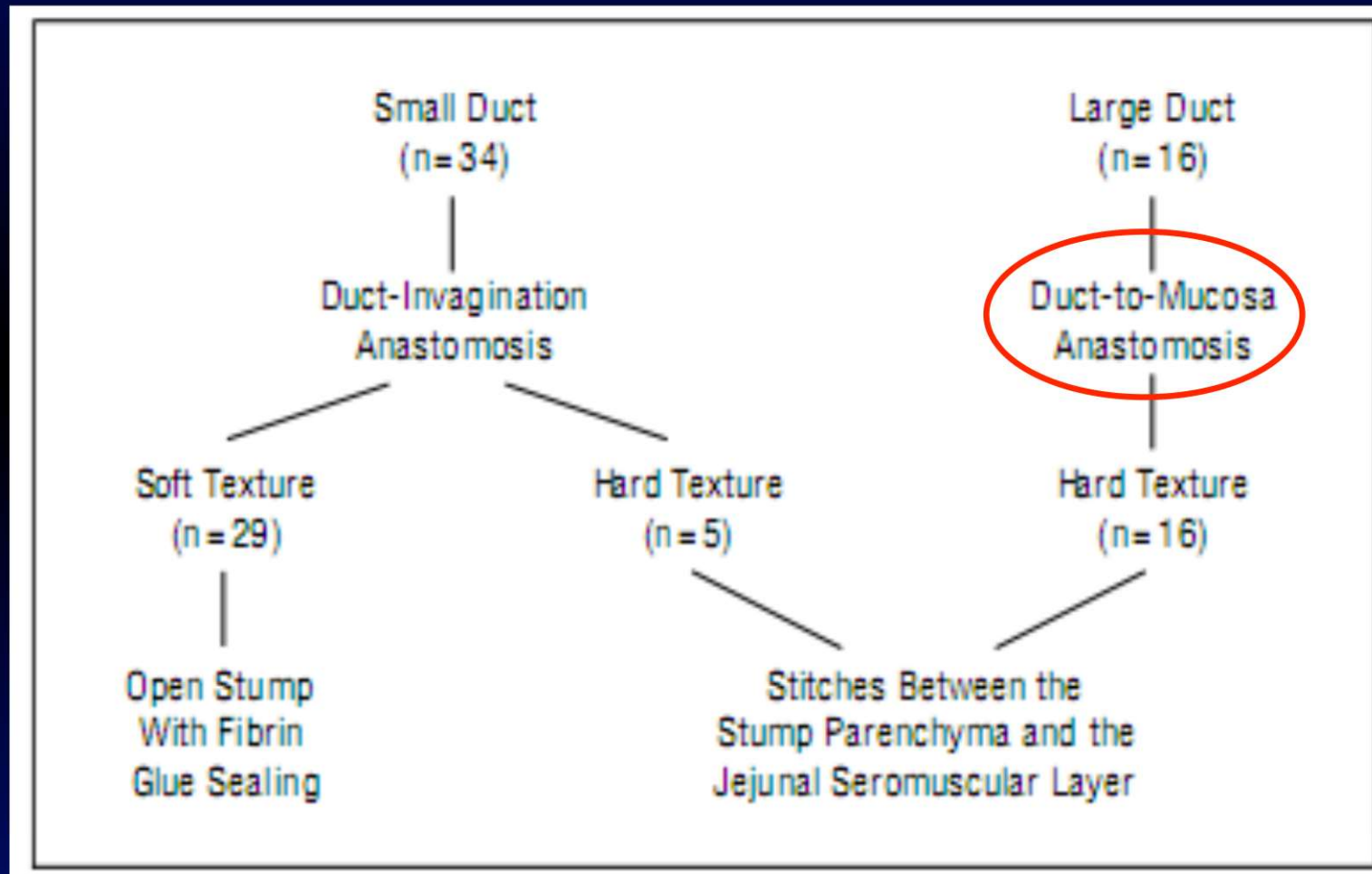


Convencional ou Y de Roux?

Table 2 Comparison of clinical outcomes between the two groups (*n* = 108)

Outcome	Total (<i>n</i> = 108)	Group 1 (IPJ) <i>n</i> = 53	Group 2 (CPJ) <i>n</i> = 55	<i>P</i> -value (group 1 vs. group 2)
Overall complications	32 (29.6%)	17 (32%)	15 (27.3%)	0.674
Nature of complications				
Pancreatic fistula	11 (10.1%)	5 (9.4%)	6 (10.9%)	0.800
DGE	9 (8.3%)	5 (9.4%)	4 (7.2%)	0.739
Wound infection	8 (7.4%)	5 (9.4%)	3 (5.4%)	0.484
Bleeding	4 (3.7%)	2 (3.7%)	2 (3.6%)	1.000
Operative mortality	4 (3.7%)	2 (3.7%)	2 (3.6%)	1.000
Mean duration of surgery, min (95% CI, OR)		442 (300–510) ± 32.0	370 (240–500) ± 38.5	0.005
Mean hospital stay, days (95% CI, OR)		10.1 (5–27) ± 3.7	9.5 (4–26) ± 5.0	0.483

Selection of **Pancreaticojejunostomy** Techniques According to Pancreatic Texture and Duct Size



Frequency of a Pancreatic Fistula (SL) Relating to Pancreatic Texture and Duct Size*

	Pancreatic Texture and Duct Size			
Variable	Soft and Small	Hard and Small	Hard and Large	Total
Disease				
Pancreas cancer	0/2	0/3	0/6	0/11
Ampullary cancer	1/9	0/0	0/1	1/10
Cystic tumor	1/7	0/0	0/2	1/9
Chronic pancreatitis	0/2	0/1	0/5	0/8
Duodenal cancer	1/3	0/0	0/2	1/5
Bile duct cancer	1/4	0/0	0/0	1/4
Gastric cancer	0/1	0/1	0/0	0/2
Aneurysm	0/1	0/0	0/0	0/1
Surgical procedure				
PD	1/12	0/4	0/15	1/31
PpPD	3/17	0/1	0/1	3/19
Total†	4/29 (14)	0/5	0/16	4/50 (8)

Pancreatectomy for Intraductal Papillary Mucinous Neoplasm of the Pancreas: Could Pancreaticogastrostomy Be the Anastomosis of Choice?

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- ❑ Acesso direto ao pâncreas
- ❑ Coleta de material
- ❑ Estudo por imagem

Conclusões

- ❑ Os fatores de risco devem ser valorizados
- ❑ Qualquer técnica é factível em pacientes sem fatores de risco
- ❑ As anastomoses com estômago ou intestino parecem ser equivalentes
- ❑ A pancreatojejunoanastomose é a preferida. Ducto-mucosa melhor que invaginação
- ❑ Pancreatojejuno convencional ou Y de Roux são equivalentes
- ❑ A pancreatogastrostomia tem sido muito utilizada com evolução
- ❑ A cirurgia por câncer de pâncreas apresenta melhores resultados
- ❑ A técnica de Peng é ser uma opção em pacientes com fator de risco
- ❑ Pancreatogastrostomia em IPMN



Obrigado!