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Robotic surgery in Pan-NETs

Emilio Bertani

European Institute of Oncology

Milano

emilio.bertani@ieo.it


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da Vinci Xi
HOTLINE

Why Robot for Surgery of PanNETs?

- Surgical resection is the only curative treatment of pancreatic neuroendocrine tumors (PanNETs)
- Minimally invasive procedures are a safe modality for the surgical treatment of PanNETs
- Laparoscopy does not compromise oncologic resection, and is associated with decreased postoperative pain, better cosmetic results, a shorter hospital stay, and a shorter postoperative recovery period

- Pancreatic Surgery is risky and technically demanding
- Pancreatic postoperative fistula (POPF) is the main problem
- Post-op pancreatic insufficiency is 8-20% (endocrine) and 20-50% (exocrine)

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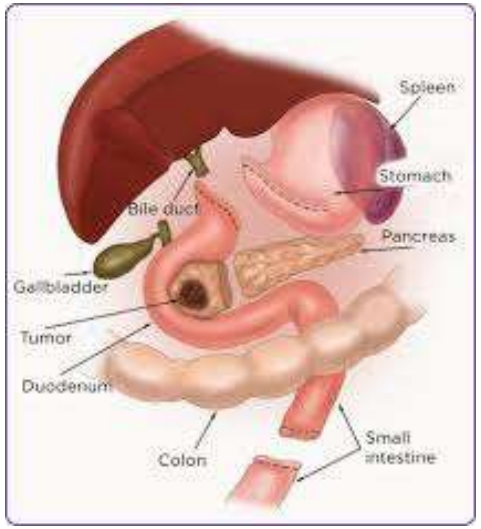
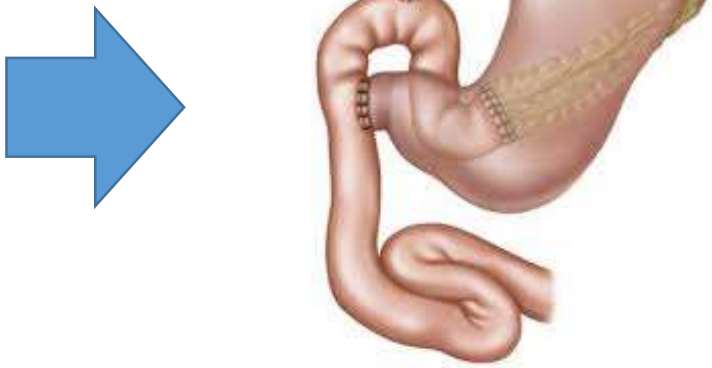
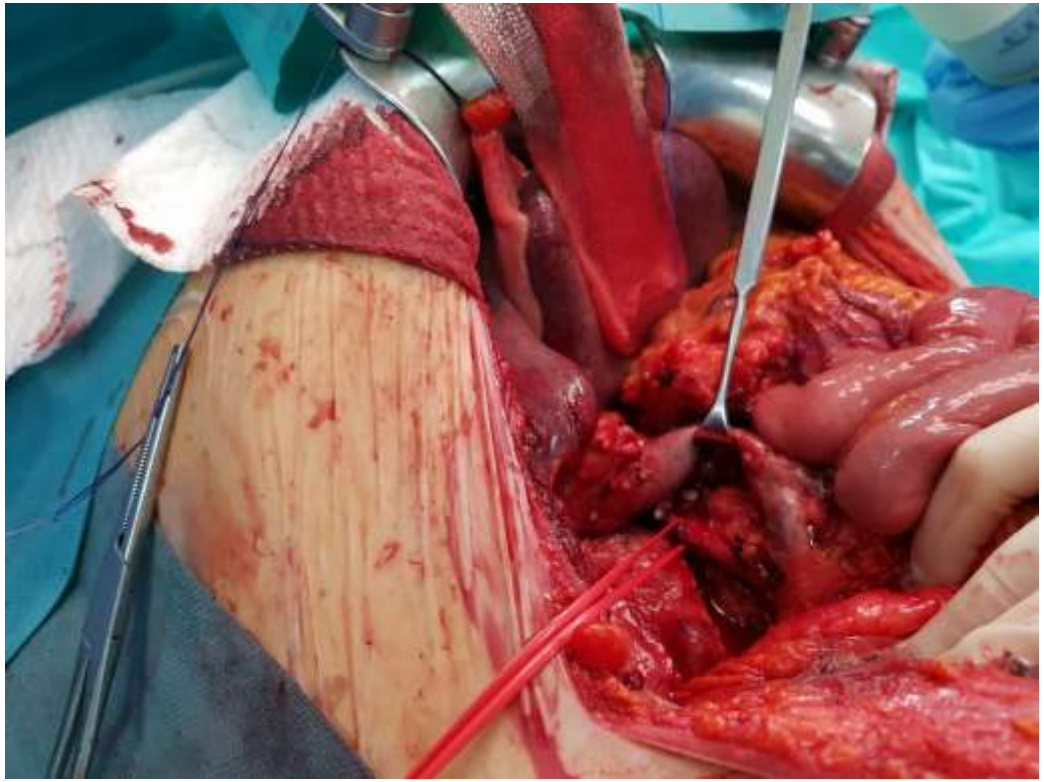
Standard pancreatic resection (SR)



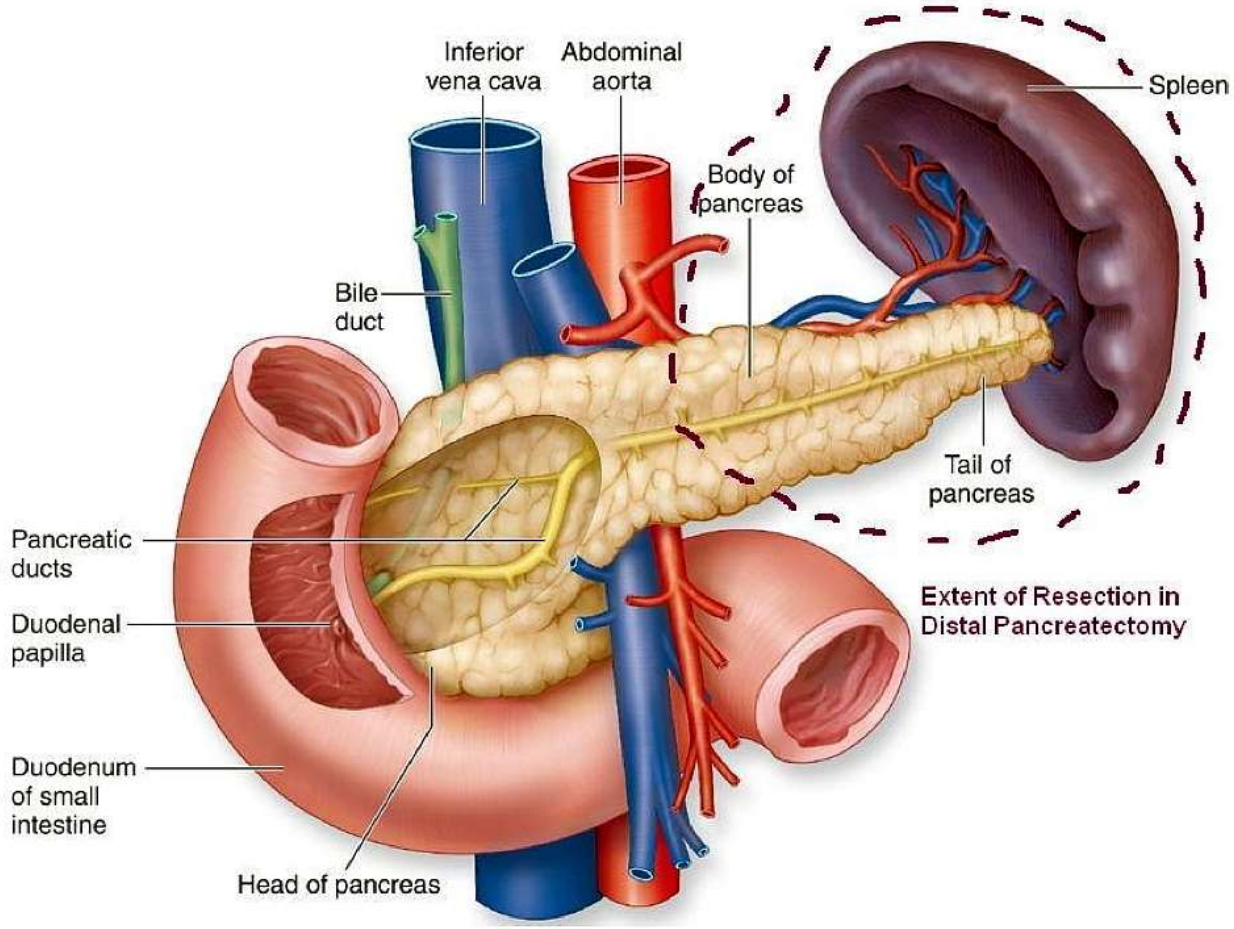




Pancreaticoduodenectomy (PD)

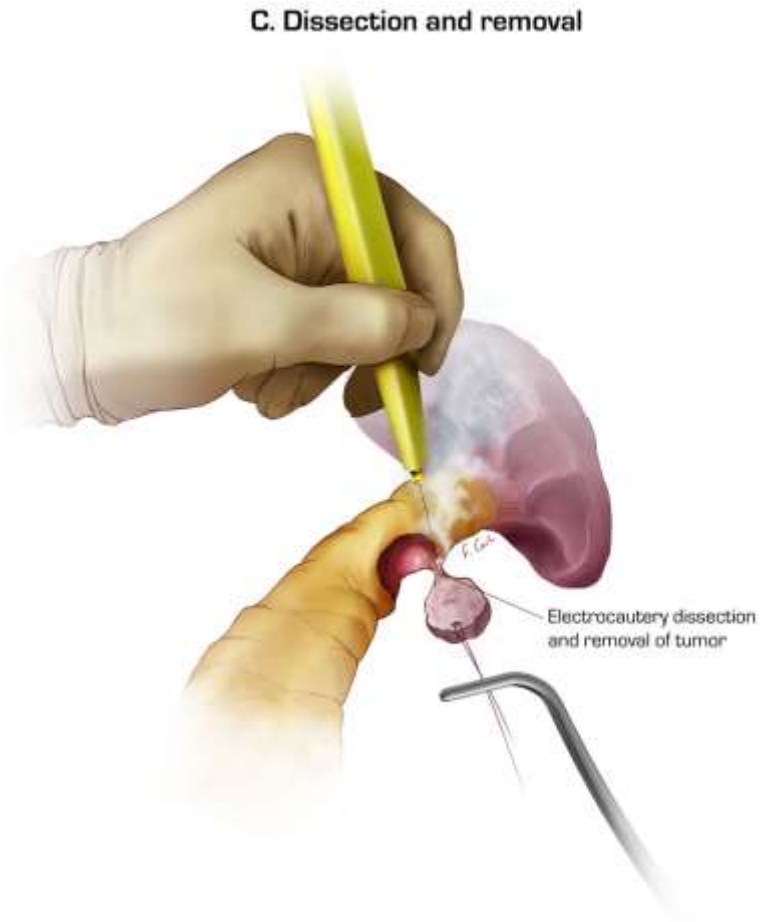
Standard pancreatic resection

Distal pancreatectomy with or without splenectomy (DP



Atypical resections

Enucleation (EN)



Systematic review

Meta-analysis of surgical outcome after enucleation *versus* standard resection for pancreatic neoplasms

F. J. Hüttner[1,2], J. Koessler-Ebs[1,2], T. Hackert[1], A. Ulrich[1], M. W. Büchler[1] and M. K. Diener[1,2]

[1]Department of General, Visceral and Transplantation Surgery, and [2]Study Centre of the German Surgical Society, University of Heidelberg, Heidelberg, Germany

Correspondence to: Professor M. W. Büchler, Department of General, Visceral and Transplantation Surgery, University of Heidelberg, Im Neuenheimer Feld 110, 69120 Heidelberg, Germany (e-mail: markus.buechler@med.uni-heidelberg.de)

EN vs SR

Enucleation

- Duration of surgery
- Blood loss
- Lenght of stay
- Less endocrine insufficiency
- Less exocrine insufficiency

Standard resection

- Higher incidence of POPF (all centers)

No difference in overall morbidity and mortality
No differences in POPF (high volume centers)

BJS 2015

Original article

Risk of pancreatic fistula after enucleation of pancreatic tumours

O. Strobel[1], A. Cherrez[1], U. Hinz[1], P. Mayer[2], J. Kaiser[1], S. Fritz[1], L. Schneider[1], M. Klauss[2], M. W. Büchler[1] and T. Hackert[1]

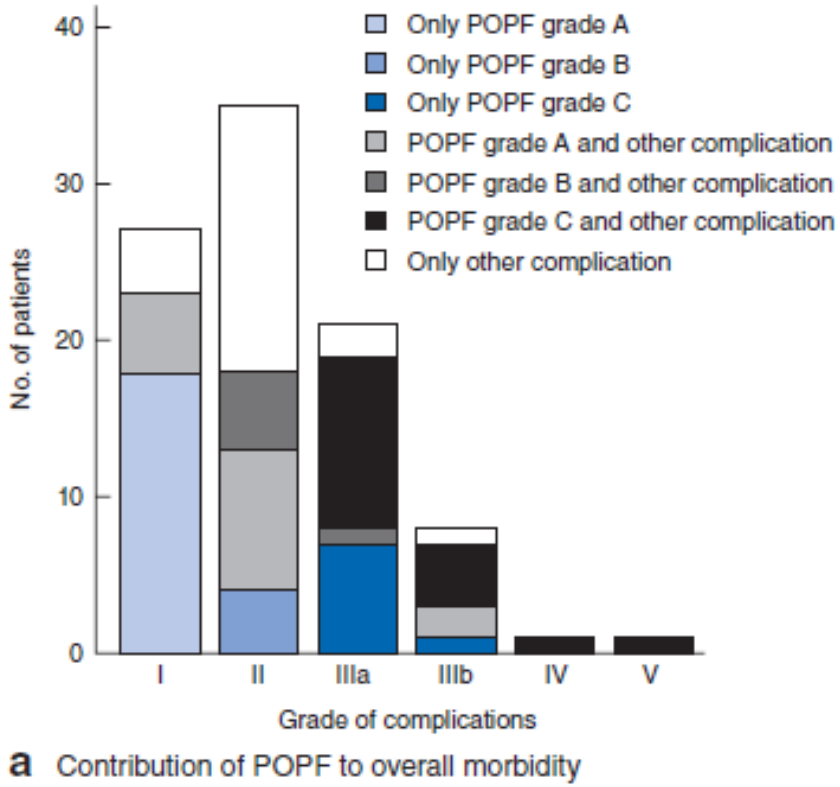
Departments of [1]Surgery and [2]Diagnostic and Interventional Radiology, Heidelberg University Hospital, Heidelberg, Germany
Correspondence to: Dr O. Strobel, Department of Surgery, Heidelberg University Hospital, Im Neuenheimer Feld 110, 69120 Heidelberg, Germany
(e-mail: oliver.strobel@med.uni-heidelberg.de)

Univariate:

- Cystic tumors
- History of pancreatitis
- Cardiac comorbidity

Multivariate:

- Cystic tumors



a Contribution of POPF to overall morbidity

Surgical approach	
Open	163 (98·2)
Laparoscopic	3 (1·8)

BJS 2015

Original article

Propensity score-matched analysis of robotic *versus* open surgical enucleation for small pancreatic neuroendocrine tumours

F. Tian, X.-F. Hong, W.-M. Wu, X.-L. Han, M.-Y. Wang, L. Cong, M.-H. Dai, Q. Liao, T.-P. Zhang and Y.-P. Zhao

Department of General Surgery, Peking Union Medical College Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College, No. 1, Shuaifuyuan, Wangfujing Avenue, Dongcheng District, Beijing 100730, China

Correspondence to: Dr Y.-P. Zhao (e-mail: zhao8028@263.net)

Rob vs Open EN

Robotic enucleation

Less blood loss
Short lenght of stay

BJS 2016

www.impactjournals.com/oncotarget/ Oncotarget, 2017, Vol. 8, (No. 20), pp: 33872-33883

Clinical Research Paper

Minimally invasive distal pancreatectomy for PNETs: laparoscopic or robotic approach?

Jiaqiang Zhang[1,2,*], Jiabin Jin[1,*], Shi Chen[1,2,*], Jiangning Gu[1,2], Yi Zhu[1], Kai Qin[1], Qian Zhan[1,2], Dongfeng Cheng[1], Hao Chen[1,2], Xiaxing Deng[1,2], Baiyong Shen[1,2] and Chenghong Peng[1,2]

[1] Department of Pancreatic Surgery, Ruijin Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, P.R. China

[2] Research Institute of Digestive Surgery, Ruijin Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, P.R. China

[*] These authors have contributed equally to this work

Rob vs LPS DP

Robotic distal pancreatectomy

Less blood loss
Higher spleen preservation rate
Higher n° of LN harvested in G2, G3 tumors*

Oncotarget 2017
Langenbecks Arch Surg 2019

Short-term and long-term outcomes after robot-assisted versus laparoscopic distal pancreatectomy for pancreatic neuroendocrine tumors (pNETs): a multicenter comparative study

Sergio Alfieri[1] · Giovanni Butturini[2] · Ugo Boggi[3] · Andrea Pietrabissa[4] · Luca Morelli[3] · Fabio Vistoli[3] · Isacco Damoli[2] · Andrea Peri[4] · Claudio Fiorillo[1] · Luigi Pugliese[4] · Marco Ramera[5] · Nelide De Lio[3] · Gregorio Di Franco[3] · Alessandro Esposito[5] · Luca Landoni[5] · Fausto Rosa[1] · Roberta Menghi[1] · Giovanni Battista Doglietto[1] · Giuseppe Quero[1,6] · The Italian Robotic pNET Group

Ann Surg Oncol
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Annals of
SURGICAL ONCOLOGY
OFFICIAL JOURNAL OF THE SOCIETY OF SURGICAL ONCOLOGY

ORIGINAL ARTICLE – ENDOCRINE TUMORS

Defining the Role of Lymphadenectomy for Pancreatic Neuroendocrine Tumors: An Eight-Institution Study of 695 Patients from the US Neuroendocrine Tumor Study Group

Alexandra G. Lopez-Aguiar, MD, MS[1], Mohammad Y. Zaidi, MD, MS[1], Eliza W. Beal, MD[2], Mary Dillhoff, MD[2], John G. D. Cannon, MD[3], George A. Poultsides, MD[3], Zaheer S. Kanji, MD[4], Flavio G. Rocha, MD[4], Paula Marincola Smith, MD[5], Kamran Idrees, MD[5], Megan Beems, MD[6], Clifford S. Cho, MD[6], Alexander V. Fisher, MD[7], Sharon M. Weber, MD[7], Bradley A. Krasnick, MD[8], Ryan C. Fields, MD[8], Kenneth Cardona, MD[1], and Shishir K. Maithel, MD[1]

	Univariable		Multivariable	
Tumor size, cm				
< 2	Ref	–	Ref	–
≥ 2	**6.6 (4.1–10.7)**	**< 0.001**	**4.9 (2.7–8.8)**	**< 0.001**
Tumor location in the pancreas				
Distal	Ref	–	Ref	–
Proximal	**2.5 (1.7–3.6)**	**<0.001**	**1.9 (1.2–3.2)**	**0.008**
Well	Ref	–	Ref	–
Moderate	**2.1 (1.2–3.7)**	**0.006**	0.9 (0.5–1.9)	0.883
Ki-67 index				
< 3%	Ref	–	Ref	–
3–20%	**3.1 (2.0–4.9)**	**< 0.001**	**2.2 (1.3–3.7)**	**0.004**

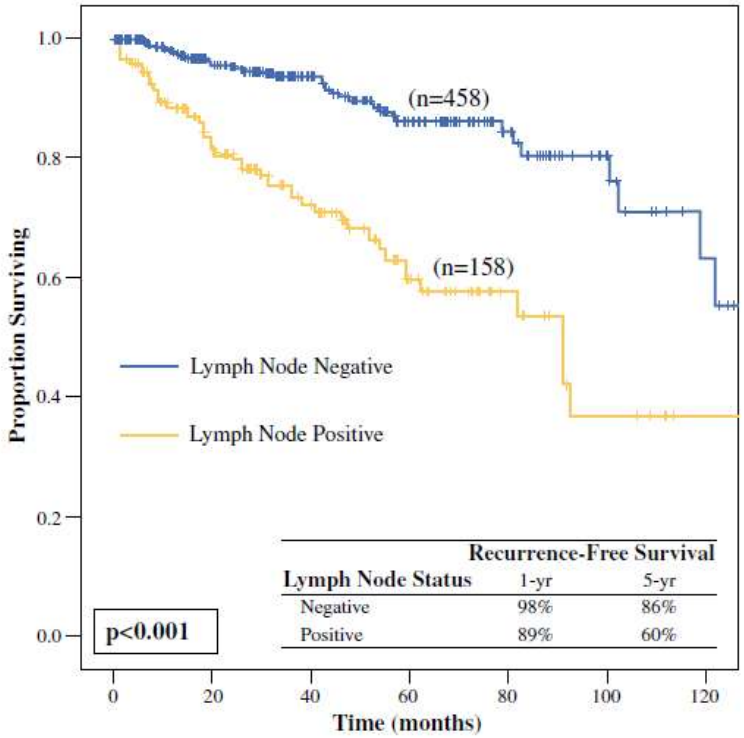


FIG. 1 Kaplan–Meier survival curve for recurrence-free survival in lymph node-positive versus lymph node-negative patients with low/intermediate grade non-functional pancreatic neuroendocrine tumors

The «2» rule:
- 2 cm
- G2
- >2 Ki-67

→ Lymphadenectomy

Ann Surg Oncol 2019

Clininical case 1

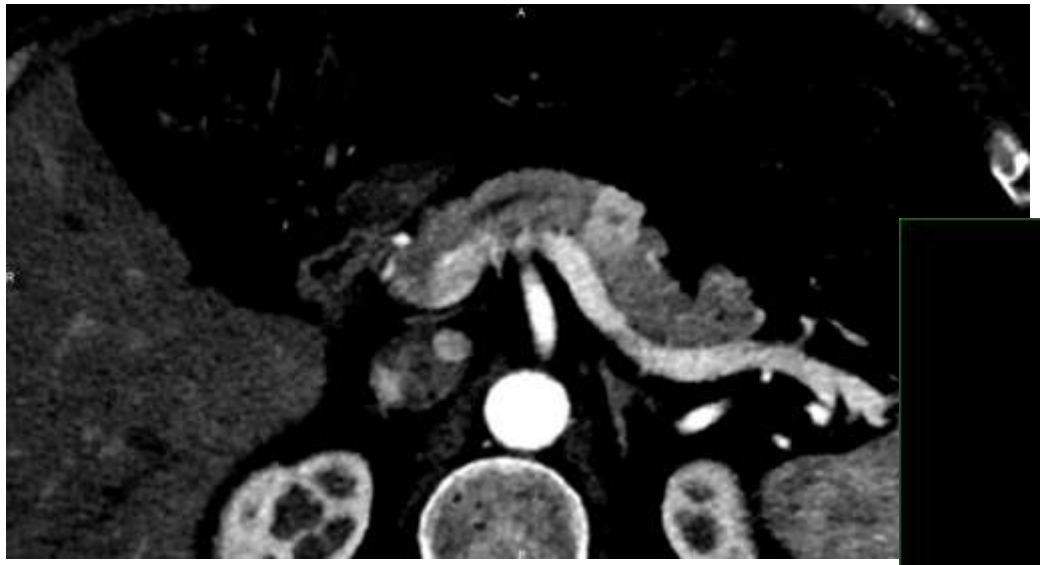
- Male, 50 yrs
- Hypertension
- Uretheral stone → Uro CT

→Pancreatic neoplasms of the body

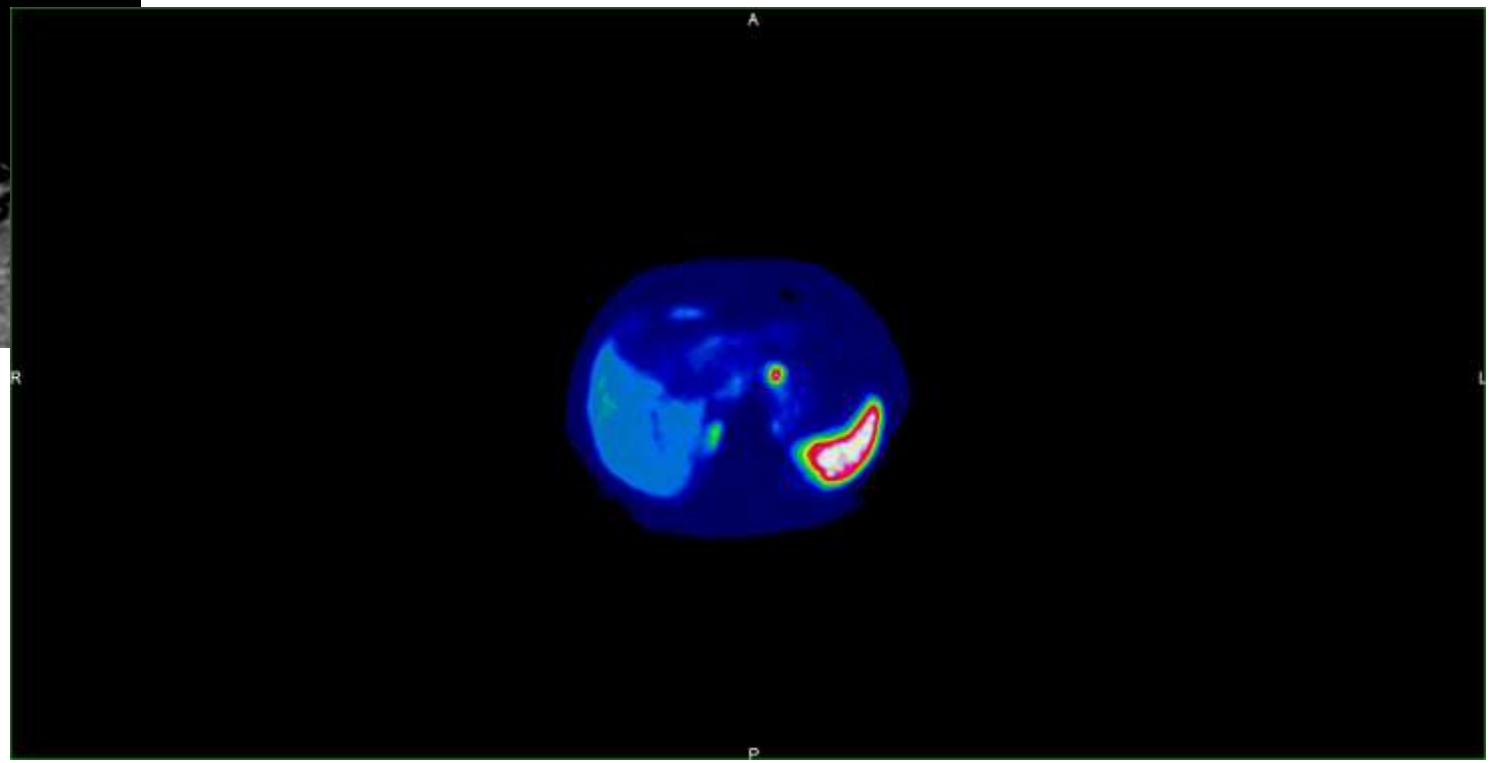
→EUS with elastography → vascularized neoplasm with increased consistency

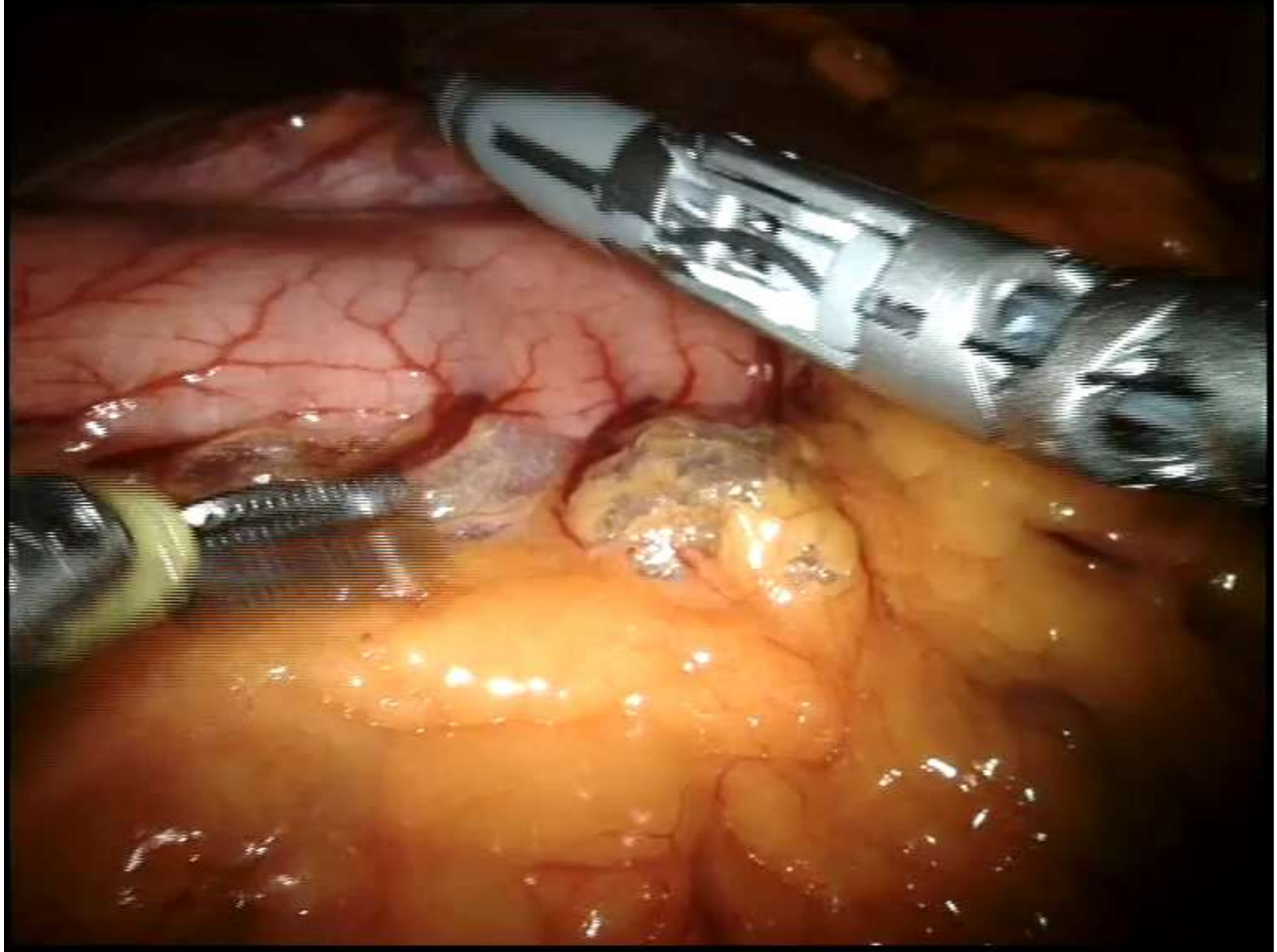
→Cytology →well differentiated NET (Ki-67 1%)

CT scan



Pet Ga-68





Clininical case 1

Well differentiated NET G2 (WHO2017) →Ki-67 10% (hot-spot)

Mitotic index: <1 mitosis/HPF, no necrosis, vascular or perineural invasion

Cromogranin and synaptophisin +

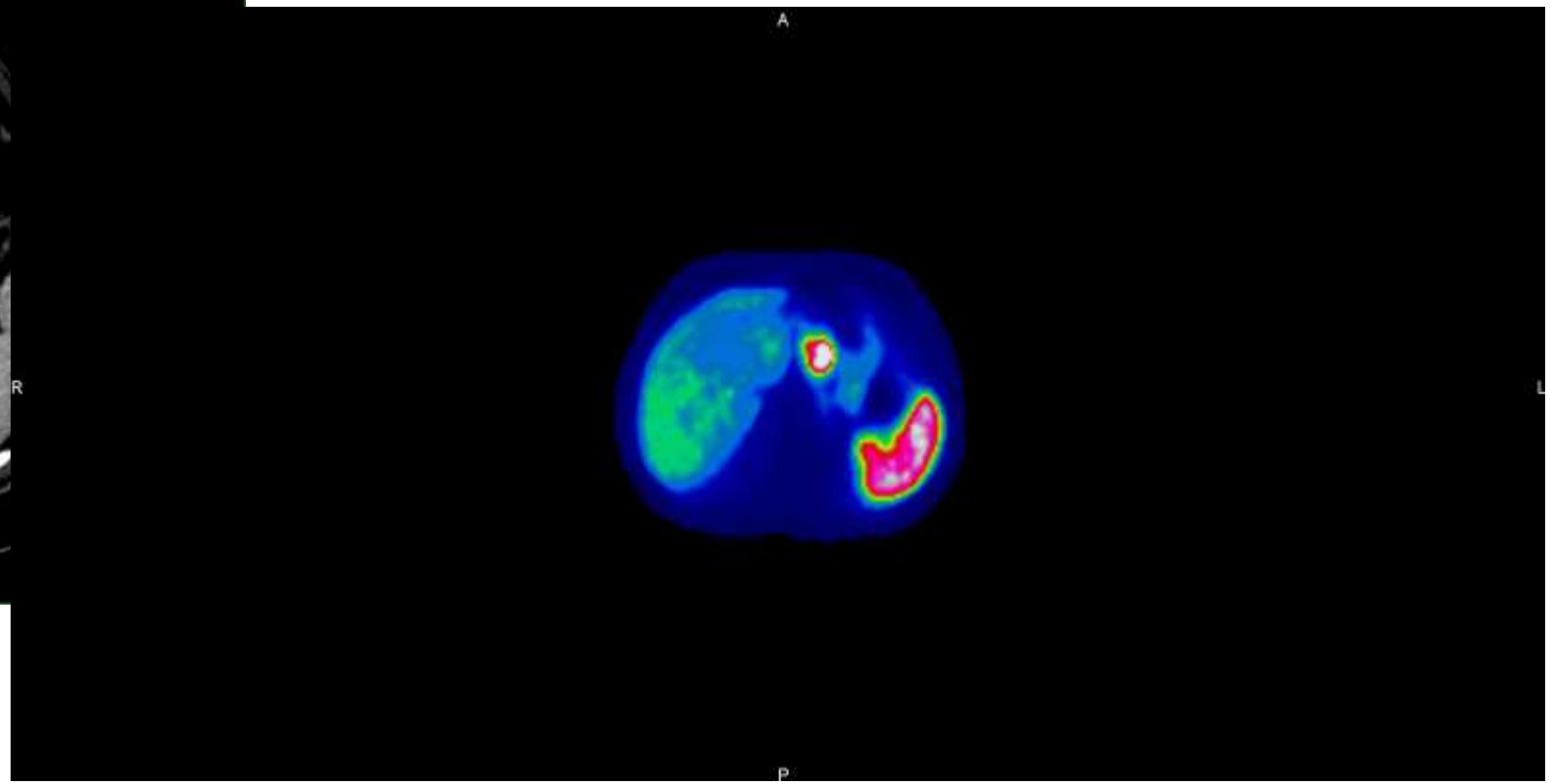
pT1; pN0; G2

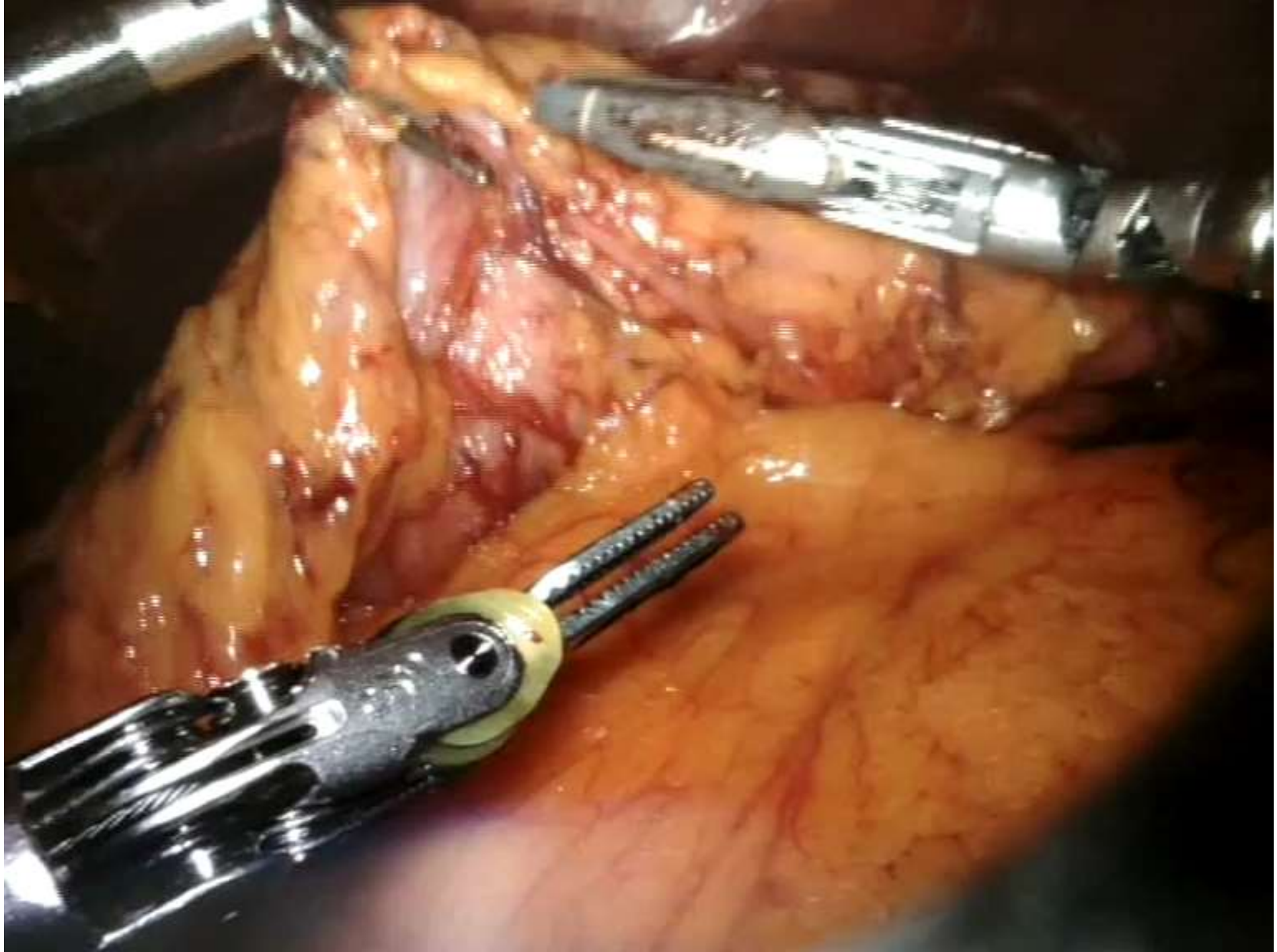
Clininical case 2

- Male, 71 yrs
- Previous cardiac ischaemic stroke, NIDDM
- Chest pain→ thorco-abdominal CT → dilatation of the ascending aorta and pancreatic cystic neoplasm 34 x 27 of diameter
- EUS →PanNet Ki-67 <1% Synaptophisin + CgA -

CT scan

Pet Ga-68





Clininical case 2

Well differentiated NET G2 (WHO 2017); Ki-67: 10%;

mitotic index <1/10 HPF; no necrosis, vascular invasion or perineural invasion; synaptophisin + CgA + focally

pT2, pN0, G2

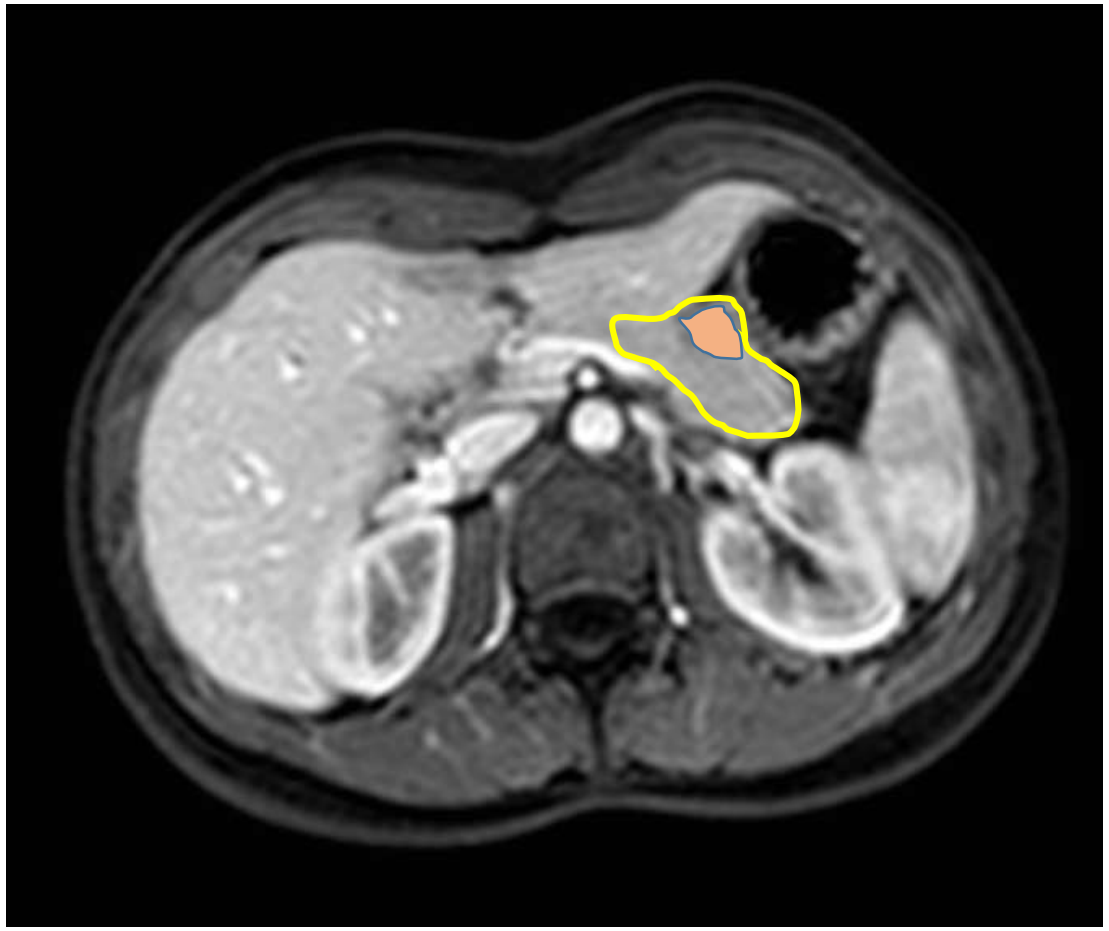
Clininical case 3

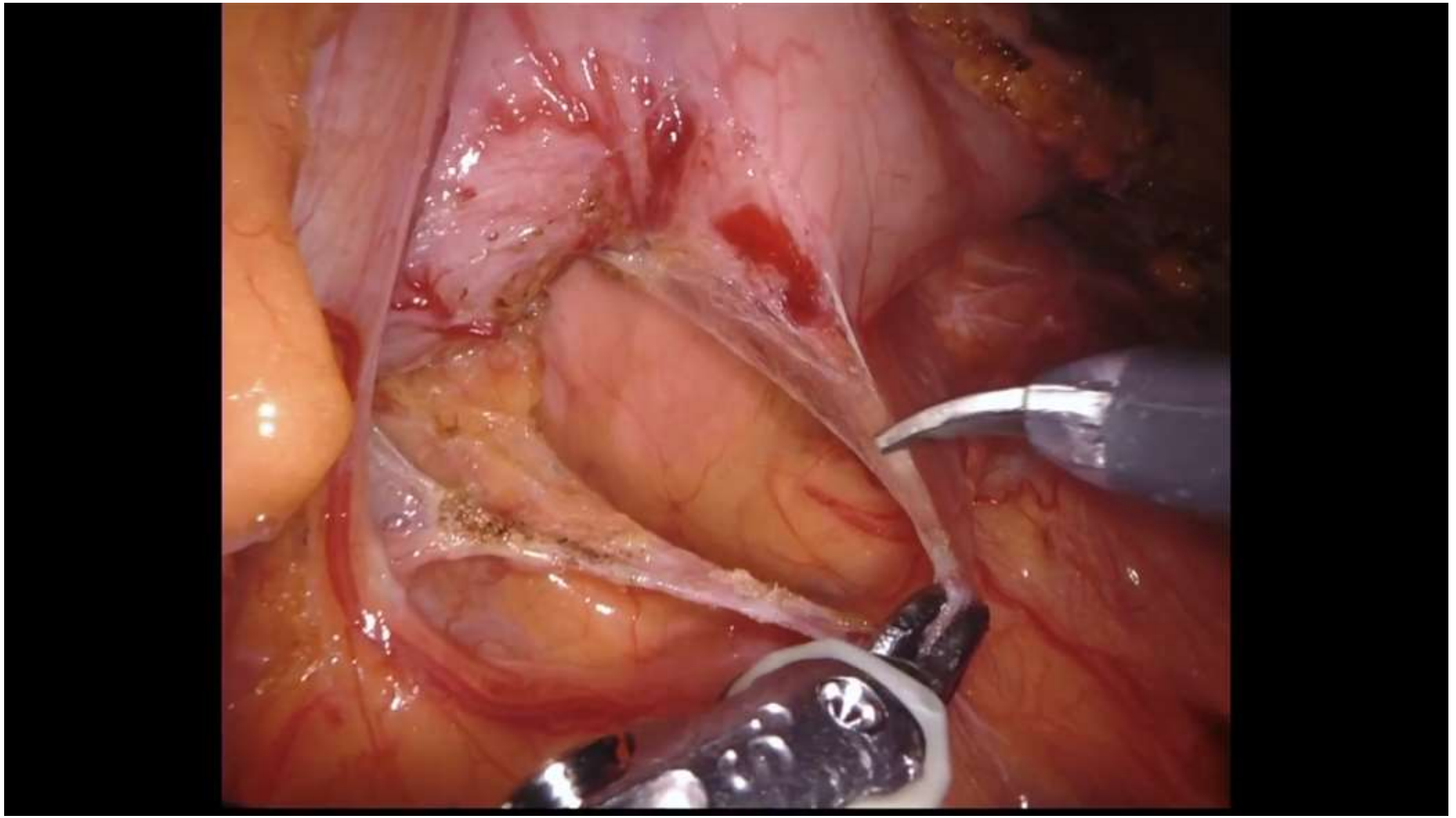
Female, 31 years

No medical history

Aspecific abdominal pain →abd US → neoplasm of the pancreatic body → MRI → Pet Ga-68 negative →FDG Pet Positive →suspicion of pseudopapillary pancreatic tumor of the pancreas

MRI





Clininical case 3

Pseudopapillary tumor of the pancreas (Ki-67) of 4%

2 negative LN

Thank you

emilio.bertani@ieo.it