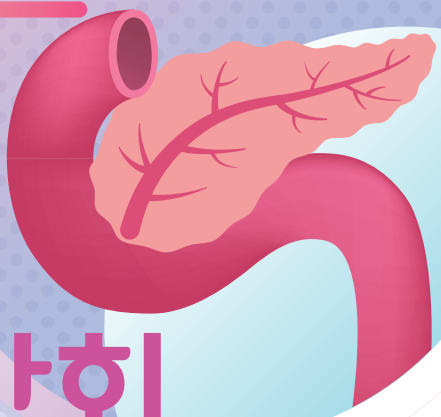

제66차
한국췌장외과학회
학술대회

일자 | 2021년 6월 12일(토) 장소 | 베어홀

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from increased sealing speed, multi-functionality, and simplified steps for use

*Design Validation Study with surgeons (n=33) operating in simulated procedures in an animate porcine laboratory model. #051950-160425
†In a design validation study with surgeons (n=33) operating in simulated procedures in an animate porcine laboratory model (26/33) #053344-160516
‡In a pre-clinical study, for both iliac dissection and lymph node dissection, the HD 1000i was significantly superior to the predicate devices in dissecting capability ($p<0.001$ in all cases). #051950-160425
*In a pre-clinical study, 100% (56/56) of porcine blood vessels remained hemostatic over a 30-day survival period. #049339-160315
†In a benchtop study with 5-7 mm porcine carotid arteries that compared median burst pressure, HARMONIC® HD 1000i (1878 mmHg) vs. competitor product A (1224 mmHg) ($p<0.0001$). #049305-160315.
‡In a benchtop study with 5-7 mm porcine carotid arteries that compared median burst pressure, HARMONIC® HD 1000i (1878 mmHg) vs. competitor product B (1171 mmHg) ($p<0.0001$). #049315-160315
*In a porcine study comparing sealing times of HARMONIC ACE®+7 and HARMONIC® HD 1000i, HARMONIC® HD 1000i Shears transected vessels faster than HARMONIC ACE®+7 (mean vessel transection time of 9.186 vs 15.291). #051753-160420
†In a design validation study with surgeons (n=33) operating in simulated procedures in an animate porcine laboratory model (26/33) #053344-160515
‡Design Validation Study with surgeons (n=33) operating in simulated procedures in an animate porcine laboratory model (33/33) #053346-160516
§Seal reliability at 240 mmHg of 98.2% vs. 98.4% for HARMONIC ACE®+7 MIN button. Speed based on average time to transect 150 mm of porcine jejunum ($p=0.0000$). #050508-160401
‖Device measurements based on a metrology study (median cut length of 18.87 mm vs. 14.56 mm). #050283-160329
#Based on average device tip grasping force (distal 5 mm of the jaw). #050295-160329

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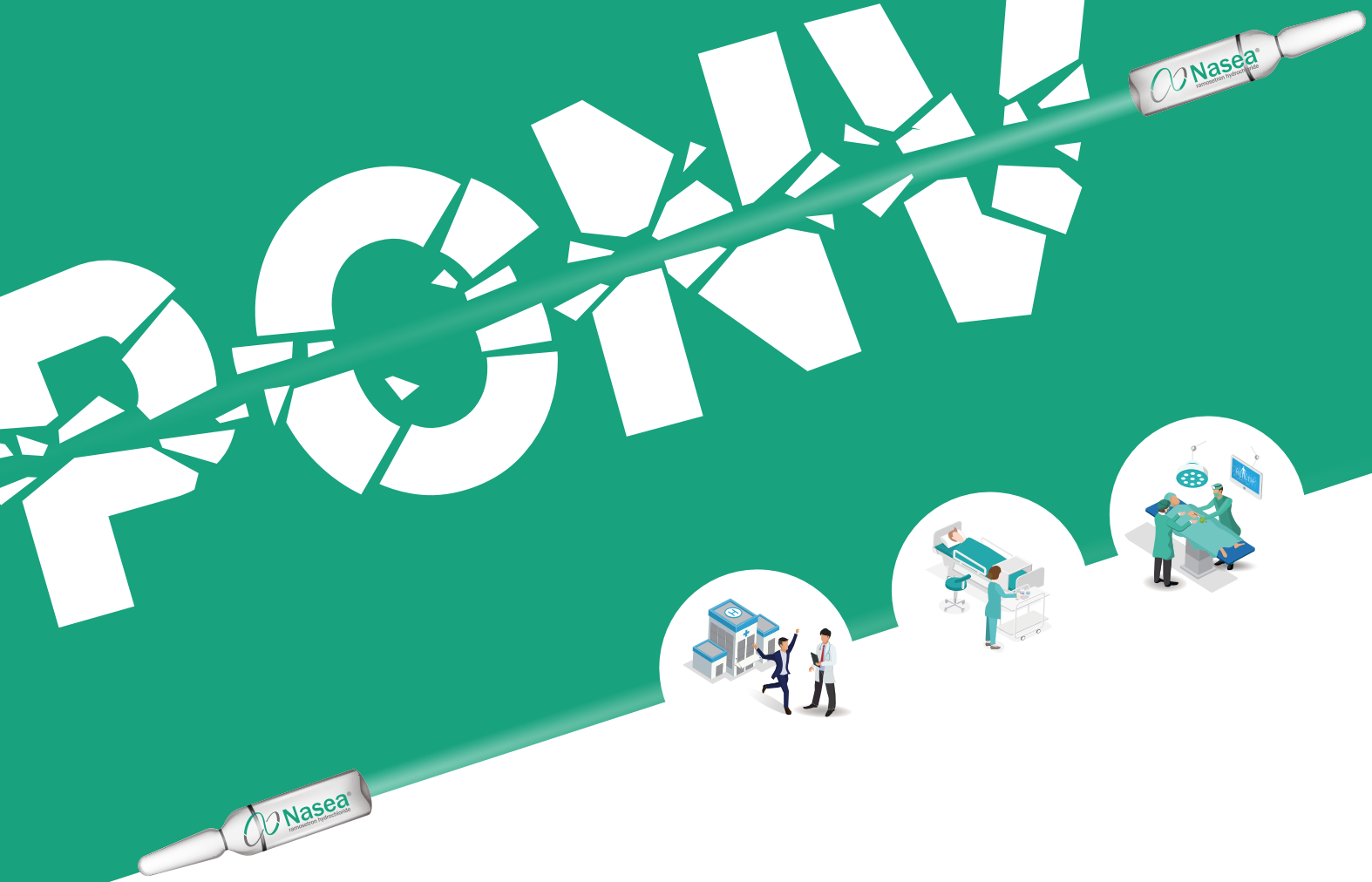

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[연구목적] Acute stoke 환자의 BP 조절시 Nicardipine과 Labetalol의 유효성 비교
[연구대상] 응급성 고혈압이 발생하는 뇌내출혈, 지주막하출혈, 급성뇌졸중으로 응급실에 내원한 18세 초과 성인환자대상으로 각 Nicardipine 26명, Labetalol 28명 총 54명 등록
[연구방법] Prospective, pseudo-randomized로 설계

Reference 1. Liu-DeRyke X., et al, *Neurocrit Care*, 2013;19(1):41-47.

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Reference
1. González-Contreras J. et al. NutrHosp . 2012;27(6):1900-7 **2.** Braga M et al., Clinical Nutrition 2009;28:378-386

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Reference
1. Solvay Pharmaceuticals GmbH. Controlled release pharmaceutical compositions for acid labile drugs. European patent, 1 931 316 B1(2010)
2. J. Enrique Domínguez-Muñoz. Pancreatic Enzyme Therapy for Pancreatic Exocrine Insufficiency. *Current Gatroentetoloy Reports* 2007, 9:116-122
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   2) 이 약 또는 이 약의 성분에 과민증이 있거나 그 병력이 있는 환자
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2. 이 약을 복용하는 동안 다음의 행위를 하지 마십시오.
   1) 이 약 캡슐에 함유된 내용물을 씹어서 효소가 구강내(입안)로 용출될 경우 구강 내(입안) 점막에 손상을 가져올 수 있습니다(예, 구강 점막의 궤양). 따라서 이 약은 통째로 삼키거나, 이 약의 내용물을 씹지 않아야 합니다.
3. 기타 이 약의 복용시 주의할 사항
   1) 급성췌장(이자)염 초기단계에서는 경구투여하지 않습니다.
   2) 소아에 투요할 경우에는 보호자의 지도감독 하에 투여합니다.
   3) 약용량 조절이 필요한 경우 의사의 감독 하에서 조절하여야 하고, 증상(예, 지방변증, 복통) 개선에 따라 안내되어야 합니다.
   4) 의약품으로부터 잠재적인 바이러스 노출
      이 약은 식용으로 사용되는 돼지의 췌장(이자)조직으로부터 유래합니다. 이 약이 사람에게 감염원을 전달할 수 있는 위험은 제조시 특정 바이러스에 대한 시험과 불활성화를 통해 줄여가고 있으나 새로운 또는 확인되지 않은 바이러스에 의한 질환을 포함하여 바이러스 질환 감염의 위험은 있을 수 있습니다. 그러므로 사람을 감염시킬 수 있는 돼지의 바이러스의 출현은 절대적으로 배제할 수는 없습니다. 그러나 돼지 췌장(이자) 추출물의 사용과 관련된 감염성 질병은 보고된 적이 없습니다.

■ **저장상의 주의사항**

1) 어린이의 손이 닿지 않는 곳에 보관해야 합니다.
2) 직사광선을 피하고 되도록이면 습기가 적은 서늘한 곳에 밀전하여 보관해야 합니다.
3) 오용을 막고 품질의 보존을 위하여 다른 용기에 바꾸어 넣지 않아야 합니다.

■ **저장방법** 기밀용기, 25℃ 이하에서 보관

■ **제 조 원** 제조의뢰자 : Abbott Arzemittel GmbH,Hans-Bockler-Allee 20 30173 Hannover Germany (독일)
제조사 : Abbott Products GmbH, Justust-von-Liebig Strase 33 31535 Neustadt Germany (독일)

판매원 : 한국애보트주식회사 서울시 강남구 대치동 947-3 삼탄빌딩 3,6,7층 대표전화 : 02-3429-9200
* 기타 자세한 사항은 제품설명서를 참조하여 주십시오.
의약품 부작용 신고를 생활화합시다. (043-719-2707/2719, www.kfda.go.kr)

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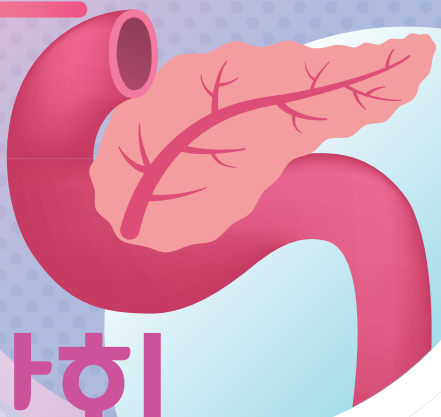
13063PJ-0812-KR



제66차
한국췌장외과학회
학술대회

일자 | 2021년 6월 12일(토) 장소 | 베어홀

KPSC Since 2004

한국췌장외과학회
Korean Pancreas Surgery Club

Contents

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한국췌장외과학회 학술대회

일시 | 2021년 6월 12일(토)

장소 | 베어홀

PROGRAM

제66차
한국췌장외과학회 학술대회

Scientific Session 1

Combined vascular resection in pancreaticoduodenectomy; Revisited

최성호(성균관의대), 최인석(건양의대)

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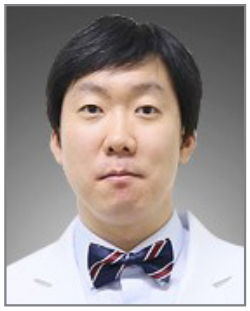
한국췌장외과학회
Korean Pancreas Surgery Club

연/자/소/개

Curriculum Vitae



이 승 재

건양의대 외과

학 력 사 항

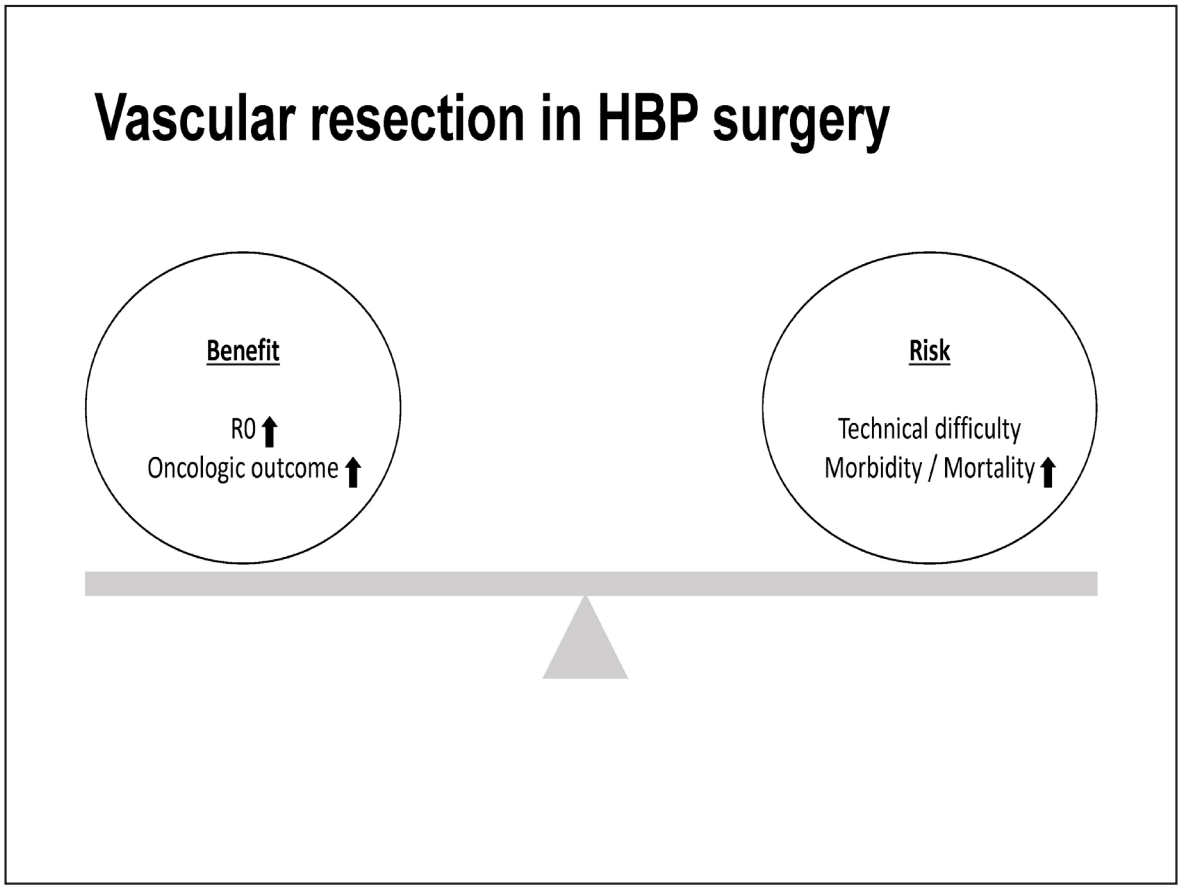
순천향의대 학사
울산의대 석사

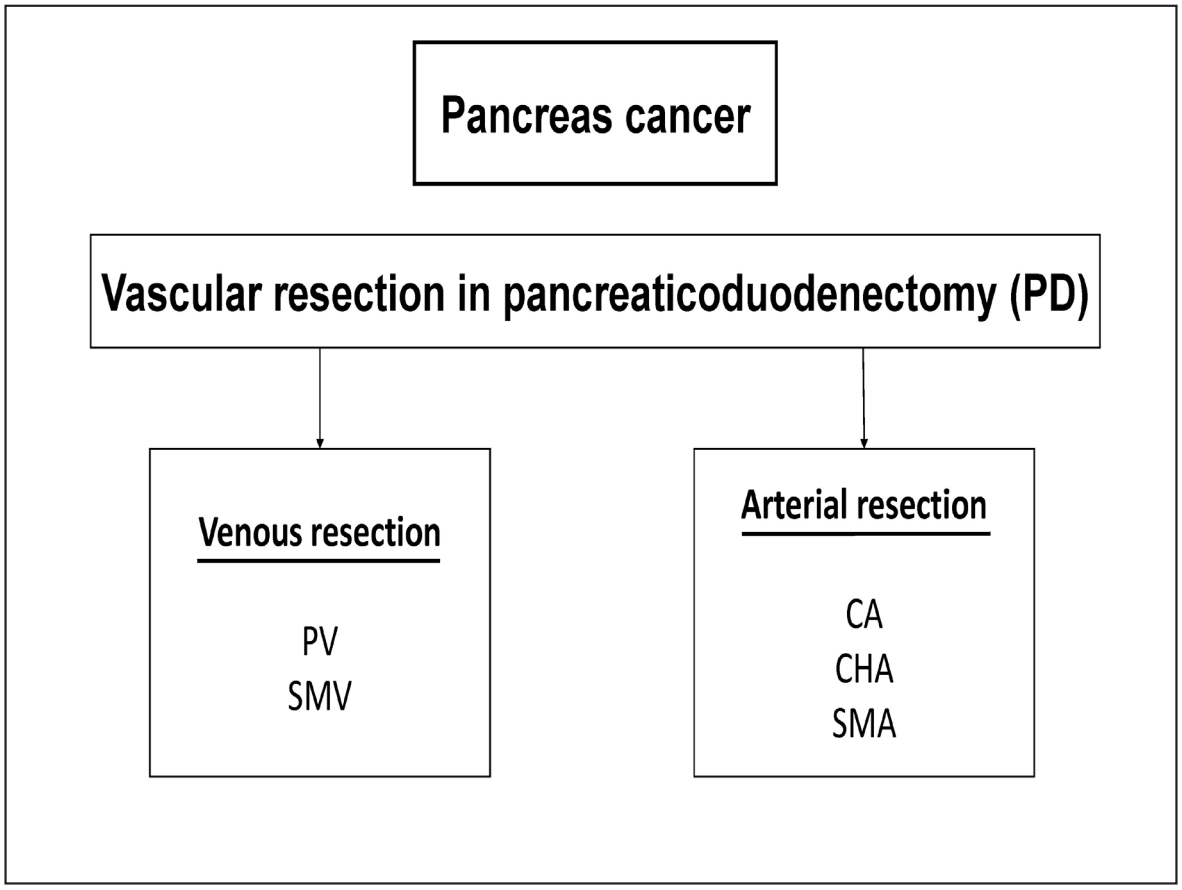
경 력 사 항

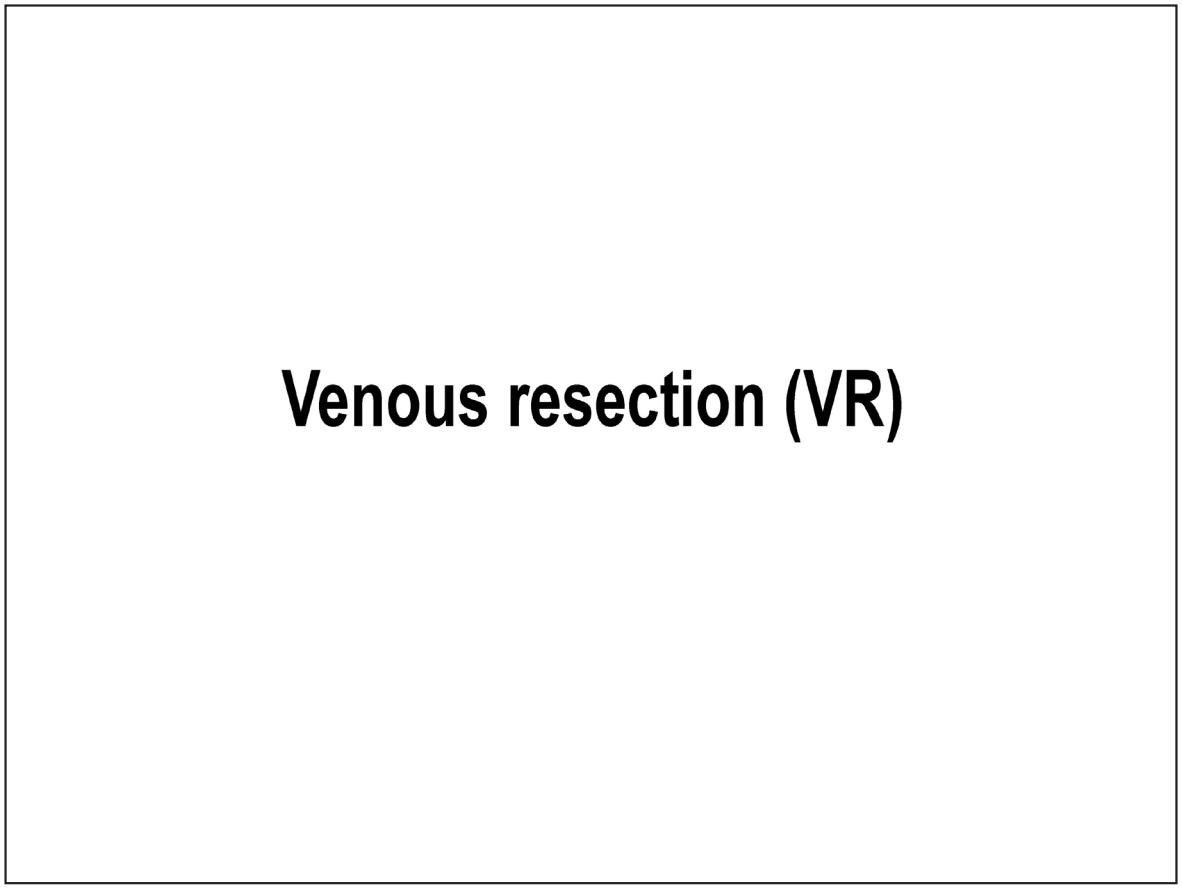
서울아산병원 외과 전공의
서울아산병원 간담췌외과 전임의
건양대병원 조교수

Clinical impact of vascular resection: RM status and Long-term outcome

이승재 (건양의대)




Pancreas cancer
Vascular resection in pancreaticoduodenectomy (PD)
Venous resection
PV
SMV
Arterial resection
CA
CHA
SMA


Venous resection (VR)

Meta-analysis: VR vs Without VR

No. of study	Reference	Year	No. of included study	No. of patients
1	F. Giovinazzo et al. BJS 2016; 103: 179–191	2016	27	9,005 (1587 with VR)
2	Peng et al. BMC Surgery (2019) 19:84	2019	30	12,031 (2186 with VR)
3	R. Bell et al. Surgical Oncology 26 (2017) 53-62	2017	16	4,145 (1207 with VR)
4	X.Z. Yu et al. EJSO 40 (2014) 371-378	2014	22	2,890 (794 with VR)
5	Y. Zhou et al. World J Surg (2012) 36:884–891	2012	19	2,247 (661 with VR)

Meta-analysis: VR vs Without VR

- Morbidity & Mortality : slightly increased in VR group

- R0 rate & Survival outcome : decreased in VR group
  - May have included more advanced tumor in VR group

Important prognostic factor in VR

- **Tumor-free margin (R0)**
  - Langenbeck's Arch Surg. 2014;399:659–665.
  - Ann Surg Oncol. 2015;22:1874–1883.
  - World J Surg. 2006;30:1526–1535.
  - GastroenterolRes Pract. 2015;2015:659–730.
  - Hepatobil Pancreat Dis Int. 2015;14:429–435.
  - Eur J Surg Oncol. 2015;41:1500–1507.
  - Ann Surg Oncol. 2009;16:789–791.
- **Tumor infiltration of the resected venous segment**
  - GastroenterolRes Pract. 2015;2015:659–730.
  - Eur J Surg Oncol. 2014;40:371–378.
  - Langenbeck's Arch Surg. 2016;401:63–69.
  - Ann Surg Oncol. 2016;23:2028–2037.

Prognostic impact of VR

- Direct invasion of resected venous segment
  - Poor survival outcomes
- Debate over the depth/length of invasion

Ideal situation of VR

- R0 resection
- No direct invasion of the resected vein

➡ **Patient selection**

Detecting venous invasion

- Standard staging modalities (CT, MRI)
  - Degree of circumferential contact
  - Length of contact
  - Degree of venous deformity
- Venography
  - CT
  - Superior mesenteric arteriography
  - Intraoperative portal venography
- EUS

Neoadjuvant treatment

- Standard treatment in borderline resectable / locally advanced pancreas cancer
- Venous invasion after neoadjuvant therapy is harder to confirm
  - Current radiologic imaging cannot distinguish between fibrosis and viable cancer
- Radiologically improved or not progression / no distant spreading
  - Exploration is generally recommended to establish resectability
- Consensus is lacking as to how to define the response to neoadjuvant treatment

Ferrone CR. et al. Ann Surg 2015;261:12–17
Savio G B. et al. Lancet Oncol. 2016 Mar;17(3):e118-e124
Del Chiaro M. et al. JAMA Surg. 2017 Nov 1;152(11):1057.
Del Chiaro M. et al. HPB (Oxford) 2019 Feb;21(2):219-225

Venous resection in PD

- Accurate selection of patients who can achieve R0 resection
- Experienced HBP/Vascular surgeons
- Neoadjuvant treatment in patients with high risk of R1 or R2 resection
- Well-designed further studies are needed

Arterial resection (AR)

Meta-analysis: AR vs Without AR

No. of study	Reference	Year	No. of included study	No. of patients
1	Mollberg N. et al. Ann Surg 2011;254:882–893	2011	26	2,609 (366 with AR)
2	Małczak P. et al. HPB (Oxford) 2020;22:961-968.	2020	19	2,710 (263 with AR)

Meta-analysis: AR vs Without AR

- Morbidity & Mortality : significantly increased in AR group
- R0 rate : no significant difference
- Survival outcome : decreased in AR group
- Limitation
  - Only included retrospective study
  - Heterogeneity (PV, SMV, SMA, HA, CA)

Arterial resection in PD

- Generally not recommended
  - Survival outcome ≥ palliative treatment
  - High mortality (10~20%)
- Highly selected patients who expected R0 resection
- Selection of patients after Neoadjuvant treatment
- Experienced HBP/Vascular surgeons

연/자/소/개

Curriculum Vitae

박 양 진

성균관의대 삼성서울병원 외과학교실 혈관외과분과

학 력 사 항

1999	서울대학교 의과대학 의학과 졸업 (학사)
2004	서울대학교 의과대학원 외과학 전공 (석사)
2010	서울대학교 의과대학원 외과학 전공 (박사)

경 력 사 항

2000	서울대학교병원 인턴 수료
2004	서울대학교병원 외과전공의 수료 및 전문의 자격 취득
2007-2009	서울대학교병원 이식혈관외과 전임의 과정 수료
2009-2010	서울대학교병원 이식혈관외과 진료교수
2010-현재	성균관의대 삼성서울병원 혈관외과 임상조교수, 조교수, 부교수
2019-현재	성균관의대 삼성서울병원 외과학교실 혈관외과분과 분과장

특 이 사 항

2014-2015	Visiting Scholar, Vascular Surgery, Mayo Clinic, MN, USA

Updated principles of vascular resection, anastomosis and anticoagulation

박양진, 양신석 (성균관의대 혈관외과)

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Contents

- Pancreatic malignancies and pancreaticoduodenectomy
- Venous resection and reconstruction
  - Assessment of resectability
  - Superior mesenteric / portal vein resection
    - Mode of resection
    - Reconstruction with various graft materials
- Postoperative consideration
  - Oncologic outcomes
  - Technical outcomes
- SMC experience

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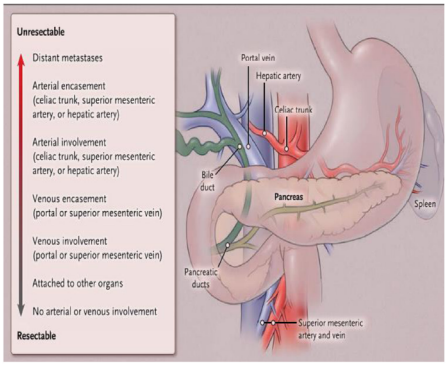
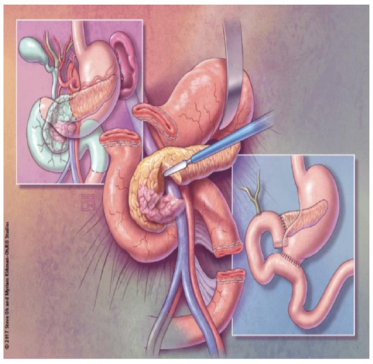
Pancreatic malignancies and Pancreaticoduodenectomy

- Poorly predicted cancers
  - Less than 5% of surviving five years after diagnosis
  - Less than 20% of survival after curative resection
- Pancreaticoduodenectomy (PD)
  - Potentially curative therapy for pancreatic head cancer





N Engl J Med 2014;371:1039-49

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Classification of Resectability

NCCN(National Comprehensive Cancer Network®)guidelines

Resectability Status	Arterial	Venous
Resectable	• No arterial tumor contact (celiac axis [CA], superior mesenteric artery [SMA], or common hepatic artery [CHA]).	• No tumor contact with the superior mesenteric vein (SMV) or portal vein (PV) or ≤180° contact without vein contour irregularity.
Borderline Resectable[b]	Pancreatic head/uncinate process: • Solid tumor contact with CHA without extension to CA or hepatic artery bifurcation allowing for safe and complete resection and reconstruction. • Solid tumor contact with the SMA of ≤180° • Solid tumor contact with variant arterial anatomy (ex: accessory right hepatic artery, replaced right hepatic artery, replaced CHA, and the origin of replaced or accessory artery) and the presence and degree of tumor contact should be noted if present, as it may affect surgical planning. Pancreatic body/tail: • Solid tumor contact with the CA of ≤180° • Solid tumor contact with the CA of >180° without involvement of the aorta and with intact and uninvolved gastroduodenal artery thereby permitting a modified Appleby procedure (some panel members prefer these criteria to be in the locally advanced category).	• Solid tumor contact with the SMV or PV of >180°, contact of ≤180° with contour irregularity of the vein or thrombosis of the vein but with suitable vessel proximal and distal to the site of involvement allowing for safe and complete resection and vein reconstruction. • Solid tumor contact with the inferior vena cava (IVC).
Locally Advanced[b,c]	Head/uncinate process: • Solid tumor contact with SMA >180° • Solid tumor contact with the CA >180° Pancreatic body/tail: • Solid tumor contact of >180° with the SMA or CA • Solid tumor contact with the CA and aortic involvement	• Unreconstructible SMV/PV due to tumor involvement or occlusion (can be due to tumor or bland thrombus)

Version: 2.2021

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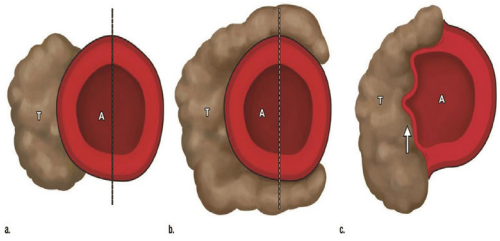
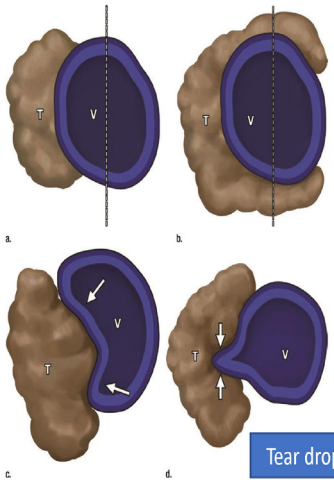
Classification of Resectability

Borderline resectability

Arterial tumor contact



Venous tumor contact



Tear drop deformity

Radiology 2014;270(1):248-260

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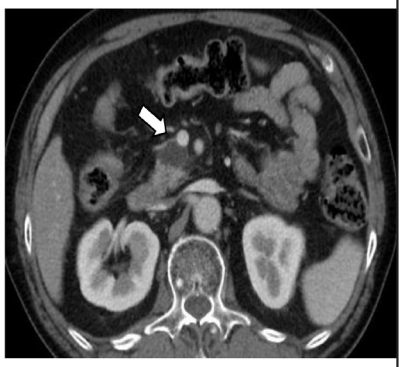
Venous Resection and Reconstruction

General principles

- Assessment to need for venous reconstruction
  - Extent of the invasion of PV/SMV
    - Circumferential involvement of a vessel
  - CT findings of venous invasion
    - Obliteration of the tumor/vessel fat plane interface
    - Length of tumor involvement of greater than 5 mm
    - Venous occlusion with formation of collateral vessels
    - Presence of a “teardrop sign” in the SMV
    - Irregularity of the wall of the blood vessel



Multidisciplinary Approach !!!

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Venous Resection and Reconstruction

Mode of resection

- Proposed ISGPS* classification of venous resections
  - Type 1: Partial venous excision with direct closure: **venorraphy**
  - Type 2: Partial venous excision using a **patch**
  - Type 3: Segmental resection with **primary veno-venous anastomosis**
  - Type 4: Segmental resection with **interposed venous conduit** and **at l east two anastomoses**

*ISGPS: International Study Group of Pancreatic Surgery

Surgery 2014;155:977-88

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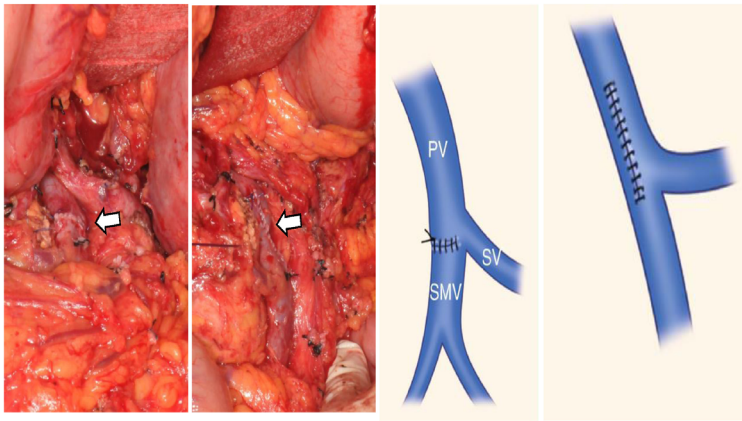
Venous Resection and Reconstruction

Partial venous excision with direct closure (venorraphy)

- Expected luminal narrowing < 30%
  - Adequate caliber to eliminate flow-limiting stenosis
  - Venorraphy
    - Transverse (TV)
    - Longitudinal (LV)



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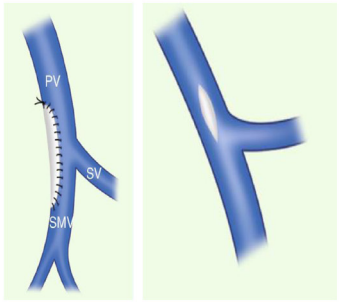
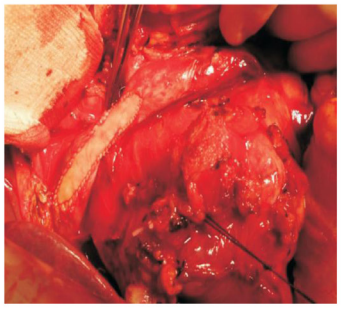
Venous Resection and Reconstruction

Partial venous excision using a patch

- PV/SMV circumferential involvement
  - 30 - 50% of circumference
  - Long segment (>2cm)
  - Ellipse-shaped venectomy
  - Patch materials
    - Autogenous vein
    - Bovine pericardium
    - ePTFE





Vasc Specialist Int 2019;35(2):60-69

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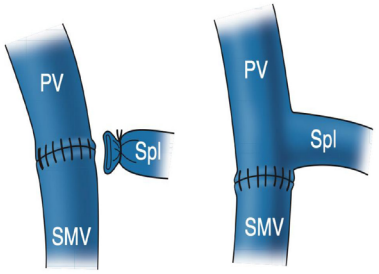
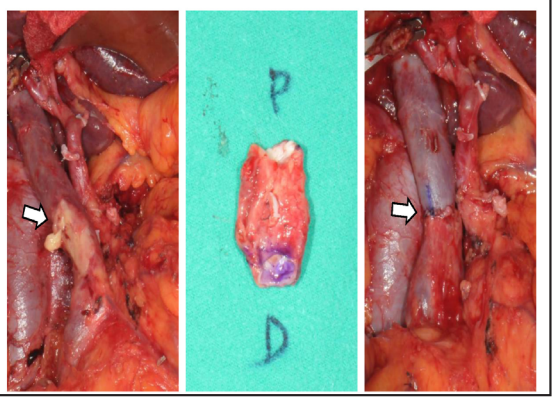
Venous Resection and Reconstruction

Segmental resection with primary veno-venous anastomosis

- Luminal narrowing > 30%
- Length of involved PV/SMV < 2 cm
- Additional mobilization maneuvers
  - Mobilization of the root of the mesentery
  - Mobilization of the right colon
  - Mobilization of the liver





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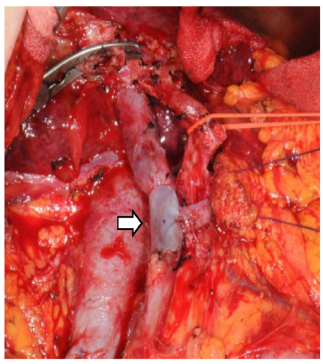
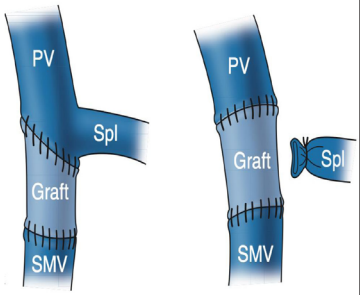
Venous Resection and Reconstruction

Segmental resection with interposed venous conduit

- Circumference of tumor involvement exceeds 30%
- Length of involved PV/SMV exceeds 2 cm
- Variety of conduits
  - Autologous vein grafts
  - Allografts
  - Synthetic grafts





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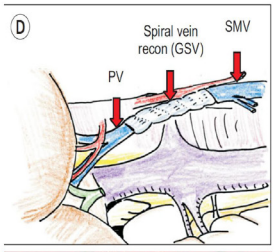
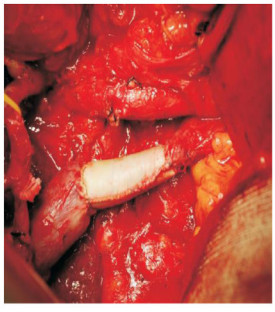
Venous Resection and Reconstruction

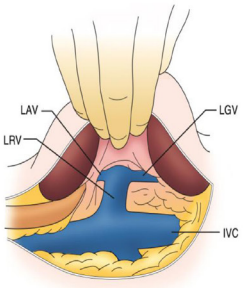
Conduit

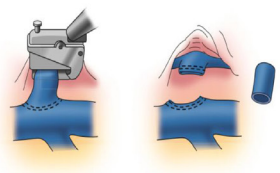
Sterile preparation before surgery !!!

- Autologous vein grafts
  - GSV or spiral GSV
  - Femoral vein
  - Internal jugular vein
  - Left renal vein
  - Splenic vein
- Cryopreserved allograft
- Synthetic graft
  - Dacron and ePTFE
  - Bovine pericardium
    - Patch
    - Tubular graft









Vasc Specialist Int 2019;35(2):60-69

SAMSUNG MEDICAL CENTER

Venous Resection and Reconstruction

Technical outcomes

ORIGINAL ARTICLE

Pancreatectomy with vein reconstruction: technique matters

Monica M. Dua[1], Thuy B. Tran[1], Jill Klausner[2], Kim J. Hwa[1], George A. Poultsides[1], Jeffrey A. Norton[1] & Brendan C. Visser[1]

[1]Department of Surgery, Division of Surgical Oncology, Stanford University School of Medicine, Stanford and [2]Department of Surgery, University of California, Los Angeles, CA, USA

- Retrospective, single center
- 2005~2014
- 90 patients / 665 pancreatectomy
- Median f/u duration 316 days (IQR 173–679)

HPB (Oxford). 2015;17(9): 824–831

SAMSUNG MEDICAL CENTER

Venous Resection and Reconstruction

Technical outcomes

Variable	All patients (*n* = 90)	Patent (*n* = 74)	Thrombosed (*n* = 16)		*P*-value
Vascular reconstruction type, *n* (%)					
LV	17 (19)	13 (18)	4 (25)	Type 1	0.001
TV	9 (10)	9 (12)	0		
Patch	17 (19)	12 (16)	5 (31)	Type 2	
IG	19 (21)	12 (16)	7 (44)	Type 4	
Primary	28 (31)	28 (38)	0	Type 3	
Conduit, *n* (%)					
None	54 (60)	50 (68)	4 (25)		0.007
Autologous	24 (27)	16 (22)	8 (50)		
Preserved	12 (13)	8 (10)	4 (25)		
Vein resected, *n* (%)					
PV	20 (22)	17 (23)	3 (18.75)		0.715
SMV	47 (52)	37 (50)	10 (62.5)		
PV/SMV confluence	23 (26)	20 (27)	3 (18.75)		
Operating time, min, median (IQR)	420 (356–486)	401 (351–468)	480 (400–546)		0.003

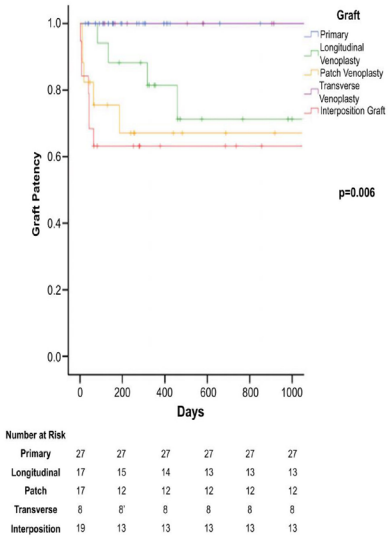
HPB (Oxford). 2015;17(9): 824–831

SAMSUNG MEDICAL CENTER

Venous Resection and Reconstruction

Technical outcomes

Primary end-to-end and TV have ***superior patency*** than the alternatives after PV/SMV resection and should be the preferred techniques for short (<3 cm) reconstructions.



HPB (Oxford). 2015;17(9): 824–831

SAMSUNG MEDICAL CENTER

Venous Resection and Reconstruction

Technical outcomes

Technical risk factors for portal vein reconstruction thrombosis in pancreatic resection

Natalia O. Glebova, MD, PhD,[a] Caitlin W. Hicks, MD, MS,[b] Kristen M. Piazza, MSPAS, PA-C,[b] Christopher J. Abularrage, MD,[b] Andrew M. Cameron, MD, PhD,[c] Richard D. Schulick, MD, MBA,[d] Christopher L. Wolfgang, MD, PhD,[e] and James H. Black III, MD,[b] *Aurora, Colo; and Baltimore, Md*

- Retrospective, single center
- 1970~2014
- 128 patients / 6522 pancreatectomy
- Median f/u duration 310 days (IQR 417 days)

J Vasc Surg 2015;62:424-33

SAMSUNG MEDICAL CENTER

Venous Resection and Reconstruction

Technical outcomes

Patient characteristic	*PVR thrombosed (n = 17; 13%)*	*PVR patent (n = 111; 87%)*	P *value*
Age, years, mean ± SEM	65 ± 3.0	63 ± 1.2	.57
Sex, male	11 (65)	60 (54)	.41
Race, white	15 (88)	93 (84)	.70
Median survival, months (IQR)	7.4 (7.7)	11.5 (15.2)	.16
Median postoperative follow-up, days (IQR)	200 (432)	190 (263)	.47
Median time to follow-up imaging, days (IQR)	193 (263)	158 (400)	.41
Median length of stay, days (IQR)	10 (6)	11 (12)	.85
Median ICU length of stay, days (IQR)	1 (1.5)	2 (4)	.28
Type of operation			
Classic Whipple	13 (76)	47 (42)	.01
Pylorus-preserving pancreaticoduodenectomy	2 (12)	30 (27)	.24
Total pancreatectomy	1 (5.8)	8 (7.2)	1
Distal pancreatectomy	0 (0)	10 (9)	.36
Blood loss, mL, mean ± SEM	2957 ± 1062	2371 ± 408	.61
Transfusion, packed red blood cell units, mean ± SEM	4.90 ± 2.68	3.78 ± 0.89	.69
Operative time, minutes, mean ± SEM	618 ± 57	424 ± 20	.002
Concomitant SMV resection	4 (24)	25 (23)	1
Concomitant arterial resection	0 (0)	2 (1.8)	1

J Vasc Surg 2015;62:424-33

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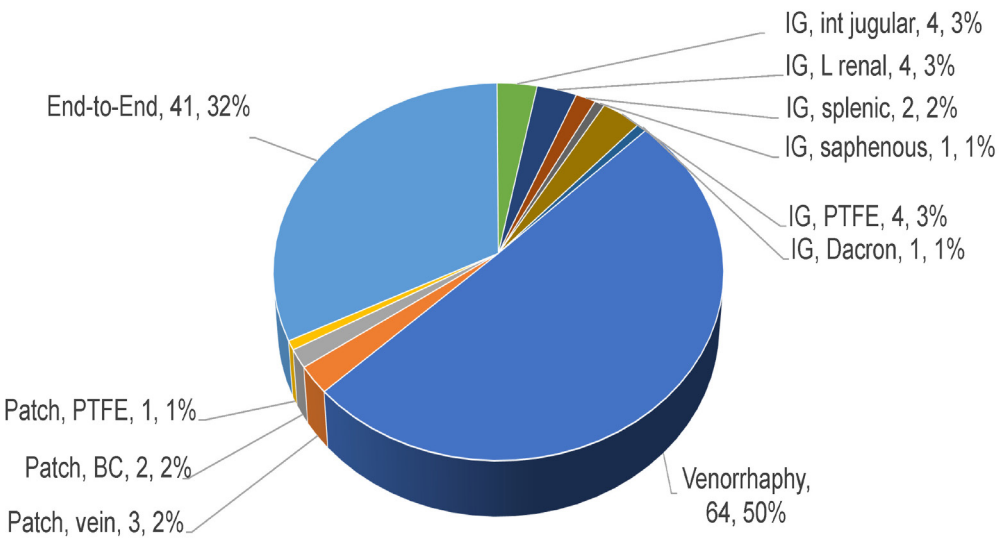
Venous Resection and Reconstruction

Technical outcomes



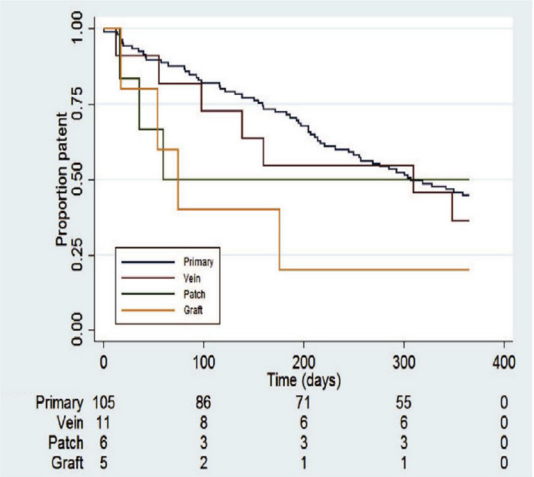
J Vasc Surg 2015;62:424-33

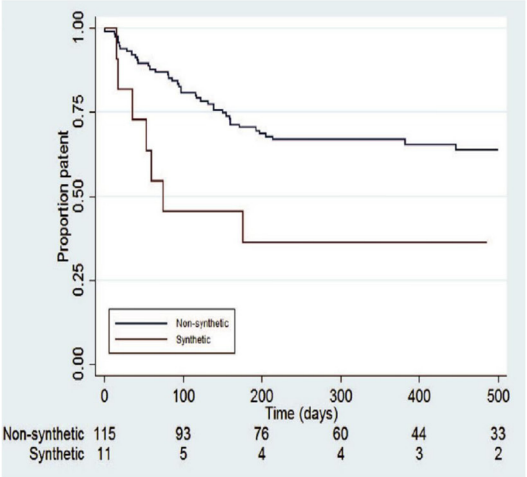
SAMSUNG MEDICAL CENTER

Venous Resection and Reconstruction

Technical outcomes

On multivariable analysis, **operative time** (OR, 1.01; 95% CI, 1.01- 1.02) and **prosthetic graft placement** (OR, 8.12; 95% CI, 1.1-74) were independent predictors of **PVR thrombosis.**





J Vasc Surg 2015;62:424-33

SAMSUNG MEDICAL CENTER

Venous Resection and Reconstruction

Oncologic outcomes

Portal Vein Resection in Borderline Resectable Pancreatic Cancer: A United Kingdom Multicenter Study

Reena Ravikumar, MBChB, Caroline Sabin, PhD, Mohammad Abu Hilal, PhD, Simon Bramhall, MD, Steven White, MD, Stephen Wigmore, PhD, Charles J Imber, MD, Giuseppe Fusai, MS, on behalf of the UK Vascular Resection in Pancreatic Cancer Study Group

- Retrospective, multicenter (9 institutes)
- 1998.12~2011.06
- 1588 pancreatic head cancer (T3, stage IIa to III)
- Median f/u duration 1.1 years (IQR 0.5 - 1.9 years)

Am Coll Surg. 2014;218(3):401-11

SAMSUNG MEDICAL CENTER

Venous Resection and Reconstruction

Oncologic outcomes

	Surgical groups				p Value	
	Total	PD	PDVR	SB	PDVR vs PD	PDVR vs SB
n (%)	1,588 (10.0)	840 (52.9)	230 (14.5)	518 (32.6)		
Sex, n (%)						
Male	856 (53.9)	468 (55.7)	115 (50.0)	273 (52.7)	0.14	0.55
Female	732 (46.1)	372 (44.3)	115 (50.0)	245 (47.3)		
Age, y, median (range)	66 (27–89)	66 (27–84)	65 (43–80)	64 (30–89)	0.61	0.12
Endoscopic USS, n (%)	220 (13.9)	122 (14.5)	38 (16.5)	60 (11.6)	0.52	0.08
MRI, n (%)	76 (4.8)	51 (6.1)	8 (3.5)	17 (3.3)	0.17	1.00
Diagnostic laparoscopy, n (%)	195 (12.3)	119 (14.2)	18 (7.8)	58 (11.2)	0.01	0.20
Preoperative biliary drainage, n (%)	953 (60)	515 (61.3)	112 (48.7)	362 (62.9)	0.0008	0.0004
Bilirubin, uM/L, median (range)	47 (3–911)	49 (3–911)	38.5 (4–798)	52 (4–671)	0.05	0.13
Hemoglobin, g/L, median (range)	12.3 (4.7–17.2)	12.7 (6.0–17.2)	12.2 (4.7–17.0)	12.1 (8.0–17.0)	0.16	0.89
Albumin, g/L, median (range)	38 (15–61)	39 (16–61)	38 (15–49)	37 (20–52)	0.02	0.68
Creatinine, mg/dL, median (range)	82 (8–301)	83 (8–301)	75 (41–183)	83 (32–230)	0.002	0.0009
Operation duration, min, median (range)	255 (102–900)	250 (102–720)	300 (108–900)	215 (120–480)	0.0001	0.0001
Hospital stay, d, median (range)	11 (0–130)	13 (0–130)	14 (0–90)	9 (0–96)	0.15	0.0001
ITU stay, d, median (range)	0 (0–40)	0 (0–39)	0 (0–40)	0 (0–14)	0.16	0.0001

PD: Pancreaticoduodenectomy; PDVR: PD + vein resection; SB: surgical bypass

Am Coll Surg. 2014;218(3):401-11

SAMSUNG MEDICAL CENTER

Venous Resection and Reconstruction

Oncologic outcomes

	Total		PD		PDVR		
	n	%	n	%	n	%	p Value
Type of PD							
Whipple	532	49.7	406	48.3	126	54.8	0.10
PPPD	538	50.3	434	51.7	104	45.2	
Pancreatic anastomosis							
PG	280	26.2	178	21.2	102	44.4	
PJ	790	73.8	662	78.8	128	55.6	0.0001
Vein resection							
Primary closure					129	56.0	NA
End to end anastomosis					65	28.0	
Interposition graft					36	16.0	
Resection margin status, n (%)							
R0	482 (46.0)		397 (48.4)		85 (37.1)		0.003
R1	567 (54.1)		423 (51.6)		144 (62.9)		
SMV, n (%)	173 (17.0)		91 (11.5)		82 (36.1)		0.0001
SMA, n (%)	86 (8.5)		62 (7.9)		24 (10.8)		0.22

Am Coll Surg. 2014;218(3):401-11

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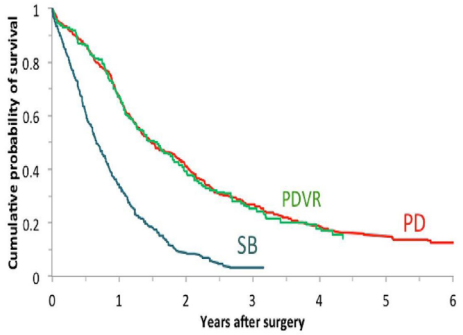
Venous Resection and Reconstruction

Oncologic outcomes

This study demonstrates **no significant difference in perioperative mortality in the 3 groups** and **a similar overall survival between PD and PDVR**; significantly better compared with SB.



Years after surgery	0	1	2	3	4	5	6
PD	719	446	226	118	66	41	19
PDVR	218	135	67	34	15		
SB	418	132	28	9			

Am Coll Surg. 2014;218(3):401-11

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SMC experience (2017.01 ~ 2020.12)

- Vascular reconstruction in biliary & pancreatic surgery
  - Eighty-six patients
  - Median age 66 y-o (range 45 – 91)
  - Male : Female 49:37

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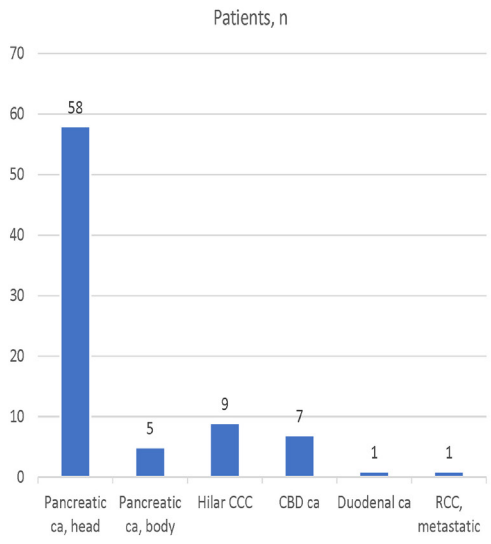
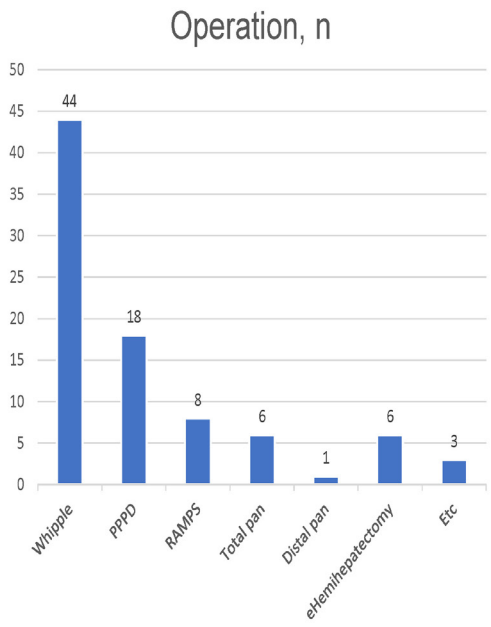
SMC experience (2017.01 ~ 2020.12)





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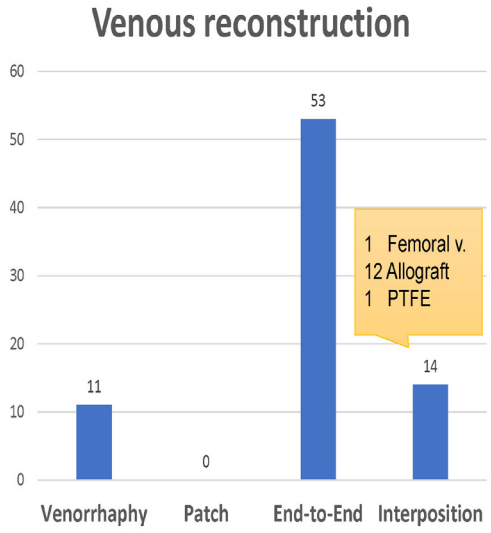
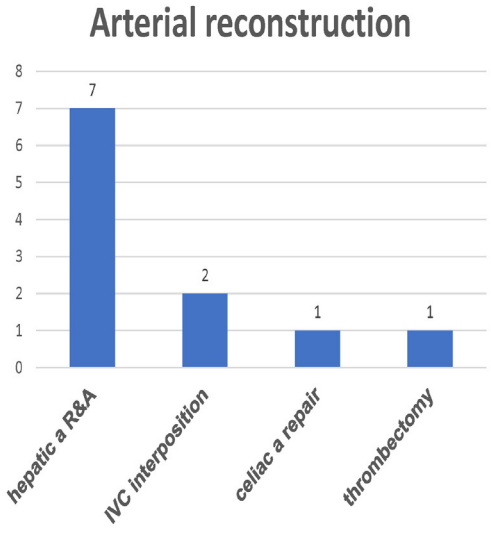
SMC experience (2017.01 ~ 2020.12)





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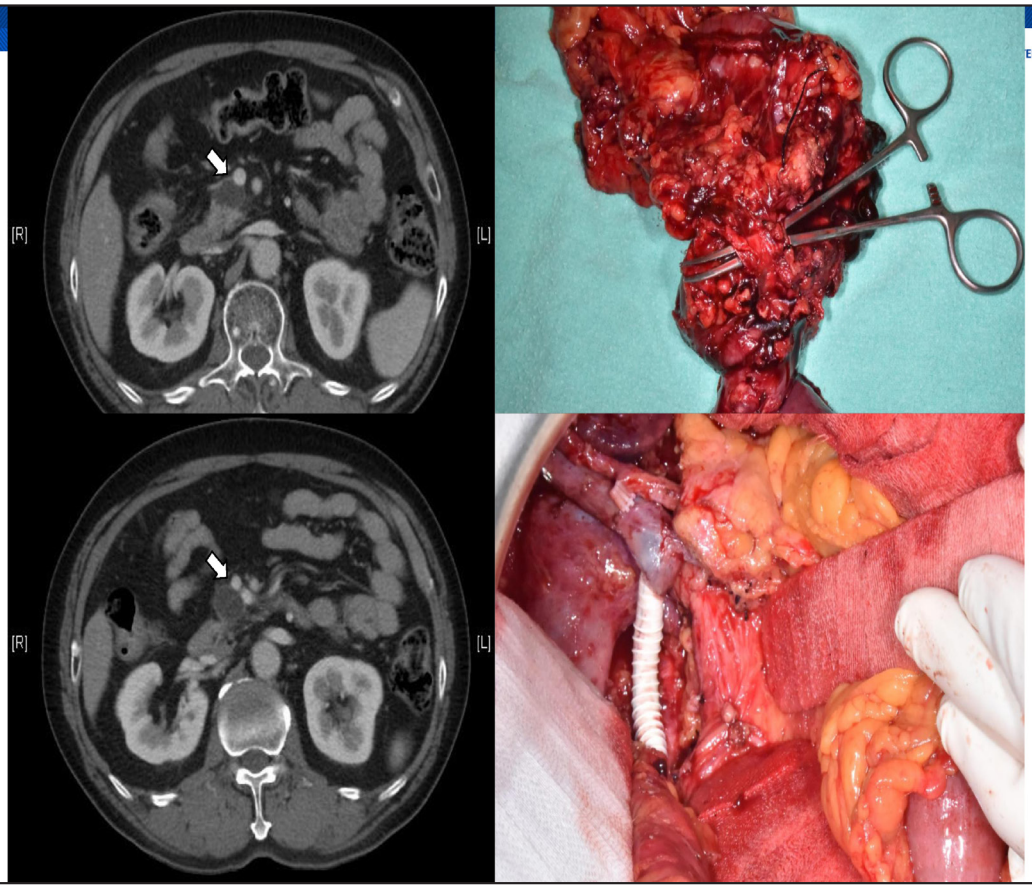
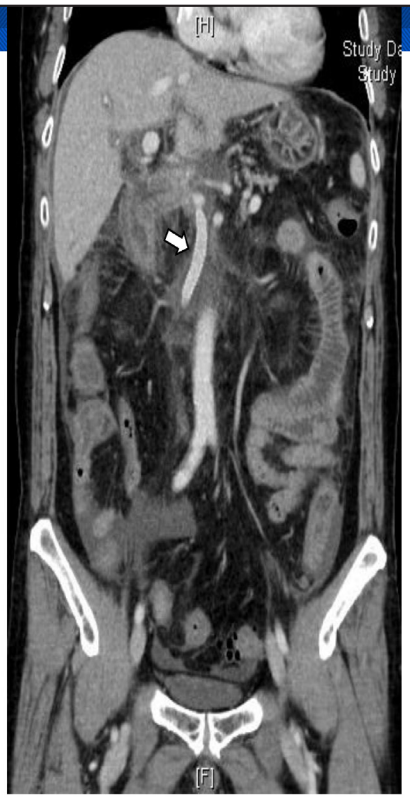
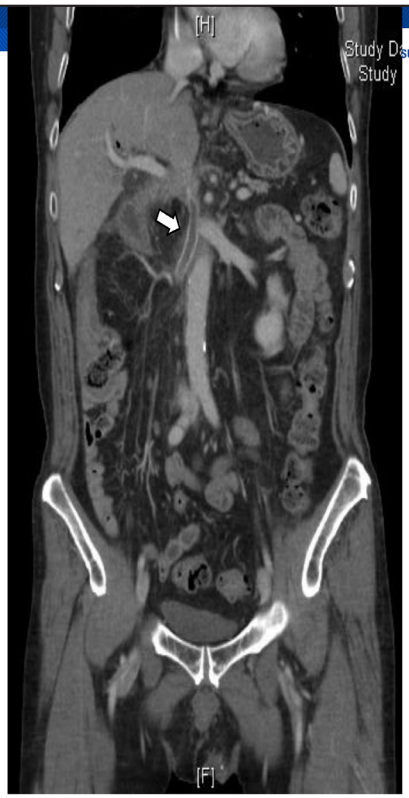
Case

- Male / 69 y-o
- r/o malignant intraductal papillary mucinous neoplasm (IPMN)
- 2019.11.19 ~ 2020.07.09 Neoadjuvant CTx (#12 FOLFIRINOX)
- 2020.09.14 Whipple's op
  - SMV resection and reconstruction w/ 7mm PTFE





2021.09.26 (POD#12)



2021.11.24 (POD#71)

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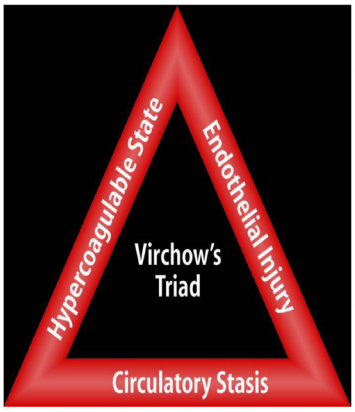
Etiology and risk factors of acute venous thrombosis

- Cancer
- Estrogen
- Family history
- Sepsis
- HIT
- Protein C,S, AT III def.
- Activated protein C resistance
- Homocysteinemia
- Antiphoppholipid Ab.
- Factor V leiden
- High factor VIII, IX, XI levels
- Dysfibrogenemia
- Prothrombin 20210 mutation



- Surgery
- Prior DVT
- Varicose vein
- Venous access
- Trauma
- Sepsis
- Vasculitis

- Advancing age
- Immobilization
- Pregnancy
- Stoke – cord injury
- Anesthesia
- Heart or lung failure
- Hyperviscosity

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Medication after venous reconstruction after PD

- **No consensus**
- **Anticoagulation** > Antiplatelet
- **Prophylactic** vs. therapeutic
  - Acute mesenteric venous thrombosis (AMVT) vs. Bleeding
- **Regimens**:
  - Parenteral: during NPO state
    - IV heparin: anti-inflammatory effect, antidote (protamine sulfate)
    - LMWH: less bleeding, no antidote
  - Oral: maintenance for 3-6 months
    - VKA: warfarin
    - NOAC or DOAC: not covered by insurance

SAMSUNG MEDICAL CENTER

ASTR

ORIGINAL ARTICLE

pISSN 2288-6575 • eISSN 2288-6796
http://dx.doi.org/10.4174/astr.2015.88.4.208
Annals of Surgical Treatment and Research

Follow-up results of acute portal and splenic vein thrombosis with or without anticoagulation therapy after hepatobiliary and pancreatic surgery

Chan Woo Cho, Yang Jin Park, Young-Wook Kim, Sung Ho Choi, Jin Seok Heo, Dong Wook Choi, Dong-Ik Kim

Department of Surgery, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Korea

Purpose: Acute portal and splenic vein thrombosis (APSVT) after hepatobiliary and pancreatic (HBP) surgery is a rare but serious complication and a treatment strategy has not been well established. To assess the safety and efficacy of anticoagulation therapy for treating APSVT after HBP surgery.
Methods: We performed a retrospective case-control study of 82 patients who were diagnosed with APSVT within 4 weeks after HBP surgery from October 2002 to November 2012 at a single institute. We assigned patients to the anticoagulation group (n = 32) or nonanticoagulation group (n = 50) and compared patient characteristics, complications, and the recanalization rate of APSVT between these two groups.
Results: APSVT was diagnosed a mean of 8.6 ± 4.8 days after HBP surgery. Patients' characteristics were not significantly different between the two groups. There were no bleeding complications related to anticoagulation therapy. The 1-year cumulative recanalization rate of anticoagulation group and nonanticoagulation group were 71.4% and 34.1%, respectively, which is statistically significant (log-rank test, P = 0.0001). In Cox regression model for multivariate analysis, independent factors associated with the recanalization rate of APSVT after HBP surgery were anticoagulation therapy (P = 0.003; hazard ration [HR], 2.364; 95% confidence interval [CI], 1.341–4.168), the absence of a vein reconstruction procedure (P = 0.027; HR, 2.557; 95% CI, 1.111–5.885), and operation type (liver resection rather than pancreatic resection; P = 0.005, HR, 2.350; 95% CI, 1.286–4.296).
Conclusion: Anticoagulation therapy appears to be a safe and effective treatment for patients with APSVT after HBP surgery. Further prospective studies of larger patient populations are necessary to confirm our findings.
[Ann Surg Treat Res 2015;88(4):208-214]

Key Words: Thrombosis, Mesentery, Surgery, Portal vein, Anticoagulants

INTRODUCTION

Abdominal intervention such as hepatobiliary and pancreatic (HBP) surgery is known to be a risk factor associated with acute portal and splenic vein thrombosis (APSVT). A recent study reported that abdominal surgeries accounted for up to 20% of all cases of acute portal vein thrombosis (PVT) [1]. APSVT after HBP surgery is a rare but serious complication. The incidence of acute PVT was reported to be 5% in patients who underwent portal vein reconstruction during pancreaticoduodenectomy [2,3]. Thrombus extension to the mesenteric vein can cause bowel infarction, with a reported mortality of 20% to 50% [4].

Despite its potentially poor outcomes, treatment strategy for APSVT after HBP surgery has not been well established, and most surgeons are reluctant to initiate anticoagulation therapy due to concern about the risk of postoperative bleeding.

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- APSVT after HBP surgery
- Retrospective case-control study
- 2002 – 2012
- 82 patients
  - Anticoagulation (n=32)
  - No anticoagulation (n=50)
- **No bleeding cx** was associated with anticoagulation Tx.

Ann Surg Treat Res 2015;88(4):208-214

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Summary

- PV/SMV resection and reconstruction
  - Curable resection (R0) in locally advanced patients
- Postoperative morbidity and mortality
  - Similar with patients undergoing PD without vascular resection
- Multidisciplinary Approach
  - HPB surgeons and vascular surgeons
  - Preparation to harvest autologous vein if needed
  - Please consult to VS before entering OR, not during the operation!!!
- Anticoagulation after HBP surgery is safe.

감사합니다.

연/자/소/개

Curriculum Vitae

이 희 성

이화의대 간담췌외과

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2006-2010	삼성서울병원 외과 전공의 수료 및 외과 전문의 취득

Maximal lower extent of SMV resection

이희성 (이화의대)

Borderline resectable pancreas cancer is defined as a tumor which is technically and grossly resectable but there is high probability of positive resection margin (R1 or R2 resection). Major vascular involvement is important for evaluate the resectability of pancreas cancer. These vessels include the superior mesenteric artery (SMA), the celiac axis (CA), and the superior mesenteric and portal veins (SMV-PV). Pancreatic tumors focally attached to SMV-PV are classified as resectable. And, even if the SMV-PV is involved more than 180 degrees, if en bloc resection is technically possible, it is considered as borderline resectable case.

However, even now, cases of invading the tributaries of SMV-PV are considered unresectable. The reason is that reconstruction is extremely dangerous and almost impossible if SMV tributaries are invaded. However, there are a few cases where reconstruction could be attempted even when SMV tributaries are involved.

We would like to discuss the maximal lower extent of SMV resection with cases. This topic seems to be the cutting-edge area edge in pancreas cancer surgery.

연/자/소/개

Curriculum Vitae

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울산의대 외과

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1995–1999	School of Medicine, Seoul National Univerisity College of Medicine, Seoul, Korea (M.D. Degree)
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2016–2018	Mayo Clinic Graduate School of Biomedical Sciences, MN, USA (Master in Biomedical Sciences, Clinical and Translational Science)

경 력 사 항

1999–2004	Internship & Resident Course, Department of Surgery, Seoul National University Hospital, Seoul, Korea
2004–2007	Military Service as a Public Health Doctor
2007–2009	Clinical Fellow, Division of Hepato–Biliary–Pancreatic Surgery, Department of Surgery, Seoul National University Hospital, Seoul, Korea
2016–2018	Research Fellow, Department of Surgery, Mayo Clinic, MN, USA

Attempt to get R0 with SMA resection

황대욱 (울산의대)

연/자/소/개

Curriculum Vitae

이 정 우

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2005.02	M.D.(No. 87257), granted by Ministry of Health and Social Affairs, Republic of Korea

Laparoscopic pancreaticoduodenectomy with mesopancreas dissection using artery first approach

이정우, 이종우, 권재현, 김현령, 장지수 (한림의대)

Purpose

Laparoscopic pancreaticoduodenectomy(LPD) is the one of most technically challenging operations of minimally invasive procedures.

Furthermore, LPD remains controversial, especially in the treatment of pancreatic cancer, where it can increase the risk of pancreatitis and major vessel invasion

However, a few studies have reported the technical and oncological feasibility of LPD. In this article, the aim is to review our experience of LPD in pancreatic cancer that can be performed with safety and good results including oncologic outcome, resection margins and survival rates at a single institution.

Method

From August 2017 to August 2020, 117 patients underwent laparoscopic pancreatico-duodenectomy in hallym university medical center. Among 117 patient, 20 patients underwent laparoscopic pancreaticoduodenectomy by using artery first approach. The patient characteristics, perioperative variables, and immediate post op outcomes were retrospectively collected and analysed.

Results

7 patient male and 13 female patients were included in this study. The median age of the patients

was 66.8 years (range 44 - 81). 10 cases was performed by portal vein resection and bovine patch graft applied. One case was performed by end to end anastomosis. Open conversion was none. The average operative time was 475.9 min(range 350 - 685 min). The mean time of superior mesenteric artery clamp was 40.6 min(rage 30 - 55 min). 30 day mortality was not observed in this series. 19 of 20 patient had negative resection margins, and the median number of lymph node harvested was 17.3 (range 4-38). The median postoperative hospital stay was 14.3 days(range 7 - 24 days),ant those around the harvested lymph nodes tested positive for metastasis in 10 patients (50%). The one patient suffered from gastric mucosa bleeding. In this case, mucosa bleeding was stopped through conservative therapies. The one patient suffered from grade C POPF.

Conclusion

The artery first approach has been devised to achieve a complete tumor resection for pancreatic head cancer. Laparoscopic pancreaticoduodenectomy using artery first approach can be safely and feasibly performed. However, more study about long term safety and oncological outcome should be required.

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특 강

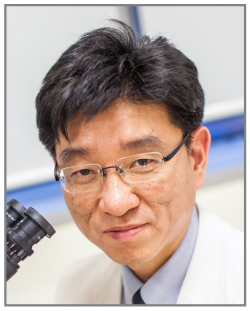
선행항암요법을 시행한 췌장암에서 수술 후 병리진단의 어려움 및 문제점

이현국(이화의대)

한국췌장외과학회
Korean Pancreas Surgery Club

연/자/소/개

Curriculum Vitae



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선행항암요법을 시행한 췌장암 검체에서 수술 후 병리 진단의 어려움 및 문제점

장기택 (성균관의대 병리과)

선행항암요법을 시행하는 췌장암 수술검체는 점진적으로 늘고 있으며 이에 따른 병리조직학적 소견의 변화는 다양하게 나타난다. 가장 먼저 고려되어야 할 것은 선행항암요법으로 인해 종양이 괴사 되고 종양 부위가 섬유화로 대체될 경우 육안검사에서 종양성 병변 부위를 확인하기 어렵다는 점이다. 췌장암은 원래 종양세포의 밀도가 높지 않고 종양 주변에 섬유화를 동반하기 때문에 선행함암요법을 시행하지 않은 경우에도 종양의 경계를 확인하기 어려운 경우가 적지 않다. 따라서 선행항암요법이 시행된 수술 검체에서는 더욱 종양의 범위를 확인하기 더 어렵기 때문에 종양성 병변으로 의심되는 병변과 주변 부위를 모두 확인해야 하기 때문에 더 많은 조직 절편 제작이 필요하다. 선행항암요법의 효과를 판정하기 위해서는 표준화된 육안 검사 프로토콜을 사용해야 하지만 이에 대해서도 아직 일치된 합의안은 확정되지 않은 상태이다. 이는 국가별로 또는 기관별로 병리과에서 췌장암 검체를 다루는 방식이 다르기 때문이며 일치된 합의안을 도출하기 위한 과정이 진행되고 있다. 선행항암요법의 효과를 측정하기 위해서는 많은 스코어 방식이 쓰이고 있지만 가장 많이 사용되는 방식은 College of American Pathologists system, Evans scoring system, and MD Anderson Cancer Center system등 3가지 방식이다. 선행항암요법은 병리 조직소견에서 세포 이형성을 유발하기 때문에 병리진단에서 세포 이형성과 분화도 등은 변형된 형태소견으로 인지되어야 하며 종양의 침범 병기 표기에서는 접두사 “ypT”형식으로 표기된다. 마지막을 선행항암요법은 종양의 분자생물학적 특성에도 변화를 유발할 것으로 예상되지만 아직 이에 대해서는 알려진 것이 많지 않아 향후 지속적인 관심과 전행적인 연구와 결과 분석이 필요하다.

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Scientific Session 2

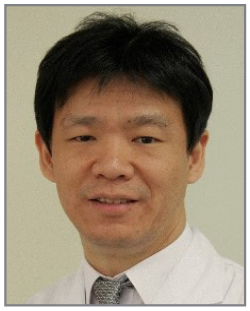
To be or not to be, that is the question; Spleen

허진석(성균관의대), 장진영(서울의대)

KPSC Since 2004
한국췌장외과학회
Korean Pancreas Surgery Club

연/자/소/개

Curriculum Vitae



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Is OPSI such an important matter?

황지웅 (한림의대)

The spleen is a reticuloendothelial organ with important hematologic and immunological functions, including clearance of bacteria from the blood and generation of immune responses to certain pathogens. However, splenectomy may be performed for several reasons and conditions, including immune thrombocytopenic purpura, hereditary spherocytosis, malignancy, and splenic trauma. Especially, to hepatobiliary surgeons, splenectomy may be considered in performing the distal or total pancreatectomy because of its anatomical proximity to, and sharing principal vessels, the left pancreas.

Various postsplenectomy sequelae have been recognized, including overwhelming postsplenectomy infections (OPSI), thrombocytosis, and increasd cancer risk. Among these postsplenectomy complications, OPSI is the most common fatal late complication of splenectomy. Infection may occur at any time after splenectomy and true incidence of OPSI has been difficult to determine because infection in splectomized patients is likelyy to be underreported.

Most of cases of OPSI are caused by S. pneumoniae, H. influenzae, and N. Meningitides and thus potentially preventable if appropriate prophylactic vaccinations are given. Many cases of delayed OPSI have been in nonimmunized immuocompetent patients. Although OPSI is a fatal postsplenectomy complication, with the proper vaccination, OPSI may no longer be a concern. Therefore, it can be said that vaccination for the splenectomized patients is very important and must be implemented.

연/자/소/개

Curriculum Vitae

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Should we do splenectomy for oncologic safety?

김재리 (경상의대)

The importance of spleen preservation has been emphasized through various studies, because of its hematological and immunological functions. Sepsis after splenectomy due to encapsulated bacteria is known as very rare but fatal complication. It usually occurs within the first two years after operation in many cases, even after adequate vaccination. In addition, some hematologic problems happened after surgery, such as high platelet count resulting in a hypercoagulability status with a risk of thromboembolic complications.

When distal pancreatectomy is performed for malignant lesions in body to tail portion of pancreas, splenectomy has been indicated traditionally to ensure R0 resection of primary tumor and clearance of regional lymph node (LN). However there is no strong evidence to support this indication. Based on the review of several previous literatures, the overall risk of splenic hilar LN (LN #10) metastasis has been overestimated. Even for obtaining negative surgical margins, splenectomy is not always necessary. Although the data about the rates of recurrence of spleen or LN #10 has not studied well, splenic recurrence cases are expected to be small. Most of the patients with metastasis of LN #10 were those with advanced tumors.

In conclusion, spleen-preserving distal pancreatectomy (vessel preserving, Warshaw technique) would be also feasible for treating well-selected pancreatic cancer patients. Our traditional concept about routine splenectomy for pancreatic cancer should be re-evaluated. The next step to make the clear guideline about splenectomy might be a large multicenter study which identify the actual rates of metastasis and recurrence in spleen and splenic hilar LN in pancreatic body/tail cancer.

연/자/소/개

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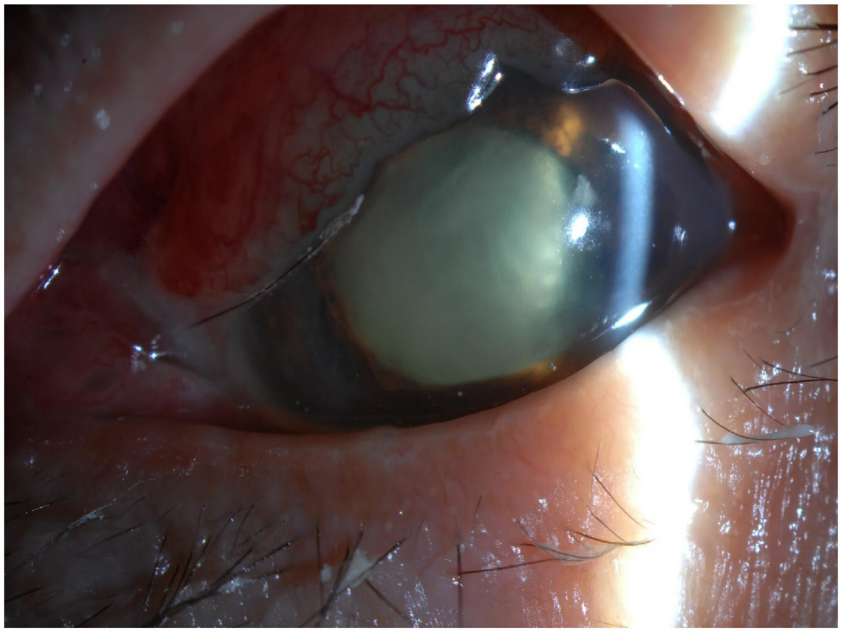
Principles and practical issues on vaccination for splenectomy

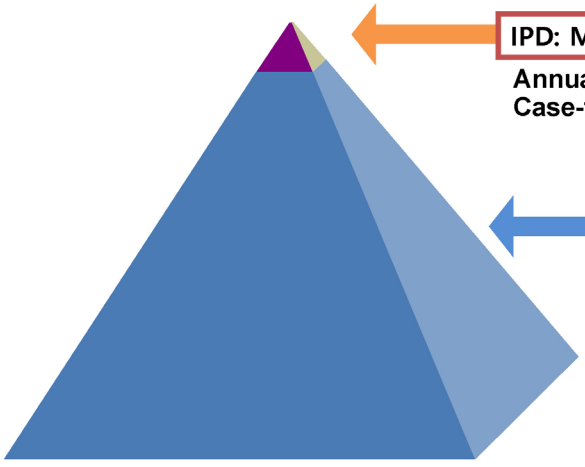
김성한 (울산의대 감염내과)



- SCLC 항암치료 1회 시행 후 발열, 시력저하, 관절통
- 눈, 혈액, 관절액에서 pneumococcus 동정됨
- Pneumococcal IE with endophthalmitis and arthritis
- 눈, 관절, 심장 수술

Pneumococcal vaccine

Pneumococcal Disease: Prevalence and Case-Fatality of Major Clinical Syndromes in US Adults[1,2]



IPD: Meningitis, Bacteremia/Sepsis etc.

Annual cases: 8,700
Case-fatality rate: 20%-30%

Non-Bacteremic Pneumococcal Pneumonia

Annual cases: 500,000
Case-fatality rate: 5% to 7%

- **Problem obtaining an etiological diagnosis in most cases of pneumonia**
- **Little to no information on serotype distribution**

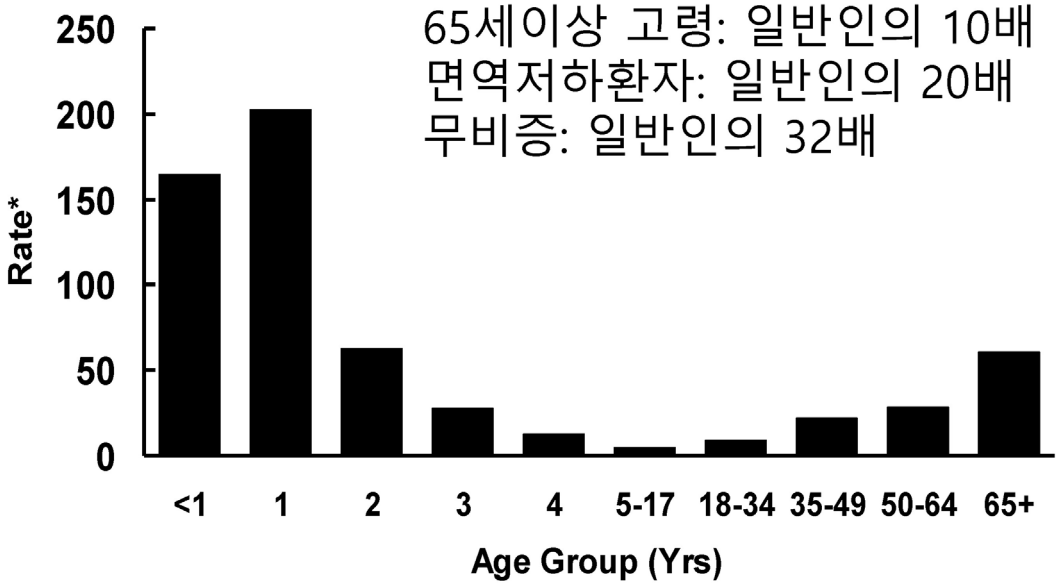
"The prevention of the large burden of disease associated with pneumococcal pneumonia should be a major objective from a public health perspective"[3]

1. CDC. *The Pink Book*. 12th ed. Washington DC: Public Health Foundation;2011
2. Huang SS, et al. *Vaccine*. 2011;29:3398-3412
3. Huss A, Scott P *et al.* CMAJ 2009; 180: 48-58

Slide courtesy of Seong-Beom Park

Invasive Pneumococcal Disease

- Incidence by Age Group :1998 -



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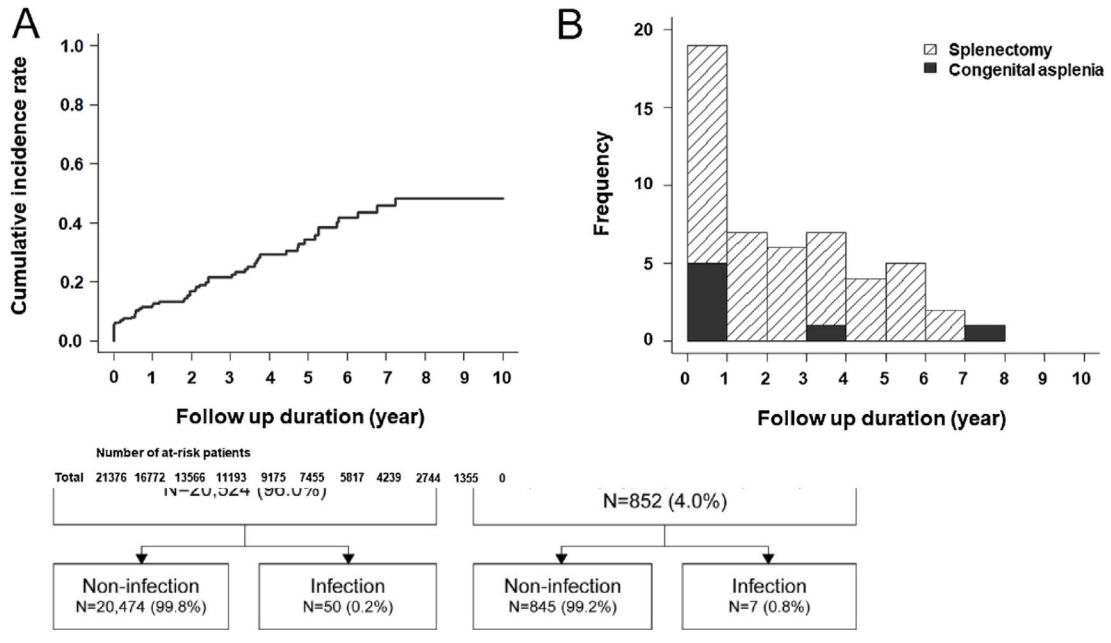
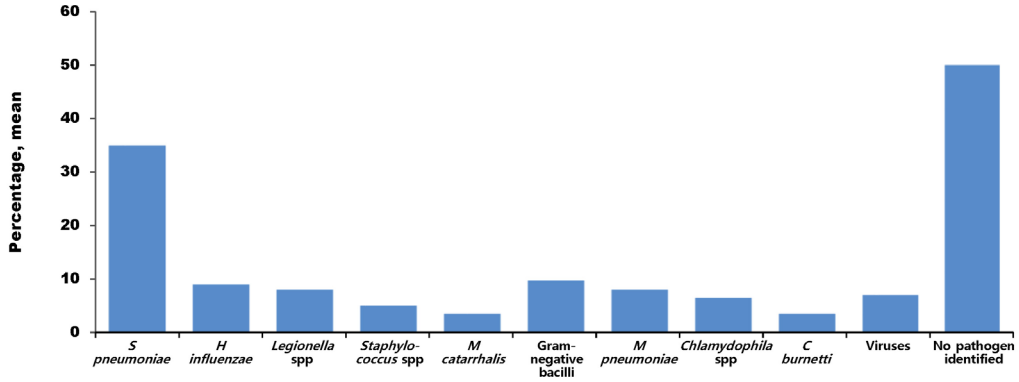


Etiology of CAP

Frequency of causative organisms* of CAP in Europe, 1990–2007[1]



- *S pneumoniae*: most frequently isolated pathogen in CAP patients within the hospital, ICU, and outpatient settings[1,2]

*Data are presented as percentage means of frequency of isolation of the respective pathogens from the studies included. Studies were identified by a literature review of all primary articles reporting studies of the clinical and economic burden of CAP in adults in Europe from January 1990 to December 2007.

CAP=community-acquired pneumonia; ICU=intensive care unit.

1. Reproduced from [Welte T et al, *Thorax*, volume 67(1), pages 71-79, 2012] with permission from BMJ Publishing Group Ltd. **2.** Lode HM. *Respir Med.* 2007;101:1864-1873.

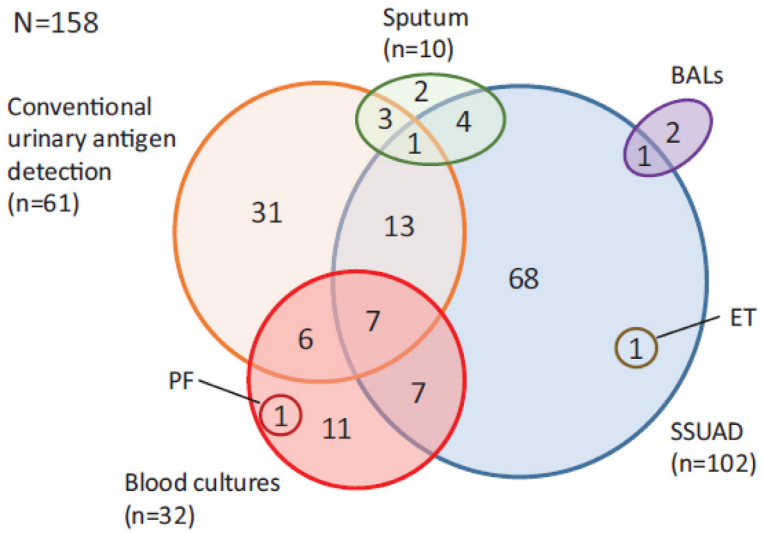
Slide courtesy of Seong-Beom Park

Etiology of CAP in Korea

	No. (%)				
	우준희 등 (감염 2001) (N=219)	정문현 등 (감염 1997) (N=54)	유철웅 등 (감염 2000) (N=81)	손장욱 등 (JKMS 2006) (N=39)	송재훈 등* (Int J Antimicrob Agents 2008) (N=108)
그람양음성균					
S. pneumoniae	**59 (26.9)**	**19 (35.2)**	**27 (33.3)**	**17 (43.6)**	**38 (35.2)**
S. aureus	25 (11.4)	5 (9.3)	13 (16.0)	1 (2.6)	12 (11.1)
viridans group streptococci	12 (5.5)	1 (1.9)		4 (10.3)	4 (3.7)
b-hemolytic streptococci	1 (0.5)	3 (5.6)			5 (4.6)
Others	2 (0.9)				2 (0.9)
그람음성균					
Klebsiella spp.	44 (20.0)	8 (14.8)	12 (14.8)	4 (10.3)	12 (11.1)
Pseudomonas spp.	28 (12.8)	1 (1.9)	5 (6.2)	4 (10.3)	7 (6.5)
Enterobacter	14 (6.4)	1 (1.9)		2 (5.1)	5 (4.6)
Haemophilus	11 (5.0)	12 (22.2)	11 (13.6)	1 (2.6)	3 (2.8)
Acinetobacter spp.	7 (3.2)	1 (1.9)		4 (10.3)	1 (0.9)
E. coli	6 (2.7)	2 (3.7)		2 (5.1)	4 (3.7)
Others	10 (4.6)	1 (1.9)	13 (16.0)		9 (8.3)
Anaerobes					3 (2.8)

Slide courtesy of Seong-Beom Park

Low sensitivities of conventional test



Clinical Infectious Diseases® 2018;66(10):1504–10

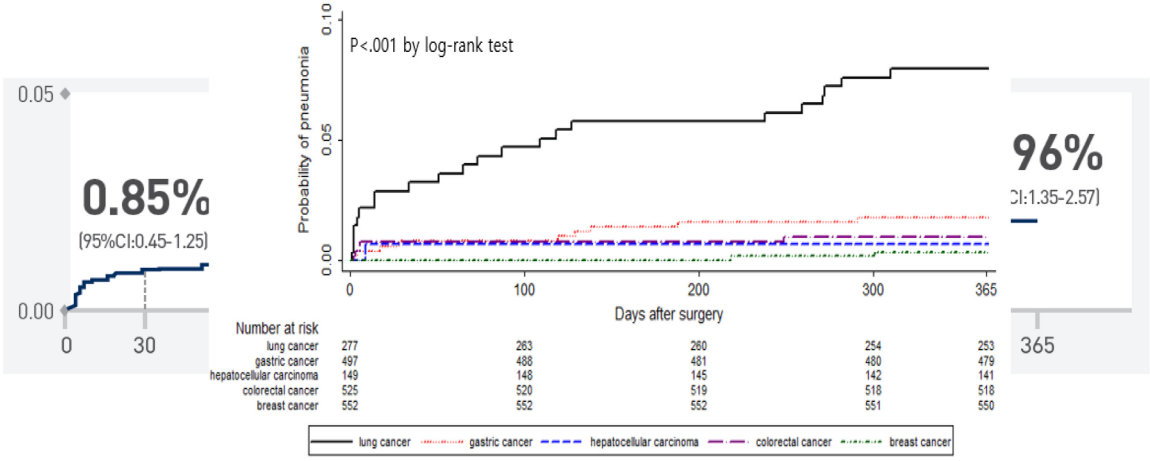
Cancer POP study

- Limited data on the incidence of POP in cancer patients
  - Lung cancer 2.1-10.7%
  - Gastric cancer 3.6-4.3%
  - Colorectal cancer 6.2%
- Few studies on the comparison of the incidence of POP between various cancers
- Investigation of the incidence of POP within 1 year after cancer surgery in patients with the 5 most common cancers at five nationwide cancer centers (서울아산병원, 삼성서울병원, 인천길병원, 전남대병원, 울산대병원)
- Allocations of the number in each center according to the number of cancer surgeries in each center

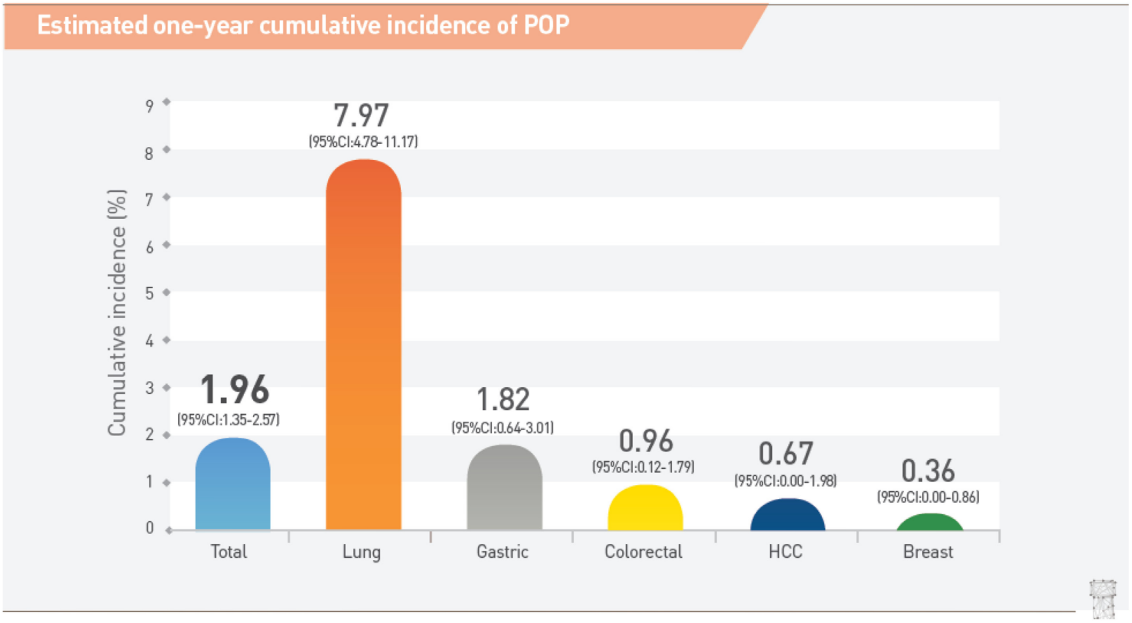
정지원, 서보정, 김성한 등. *Cancer Medicine* 2018; 7:261-9

Cancer POP study

Jan 2014 – Dec 2014
2,000명 중 39명 POP 생김 → 2.0% (95% CI 1.4-2.6)
* CAP 21%, HCAP 26%, HAP 54%

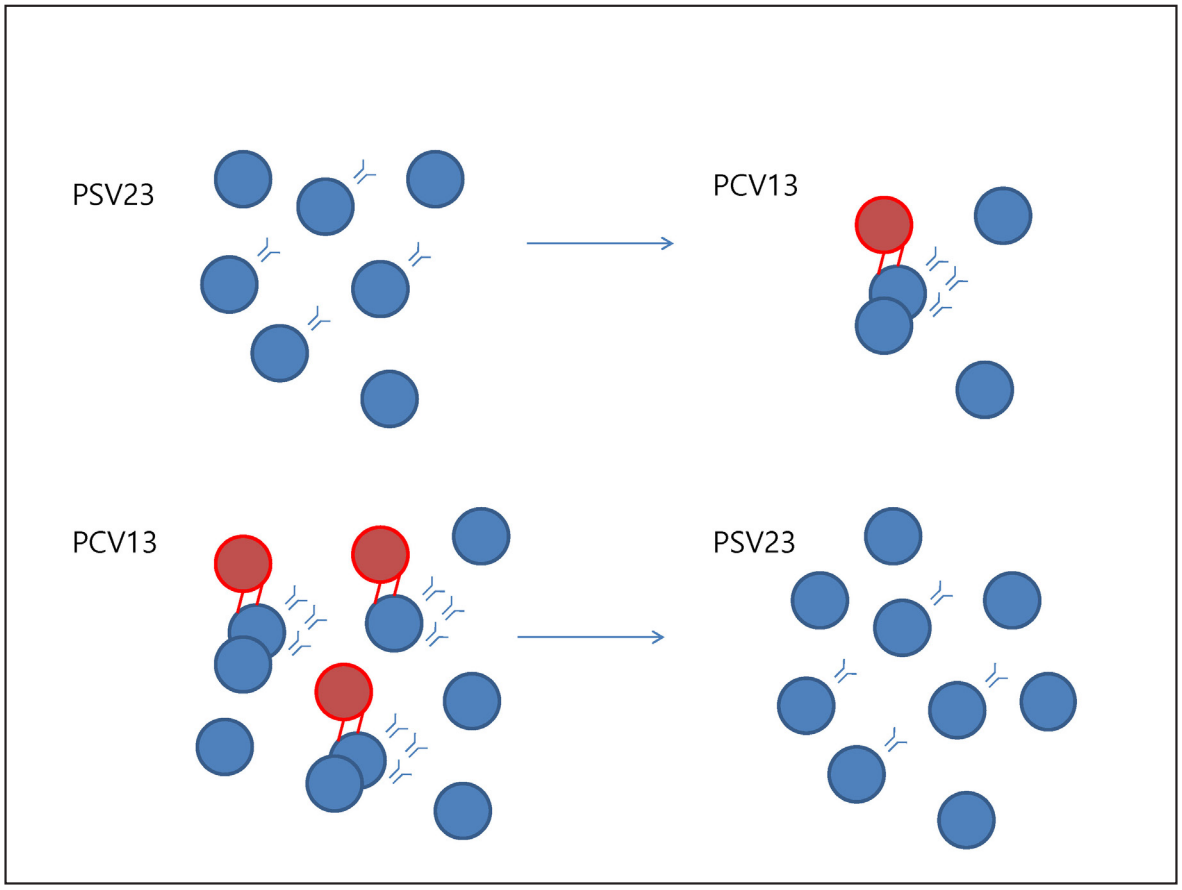


정지원, 서보정, 김성한 등. *Cancer Medicine* 2018; 7:261-9



Age (> 65 years), high CCI, smoking, peptic ulcer, and previous pneumonia history were independent risk factors for POP.

정지원, 서보정, 김성한 등. Cancer Medicine 2018; 7:261-9



- 23-valent polysaccharide vaccine (PPSV23)
- 13-valent conjugate vaccine (PCV13)

백신 효능

- 초기의 RCT
  - Pneumococcal pneumonia를 줄임
  - 그러나, 이후 RCT는 이를 증명하지 못함

  * Pneumococal pneumonia 진단의 민감도가 낮음. All cause mortality는 백신의 효능을 희석할 수 있음
  * Bacteremia는 선진국에서는 빈도가 낮아서 outcome 으로 측정이 어려움
- 백신 시판 후에 관찰연구
  - Invasive pneumococcal disease (i.e. pneumococcal bacteremia or meningitis)를 44%-81% 줄임

적응증

1. 65세 이상
2. 만성질환자(폐[COPD, emphysema, asthma], 심장[CHF, cardiomyopathy, 고혈압은 제외], 간[LC, alcoholism], 내분비 질환[DM])
3. 면역저하환자
4. 무비증
5. Cochlear implant, CSF leaks
6. 그 외: 요양원 거주자, 흡연자

백신 효능 지속기간 및 재접종

- 65세 이상의 고령층에서 백신 접종 5년 후에 유의하게 효능이 감소한다는 보고가 있지만 다른 연구는 이를 증명하지 못함
- 재접종 적응증

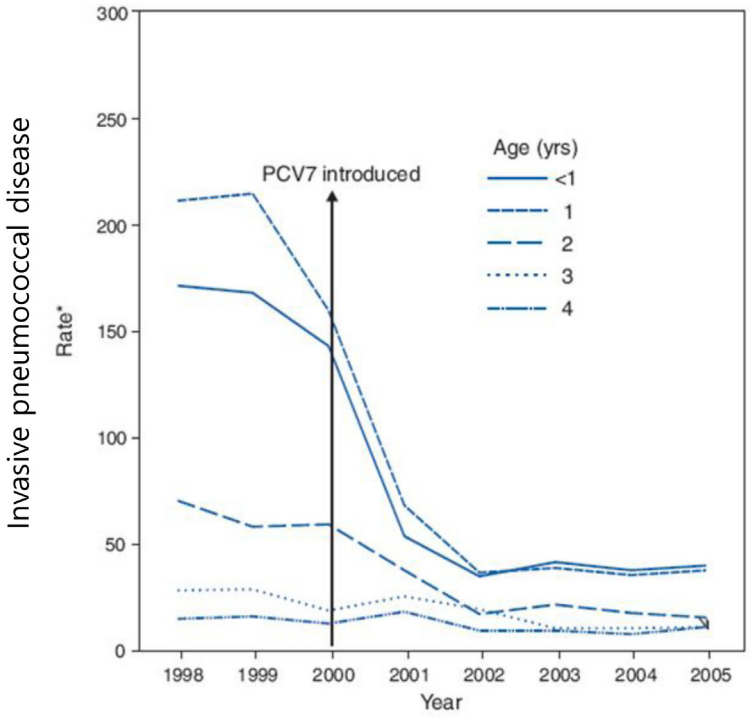
(1) 19-64세 사이에 접종받는 경우에서 아래에 해당하는 경우에만 5년 후에 한번 재접종함(one time revaccination)

– 만성신부전 또는 신증후군
– 무비증(eg, splenectomy or sickle cell anemia)
– 면역저하환자

(2) 어떤 적응증이든 첫 접종을 1 or 2차례 65세 이전에 접종받은 경우는 5년이상 경과하여 65세가 된 경우 65세 또는 그 이후에 한번 재접종

- 23-valent polysaccharide vaccine (PPSV23)
- 13-valent conjugate vaccine (PCV13)

미국 8개주에서 최근 추이



*Per 100,000 population.

MMWR 2008;57:144-8

백신 효능

- 백신 serotype에 대한 invasive pneumococcal disease를 76%-97% 줄임
- 폐렴에 대한 백신 효능도 20%-37%
- 비인두에 pneumococcus의 보균자도 줄임

* CAPiTA trial (65세이상 성인을 대상으로 RCT)- NEJM 2015;372:1114-25
  - IPD (invasive pneumococcal disease) 75% 감소
  - Nonbacteremic pneumonia 45% 감소

PCV13

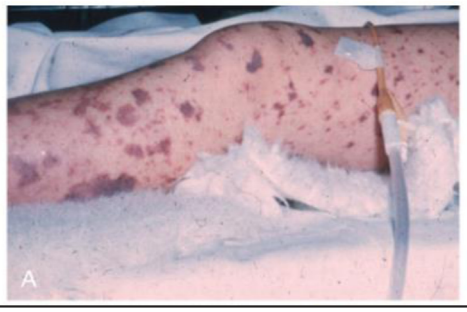
- 적응증
  (1) 19세이상 성인 중에서 아래의 경우
  – 면역저하환자
  – 무비증(eg, splenectomy or sickle cell anemia)
  – CSF leak
  – Cochlear implant
  (2) 65세이상 성인
- Initial:
  – PCV13 → PPSV23 at least 8 weeks later ➔ subsequent PPV is the same (age 19-64)
  – PCV13 → PPSV23 at least 12 mo later ➔ subsequent PPV is the same (age 65 or more)
- PPSV23 vaccinee: PCV13 1 year or more interval

53세 무비증 환자

처음	8주후	5년후	65세
PCV13	PPSV23	PPSV23	PPSV23

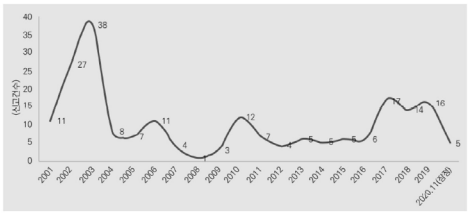
62세 남자

- 3일전 제주도 여행
- 내원 당일 열감, 오한, 두통
- CSF: WBC 5500, neutrophil 92%, protein 444 mg/dL, glucose 2 mg/dL
- HD#3: Blood culture *Neisseria meningitidis*



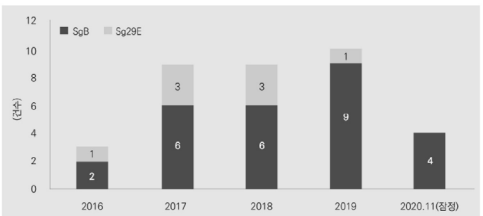
Epidemiology in Korea

- 1960년대 이후 매년 40명 이하의 소규모 발생



구 분	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
신고건수 (사망)	1	3	12	7(2)	4	6	5	6(1)	6	17(1)	14(1)	16(1)	5
발생률 (10만명당)	0.00	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.03	0.03	0.01

<연도별 수막구균 감염증 신고현황 및 발생률>

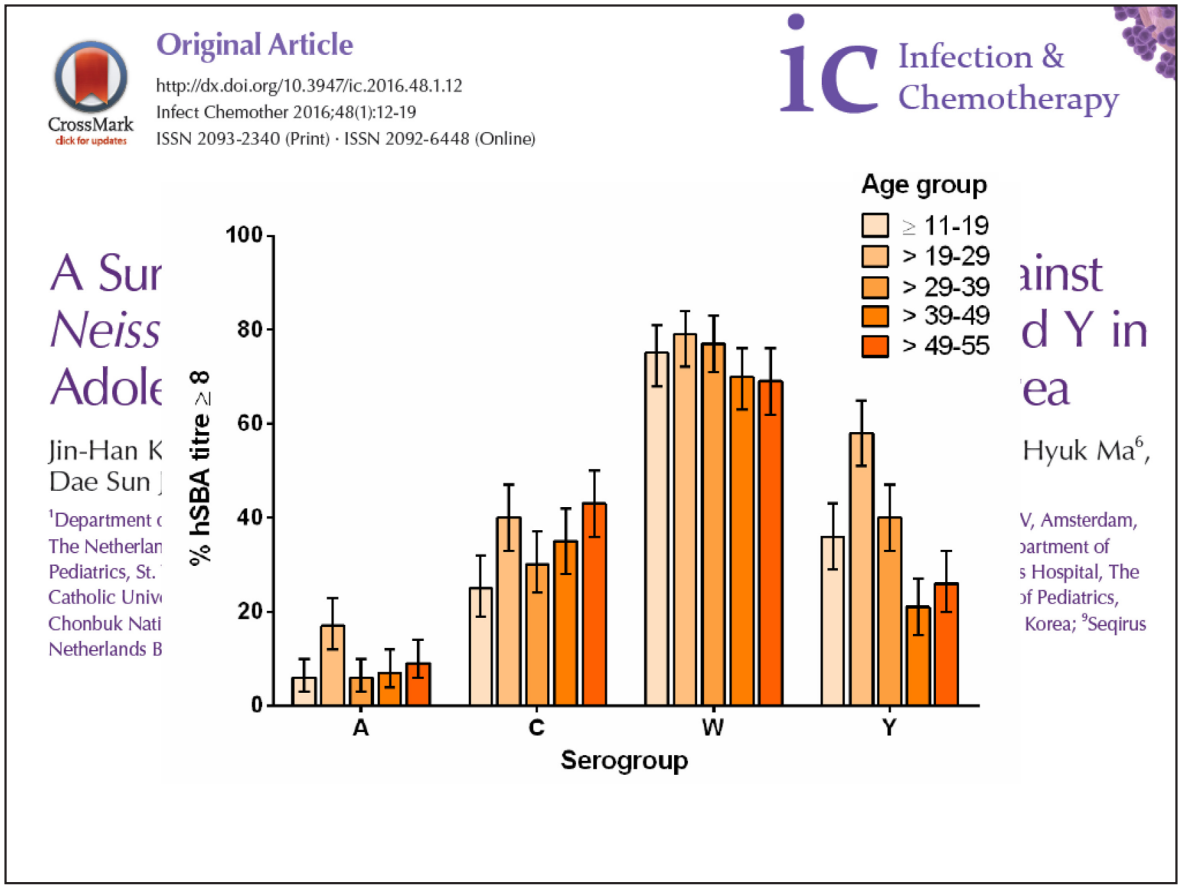


<국내 수막구균감염증 환자의 혈청군>

2021년도 수막구균감염증 관리지침, 질병관리청

Carriage rate in Korea

- Hwang IU et al, 2010, *J Korean Miol Med Assoc*
  - Carriage rates showed that meningococci were isolated from **17.6–21.7%** of soldiers
  - The majority of the serogroups were B (31.9~60%) and C (11.8~17.4%).
- Areum Durey et al, 2011, *Yonsei Med J*
  - 136 first year of university students, Incheon, March 2009
  - Carriage rates: **11.8% -> 14.1%** (4 wks f/u)
  - Serogroup C (31.3%) > serogroup B (18.8%)
- Han Wool Kim et al, 2017, *J Korean Med Sci*
  - 1,460 first-year high school students in Gyeonggi in 2015
  - Total carriage rate: **3.4%**
  - Serogroup B (24.5%) > serogroup C (22.4%) > serogroup 29E (12.2%) > sergroup Y (10.2%)



Vaccines

- 국내 사용 중인 수막구균 백신 : 4가 단백결합백신(멘비오, 메낙트라), 혈청형 A, C, Y, W-135
- 12주 (최소 8주) 간격으로 2회 접종 → 3-5년 후 재접종
- *N. meningitides* serogroup B (MenB)
  - Two serogroup B vaccines have now been introduced.
  - MenB-4C (Bexsero): licensed in Europe in 2013 and in the US in 2015
  - MenB-FHbp (Trumenba): licensed in the US 2014 and in Europe in 2017
  - In the US, the Advisory Committee on Immunization Practices (ACIP) recommends that adolescents and young adults aged 16 to 23 years (the age of greatest risk) may be vaccinated with a serogroup B vaccine.

예방접종 대상 감염병의 역학과 관리(수막구균) 5판, 2017, 질병관리청

Spleen

- Remove particles (opsonized microbes) by the red pulp macrophages
- Initiate adaptive immune responses by the white pulp lymphocytes
- Encapsulated organisms cleared by opsonization and pahgocytosis
- Susceptible to disseminated infections with encapsulated bacteria such as pneumococci and meningococci

Abbas AK, et al. Cellular and Molecular Immunology. 8th ed.

OPSI

- 5% (0.1%-8.5%): 10-20 fold higher than general population
- 50-fold greater risk of pneumococcal infections and 3-fold greater influenza-associated mortality

JAMA Surgery 2020; 155:1068-77

Timing

- At least 2-week prior to surgery
- At least 2-week apart from surgery
- Not solid data, so during the hospital stay for 100% coverage
- Half of OPSI within 2 years after surgery, but the risk persists during the lifetime

JAMA Surgery 2020; 155:1068-77

요약

- PCV13 → 2개월 후 PPSV23 → 5년 후 PPSV23
- Meningococcal conjugate vaccine (Menveo는 PCV13 동시접종 가능) → 2개월 후 재접종 → 5년 후 재접종
- Hib vaccine, influenza vaccine (매년)
- 가능하면 수술하기 2주 전(4-6주 전)
- 접종이 누락되었으면, 입원 중 접종 → 추가 접종은 외래 추적 중

제66차
한국췌장외과학회 학술대회

Case presentation

이승은(중앙의대), 한인웅(성균관의대)

KPSC Since 2004
한국췌장외과학회
Korean Pancreas Surgery Club

Grade 1 Duodenal NET with simultaneous nodal/distant metastases

권용재 (울산의대)

Pancreaticoduodenectomy with "colon-last" approach for pancreatic head cancer

김지수, 강창무 (연세의대)

Margin-negative surgery is very important in surgical oncology. Considering margin-negative pancreatectomy is known to be essential for cure of the pancreatic cancer, Pancreaticoduodenectomy (PD) with combined venous vascular or arterial resection can be a potential option for margin-negative resection, especially, in era of neoadjuvant treatment with potent systemic chemotherapy. To the contrary, special attention was not paid on combined colonic resection during PD. In this presentation, safe surgical technique for PD with combined colonic resection is introduced, under the name of PD with "*colon-last*" approach. Personal experiences and potential advantages of this surgical technique are also discussed. **Case:** A 58-year-old female was first visited to the hospital with dark urine and was diagnosed with locally advanced pancreatic cancer with common bile duct, transverse colon and superior mesenteric vein (SMV) long segment invasion on Computed Tomography (CT) and Magnetic resonance cholangiopancreatography. She immediately received neoadjuvant chemotherapy with FOLFIRINOX. With severe neutropenia, from the 4th chemotherapy, a 50% dose reduction was performed, and a total of 10 FOLFIRINOX chemotherapy was received. On follow-up CT, there was no change in tumor's status, and it was difficult for her to continue chemotherapy, so surgical treatment was decided. Pancreaticoduodenectomy with "*colon-last*" approach including transverse colon segmental resection, SMV segmental resection with end to end anastomosis, and colon end to end anastomosis were performed. She recovered routinely and was discharged 11 days after surgery. She is currently in outpatient follow-up without further chemotherapy and without recurrence.

Undifferentiated carcinoma with osteoclast-like giant cells mimicking solid pseudopapillary neoplasm at pancreas head

김나루 (가톨릭의대)

한국췌장외과학회 Korean Pancreas Surgery Club

Patient information

- **Age/Sex** : 72/F
- **C.C** : Epigastric pain
- **P.I**
  - Epigastric pain 으로 local 내원한 환자로 당시 lab에서 hyperglycemia 및 Amylase, lipase 상승소견 보여 CT 시행 하였으며 3.3cm pancreas head mass 확인되서 본원 내원함
- **Past Hx.** : DM (New onset, 1week ago) – medication start
- **Op Hx.** : 2001 hysterectomy
- **Family Hx.** : (-)
- **Social Hx.** : Smoking/alcohol (-/-)

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Initial vital sign & Laboratory findings

- V/S : 160/84-81-16-37.0
- Lab : WBC / Hb / Plt : 4330 / 12.3 / 164,000 CRP: 0.03

  Pro / Alb : 6.8 / 4.2 g/dl

  PT / aPTT : 102% (0 .99 INR) / 36.3 sec

  Amylase/lipase : 259/ 1366 IU/L

  T-Bil / AST / ALT / ALP : 0.37 / 12 / 13 / U/L

  CEA/CA19-9 : 14.94/1025 U/ml

  Glucose 346mg/dl, HbA1C 13.4%

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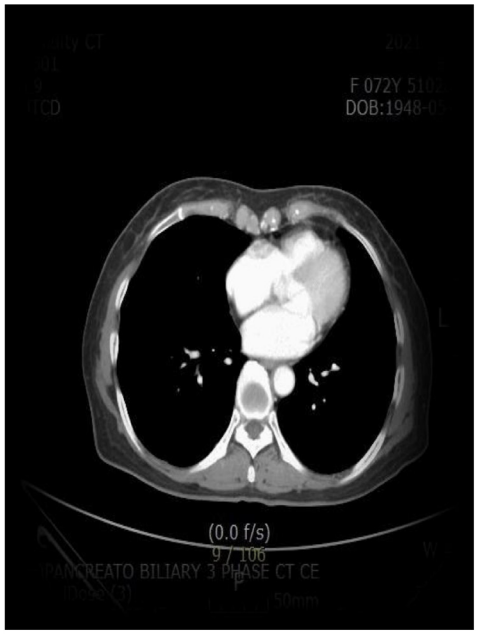
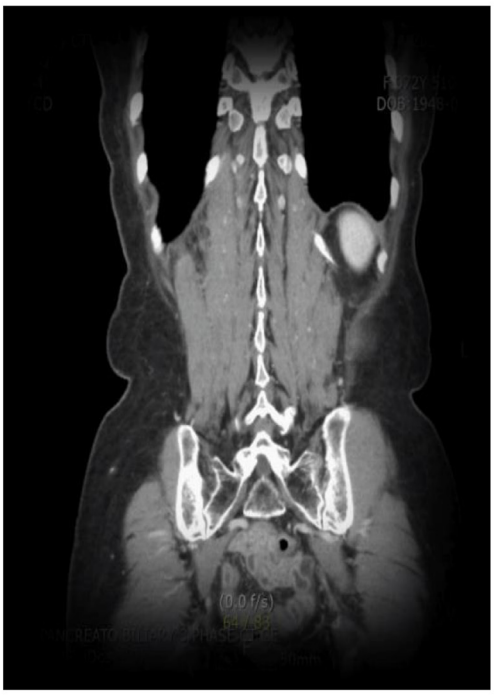
CT (3/11 outside)





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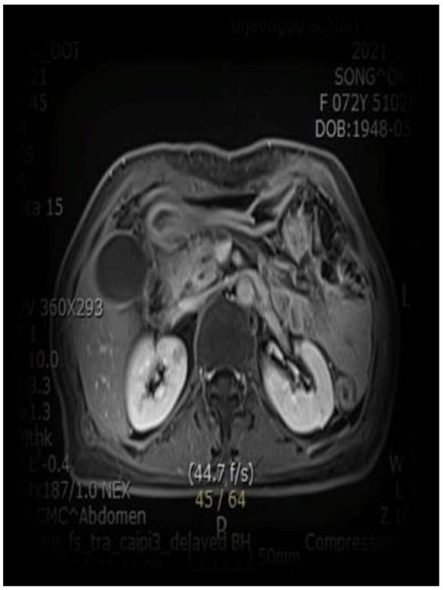
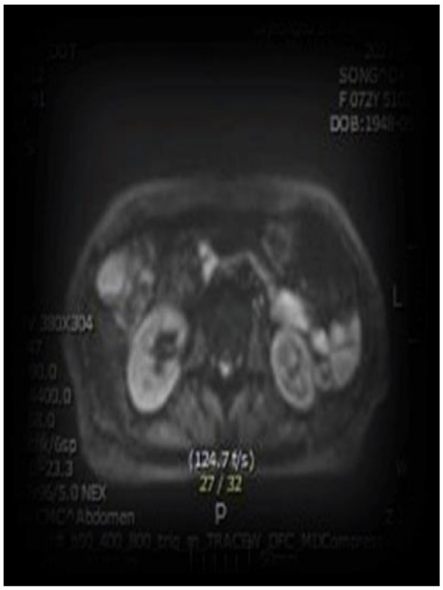
MRI (3/17)





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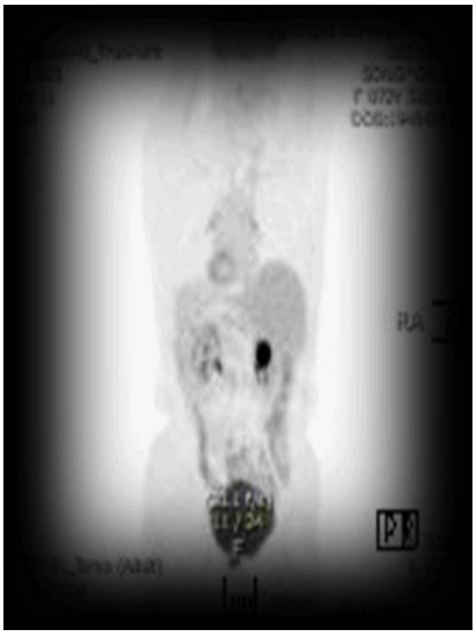
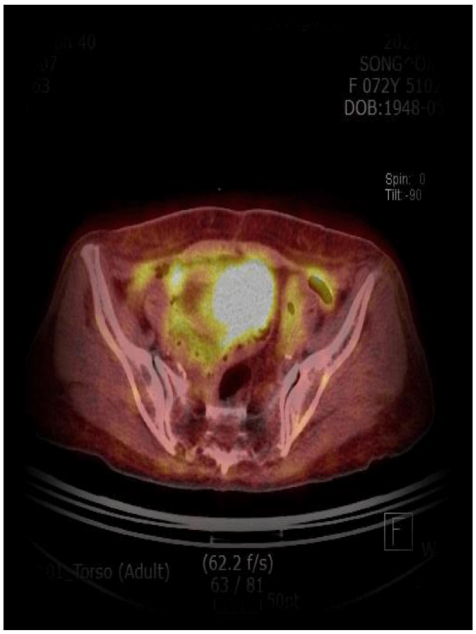
PET (3/22)





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Operation

- **Op. date**: 2021/3/23
- **Op. name**: Pylorus preserving pancreaticoduodenectomy
- **OP findings**
  - Location: Pancreas head uncinate process
  - Size: 3.5 cm.
  - Adjacent organ invasion - mesocolon (+)
  - major vessel invasion- no
  - CBD diameter: (1 cm)
  - Pancreas
    - texture: hard (d/t pancreatitis)
    - duct diameter: (0.2 cm)
  - Enlarged nodes : No. 8, 12, 13, 14,16
  - Margin status
    - Pancreatic resection margin- negative for malignancy

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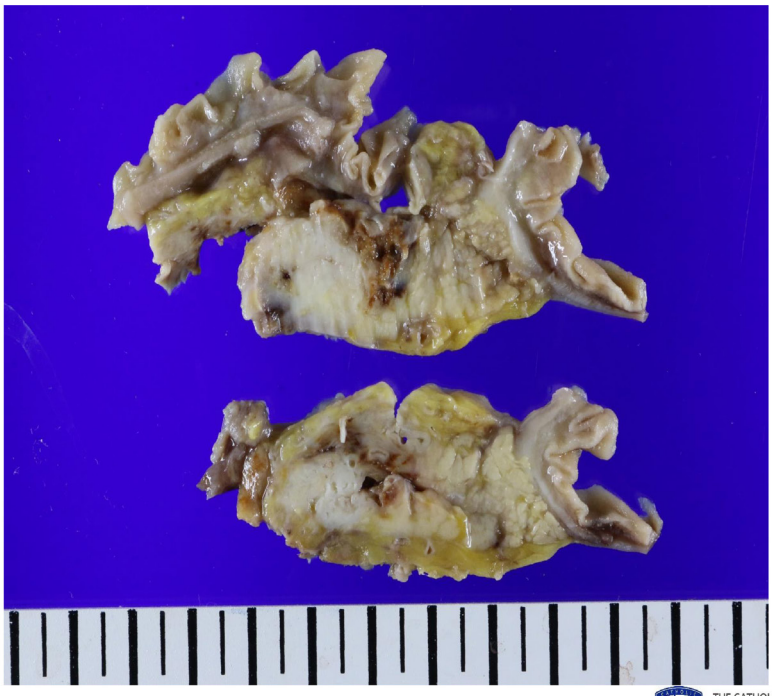
Pathologic findings

Gross



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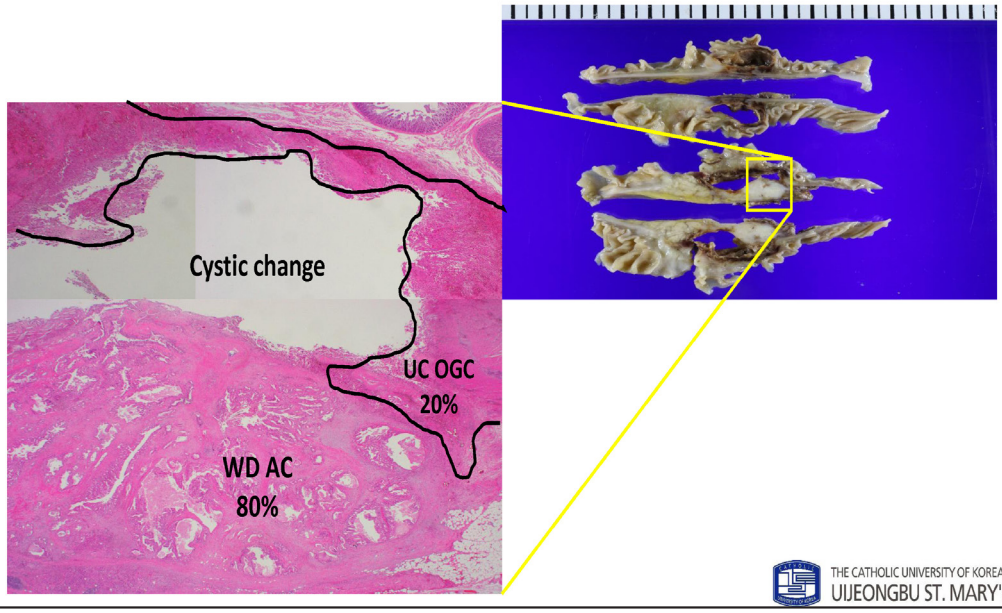
Pathologic findings

- **UC-OGC:** Undifferentiated carcinoma with osteoclast-like giant cells 20%
- **WD AC:** Well differentiated adenocarcinoma 80%



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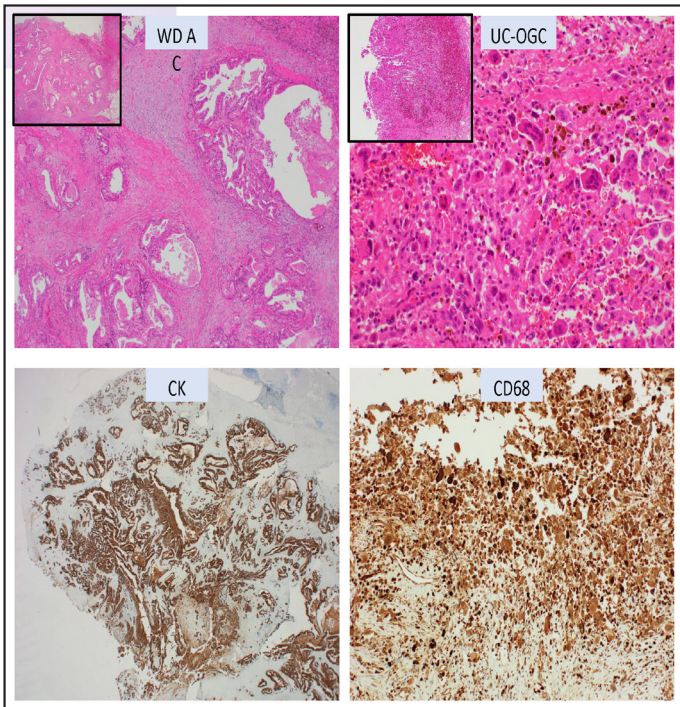

- **Microscopic description**

a) Tumor Size; 1.5x1.0cm (solid portion), 3.0x2.0cm (including hemorrhagic cyst portion)
b) Histologic type; adenocarcinoma
c) Histologic differentiation; well
d) Pattern of tumor growth; infiltrative
e) Lymphatic invasion; absent
f) Vascular invasion; absent
g) Perineural invasion; present
h) Lymph node metastasis; absent; 0/7
LN 8 (0/4), LN 12 (0/1), LN 13 (0/1), LN 16 (0/1)
i) Resected margin involvement; negative

- **T2N0, stage IB**

- **Immunohistochemistry**

CD68 positive in scattered macrophages
CK7 positive in adenocarcinoma component
P53 positive
CK-pan positive in adenocarcinoma component
CK8&18-서울 positive

Adenocarcinoma, well differentiated with undifferentiated carcinoma with osteoclast-like giant cells

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Postoperative course

- POD # 2: SOW start
- POD # 4: SD start
- POD #6: JP remove
- POD #10: Discharge
- POD # 4week: CEA/CA19-9 1.05/20.32 (Preop CEA/CA19-9 : 14.94/1025)
- POD # 6 week : Gemcitabine chemotherapy start
  - Regimen : gemcitabine single 1000mg/BSA (m^2)- D1, D8 D15, q 4wks
  - 2021-05-10 Cycle 1 D1 100%
  - 2021-05-17 D8 80%
  - 2021-05-24 D15 80%
  - 2021-06-07 Cycle 2 D1

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Review

Undifferentiated carcinoma with osteoclast-like giant cells of the pancreas

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Epidemiology

Int J Clin Exp Pathol (2015)
J Pathol (2017)
Frontiers in Oncology (2021)

- **Undifferentiated carcinoma**
  - An extremely rare and aggressive neoplasm comprises < 1% of non-endocrine pancreatic tumors
  - Histological appearance: anaplastic carcinoma, pleomorphic carcinoma, pleomorphic large cell carcinoma, pleomorphic giant cell carcinoma, spindle cell carcinoma, sarcomatoid carcinoma and carcinosarcoma
  - WHO Classification
    - Lumped together into one single category designated as undifferentiated carcinoma of the pancreas despite their histological differences
    - **Undifferentiated carcinoma with osteoclast-like giant cells of the pancreas(UCOGC) :** Rare variant of ductal pancreatic adenocarcinoma

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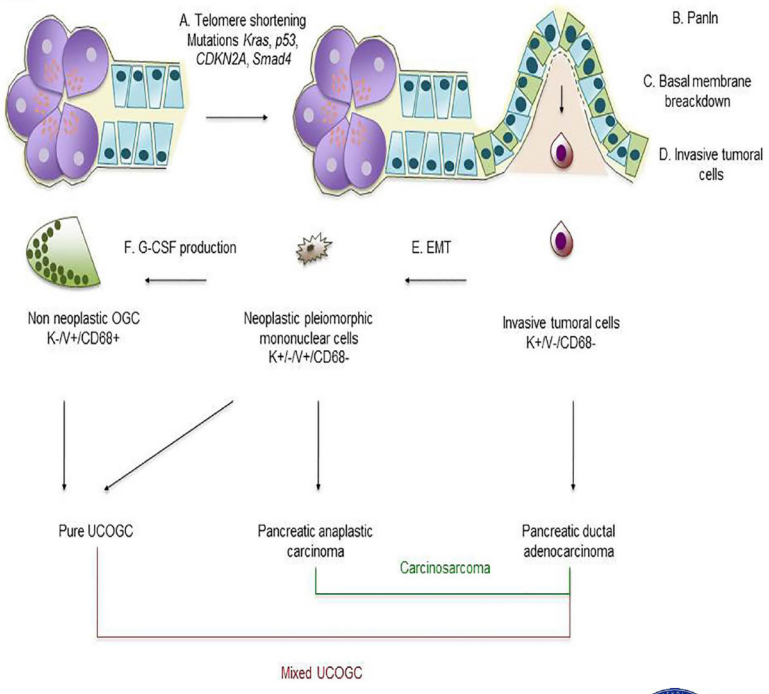
Frontiers in Oncology (2021)



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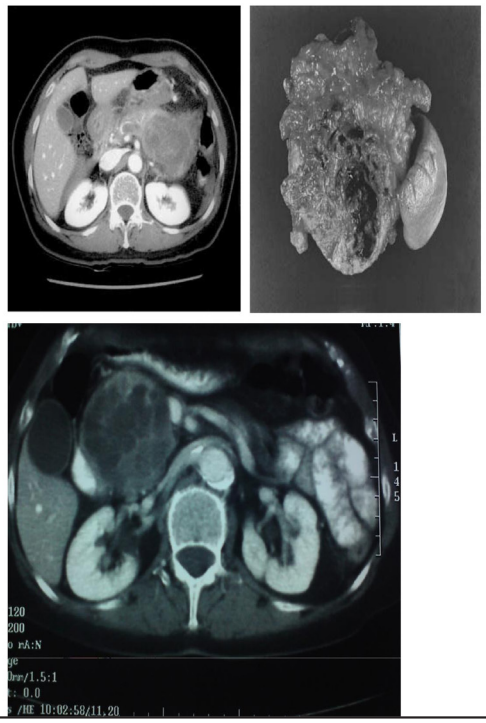
Imaging findings

World J Gastroenterol (2015)
International Journal of Surgery Case Reports (2016)



CT and MRI showed a cystic mass

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Pathologic findings

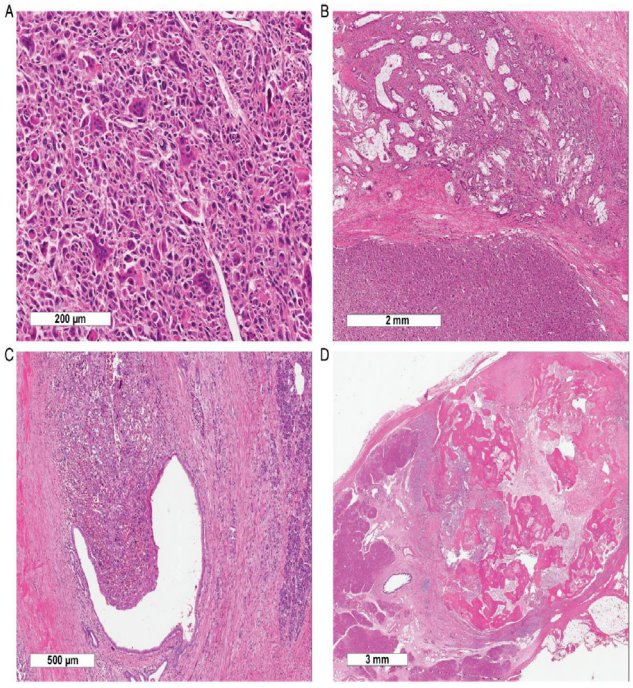

Figure 1. Histological features of pancreatic undifferentiated carcinoma with osteoclast-like giant cells (UCOGC).

(A) This pure UCOGC consists of a mixture of neoplastic pleomorphic mononuclear cells and non-neoplastic multinucleated giant cells.
(B) Approximately 60% of the UCOGCs in our series had an associated PDAC, consisting of malignant glands in a desmoplastic stroma.
(C) A subset of cases showed prominent intraductal growth.
(D) Some cases also showed osteoid formation.

J Pathol (2017)

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Immunohistochemistry

Int J Clin Exp Pathol (2015)
J Korean Med Sci (2005)

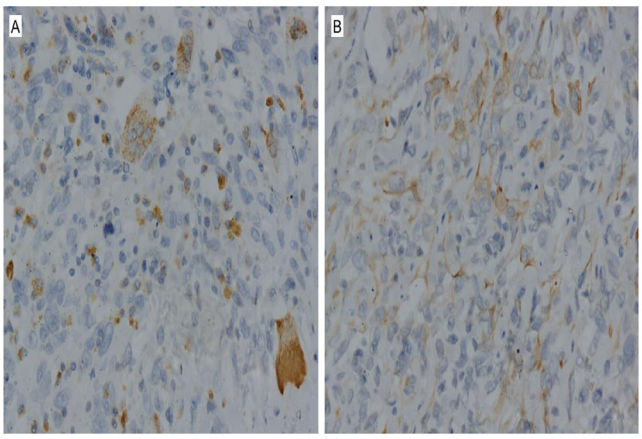

Figure 2. Histomorphologic findings: The immunohistochemical findings show CD68 expression in OGCs (A, magnification × 40), and positive staining by CK7 (B, magnification × 40).

Table 2. Results of immunohistochemical, ultrastructural and molecular biological studies

Study	Ductal carcinoma cell	Mononuclear cell	Osteoclast-like giant cell	Pleomorphic large cell
Immunohistochemistry				
CK	+	-	-	-
EMA	+	-	-	-
CD-68	-	+	+	-
Lysozyme	-	+	+	-
Vimentin	-	+	+	+
PCNA	+	-	-	-
p53	-	+	-	-
Electron microscopy				
Mitochondria		Abundant	Abundant	
Endoplasmic reticulum		Moderate	Empty	
Microvilli		None	None	
Desmosome		None	None	
K-ras gene analysis				
Codon 12	-	-	-	-
Codon 13	-	-	-	-

CK, cytokeratin; EMA, epithelial membrane antigen; PCNA, proliferating cell nuclear antigen.

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Clinical characteristics

Int J Clin Exp Pathol (2015)

Table 1. Clinical and pathological features of pancreatic undifferentiated carcinomas with osteoclast-like giant cells

Sample	Age (years)	Sex	Neoadj Tx	Surgical procedure	OS (months)	Sub hist (%)	Associated neoplasms	PanIN (grade)	Intraductal growth	Osteoid formation	Tumor stage[a]	Tumor size (cm)	LN mets	Vascular invasion	Perineural invasion
OST1	71	F	No	W	NA	100	None	No	Yes	No	T2	2-5	No	Yes	Yes
OST2	38	F	No	DP	NA	70	MCN/PDAC	No	Yes	No	T3	10-5	No	No	No
OST3	69	M	No	W	113	100	None	Yes (high)	No	No	T3	2-2	Yes	Yes	Yes
OST4	85	F	No	W	9	70	None	Yes (high)	Yes	No	T3	6-5	Yes	Yes	Yes
OST5	66	M	No	W	8	100	PDAC	Yes (high)	Yes	Yes	T2	2-0	No	Yes	No
OST6	55	F	No	W	28	70	PDAC	Yes (high)	Yes	No	T3	3-0	No	Yes	Yes
OST7	65	M	No	DP	NA	54	None	No	No	No	T3	15-0	Yes	Yes	Yes
OST8	69	F	Yes	W	Alive	100	None	Yes (high)	Yes	Yes	T3	2-5	No	Yes	Yes
OST9	72	M	No	W	15	100	PDAC	Yes (high)	No	No	T2	2-5	No	Yes	No
OST10	49	F	No	W	0	60	PDAC	Yes (high)	Yes	No	T3	4-0	Yes	Yes	Yes
OST11	54	M	No	W	10	70	PDAC	Yes (high)	Yes	No	T3	3-7	Yes	Yes	Yes
OST12	58	M	Yes	W	Alive	100	None	No	No	No	T3	3-2	Yes	Yes	Yes
OST13	78	F	Yes	DP	Alive	70	PDAC	Yes (high)	No	No	T2	3-5	Yes	Yes	Yes
OST14	68	M	No	W	16	100	None	No	Yes	No	T3	3-0	No	Yes	Yes
OST15	64	M	No	DP	36	100	PDAC	Yes (high)	No	No	T2	4-0	No	Yes	No
OST16	66	F	Yes	W	Alive	100	None	Yes (low)	No	No	T3	1-3	No	Yes	Yes
OST17	64	F	No	DP	Alive	100	MCN/PDAC	No	Yes	No	T2	4-0	No	Yes	Yes
OST18	58	F	No	W	NA	100	PDAC	Yes (low)	No	Yes	T3	4-0	Yes	Yes	Yes
OST19	68	M	No	W	5	100	PDAC	Yes (low)	No	No	T1	1-2	No	Yes	Yes
OST20	64	F	No	W	12	100	PDAC	Yes (high)	Yes	No	T3	4-0	Yes	Yes	Yes
OST21	70	M	No	W	Alive	90	None	No	No	No	T3	3-8	No	Yes	Yes
OST22	80	F	No	W	NA	56	IPMN/PDAC	Yes (high)	Yes	Yes	T3	5-0	Yes	Yes	Yes

Neoadj Tx = neoadjuvant chemotherapy; OS = overall survival; W = Whipple resection; DP = distal pancreatectomy with splenectomy; NA = not available; Sub hist = % of grossly identified tumor submitted for histological examination; LN mets = lymph node metastasis.
[a]AJCC, 7th edition [26].

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Prognosis

Int J Clin Exp Pathol (2015)
Frontiers in Oncology (2021)

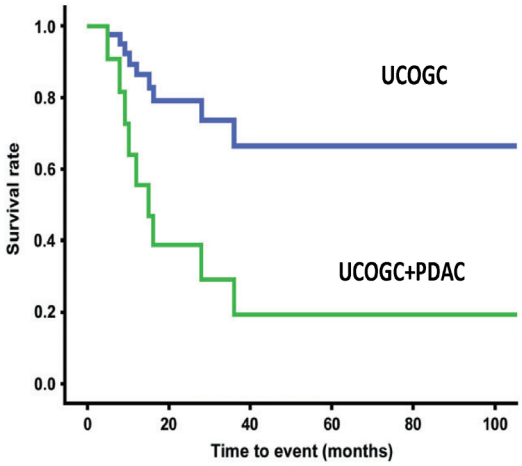

Figure 2. Survival in pure UCOGC versus UCOGC with associated PDAC. The median overall survival for pure UCOGC (seven cases, blue line) was 36 months (IQR 16–72 months), compared with 15 months (IQR 9–32 months) for UCOGC with associated PDAC (nine cases, green line). p =0.04, log-rank test.

- The survival of UC-OGC varies from 4 months to 10 yr (1998)
- The other study: only two long-term survivors in a group of 32 patients (2002)
- 80% of the patients who underwent curative surgery survived for at least 2 years (2011)

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Treatment

Intern Med (2012)
Frontiers in Oncology (2021)

- Due to the rarity of UC-OGC, treatment options have never been standardized
- **Surgery** : the first-choice treatment
- **Standard chemotherapeutic regimens** can be used
  - UC-OGC is considered a variant of PDAC
  - Gemcitabine was administered with a protocol of 1,000 mg/m weekly for three weeks followed by one week of rest
  - FOLFIRINOX is currently preferred to gemcitabine since this results in better overall survival
- **Immunotherapy**: PD-1 or PD-L1 monoclonal antibody therapy
  - PDL1 is expressed in neoplastic cells of about 60–80% of UC-OGC cases, and particularly in cases with an associated pancreatic ductal adenocarcinoma

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Thank you for your attention

Postoperative euglycemic diabetic ketoacidosis following pancreatectomy

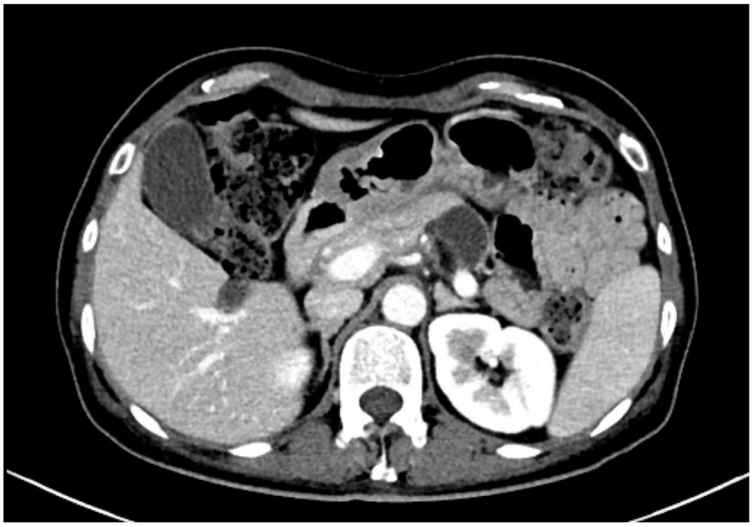
류윤범 (울산의대)

CASE 1

Chief complaint & Present illness

- 이 ㅇ 희 (F / 52)
- Chief complaint
  - Poor blood glucose control
- Present illness
  - 2020년 7월 11일 상기 C.C.로 시행한 복부 CT에서 pancreas tail의 3cm sized cystic mass (r/o MCN) 소견으로 수술적 치료 위해 입원
- Underlying disease
  - HTN
  - DM
- Medication
  - Amaryl 4mg bid + Diabex 1000mg qd + Jardian 25mg 0.5T qd
  - Amlodipin 5mg qd + Telmisartan 5mg qd

- r/o MCN, pancreas, body/tail, 3.7cm
  -> 7/31 SSLDP (Warshaw) : spleen partial discoloration



Postoperative course

- 2020.08.03, POD #3 (lab findings)

2020-08-03 08:05:23

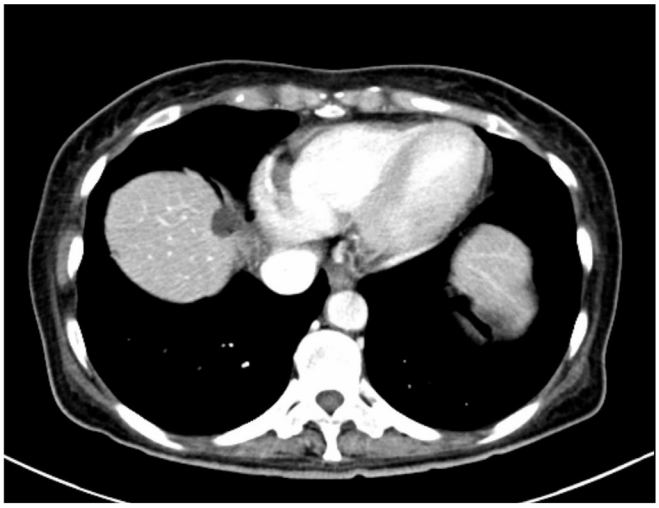
WBC (Qn)[ChemR-I...	15.9	▲ 4	10	x10*/uL
RBC (Qn)[ChemR-I]...	4.63	4.0	5.4	x10^...
Hb (Qn)[ChemR-I],...	14.9	12	16	g/dl
Hct (Qn)[ChemR-I],...	43.5	36	48	%
MCV (Qn)[ChemR-...	94.0	80	100	fl
MCH (Qn)[ChemR-...	32.2	▲ 26	32	pg
MCHC (Qn)[Chem...	34.3	32	36	%
RDW (Qn)[ChemR-...	11.9	11.5	14.5	%
Platelet (Qn)[Che...	288	150	350	x10*/uL
MPV (Qn)[ChemR-I...	10.6	8.0	12.6	fl
PDW (Qn)[ChemR-...	12.3	9.4	15.0	fl
E-ALC (Qn)[ChemR...	690			/uL
E-neutrophil (Qn)[...	86.3	▲ 50	75	%
E-lymphocyte (Qn)...	4.3	▼ 20	44	%
E-monocyte (Qn)[C...	9.1	▲ 2	9	%
E-eosinophil (Qn)[...	0.0	▼ 1	5	%
E-basophil (Qn)[Ch...	0.3	0	1	%
IG % (Qn)[ChemR-...	0.4			%
E-ANC (Qn)[Chem...	13630			/uL

2020-08-03 08:06:39

CRP (Qn),Blood	9.55	▲ 0	0.6	mg/dL

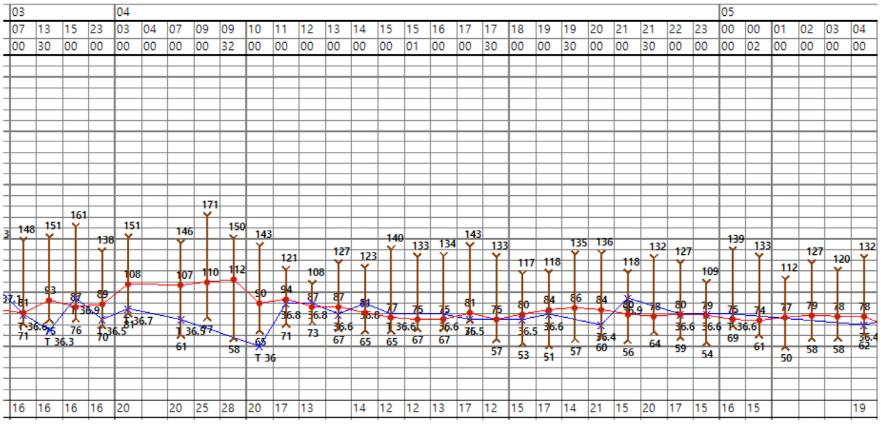
Postoperative course

- 2020.08.03, POD #3 (Abdomen pelvis CT)



Postoperative course

- 2020.08.04, POD #4



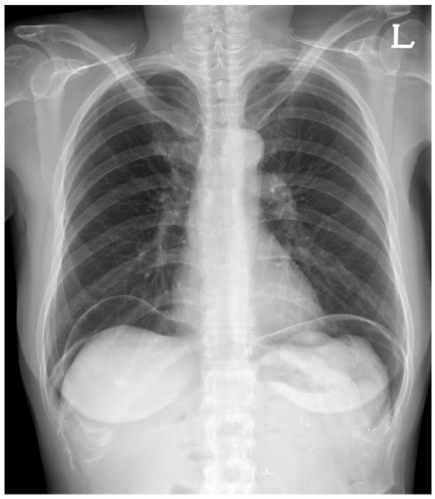
Chest discomfort

ABGA, CXR, EKG F/U
MAT contact -> ICU adm.

Postoperative course

- 2020.08.04, POD #4

전해질	2020-08-04 07:50:01			
pH (Qn)[EM],Arter...	7.109	7.35	7.45	
pCO2 (Qn)[EM],Ar...	8.9	35	45	mmHg
pO2 (Qn)[EM],Art...	149.2	83	108	mmHg
Base excess (Qn),A...	-26.9			mmE...
Bicarbonate (Qn),...	2.8	23	29	mmE...
O2 saturation (Qn),...	98.5	94	100	%
FiO2 (Des),Artery b...	Nasal prong (2)L/min.			%



2020-08-04 06:53:25

Phosphorus (Qn)[C...	4.0	2.5	4.5	mg/dL
Glucose (Qn)[Che...	391	70	99	mg/dL
Creatinine (Qn)[Ch...	0.89	0.70	1.40	mg/dL
BUN (Qn)[ChemR-I...	19	10	26	mg/dL
Total protein (Qn)[...	6.8	6	8	g/dL
Albumin (Qn)[Che...	3.4	3.5	5.2	g/dL
AST(SGOT) (Qn)[C...	18		40	IU/L

해질 2020-08-04 08:35:42

Lactic acid (Qn)[E...	0.8	0.36	0.75	mmol/L
pH (Qn)[EM],Arter...	6.990	7.35	7.45	
pCO2 (Qn)[EM],Ar...	9.8	35	45	mmHg
pO2 (Qn)[EM],Art...	155.7	83	108	mmHg
Base excess (Qn),A...	-27.2			mmE...
Bicarbonate (Qn),...	2.4	23	29	mmE...
O2 saturation (Qn)	98.1	94	100	%

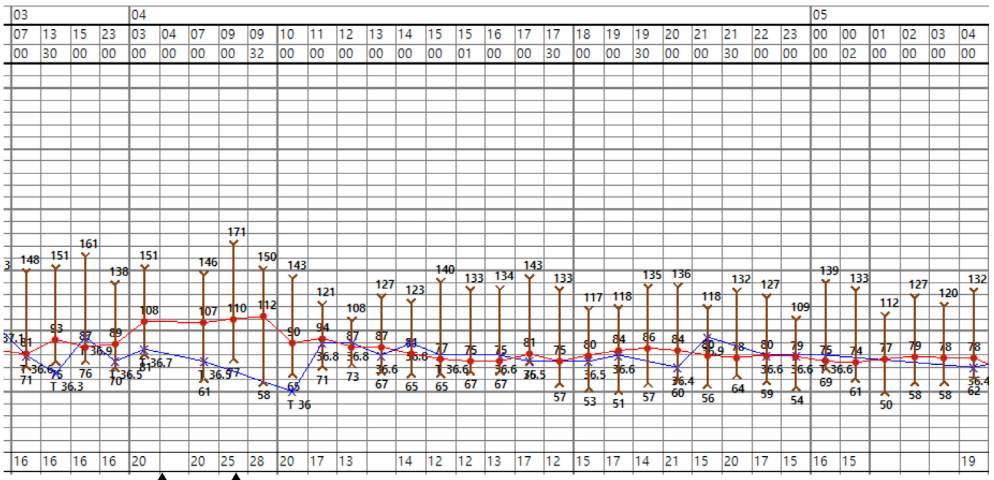
Diabetic ketoacidosis (DKA)

Potassium (Qn)[E...	4.4	3.5	5.1	mmol/L
Chloride (Qn)[EM],...	98	98	110	mmol/L
Amylase (Qn)[Che...	55	30	110	U/L
Lipase (Qn)[Chem...	37	13	60	U/L
CRP (Qn),Blood	7.53	0	0.6	mg/dL
eGFR(CKD-EPI) (Q...	75	60		ml/m...
eGFR(MDRD) (Qn)...	≥60(67)	60		ml/m...

Ionized calcium(m...	1.24	0.98	1.13	mmol/L
Glucose (Qn)[POC...	563	70	99	mg/dL
Hct (Qn)[POCT],Bl...	45.0	36	48	%

2020-08-04 14:23:58

Blood β-ketone (Q...	3.1		<0.6	mmol/L



BST	271	306	293	400		306	240	189	122	110	83	110		221		205		141		119

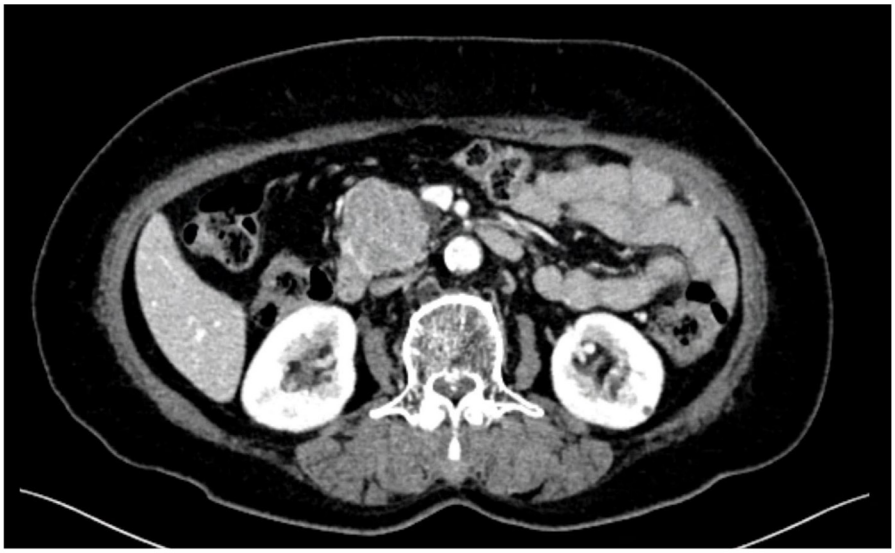
Control RI infusion -> po med 전환 예정 RI 6iu 7iu 5iu RI infusion start

CASE 2

Chief complaint & Present illness

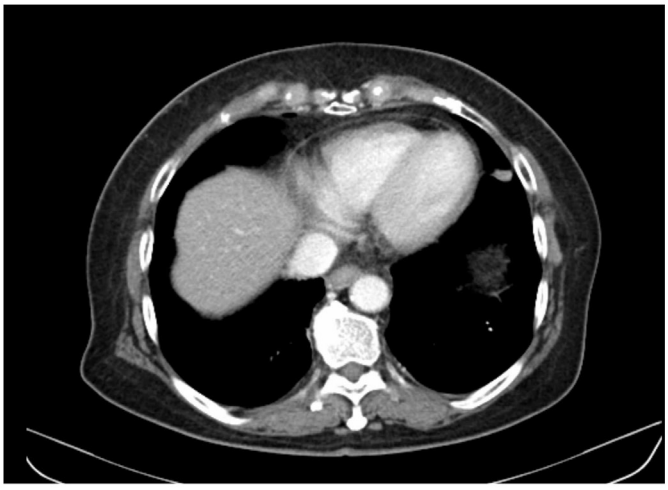
- 홍 ○ 숙 (F / 70)
- Chief Complaint
  - Increased size of a serous cystadenoma in the pancreas head
- Present illnesss
  - 2017년 타원에서 발견된 pancreas head의 serous cystadenoma 로 본원 소화기내과 외래 추적관찰 중 크기 증가(3.3cm->5.2cm)로 의뢰되어 수술적 치료 위해 입원
- Underlying disease
  - s/p L-AR d/t colon ca. (2015)
  - DM (2/25 HbA1c : 11.4%)
- Medication
  - Amaryl 4mg bid + Glupa 850mg qd + Jardian 25mg 0.5T qd

- Serous cystadenoma, pancreas, head, 5.2cm
  -> 2/26 PPPD with RHA resection & reconstruction



Postoperative course

- Abdomen Pelvis CT (2021.03.03, POD #5)



Postoperative course

- 2021.03.05, POD #7 (F/U Lab. findings, chest x-ray)

2021-03-05 07:56:05

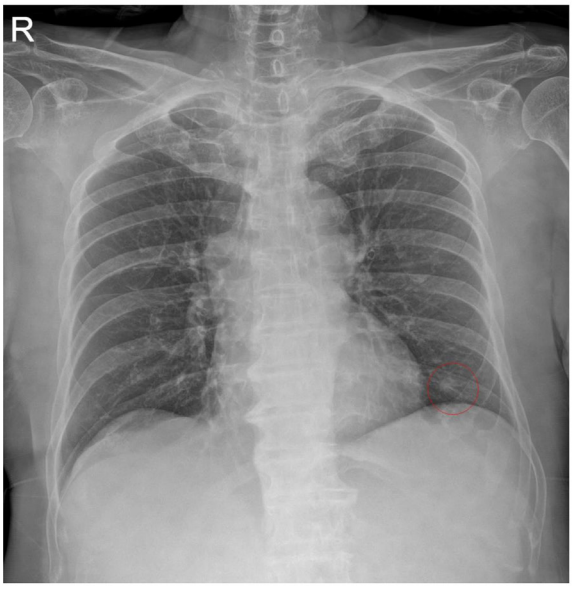
WBC (Qn)[ChemR...	12.0	4	10	x10*/uL
RBC (Qn)[ChemR-I...	3.97	4.0	5.4	x10^6...
Hb (Qn)[ChemR-I]...	12.3	12	16	g/dl
Hct (Qn)[ChemR-I...	35.9	36	48	%
MCV (Qn)[ChemR...	90.4	80	100	fl
MCH (Qn)[ChemR...	31.0	26	32	pg
MCHC (Qn)[Che...	34.3	32	36	%
Platelet (Qn)[Che...	436	150	350	x10*/uL

2021-03-05 08:01:52

Total calcium (Qn...	8.0	8.6	10.2	mg/dL
Glucose (Qn)[Che...	96	70	99	mg/dL
Creatinine (Qn)[C...	0.62	0.70	1.40	mg/dL
BUN (Qn)[ChemR-...	9	10	26	mg/dL
Uric acid (Qn)[Ch...	5.4	3	7	mg/dL
Total protein (Qn)...	5.7	6	8	g/dL
Albumin (Qn)[Che...	3.1	3.5	5.2	g/dL
AST(SGOT) (Qn)[...	16		40	IU/L
ALT(SGPT) (Qn)[C...	26		40	IU/L
Alkaline phosphat...	37	40	120	IU/L
Total bilirubin (Qn...	0.2	0.2	1.2	mg/dL
Direct bilirubin (Q...	0.2		0.5	mg/dL
Sodium (Qn)[EM],...	135	135	145	mmol/L
Potassium (Qn)[E...	4.9	3.5	5.1	mmol/L
Chloride (Qn)[EM]...	101	98	110	mmol/L
Amylase (Qn)[Ch...	19	30	110	U/L
Lipase (Qn)[Chem...	17	13	60	U/L
CRP (Qn),Blood	4.06	0	0.6	mg/dL
eGFR(CKD-EPI) (Q...	92	60		ml/mi...
eGFR(MDRD) (Qn...	≥60(>90)	60		ml/mi...

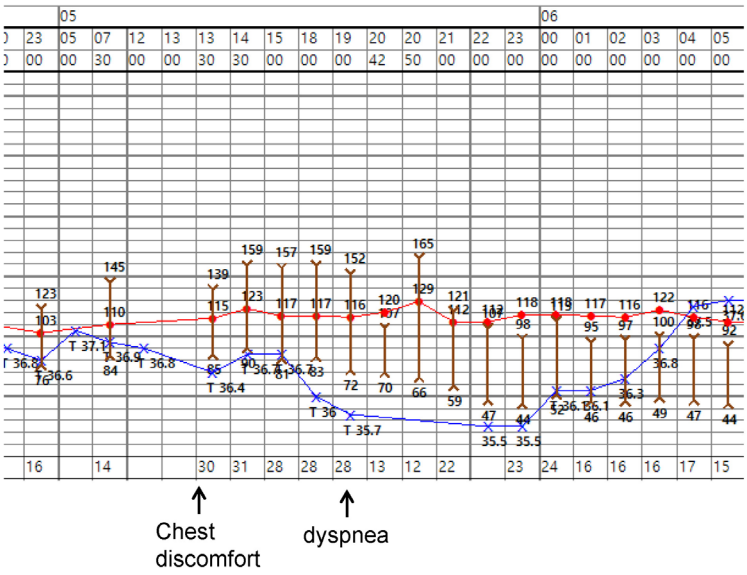
Postoperative course

- 2021.03.05, POD #7 (F/U Lab. findings, chest x-ray)



Postoperative course

- 2021.03.05, POD #7 (chest discomfort)



Postoperative course

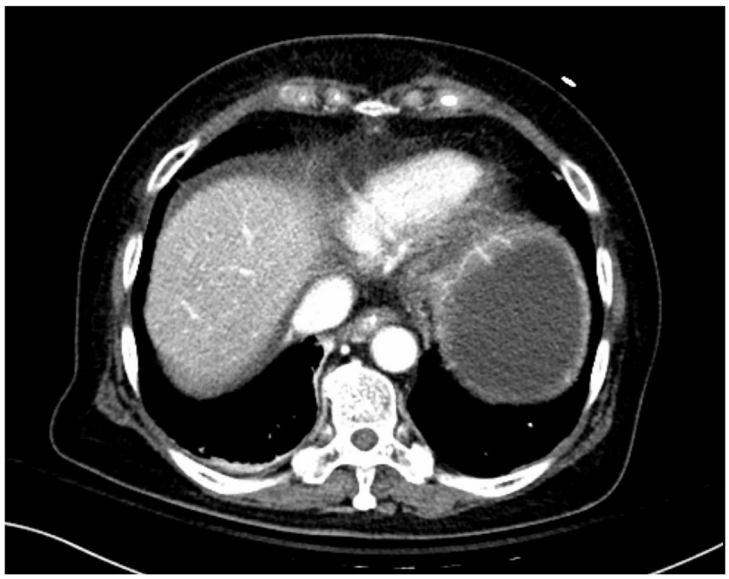
- 2021.03.05, POD #7 (chest discomfort)

2021-03-05 14:07:55				
D-dimer (Qn),Blood	11.66	▲	0.5	ug/m...
2021-03-05 14:15:12				
CK (Qn)[ChemR-I],...	49	▼	50	250 IU/L
2021-03-05 14:09:05				
Troponin I (Qn),Blood	0.009		1.5	ng/mL
CK-MB (Qn),Blood	2.4		5	ng/mL
2021-03-05 14:11:13				
BNP (Qn),Blood	32		73	pg/mL

전해질	2021-03-05 19:12:00			
pH (Qn)[EM],Arter...	7.019	▼	7.35	7.45
pCO2 (Qn)[EM],Ar...	11.7	▼	35	45 mmHg
pO2 (Qn)[EM],Art...	170.3	▲	83	108 mmHg
Base excess (Qn),A...	-28.1			mmE...
Bicarbonate (Qn),...	3.0	▼	23	29 mmE...
O2 saturation (Qn),...	98.7		94	100 %
FiO2 (Des),Artery b...	Room air.			%

Postoperative course

- 2021.03.05, POD #7 (AP-CT)



2021-03-05 20:57:55

Total calcium (Qn)[...	7.3	8.6	10.2	mg/dL
Phosphorus (Qn)[C...	4.3	2.5	4.5	mg/dL
Glucose (Qn)[Che...	337	70	99	mg/dL
Creatinine (Qn)[Ch...	0.81	0.70	1.40	mg/dL
BUN (Qn)[ChemR-I...	16	10	26	mg/dL
Albumin (Qn)[Che...	2.9	3.5	5.2	g/dL
AST(SGOT) (Qn)[C...	26		40	IU/L

2021-03-05 20:04:52

Lactic acid (Qn)[E...	1.1	0.36	0.75	mmol/L
pH (Qn)[EM],Arter...	6.894	7.35	7.45	
pCO2 (Qn)[EM],Ar...	14.4	35	45	mmHg
pO2 (Qn)[EM],Art...	161.1	83	108	mmHg
Base excess (Qn),A...	-28.6			mmE...
Bicarbonate (Qn),...	2.8	23	29	mmE...
O2 saturation (Qn),...	97.6	94	100	%

Diabetic ketoacidosis (DKA)

CK (Qn)[ChemR-I],...	50	50	250	IU/L
LD (Qn)[ChemR-I],...	376	120	250	IU/L
Magnesium (Qn)[C...	2.30	1.8	3.0	mg/dL
CRP (Qn),Blood	4.08	0	0.6	mg/dL
eGFR(CKD-EPI) (Q...	74	60		ml/m...
eGFR(MDRD) (Qn)...	≥60(70)	60		ml/m...

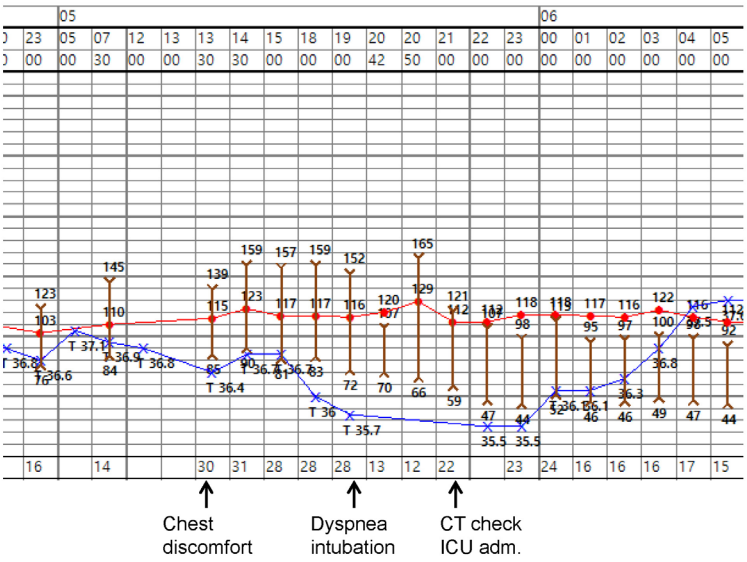
Sodium (Qn)[POCT...	125	135	145	mEq/L
Potassium (Qn)[PO...	5.1	3.5	5.5	mEq/L
Ionized calcium(m...	>4.1	3.9	4.5	mg/dL
Ionized calcium(m...	1.03	0.98	1.13	mmol/L
Glucose (Qn)[POC...	313	70	99	mg/dL
Hct (Qn)[POCT],Bl...	31.0	36	48	%

2021-03-05 20:58:26

Procalcitonin (Qn),...	0.36		0.5	ng/mL
Osmolality (Qn)[Ch...	295	275	300	mos...

2021-03-05 23:46:32

Blood β-ketone (Q...	3.3		<0.6	mmol/L



BST 144 110 177 247 313 305 245 210

3/2 부터 Amaryl 4mg bid + Jardian 25mg 0.5T qd + Glupa 850mg qd 복용

Clinical Therapeutics/Volume 38, Number 12, 2016

Review Article

SGLT2 Inhibitor–associated Diabetic Ketoacidosis: Clinical Review and Recommendations for Prevention and Diagnosis

Ronald M. Goldenberg, MD[1]; Lori D. Berard, RN, CDE[2]; Alice Y.Y. Cheng, MD[3]; Jeremy D. Gilbert, MD[4]; Subodh Verma, MD, PhD[5]; Vincent C. Woo, MD[6]; and Jean-François Yale, MD[7]

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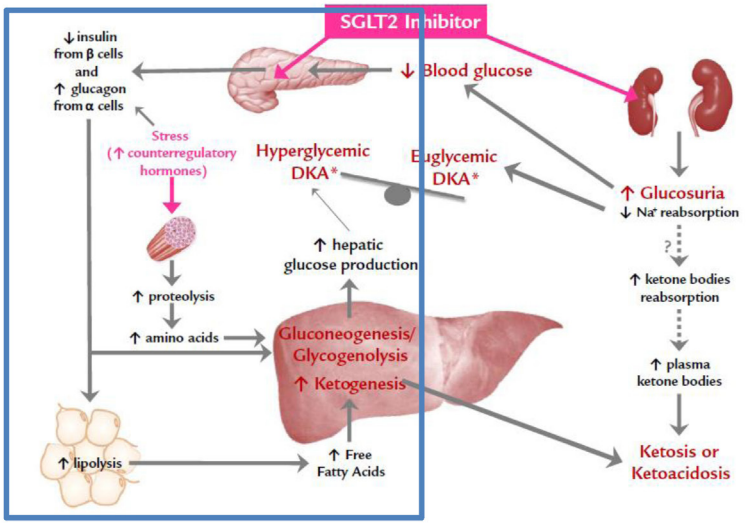

Figure 1. Mechanism of sodium-glucose cotransporter 2 (SGLT2) inhibitor–associated diabetic ketoacidosis. *The balance between hepatic glucose production and glucosuria determines euglycemic or hyperglycemic diabetic ketoacidosis (DKA). Adapted from Singh.[7]

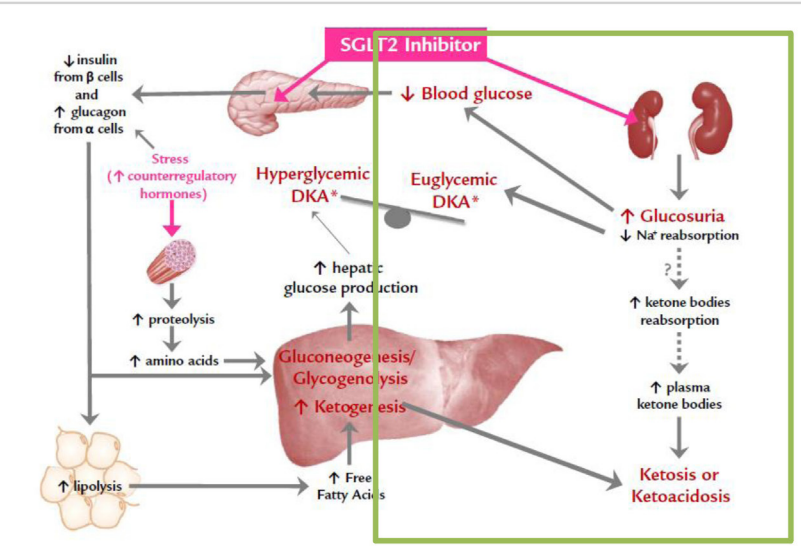

Figure 1. Mechanism of sodium-glucose cotransporter 2 (SGLT2) inhibitor–associated diabetic ketoacidosis. *The balance between hepatic glucose production and glucosuria determines euglycemic or hyperglycemic diabetic ketoacidosis (DKA). Adapted from Singh.[7]

Table. Precipitants for sodium-glucose cotransporter 2 (SGLT2) inhibitor–associated diabetic ketoacidosis and actions to prevent its occurrence.

The insulin dose should be maintained, and supplemental insulin may be necessary

Precipitant	Action(s) Regarding SGLT2 Inhibitor
Acute illness (eg, infection, gastroenteritis, myocardial infarction/stroke)	Hold at onset Restart when feeling well and able to eat and drink
Bariatric surgery	Hold while on preoperative low-carbohydrate diet Revaluate postoperatively
Major surgical procedures	Hold 3 days* before surgery Restart when feeling well and able to eat and drink
Risk of dehydration (eg, extensive exercise, preparing for colonoscopy)	Hold until able to maintain hydration
Low-carbohydrate diet	Hold until normal diet resumes
Excessive alcohol intake	Stop immediately Reassess at a later date

SGLT2 inhibitor (-gliflozin)

- Empagliflozin
  - Jardiance
  - Jardiance duo : + metformin
- Dapagliflozin
  - Forxiga
  - Xigduo : + metformin
- Ertugliflozin
  - Steglatro

Pancreatic metastasis from hepatocellular carcinoma

이정민 (연세의대)

Male, 76 years old

- **Chief complaints**
  - Abnormal AFP finding (2018.06.11)
- **Present Illness**

  상기 환자 건강 검진 상에서 Alpha Fetoprotein 증가 소견 있어 제주 한라 병원에서 시행한 MRI 상에서 HCC 확인되어 TACE 시행 위해 본원 내원함.

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- **Past medical history**
  - HTN (+) : 08′ Amlodipine, Valsartan
  - DM (+) : 17′ Sitagliptin, Metformin
- **Social history**
  - Alcohol (+)
    소주2병, 일주일 3회, 20년
  - Smoking (-)
- **Review of system**
  - General weakness/weight loss (-/-)
  - Abdominal pain (-)
- **Physical examination**
  - Abdomen soft, flat
    tenderness (-)
- **Lab findings**
  - LFT : unremarkable
  - Non-B / Non-C
  - Tumor markers
    - AFP : 1500 ng/ml
    - PIVKA-II : 72.1 mAU/mL

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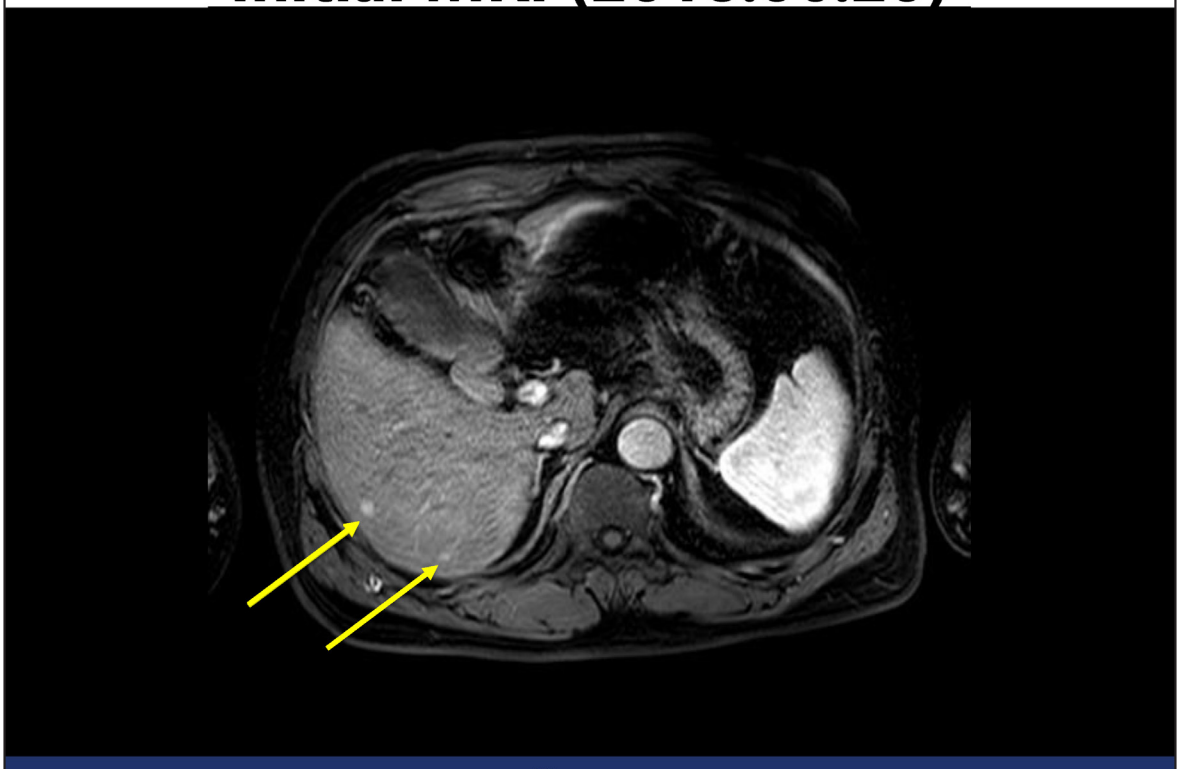
Initial MRI (2018.06.20)



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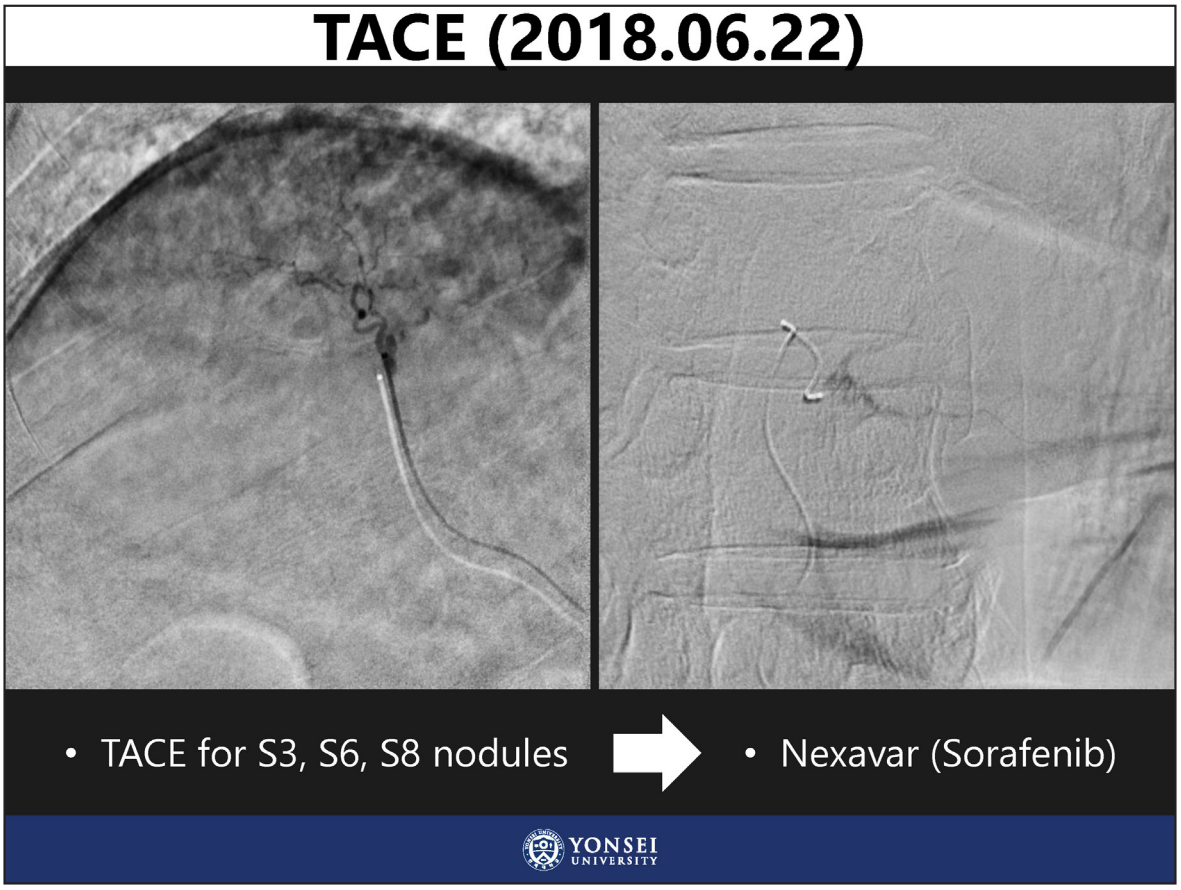
TACE (2018.06.22)
• TACE for S3, S6, S8 nodules
• Nexavar (Sorafenib)
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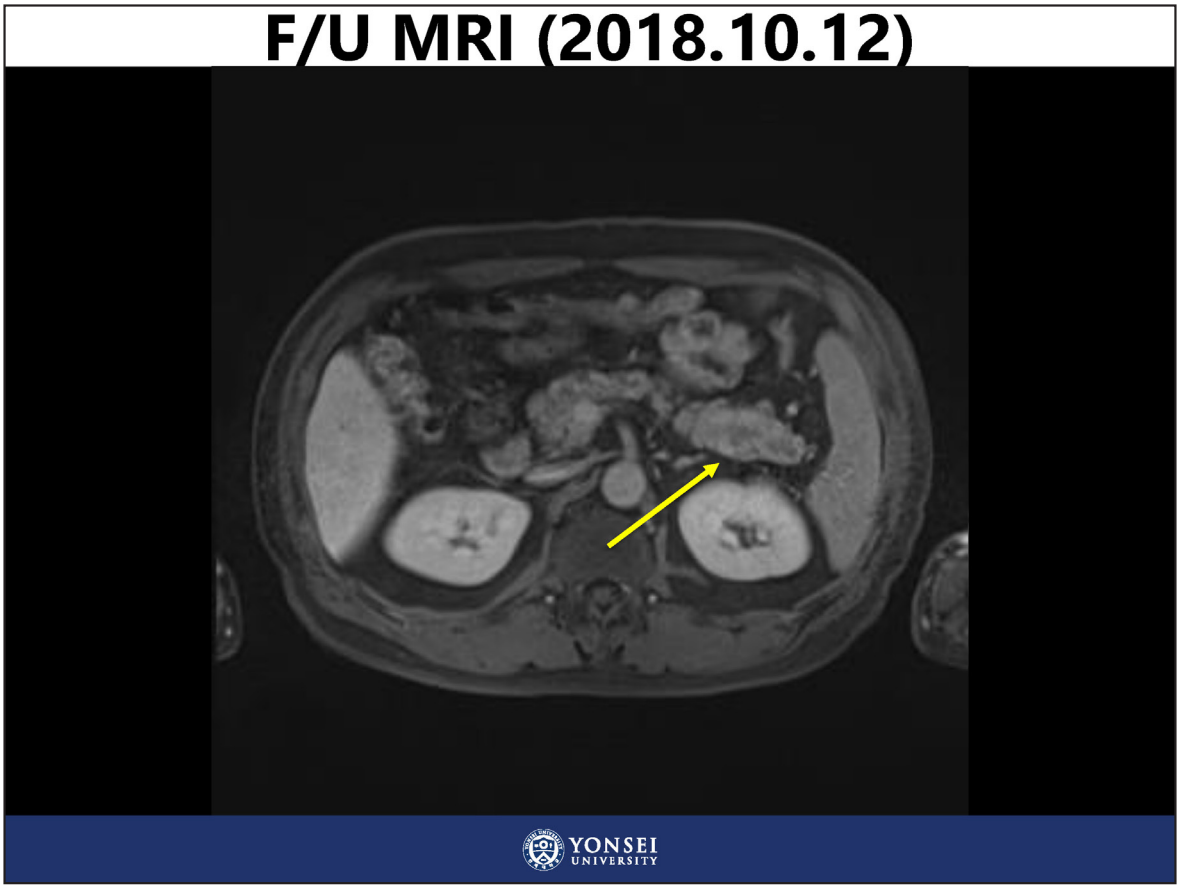
F/U MRI (2018.10.12)
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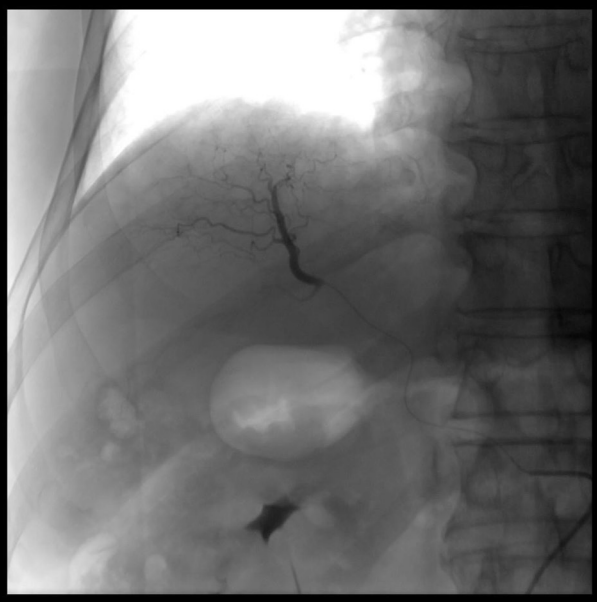
2nd TACE (2019.01.10)



- TACE for S8 nodule

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Operation (2019-02-28)

- **Laparoscopic distal pancreatectomy**
- Op findings
  - Whitish solid mass at pancreas tail with necrosis
  - No fibrotic change or adhesion around pancreas
  - Pancreas : soft, p-duct 2mm / internal drain inserted
- Total OP time : 90 min

  EBL : 750 cc

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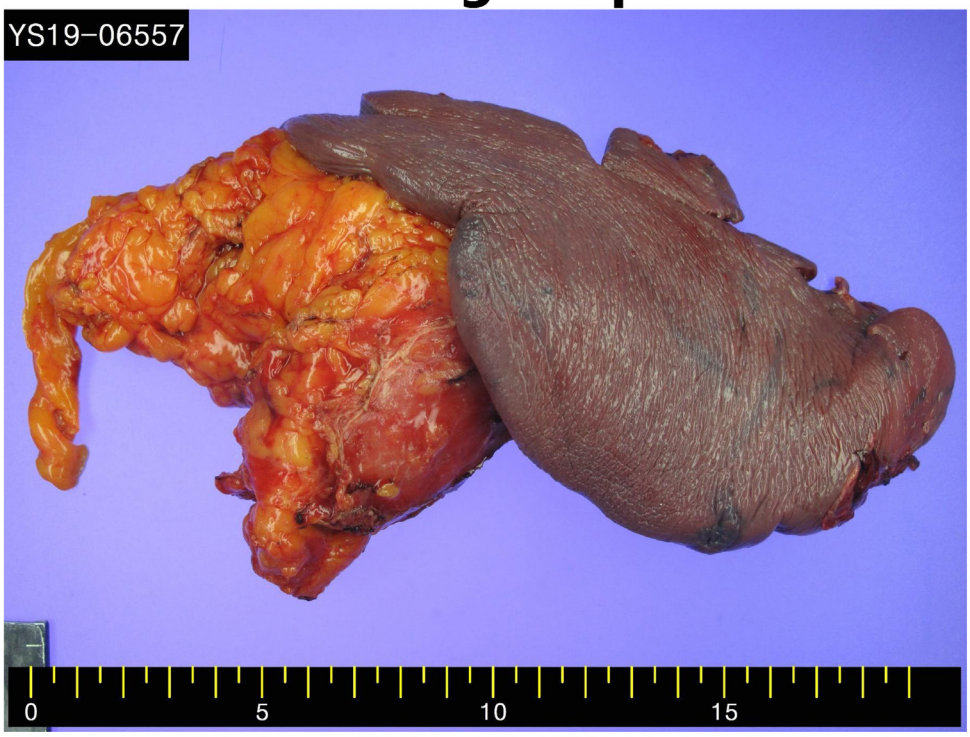
Gross finding of specimen



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Pathologic report

- Metastatic hepatocellular carcinoma
  - ✓ Size : 5.5 x 4.5 x 3.2 cm
  - ✓ Surgical margin: free from tumor, R0
  - ✓ Lymph node: 0/8
  - ✓ Presence of tumor thrombi and necrosis
  - ✓ The immunohistochemical stain results
    - **Hepatocyte**: focal positive in tumor cells
    - **AFP**: diffuse strong positive in tumor cells
    - **CK19**: focal positive in tumor cells
    - CD56: negative

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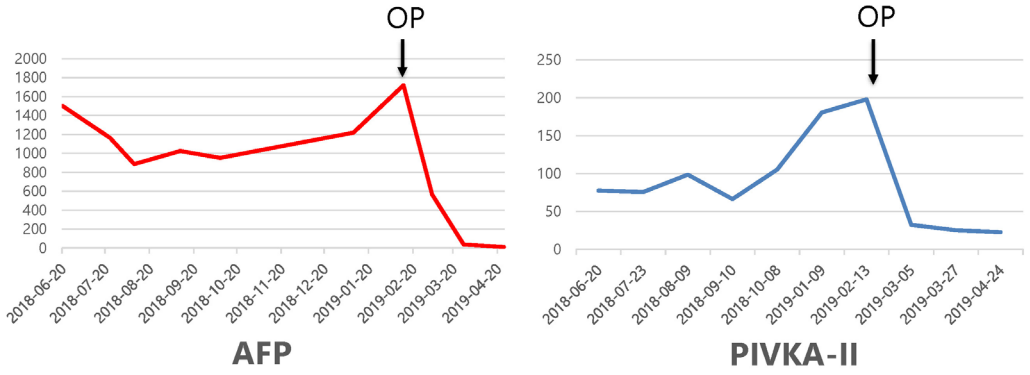
Postop Course

- **POD #5)** Abdomen CT
  - ✓ No unusual post-op findings
  - ✓ Drain Catheter removal
- **POD #6)** Discharge
- **Tumor marker**



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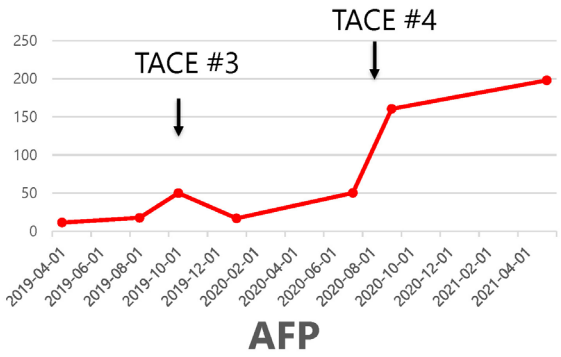
Follow up Course

- 3rd TACE (2019.12.04): S7 & S8
- 4th TACE (2020.08.24): S8
- Regorafenib (2020.10.08 – 2021.02.24)



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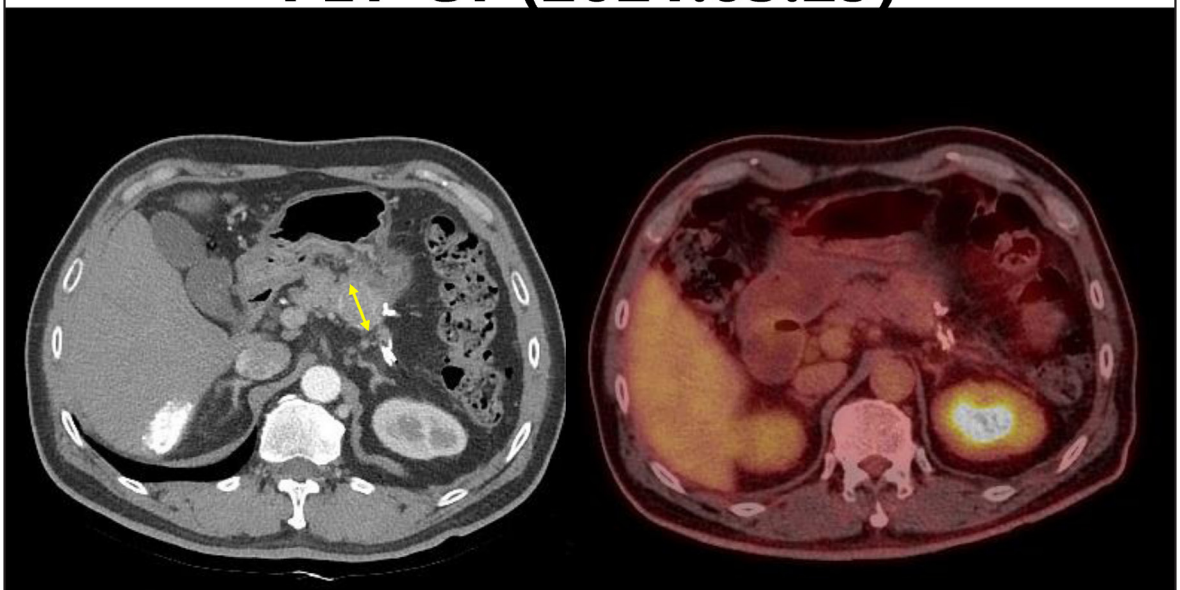
PET-CT (2021.03.29)



- Bulging mass of pancreas body near resection margin
- EUS-guided biopsy : Negative for malignancy

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Operation (2021-05-13)

- **Laparoscopic distal pancreatectomy**
- Op findings
  - Severe adhesion between pancreas and stomach
  - Bulging mass-like lesion
- Pathologic findings
  - ✓ Pseudocyst with xanthogranulomatous inflammation
  - ✓ Size : 3.3 x 1.2 x 0.3 cm
  - ✓ Surgical margin: not involved

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Postop Course

- **POD #5)** Abdomen CT
  - ✓ No unusual post-op findings
  - ✓ Drain Catheter removal
- **POD #6)** Discharge
- **Tumor marker (AFP)**
  - Pre-op: 198 ng/ml → Post-op: 131 ng/ml

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- Review

Isolated pancreas metastasis

Jung Min Kim, *Hyung Sun Kim, Joon Seong Park*

Division of Hepatobiliarypancreas Surgery
Department of Surgery
Gangnam Severance Hopital, Seoul, Republic of Korea

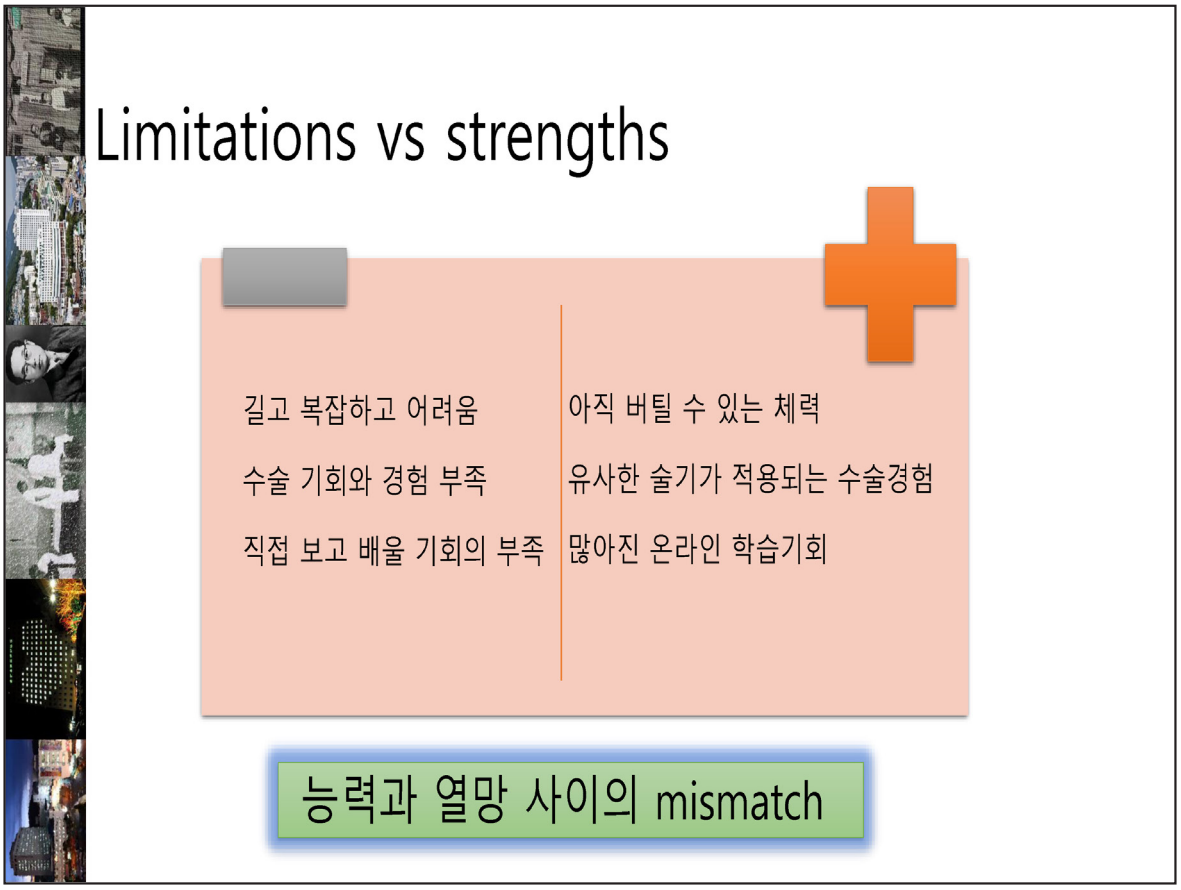
Severance

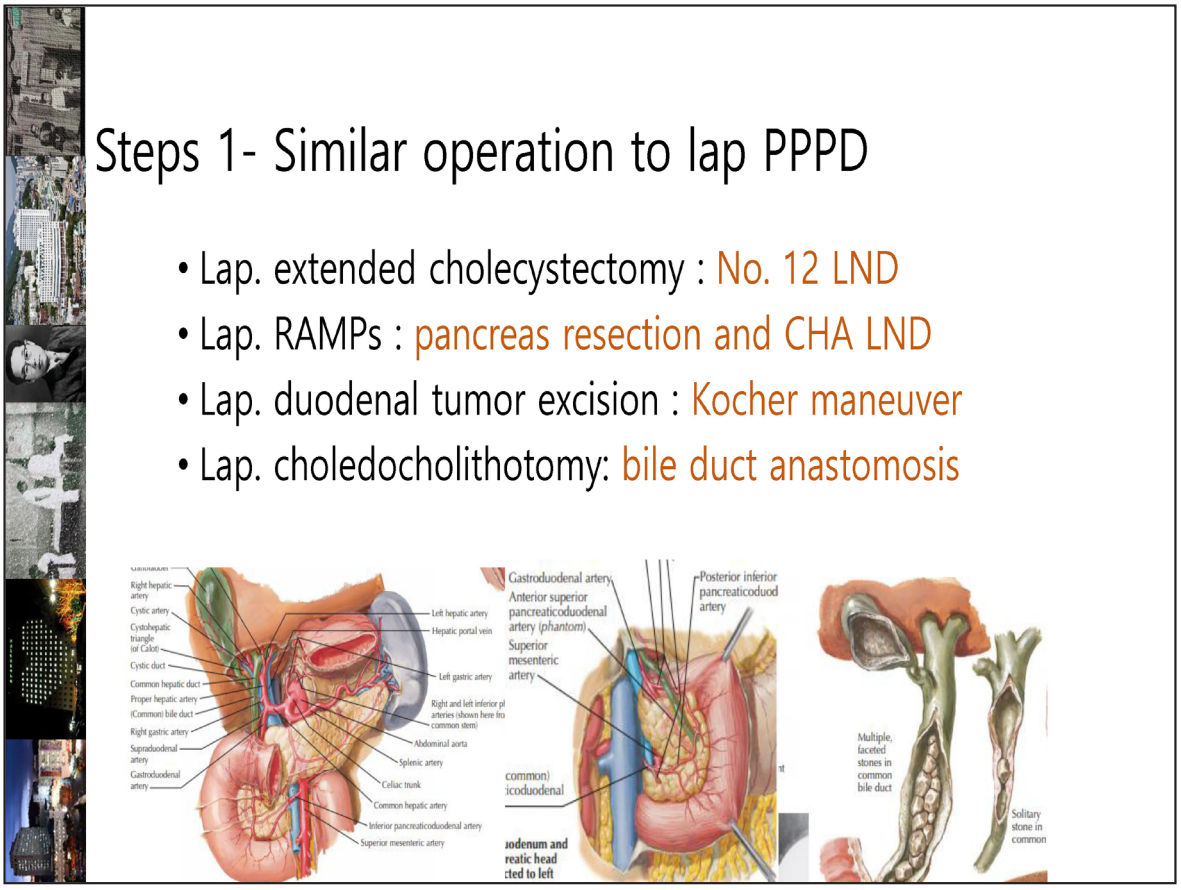
Step by step on the long way for minimal invasive PPPD as an inexperienced surgeon

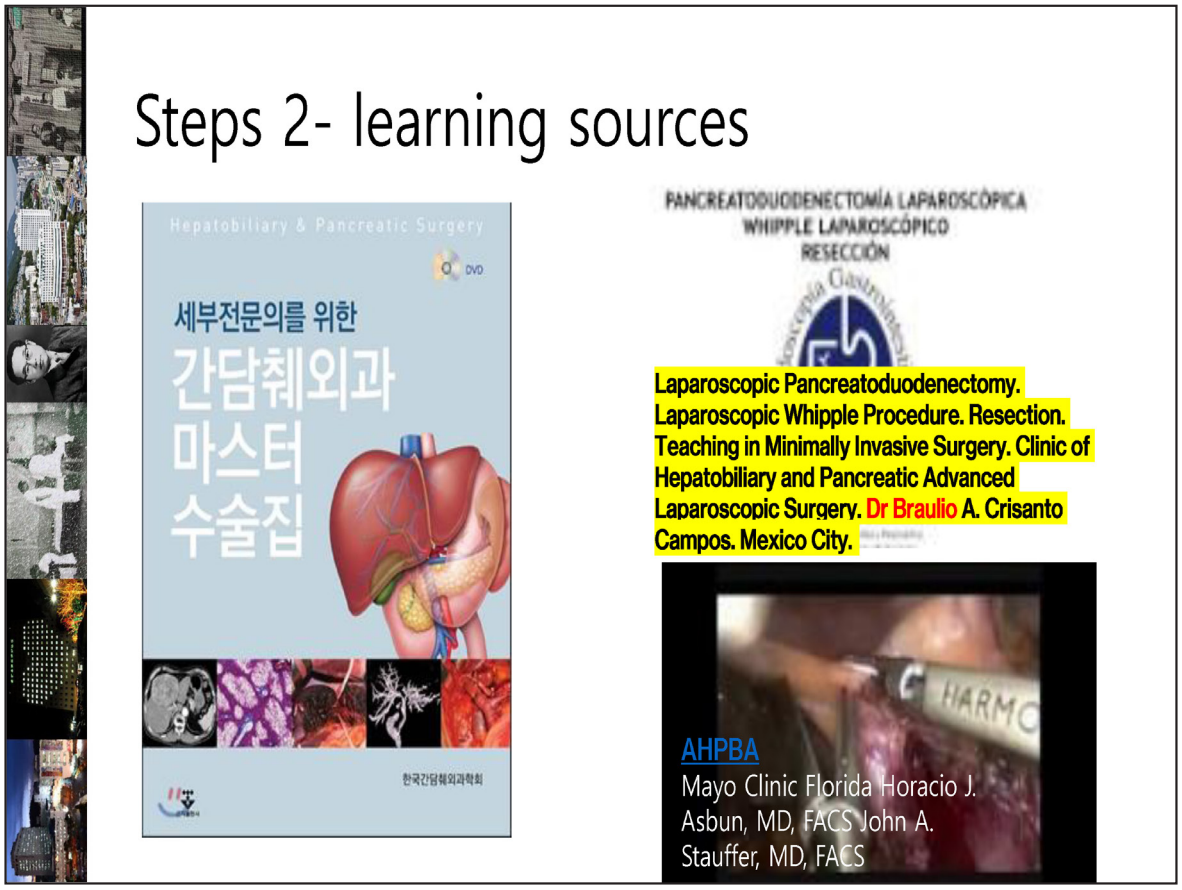
문형환, 조지훈, 최영일, 신동훈 (고신의대)

Contents

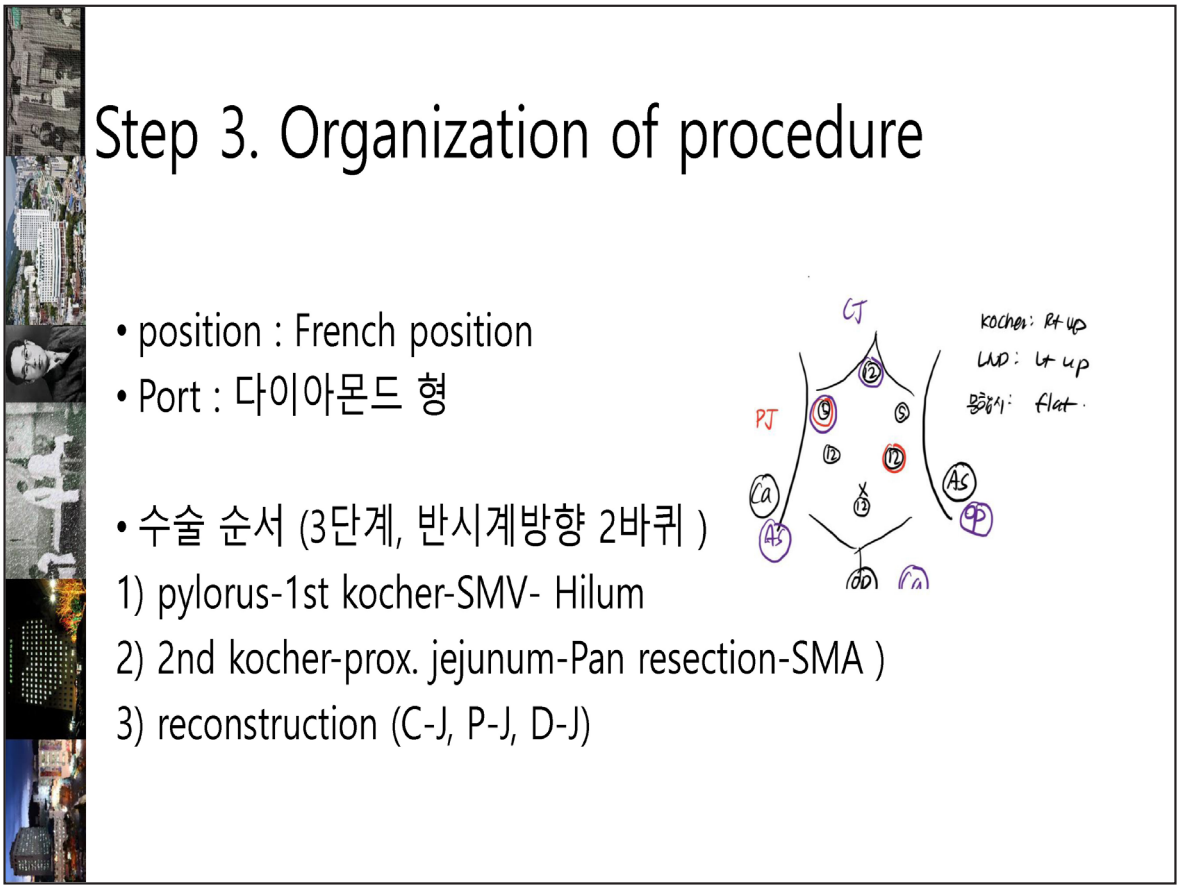
- Limitations and strengths as inexperienced surgeon
- Steps for minimal invasive PPPD
- Video clip
- Comparison of open vs lap PPPD
- Self-reflection
- Still the loooong way to go
- Summary


Limitations vs strengths
길고 복잡하고 어려움
수술 기회와 경험 부족
직접 보고 배울 기회의 부족
아직 버틸 수 있는 체력
유사한 술기가 적용되는 수술경험
많아진 온라인 학습기회
능력과 열망 사이의 mismatch


Steps 1- Similar operation to lap PPPD
• Lap. extended cholecystectomy : No. 12 LND
• Lap. RAMPs : pancreas resection and CHA LND
• Lap. duodenal tumor excision : Kocher maneuver
• Lap. choledocholithotomy: bile duct anastomosis
Right hepatic artery
Cystic artery
Cystohepatic triangle (of Calot)
Cystic duct
Common hepatic duct
Proper hepatic artery
(Common) bile duct
Right gastric artery
Supraduodenal artery
Gastroduodenal artery
Left hepatic artery
Hepatic portal vein
Left gastric artery
Abdominal aorta
Splenic artery
Celiac trunk
Common hepatic artery
Inferior pancreaticoduodenal artery
Superior mesenteric artery
Gastroduodenal artery
Anterior superior pancreaticoduodenal artery (phantom)
Superior mesenteric artery
Posterior inferior pancreaticoduod artery
Multiple, faceted stones in common bile duct
Solitary stone in common


Steps 2- learning sources
Hepatobiliary & Pancreatic Surgery
DVD
세부전문의를 위한
간담췌외과
마스터
수술집
한국간담췌외과학회
PANCREATODUODENECTOMÍA LAPAROSCÓPICA
WHIPPLE LAPAROSCÓPICO
RESECCIÓN
Laparoscopic Pancreatoduodenectomy. Laparoscopic Whipple Procedure. Resection. Teaching in Minimally Invasive Surgery. Clinic of Hepatobiliary and Pancreatic Advanced Laparoscopic Surgery. Dr Braulio A. Crisanto Campos. Mexico City.
AHPBA
Mayo Clinic Florida Horacio J. Asbun, MD, FACS John A. Stauffer, MD, FACS


Steps 2- learning sources
제1차
최소침습췌장수술 연구회
Korean Study Group on Minimally invasive Pancreatic Surgery, K-MIPS
일 시 : 2019년 8월 30일(금) 8:30 - 17:30
장 소 : 서울아산병원 생명과학연구원 지하1층 대강당
Program
Laparoscopic Pancreatoduodenectomy
[Live Surgery] Laparoscopic Pancreatoduodenectomy Surgery by Yoo-Seok, Yoon M.D., Ph.D. General Surgery
TVASurg
Laparoscopic Blumgart-style Pancreaticojejunostomy

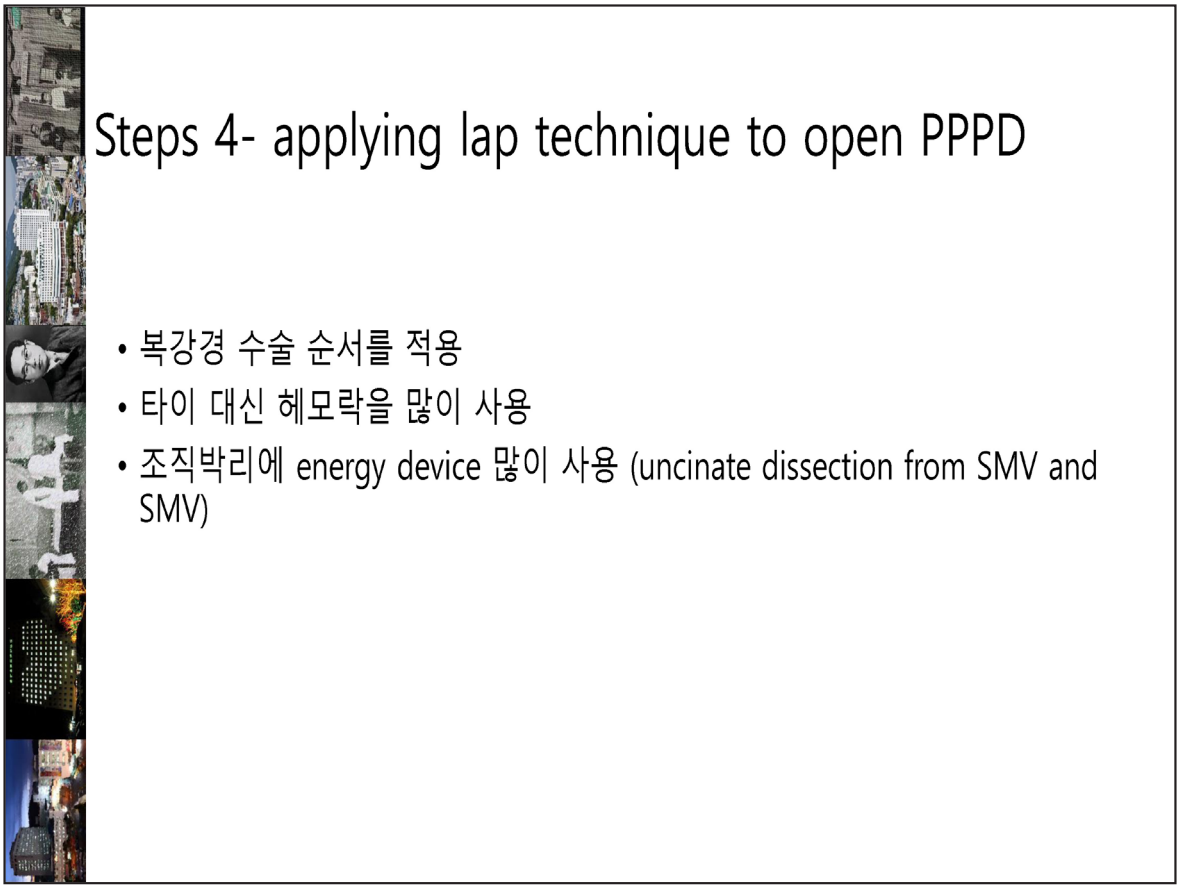


Step 3. Organization of procedure

- position : French position
- Port : 다이아몬드 형

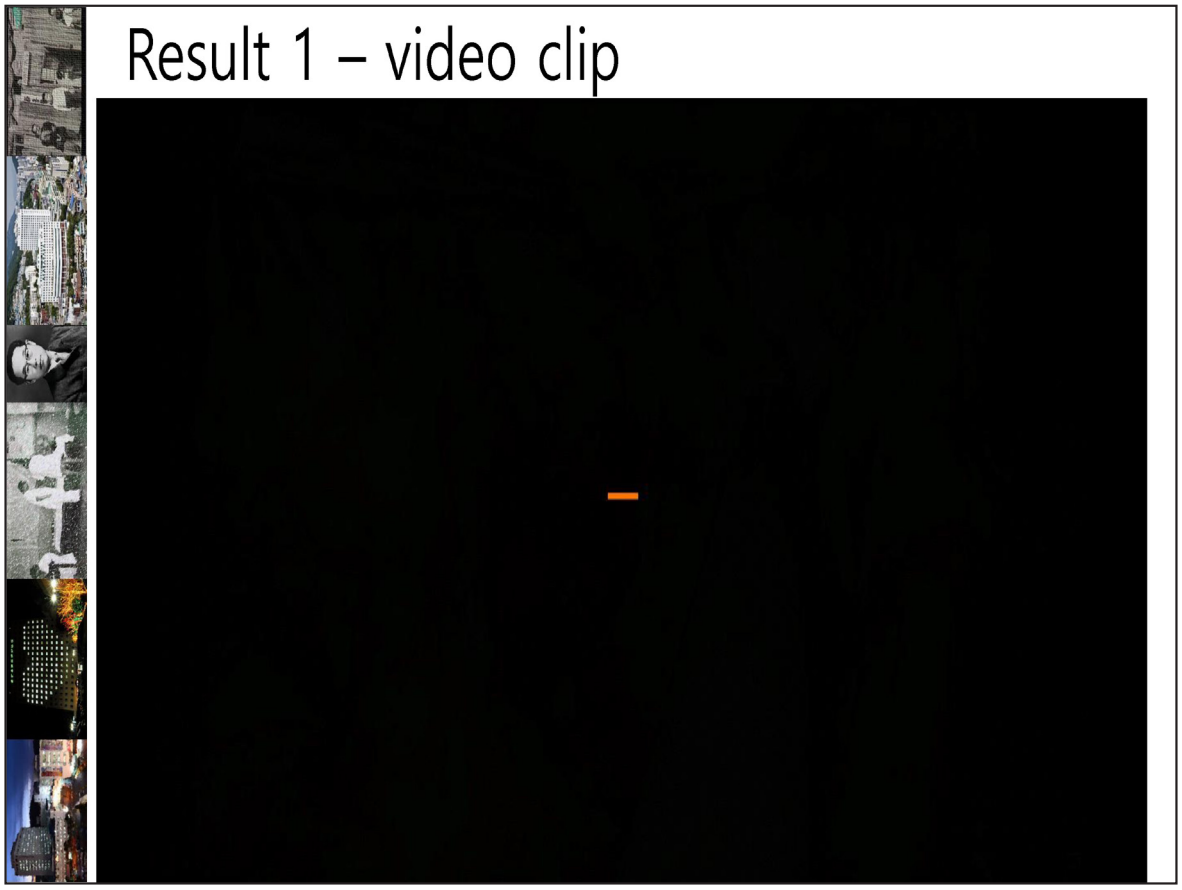
- 수술 순서 (3단계, 반시계방향 2바퀴)

1) pylorus-1st kocher-SMV- Hilum
2) 2nd kocher-prox. jejunum-Pan resection-SMA)
3) reconstruction (C-J, P-J, D-J)



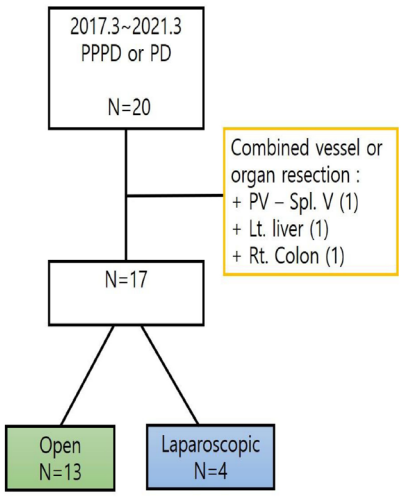
Steps 4- applying lap technique to open PPPD

- 복강경 수술 순서를 적용
- 타이 대신 헤모락을 많이 사용
- 조직박리에 energy device 많이 사용 (uncinate dissection from SMV and SMV)



Result 2 : Comparison of open vs lap PPPD

as personal experience



	Open (n=13)	Lap (n=4)	P value
Age (years)	67 (48-77)	61 (60-75)	0.690
BMI	20.8 (17.8-27.9)	22.9 (20.0-23.5)	0.308
Diagnosis			0.240
Pancreas head ca.	4	0	
/dCCA or AoV ca.	7	4	
/Other	2	0	
OP time (min)	485 (395-660)	887 (820-960)	0.003
EBL (cc)	500 (100-2200)	450 (100-1100)	0.864
POPF ≥ grade B	1	1	0.700
Hospital stay	17 (10-117)	22 (16-37)	0.461
In hospital mortality	0	0	-

4 cases

수술 날짜	성별	나이	수술명	진단	BMI	OP time	EBL (cc)	P duct size (mm)	pancreas texture	PJ method	POPF	LN 개수	재원 기간
2019-05-14	F	75	PPPD	dCCA	20.0	15:45	1100	3	hard	Conventional (open)	0	15	19
2019-10-01	M	60	PPPD	dCCA	22.7	16:00	500	1.5	hard	Conventional (open)	2	12	37
2021-01-15	F	62	PPPD	dCCA	23.2	13:50	400	2.5	mod	Bullumgart style	0	12	16
2021-02-16	M	60	PPPD	dCCA	23.5	13:40	100	3	hard	Bullumgart style	1	16	25

주요 부분 마다 소요시간 (4th case)			
Dudenum	76 min	Uncinate (+prox. Jejumum R)	85 min
Kocher	48 min	C-J	32 min
Hilum (+CBD R)	113 min	P-J	91 min

문제점 Self-reflection

- Stomach 에 대한 해부학적 지식이 약해서 Pylorus resection까지 시간이 오래 걸린다.
- Hilum dissection시에 조직들이 염증반응으로 인해 딱딱하거나 붙어있는 경우 혈관과 분리가 어렵고 오래 걸린다.
- Uncinate dissection시에 SMV-PV branch 출혈시 수술 필드가 피로 가득차서 bleeding control이 어렵다.
- P-J Interrepted suture로 하니 실이 많고 실이 헷갈리고 tie가 많아져 시간이 오래 걸린다.
- 긴장된 상태와 자세로 오랜 수술시 어깨와 목의 통증이 생긴다.
- 휴식과 식사시간이 필요

Still the loooong way to go

- 참여하는 모든 인력의 피로도
- 약해져 가는 체력
- 학습곡선에 도달하는 시간 줄이기
- Dry lap 연습
- 편안한 자세에서 수술방법 연구
  (술자, 어시스트, 스코피스트)
- 로봇수술 응용

Summary

- Minimal invasive (PP)PD의 경험이 없던 외과 의사에게 복강경 PPPD는 복잡하고 어려우며, 학습과 수술에 오랜 시간이 필요했다.
- 교과서 (동영상 포함), 학술대회의 교육 프로그램 및 학술 동영상, SNS 비디오, 워크샵 참가 등은 복강경 PPPD를 배울 수 있는 유익한 기회가 되었다.
- 그러나 학습곡선을 극복하기 위해서는 많은 연습과 지속적인 배움이 필요할 것으로 생각된다.

다양한 학습의 기회와 유익한 강의를 해주시는 학회의 여러 교수님들께 감사드립니다.

제66차
한국췌장외과학회 학술대회

발행일 • 2021년 6월 12일

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