

## Curative Resection of Locally Advanced Pancreatic cancer after FOLFIRINOX Chemotherapy

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### 증 례 1

53세 여환 고혈압 외 특이 내과적 병력 없던 자로 내원 6주 전부터 복통, 요통 지속되어 타 병원 내원하여 시행한 복부 전산화단층촬영에서 췌장암 의심 소견으로 본원 내원하였다. 췌장암 진단 이후 FOLFIRINOX 치료하였으며, 원발 종괴 크기 감소하였으나 새로 발생한 췌장 종괴 있어 수술적 절제 시행하였으며, 현재 보조 항암화학요법 중이다.

### 증 례 2

62세 남환 고혈압 외 특이 내과적 병력 없던 자로 내원 1주 전부터 복통, 소변 색 검어져 타 병원 내원하여 시행한 혈액검사, 초음파에서 폐색성 황달 의심 소견으로 본원 내원하였다. IgG4 related disease 진단 하 steroid 치료하며, 외래 추적 관찰하였으며 추적관찰 복부 전산화단층촬영에서 췌장암 의심되어 입원하여 검사 시행 후 췌장암 진단되었다. 이후 FOLFIRINOX 치료하였으며 수술적 절제 시행하였으며 현재 보조 항암화학요법 이후 경과 관찰 중이다.

**Key Words:** Pancreatic cancer, locally advanced, FOLFIRINOX

## Introduction

- **FOLFIRINOX Chemotherapy**

for Borderline resectable or locally advanced pancreatic cancer

- Duration : Feb. 2015~Dec. 2016
- At Severance hospital
- 29 patients were included

- **Regimen**

- Fluorouracil            400 mg/m<sup>2</sup>    D1
- Fluorouracil            1,200 mg/m<sup>2</sup>    D1-2 for 23 hr
- Oxaliplatin              85 mg/m<sup>2</sup>      D1
- Irinotecan               180 mg/m<sup>2</sup>     D1
- Leucovorin              200 mg/m<sup>2</sup>     D1

## Baseline characteristics

	Total patients (N=29)
Sex, n (%) : Female	12 (41.4%)
Age, mean (SD)	62.2 (±8.3)
Location of main mass	
Head	16 (55.2%)
Body/Tail	13 (44.8%)
Resectability	
Borderline resectable	7 (24.1%)
Locally advanced	22 (75.9%)
Received cycle of FOLFIRINOX	11.4 (±7.1)
Best response	
PR	10 (34.5%)
SD	17 (58.6%)
PD	2 (6.9%)
Converted to resectable disease	6 (20.7%)**

\*\*Two cases were borderline resectable, four cases were Locally advanced.

**Case 1.**

- F/53

- **Chief complaint**

  - Abdominal pain

  - Back pain

- **Present illness**

고혈압 외 특이 내과적 병력 없던 자로 내원 6주 전부터 복통, 요통 지속되어 타 병원 내원하여 시행한 복부 전산화단층촬영에서 췌장암 의심 소견으로 본원 내원 하였다.

**Case 1.**

- **Past medical history**

  - Hypertension

- **Social history**

  - Smoking: nonsmoker

  - Alcohol: current drinker, 소주 1병/주 1회 x 30년

- **Review of systems**

  - Fever(-) Chill(-) Nausea(-) Vomiting(-)

  - **Abdominal pain (+) Back pain (+)**

### Case 1.

- **Physical examination**

V/S 135/86 mmHg-65/min-14/min-37.1°C

Performance status: ECOG 1

Abdomen: soft & flat, palpable mass (-)

Normo-active bowel sound

### Case 1.

- **Laboratory results**

WBC 7,210 /uL, Hb 13.7 g/dL, Platelet 220,000 /uL

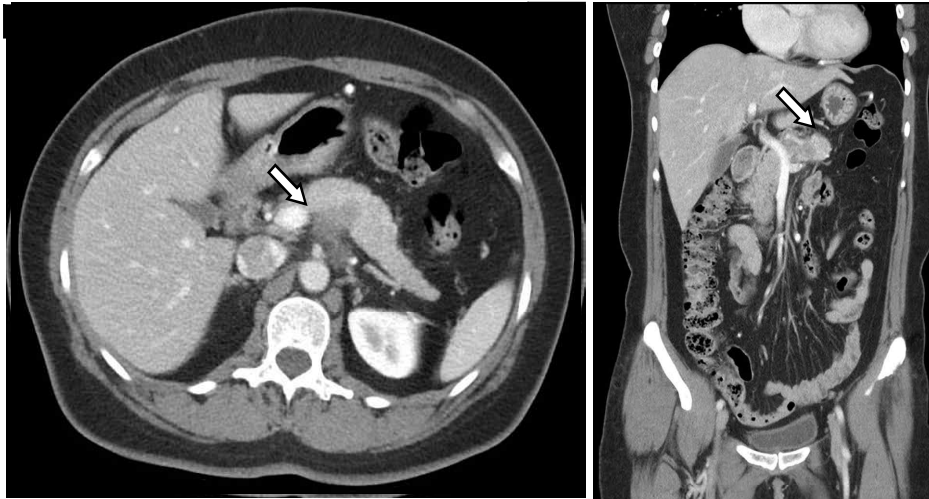
T.bil 0.5 mg/dL, ALP 56 IU/L, AST 19 IU/L, ALT 21 IU/L, Prothrombin time 94% (INR 1.03)

CA 19-9 20.3 U/mL (0.0~34.0 U/mL)

CEA 1.22 ng/mL (0.0~5.0 ng/mL)

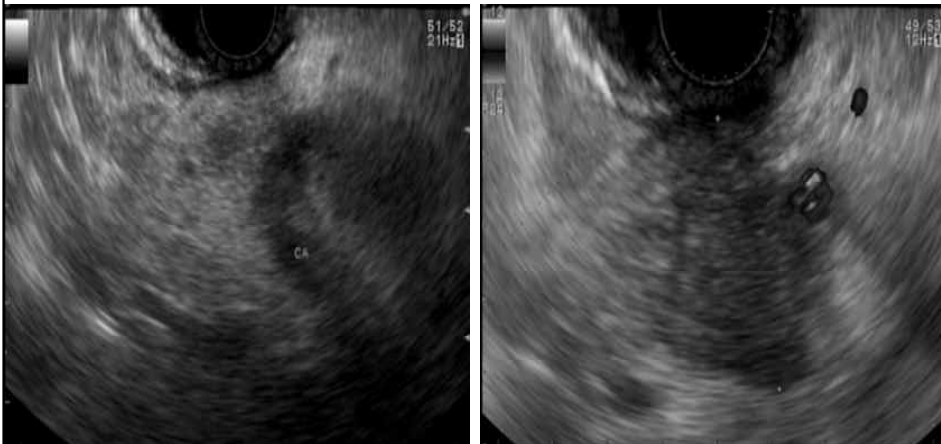
Lewis a/b -/+

**Initial APCT** (2015.08.01, outside)



A 1.3 cm ill-defined hypovascular mass in the pancreas body Tumor encasement of celiac trunk, common hepatic artery & splenic artery

**EUS-FNA** (2015.08.05)



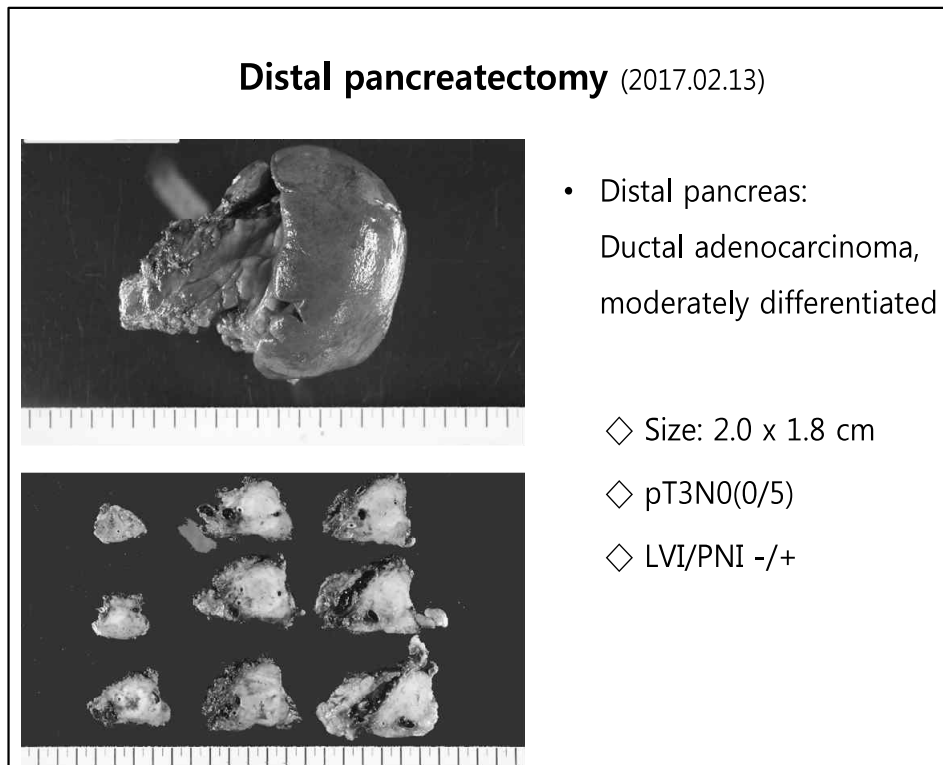
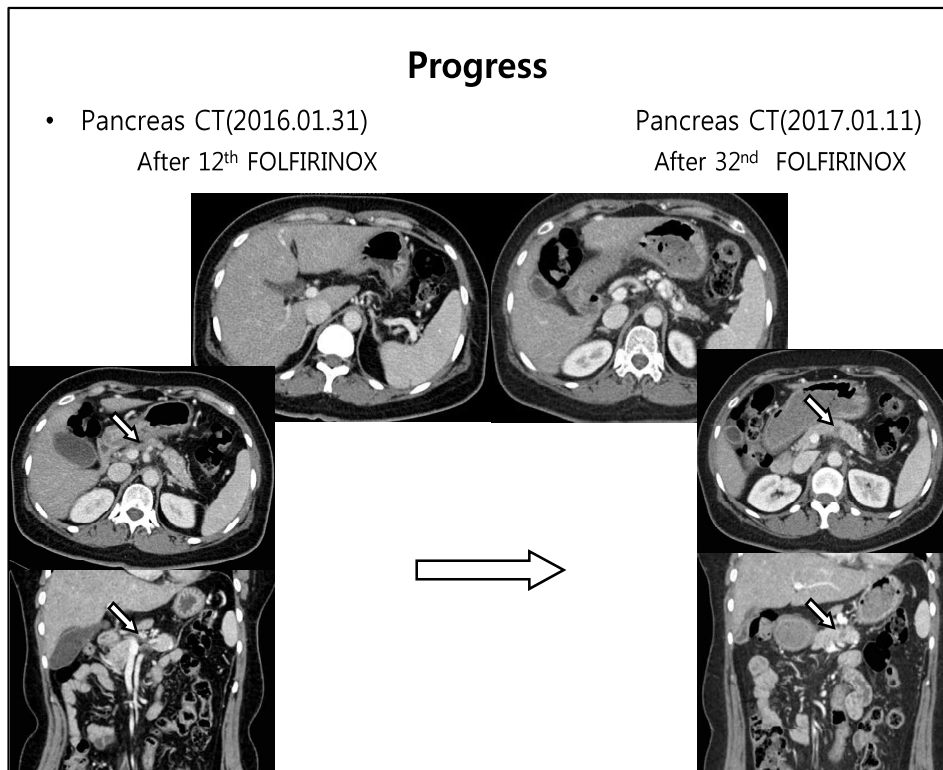
- Pancreatic mass of body
- Size : 1.9 cm
- Echo intensity : hypo-echoic
- Margin : rough

### Initial PET CT (2015.08.06)



### Progress

- Locally advanced pancreatic cancer로 진단 후 FOLFIRINOX 시작하였고, 32차 FOLFIRINOX 진행 후 CT에서 newly developed pancreatic mass (body) 있어 distal pancreatectomy 시행하였다.



## Final diagnosis

- Pancreatic cancer, locally advanced

s/p 1<sup>st</sup>~3<sup>rd</sup> FOLFIRINOX (2015.08.08-2016.12.30)

→ newly developed pancreatic mass (1.4 cm)

s/p distal pancreatectomy (2017.2.13) : pT3N0

s/p 1<sup>st</sup>~3<sup>rd</sup> adjuvant Gemcitabine (2017.3.28-06.20)

## Case 2.

- M/62

- **Chief complaint**

**Epigastric pain**

**Dark-colored urine**

- **Present illness**

고혈압 외 특이 내과적 병력 없던 자로 내원 1주 전부터 복통, 소변색이 검어지는 증상 있어 타 병원 내원하여 시행한 혈액검사, 초음파에서 폐색성 황달 의심 소견으로 본원 내원하였다.



## Case 2.

- **Past medical history**

Hypertension

- **Social history**

Smoking: ex-smoker, 1P/d x 40 Yrs = 40 PY

Alcohol: nondrinker

- **Review of systems**

Fever (-) Chill (-) Nausea (-) Vomiting (-)

**Abdominal pain (+) Dark-colored urine (+)**

## Case 2.

- **Physical examination**

V/S 128/87 mmHg - 81 /min-20 /min-36.8°C

Performance status: ECOG 1

Icteric sclera

Abdomen: soft & flat, palpable mass (-)

Normo-active bowel sound

## Case 2.

- **Laboratory results**

WBC 6,450 /uL, Hb 13.1 g/dL, Platelet 243,000 /uL

T.bil/D.bil **7.6/6.1** mg/dL, ALP **443** IU/L, AST/ALT **249/474** IU/L

GGT **533** IU/L, Amylase/Lipase **248/839** U/L

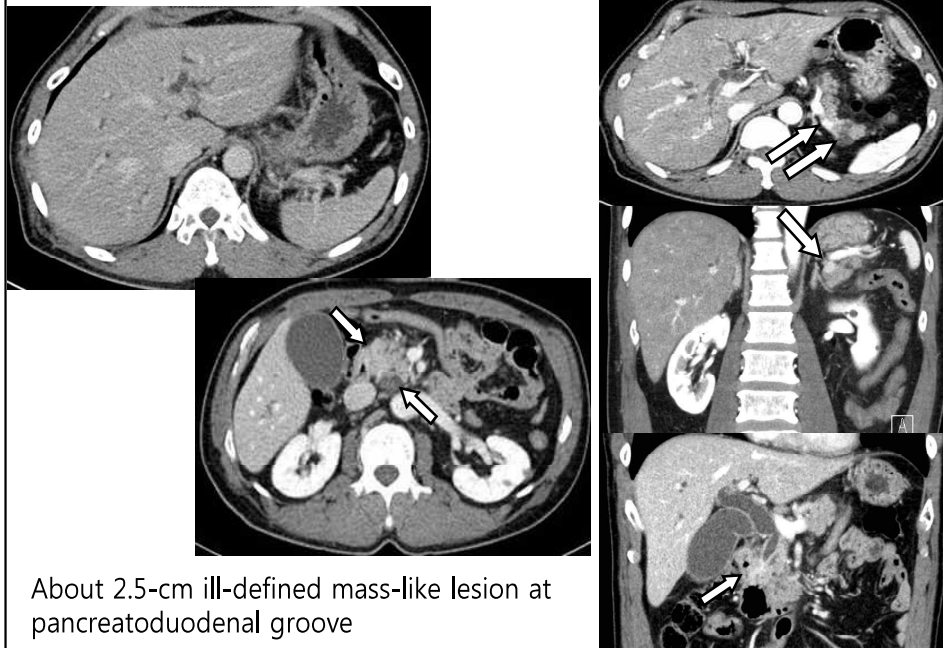
Prothrombin time 100% (INR 0.90)

CA 19-9 2.8 U/mL (0.0~34.0 U/mL)

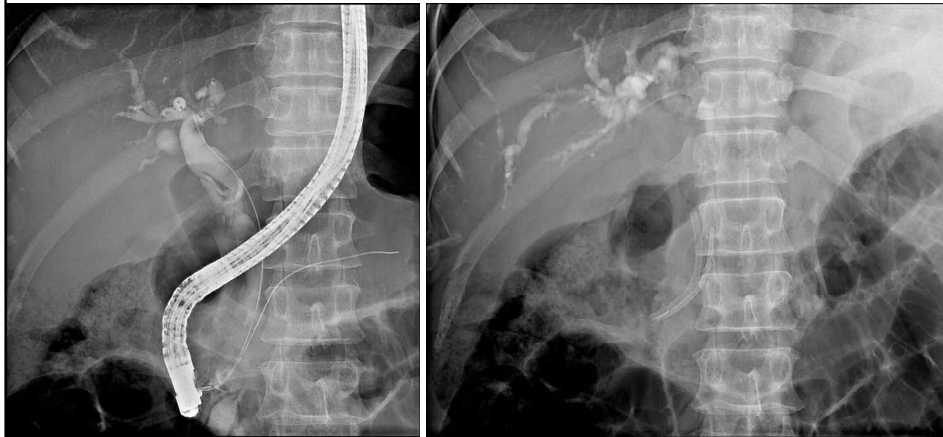
CEA 3.53 ng/mL (0.0~5.0 ng/mL)

Lewis a/b -/-

### Initial Biliary CT (2016.01.22)

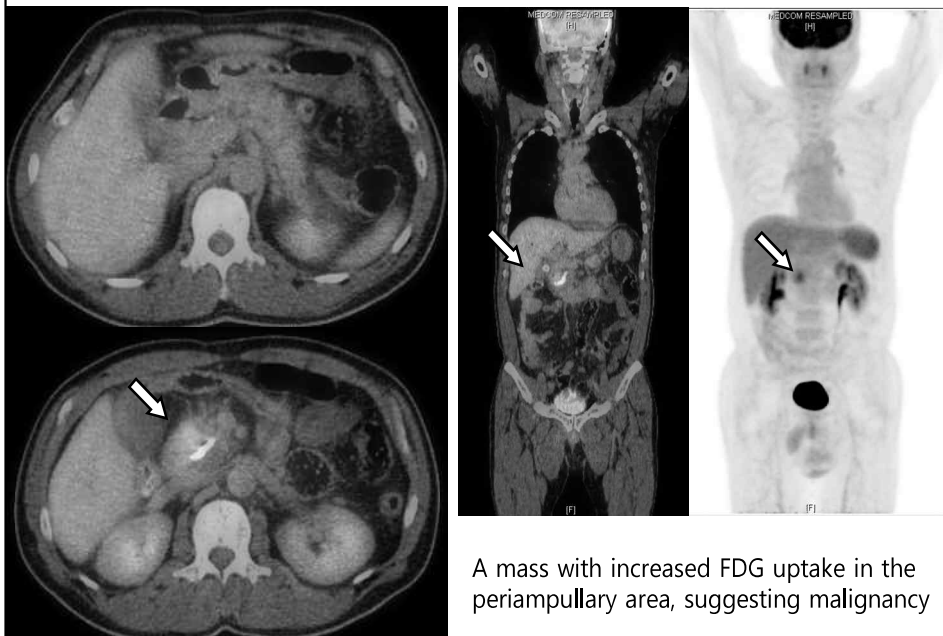


**ERCP (2016.1.25)**



- Abrupt narrowing at distal CBD level with proximal ductal dilatation
- ERBD, ERPD was deployed

**Initial PET CT (2016.01.28)**



A mass with increased FDG uptake in the peripancreatic area, suggesting malignancy

## Case 2.

- **ERCP-biopsy at AOV(2016.01.25)**

Chronic nonspecific inflammation with a few degenerative atypical epithelium

- **Laboratory results**

ANA Titration 1:40 negative

Subclass IgG4 **1160.0** mg/L

- **Liver biopsy, sono-guided(2016.02.22)**

Hepatocellular cholestasis

## Impression

# R/O IgG4 associated cholangitis

# R/O Ampulla of Vater cancer, R/O distal CBD cancer, less likely

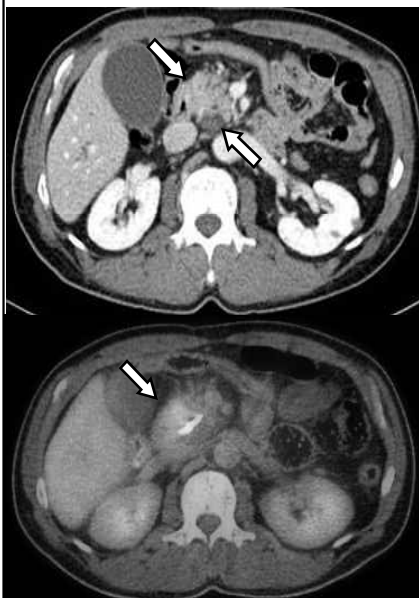
# Hypertension

### Progress

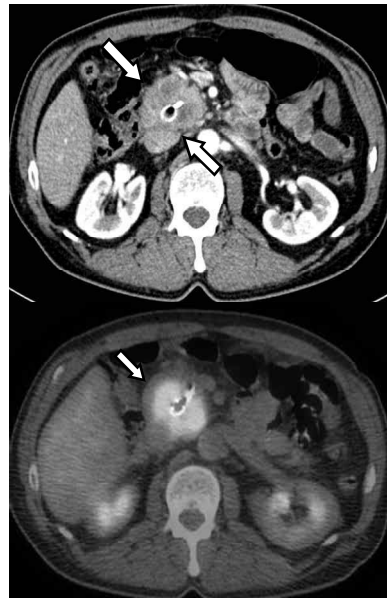
- IgG4 associated cholangitis로 steroid 투약하며, 외래 추적 관찰 중  
2016.5.11 CT에서 Pancreas head mass-like lesion 의심되어 재입원하여  
EUS-FNA 시행하였다.
- **Pancreas aspirate cytology (2016.05.19)**  
Diffusely scattered pancreatobiliary epithelial cells with high grade  
dysplasia, suggestive of adenocarcinoma

### Progress

Initial CT biliary, PET CT(2016.1)



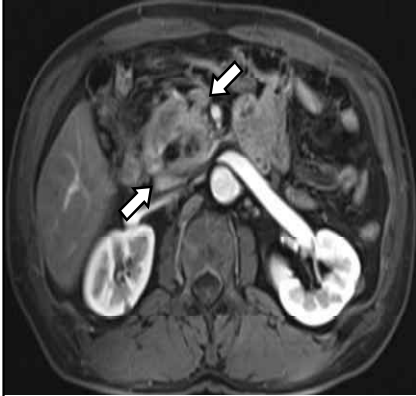
CT biliary, PET CT(2016.5)



Steroid  
투약  
→


### Progress

• MRI(2016.5.25)




4.6 cm

1<sup>st</sup>~4<sup>th</sup>  
FOLFIRINOX





MRI (2016.7.30)

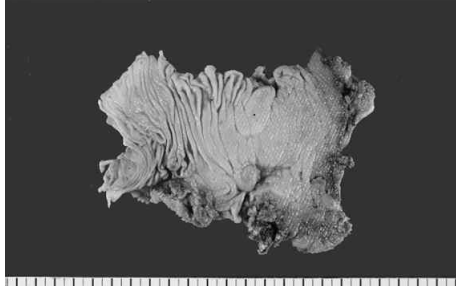


3.4 cm

### PPPD (2016.08.26)







- Ductal adenocarcinoma, moderately differentiated
- ◇ Size: 3.4x3.0 cm
- ◇ pT3N1 (2/19)
- ◇ LVI/PNI +/+
- Note) Mass의 epicenter가 pancreas head에 있어 pancreas origin의 종양으로 판단됩니다.

### Final diagnosis

- Pancreas head cancer, Ampulla of Vater invasion

s/p 1<sup>st</sup>~4<sup>th</sup> FOLFIRINOX (2016.06.03~07.19)

s/p PPPD (2016.08.26) (pT3N1 (2/19)), LVI/PNI +/+

s/p 1<sup>st</sup>~4<sup>th</sup> adjuvant Gemcitabine (2016.10.20~2017.2.3)

\* APCT (2017.05.22): Pancreatic cancer postop without recurrent lesions.

### Review

*Annals of Oncology* 24: 2404–2492, 2013  
doi:10.1093/annonc/mdt239  
Published online 12 July 2013

#### Neoadjuvant treatment of borderline resectable and non-resectable pancreatic cancer

V. Hoinmann\*, M. Haas & S. Boock

*Department of Medical Oncology and Comprehensive Cancer Center, Ludwig-Maximilians-University of Munich, Munich, Germany*

본원  
ORR 34.5%,  
DCR 93.1%

**Table 4.** Efficacy of FOLFIRINOX in LAPC based on objective response rate

References	Study design	Stage of disease	n	CR (%)	PR (%)	SD (%)	PD (%)	ORR (%)	DCR (%)
Conroy [30]	Phase II	LAPC	11	na	na	na	na	27	na
		Metastatic	35					26	
Gunturu [32]	Retrospective	LAPC	16	6	44	44	0	50	94
		Metastatic	17	0	47	35	12	47	82
Faris [33]	Retrospective	LAPC	12	0	42	58	0	42	100
		Metastatic	17	0	35	41	24	35	76
Peddi [34]	Registry	LAPC	18	6	28	50	17	34	84
		Metastatic	22	0	18	46	36	18	64
Marthey [35]	Prospective database	LAPC	53	0	30	53	17	30	83

LAPC, locally advanced pancreatic cancer; CR, complete response; PR, partial response; SD, stable disease; PD, progressive disease. ORR, objective response rate; DCR, disease control rate.