Surgical management for advanced pancreatic adenocarcinoma

RESECTION OF OLIGOMETASTATIC DISEASE

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PANCREATIC DUCTAL ADENOCARCINOMA

- Morbidity and mortality
- Short survival of stage IV
- Lack of any randomized controlled trials (RCT)

PANCREATIC DUCTAL ADENOCARCINOMA

Liver metastasis

- **Oligometastases**

  Distant metastasis to a single or limited number of organs

  Number of metastases with a high potential for a complete resection.

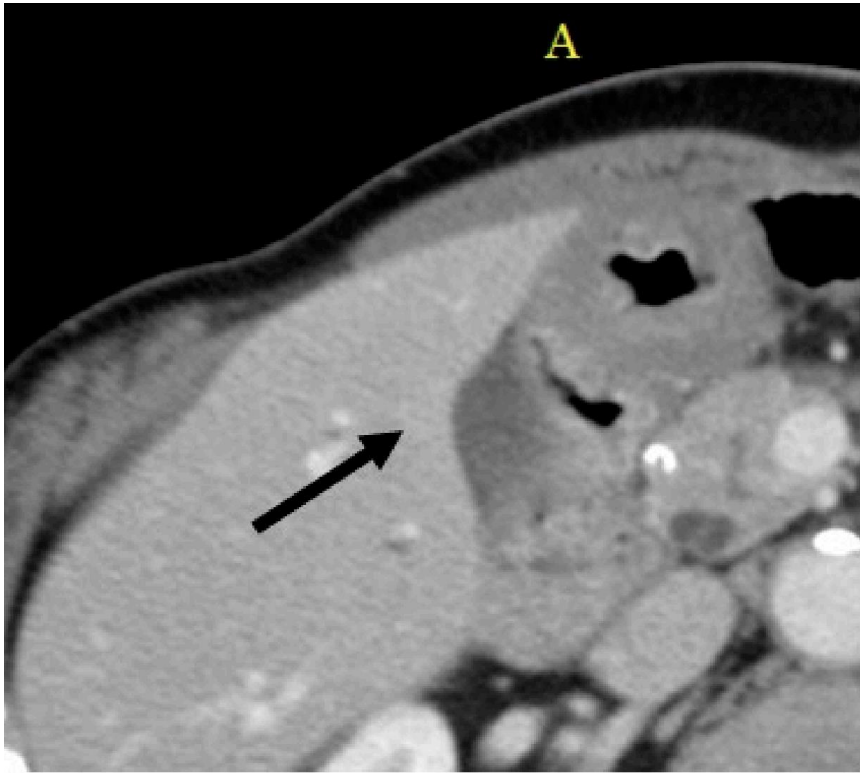
  1-3 liver metastases easily resected by atypical resection

- **Incidental synchronous liver metastasis**

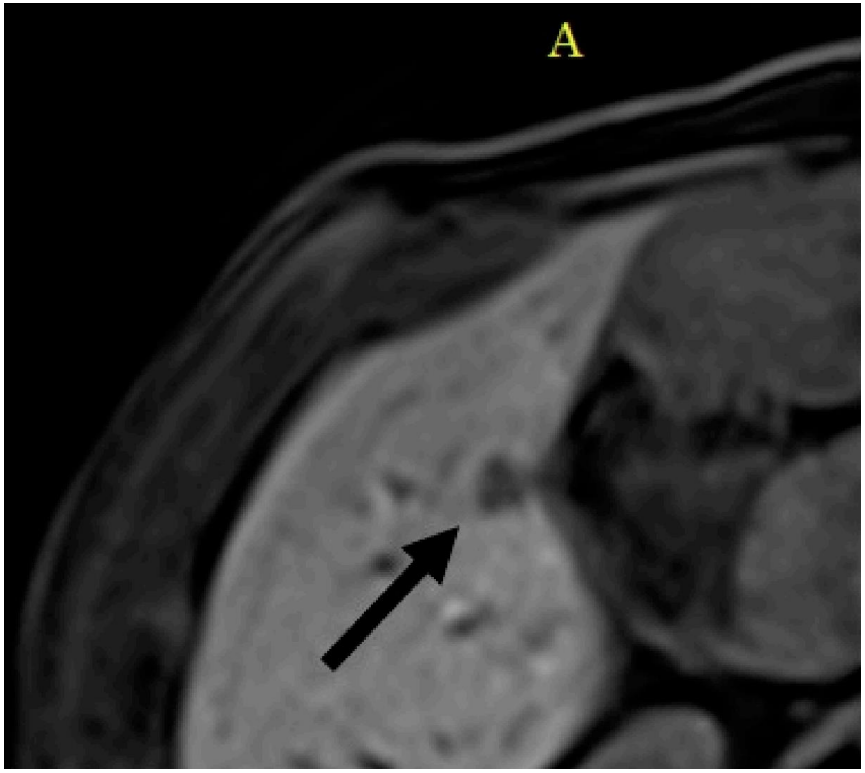
  Surgeon unaware preoperatively

PANCREATIC DUCTAL ADENOCARCINOMA

Liver metastasis: CT scan *vs* MRI



Portal-venous phase CT



Hepatobiliary phase MRI

MRI

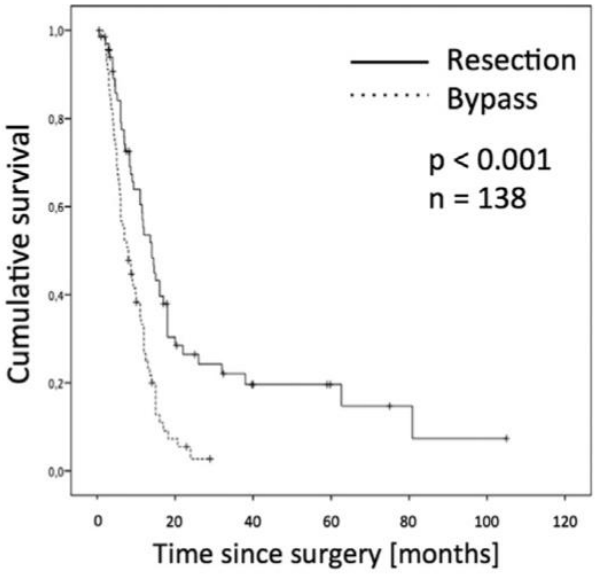
Tsurusaki M. Cancers 2020

RESECTION *VS* NO RESECTION

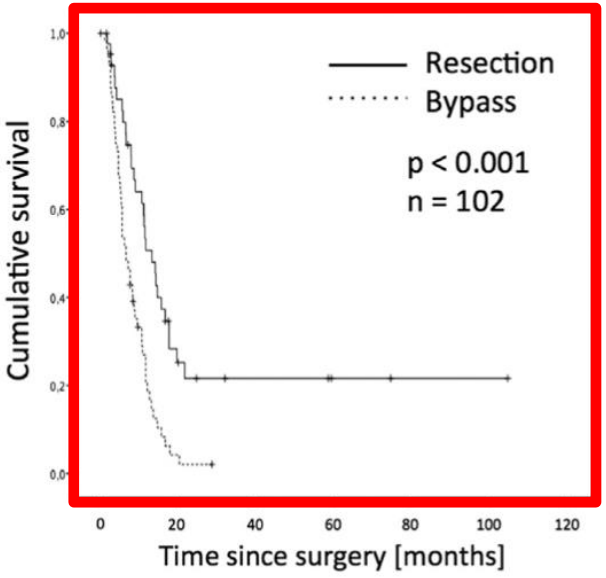
Synchronous resections of hepatic oligometastatic pancreatic cancer: Disputing a principle in a time of safe pancreatic operations in a retrospective multicenter analysis

Michael Tachezy, MD,[a] Florian Gebauer, MD,[a] Monika Janot, MD,[c] Waldemar Uhl, MD,[c] Alessandro Zerbi, MD,[d] Marco Montorsi, MD,[d] Julie Perinel, MD,[e] Mustapha Adham, MD,[e] Christos Dervenis, MD,[f] Christos Agalianos, MD,[f] Giuseppe Malleo, MD,[g] Laura Maggino, MD,[g] Alexander Stein, MD,[b] Jakob R. Izbicki, MD,[a] *and* **Maximilian Bockhorn, MD,[a]** *Hamburg and Bochum, Germany, Milan and Verona, Italy, Lyon, France, and Athens, Greece*

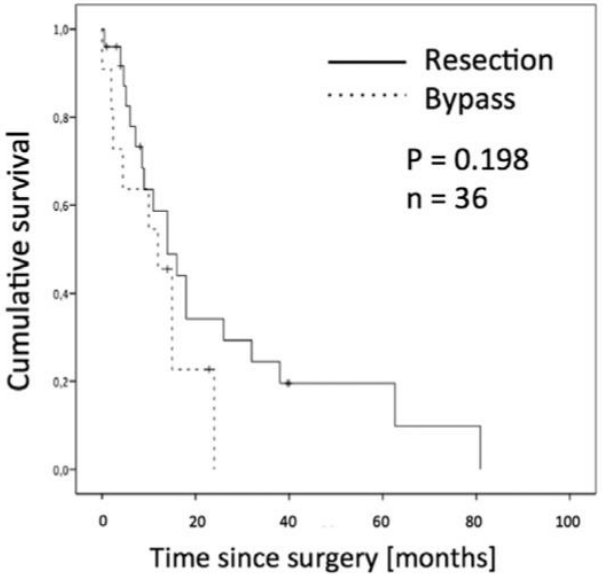
All tumors



Pancreas Head



Pancreas Body/Tail



p<0.001

Tachezy M, et al. Surgery 2016

❑ Pancreatic head adenocarcinoma

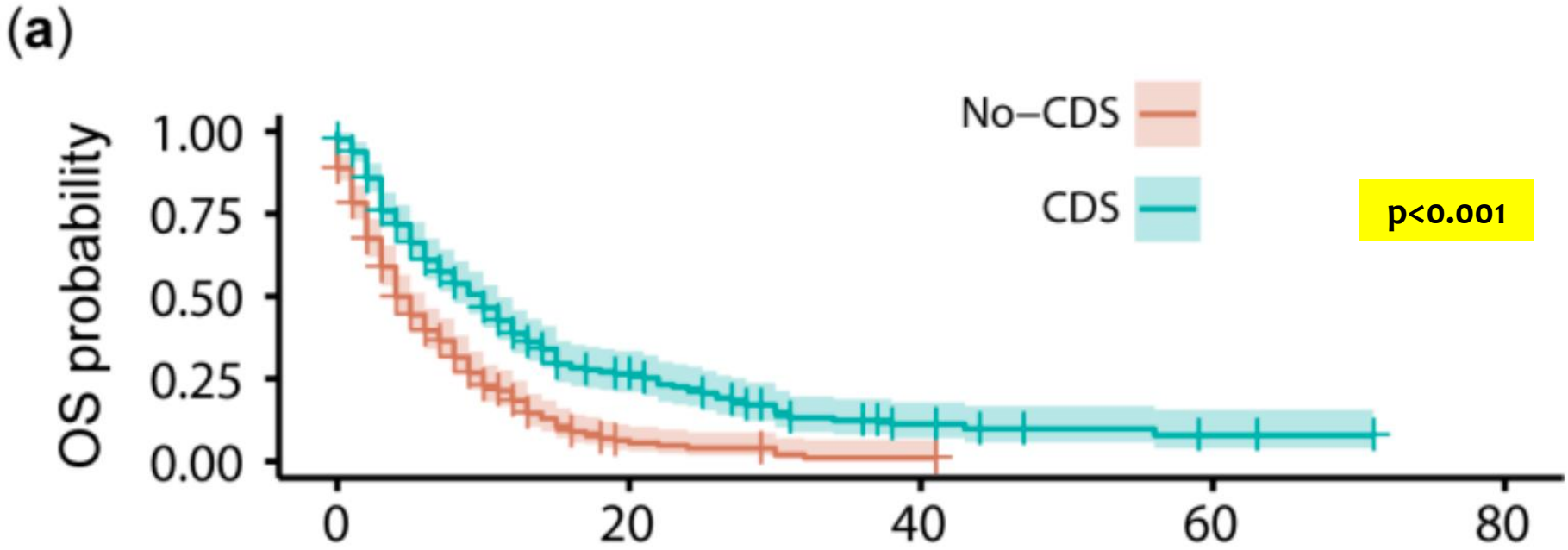
cancers

MDPI

Article

Survival Benefit of Resection Surgery for Pancreatic Ductal Adenocarcinoma with Liver Metastases: A Propensity Score-Matched SEER Database Analysis

CDS: Cancer-directed surgery



p<0.001

RESECTION *VS* NO RESECTION

Pausch TM, et al. Cancers 2022

RESECTION *VS* NO RESECTION

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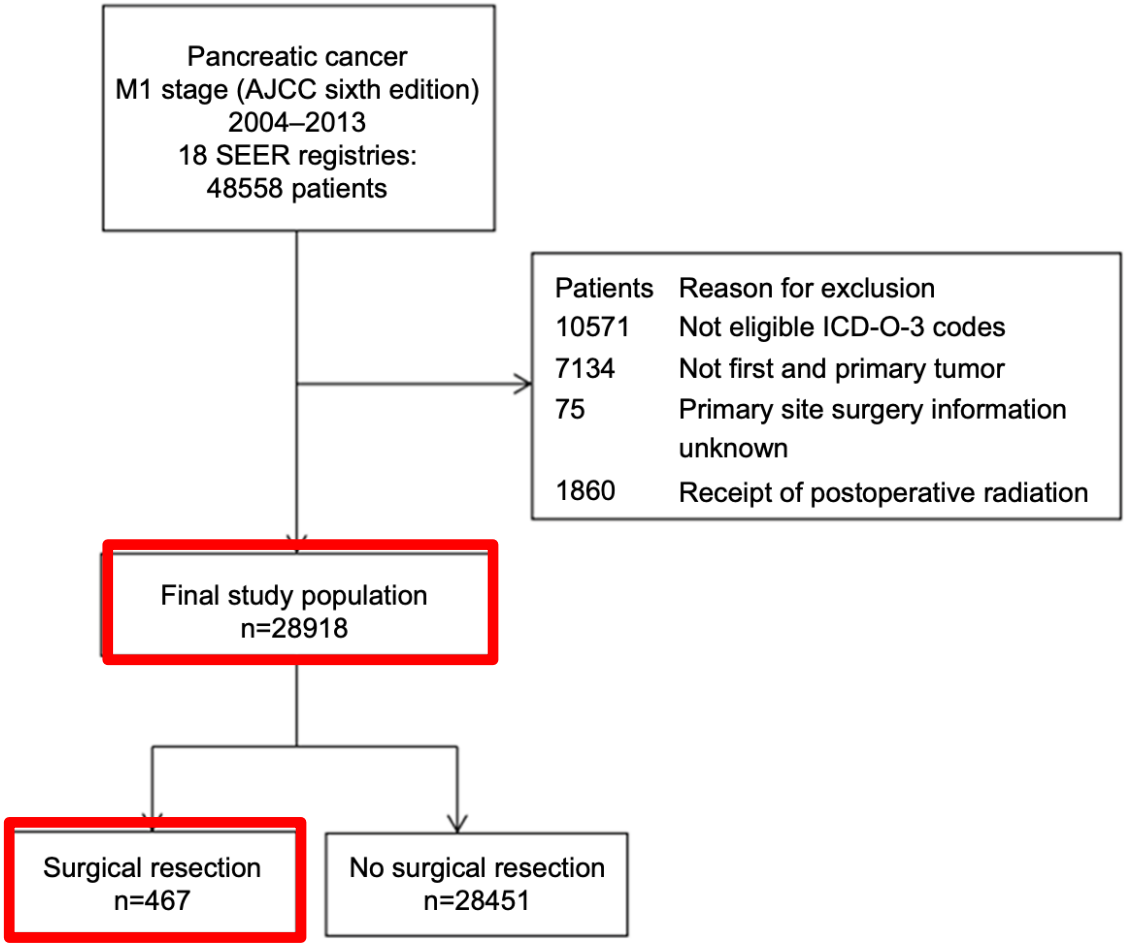
ORIGINAL RESEARCH

Surgical resection of a primary tumor improves survival of metastatic pancreatic cancer: a population-based study



Tao L, et al. Cancer Manag Res 2017:9

Cancer Management and Research

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ORIGINAL RESEARCH

Surgical resection of a primary tumor improves survival of metastatic pancreatic cancer: a population-based study

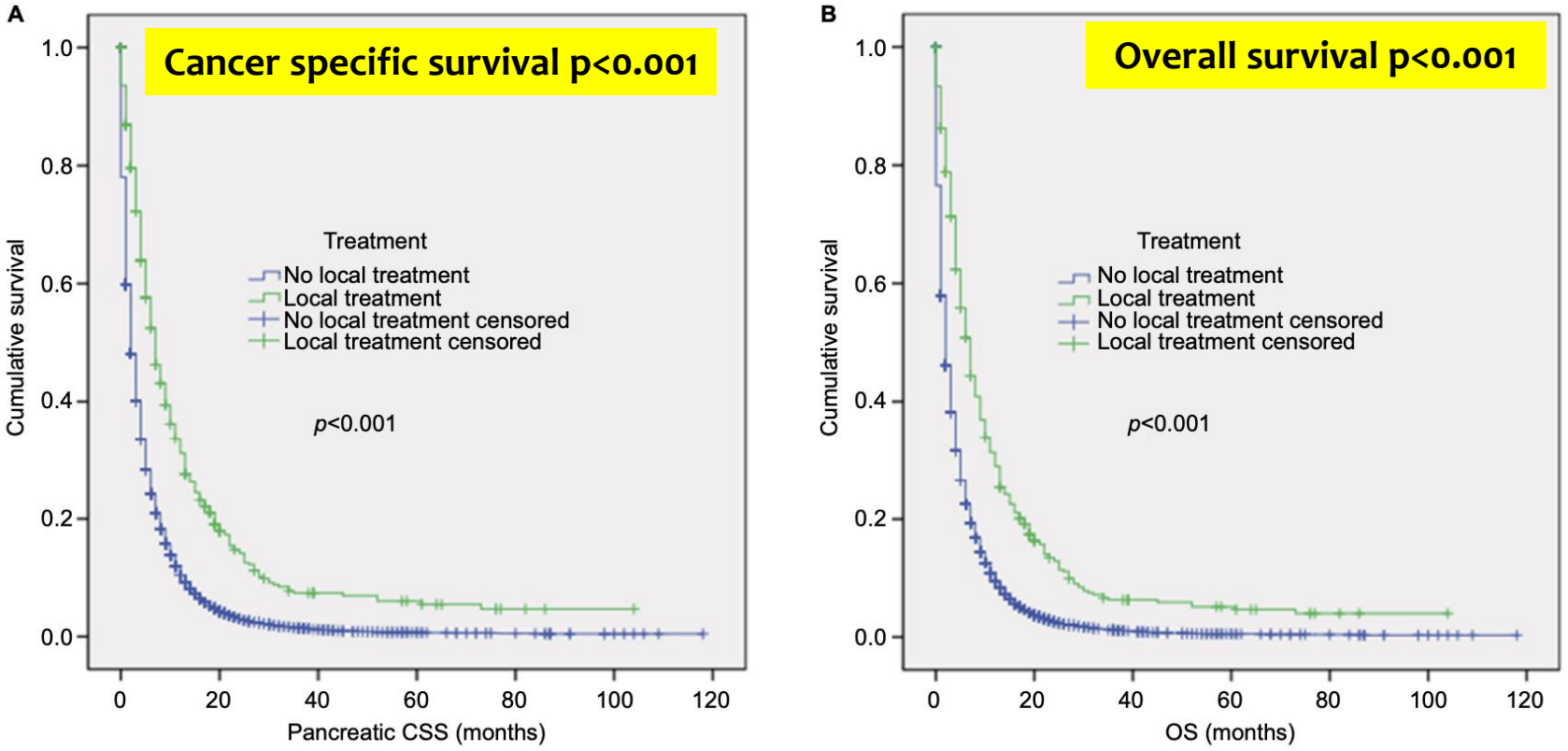


Figure 2 Survival curves with the log-rank test of (**A**) CSS ($p<0.001$) and (**B**) OS ($p<0.001$).
Abbreviations: CSS, cancer-specific survival; OS, overall survival.

RESECTION *VS* NO RESECTION

Tao L, et al. Cancer Manag Res 2017:9

Journal of Pancreatic Cancer
Volume 4.1, 2018
DOI: 10.1089/pancan.2018.0011

Journal of
Pancreatic Cancer
Mary Ann Liebert, Inc. publishers

ORIGINAL ARTICLE Open Access

6 patients

Survival of Patients with Oligometastatic Pancreatic Ductal Adenocarcinoma Treated with Combined Modality Treatment Including Surgical Resection: A Pilot Study

RESECTION *VS* NO RESECTION

Table 2. Univariate Analysis Comparing 3 Groups

Groups comparison	Median overall survival in years (95% CI)	Log rank (*p*-value)
M1 surgery group	2.77 years (0.71–3.69)	0.6
M0 surgery group	2.02 years (0.98–3.05)	
M1 no surgery group	0.98 years (0.55–1.25)	0.01
M1 surgery group	2.77 years (0.71–3.69)	
M0 surgery group	2.02 years (0.98–3.05)	0.005
M1 no surgery group	0.98 years (0.55–1.25)	

Kandel P, et al. J Panc Cancer 2018

Journal of Pancreatic Cancer
Volume 4.1, 2018
DOI: 10.1089/pancan.2018.0011

Journal of
Pancreatic Cancer
Mary Ann Liebert, Inc. publishers

ORIGINAL ARTICLE Open Access

Survival of Patients with Oligometastatic Pancreatic Ductal Adenocarcinoma Treated with Combined Modality Treatment Including Surgical Resection: A Pilot Study

RESECTION *VS* NO RESECTION

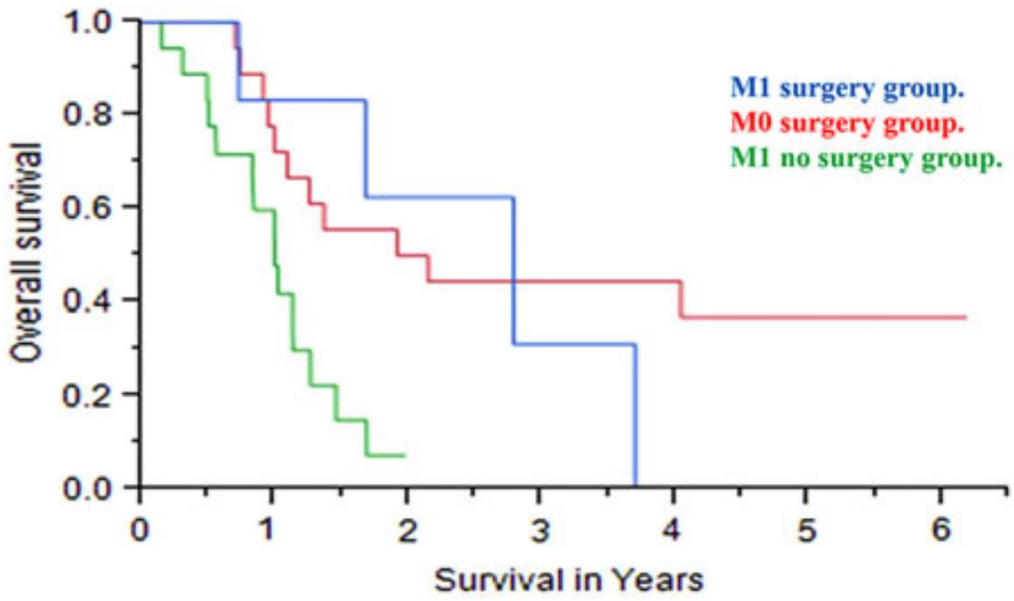


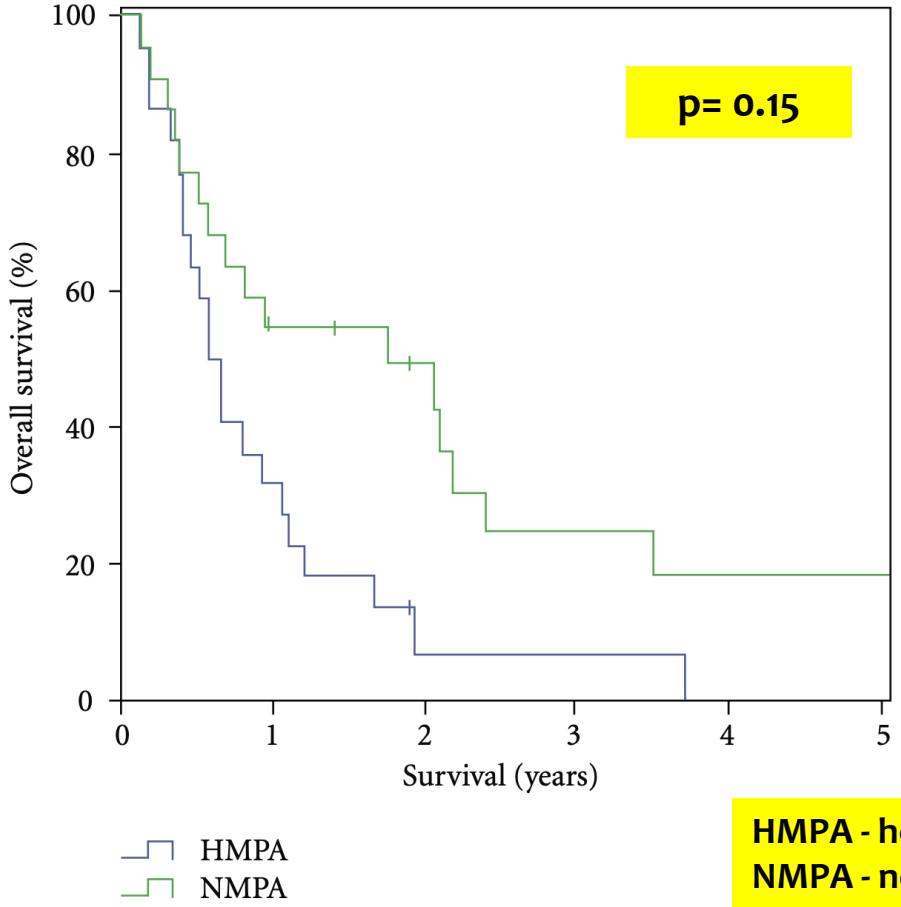
FIG. 1. A Kaplan–Meier survival curve comparing survival in the three groups.

Hindawi Publishing Corporation
Gastroenterology Research and Practice
Volume 2012, Article ID 939350, 8 pages
doi:10.1155/2012/939350

INCIDENTAL

Research Article

The Impact of Simultaneous Liver Resection for Occult Liver Metastases of Pancreatic Adenocarcinoma



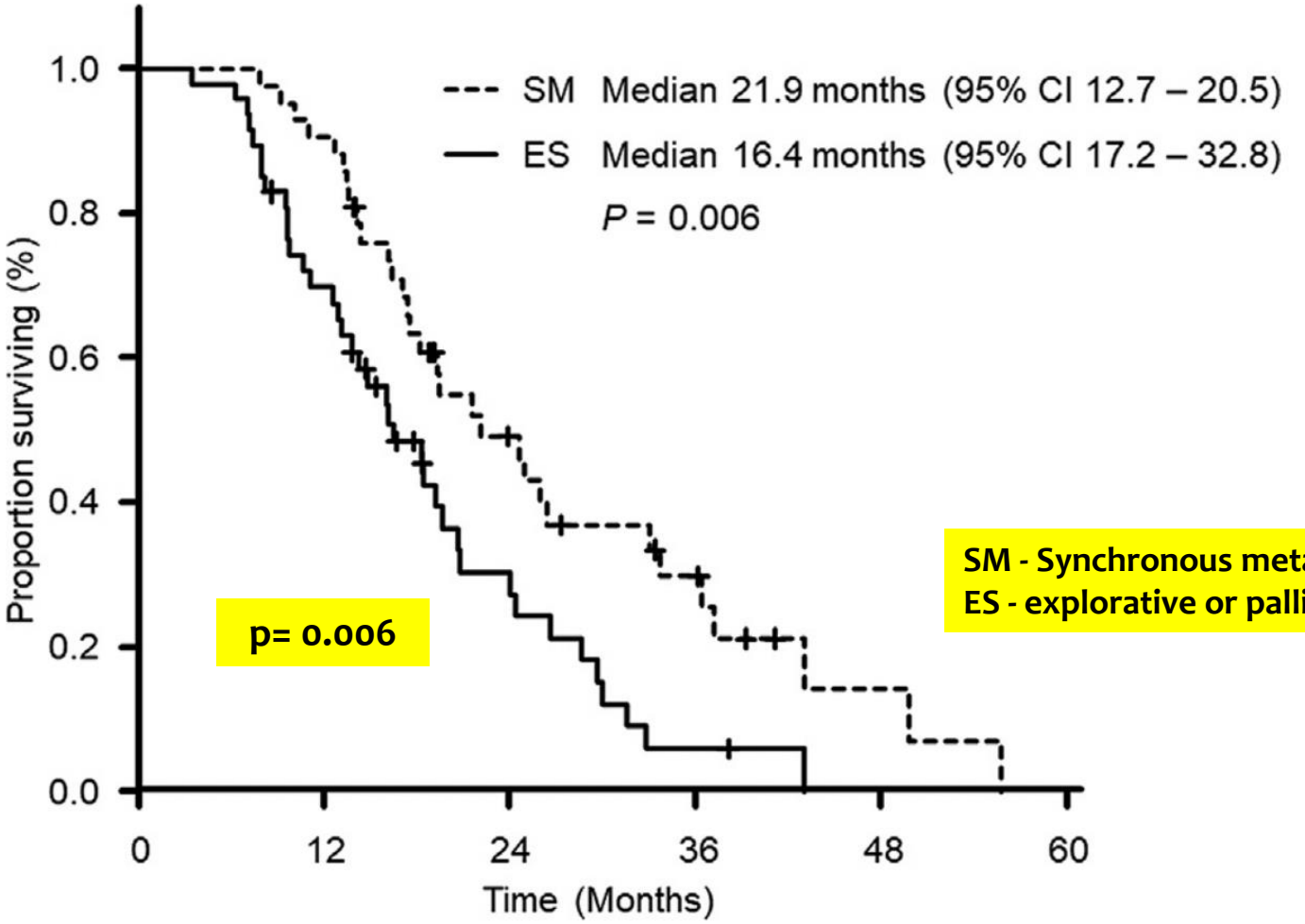
p= 0.15

OS 16.6mo

HMPA - hepatic metastasized pancreatic adenocarcinoma
NMPA - nonmetastasized pancreatic adenocarcinoma

Klein F, et al. Gastroenterol Res Pract 2012

RESECTION *VS* NO RESECTION



p= 0.006

SM - Synchronous metastasectomy
ES - explorative or palliative surgery

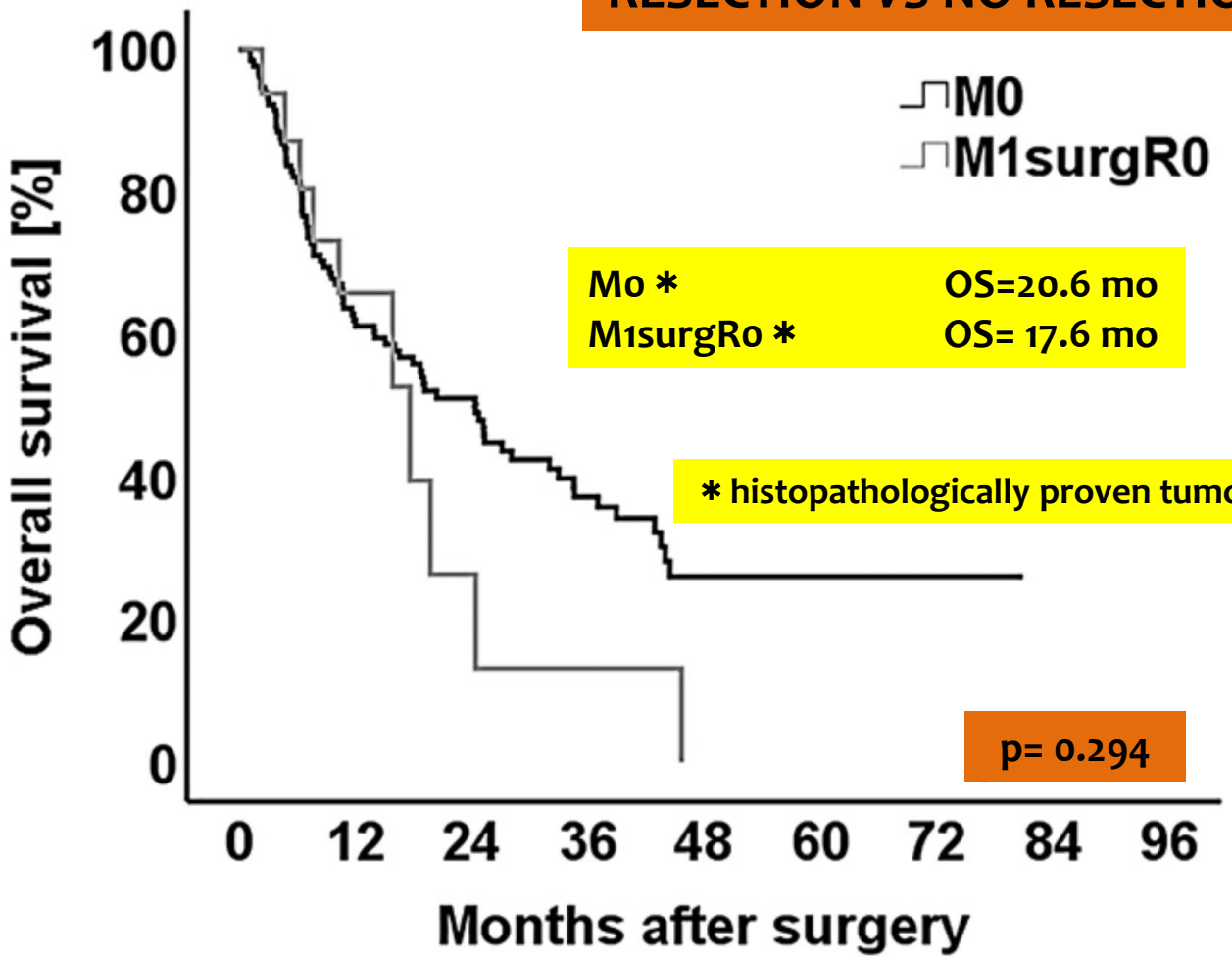
Tanaka M, et al. Eur J Surg Oncol. 2019;45:1453–9.

International Journal of Clinical Oncology (2021) 26:1911–1921
https://doi.org/10.1007/s10147-021-01961-5

ORIGINAL ARTICLE

Surgical margin clearance and extended chemotherapy defines survival for synchronous oligometastatic liver lesions of the ductal adenocarcinoma of the pancreas

RESECTION *VS* NO RESECTION



M0 * **OS=20.6 mo**
M1surgR0 * **OS= 17.6 mo**

*** histopathologically proven tumor-free extended resection**

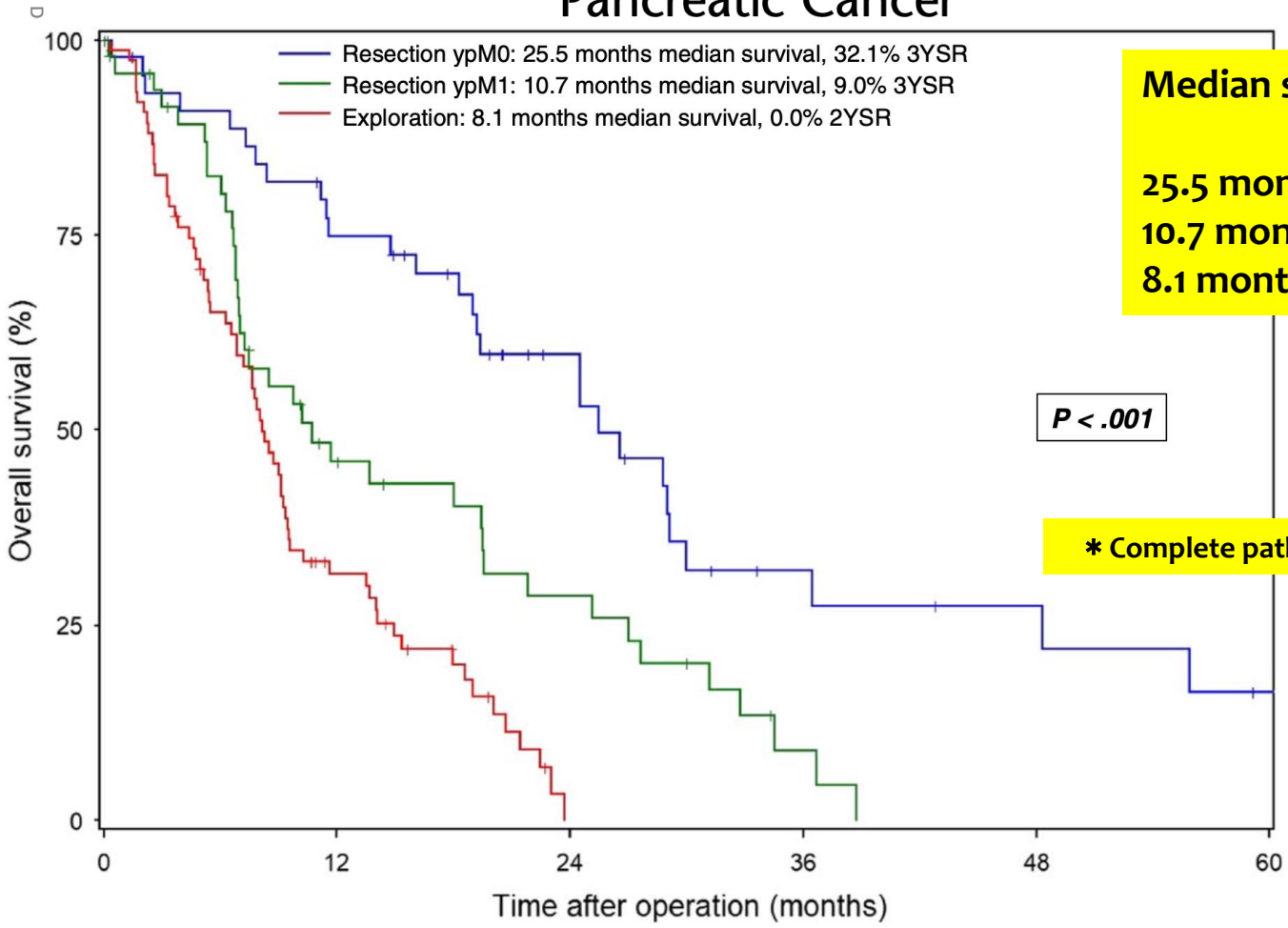
p= 0.294

Safi SA, et al. Int J Clin Oncol 2021;26:1911–21

- ❑ Pancreatic head adenocarcinoma
- ❑ Resection

CHEMOTHERAPY

Oncological Outcome of Conversion Surgery After Preoperative Chemotherapy for Metastatic Pancreatic Cancer



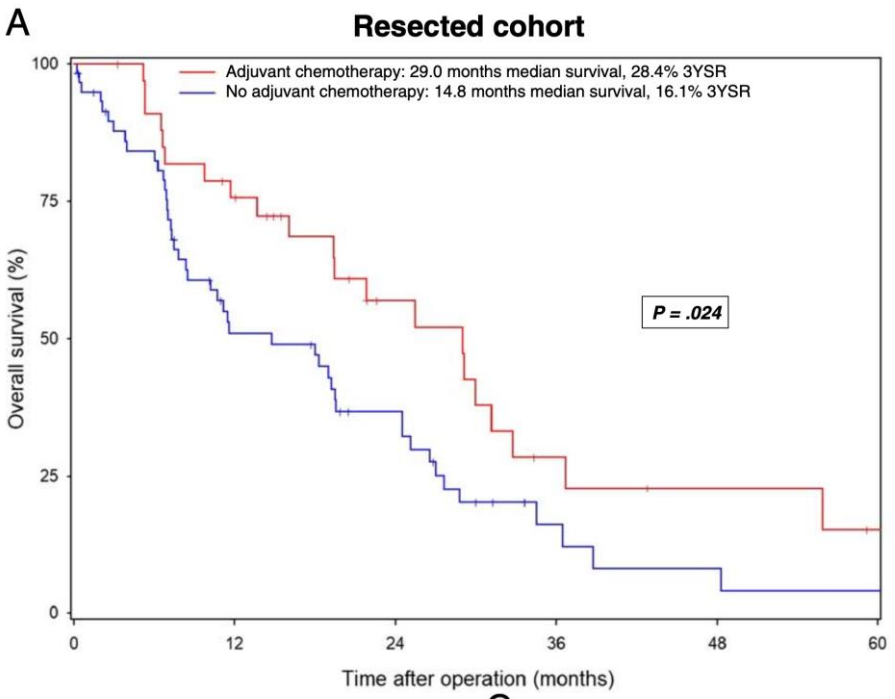
Median survival

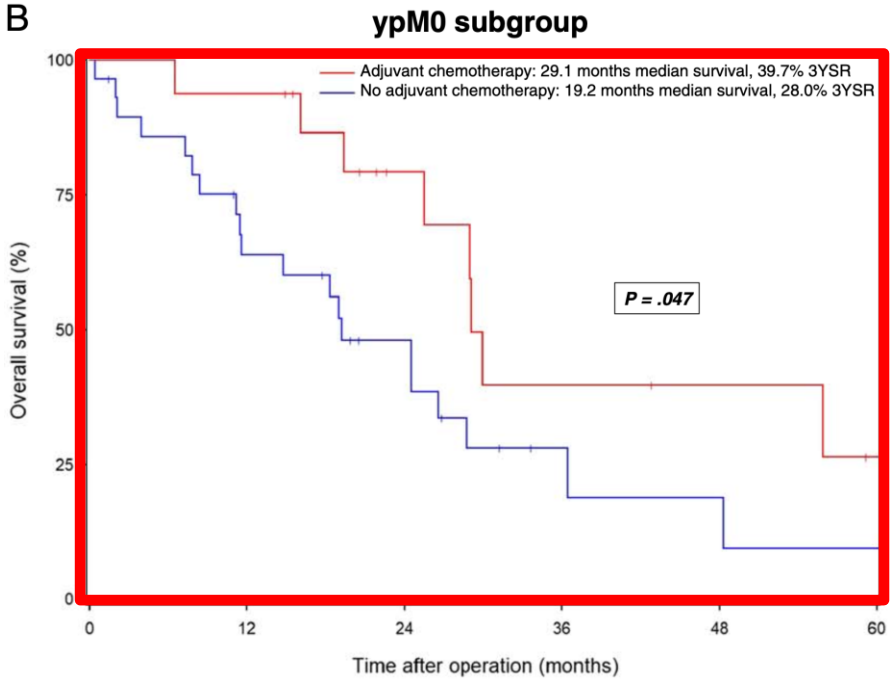
25.5 months *
10.7 months
8.1 months

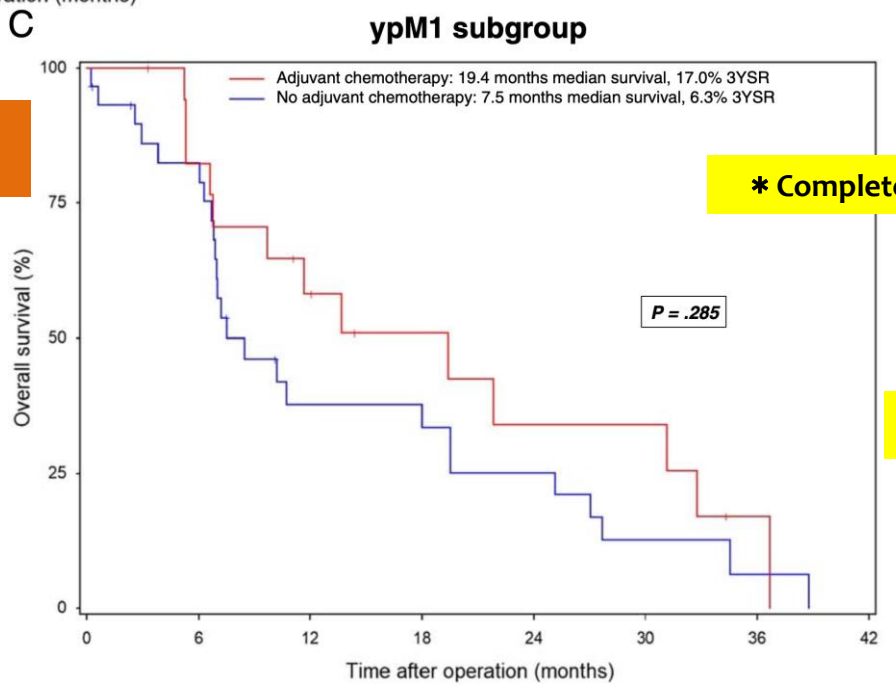
*** Complete pathological response (ypM0)**

RESECTION *VS* NO RESECTION

Hank T, et al. Ann Surg 2023







CHEMOTHERAPY

*** Complete pathological response (ypMo)**

Adjuvant chemotherapy

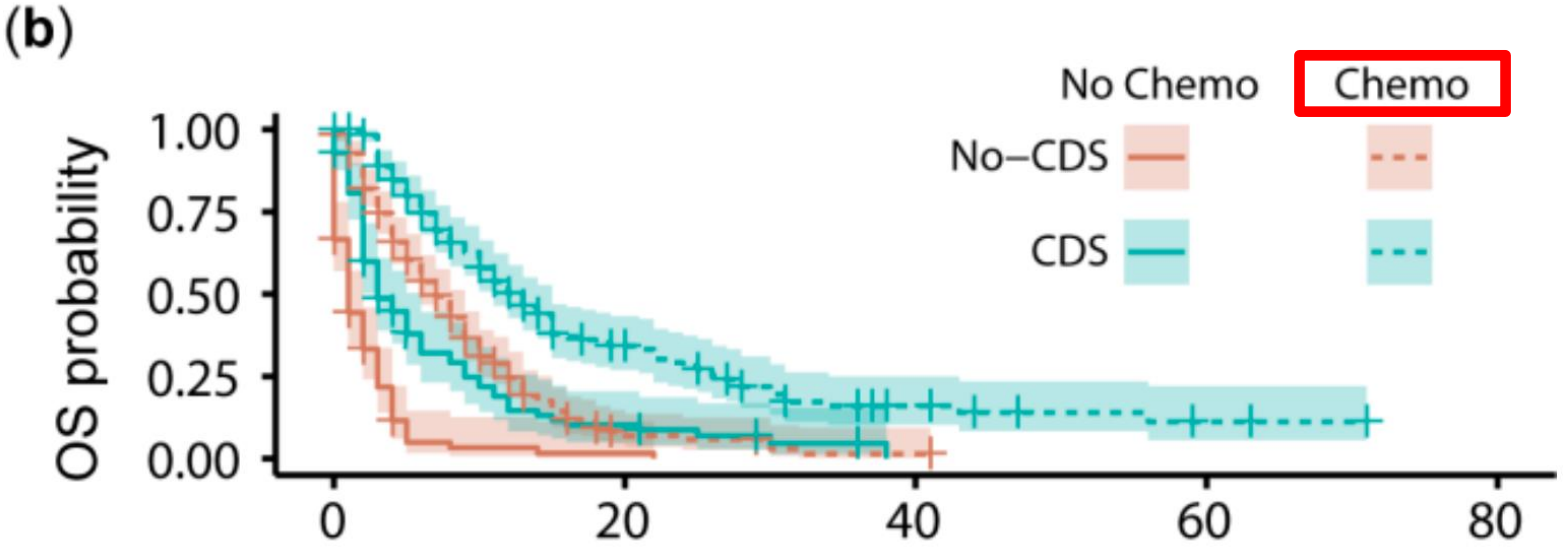
Hank T, et al. Ann Surg 2023

cancers

MDPI

Article

Survival Benefit of Resection Surgery for Pancreatic Ductal Adenocarcinoma with Liver Metastases: A Propensity Score-Matched SEER Database Analysis



Cancer-directed surgery

CHEMOTHERAPY

Adjuvant chemotherapy

Pausch TM, et al. Cancers 2022

Ann Surg Oncol
DOI 10.1245/s10434-017-5885-4

Annals of
SURGICAL ONCOLOGY
OFFICIAL JOURNAL OF THE SOCIETY OF SURGICAL ONCOLOGY

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ORIGINAL ARTICLE – PANCREATIC TUMORS

Downstaging in Stage IV Pancreatic Cancer: A New Population Eligible for Surgery?

- ❑ Downstaging
  - Gemcitabine
  - Gemcitabine and nab-paclitaxel
  - FOLFIRINOX
- ❑ intraoperative US
  - Lesion still evident:
    - US-guided fine-needle aspiration
      - Positive:
        - Resection aborted

Neoadjuvant chemotherapy

CHEMOTHERAPY

Frigerio I, et al. Ann Surg Oncol 2017

Oligomestatatic: ≤2 metastatic tumors total in liver or lung, each <4 cm

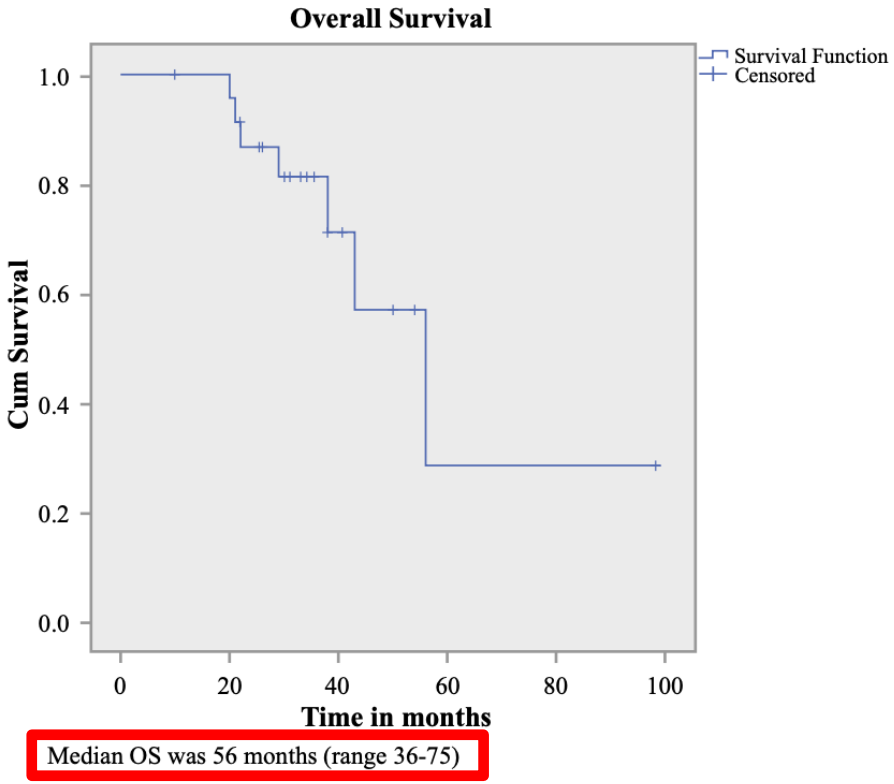


FIG. 1 Overall survival from diagnosis. *Cum* cumulative, *OS* overall survival

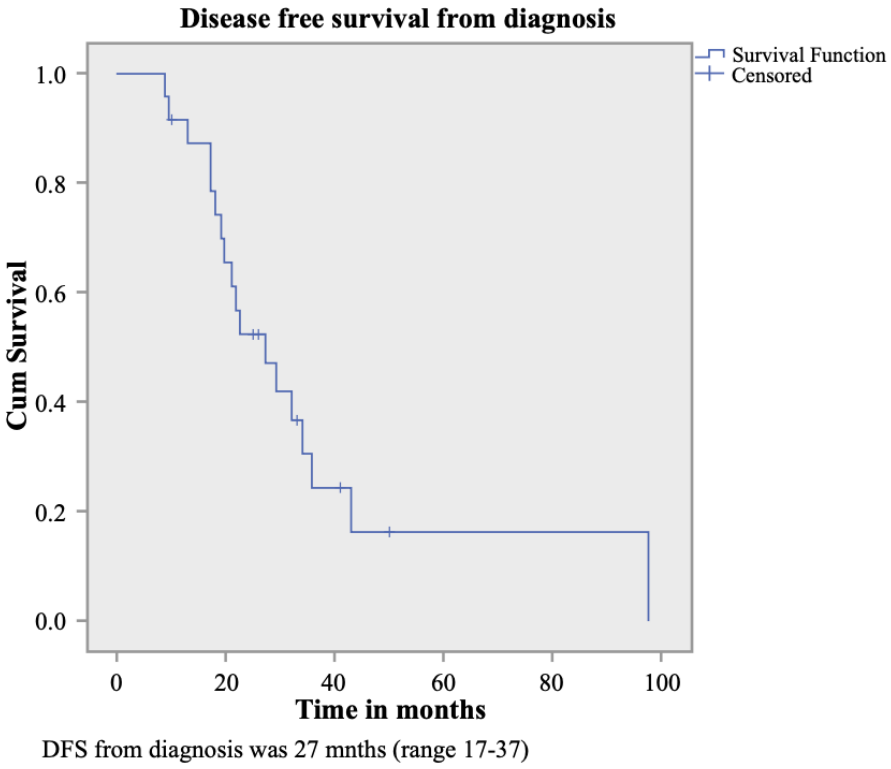


FIG. 2 Disease-free survival from diagnosis. *Cum* cumulative, *DFS* disease-free survival

Frigerio I, et al. Ann Surg Oncol 2017

- ❑ Pancreatic head adenocarcinoma
- ❑ Resection
- ❑ Chemotherapy
  - Conversion therapy
  - Neoadjuvant chemotherapy
  - Adjuvant chemotherapy

OPEN

Oncological Outcome of Conversion Surgery After Preoperative Chemotherapy for Metastatic Pancreatic Cancer

CA 19-9

TABLE 4. Multivariable Analysis of Prognostic Factors for Overall Survival in the Resection Cohort

Variable	Category	HR	95% CI	*P*
Likelihood Rario: χ^2 33.35, 5 DF, $P < 0.0001$				
Conversion surgery	Resection ypM1 vs. ypM0	1.99	1.17–3.39	**0.011**
CA19-9	≥400 U/mL vs. <400 U/mL	6.89	2.96–16.03	**< 0.001**
Adjuvant chemotherapy	Yes vs. no	0.44	0.26–0.75	**0.003**
Not included				
Neoadjuvant therapy	F vs. G/GF/O	—	—	0.895
Vascular involvement	Arterial/venous vs. no	—	—	0.624
Timing of operation*	< 5/≥ 9 mo vs. 5– < 9 mo	—	—	0.289
ASA classification	ASA 3–4 vs. ASA 1–2	—	—	0.075

Bold indicates a statistically significant P-value.
*Time from diagnosis to surgery.
F indicates FOLFIRINOX; G, gemcitabine, GF, gemcitabine + FOLFIRINOX; O, other.

CA 19-9 <400 U/mL

Hank T, et al. Ann Surg 2023

CA 19-9

Biochemical downstaging

TABLE 2 Preoperative data and surgical outcome

Patient	Local stage	Pre-CHT size (mm)	Post-CHT size (mm)	CHT	Pre-CHT CA19-9 (U/mL)	Post-CHT CA19-9 (U/mL)	Diagnostic workout at restaging	Surgery	Operative time (min)	PF (B/C)	PO stay
1	R	32	18	Gem	33	223	CT	PD	345	No	7
3	R	23	18	FOLFIRINOX	955	48	CT, ^{18}PET-FDG	PD, PVR	430	No	8
4	LAPC	35	20	Gem	184	10	CT	PD	265	No	7
7	LAPC	40	11	FOLFIRINOX	1100	18	CT	PD	240	B	7
9	LAPC	30	25	FOLFIRINOX	286	5	CT	PD	275	No	9
10	R	22	20	FOLFIRINOX	663	28	CT	PD	400	No	30
11	BRL	45	30	FOLFIRINOX	3600	56	CT, ^{18}PET–FDG	PD	310	No	13
12	R	35	35	Gem nab-P	1300	1	CT	PD	150	No	9
15	BLR	27	20	Gem	1	1	CT, ^{18}PET–FDG	PD	340	No	14
16	BLR	NA	30	Gem	15	NA	CT, ^{18}PET–FDG	PD	330	B	16
17	LAPC	26	15	FOLFIRINOX	1198	34	CT	PD	290	No	8
18	LAPC	33	18	FOLFIRINOX	3017	85	CT, ^{18}PET–FDG	PD	310	No	14
20	LAPC	38	15	FOLFIRINOX	173	8	CT, ^{18}PET–FDG	PD	340	B	27
24	R	30	30	FOLFIRINOX	45	NA	CT, ^{18}PET–FDG	PD	330	No	12

P< 0.001

CA 19-9 596 U/mL
CA 19-9 18 U/mL

Frigerio I, et al. Ann Surg Oncol 2017

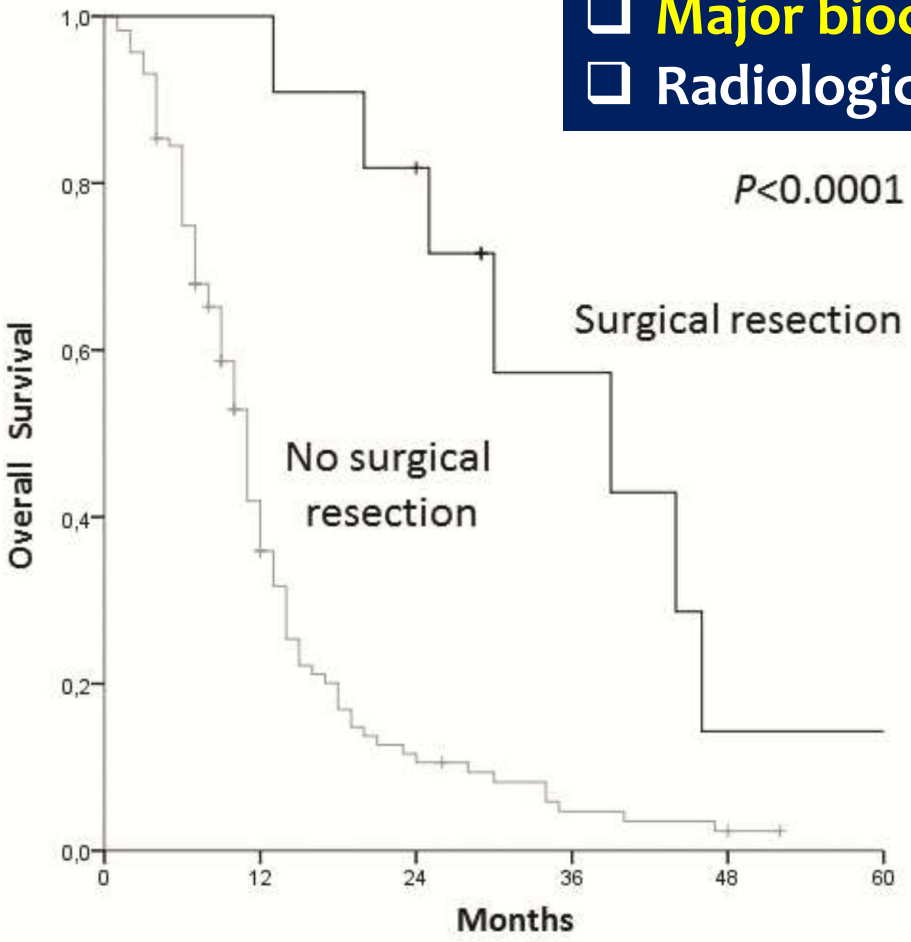
PREDICTORS FOR RESECTABILITY

- ❑ Shrinkage rate of the primary tumor
- ❑ Postchemotherapy CA19-9 serum levels *

Tanaka M, et al. Eur J Surg Oncol. 2019;45:1453–9.

PREDICTORS FOR RESECTABILITY

- ❑ Primary tumor resectable or borderline
- ❑ Major biochemical response
- ❑ Radiological response of the liver metástases



Crippa S, et al. Eur J Surg Oncol 2016;42:1533–9

CA 19-9

- No biochemical response:
  - no CA 19-9 decrease
  - or
  - decrease < 50%
- Minor biochemical response
  - decrease of 50% - 89%
- Major biochemical response
  - decrease ≥ 90%

Crippa S, et al. Eur J Surg Oncol 2016;42:1533–9

- ❑ Pancreatic head adenocarcinoma
- ❑ Resection
- ❑ Chemotherapy
  - Conversion therapy
  - Neoadjuvant chemotherapy
  - Adjuvant chemotherapy
- ❑ CA 19-9
  - Major biochemical response
    - decrease ≥ 90%

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EJSO 43 (2017) 358–363

EJSO the Journal of Cancer Surgery

www.ejso.com

Radical surgery of oligometastatic pancreatic cancer

Type of resection

Table 2
Types and timing of hepatic resections.

Liver resection	Overall	Synchronous	Metachronous
1× atypical	55 (64.7%)	43	12
2× atypical	15 (17.7%)	14	1
3× atypical	1 (1.1%)	–	1
4× atypical	2 (2.4%)	2	–
Bisegmentectomy	2 (2.4%)	1	1
Bisegmentectomy & 1× atypical	3 (3.5%)	1	2
Right hepatectomy	6 (7.1%)	1	5
Extended right hepatectomy	1 (1.1%)	–	1
	85 (100%)	62	23

Hackert T, et al. Eur J Surg Oncol 2017;43:358-63

Updates Surg
DOI 10.1007/s13304-015-0283-6

ORIGINAL ARTICLE

Type of resection

Surgery for isolated liver metastases from pancreatic cancer

Table 1 Characteristics of patients

No.	Sex/ age	Pancreatic surgery	Postoperative course	DFI[a] (months)	Liver surgery	No. of mets (size[b])	Recurrence (DFS[c])	Follow-up (months)	Status
1	M/56	PD	PF-C, bleeding, relaparotomy	14	Wedge	1 (2,2 cm)	–	58	Alive
2	M/39	PD		7	Right Hepatectomy	1 (2,1 cm)	Multiple (20 mo)	23	Dead
3	M/55	PD	PF-A	10	Wedge	1 (3,5 cm)	Liver (4 mo)	9	Dead
4	M/41	PD	DGE-A	8	Wedge	1 (1,8 cm)	Peritoneum (8 mo)	11	Dead
5	F/52	PD		Synchro	Wedge	2 (2,6 cm)	Liver (6 mo)	8	Dead
6	M/63	PD		Synchro	Wedge	1 (0,5 cm)	Liver (7 mo)	13	Dead
7	M/75	TP	Pleural effusion	Synchro	Wedge	3 (2,4 cm)	Pancreatic bed (3 mo)	6	Dead
8	F/54	PD	PF-A	Synchro	Wedge	1 (1,7 cm)	Liver (2 mo)	8	Dead
9	M/52	PD	Pneumonia	Synchro	Wedge	2 (2,5 cm)	Multiple (4 mo)	7	Dead
10	F/65	LP	PF-A	Synchro	Wedge	2 (2,4 cm)	Liver (5 mo)	9	Dead
11	M/51	TP		Synchro	Wedge	1 (2 cm)	Multiple (2 mo)	4	Dead
12	F/78	PD		Synchro	Wedge	1 (1,8 cm)	Liver (5 mo)	11	Dead
13	F/64	LP	PF-A	Synchro	Wedge	1 (1 cm)	Liver (5 mo)	9	Dead
14	F/53	TP		Synchro	Bisegment and Wedge	3 (2,8 cm)	Liver (2 mo)	5	Dead
15	F/64	PD	PF-B	Synchro	Wedge	2 (2,5 cm)	Multiple (2 mo)	3	Alive

PD pancreatoduodenectomy, *TP* total pancreatectomy, *LP* left pancreatectomy, *PF-A,B,C* pancreatic fistula graded according to reference 19, *DGE-A,B,C* delayed gastric emptying graded according to reference 20

[a] *DFI* disease-free interval defined as the interval between pancreatic surgery and the diagnosis of liver metastases

[b] In patients with multiple metastases, the diameter of the largest lesion is reported

[c] *DFS* disease-free survival defined as the time from resection of metastases to diagnosis of recurrence

Zanini N , et al. Updates Surg 2015

- ❑ Pancreatic head adenocarcinoma
- ❑ Resection
- ❑ Chemotherapy
  - Conversion therapy
  - Neoadjuvant chemotherapy
  - Adjuvant chemotherapy
- ❑ CA 19-9
  - Major biochemical response
    - decrease ≥ 90%
- ❑ Wedge resection

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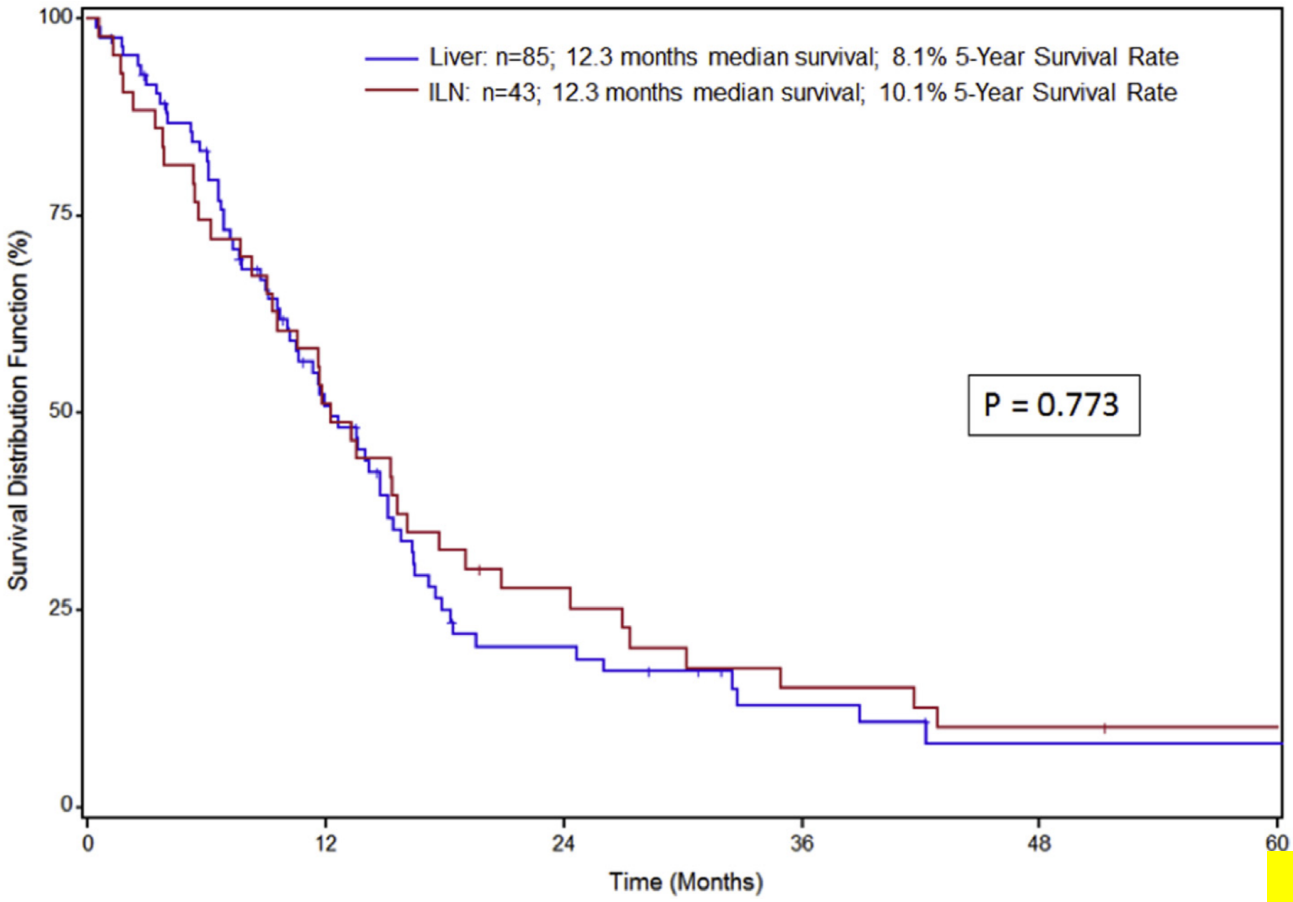
EJSO 43 (2017) 358–363

EJSO
the Journal of Cancer Surgery

www.ejso.com

Radical surgery of oligometastatic pancreatic cancer



Location

Liver *vs* Lymph nodes *

Hackert T, et al. Eur J Surg Oncol 2017;43:358-63

World Journal of Gastroenterology

Submit a Manuscript: http://www.wjgnet.com/esps/ World J Gastroenterol 2017 March 14; 23(10): 1872-1880

DOI: 10.3748/wjg.v23.i10.1872 ISSN 1007-9327 (print) ISSN 2219-2840 (online)

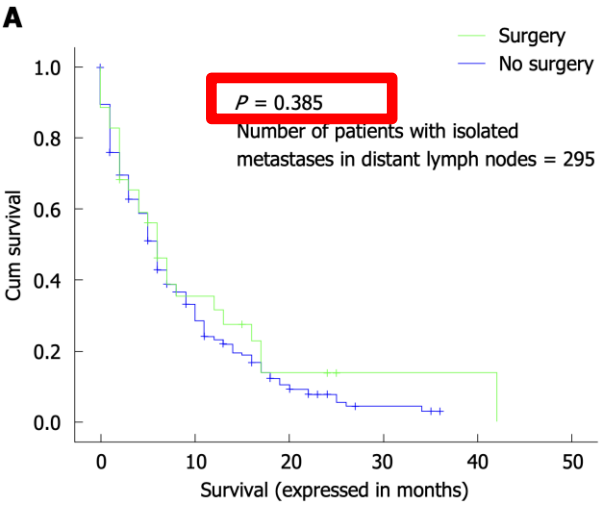
ORIGINAL ARTICLE

Observational Study

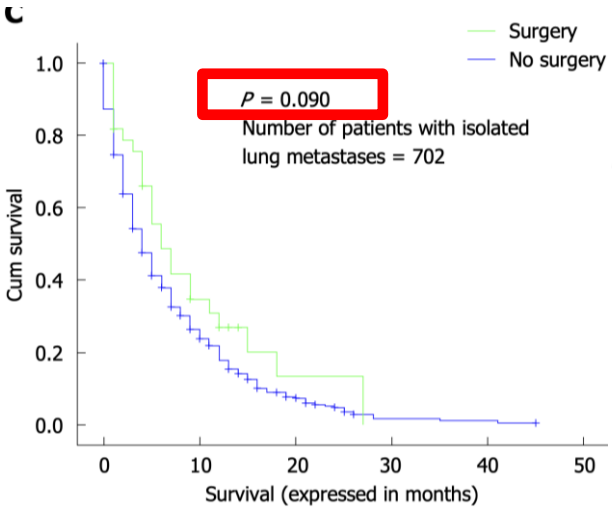
Prognostic value of site-specific metastases in pancreatic adenocarcinoma: A Surveillance Epidemiology and End Results database analysis

Location

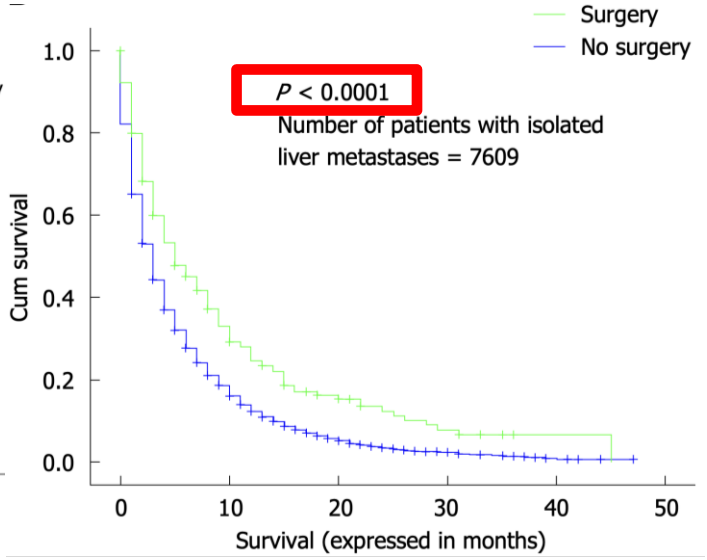
Lymph nodes



Lung



Liver



Liver

Oweira H, et al. World J Gastroenterol 2017; 23: 1872-80

- ❑ Pancreatic head adenocarcinoma
- ❑ Resection
- ❑ Chemotherapy
  - Conversion therapy
  - Neoadjuvant chemotherapy
  - Adjuvant chemotherapy
- ❑ CA 19-9
  - Major biochemical response
    - decrease ≥ 90%
- ❑ Wedge resection
- ❑ Liver only

PANCREATIC DUCTAL ADENOCARCINOMA

Time point Liver metastasis

- ❑ Synchronous
- ❑ Metachronous

SYNCHRONOUS *VS* METACHRONOUS

ELSEVIER

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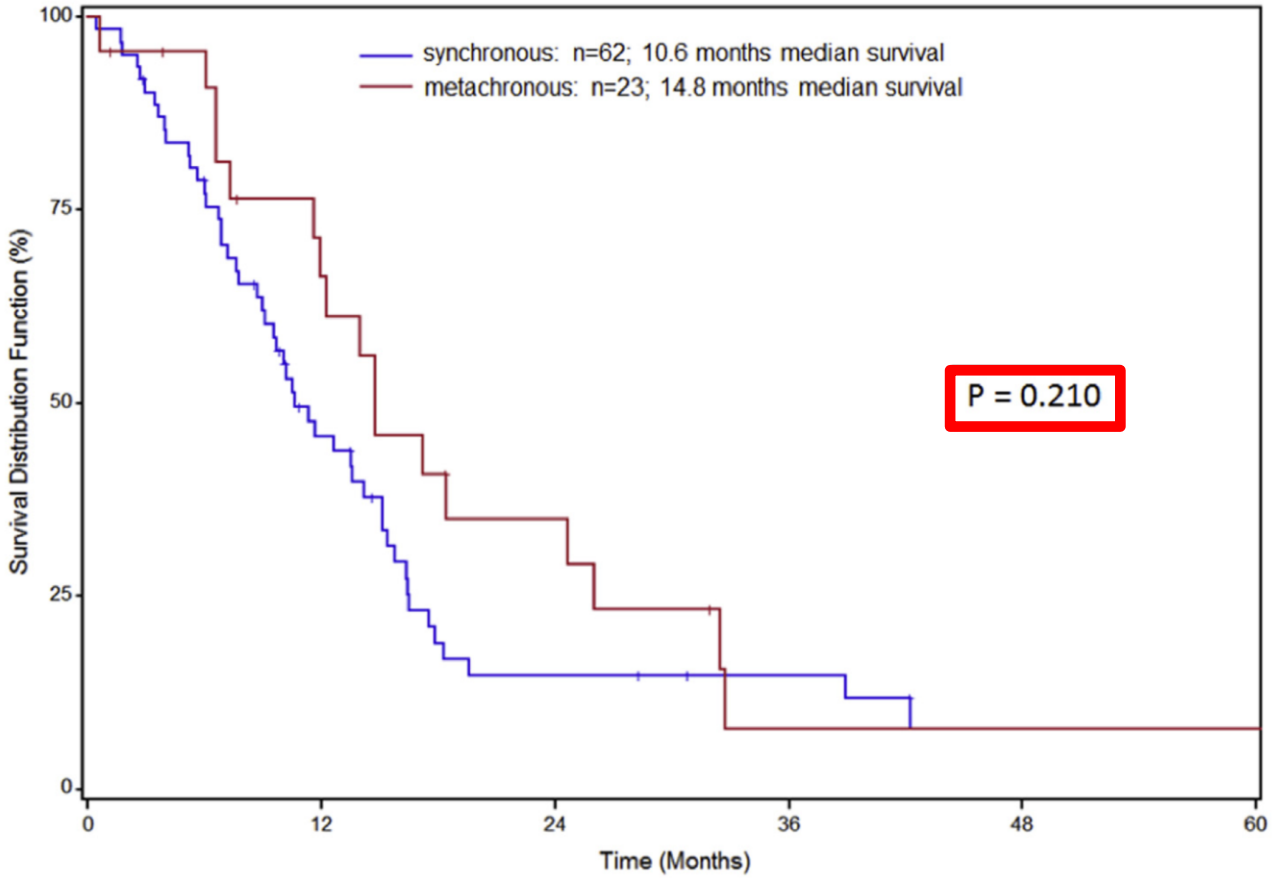
EJSO the Journal of Cancer Surgery

EJSO 43 (2017) 358–363

www.ejso.com

Radical surgery of oligometastatic pancreatic cancer



Hackert T, et al. Eur J Surg Oncol 2017;43:358-63

Synchronous *vs* Metachronous *

SYNCHRONOUS *VS* METACHRONOUS

Table 2 Potential prognostic factors and effect on overall survival

	No. of cases (%)	Median OS (mo)	95 % CI	*p* value[a]
Patient related				
Sex				
Male	8 (53)	9.1	3.1–15.1	0.245
Female	7 (47)	8.9	7.8–9.0	
Age				
<60 yrs	9 (60)	9.1	6.8–11.5	0.719
≥60 yrs	6 (40)	9.2	8.6–9.8	
Primary tumor related				
Grading				
G1	0 (0)			0.204
G2	4 (27)	6.0	1.0–11.0	
G3	11 (73)	9.2	8.6–9.8	
Resection margin status				
R0	7 (47)	9.2	8.9–9.5	0.438
R1	8 (53)	8.9	4.3–13.5	
R2	0 (0)			
Metastases related				
Timing				
Metachronous	4 (27)	11.4	0.0–25.1	0.038
Synchronous	11 (73)	8.3	6.9–9.7	
Number				
Single	9 (60)	11.0	5.4–16.6	0.056
Multiple	6 (30)	8.0	6.1–9.9	
Size of the largest lesion				
<2.0 cm	5 (33)	11.0	6.5–15.5	0.863
≥2.0 cm	10 (67)	9.1	5.9–12.3	

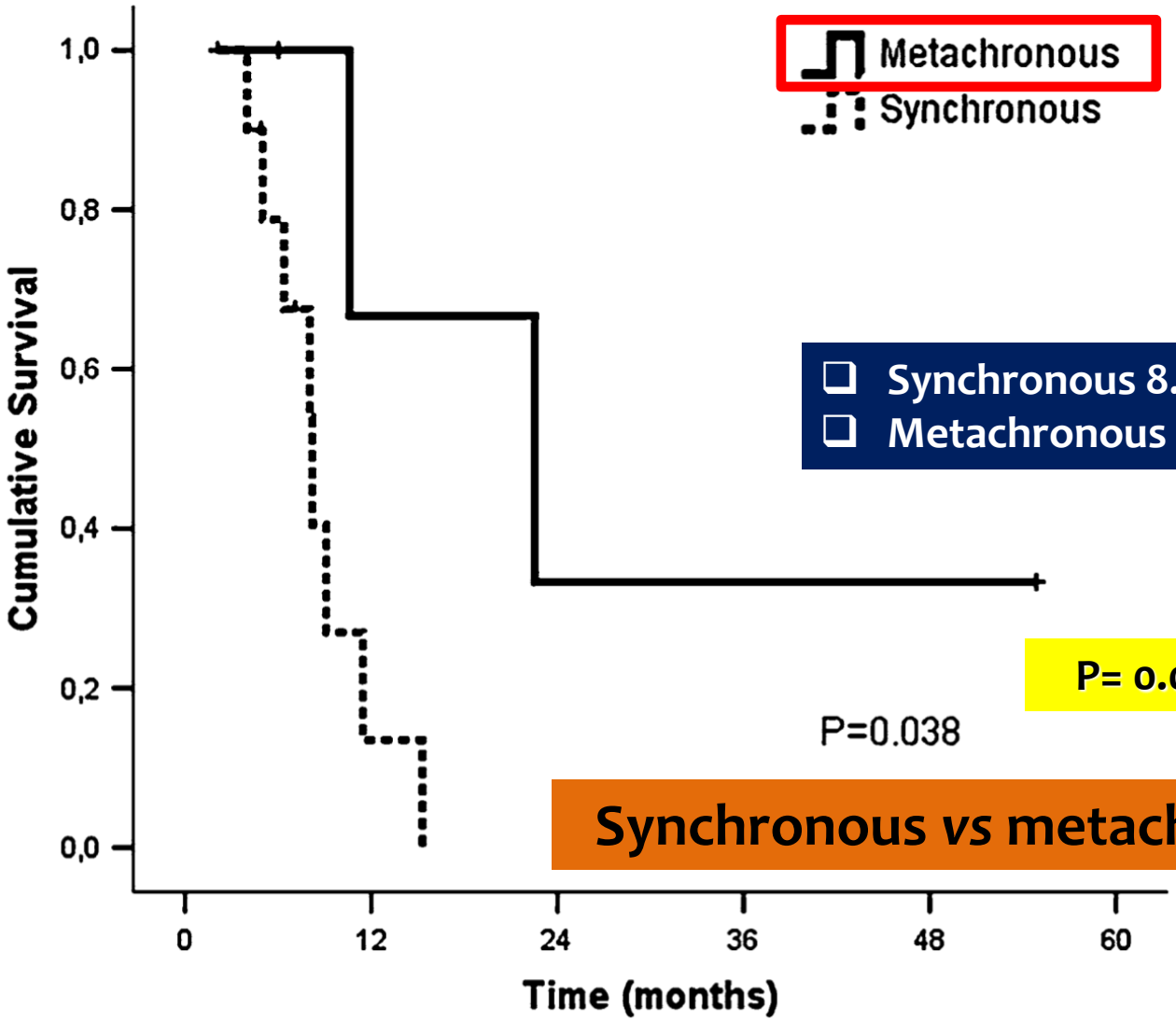
OS overall survival defined as the time interval between surgery for liver metastases and last follow-up or death

[a] Log-rank test

Zanini N , et al. Updates Surg 2015

Metachronous

POTENTIAL PROGNOSTIC FACTORS



- Synchronous 8.3 months
- Metachronous 11.4 months

P= 0.038

Synchronous *vs* metachronous

Zanini N , et al. Updates Surg 2015

- ❑ Pancreatic head adenocarcinoma
- ❑ Resection
- ❑ Chemotherapy
  - Conversion therapy
  - Neoadjuvant chemotherapy
  - Adjuvant chemotherapy
- ❑ CA 19-9
  - Major biochemical response
    - decrease ≥ 90%
- ❑ Wedge resection
- ❑ Liver only
- ❑ Synchronous or metachronous

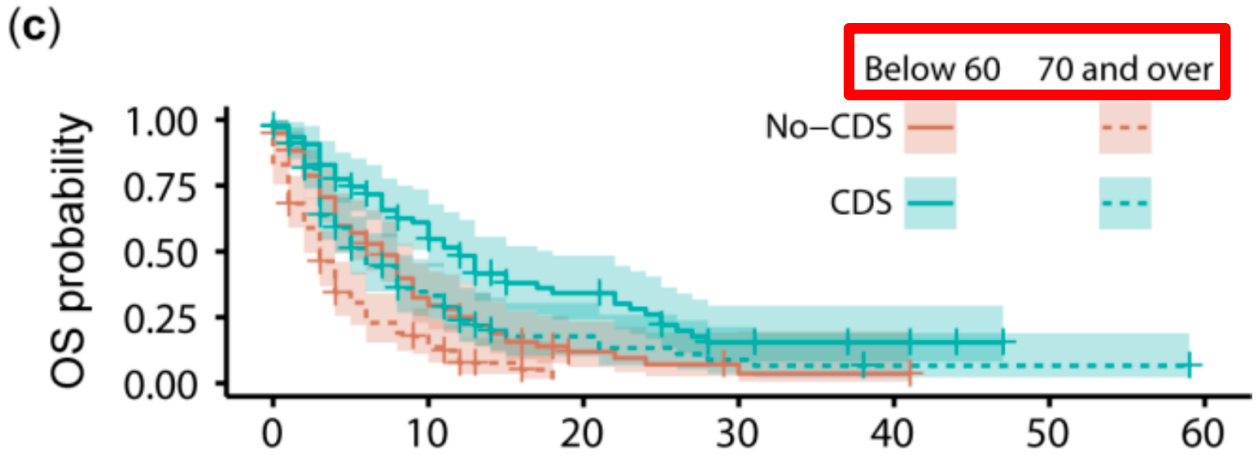
cancers

MDPI

Article

Survival Benefit of Resection Surgery for Pancreatic Ductal Adenocarcinoma with Liver Metastases: A Propensity Score-Matched SEER Database Analysis

AGE



- Younger than 70

Cancer-directed surgery

- ❑ Pancreatic head adenocarcinoma
- ❑ Resection
- ❑ Chemotherapy
  - Conversion therapy
  - Neoadjuvant chemotherapy
  - Adjuvant chemotherapy
- ❑ CA 19-9
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cancers

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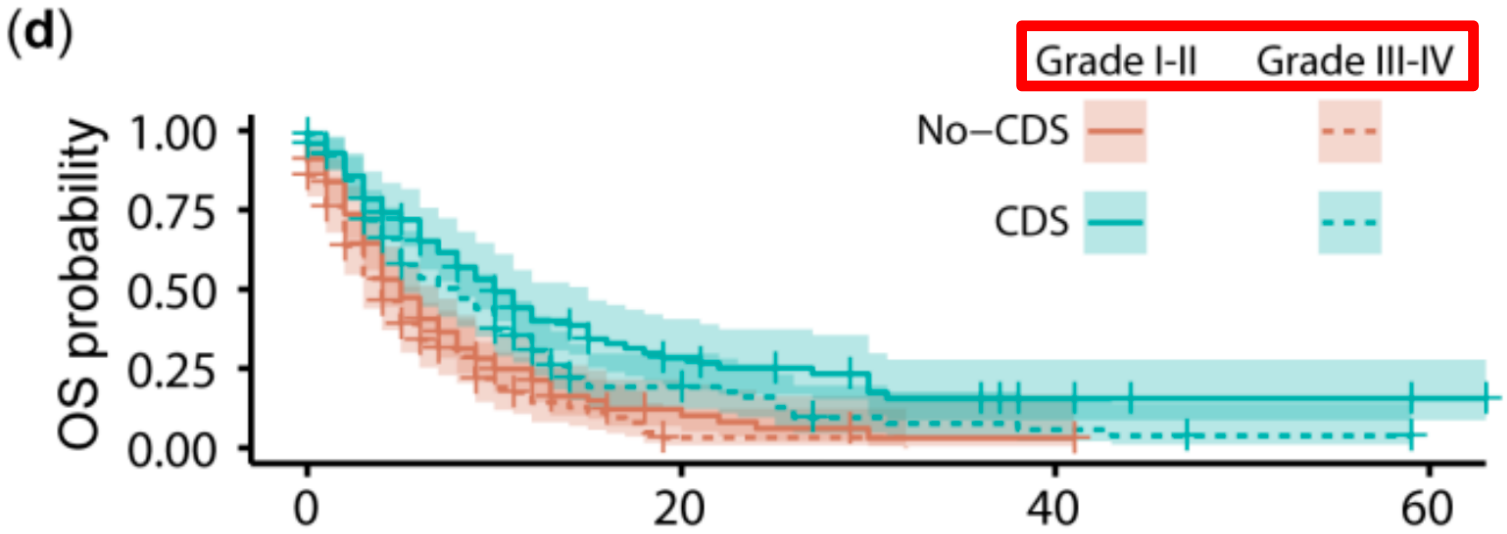
Article

Survival Benefit of Resection Surgery for Pancreatic Ductal Adenocarcinoma with Liver Metastases: A Propensity Score-Matched SEER Database Analysis

Differentiation



❑ **Well-differentiated tumors**

Cancer-directed surgery

Pausch TM, et al. Cancers 2022

- Pancreatic head adenocarcinoma
- Resection
- Chemotherapy
  - Conversion therapy
  - Neoadjuvant chemotherapy
  - Adjuvant chemotherapy
- CA 19-9
  - Major biochemical response
    - decrease ≥ 90%
- Wedge resection
- Liver only
- Synchronous or metachronous
- Younger than 70
- Well-differentiated tumors

STUDIES ON SURGERY OF LIVER OLIGOMETASTASIS IN PDAC

Author	Patients	Time point	Chemotherapy	Overall survival (mo)	Mortality
Shrikhande (2007)	11	Synchronous	Adjuvant	11.4	0
Klein (2012)	22	Synchronous	Adjuvant	16.6	0
Zanini (2015)	15	Synchronous Metachronous	Adjuvant	9.1	0
Tachezy (2016)	69	Synchronous	Neoadjuvant	14	1
Crippa (2016)	11	Synchronous	Neoadjuvant	39	N/A
Hackert (2017)	85	Synchronous Metachronous	Adjuvant	12.3	2.9
Frigerio (2017)	24	Synchronous	Neoadjuvant	56	0
Takeda (2022)	10	Synchronous	Neoadjuvant	54.6	0
Hank (2023)	45	Synchronous	Neoadjuvant	25.5	1
Bachellier (2022)	92	Synchronous	Neoadjuvant	18.2	5.4
Shao (2021)	50	Synchronous	Neoadjuvant	16	0
Safi (2021)	35	Synchronous	Neoadjuvant	10.3	7.9

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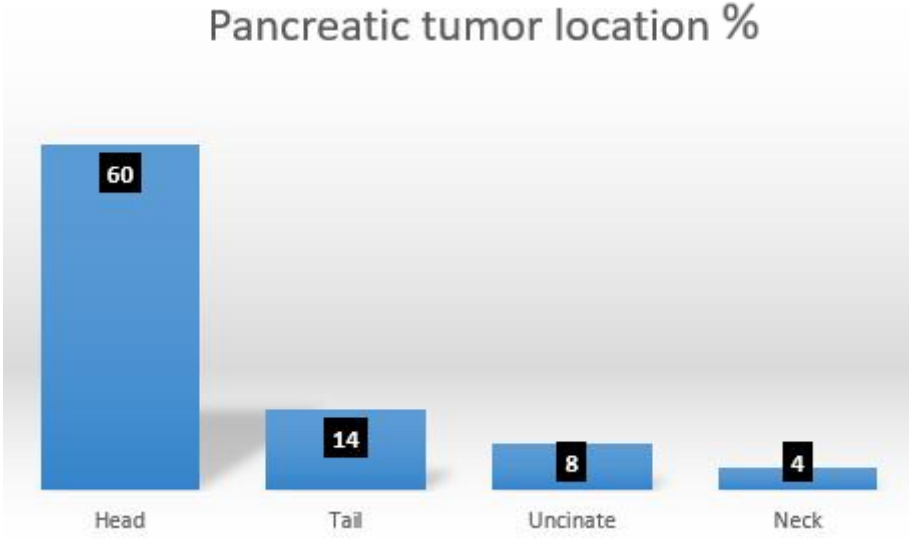
PANCREAS STUDY GROUP

Fabrizio Di Benedetto (Modena University, Italy)
Orlando J. Torres (Maranhão Federal University, Brazil)

- **33 participants, 50 cases from 11 centers:**

Deniz Balci, Orlando J. Torres, Nikolaos Machairas, Erdins Kamer, Kvasivka Oleksandr, Alpen Yahya Gumusoglu, Nur Hilal Kiziltoprak, Marco Vivarelli, Maria Conticchio, Andrea Belli, Reinhold Klug

Pancreatic tumor location



Preoperatively pancreatic tumor size (Mean ± SD)	29.35 ± 17.65
Preoperatively CA 19-9 (Mean ± SD)	826.9 ± 1951.69

Pancreas Study Group

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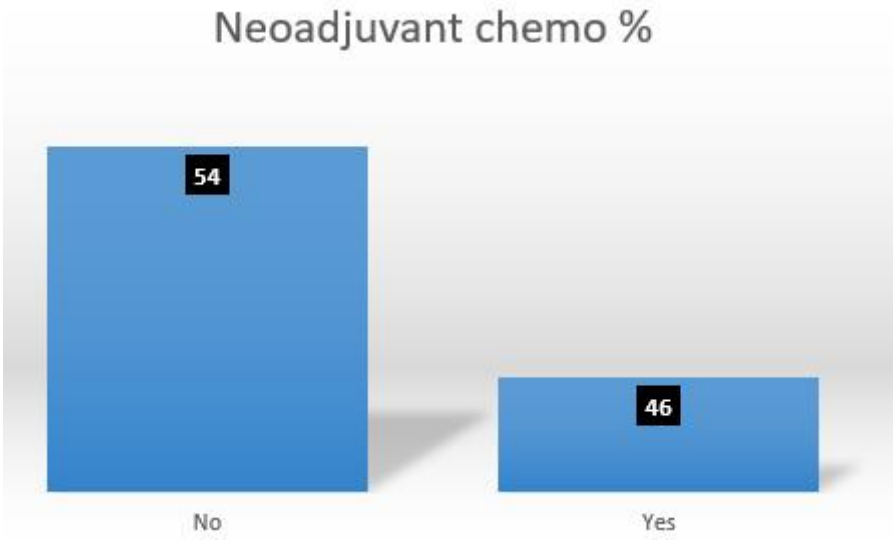
Neoadjuvant chemotherapy



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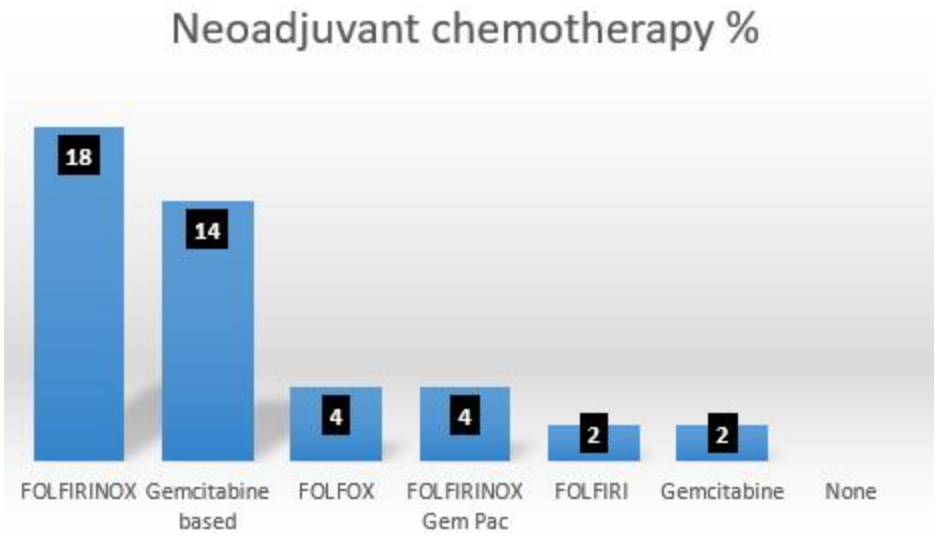
Neoadjuvant chemotherapy



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Liver segments involved

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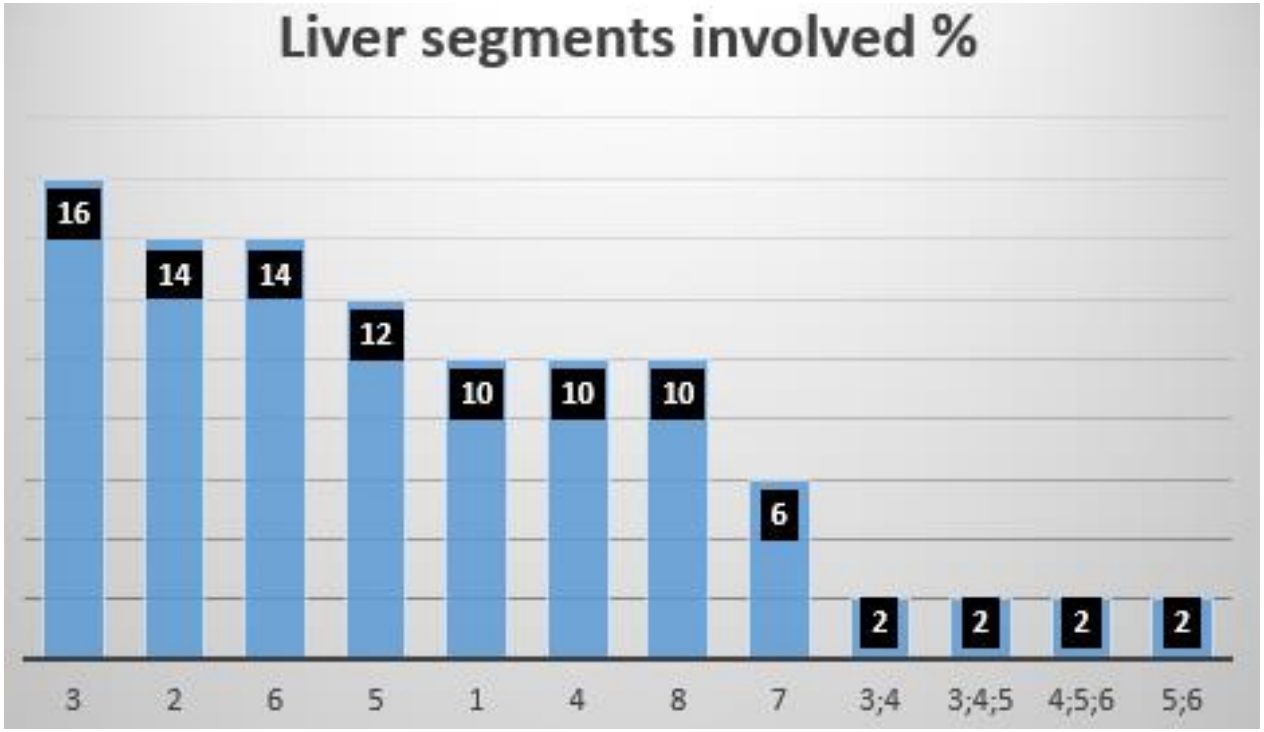

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Liver resection

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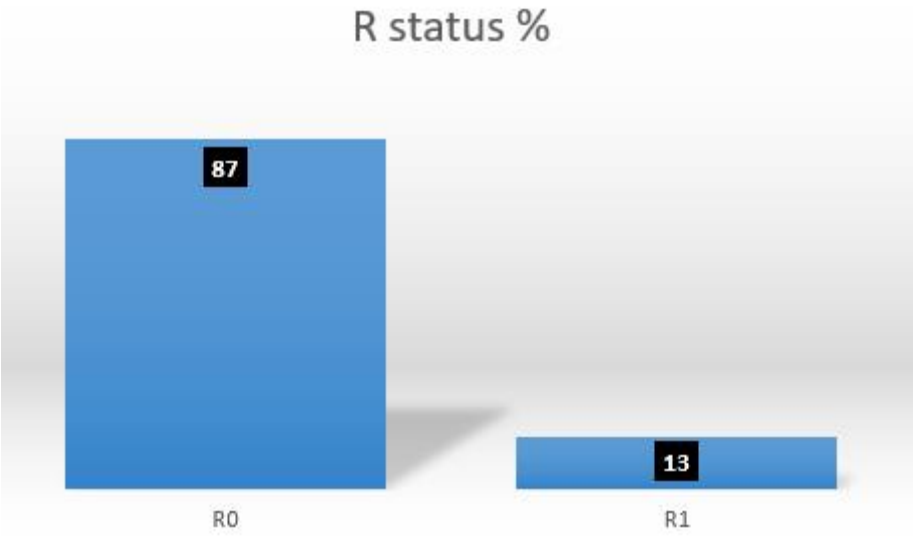
R Status



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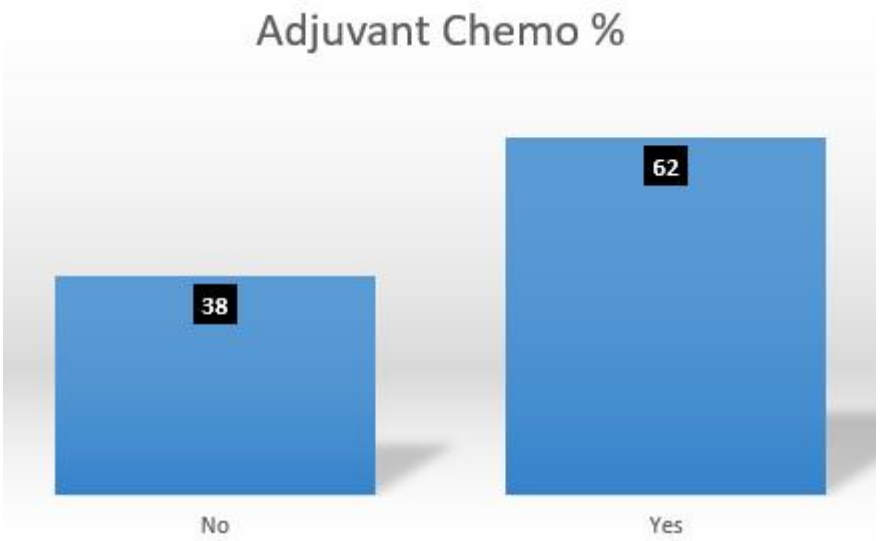
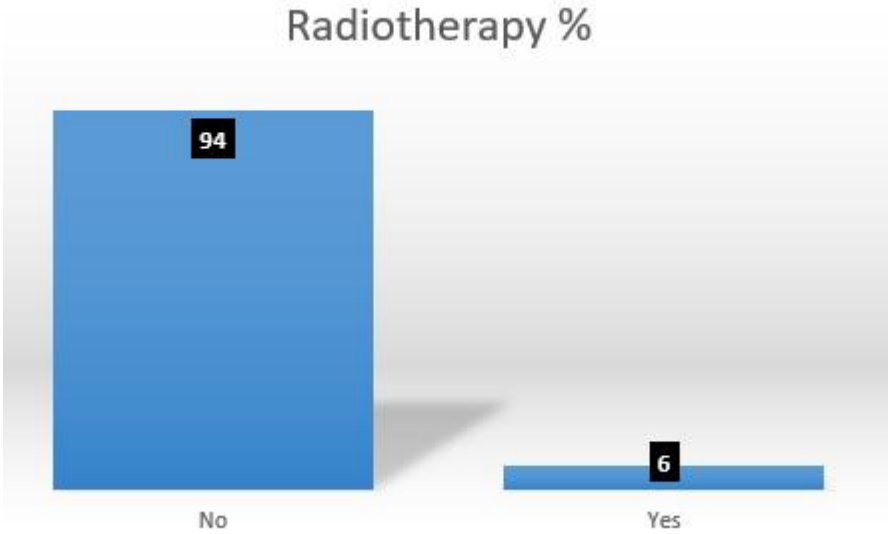
Adjuvant chemo and radiotherapy





Number of metastasis after adjuvant therapy (Mean ± SD)	0.72 ± 1.71

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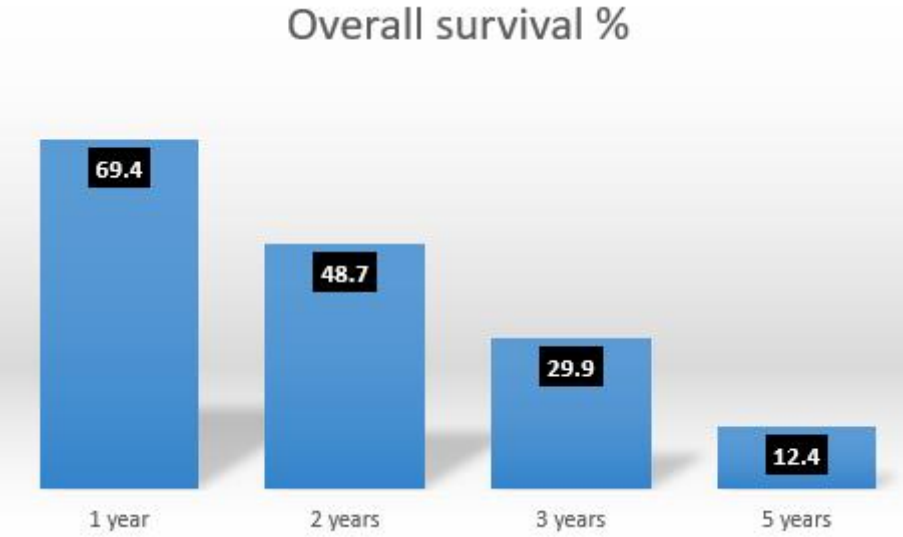
Overall survival



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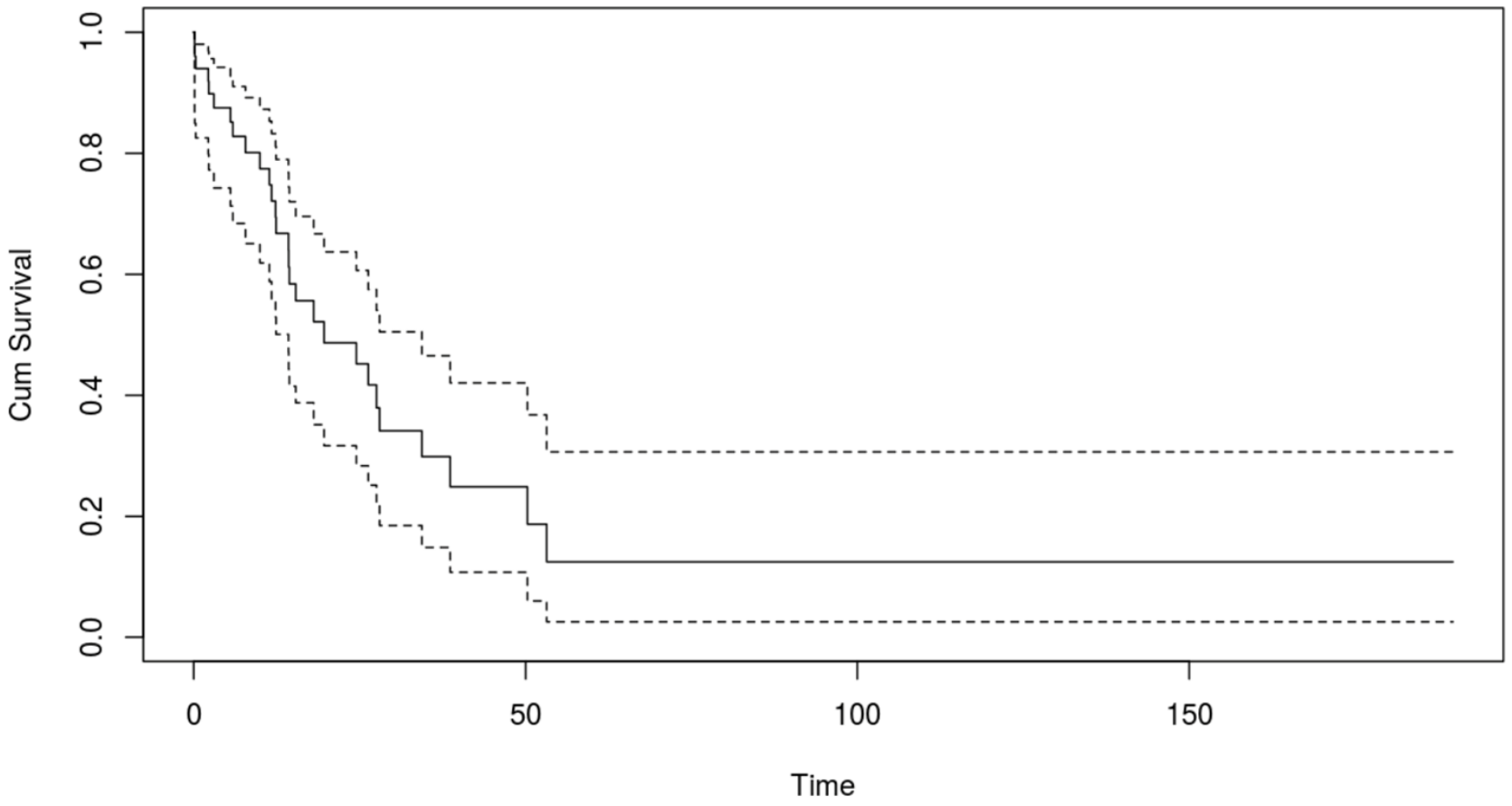
ISLS INTERNATIONAL SOCIETY OF LIVER SURGEONS

Overall survival



Pancreas Study Group

Ongoing clinical trials of surgery for oligometastasis of PDAC

Registration number	Study name	Objective	Definition of oligometastasis	Treatment arm	Primary endpoint	Phase	Country	Start of study
NCT03398291	CSPAC-1[51]	PDAC with liver oligometastasis	≤3 liver metastases Irrespective of their distribution within the liver lobes	Arm 1: Simultaneous resection of the primary tumor and liver metastasis after conversion chemotherapy Arm 2: Standard chemotherapy	Real OS (from diagnosis to death)	III	China	2019
NCT04617457	HOLIPANC[52]	PDAC with liver oligometastasis	≤5 liver metastases Potentially resectable or treatable by ablative procedures	NAC with liposomal irinotecan combined with oxaliplatin and 5-FU	OS-res (OS after R0/R1 resection)	II	Germany	2021
UMIN000027229/ jRCTs051180199	SP Study[50]	PDAC with peritoneal metastasis	Inclusion criteria Macroscopic peritoneal dissemination with otherwise R PDAC Microscopic peritoneal dissemination with UR-LA PDAC	Arm1: Intravenous and intraperitoneal paclitaxel with S-1 Arm2: Gemcitabine plus nab-paclitaxel	OS	III	Japan	2020

Abbreviations: 5-FU, 5-fluorouracil; NAC, neoadjuvant chemotherapy; OS, overall survival; PDAC, pancreatic ductal adenocarcinoma; R, resectable; UR-LA, unresectable locally advanced.

Yasuda S, et al. Ann Gastroenterol Surg. 2023;7:358–66.

CONCLUSION

- ❑ Surgery can be done safely
- ❑ Liver resection does not lead to higher mortality
- ❑ Selected patients benefits from surgical resection
- ❑ Oligometastases
- ❑ R0 resection
- ❑ Limited to the liver
- ❑ MRI evaluation
- ❑ CA 19-9 <400 U/mL

  Major biochemical response

  decrease ≥ 90%
- ❑ Synchronous *VS* Metachronous *
- ❑ Neoadjuvant chemotherapy
- ❑ Adjuvant chemotherapy
- ❑ Multi-institutional RCT are required

Thanks!

Lençóis Maranhenses - Brazil