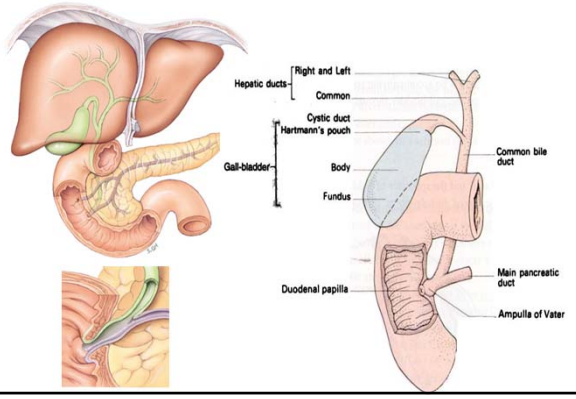
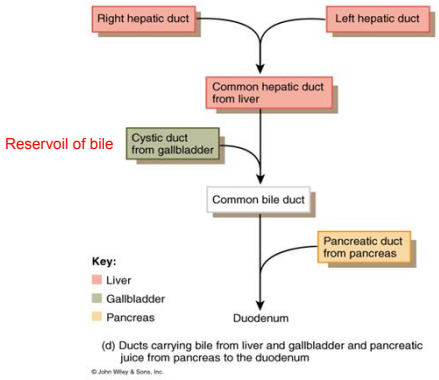
膽胰癌– 外科治療
Surgery for biliopancreatic cancer

Yan-Shen Shan, MD, PhD,
Professor
Institute of Clinical Medicine, College of Medicine, NCKU
Division of General Surgery, Department of Surgery, NCKUH
Tainan, Taiwan

Anatomy of hepatobiliary pancreatic tract



The flow of bile



(d) Ducts carrying bile from liver and gallbladder and pancreatic juice from pancreas to the duodenum

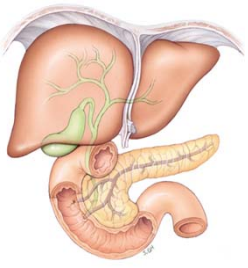
Pathophysiologic Classification of Jaundice

- **Hemolytic Jaundice**
- **Hepatic Jaundice**
- **Obstructive Jaundice (Cholestasis):** (surgical jaundice)

Intrahepatic (including Klatskin tumor)
Extrahepatic
- Gallstones
- Sclerosing cholangitis
- Carcinoma of Ampulla of Vater
- Carcinoma of Pancreas (head)
- Carcinoma of bile ducts ,
- Post-traumatic stricture
- Metastatic
- Lymph nodes of porta hepatis

Surgical procedures
depends on etiologies

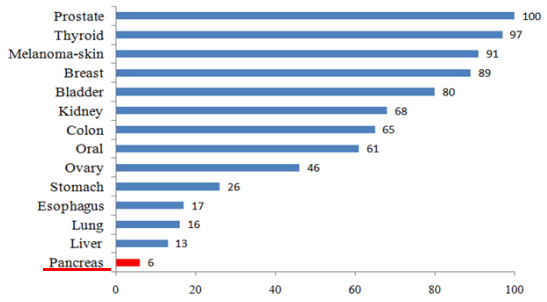
- Hepatectomy (R't or L't) with Roux-en-Y hepaticojejunostomy
- Cholecystectomy
- Choledocholithtomy with T-tube
- Sphincteroplasty
- Pancreaticoduodenectomy



Management of pancreatic cancer in NCKUH

6

Survival rates in the world



Five-year Relative Survival Rates (%) by Stage at Diagnosis, 1999-2005

American Cancer Society, Surveillance and Health Policy Research, 2010

7

Pancreatic Cancer

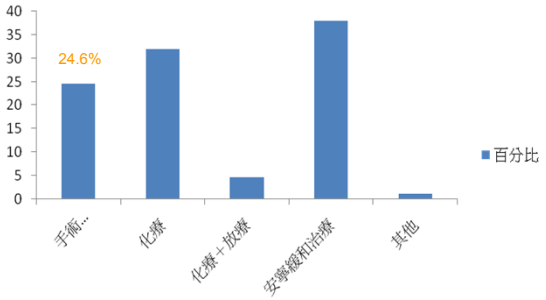
- Adenocarcinoma of the pancreas continues to be a most formidable disease:
  - The 4th leading cause of cancer-related death in USA
  - The 8th leading cause of cancer-related death in Taiwan (2014)
  - Median survival of metastatic/unresectable pancreatic cancer: 4-6 months

Why the prognosis is poor in pancreatic cancer?

1. Early metastasis: clinical early but molecular late
2. Lower resectability (15-20%), poor prognosis in resectable patients
3. Low efficiency in chemotherapy
4. Special role of pancreas in GI tract: malnutrition, infection (fungus, GNB)

9

The ratio of different modality for management of pancreatic cancer in NCKUH



Why the prognosis is poor in pancreatic adenocarcinoma?

1. Early metastasis: clinical early but molecular late
2. Lower resectability
3. Low efficiency in chemotherapy
4. Special role of pancreas in GI tract: malnutrition, infection (fungus, GNB)

→ How can we improve the resectability?

11

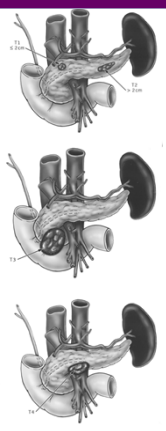
Staging of pancreatic cancer

	Primary Tumor (T)
TX	cannot be determine
T0	No evidence
Tis	In situ
T1	Limited to pancreas, 2cm or less in greatest dimension
T2	Limited to pancreas, more than 2cm in greatest dimension
T3	Extends beyond pancreas but without involvement of celiac axis or SMA
T4	Involves celiac axis or the SMA

	Regional Lymph Nodes (N)
NX	Cannot be assessed
N0	No regional lymph node metastasis
N1	Regional lymph node metastasis

	Distant Metastasis (M)
MX	Cannot assess
M0	No distant metastasis
M1	Distant metastasis

Tram et al. "Diagnosis, Staging, and Surveillance of Pancreatic Cancer ." Am. J. Roentgenol. May 2003 180:1311-1323



Guideline for Surgery

RESECTABLE

No distant metastases
Clear fat plane around celiac and superior mesenteric arteries (SMA)
Patent superior mesenteric vein (SMV)/portal vein

BORDERLINE RESECTABLE

Severe unilateral or bilateral SMV/portal impingement
<180 degree tumor abutment on SMA
Abutment or encasement of hepatic artery, if reconstructible
SMV occlusion, if of a short segment, and reconstructible

UNRESECTABLE

Distant metastases
Greater than 180 degrees SMA encasement, any celiac abutment
Unreconstructible SMV/portal occlusion
Aortic invasion or encasement

Surgical procedures for pancreatic cancer

- Pancreatic head cancer:
  Pancreaticoduodenectomy (Whipple, PD) or pylorus-preserving pancreaticduodenectomy (PPPD)
- Body and tail pancreatic cancer:
  Distal pancreatectomy

14

History of Pancreaticodoudenectomy

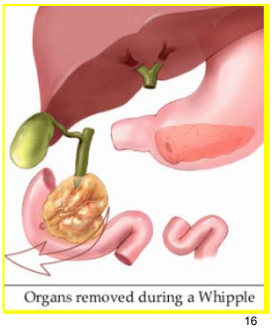
- 1912: Walter Kausch
- 1935: Allen Whipple
  - Two-stage: P-duct ligation
  - 1942: One-stage
    - PJ anastomosis
    - Mortality:31%
- 1942: Kenneth Watson
  - Pylorus-preserving PD (PPPD)

Dr. Walter Kausch

Dr. Allen Whipple

Major Procedures in PD and PPPD

- Expose phase (evaluation of resectability)
- Removal phase
- Reconstruction phase

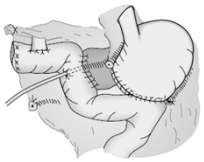


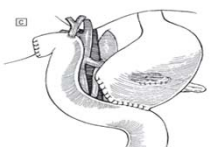
Organs removed during a Whipple

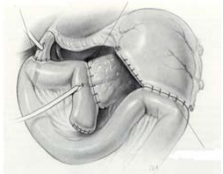
16

Reconstruction phase in Whipple

- Hepaticojejunostomy
- Pancreaticojejunostomy (pancreaticogastrostomy):
  duct-to-mucosa (with or without stent, internal or external), invagination
- Gastrojejunostomy

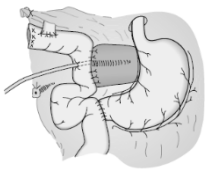


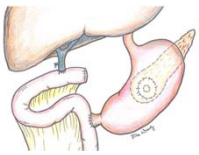


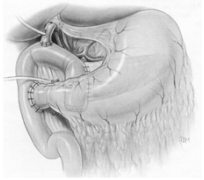


Reconstruction phase in In PPPD

- Hepaticojejunostomy
- Pancreaticojejunostomy (pancreaticogastrostomy):
  duct-to-mucosa (with or without stent, internal or external), invagination
- Duodenojejunostomy







18

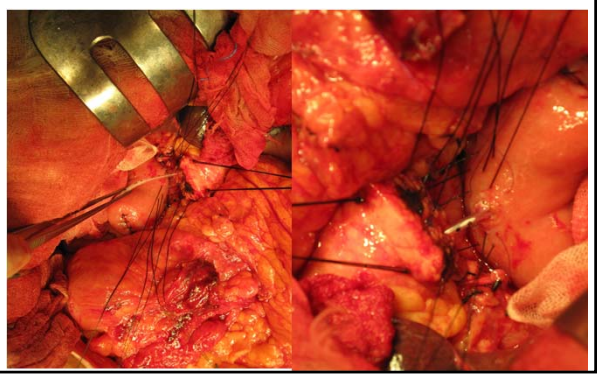
Surgical Mortality and Morbidity

(before 2009)

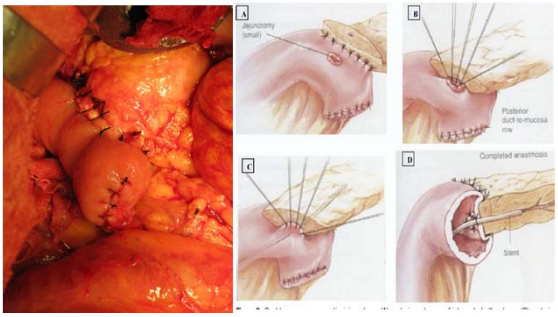
- Surgical mortality
  - — < 5%, even 0% in high volume hospital
  - — 2.6% in NCKUH, 4.8% in Taipei VGH
- Surgical morbidity
  - — in experienced centers: 46% - 59%
  - — around 40% in NCKUH (including 26% DGE and 7.6% pancreatic leakage)
  - — 35.6% in Taipei VGH

Yeo CJ, et al. Ann Surg 1998; 227:821-831.
Trede M, et al. Ann Surg 1990; 211:447-458.
Cameron JL, et al. Ann Surg 1993; 217:430-438.
Castillo CFD, et al. Arch Surg 1995; 130:295-300.
Yeo CJ, et al. Ann Surg 1997; 226:248-260.

Duct-to-Mucosa +Invagination



Duct-to-Mucosa+ Invagination (present in NCKUH)



J Am Coll Surg Vol. 208, No. 5, May 2009

The patient number of pancreatic surgery in NCKUH (2010~2014.Aug 8th)

Age	10-39	40-49	50-59	60-69	70-79	≥80	Total
PD and PPPD		29	53	60	52	15	221
DP	5	10	15	10	10	4	54

Patient distribution

總人數：273
台北：4
新竹：2
台中：4
彰化：1
南投：1
嘉義：20
台南：218
高雄：20
屏東：2
台東：1

Mortality in pancreatic surgery:

1/221 (0.45%) in PD and PPPD, 1/54 (1.9%) in DP
morbidity: around 10%, hospital:12 days

- 82 y/0, borderline resectable pancreatic head cancer,
- PD with total pancreatectomy and portal vein resection
- Postoperative complication: late SMV stricture with small molecular heparin treatment
- Died 29days after resection due to suspicion of sepsis (didn't survey for sign of DNR)

Resectable pancreatic cancer:
Stage I and Stage II

- Patients with resectable disease, standard treatment is surgical resection
- Surgery offers only chance for cure **but**

~Following potentially curative PD, disease recurs in 80-90% of patients
~Median survival ranges: 13-20 months
5 year survival rate: ~20%
~Most common sites of first recurrence are liver metastasis and local-regional failure

25

How about Taiwan's results?
(before 2011)

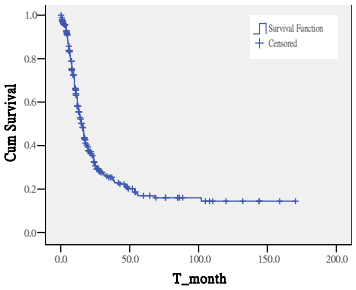
- Six medical centers:
  NCKUH, NTUH, VGHTC, VGHKH, TMH, Changhua-Christian Hospital
- Pancreatic head cancer

Demographics of patients with pancreatic head cancer from six medical centers

Characteristics		Operation method		Univariate *P-value*	Multivariate *P-value*
		Whipple (n=307)	PPPD (n=124)		
Sex	Male	196	70	0.153	0.581
	Female	111	54		
Age (years), mean ± SD		64.7 ± 10.1	64.9 ± 12.4	0.883	0.567
Blood loss (ml), mean ± SD		847.7 ± 809.3	648.3 ± 541.7	0.021	0.363
Operation time (min), mean ± SD		407.0 ± 140.0	366.0 ± 152.7	0.065	
Resection margin:	R0:R1	231:42	89:10	0.194	
Differentiation	Poor	34	19	0.385	
	Moderate	218	79		
	Well	43	17		
LN	Positive	124	25	0.046	0.777
	Negative	78	29		
Recurrence	Yes	200	85	0.834	
	Nil	89	36		
Survival	Yes	91	71	0.807	
	nil	201	84		

27

After five years, the risk of recurrence is very low



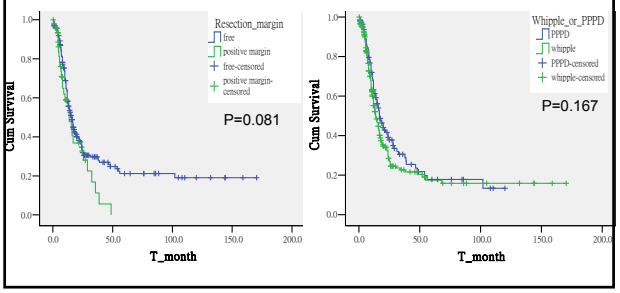
1-year survival: 62.0%
3-year survival: 25.4%
5-year survival: 17.0%
10-year survival: 14.4%

Median Survival: 15.3 m

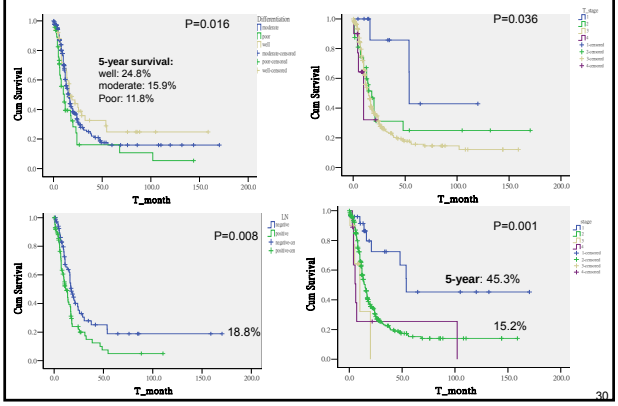
28

Free margin patients had longer survival

5-year survival: Whipple 16.7%
PPPD 17.8%



Well Differentiation and Early Staging Achieved Good Overall Survival



30

Multivariate analysis of prognostic factors for recurrence-free survival in patients with pancreatic head cancer

Parameter	Disease-free survival		
	OR	**95% CI**	***P-value***
Age	1.011	0.997-1.025	0.128
Differentiation (poor/ moderate or well)	0.617	0.372-1.023	0.061
Stage (I/II-IV)	5.405	1.730-16.95	0.004

31

Multivariate analysis of prognostic factors for overall survival in patients with pancreatic head cancer

Parameter	Disease-free survival		
	OR	95% CI	*P-value*
Age	1.006	0.984-1.028	0.614
Preoperative drainage (yes/ nil)	0.665	0.427-1.037	0.072
Differentiation (poor/ moderate or well)	0.607	0.287-1.287	0.405
LN (positive/ negative)	0.638	0.408-1.000	0.050
T stage (T1/ T2-4)	3.230	0.514-20.00	0.212

32

Locally Advanced Pancreatic Cancer:

Stage III (T4, N0-1,M0)

- Surgically unresectable tumor (extension or involving the surrounding vessels or organs) without evidence of distant mets.
- 26% of pancreatic cancer at diagnosis
- The median survival is less than 12 months, despite the use of chemotherapy, chemoradition, or both.
- SEER: 5-year survival rate is 8.7%

AJCC 6th ed. New York, NY: Springer, 2002,pp157-164

33

Therapeutic Modalities Used in Locally Advanced Pancreatic Cancer:

No universal protocol

- Chemotherapy
- Radiation
- Pancreatic enzymes and diabetic medications
- Stents; ERBD/ PTCD
- Palliative surgery

Possible curative surgery following neoadjuvent treatment

34

How to Improve Resectability

- Methods:

  SMA approach

  Neo-adjuvant therapy for locally advanced therapy

  Chemotherapy

  Concurrent chemoradiation

SMA approach

- Indications
  - Uncinate process lesions
  - Major vessel resection

SMA approach

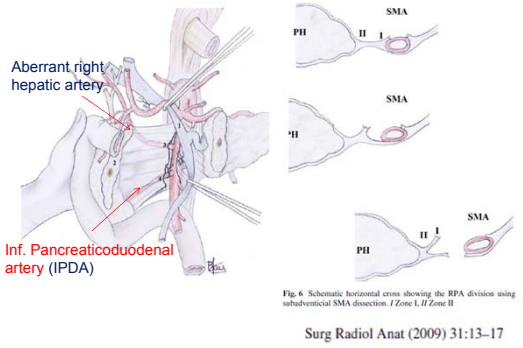
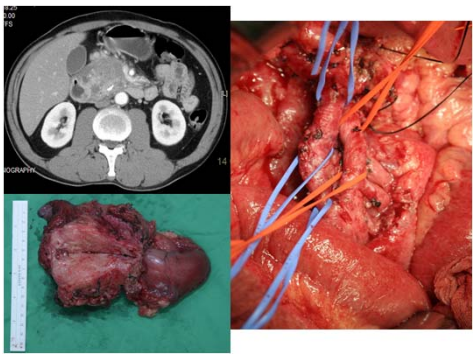


Fig. 6 Schematic horizontal cross showing the RPA division using subadventicial SMA dissection. *I* Zone I, *II* Zone II

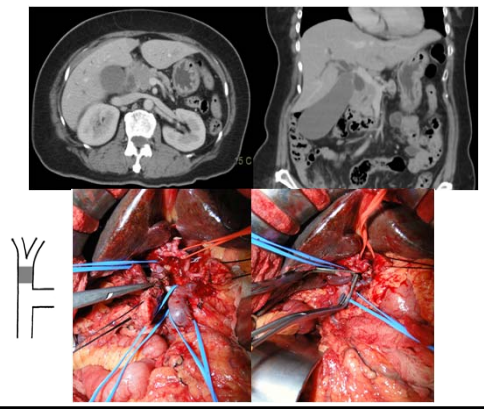
Surg Radiol Anat (2009) 31:13–17

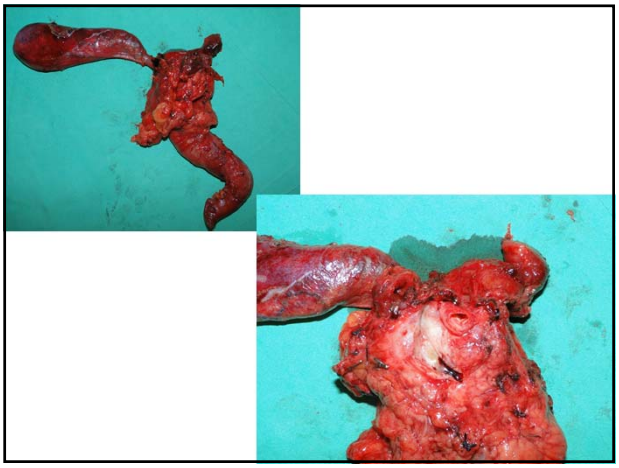
Uncinate process lesions:

Chronic pancreatitis



Portal vein invasion

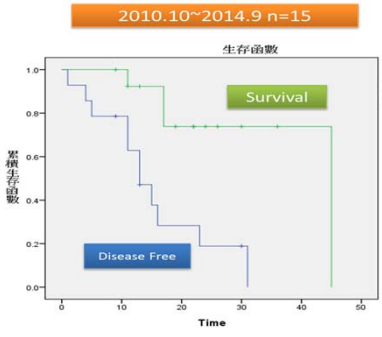




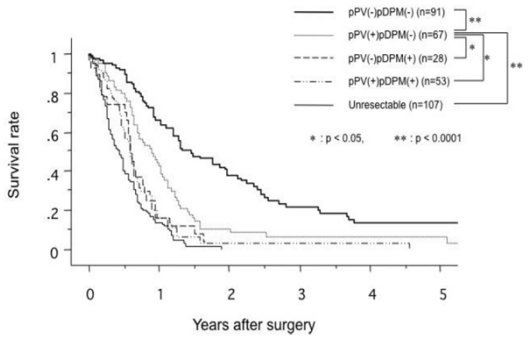
NCKUH initial experience

Age	Sex	Dx TMN	Length of vein resected	OP time (min)	PV clamping time (min)	Blood loss (ml)	Complications	Mortality	LOS	Survival (m)
62	F	T3N1	2cm	300	NA	700	Bleeding pneumonia	n	58	54
48	M	T3N1	2cm	302	NA	800	n	n	25	13
42	M	T3N1	3cm	430	42	450	n	n	15	>9
62	M	T3N1	4.5cm	442	28	600	Hemobilia (PTCD)	n	13	>9
73	M	T3N1	2cm	450	14	1600	n	n	25	>7
62	F	T3N1	3cm	390	14.5	1000	n	n	14	+

Survival of PDCA with PV resection

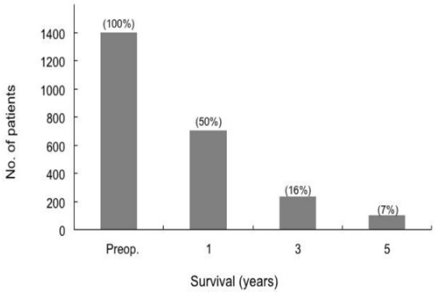


Median DFS: 14 ms
Median OS: not reached



An Integrated Textbook of Basic Science, Medicine, and Surgery, 2nd

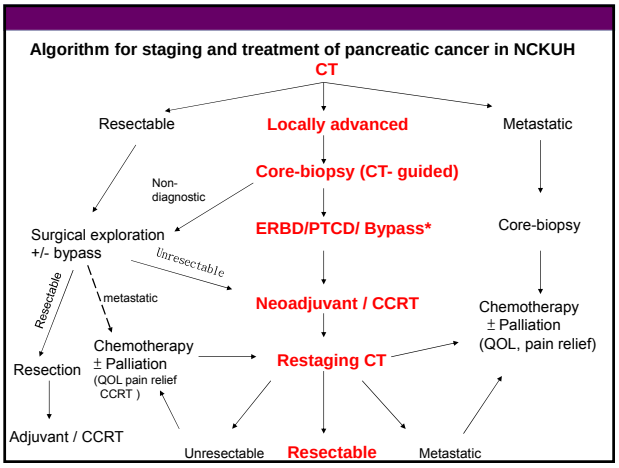
Survival of PDCA patients received portal vein resection



Cancers **2010** *24 November 2010*

How to improve resectability in LAPC, borderline, or uncinate pancreatic cancer

- Methods:
  - SMA approach
  - Neo-adjuvant therapy for locally advanced therapy
    - Chemotherapy
    - Concurrent chemoradiation



Criteria of locally advanced pancreatic cancer in NCKUH

- Unresectable locally advanced pancreatic ca:
  failed exploratory laparotomy
  computed tomography (CT)
- The criteria of CT: tumor involved
  confluence of portal and splenic vein,
  superior mesentery artery,
  severe peri-tumor soft tissue invasion, and
  extensive lymphoadenopathy in the celiac trunk.

47

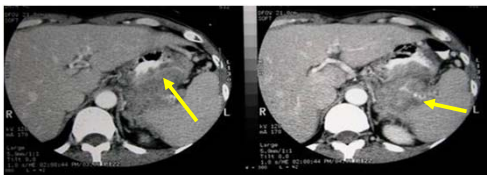
Case 1

- 55 year-old male
- Left flank dull pain with radiation to back since June, 2003
- Decrease of appetite
- Weight loss (3 kg/month)
- PPU, subtotal gastrectomy + BII, 30 years ago
- Abdominal echo (June 16, 2003): pancreatic tail mass

Tumor marker	CEA	CA125	CA199	CA153
July 9, 2003	1.2	11.6	4.9	10.2

48

Abdominal CT Pancreatic tail tumor (7x6x4 cm) with stomach invasion



Exploration: Unresectable,
A huge pancreatic tail tumor fixed to retroperitoneum with invasion to stomach, spleen, liver, diaphragm, mesocolon, and SMA root
Biopsy: adenocarcinoma

49

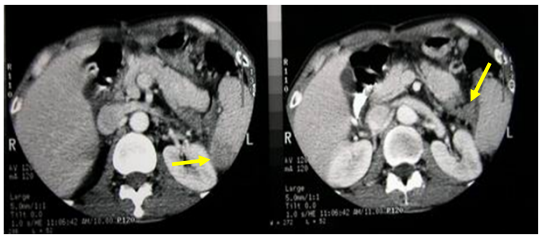
Treatment - CCRT

Regimen:

- Radiotherapy with 4500 cGy/25Fx
- Chemotherapy with Gemcitabine 400 mg/m^2 + Oxaliplatin 30 mg/m^2 , q2w x III
- After radiotherapy, chemotherapy with Gemcitabine 1000 mg/m^2 ,q2w x III

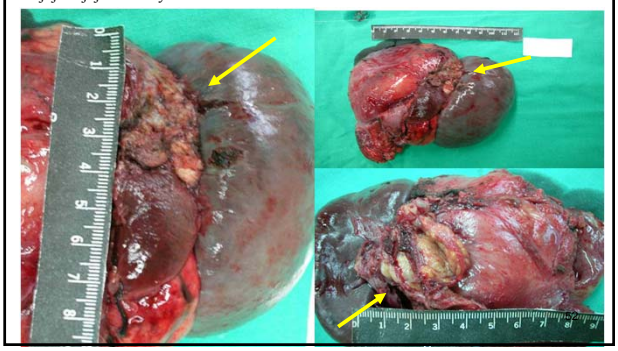
50

Sep.25, 2003 After CCRT: Abdominal CT: Pancreatic tail tumor (2x2x1 cm), R/O splenic hilum invasion with splenic infarction



51

Oct.14, 2003: En-bloc resection of tumor: Distal pancreatectomy + splenectomy + total gastrectomy + wedge resection of liver (S3) + partial excision of diaphragm + Roux-en-Y esophagojejunostomy + jejunojejunostomy

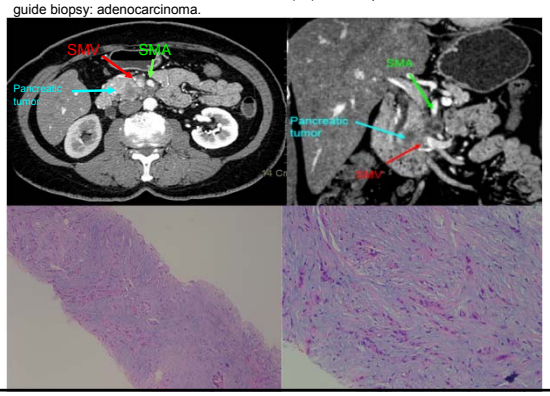


Pathological Report

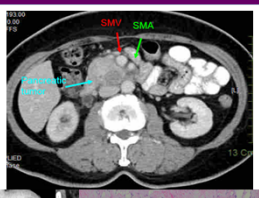
- Retroperitoneum pancreatic bed: fibrosis
- Pancreas: adenocarcinoma, poorly differentiated adenocarcinoma
- LN metastasis: negative
- Stomach adenocarcinoma by invasion
- Liver (S3): negative
- Spleen: negative

53

Case 2: 58-year-old female patient, uncinate process locally advanced pancreatic cancer, size 3.2 cm, with encasement of SMA (T4) and compression to SMV. CT-guide biopsy: adenocarcinoma.



- After received CCRT, the tumor size was downstaged to T3.
- PET-CT showed a hot spot mass at pancreatic head, SUV value 7.8.
- She received whipple's procedure after CCRT.
- Pathology: tumor size 2.2 cm with fibrosis, TRG: III, LN(-): 0/12



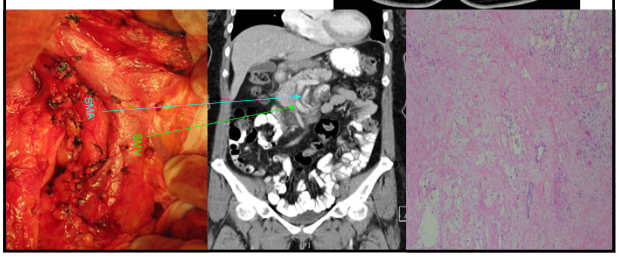


Table 1. The demographics of patients with locally advanced pancreatic cancer after gemcitabine-based treatment

Characteristics	No. of patients
Sex (M:F)	26: 14
Age (years), mean (range)	63.5 (39-80)
Location	
Head: body: tail	17: 18: 5
Treatment: Chemotherapy# : Chemoradiation (CCRT)*	25: 15
CT: resectable	20 (9: 7: 4)
Surgery	17 (42.5%)
Whipple: central pancreatectomy: distal pancreatectomy	5: 7: 5
R0: R1: R2 resection	14: 2: 1
Overall survival, median (mean± SD), months	12.5 (22.5 ± 4)
Surgery v.s. non-surgery	21 (33.1 ± 7) vs 9.0 (10.5 ± 2)
Progressive survival, median (mean± SD), months	18.2 (9.0 ± 3)
Surgery v.s. non-surgery	15 (32.1 ± 6) vs 4.0 (6.7 ± 2)

#: 20 patients received phase I/II GOFT, 6 patients with GOFS, *: 5 patients received CCRT Tainan program, 8 patients received gem induction chemotherapy and reduced dose gem with R/T

BMC Surgery 2014

Progression-free survival

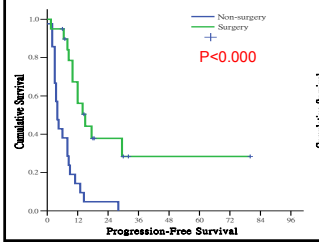
2-year survival:
Surgery vs non-surgery: 37.9 v.s. 4.8

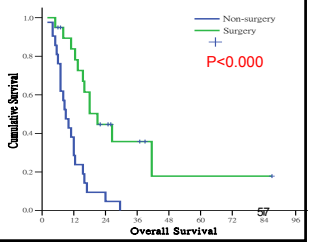
5-year survival:
Surgery vs non-surgery: 28.4 v.s. 0

Overall Survival

2-year survival:
Surgery vs non-surgery: 44.7 v.s. 4.8

5-year survival:
Surgery vs non-surgery: 17.9 v.s. 0





57

Table 2 . Multivariate analysis of predictive factors for resectability after treatment

Parameter	Resectable operation		
	OR	95% CI	*P*
Age	0.939	0.876-1.00	0.075
Tumor location (tail vs head or body)	50	1.218->100	**0.039***
CA 199 (pre-op <152 vs >152)	14.686	1.114-193.688	**0.041***
CA 199 after C/T: decrease vs increase	66.67	0.416->100	0.105
CA125 after C/T: decrease vs increase	8.547	0.138-500	0.308

*Significant; Abbreviations: OR: odds ratio; 95% CI: 95% confidence interval

58

Table 3. Multivariate analysis of risk factors for recurrence-free survival

Parameter	Recurrence-free survival		
	OR	95% CI	*P*
Age	0.990	0.914-1.072	0.806
Sex: male/female	3.196	0.617-16.552	0.166
CA 199 (pre-C/T <294 vs >294)	1.776	0.357-8.850	0.483
CA 199 (pre-op <152 vs >152)	26.32	3.300-200	**0.002***
CA 199 (post-op <82 vs >82)	2.137	0.524-8.696	0.290
CEA (post-op <6 vs >6)	2.604	0.749-9.091	0.132
CA 125 (pre-op <32.8 vs >32.8)	55.56	6.579-500	**<0.001***

*Significant. Abbreviations: OR: odds ratio; 95% CI: 95% confidence interval

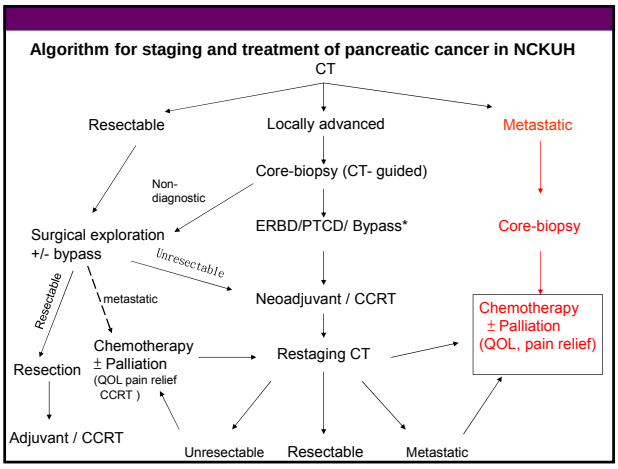
59

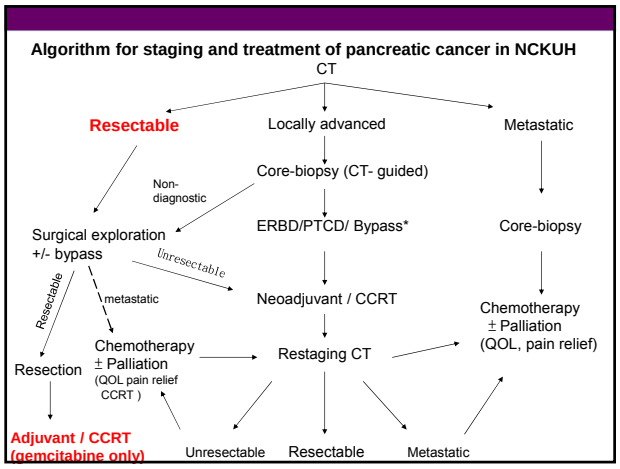
Table 4. Patterns of failure after neoadjuvant therapy and surgery

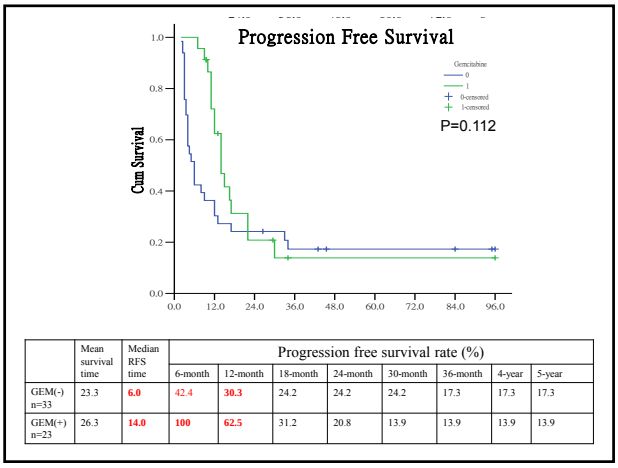
Recurrent Site	Surgery (n=17)	Non-surgery (n=23)
Liver	8	21
Peritoneum	6	12
Others (bone, lung, soft tissue, brain)	4	5
Loco-regional	1	0
Disease free	3	0

60

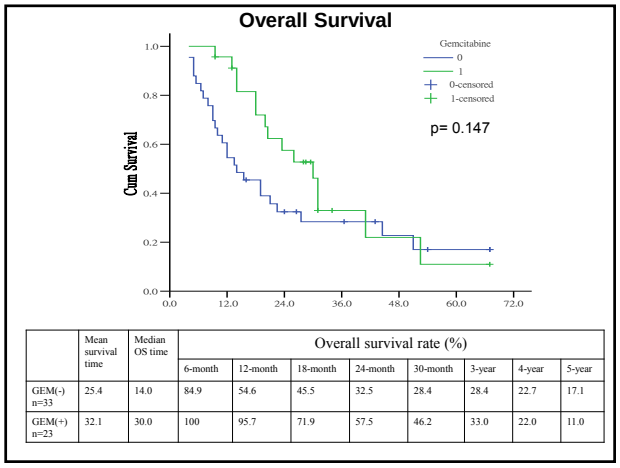
m2 Dr. Shan will insert slide with additional column
RRR, 2010/11/14







	Mean survival time	Median RFS time	Progression free survival rate (%)							
			6-month	12-month	18-month	24-month	30-month	36-month	4-year	5-year
GEM(-) n=33	23.3	6.0	42.4	30.3	24.2	24.2	24.2	17.3	17.3	17.3
GEM(+) n=23	26.3	14.0	100	62.5	31.2	20.8	13.9	13.9	13.9	13.9



	Mean survival time	Median OS time	Overall survival rate (%)							
			6-month	12-month	18-month	24-month	30-month	3-year	4-year	5-year
GEM(-) n=33	25.4	14.0	84.9	54.6	45.5	32.5	28.4	28.4	22.7	17.1
GEM(+) n=23	32.1	30.0	100	95.7	71.9	57.5	46.2	33.0	22.0	11.0

The benefit of postoperative adjuvant therapy

- In our experience, postoperative adjuvant can delay the median recurrence time about 8 months, and prolong patient median survival to 30 months and within 3-year survival benefit
- CONKO-001 trial also proved Gem treatment can prolong PFS after resection

JASPAC 01

Randomized phase III trial of adjuvant chemotherapy with gemcitabine versus S-1 for patients with resected pancreatic cancer

Akira Fukutomi, Katsuhiko Uesaka, Narikazu Boku, Hideyuki Kanemoto, Masaru Konishi, Ippei Matsumoto, Yuji Kaneoka, Yasuhiro Shimizu, Shoji Nakamori, Hirohiko Sakamoto, Soichiro Morinaga, Osamu Kainuma, Koji Imai, Naohiro Sata, Shoichi Hishinuma, Takayuki Nakamura, Michio Kanai, Satoshi Hirano, Yukinobu Yoshikawa, Yasuo Ohashi

Japan Adjuvant Study Group of Pancreatic Cancer

Presented at the 2013 ASCO Annual Meeting. Presented data is the property of the author. ASCO Annual '13 Meeting

Presented By Akira Fukutomi, MD at 2013 ASCO Annual Meeting

Study Design

- Randomized, phase III, open-label, multicenter study

Curative resection for PC

Within 10 weeks after surgery

Randomization

Stratification factors
- Institution
- Residual tumor status (R0/R1)
- Nodal status (N0/N1)

GEM
1000 mg/m² d1, 8, 15
repeated every 4 wks
for 6 courses

S-1
80, 100, 120 mg*/day, d1-28
repeated every 6 wks
for 4 courses

*According to body surface area (m²),
BSA < 1.25, 1.25 ≤ BSA < 1.5, BSA ≥ 1.5

PRESENTED AT: ASCO Annual '13 Meeting

Presented By Akira Fukutomi, MD at 2013 ASCO Annual Meeting

Patient Disposition

Patients enrolled
(n=385)

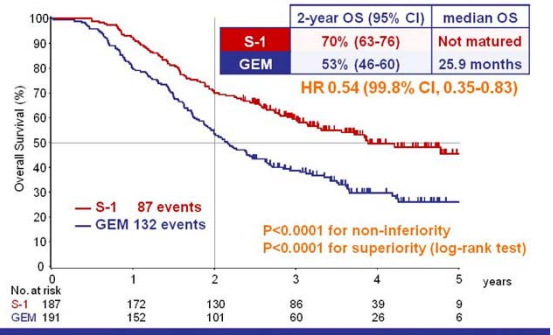
Assigned to receive GEM (n=193)	Assigned to receive S-1 (n=192)
1 pt: recurrence on the enrolled day	1 pt: paraaortic node mets at surgery
Eligible for GEM (n=192)	Eligible for S-1 (n=191)
1 pt: no treatment	4 pts: no treatment
Assessed for GEM (n=191)	Assessed for S-1 (n=187)

Full analysis set: 378 pts

PRESENTED AT: ASCO Annual '13 Meeting

Presented By Akira Fukutomi, MD at 2013 ASCO Annual Meeting

Overall Survival

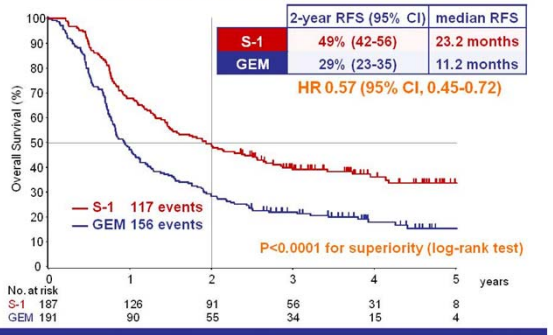


Based on the final data (219 events)

PRESENTED AT: ASCO Annual '13 Meeting

Presented By Akira Fukutomi, MD at 2013 ASCO Annual Meeting

Relapse-Free Survival



Based on the final data (273 events)

PRESENTED AT: ASCO Annual '13 Meeting

Presented By Akira Fukutomi, MD at 2013 ASCO Annual Meeting

Algorithm for staging and treatment of pancreatic cancer in NCKUH

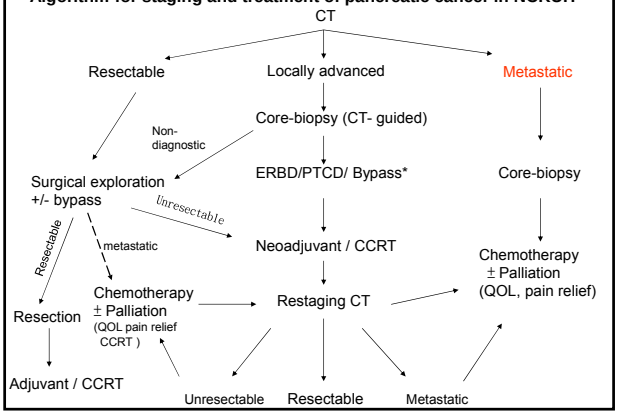


TABLE 2 Characteristics of Patients with Locally Advanced/Metastatic Pancreatic Cancer Receiving Phase I Chemotherapy GOFT

Characteristics		Patients number
Eligible patients		13
Sex (M: F)		6: 7
Age (years)	Median	67
	Range	57-78
Disease status	Locally advanced	7
	Metastatic	6
Karnofsky score	100	8
	90	3
	70	1
	50	1
ECOG score	0	9
	1	2
	2	2

The phase I chemotherapy was conducted by three-at-once method.

Shan YS HepatoGastroenterology 2007

GOFT for pancreatic cancer (phase I)

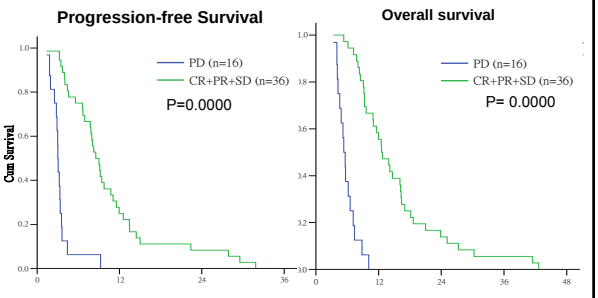
TABLE 3 Objective Tumor Response

Dose level	Patients	Response CR	PR	SD	PD	Response(%) rate
1	6	1	2	2	1	50
2	6	0	4	1	1	66.7
3	1	0	0	1	0	0
Total	13	1	6	4	2	53.8

CR: complete response; PR: partial response; SD: stable disease; PD: progression disease.

Shan YS HepatoGastroenterology 2007

The results of advanced pancreatic cancer patients received phase II GOFT treatment



Median RFS 9 months vs 3 months , 1-year progression free rate 38%

Median survival: 13 months vs 5 months

The Feasibility of Metastasectomy for Pancreatic Cancer in Modern Era

Pulmonary Metastasectomy

- First described case in 1882
  - Incidental resection during chest wall resection
- First long-term survivor in 1939
  - Metastatic renal cell carcinoma
  - Survived 23 years after resection
- Survival benefits in
  - Colorectal cancer, soft tissue sarcoma, renal cell carcinoma, etc.

Abeloff: Abeloff's Clinical Oncology, 4th ed.

Pulmonary Metastasectomy

- Criteria for resection
  - Appear to be completely resectable
  - Adequate cardiopulmonary reserve
  - Technical feasibility
  - Controlled primary tumor site
  - Absence of extra-pulmonary metastatic disease

Abeloff: Abeloff's Clinical Oncology, 4th ed.

Hepatic Metastasectomy

- First attempt before World War II
- Metastasectomy rather than formal lobectomy
- Colorectal cancer
  - Often isolated liver metastasis
  - 5-year survival improved after metastectomy
- Gastric cancer and pancreatic cancer
  - Short mean survival
  - Often widespread metastases

Abeloff: Abeloff's Clinical Oncology, 4th ed.

Metastasectomy in Pancreatic Cancer

- No study about hepatic metastasectomy
- One study about pulmonary metastasectomy in 2011/07
- Inclusion criteria for pulmonary metastectomy
  - Primary diagnosis of pancreatic cancer
  - No distant metastases at the time of diagnosis
  - Pancreaticoduodenectomy
  - Isolated pulmonary metastasis

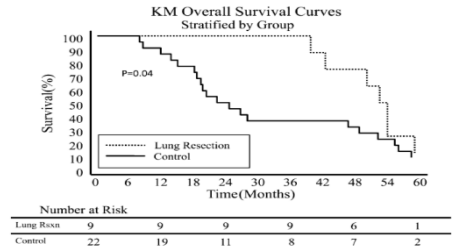
J Gastrointest Surg
DOI 10.1007/s11605-011-1605-8

ORIGINAL ARTICLE

Pulmonary Resection for Isolated Pancreatic Adenocarcinoma Metastasis: an Analysis of Outcomes and Survival

George J. Arnaoutakis · Deepa Rangachari · Daniel A. Laheru · Chris A. Iacobuzio-Donahue · Ralph H. Hruban · Joseph M. Herman · Barish H. Edil · Timothy M. Pawlik · Richard D. Schulick · John L. Cameron · Avedis Meneshian · Stephen C. Yang · Christopher L. Wolfgang

J Gastrointest Surg
DOI 10.1007/s11605-011-1605-8
ORIGINAL ARTICLE
Pulmonary Resection for Isolated Pancreatic Adenocarcinoma Metastasis: an Analysis of Outcomes and Survival
George J. Arnaoutakis · Deepa Rangachari · Daniel A. Laheru · Chris A. Iacobuzio-Donahue · Ralph H. Hruban · Joseph M. Herman · Barish H. Edil · Timothy M. Pawlik · Richard D. Schulick · John L. Cameron · Avedis Meneshian · Stephen C. Yang · Christopher L. Wolfgang



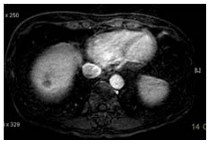
Case I

- Name: 莊○蘭
- Age: 58 years old
- Gender: female
- Diagnosis
  - Pancreatic ductal adenocarcinoma status post Whipple's operation on 2009/04/01

- 2009.06 Elevated CA-199 level (325.76)
  Abdominal CT: liver metastases

- 2009.06 - 2009.11
  Chemotherapy with Gemcitabine, Oxaliplatin and 5-Fu + oral Sunitinib (GOFS)
  → CA-199: normal
  → abdominal CT: negative

- 2009.11 - 2010.11 Normal CA-199
- 2011.02 Elevated CA-199 (34.85), Abdominal CT: (-)
- 2011.05 CA-199 level increased to 82.26
  Abdominal MRI: liver metastases



- 2011.06 Partial hepatectomy * II
- 2011.06 - 2011.08 Chemotherapy with GOFS
- 2011.08 Abdominal CT: negative
- 2015 0628 admitted to hospiece due to liver meta and peritoneal seeding

Case II: 70y/o male

- 2008.08 Epigastralgia for 20 days
  Abdominal CT: unresectable pancreatic ca
- 2008.09 Biopsy: adenocarcinoma

- 2008.09 - 2008.12 Chemotherapy with GOFS
  → CA-199: normal
  → abdominal CT: tumor size↓

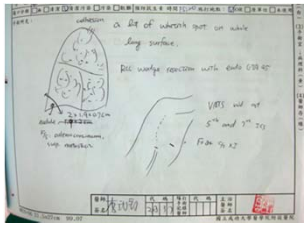
2009.02 - 2009.03 Radiation therapy: 5040cGy

2009.04 - 2009.06 Chemotherapy with Gemcitabine

2009.06 .15 Segmental pancreatectomy + Roux-en-Y pancreaticojejunostomy
frozen margin: positive → additional end resection

2011.07 A right lower lung nodule 0.3cm → 2.3cm

2011.07 VATS with resection of lung



The present outcome of pancreatic cancer patient received metastectomy

Age	Sex	Treatment	Metastectomy	Survival
58	F	C/T (GOFS)	Hepatectomy	-, 6Y2m
70	M	CT (GOFS, Gem) R/T	Lung resection	+
50	M	GOFL	Whipple	+
38	M	GOFL	Hepatectomy	-
58	M	Adjuvant (Gem)	Lung resection	+

Metastasectomy in Pancreatic Cancer

- Good biology for resection
  - Relatively long interval between initial resection of the pancreatic primary and relapse
  - Isolated and stable disease over time
  - Favorable response to systemic therapy

Milestones for management of pancreatic cancer in NCKUH

- 2003 Tainan pancreatic group: 成大醫院, 台南市醫,奇美, 新樓, 嘉基, 大林慈濟, 聖馬爾定等共七家醫院, 執行治療計劃 (GOFT, phase I and II), CCRT, MDT team for pancreatic cancer
- 2004 建立成大醫院治療guideline
- 2008 國家衛生院加入
- 2010, Oct 成大成立上消化道癌症團隊
- 2011 PEP02, phase II, 2nd line treatment, (BJC, 2013)
- 2011 Cooperation with OSUCCC
- 2014 MM398, phase III, 2nd line treatment (completed)

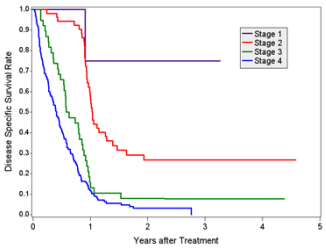
88

Conclusion

- Pancreaticoduodenectomy for pancreatic head cancer
  - Surgical mortality: decreased
  - Surgical morbidity: high and unchanged, decreased in experienced team
- Neoadjuvant therapy can downstage the severity of pancreatic cancer in some patients to increase the resectibility and patients survival.
- SMA approach can be performed safely to increase resectability
- Under new chemotherapy, matastectomy may be suitable for some selected patients.

89

Disease-specific survival of pancreatic cancer (2010-2012) in NCKUH



Stage	Patient No (%)	胰臟癌死亡數 (%)	一年疾病別存活率	三年疾病別存活率	五年疾病別存活率
I	6 (2.6)	1 (0.5)	80.0	80.0	80.0
II	52 (22.5)	36 (17.7)	58.8	26.7	26.7
III	38 (16.5)	35 (17.2)	15.8	7.9	7.9
IV	135 (58.4)	131 (64.5)	11.9	1.6	NA
總人數	231 (100.0)	203 (100.0)	24.5	9.7	9.7

Thank You!

"I think a life for music is a well-spent one, and that's what I have dedicated mine to." Pavarotti

91