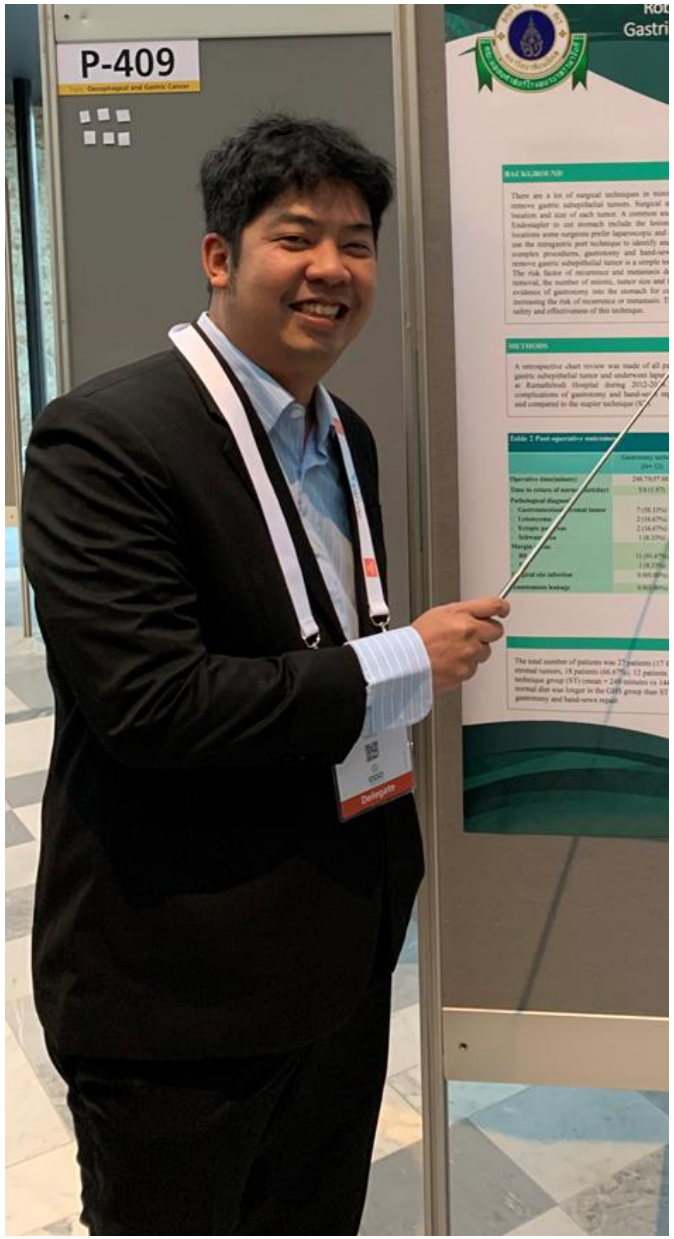

P-409
Delegate

Gastric Cancer for Resident 2020

Chairat Supsamutchai
Surgical Oncology

GI and General Surgical Unit, Department of Surgery,
Ramathibodi Hospital, Mahidol University.

Precursors

Lauren Classification

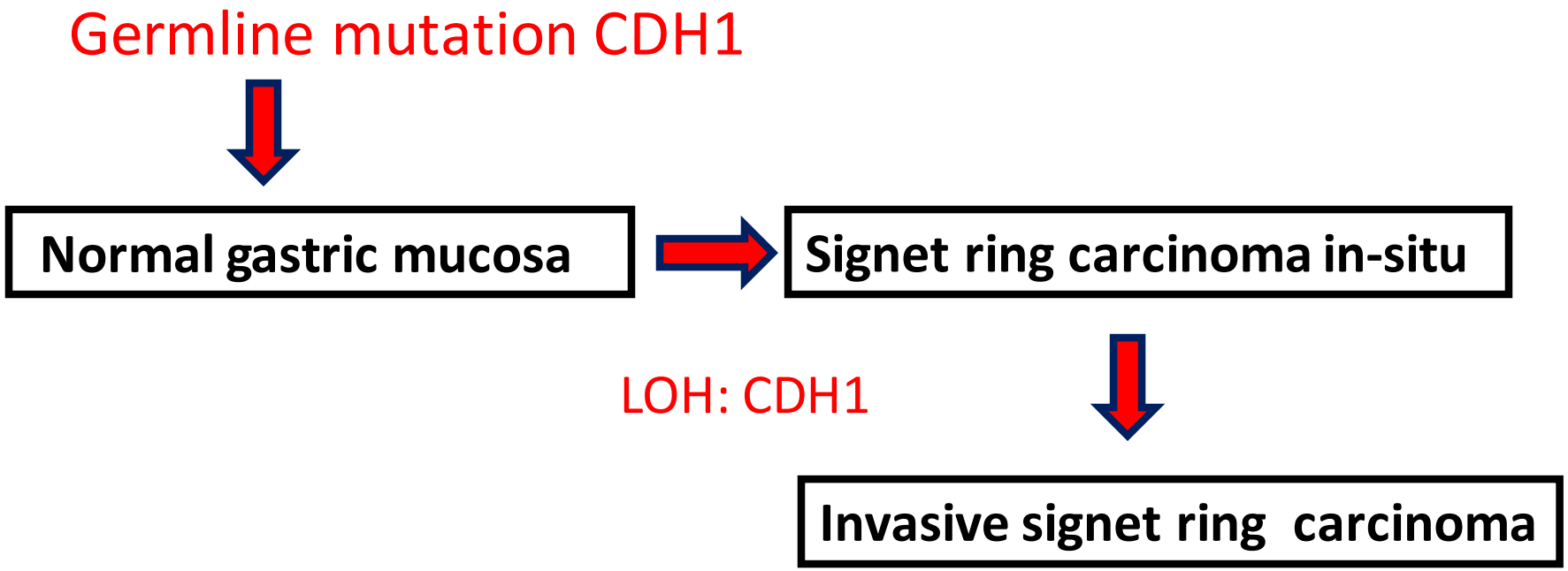
Intestinal Type ➔ Correa pathway

Diffuse Type ➔ Carneiro pathway

Evgeny Yakirevich, Murray B. Resnick .Gastroenterol Clin N Am 2013

Bing Hu, Nassim El Hajj, Scott SittlerJ Gastrointest Oncol 2012;3 (3):251-261

Carneiro pathway



Evgeny Yakirevich, Murray B. Resnick

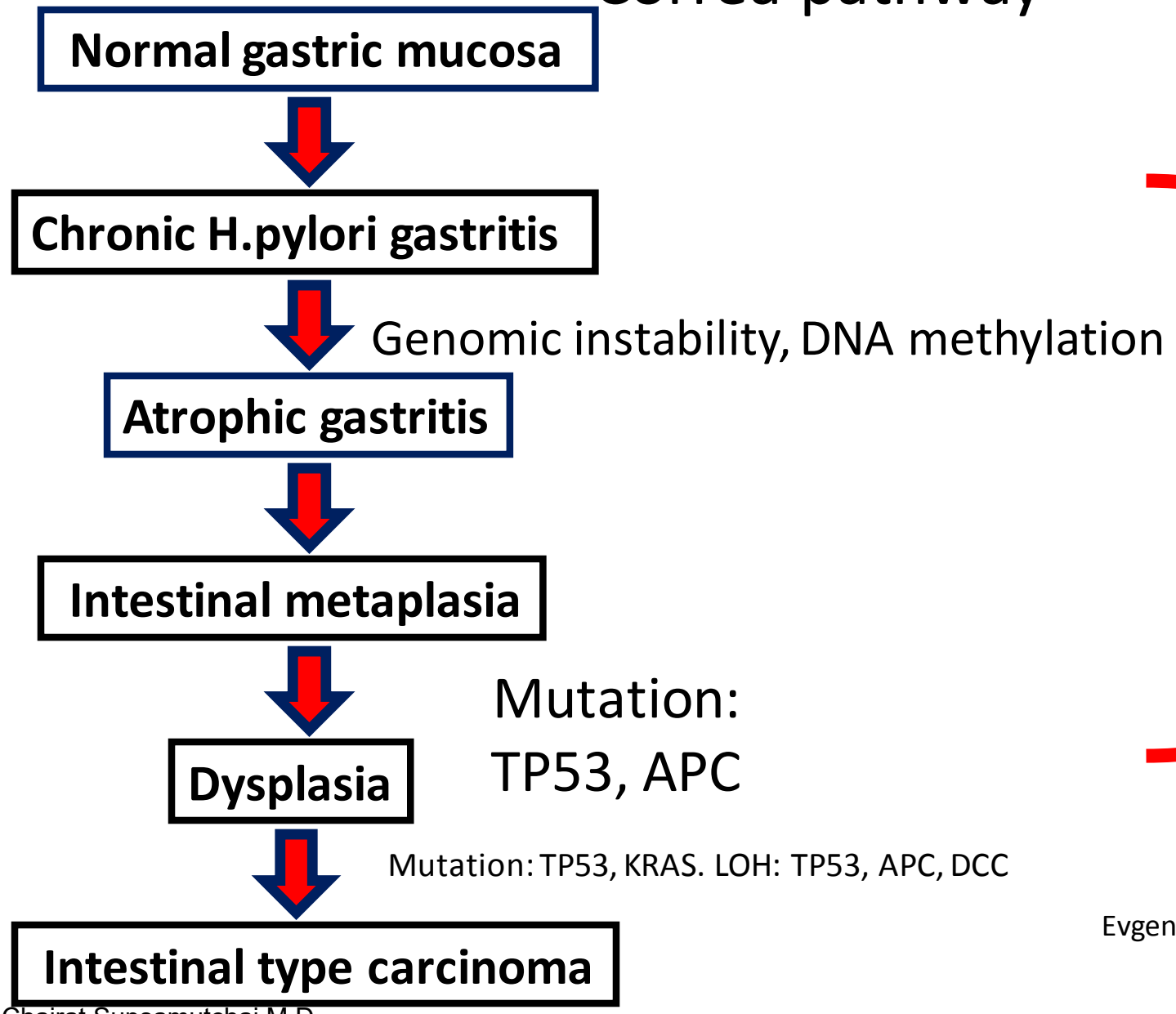
Gastroenterol Clin N Am 2013

Inherited predisposition syndromes for gastric cancer

Cancer Syndrome	Gene	Population Frequency	Gastric Cancer Risk
Hereditary diffuse gastric cancer (HDGC)	CDH1	Very rare	>80%
Hereditary breast/ ovarian cancer	BRCA1/2	1/40 to 1/400	2.6–5.5%
Lynch syndrome	MLH1, MSH2, MSH6, PMS2, Epcam	1/440	6–13%
Li-Fraumeni syndrome	P53	1/5000	2.8%
Familial adenomatous Polyposis	APC	1/10,000 to 1/15,000	0.5%–2%
Juvenile polyposis	SMAD4, BMPR1A	1/16,000 to 1/100,000	21%
Peutz-Jeghers syndrome	STK11	1/25,000 to 1/250,000	29%

Chun N, Ford JM. Genetic testing by cancer site: stomach. Cancer J 2012 Jul-Aug;18(4)

Correa pathway

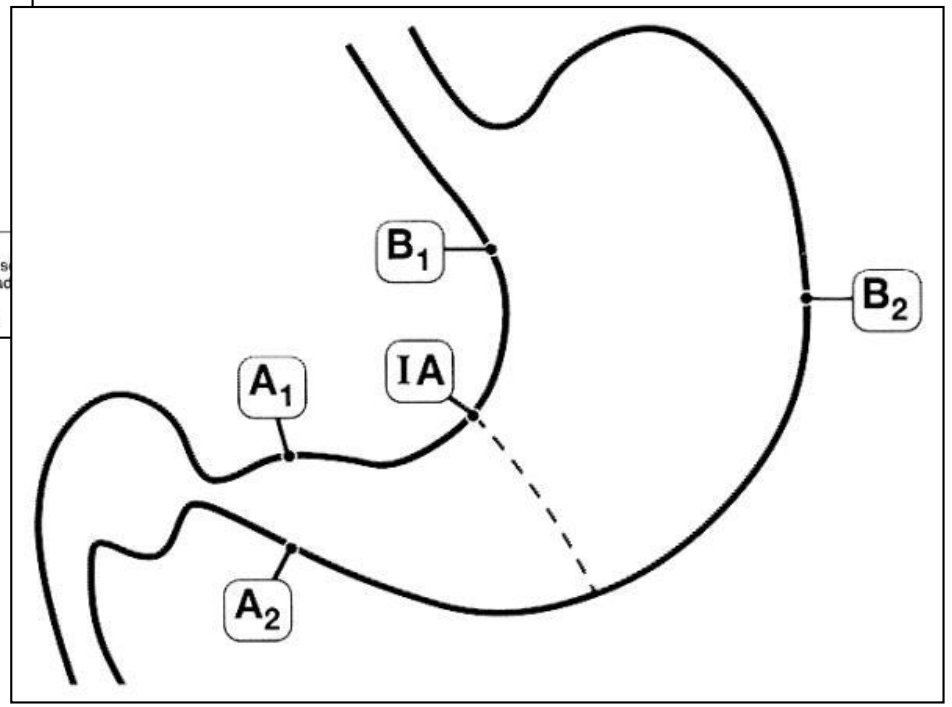


Evgeny Yakirevich, Murray B. Resnick

Classification and Grading of Gastritis: The Updated Sydney System

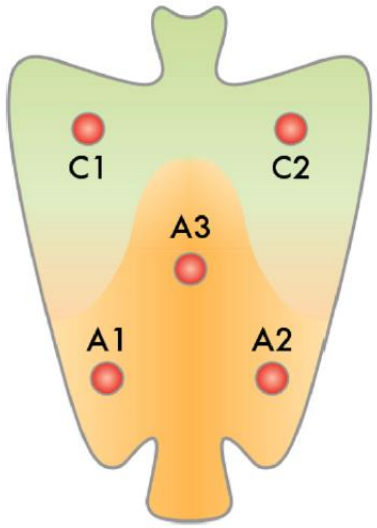
Type of gastritis	Etiologic factors	Gastritis synonyms
Nonatrophic	*Helicobacter pylori* ?Other factors	Superficial Diffuse antral gastritis (DAG) Chronic antral gastritis (CAG) Interstitial—follicular Hypersecretory Type B[a]
Atrophic		
Autoimmune	Autoimmunity	Type A[a] Diffuse Corporal Pernicious anemia-associated
Multifocal atrophic	*Helicobacter pylori* Dietary ?Environmental factors	Type B,[a] type AB[a] Environmental Metaplastic
Special forms		
Chemical[b]	Chemical irritation Bile NSAIDs ? Other agents	Reactive Reflux NSAID Type C[a]
Radiation	Radiation injury	
Lymphocytic	Idiopathic? Immune mechanisms Gluten Drug (ticlopidine) ? *H. pylori*	Varioliform (endoscopic) Celiac disease-associated
Noninfectious granulomatous	Crohn's disease Sarcoidosis Wegener's granulomatosis and other vasculitides Foreign substances Idiopathic	Isolated granulomatous
Eosinophilic	Food sensitivity ? Other allergies	Allergic
Other infectious gastritides	Bacteria (other than *H. pylori*) Viruses Fungi Parasites	Phlegmonous

NSAIDs, nonsteroidal anti-inflammatory drugs.
[a] Alphabetic designations of gastritis were abandoned in the original presentation of the Sydney System. That approach is also recommended here. Use of "Type B" to denote either atrophic *or* non-atrophic gastritis is considered to be especially misleading.
[b] Many participants favor substitution of *gastropathy* for *gastritis* to describe conditions that result from chemical injury.



Operative Link for Gastritis Assessment

OLGA staging system



Atrophy Score		Corpus			
		No Atrophy (score 0)	Mild Atrophy (score 1)	Moderate Atrophy (score 2)	Severe Atrophy (score 3)
Antrum	No Atrophy (score 0) (including *incisura angularis*)	STAGE 0	STAGE I	STAGE II	STAGE II
	Mild Atrophy (score 1) (including *incisura angularis*)	STAGE I	STAGE I	STAGE II	STAGE III
	Moderate Atrophy (score 2) (including *incisura angularis*)	STAGE II	STAGE II	STAGE III	STAGE IV
	Severe Atrophy (score 3) (including *incisura angularis*)	STAGE III	STAGE III	STAGE IV	STAGE IV

M. Rugge, P. Correa, F. Di Mario, et al. Digestive and Liver Disease 2008.

Operative link on gastric intestinal metaplasia assessment (OLGIM)

		CORPUS BIOPSY SPECIMENS Intestinal Metaplasia (IM)			
		IM absent score 0	IM mild score 1	IM moderate score 2	IM severe score 3
ANTRUM BIOPSY SPECIMENS Overall score of Intestinal Metaplasia (IM) as assessed in the 3 biopsy samples obtained from the antrum and angularis incisura	IM absent score 0	Stage 0	Stage I	Stage II	Stage II
	IM mild score 1	Stage I	Stage I	Stage II	Stage III
	IM moderate score 2	Stage II	Stage II	Stage III	Stage IV
	IM severe score 3	Stage III	Stage III	Stage IV	Stage IV

M. Rugge et al. Best Practice & Research Clinical Gastroenterology 27 2013.

Univariate and multivariate analyses of the risk of gastric cancer in subjects according to gastritis OLGA

OLGA stage, n (%)	Gastric cancer patients n = 474	Control subjects n = 474	Crude OR (95% CIControl subjects n = 474)	Adjusted OR (95% CI)
0	37 (7.8)	90 (19.0)	1.00	1.00
I	82 (17.3)	131 (27.6)	1.52 (0.95–2.44)	1.12 (0.67–1.88)*
II	136 (28.7)	127 (26.8)	2.61 (1.66–4.10)	1.54 (0.92–2.56)*
III	**114 (24.1)**	**69 (14.6)**	**4.02 (2.47–6.53)**	**2.09 (1.20–3.63)***
IV	**105 (22.2)**	**57 (12.0)**	**4.48 (2.72–7.40)**	**2.04 (1.14–3.63)***
P for trend			< 0.0001	0.0012

S.-J. Cho, I. J. Choi, M.-C. Kook. Aliment Pharmacol Ther 2013; 38: 1292-1302

Univariate and multivariate analyses of the risk of gastric cancer in subjects according to gastritis OLG IM staging systems

OLGIM stage, n (%)	Gastric cancer patients n = 474	Control subjects n = 474	Crude OR (95% CIControl subjects n = 474)	Adjusted OR (95% CI)
0	09 (23.0)	1266 (56.1)	1.00	1.00
I	91 (19.2)	86 (18.1)	2.58 (1.78–3.74)	2.38 (1.59–3.57)‡
II	70 (14.8)	53 (11.2)	3.22 (2.11–4.91)	2.97 (1.85–4.75)‡
III	98 (20.7)	41 (8.6)	5.83 (3.81–8.94)	5.50 (3.38–8.95)‡
IV	106 (22.4)	28 (5.9)	9.24 (5.76–14.82)	8.91 (5.16–15.37)‡
P for trend			<0.0001	<0.0001

S.-J. Cho, I. J. Choi, M.-C. Kook. Aliment Pharmacol Ther 2013; 38: 1292-1302

Journal of Surgical Oncology 43:101–105 (1990)

Occurrence of Intestinal Metaplasia of the Stomach in Thai Patients With Gastritis, Benign Ulcer, and Gastric Cancer

PAISAL PONGCHAIRERKS, MD, PANAS CHALERMSANYAKORN, MD, AND MONGKOL TANJAPATKUL, MD

From the Departments of Surgery (P.P., M.T.) and Pathology (P.C.), Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

IM 34.1% Benign ulcer
54.4% Cancer

> 60 year ➔ 70%

An Endoscopic Recognition of the Atrophic Border and its Significance in Chronic Gastritis

K. Kimura,* T. Takemoto **

Endoscopy 3 (1969) 87–97

endoscopic atrophic border are rather easily recognized by discriminating differences both in color and niveau of the mucosa. It is low in niveau and yellowish pale in color with atrophic features on the one side and on the other side, the color is rather homogenously reddish with a higher level of the mucosa. The atrophic border itself is by no means

Fig. 1 The endoscopic atrophic border, which lies between the lesser curvature and the anterior wall. The differences both in color and niveau are remarkable, with atrophic features of capillary networks on the one side, but not visible on the other side of the endoscopic atrophic border. Classified as type 0–1.

Fig. 2 The endoscopic atrophic border, which lies parabolically above the angulus. On the pyloric area atrophic findings are visible, but the niveau difference is not remarkable. Classified as type C-11.

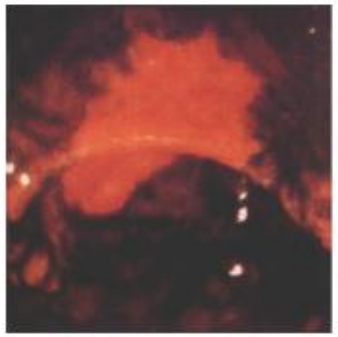


Fig. 3 The discoloring congo red. The discoloring border is recognized parabolically above the angulus in a type C-11. A selective application of congo red method using the Machida fibergastroscope, FGS-B.

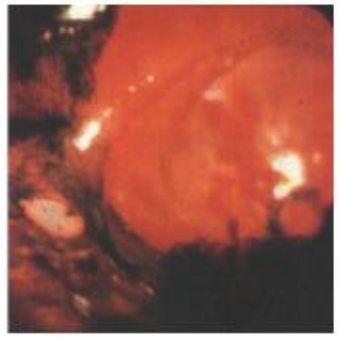


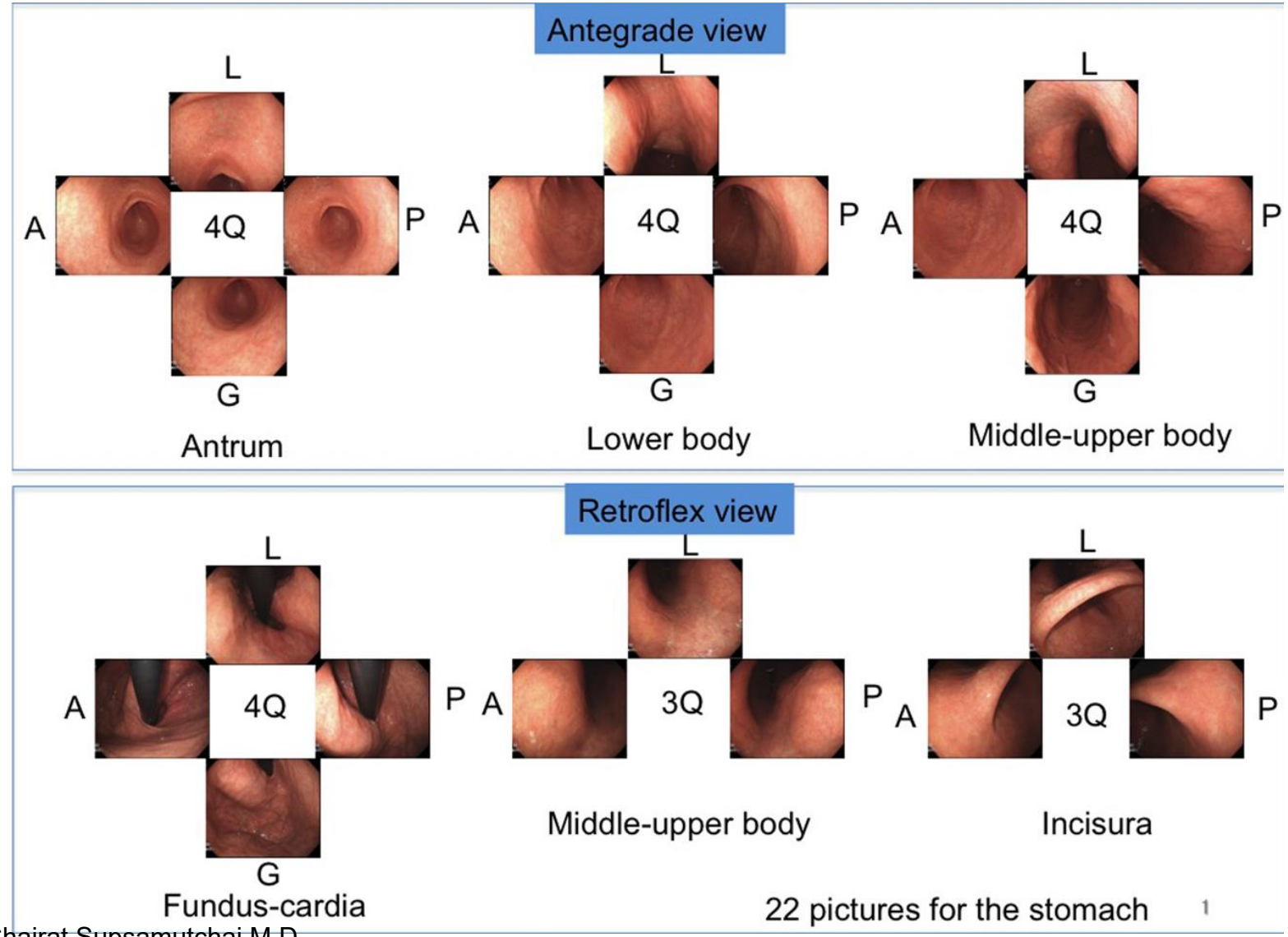
Fig. 4 The discoloring congo red. The border is just crossing the anterior basis of the angulus, coming down into the greater curvature of the antrum. The biopsies were performed perpendicularly across the discoloring border.

Intestinal metaplasia

1. whitish mucosa
   rough mucosal surface uneven mucosal surface
2. villous appearance.
3. atypical collecting venules
   abnormal morphology and uneven distribution
4. patchy redness.

Nobuhiro Fukuta et al. Digestive Endoscopy 2013; 25: 526–534

Systematic screening protocol for the stomach (SSS)



Yao K. Ann. Gastroenterol. 2013; 26: 12–23.

Surgical treatment
Gastric Cancer

English language 100 publications from 1970-1992 (99,785 cases)

	Japan	Non-Japan
No. of series	15	85
Resection rate(%)	93.1	35.2
Curative resection (%)	58.6	17.8
5 Yr-survival rate (%)	60.5	39.4
(after curative resection)	(6,736/11,139)	(2,836/7,205)

Akoh&Macintyre
Br J Surg 1992

What made such a remarkable difference in the survival?

Three hypothesis

1. The “different disease hypothesis”
2. The “stage migration hypothesis”
3. The “treatment hypothesis”

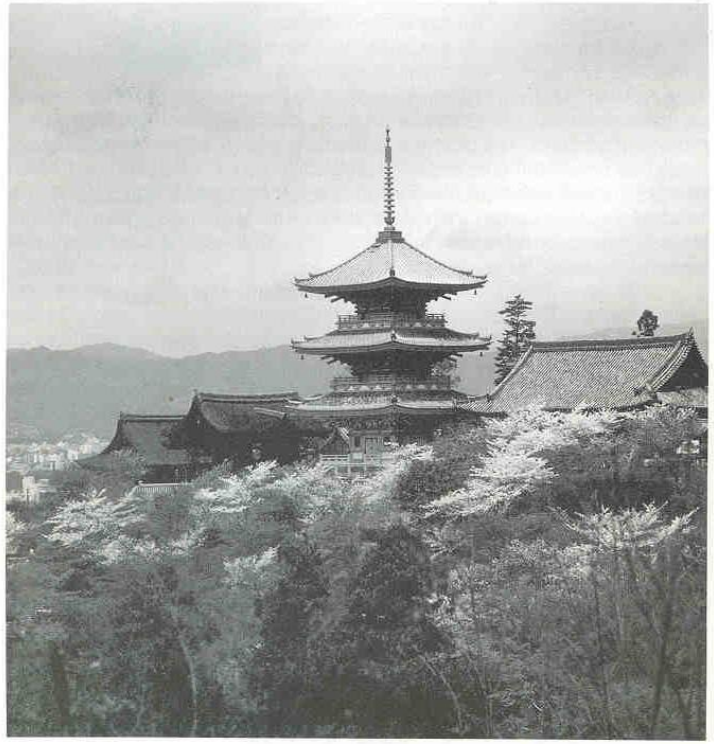
Arguments against extended LND in the Western countries

- Fatal disease (Captian of death)
- Postoperative mortality&morbidity
- Operative time&cost of intensive care
- Experience and learning curve effect
- No prospective randomized studies from Japan
- Lymph node metastasis, indicator but not governor of survival (stage migration phenomenon)

1995 国際胃癌会議

1st INTERNATIONAL GASTRIC CANCER CONGRESS

Second Announcement and Call for Abstract



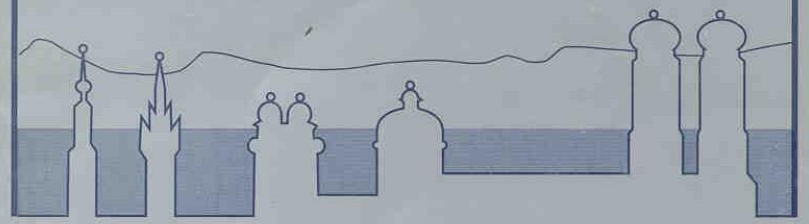
KYOTO JAPAN

MARCH 29 - APRIL 1, 1995

Joint Panel Discussion with 64th Meeting of Japanese Research Society for Gastric Cancer, March 29, 1995

2nd INTERNATIONAL GASTRIC CANCER CONGRESS

1997 国際胃癌会議



MUNICH – April 27–30, 1997

CO-SPONSORED BY UICC & WHO-CC

Final Program

International Gastric Cancer Association

Technische Universität München
Klinikum rechts der Isar

1999 國際胃癌學會

3rd INTERNATIONAL GASTRIC CANCER CONGRESS

SEOUL, KOREA, APRIL 27-30, 1999

Final Program and Call for Abstract

International Gastric Cancer Association
Korean Gastric Cancer Association

D1 or D2

- Cuschieri et al. (MRC-UK)
  Lancet 1996
  Br J Cancer 1999
- Bonenkamp et al. (Dutch Gastric Cancer Group)
  Lancet 1995
  N Eng J Med 1999
  Lancet Oncol 2010
- *Degiuli et al.* Italian Gastric Cancer Study Group (IGCSG) randomized surgical trial
  J Clin Oncol 1998
  BJS 2014

	D1 (n=200)	D2 (n=200)
• P.O. hospital stay (days)	18	23
• P.O.complications (%)	21	33
• P.O. mortality (%)	6.5	13
with P.S.		16
without P.S.		9
• 5 yr-survival (%)	35	33

Cuschieri et al
Lancet 1996
Cuschieri et al
Br J Cancer 1999

	D1 (n=380)	D2 (n=331)
• P.O. hospital stay (days)	14	16
• P.O.complications (%)	25	43
• P.O. mortality (%)	4	10
• 5 yr-survival (%)	45	47

Bonenkamp et al
Lancet 1995
Bonenkamp et al
NEJM 1999

	D1	D2
British Trials	200	200
P.O. morbidity	28%	46%
P.O. mortality	6.5%	13%
5-yr survival	35%	33%
Dutch Trials	380	331
P.O. morbidity	25%	43%
P.O. mortality	4%	10%
5-yr survival	45%	47%

- *Cuschieri et al Lancet 1996*
- *Cuschieri et al Br J Cancer 2000*

- *Bonenkamp et al Lancet 1995*
- *Bonenkamp et al NEJM 1999*

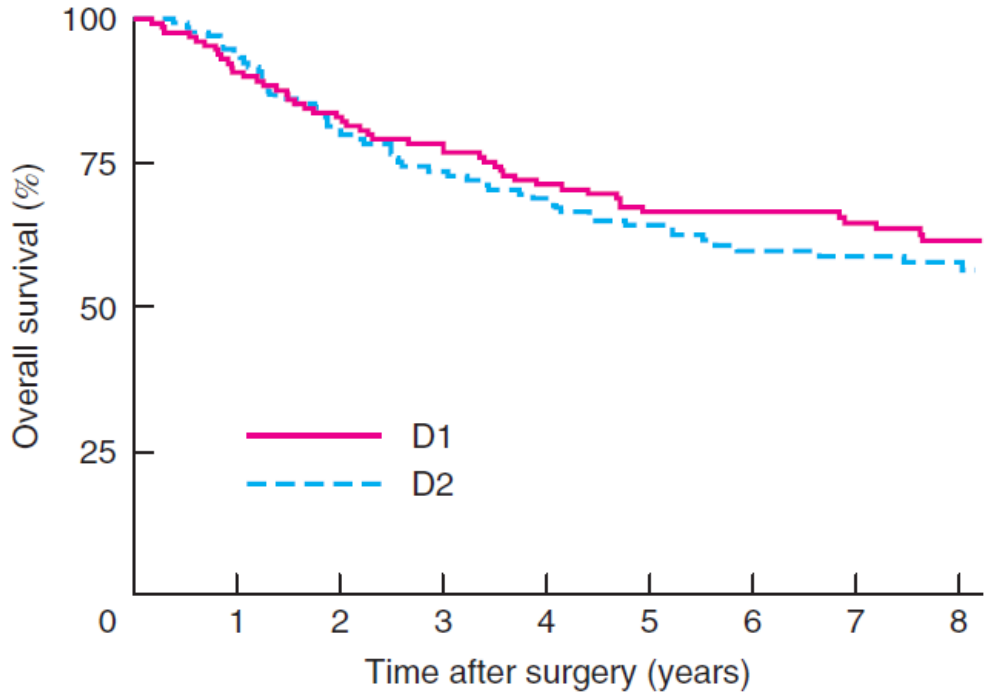
Morbidity and mortality after D1 and D2 gastrectomy for cancer : Interim analysis of the Italian Gastric Cancer Study Group (IGCSG) randomized surgical trial

	D1 (n=76)	D2 (n=86)
• P.O. hospital stay (days)	12	12
• P.O. complications (%)	10.5	16.2
• P.O. mortality (%)	1.3	0

Degiuli et al
EJSO 2004

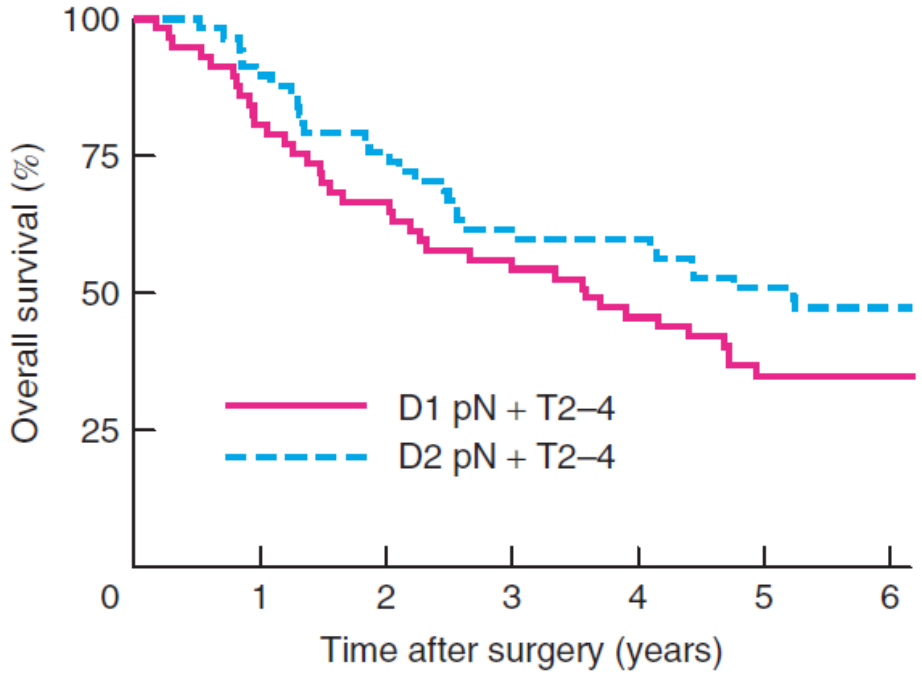
IGCSG-R01 RCT

D2 gastrectomy is not associated with improved overall survival



No. at risk

D1	129	117	107	100	91	82	75	67	49
D2	131	121	104	94	88	79	64	56	46



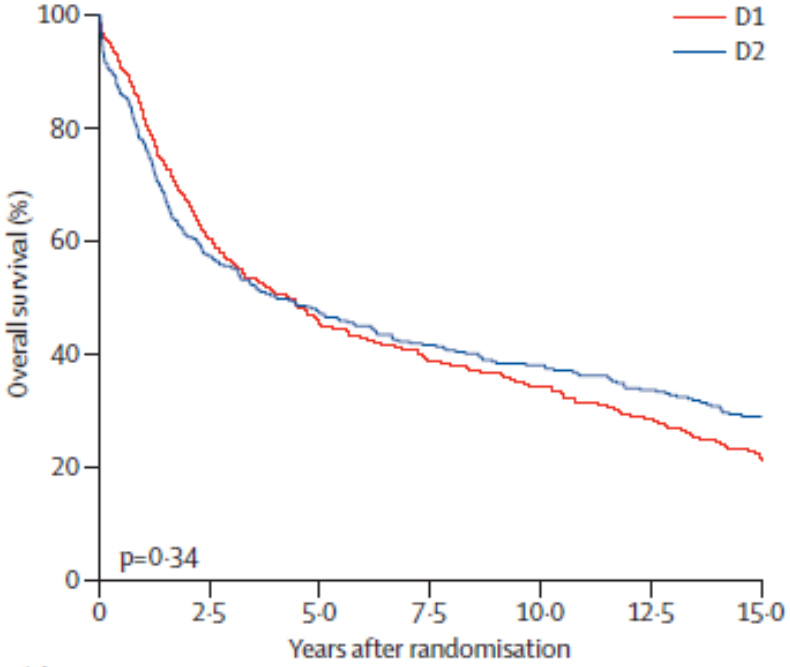
No. at risk

D1 pN + T2–4	57	46	38	32	26	19	16
D2 pN + T2–4	58	52	43	35	34	28	23

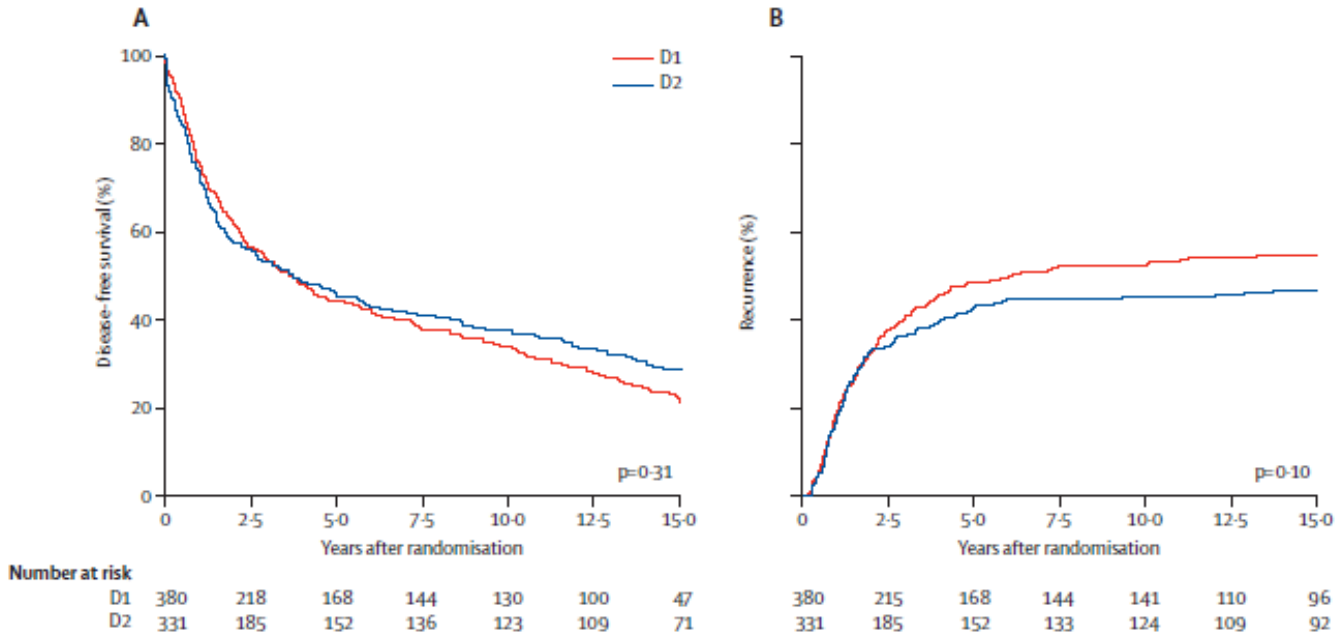
Overall survival

BJS 2014; 101: 23–31

Surgical treatment of gastric cancer: 15-year follow-up results of the randomised nationwide Dutch D1 D2 trial



Overall survival in patients treated with curative intent (n=711)

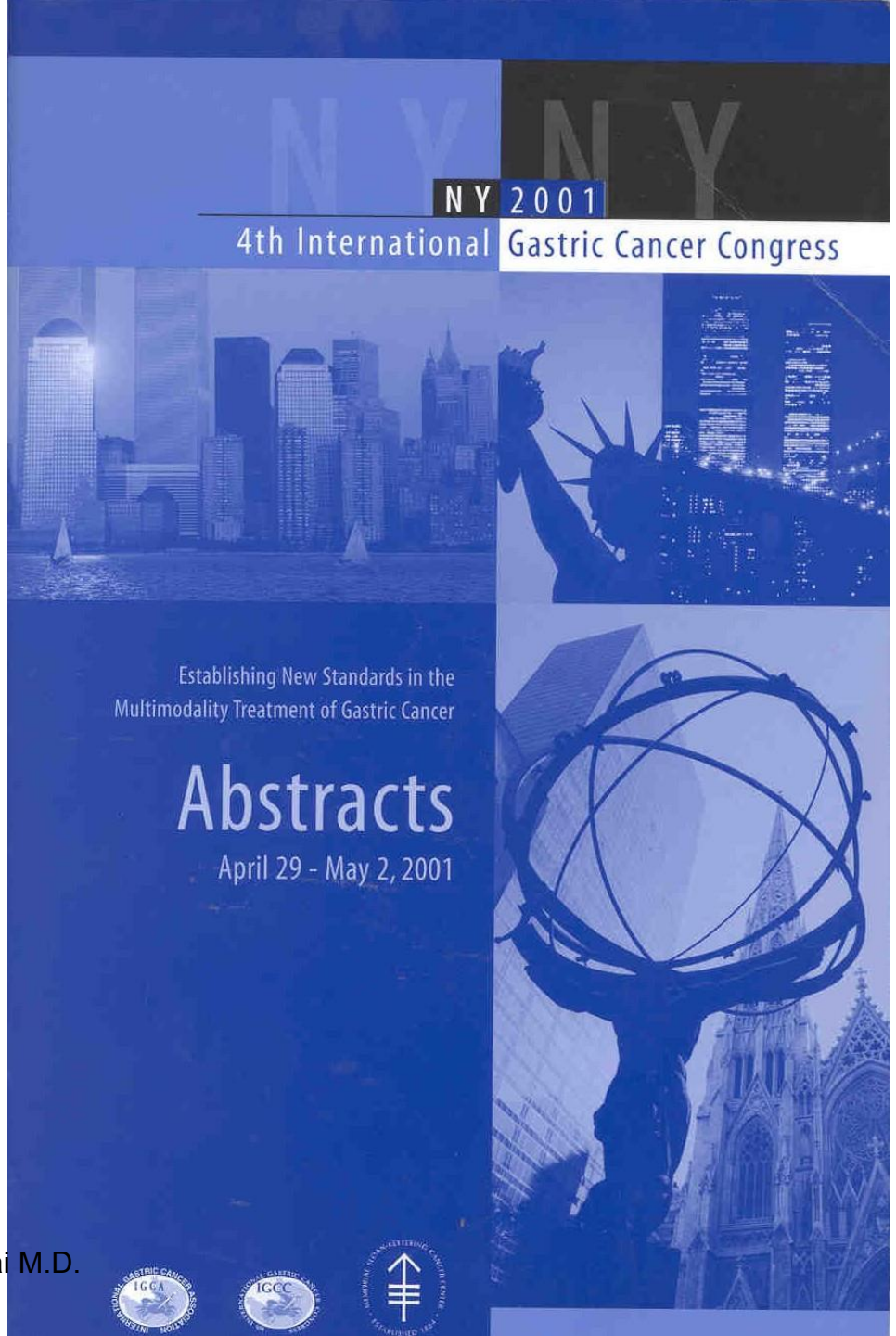


Disease-free survival and risk of recurrence in patients treated with curative intent (n=711)

Lancet Oncol 2010; 11: 439–49

Gastric Cancer

Treatment Option


NY 2001
4th International Gastric Cancer Congress
Establishing New Standards in the
Multimodality Treatment of Gastric Cancer
Abstracts
April 29 - May 2, 2001

Gastric Cancer : 5 Years survival rate

Stage	USA	Japan
IA	78%	90%
IB	58%	85%
II	34%	75%
IIIA	20%	50%
IIIB	8%	30%
IVA	7%	15%
IVB	7%	5%

USA : National Cancer Data Base 1987-1996 (50,191 GC)

- ***Hundahl et al Cancer 2000***

Japan : 18 Institutes 1985-1994

Fujii et al Gastric Cancer 1999

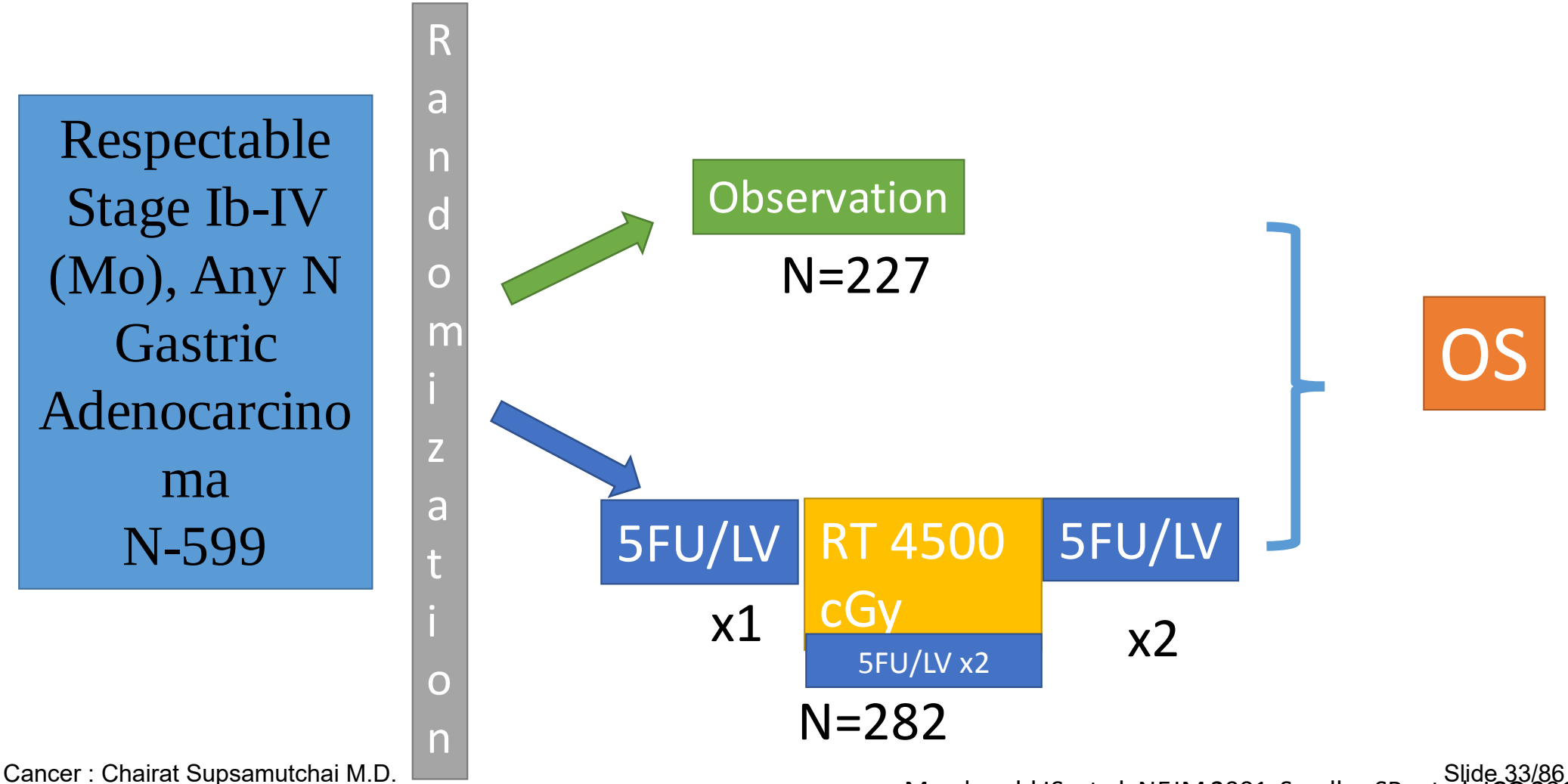
Phase3 SWOG 9008/INT-0116 Resected Gastric Cancer (USA)

CHEMORADIOTHERAPY AFTER SURGERY COMPARED WITH SURGERY ALONE FOR ADENOCARCINOMA OF THE STOMACH OR GASTROESOPHAGEAL JUNCTION

JOHN S. MACDONALD, M.D., STEPHEN R. SMALLEY, M.D., JACQUELINE BENEDETTI, PH.D., SCOTT A. HUNDAHL, M.D., NORMAN C. ESTES, M.D., GRANT N. STEMMERMANN, M.D., DANIEL G. HALLER, M.D., JAFFER A. AJANI, M.D., LEONARD L. GUNDERSON, M.D., J. MILBURN JESSUP, M.D., AND JAMES A. MARTENSON, M.D.

726 · N Engl J Med, Vol. 345, No. 10 · September 6, 2001

Phase3 SWOG 9008/INT-0116 Resected Gastric Cancer (USA)



Macdonald JS, et al. NEJM 2001, Smalley SR, et al. JCO 2012

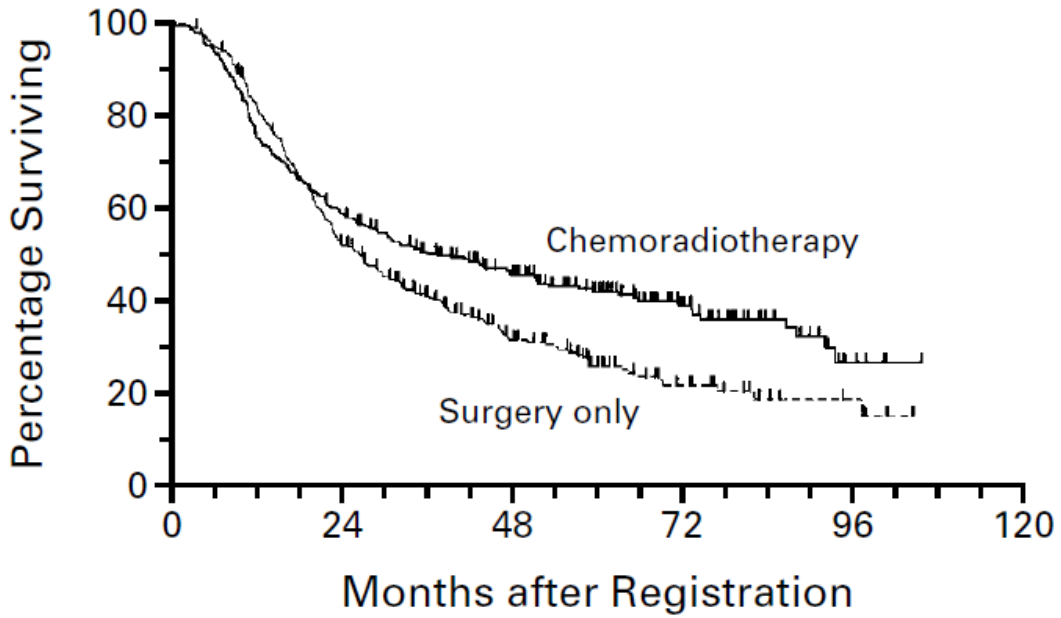


Figure 1. Overall Survival among All Eligible Patients, According to Treatment-Group Assignment.

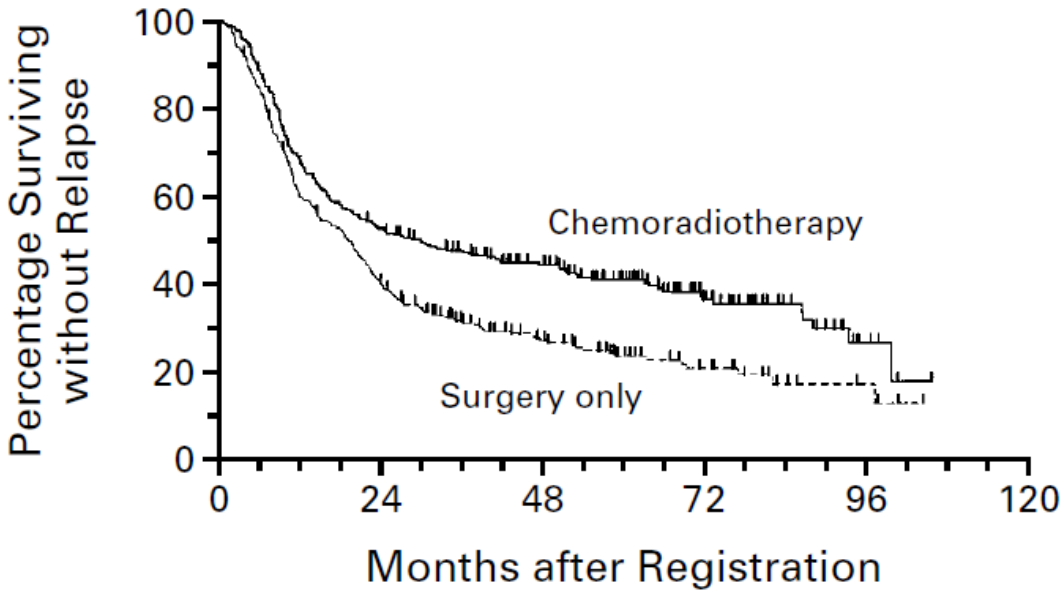


Figure 2. Relapse-free Survival among All Eligible Patients, According to Treatment-Group Assignments.

overall survival

surgery group = 27 months

chemoradiotherapy group =36 months, P=0.005

the hazard ratio for death was 1.35

N Engl J Med, Vol. 345, No. 10 · September 6, 2001

10 Year follow-up

OS

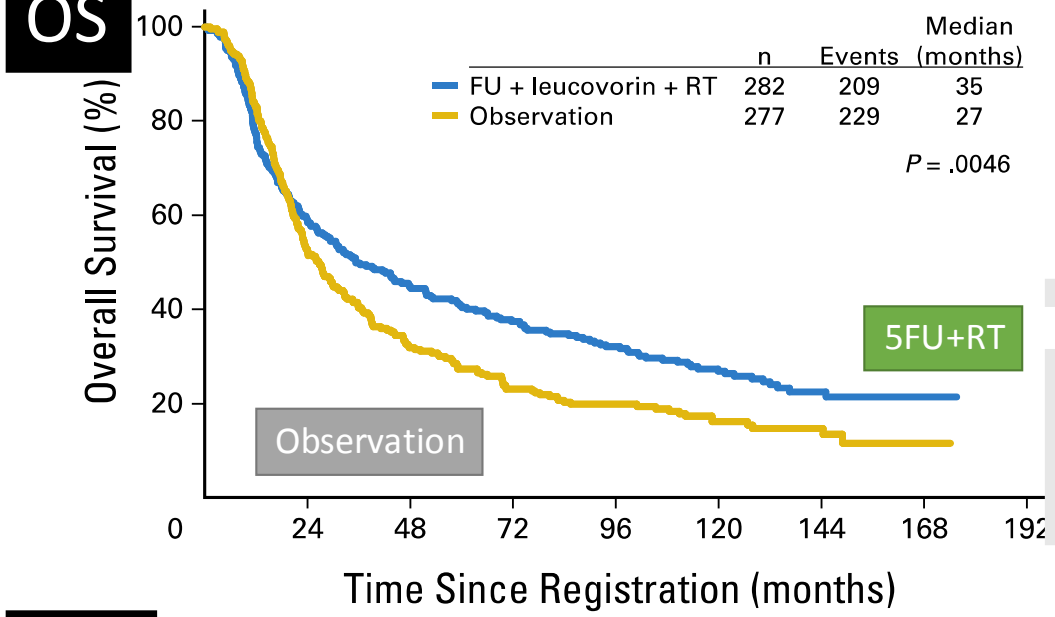
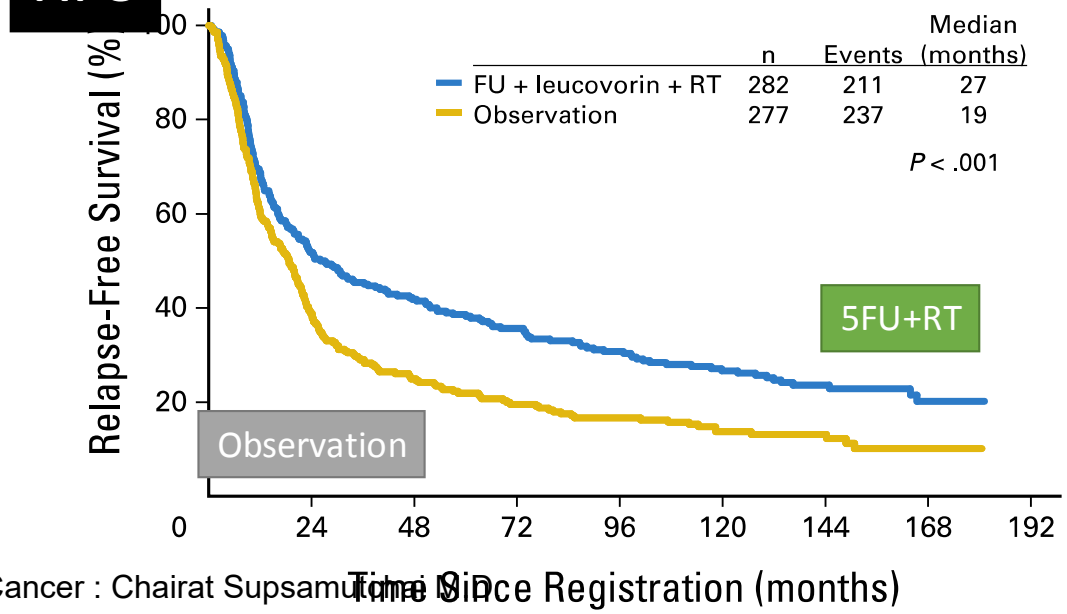


Table 2. Patterns of Failure by Arm

Relapse Status	Radiochemotherapy No.	%	Control (surgery alone) No.	%	Total No.	%
No relapse*	135	48	67	24	202	36
Relapse*	147	52	210	76	357	64
Sites of relapse (% of those randomly assigned)*						
Local	7	2	21	8	28	5
Regional	62	22	109	39	171	31
Distant	46	16	49	18	95	17
Unknown site	32	11	31	11	63	11
Total	282		277		559	

*Indicates statistically significant comparisons. $P < .001$ for relapse *v* no relapse (χ^2); $P = .012$ for sites of relapse (among those with sites reported, χ^2 test for trend).

RFS



- Locoregional Relapse 47% vs 24%
- Only 64% completed all planned treatment

Less than D1 = 54%
D1 = 36%
D2 = 10%

Macdonald JS, et al. NEJM 2001, Smalley SR, et al. JCO 2012

Results

-- D2 10%, D1 36%, D0 54%
-- complete treatment protocol 64%
-- grade III toxicity 41% and grade IV toxicity 32%
-- death from chemoradiation 1%
-- adeno CA of EGJ 20%
-- 15% LN –ve
-- RT = local treatment as surgery

Macdonald et al
NEJM 2001

USA

Surgery with Post op CCRT

Comparison of results : Trials Int-0116 and JCOG 9501

	Int 0116	JCOG 9501
No. of pts	**281**	**523**
Surgery D0	**54%**	**-**
D1	**36%**	**-**
D2	**10%**	**50%**
D3	**-**	**50%**
Adjuvant Radiation	**45 Gy**	**None**
Chemotherapy	**5 FU + LV**	**None**
Tumor – related deaths	**1.1%**	**0.8%**
Survival 3–yr	**50%**	**-**
5–yr	**42%**	**71.4%**

Cumulative 5-years survival rate(%)

Stage	USA (n=6,525)	Germany (n=1,654)	Japan (n=1,679)
IA	60	85	96
IB	45	70	94
II	28	45	87
IIIA	15	30	60
IIIB	10	18	40
IV	5	10	10

USA : Wanebo et al Ann Surg 1993
Germany : Roder et al Cancer 1993
Japan : Maruyama et al Gastric Cancer

Neoadjuvant (perioperative) chemotherapy

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JULY 6, 2006 VOL. 355 NO. 1

Perioperative Chemotherapy versus Surgery Alone for Resectable Gastroesophageal Cancer

David Cunningham, M.D., William H. Allum, M.D., Sally P. Stenning, M.Sc., Jeremy N. Thompson, M.Chir., Cornelis J.H. Van de Velde, M.D., Ph.D., Marianne Nicolson, M.D., J. Howard Scarffe, M.D., Fiona J. Lofts, Ph.D., Stephen J. Falk, M.D., Timothy J. Iveson, M.D., David B. Smith, M.D., Ruth E. Langley, M.D., Ph.D., Monica Verma, M.Sc., Simon Weeden, M.Sc., and Yu Jo Chua, M.B., B.S., for the MAGIC Trial Participants*

Neoadjuvant (perioperative) chemotherapy

MAGIC

Surgery

ECF ➔ Surgery ➔ ECF

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JULY 6, 2006 VOL. 355 NO. 1

Perioperative Chemotherapy versus Surgery Alone for Resectable Gastroesophageal Cancer

David Cunningham, M.D., William H. Allum, M.D., Sally P. Stenning, M.Sc., Jeremy N. Thompson, M.Chir., Cornelis J.H. Van de Velde, M.D., Ph.D., Marianne Nicolson, M.D., J. Howard Scarffe, M.D., Fiona J. Lofts, Ph.D., Stephen J. Falk, M.D., Timothy J. Iveson, M.D., David B. Smith, M.D., Ruth E. Langley, M.D., Ph.D., Monica Verma, M.Sc., Simon Weeden, M.Sc., and Yu Jo Chua, M.B., B.S., for the MAGIC Trial Participants*

FNLCC/FFCD

Surgery

5-FU/Cisplatin ➔ Surgery

VOLUME 29 · NUMBER 13 · MAY 1 2011

JOURNAL OF CLINICAL ONCOLOGY ORIGINAL REPORT

Perioperative Chemotherapy Compared With Surgery Alone for Resectable Gastroesophageal Adenocarcinoma: An FNCLCC and FFCD Multicenter Phase III Trial

Marc Ychou, Valérie Boige, Jean-Pierre Pignon, Thierry Conroy, Olivier Bouché, Gilles Lebreton, Muriel Ducourtieux, Laurent Bedenne, Jean-Michel Fabre, Bernard Saint-Aubert, Jean Genève, Philippe Lasser, and Philippe Rougier

EORTC 40954

Surgery

5-FU/Cisplatin ➔ Surgery

VOLUME 28 · NUMBER 35 · DECEMBER 10 2010

JOURNAL OF CLINICAL ONCOLOGY ORIGINAL REPORT

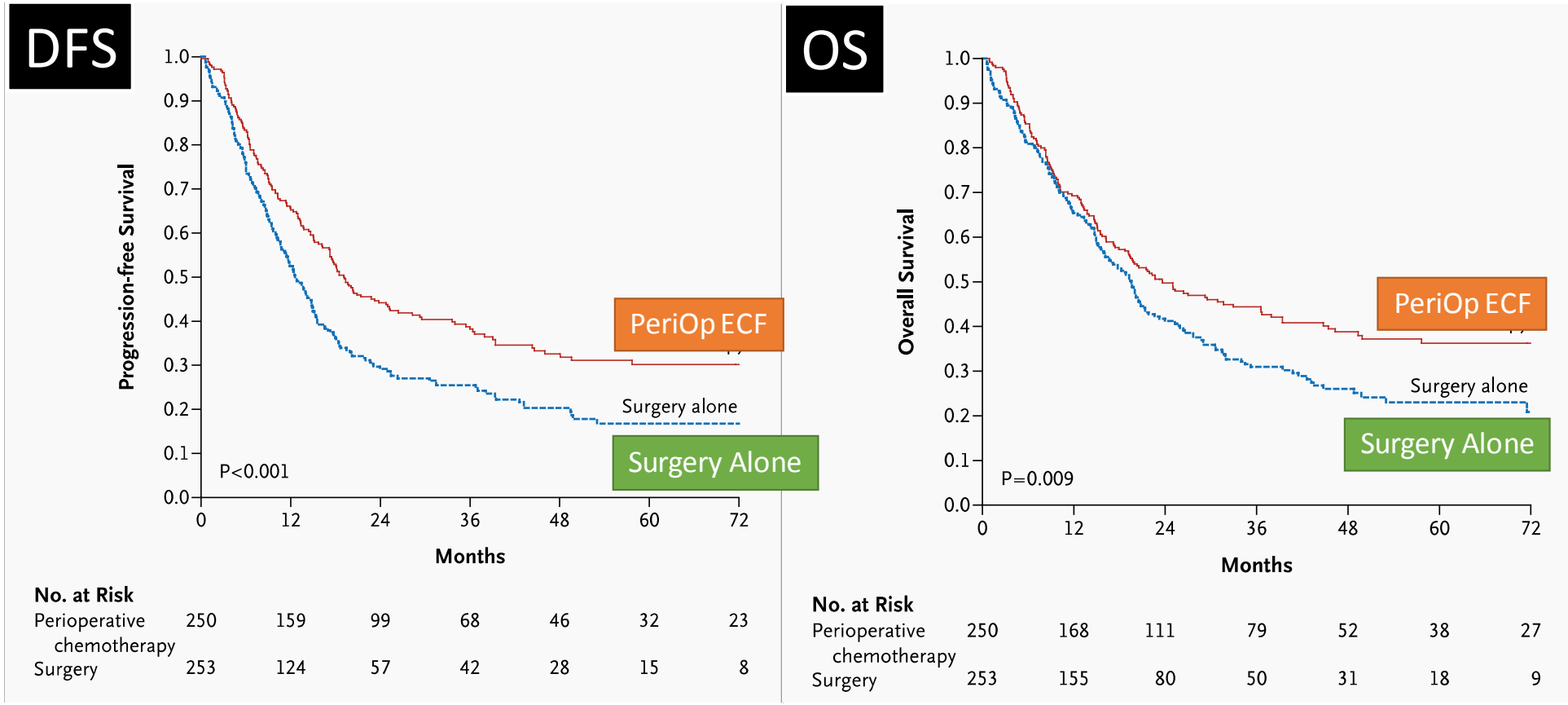
Neoadjuvant Chemotherapy Compared With Surgery Alone for Locally Advanced Cancer of the Stomach and Cardia: European Organisation for Research and Treatment of Cancer Randomized Trial 40954

Christoph Schuhmacher, Stephan Gretschel, Florian Lordick, Peter Reichardt, Werner Hohenberger, Claus F. Eisenberger, Cornelie Haag, Murielle E. Mauer, Baktiar Hasan, John Welch, Katja Ott, Arnulf Hoelscher, Paul M. Schneider, Wolf Bechstein, Hans Wilke, Manfred P. Lutz, Bernard Nordlinger, Eric Van Cutsem, Jörg R. Siewert, and Peter M. Schlag

Perioperative chemotherapy

docetaxel, oxaliplatin, and fluorouracil/leucovorin (FLOT)

epirubicin, cisplatin, and fluorouracil or capecitabine (ECF/ECX)



	PeriOP ECF	Surgery Alone	HR (95% CI; P-value)
5-yr DFS	33%	19%	0.66 (95% CI 0.53 - 0.81; P<0.001)
5-yr OS	36%	23%	0.75 (95% CI 0.60 - 0.93; P=0.009)

Cunningham D, et al. NEJM 2006

Perioperative chemotherapy versus surgery alone for resectable gastroesophageal cancer (MAGIC Trial)

Result:

- P.O. morbidity & mortality were similar
- Resected tumor were smaller and less advanced
- 5-year survival rate 36% vs 23%

Note:

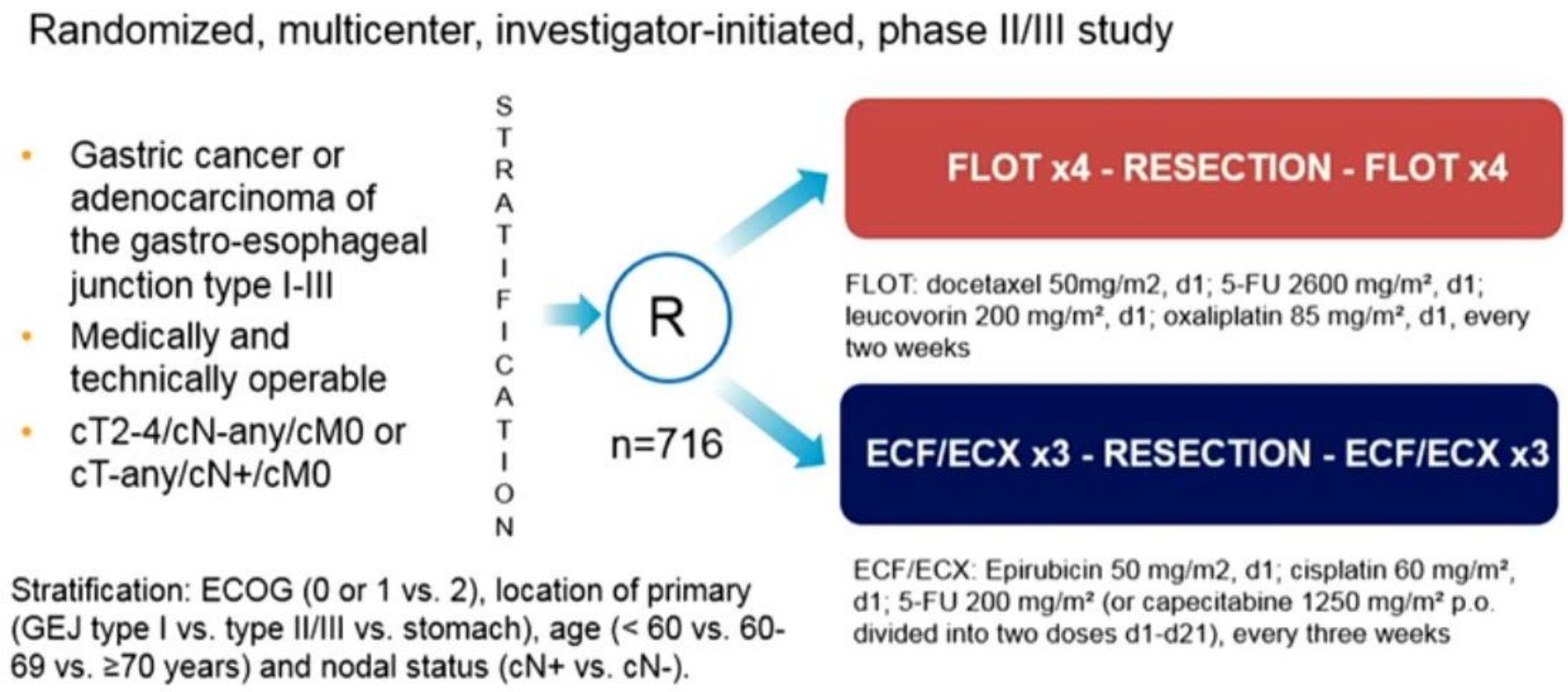
- Only 42% completed all protocol treatment
- Only 42% of D2 gastrectomy

- Cunningham et al NEJM 2006

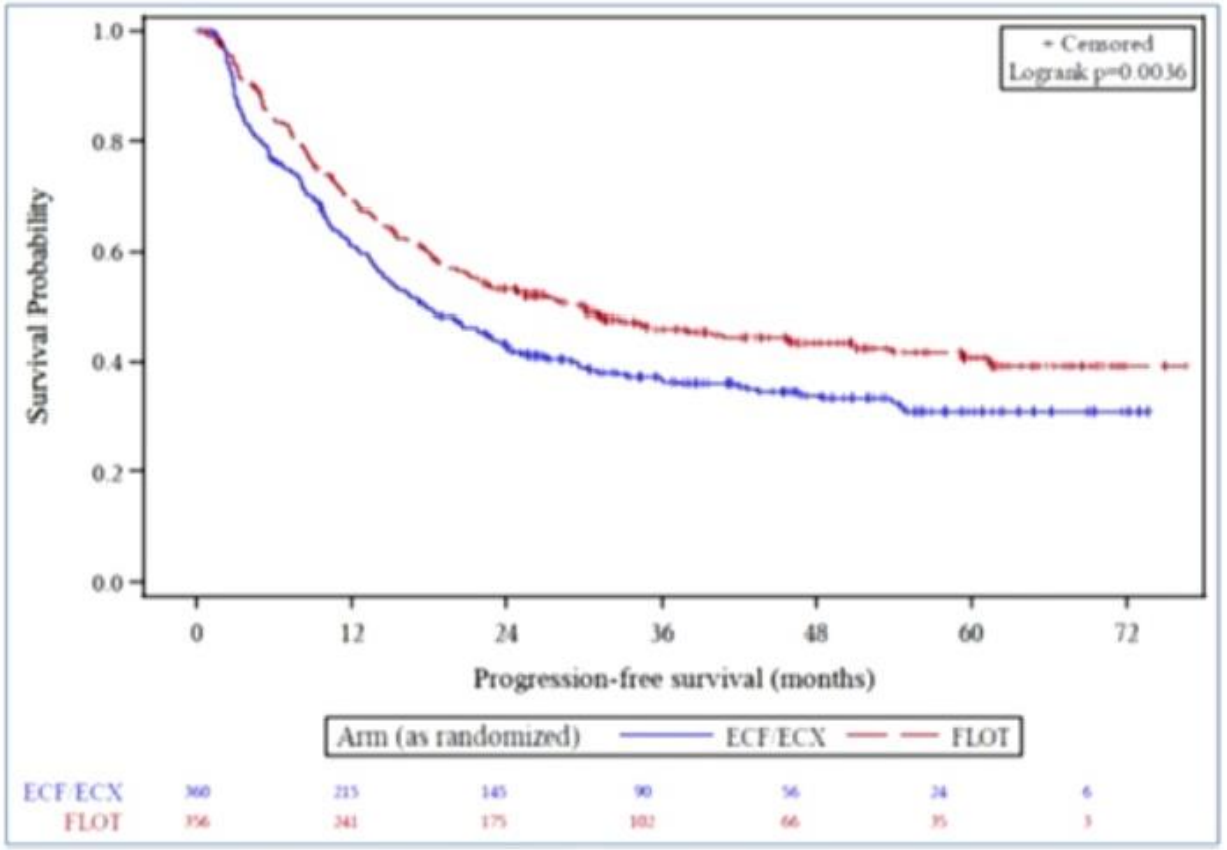
Perioperative chemotherapy

with docetaxel, oxaliplatin, and fluorouracil/leucovorin (FLOT) versus epirubicin, cisplatin, and fluorouracil or capecitabine (ECF/ECX) for resectable gastric or gastroesophageal junction (GEJ) adenocarcinoma (FLOT4-AIO): A multicenter, randomized phase 3 trial.

FLOT 4



FLOT 4 Progression Free Survival

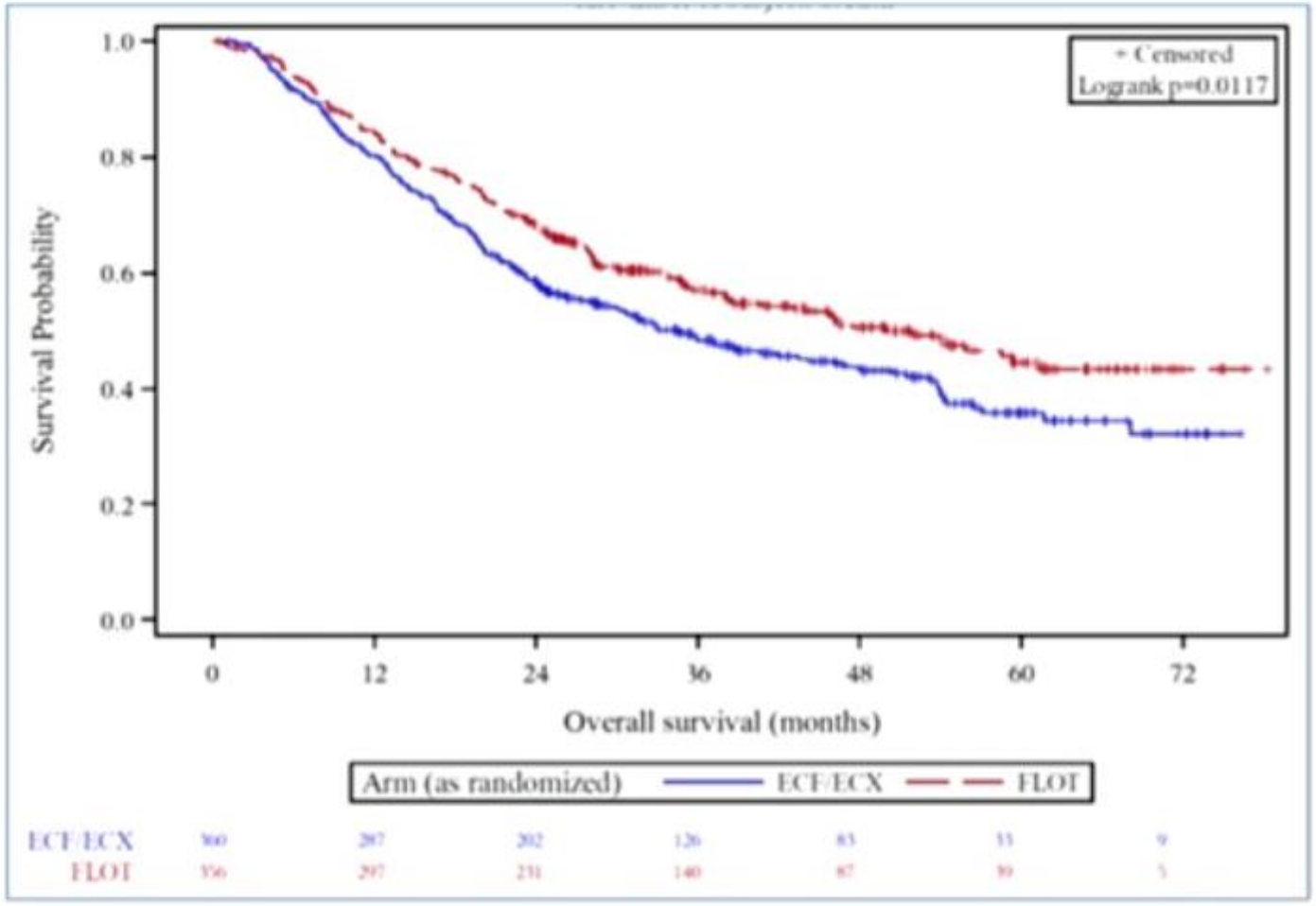


	ECF/ECX	FLOT
mPFS	18 months [15-22]	30 months [21-41]
HR	0.75 [0.62-0.91] p=0.004 (log rank)	

PFS rate*	ECF/ECX	FLOT
2y	43%	53%
3y	37%	46%
5y	31%	41%

Al-Batran S ESMO 2017 LBA 27

FLOT4 Overall Survival



	ECF/ECX	FLOT
mOS	35 months [27-46]	50 months [38-na]
HR	0.77 [0.63 - 0.94] p=0.012 (log rank)	

OS rate*	ECF/ECX	FLOT
2y	59%	68%
3y	48%	57%
5y	36%	45%

EU

Peri-operative chemo

Chemo➔ Surgery ➔ Chemo


MONGOLIA
CHINA
Beijing
Harbin
Changchun
Shenyang
Pyongyang
Seoul
Tokyo
Osaka
Shanghai
Taipei
Hong Kong
Lhasa
Chengdu
Chongqing
Wuhan
Nanjing
Zhengzhou
Xi'an
Lanzhou
Urumqi
Yinchuan
Tianjin
Guiyang
Changsha
Nanning
Kunming
Fuzhou
Hangzhou
Nanchang
Ulaanbaatar
Irkutsk
Chita
Ulan-Ude
Khabarovsk
Vladivostok
Sapporo
Kashi
Delhi
Kathmandu
Thimphu
Dhaka
Calcutta
Rangoon
BURMA
THAILAND
Bangkok
Chiang Mai
LAOS
Vientiane
VIETNAM
Hanoi
Ho Chi Minh City
Can Tranh
Phnom Penh
Phuket
Songkhla
Bandar Aceh
Kuala Lumpur
Manila
Legaspi
Puerto Princesa
Zamboanga
Philippines Sea
Bay of Bengal
North Pacific Ocean

Japan

- **The General Rules (GR) for Gastric Cancer Study in Surgery and Pathology**

(1st Japanese edition) in 1963

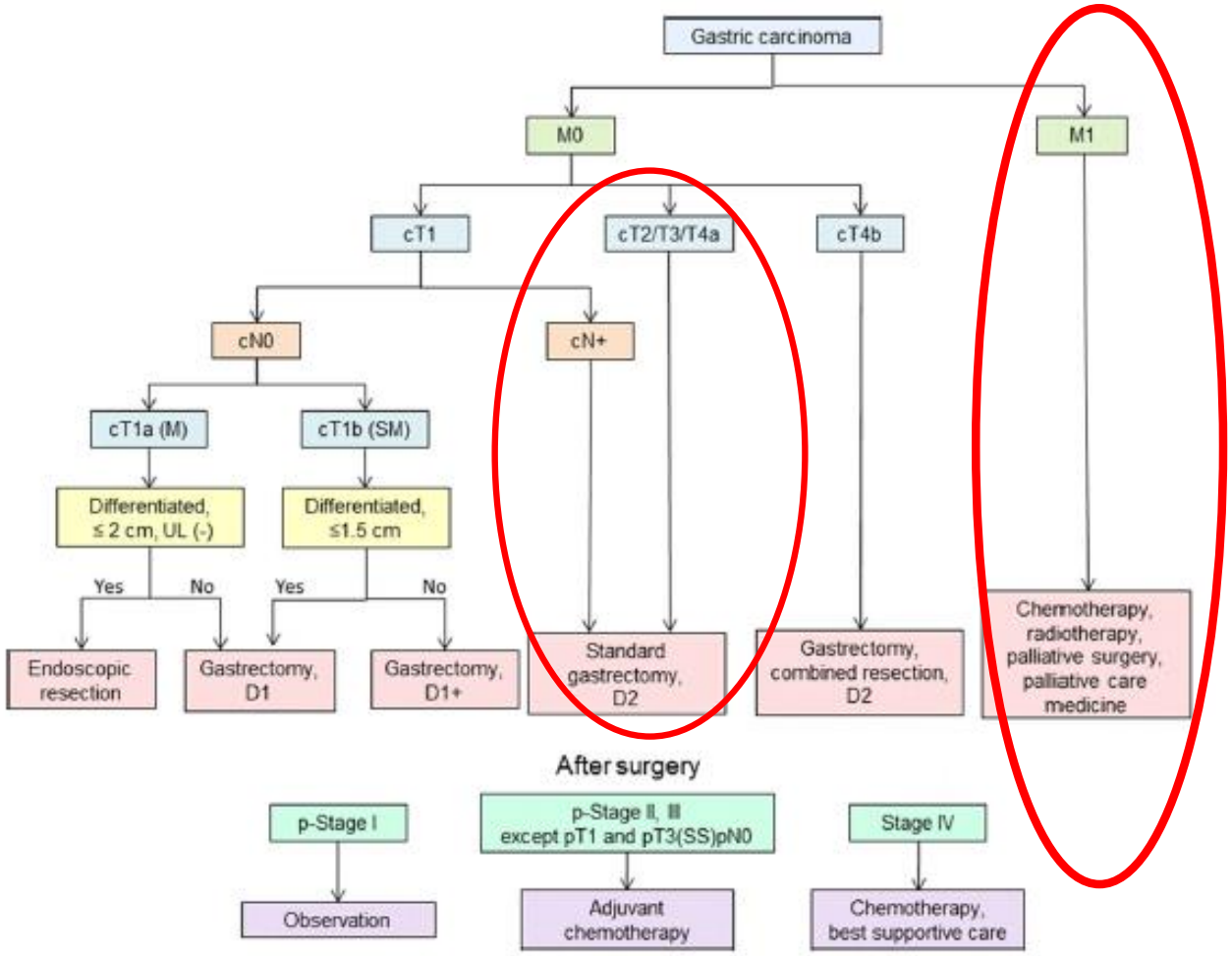
Japanese Research Society for Gastric Cancer (JRSGC) 1963

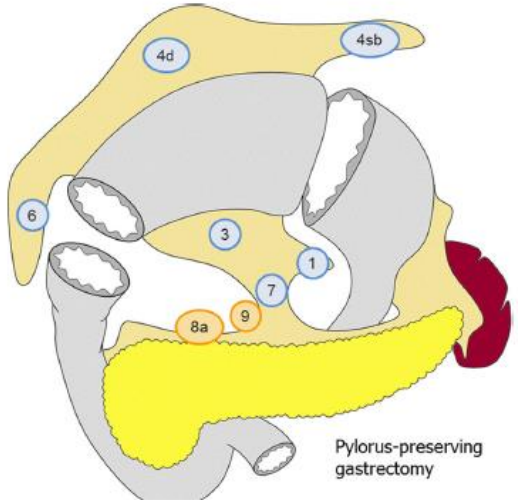
- **1995** 1st English edition of the Japanese classification of gastric carcinoma (12th Japanese edition of GR)
- **1997** The JRSGC was transformed into the Japanese Gastric Cancer Association
- **1998** 2nd English edition of the Japanese classification of gastric carcinoma (13th Japanese edition of GR)
- **2010** 3rd English edition of the Japanese classification of gastric carcinoma
- **2014** 4th English edition of the Japanese classification of gastric carcinoma
- **2018** 5th English edition of the Japanese classification of gastric carcinoma

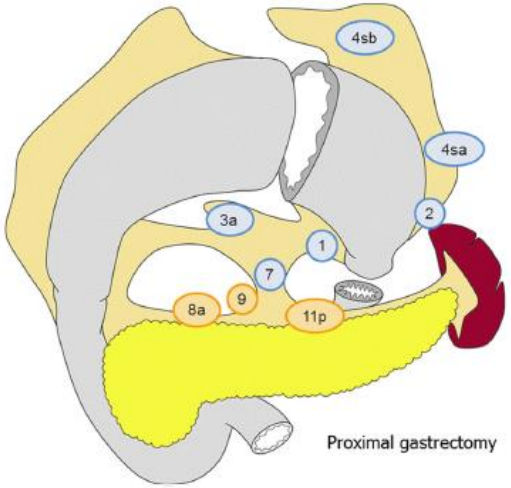
Japanese Gastric Cancer Association Gastric Cancer

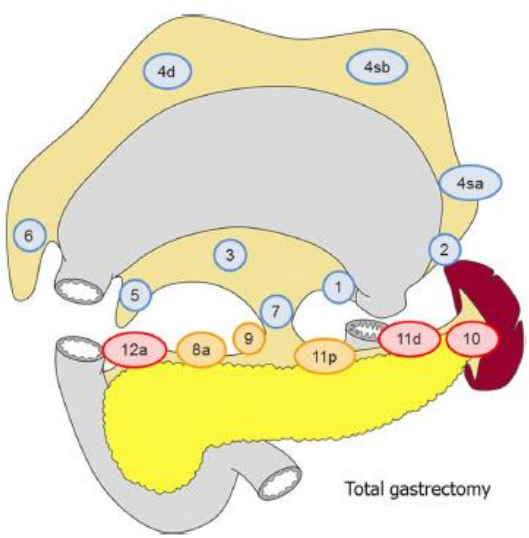
Japanese gastric cancer treatment guidelines 2014 (ver. 4)

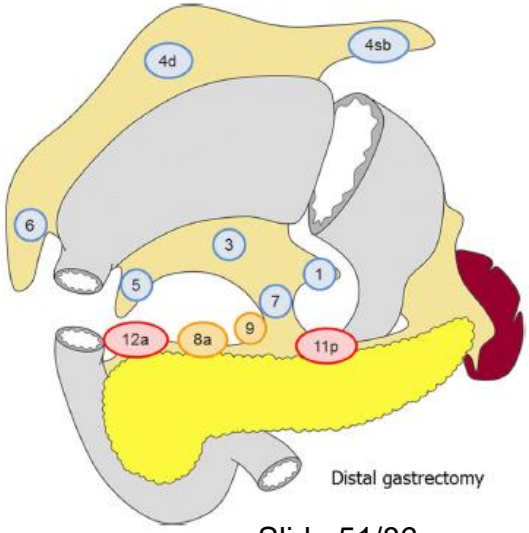
Japanese Gastric Cancer Association[1]

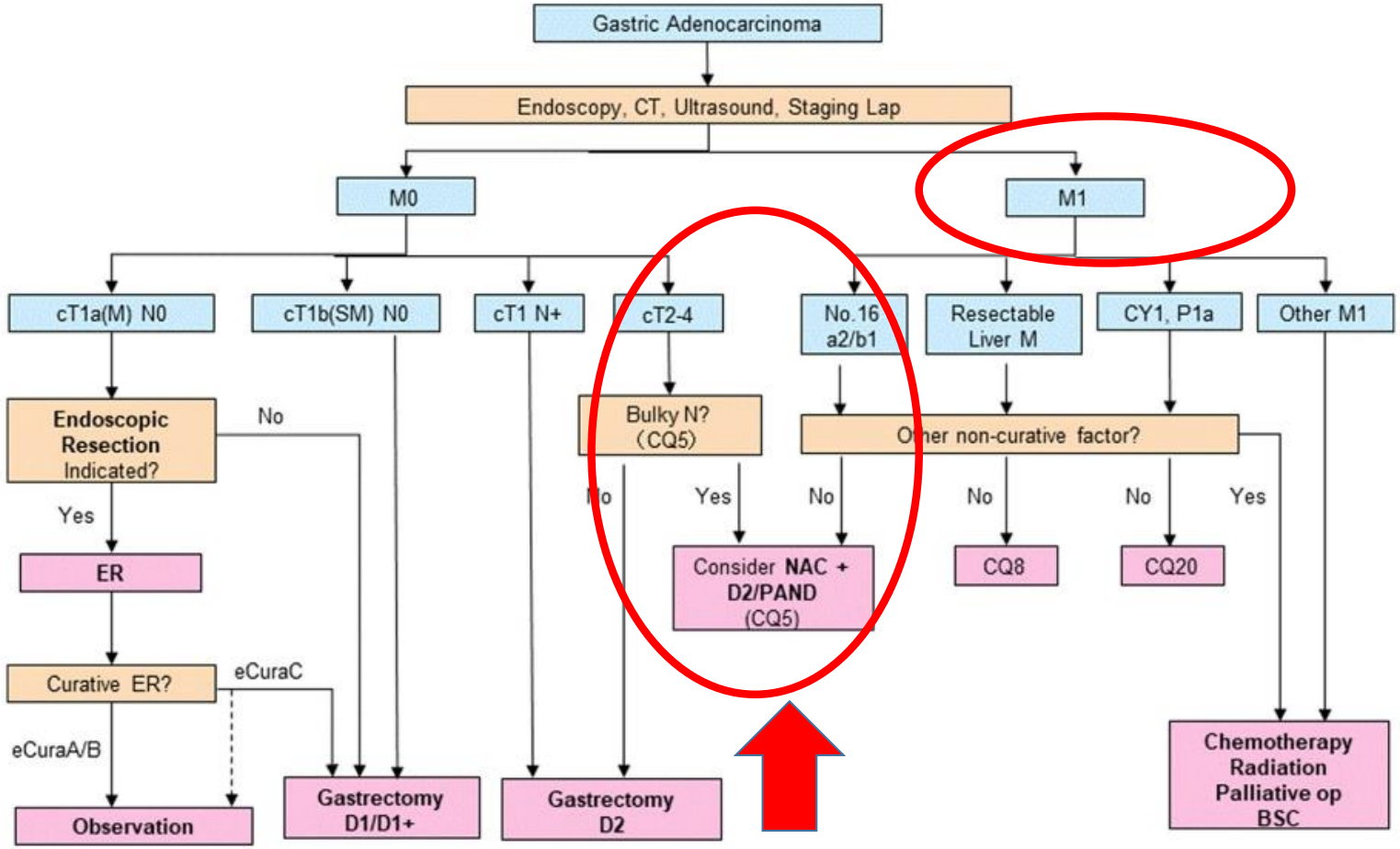


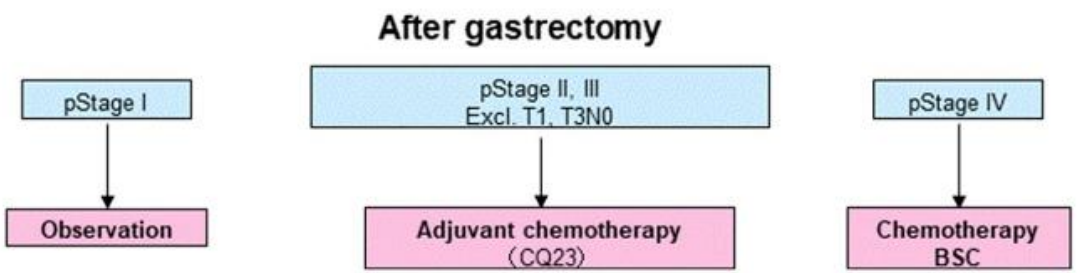


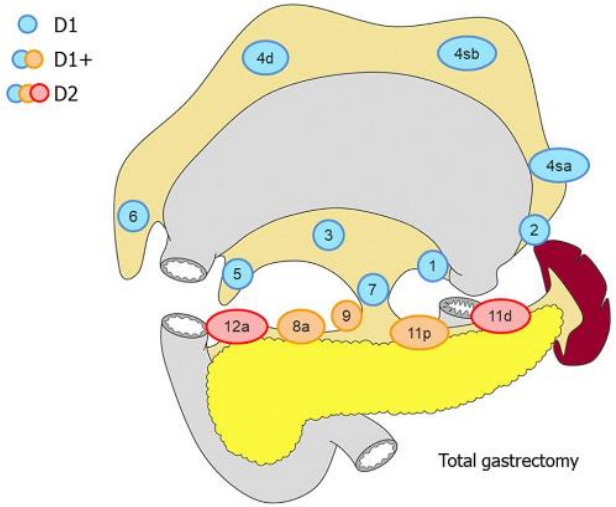


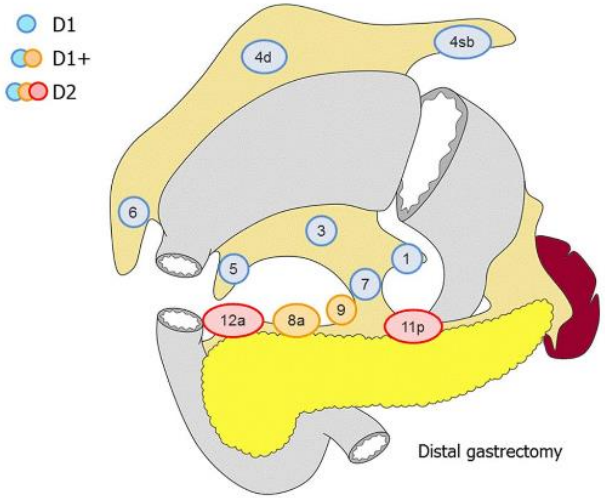






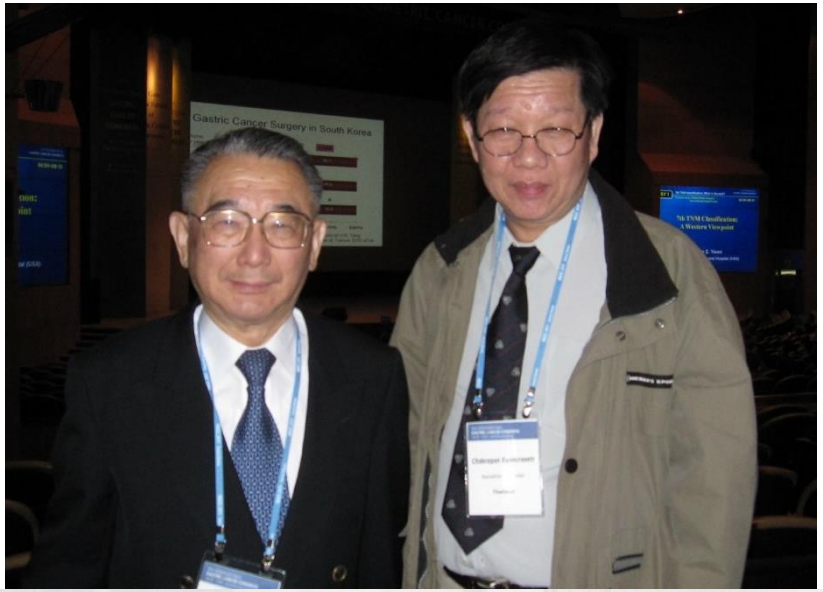






Gastric Cancer : Chairat Supsamutchai M.D.

Japanese gastric cancer treatment guidelines 2018 (5th edition)



from the left; back row; Mr. Sadaharu Asai (our son in law), Sakiko (our daughter), Wakiko, and Keiichi. front row; Chisako (our third grand daughter, 3 year 5 months old), Mayuko (our second grand daughter, 6 years old) and Yukako (our first grand daughter, 9 years old), November 2016

Merry Christmas and a Happy New Year 2017

Wakiko and Keiichi realized our dream in this March 2016, skiing in Zermatt together with our grand daughter Yukako.

Keiichi Maruyama
Professor of Surgery, Department of Surgical Oncology
University of Health and Welfare Sanno Medical Center
8-5-35, Akasaka, Minato-ku, Tokyo 107-0052, Japan
Tel: +81(Japan) -3-3402-5581, Telefax: +81-3-3469-5236

Professor Chakrapan Euanorasetr, M.D.
Department of Surgery
Ramathibodi Hospital
Mahidol University
270, Rama VI Road, Ratchathewi
Bangkok 10400
Thailand

Tokyo, December 2016

Wakiko and Keiichi Maruyama
50-2-302 Motooyogi, Shibuya-ku
Tokyo 151-0062, Japan
Home tel: +81-3-3469-5222
Home fax: +81-3-3469-5236
mobile phone +81-90-1048-4361

Dear Professor Chakrapan Euanorasetr,

Our best wishes for a Merry Christmas and a Happy New Year 2017 to you and your family.

We believe you and your family are very well and happy. Year 2016 was a good period for all Maruyama's family. I am still working at the outpatient clinic of the Sanno University Hospital. Wakiko and I are enjoying life ; traveling, skiing, opera, foods, etc. Our daughter Sakiko and her husband Sadaharu Asai are successfully working as lawyers in Nagoya. We have three small grand daughters. Life in Japan is now peaceful and stable.

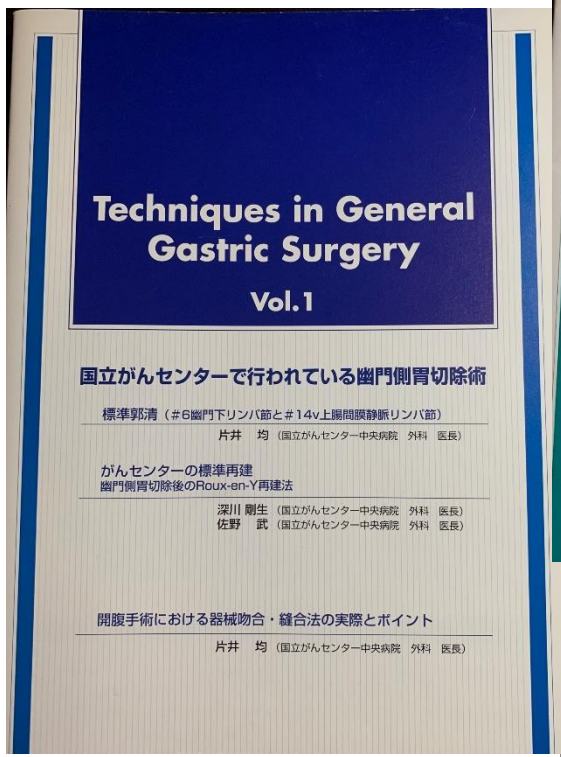
We hope year 2017 will be a very happy and brilliant year for you and your family. We look forward to meeting you again in the near future.

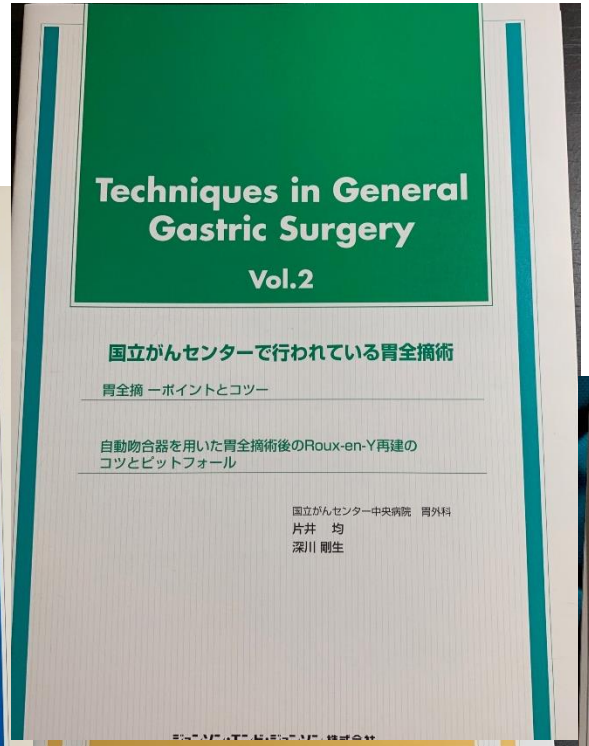
I felt sorry to hear your beloved King passed away.

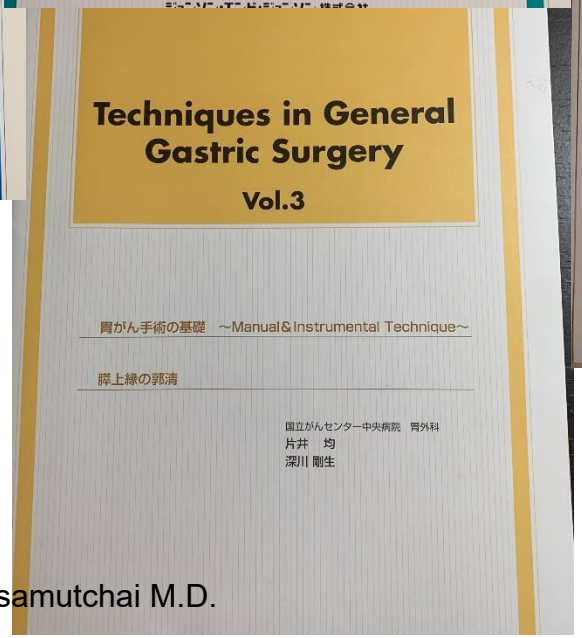
Keiichi Maruyama

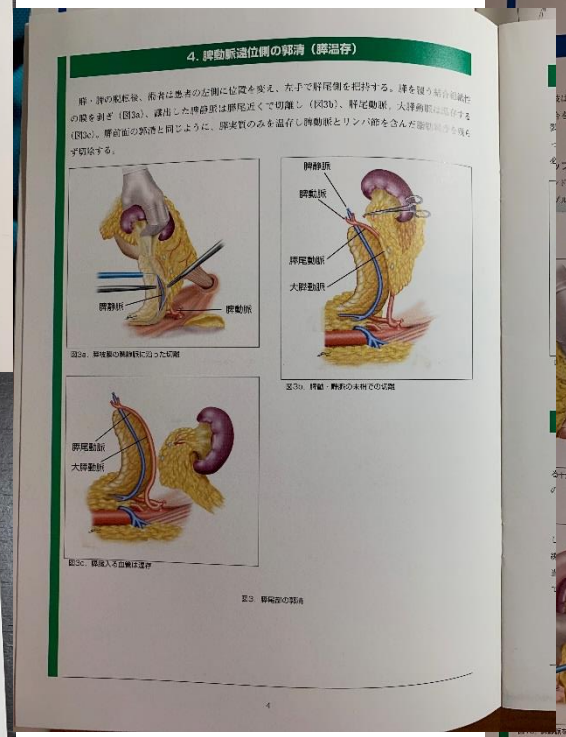
Wakiko and Keiichi in Zermatt March 2016

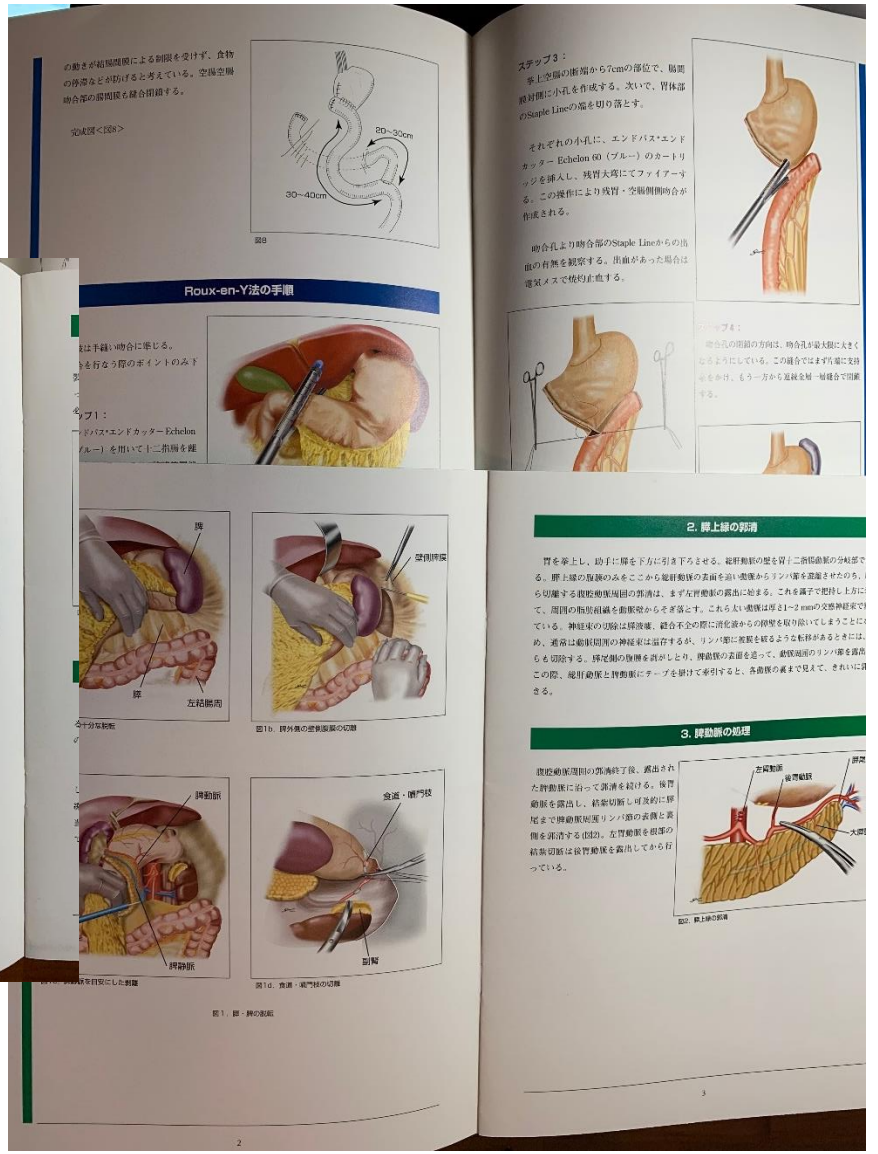
Our daughter and grand daughters at a tea ceremony


Techniques in General
Gastric Surgery
Vol.1
国立がんセンターで行われている幽門側胃切除術
標準郭清（＃6幽門下リンパ節と＃14v上腸間膜静脈リンパ節）
片井　均（国立がんセンター中央病院　外科　医長）
がんセンターの標準再建
幽門側胃切除後のRoux-en-Y再建法
深川 剛生（国立がんセンター中央病院　外科　医長）
佐野　武（国立がんセンター中央病院　外科　医長）
開腹手術における器械吻合・縫合法の実際とポイント
片井　均（国立がんセンター中央病院　外科　医長）


Techniques in General
Gastric Surgery
Vol.2
国立がんセンターで行われている胃全摘術
胃全摘 ーポイントとコツー
自動吻合器を用いた胃全摘術後のRoux-en-Y再建の
コツとピットフォール
国立がんセンター中央病院　胃外科
片井　均
深川 剛生


Techniques in General
Gastric Surgery
Vol.3
胃がん手術の基礎　～Manual&Instrumental Technique～
膵上縁の郭清
国立がんセンター中央病院　胃外科
片井　均
深川 剛生


4. 脾動脈遠位側の郭清（膵温存）
脾静脈
脾動脈
膵尾動脈
大膵動脈


Roux-en-Y法の手順
2. 膵上縁の郭清
3. 脾動脈の処理
左結腸周
脾静脈
副腎

Dr. MARUYAMA's Technical Note

Surgical Treatment of Gastric Cancer

Keiichi Maruyama

Dept. of Surgical Oncology, Univ. of Health and Welfare Sanno Hospital
former Chief, Gastric Cancer Division, National Cancer Center, Tokyo

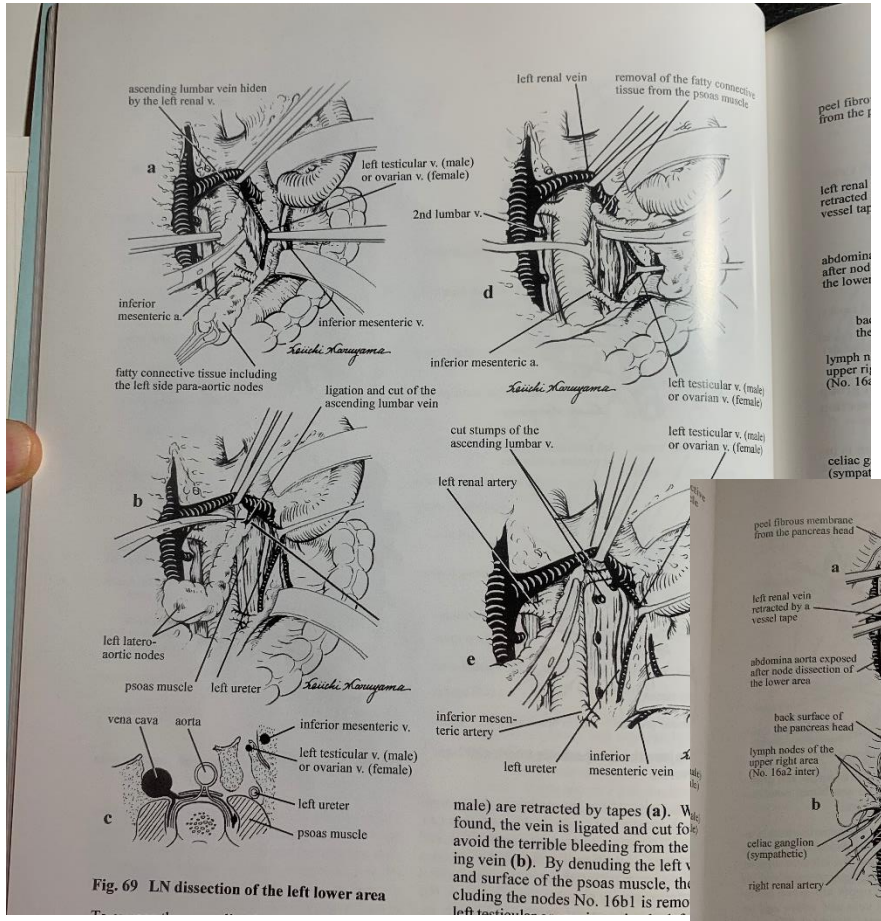


Fig. 69 LN dissection of the left lower area

male) are retracted by tapes (a). W
found, the vein is ligated and cut fo
avoid the terrible bleeding from the
ing vein (b). By denuding the left v
and surface of the psoas muscle, th
cluding the nodes No. 16b1 is remo

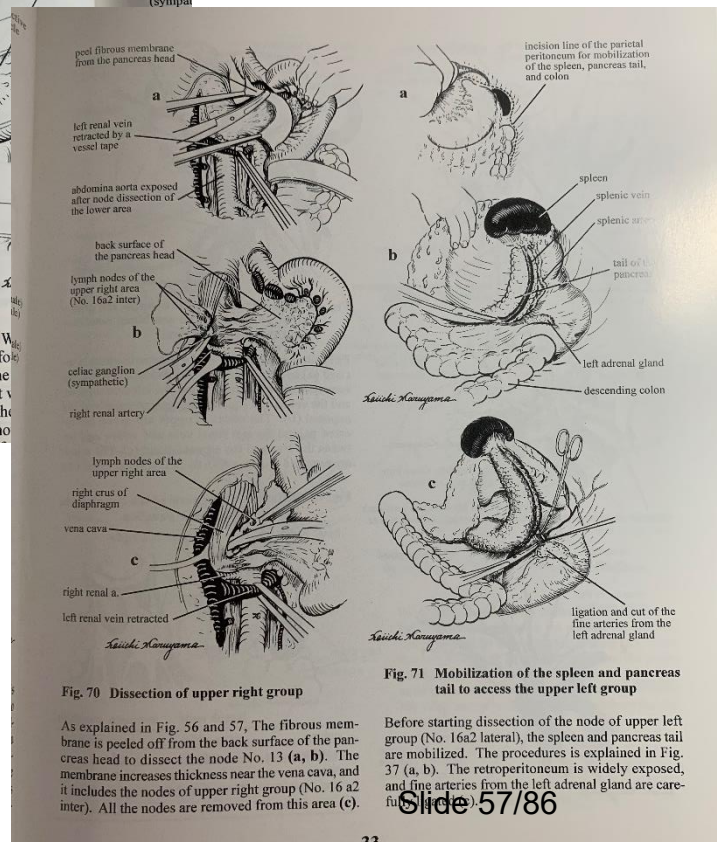
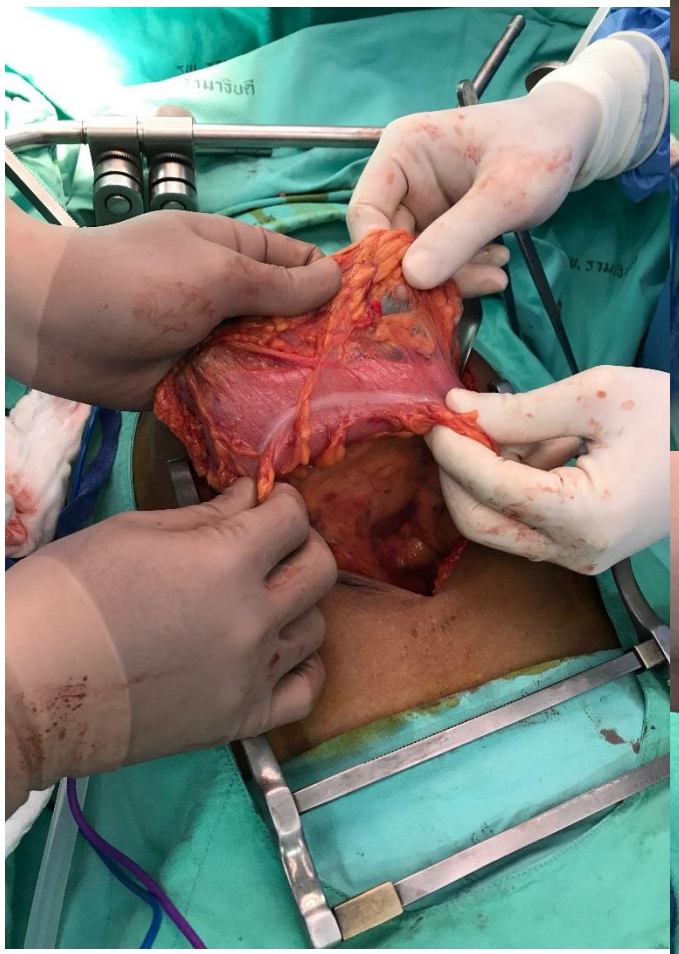


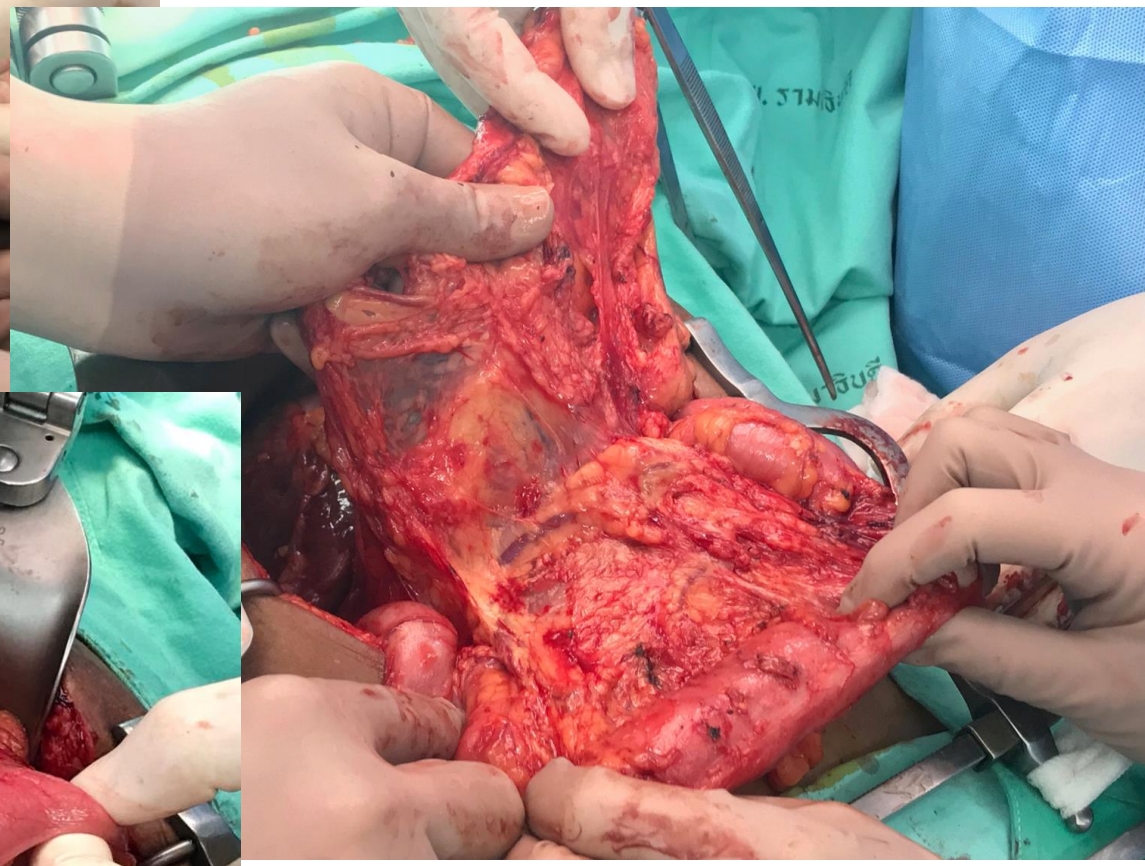
Fig. 70 Dissection of upper right group

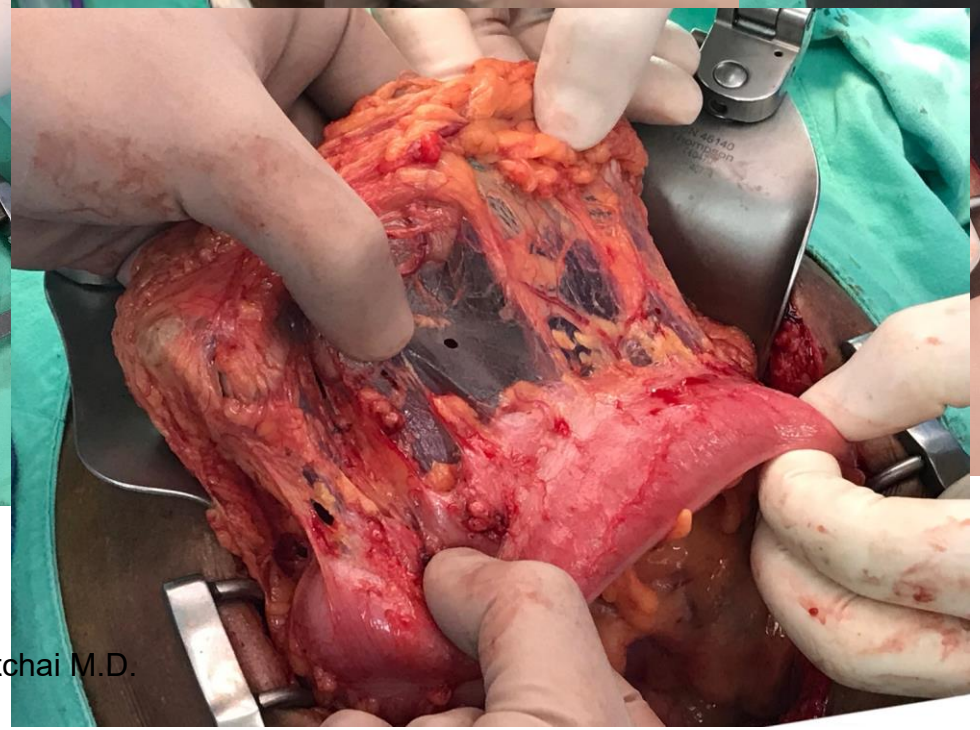
As explained in Fig. 56 and 57, The fibrous membrane is peeled off from the back surface of the pancreas head to dissect the node No. 13 (a, b). The membrane increases thickness near the vena cava, and it includes the nodes of upper right group (No. 16 a2 inter). All the nodes are removed from this area (c).

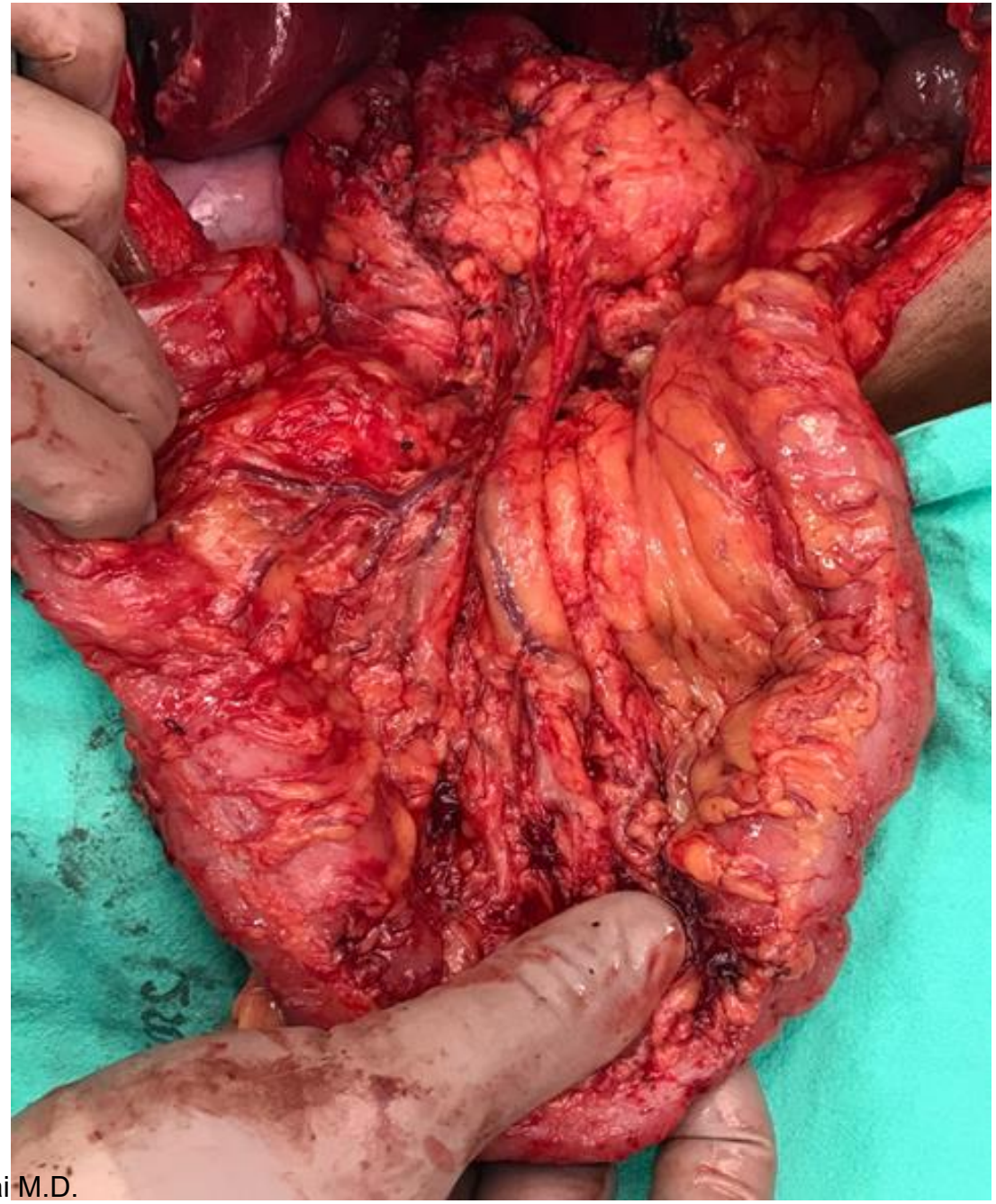
Fig. 71 Mobilization of the spleen and pancreas tail to access the upper left group

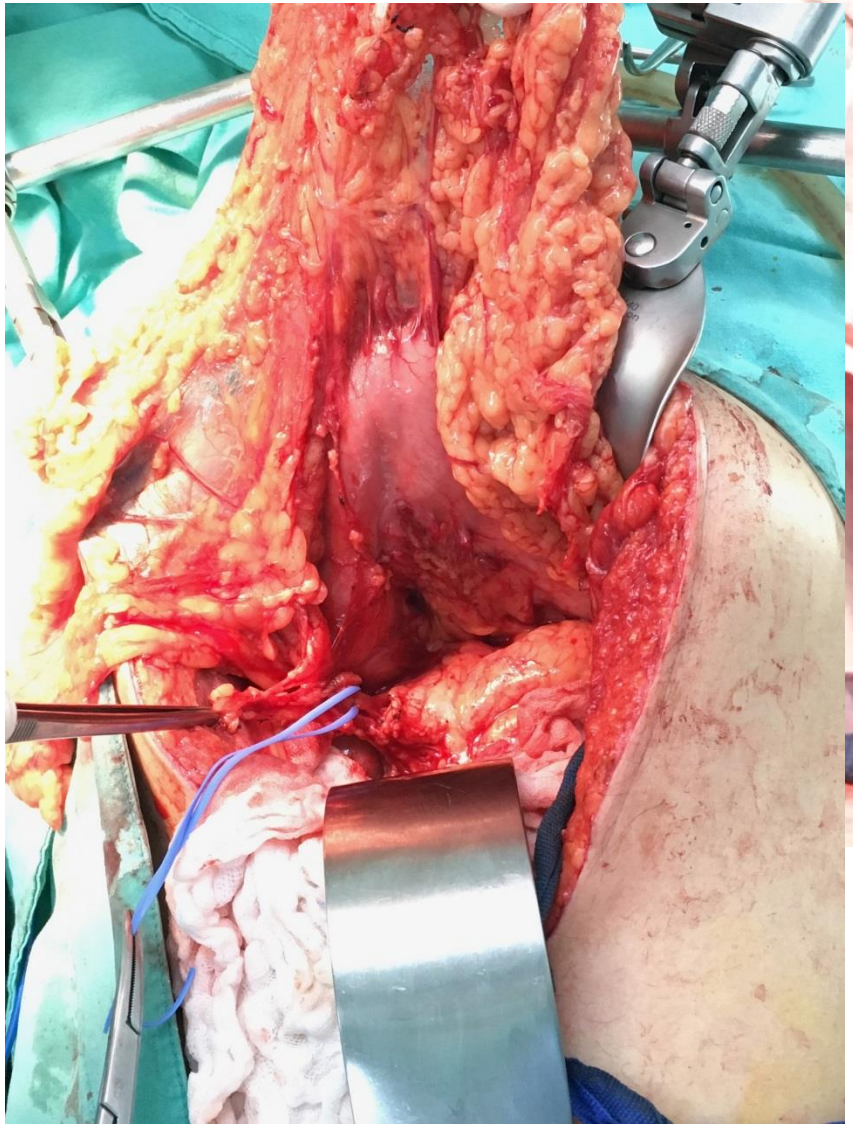
Before starting dissection of the node of upper left group (No. 16a2 lateral), the spleen and pancreas tail are mobilized. The procedures is explained in Fig. 37 (a, b). The retroperitoneum is widely exposed, and fine arteries from the left adrenal gland are care-

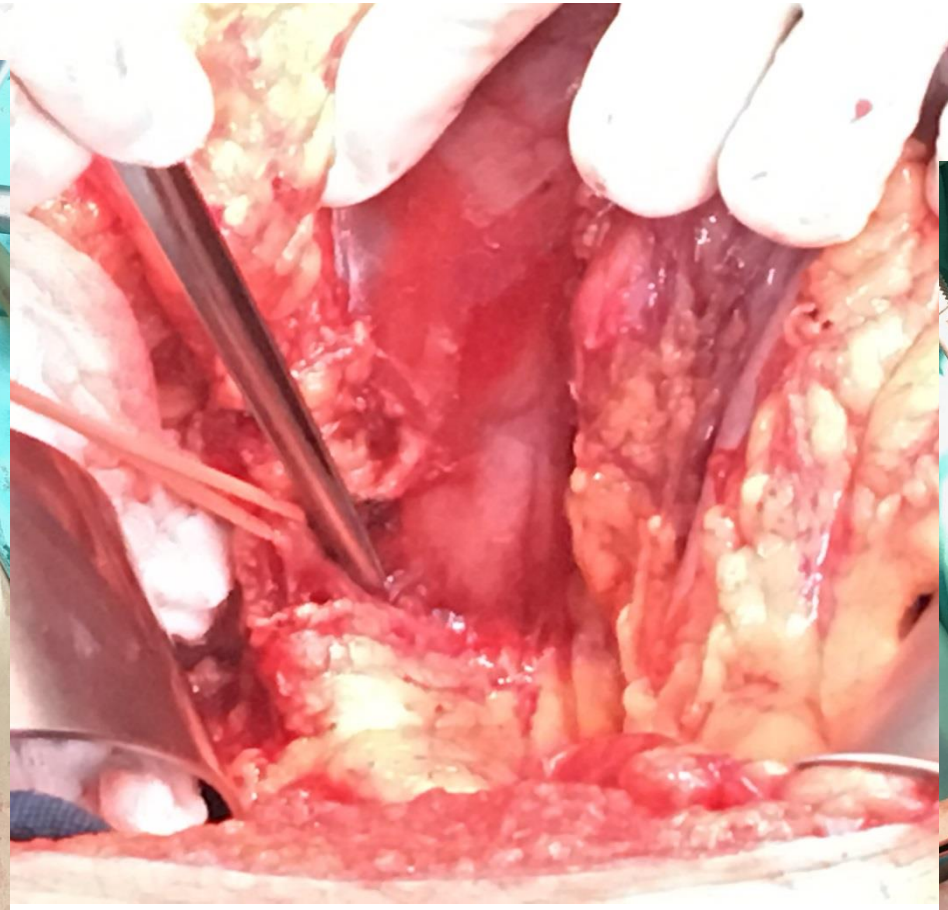


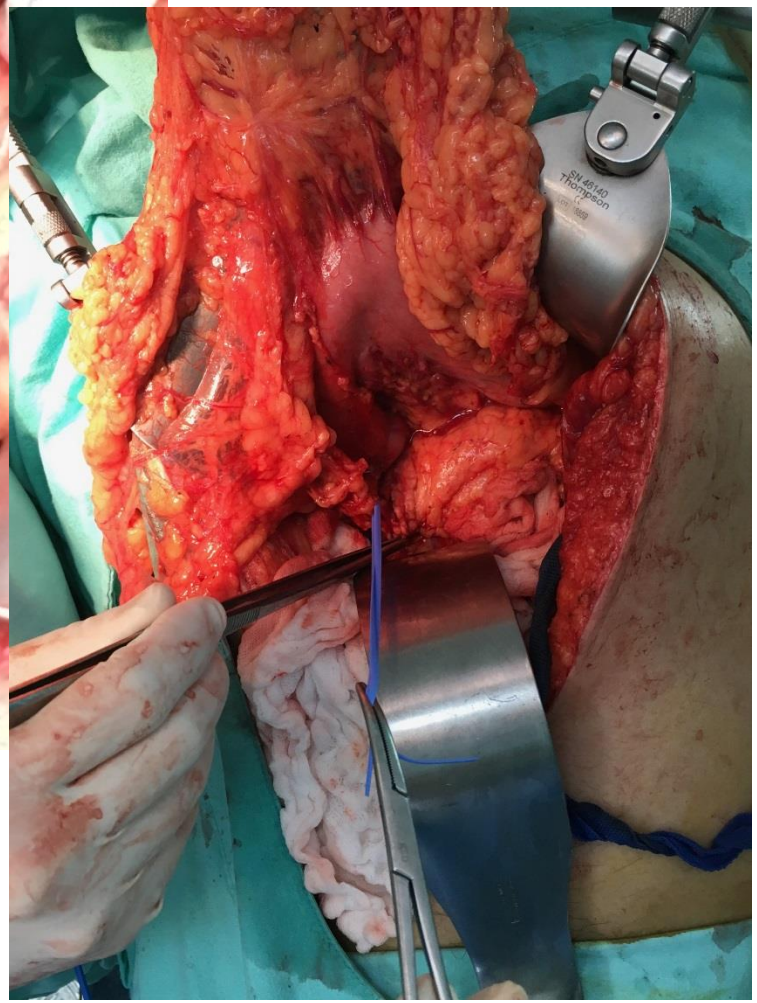


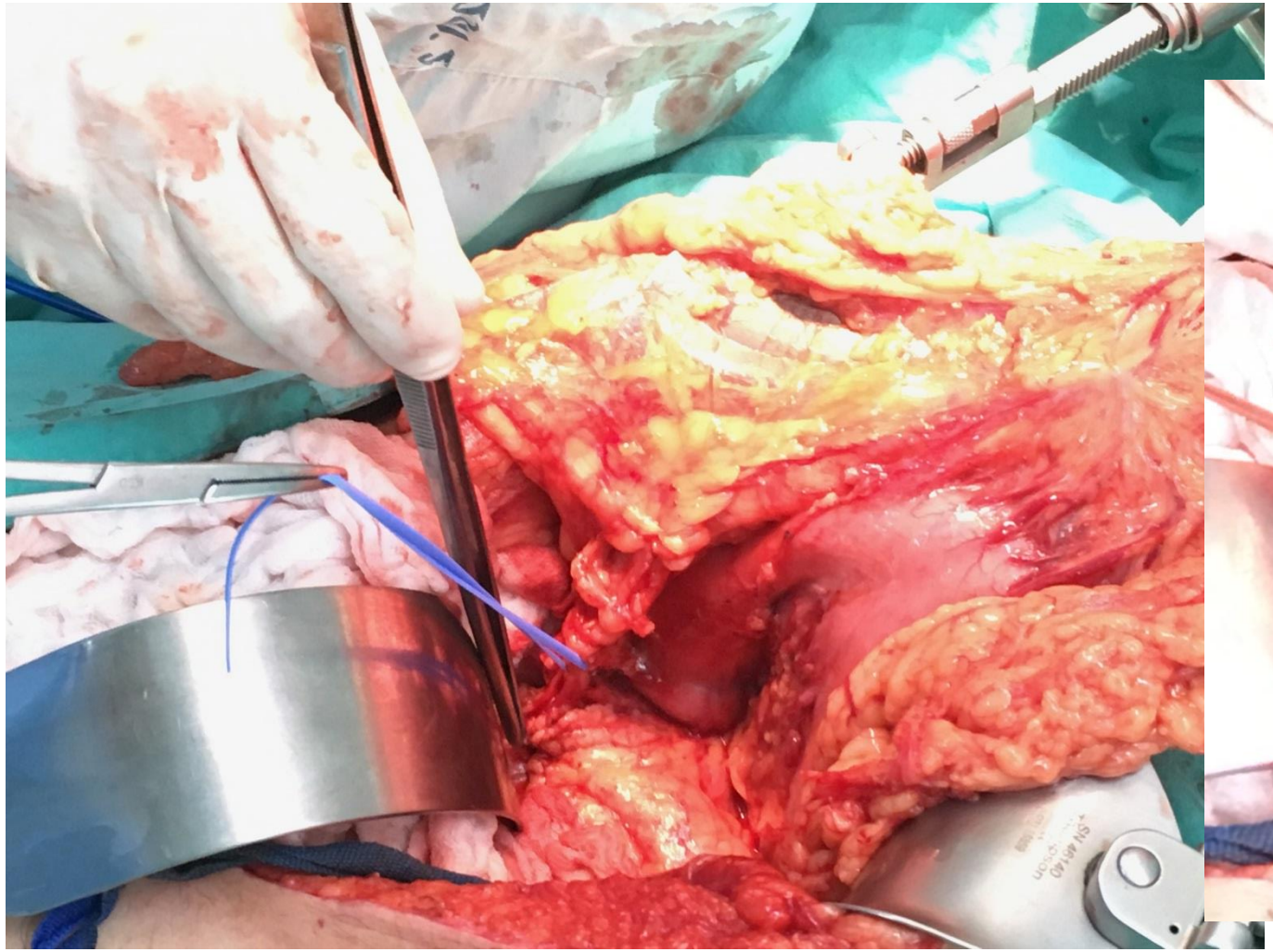


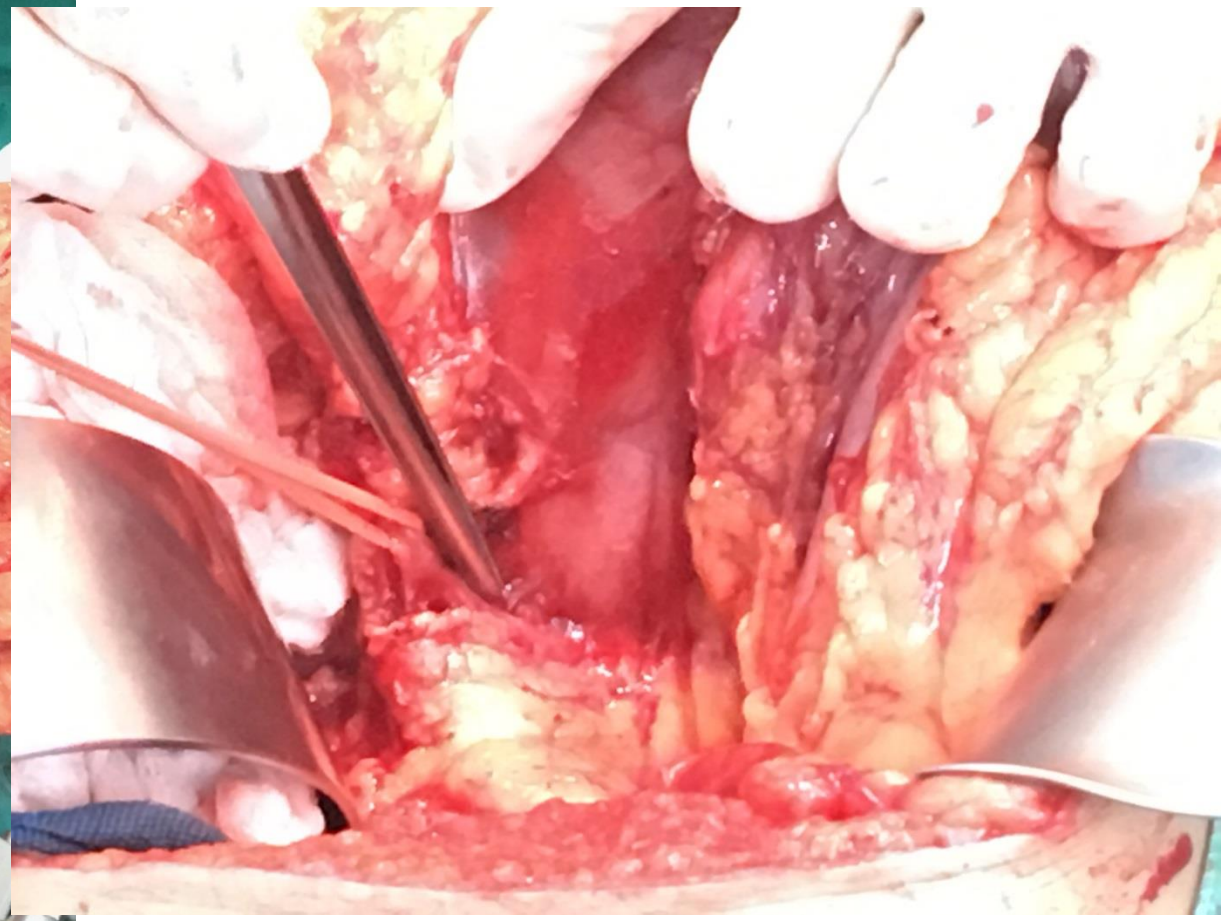


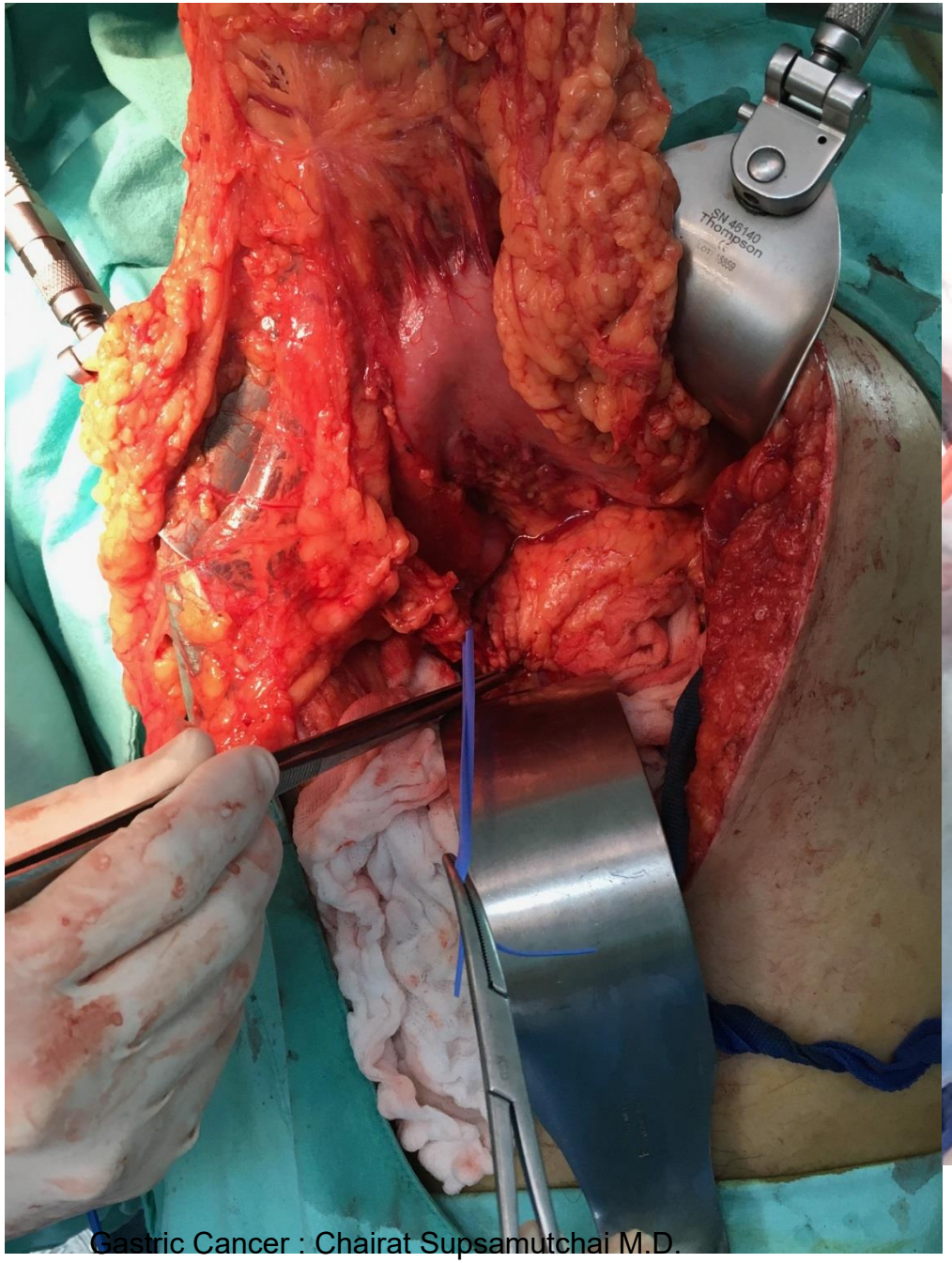


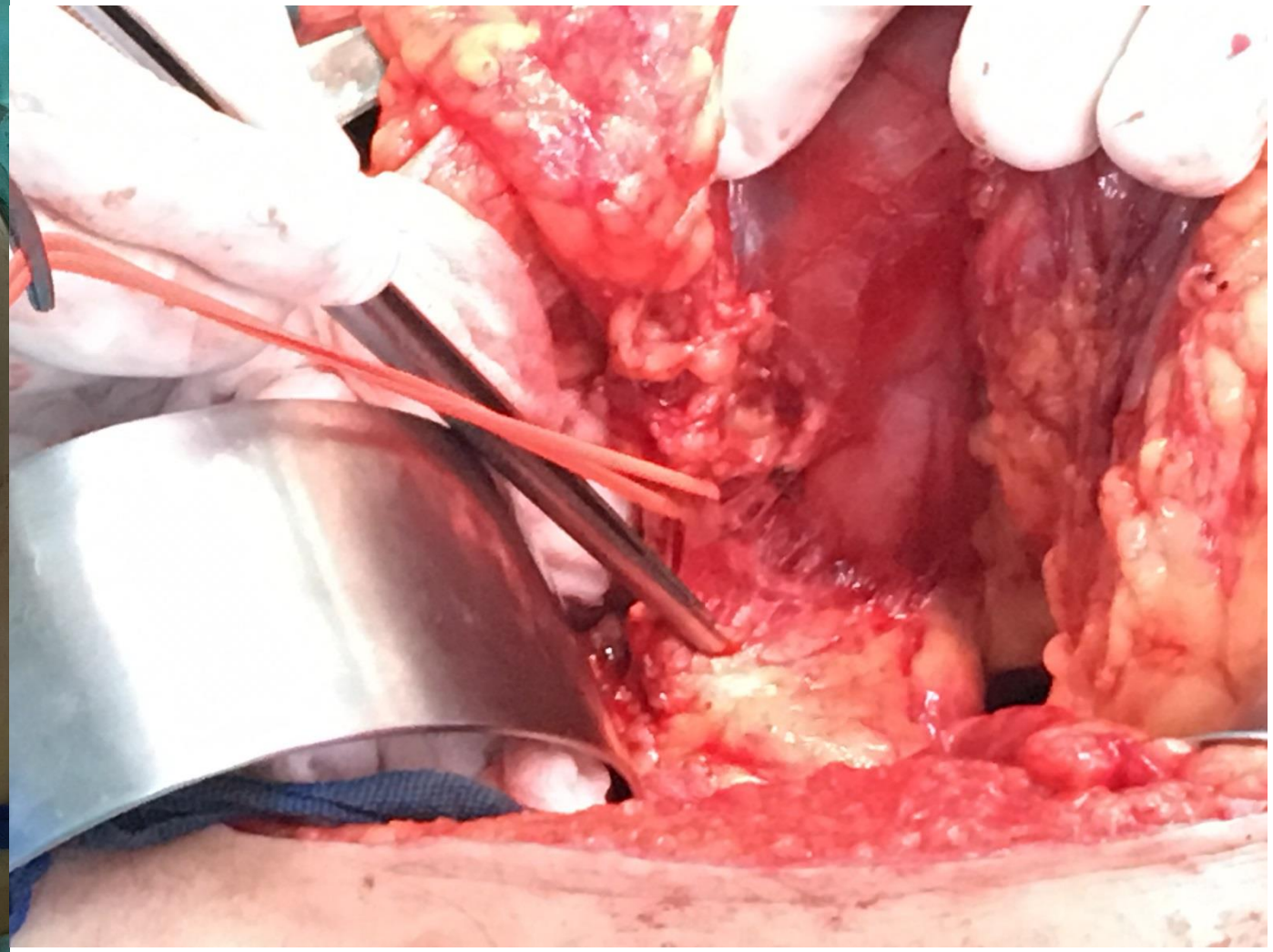


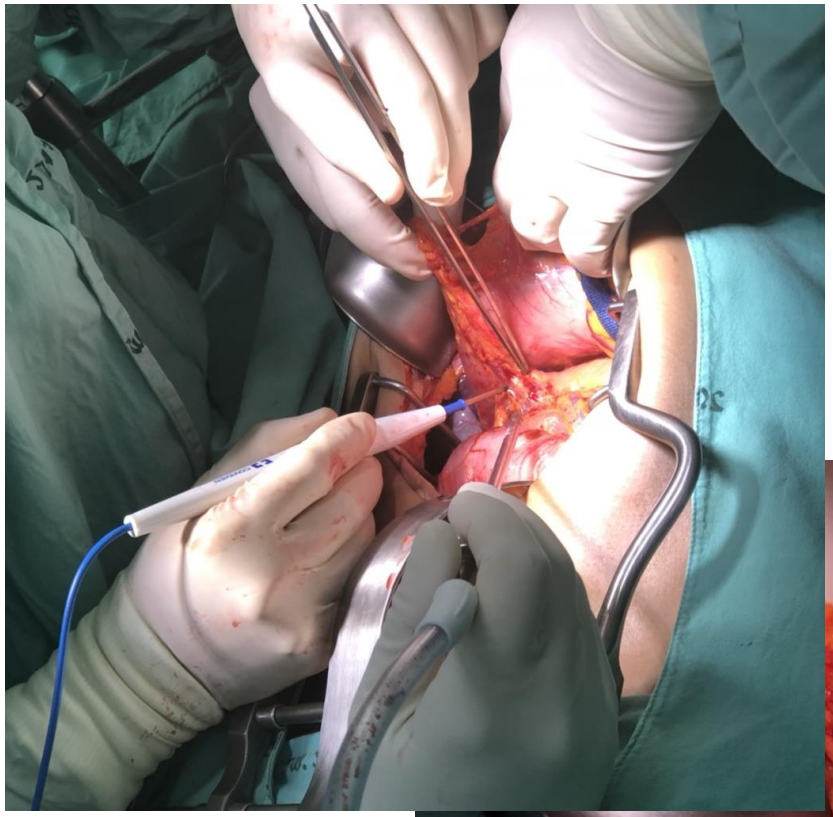


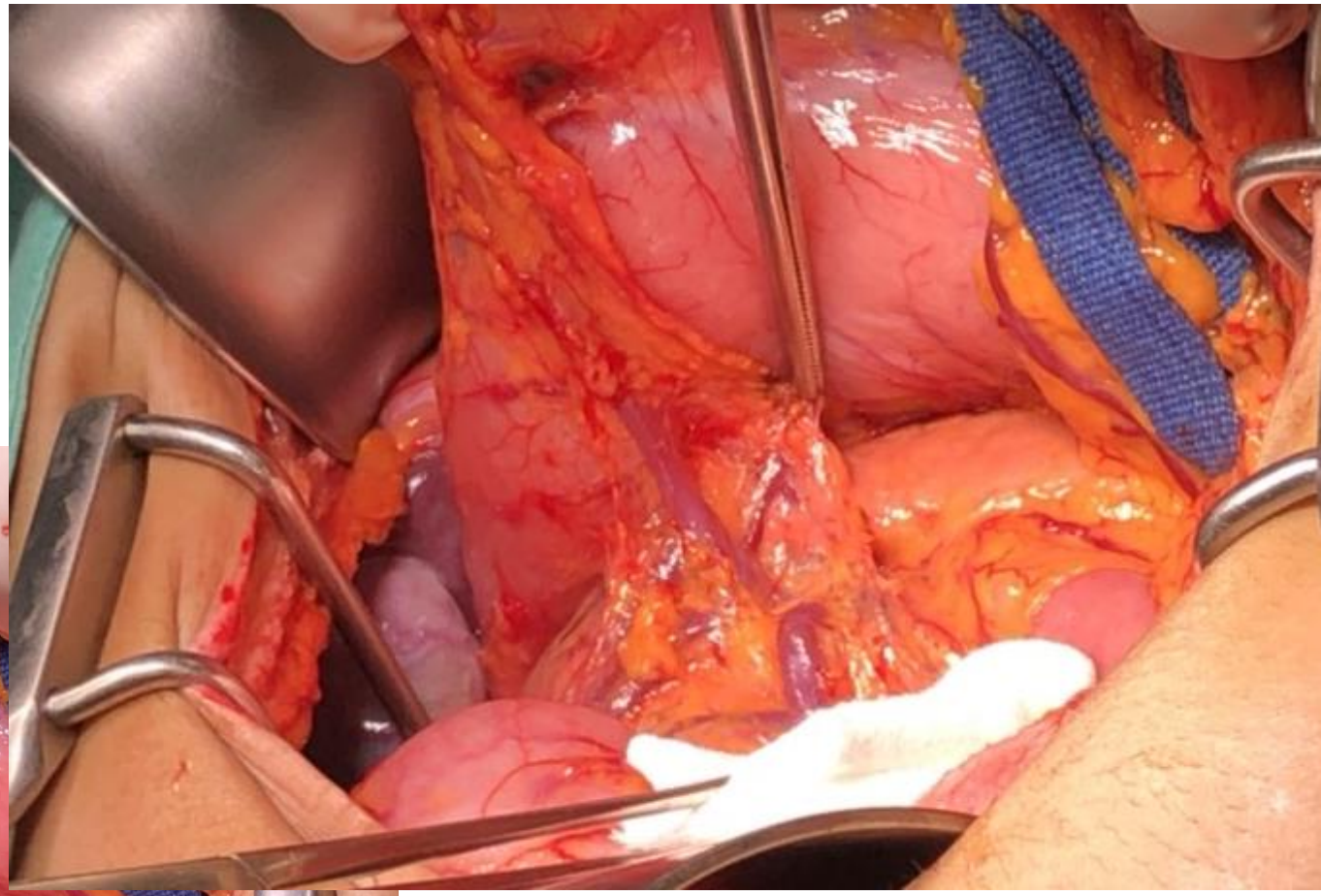


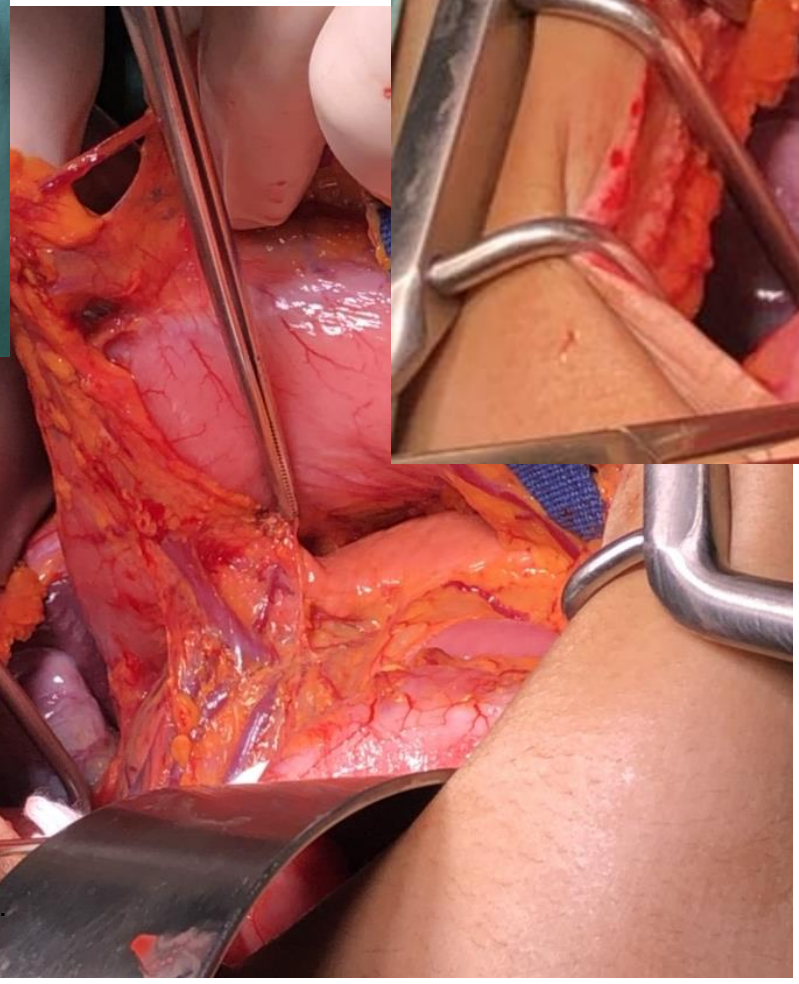


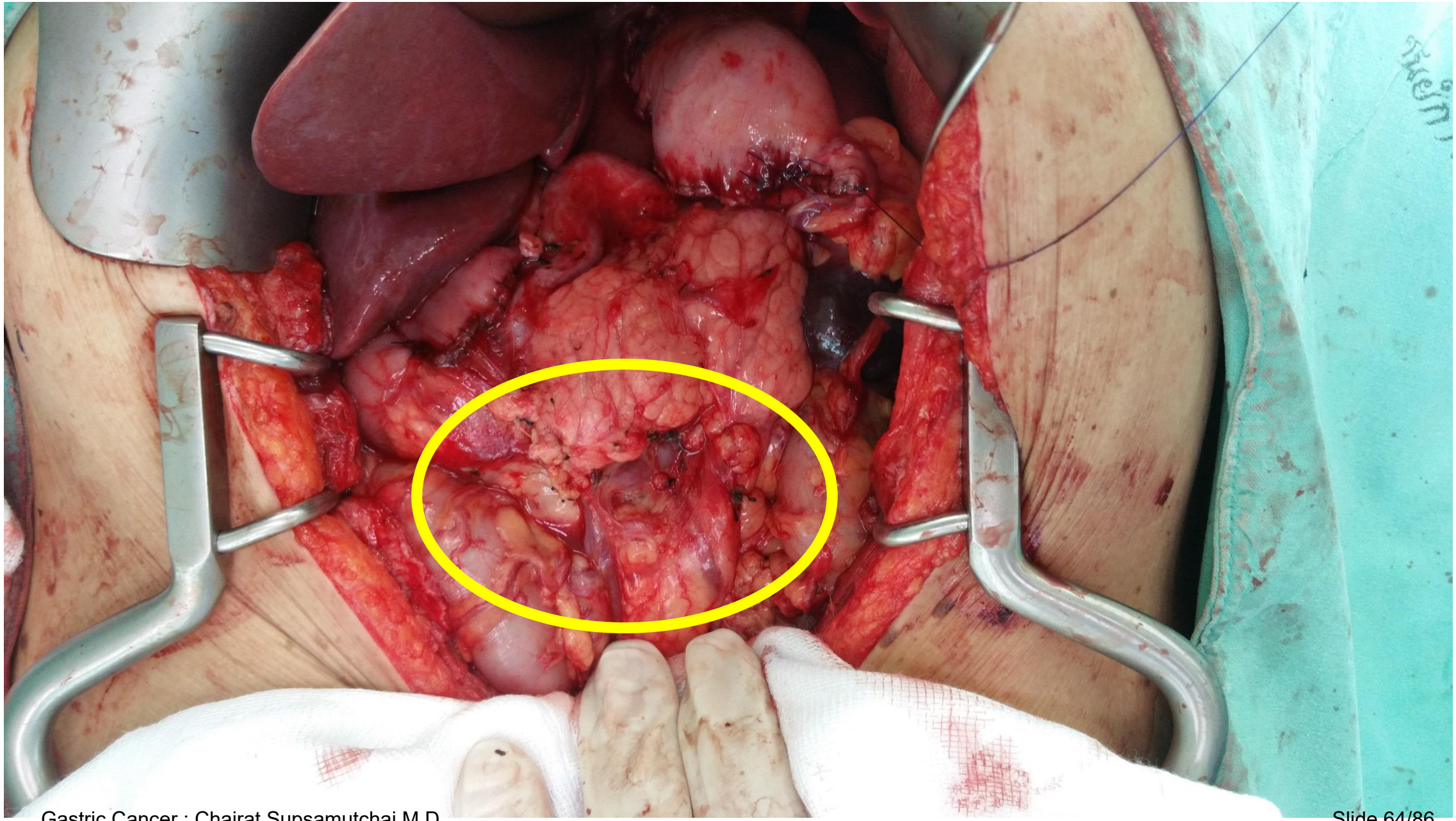

SN 46140
Thompson

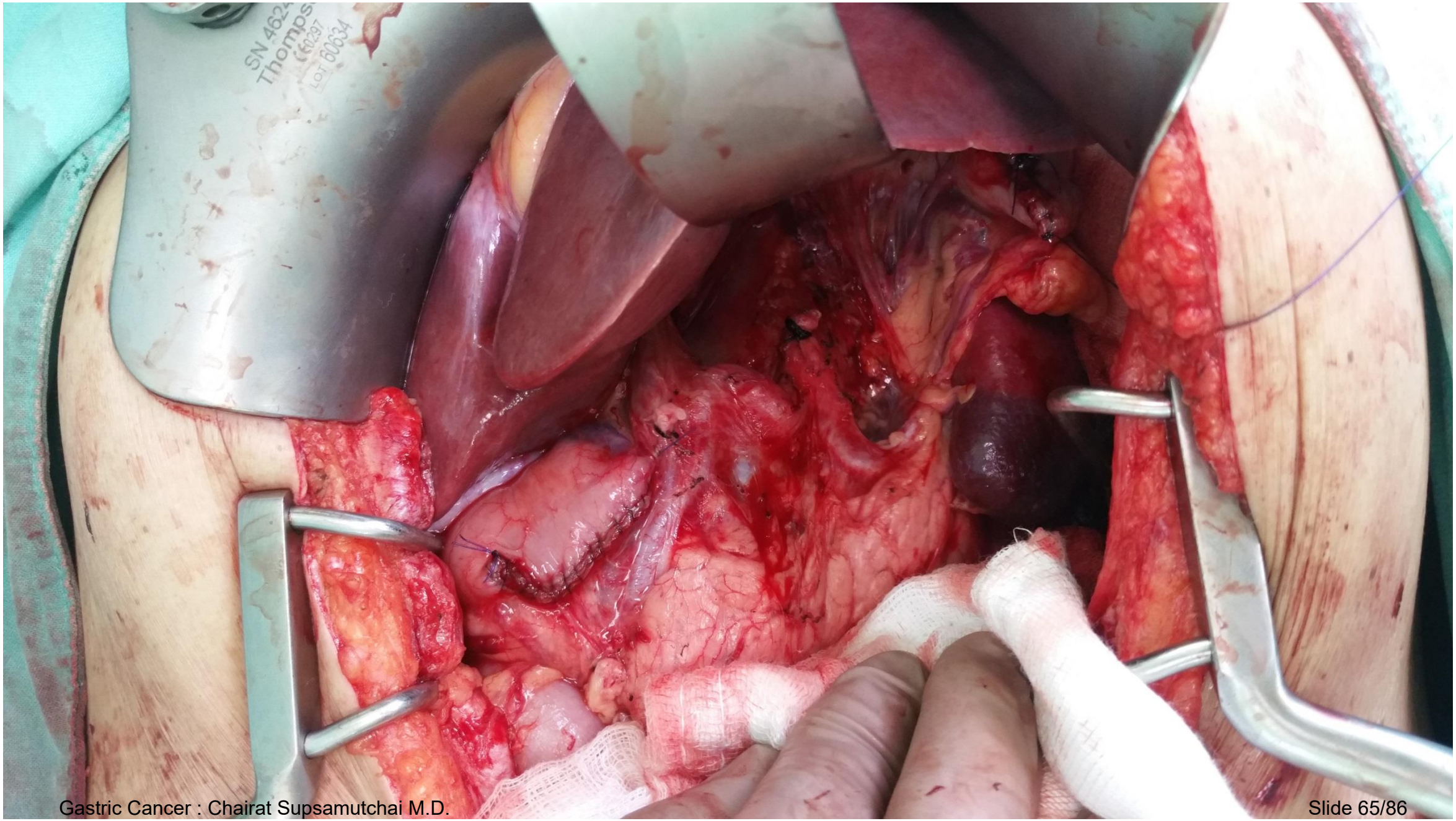


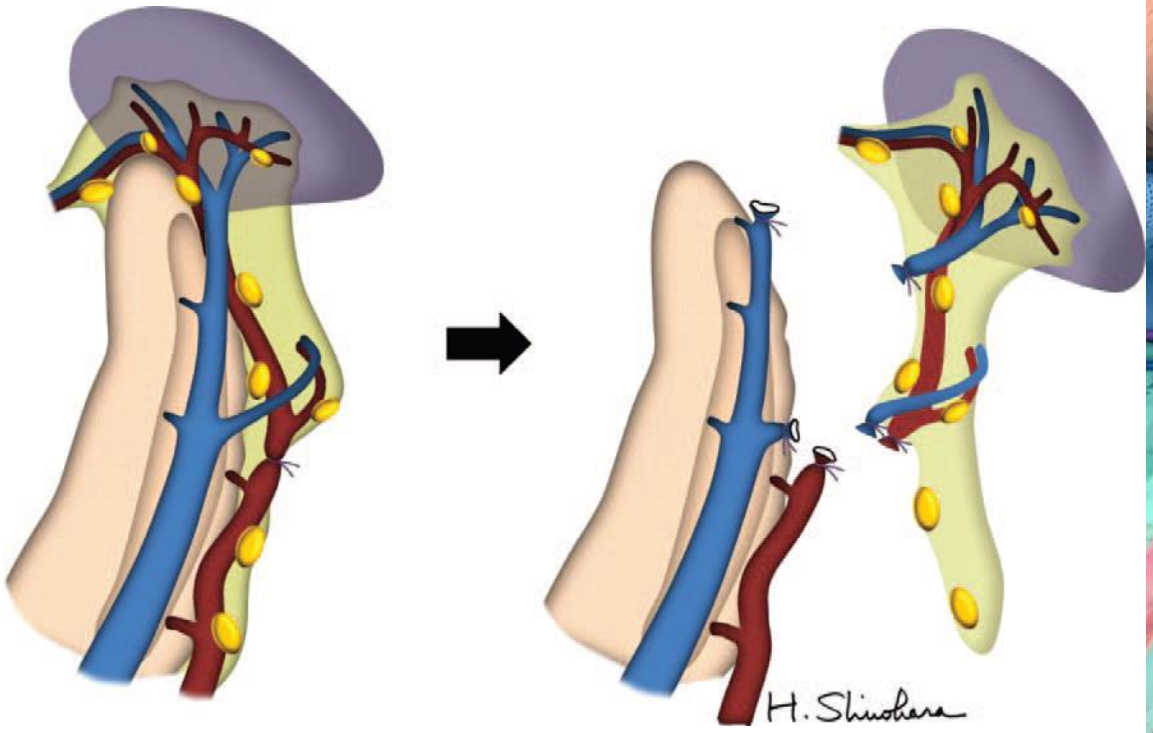


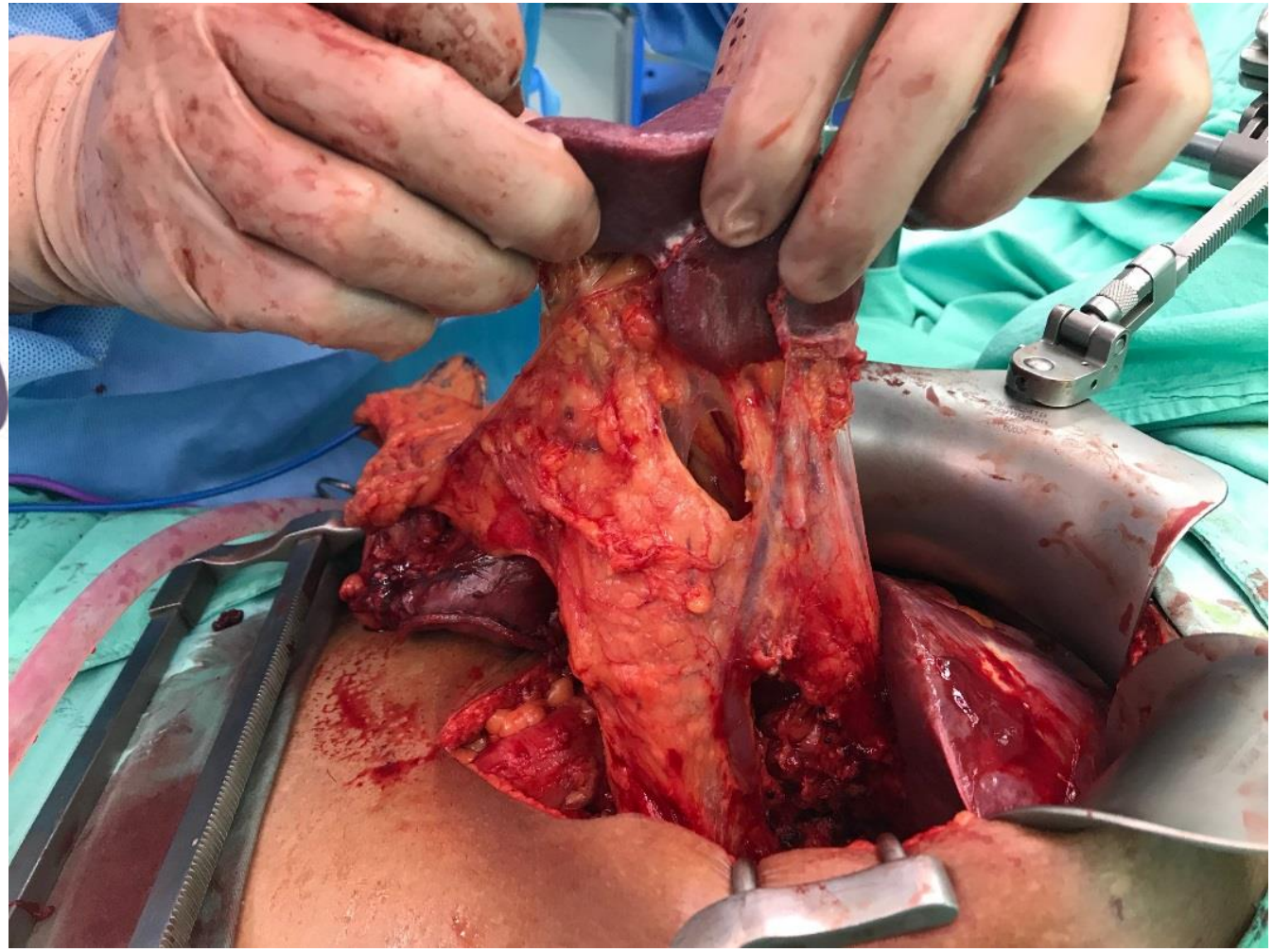


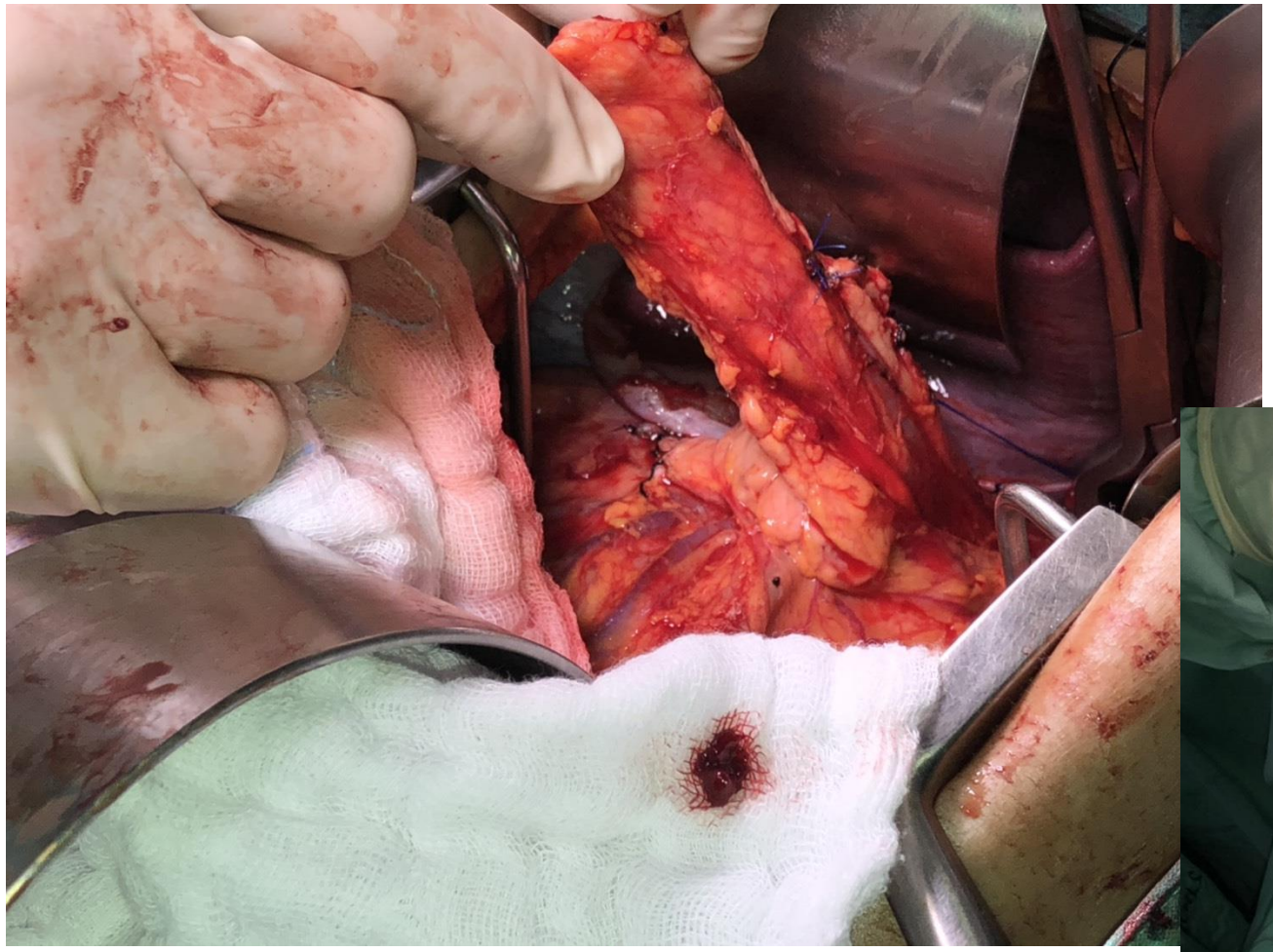


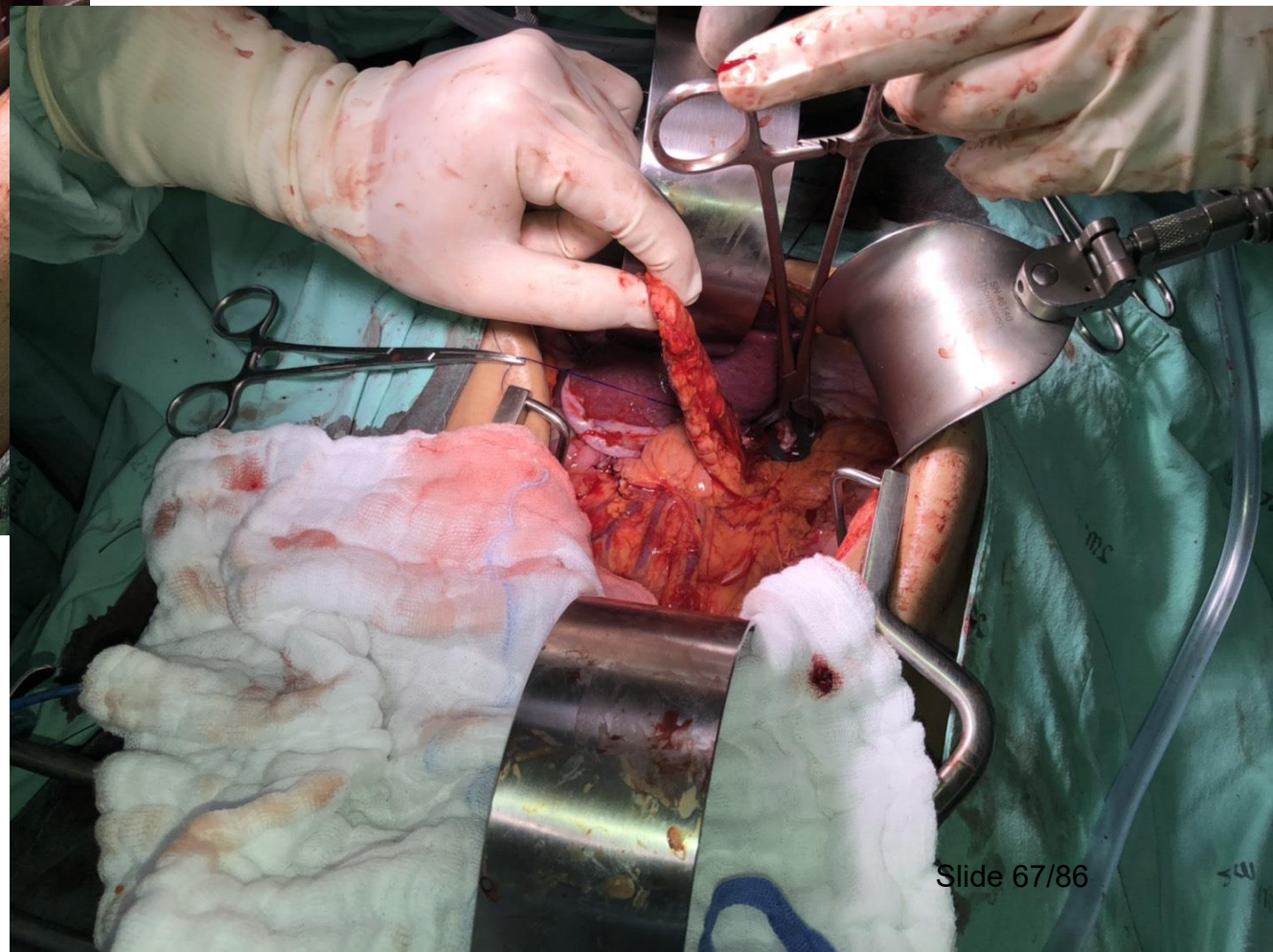


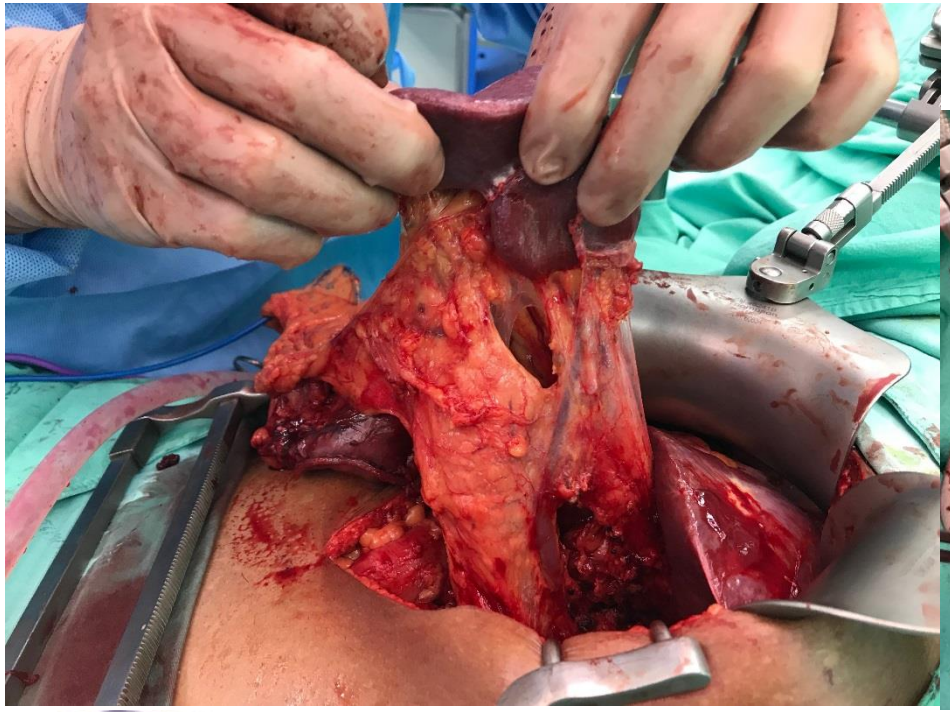


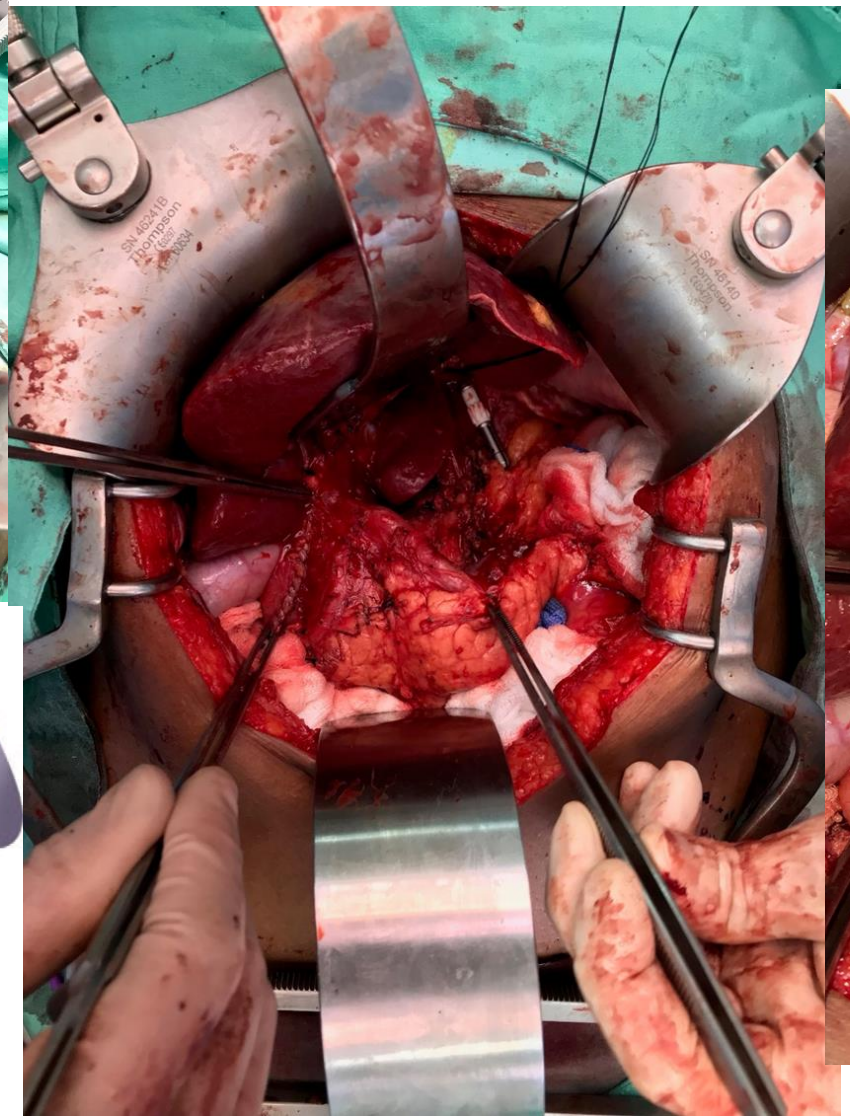

H. Shinohara

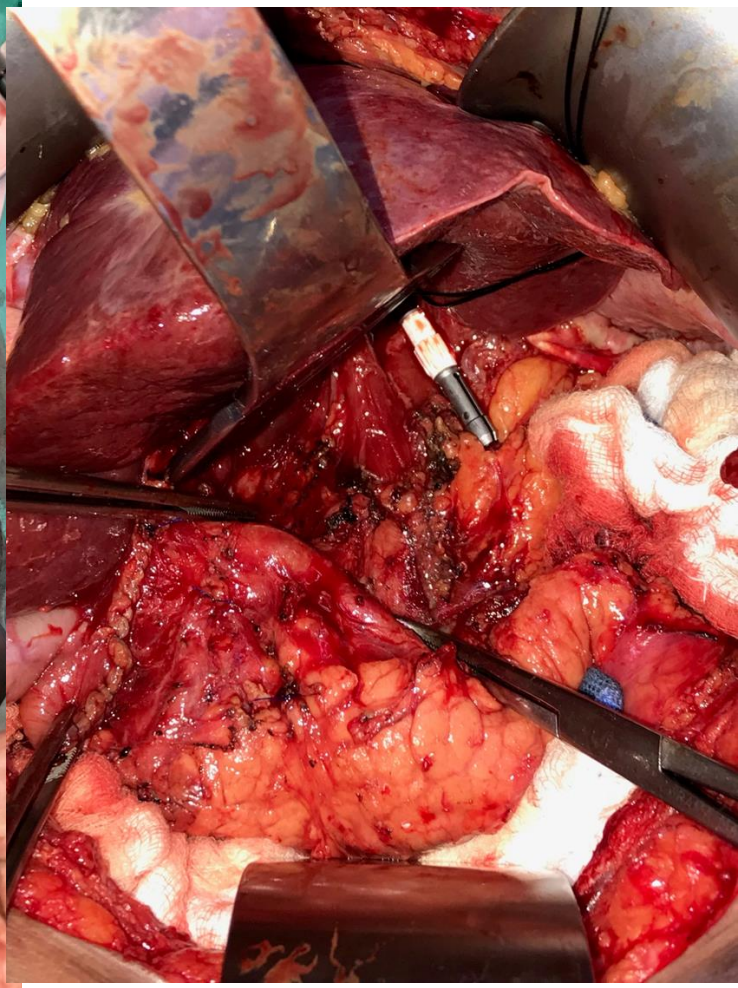


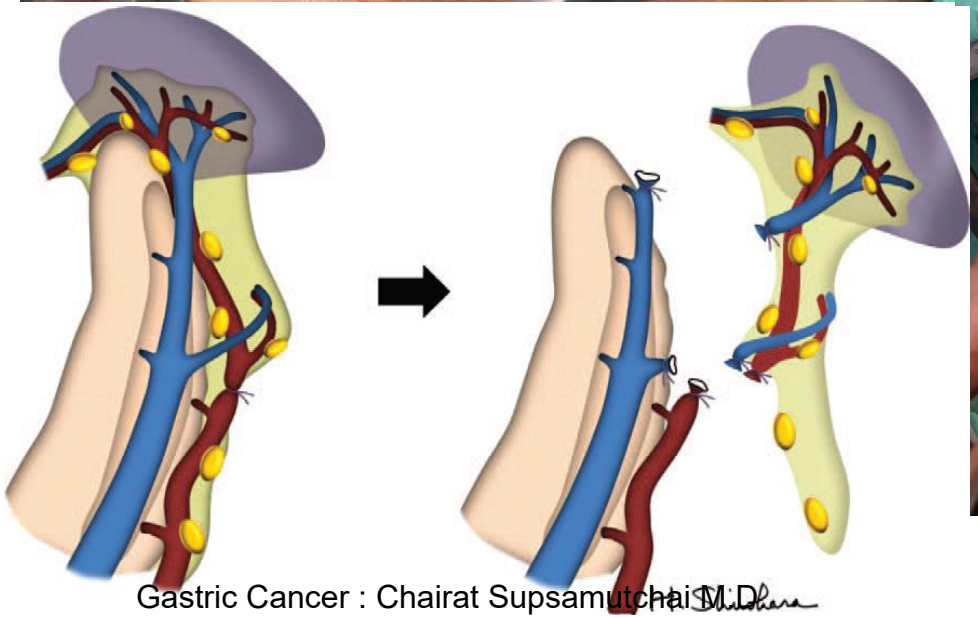


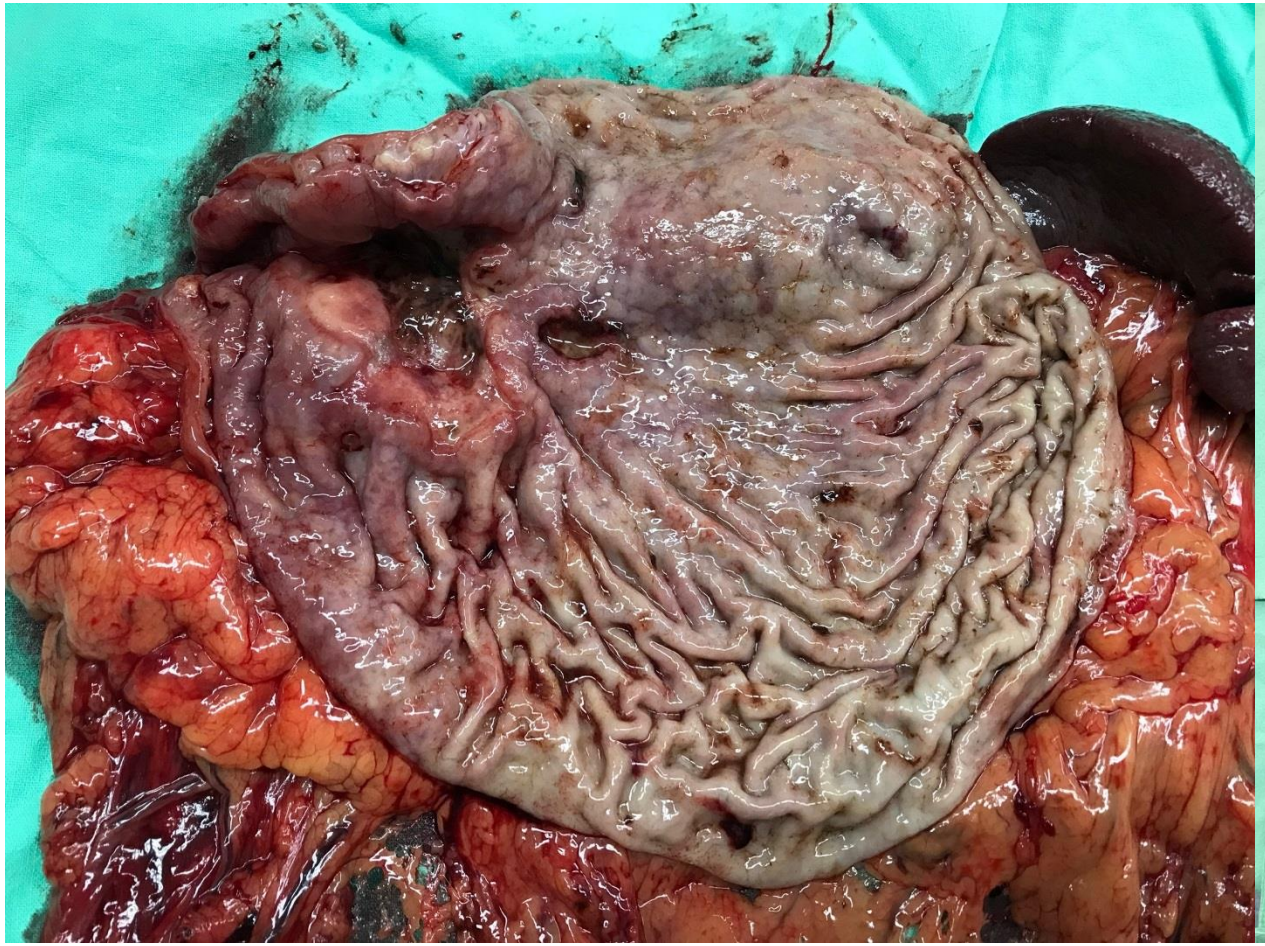


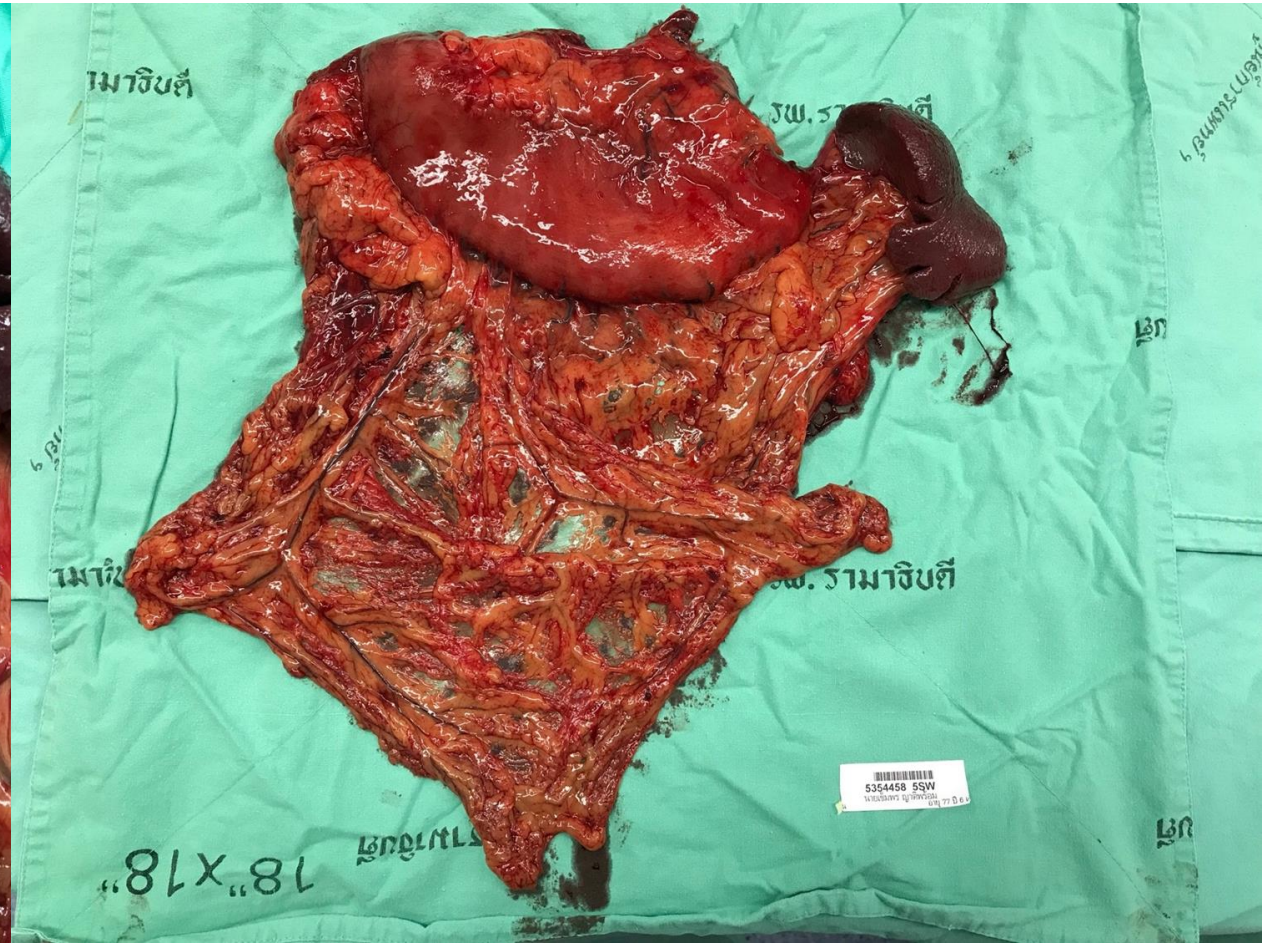











รามาธิบดี
18"x18"

Journal of Clinical Oncology®
An American Society of Clinical Oncology Journal

CANCERS OF THE ESOPHAGUS AND STOMACH

Primary results of a phase III trial to evaluate bursectomy for patients with subserosal/serosal gastric cancer (JCOG1001).

Masanori Terashima, Yuichiro Doki, Yukinori Kurokawa, Junki Mizusawa, Hitoshi Katai, Takaki Yoshikawa, ...

Show More

Abstract Disclosures

THE LANCET
Gastroenterology & Hepatology
Volume 3, Issue 7, July 2018, Pages 460-468

Articles

Bursectomy versus omentectomy alone for resectable gastric cancer (JCOG1001): a phase 3, open-label, randomised controlled trial

Yukinori Kurokawa MD [a], Prof Yuichiro Doki MD [a], Junki Mizusawa ME [b], Masanori Terashima MD [c], Hitoshi Katai MD [d], Takaki Yoshikawa MD [e], Yutaka Kimura MD [f], Shuji Takiguchi MD [a], Yasunori Nishida MD [g], Norimasa Fukushima MD [h], Yoshiaki Iwasaki MD [i], Masahide Kaji MD [j], Motohiro Hirao MD [k], Hiroshi Katayama MD [b], Prof Mitsuru Sasako MD [l]

1204 patients

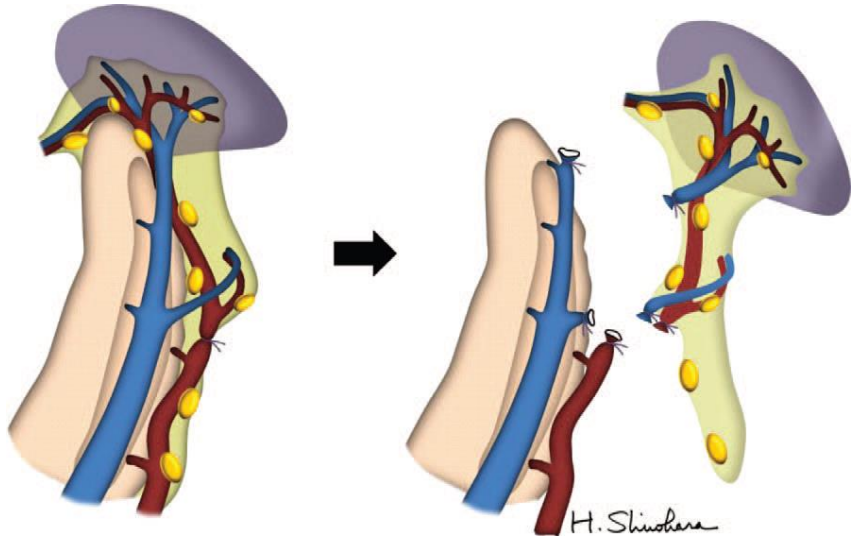
5-year overall survival was 76·7% in the non-bursectomy group and 76·9% in the bursectomy group

Bursectomy did not provide a survival advantage over non-bursectomy.

D2 dissection with omentectomy alone should be done as a standard surgery for resectable cT3–T4a gastric cancer.

Randomized Controlled Trial to Evaluate Splenectomy in Total Gastrectomy for Proximal Gastric Carcinoma

Takeshi Sano, MD, PhD, Mitsuru Sasako, MD, PhD,† Junki Mizusawa, ME,‡ Seiichiro Yamamoto, PhD,‡ Hitoshi Katai, MD, PhD,§ Takaki Yoshikawa, MD, PhD,¶ Atsushi Nashimoto, MD, PhD,|| Seiji Ito, MD, PhD,¶¶ Masahide Kaji, MD, PhD,†† Hiroshi Imamura, MD, PhD,‡‡ Norimasa Fukushima, MD, PhD,§§ and Kazumasa Fujitani, MD, PhD¶¶, on behalf of the Stomach Cancer Study Group of the Japan Clinical Oncology Group



Proximal gastric adenocarcinoma of T2-4/N0-2/M0 not invading the greater curvature

splenectomy should be avoided as it increases operative morbidity without improving survival.

254 patients in the splenectomy group, 6 patients (2.4%) had histological metastasis in No. 10 nodes

Inclusion criteria

Before operation

Histologically proven adenocarcinoma

A T2/T3/T4 tumor located in the upper third of the stomach

Absence of or 3 cm or shorter esophageal invasion by endoscopy and barium fluoroscopy

Absence of tumor invasion of the greater curvature

Not a stump cancer

Not of linitis plastica type (Borrmann type 4)

N0/N1/N2 and M0 by diagnostic imaging

Adjuvant chemotherapy

The Japanese ACTS-GC

(Adjuvant Chemotherapy Trial of S-1 for Gastric Cancer) phase III trial randomized

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Adjuvant Chemotherapy for Gastric Cancer with S-1, an Oral Fluoropyrimidine

Shinichi Sakuramoto, M.D., Mitsuru Sasako, M.D., Toshiharu Yamaguchi, M.D., Taira Kinoshita, M.D., Masashi Fujii, M.D., Atsushi Nashimoto, M.D., Hiroshi Furukawa, M.D., Toshifusa Nakajima, M.D., Yasuo Ohashi, Ph.D., Hiroshi Imamura, M.D., Masayuki Higashino, M.D., Yoshitaka Yamamura, M.D., Akira Kurita, M.D., and Kuniyoshi Arai, M.D., for the ACTS-GC Group*

VOLUME 29 · NUMBER 33 · NOVEMBER 20 2011

JOURNAL OF CLINICAL ONCOLOGY ORIGINAL REPORT

Five-Year Outcomes of a Randomized Phase III Trial Comparing Adjuvant Chemotherapy With S-1 Versus Surgery Alone in Stage II or III Gastric Cancer

Mitsuru Sasako, Shinichi Sakuramoto, Hitoshi Katai, Taira Kinoshita, Hiroshi Furukawa, Toshiharu Yamaguchi, Atsushi Nashimoto, Masashi Fujii, Toshifusa Nakajima, and Yasuo Ohashi

The CLASSIC

(Capecitabine and Oxaliplatin Adjuvant Study in Stomach Cancer)
South Korea, China, and Taiwan
phase III trial randomized

Adjuvant capecitabine and oxaliplatin for gastric cancer after D2 gastrectomy (CLASSIC): a phase 3 open-label, randomised controlled trial

Yung-Jue Bang, Young-Woo Kim, Han-Kwang Yang, Hyun Cheol Chung, Young-Kyu Park, Kyung Hee Lee, Keun-Wook Lee, Yong [illegible] Jae Yong Cho, Young Jae Mok, Yeul Hong Kim, Jiafu Ji, Ta-Sen Yeh, Peter Button, Florin Sirzén, Sung Hoon Noh*, for the CLASSIC tr*

Lancet 2012; 379: 315–21

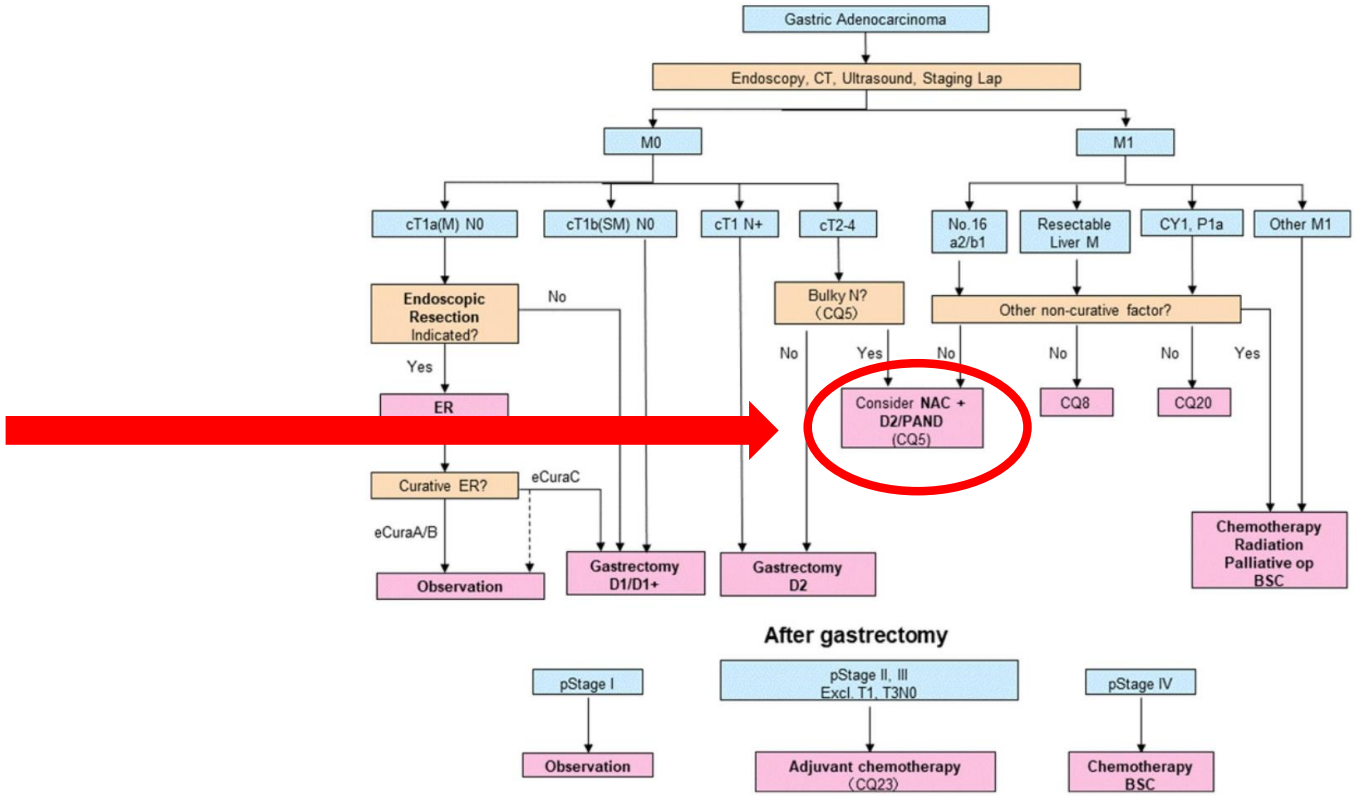
Adjuvant capecitabine plus oxaliplatin for gastric cancer after D2 gastrectomy (CLASSIC): 5-year follow-up of an open-label, randomised phase 3 trial

Sung Hoon Noh, Sook Ryun Park, Han-Kwang Yang, Hyun Cheol Chung, Ik-Joo Chung, Sang-Woon Kim, Hyung-Ho Kir Hoon-Kyo Kim, Wansik Yu, Jong Inn Lee, Dong Bok Shin, Jiafu Ji, Jen-Shi Chen, Yunni Lim, Stella Ha, Yung-Jue Bang*, on trial investigators†*

Lancet Oncol 2014; 15: 1389–96

Japan and East Asia

D2 gastrectomy with post op chemo

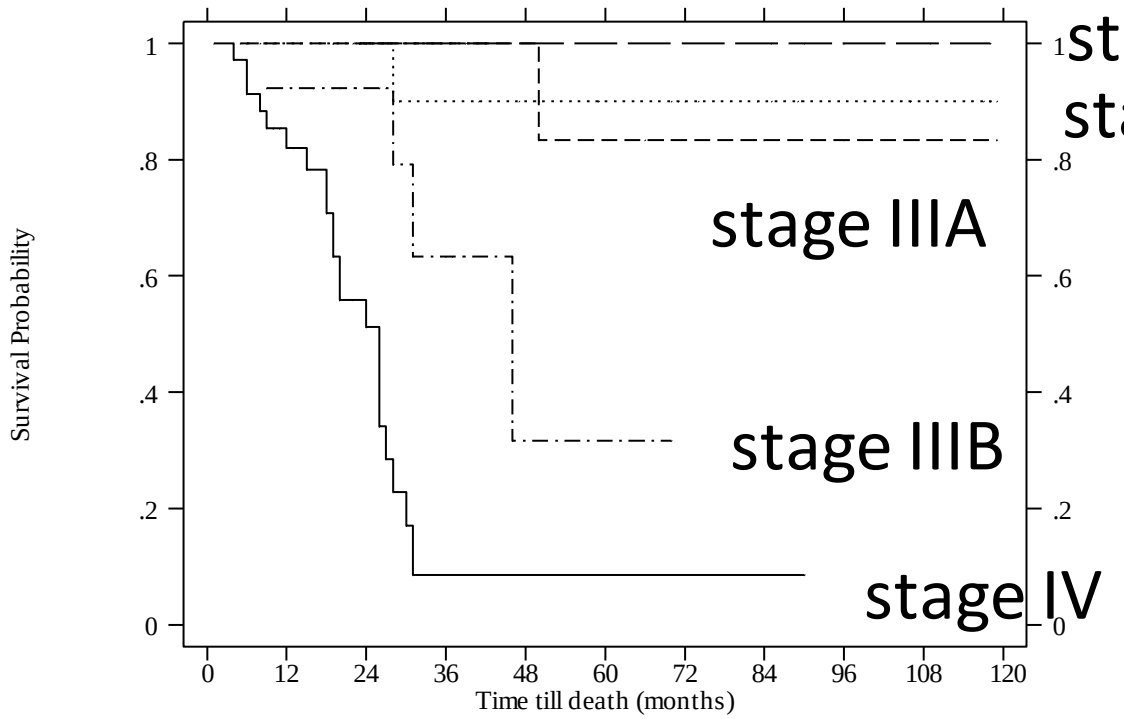


Ramathibodi
Gastric cancer

Results of D2 Gastrectomy for Gastric Adenocarcinoma: 10-Year Experience in Thai Patients

Chakrapan Euanorasetr MD*,
Panuwat Lertsithichai MD, MSc*

* Department of Surgery, Faculty of Medicine, Ramathibodi Hospital, Mahidol University



AJCC edition 6

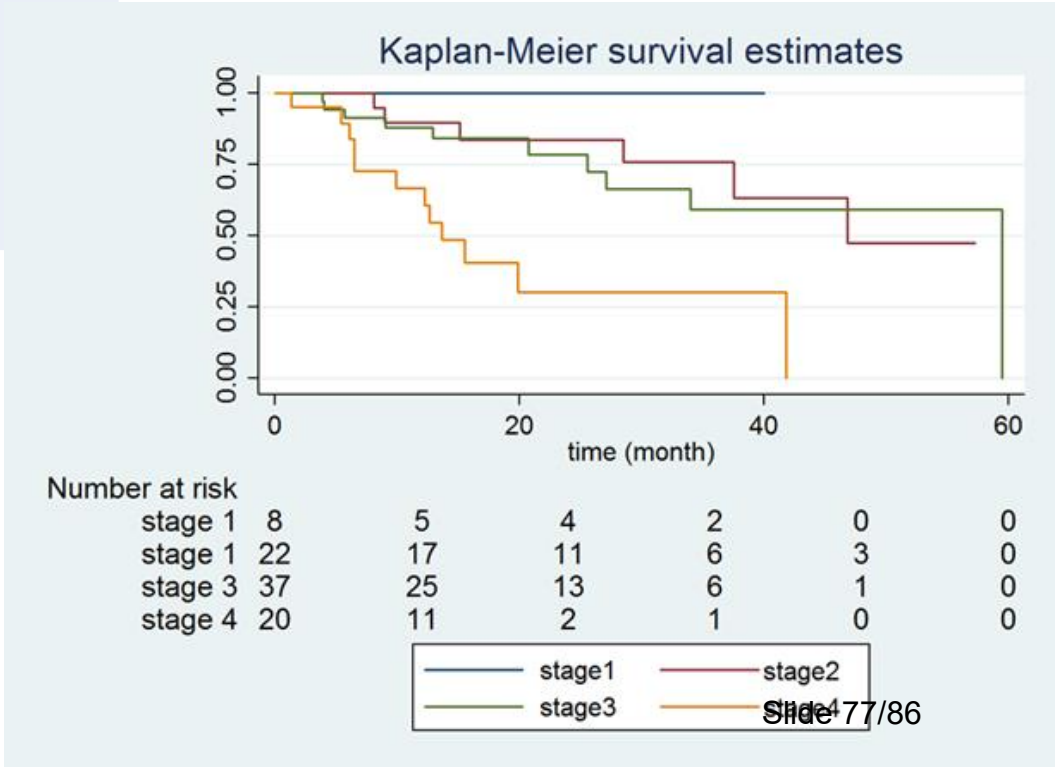
Survival curves for stages (1995-2005)
(N= 97)

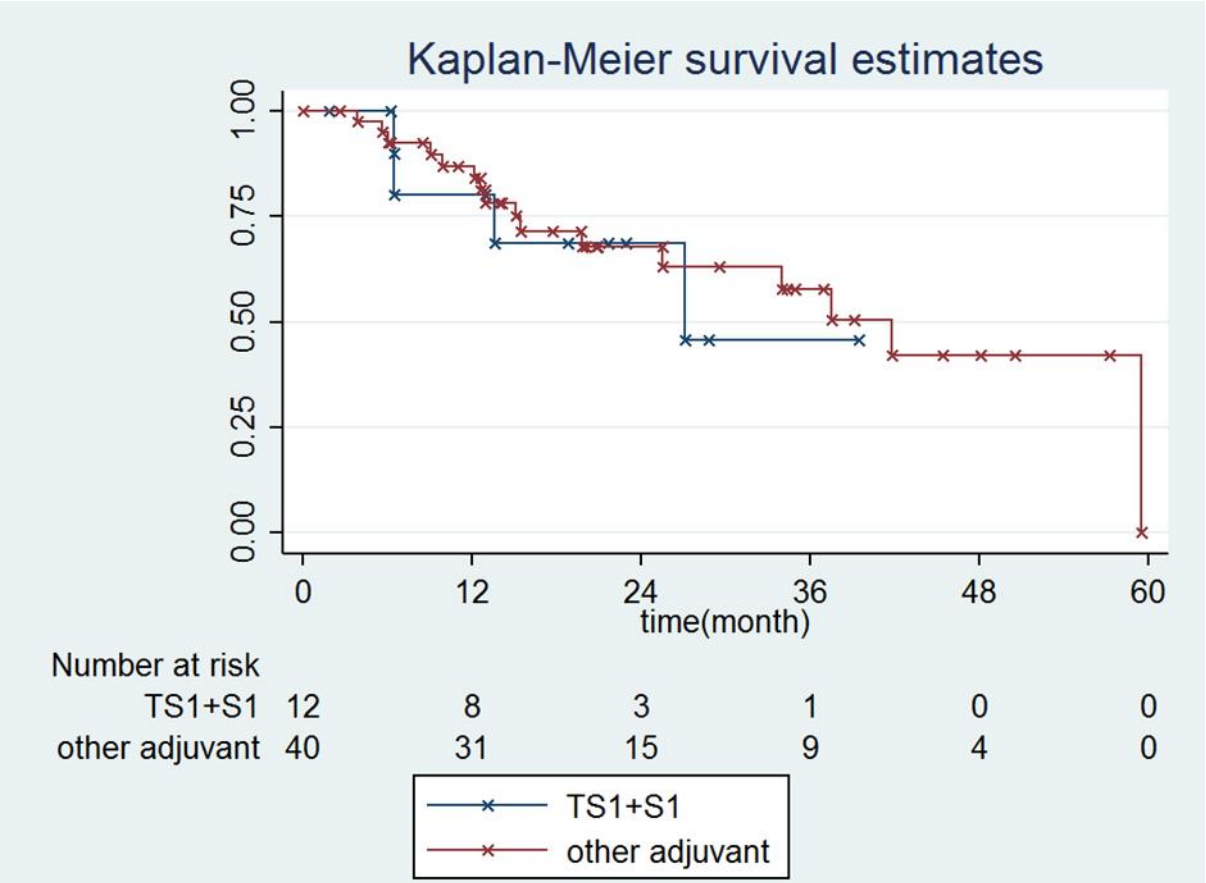
J Med Assoc Thai 2007; 90 (2): 291-300

stage	N total	N death	5 year survival			p-value
			Median time	% survival	95%CI	
1	8	0	.	100	.	
2	22	6	46.85	47.45	13.94 to 75.42	
3	37	10	59.51	59.04	33.41 to 77.62	0.0003
4	20	12	13.61	30.27	9.14 to 55.05	

Survival curves for stages (2005-2016)

AJCC edition 7





Adjuvant	N total	N death	5 year survival			p-value
			Median time	% survival	95%CI	
TS1+S1	12	4	27.08	45.71	8.19 to 78.28	0.7757
other	40	16	41.84	42.05*	19.49 to 63.19*	

Is Splenectomy Necessary or Beneficial in Curative Surgery of Gastric Cancer?

Chairat Supsamutchai MD*, Teerawut Rakchob MD*, Pitichote Hiranyatheb MD*,
Chuleeporn Jiarpinitnun MD**, Nuttapong Ngamphaiboon MD***, Pattawia Choikrua BSc

** Department of surgery, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand*
*** Department of Diagnostic and Therapeutic Radiology, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand*
**** Department of Medicine, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand*

Background: *Gastrectomy with D2 lymphadenectomy is a standard treatment of gastric cancer in Japan and Korea. Splenectomy in gastric cancer surgery has no clear benefits for removing lymph nodes unless it is removing the metastasis of the lymph nodes at the splenic hilum (Group 10).*
Objective: *Report the outcome of post gastrectomy with or without splenectomy, together with the effects on lymph node metastasis, including lymph nodes at the splenic hilum and examined lymph nodes.*
Material and Method: *A retrospective chart review was made of all patients who presented with gastric cancer after curative surgery resection between January 1, 2006 and December 31, 2016 at Ramathibodi Hospital, Bangkok, Thailand. Comparisons were made between the non-splenectomy group and the splenectomy group.*
Results: *Seventy patients were included in the non-splenectomy group and 35 patients were included in the splenectomy group. The data including age, gender, histologic type, location of cancer, and TMN staging showed no statistical difference between the groups. For the lymph node Group 10 metastasis, the number of lymph nodes dissected and lymph node metastasis showed no statistical significance in both groups (p-value = 0.524 and 0.160 respectively). The rate of lymph node Group 10 metastasis was 6.25%, which was found in the splenectomy group. The data showed that the patients in the splenectomy group had more dissected lymph nodes than the non-splenectomy group (p-value = 0.0004). Conversely, the lymph node metastasis in both groups showed no statistical difference (p-value = 0.925). The median follow-up time was 59.51 months. The recurrence rate, metastasis rate, and overall survival showed no statistical difference in both groups. The five years' survival in the non-splenectomy group was 44.88 months and the splenectomy group was 53.75 months (p-value = 0.9368).*
Conclusion: *In most cases, curative gastric resection with D2 lymphadenectomy is an adequate treatment for gastric cancer. Unnecessary splenectomy does not benefit overall survival.*

Keywords: *Splenectomy, Non-splenectomy, Curative resection, Total gastrectomy, Subtotal gastrectomy*

J Med Assoc Thai 2017; 100 (Suppl. 9): S136-S142
Full text. e-Journal: *http://www.jmatonline.com*

The standard treatment of gastric adenocarcinoma is curative resection with adequate regional lymphadenectomy. Standard gastrectomy is the surgical procedure of choice for curative intent[1]. Total gastrectomy is necessary for cancer at the proximal part of stomach. Once the tumor invades adjacent organs such as the spleen, pancreas, the en-bloc resection is performed with curative intent. The risk of lymph node metastasis to the splenic hilum lymph nodes for tumors located at the proximal part of the stomach is 10 to 20%. In these cases, splenectomy is necessary to completely remove the splenic hilum lymph nodes[2].

In 2002, Csendes et al reported a prospective randomized study comparing D2 total gastrectomy versus D2 total gastrectomy plus splenectomy in 187 patients with gastric carcinoma. This report showed that the five years' overall survival in the splenectomy group and the splenic preservation group was 42% and 36% respectively, which is statistically not significantly different[3]. In 2006, Yu et al reported a randomized clinical trial of splenectomy versus splenic preservation in patients with proximal gastric cancer. The report showed that gastrectomy with splenectomy had benefits of removing lymph node metastasis at the splenic hilum and gave better survival rates. However,

Correspondence to:
Rakchob T, Department of Surgery, Faculty of Medicine, Ramathibodi Hospital, 270 Rama 6 Road, Ratchathewi, Bangkok 10400, Thailand.
Phone & Fax: +66-2-2011304
E-mail: Teerawutrakchob@gmail.com

Is Splenectomy Necessary or Beneficial in Curative Surgery of Gastric Cancer?

Chairat Supsamutchai MD*, Teerawut Rakchob MD*, Pitichote Hiranyatheb MD*,
Chuleeporn Jiarpinitnun MD**, Nuttapong Ngamphaiboon MD***, Pattawia Choikrua BSc

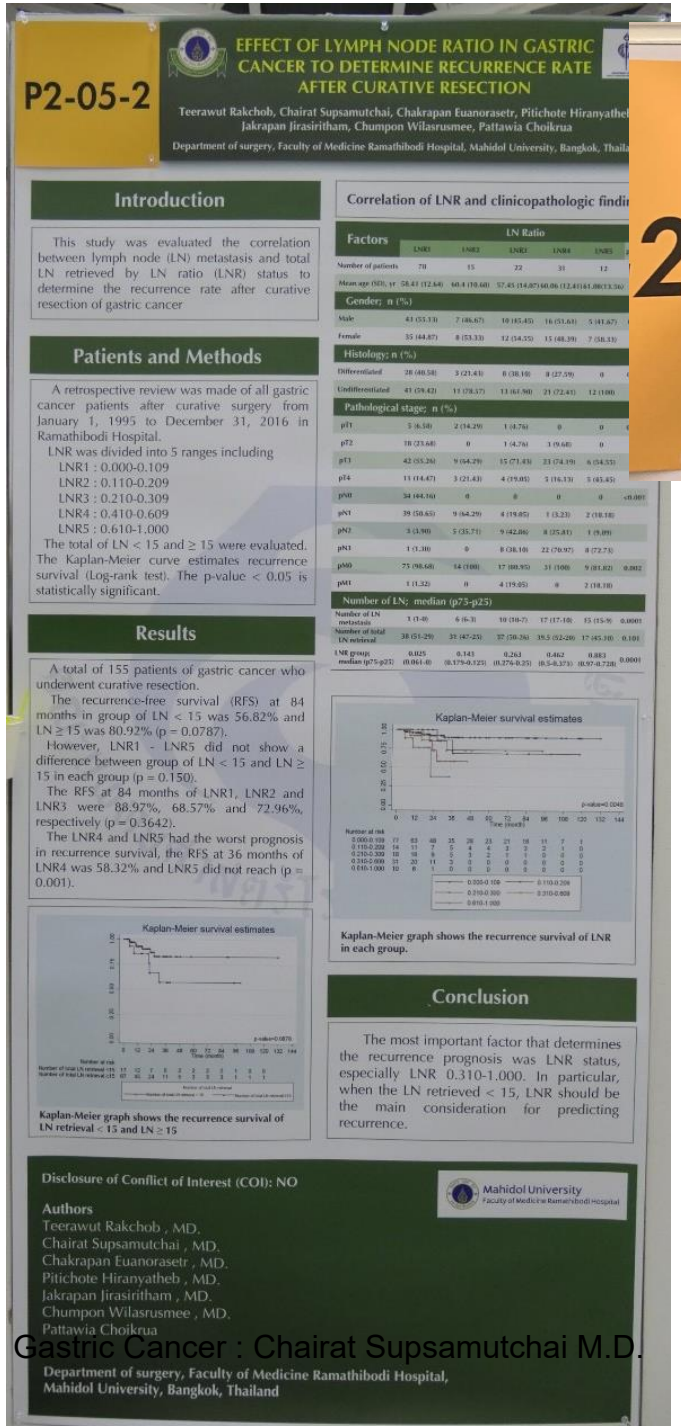
** Department of surgery, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand*
*** Department of Diagnostic and Therapeutic Radiology, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand*
**** Department of Medicine, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand*

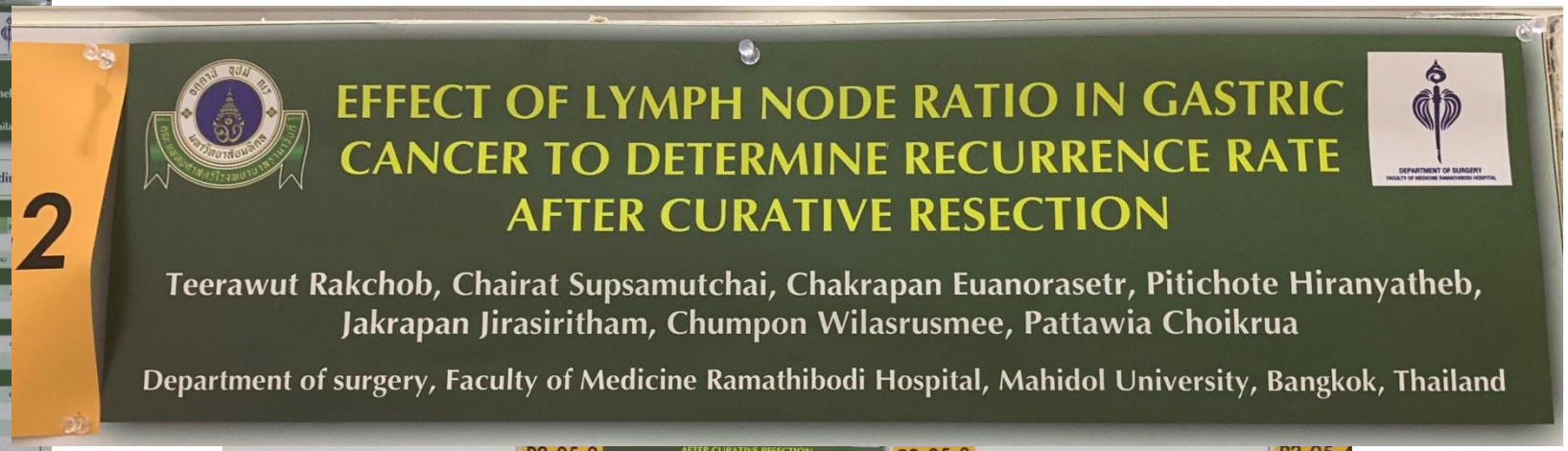
Lymph nodes (LN)	Non-splenectomy (n = 70)	Splenectomy (n = 35)	*p*-value
Number of LN (total)			
LN dissected, median (range)	22 (14 to 37)	43 (26 to 64)	0.0004*
LN metastasis, median (range)	3 (1 to 9)	3 (0 to 7)	0.925
Rate of LN metastasis, (%) median (range)	21.05 (4.34 to 35.71)	6.66 (0 to 33.33)	0.263
Number of LN (Group 10)			
LN dissected, median (range)	5 (2 to 6)	5 (2 to 10)	0.524
LN metastasis, median (range)	0 (0 to 0)	1 (0 to 1)	0.160
Rate of LN group 10 metastasis, (%) median (range)	0 (0 to 0)	6.25 (0 to 41.66)	0.129

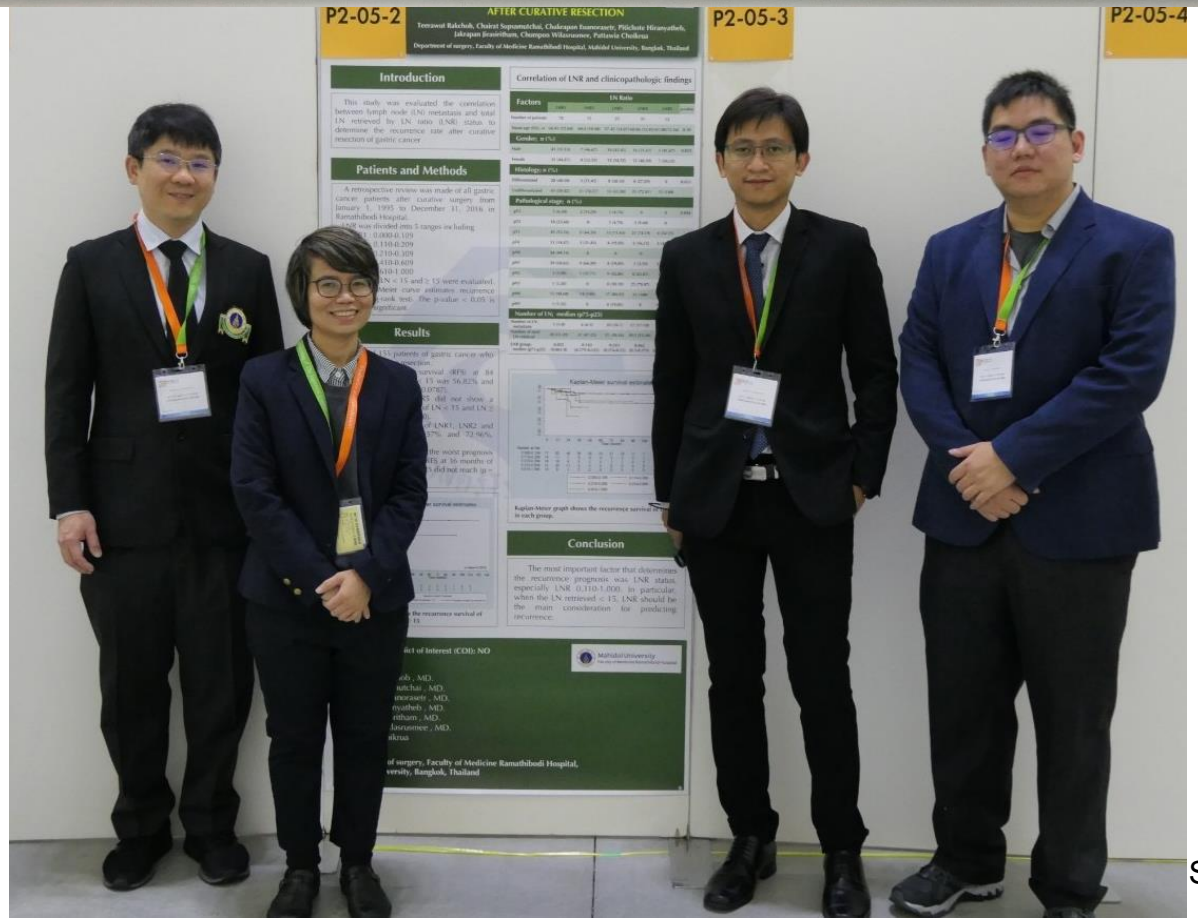
* Significant level <0.05

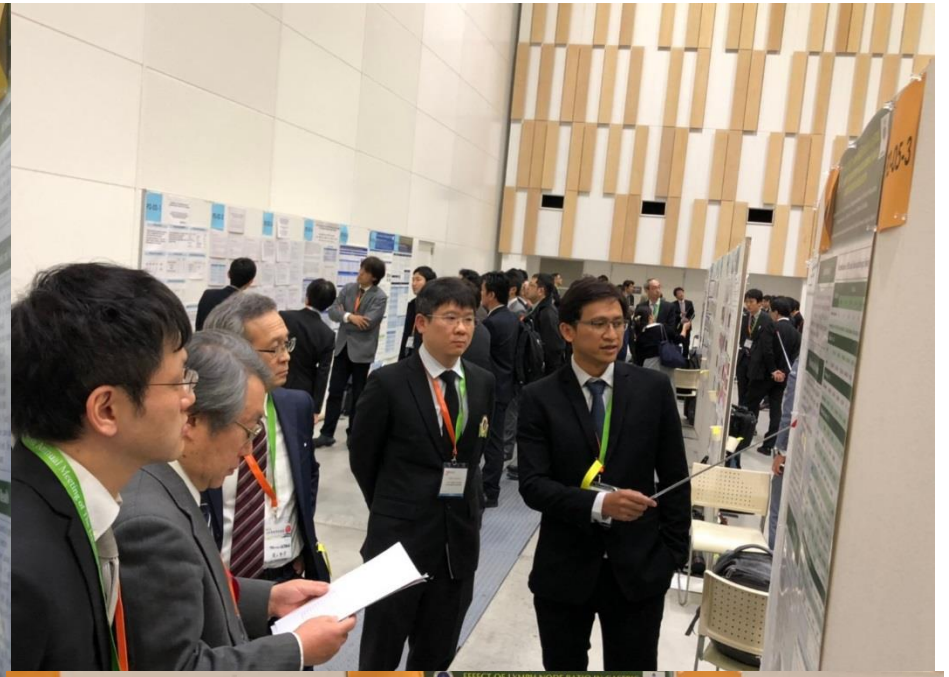
6.25 %

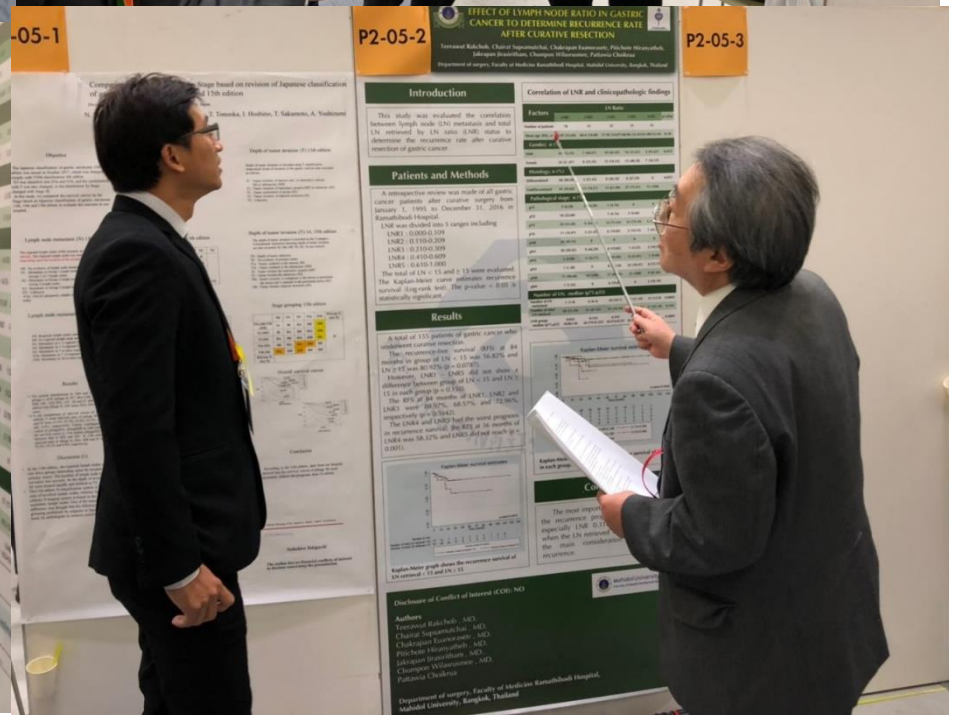
The 91st Annual Meeting of The Japanese Gastric Cancer Association


P2-05-2
EFFECT OF LYMPH NODE RATIO IN GASTRIC CANCER TO DETERMINE RECURRENCE RATE AFTER CURATIVE RESECTION
Teerawut Rakchob, Chairat Supsamutchai, Chakrapan Euanorasetr, Pitichote Hiranyatheb, Jakrapan Jirasiritham, Chumpon Wilasrusmee, Pattawia Choikrua
Department of surgery, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
Introduction
This study was evaluated the correlation between lymph node (LN) metastasis and total LN retrieved by LN ratio (LNR) status to determine the recurrence rate after curative resection of gastric cancer
Patients and Methods
A retrospective review was made of all gastric cancer patients after curative surgery from January 1, 1995 to December 31, 2016 in Ramathibodi Hospital.
LNR was divided into 5 ranges including
LNR1 : 0.000-0.109
LNR2 : 0.110-0.209
LNR3 : 0.210-0.309
LNR4 : 0.410-0.609
LNR5 : 0.610-1.000
The total of LN < 15 and ≥ 15 were evaluated. The Kaplan-Meier curve estimates recurrence survival (Log-rank test). The p-value < 0.05 is statistically significant.
Results
A total of 155 patients of gastric cancer who underwent curative resection.
The recurrence-free survival (RFS) at 84 months in group of LN < 15 was 56.82% and LN ≥ 15 was 80.92% (p = 0.0787).
However, LNR1 - LNR5 did not show a difference between group of LN < 15 and LN ≥ 15 in each group (p = 0.150).
The RFS at 84 months of LNR1, LNR2 and LNR3 were 88.97%, 68.57% and 72.96%, respectively (p = 0.3642).
The LNR4 and LNR5 had the worst prognosis in recurrence survival, the RFS at 36 months of LNR4 was 58.32% and LNR5 did not reach (p = 0.001).
Correlation of LNR and clinicopathologic findi
Factors
LN Ratio
Kaplan-Meier survival estimates
Kaplan-Meier graph shows the recurrence survival of LNR in each group.
Kaplan-Meier survival estimates
Kaplan-Meier graph shows the recurrence survival of LN retrieval < 15 and LN ≥ 15
Conclusion
The most important factor that determines the recurrence prognosis was LNR status, especially LNR 0.310-1.000. In particular, when the LN retrieved < 15, LNR should be the main consideration for predicting recurrence.
Disclosure of Conflict of Interest (COI): NO
Mahidol University
Faculty of Medicine Ramathibodi Hospital
Authors
Teerawut Rakchob , MD.
Chairat Supsamutchai , MD.
Chakrapan Euanorasetr , MD.
Pitichote Hiranyatheb , MD.
Jakrapan Jirasiritham , MD.
Chumpon Wilasrusmee , MD.
Pattawia Choikrua
Department of surgery, Faculty of Medicine Ramathibodi Hospital,
Mahidol University, Bangkok, Thailand


2
EFFECT OF LYMPH NODE RATIO IN GASTRIC CANCER TO DETERMINE RECURRENCE RATE AFTER CURATIVE RESECTION
DEPARTMENT OF SURGERY
FACULTY OF MEDICINE RAMATHIBODI HOSPITAL
Teerawut Rakchob, Chairat Supsamutchai, Chakrapan Euanorasetr, Pitichote Hiranyatheb, Jakrapan Jirasiritham, Chumpon Wilasrusmee, Pattawia Choikrua
Department of surgery, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand


P2-05-2
P2-05-3
P2-05-4


P2-05-3


P2-05-1
P2-05-2
P2-05-3
EFFECT OF LYMPH NODE RATIO IN GASTRIC CANCER TO DETERMINE RECURRENCE RATE AFTER CURATIVE RESECTION
Introduction
Patients and Methods
Results

Annals of Medicine and Surgery 54 (2020) 57–61

Contents lists available at ScienceDirect

Annals of Medicine and Surgery

journal homepage: www.elsevier.com/locate/amsu

Recurrence outcome of lymph node ratio in gastric cancer after underwent curative resection: A retrospective cohort study

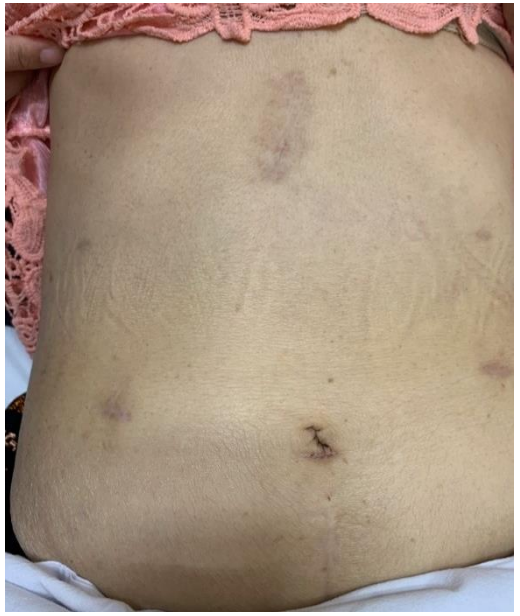
Chairat Supsamutchai, Chumpon Wilasrusmee, Jakrapan Jirasiritham, Teerawut Rakchob, Songpol Phosuwan, Tanet Chatmongkonwat, Pattawia Choikrua, Tharin Thampongsa*

Department of Surgery, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Thailand

Future at Ramathibodi

➔ Minimally invasive surgery for Gastric cancer

➔ Biomarker



Future

Diagnosis ➔ Endoscope patho, AI

Surgery ➔ Laparoscopic, Robotic, Sentinel LN, navigation, peritonectomy , intraabdominal chemo

Biomarker ➔ PDL1 , MIS, Gene

Chemo and RT ➔ effective regimen

Target ➔ multiple target replace chemo

Conversion therapy

Thank you