

# Current Status of Laparoscopic Gastrectomy for gastric cancer

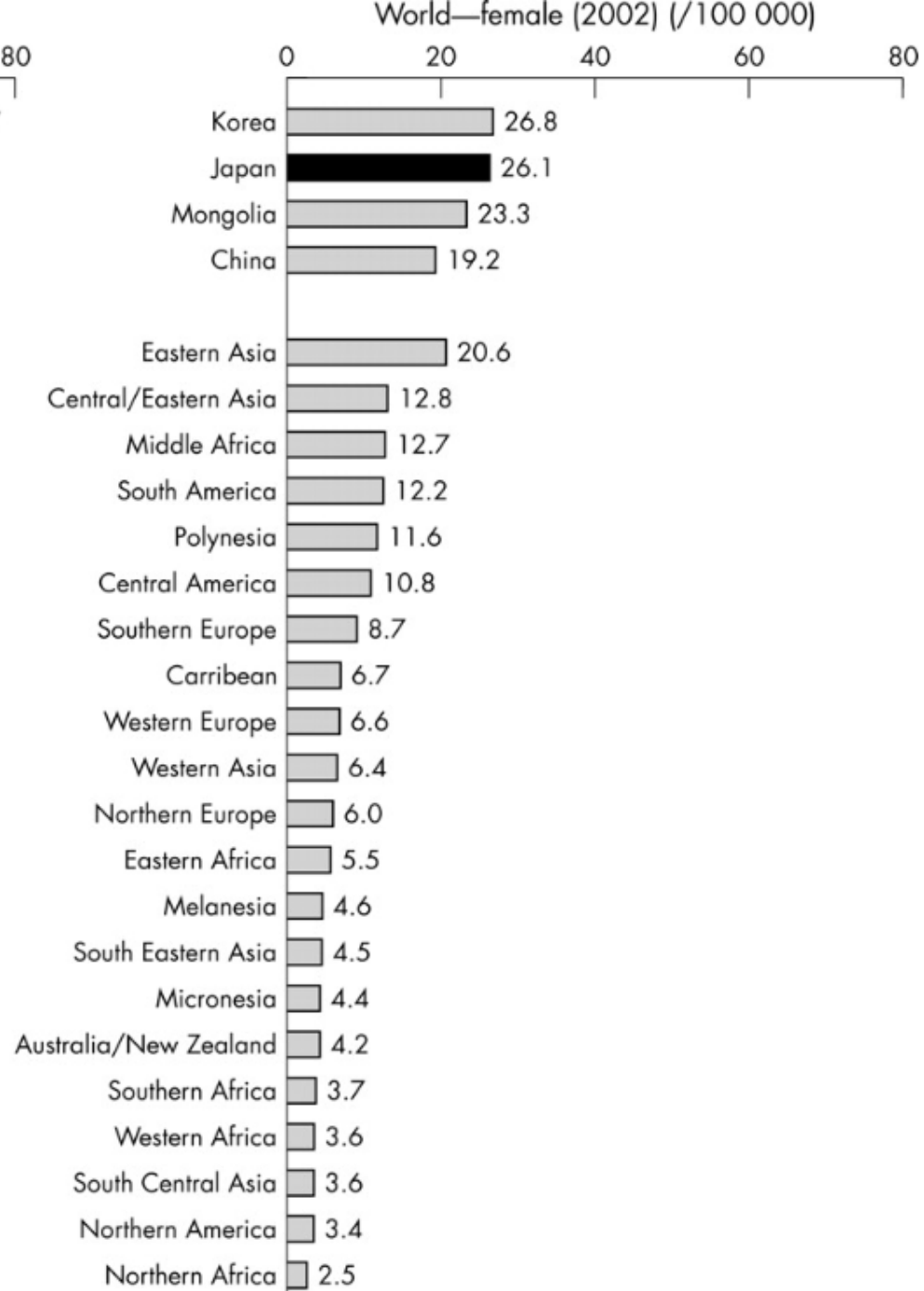
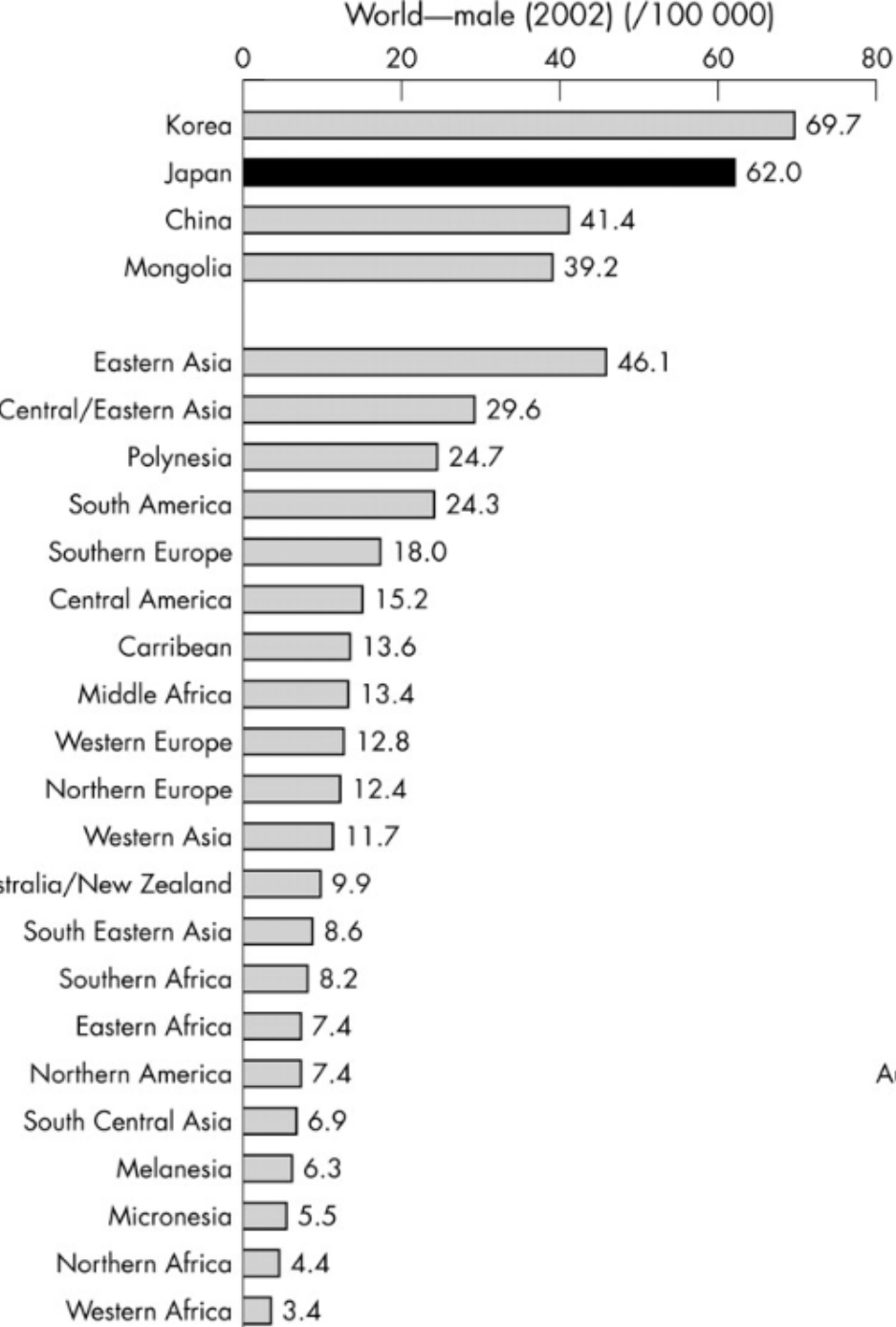
Cheng-Chan Yu  
Department of Surgery  
Taichung Tsu-Chi Hospital  
Taiwan



**A**

■ <math>< 5.9</math> ■ <math>< 9.6</math> ■ <math>< 14.6</math> ■ <math>< 23.6</math> ■ <math>< 70.0</math>

[Age standardised (world) rate per 100 000]



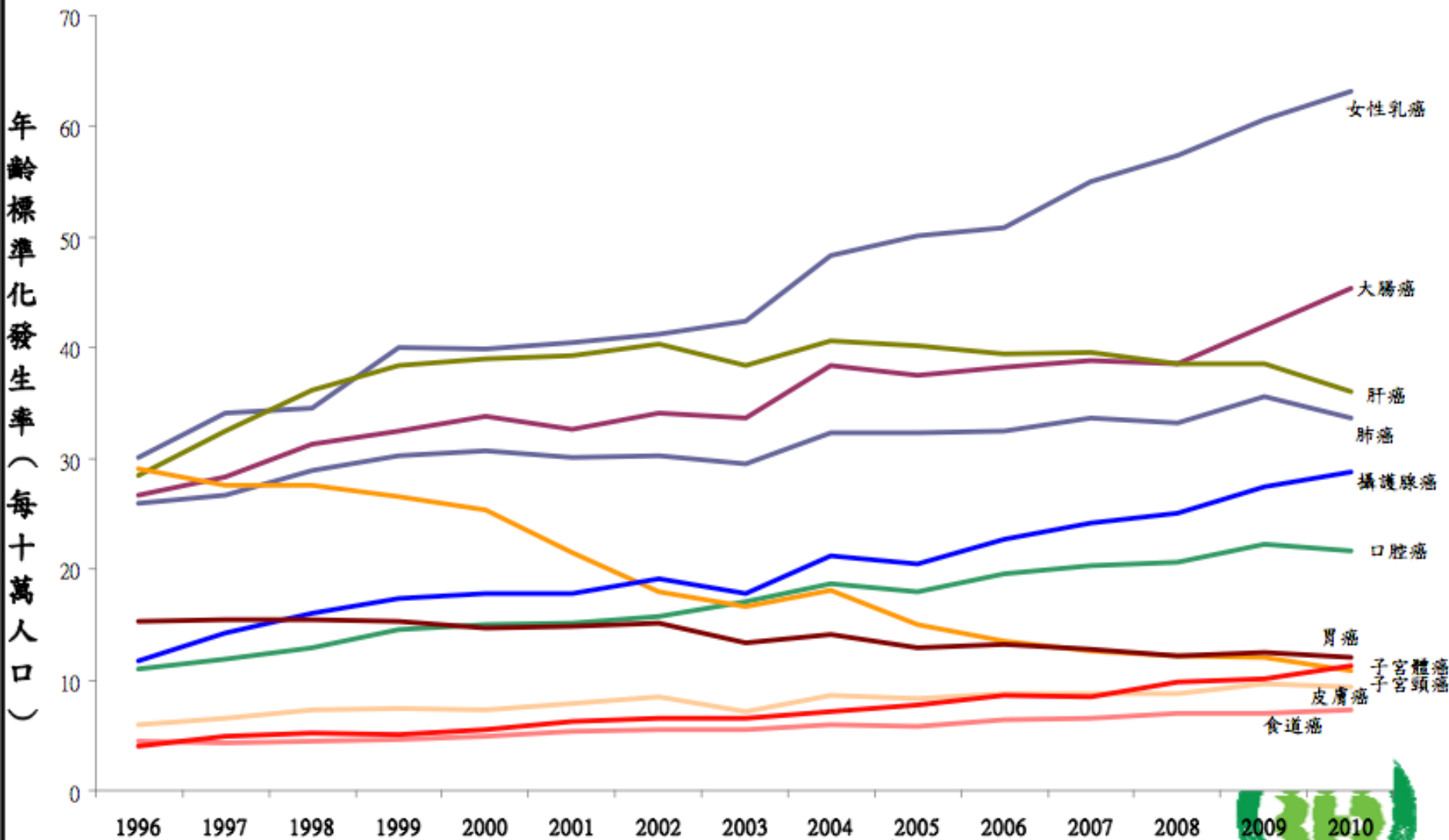
# 2010年與2009年國人常見癌症發生人數比較

發生序位	原發部位	癌症時鐘 (每幾分鐘 發生一例)	2010年			2009年			2010年發生 人數增減值	2010年發生率 增減值
			個案數	標準 化率	年齡 中位數	個案數	標準 化率	年齡 中位數		
1	大腸	37.4	14,040	45.3	66	12,488	41.4	67	1,552	3.9
2	肝及肝內膽管	47.7	11,023	36.1	65	11,080	37.3	65	-57	-1.2
3	肺、支氣管及氣管	49.5	10,615	33.6	70	10,643	34.8	70	-28	-1.2
4	女性乳房	54.4	9,655	63.2	52	8,926	59.9	52	729	3.3
5	口腔、口咽及下咽	80.1	6,560	21.7	54	6,480	22.0	53	80	-0.3
6	攝護腺	119.7	4,392	28.8	74	4,013	26.9	74	379	1.9
7	胃	136.4	3,854	12.0	70	3,848	12.4	70	6	-0.4
8	皮膚	176.5	2,978	9.3	73	2,928	9.5	72	50	-0.2
9	子宮體	302.6	1,737	11.3	54	1,496	9.9	53	241	1.4
10	子宮頸	312.9	1,680	10.8	56	1,796	11.9	55	-116	-1.1
	全癌症	5.8	90,649	296.7	62	87,189	293.4	63	3,460	3.3

- 註：1. 發生序位係以2010年癌症發生人數由高至低排序。  
 2. 2010年與2009年癌症發生人數增減情形：2010年發生人數-2009年發生人數。  
 3. 發生時鐘係指每分鐘有多少名新診斷個案。  
 4. 台灣癌症登記資料庫(不含原位癌)



# 1979-2010年台灣重要癌症發生率長期趨勢

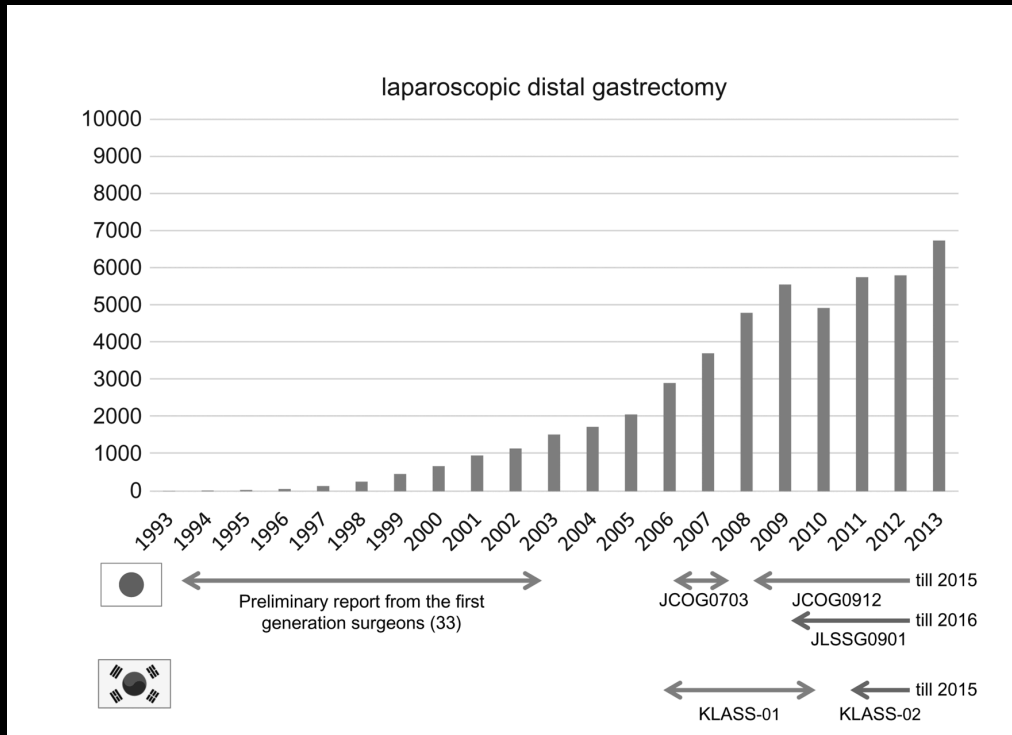


註：1.年齡標準化發生率，係以西元2000年世界標準人口為標準人口計算。  
2.台灣癌症登記資料庫(不含原位癌)



# Current status of Laparoscopic Gastrectomy for Gastric Cancer

# Japan

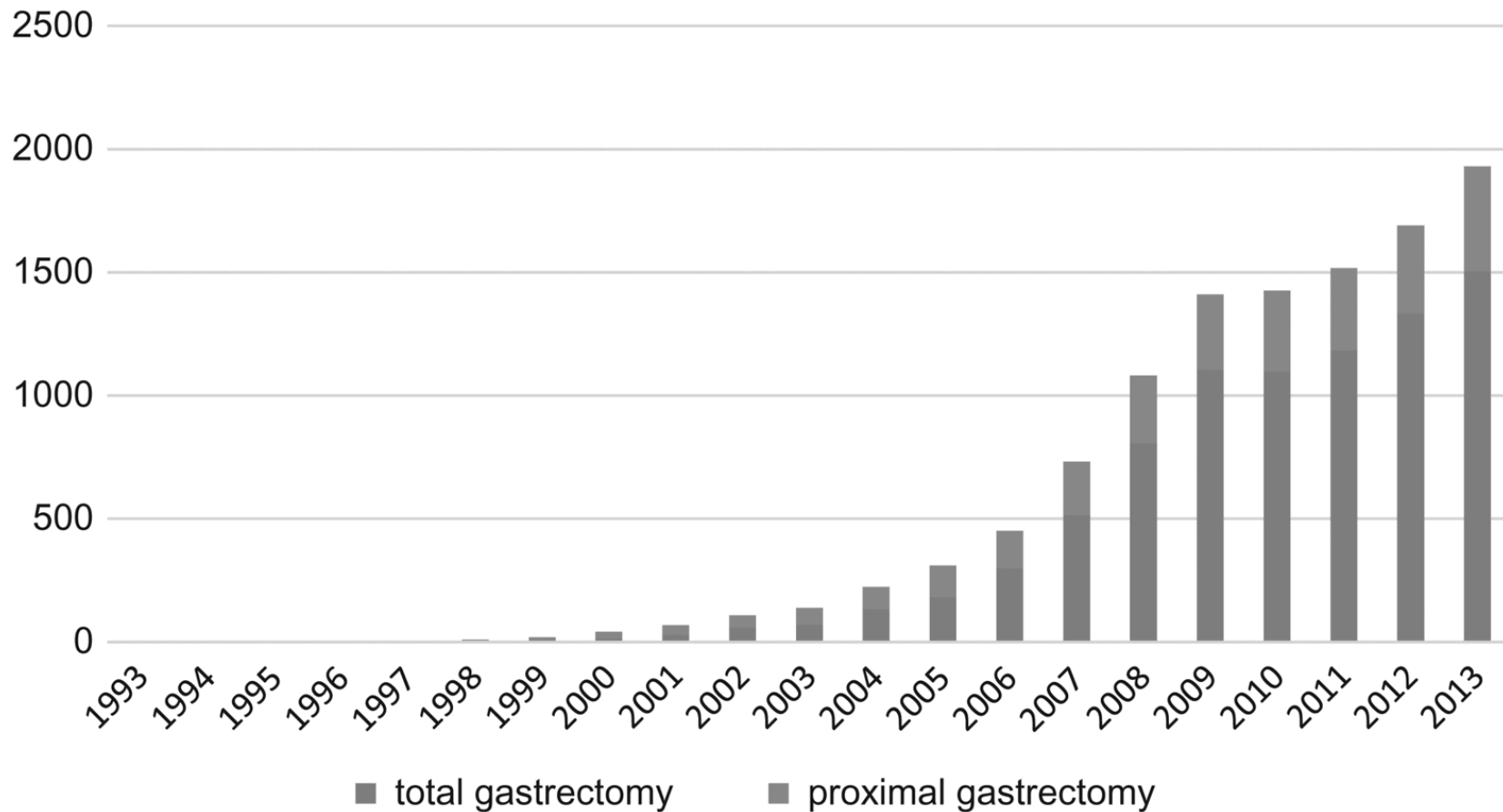


**TABLE III. Ongoing Multicenter Randomized Prospective Studies of LAG**

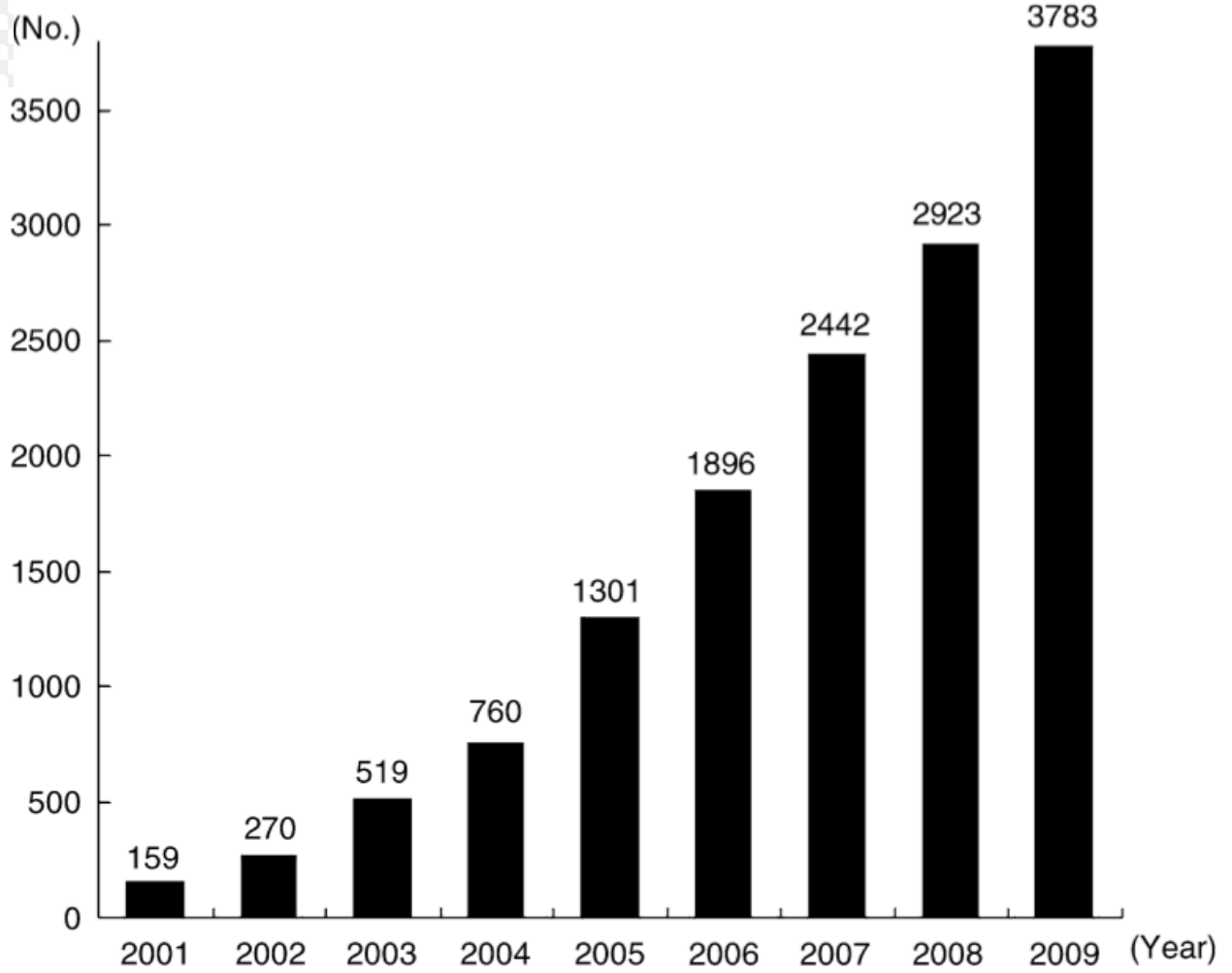
Study	Design	Eligibility	Primary endpoint	Estimated enrollment
JCOG0912	III (LADG, LAPPG vs. Open)	Stage I	Overall survival	920
KLASS I	III (LADG vs. ODG)	Stage I	Overall survival	1,400
JLSSG0901	Randomized II/III (LADG vs. ODG)	MP/SS/SE, N0-2, M0	P-II: morbidity rate, P-III: relapse free survival	P-II: 180, P-III: total 500
KLASS II	III (LADG vs. ODG)	Advanced cancer	Three years disease free survival	1,000

JCOG, Japan Clinical Oncology Group; KLASS, Korean Laparoscopic Gastrointestinal Surgery Study Group; JLSSG, Japanese Laparoscopic Surgery Study Group; LADG, laparoscopy-assisted distal gastrectomy; LAPPG, laparoscopy-assisted pylorus preserving gastrectomy; ODG, open distal gastrectomy.

# laparoscopic total + proximal gastrectomy







**Table 1** Prospective multicenter trials of minimal invasive gastrectomy in Korea

Study	KLASS 01	KLASS 02	KLASS 03	KLASS 04	KLASS 05	Robot	SENORITA
Current status	Enrollment: finished	Enrollment: finished	Enrollment: finished	Recruiting patients	Recruiting participant	Results are reported, data collection for subsequent study	Recruiting patients
Phase	III	III	II	III	III	II (observational matched cohort)	III
Intervention	LDG vs. ODG	LDG vs. ODG	LTG	LAPPG vs. LDG	LPG vs. LTG	RG vs. LG	LSNNS vs. LG
Inclusion criteria	Clinical stage I	cT2–T4a	cT1N0	cT1N0	cT1N0, upper 1/3 location	cT1–T3	cT1N0
Sample size	1,416	1,050	168	256	–	400 (finally 434 were enrolled)	580
Primary endpoint	5-year overall survival	3-year relapse-free survival	Morbidity and mortality	Incidence of Dumping syndrome	–	Morbidity and mortality	3-year disease-free survival
Secondary endpoint	Disease free survival, morbidity and mortality, quality of life, inflammatory and immune response, and cost-effectiveness	3-year overall survival, morbidity and mortality, postoperative recovery index, and quality of life	The surgical outcomes according to several methods of reconstruction and the postoperative course	3-year relapse-free survival and overall survival, morbidity and mortality, body weight change, fat volume change on abdominal CT scan, change of protein and albumin, quality of life, incidence of gallstone, and gross and microscopic changes measured by gastroscopy	–	Operative time, blood loss, rate of open conversion, recovery of bowel function, length of hospital stay, and financial costs	Morbidity and quality of life
Year started	February 2006	October 2011	October 2012	July 2015	–	May 2011	March 2013
Year of completion (estimated)	August 2015	May 2018	November 2013	June 2023	–	December 2012	December 2022

KLASS, Korean Laparoscopic Gastrointestinal Surgery Study; SENORITA, Sentinel Node Oriented Tailored Approach; LDG, laparoscopic distal gastrectomy; ODG, open distal gastrectomy; LTG, laparoscopic total gastrectomy; LAPPG, laparoscopy-assisted pylorus preserving gastrectomy; LPG, laparoscopic proximal gastrectomy; RG, robot gastrectomy; LG, laparoscopic gastrectomy; LSNNS, laparoscopic sentinel node navigation surgery.

# Japanese classification of gastric cancer

## 胃癌取扱い規約

Japanese Classification of Gastric Carcinoma

第15版

2017年10月

日本胃癌学会・編

October 2017 (The 15th Edition)  
Japanese Gastric Cancer Association

金原出版株式会社

## 胃癌取扱い規約

Japanese Classification of Gastric Carcinoma

2010年3月

第14版

日本胃癌学会・編

March 2010 (The 14th Edition)  
Japanese Gastric Cancer Association

金原出版株式会社

## 胃癌取扱い規約

1999年6月【第13版】

Japanese Classification of  
Gastric Carcinoma

June 1999  
(The 13th Edition)  
Japanese Gastric Cancer Association

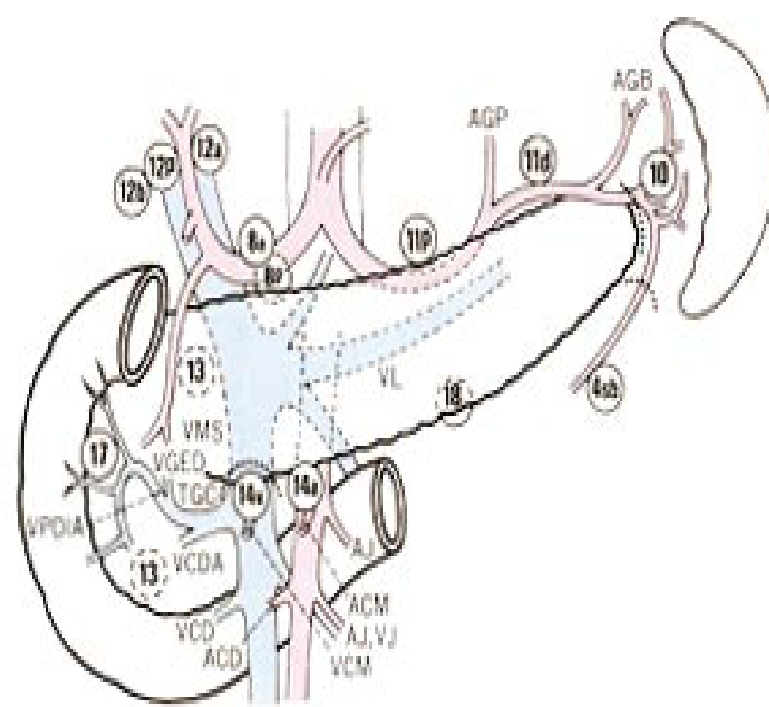
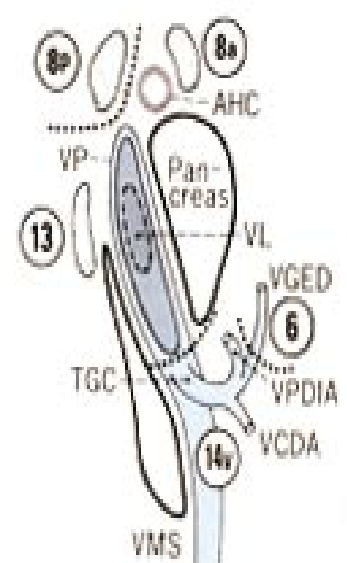
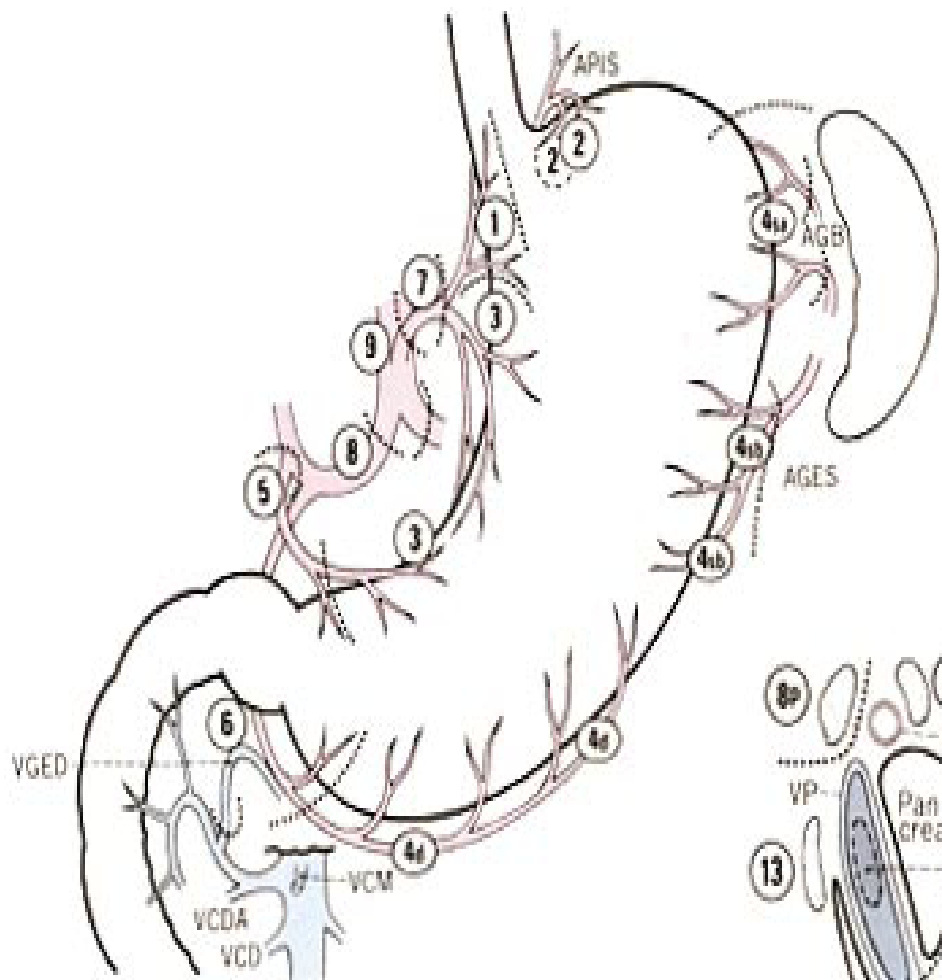
日本胃癌学会／編



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APIS : A. phrenica inferior sinistra  
 AGB : Aa. gastricae breves  
 AGES : A. gastroepiploica sinistra  
 VGED : V. gastroepiploica dextra  
 VCDA : V. colica dextra accessoria  
 VCM : V. colica media  
 VCD : V. colica dextra  
 VJ : V. jejunalis  
 AGP : A. gastrica posterior

AHC : A. hepatica communis  
 VP : V. portae  
 VL : V. lienalis  
 VMS : V. mesenterica superior  
 VPDIA : V. pancreaticoduodenalis inferior anterior  
 TGC : Truncus gastrocolicus  
 ACM : A. colica media  
 AJ : A. jejunalis



- 1 Right paracardial LNs, including those along the first branch of the ascending limb of the left gastric artery.
- 2 Left paracardial LNs including those along the esophagocardiac branch of the left subphrenic artery
- 3a Lesser curvature LNs along the branches of the left gastric artery
- 3b Lesser curvature LNs along the 2nd branch and distal part of the right gastric artery
- 4sa Left greater curvature LNs along the short gastric arteries (perigastric area)
- 4sb Left greater curvature LNs along the left gastroepiploic artery (perigastric area)
- 4d Rt. greater curvature LNs along the 2nd branch and distal part of the right gastroepiploic artery
- 5 Suprapyloric LNs along the 1st branch and proximal part of the right gastric artery
- 6 Infrapyloric LNs along the first branch and proximal part of the right gastroepiploic artery down to the confluence of the right gastroepiploic vein and the anterior superior pancreatoduodenal vein
- 7 LNs along the trunk of left gastric artery between its root and the origin of its ascending branch
- 8a Anterosuperior LNs along the common hepatic artery
- 8p Posterior LNs along the common hepatic artery

- 9 Celiac artery LNs
- 10 Splenic hilar LNs including those adjacent to the splenic artery distal to the pancreatic tail, and those on the roots of the short gastric arteries and those along the left gastroepiploic artery proximal to its 1st gastric branch
- 11p Proximal splenic artery LNs from its origin to halfway between its origin and the pancreatic tail end
- 11d Distal splenic artery LNs from halfway between its origin and the pancreatic tail end to the end of the pancreatic tail
- 12a Hepatoduodenal ligament LNs along the proper hepatic artery, in the caudal half between the confluence of the right and left hepatic ducts and the upper border of the pancreas
- 12b Hepatoduodenal ligament LNs along the bile duct, in the caudal half between the confluence of the right and left hepatic ducts and the upper border of the pancreas
- 12p Hepatoduodenal ligament LNs along the portal vein in the caudal half between the confluence of the right and left hepatic ducts and the upper border of the pancreas
- 13 LNs on the posterior surface of the pancreatic head cranial to the duodenal papilla
- 14v LNs along the superior mesenteric vein
- 15 LNs along the middle colic vessels
- 16a1 Paraaortic LNs in the diaphragmatic aortic hiatus
- 16a2 Paraaortic LNs between the upper margin of the origin of the celiac artery and the lower border of the left renal vein
- 16b1 Paraaortic LNs between the lower border of the left renal vein and the upper border of the origin of the inferior mesenteric artery

# Treatment Guideline

## 胃癌 治療ガイドライン



医師用 2018年1月改訂 第5版

日本胃癌学会 編

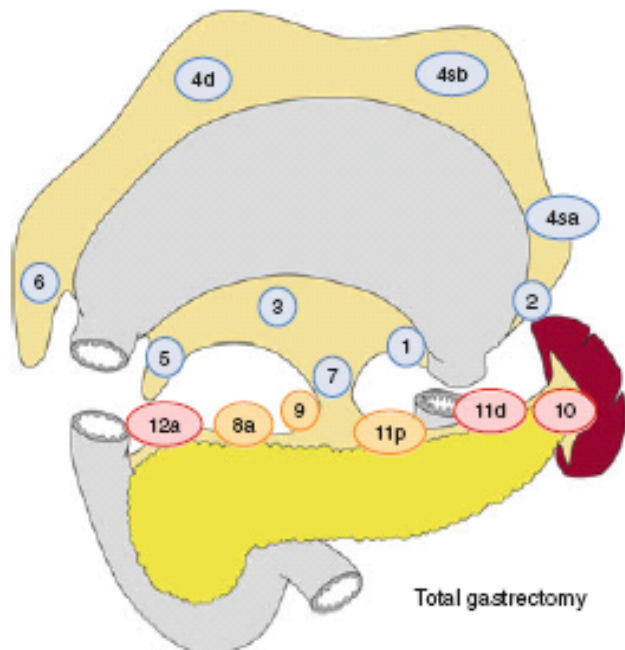
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# Scope of Lymphadenectomy

## 2.3.1.1 Total gastrectomy

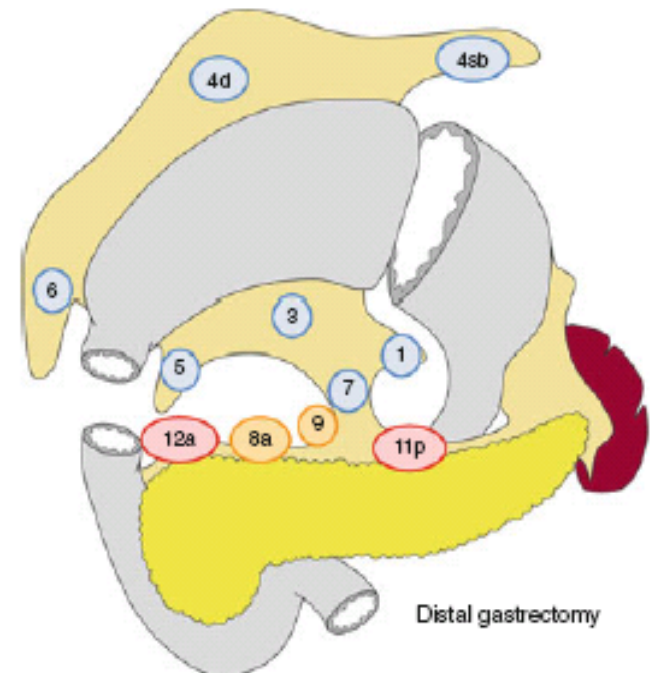
- D0: Lymphadenectomy less than D1
- D1: Nos. 1–7
- D1+: D1 + Nos. 8a, 9, 11p
- D2: D1 + Nos. 8a, 9, 10, 11p, 11d, 12a.

For tumors invading the esophagus, D1+ includes No. 110<sup>1</sup>, D2 includes Nos. 19, 20, 110, and 111.



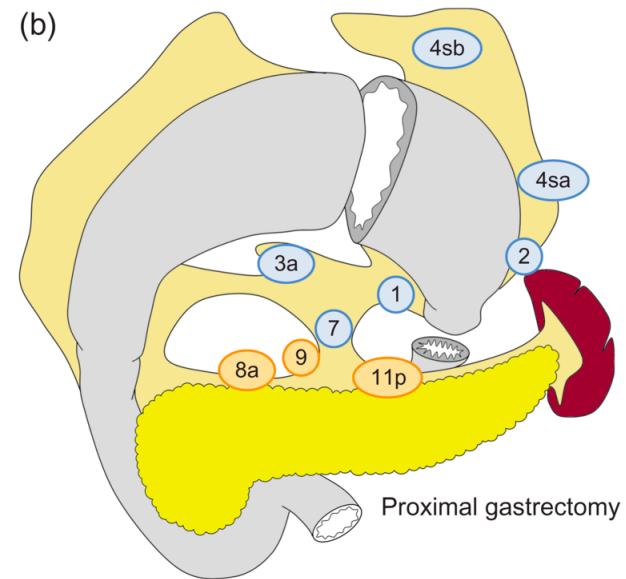
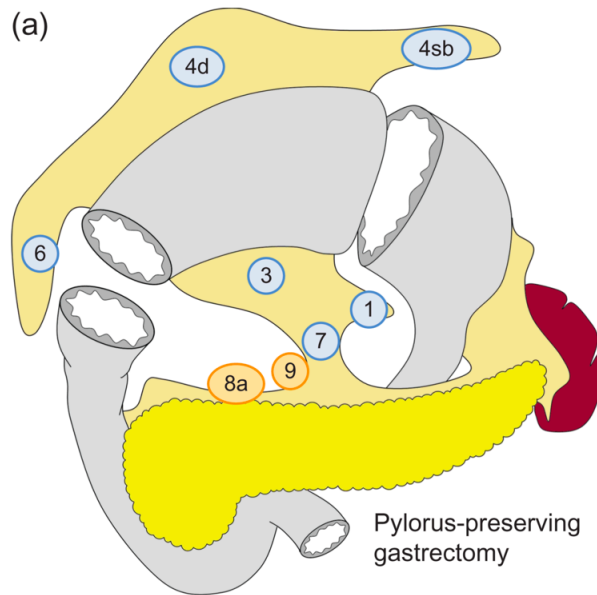
## 2.3.1.2 Distal gastrectomy

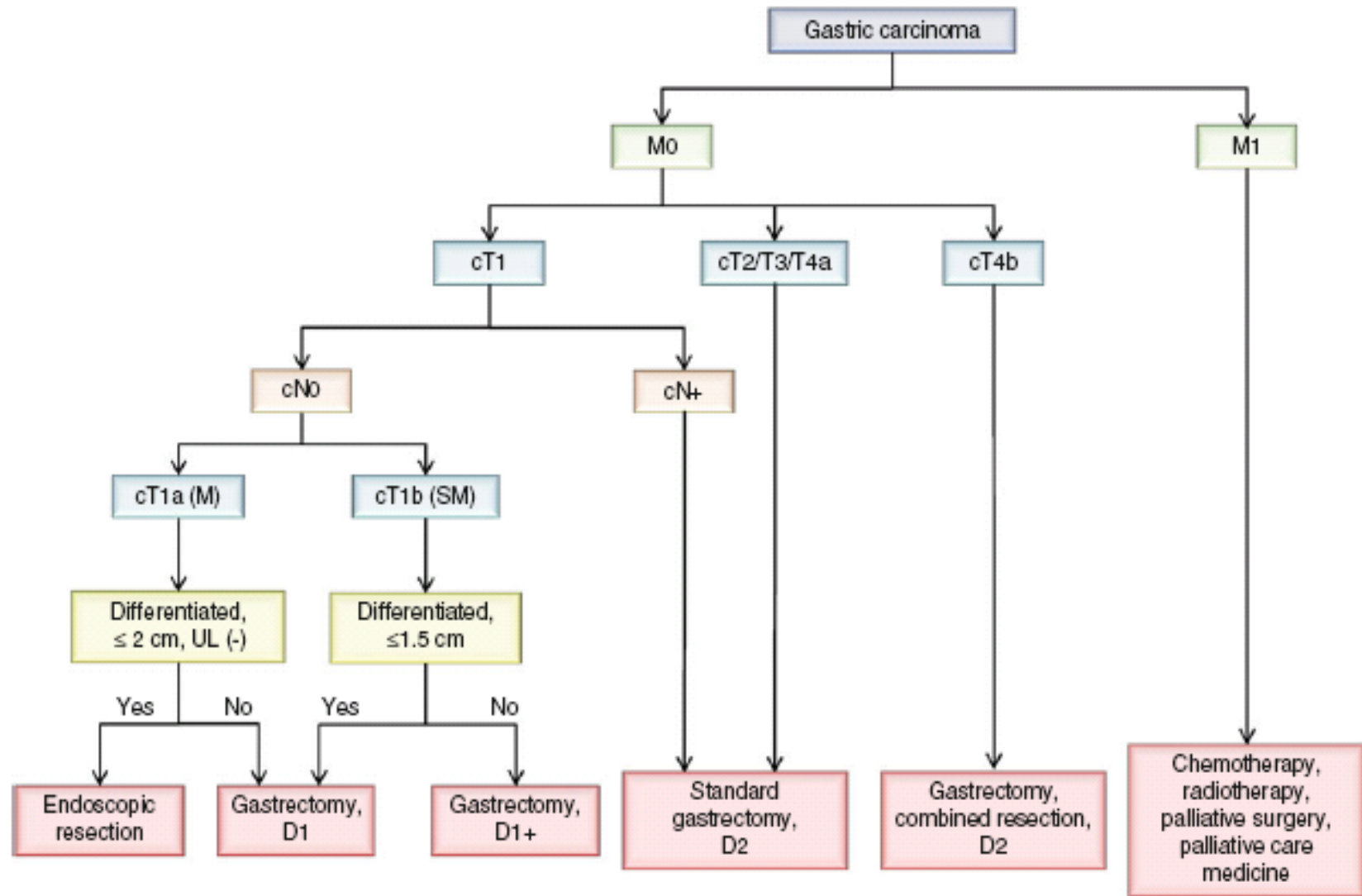
- D0: Lymphadenectomy less than D1
- D1: Nos. 1, 3, 4sb, 4d, 5, 6, 7
- D1+: D1 + Nos. 8a, 9
- D2: D1 + Nos. 8a, 9, 11p, 12a.



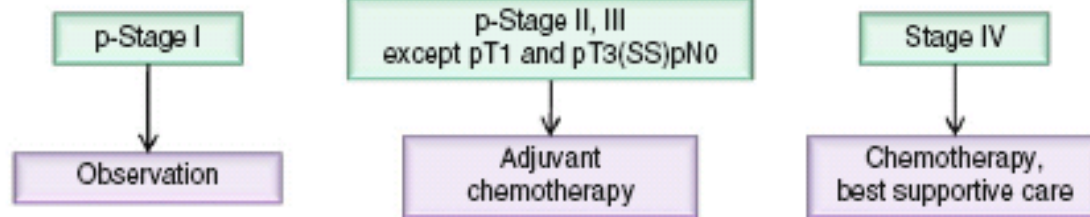


# Scope of Lymphadenectomy





After surgery



# Current Evidences

# A multicenter study on oncologic outcome of laparoscopic gastrectomy for Early cancer in Japan.

- 1249 LG (DG, PG, TG)
- FU period average 39m, median 36m
- 5 year disease free survival  
stage IA : 99.8%, stage IB 98.7, stage II 85.7%
- Only 6 cases of recurrence

# Multicenter Randomized Prospective Studies of LAG

**TABLE III. Ongoing Multicenter Randomized Prospective Studies of LAG**

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# KLASS-I

## Short Term Outcome

- To determine the safety of laparoscopy-assisted distal gastrectomy (LADG) compared with open distal gastrectomy (ODG) in patients with clinical **stage I** gastric cancer in Korea.

**Modified Intention-to-treat Population**

<b>Variables</b>	<b>LADG (n = 686)</b>	<b>ODG (n = 698)</b>	<b>P</b>	
<b>Extent of resection</b>				
Distal gastrectomy	675 (98.4%)	685 (98.1%)	0.605	
Total gastrectomy	10 (1.5%)	13 (1.9%)		
Laparotomy and biopsy	1 (0.1%)	0 (0%)		
<b>Reconstruction*</b>				
Billroth-I	433 (63.2%)	502 (71.9%)	<0.001	
Billroth-II	232 (33.9%)	163 (23.4%)		
Roux-en-Y	20 (2.9%)	33 (4.7%)		
<b>Lymph node dissection*</b>				
D1 + $\alpha$	1 (0.1%)	1 (0.1%)	0.003	
D1 + $\beta$	300 (43.7%)	249 (35.7%)		
D2	384 (56.0%)	448 (64.2%)		
<b>Combined resection</b>	37 (5.4%)	37 (5.3%)	0.939	
Gall bladder	24 (3.5%)	25 (3.6%)	0.472	
Spleen	5 (0.7%)	1 (0.1%)		
Colon	0 (0%)	1 (0.1%)		
Adrenal	1 (0.1%)	1 (0.1%)		
Ovary	2 (0.3%)	1 (0.1%)		
Others <sup>†</sup>	5 (0.6%)	8 (1.1%)		
<b>Operation time (min)</b>	184.7 ± 55.0	145.8 ± 49.4		<0.001
<b>Estimated blood loss (mL)</b>	118.6 ± 149.0	194.2 ± 166.3		<0.001
<b>Intraoperative transfusion</b>				
No	681 (99.3%)	690 (98.9%)	0.421	
Yes	5 (0.7%)	8 (1.1%)		
<b>No. retrieved lymph nodes</b>	40.5 ± 15.2	43.3 ± 15.7	0.001	
<b>Hospital stay (d)</b>	7.2 ± 3.2	8.0 ± 4.3	<0.001	

**Table 3. Postoperative Morbidity Within 30 Postoperative Days**

<b>Variables</b>	<b>Modified Intention-to-treat Population</b>		
	<b>LADG (n = 686)</b>	<b>ODG (n = 698)</b>	<b>P</b>
No. postoperative morbidity	94 (13.7%)	132 (18.9%)	0.009
Intra-abdominal complication	54 (7.9%)	70 (10.0%)	0.160
Fluid collection/abscess	6 (0.9%)	8 (1.1%)	0.614
Intra-abdominal bleeding	14 (2.0%)	16 (2.3%)	0.748
Intraluminal bleeding	4 (0.6%)	11 (1.6%)	0.074
Anastomotic leakage	5 (0.7%)	7 (1.0%)	0.583
Intestinal obstruction	3 (0.4%)	2 (0.3%)	0.684
Ileus	13 (1.9%)	18 (2.6%)	0.390
Stenosis	2 (0.3%)	1 (0.1%)	0.621
Stasis	7 (1.0%)	10 (1.4%)	0.486
Pancreatitis	1 (0.1%)	0 (0%)	0.496
Cholecystitis	0 (0%)	1 (0.1%)	1.000
Idiopathic small bowel perforation	1 (0.1%)	0 (0%)	0.496
<b>Wound complication</b>	<b>25 (3.6%)</b>	<b>49 (7.0%)</b>	<b>0.005</b>
Seroma	12 (1.7%)	22 (3.2%)	0.092
Hematoma	3 (0.4%)	6 (0.9%)	0.507
Infection	7 (1.0%)	7 (1.0%)	0.974
Dehiscence	3 (0.4%)	13 (1.9%)	0.013
Evisceration	0 (0%)	1 (0.1%)	1.000
Medical complications	19 (2.8%)	20 (2.9%)	0.914
Respiratory	5 (0.7%)	11 (1.6%)	
Cardiovascular	3 (0.4%)	2 (0.3%)	



# KLASS-I trial

## Long term outcomes

- the 5-year overall survival (OS) rates were very similar in the two groups (95.8% in the laparoscopic group and 95.9% in the open group; log-rank  $P = 0.774$ ).
- The long-term survival after laparoscopic distal gastrectomy is not inferior to that of open distal gastrectomy in clinical stage I gastric cancer.

ORIGINAL ARTICLE

# Long-term outcomes of laparoscopy-assisted distal gastrectomy with suprapancreatic nodal dissection for clinical stage I gastric cancer: a multicenter phase II trial (JCOG0703)

**Naoki Hiki<sup>1</sup> · Hitoshi Katai<sup>2</sup> · Junki Mizusawa<sup>3</sup> · Kenichi Nakamura<sup>3</sup> ·  
Mikihito Nakamori<sup>4</sup> · Takaki Yoshikawa<sup>5</sup> · Kazuyuki Kojima<sup>6</sup> · Haruhiko Imamoto<sup>7</sup> ·  
Motoki Ninomiya<sup>8</sup> · Seigo Kitano<sup>9</sup> · Masanori Terashima<sup>10</sup> · On behalf of Stomach  
Cancer Study Group of Japan Clinical Oncology Group**

Received: 23 August 2016 / Accepted: 30 December 2016 / Published online: 16 January 2017

# Result

- 176 eligible patients
- No patients had recurrent disease, and three of the patients died within the follow-up period
- The 5-year overall survival was 98.2% (95% confidence interval 94.4–99.4%) and the 5-year relapse-free survival was 98.2% (95% confidence interval 94.4–99.4%).

# KLASS-02

## Short Term Results

- Total 1060 pts, cT2-4a and N0-1
- LDG (n = 526) or ODG group (n = 524) between November 2011 and April 2015
- LDG with D2 lymphadenectomy for locally advanced gastric cancer has benefits of less complication rate, faster recovery, and less pain without compromising oncologic safety, compared with open surgery.



## ClinicalTrials.gov

A service of the U.S. National Institutes of Health

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### Multicenter Study on Laparoscopic Distal Subtotal Gastrectomy for Advanced Gastric Cancer (CLASS-01)

**This study is currently recruiting participants.**

*Verified July 2013 by Nanfang Hospital of Southern Medical University*

**Sponsor:**

Nanfang Hospital of Southern Medical University

**Information provided by (Responsible Party):**

Guoxin Li, Nanfang Hospital of Southern Medical University

**ClinicalTrials.gov Identifier:**

NCT01609309

First received: May 29, 2012

Last updated: July 30, 2013

Last verified: July 2013

[History of Changes](#)

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[No Study Results Posted](#)

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#### ▶ Purpose

- Laparoscopic distal subtotal gastrectomy with lymph node dissection as minimally invasive surgery has gained popularity for the treatment of early gastric cancer in East Asian countries, even though the long-term follow-up outcome based on multicenter randomized clinical trial (RCT) is still awaited.
- For the patient with locally advanced gastric cancer, several studies indicated that laparoscopic distal subtotal gastrectomy with D2 lymphadenectomy is a technically feasible and safe procedure by experienced surgeons in high-volume specialized hospitals. However, the application of it is controversial mainly due to lack of solid evidence on the oncologic efficacy. Therefore, conventional open approach is still the current standard for advanced gastric cancer.
- Nowadays, the proportion of patients with locally advanced gastric cancer is estimated up to 80 per cent of all gastric cancer cases in China. Before the clinical application of laparoscopic procedure for the treatment with curative intent to advanced gastric cancer located at the middle- or lower-third of the stomach, the oncologic efficacy must be verified.
- Accordingly, the comparison of long-term outcome between laparoscopic and open distal subtotal gastrectomy with D2 lymphadenectomy for locally advanced gastric cancer based on a well designed multicenter RCT is needed.

Taiwan?



# Personal experience

- November 2007 ~ July 2016
- 101 consecutive patients underwent curative laparoscopic distal gastrectomy
- clinically serosa-negative gastric carcinoma (cT1-3)

<b>Total patients</b>	<b>101</b>
Age	62.3 [61, 28-92]
Male : Female	60:41
ASA 1:2:3:4	43:50:6:2
BMI	23
D1:D1+:D2	11:52:38
BI : BII : RY	1:59:41
Combine resection GB : A-colon : adrenal	7:1:1
Conversion	1 (case 21)



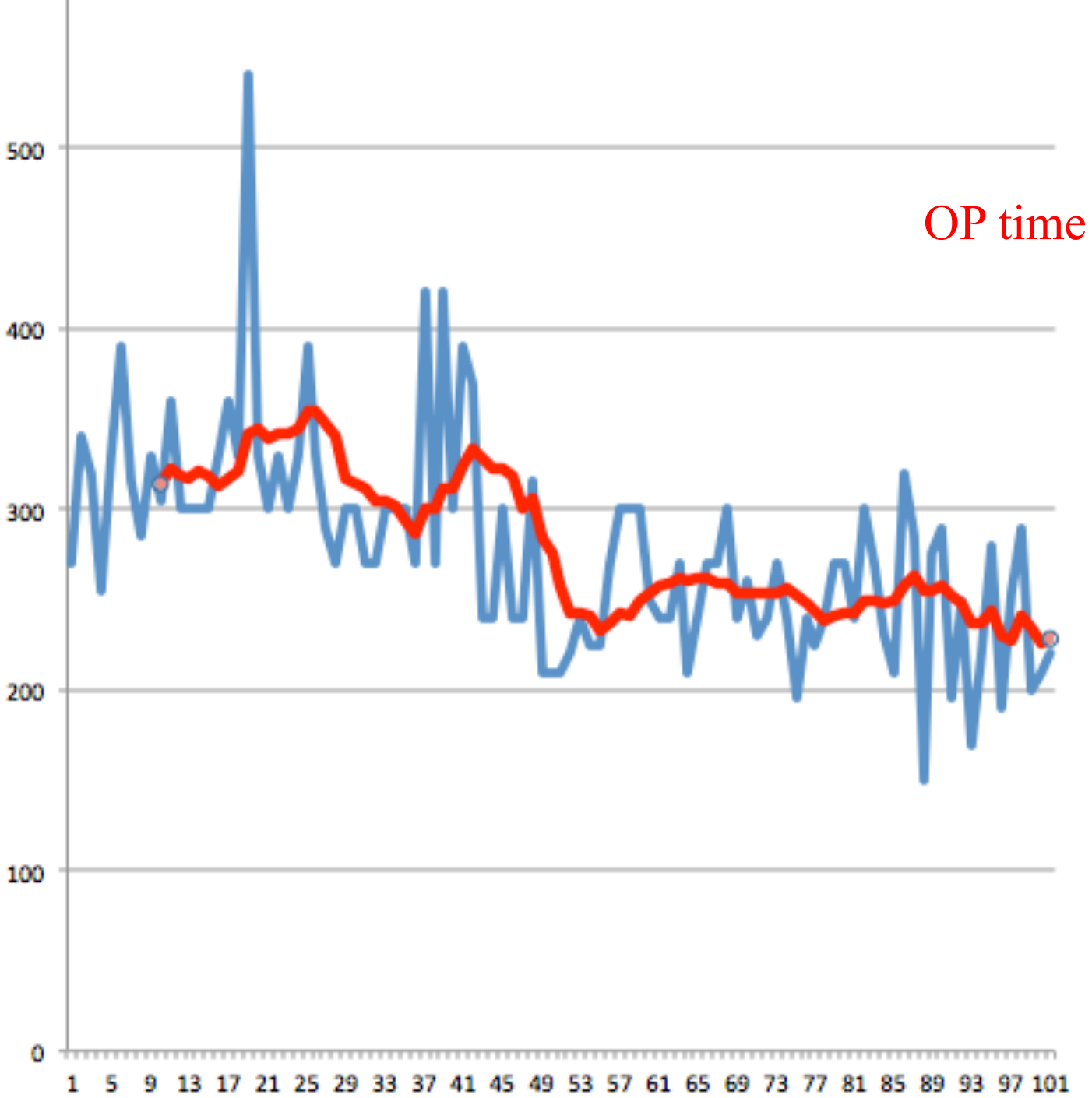
Total patients	101
T stage Tis : m : sm : mp : ss : se: si	3:35:38:10:10:4:1
N stage N0:N1:N2:N3	73:12:12:4
Harvested LN	38.3 [37, 6-77]
EBL	89.1 [70, 10-400]
OP time	278 [270, 150-540]
On Water	4, [3, 2-79]
POD stay	11, [8, 6-85]
Complications	13
Mortality	0

<b>Post-OP Complications</b>	<b>13patients</b>
Pancreatic fistula	4
Chylous leakage	2
Duodenal stump leakage*	1
Acute A loop syndrome*	1
Acute Acalculus Cholecystitis	1
Delayed gastric emptying	3
Omental necrosis*	1
RGEA bleeding*	1
AMI	1
Re-operation*	4

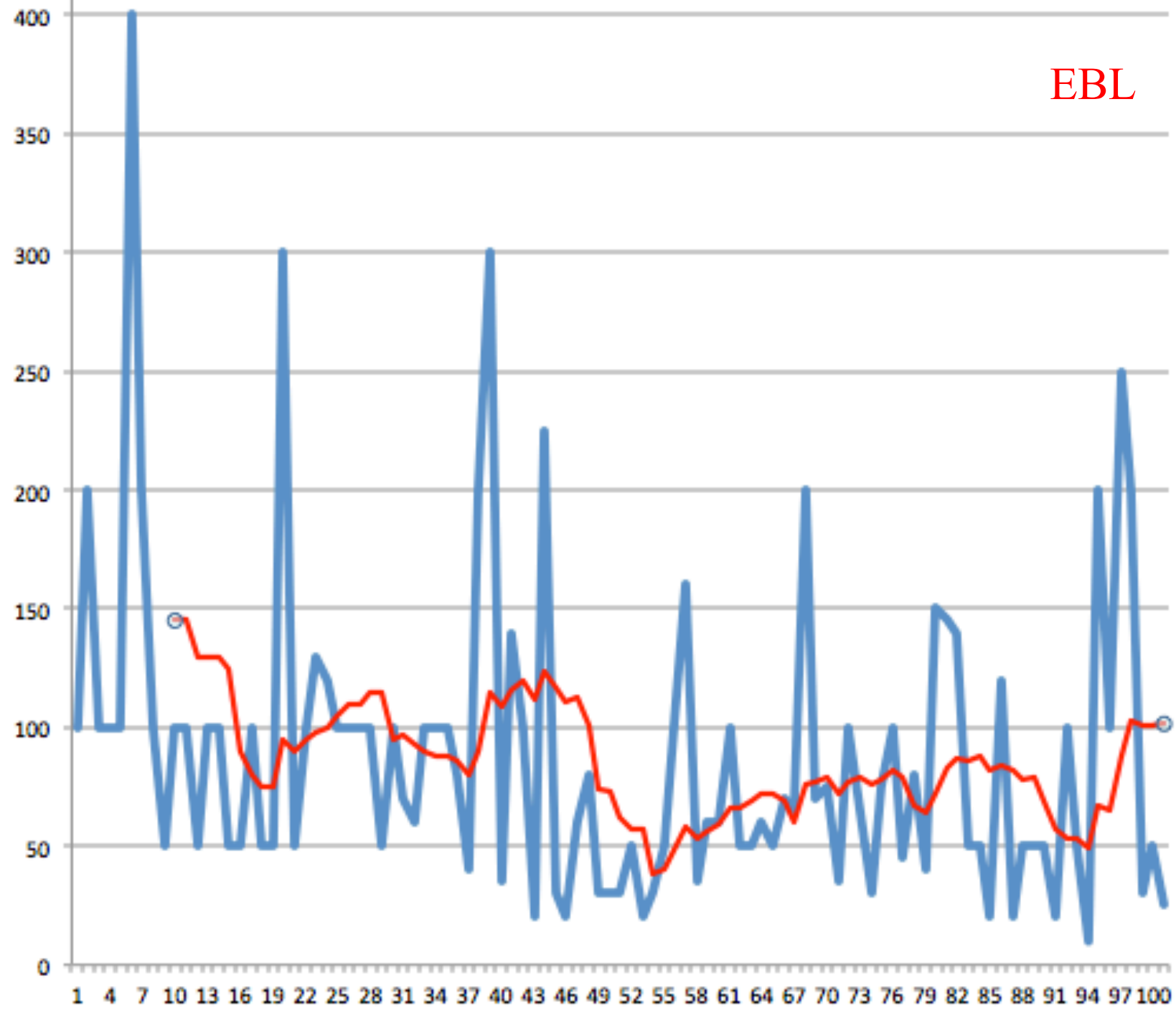
Table 4. Summary of recurrence, timing, patterns, and sites

Case	Age/ sex	Nodal dissection	TNM	Time to recurrence	Recurrence pattern	Survival status	
#8	66F	D1A	T2N0M0	9.5 months	Hepatoduodenal ligament lymph node	Dead	Under immunosuppressive therapy for Pemphigus
#30	62M	D1B	T1bN0M0	48 months	Para-aortic lymph node	Alive	Free of locoregional recurrence
#33	52F	D1B	T3N1M0	33 months	Peritoneal dissemination	Alive	Neuroendocrine carcinoma
#42	52M	D1B	T4aN3aM 0	37 months	Multiple bone metastasis	Dead	Free of locoergional recurrence

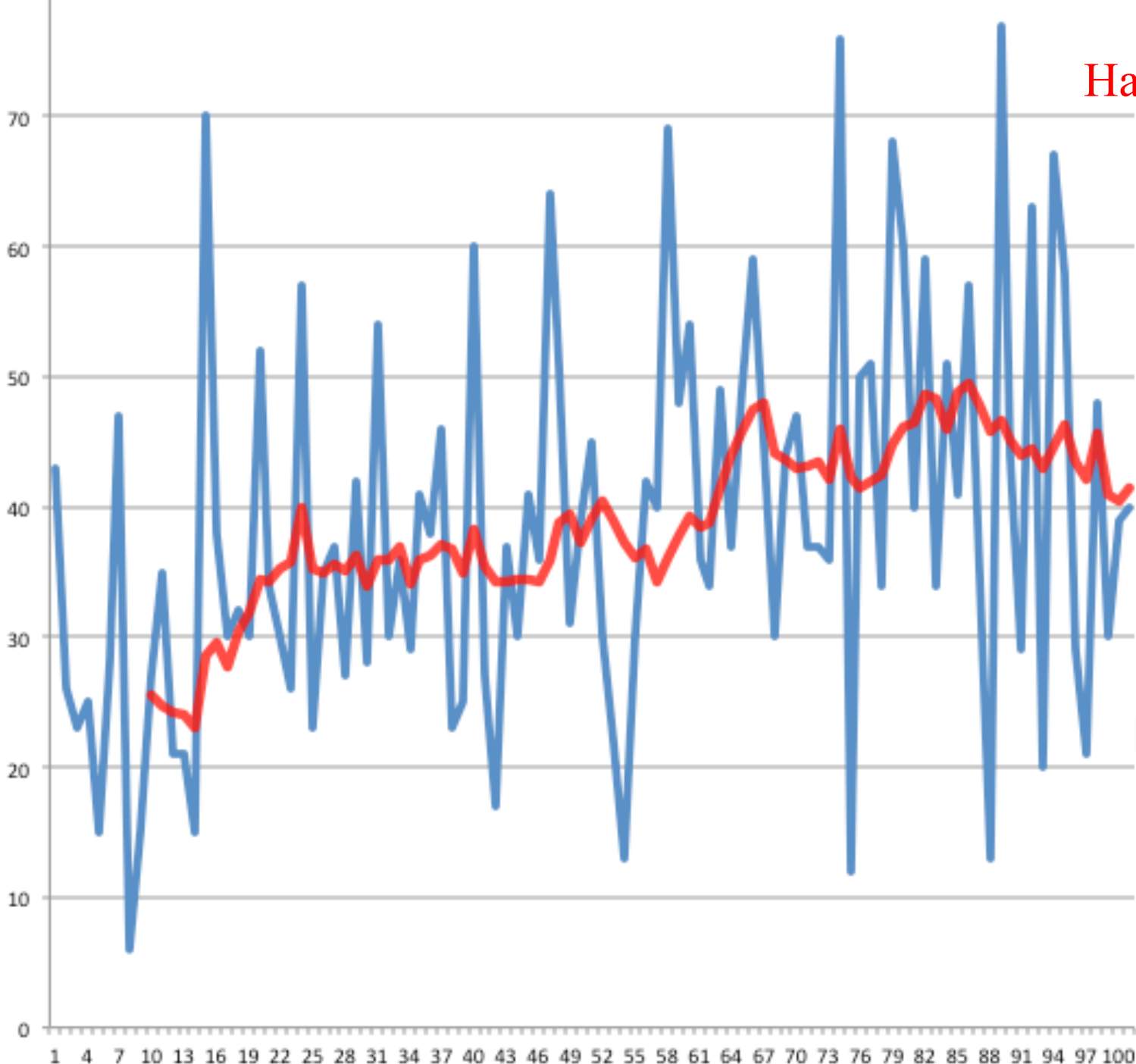
# Learning Curve of LADG



EBL



Harvested LN



# Conclusions

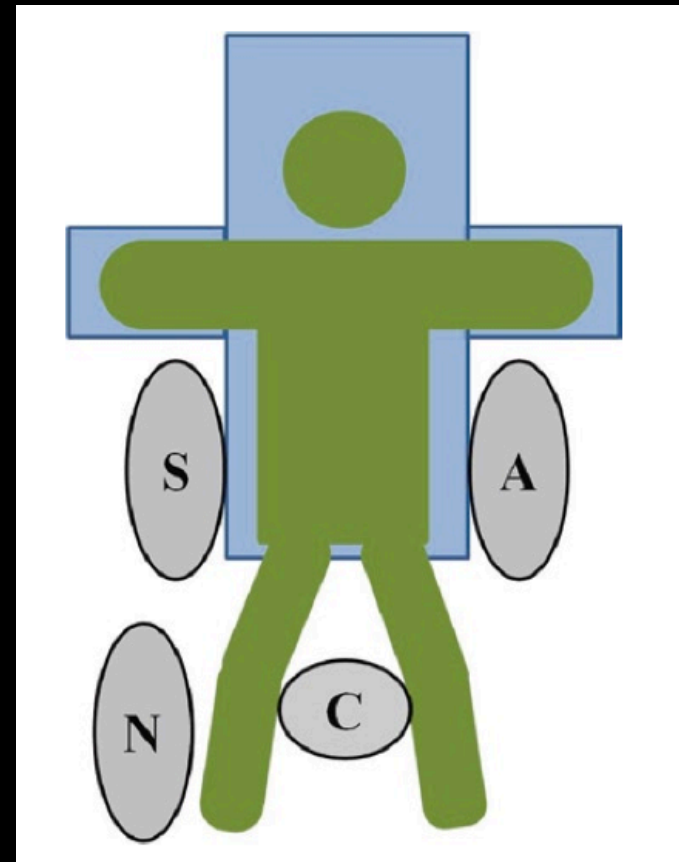
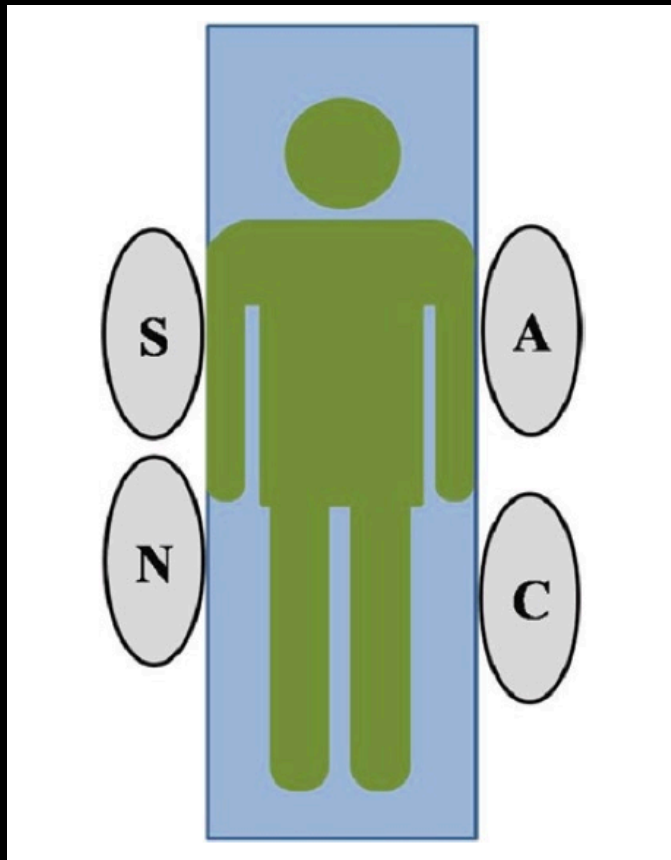
- At least **50 cases** are essential for overcoming the learning curve.
- Comparable results with endemic countries

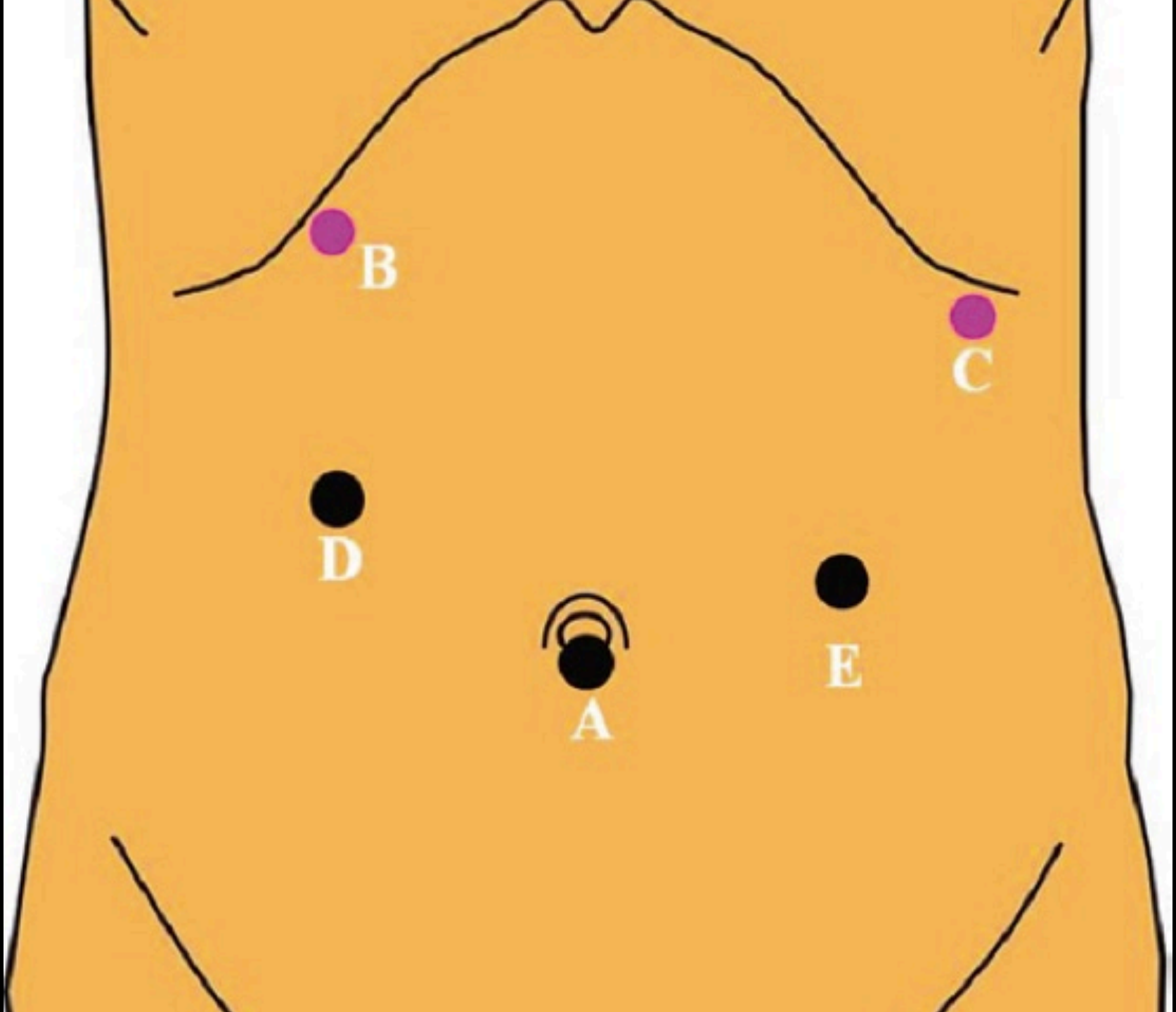


# How to set up...

1. Patient position
2. Trocar position
3. Liver retraction

# Position of the Patient and Operators, and Placement of Ports:



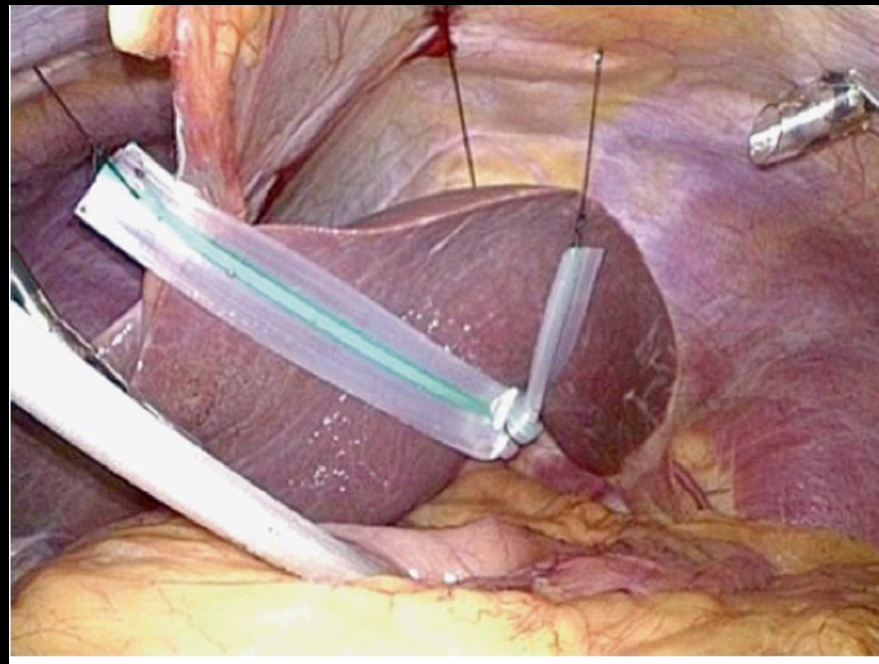
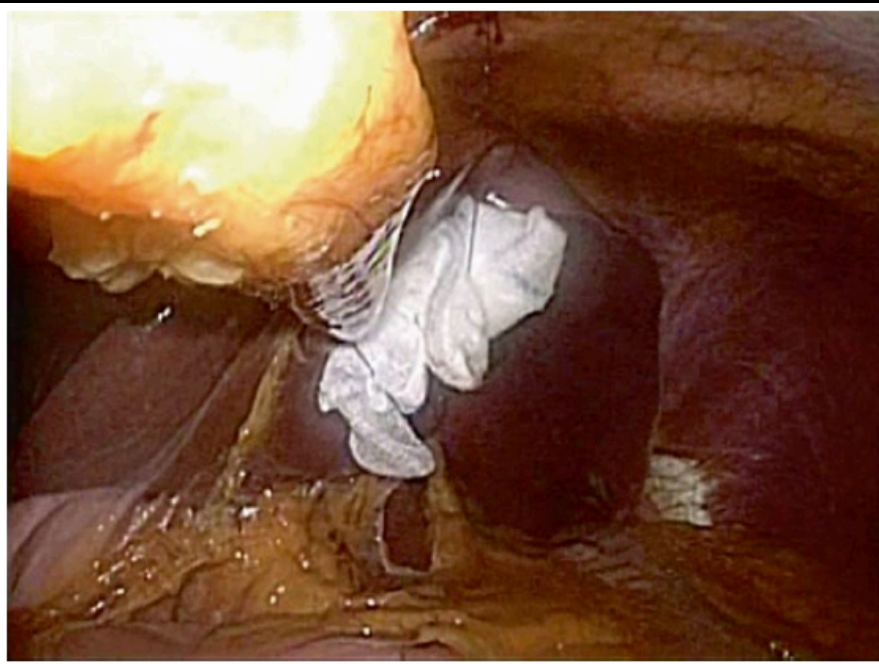
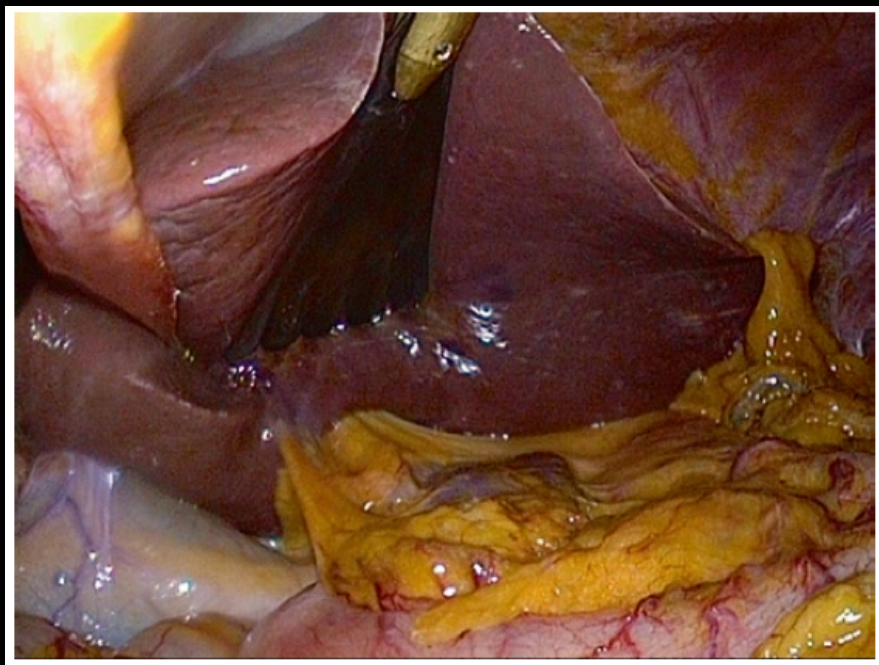
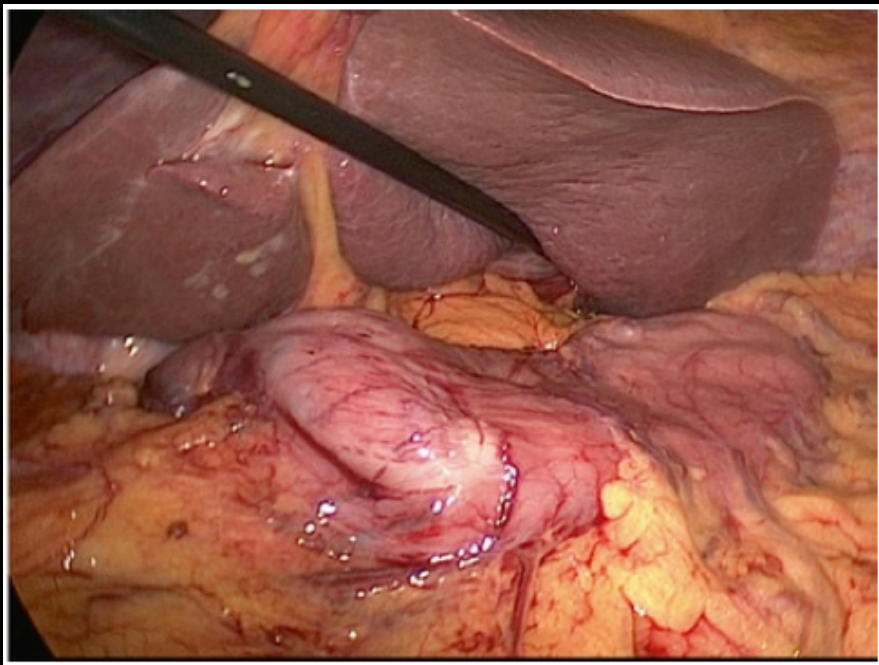


# Factors to be Considered...

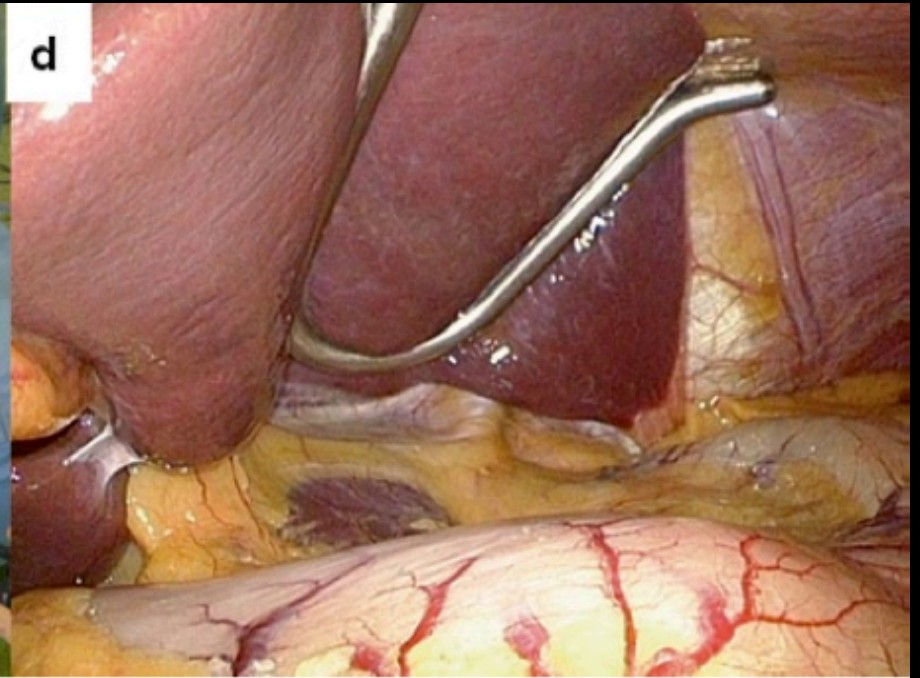
- Anatomy of upper abdominal organs: size and location of stomach and pancreas
- Surgical goal (method and extent of surgery) : D2, total?
- Individual body habitus of the patient: obese?
- Instruments to be used: length of instruments
- Technical level of assistants or scrub nurse.

# How to Do a Liver Retraction

- important to perform laparoscopic upper gastrointestinal (GI) surgery
- ensure an adequate working space
- **Methods**
  - \* fan- shaped retractor
  - \* Nathanson' s liver retractor
  - \* Penrose drain
  - \* suture-and-lift technique using a straight needle



# Nathanson's liver retractor



How I Do It:  
Laparoscopic D2 dissection

**Cheng-Chan Yu**





# Principle

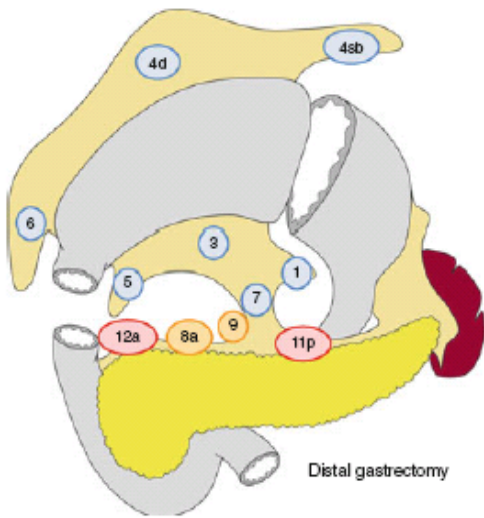
## 2.3.1.2 Distal gastrectomy

D0: Lymphadenectomy less than D1

D1: Nos. 1, 3, 4sb, 4d, 5, 6, 7

D1+: D1 + Nos. 8a, 9

D2: D1 + Nos. 8a, 9, 11p, 12a.



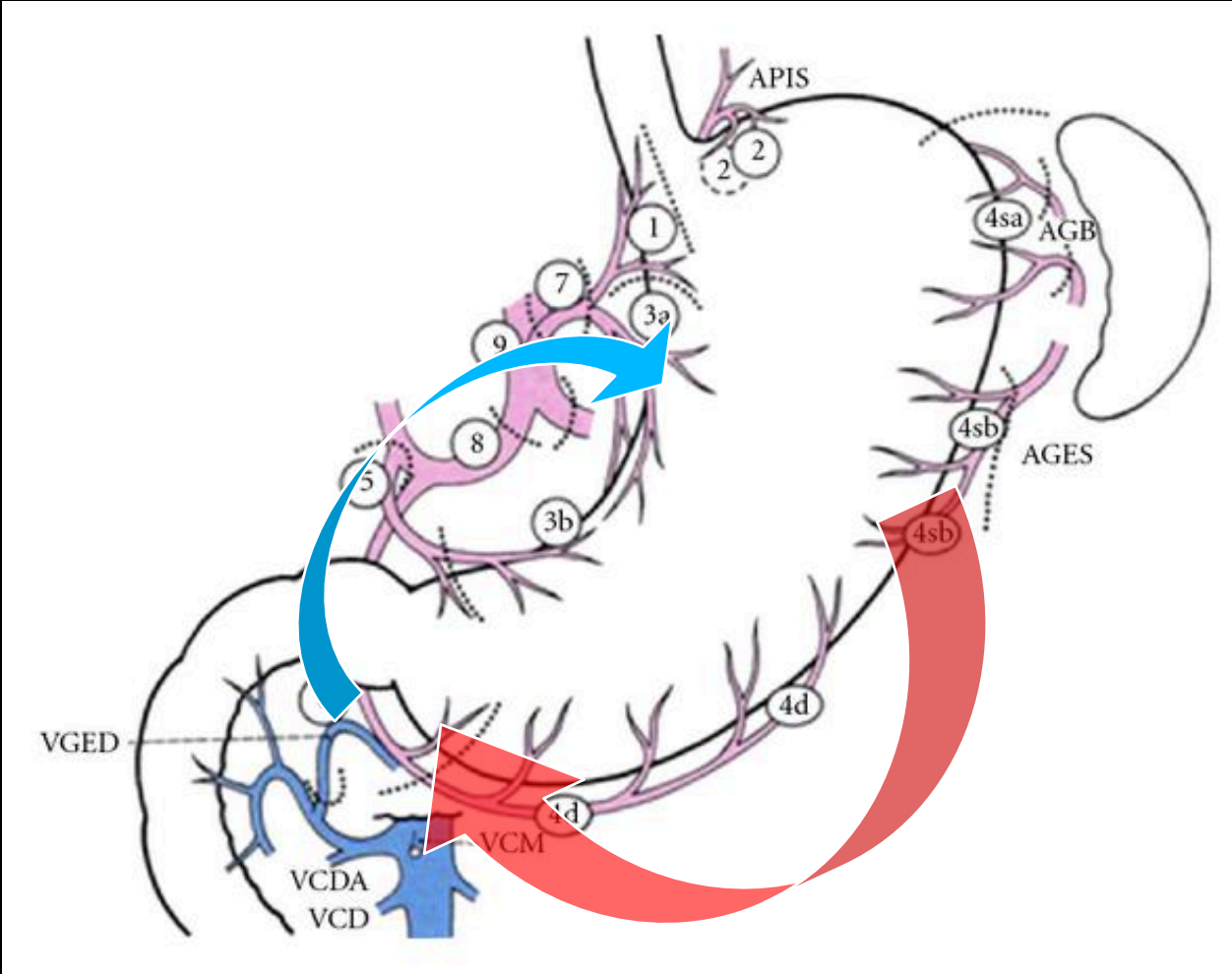
- Surgical plane
- Outer most layer of nerve
- Avoid bleeding

# Laparoscopic Lymph Nodes Dissection

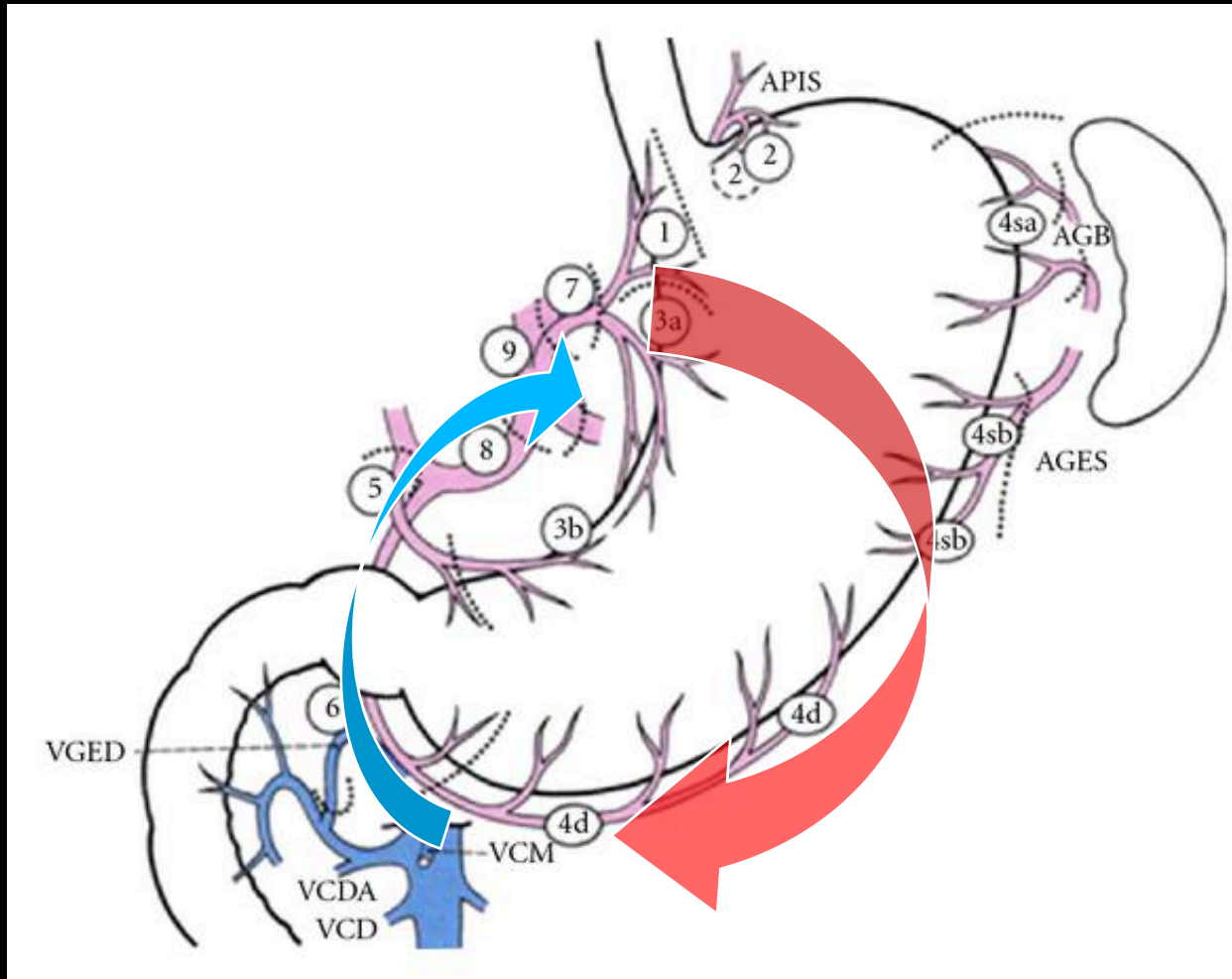
- 1, 3a, 3b, 4sb
- 4d, 6
- 5, 12a
- 7, 8a, 9, 11p

Modified Clockwise lymphadnectomy  
St1 and 3a first!

# Clockwise lymphadnectomy



# Modified Clockwise lymphadenectomy

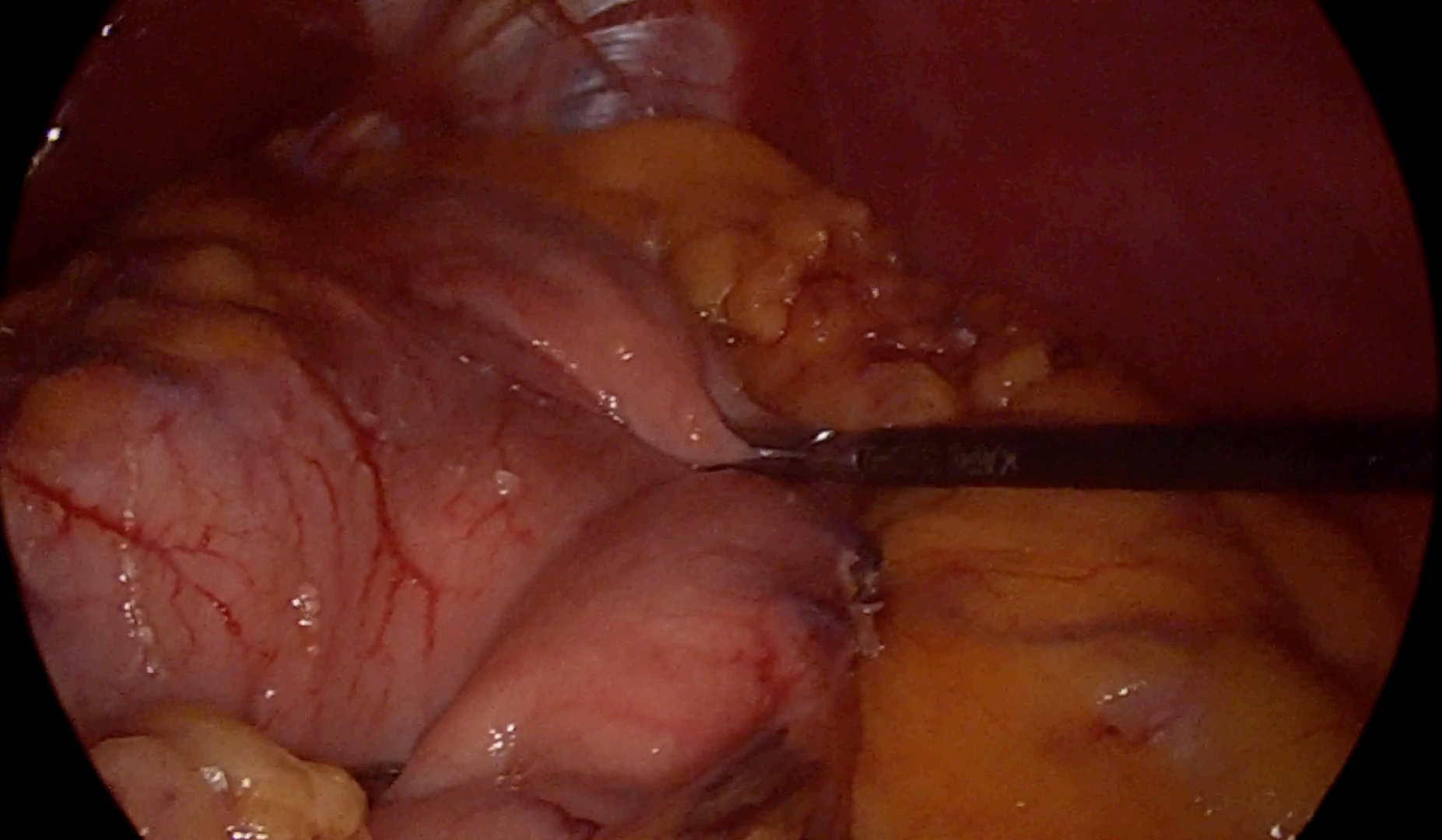


# Modified clockwise: St. 1 and 3a first!

Easily to keep the longitudinal axis of stomach  
and maintain the dissection plane before  
duodenal transection

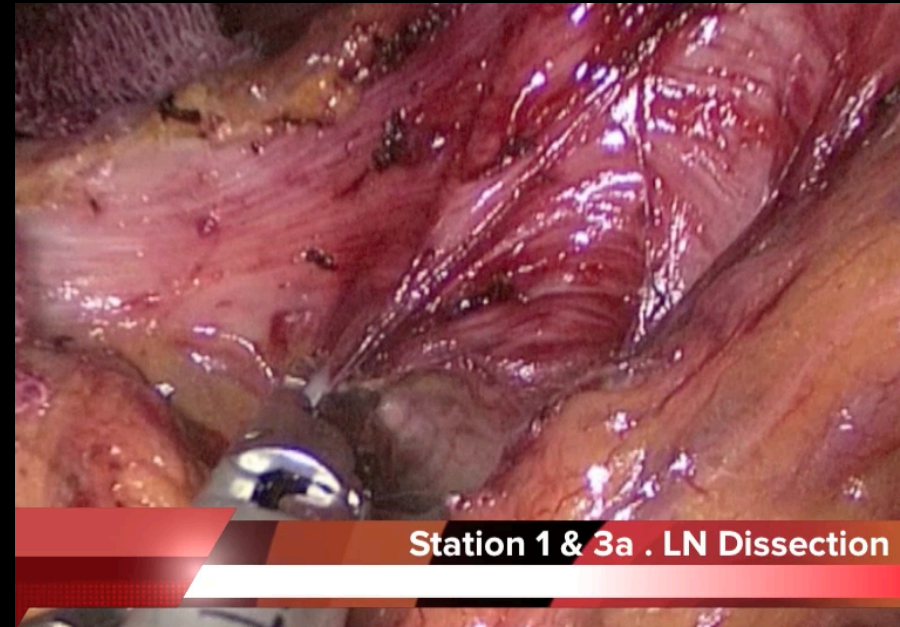
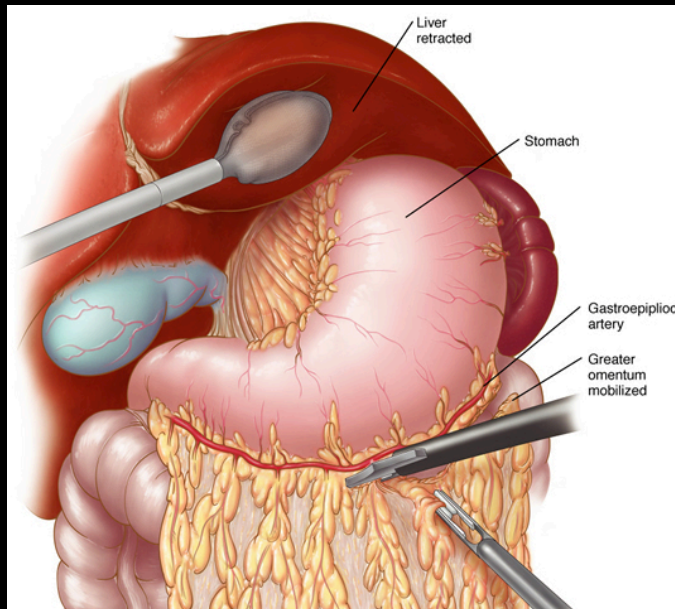
From anterior to posterior, From medial to  
lateral

Non-touch principle



# Dissection of Lymph Nodes Along the Lesser Curvature (Nos. 1, 3 Lymph Nodes)

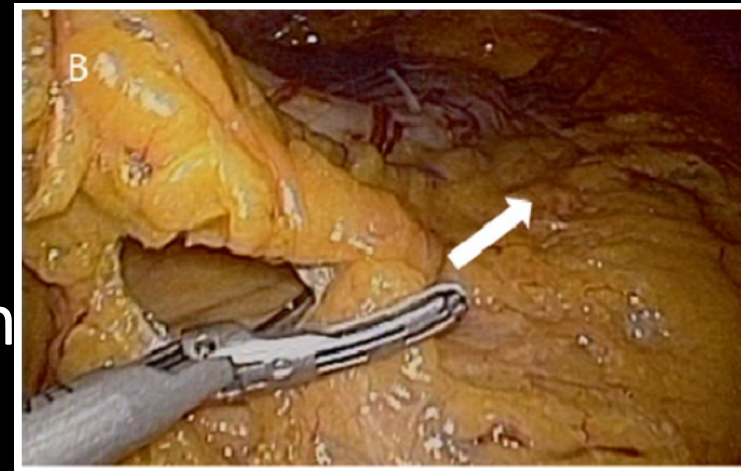
- Keeping dissection plane
- At the completion of the dissections there should be no residues of fat tissue.
- Pitfalls: avoiding esophagus/stomach injury

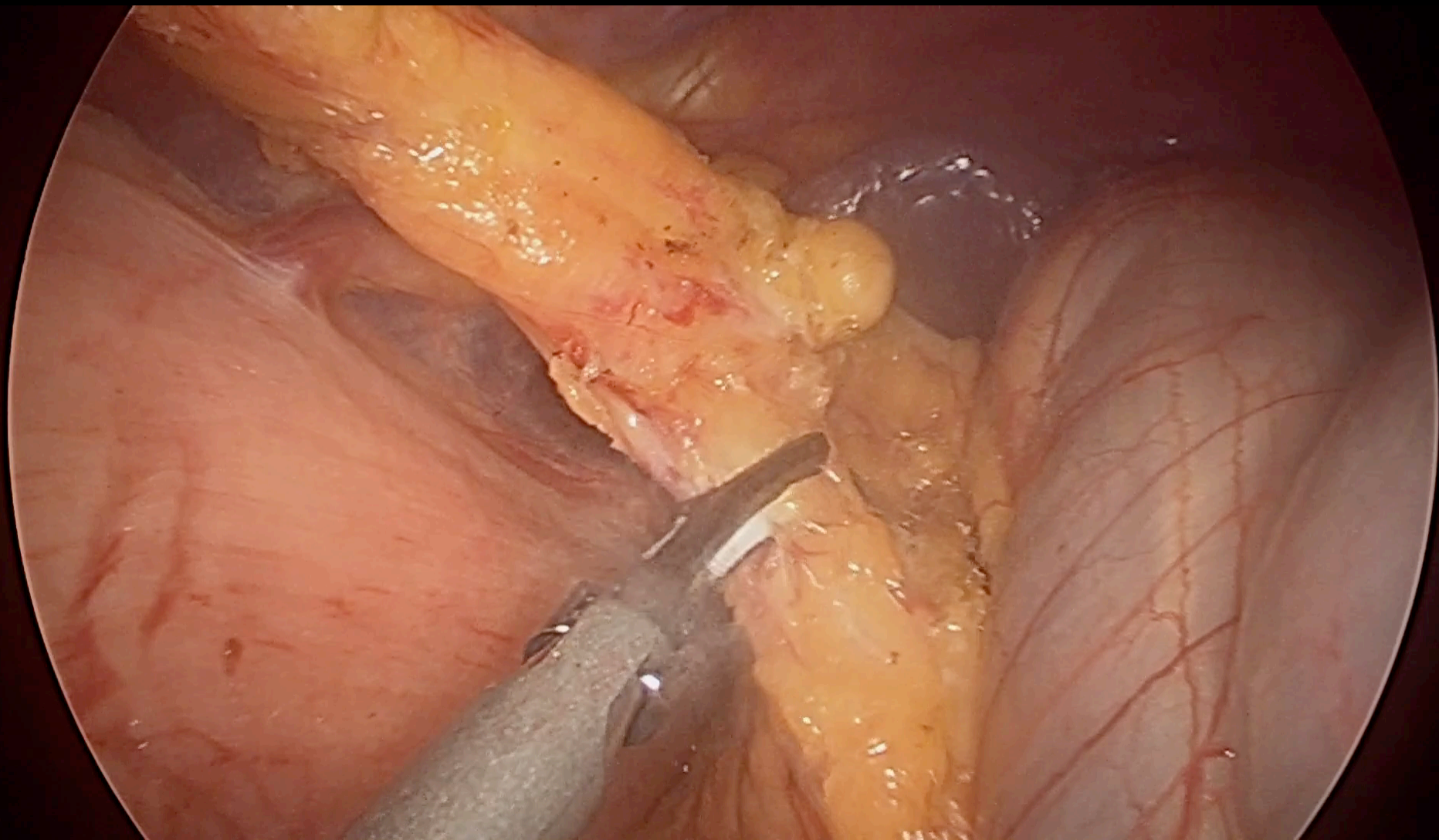




# Dissection of the Greater Omentum and Left Gastroepiploic Vessels (4sb Lymph Nodes)

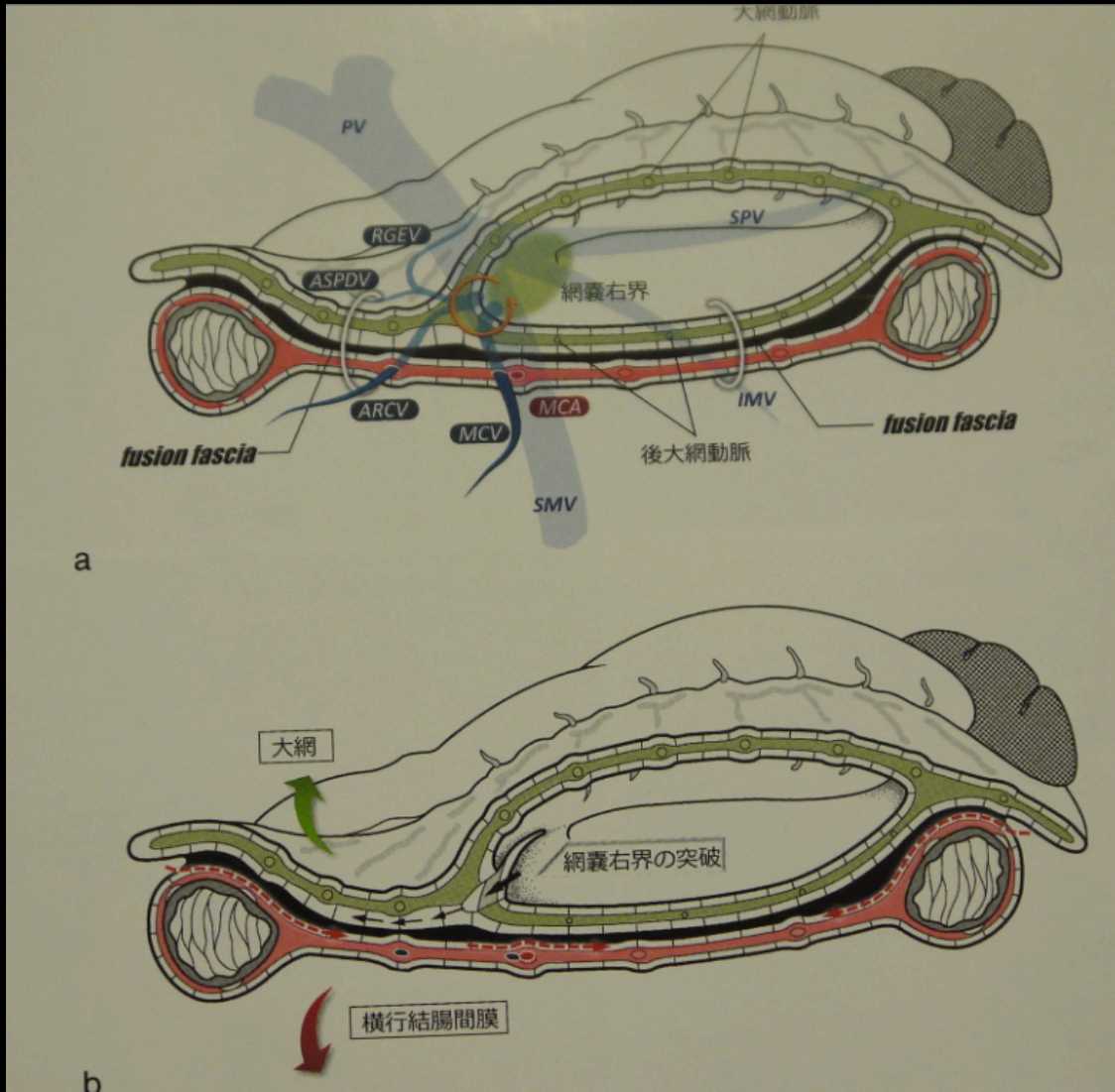
- total or partial omentectomy?
- 3-4cm from gastroepiploic vessels
- dissection the **root** of the left gastroepiploic vessels
- Pitfalls: injuring the transverse colon and lower pole of spleen





# St 4d Dissection

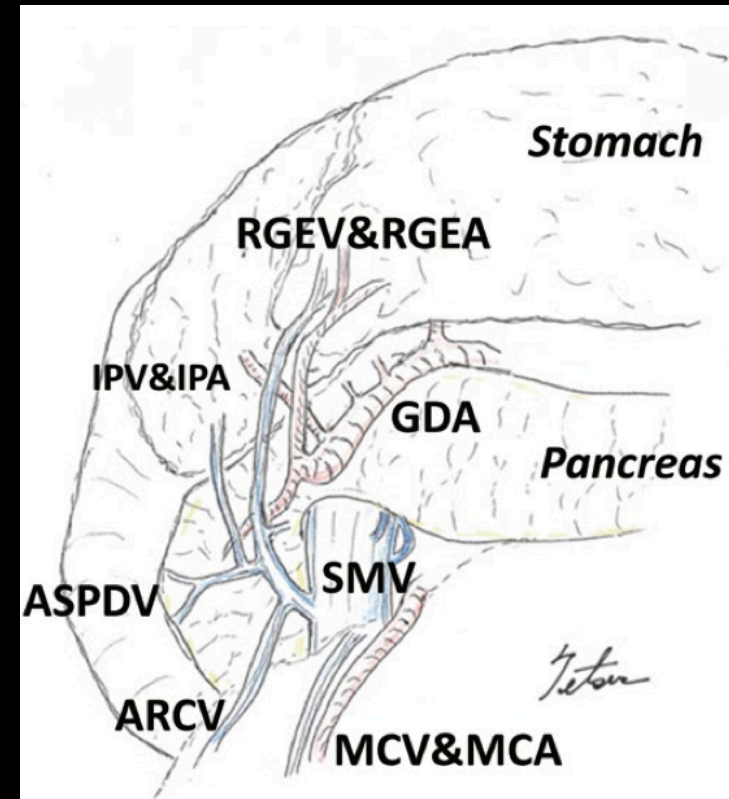
## “Right side Omentectomy”



# Infrapyloric Lymph Nodes (Station 6)

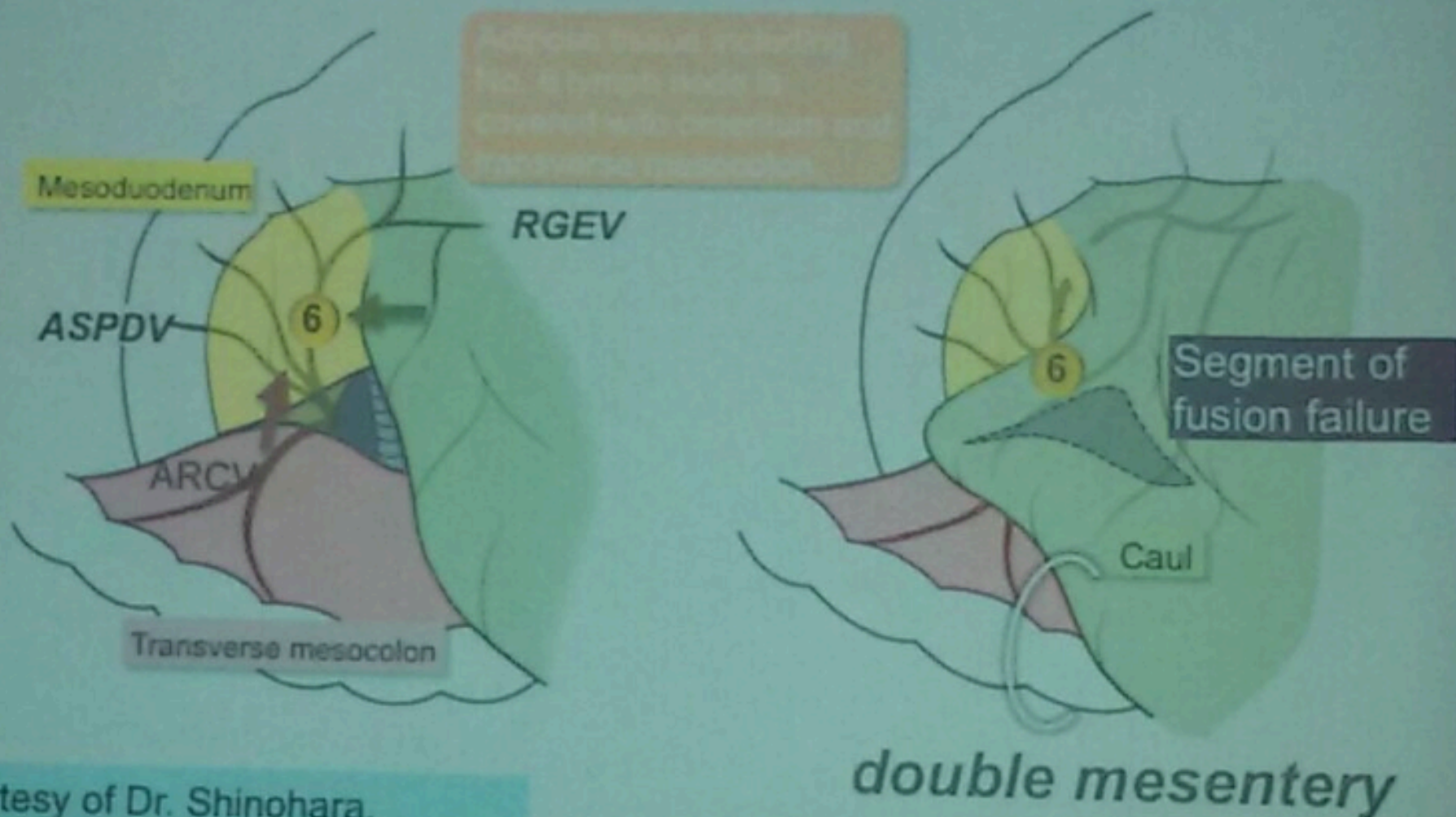
# Infrapyloric Lymph Nodes (Station 6)

- frequently metastasis in L/3 and M/3 gastric ca
- complicated anatomy
- require delicate manipulation
- pancreatic injury results pancreatitis, abscess, fistula
- 初學者的第一個罩門

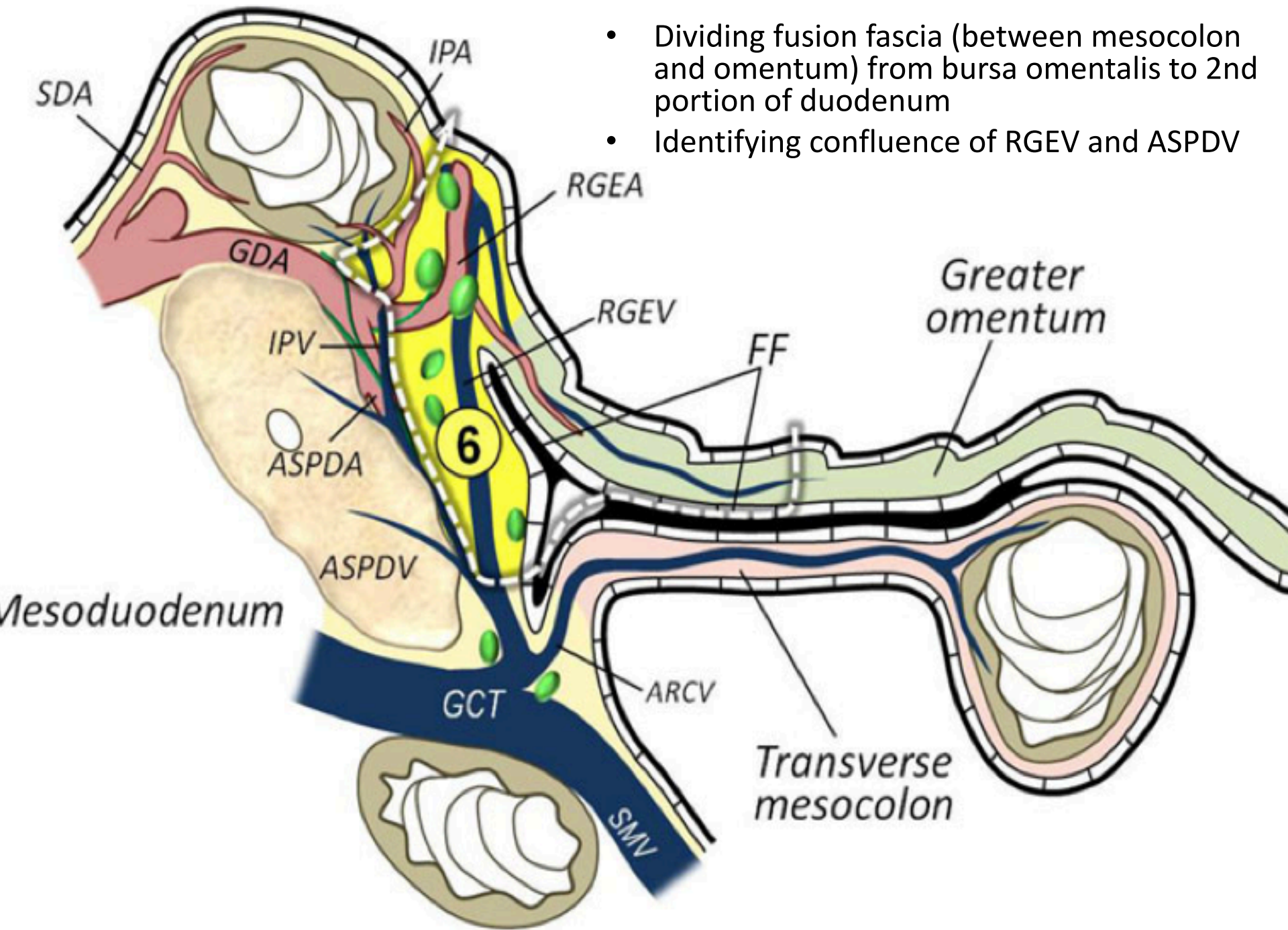


# Fusion of 3 different membranes

Mesoduodenum, omentum and transverse mesocolon.



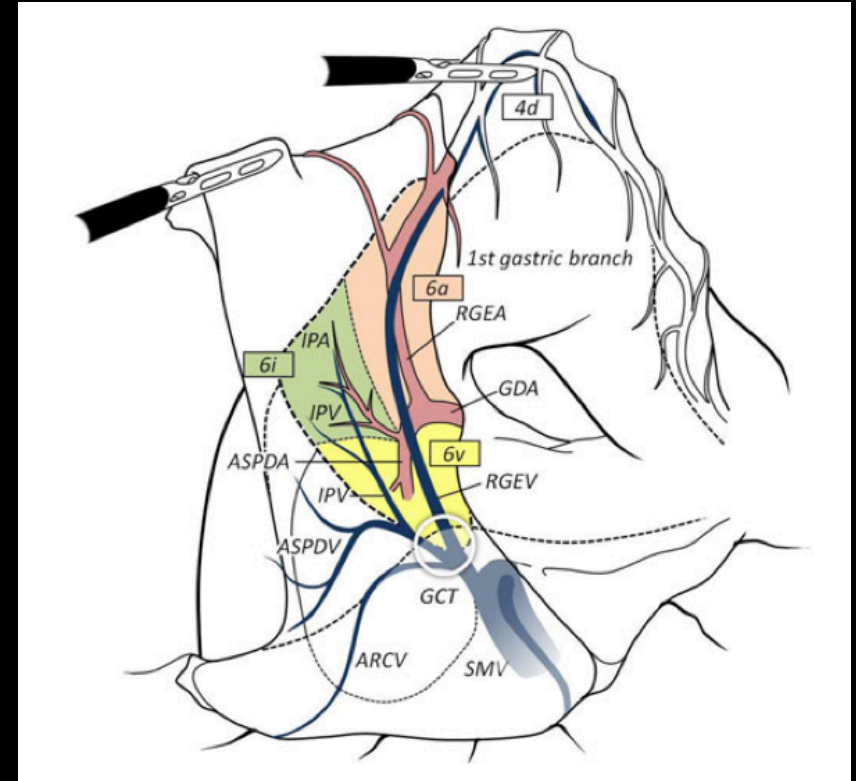
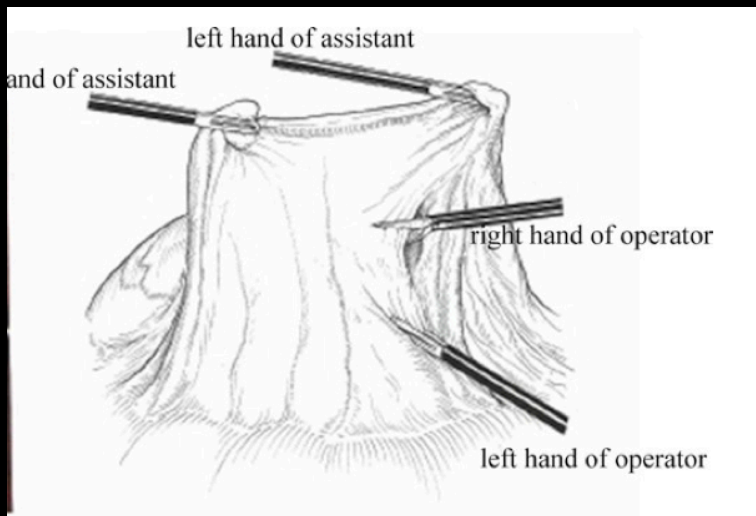
Courtesy of Dr. Shinohara,  
Toranomon Hospital



- Dividing fusion fascia (between mesocolon and omentum) from bursa omentalis to 2nd portion of duodenum
- Identifying confluence of RGEV and ASPDV

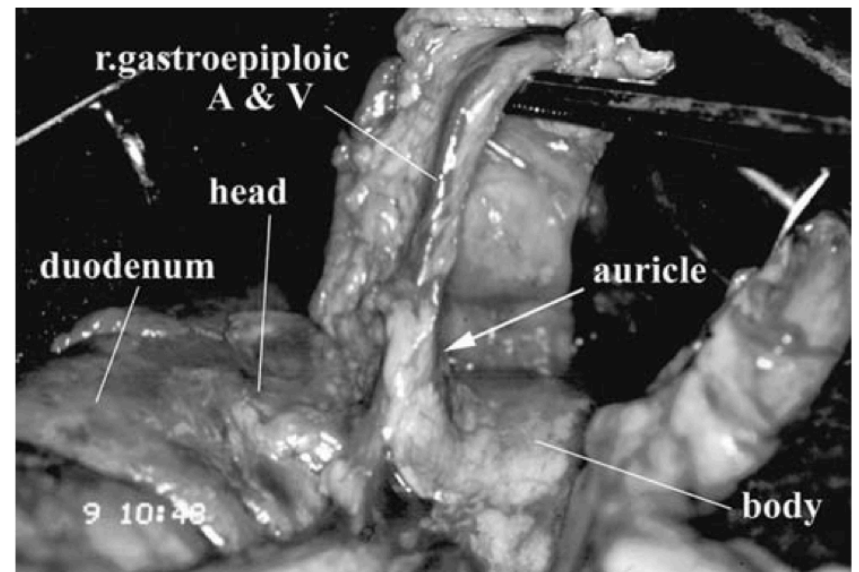
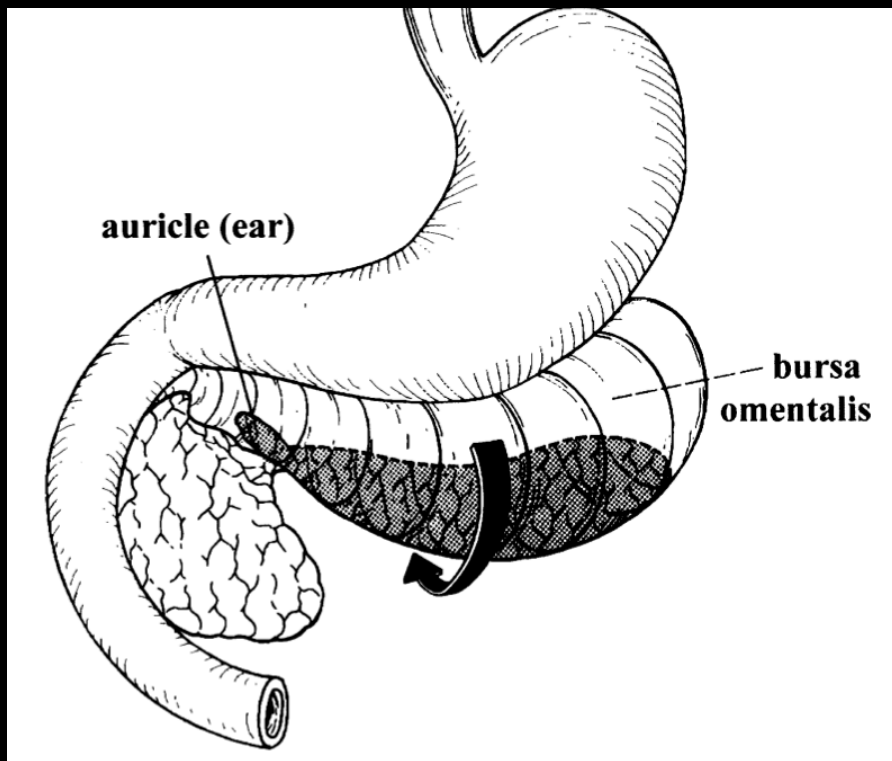
# How to Approach

- Left side approach!
- 6v-->6a-->6i

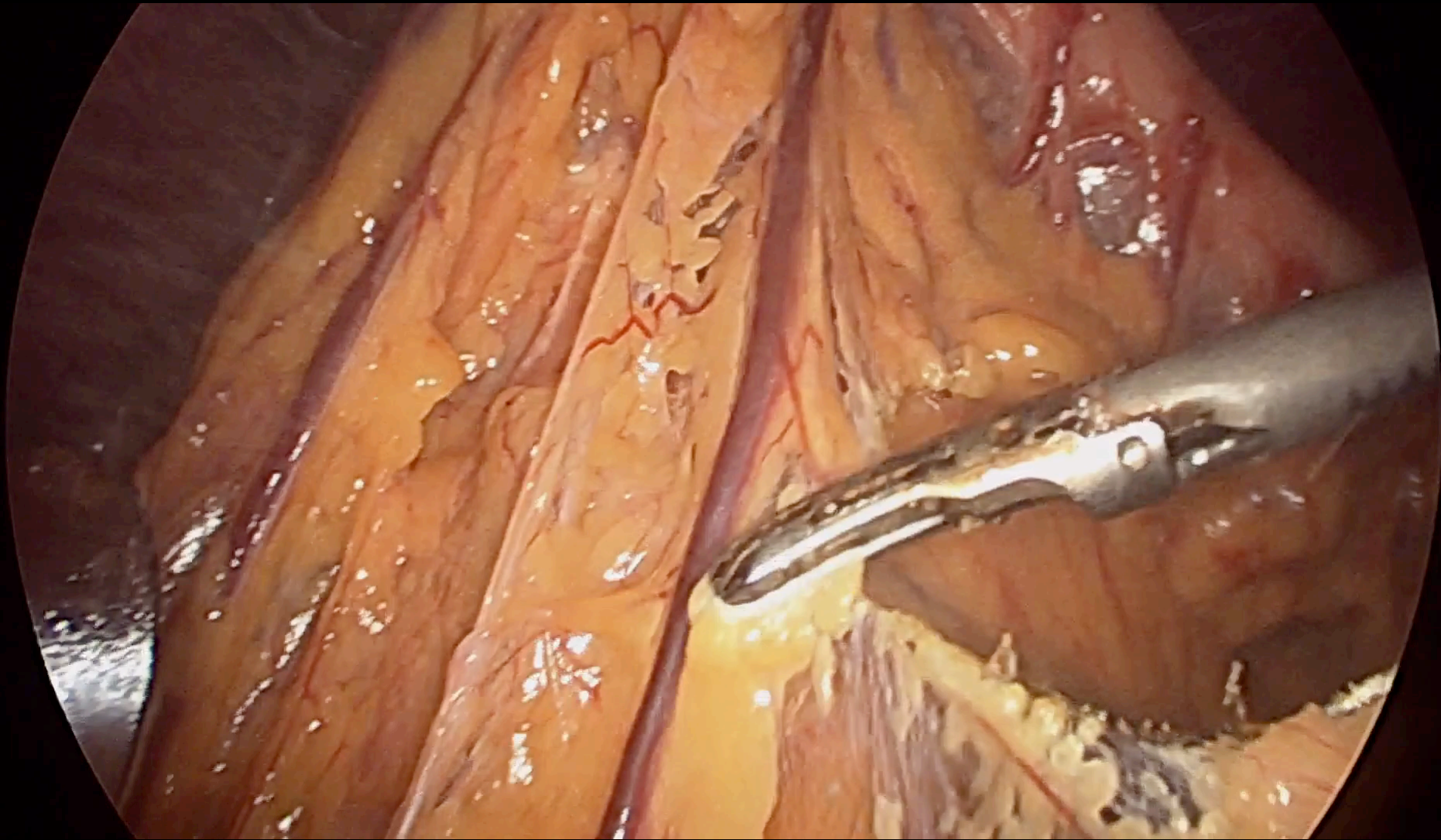




# “Auricle” of Pancreas!



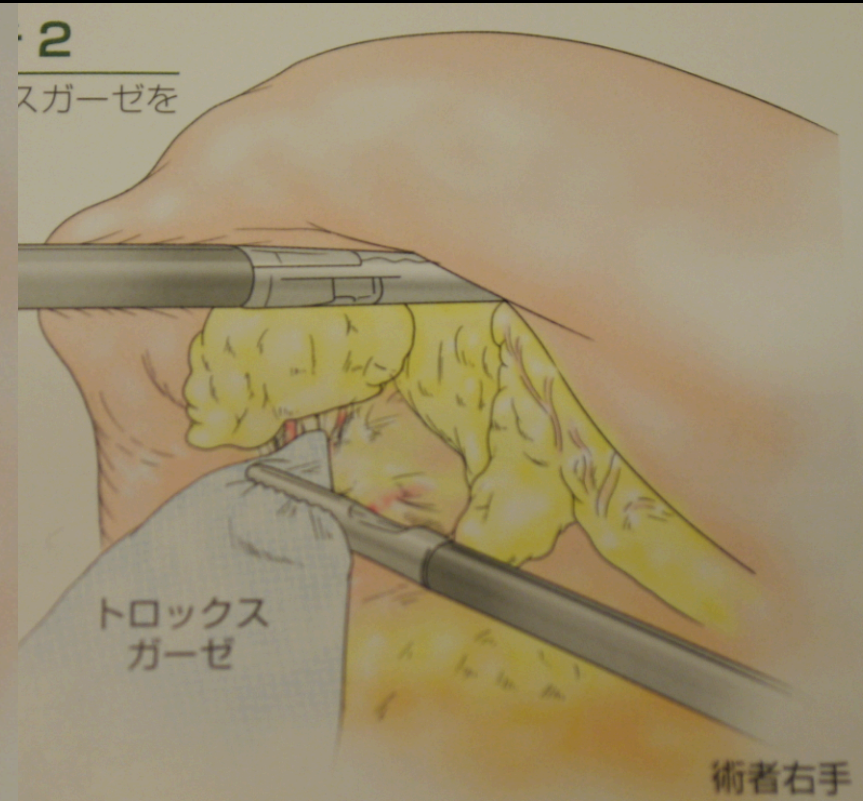
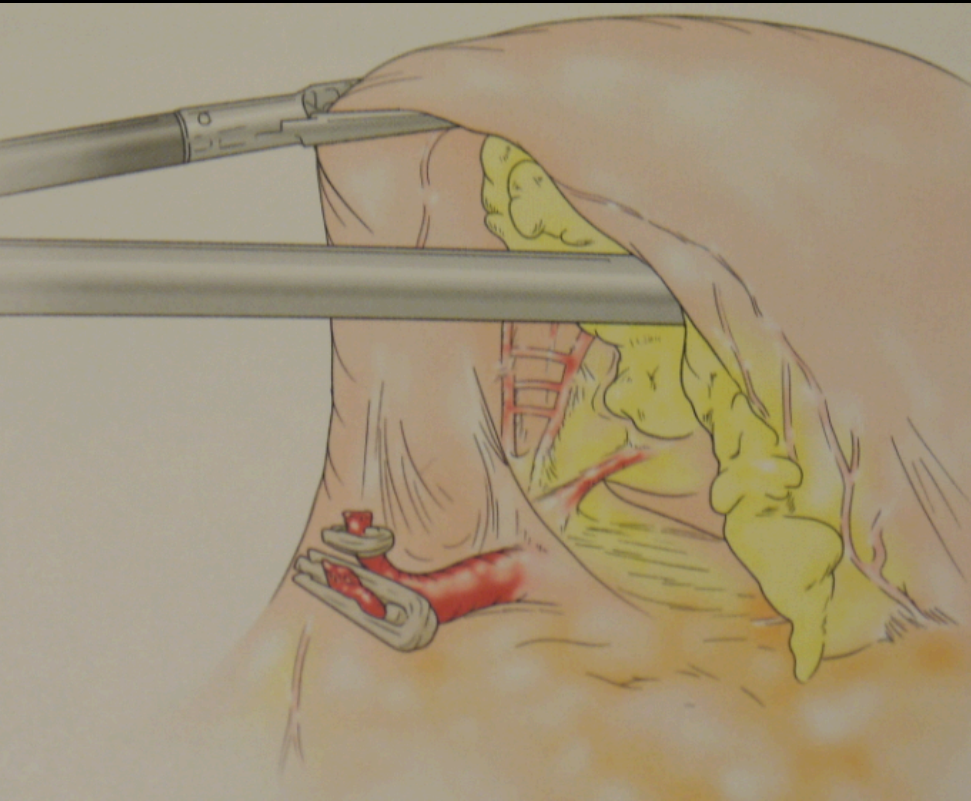
**Fig. 3.** Auricle or ear of the pancreas. A pyramidal projection of the pancreatic neck is extended upward along the right gastroepiploic artery and vein (A & V)



# Supraduodenal Dissection (No. 5 and 12a Lymph Nodes)

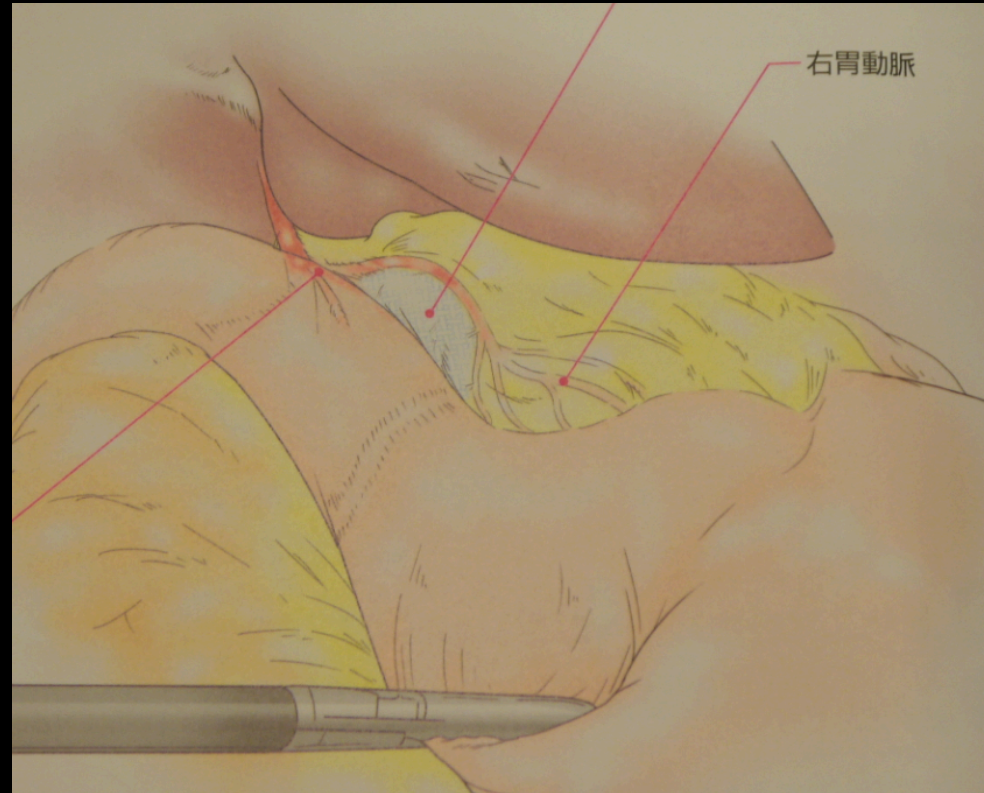
- Infraduodenal Portion

- ★ dissect along the GDA and expose the GDA, CHA, and the medial side of the PHA
- ★ Insert a gauze pad in the infraduodenal area

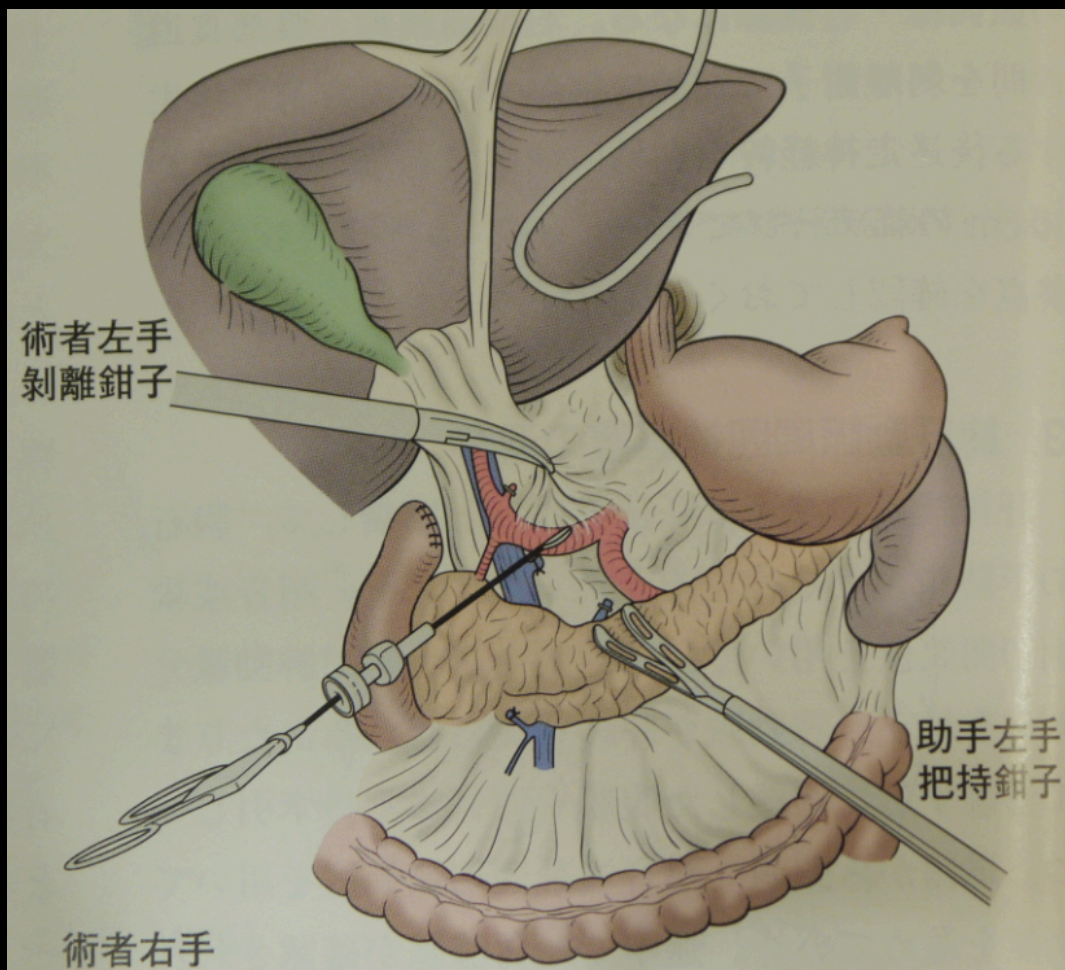


# Supraduodenal Portion

- Divide the SDA and identify the gauze
- Dissect the hepatoduodenal ligament and expose the root of the RGA and the lateral side of the PHA.
- Divide the lesser omentum from the left side of the liver hilum to the esophagogastric junction.
- The RGA is divided at its origin between the clips.

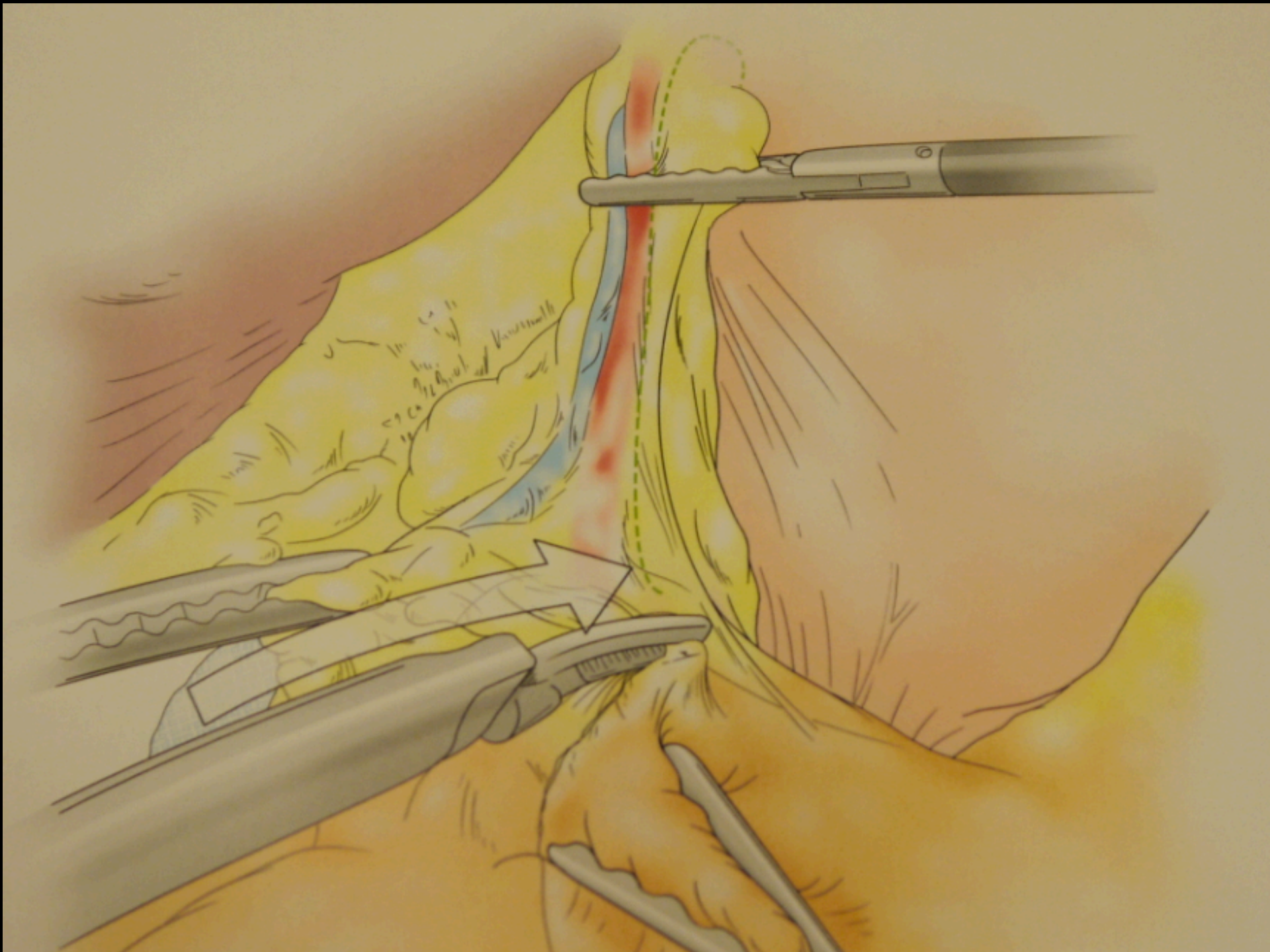


# Suprapancreatic Dissection: St 7, 8a,9,11p



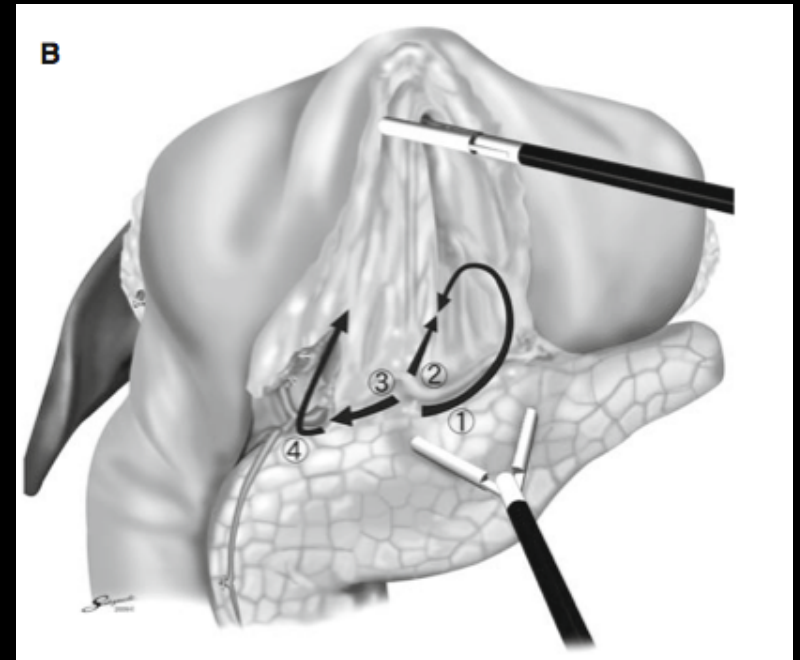
## Difficulties encountered in laparoscopic suprapancreatic D2 nodal dissection

- Suprapancreatic adipose tissue bearing target lymph nodes is **fragile and hemorrhages easily** --> inadequate nodal dissection.
- The target lymph nodes are located in the **dorsal area** of the common hepatic and splenic arteries



# How to Approach?

- Conventional Method
- Left side Approach
- Medial Approach





- into PV:  
50~80%

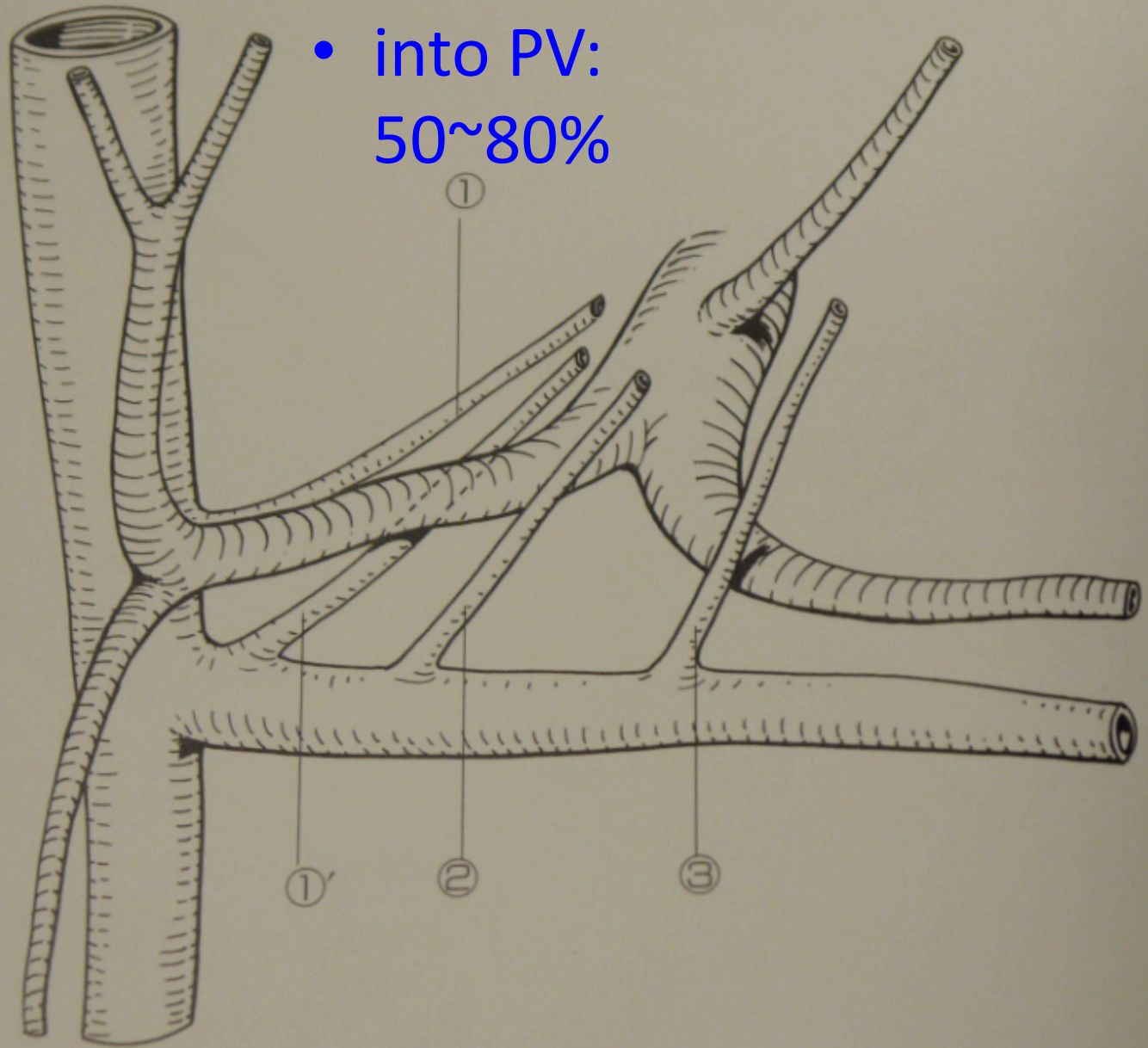
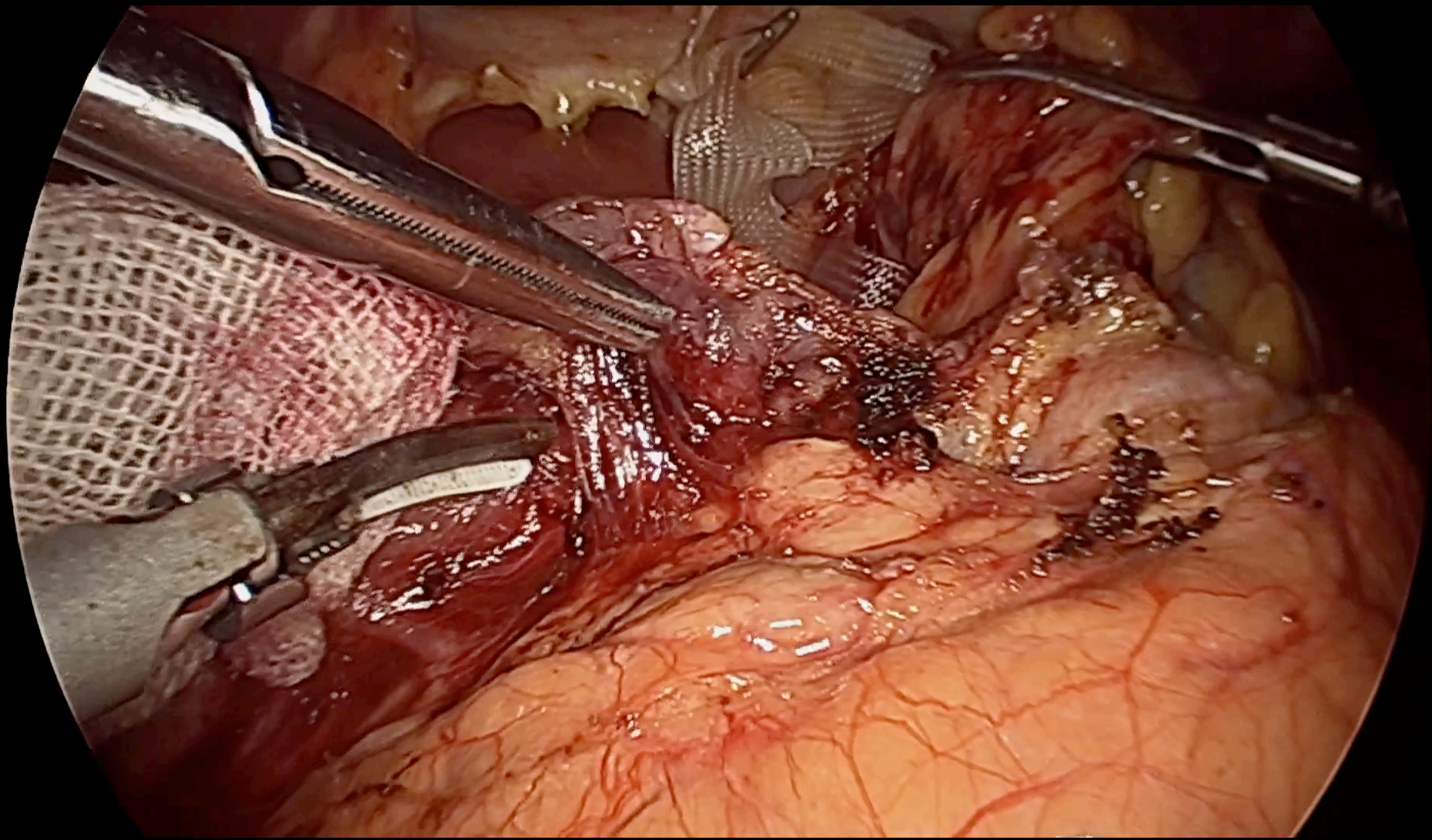


图 16 左胃静脈

# Dissection of Lymph Nodes Around the Splenic Artery (No. 11p Lymph Nodes)

- The boundaries of the 11p area are the left gastric artery (right side), **posterior gastric artery (left side)**, upper border of the pancreas (inferiorly) and the crus muscle (superiorly).
- Pitfalls (Frequent Complications): bleeding, pancreatic injury



# Conquer the Learning Curve

# Possible problems in Taiwan

- Difficulties in cases accumulation
- Lack of Long-term results for advanced cancer
- Low accuracy of pre-operative staging (EUS) :  
20 cases with EUS, 40% accuracy rate(50%  
over-estimate, 10% under-estimate)

- In non-endemic region like Taiwan, the caseload is much smaller than those in Japan and Korea because of the moderate incidence (annual incidence of gastric cancer 16 / 100,000) and the small proportion of early cancer (22.15%).

- Lack of laparoscopic team (Doctor)
- Lack of laparoscopic team (Nurse)!
- Difficult tumor location : palpation, IntraOP gastroscopie, dye or clip
- Difficult EJ anastomosis
- Time consuming
- Self-pay for Disposable instrument

- In our low-volume center, it is very difficult to maintain excellent teamwork. Inexperienced assistants and nurses may hinder the proficiency of teamwork during the early phase of learning curve.



**How to start**

# Team Work

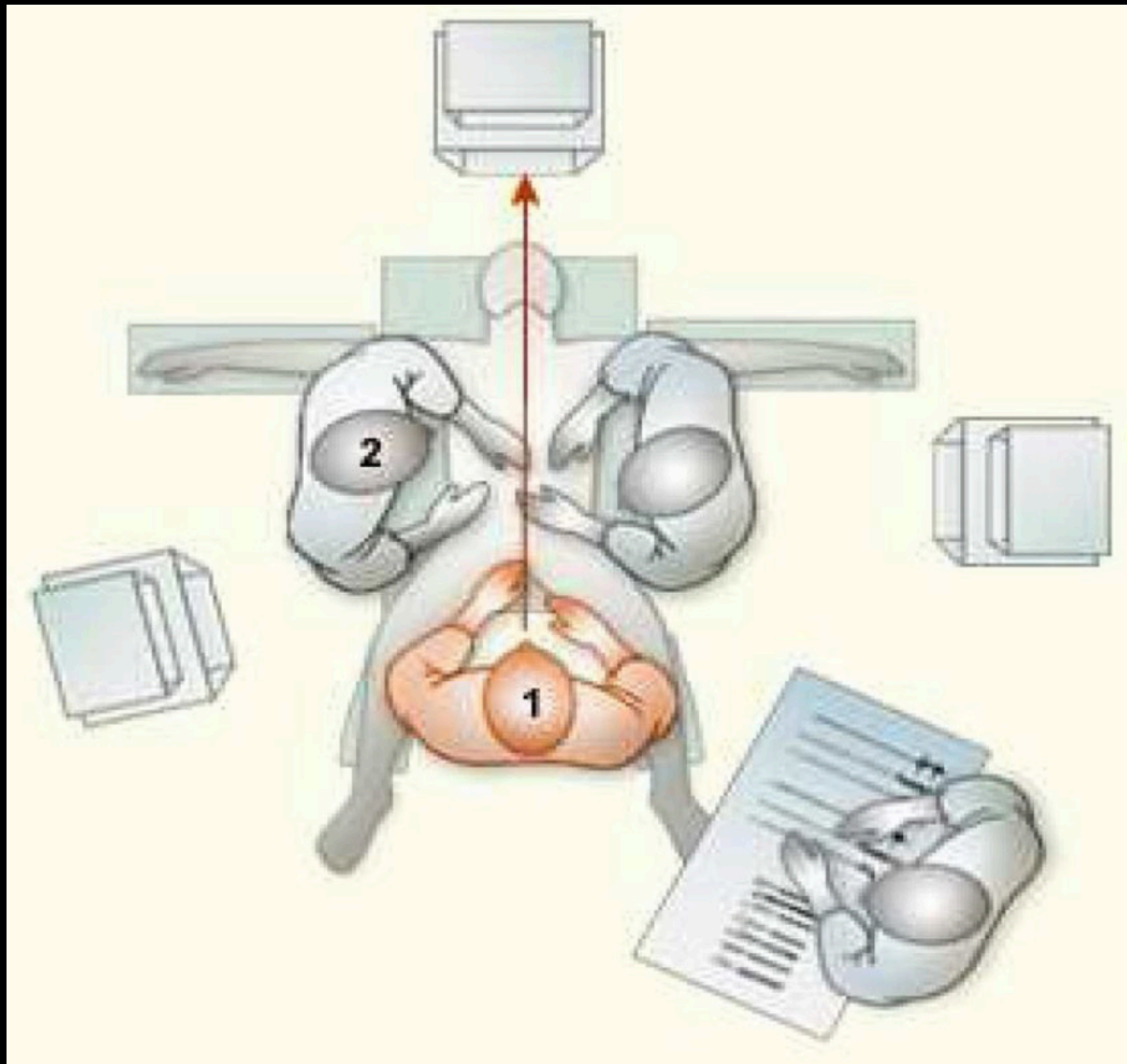
Talk with your boss!



# Communicate with colleagues



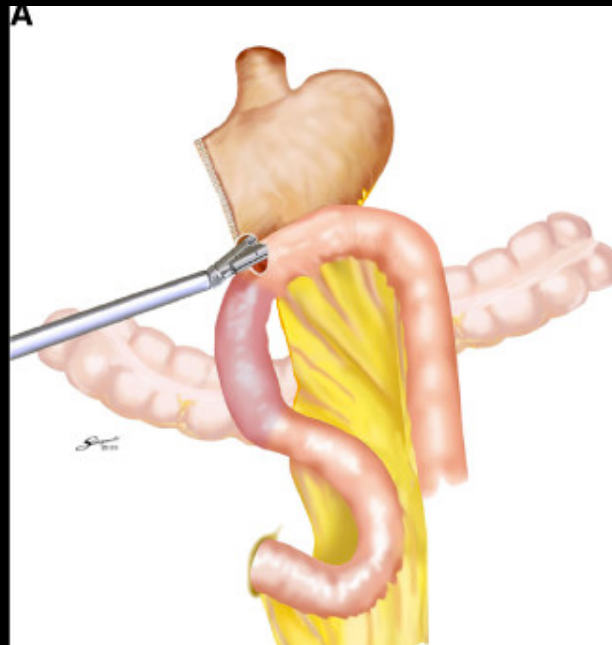
# Set up a laparoscopic team



**Adequate indication**

# Early cancer in lower stomach

- D2 and total gastrectomy are technical challenging for beginners



# BMI<25, ASA<3

- Overweight and obesity were associated with poor early surgical outcomes of laparoscopic-assisted gastrectomy
- Longer OP time, less retrieved nodes, more complications for obese patients



Surg Laparosc Endosc Percutan Tech. 2011 Jun;21(3):151-4

Surg Endosc. 2009 Nov;23(11):2473-9.

Surg Endosc. 2013 Jun 21.



# Basic laparoscopic suture technique



# From extra-coporeal to intra-coporeal anastomosis

