ΚΑΡΚΙΝΟΣ ΟΙΣΟΦΑΓΟΥ: ΤΥΠΟΙ ΕΠΕΜΒΑΣΕΩΝ

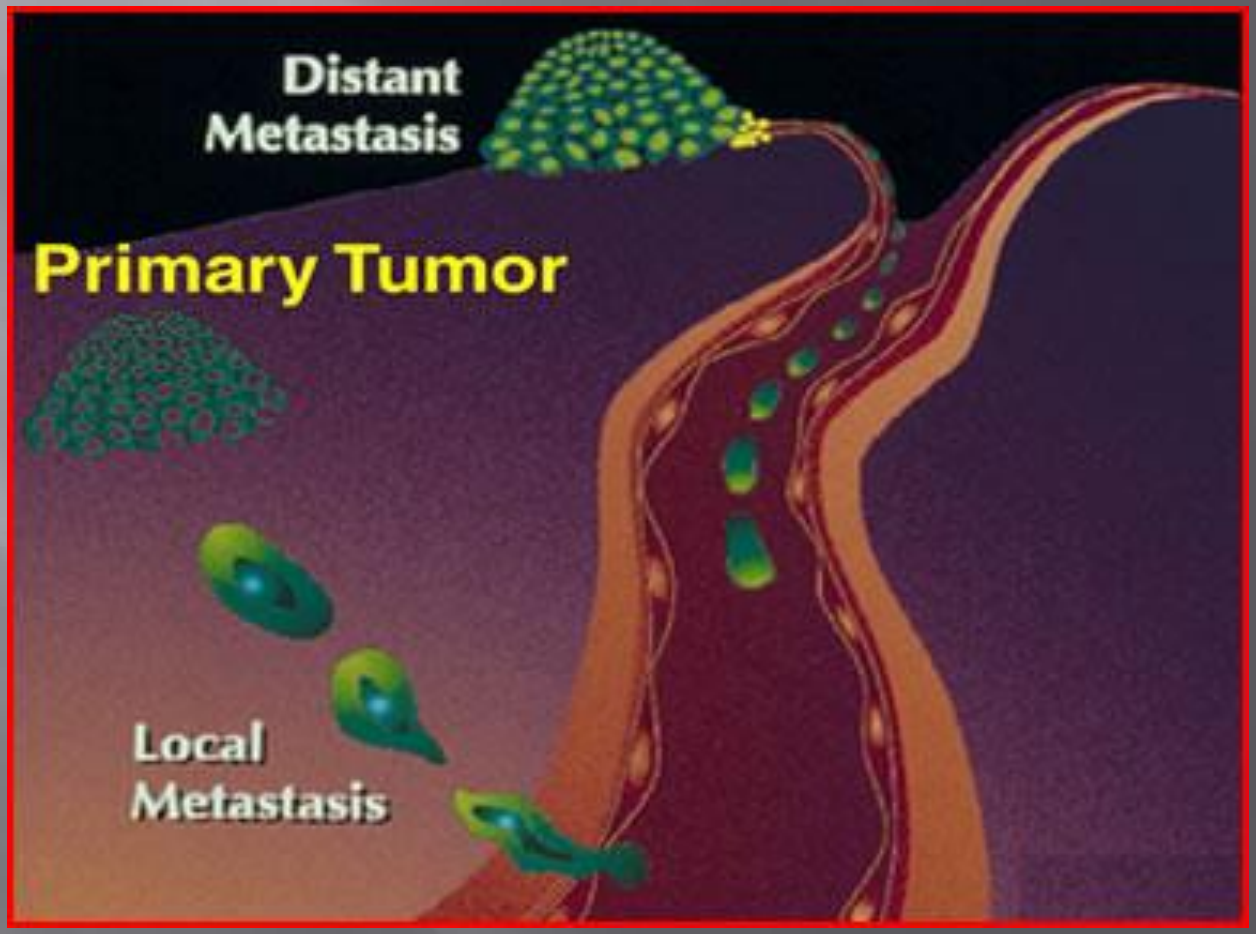
Θεοδώρου Δημήτριος

Χειρουργός

Καθηγητής ΕΚΠΑ

Μονάδα Χειρουργικής Ανωτέρου Πεπτικού

Θεωρίες εξάπλωσης καρκίνου



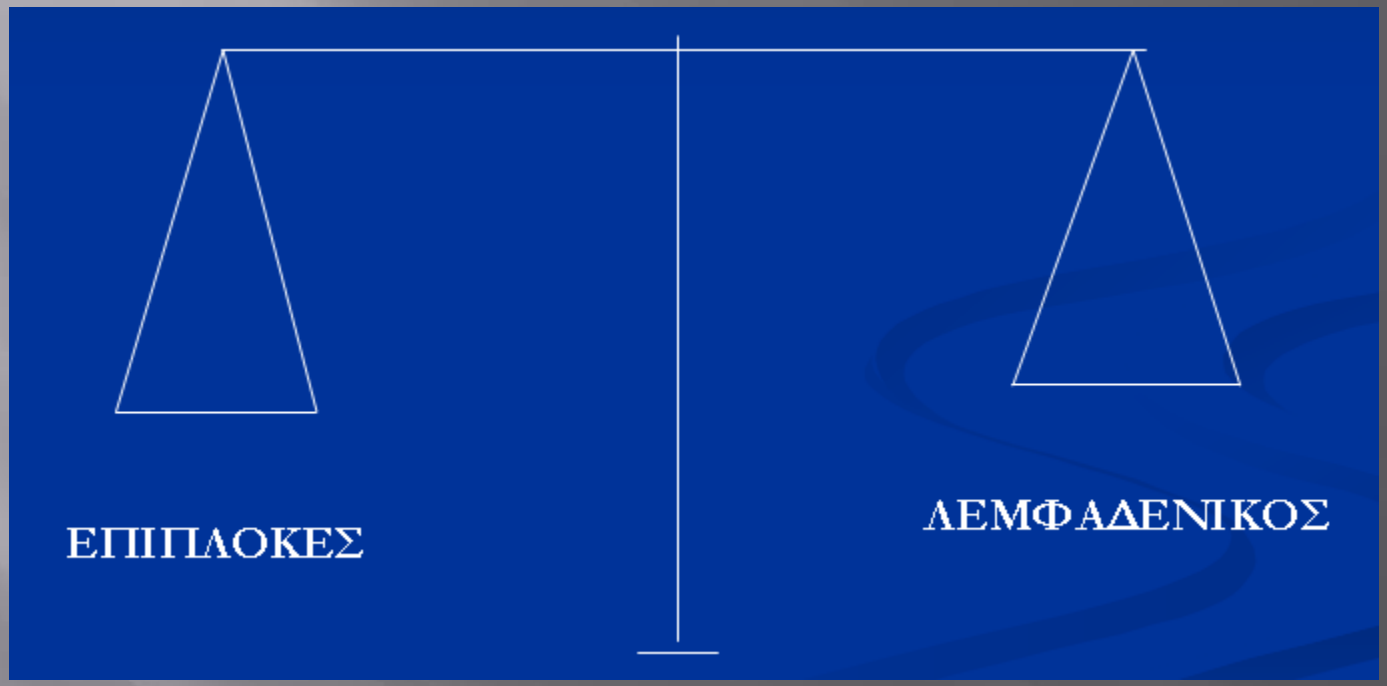
Ερώτημα

Σε ποια έκταση απαιτείται

και

πόσο ωφέλιμος είναι ο

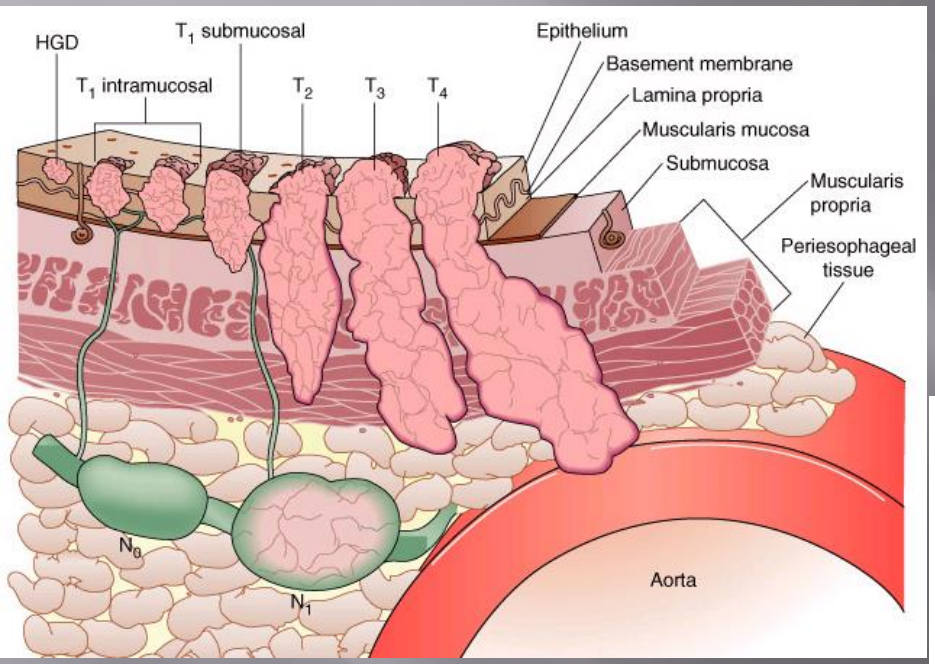
Λεμφαδενικός Καθαρισμός ;;;

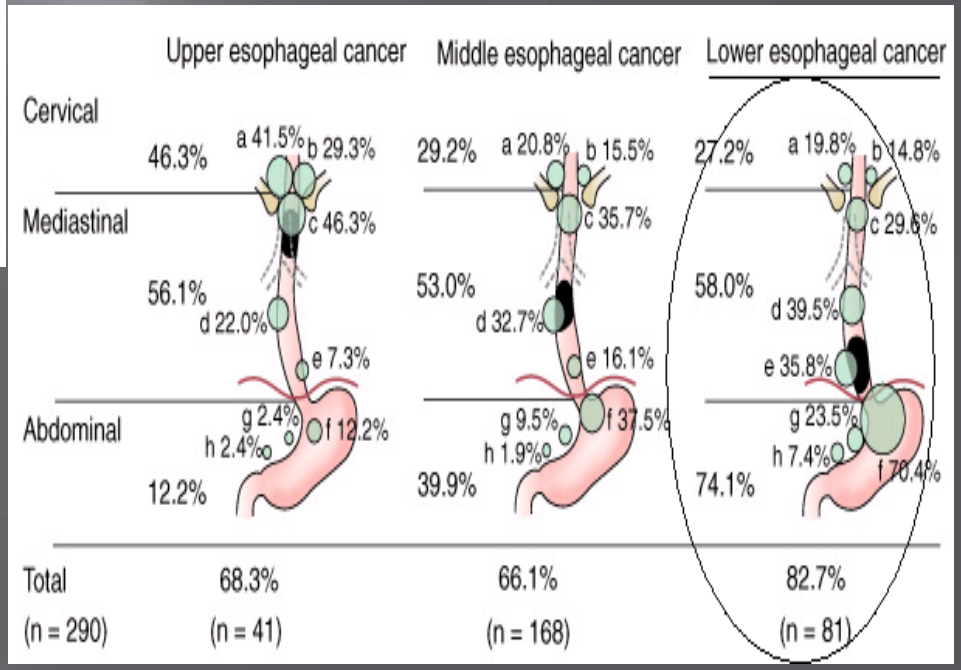

ΕΠΙΠΛΟΚΕΣ
ΛΕΜΦΑΔΕΝΙΚΟΣ

Προβλήματα

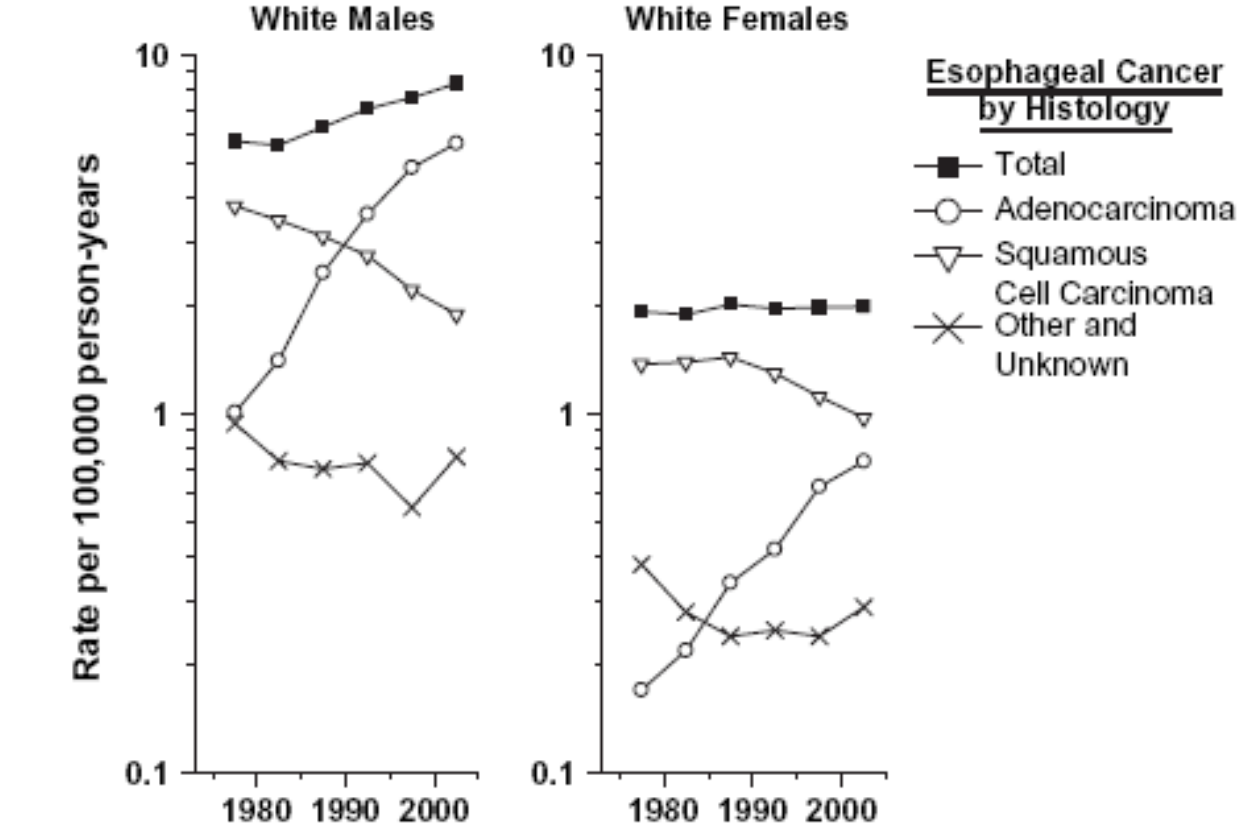
- Ιδιαιτερότητες οργάνου
- Καρκινικοί τύποι
- Αδυναμίες μελετών
- Επίδραση νέο/επικουρικών

Ιδιαιτερότητες Οργάνου





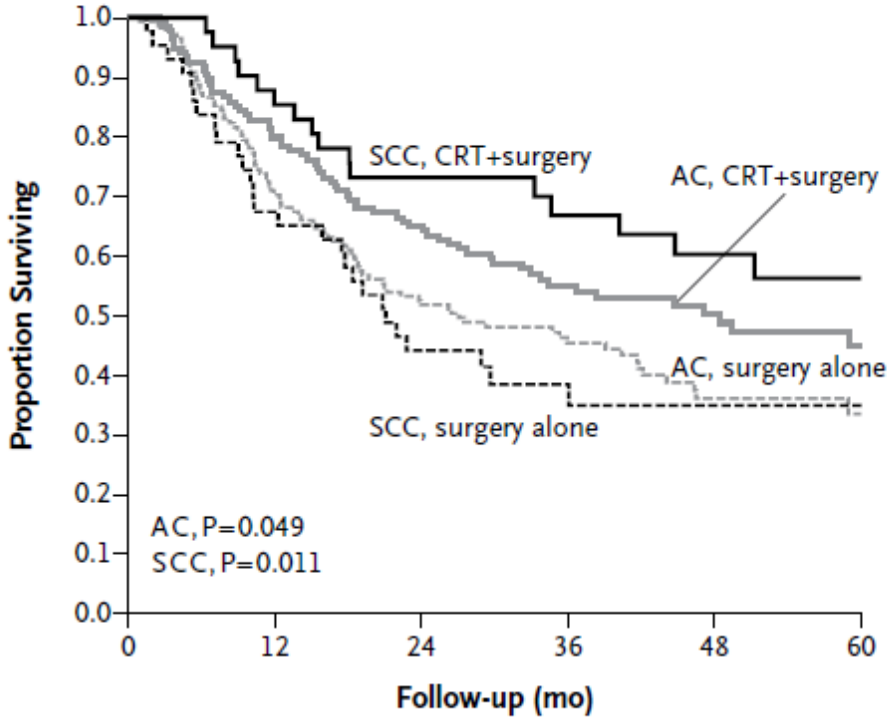
Καρκινικοί τύποι



J Natl Cancer Inst 2008;100:1184–1187

Καρκινικοί τύποι

B Survival According to Tumor Type and Treatment Group



No. at Risk

AC, CRT+surgery	134	107	87	53	34	18
AC, surgery alone	141	99	73	50	25	10
SCC, CRT+surgery	41	35	30	21	15	8
SCC, surgery alone	43	29	19	11	8	4
Total	359	270	209	135	82	40

Αδυναμίες μελετών

- Σπάνια νόσος
- Χειρουργεία όχι σαφώς καθορισμένα
- Μίξη τύπων καρκίνων

Σταδιοποίηση Καρκίνου Οισοφάγου

- **Αλλαγές TNM**

Primary Tumor (T)[a]

Tx	Primary tumor cannot be assessed
T0	No evidence of primary tumor
Tis	High-grade dysplasia[b]
T1	Tumor invades lamina propria, muscularis mucosae, or submucosa
T1a	Tumor invades lamina propria or muscularis mucosae
T1b	Tumor invades submucosa
T2	Tumor invades muscularis propria
T3	Tumor invades adventitia
T4	Tumor invades adjacent structures
T4a	Resectable tumor invading pleura, pericardium or diaphragm
T4b	Unresectable tumor invading other adjacent structures, such as aorta, vertebral body, trachea, etc.

Regional Lymph Nodes (N)

Nx	Regional Lymph Nodes cannot be assessed
N0	No regional lymph node metastasis
N1	Metastases in 1-2 regional lymph nodes
N2	Metastases in 3-6 regional lymph nodes
N3	Metastases in ≥ 7 regional lymph nodes

Distant Metastasis (M)

M0	No distant metastasis
M1	Distant metastasis

Τύποι οισοφαγεκτομών

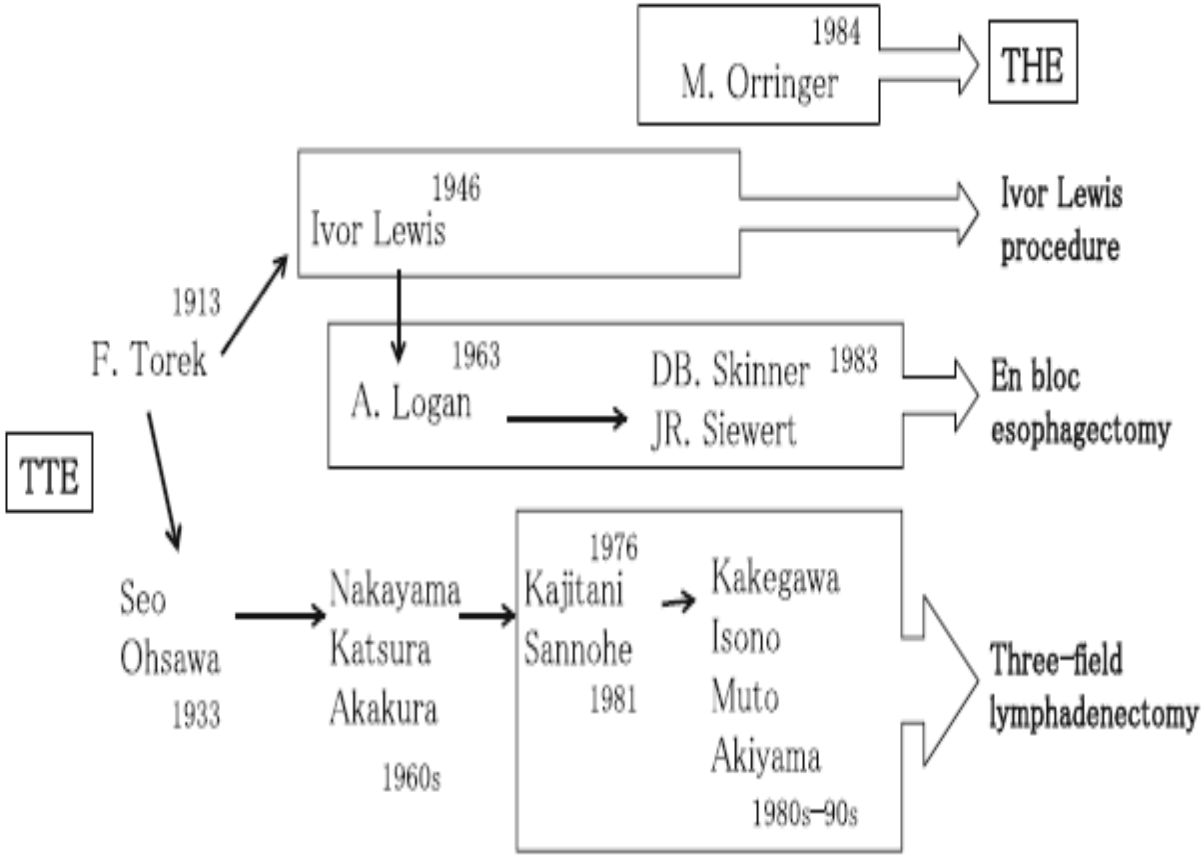


Fig. 1 A history of esophageal surgery and the school of esophageal surgery. *TTE* transthoracic esophagectomy, *THE* transhiatal esophagectomy

Τύποι οισοφαγεκτομών

- Ενδοσκοπική εκτομή
- Χωρίς λεμφαδενικό καθαρισμό
- Ενός πεδίου λεμφαδενικό (κοιλιά)
- Δυο πεδίων λεμφαδενικό (κοιλιά, Θώρακας)
- Τριών πεδίων λεμφαδενικός (κοιλιά, θώρακας, τράχηλος)

Ενδοσκοπική εκτομή

REVIEW

Endoscopic resection of gastric and esophageal cancer

Bryan Balmadrid*, and Joo Ha Hwang

Division of Gastroenterology, University of Washington, Seattle, WA, USA

*Corresponding author. Box 359773, 325 9th Avenue, Seattle, WA 98104, USA. Tel: +1-414-745-9871; Fax: +1-206-744-8698;
Email: bbalmadrid@medicine.washington.edu

Abstract

Endoscopic submucosal dissection (ESD) and endoscopic mucosal resection (EMR) techniques have reduced the need for surgery in early esophageal and gastric cancers and thus has lessened morbidity and mortality in these diseases. ESD is a relatively new technique in western countries and requires rigorous training to reproduce the proficiency of Asian countries, such as Korea and Japan, which have very high complete (*en bloc*) resection rates and low complication rates. EMR plays a valuable role in early esophageal cancers. ESD has shown better *en bloc* resection rates but it is easier to master and maintain proficiency in EMR; it also requires less procedural time. For early esophageal adenocarcinoma arising from Barrett's, ESD and EMR techniques are usually combined with other ablative modalities, the most common being radiofrequency ablation because it has the largest dataset to prove its success. The EMR techniques have been used with some success in early gastric cancers but ESD is currently preferred for most of these lesions. ESD has the added advantage of resecting into the submucosa and thus allowing for endoscopic resection of more aggressive (deeper) early gastric cancer.

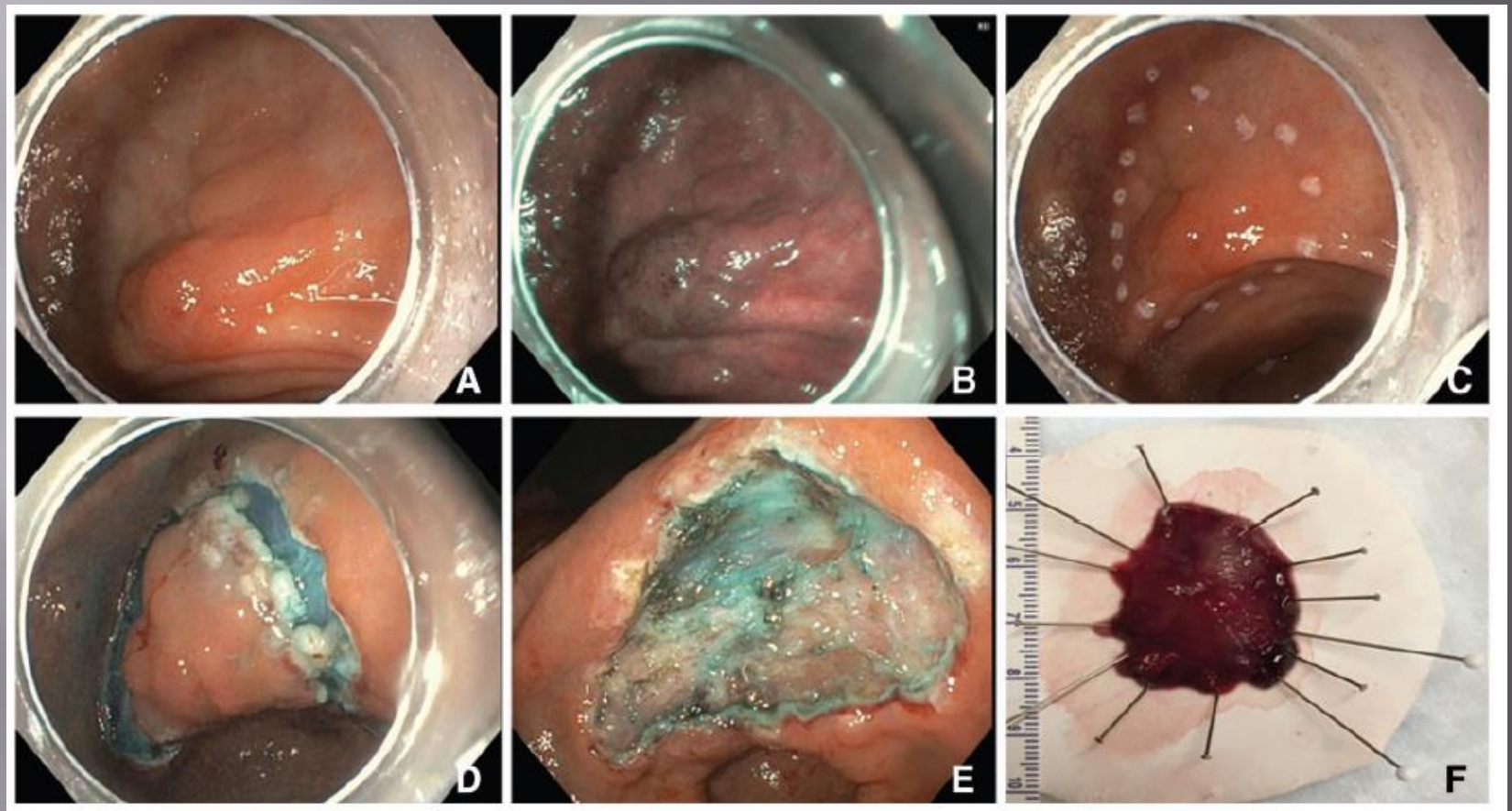


Figure 2. Endoscopic submucosal dissection (ESD) technique in early gastric cancer located at the incisura. (A) Mucosal lesion, spanning approximately 2 cm in white light view. (B) Mucosal lesion, giving cause for concern, in narrow band image view. (C) Perimeter of planned incision marked with electrocautery. (D) After circumferential incision. (E) After completion of dissection. (F) Resection specimen 34 mm x 29 mm.

Ενδοσκοπική εκτομή

- T1α λεμφαδενική μετάσταση 2%
- T1b λεμφαδενική μετάσταση 30% (5-51%)

Ενδοσκοπική εκτομή

- Μέγεθος > 30 χιλ
- Βάθος διήθησης sm3
- Χαμηλή διαφοροποίηση
- Λεμφαγγειακή διήθηση

Χωρίς λεμφαδενικό

Table 5. KAPLAN-MEIER SURVIVAL AFTER TRANSHIATAL ESOPHAGECTOMY BY TUMOR STAGE

		Survival (%)	
TNM Stage	No. of Patients	2 Years	5 Years
0	72	83	51
I	94	84	59
IIA	189	50	22
IIB	79	51	29
III	296	32	10
IVA	28	17	7
IVB	39	6	0

TOTAL 23%

ANNALS OF SURGERY
Vol. 230, No. 3, 392–403

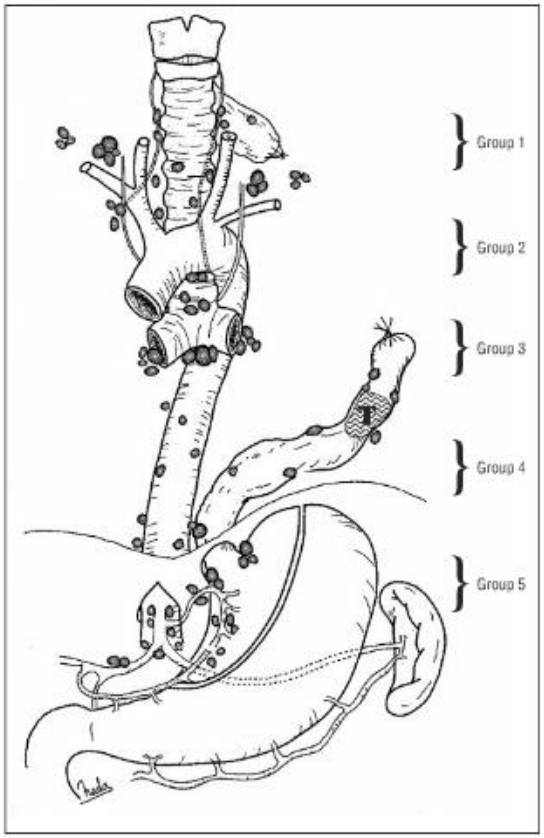
Τριών πεδίων

- Κοιλιά, θώρακας και τράχηλος
- Στο παρελθόν χρήση σε ανωτέρου οισοφάγου
- Σήμερα στους ανωτέρου τελική χημειοακτινο
- Πολύ υψηλή νοσηρότητα
- Ελάχιστα κέντρα στον κόσμο

REVIEW ARTICLE

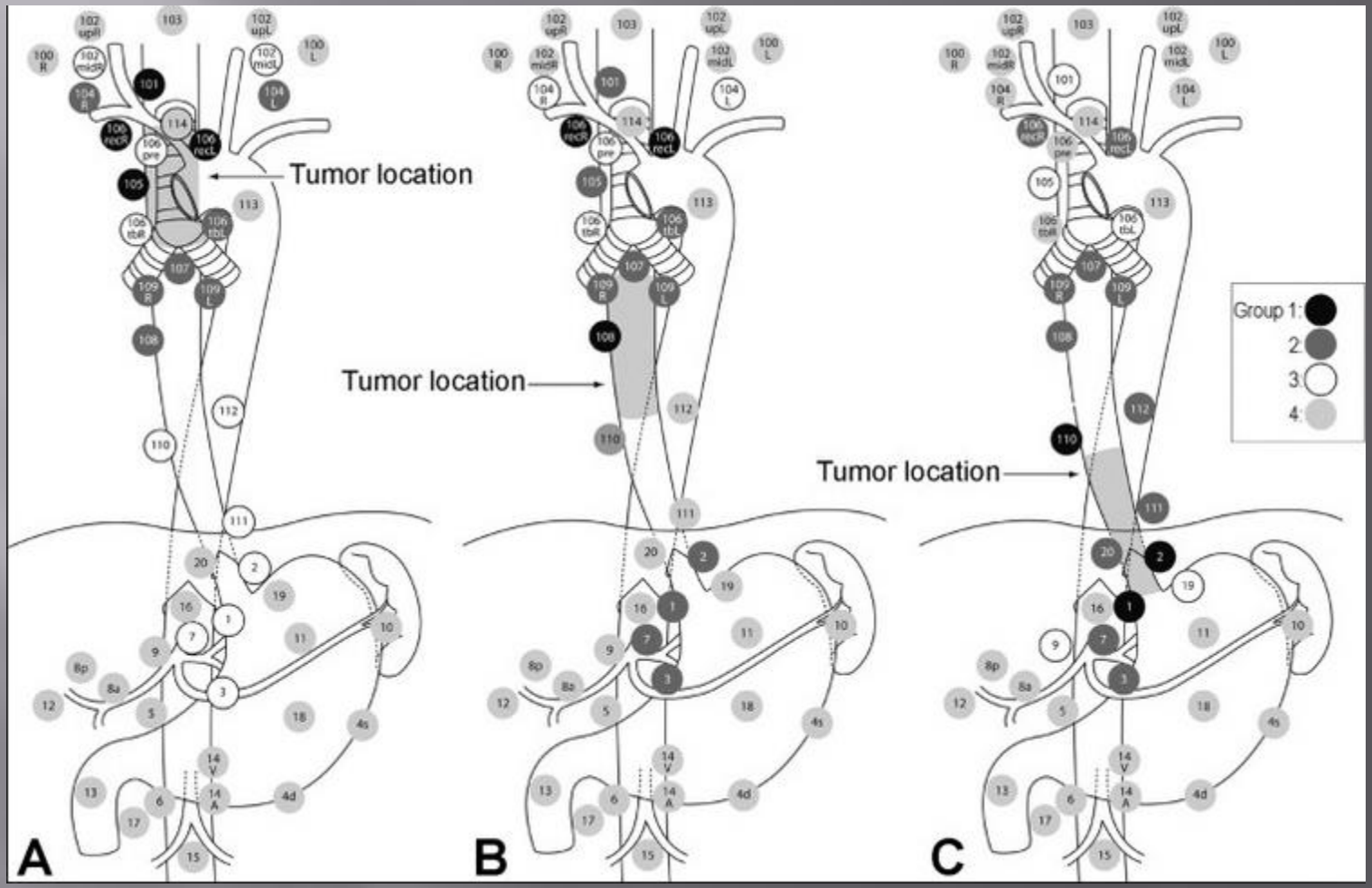
Extended Esophagectomy With 3-Field Lymph Node Dissection for Esophageal Cancer

Mitsuo Tachibana, MD; Shoichi Kinugasa, MD; Hiroshi Yoshimura, MD; Dipok Kumar Dhar, MD; Naofumi Nagasue, MD



Lymph node mapping of esophageal cancer. Three-field lymph node dissection includes removal of the 5 groups of lymph nodes: group 1, bilateral cervical lymph nodes; group 2, superior mediastinal lymph nodes; group 3, middle mediastinal lymph nodes; group 4, inferior mediastinal lymph nodes; and group 5, abdominal lymph nodes.

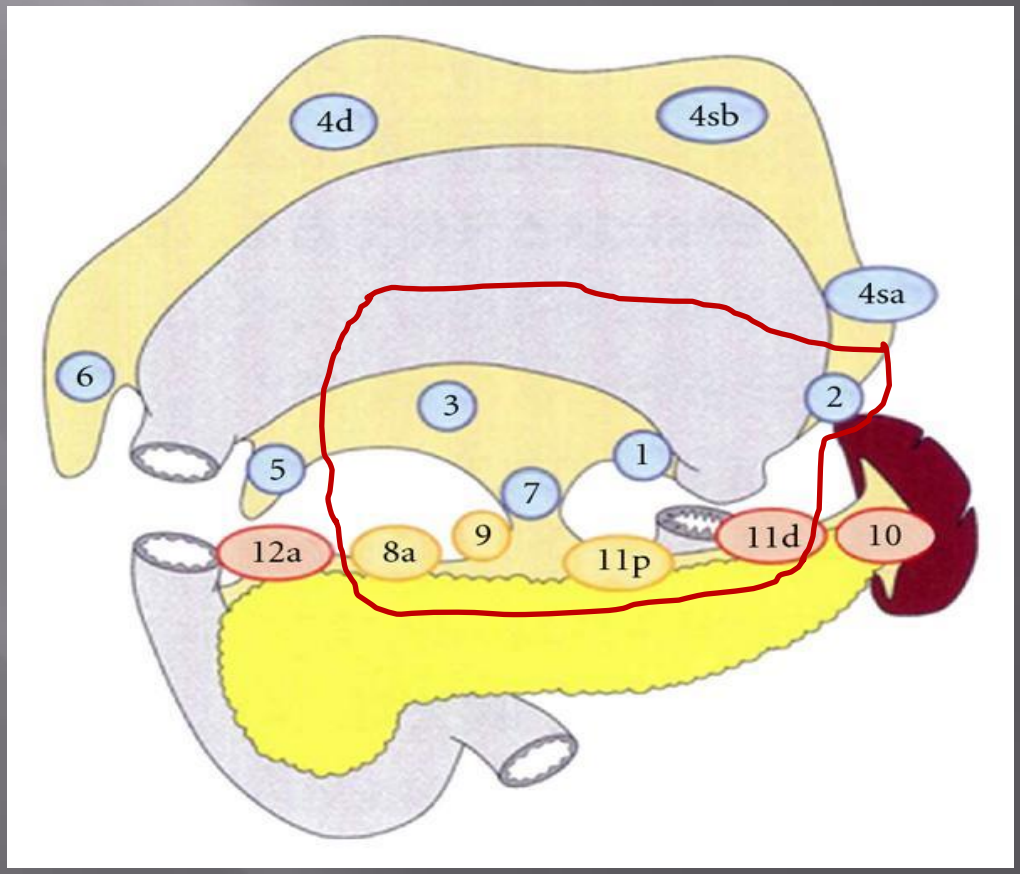
Arch Surg. 2003;138:1383-1389



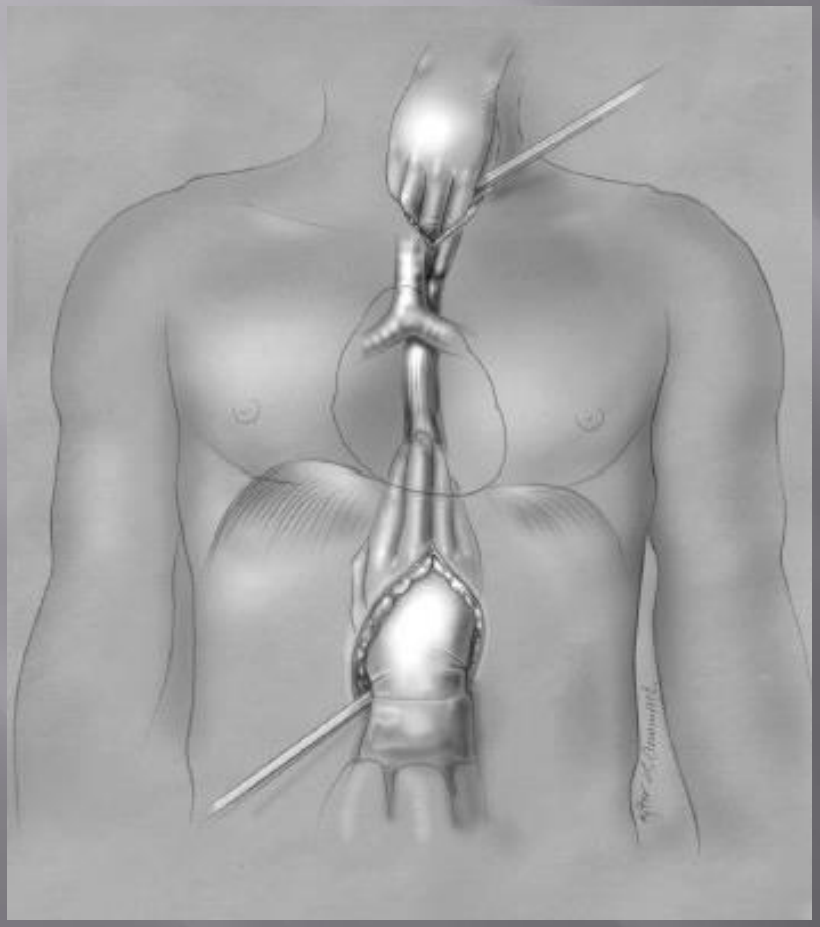
Arch Surg. 2003;138:1383-1389

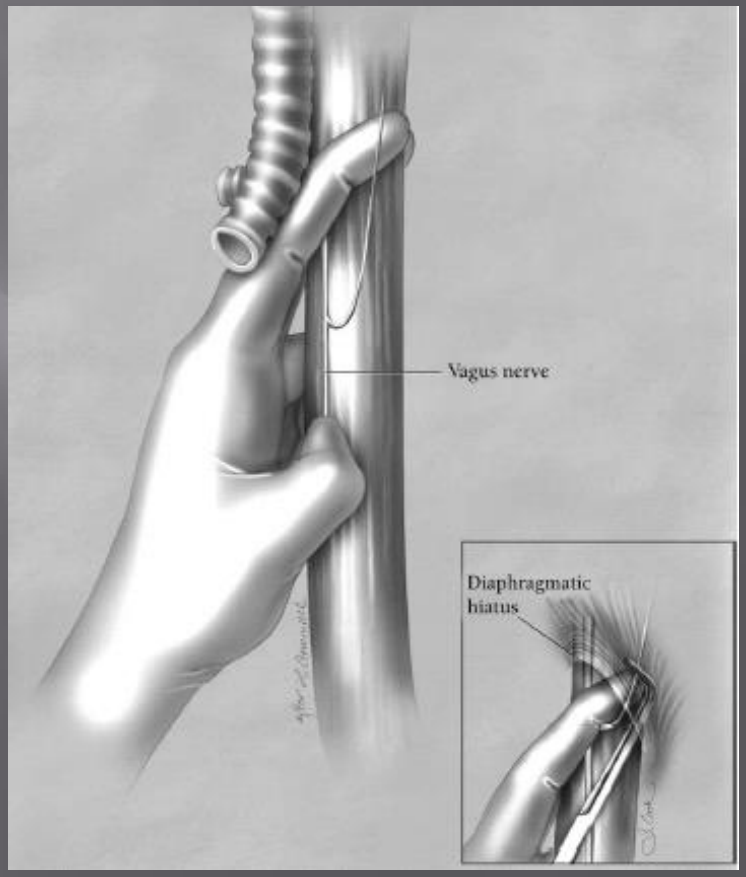
Ενός Πεδίου : Κοιλιάς

- Σταθμοί 1,2,3,7,8,9,11 κοιλιά



ΔιαΔιαφραγματική Ενός Πεδίου





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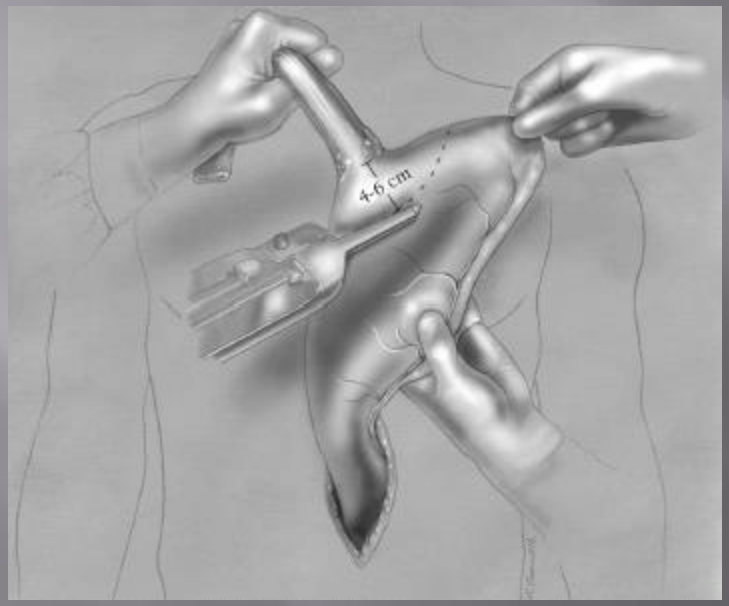

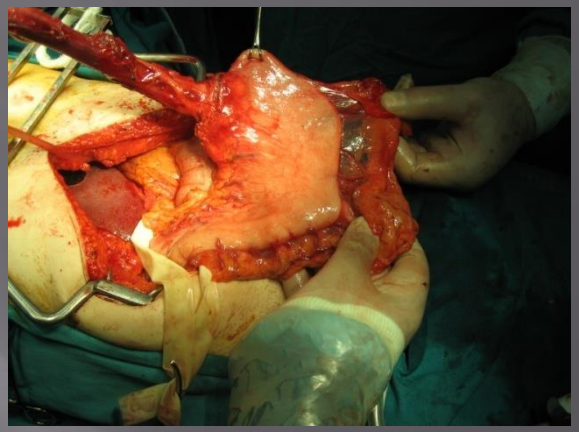

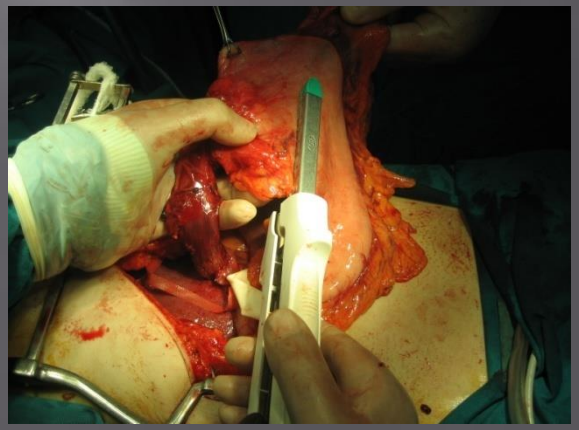

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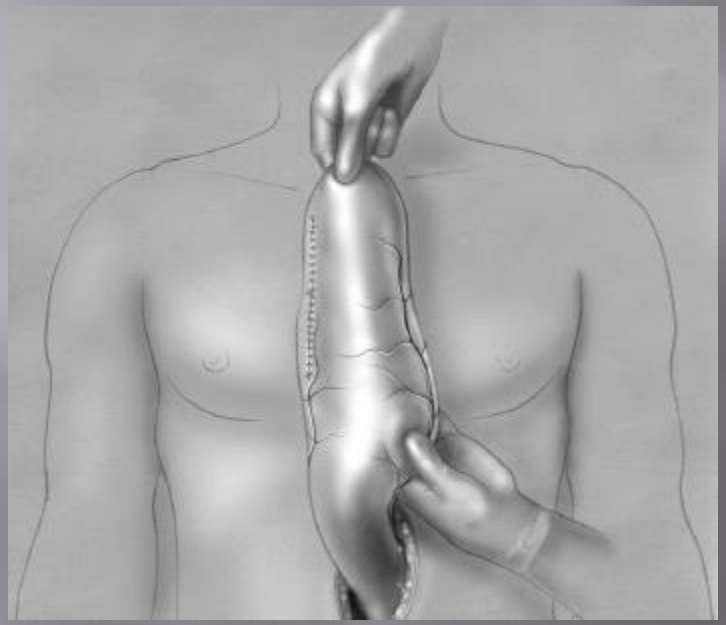
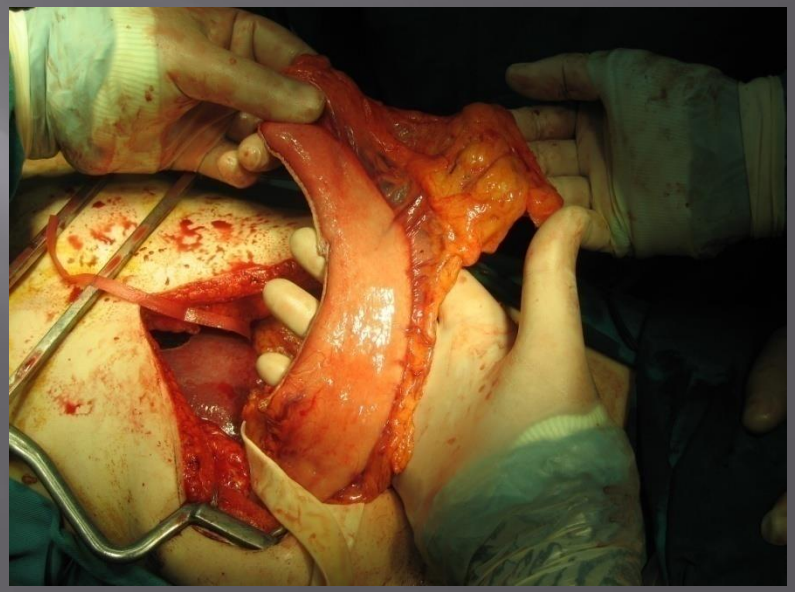
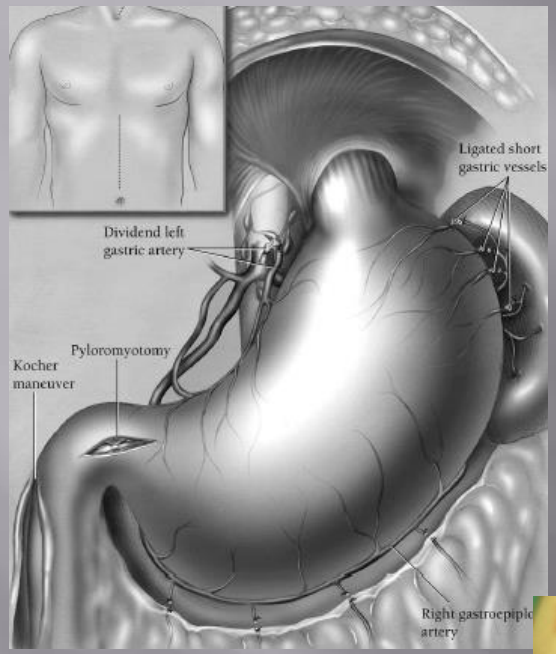
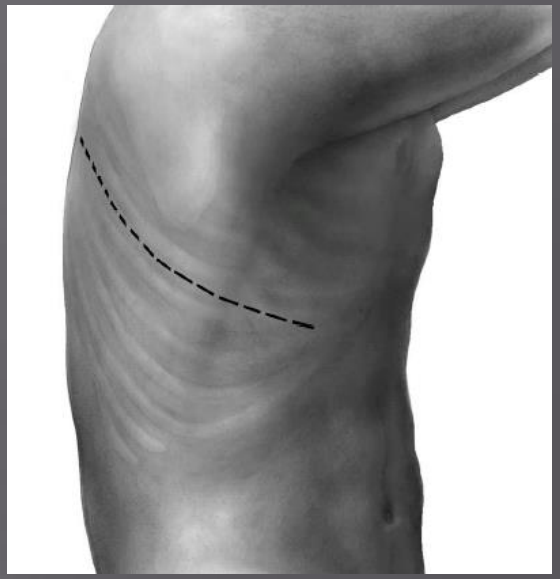
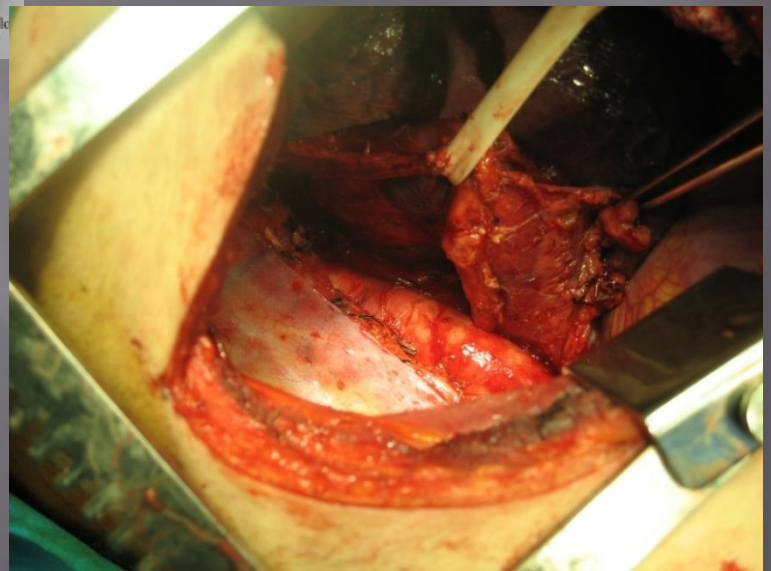




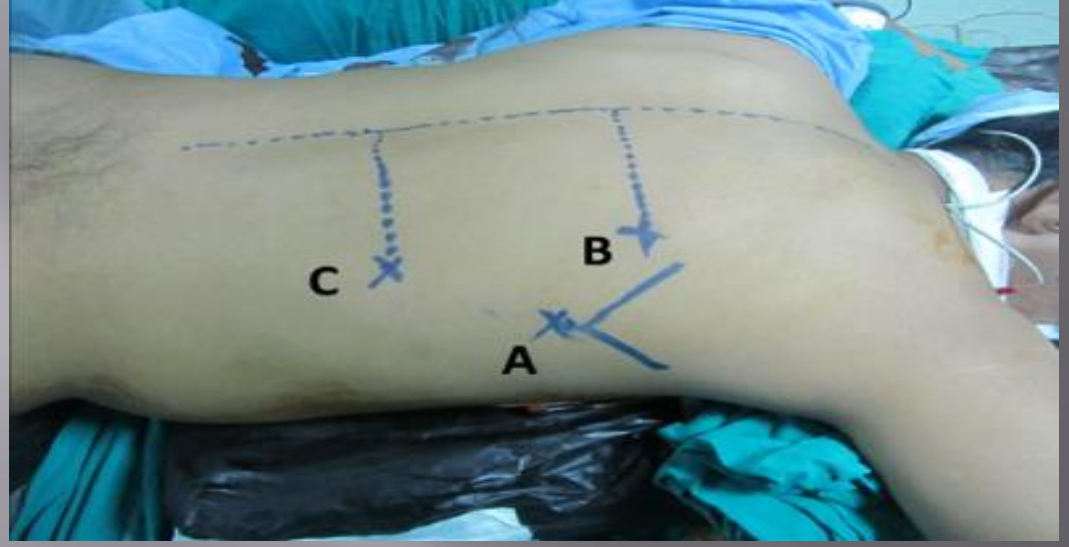
Δυο Πεδίων

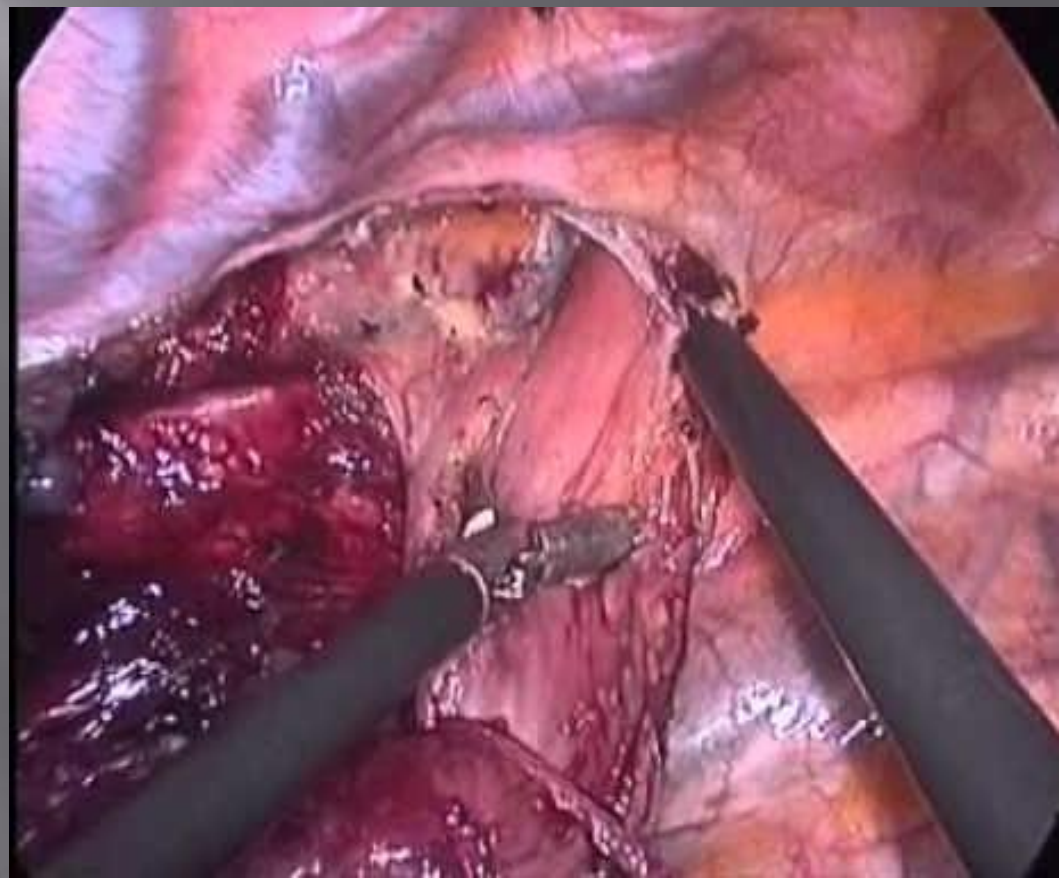




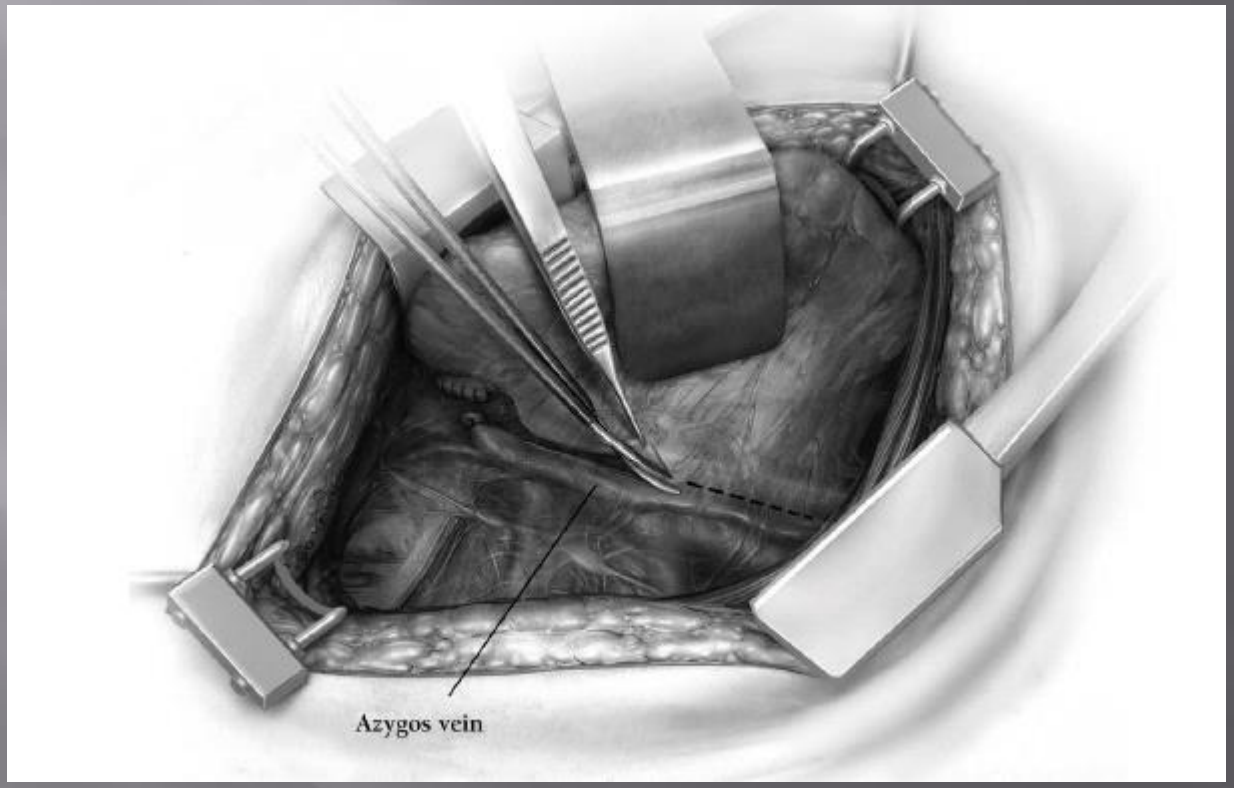


Enblock resection


C
B
A

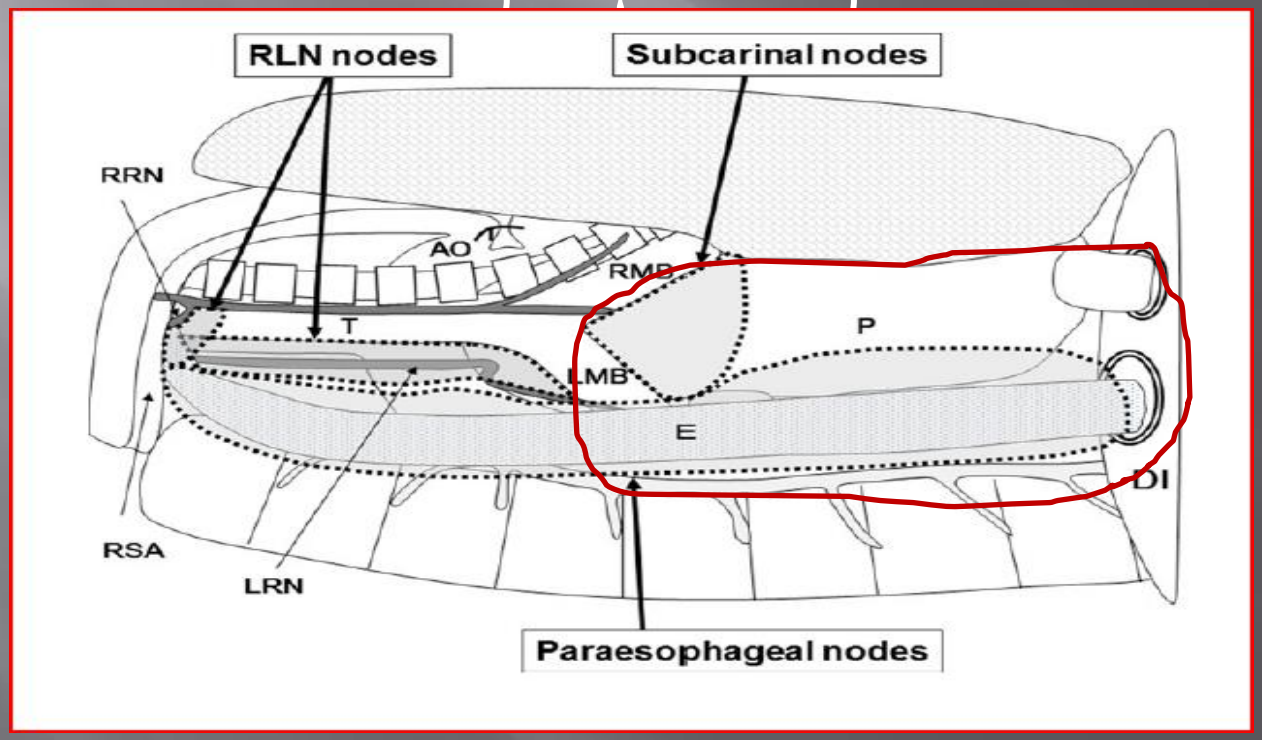


Τι είναι λεμφαδενικός καθαρισμός???



Δυο Πεδίων : Κοιλιάς Μεσοθωρακίου

- Σταθμοί 1,2,3,7,8,9,11 κοιλιά
- Μέσοι και κατώτεροι μεσοθωρακικοί



Αριθμός Λεμφαδένων

- Ενός Πεδίου 15
- Δύο Πεδίων 25

The New England Journal of Medicine

EXTENDED TRANSTHORACIC RESECTION COMPARED WITH LIMITED TRANSHIATAL RESECTION FOR ADENOCARCINOMA OF THE ESOPHAGUS

JAN B.F. HULSCHER, M.D., JOHANNA W. VAN SANDICK, M.D., ANGELA G.E.M. DE BOER, PH.D., BAS P.L. WIJNHOVEN, M.D., JAN G.P. TIJSSEN, PH.D., PAUL FOCKENS, M.D., PEEP F.M. STALMEIER, PH.D., FIEBO J.W. TEN KATE, M.D., HERMAN VAN DEKKEN, M.D., HUUG OBERTOP, M.D., HUGO W. TILANUS, M.D., AND J. JAN B. VAN LANSCHOT, M.D.

N Engl J Med, Vol. 347, No. 21 · November 21, 2002

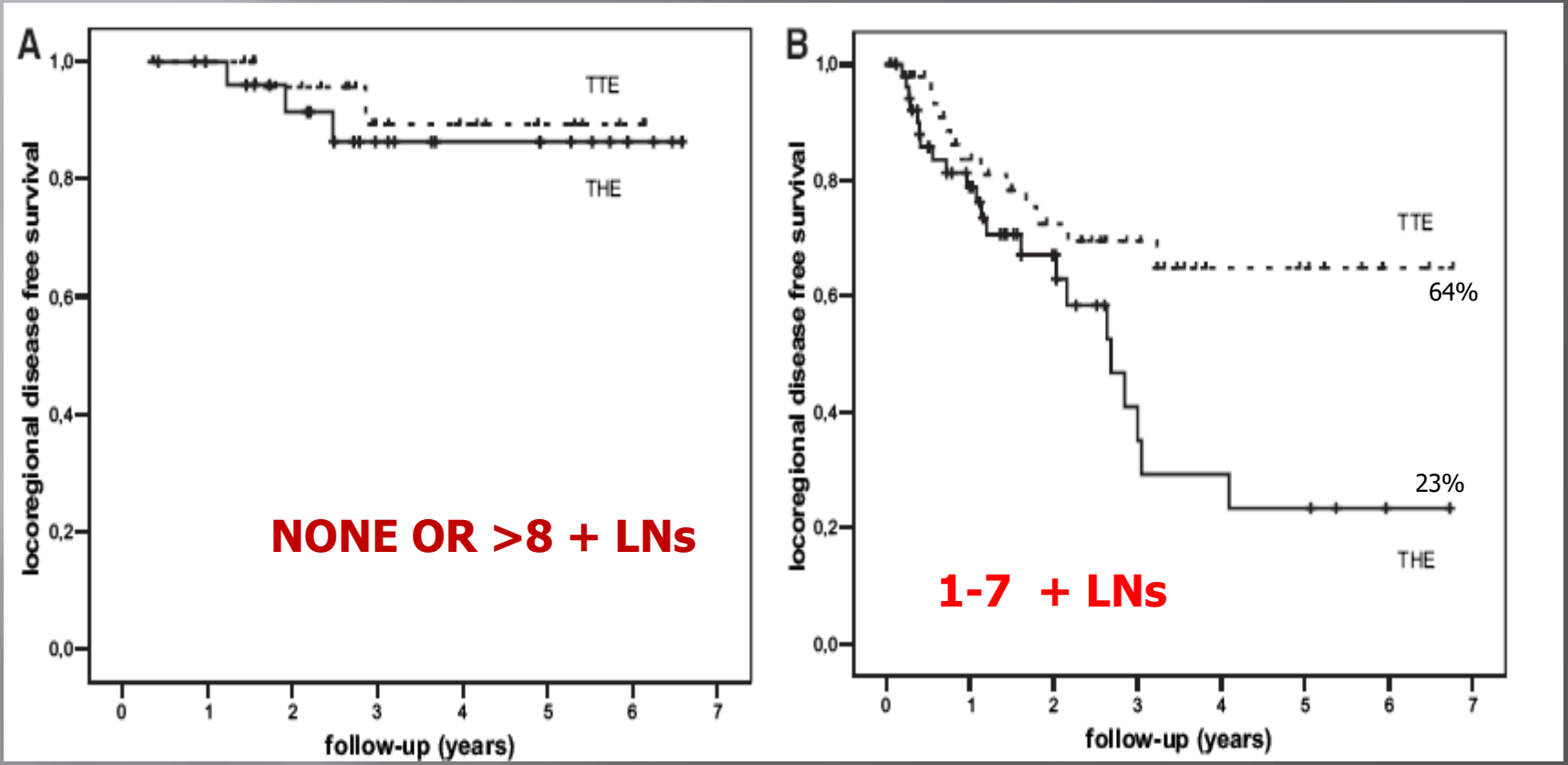
Variable	Transhiatal Esophagectomy (N= 106)	Transthoracic Esophagectomy (N= 114)	P Value
	ΈΝΑ ΠΕΔΙΟ	ΔΥΟ ΠΕΔΙΑ	
Postoperative complications — no. (%)			
Pulmonary complications*	29 (27)	65 (57)	<0.001
Cardiac complications	17 (16)	30 (26)	0.10
Anastomotic leakage†	15 (14)	18 (16)	0.85
Subclinical	9 (8)	8 (7)	
Clinical	6 (6)	10 (9)	
Vocal-cord paralysis‡	14 (13)	24 (21)	0.15
Chylous leakage	2 (2)	11 (10)	0.02
Wound infection	8 (8)	11 (10)	0.53
Ventilation time — days			<0.001
Median	1	2	
Range	0–19	0–76	
ICU–MCU stay — days§			<0.001
Median	2	6	
Range	0–38	0–79	
Hospital stay — days¶			<0.001
Median	15	19	
Range	4–63	7–154	
In-hospital mortality — no. (%)	2 (2)	5 (4)	0.45

Extended Transthoracic Resection Compared With Limited Transhiatal Resection for Adenocarcinoma of the Mid/Distal Esophagus

Five-Year Survival of a Randomized Clinical Trial

Jikke M. T. Omloo, MD, Sjoerd M. Lagarde, MD,* Jan B. F. Hulscher, MD,* Johannes B. Reitsma, MD, PhD,† Paul Fockens, MD, PhD,‡ Herman van Dekken, MD, PhD,§ Fiebo J. W. ten Kate, MD,¶ Huug Obertop, MD,‖ Hugo W. Tilanus, MD, PhD,‖ and J. Jan B. van Lanschot, MD‖*

Ann Surg 2007;246: 992–1001



Ann Surg 2007;246: 992–1001

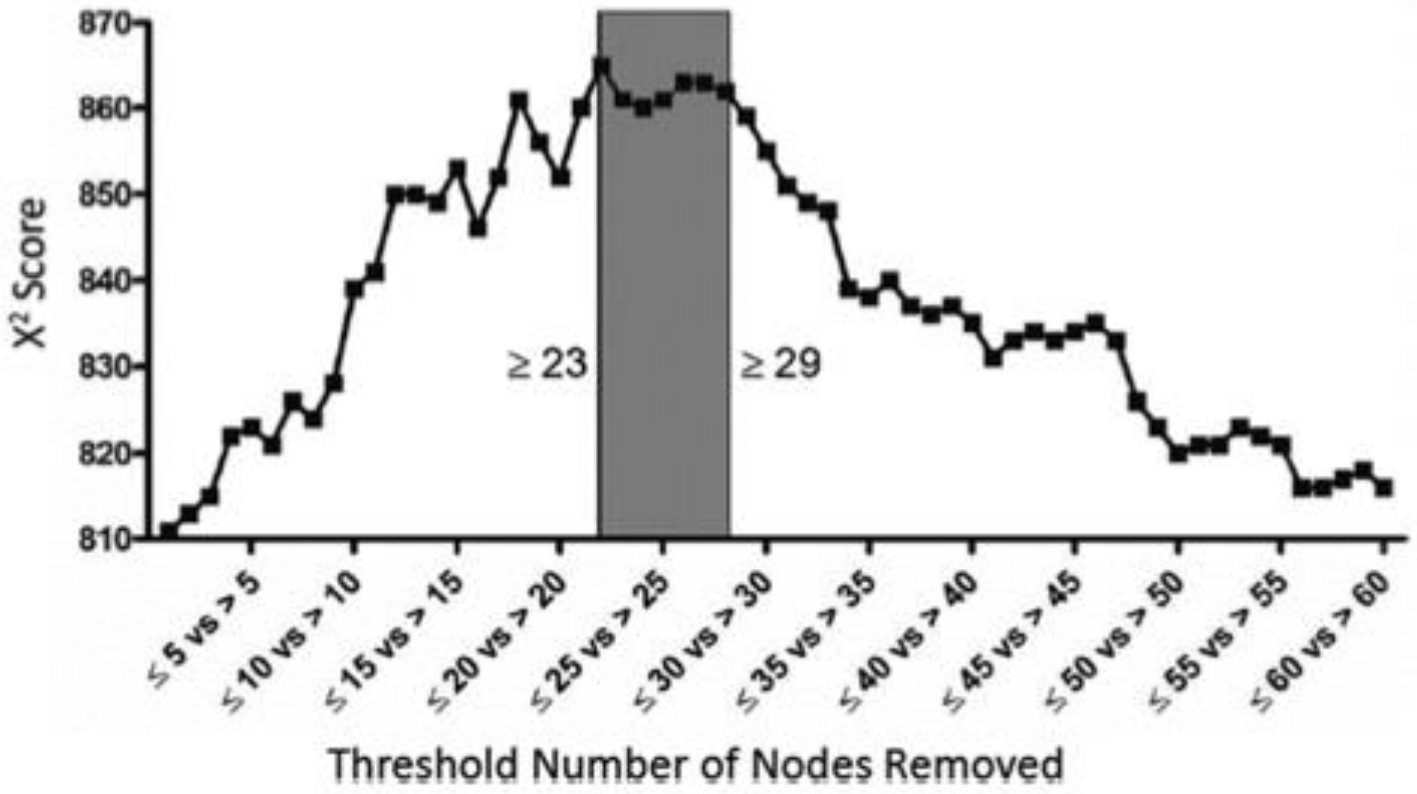


FIG 19. Results of Cox regression modeling in 2303 patients with esophageal cancer using thresholds of lymph nodes removed, ranging from 1 to 60 nodes. (Reprinted with permission from Peyre and colleagues.[76])

British Journal of Cancer (2008) 98, 547 – 557

www.bjcancer.com

Staging investigations for oesophageal cancer: a meta-analysis

EPM van Vliet*[,1], MH Heijenbrok-Kal[2,3], MGM Hunink[2,3], EJ Kuipers[1,4] and PD Siersema[1,5]

[1]Department of Gastroenterology and Hepatology, Erasmus MC – University Medical Center Rotterdam, Rotterdam, The Netherlands; [2]Department of Epidemiology and Biostatistics, Erasmus MC – University Medical Center Rotterdam, Rotterdam, The Netherlands; [3]Department of Radiology, Erasmus MC – University Medical Center Rotterdam, Rotterdam, The Netherlands; [4]Department of Internal Medicine, Erasmus MC – University Medical Center Rotterdam, Rotterdam, The Netherlands; [5]Department of Gastroenterology and Hepatology, University Medical Center Utrecht, Utrecht, The Netherlands

Table 4 Summary of the number of included studies, the total number of patients, pooled sensitivity, pooled specificity, and the pooled log odds ratio given per disease and investigation

Disease	Investigation	Number of included studies	Total number of patients	Pooled sensitivity (95% CI)	Pooled specificity (95% CI)	Pooled log odds ratio (95% CI)
Regional lymph node metastases	EUS	31	1841	0.80 (0.75–0.84)	0.70 (0.65–0.75	1.94 (1.71–2.17)
Regional lymph node metastases	CT	17	943	0.50 (0.41–0.60)	0.83 (0.77–0.89)	1.40 (1.08–1.72)
Regional lymph node metastases	FDG-PET	10	424	0.57 (0.43–0.70)	0.85 (0.76–0.95)	1.71 (1.22–2.20)
Celiac lymph node metastases	EUS	5	339	0.85 (0.72–0.99)	0.96 (0.92–1.00)	3.89 (2.67–5.11)
Abdominal lymph node metastases	CT	5	254	0.42 (0.29–0.54)	0.93 (0.86–1.00)	1.74 (0.45–3.04)
Distant metastases	CT	7	437	0.52 (0.33–0.71)	0.91 (0.86–0.96)	2.10 (1.59–2.62)
Distant metastases	FDG-PET	9	475	0.71 (0.62–0.79)	0.93 (0.89–0.97)	2.93 (2.41–3.45)

CI = confidence interval; EUS = endoscopic ultrasonography; CT = computed tomography; FDG = ^{18}F-fluoro-2-deoxy-D-glucose positron emission tomography.

Ενός έναντι Δυο Πεδίων

World J Surg (2012) 36:98–103
DOI 10.1007/s00268-011-1307-0

Evidence-Based Selective Application of Transhiatal Esophagectomy in a High-Volume Esophageal Center

Claire L. Donohoe · Naoimh J. O'Farrell · Narayamasamy Ravi · John V. Reynolds

Individualised Surgical Treatment of Patients with an Adenocarcinoma of the Distal Oesophagus or Gastro-Oesophageal Junction

J.B.F. Hulscher J.J.B. van Lanschot

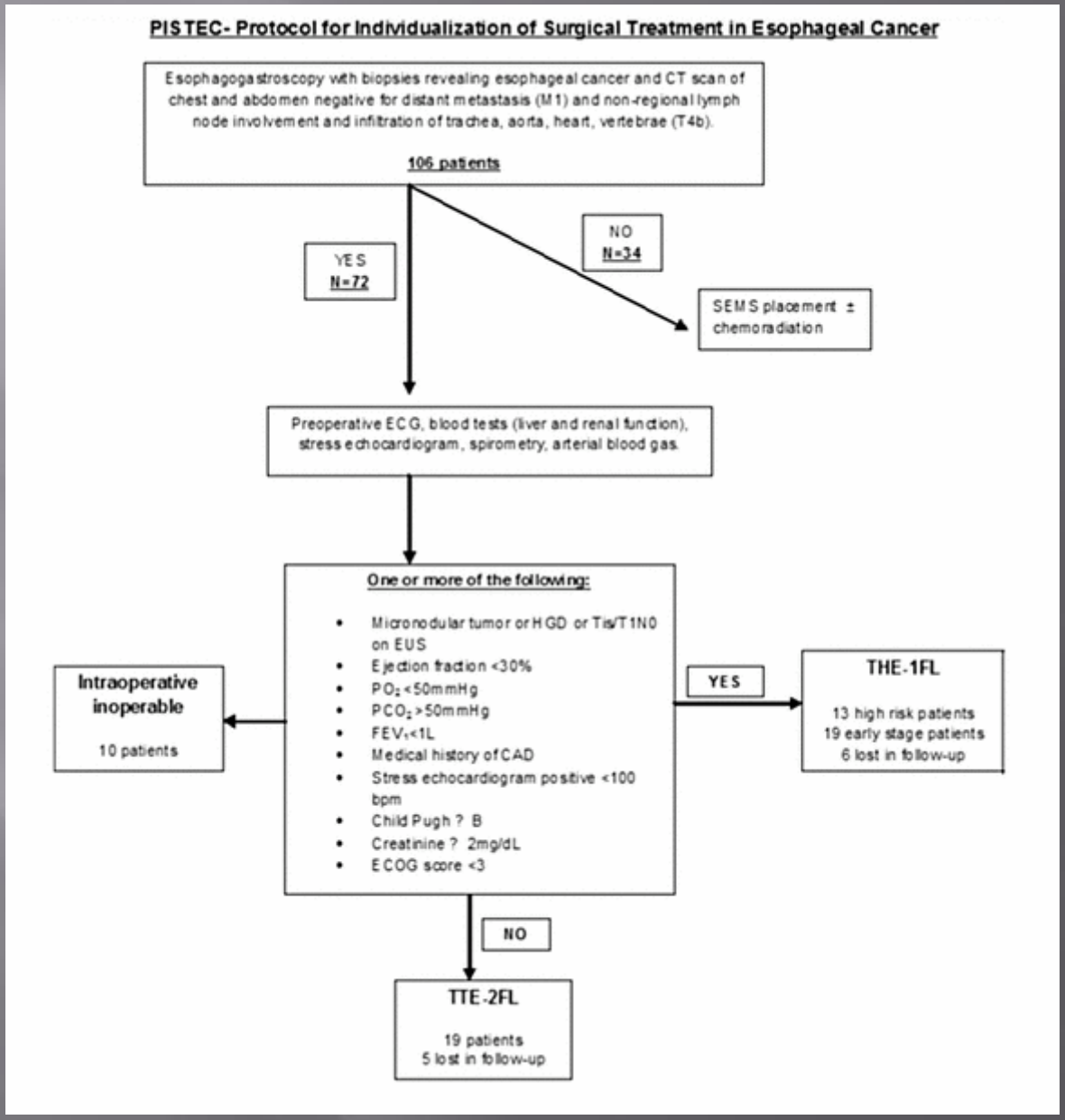
Department of Surgery, Academic Medical Centre, University of Amsterdam, Amsterdam, The Netherlands

Esophagus (2014) 11:258–266
DOI 10.1007/s10388-014-0440-x

ORIGINAL ARTICLE

Is there room for improvement in esophageal cancer surgery? Results of a prospective protocol for individualization of surgical treatment

Dimitrios Theodorou · Georgia Doulami · Nikolaos Memos · Nikolaos Kokoroskos · Gavriella-Zoi Vrakopoulou · Stamatina Triantafyllou · Eleftheria Kleidi · Stylianos Katsaragakis · George Zografos


PISTEC- Protocol for Individualization of Surgical Treatment in Esophageal Cancer
Esophagogastroscopy with biopsies revealing esophageal cancer and CT scan of chest and abdomen negative for distant metastasis (M1) and non-regional lymph node involvement and infiltration of trachea, aorta, heart, vertebrae (T4b).
106 patients
YES
N=72
NO
N=34
SEMS placement ± chemoradiation
Preoperative ECG, blood tests (liver and renal function), stress echocardiogram, spirometry, arterial blood gas.
One or more of the following:
Micronodular tumor or HGD or Tis/T1N0 on EUS
Ejection fraction <30%
PO_2 <50mmHg
PCO_2 >50mmHg
FEV_1 <1L
Medical history of CAD
Stress echocardiogram positive <100 bpm
Child Pugh ? B
Creatinine ? 2mg/dL
ECOG score <3
YES
THE-1FL
13 high risk patients
19 early stage patients
6 lost in follow-up
Intraoperative inoperable
10 patients
NO
TTE-2FL
19 patients
5 lost in follow-up

ORIGINAL ARTICLE

Impact of Extent of Lymphadenectomy on Survival, Post Neoadjuvant Chemotherapy and Transthoracic Esophagectomy

Alexander W. Phillips, MA, FRCSEd, Sjoerd M. Lagarde, MD, PhD,† Maziar Navidi, MBBS, FRCS,* Babbet Disep, FRCPath,‡ and S. Michael Griffin, OBE, MD, FRCSEd**

Conclusions: The present study demonstrates high lymph node yields are possible after transthoracic esophagectomy with *en bloc* 2-field lymphadenectomy in patients post neoadjuvant chemotherapy. This allows excellent postoperative staging. Furthermore, the extent of lymphadenectomy must be correlated with node location, which may have important implications in patients who have a less extensive lymphadenectomy.

Annals of Surgery • Volume XX, Number X, Month 2016

Group 1—A Transhiatal Resection With Complete Abdominal Lymphadenectomy

Group 2—A Limited Abdominal Lymphadenectomy

Group 3—A Limited Intrathoracic Lymphadenectomy

TABLE 3. Postsurgery Pathologic Characteristics of Patients With Adenocarcinoma of the Distal Esophagus or Gastroesophageal Junction Who Underwent Neoadjuvant Chemotherapy Followed by Transthoracic Esophagectomy With 2-field Lymphadenectomy

	Group 1	*P*	Group 2	*P*	Group 3	*P*
Number of patients	41 (21.8%)	—	41 (21.8%)	—	49 (26.1%)	—
Non radical proximal or distal resection	4	0.002	1	1.000	0	0.575
Location GEJ	24	0.588	27	0.716	27	0.231
Poor differentiation	29	0.360	29	0.360	36	0.163
TRG 1,2	0	0.604	1	1.000	2	1.0000
Number of resected nodes*	33 (10–64)	0.844	31 (15–67)	0.271	32 (16–63)	0.613
Number of positive nodes*	8 (1–35)	<0.001	7 (1–35)	0.003	7 (1–35)	0.001
Post-treatment T-stage (ypT)						
ypT0	0	0.202	0	0.194	0	0.117
ypT1	2	—	2	—	5	—
ypT2	4	—	3	—	10	—
ypT3	30	—	31	—	28	—
ypT4	5	—	5	—	6	—
Post-treatment N-stage (ypN)						
ypN1	7	0.001	6	0.001	8	0.001
ypN2	9	—	12	—	13	—
ypN3	25	—	23	—	28	—
Extracapsular LNI present	33	0.001	32	0.002	32	0.302
5-Year cancer-specific survival (SE)	10.1% (5%)	—	5.9% (4.0%)	—	17.9% (5.9%)	—

Ann Surg Oncol (2016) 23:626–632
DOI 10.1245/s10434-015-4898-0

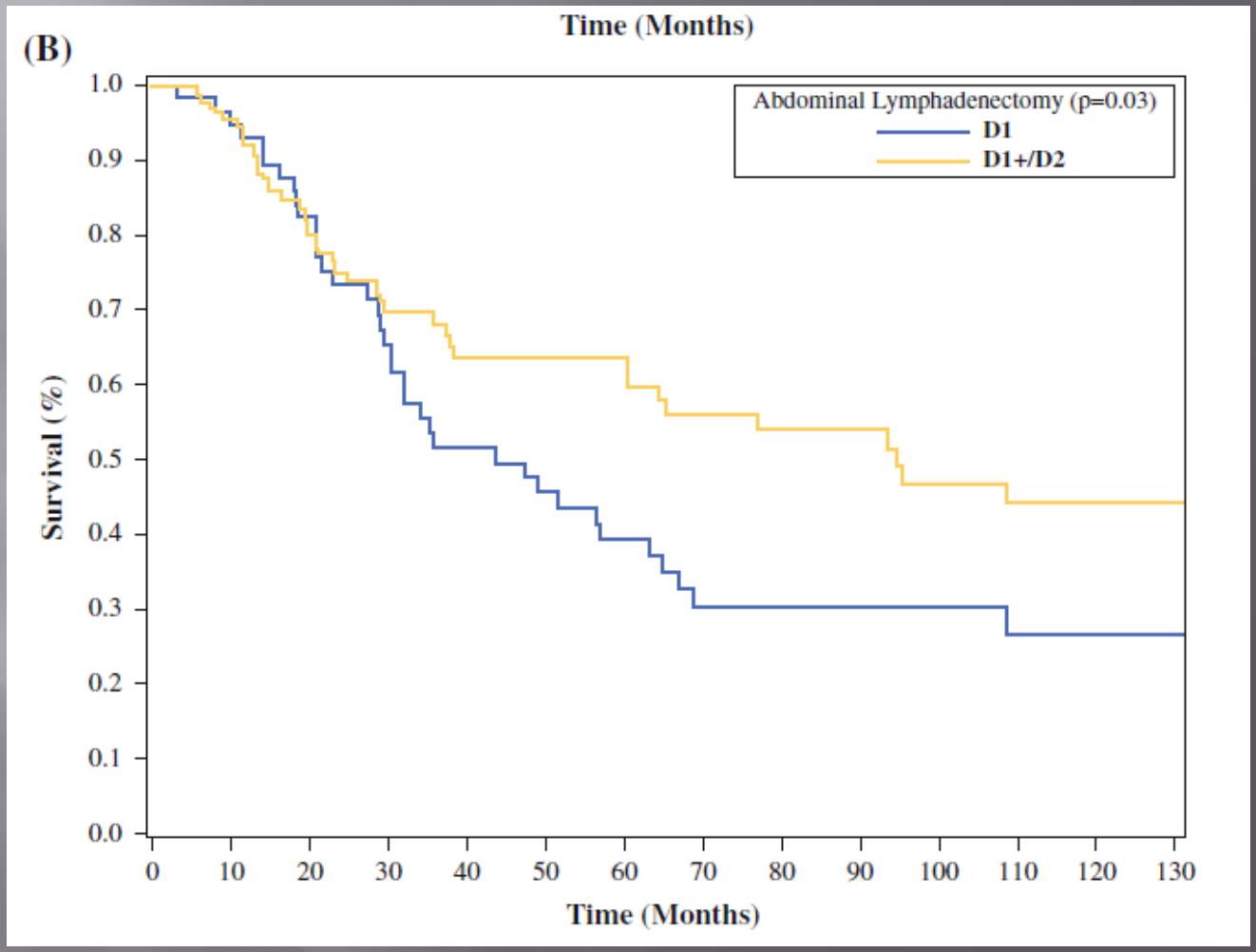
Annals of
SURGICAL ONCOLOGY
OFFICIAL JOURNAL OF THE SOCIETY OF SURGICAL ONCOLOGY

ORIGINAL ARTICLE – THORACIC ONCOLOGY

Long-Term Survival in Patients with Gastroesophageal Junction Cancer Treated with Preoperative Therapy: Do Thoracic and Abdominal Approaches Differ?

Peter J. Kneuertz, MD[1], Wayne L. Hofstetter, MD[2], Yi-Ju Chiang, MSPH[3], Prajnan Das, MD, MPH[3], Mariela Blum, MD[4], Elena Elimova, MD[4], Paul Mansfield, MD[5], Jaffer Ajani, MD[4], and Brian Badgwell, MD, MS[5]

[1]Department of Surgery, The University of Texas Health Science Center, Houston, TX; [2]Department of Thoracic and Cardiovascular Surgery, The University of Texas MD Anderson Cancer Center, Houston, TX; [3]Department of Radiation Oncology, The University of Texas MD Anderson Cancer Center, Houston, TX; [4]Department of Gastrointestinal Medical Oncology, The University of Texas MD Anderson Cancer Center, Houston, TX; [5]Department of Surgical Oncology, The University of Texas MD Anderson Cancer Center, Houston, TX


(B)
Time (Months)
Abdominal Lymphadenectomy (ρ=0.03)
D1
D1+/D2
Survival (%)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0
10
20
30
40
50
60
70
80
90
100
110
120
130
Time (Months)

- Ο λεμφαδενικός καθαρισμός δυο πεδίων βελτιώνει ην επιβίωση ακόμα και μετά την χρήση προεγχειρητικών θεραπειών

ΕΛΑΧΙΣΤΑ ΕΠΕΜΒΑΤΙΚΕΣ ΤΕΧΝΙΚΕΣ ΟΙΣΟΦΑΓΕΚΤΟΜΗΣ

(Video-assisted) thoracoscopic transthoracic esophagectomy (with cervical anastomosis)
Total thoracoscopic and laparoscopic esophagectomy (Total MIE)
Esophagectomy using either the thoracoscopic or laparoscopic approach (Hybrid MIE)
Video-assisted thoracoscopic surgery (VATS) esophagectomy with (hand-assisted) laparoscopic surgery
Robot-assisted thoracoscopic esophagectomy
Video-assisted Ivor-Lewis esophagectomy (with intrathoracic esophagogastric anastomosis)
Laparoscopic transhiatal esophagectomy
Mediastinoscope-assisted transhiatal esophagectomy

Table 2 Differences between left lateral decubitus position and prone position in thoracoscopic esophagectomy

	Left lateral decubitus position	Prone position
Retraction of right lung	Necessary	Not necessary
	Assistant's skill is important	Gravity and pneumothorax
Suction of blood	Necessary	Not so necessary
	Blood pools at the surgical field (posterior mediastinum)	Blood pools at the anterior mediastinum due to the gravity
Surgeon's position	Similar to open esophagectomy	Ergonomic position of hands
One-lung ventilation	Necessary	Not always required
Airway management by anesthesiologist	Easy	Not easy
Emergency conversion to open thoracotomy	Easy	Not easy

J Gastrointest Surg (2012) 16:1768–1774
DOI 10.1007/s11605-012-1950-2

HOW I DO IT

Refinement of Minimally Invasive Esophagectomy Techniques After 15 Years of Experience

Jie Zhang · Rui Wang · Shilei Liu · James D. Luketich · Sufeng Chen · Haiquan Chen · Matthew J. Schuchert

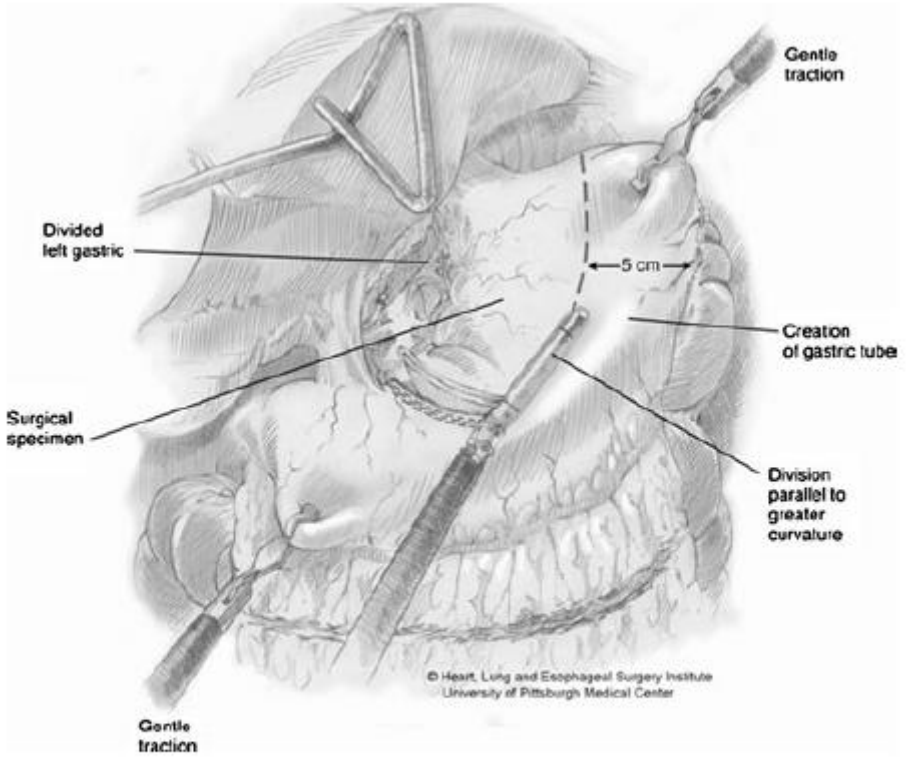


Fig. 1 Tubularization of the gastric conduit maintaining a diameter of 5–6 cm

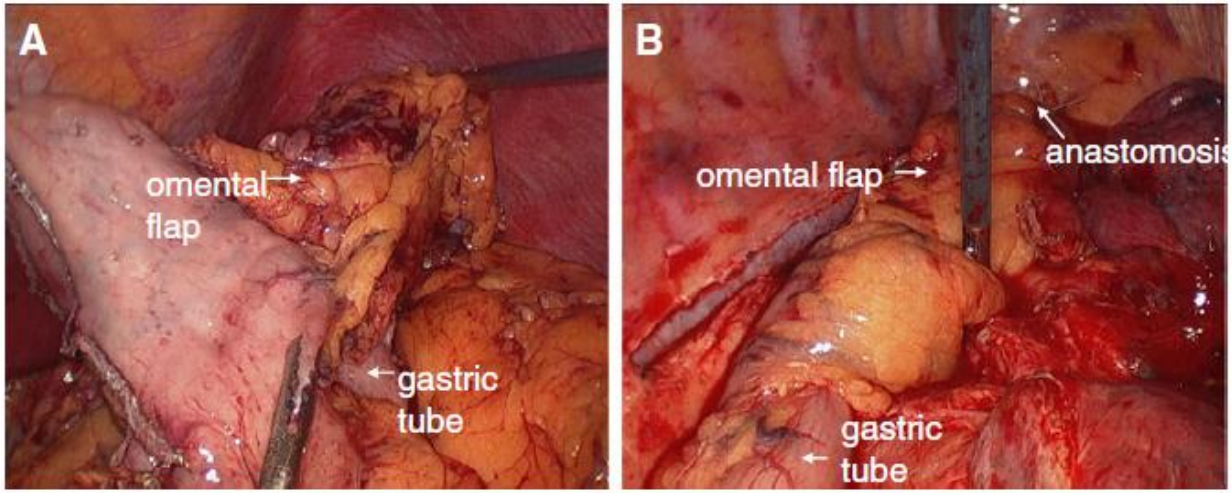
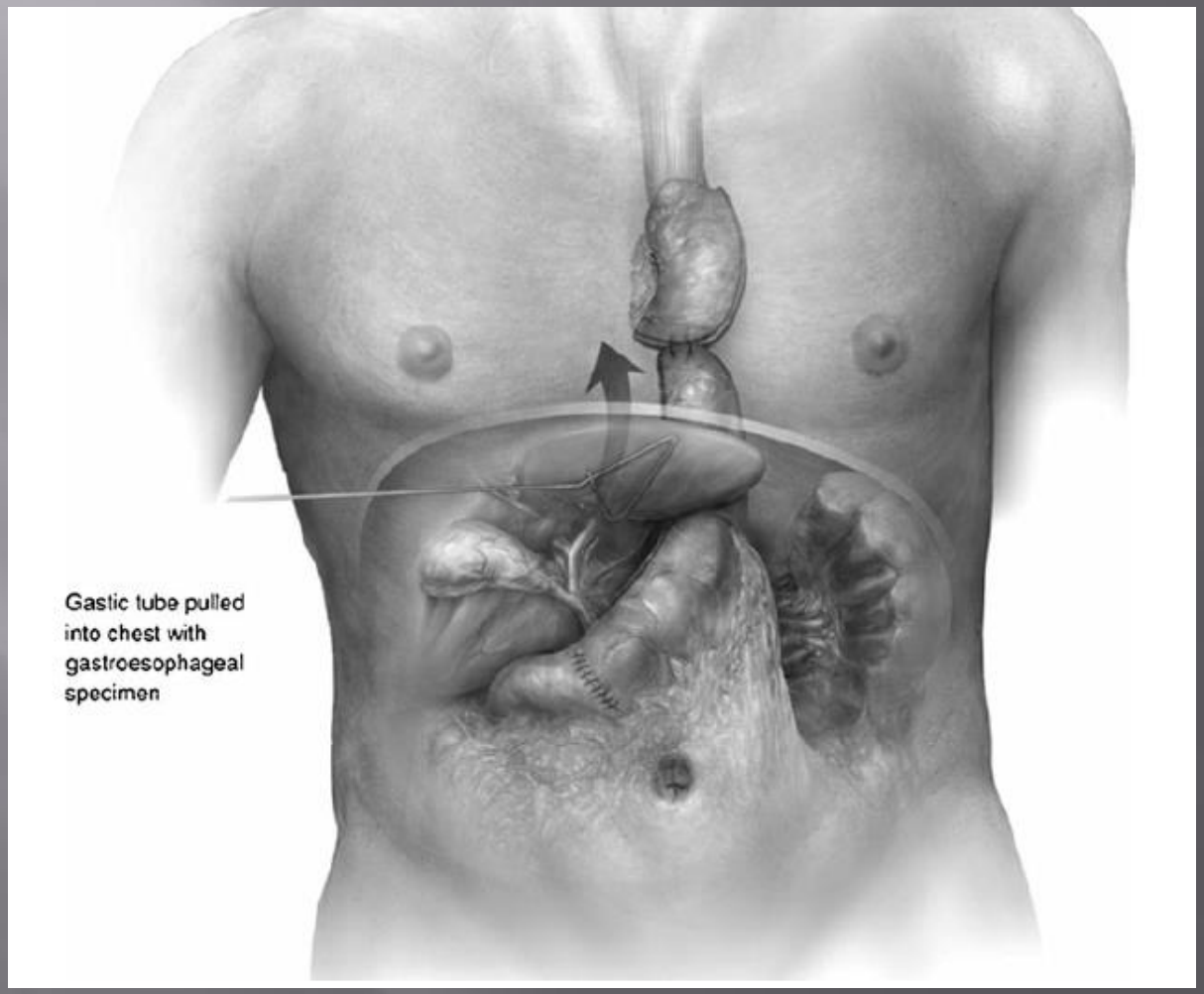


Fig. 2 **a** Creation of an omental pedicle flap. The flap is 3 cm wide and 8–10 cm long, originating from the upper aspect of the greater curve. When it is transposed into the mediastinum, great care is taken to avoid twisting the gastric conduit and compromising the flap integrity. **b** Completed anastomosis with omental pedicle wrap. The pedicle is wrapped circumferentially around the anastomosis, and one Endostitch suture is applied to anchor the flap to the top of the anastomosis


Gastic tube pulled
into chest with
gastroesophageal
specimen

Outcomes After Minimally Invasive Esophagectomy:

Review of Over 1000 Patients

James D. Luketich, MD, Arjun Pennathur, MD, Omar Awais, DO, Ryan M. Levy, MD, Samuel Keeley, MD, Manisha Shende, MD, Neil A. Christie, MD, Benny Weksler, MD, Rodney J. Landreneau, MD, Ghulam Abbas, MD, Matthew J. Schuchert, MD, and **Katie S. Nason, MD, MPH**

Department of Cardiothoracic Surgery, University of Pittsburgh, Pittsburgh, PA

Results—The MIE-neck was performed in 481 (48%) and MIE-Ivor Lewis in 530 (52%). Patients undergoing MIE-Ivor Lewis were operated in the current era. The median number of lymph nodes resected was 21. The operative mortality was 1.68%. Median length of stay (8 days) and ICU stay (2 days) were similar between the 2 approaches. Mortality rate was 0.9%, and recurrent nerve injury was less frequent in the Ivor Lewis MIE group ($P < 0.001$).

Ann Surg. 2012 July ; 256(1): 95–103.

ORIGINAL ARTICLE

Minimally Invasive Esophagectomy

Results of a Prospective Phase II Multicenter Trial—the Eastern Cooperative Oncology Group (E2202) Study

James D. Luketich, MD, Arjun Pennathur, MD,* Yoko Franchetti, PhD,† Paul J. Catalano, PhD,† Scott Swanson, MD,‡ David J. Sugarbaker, MD,‡ Alberto De Hoyos, MD,§ Michael A. Maddaus, MD,¶ Ninh T. Nguyen, MD,|| Al B. Benson, MD,§ and Hiran C. Fernando, MD***

TABLE 3. Grade 1 to 4 Adverse Events Typically Associated With Esophagectomy Within 30 Days After Surgery

Adverse Event	Grade 1 or 2 (n)	Grade 3 (n)	Grade 4 (n)	Total Patients With Grade 3 or Higher Complications (n = 105), n (%)
Atrial fibrillation	14	2	1	3 (2.9%)
Anastomotic leak	3	6	3	9 (8.6%)
Pneumonitis/pulmonary infiltrates	1	3	1	4 (3.8%)
ARDS	0	0	6	6 (5.7%)
Chylothorax	2	1	0	1 (1%)
Dysphagia	8	12	2	14 (13.3%)
Esophageal stenosis	0	6	0	6 (5.7%)

ARDS indicates acute respiratory distress syndrome.

Annals of Surgery • Volume 261, Number 4, April 2015

Minimally Invasive Esophagectomy

Results of a Prospective Phase II Multicenter Trial—the Eastern Cooperative Oncology Group (E2202) Study

James D. Luketich, MD, Arjun Pennathur, MD,* Yoko Franchetti, PhD,† Paul J. Catalano, PhD,† Scott Swanson, MD,‡ David J. Sugarbaker, MD,‡ Alberto De Hoyos, MD,§ Michael A. Maddaus, MD,¶ Ninh T. Nguyen, MD,|| Al B. Benson, MD,§ and Hiran C. Fernando, MD***

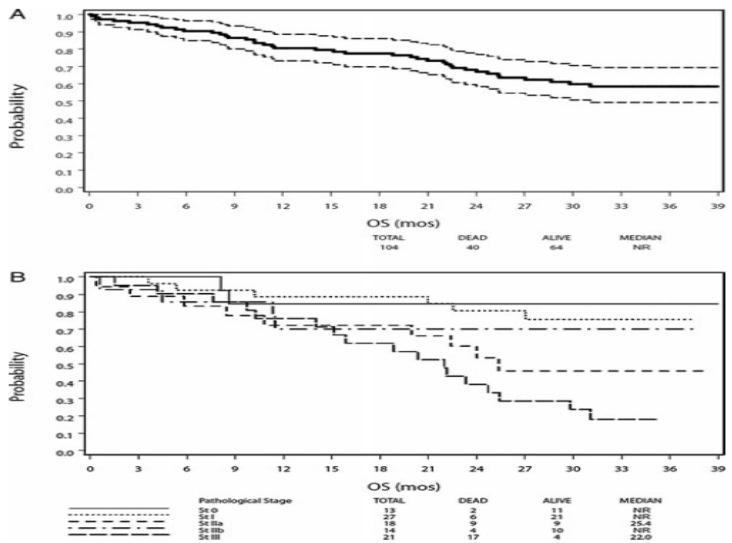


FIGURE 2. Overall survival after MIE. A, Kaplan-Meier plot of estimated overall survival for the study cohort. Dotted lines denote a 95% confidence band for the probability of survival. The median overall survival was not reached. B, Kaplan-Meier plot of estimated overall survival stratified by pathological stage. NR indicates not reached; OS, overall survival.

Minimally invasive versus open oesophagectomy for patients with oesophageal cancer: a multicentre, open-label, randomised controlled trial

Surya S A Y Biere, Mark I van Berge Henegouwen, Kirsten W Maas, Luigi Bonavina, Camiel Rosman, Josep Roig Garcia, Suzanne S Gisbertz, Jean H G Klinkenbijl, Markus W Hollmann, Elly S M de Lange, H Jaap Bonjer, Donald L van der Peet, Miguel A Cuesta

Lancet 2012; 379: 1887–92

	OO (N=56)	MIO (N=59)	p value
Primary outcomes			
Pulmonary infection within 2 weeks	16 (29%)	5 (9%)	0·005
Pulmonary infection in-hospital	19 (34%)	7 (12%)	0·005
Secondary outcomes			
Hospital stay (days)*	14 (1–120)	11 (7–80)	0·044
Short-term quality of life†			
SF 36†			
Physical component summary	36 (6; 34–39)	42 (8; 39–46)	0·007
Mental component summary	45 (11; 40–50)	46 (10; 41–50)	0·806
EORTC C30†			
Global health	51 (21; 44–58)	61 (18; 56–67)	0·020
OES 18‡			
Talking	37 (39; 25–49)	18 (26; 10–26)	0·008
Pain	19 (21; 13–26)	8 (11; 5–11)	0·002
Total lymph nodes retrieved*	21 (7–47)	20 (3–44)	0·852
Resection margin§			0·080
R0	47 (84%)	54 (92%)	..
R1	5 (9%)	1 (2%)	..
pStage¶			0·943
0	0 (0%)	1 (2%)	..
I	4 (7%)	4 (7%)	..
IIa	16 (29%)	17 (29%)	..
IIb	6 (11%)	9 (15%)	..
III	14 (25%)	11 (19%)	..
IV	5 (9%)	4 (7%)	..
No residual tumour or lymph-node metastasis	7 (13%)	9 (15%)	..
Mortality‖			0·590
30-day mortality	0 (0%)	1 (2%)	..
In-hospital mortality	1 (2%)	2 (3%)	..

	OO (N=56)	MIO (N=59)	p value
Intraoperative data			
Operative time (min)*†	299 (66–570)	329 (90–559)	0·002
Blood loss (mL)†	475 (50–3000)	200 (20–1200)	<0·001
Conversions‡	NA	8 (14%)	..
Level of anastomosis§			0·970
Cervical	37 (66%)	38 (64%)	
Thoracic	15 (27%)	17 (29%)	
Postoperative data			
ICU stay (days)†	1 (0–106)	1 (0–50)	0·706
VAS (10 days)¶	3 (2)	2 (2)	0·001
Epidural failure‖	11 (20%)	10 (17%)	0·734
Other complications			
Anastomotic leakage	4 (7%)	7 (12%)	0·390
Thoracic complications without anastomotic leakage**	2 (4%)	2 (3%)	0·958
Vocal-cord paralysis††	8 (14%)	1 (2%)	0·012
Pulmonary embolism	0 (0%)	1 (2%)	0·328
Reoperations	6 (11%)	8 (14%)	0·641

Data are median (range), n (%), or mean (SD), unless otherwise indicated. OO=open oesophagectomy. MIO=minimally invasive oesophagectomy. NA=not applicable. ICU=intensive-care unit. VAS=Visual Analogue Scale pain score. *Time from skin incision to skin closure. †Skewed distribution, Mann-Whitney test applied. ‡Six patients were converted to thoracotomy and two to laparotomy. §Four patients in the OO group and four in the MIO group did not undergo resection with subsequent anastomosis because of metastasis or irresectability of the tumour. ¶Linear mixed model. ‖In the first 2 days after surgery. **Thoracic complications not related to leakage were mediastinitis, empyema, chylous leakage needing reoperation, and hiatal herniation. ††Confirmed by laryngoscopy.

Table 3: **Other outcomes of the intention-to-treat population**

Review Article | August 2012

Evidence to Support the Use of Minimally Invasive Esophagectomy for Esophageal Cancer: A Meta-analysis FREE

Marc Dantoc, MBBS(Hons), MPhil(Med); Michael R. Cox, MBBS, MS, FRACS; Guy D. Eslick, PhD, FFPH

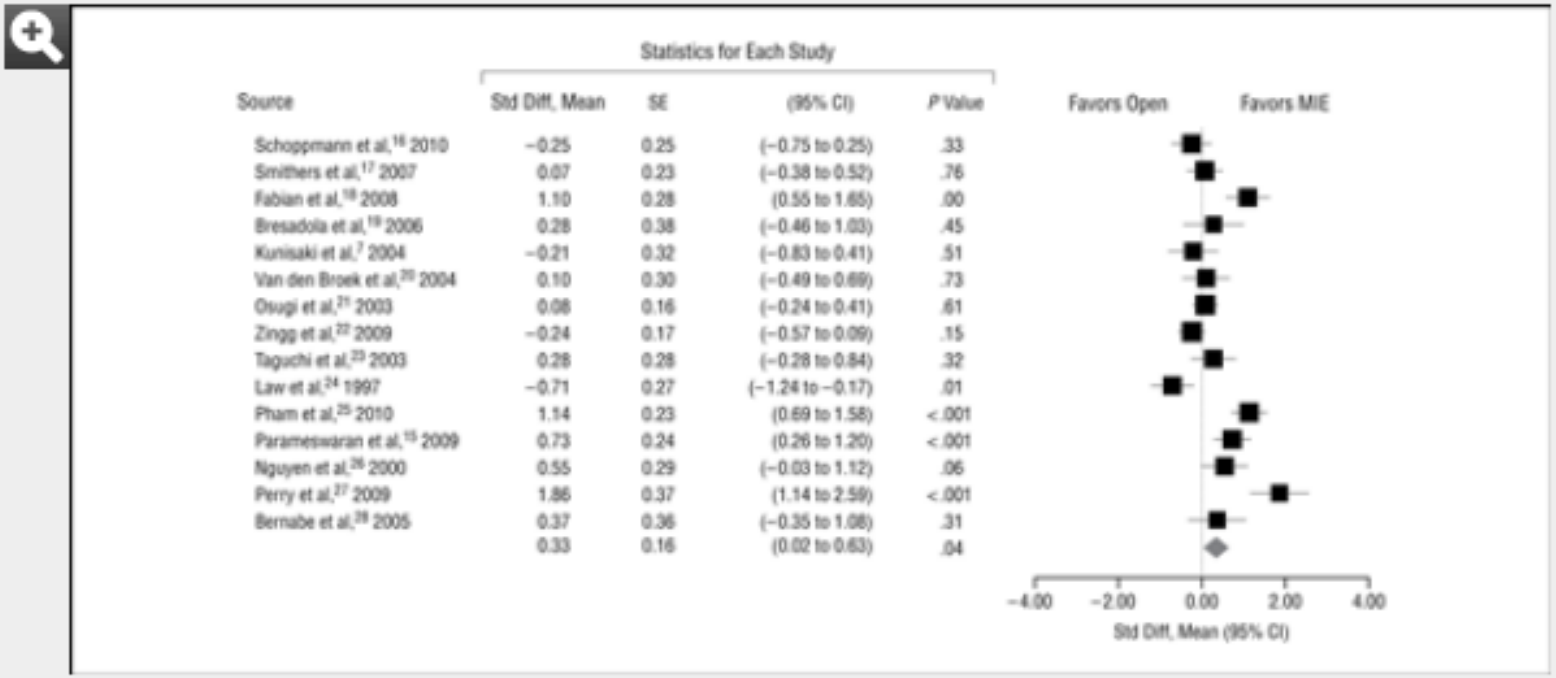
Arch Surg. 2012;147(8):768-776. doi:10.1001/archsurg.2012.1326.

Table 1. Overall Characteristics of the Studies

Source	Country	Sample Size, No. of Patients	Sex, %				Mean Age, y	Specific MIE Technique Used	EOL, No. of Fields
			MIE Group		Open Group				
			Male	Female	Male	Female			
Schoppmann et al,[16] 2010	Austria	62	25	6	21	10	60.1	TLSE	2
Smithers et al,[17] 2007	Australia	446	20	3	104	10	62.5	TLSE	2
Fabian et al,[18] 2008	United States	65	16	6	31	12	62.0	TLSE	2
Shiraishi et al,[3] 2006	Japan	153	62	16	31	6	62.4	TLSE	3
Bresadola et al,[19] 2006	Italy	28	8	6	13	1	60.24	THE + TLSE	2
Kunisaki et al,[7] 2004	Japan	45	21	9	12	3	62.5	VATS + HALS	2
Van den Broek et al,[20] 2004	The Netherlands	45	19	6	14	6	63.5	THE	2
Osugi et al,[21] 2003	Japan	119	34	13	57	15	63.7	VATS	3
Zingg et al,[22] 2009	Australia	154	45	11	71	27	67.05	TLSE	2
Taguchi et al,[23] 2003	Japan	69	20	20	24	5	61.65	VATS	3
Law et al,[24] 1997	Hong Kong	81	13	5	55	8	64.5	TSE	2
Pham et al,[25] 2010	United States	90	41	3	33	13	61.5	TLSE	2
Parameswaran et al,[15] 2009	United Kingdom	80	45	3	21	9	67.5	TLSE	2
Nguyen et al,[26] 2000	United States	54	7	5	29	7	65.3	TLSE	2
Perry et al,[27] 2009	United States	42	18	11	17	4	65.4	LIE	2
Bernabe et al,[28] 2005	United States	31	11	3	16	1	64.0	THE	2

Abbreviations: EOL, extent of lymphadenectomy; HALS, hand-assisted laparoscopic esophagectomy; LIE, laparoscopic inversion esophagectomy; MIE, minimally invasive esophagectomy; THE, transhiatal esophagectomy; TLSE, thoracolaparoscopic esophagectomy; TSE, thoracoscopic-assisted esophagectomy; VATS, video-assisted thoracoscopic esophagectomy.

Figure 2. Forest plot for lymph nodes retrieved, open vs minimally invasive esophagectomy (MIE). The size of the data marker corresponds to the relative weight assigned in the pooled analysis using random effects models. Std Diff indicates standard difference.



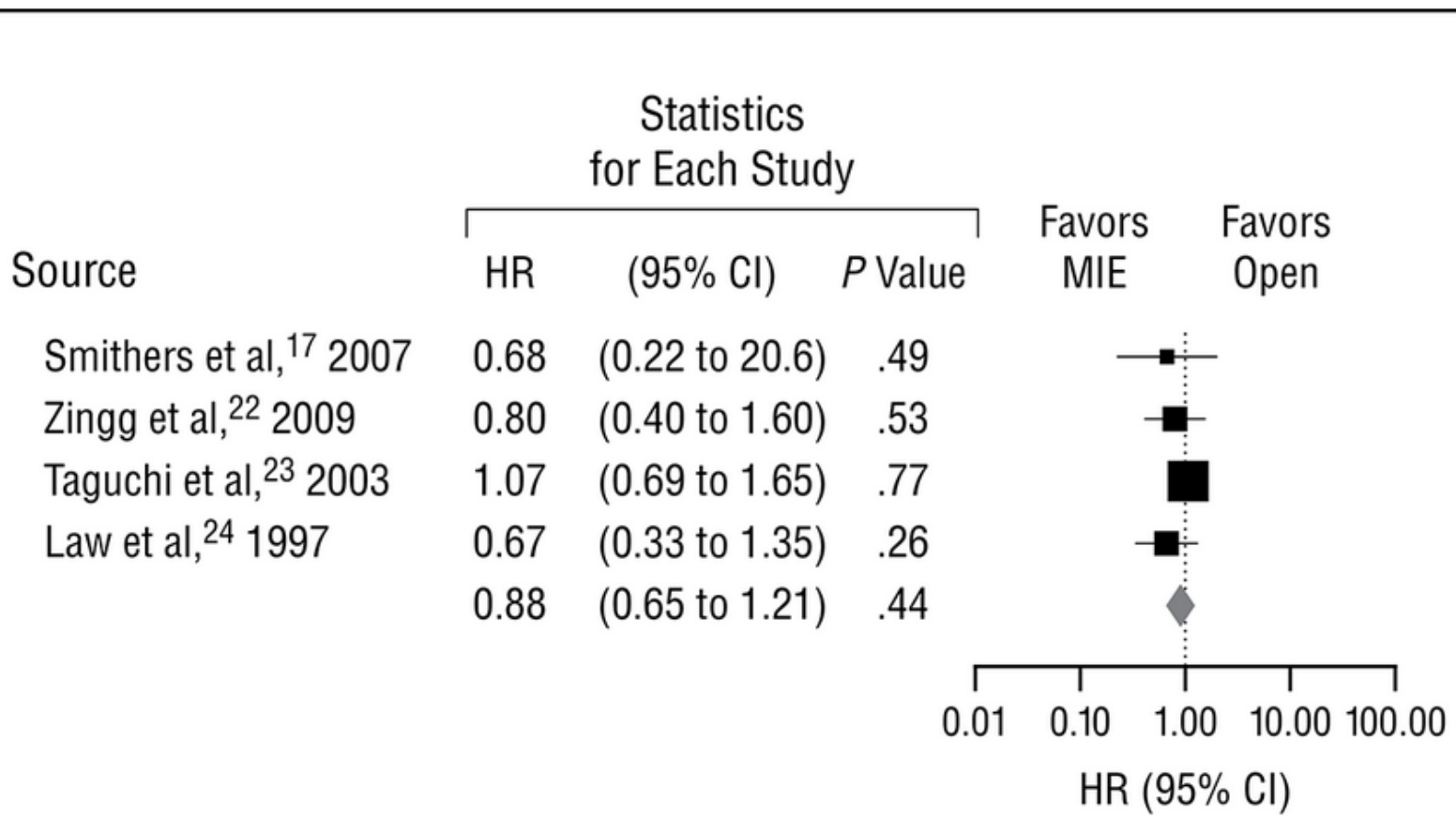
Αρ Λεμφαδένων

Table 2. Number of LNs Retrieved: Comparison of Open vs MIE Procedures

Source	Sample Size, No. of Patients	Reported No. of LNs Retrieved[a]		*P* Value[b]
		MIE Group	Open Group	
Schoppmann et al,[16] 2010	62	17.9 (7.7)	20.5 (12.6)	.33
Smithers et al,[17] 2007	446	17 (9-33)	16 (1-44)	.76
Fabian et al,[18] 2008	65	15 (6)	8 (7)	<.001
Bresadola et al,[19] 2006	28	22.23 (12.0)	18.61 (3.4)	.45
Kunisaki et al,[7] 2004	45	24.5 (10)	26.6 (10.4)	.51
Van den Broek et al,[20] 2004	45	7 (4.9)	6.5 (4.9)	.73
Osugi et al,[21] 2003	119	33.9 (12)[c]	32.8 (14)[c]	.61
Zingg et al,[22] 2009	154	5.7 (0.4)[c]	6.75 (0.5)[c]	.15
Taguchi et al,[23] 2003	69	31.9 (11.5)	29.3 (10.1)	.32
Law et al,[24] 1997	81	7 (2-13)	13 (5-34)	.01
Pham et al,[25] 2010	90	13 (9-15)	8 (3-14)	<.001
Parameswaran et al,[15] 2009	80	23 (7-49)	10 (2-23)	<.001
Nguyen et al,[26] 2000	54	10.8 (8.4)	6.6 (5.8)	.06
Perry et al,[27] 2009	42	10 (4-12)	3 (0-7)	<.001
Bernabe et al,[28] 2005	31	9.8	8.7	.31

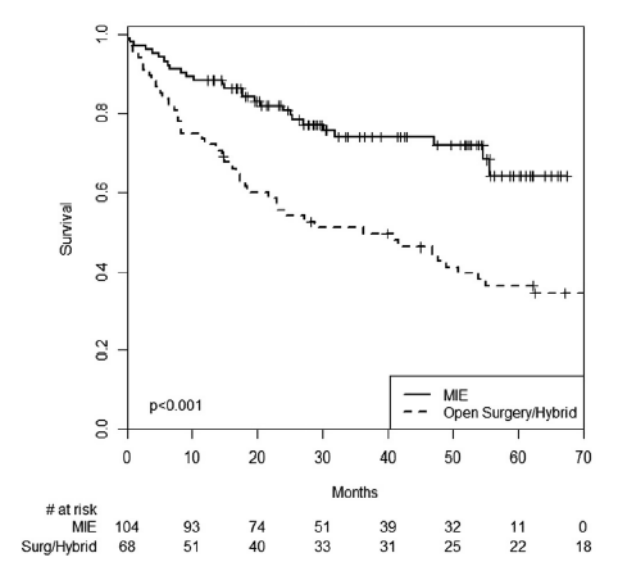
Abbreviations: LNs, lymph nodes; MIE, minimally invasive esophagectomy.
[a] Data are presented as median (SE) or median (range).
[b] $P < .05$ considered statistically significant.
[c] Data are given as median (SD).

5 ετής

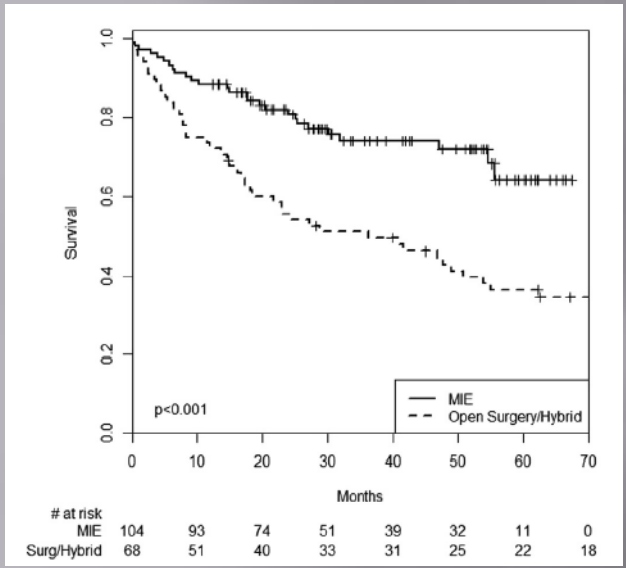

Statistics for Each Study
Source
HR
(95% CI)
P Value
Favors MIE
Favors Open
Smithers et al,[17] 2007 0.68 (0.22 to 20.6) .49
Zingg et al,[22] 2009 0.80 (0.40 to 1.60) .53
Taguchi et al,[23] 2003 1.07 (0.69 to 1.65) .77
Law et al,[24] 1997 0.67 (0.33 to 1.35) .26
0.88 (0.65 to 1.21) .44
0.01
0.10
1.00
10.00
100.00
HR (95% CI)

Minimally Invasive Esophagectomy Provides Significant Survival Advantage Compared with Open or Hybrid Esophagectomy for Patients with Cancers of the Esophagus and Gastroesophageal Junction

Francesco Palazzo, MD, FACS, Ernest L Rosato, MD, FACS, Asadulla Chaudhary, BS, Nathaniel R Evans III, MD, FACS, Jocelyn A Sendecki, MSPH, MS, Scott Keith, PhD, Karen A Chojnacki, MD, FACS, Charles J Yeo, MD, FACS, Adam C Berger, MD, FACS



J Am Coll Surg 2015;220:672–679.



CONCLUSIONS: This study supports MIE for EC as a superior procedure with respect to overall survival, perioperative mortality, and severity of postoperative complications. Several biases may have affected these results: earlier stage in the MIE group and disparity in timing of the procedures. These results will need to be confirmed in future prospective studies with longer follow-up. (J Am Coll Surg 2015;220:672–679. © 2015 by the American College of Surgeons)

J Am Coll Surg 2015;220:672–679.

Table 1. Patient Demographics and Pathology by Operation Type

Variable	MIE (n = 104)	OHE (n = 68)	p Value
Age, y, mean (SD) [minimum, maximum]	62.3 (10.4) [31, 86]	60.0 (9.4) [41, 79]	0.12
Sex, n (%)			0.32
Male	86 (82.7)	51 (75.0)	
Female	18 (17.3)	17 (25.0)	
Pathologic diagnosis at operation, n (%)			0.02
Adenocarcinoma	94 (90.4)	54 (79.4)	
Squamous cell carcinoma	10 (9.6)	14 (20.6)	
Pathologic stage, n (%)			<0.01
0 Rx*	23 (22.1)	16 (23.5)	
1	49 (47.1)	15 (22.1)	
2	20 (19.2)	27 (39.7)	
3	12 (11.5)	10 (14.7)	
Neoadjuvant therapy, n (%)	55 (52.9)	53 (77.9)	<0.01
Complete response, n (%)	20 (19.2)	15 (22.1)	0.70

*0 Rx: complete response.
MIE, minimally invasive esophagectomy; OHE, open or hybrid esophagectomy.

J Am Coll Surg 2015;220:672–679.

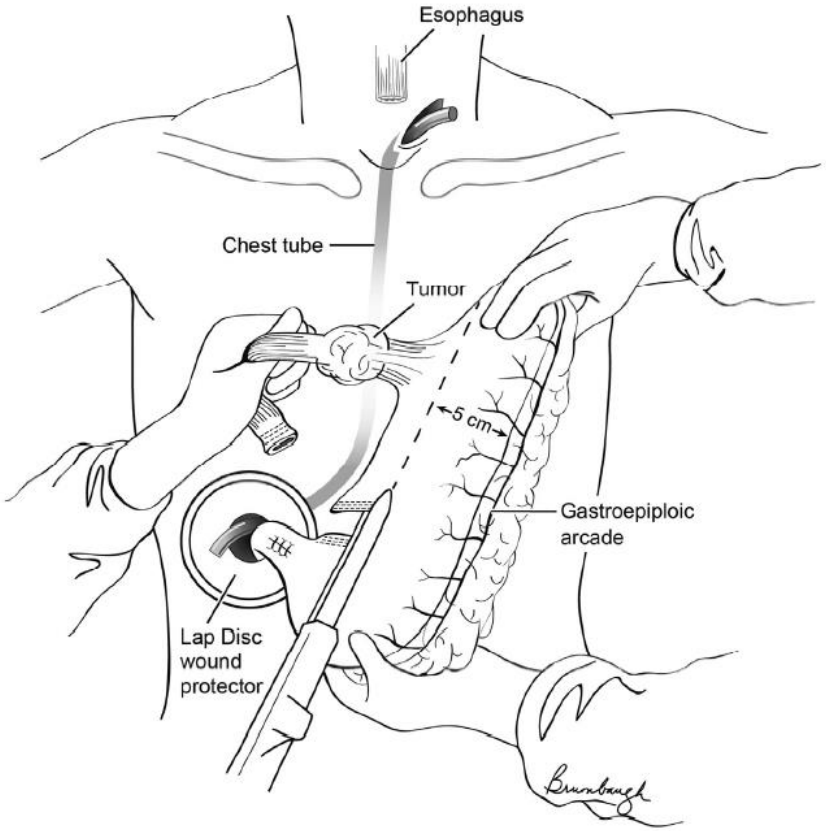
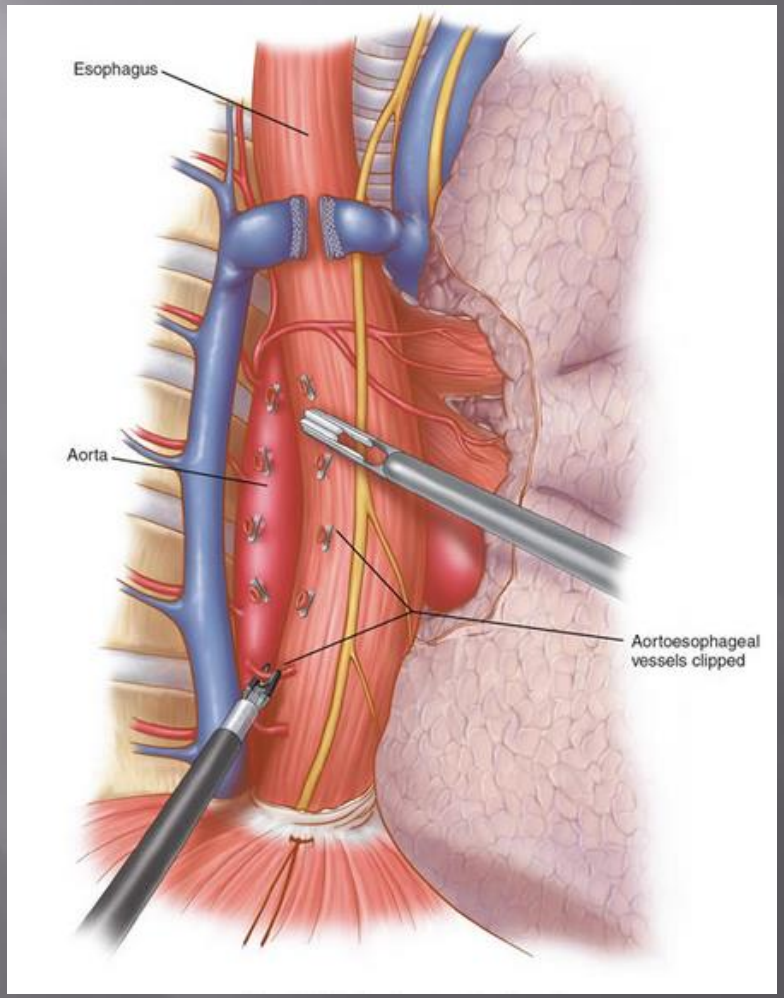
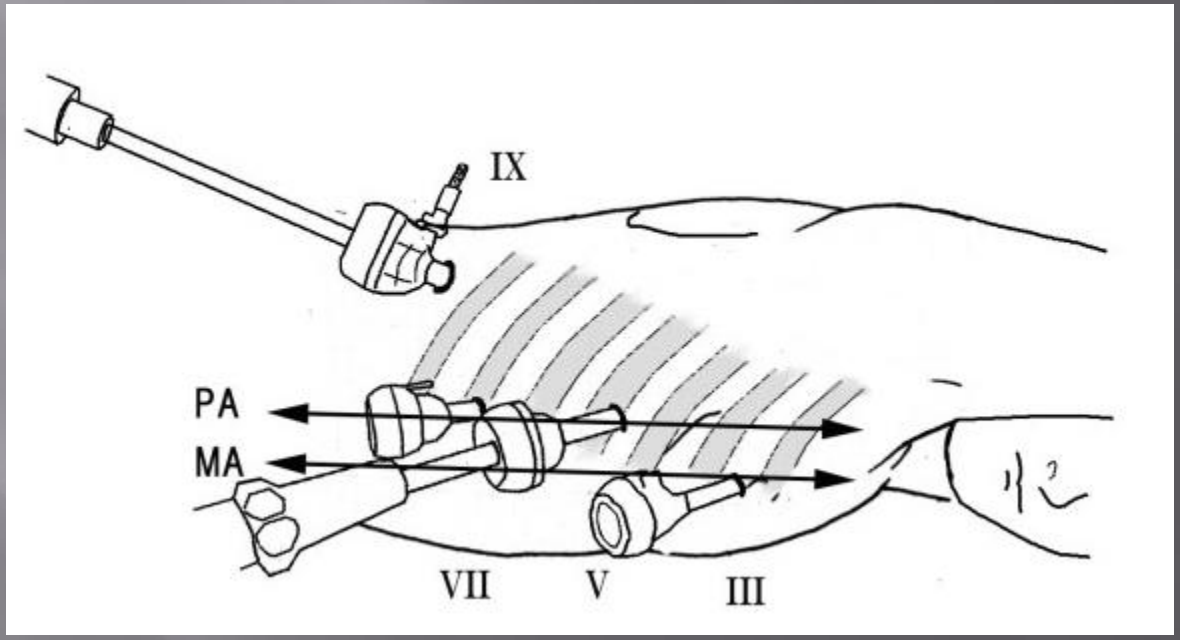
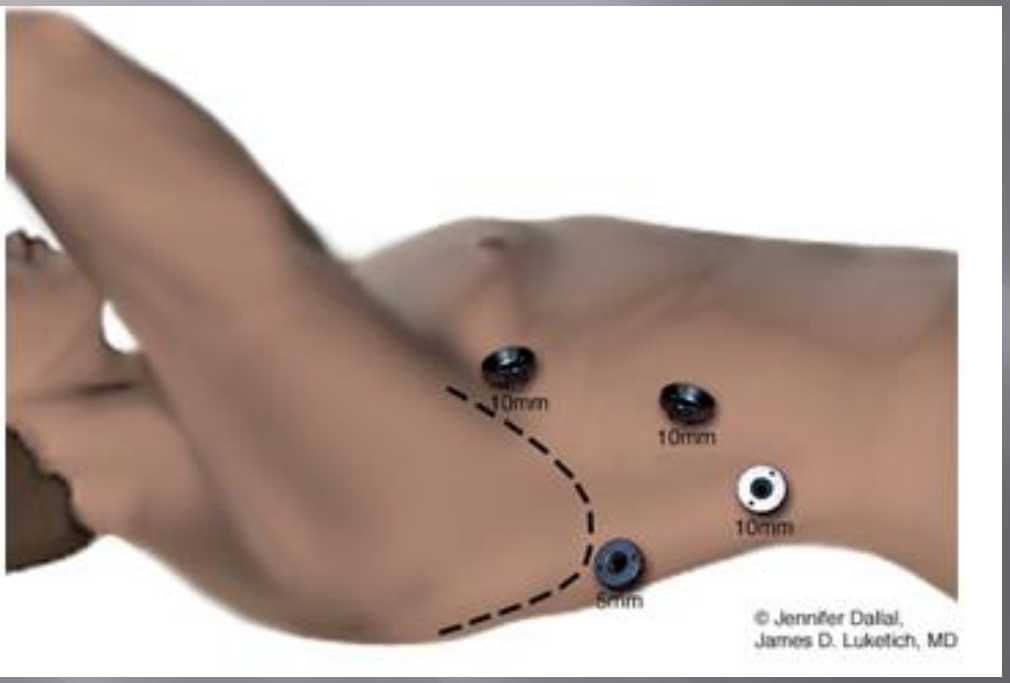
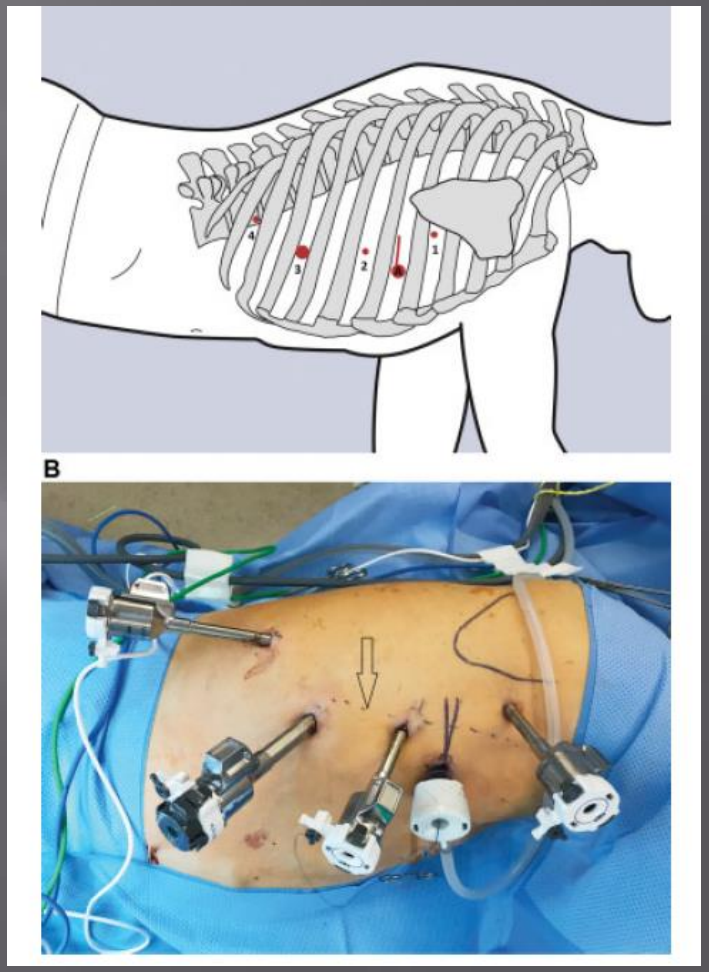


Figure 1. Extracorporeal creation of gastric conduit via enlarged port site in right upper quadrant. Cervical incision depicted after division of proximal esophagus. (Reprinted from: Palazzo F, Evans NR 3rd, Rosato EL. Minimally invasive esophagectomy with extracorporeal gastric conduit creation–how I do it. J Gastrointest Surg 2013; 17:1683–1688; with permission.)


Esophagus
Aorta
Aortoesophageal vessels clipped


IX
PA
MA
VII
V
III


10mm
10mm
10mm
8mm
© Jennifer Dalial,
James D. Luketich, MD


B

Συμπεράσματα

- Ο λεμφαδενικός καθαρισμός σαφώς ωφελεί κάποιους ασθενείς
- Ιδανικά πρέπει να βρεθεί μια μέθοδος εκτίμησης του Ν προεγχειρητικά
- Ο τύπος του χειρουργείου αφορά την έκταση του λεμφαδενικού και όχι τις τομές
- Η επίδραση των νεοεπικουρικών θεραπειών διερευνάται και δεν φαίνεται να επηρεάζει την επιλογή χειρουργείου


ΤΟ ΚΑΤΑΣΤΗΜΑ
ΣΗΜΕΡΑ ΔΕΝ
ΘΑ ΕΙΝΑΙ ΑΝΟΙΧΤΟ
ΓΙΑΤΙ ΘΑ ΕΙΝΑΙ
ΚΛΕΙΣΤΟ