Akciğer Kanseri ve Cerrahi Tedavi

Dr. Volkan ERDOĞU

CANCEROUS TUMOURS IN THE RESPIRATORY ORGANS.

The lungs are less prone than most other organs to cancerous disease. Indeed, pathologists of vast experience have encountered but isolated examples of pulmonary cancer.[1] As our acquaintance with tumours generally, and with malignant ones in particular, was, until lately, somewhat defective,—the diagnosis of a malady so rare as the present one, necessarily remained obscure, and the records, concerning its course, very imperfect. Several cases, recently observed by other pathologists, and some by myself, have enabled me to draw up a historical notice of the disease, which may possibly aid in its detection during life.[2]

Cancer of the lung is incomparably more frequent in males than in females. Out of 22 cases, collected by myself, 5 concern women, and 17 men. In childhood, the disease is unknown. Of the above 22 cases, 9 occurred between the 20th and 29th years; 8 between the 30th and 39th; 2 between the 40th and 49th; 2 between the 50th and 59th; and 1 between the 70th and 79th years. The morbid disposition is, accordingly, greatest in the prime of life.

The disease may be either *primary* or *secondary*,—more frequently the latter. But even where the cancer originally and mainly occupies the lungs, it is always deeply rooted in the organism, other parts being, simultaneously, more or less involved. This remark applies, particularly, to the secondary

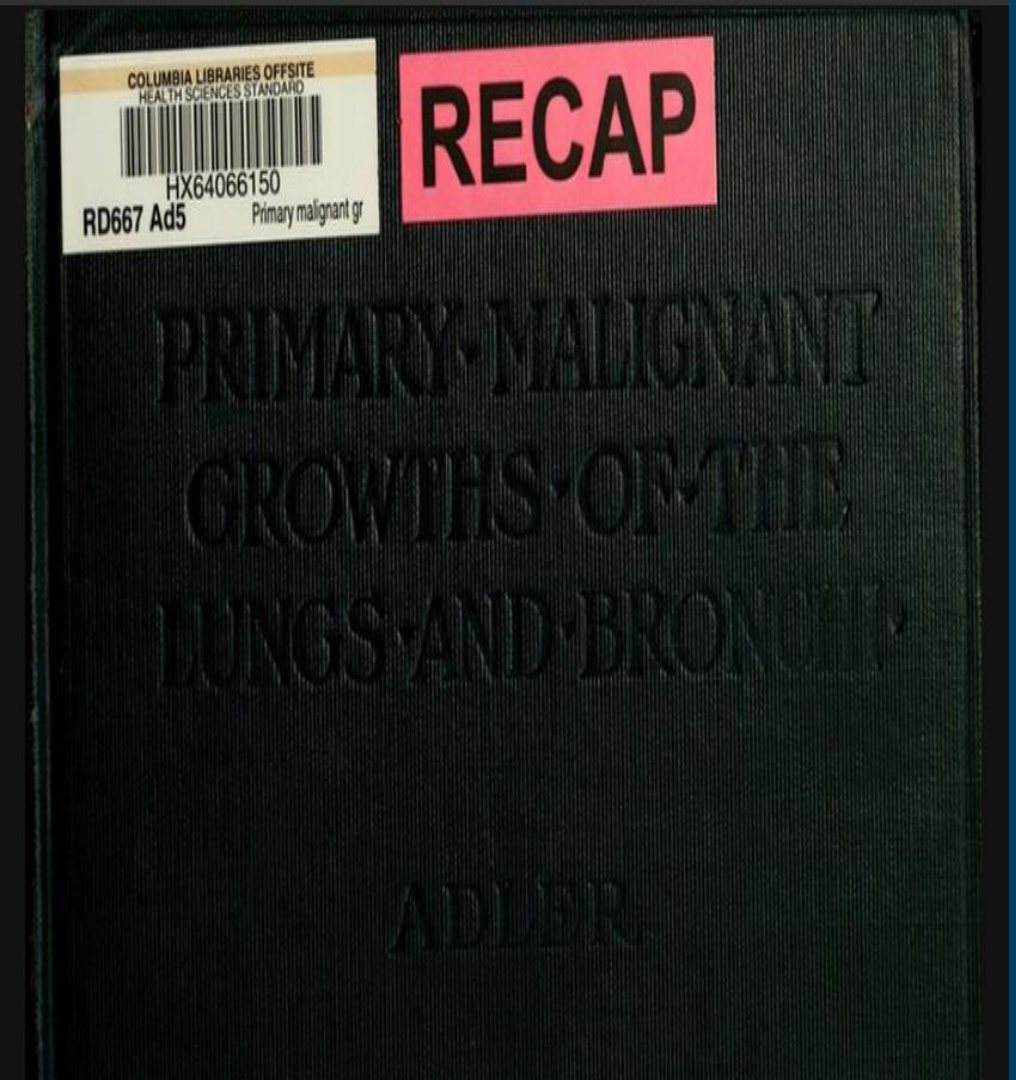
[1] Out of 900 subjects examined, Bayle met with but one example of what he terms "Phthisie carcinomateuse."

[2] Besides the cases related by Morgagni, Bayle, Laennec, and Andral,—see Oettinger (Jahrb. d. Münchn. ärtzl. p. 98, Ver. 1835); Struve (Diss. de fungo Pulm. Lips. 1837); Heyfelder (Studien, &c. Bd. i, p. 62); Stokes (Diseases of the Chest); Carswell (Elementary Forms of Disease, fasc. iii, pl. 1, 2, 3); Durand-Fardel (Journ.

Doktor Hasse, 1846

- Yayınlanmış 22'den fazla akciğer kanseri vakası bulamamıştı

- Solunum Organlarındaki Kanserli Tümörler" bölümünde şunları belirtti:
  - "Akciğerlerde kanser görülme ihtimali diğer organlara göre daha azdır”

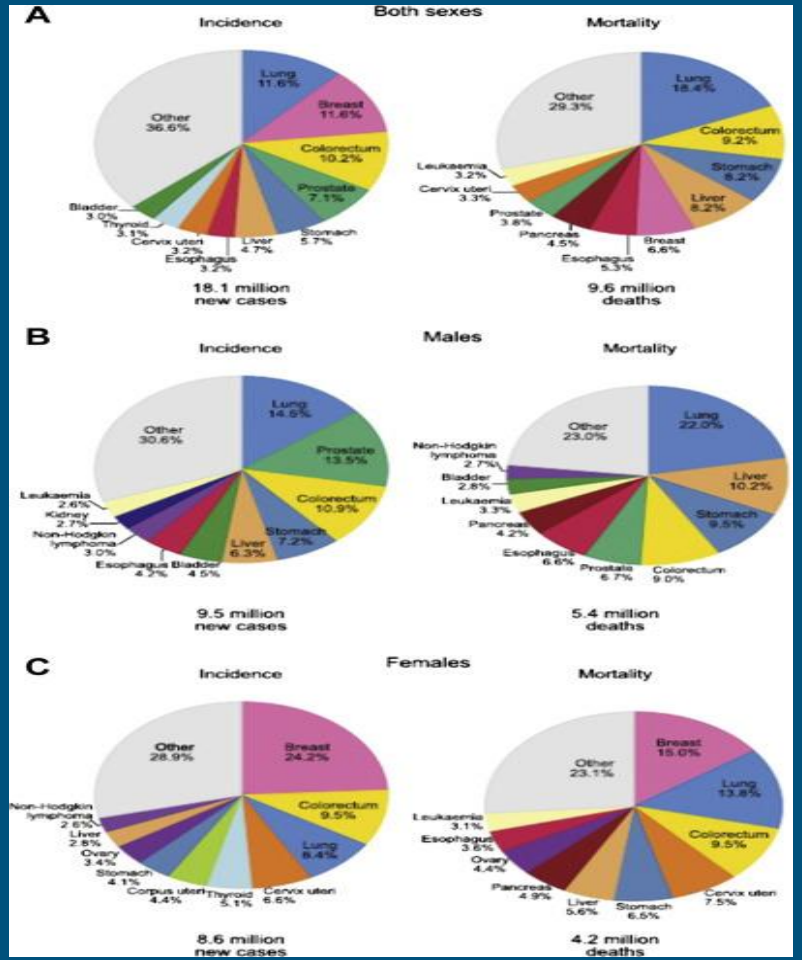


- Amerikalı doktor Dr. Isaac Adler; 1912'de akciğer kanseri hastalarının sıklıkla sigara içtiklerini bildirdiği gözlemine dayanarak **sigara içimi ile akciğer kanseri arasında** bir bağlantı öneren ilk bilim adamıydı (374 olgu)

- Lung cancer is a unique disease in that the major etiologic agent is an addictive product that is made and promoted by an industry. Approximately 85% to 90% of cases are caused by voluntary or involuntary (second-hand) cigarette smoking. Reduction of lung cancer mortality will require effective public health policies to prevent initiation of smoking, U.S. Food and Drug Administration (FDA) oversight of tobacco products, and other tobacco control measures.

- Persistent smoking is associated with second primary cancers, treatment complications, drug interactions, other tobacco-related medical conditions, diminished quality of life, and reduced survival.
- Reports from the Surgeon General on both active smoking (http://www.cdc.gov/tobacco/data_statistics/sgr/2004/pdfs/executivesummary.pdf) and second-hand smoke show that both cause lung cancer. The evidence shows a 20% to 30% increase in the risk for lung cancer from second-hand smoke exposure associated with living with a smoker (http://www.ncbi.nlm.nih.gov/books/NBK44324/).
  Every person should be informed of the health consequences, addictive nature, and mortal threat posed by tobacco consumption and exposure to tobacco smoke, and effective legislative, executive, administrative, or other measures should be contemplated at the appropriate governmental level to protect all persons from exposure to tobacco smoke (www.who.int/tobacco/framework/final_text/en/).
- Further complicating this problem, the delivery system of lung carcinogens also contains the highly addictive substance, nicotine. Reduction of lung cancer mortality will require widespread implementation of Agency for Healthcare Research and Quality (AHRQ) Guidelines (http://www.ahrq.gov/professionals/clinicians-providers/guidelines-recommendations/tobacco/index.html) to identify, counsel, and treat patients with nicotine habituation.
- Patients who are current or former smokers have significant risk for the development of lung cancer; chemoprevention agents are not yet established for these patients. When possible, these patients should be encouraged to enroll in chemoprevention trials.
- Lung cancer screening using low-dose CT (LDCT) is recommended in select high-risk smokers and former smokers (see the NCCN Guidelines for Lung Cancer Screening).
- See the NCCN Guidelines for Smoking Cessation.

- 1919'da St. Louis'deki Barnes Hastanesi Tıp Bölümü başkanı Dr. George Dock, eğitim hastanesindeki tüm üçüncü ve dördüncü sınıf tıp öğrencilerinden **çok nadir görülen bir hastalığı olan bir adamın otopsisini** gözlemlemelerini istedi. Öğrencilerin çoğunun muhtemelen **kariyerlerinde başka bir vaka görmeyeceklerini** iddia etti



- İçinde bulunduğumuz çağda, en son küresel istatistiksel analiz, 2012 yılında önümüzdeki 6 yıl için tahmin;
  - 1,8 milyon yeni vakanın (2 milyon)
  - 1,6 milyon ölüm (1,76 milyon)

Hangi hastalar opere olabilir

19% were diagnosed while the cancer was still confined to the primary site; 24% were diagnosed after the cancer had spread to regional lymph nodes or directly beyond the primary site; 55% were diagnosed after the cancer had already metastasized; and for the remaining 2% the staging information was unknown. The corresponding 5-year relative survival rates were 61.4% for localized, 34.5% for regional, 6.1% for distant, and 14.6% for unstaged.[3]

- Genel kondisyon
- Rezektable / Küratif
- Seçilmiş oligometastaz
- T1-2-3-4 (N0-1)
- T1-2-T3 non inv N2
    - Neoadjuvan sonrası mediastinal downstage
- Salvage

Akciğer kanserinde TNM

- 1.TNM 1977 Amerikan ortak komitesi

- İlk major revizyon 1997
  - Evre I ve II (IA-B/IIA-B)
  - Satellit nodül T4
  - Farklı lob nodül M1

- 6. TNM 2001
  - Değişiklik yok
  - Cerrahi olgular
  - Sınırlı coğrafya

- 7. TNM 2009
  - T2=3-7 cm
  - T3 >7 cm
  - Satellit nodül T3
  - Farklı lob T4
- PET-CT henüz çok aktif değil
- Coğrafi limitasyon devam ediyor

- 8. TNM 2017
  - 19 ülke 40 merkez
  - Prospektif data eklendi
  - Cerrahi uygulanmayan olgular daha çok temsil edildi

	TNM 7th EDITION	TNM 8th EDITION
T	-	Tis
	-	Tmi
	-	Tss
	T1a (≤2 cm)	T1a (≤1 cm)
	T1b (>2 -3 cm)	
	T2a (>3-5 cm)	
	T2b (>5-7 cm)	
	T3 (>7 cm)	
	T3 - atelectasis/pneumo involving whole lung)	
	T3 tumor involving the bronchus <2cm distance carina	
	T3 -invasion of the diaphragm	T4 (invasion of the diaphragm)
N	No changes	
M	M1b - distant metastasis	M1b - single extrathoracic metastasis M1c - multiple extrathoracic metastases

What is new in the TNM 8th edition

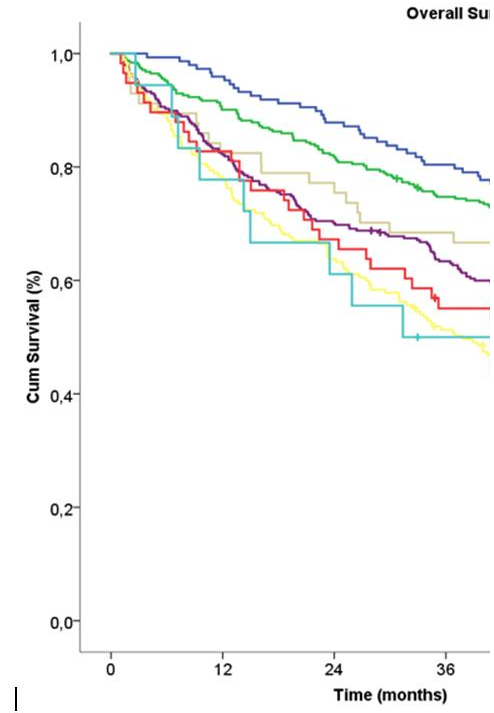
In the new TNM 8th edition the size went down for several T-categories, and some new pathology based categories were introduced.

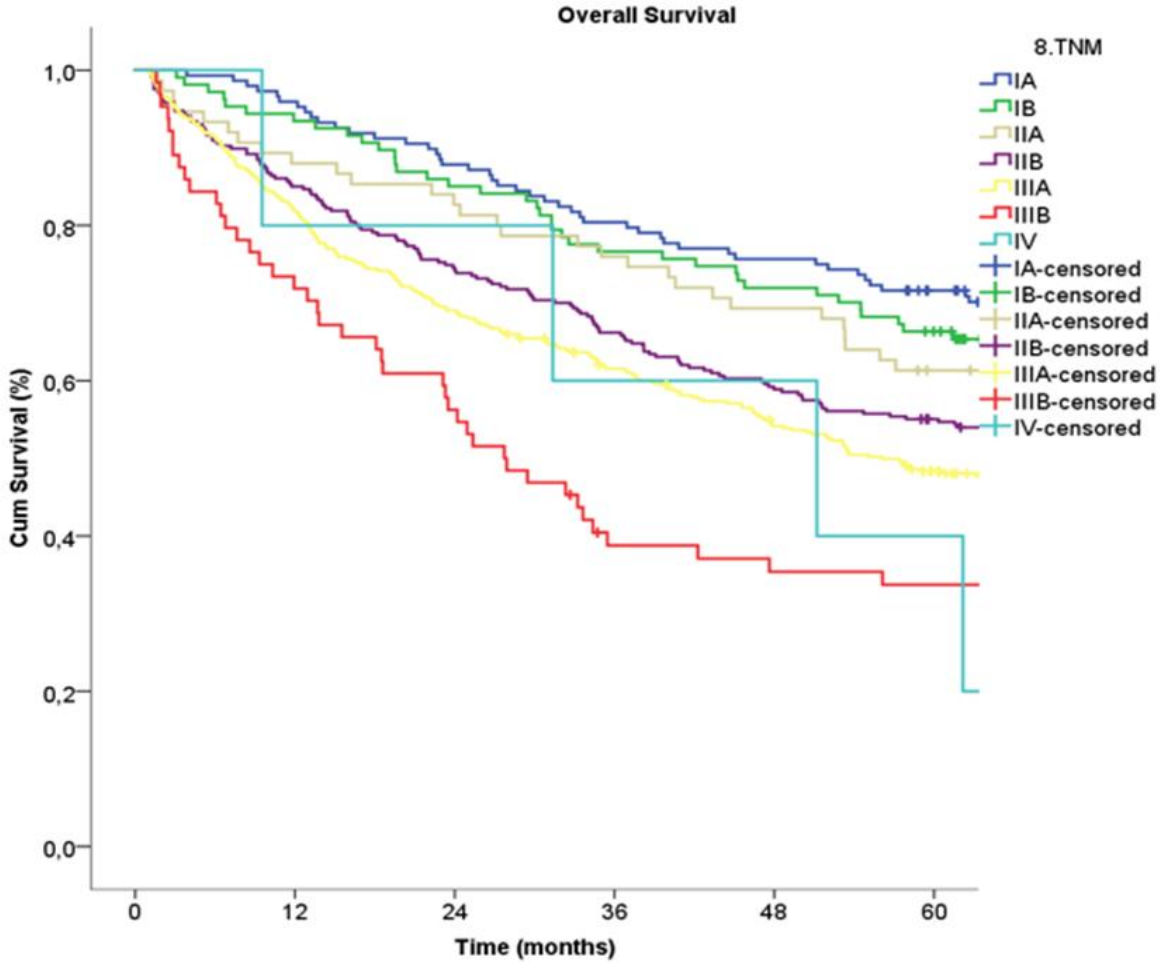
Also, new M-categories were introduced regarding extrathoracic metastatic disease.

Size of a solid lesion is defined as maximum diameter in any of the three orthogonal planes in lung window.
In subsolid lesions T-classification is defined by the diameter of the solid component and not the diameter of the complete groundglass lesion.

TNM 8th - Primary tumor characteristics

T_x	Tumor in sputum/bronchial washings but not be assessed in imaging or bronchoscopy
T_0	No evidence of tumor
T_{is}	Carcinoma in situ
T_1	≤ 3 cm surrounded by lung/visceral pleura, not involving main bronchus
$T_{1a(mi)}$	Minimally invasive carcinoma
T_{1a}	≤ 1 cm
	bronchus without carina, regardless of distance from sceral pleural *or* ostructive pneumonitis extending to hilum
	st dimension *or* t involves chest wall, pericardium, phrenic nerve *or* e same lobe
	nension *or* ion of mediastinum, diaphragm, heart, great vessels, erve, carina, trachea, oesophagus, spine *or* ferent lobe of ipsilateral lung
	ial and/or hilar nodes and intrapulmonary nodes
2	Ipsilateral mediastinal and/or subcarinal nodes
3	Contralateral mediastinal or hilar; ipsilateral/contralateral scalene/ supraclavicular
M_1	Distant metastasis
M_{1a}	Tumor in contralateral lung or pleural/pericardial nodule/malignant effusion
M_{1b}	Single extrathoracic metastasis, including single non-regional lymphnode
M_{1c}	Multiple extrathoracic metastases in one or more organs


Overall Su
1,0
0,8
0,6
0,4
0,2
0,0
Cum Survival (%)
0
12
24
36
Time (months)

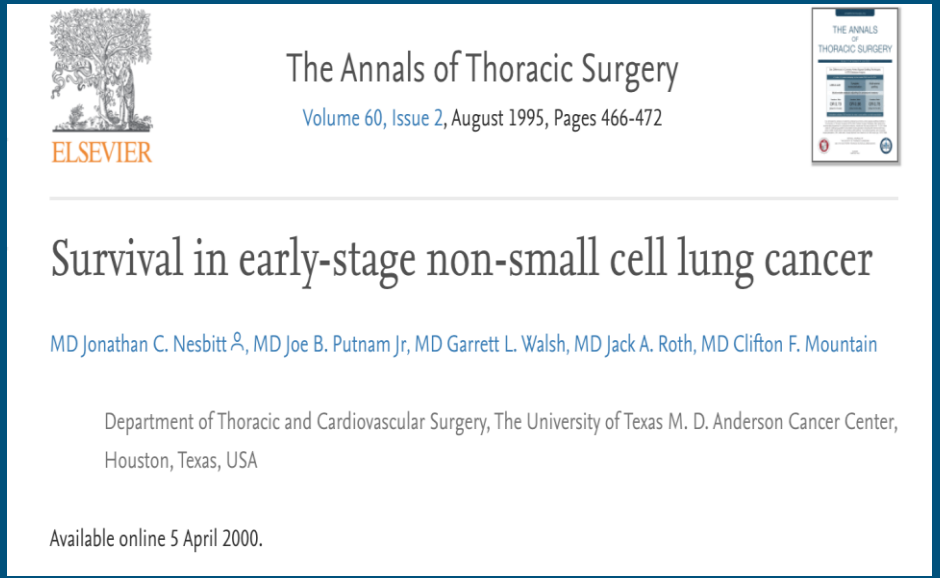

Overall Survival
8.TNM
IA
IB
IIA
IIB
IIIA
IIIB
IV
IA-censored
IB-censored
IIA-censored
IIB-censored
IIIA-censored
IIIB-censored
IV-censored
1,0
0,8
0,6
0,4
0,2
0,0
Cum Survival (%)
0
12
24
36
48
60
Time (months)

Klinik Evre

- Preoperatif dönem
  - Radyolojik
    - PET-CT / CT
  - İnvaziv - minimal invaziv
    - EBUS/EUS
    - Mdx

Patolojik Evre

- Postoperatif dönem
  - Piyesin detaylı incelenmesi



The Annals of Thoracic Surgery
Volume 60, Issue 2, August 1995, Pages 466-472

Survival in early-stage non-small cell lung cancer

MD Jonathan C. Nesbitt, MD Joe B. Putnam Jr, MD Garrett L. Walsh, MD Jack A. Roth, MD Clifton F. Mountain

Department of Thoracic and Cardiovascular Surgery, The University of Texas M. D. Anderson Cancer Center, Houston, Texas, USA

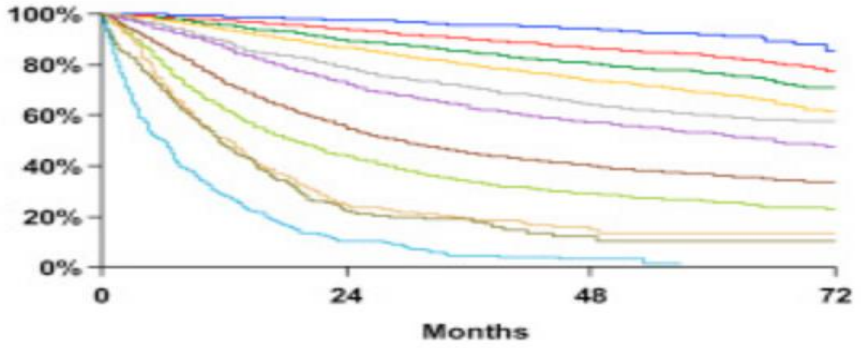
Available online 5 April 2000.

- **1995**
  - Overall survival

    p EVRE I %64.6 (%55 - %72)

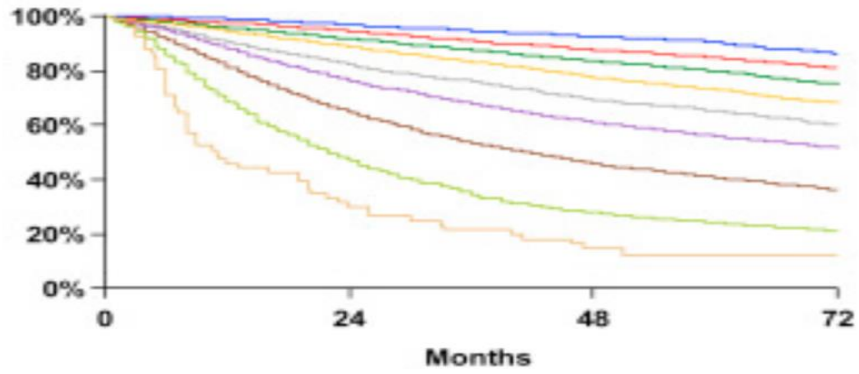
    p EVRE II %41.2 (29% - %51)

Klinik Evre



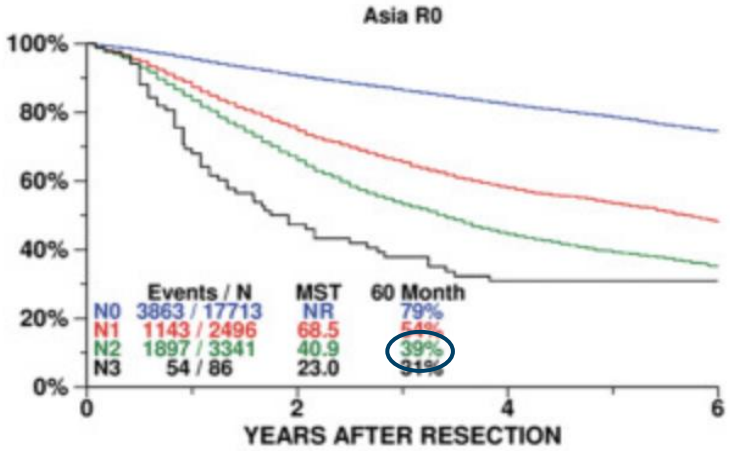
Proposed	Events / N	MST	24 Month	60 Month
IA1	68 / 781	NR	97%	92%
IA2	505 / 3105	NR	94%	83%
IA3	546 / 2417	NR	90%	77%
IB	560 / 1928	NR	87%	68%
IIA	215 / 585	NR	79%	60%
IIB	605 / 1453	66.0	72%	53%
IIIA	2052 / 3200	29.3	55%	36%
IIIB	1551 / 2140	19.0	44%	26%
IIIC	831 / 986	12.6	24%	13%
IVA	336 / 484	11.5	23%	10%
IVB	328 / 398	6.0	10%	0%

Patolojik Evre

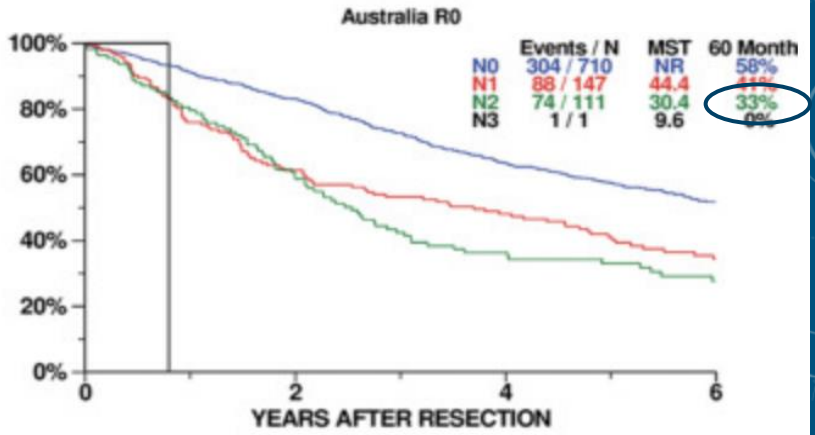


Proposed	Events / N	MST	24 Month	60 Month
IA1	139 / 1389	NR	97%	90%
IA2	823 / 5633	NR	94%	85%
IA3	875 / 4401	NR	92%	80%
IB	1618 / 6095	NR	89%	73%
IIA	556 / 1638	NR	82%	65%
IIB	2175 / 5226	NR	76%	56%
IIIA	3219 / 5756	41.9	65%	41%
IIIB	1215 / 1729	22.0	47%	24%
IIIC	55 / 69	11.0	30%	12%

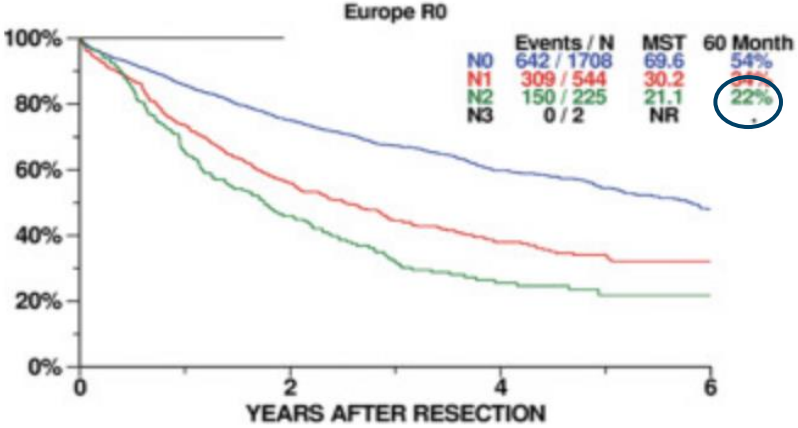
Asia



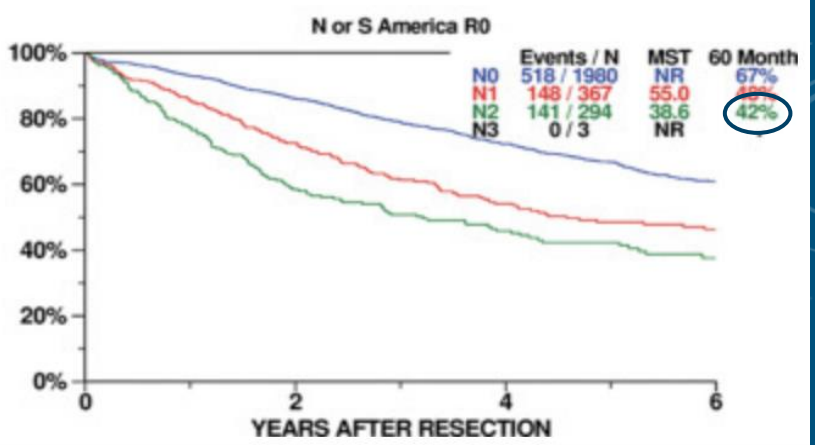
Australia

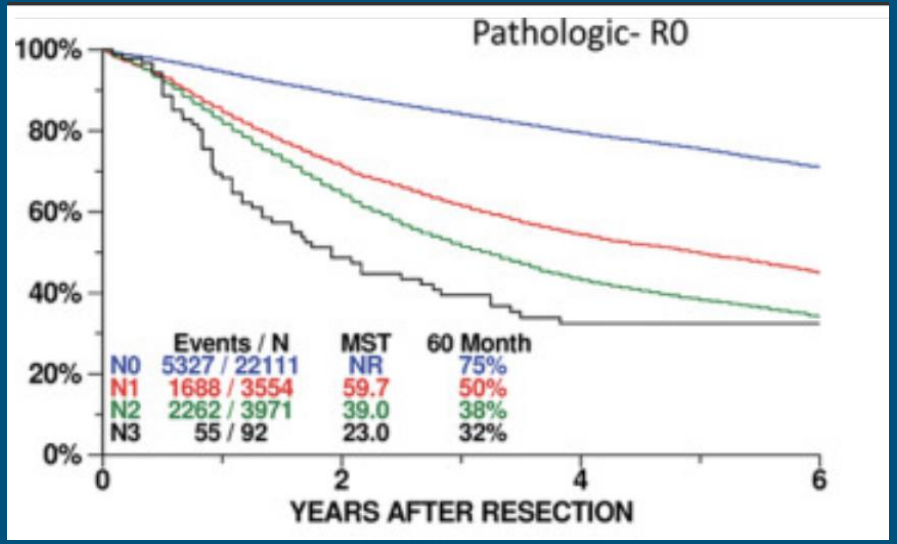


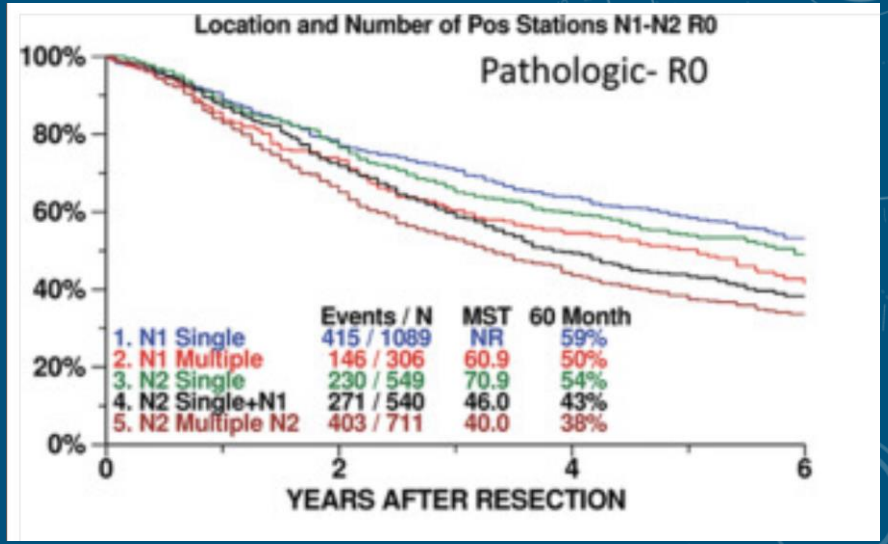
Europe



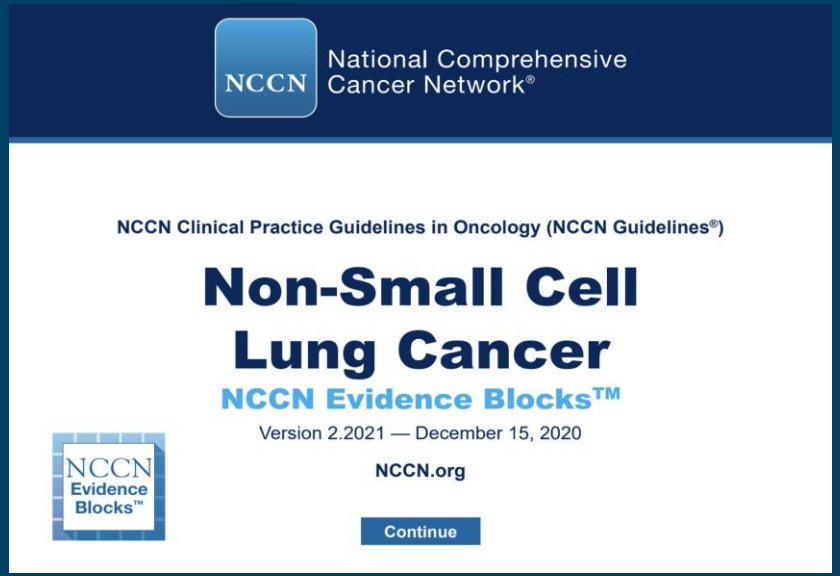
North/South America




Pathologic- R0
100%
80%
60%
40%
20%
0%
Events / N
MST
60 Month
N0 5327 / 22111 NR 75%
N1 1688 / 3554 59.7 50%
N2 2262 / 3971 39.0 38%
N3 55 / 92 23.0 32%
0
2
4
6
YEARS AFTER RESECTION


Location and Number of Pos Stations N1-N2 R0
Pathologic- R0
100%
80%
60%
40%
20%
0%
Events / N
MST
60 Month
1. N1 Single 415 / 1089 NR 59%
2. N1 Multiple 146 / 306 60.9 50%
3. N2 Single 230 / 549 70.9 54%
4. N2 Single+N1 271 / 540 46.0 43%
5. N2 Multiple N2 403 / 711 40.0 38%
0
2
4
6
YEARS AFTER RESECTION

Ulusal Kapsamlı Kanser Ağı® (NCCN®), hasta bakımı, araştırma ve eğitime ayrılmış 32 önde gelen kanser merkezinden oluşan kar amacı gütmeyen bir ittifaktır



Tanı ve tedavideki gelişmeler

- 2001 PET-CT, CT den daha sensitif. Ancak henüz rutin evreleme ve tanıda kullanımı için çok erken

- 2010 önerisi
  - EBUS-EUS evreleme girişimlerine eklenmeli

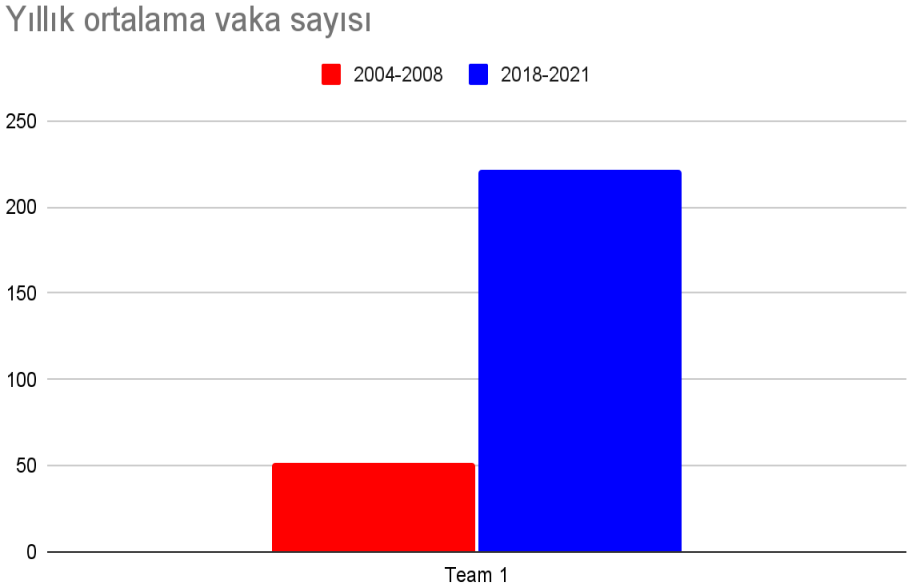
- >4 cm adjuvan tedavi
  - Çalışma sonucuna göre CALGB 9633

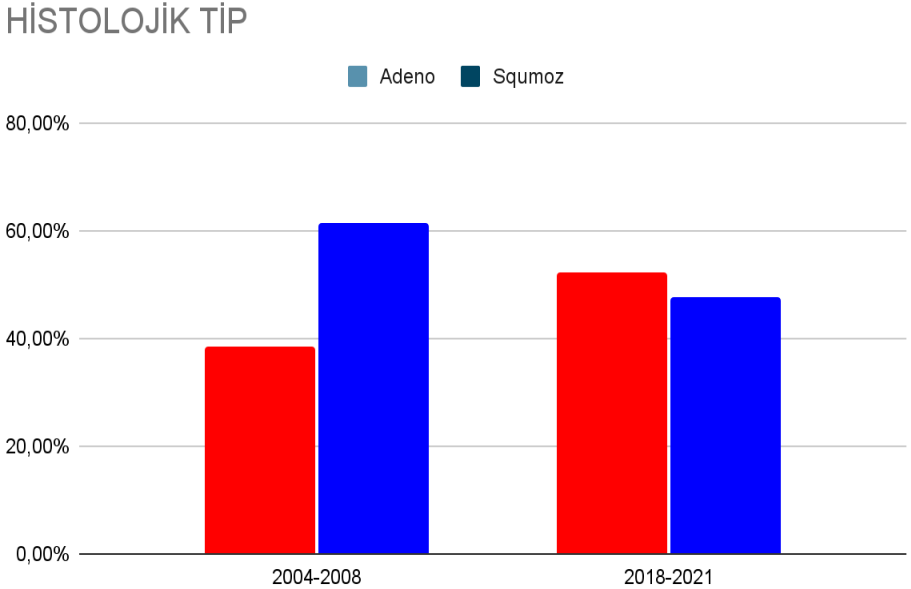
- N2 olgularda
  - KT+ Mediastinal RT yerine KT+/- Mediastinal RT önerisi

- PORT multiple N2, ekstrakapsüler N2, yetersiz/uygunsuz LN diseksiyonu

52/yıl - 221/yıl

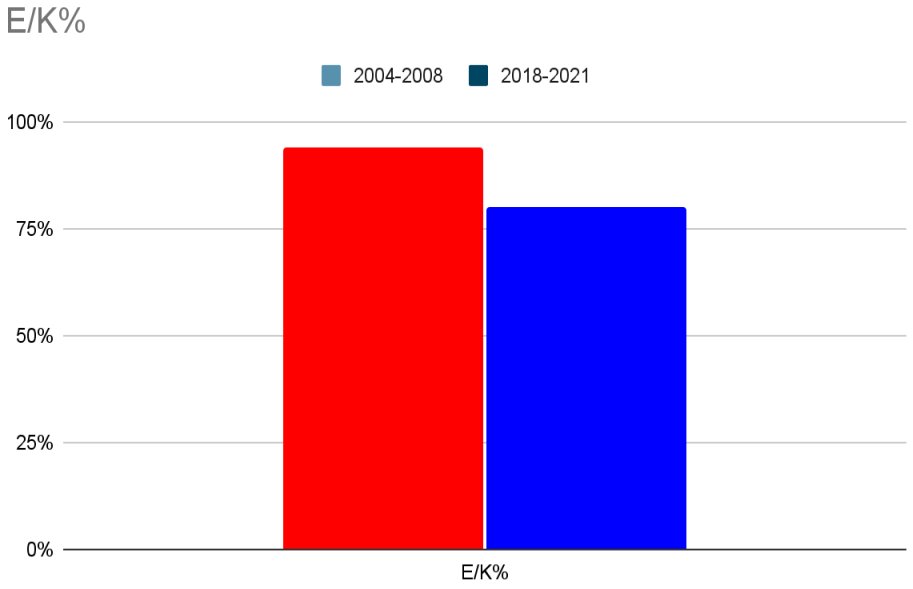
%38 A - %52 A

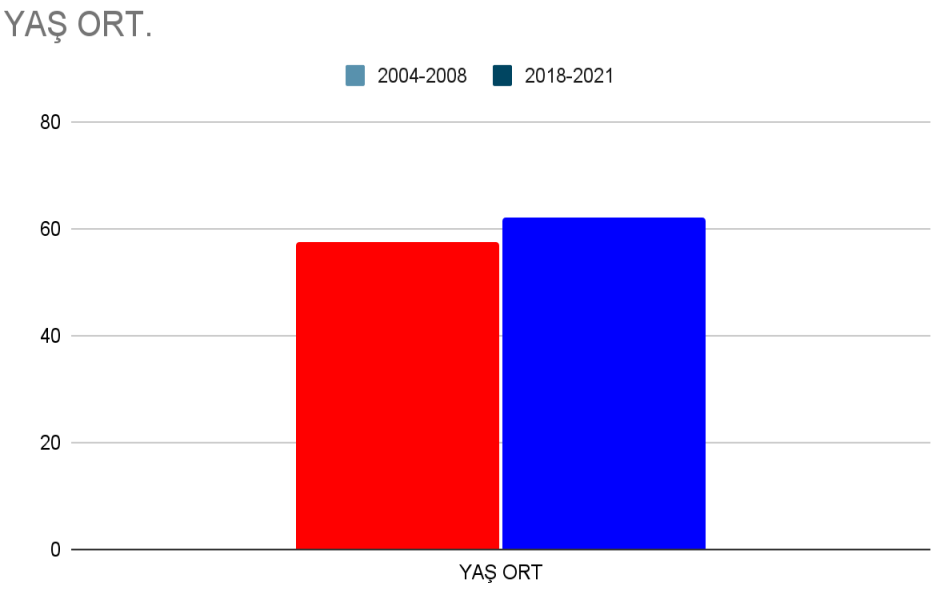




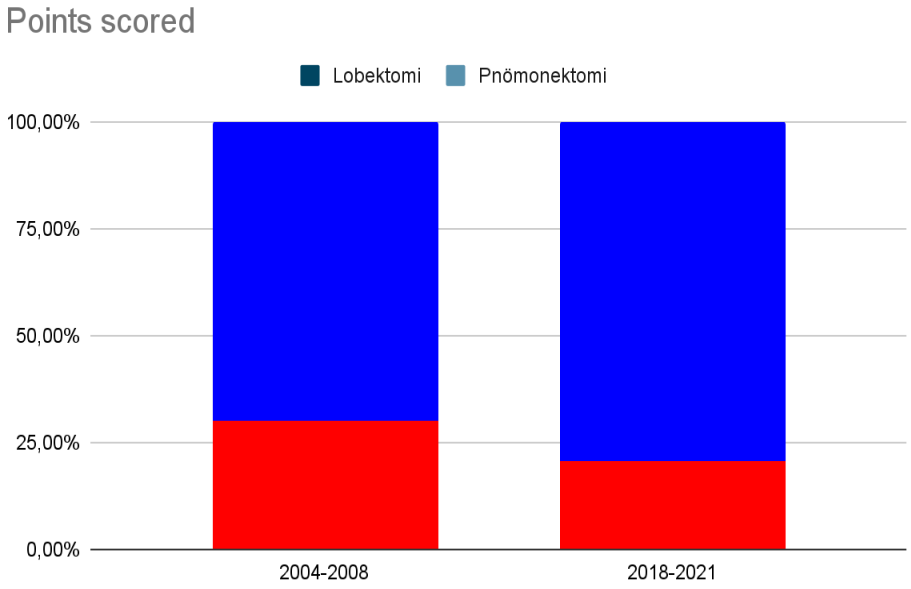
%94 - %80

57 Yaş - 62 Yaş



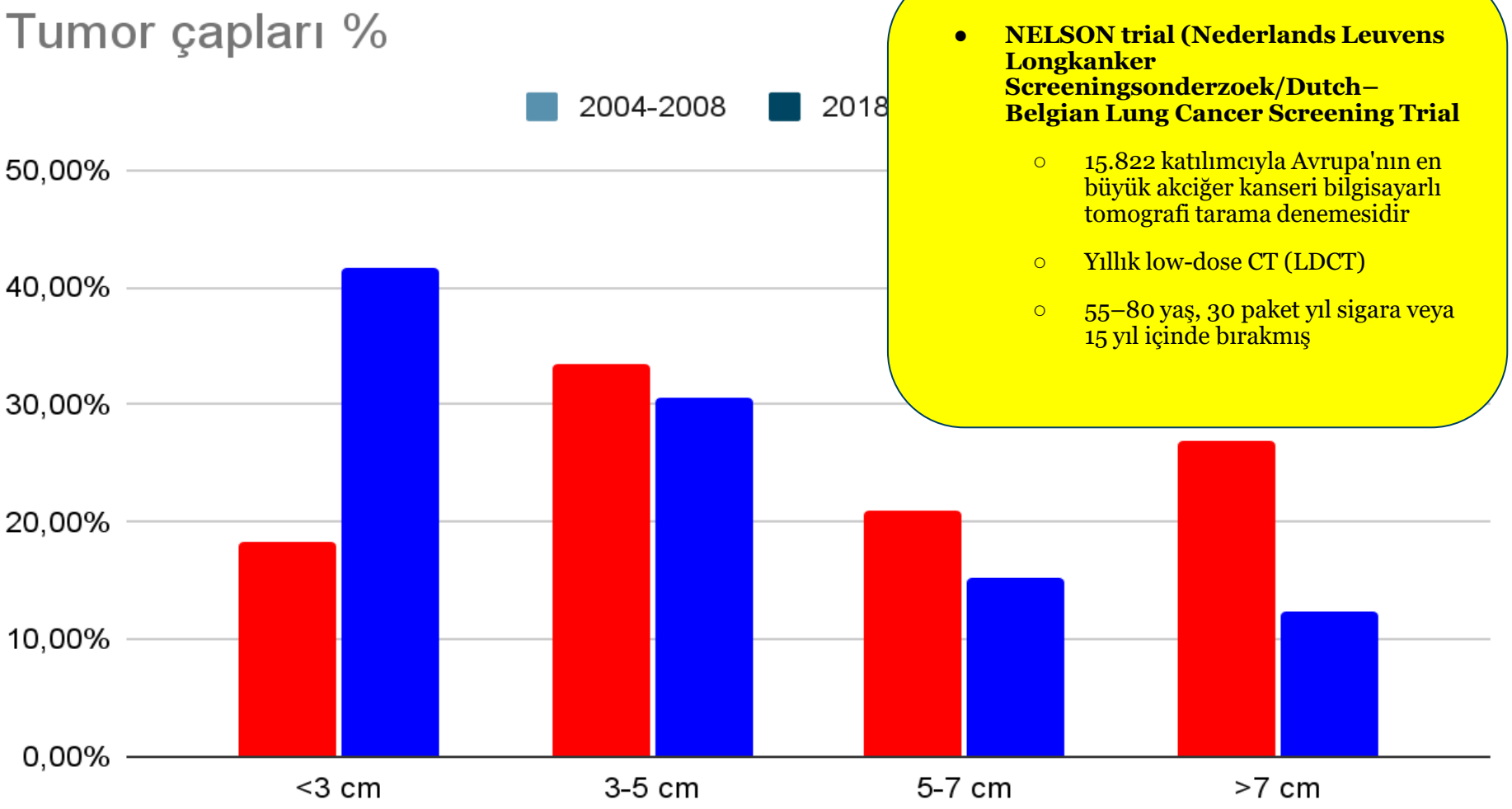


%30 - %20


Points scored
Lobektomi
Pnömonektomi
100,00%
75,00%
50,00%
25,00%
0,00%
2004-2008
2018-2021

%27 - %24

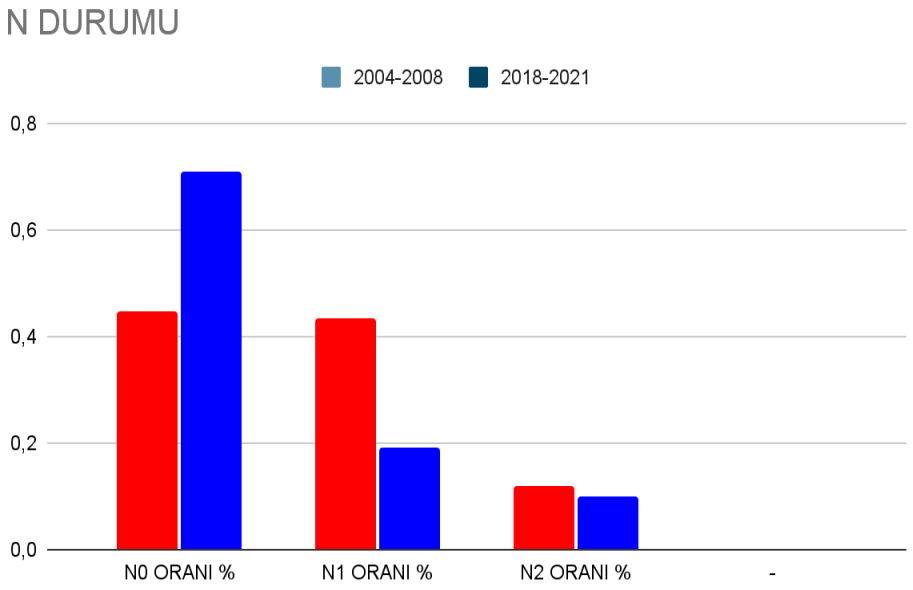

Points scored
Pnömonektomi
Sleeve L
80,00%
60,00%
40,00%
20,00%
0,00%
2004-2008
2018-2021

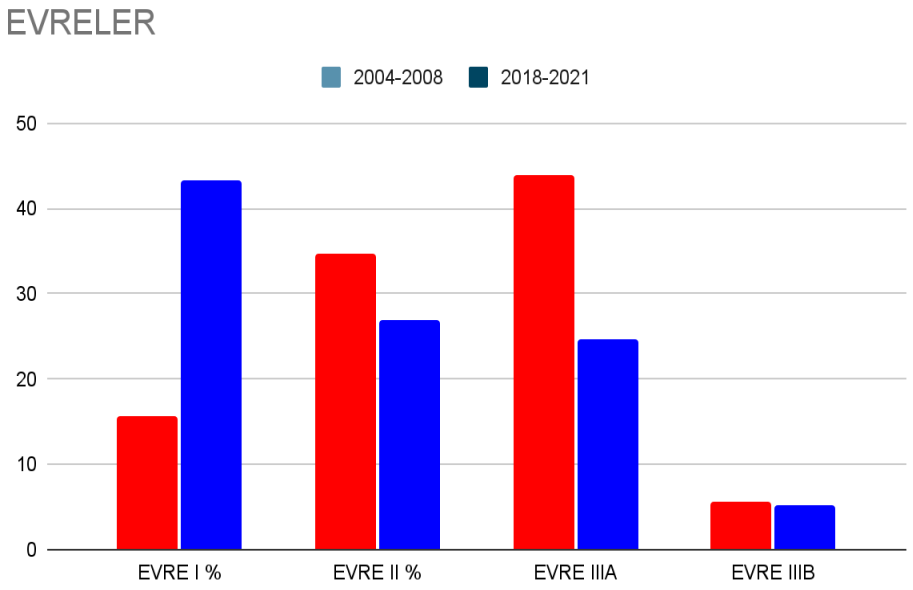


- **NELSON trial (Nederlands Leuvens Longkanker Screeningsonderzoek/Dutch–Belgian Lung Cancer Screening Trial**
  - 15.822 katılımcıyla Avrupa'nın en büyük akciğer kanseri bilgisayarlı tomografi tarama denemesidir
  - Yıllık low-dose CT (LDCT)
  - 55–80 yaş, 30 paket yıl sigara veya 15 yıl içinde bırakmış

N0 (%44-%70)-N1 (%43-%19)-N2 (%12-%10)

I (%15-%43) - II (%35-%27) - IIIA (%44-%25)

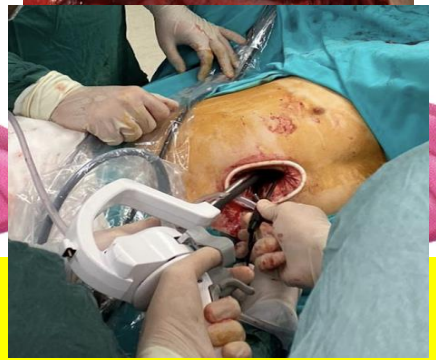


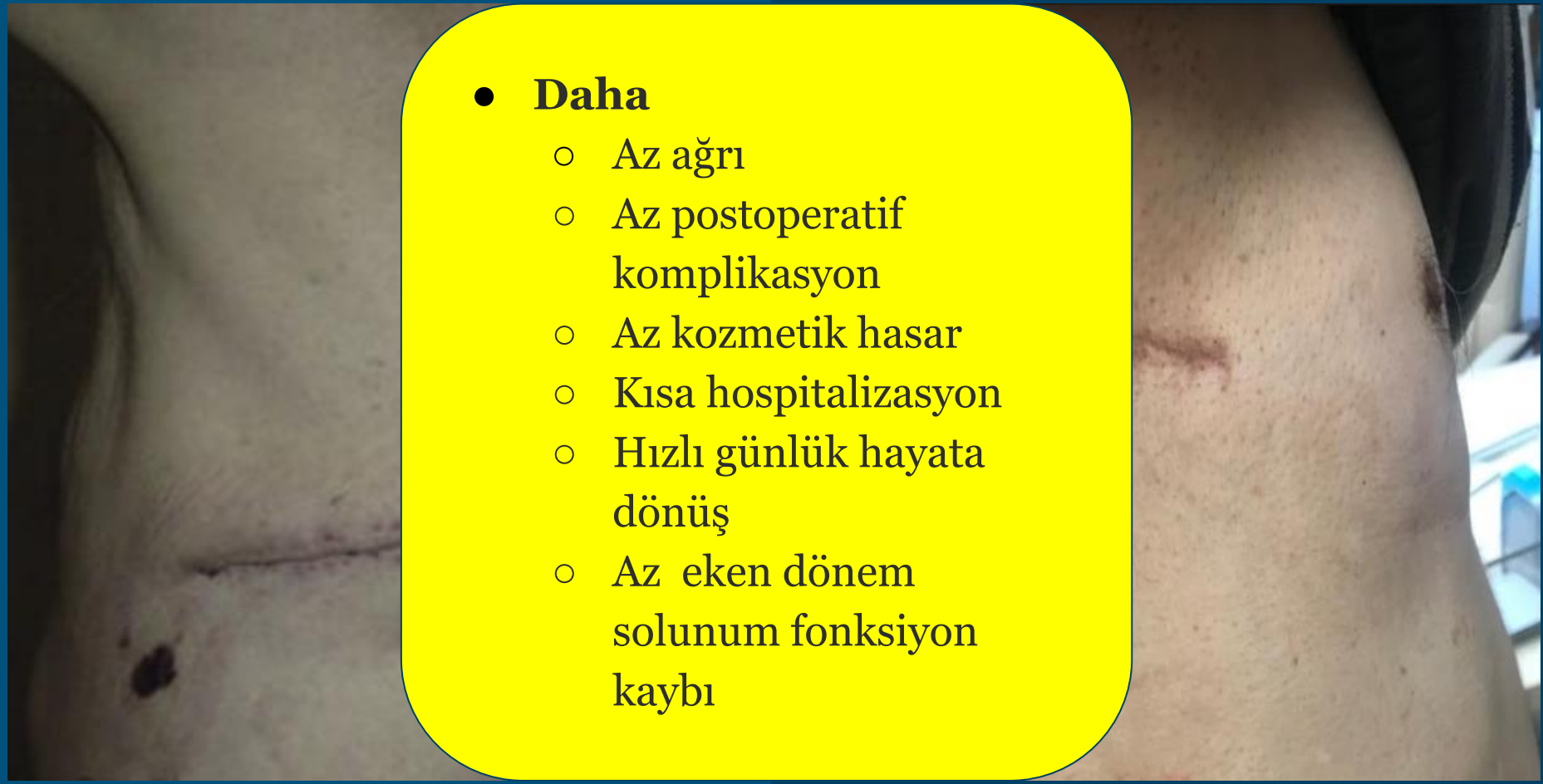


- Operable vaka sayıları hızla artıyor
- Ka
- Tü
kü
- Ad
art

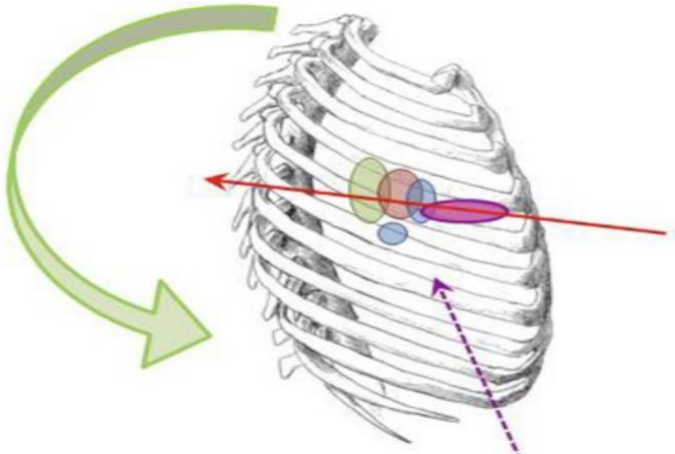
D

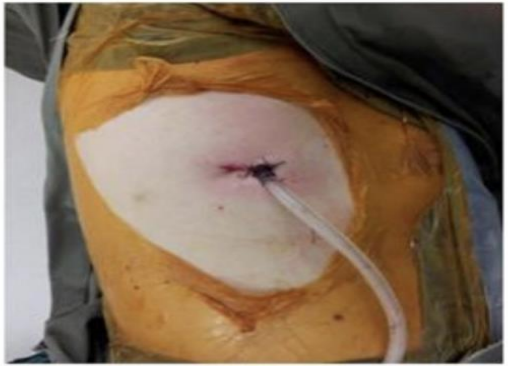




- **Daha**
  - Az ağrı
  - Az postoperatif komplikasyon
  - Az kozmetik hasar
  - Kısa hospitalizasyon
  - Hızlı günlük hayata dönüş
  - Az eken dönem solunum fonksiyon kaybı


(camera port
eliminated)



Case Reports > Interact Cardiovasc Thorac Surg. 2011 Mar;12(3):514-5.
doi: 10.1510/icvts.2010.256222. Epub 2010 Dec 5.

Single-port video-assisted thoracoscopic lobectomy

Diego Gonzalez [1], Marina Paradela, Jose Garcia, Mercedes Dela Torre

Affiliations — collapse

Affiliation

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Abstract

The video-assisted thoracoscopic surgery (VATS) approach to lobectomy for non-small cell lung cancer varies among hospitals. Although three to four incisions are usually made, the operation may be successfully carried out using only two incisions with similar results. We observed that for lower lobes the second incision could be eliminated in selected cases. We describe a case report of a 74-year-old female operated by a single-port approach for a lower-lobe VATS lobectomy.

› Ann Thorac Surg. 2013 Feb;95(2):426-32. doi: 10.1016/j.athoracsur.2012.10.070. Epub 2012 Dec 5.

Uniportal video-assisted thoracoscopic lobectomy: two years of experience

Diego Gonzalez-Rivas [1], Marina Paradela, Ricardo Fernandez, Maria Delgado, Eva Fieira, Lucía Mendez, Carlos Velasco, Mercedes de la Torre

Background: A video-assisted thoracoscopic approach to lobectomy varies among surgeons. Typically, 3 to 4 incisions are made. Our approach has evolved from a 3-port to a 2-port approach to a single 4- to 5-cm incision with no rib spreading. We report results with single-incision video-assisted thoracic major pulmonary resections during our first 2 years of experience.

Methods: In June 2010, we began performing video-assisted thoracoscopic lobectomies through a uniportal approach (no rib spreading). By July 12, 2012, 102 patients had undergone this single-incision approach.

Results: Of 102 attempted major resections, 97 were successfully completed with a single incision (operations in 3 patients were converted to open surgery and 2 patients needed 1 additi incision). Five uniportal pneumonectomies were not included in the study. We

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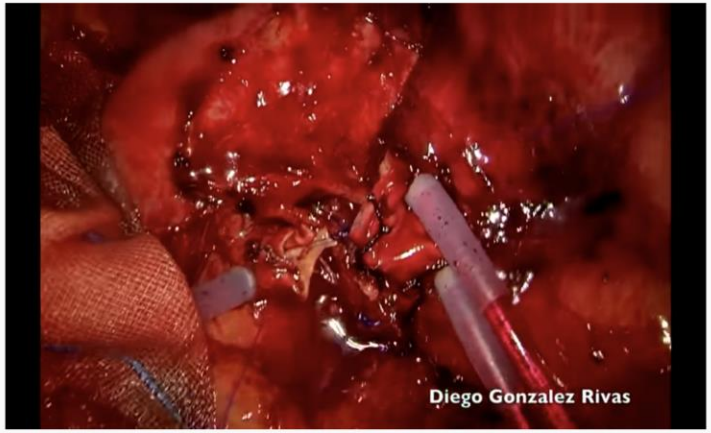


Uniportal VATS vascular anastomosis during double sleeve

Eur J Cardiothorac Surg. 2020 Aug 1;58(Suppl_1):i14-i22. doi: 10.1093/ejcts/ezaa037.

Technical aspects of uniportal video-assisted thoracoscopic double sleeve bronchovascular resections

Diego Gonzalez-Rivas [1,2], Alejandro Garcia [2], Chang Chen [1], Yang Yang [1], Lei Jiang [1], Dmitrii Sekhniaidze [3], Gening Jiang [1], Yuming Zhu [1]

Affiliations + expand

PMID: 32083654 DOI: 10.1093/ejcts/ezaa037

Review Eur J Cardiothorac Surg. 2016 Jan;49 Suppl 1:i6-16. doi: 10.1093/ejcts/ezv410. Epub 2015 Nov 25.

Uniportal video-assisted thoracoscopic bronchovascular, tracheal and carinal sleeve resections†

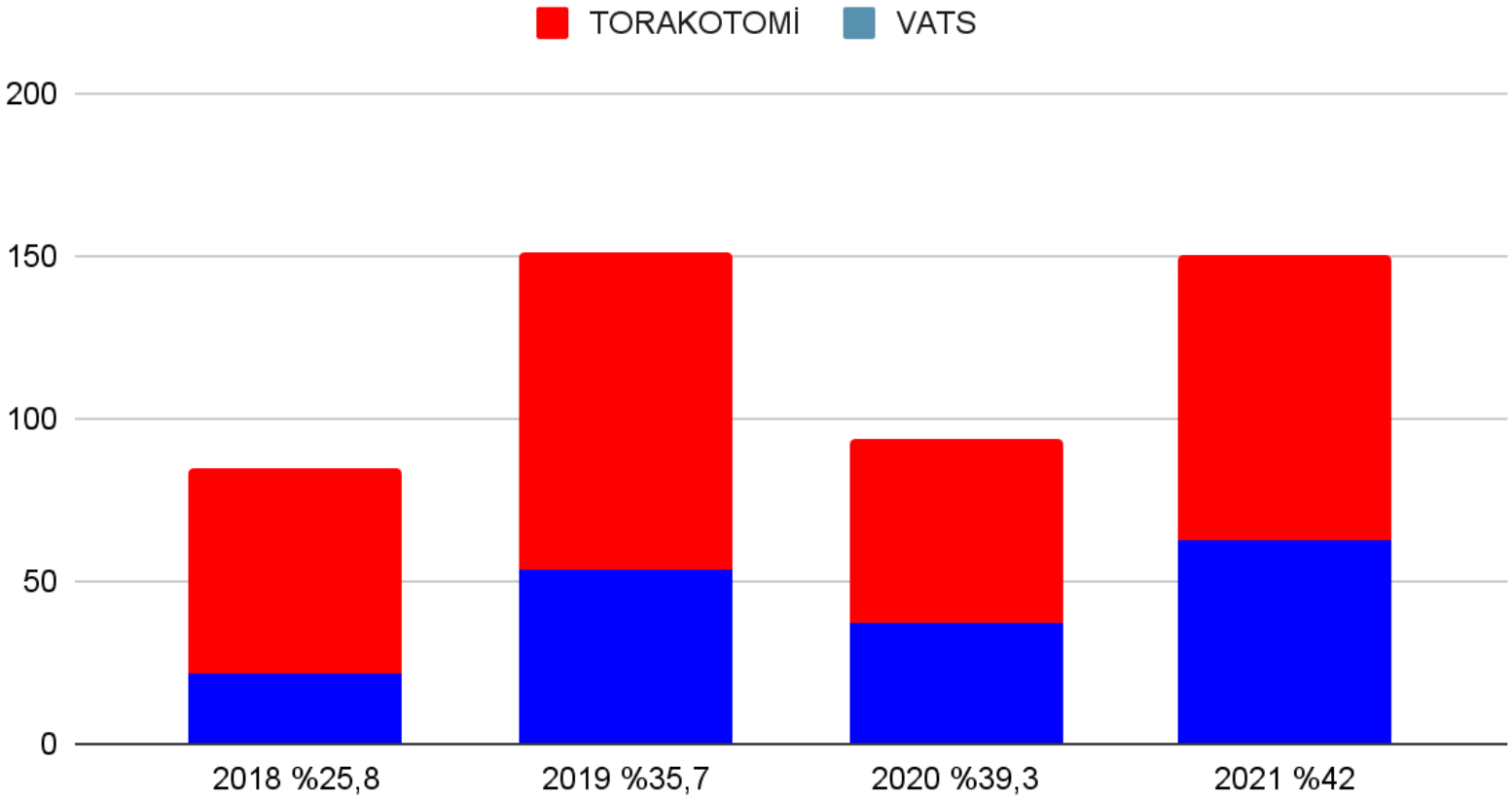
Diego Gonzalez-Rivas [1], Yang Yang [2], Tomaz Stupnik [3], Dmitrii Sekhniaidze [4], Ricardo Fernandez [5], Carlos Velasco [6], Yuming Zhu [2], Gening Jiang [2]

Affiliations + expand

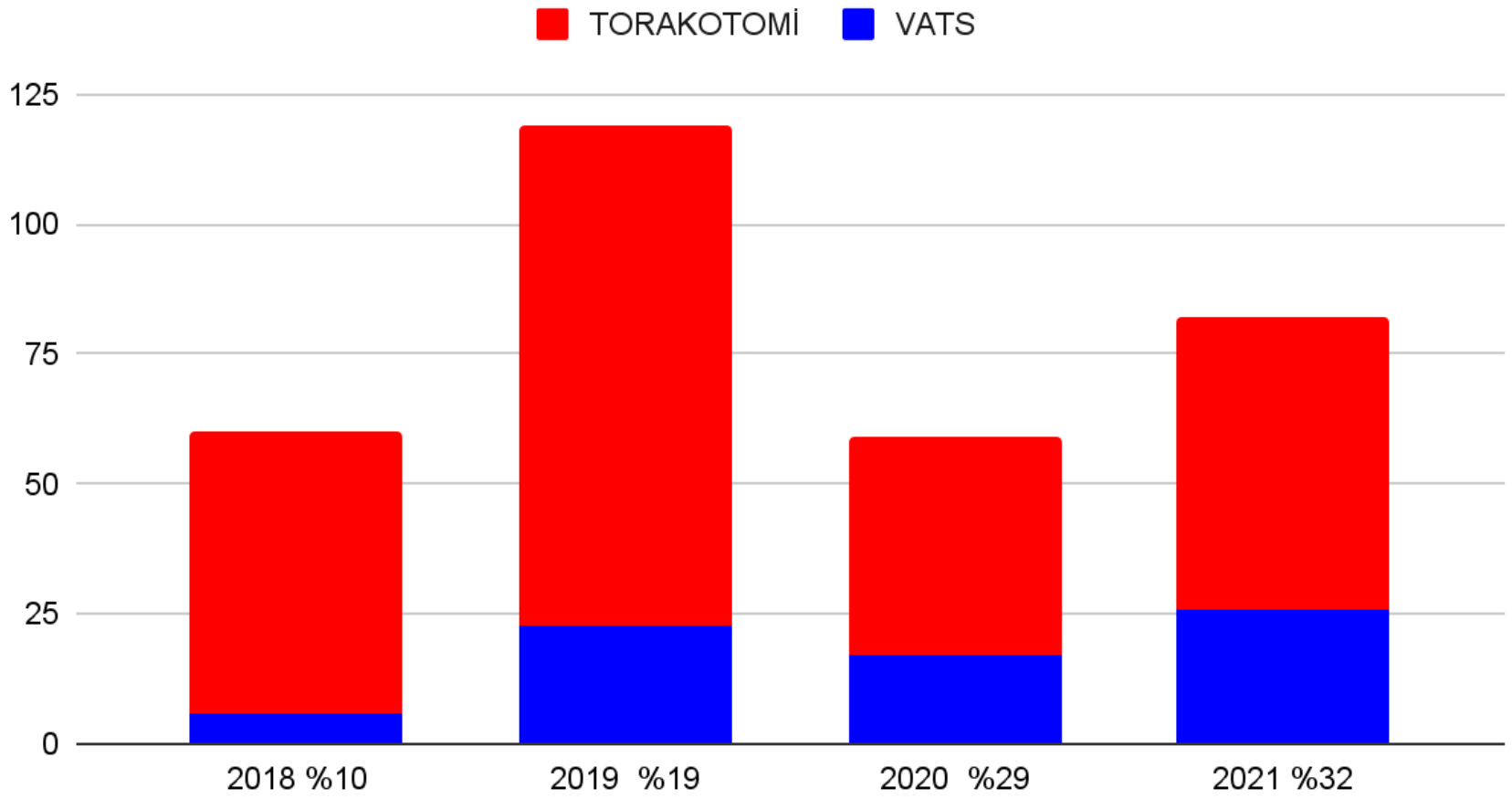
PMID: 26609055 DOI: 10.1093/ejcts/ezv410

Abstract

0-3 cm VATS Tercihleri



3-5 cm VATS Tercihleri



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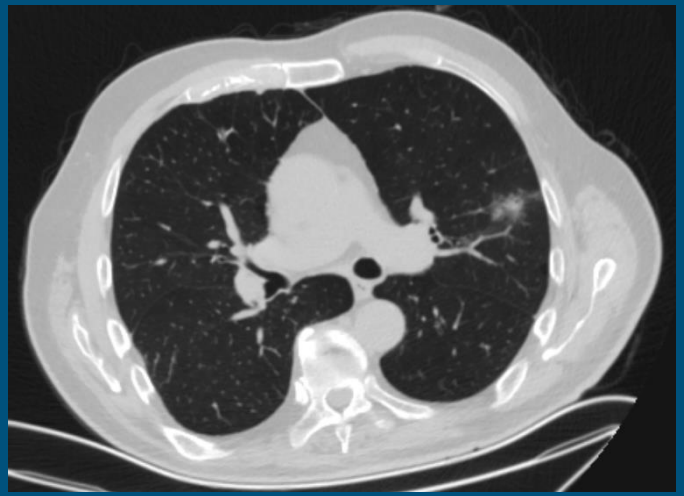
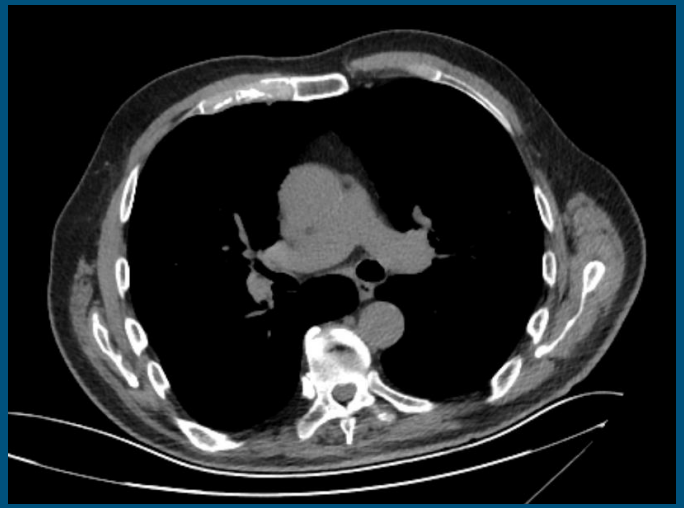
PRINCIPLES OF DIAGNOSTIC EVALUATION

- Patients with a strong clinical suspicion of stage I or II lung cancer (based on risk factors and radiologic appearance) do not require a biopsy before surgery.
  - A biopsy adds time, costs, and procedural risk and may not be needed for treatment decisions.
  - A preoperative biopsy may be appropriate if a non-lung cancer diagnosis is strongly suspected that can be diagnosed by core biopsy or fine-needle aspiration (FNA).
  - A preoperative biopsy may be appropriate if an intraoperative diagnosis appears difficult or very risky.[1]
  - If a preoperative tissue diagnosis has not been obtained, then an intraoperative diagnosis (ie, wedge resection, needle biopsy) is necessary before lobectomy, bilobectomy, or pneumonectomy.[1]
- Bronchoscopy should preferably be performed during the planned surgical resection, rather than as a separate procedure.
  - Bronchoscopy is required before surgical resection (see NSCL-2).
  - A separate bronchoscopy may not be needed for treatment decisions before the time of surgery and adds time, costs, and procedural risk.
  - A preoperative bronchoscopy may be appropriate if a central tumor requires pre-resection evaluation for biopsy, surgical planning (eg, potential sleeve resection), or preoperative airway preparation (eg, coring out an obstructive lesion).
- Invasive mediastinal staging is recommended before surgical resection for most patients with clinical stage I or II lung cancer (see NSCL-2).
  - Patients should preferably undergo invasive mediastinal staging (mediastinoscopy) as the initial step before the planned resection (during the same anesthetic procedure), rather than as a separate procedure. For patients undergoing endobronchial ultrasound (EBUS)/ endoscopic ultrasound (EUS) staging, this may require a separate procedure to allow evaluation if onsite rapid cytology interpretation is not available.
  - A separate staging procedure adds time, costs, coordination of care, inconvenience, and an additional anesthetic risk.
  - Preoperative invasive mediastinal staging may be appropriate for a strong clinical suspicion of N2 or N3 nodal disease or when intraoperative cytology or frozen section analysis is not available.

- 0-3 cm lezyon
  - 152 tanısız operasyon %50
  - 152 preop tanı var %50

- SPN 457 OLGU
  - 266 Malign %58
    - Primer ca
    - Metastaz





Solid and subsolid nodules are the 2 main types of pulmonary nodules that may be seen on chest CT scans. The Fleischner Society has recommendations for patients with solid and subsolid nodules.[67,68] Subsolid nodules include 1) nonsolid nodules also known as ground-glass opacities (GGOs) or ground-glass nodules (GGNs); and 2) part-solid nodules, which contain both ground-glass and solid components.[68,71-73] Nonsolid nodules are mainly adenocarcinoma in situ (AIS) or minimally invasive adenocarcinoma (MIA), formerly known as bronchioloalveolar carcinoma (BAC) (see *Adenocarcinoma* in this Discussion); patients have 5-year disease-free survival of 100% if these nonsolid nodules are completely resected.[61,68,71,72,74-76] Data suggest that many nonsolid nodules discovered incidentally on CT imaging will resolve and many of those that

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  - A separate staging procedure adds time, costs, coordination of care, inconvenience, and an additional anesthetic risk.
  - Preoperative invasive mediastinal staging may be appropriate for a strong clinical suspicion of N2 or N3 nodal disease or when intraoperative cytology or frozen section analysis is not available.

Review > Transl Lung Cancer Res. 2014 Aug;3(4):225-33.
doi: 10.3978/j.issn.2218-6751.2014.08.05.

Preoperative mediastinal lymph node staging for non-small cell lung cancer: 2014 update of the 2007 ESTS guidelines

Paul De Leyn [1], Christophe Dooms [1], Jaroslaw Kuzdzal [1], Didier Lardinois [1], Bernward Passlick [1], Ramon Rami-Porta [1], Akif Turna [1], Paul Van Schil [1], Frederico Venuta [1], David Waller [1], Walter Weder [1], Marcin Zielinski [1]

Affiliations + expand

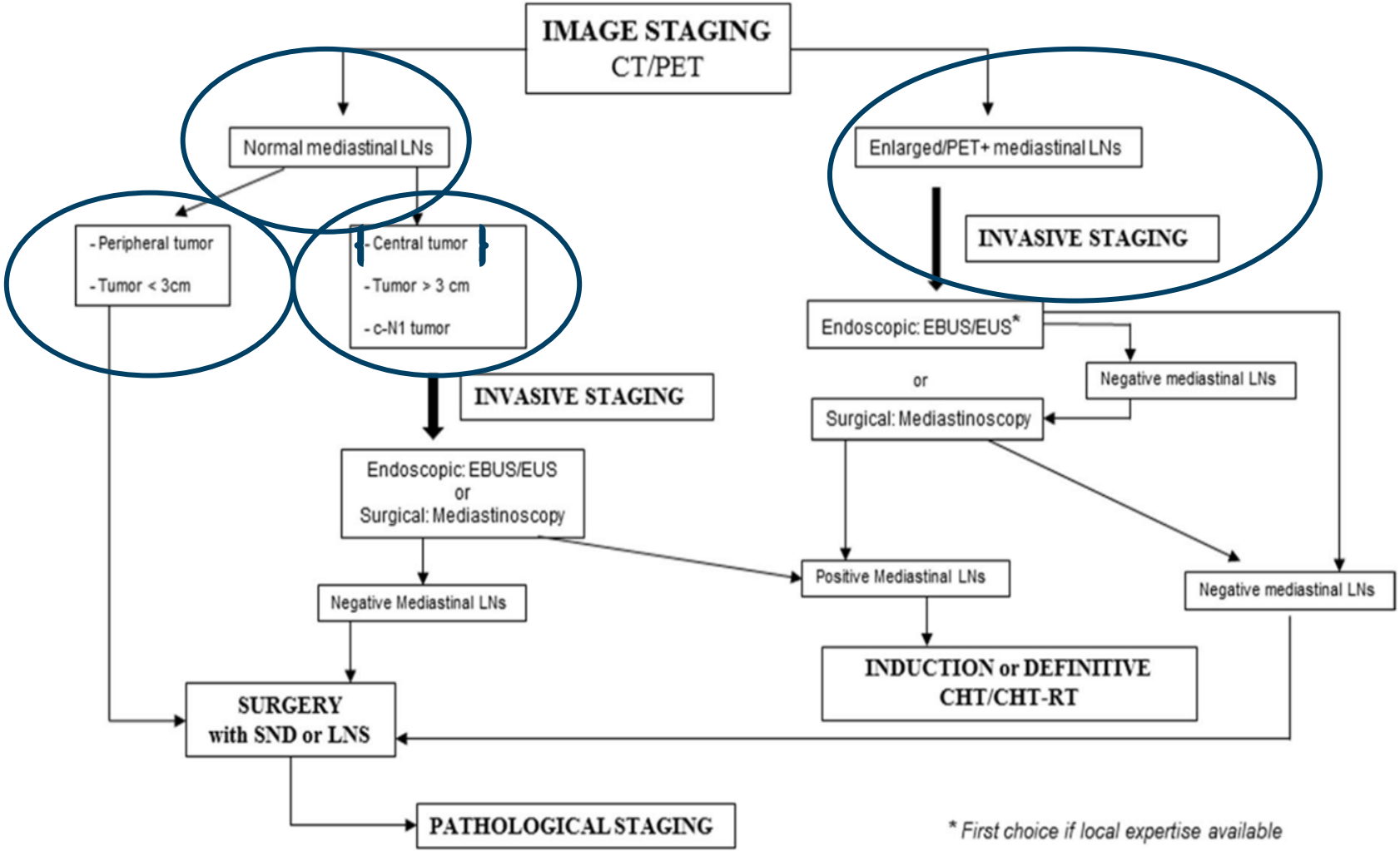


IMAGE STAGING
CT/PET
Normal mediastinal LNs
- Peripheral tumor
- Tumor < 3cm
- Central tumor
- Tumor > 3 cm
- c-N1 tumor
INVASIVE STAGING
Endoscopic: EBUS/EUS
or
Surgical: Mediastinoscopy
Negative Mediastinal LNs
Positive Mediastinal LNs
SURGERY
with SND or LNS
PATHOLOGICAL STAGING
Enlarged/PET+ mediastinal LNs
INVASIVE STAGING
Endoscopic: EBUS/EUS*
or
Surgical: Mediastinoscopy
Negative mediastinal LNs
Negative mediastinal LNs
INDUCTION or DEFINITIVE
CHT/CHT-RT
* First choice if local expertise available

Annals of the American Thoracic Society

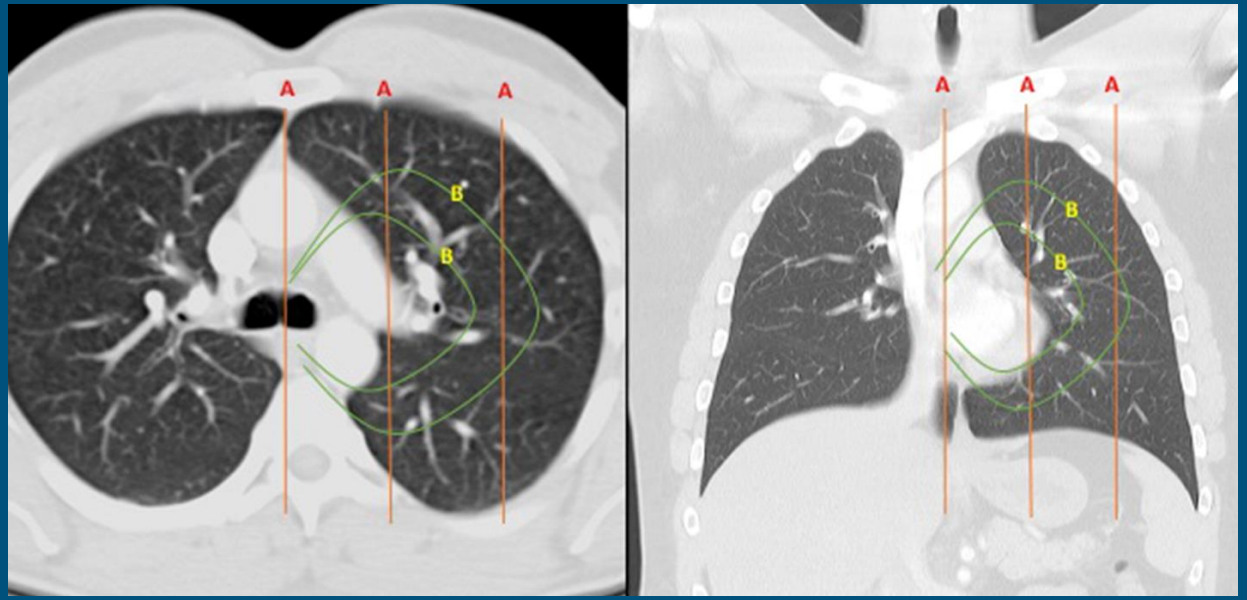
What Exactly Is a Centrally Located Lung Tumor? Results of an Online Survey

Roberto F. Casal [1], **Macarena R. Vial** [2], **Russell Miller** [3], **Lakshmi Mudambi** [1], **Horiana B. Grosu** [1], **George A. Eapen** [1], **Carlos A. Jimenez** [1], **Rodolfo C. Morice** [1], **Lorraine Cornwell** [4], and **David Ost** [1]

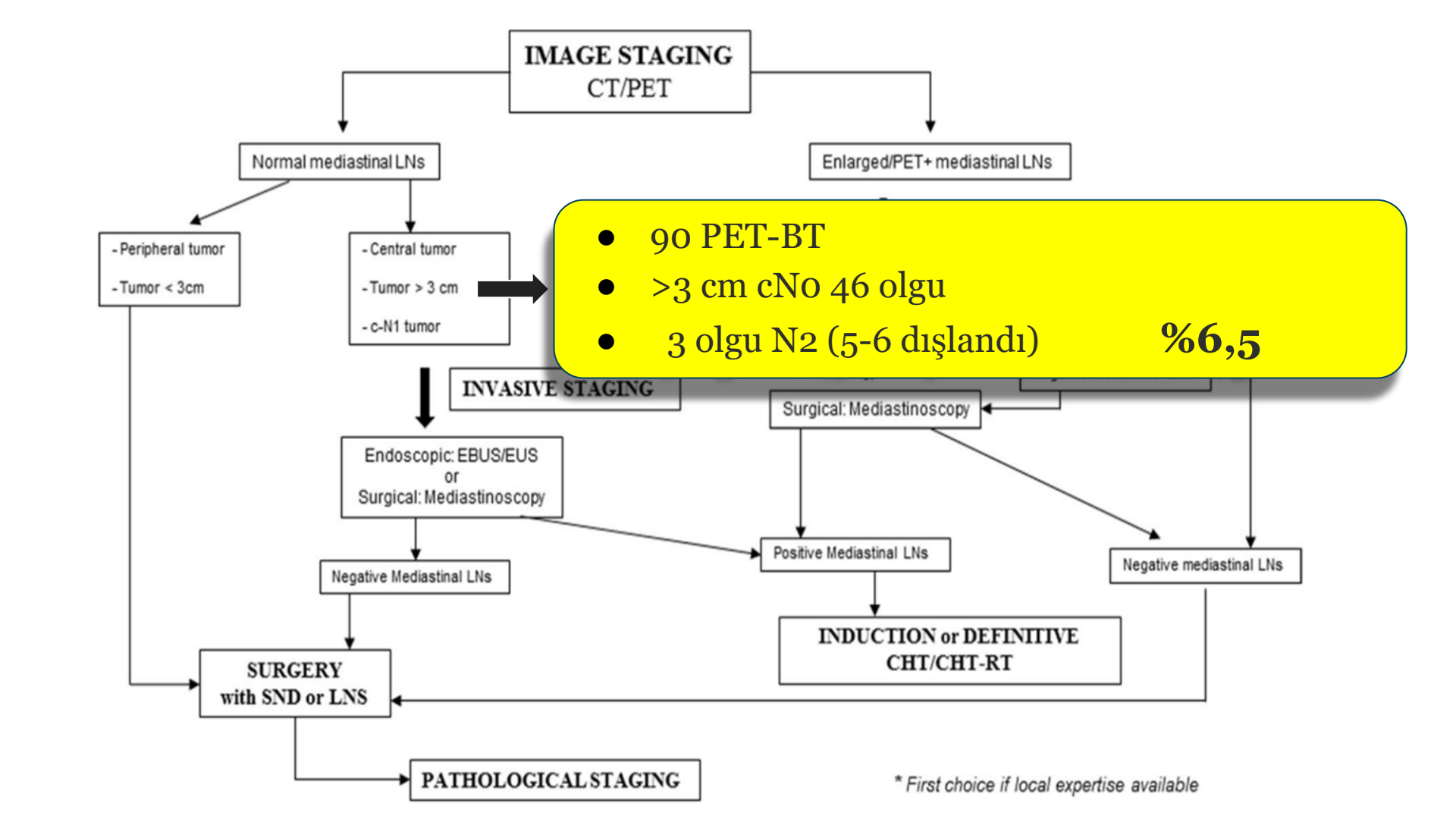
+ Author Affiliations

The total number of participants was 218. The response rate was 23% (130/556) for AABIP members, and 7% (88/1,193) for CTS Net members, with 95% of all respondents practicing within the United States.

With regard to the definition of central lung tumors, 119 (55%) participants chose the inner one-third of the hemithorax, 63 (29%) chose tumors in contact with hilar structures, 33 (15%) chose the inner two-thirds of the hemithorax, and 3 (1%) chose “other definitions.” Responses to all questions are summarized in Table 2.



It is important to be aware that there are other definitions of central/peripheral lung tumors that were created with different purposes, unrelated to the prevalence of occult mediastinal disease. The most popular definition is likely the one created by radiation oncologists, who define central tumors as those located within 2 cm of the proximal bronchial tree, heart, great vessels, trachea, or other mediastinal structures (12, 13). This definition was developed to evaluate the safety of stereotactic body radiation therapy in central versus peripheral tumors, and it is commonly used to adjust radiation doses. However, its ability of to predict occult N2 disease was never tested, and, hence, it should not be employed to decide whether or not invasive mediastinal staging is indicated.



- 90 PET-BT
- >3 cm cN0 46 olgu
- 3 olgu N2 (5-6 dışlandı) **%6,5**

IMAGE STAGING
CT/PET

- 0-3 cm BCS 0-2 cm (izole 5-6-8-9 dışlandı)
  - Occult N2 **%1,7**
- Tüm çaplarda
  - **%6**
- Limitasyon
  - EBUS verileri
  - Cerrahiye konsülte edilmeyen hasta
  - Yetersiz PET-BT verileri

- Kuzey Amerika çalışması: Periferik tümörlerde BT ve PET-BT de cN0-pN2 varlığı %2,9 --- Santral tümörlerde bu oran %21,6

Endoscopic EBUS/EUS*

ELSEVIER

The Annals of Thoracic Surgery
Volume 84, Issue 1, July 2007, Pages 177-181

Original article
General thoracic

Risk Factors for Occult Mediastinal Metastases in Clinical Stage I Non-Small Cell Lung Cancer

Presented at the Poster Session of the Forty-third Annual Meeting of The Society of Thoracic Surgeons, San Diego, CA, Jan 29–31, 2007.

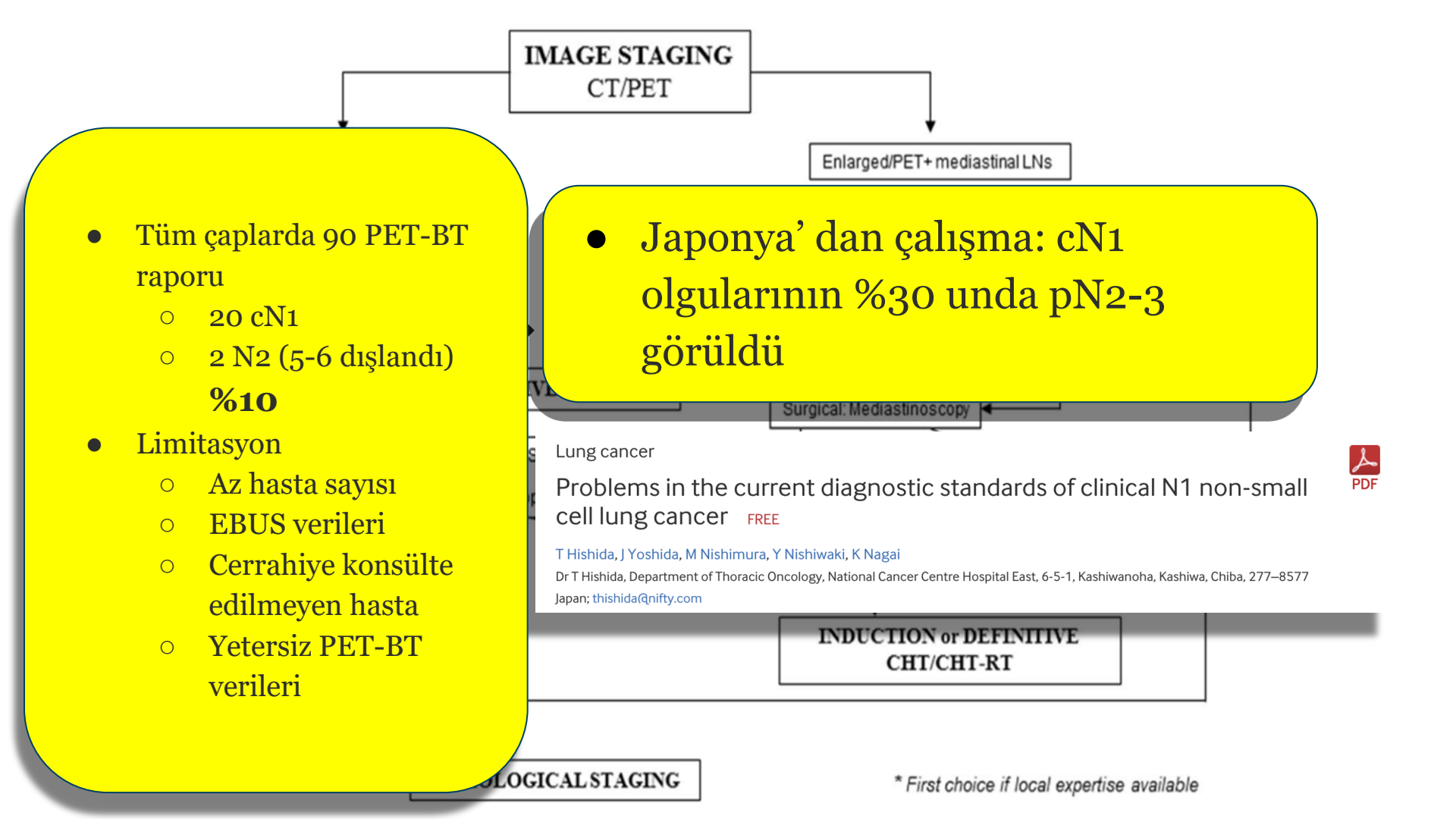
Paul C. Lee MD, Jeffrey L. Port MD, Robert J. Korst MD, Yaakov Liss BA, Danish N. Meherally MPH, Nasser K. Altorki MD

Division of Thoracic Surgery, Department of Cardiothoracic Surgery, New York Presbyterian Hospital–Weill Medical College of Cornell University, New York, New York

Accepted 26 March 2007, Available online 19 June 2007.

OLOGICAL STAGING

* First choice if local expertise available



- Tüm çaplarda 90 PET-BT raporu
  - 20 cN1
  - 2 N2 (5-6 dışlandı)

  %10
- Limitasyon
  - Az hasta sayısı
  - EBUS verileri
  - Cerrahiye konsülte edilmeyen hasta
  - Yetersiz PET-BT verileri

- Japonya' dan çalışma: cN1 olgularının %30 unda pN2-3 görüldü

Lung cancer

Problems in the current diagnostic standards of clinical N1 non-small cell lung cancer FREE

T Hishida, J Yoshida, M Nishimura, Y Nishiwaki, K Nagai

Dr T Hishida, Department of Thoracic Oncology, National Cancer Centre Hospital East, 6-5-1, Kashiwanoha, Kashiwa, Chiba, 277–8577 Japan; thishida@nifty.com

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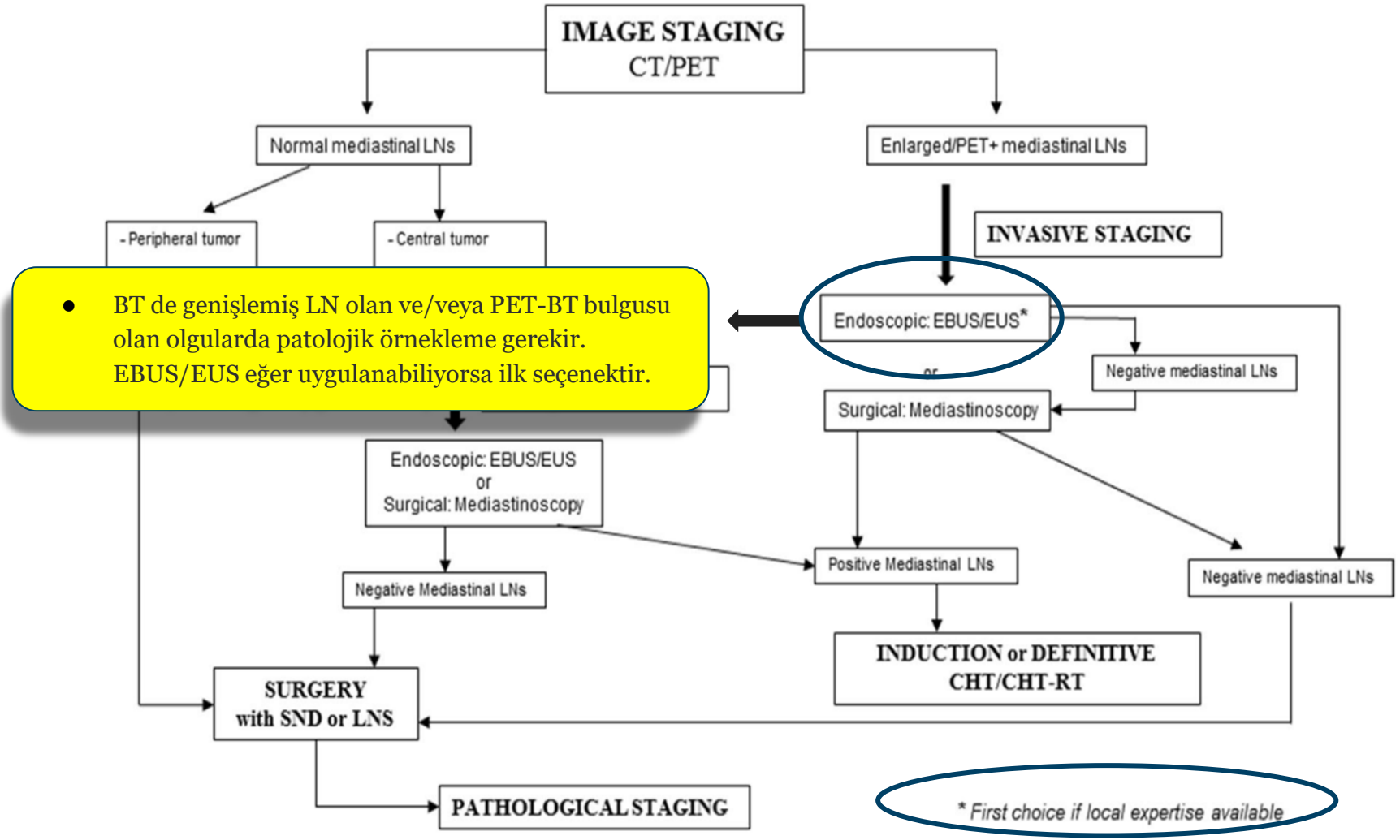
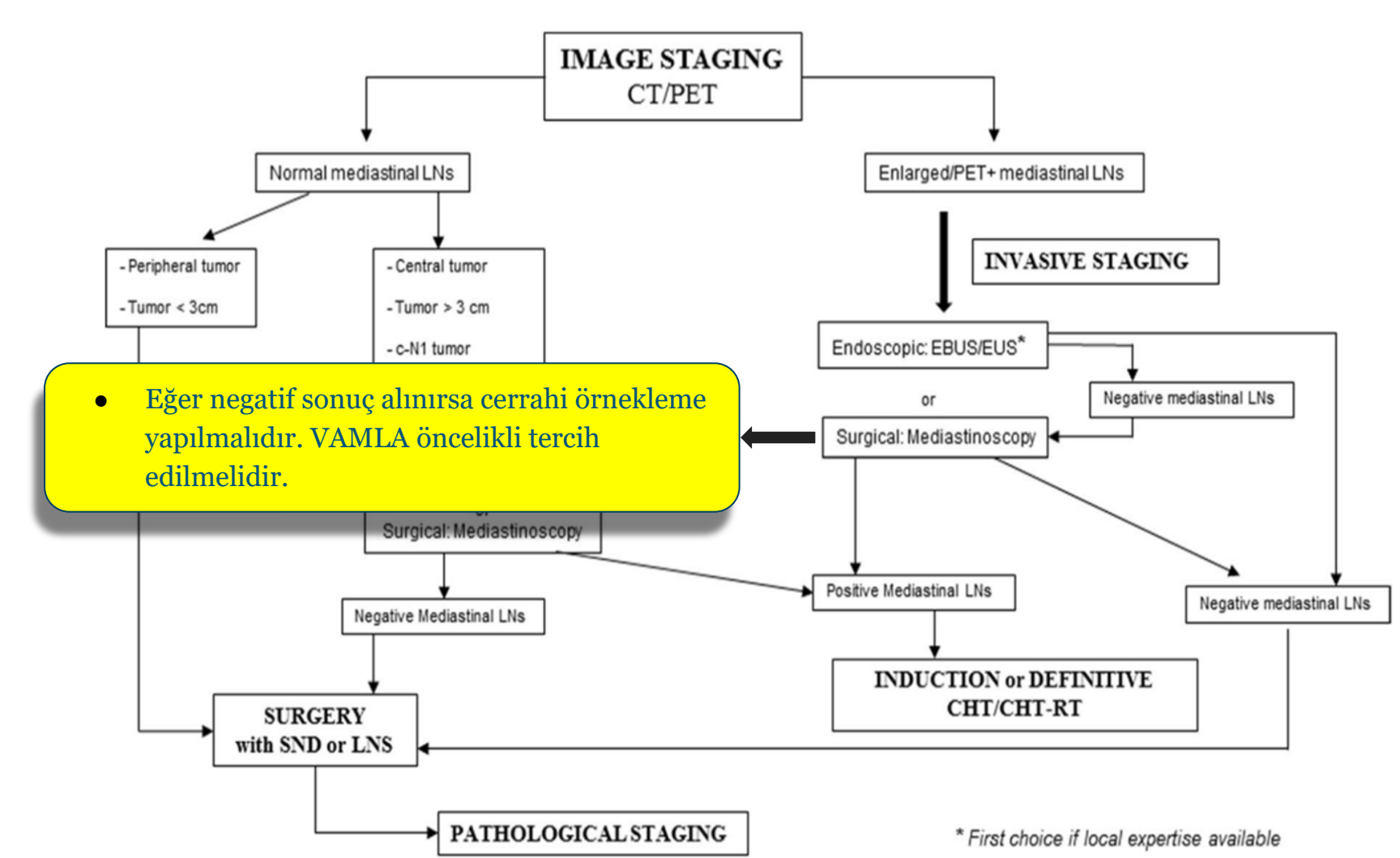


- BT de genişlemiş LN olan ve/veya PET-BT bulgusu olan olgularda patolojik örnekleme gerekir. EBUS/EUS eğer uygulanabiliyorsa ilk seçenektir.



- Eğer negatif sonuç alınırsa cerrahi örnekleme yapılmalıdır. VAMLA öncelikli tercih edilmelidir.

2003-2005 vs 2017-2019

ARAŞTIRMA MAKALESİ / *RESEARCH ARTICLE*

What Has Changed in the Indications and Outcomes of Cervical Mediastinoscopy for Mediastinal Staging in Non-small Cell Lung Cancer Over the Years?

Yıllar İçerisinde Küçük Hücreli Dışı Akciğer Kanserinin Mediastinal Evrelemesinde, Servikal Mediastinoskopi Endikasyonu ve Sonuçlarında Neler Değişti?

Volkan Erdogu[1], Yunus Aksoy[1], Atilla Pekcolaklar[2], Muzaffer Metin[1]

[1]Department of Thoracic Surgery, Yedikule Chest Diseases and Thoracic Surgery Education and Research Hospital, Istanbul;
[2]Thoracic Surgery Department, Bursa City Hospital, Bursa, Turkey

Table 2. *Demographic and pathological features of the patients*

Variables	Total, (n=715)	Group 1, (n=454)	Group 2, (n=261)	p value
Gender, n (%)				
Male	681 (95.2%)	441 (97.1%)	240 (91.9%)	1.000
Female	34 (4.8%)	13 (2.9%)	21 (8.1%)	
Age, years ± SD	58.8±7.2	56.4±7.5	61.2±7.3	0.457
Indication of CM, n (%)	715/1071 (66.8%)	454/610 (74.4%)	261/461 (56.6%)	<0.001
Major complications, n (%)	10 (1.4%)	9 (2%)	1 (0.4%)	0.103
Neoadjuvant treatment because of cN2, n (%)	45 (6.3%)	18 (4%)	27 (10.3%)	0.001
Clinic multiple N2-N3, n (%)	82 (11.4%)	78 (17.2%)	4 (1.5%)	<0.001
Patients underwent resection*, n (%)	389 (54.4%)	195 (42.9%)	194 (74.3%)	
– Unexpected pN2, n (%)	63 (16.2%)	45 (23.1%)	18 (9.3%)	<0.001
– False negative, n (%)	25 (6.4%)	17 (8.7%)	8 (4.1%)	0.065
– Station 7, n (%)	19 (4.9%)	13 (6.6%)	6 (3%)	0.102
– Station 4R, n (%)	6 (1.5%)	4 (2%)	2 (1%)	0.685

CM. cervical mediastinoscopy; n, number; N, node; cN2, clinic N2; N2-N3, clinic N2. N3; pN2, pathological N2; SD, standard deviation.
* Anatomic lung resection which was at least a lobectomy and mediastinal lymph node dissection.

PRINCIPLES OF DIAGNOSTIC EVALUATION

- The least invasive biopsy with the highest yield is preferred as the first diagnostic study.
  - ◊ Patients with central masses and suspected endobronchial involvement should undergo bronchoscopy.
  - ◊ Patients with peripheral (outer one-third) nodules may benefit from navigational bronchoscopy, radial EBUS, or transthoracic needle aspiration (TTNA).
  - ◊ Patients with suspected nodal disease should be biopsied by EBUS, EUS, navigational bronchoscopy, or mediastinoscopy.
    - – EBUS provides access to nodal stations 2R/2L, 4R/4L, 7, 10R/10L, and other hilar nodal stations if necessary.
    - – An EBUS-TBNA negative for malignancy in a clinically (PET and/or CT) positive mediastinum should undergo subsequent mediastinoscopy prior to surgical resection.
    - – EUS–guided biopsy provides additional access to stations 5, 7, 8, and 9 lymph nodes if these are clinically suspicious.
    - – TTNA and anterior mediastinotomy (ie, Chamberlain procedure) provide additional access to anterior mediastinal (stations 5 and 6) lymph nodes if these are clinically suspicious. If TTNA is not possible due to proximity to aorta, VATS biopsy is also an option.
  - ◊ EUS also provides reliable access to the left adrenal gland.
  - ◊ Lung cancer patients with an associated pleural effusion should undergo thoracentesis and cytology. A negative cytology result on initial thoracentesis does not exclude pleural involvement. An additional thoracentesis and/or thoracoscopic evaluation of the pleura should be considered before starting curative intent therapy.
  - ◊ Patients suspected of having a solitary site of metastatic disease should have tissue confirmation of that site if feasible.
  - ◊ Patients suspected of having metastatic disease should have confirmation from one of the metastatic sites if feasible.
  - ◊ Patients who may have multiple sites of metastatic disease—based on a strong clinical suspicion—should have biopsy of the primary lung lesion or mediastinal lymph nodes if it is technically difficult or very risky to biopsy a metastatic site.

Journal of Thoracic Oncology

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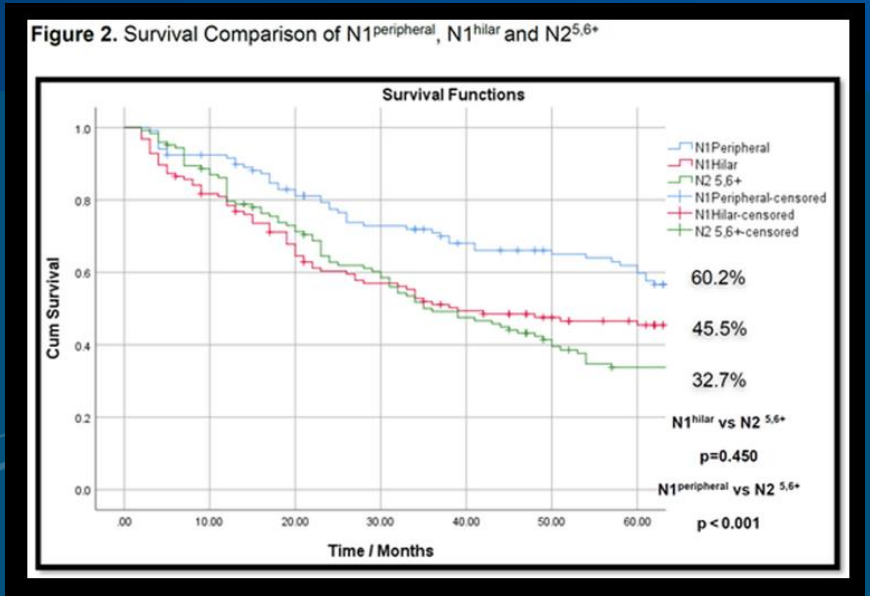
POSTERS | VOLUME 14, ISSUE 10, SUPPLEMENT , S545-S546, OCTOBER 01, 2019

P1.13-02 Should Aortic Lymph Nodes be Considered Hilar Lymph Nodes in Patients with Completely Resected NSCLC? A Multicenter Study

N. Citak • L. Guglielmetti • Y. Aksoy • ... I. Opitz • W. Weder • I. Inci • Show all authors

Open Archive • DOI: https://doi.org/10.1016/j.jtho.2019.08.1139 • Check for updates

PlumX Metrics



Hilar lenf nodu metastazı ile aynı sağkalım

Eur J Cardiothorac Surg. 2014 May;45(5):882-7. doi: 10.1093/ejcts/ezt478. Epub 2013 Sep 29.

The N2 paradox: similar outcomes of pre- and postoperatively identified single-zone N2a positive non-small-cell lung cancer

Thomas Tsitsias [1], Anas Boulemden, Keng Ang, Apostolos Nakas, David A Waller

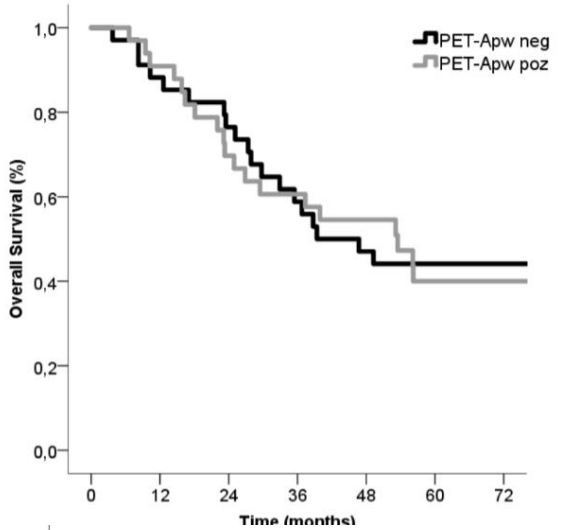
Affiliations — collapse

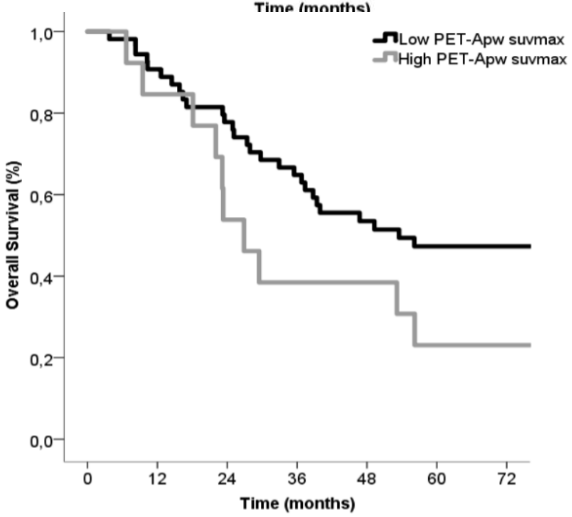
Affiliation

1 Department of Thoracic Surgery, Glenfield Hospital, Leicester, UK.

PMID: 24080282 DOI:

Results: At a median follow-up of 38.7 months (standard error 10, 95% confidence interval (CI) 19.0-58.4), the overall median survival was 22.2 months (95% CI 14.6-29.8) with 1-, 2- and 5-year survival rates of 63.3, 46.6 and 13.2%, respectively. Survival after resection of pN2 disease is adversely affected by the need for pneumonectomy, multizone pN2b involvement and by non-compliance with adjuvant chemotherapy. Pathological involvement of the subcarinal zone but no other zone appears to be associated with an adverse prognosis (hazard ratio (HR) 1.87, P = 0.063). Importantly, long-term survival is not different between those patients who have a negative preoperative PET-CT scan and yet are found to have pN2 after resection, and those who are single-zone cN2a positive before resection on PET-CT scan (HR 1.37, P = 0.335).





- APP PET-BT (+) %40
  - Medyan 53,5 ay
- APP PET-BT (-) %44,1
  - Medyan 39,4 ay

p=0.896, HR=1.041, 95%CI=0.564-1.922

- Düşük SUVmax
  - Medyan sağkalım; 53, 5 ay (n=54)
- Yüksek SUVmax
  - Medyan sağkalım 26,8 ay (n=13)

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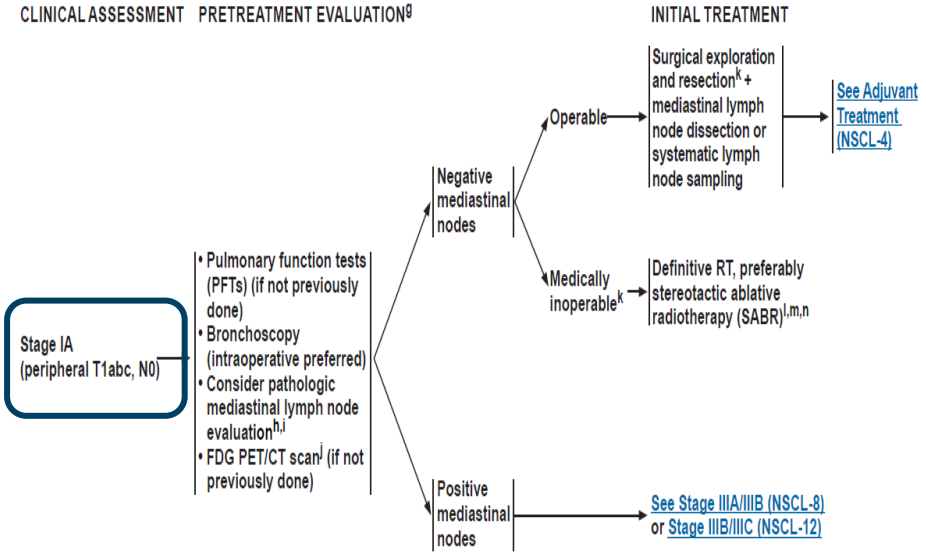


[g] Testing is not listed in order of priority and is dependent on clinical circumstances, institutional processes, and judicious use of resources.

[h] Methods for evaluation include mediastinoscopy, mediastinotomy, EBUS, EUS, and CT-guided biopsy. An EBUS-TBNA negative for malignancy in a clinically (PET and/or CT) positive mediastinum should undergo subsequent mediastinoscopy prior to surgical resection.

[i] There is low likelihood of positive mediastinal lymph nodes when these nodes are CT and PET negative in solid tumors <1 cm and purely non-solid tumors <3 cm. Thus, pre-resection pathologic mediastinal evaluation is optional in these settings.

[j] PET/CT performed skull base to knees or whole body. Positive PET/CT scan findings for distant disease need pathologic or other radiologic confirmation. If PET/CT scan is positive in the mediastinum, lymph node status needs pathologic confirmation.

[k] See Principles of Surgical Therapy (NSCL-B).

[l] See Principles of Radiation Therapy (NSCL-C).

[m] Image-guided thermal ablation therapy (eg, cryotherapy, microwave, radiofrequency) may be an option for select patients not receiving SABR or definitive RT. See Principles of Image-Guided Thermal Ablation Therapy (NSCL-D).

[n] If empiric therapy is contemplated without tissue confirmation, multidisciplinary evaluation that at least includes interventional radiology, thoracic surgery, and interventional pulmonology is required to determine the safest and most efficient approach for biopsy, or to provide consensus that a biopsy is too risky or difficult and that the patient can proceed with therapy without tissue confirmation. (IJsseldijk MA, et al. J Thorac Oncol 2019;14:583-595.)

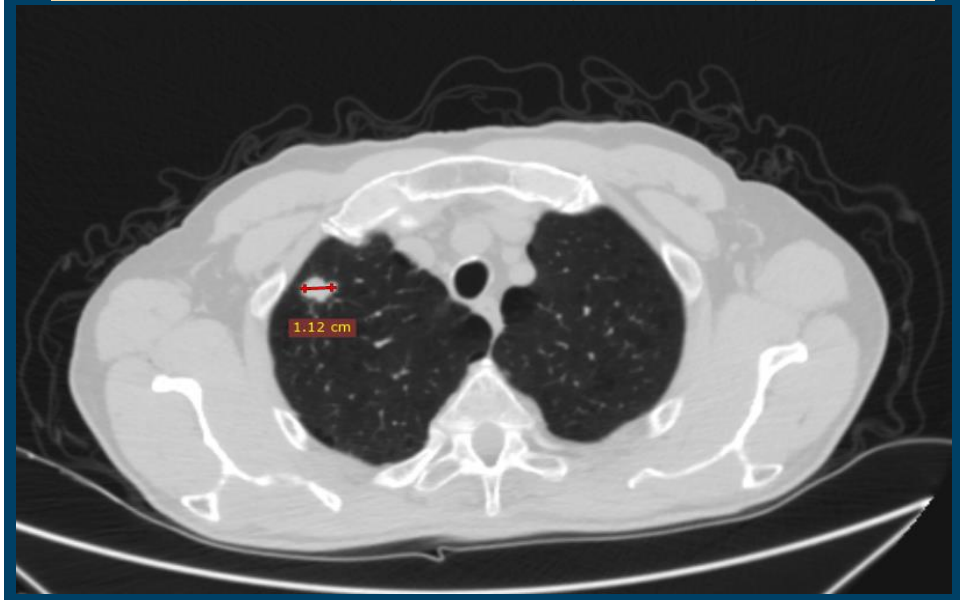
	N0	N1	N2	N3
T1	IA	IIB	IIIA	IIIB
M1b	IVA	IVA	IVA	IVA
M1c	IVB	IVB	IVB	IVB

T1

Tumor size ≤3cm

- Tumor ≤1cm => T1a
- Tumor >1cm but ≤2cm =>T1b
- Tumor >2cm but ≤3cm => T1c

T1a(mi) is pathology proven 'minimally invasive', irrespective of size.



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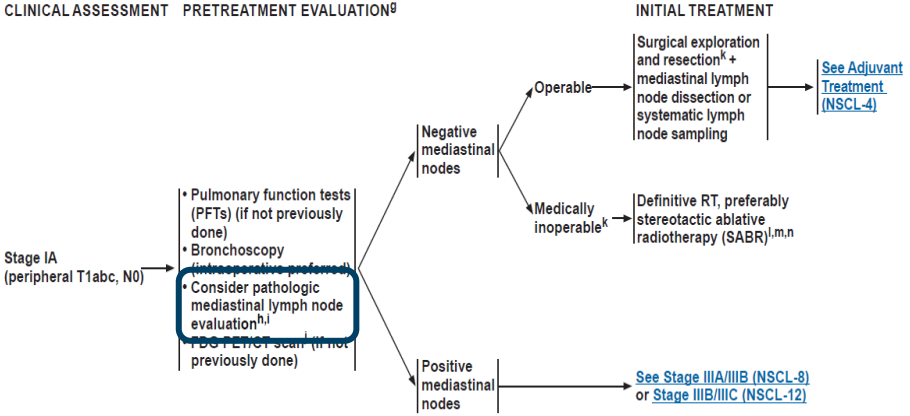

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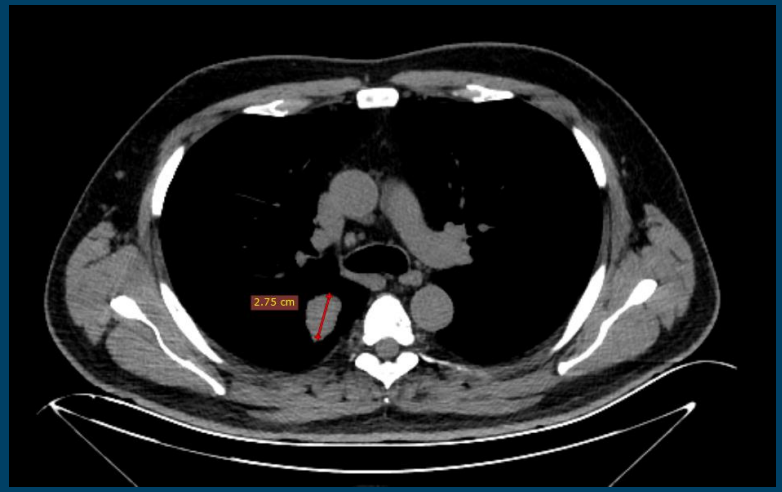

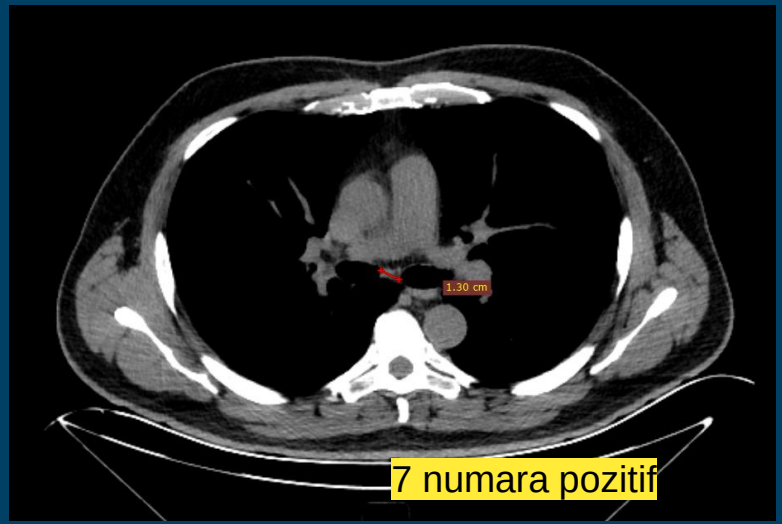

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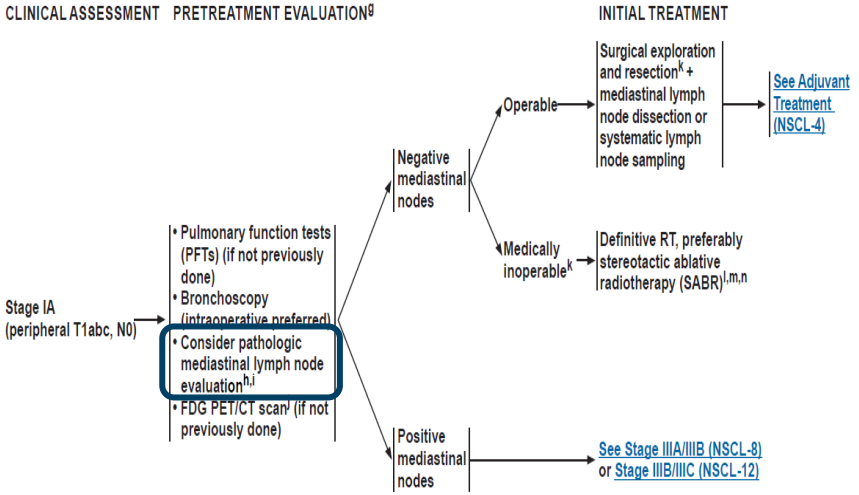

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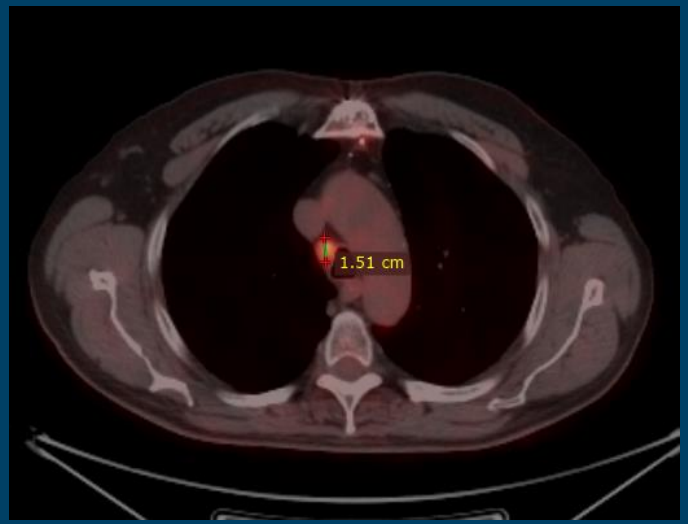

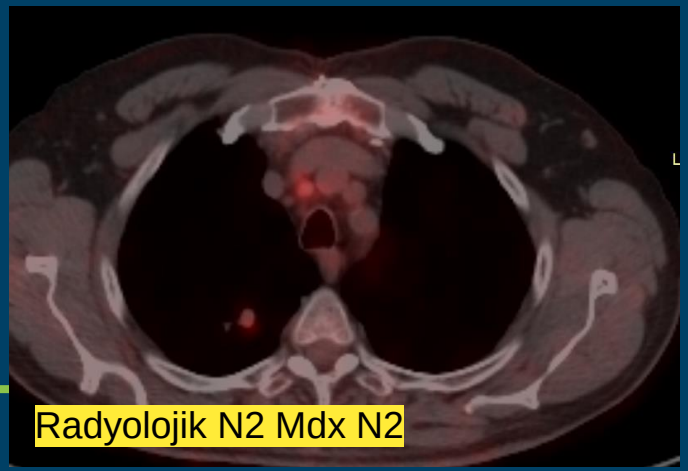

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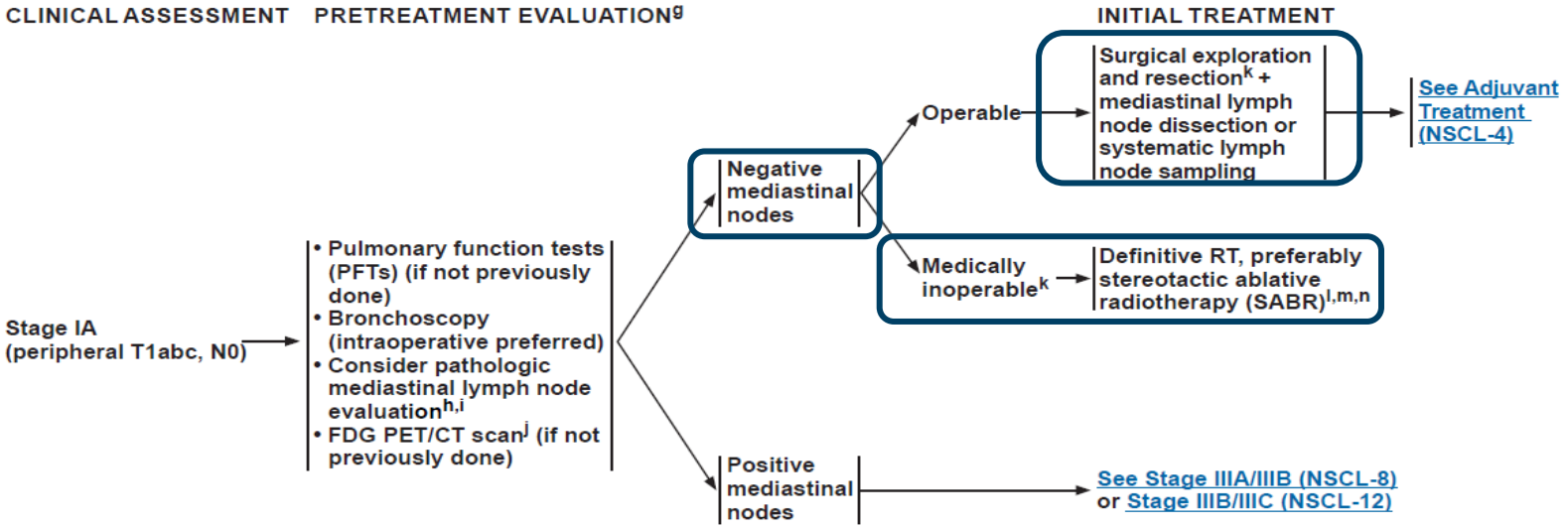

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lenf nodu rezeksiyonunun rolünü ele alan İngilizce makaleleri belirlemek için bir Medline araştırması yapıldı. Tam lenfatik diseksiyonun tercih edilme nedenlerine ilişkin görüşler arasında tam rezeksiyon, tespit edilmemiş mikrometastazın rezeksiyonu nedeniyle gelişmiş nodal evreleme ve daha iyi lokal kontrol. Rutin tam lenfatik diseksiyona karşı argümanlar, artan morbidite, ameliyat süresinin uzaması ve sağkalımda iyileşme olduğuna dair kanıt eksikliğidir. Küçük hücreli dışı akciğer kanserinin tam rezeksiyonu için birçok yazar, cerrahi sırasında standart yaklaşım olarak sistematik bir nodal diseksiyon önermektedir ve bunun hem yeterli nodal evreleme sağladığını hem de tam rezeksiyonun garanti edildiğini

Although frailty is an increasingly recognized predictor of surgical and other treatment morbidity, a preferred frailty assessment system has not been established.[331-333]

The *Principles of Surgical Therapy* are described in the NSCLC algorithm and are summarized here (see the NCCN Guidelines for NSCLC). Determination of resectability, surgical staging, and pulmonary resection should be performed by thoracic surgeons who should participate in multidisciplinary clinics and/or tumor boards for patients with lung cancer.

Lymph Node Dissection

The ACOSOG Z0030 randomized trial compared systematic mediastinal lymph node sampling versus complete lymphadenectomy during pulmonary resection in patients with NSCLC who had either N0 (no demonstrable metastasis to regional lymph nodes) or N1 (metastasis to lymph nodes in the ipsilateral peribronchial and/or hilar region, including direct extension) disease. In patients with early-stage NSCLC who had negative nodes by systematic lymph node dissection, complete

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mediastinal lymph node dissection did not improve survival.[348,349] Thus, systematic lymph node sampling is appropriate during pulmonary resection; one or more nodes should be sampled from all mediastinal stations. For right-sided cancers, an adequate mediastinal lymphadenectomy should include stations 2R, 4R, 7, 8, and 9. For left-sided cancers, stations 4L, 5, 6, 7, 8, and 9 should be sampled.[348] Patients should have N1 and N2 node resection and mapping (American Thoracic Society map) with a minimum of 3 N2 stations sampled or a complete lymph node dissection.[135] The lymph node map from the IASLC may be useful.[350] Formal ipsilateral mediastinal lymph node dissection is indicated for patients undergoing resection for stage IIIA (N2) disease. For patients undergoing sublobular resection, the appropriate N1 and N2 lymph node stations should be sampled unless not technically feasible because sampling would substantially increase the surgical risk.

postoperative morbidity and mortality, minimal risk of intraoperative bleeding, or minimal locoregional recurrence.[360-364] Thoracoscopic lobectomy is associated with less morbidity, fewer complications, and more rapid return to function than lobectomy by thoracotomy.[365-368]

In patients with stage I NSCLC who had thorascopic lobectomy with lymph node dissection, the 5-year survival rate, long-term survival, and local recurrence rate were comparable to those achieved by routine open lung resection.[369-373] Thorascopic lobectomy has also been shown to improve discharge independence in older populations and patients at high risk.[374,375] Data show that thorascopic lobectomy improves the ability of patients to complete postoperative chemotherapy regimens.[376,377] Based on its favorable effects on postoperative recovery and morbidity, thorascopic lobectomy (including robotic-assisted approaches) is recommended in the NSCLC algorithm as an acceptable approach for

- MLND ve MLNS yi karşılaştıran en büyük randomize çalışma ACOSOG Z0030
  - J Thorac Cardiovasc Surg 2011;141:662-70

sampling versus complete lymphadenectomy during pulmonary resection in the patient with

- Evre I sağkalım farkı yok
- Evre II sağkalım farkı var

Conclusions

If systematic and thorough presection sampling of the mediastinal and hilar lymph nodes is negative, mediastinal lymph node dissection does not improve survival in patients with early stage non–small cell lung cancer, but these results are not generalizable to patients staged radiographically or those with higher stage tumors.

PRINCIPLES OF SURGICAL THERAPY

Evaluation

- Determination of resectability, surgical staging, and *pulmonary resection should be performed by thoracic surgeons who perform lung cancer surgery as a prominent part of their practice*.
- CT and PET/CT used for staging should be within 60 days before proceeding with surgical evaluation.
- For medically operable disease, resection is the preferred local treatment modality (other modalities include SABR, thermal ablation such as radiofrequency ablation, and cryotherapy). Thoracic surgical oncology consultation should be part of the evaluation of any patient being considered for curative local therapy. In cases where SABR is considered for high-risk or borderline operable patients, a multidisciplinary evaluation including a radiation oncologist is recommended.
- The overall plan of treatment as well as needed imaging studies should be determined before any non-emergency treatment is initiated.
- Thoracic surgeons should actively participate in multidisciplinary discussions and meetings regarding lung cancer patients (eg, multidisciplinary clinic and/or tumor board).
- Patients who are active smokers should be provided counseling and smoking cessation support (NCCN Guidelines for Smoking Cessation). While active smokers have a mildly increased incidence of postoperative pulmonary complications, these should not be considered a prohibitive risk for surgery. Surgeons should not deny surgery to patients solely due to smoking status, as surgery provides the predominant therapy for patients with early-stage lung cancer.

Resection

- Anatomic pulmonary resection is preferred for the majority of patients with NSCLC.
- Sublobar resection - Segmentectomy and wedge resection should achieve parenchymal resection margins ≥2 cm or ≥ the size of the nodule.
- Sublobar resection should also sample appropriate N1 and N2 lymph node stations unless not technically feasible without substantially increasing the surgical risk.
- Segmentectomy (preferred) or wedge resection is appropriate in selected patients for the following reasons:
  - Poor pulmonary reserve or other major comorbidity that contraindicates lobectomy
  - Peripheral nodule[1] ≤2 cm with at least one of the following:
    - ◊ Pure AIS histology
    - ◊ Nodule has ≥50% ground-glass appearance on CT
    - ◊ Radiologic surveillance confirms a long doubling time (≥400 days)
- VATS or minimally invasive surgery (including robotic-assisted approaches) should be strongly considered for patients with no anatomic or surgical contraindications, as long as there is no compromise of standard oncologic and dissection principles of thoracic surgery.
- In high-volume centers with significant VATS experience, VATS lobectomy in selected patients results in improved early outcomes (ie, decreased pain, reduced hospital length of stay, more rapid return to function, fewer complications) without compromise of cancer outcomes.
- Lung-sparing anatomic resection (sleeve lobectomy) is preferred over pneumonectomy, if anatomically appropriate and margin-negative resection is achieved.
- T3 (invasion) and T4 local extension tumors require en-bloc resection of the involved structure with negative margins. If a surgeon or center is uncertain about potential complete resection, consider obtaining an additional surgical opinion from a high-volume specialized center.

Margins and Nodal Assessment (see NSCL-B 2 of 4)

[1]Peripheral is defined as the outer one third of the lung parenchyma.

The Role of Surgery in Patients with Stage IIIA (N2) NSCLC (see NSCL-B 2 of 4 through NSCL-B 4 of 4)

Thoracic Oncology | Published: 21 October 2021

Segmentectomy…Because We Can or Because We Should?

Justin M. Karush DO

Annals of Surgical Oncology **29**, 28–29 (2022) | Cite this article

Randomized trial of lobectomy versus limited resection for T1 N0 non-small cell lung cancer. Lung Cancer Study Group.

Ginsberg RJ[1], Rubinstein LV

Author information

The Annals of Thoracic Surgery, 01 Sep 1995, 60(3):615-22; discussion 622-3

DOI: 10.1016/0003-4975(95)00537-u PMID: 7677489

Conclusions: Compared with lobectomy, limited pulmonary resection does not confer improved perioperative morbidity, mortality, or late postoperative pulmonary function. Because of the higher death rate and locoregional recurrence rate associated with limited resection, lobectomy still must be considered the surgical procedure of choice for patients with peripheral T1 N0 non-small cell lung cancer.

Thoracic Oncology | Published: 06 October 2021

Comparison Between Wedge Resection and Lobectomy/Segmentectomy for Early-Stage Non-small Cell Lung Cancer: A Bayesian Meta-analysis and Systematic Review

Yucong Shi MSc, Sizhi Wu PhD, Shengsuo Ma MSc, Yiwen Lyu MSc, Huachong Xu PhD, Li Deng PhD ✉ & Xiaoyin Chen PhD ✉

Annals of Surgical Oncology **29**, 1868–1879 (2022) | Cite this article

Sonuçlar

Erken evre KHDAK'li hastalarda lobektomi uygulanan hastalar, wedge rezeksiyon yapılan hastalara göre en düşük OS risk oranına sahipti, bu da lobektomi uygulanan hastaların genel sağkalımının wedge rezeksiyon uygulanan hastalardan daha yüksek olduğunu gösterir. Ancak, DFS ve RFS ile ilgili olarak, üç cerrahi yaklaşım anlamlı bir fark göstermedi.

THE LANCET
Volume 399, Issue 10335, 23–29 April 2022, Pages 1607-1617

Articles

Segmentectomy versus lobectomy in small-sized peripheral non-small-cell lung cancer (JCOG0802/WJOG4607L): a multicentre, open-label, phase 3, randomised, controlled, non-inferiority trial

Prof Hisashi Saji MD [a] ✉, Morihito Okada MD [b], Masahiro Tsuboi MD [c], Ryu Nakajima MD [d], Kenji Suzuki MD [e], Keiju Aokage MD [c], Tadashi Aoki MD [f], Jiro Okami MD [g], Ichiro Yoshino MD [h], Hiroyuki Ito MD [i], Norihito Okumura MD [j], Masafumi Yamaguchi MD [k], Norihiko Ikeda MD [l], Masashi Wakabayashi MSc [m], Kenichi Nakamura MD [m], Haruhiko Fukuda MD [m], Shinichiro Nakamura MD [o], Tetsuya Mitsudomi MD [p], Shun-Ichi Watanabe MD [n], Hisao Asamura MD [q] on behalf of the

We conducted this randomised, controlled, non-inferiority trial at 70 institutions in Japan. Patients with clinical stage IA NSCLC (tumour diameter ≤2 cm; consolidation-to-tumour ratio >0·5) were randomly assigned 1:1 to receive either lobectomy or segmentectomy. Randomisation was done via the minimisation

Improved overall survival was observed consistently across all predefined subgroups in the segmentectomy group. At 1 year follow-up, the significant difference in the reduction of median forced expiratory volume in 1 sec between the two groups was 3·5% (p<0·0001), which did not reach the predefined threshold for clinical significance of 10%. The 5-year relapse-free survival was 88·0% (95% CI 85·0–90·4)

0·474–0·927; one-sided p<0·0001 for non-inferiority; p=0·0082 for superiority). Improved overall survival was observed consistently across all predefined subgroups in the segmentectomy group. At 1 year follow-up, the significant difference in the

Bildiğimiz kadarıyla bu çalışma, küçük periferik KHDAK'li hastaların genel sağkalımında lobektomiye karşı segmentektominin faydalarını gösteren ilk faz 3 denemeydi. Bulgular, segmentektominin bu hasta popülasyonu için standart cerrahi prosedür olması gerektiğini göstermektedir.

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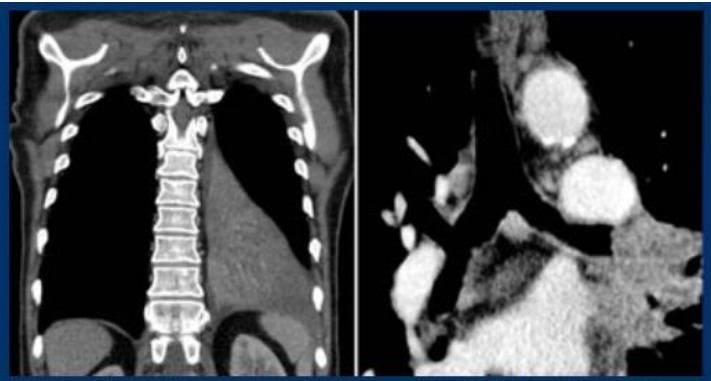
CLINICAL ASSESSMENT



T2 tumor - A typical T2 tumor with atelectasis/pneumonitis of the left lower lobe up to the hilum, due to involvement of the left main bronchus.

T2

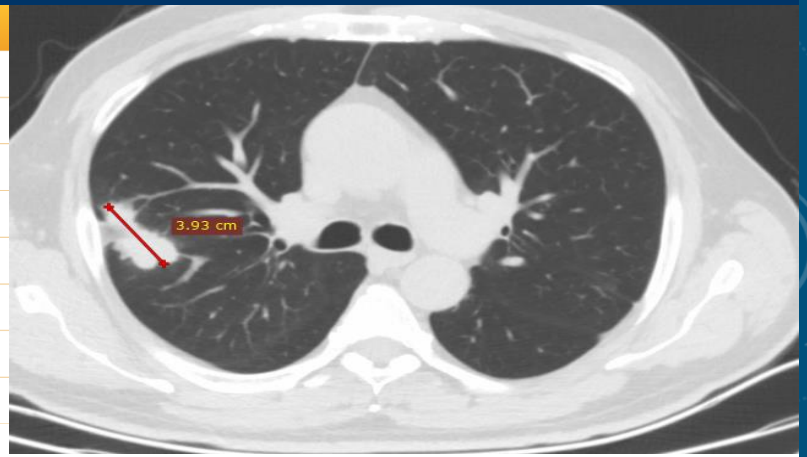
- Tumor size >3cm to ≤5cm or
- Tumor of any size that
  - invades the visceral pleura
  - involves main bronchus, but not the carina
  - shows an atelectasis or obstructive pneumonitis that extends to the hilum

T2a= >3 to 4cm

T2b= >4 to 5cm

Stage IB (peripheral T2a, N0)
Stage I (central T1abc–T2a, N0)
Stage II (T1abc–2ab, N1; T2b, N0)
Stage IIB (T3, N0)[e]
Stage IIIA (T3, N1)

	N0	N1	N2	N3
T1	IA	IIB	IIIA	IIIB
T2a	IB	IIB	IIIA	IIIB
T2b	IIA	IIB	IIIA	IIIB
T3	IIB	IIIA	IIIB	IIIC
T4	IIIA	IIIA	IIIB	IIIC
M1a	IVA	IVA	IVA	IVA
M1b	IVA	IVA	IVA	IVA
M1c	IVB	IVB	IVB	IVB



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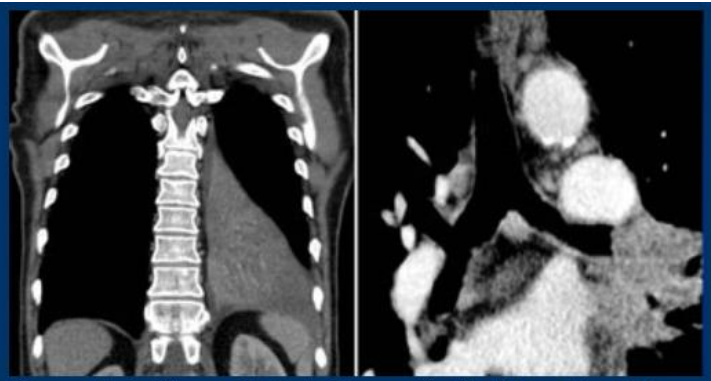

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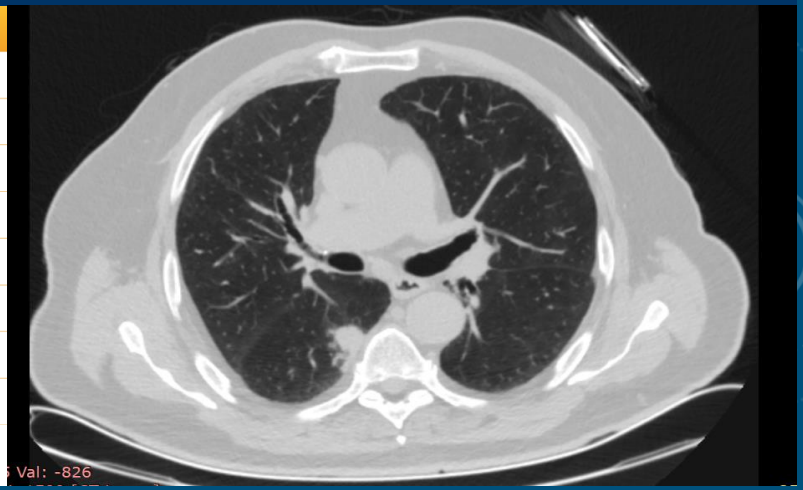
	N0	N1	N2	N3
T1	IA	IIB	IIIA	IIIB
T2a	IB	IIB	IIIA	IIIB
T2b	IIA	IIB	IIIA	IIIB
T3	IIB	IIIA	IIIB	IIIC
T4	IIIA	IIIA	IIIB	IIIC
M1a	IVA	IVA	IVA	IVA
M1b	IVA	IVA	IVA	IVA
M1c	IVB	IVB	IVB	IVB



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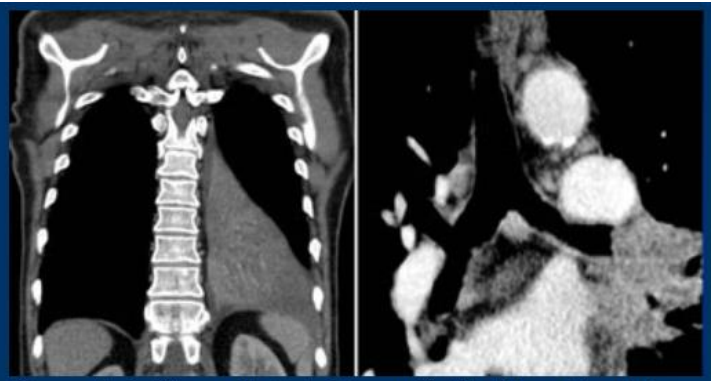

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T2a	IB	IIB	IIIA	IIIB
T2b	IIA	IIB	IIIA	IIIB
T3	IIB	IIIA	IIIB	IIIC
T4	IIIA	IIIA	IIIB	IIIC
M1a	IVA	IVA	IVA	IVA
M1b	IVA	IVA	IVA	IVA
M1c	IVB	IVB	IVB	IVB

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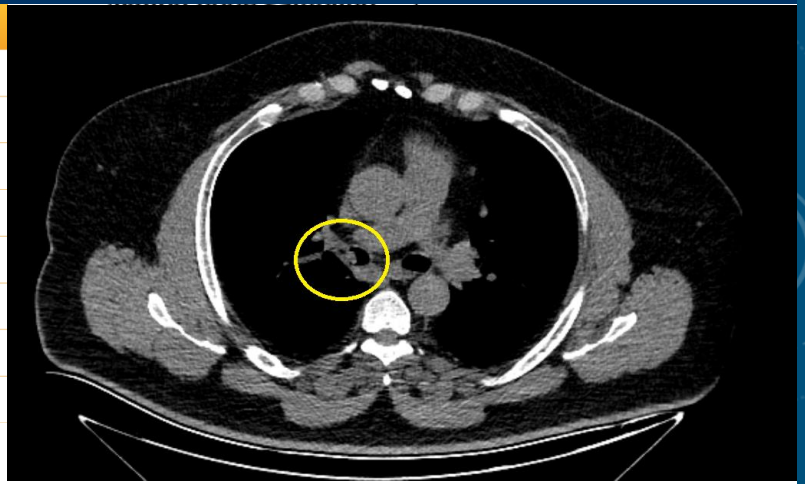
Stage I (central T1abc–T2a, N0)

Stage II (T1abc–2ab, N1; T2b, N0)

Stage IIB (T3, N0)[e]

Stage IIIA (T3, N1)



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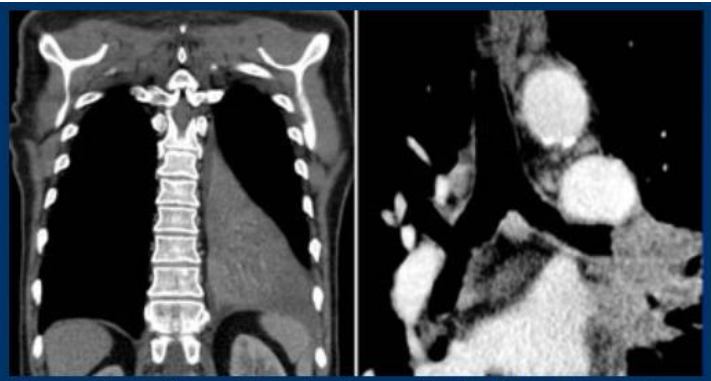

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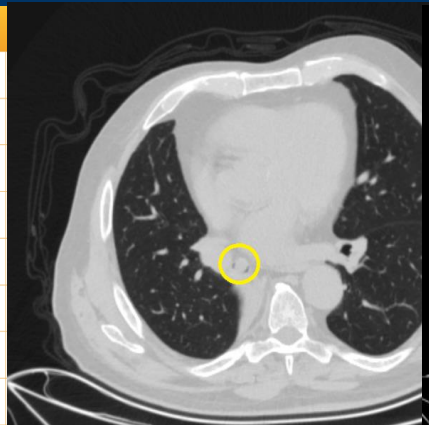
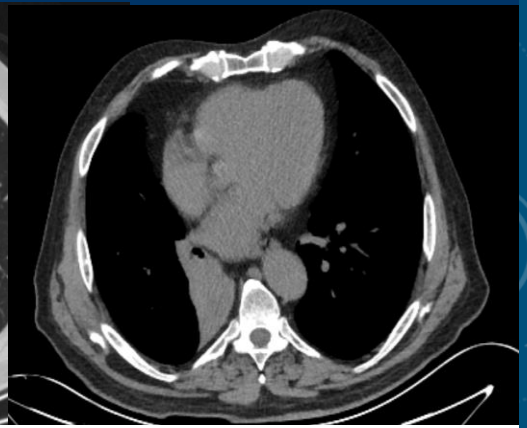
Stage IIIA (T3, N1)

	N0	N1	N2
T1	IA	IIB	IIIA
T2a	IB	IIB	IIIA
T2b	IIA	IIB	IIIA
T3	IIB	IIIA	IIIB
T4	IIIA	IIIA	IIIB
M1a	IVA	IVA	IVA
M1b	IVA	IVA	IVA
M1c	IVB	IVB	IVB





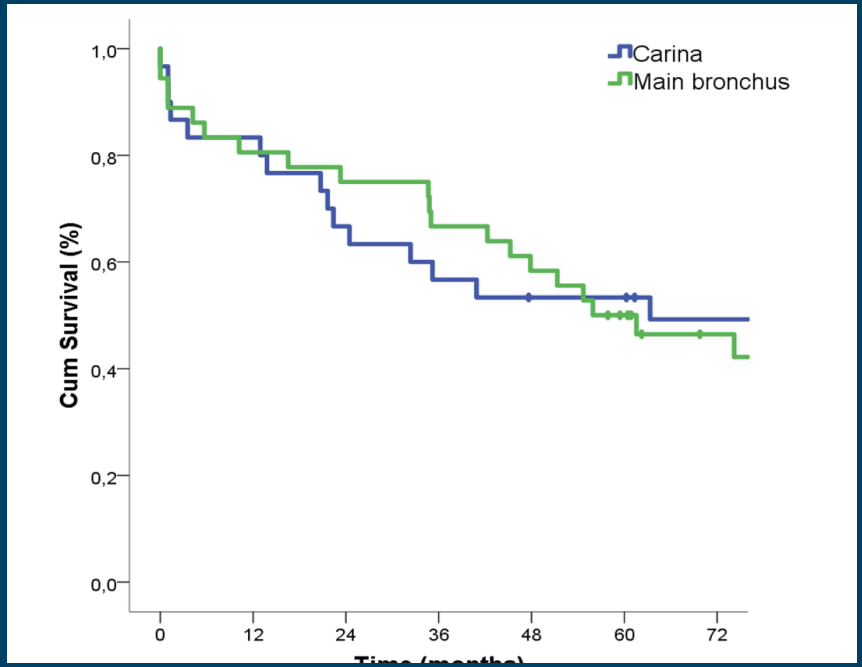
General Thoracic and Cardiovascular Surgery
https://doi.org/10.1007/s11748-020-01545-6

ORIGINAL ARTICLE

Does the carinal involvement have the same surgical outcome as the main bronchus involvement in patients with non-small cell lung cancer?

Volkan Erdogu[1] · Necati Citak[2] · Celal Bugra Sezen[1] · Yunus Aksoy[1] · Selin Onay[1] · Yasemin Emetli[1] · Cemal Aker[1] · Ozkan Saydam[1] · Adnan Sayar[1] · Muzaffer Metin[1]

Received: 6 July 2020 / Accepted: 30 October 2020



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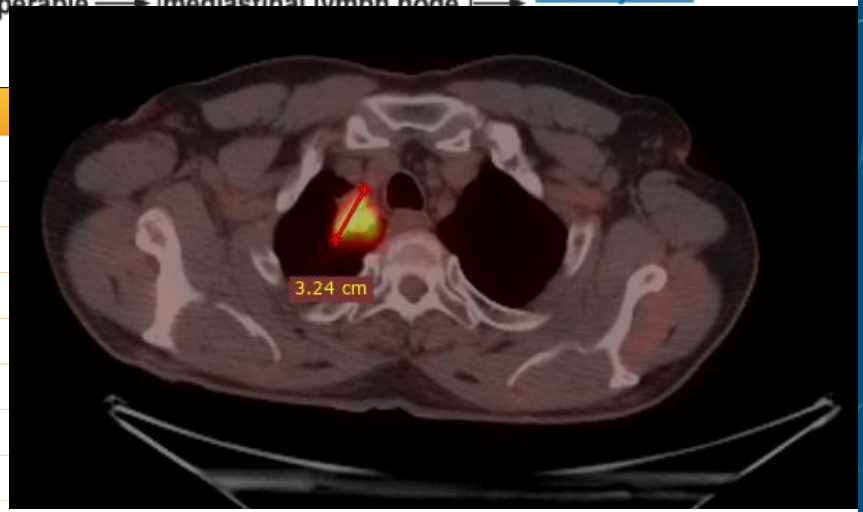
Discussion

CLINICAL ASSESSMENT | **PRETREATMENT EVALUATION[g]** | **INITIAL TREATMENT**

Operable → Surgical exploration and resection[k,p,q] + mediastinal lymph node → See Adjuvant

Stage IB (peripheral T2a, N0)
Stage I (central T1abc–T2a, N0)
Stage II (T1abc–2ab, N1; T2b, N0)
Stage IIB (T3, N0)[e]
Stage IIIA (T3, N1)

	N0	N1	N2	N3
T1	IA	IIB	IIIA	IIIB
T2a	IB	IIB	IIIA	IIIB
T2b	IIA	IIB	IIIA	IIIB
T3	IIB	IIIA	IIIB	IIIC
T4	IIIA	IIIA	IIIB	IIIC
M1a	IVA	IVA	IVA	IVA
M1b	IVA	IVA	IVA	IVA
M1c	IVB	IVB	IVB	IVB



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CLINICAL ASSESSMENT **PRETREATMENT EVALUATION[g]**

Operable

	N0	N1	N2	N3
T1	IA	IIB	IIIA	IIIB
T2a	IB	IIB	IIIA	IIIB
T2b	IIA	IIB	IIIA	IIIB
T3	IIB	IIIA	IIIB	IIIC
T4	IIIA	IIIA	IIIB	IIIC
M1a	IVA	IVA	IVA	IVA
M1b	IVA	IVA	IVA	IVA
M1c	IVB	IVB	IVB	IVB

Stage IB (peripheral T2a, N0)
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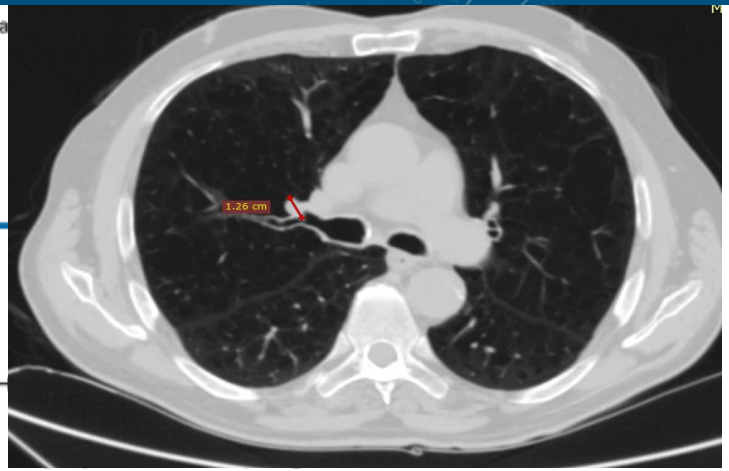
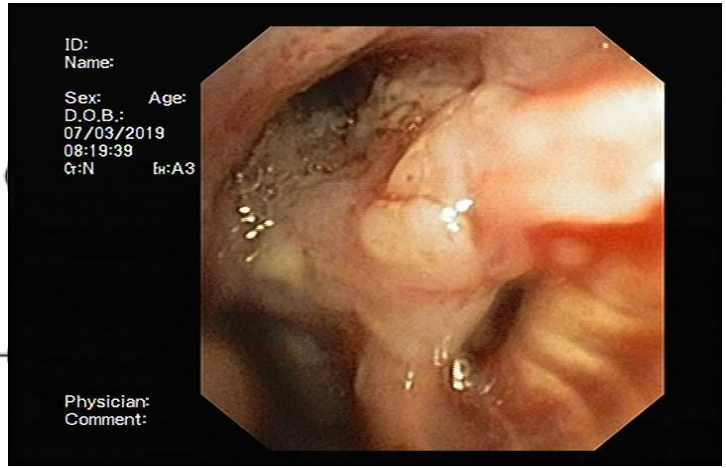
Stage II (T1abc–2ab, N1; T2b, N0)
Stage IIB (T3, N0)[e]
Stage IIIA (T3, N1)





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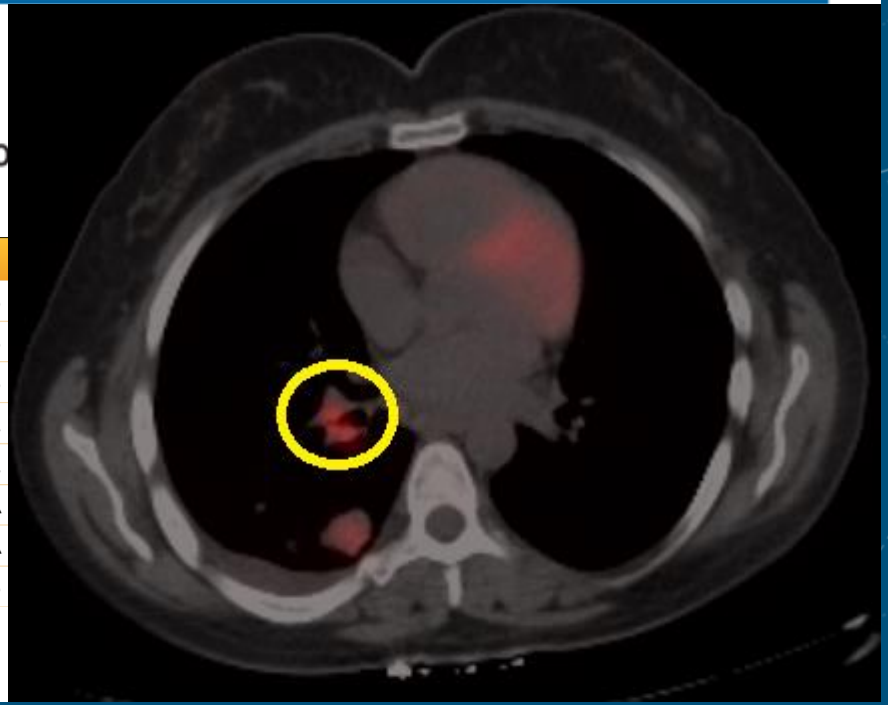
CLINICAL ASSESSMENT **PRETREATMENT EVALUATION[g]**

	N0	N1	N2	N3
T1	IA	IIB	IIIA	IIIB
T2a	IB	IIB	IIIA	IIIB
T2b	IIA	IIB	IIIA	IIIB
T3	IIB	IIIA	IIIB	IIIC
T4	IIIA	IIIA	IIIB	IIIC
M1a	IVA	IVA	IVA	IVA
M1b	IVA	IVA	IVA	IVA
M1c	IVB	IVB	IVB	IVB

Stage IB (peripheral T2a, N0)
Stage I (central T1abc–T2a, N0)
Stage II (T1abc–2ab, N1; T2b, N0)
Stage IIB (T3, N0)[e]
Stage IIIA (T3, N1)

nodes



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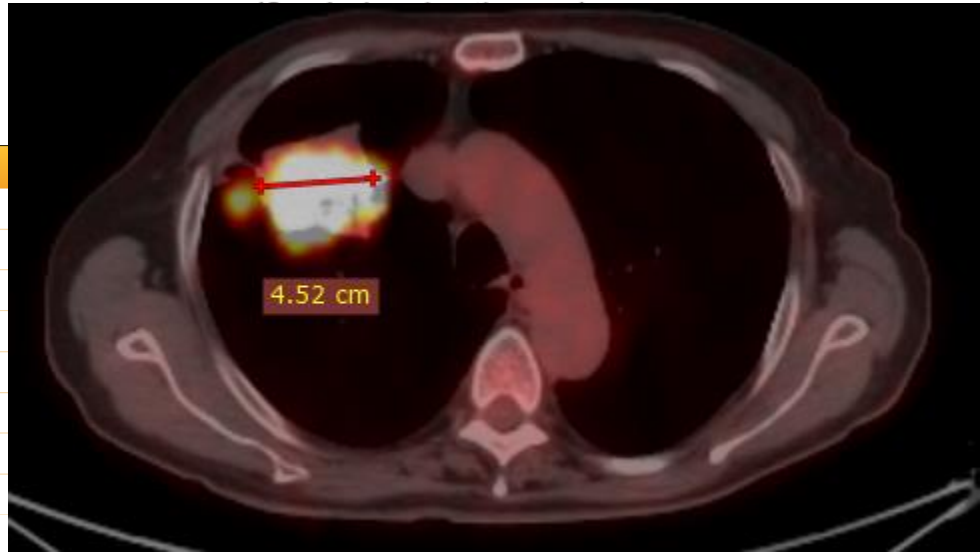
CLINICAL ASSESSMENT **PRETREATMENT EVALUATION[g]** **INITIAL TREATMENT**

Stage IB (peripheral T2a, N0)
Stage I (central T1abc–T2a, N0)
Stage II (T1abc–2ab, N1; T2b, N0)
Stage IIB (T3, N0)[e]
Stage IIIA (T3, N1)

	N0	N1	N2
T1	IA	IIB	IIIA
T2a	IB	IIB	IIIA
T2b	IIA	IIB	IIIA
T3	IIB	IIIA	IIIB
T4	IIIA	IIIA	IIIB
M1a	IVA	IVA	IVA
M1b	IVA	IVA	IVA
M1c	IVB	IVB	IVB



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CLINICAL ASSESSMENT **PRETREATMENT EVALUATION[g]**

Stage IB (peripheral T2a, N0)
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	N0	N1	N2
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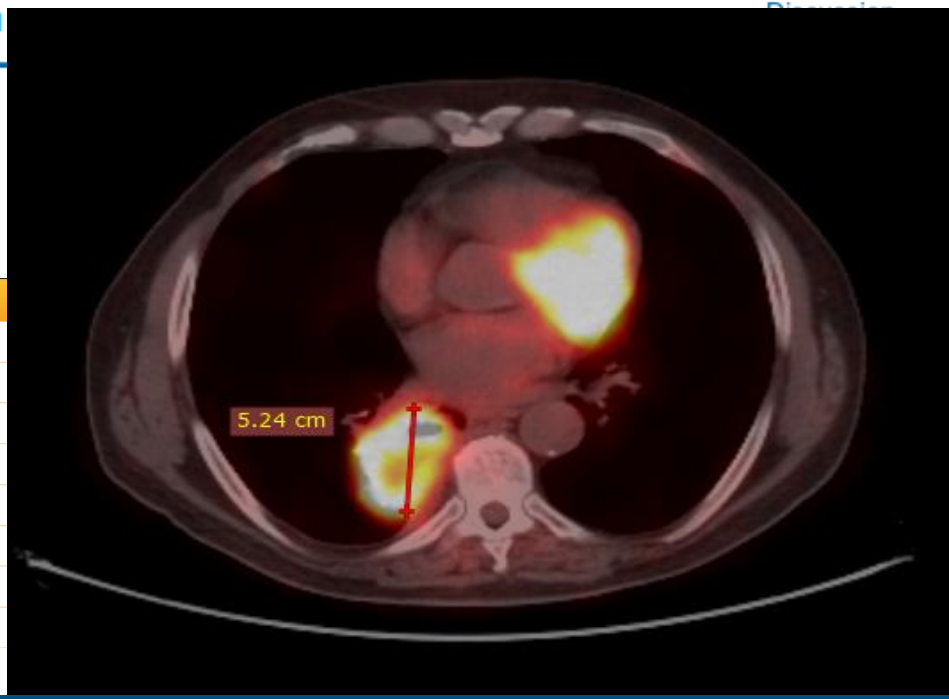
T2b	IIA	IIB	IIIA
T3	IIB	IIIA	IIIB
T4	IIIA	IIIA	IIIB
M1a	IVA	IVA	IVA
M1b	IVA	IVA	IVA
M1c	IVB	IVB	IVB



[e] T3, N0 related to size or satellite nodules.

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CLINICAL ASSESSMENT | **PRETREATMENT EVALUATION[g]** | **INIT**

Stage IB (peripheral T2a, N0)
Stage I (central T1abc–T2a, N0)
Stage II (T1abc–2ab, N1; T2b, N0)
Stage IIB (T3, N0)[e]
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	N0	N1	N2	N3
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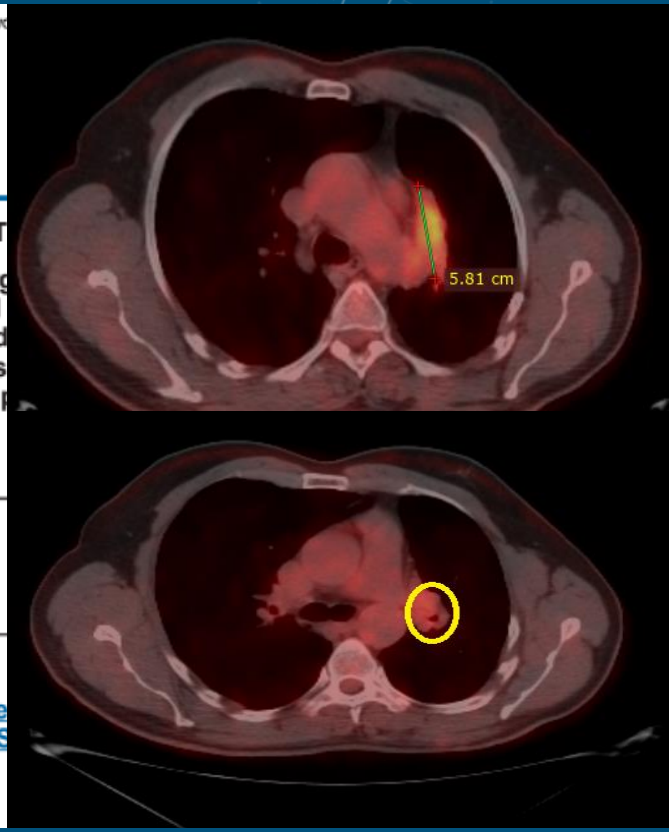
T2a	IB	IIB	IIIA	IIIB
T2b	IIA	IIB	IIIA	IIIB
T3	IIB	IIIA	IIIB	IIIC
T4	IIIA	IIIA	IIIB	IIIC
M1a	IVA	IVA	IVA	IVA
M1b	IVA	IVA	IVA	IVA
M1c	IVB	IVB	IVB	IVB

Operable → Surg and med diss lymp

cally erable[k] → N0 / N1

M1b → See or S



[e] T3, N0 related to size or satellite nodules.

www.impactjournals.com/oncotarget/ Oncotarget, 2017, Vol. 8, (No. 28), pp: 45777-45783

Research Paper

Prognostic significance of subclassification of stage IIB lung cancer: a retrospective study of 226 patients

Nanchang Yin[1], Minwen Ha[2], Yu Liu[3], Huizi Gu[4], Zetian Zhang[5] and Wei Liu[2]

differences in the 5-year survival between T1b and T2a, between T1b and T2b, and between T1c and T2b (p = 0.005, 0.002, and 0.042, respectively). The 5-year survival of patients with pleural invasion and vessel invasion was significantly worse than that of their counterparts (p = 0.009 and <0.001, respectively). Subclassification of stage IIB lung cancer is of prominent prognostic significance. It is recommended that the current

SUBGROUPS IN TERMS OF PROGNOSIS AFTER THE NEWLY-PROPOSED N CLASSIFICATION? A MODELLING STUDY

Necati Çıtak, Volkan Erdoğu, Yunus Aksoy, Atilla Pekçolaklar, Muzaffer Metin, Adnan Sayar
Istanbul / Turkey

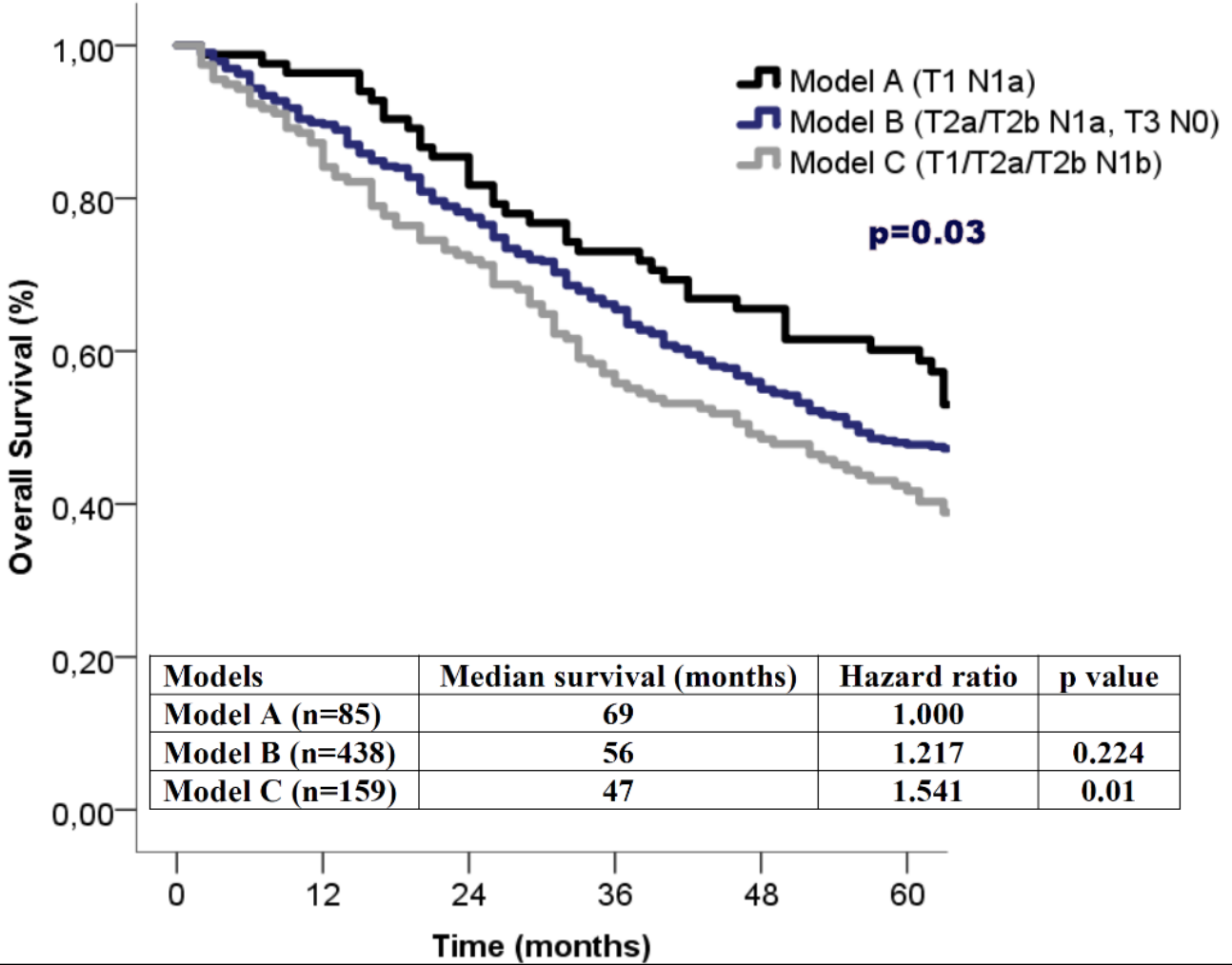
29th ESTS MEETING
20 - 22 JUNE 2021
EUROPEAN CONFERENCE ON GENERAL THORACIC SURGERY
VIRTUAL MEETING

Mod

T1N
HR: 1

T2aN1
HR: 1.1

T2bN1b
HR: 1.672



Models	Median survival (months)	Hazard ratio	p value
Model A (n=85)	69	1.000	
Model B (n=438)	56	1.217	0.224
Model C (n=159)	47	1.541	0.01

Citak, Er

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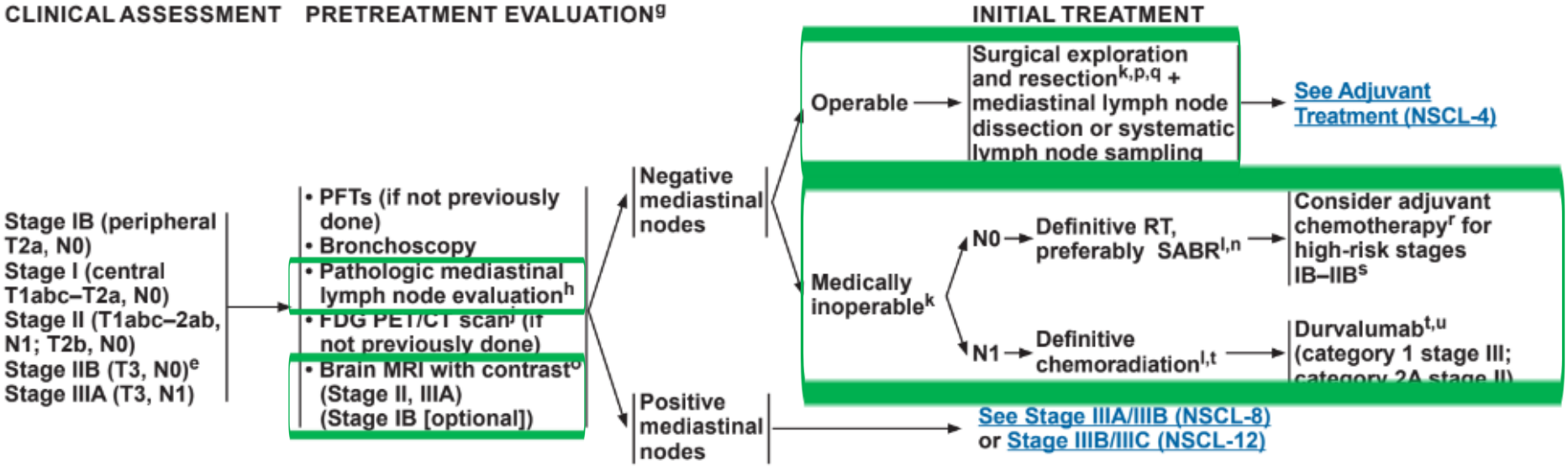


[n] If empiric therapy is contemplated without tissue confirmation, multidisciplinary evaluation that at least includes interventional radiology, thoracic surgery, and interventional pulmonology is required to determine the safest and most efficient approach for biopsy, or to provide consensus that a biopsy is too risky or difficult and that the patient can proceed with therapy without tissue confirmation. (IJsseldijk MA, et al. J Thorac Oncol 2019;14:583-595.)

- Senkron Akciğer Kanseri

- Farklı histolojik tip

- Aynı histoloji
  - Moleküler genetik çalışmalar
  - Bir taraf in situ CA
  - Farklı lob veya akciğer ve ortak lenfatik yolakta tümör yok
  - Ekstrapulmoner metastaz olmaması

- Metakron Akciğer Kanseri

- Farklı histolojik tip

- < 2 yıl metastaz
- 2-4 yıl Gri bölge
  - Aynı taraf ise = lokal nüks = cerrahi
  - Karşı taraf ise sistemik met = olguya göre hareket et
- >4 yıl

- **Aynı tarafta** birden fazla kanser

- Evreleme mediastinoskopi

- Pozitif ise metastaz

- Negatif ise

- **Aynı** lob **aynı** histoloji → Satellit = Rezeksiyon
- **Farklı** lob **aynı** histoloji → Mediastinal ve hiler LN frozen s.
  - Pozitif ise metastaz = Metastaz cerrahisi
  - Negatif ise Senkron Akc CA = Rezeksiyon
- **Aynı** lob **farklı** histoloji → Senkron Akc CA = Rezeksiyon

- **Bilateral** birden fazla kanser

- Evreleme mediastinoskopi

- Pozitif ise metastaz

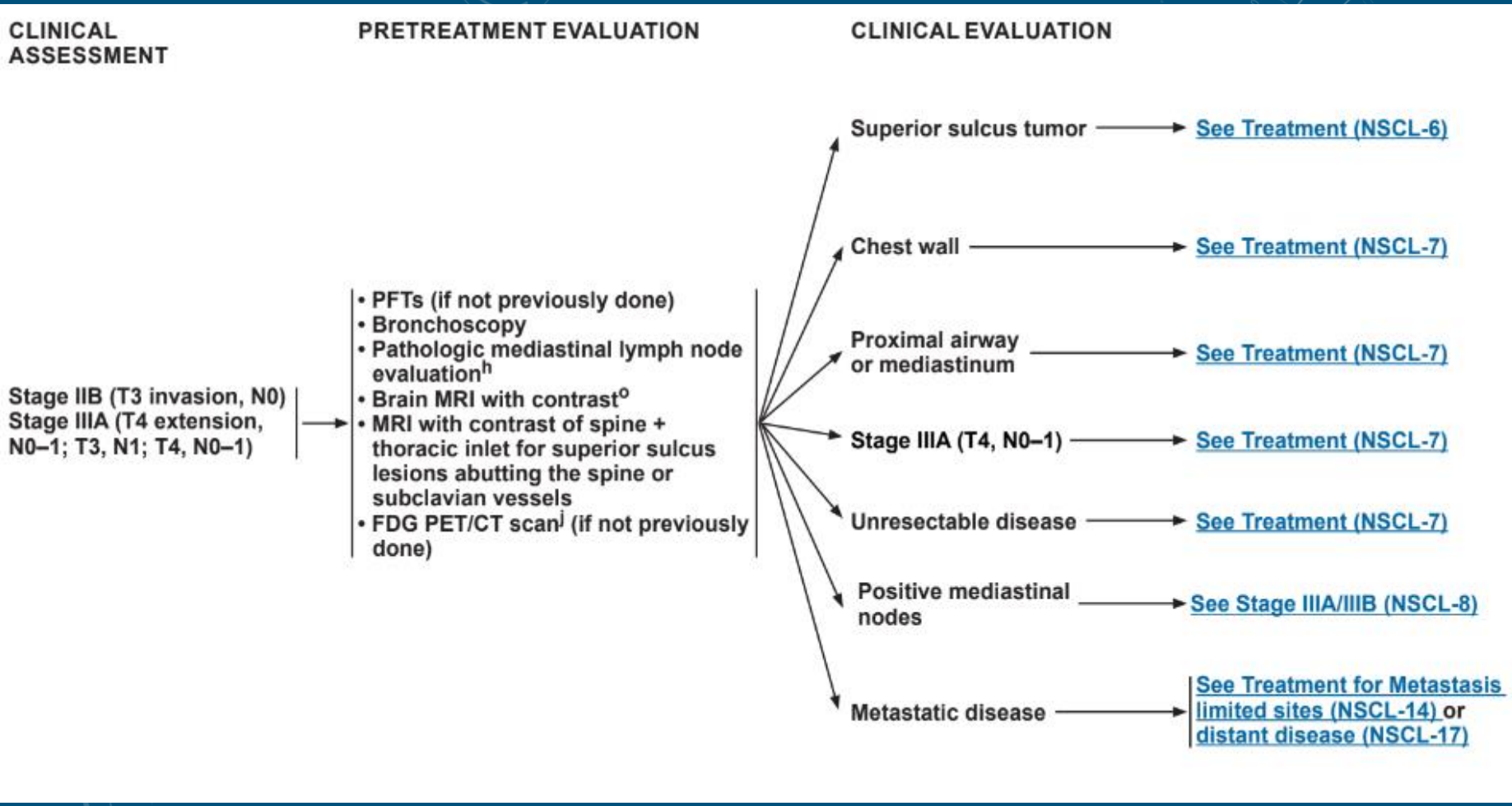
- Negatif ise

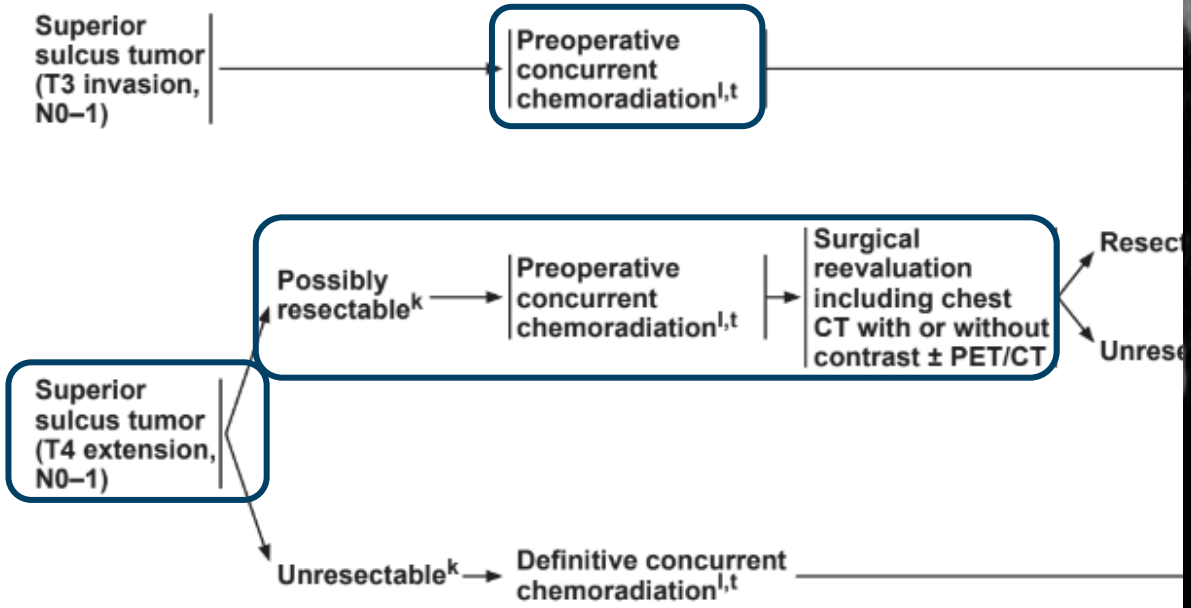
- Her iki taraf tümör tanısı biliniyor

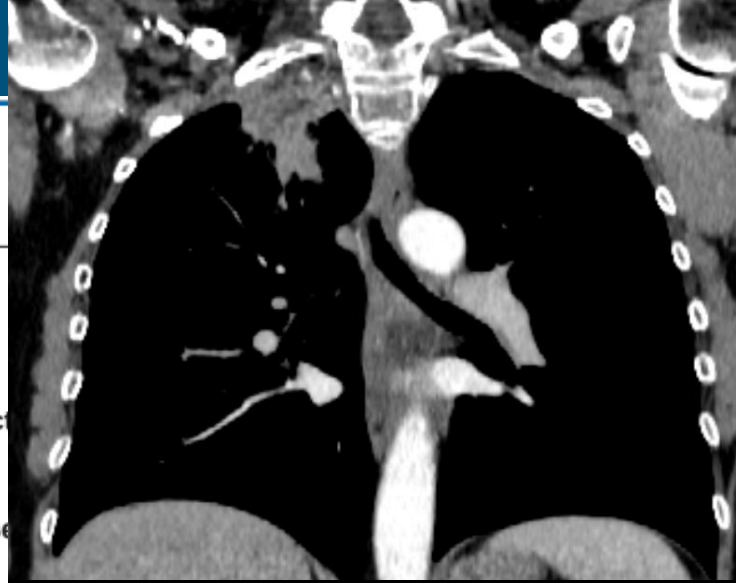
- Rezeksiyon (İlk daha ileri evreye)

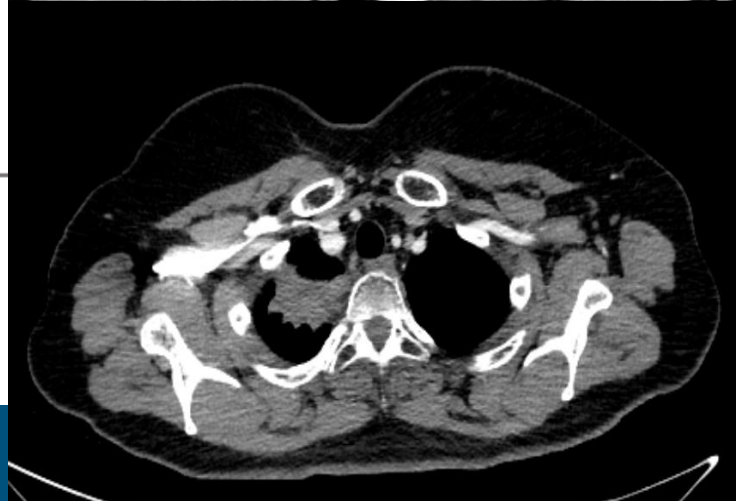
- Bir taraf tümör tanısı biliniyor

- Tanı ve tedavi amaçlı cerrahi (İlk olarak tanısı bilinmeyen tarafa)


CLINICAL ASSESSMENT
PRETREATMENT EVALUATION
CLINICAL EVALUATION
Stage IIB (T3 invasion, N0)
Stage IIIA (T4 extension, N0–1; T3, N1; T4, N0–1)
• PFTs (if not previously done)
• Bronchoscopy
• Pathologic mediastinal lymph node evaluation[h]
• Brain MRI with contrast[o]
• MRI with contrast of spine + thoracic inlet for superior sulcus lesions abutting the spine or subclavian vessels
• FDG PET/CT scan[j] (if not previously done)
Superior sulcus tumor
See Treatment (NSCL-6)
Chest wall
See Treatment (NSCL-7)
Proximal airway or mediastinum
See Treatment (NSCL-7)
Stage IIIA (T4, N0–1)
See Treatment (NSCL-7)
Unresectable disease
See Treatment (NSCL-7)
Positive mediastinal nodes
See Stage IIIA/IIIB (NSCL-8)
Metastatic disease
See Treatment for Metastasis limited sites (NSCL-14) or distant disease (NSCL-17)



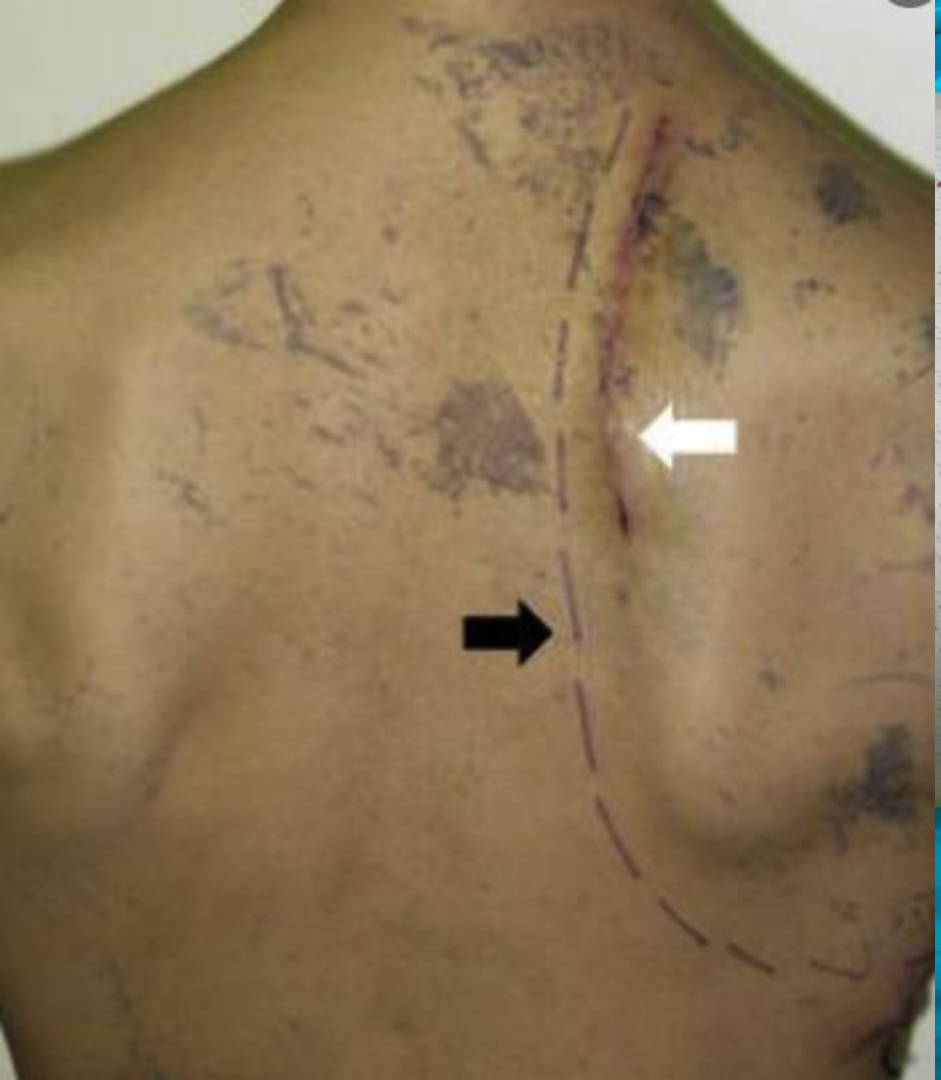


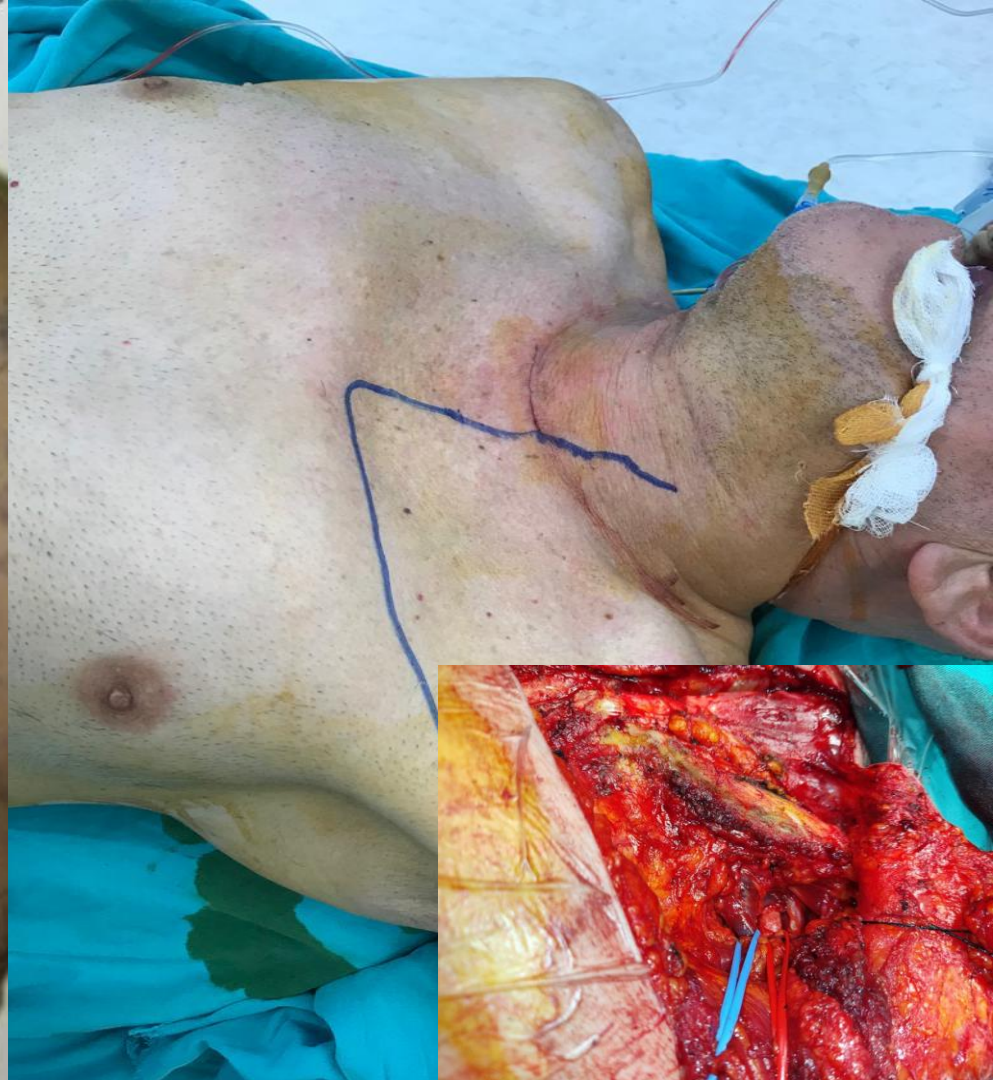


Staging

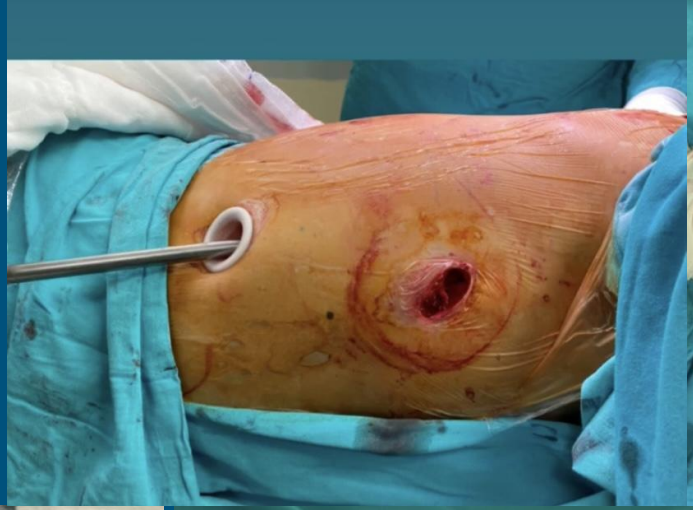
Go to:

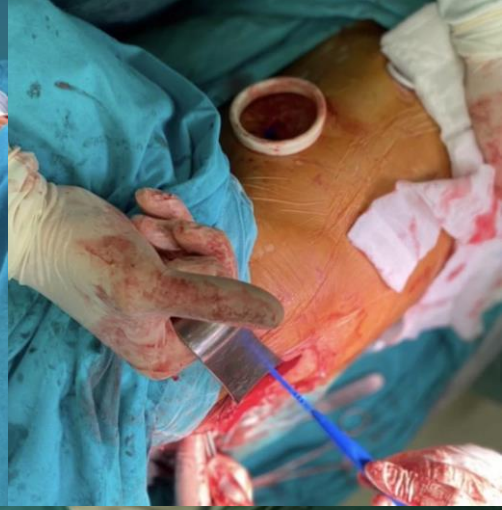
By definition Pancoast tumors are classified as T3 tumors when they invade only the chest wall and/or the sympathetic chain. Tumors that invade the brachial plexus, vertebral bodies, and vascular structures are classified as T4. According to their N status, the final stage is IIB if the tumor is T3N0, IIA if T3N1–2 or T4N0–1, and IIB if T3N3 or T4N2–3 (16). A careful mediastinal staging is

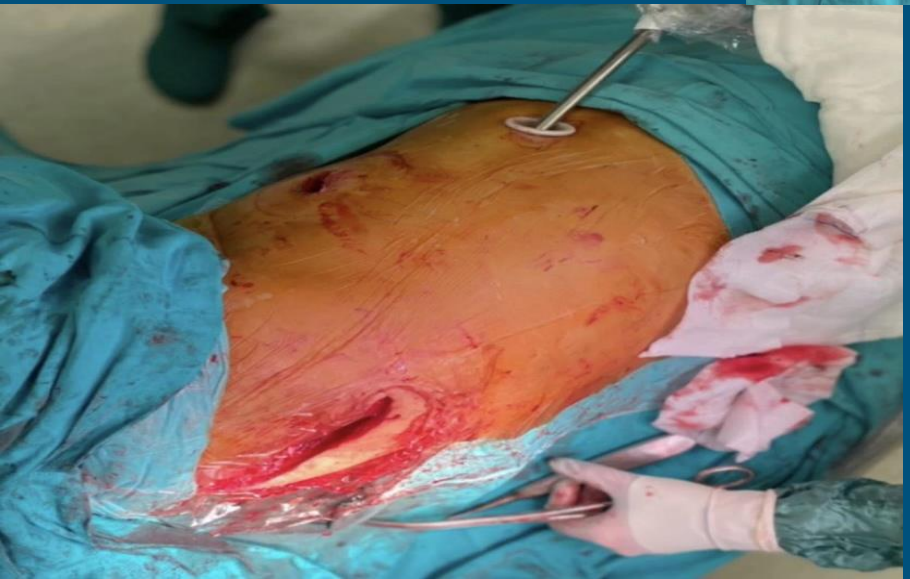


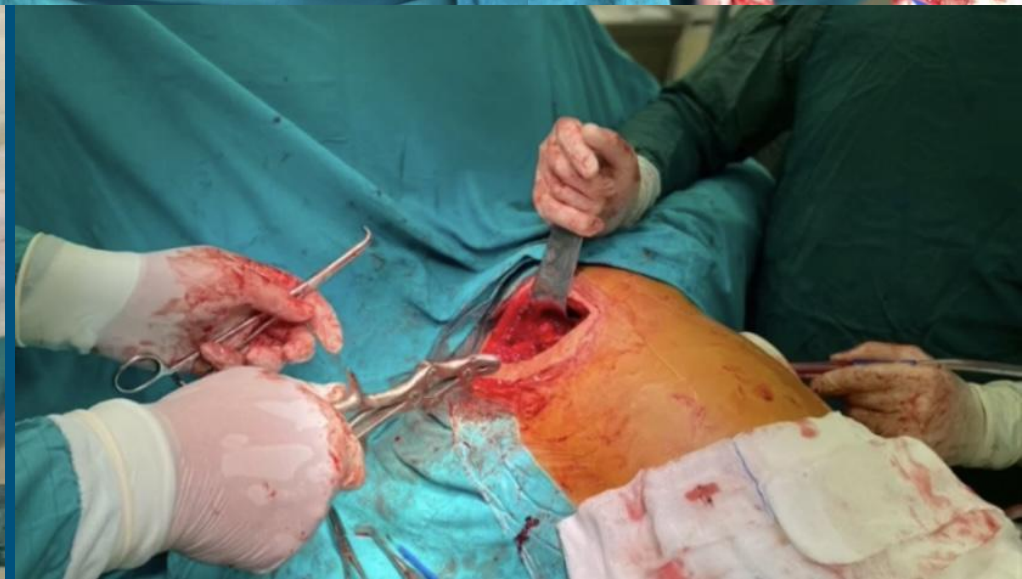


VATS Hibrid Pankoast









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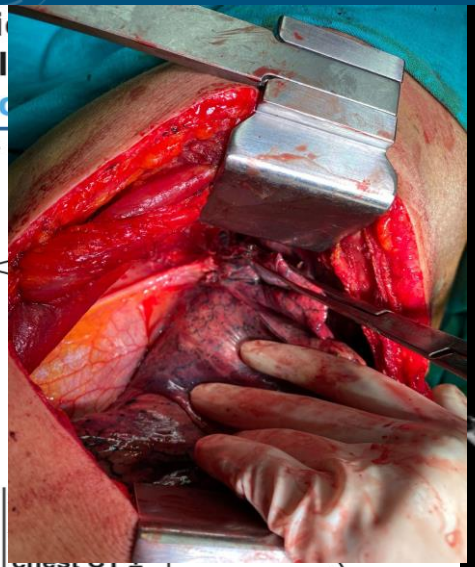
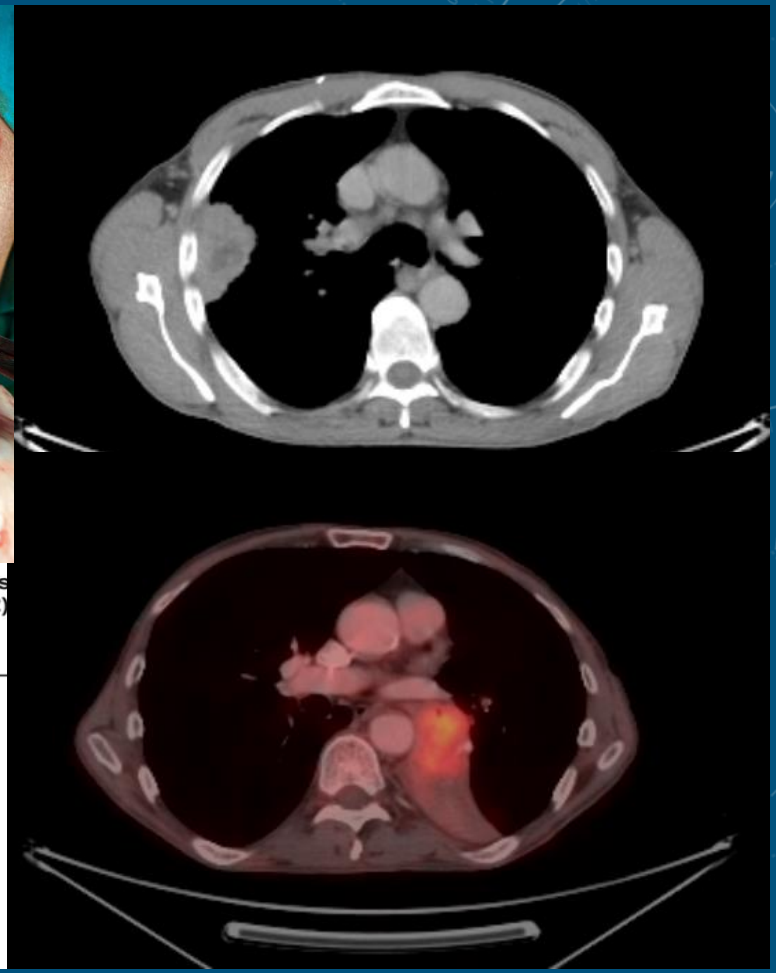
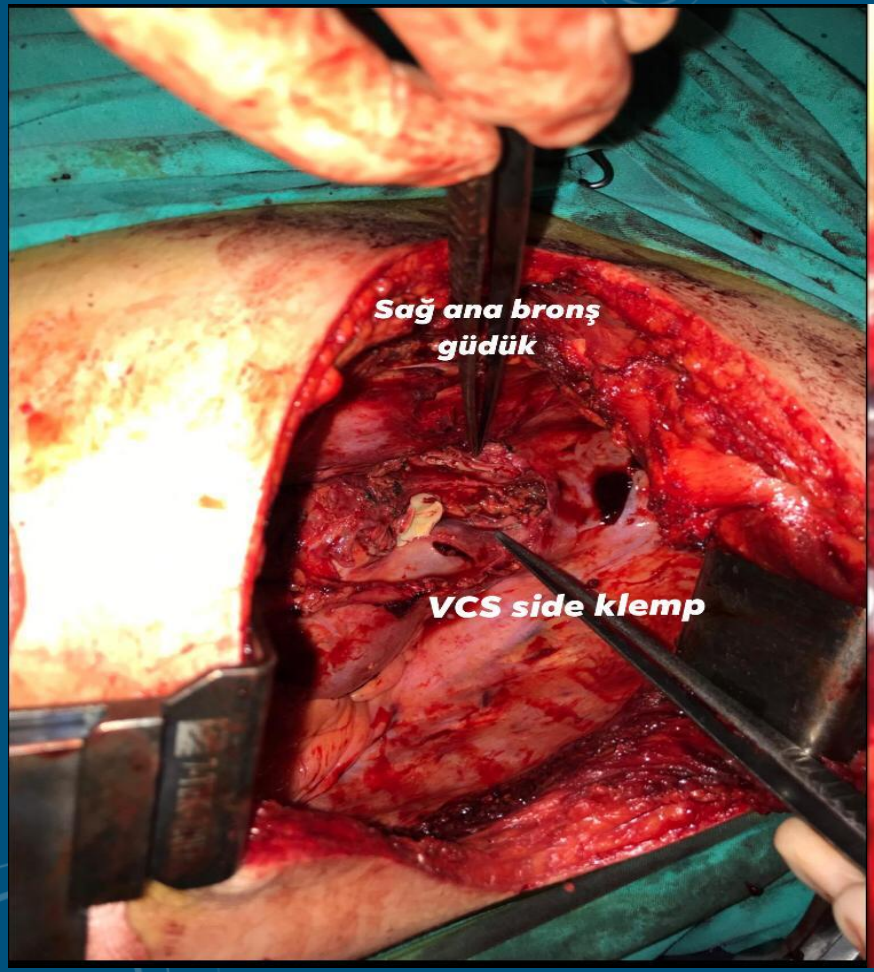
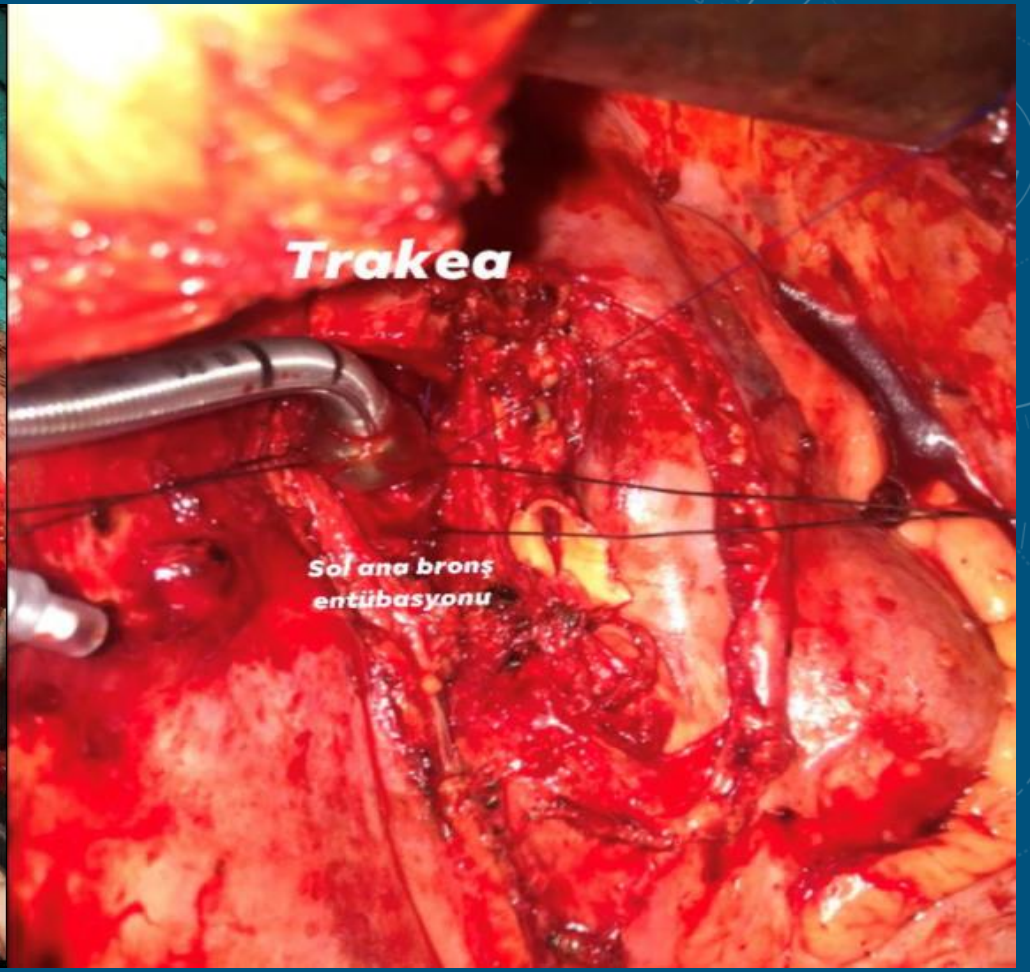
CLINICAL PRESENTATION	INITIAL TREATMENT
Chest wall, proximal airway, or mediastinum (T3 invasion, N0–1 Resectable T4 extension, N0–1)	Surgery[k,q] (preferred) or
Stage IIIA (T4, N0–1)	Concurrent chemoradiation[l,t] or Chemotherapy[r] → PET/CT → Margins (R1, R2)
Stage IIIA (T4, N0–1) Unresectable	Definitive concurrent chemoradiation[l,t] (category 1)

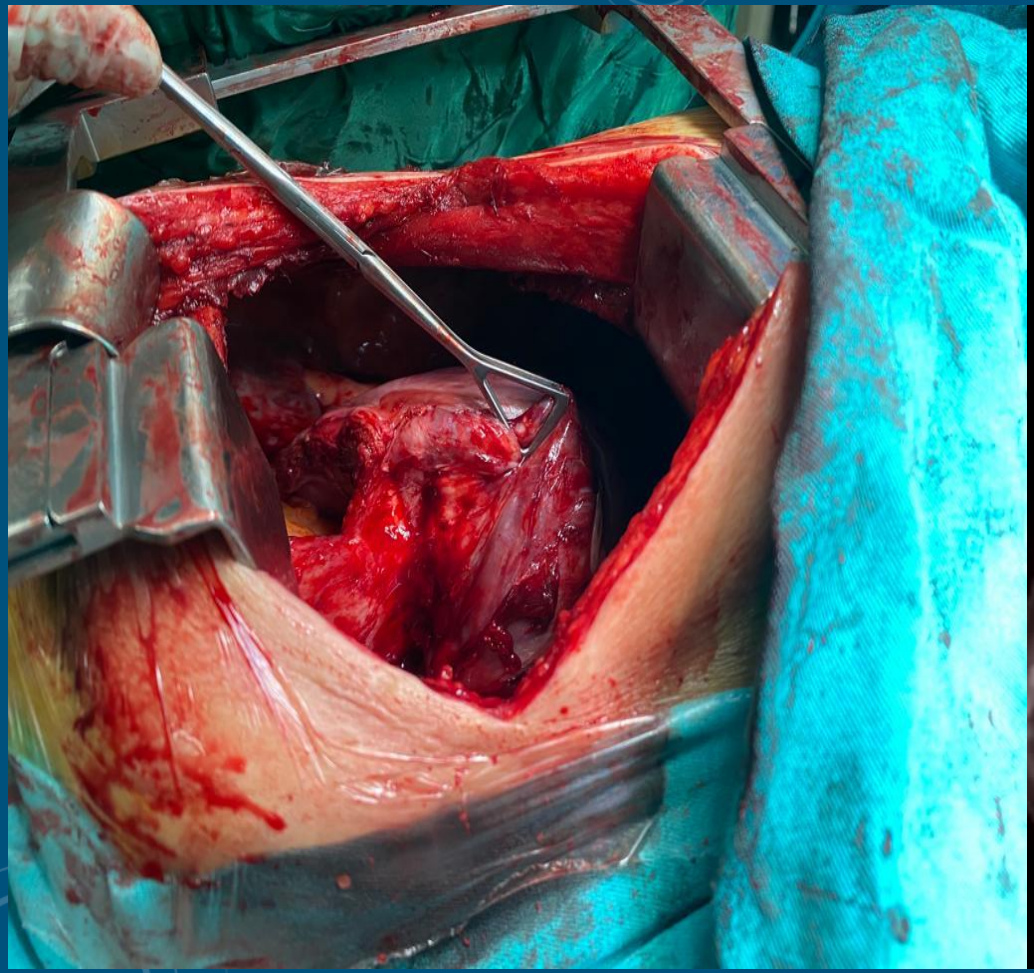
[k] See Principles of Surgical Therapy (NSCL-B).
[l] See Principles of Radiation Therapy (NSCL-C).
[q] Consider testing for *EGFR* mutation on surgical tissue or biopsy in stages IB–IIIA.
[r] See Systemic Therapy Regimens for Neoadjuvant and Adjuvant Therapy (NSCL-E).
[t] See Concurrent Chemoradiation Regimens (NSCL-F).
[u] Durvalumab is not recommended for patients following definitive surgical resection.
[v] R0 = no residual tumor, R1 = microscopic residual tumor, R2 = macroscopic residual tumor.
[y] Consider RT boost if chemoradiation is given as initial treatment.

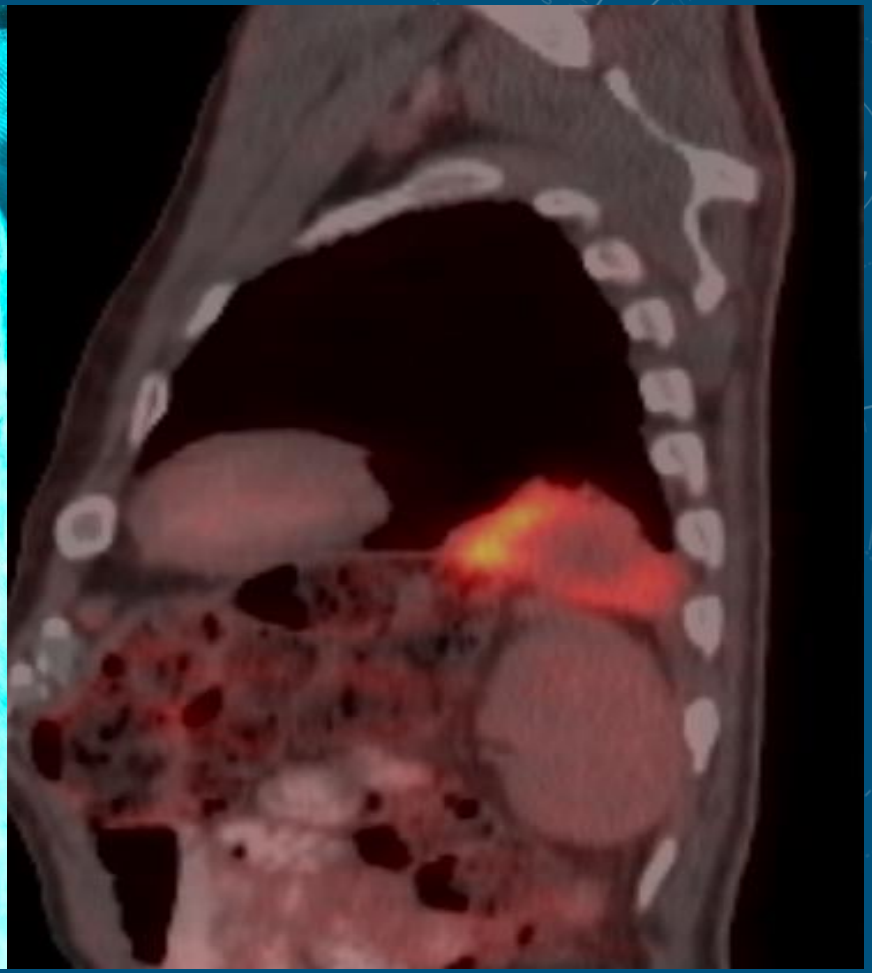


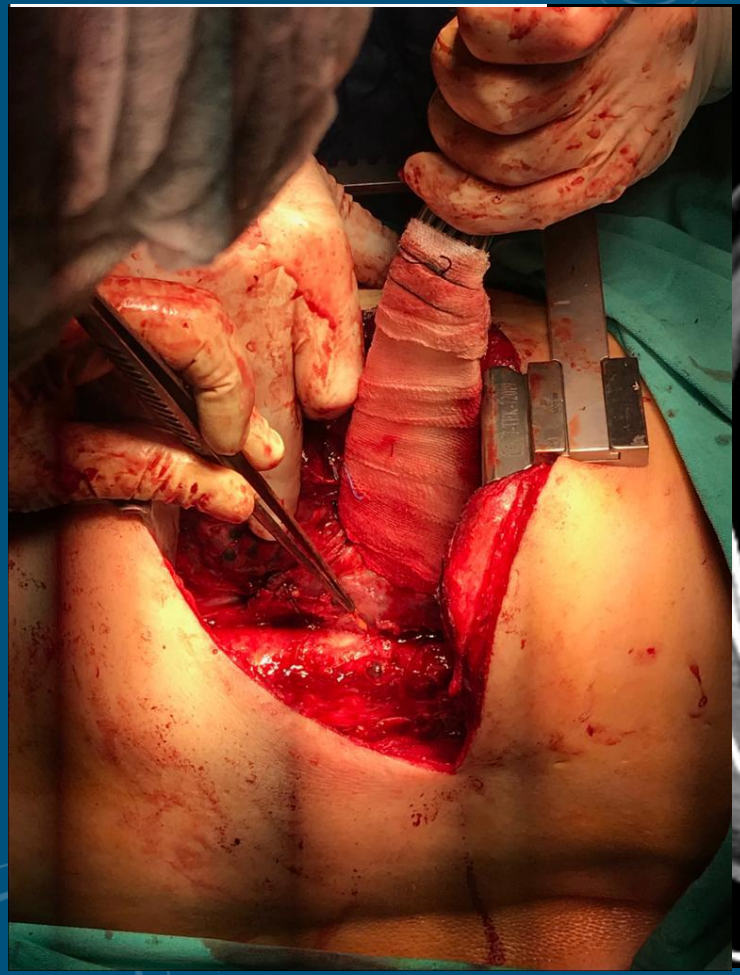


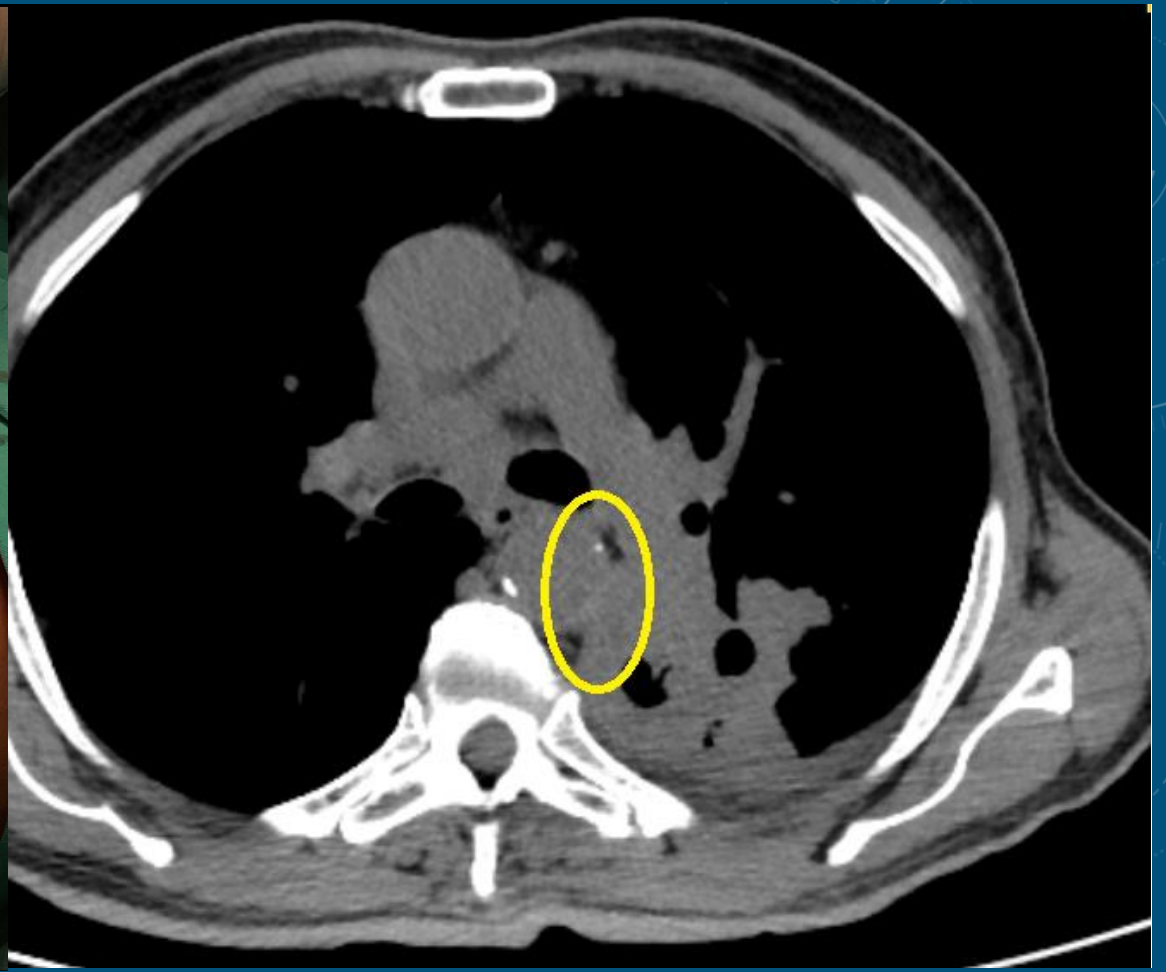

Sağ ana bronş
güdük
VCS side klemp


Trakea
Sol ana bronş
entübasyonu









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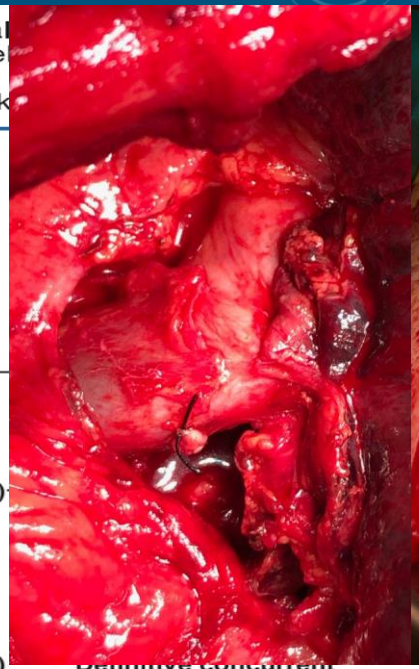
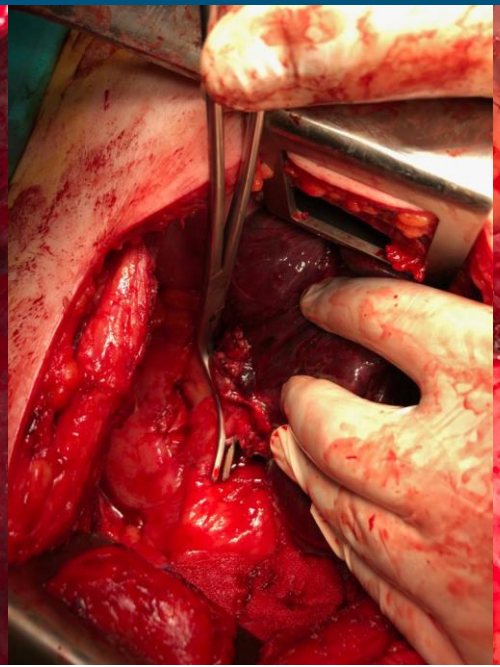
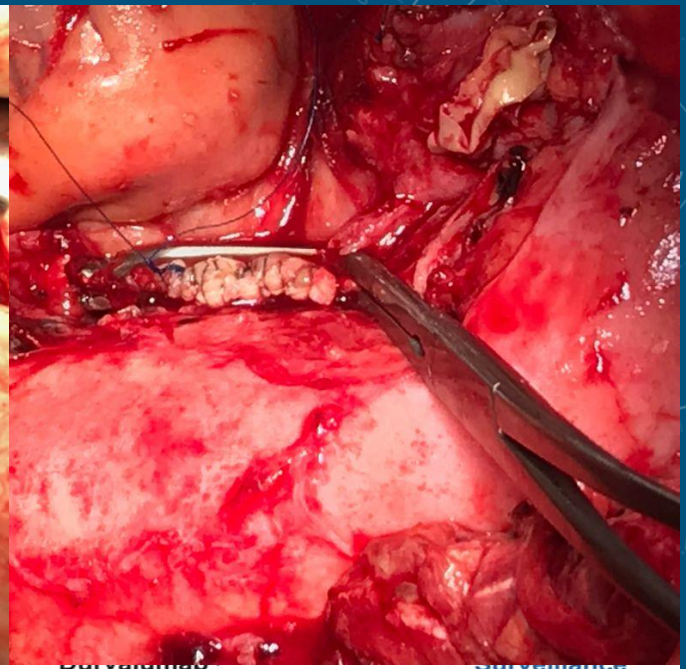
CLINICAL PRESENTATION







Chest wall, proximal airway, or mediastinum (T3 invasion, N0–1 Resectable T4 extension, N0–1)

Stage IIIA (T4, N0–1)

Stage IIIA (T4, N0–1) Unresectable → **chemoradiation[l,t] (category 1)** → **(category 1)** → **(NSCL-16)**

[k] See Principles of Surgical Therapy (NSCL-B).
[l] See Principles of Radiation Therapy (NSCL-C).
[q] Consider testing for *EGFR* mutation on surgical tissue or biopsy in stages IB–IIIA.
[r] See Systemic Therapy Regimens for Neoadjuvant and Adjuvant Therapy (NSCL-E).
[t] See Concurrent Chemoradiation Regimens (NSCL-F).
[u] Durvalumab is not recommended for patients following definitive surgical resection.
[v] R0 = no residual tumor, R1 = microscopic residual tumor, R2 = macroscopic residual tumor.
[y] Consider RT boost if chemoradiation is given as initial treatment.

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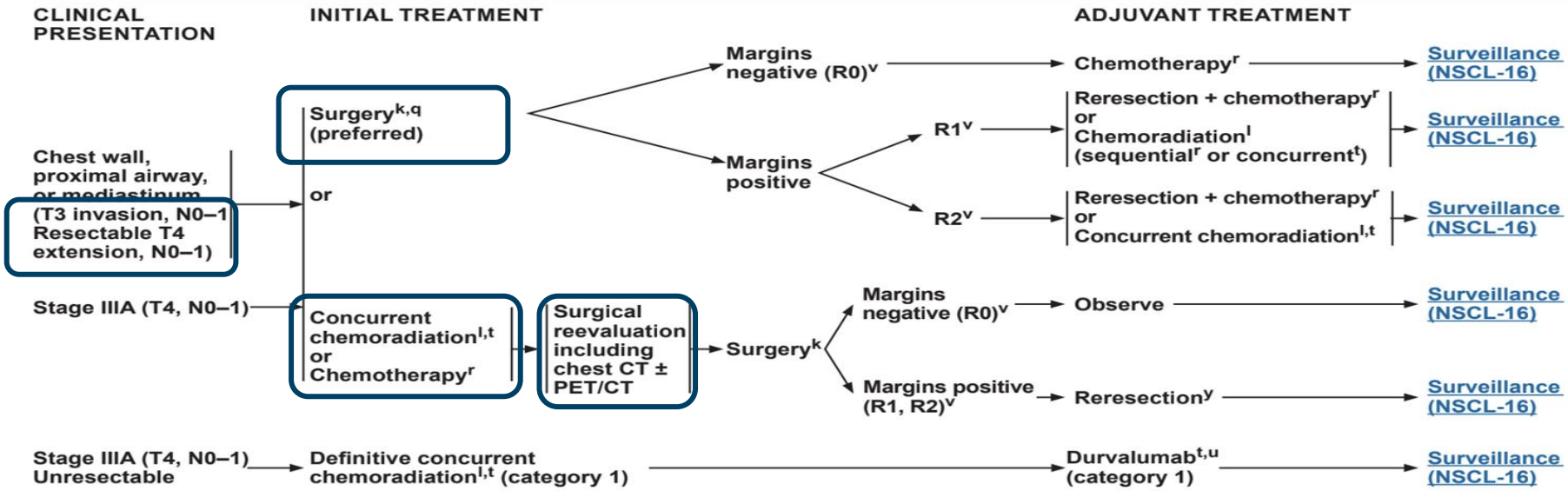

[k] See Principles of Surgical Therapy (NSCL-B).
[l] See Principles of Radiation Therapy (NSCL-C).
[q] Consider testing for *EGFR* mutation on surgical tissue or biopsy in stages IB–IIIA.
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[v] R0 = no residual tumor, R1 = microscopic residual tumor, R2 = macroscopic residual tumor.
[y] Consider RT boost if chemoradiation is given as initial treatment.

PRINCIPLES OF SURGICAL THERAPY

Evaluation

- Determination of resectability, surgical staging, and ***pulmonary resection should be performed by thoracic surgeons who perform lung cancer surgery as a prominent part of their practice***.
- CT and PET/CT used for staging should be within 60 days before proceeding with surgical evaluation.
- For medically operable disease, resection is the preferred local treatment modality (other modalities include SABR, thermal ablation such as radiofrequency ablation, and cryotherapy). Thoracic surgical oncology consultation should be part of the evaluation of any patient being considered for curative local therapy. In cases where SABR is considered for high-risk or borderline operable patients, a multidisciplinary evaluation including a radiation oncologist is recommended.
- The overall plan of treatment as well as needed imaging studies should be determined before any non-emergency treatment is initiated.
- Thoracic surgeons should actively participate in multidisciplinary discussions and meetings regarding lung cancer patients (eg, multidisciplinary clinic and/or tumor board).
- Patients who are active smokers should be provided counseling and smoking cessation support (NCCN Guidelines for Smoking Cessation). While active smokers have a mildly increased incidence of postoperative pulmonary complications, these should not be considered a prohibitive risk for surgery. Surgeons should not deny surgery to patients solely due to smoking status, as surgery provides the predominant therapy for patients with early-stage lung cancer.

Resection

- Anatomic pulmonary resection is preferred for the majority of patients with NSCLC.
- Sublobar resection - Segmentectomy and wedge resection should achieve parenchymal resection margins ≥2 cm or ≥ the size of the nodule.
- Sublobar resection should also sample appropriate N1 and N2 lymph node stations unless not technically feasible without substantially increasing the surgical risk.
- Segmentectomy (preferred) or wedge resection is appropriate in selected patients for the following reasons:
  - Poor pulmonary reserve or other major comorbidity that contraindicates lobectomy
  - Peripheral nodule[1] ≤2 cm with at least one of the following:
    - Pure AIS histology
    - Nodule has ≥50% ground-glass appearance on CT
    - Radiologic surveillance confirms a long doubling time (≥400 days)
- VATS or minimally invasive surgery (including robotic-assisted approaches) should be strongly considered for patients with no anatomic or surgical contraindications, as long as there is no compromise of standard oncologic and dissection principles of thoracic surgery.
- In high-volume centers with significant VATS experience, VATS lobectomy in selected patients results in improved early outcomes (ie, decreased pain, reduced hospital length of stay, more rapid return to function, fewer complications) without compromise of cancer outcomes.
- Lung-sparing anatomic resection (sleeve lobectomy) is preferred over pneumonectomy, if anatomically appropriate and margin-negative resection is achieved.
- T3 (invasion) and T4 local extension tumors require en-bloc resection of the involved structure with negative margins. If a surgeon or center is uncertain about potential complete resection, consider obtaining an additional surgical opinion from a high-volume specialized center.

Margins and Nodal Assessment (see NSCL-B 2 of 4)

The Role of Surgery in Patients with Stage IIIA (N2) NSCLC (see NSCL-B 2 of 4 through NSCL-B 4 of 4)

[1]Peripheral is defined as the outer one third of the lung parenchyma.

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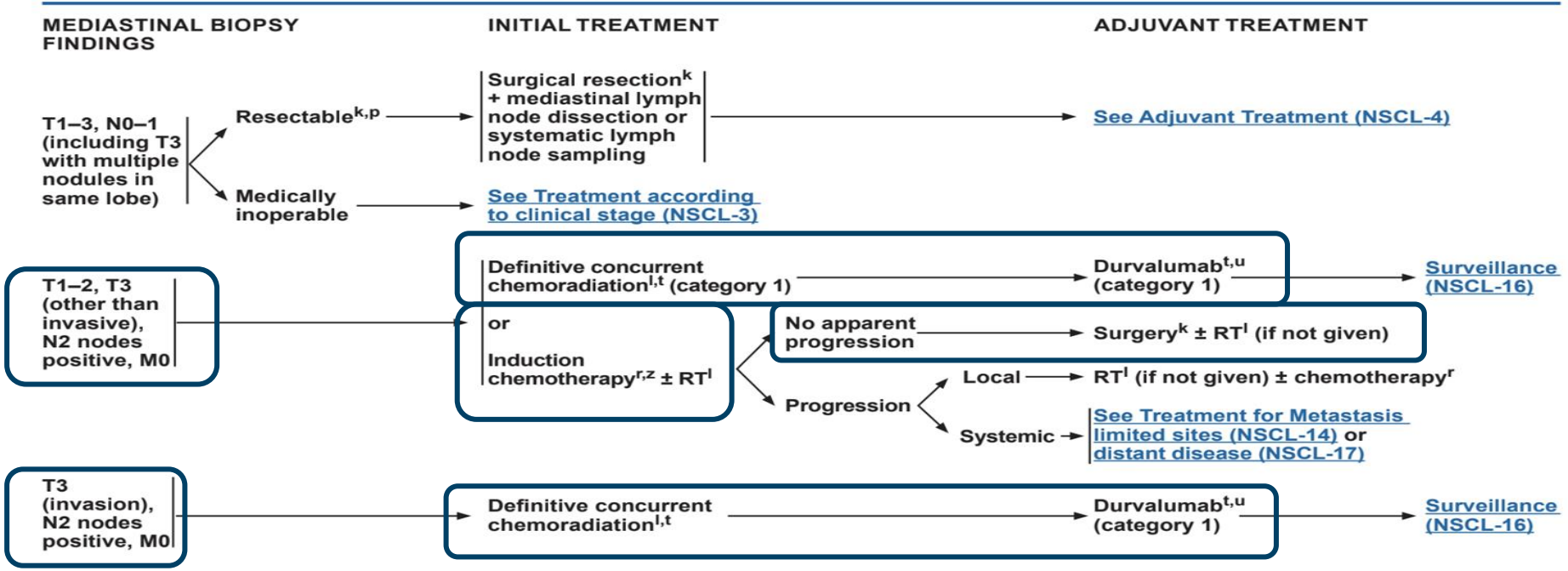

[k] See Principles of Surgical Therapy (NSCL-B).
[l] See Principles of Radiation Therapy (NSCL-C).
[p] After surgical evaluation, patients likely to receive adjuvant chemotherapy may be treated with induction chemotherapy as an alternative.
[r] See Systemic Therapy Regimens for Neoadjuvant and Adjuvant Therapy (NSCL-E).
[t] See Concurrent Chemoradiation Regimens (NSCL-F).
[u] Durvalumab is not recommended for patients following definitive surgical resection.
[z] Chest CT with contrast and/or PET/CT to evaluate progression.

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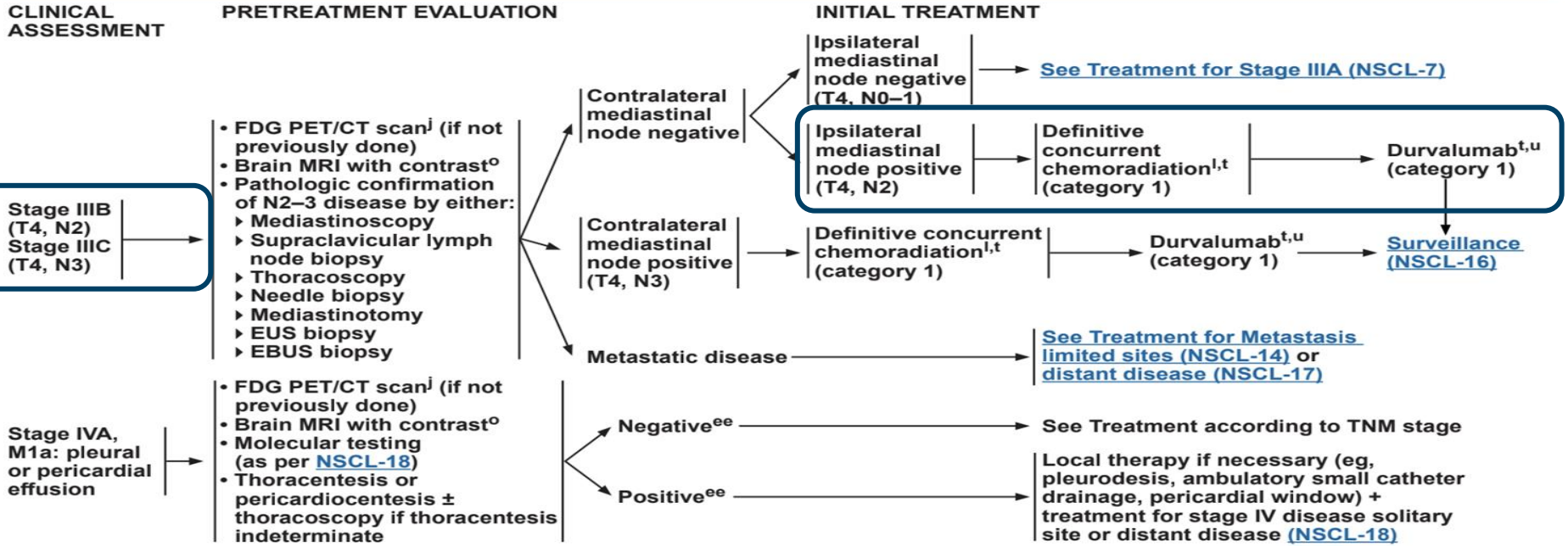

[j] PET/CT performed skull base to knees or whole body. Positive PET/CT scan findings for distant disease need pathologic or other radiologic confirmation. If PET/CT scan is positive in the mediastinum, lymph node status needs pathologic confirmation.

[l] See Principles of Radiation Therapy (NSCL-C).

[o] If MRI is not possible, CT of head with contrast.

[t] See Concurrent Chemoradiation Regimens (NSCL-F).

[u] Durvalumab is not recommended for patients following definitive surgical resection.

[ee] Most pleural (pericardial) effusions with lung cancer are a result of the tumor. In a few patients, however, multiple microscopic examinations of pleural (pericardial) fluid are negative for tumor, and fluid is non-bloody and not an exudate. If these elements and clinical judgment dictate that the effusion is not related to the tumor, the effusion should be excluded as a staging descriptor.

PRINCIPLES OF SURGICAL THERAPY

The Role of Surgery in Patients with Stage IIIA (N2) NSCLC

- Repeat mediastinoscopy, while possible, is technically difficult and has a lower accuracy compared to primary mediastinoscopy. One possible strategy is to perform EBUS (± EUS) in the initial pretreatment evaluation and reserve mediastinoscopy for nodal restaging after neoadjuvant therapy.[5]
- Patients with a single lymph node smaller than 3 cm can be considered for a multimodality approach that includes surgical resection.[1,6,7]
- Restaging after induction therapy is difficult to interpret, but CT +/- PET should be performed to exclude disease progression or interval development of metastatic disease.
- Patients with negative mediastinum after neoadjuvant therapy have a better prognosis.[7,8]
- Neoadjuvant chemoradiotherapy is used in 50% of the NCCN Member Institutions, while neoadjuvant chemotherapy is used in the other 50%. Overall survival appears similar provided RT is given postoperatively, if not given preoperatively.[5,9] Neoadjuvant chemoradiotherapy is associated with higher rates of pathologic complete response and negative mediastinal lymph nodes.[10] However, that is achieved at the expense of higher rates of acute toxicity and increased cost.
- When neoadjuvant chemoradiotherapy is used with doses lower than those used for standard definitive therapy, all efforts should be made to minimize any possible breaks in radiotherapy for surgical evaluation. Treatment breaks of more than 1 week are considered unacceptable.
- When timely surgical evaluation is not available, the strategy of neoadjuvant chemoradiotherapy should not be used. Another option in individual cases, and with the agreement of the thoracic surgeon, is to complete definitive chemoradiotherapy prior to re-evaluation and consideration for surgery.[11,12] If a surgeon or center is uncertain about the feasibility or safety of resection after definitive doses of radiation, consider obtaining an additional surgical opinion from a high-volume specialized center. These operations may also benefit from additional considerations of soft tissue flap coverage in the radiation field at the time of resection.
- Data from a large multi-institutional trial indicate that pneumonectomy after neoadjuvant chemoradiotherapy has unacceptable morbidity and mortality.[2] However, it is not clear if this is also true with neoadjuvant chemotherapy alone. Further, many groups have challenged that cooperative group finding with single-institution experiences demonstrating safety of pneumonectomy after induction therapy.[13-16] In addition, there is no evidence that adding RT to induction regimens for patients with operable stage IIIA (N2) disease improves outcomes compared to induction chemotherapy.[17]

A questionnaire was submitted to the NCCN Member Institutions in 2010 regarding their approach to patients with N2 disease. Their responses indicate the patterns of practice when approaching this difficult clinical problem.

a) Would consider surgery in patients with one N2 lymph node station involved by a lymph node smaller than 3 cm: (90.5%)
b) Would consider surgery with more than one N2 lymph node station involved, as long as no lymph node was bigger than 3 cm: (47.6%)
c) Uses EBUS (+/- EUS) in the initial evaluation of the mediastinum: (80%)
d) Uses pathologic evaluation of the mediastinum, after neoadjuvant therapy, to make a final decision before surgery: (40.5%)
e) Would consider neoadjuvant therapy followed by surgery when a patient is likely, based on initial evaluation, to require a pneumonectomy: (54.8%)

References

N2 de Cerrahi

Practice Guideline > Chest. 2013 May;143(5 Suppl):e314S-e340S. doi: 10.1378/chest.12-2360.

Treatment of stage III non-small cell lung cancer: Diagnosis and management of lung cancer, 3rd ed: American College of Chest Physicians evidence-based clinical practice guidelines

Nithya Ramnath [1], Thomas J Dilling [2], Loren J Harris [3], Anthony W Kim [4], Gaetane C Michaud [4], Alex A Balekian [5], Rebecca Diekemper [6], Frank C Detterbeck [4], Douglas A Arenberg [7]

Affiliations + expand

PMID: 23649445 DOI: 10.1378/chest.12-2360

Abstract

Objectives: Stage III non-small cell lung cancer (NSCLC) describes a heterogeneous population with disease presentation ranging from apparently resectable tumors with occult microscopic nodal metastases to unresectable, bulky nodal disease. This review updates the published clinical trials since the last American College of Chest Physicians guidelines to make treatment recommendations for this controversial subset of patients.

Results: For individuals with stage IIIA or IIIB disease, good performance scores, and minimal weight loss, treatment with combined chemoradiotherapy results in better survival than radiotherapy alone. Consolidation chemotherapy or targeted therapy following definitive chemoradiation for stage IIIA is not supported. Neoadjuvant therapy followed by surgery is neither clearly better nor clearly worse than definitive chemoradiation. Most of the arguments made regarding patient selection for

Öneri Özetleri

Discrete Mediastinal Node Involvement

3.5.1. In patients with discrete N2 involvement by NSCLC identified preoperatively (IIIA), we recommend the treatment plan should be made with the input from a multidisciplinary team (Grade 1C).

Remark: The multidisciplinary team should include at a minimum a thoracic surgeon, medical oncologist, and radiation oncologist.

3.5.2. In patients with discrete N2 involvement by NSCLC identified preoperatively (IIIA), either definitive chemoradiation therapy or induction therapy followed by surgery is recommended over either surgery or radiation alone (Grade 1A).

Remark : As the data do not permit the selection of one option or the other as superior, patient values and preferences should factor significantly in the decision.

3.5.3. In patients with discrete N2 involvement by NSCLC identified preoperatively (IIIA), primary surgical resection followed by adjuvant therapy is not recommended (except as part of a clinical trial) (Grade 1C).

4.5.1. In patients with NSCLC undergoing surgical resection, systematic mediastinal lymph node sampling or complete mediastinal lymph node dissection is recommended (Grade 1B).

Remark: It is unclear whether lymphadenectomy offers a survival benefit over systematic sampling, but in general, lymphadenectomy is suggested if there is evidence of N2 node involvement.

N2 de Cerrahi

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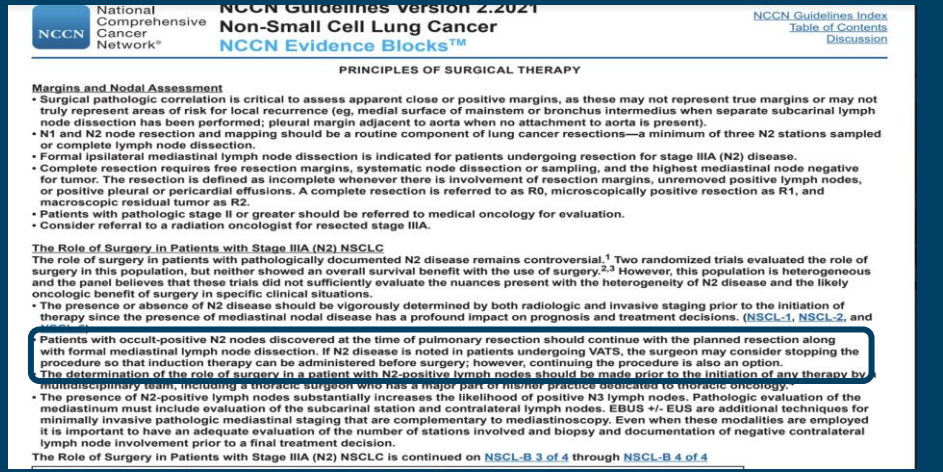
Öneri Özetleri

4.5.2. In patients with NSCLC who have incidental (occult) N2 disease (IIIA) found at surgical resection despite thorough preoperative staging and in whom complete resection of the lymph nodes and primary tumor is technically possible, completion of the planned lung resection and mediastinal lymphadenectomy is suggested (Grade 2C).

Remark: This recommendation assumes that staging for distant disease and invasive preoperative mediastinal staging according to guidelines have been carried out.

Remark: In a patient who has not received preoperative staging despite clinical suspicion of N2 node involvement (ie, enlarged on CT, uptake on PET, or negative CT and PET but with a central tumor or N1 involvement), the operation should be aborted and staging completed if N2 disease is identified intraoperatively.



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PRINCIPLES OF SURGICAL THERAPY

Margins and Nodal Assessment

- Surgical pathologic correlation is critical to assess apparent close or positive margins, as these may not represent true margins or may not truly represent areas of risk for local recurrence (eg, medial surface of mainstem or bronchus intermedius when separate subcarinal lymph node dissection has been performed; pleural margin adjacent to aorta when no attachment to aorta is present).
- N1 and N2 node resection and mapping should be a routine component of lung cancer resections—a minimum of three N2 stations sampled or complete lymph node dissection.
- Formal ipsilateral mediastinal lymph node dissection is indicated for patients undergoing resection for stage IIIA (N2) disease.
- Complete resection requires free resection margins, systematic node dissection or sampling, and the highest mediastinal node negative for tumor. The resection is defined as incomplete whenever there is involvement of resection margins, unremoved positive lymph nodes, or positive pleural or pericardial effusions. A complete resection is referred to as R0, microscopically positive resection as R1, and macroscopic residual tumor as R2.
- Patients with pathologic stage II or greater should be referred to medical oncology for evaluation.
- Consider referral to a radiation oncologist for resected stage IIIA.

The Role of Surgery in Patients with Stage IIIA (N2) NSCLC

The role of surgery in patients with pathologically documented N2 disease remains controversial.[1] Two randomized trials evaluated the role of surgery in this population, but neither showed an overall survival benefit with the use of surgery.[2,3] However, this population is heterogeneous and the panel believes that these trials did not sufficiently evaluate the nuances present with the heterogeneity of N2 disease and the likely oncologic benefit of surgery in specific clinical situations.

- The presence or absence of N2 disease should be vigorously determined by both radiologic and invasive staging prior to the initiation of therapy since the presence of mediastinal nodal disease has a profound impact on prognosis and treatment decisions. (NSCL-1, NSCL-2, and NSCL-3)
- Patients with occult-positive N2 nodes discovered at the time of pulmonary resection should continue with the planned resection along with formal mediastinal lymph node dissection. If N2 disease is noted in patients undergoing VATS, the surgeon may consider stopping the procedure so that induction therapy can be administered before surgery; however, continuing the procedure is also an option.
- The determination of the role of surgery in a patient with N2-positive lymph nodes should be made prior to the initiation of any therapy by a multidisciplinary team, including a thoracic surgeon who has a major part of his/her practice dedicated to thoracic oncology.
- The presence of N2-positive lymph nodes substantially increases the likelihood of positive N3 lymph nodes. Pathologic evaluation of the mediastinum must include evaluation of the subcarinal station and contralateral lymph nodes. EBUS +/- EUS are additional techniques for minimally invasive pathologic mediastinal staging that are complementary to mediastinoscopy. Even when these modalities are employed it is important to have an adequate evaluation of the number of stations involved and biopsy and documentation of negative contralateral lymph node involvement prior to a final treatment decision.

The Role of Surgery in Patients with Stage IIIA (N2) NSCLC is continued on NSCL-B 3 of 4 through NSCL-B 4 of 4

2022

Management of Stage III Non–Small-Cell Lung Cancer: ASCO Guideline

Megan E. Daly, MD[1]; Navneet Singh, MD, DM[2]; Nofisat Ismaila, MD, MSc[3]; Mara B. Antonoff, MD[4]; Douglas A. Arenberg, MD[5]; Jeffrey Bradley, MD[6]; Elizabeth David, MD[7]; Frank Detterbeck, MD[8]; Martin Früh, MD[9,10]; Matthew A. Gubens, MD, MS[11]; Amy C. Moore, PhD[12]; Sukhmani K. Padda, MD[13]; Jyoti D. Patel, MD[14]; Tanyanika Phillips, MD, MPH[15]; Angel Qin, MD[5]; Clifford Robinson, MD[16]; and Charles B. Simone II, MD[17]

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THE BOTTOM LINE

Management of Stage III Non–Small-Cell Lung Cancer: ASCO Guideline

Guideline Questions

1. What is the appropriate evaluation and staging workup for patients with suspected stage III non–small-cell lung cancer (NSCLC)?
2. Which patients with stage III NSCLC may be considered for surgical resection?
3. Which patients with potentially resectable stage III NSCLC should be considered for neoadjuvant therapy?
4. Which patients with resected stage III NSCLC should be considered for adjuvant therapy?
5. What is the appropriate management for patients with unresectable stage III NSCLC?

Target Population

Patients with stage III NSCLC.

Target Audience

Medical oncologists, radiation oncologists, thoracic surgeons, pulmonologists, pathologists, radiologists, primary care physicians, nurse practitioners, physician assistants, pharmacists, nurses, and other providers.

Methods

An Expert Panel was convened to develop clinical practice guideline recommendations on the basis of a systematic review of the medical literature.

TABLE 1. Evidence Table Regarding Multimodality Treatment With or Without Surgery for Stage III NSCLC

Patient or population: Patients with stage III NSCLC
Setting: Outpatient
Intervention: Induction/Concurrent CRT + Surgery
Comparison: Definitive RT or CRT

	Anticipated Absolute Effects[a] (95% CI)					
Outcomes	Risk With Definitive RT or CRT	Risk With Induction CRT + Surgery	Relative Effect (95% CI)	No. of Participants (studies)	Certainty of the Evidence (GRADE)	Comments
OS	320 per 1,000	298 per 1,000 (271 to 330)	HR 0.92 (0.82 to 1.04)	1,322 (six RCTs) Meta-analysis	Low[b,c,d]	Meta-analysis did not find a significant difference in OS in patients with locally advanced NSCLC after induction treatment and surgery compared with definitive CRT[8]
OS follow up: mean 22.5 months	325 per 1,000	289 per 1,000 (240 to 351)	HR 0.87 (0.70 to 1.10)	396 (one RCT)	Low[b,e]	There was no significant survival advantage to surgery after CRT despite improved PFS[32]
OS follow-up: median 78 months	175 per 1,000	144 per 1,000 (97 to 214)	HR 0.81 (0.53 to 1.25)	161 (one RCT)	Low[b,f]	The evidence suggests that induction CRT + surgery results in little to no difference in OS[31]
OS follow-up: median 6 years	303 per 1,000	318 per 1,000 (264 to 377)	HR 1.06 (0.85 to 1.31)	332 (one RCT)	Low[b,g]	Surgery did not improve OS or PFS compared with radiotherapy[33]
OS	344 per 1,000	289 per 1,000 (57 to 856)	HR 0.81 (0.14 to 4.60)	61 (one RCT)	Low[h]	The evidence suggests that induction CRT + surgery results in little to no difference in OS[35]
OS	392 per 1,000	351 per 1,000 (290 to 418)	HR 0.87 (0.69 to 1.09)	341 (one RCT)	Low[h,i]	Induction CRT + surgery may result in little to no difference in OS[146]

Öneri Özetleri

N2 de cerrahi

- Cerrahi rezeksiyon için planlanan N2 hastalığı olan hastalar neoadjuvan kemoterapi veya neoadjuvan eş zamanlı kemoradyoterapi almalıdır (Tip: Kanıta dayalı; yarar zarardan ağır basar; Kanıt kalitesi: yüksek; Öneri gücü: güçlü)

İyi prognoz

- Neoadjuvan tedavi öncesi
  - Düşük hastalık yükü
    - T ve N2 tutulum derecesi
  - Genç yaş
  - Düşük komorbidite
  - Düşük PET-BT aktivitesi

İyi prognoz

- Neoadjuvan tedavi sonrası
  - Düşük PET-BT aktivitesi
  - T de küçülme
  - Mediastinal downstage

PRINCIPLES OF SURGICAL THERAPY

The Role of Surgery in Patients with Stage IIIA (N2) NSCLC

- Repeat mediastinoscopy, while possible, is technically difficult and has a lower accuracy compared to primary mediastinoscopy. One possible strategy is to perform EBUS (± EUS) in the initial pretreatment evaluation and reserve mediastinoscopy for nodal restaging after neoadjuvant therapy.[5]
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- Patients with negative mediastinum after neoadjuvant therapy have a better prognosis.[7,8]
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e) Would consider neoadjuvant therapy followed by surgery when a patient is likely, based on initial evaluation, to require a pneumonectomy: (54.8%)

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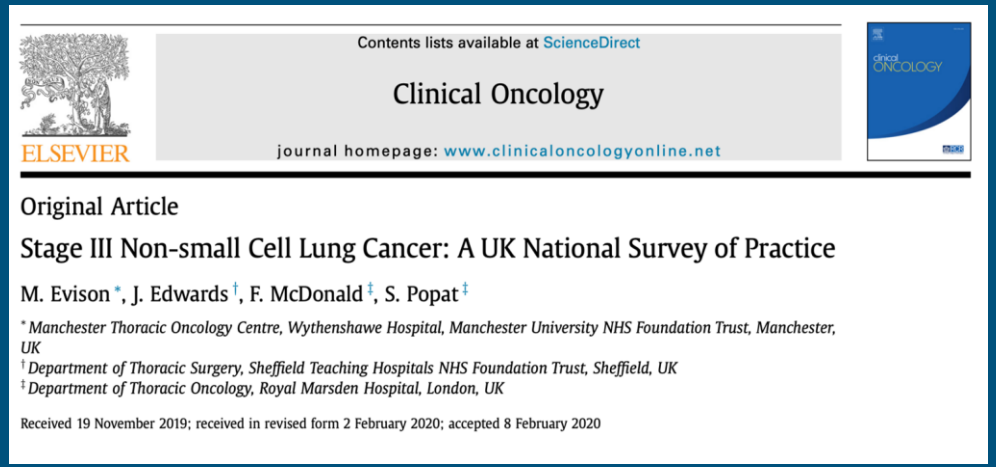
Evre III olgularda cerrahi, multimodalite tedavi rejiminin bir parçası olmalı mı?



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Original Article

Stage III Non-small Cell Lung Cancer: A UK National Survey of Practice

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Evre III olgularda cerrahi, multimodalite tedavi rejiminin bir parçası olmalı mı?

Table 1
Answers to case 1 stratified by specialty of respondent (single-station N2 with good physiological reserve and resectable with a lobectomy)

	Thoracic surgeons	Radiation oncologists	Medical oncologists	Respiratory physicians
Surgery + adjuvant chemotherapy	PD-L1 0%: 50%	PD-L1 0%: 46%	PD-L1 0%: 39%	PD-L1 0%: 46%
	PD-L1 ≥1%: 53%	PD-L1 ≥1%: 38%	PD-L1 ≥1%: 28%	PD-L1 ≥1%: 43%
Neoadjuvant chemotherapy + surgery	PD-L1 0%: 17%%	PD-L1 0%: 16%	PD-L1 0%: 17%	PD-L1 0%: 11%
	PD-L1 ≥1%: 20%	PD-L1 ≥1%: 8%	PD-L1 ≥1%: 11%	PD-L1 ≥1%: 7%
Trimodality (CRT + surgery)	PD-L1 0%: 7%	PD-L1 0%: 2%	PD-L1 0%: 17%	PD-L1 0%: 11%
	PD-L1 ≥1%: 7%	PD-L1 ≥1%: 2%	PD-L1 ≥1%: 15%	PD-L1 ≥1%: 7%
Concurrent CRT	PD-L1 0%: 0%	PD-L1 0%: 12%	PD-L1 0%: 13%	PD-L1 0%: 4%
	PD-L1 ≥1%: 0%	PD-L1 ≥1%: 4%	PD-L1 ≥1%: 0%	PD-L1 ≥1%: 0%
Concurrent CRT plus durvalumab	PD-L1 0%: 7%	PD-L1 0%: 2%	PD-L1 0%: 7%	PD-L1 0%: 0%
	PD-L1 ≥1%: 0%	PD-L1 ≥1%: 32%	PD-L1 ≥1%: 33%	PD-L1 ≥1%: 21%
All options possible	PD-L1 0%: 17%	PD-L1 0%: 20%	PD-L1 0%: 7%	PD-L1 0%: 21%
	PD-L1 ≥1%: 13%	PD-L1 ≥1%: 14%	PD-L1 ≥1%: 2%	PD-L1 ≥1%: 18%

CRT, chemoradiotherapy.

Evre III olgularda cerrahi, multimodalite tedavi rejiminin bir parçası olmalı mı?

Answers to case 2 stratified by specialty of respondent (single-station N2 with good physiological reserve and resectable with a pneumonectomy)

	Thoracic surgeons	Radiation oncologists	Medical oncologists	Respiratory physicians
Surgery + adjuvant chemotherapy	PD-L1 0%: 33%	PD-L1 0%: 16%	PD-L1 0%: 15%	PD-L1 0%: 21%
	PD-L1 ≥1%: 34%	PD-L1 ≥1%: 8%	PD-L1 ≥1%: 11%	PD-L1 ≥1%: 21%
Neoadjuvant chemotherapy + surgery	PD-L1 0%: 17%	PD-L1 0%: 6%	PD-L1 0%: 11%	PD-L1 0%: 11%
	PD-L1 ≥1%: 17%	PD-L1 ≥1%: 6%	PD-L1 ≥1%: 0%	PD-L1 ≥1%: 0%
Trimodality (CRT + surgery)	PD-L1 0%: 17%	PD-L1 0%: 0%	PD-L1 0%: 19%	PD-L1 0%: 7%
	PD-L1 ≥1%: 10%	PD-L1 ≥1%: 0%	PD-L1 ≥1%: 19%	PD-L1 ≥1%: 4%
Concurrent CRT	PD-L1 0%: 13%	PD-L1 0%: 40%	PD-L1 0%: 30%	PD-L1 0%: 18%
	PD-L1 ≥1%: 7%	PD-L1 ≥1%: 6%	PD-L1 ≥1%: 4%	PD-L1 ≥1%: 7%
Concurrent CRT plus durvalumab	PD-L1 0%: 7%	PD-L1 0%: 12%	PD-L1 0%: 9%	PD-L1 0%: 0%
	PD-L1 ≥1%: 10%	PD-L1 ≥1%: 62%	PD-L1 ≥1%: 51%	PD-L1 ≥1%: 39%
All options possible	PD-L1 0%: 7%	PD-L1 0%: 14%	PD-L1 0%: 9%	PD-L1 0%: 29%
	PD-L1 ≥1%: 14%	PD-L1 ≥1%: 14%	PD-L1 ≥1%: 9%	PD-L1 ≥1%: 18%

CRT, chemoradiotherapy.

Evre III olgularda cerrahi, multimodalite tedavi rejiminin bir parçası olmalı mı?

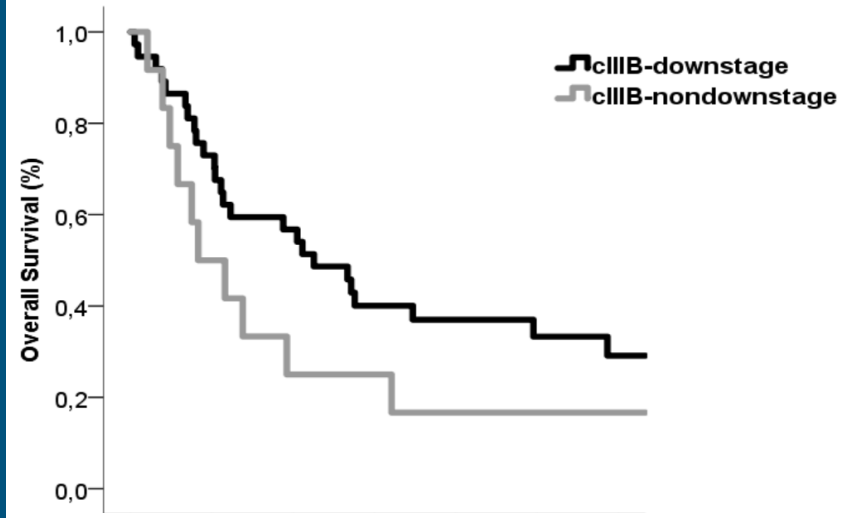
Answers to case 3 stratified by specialty of respondent (multi-station N2 with good physiological reserve and resectable with a lobectomy)

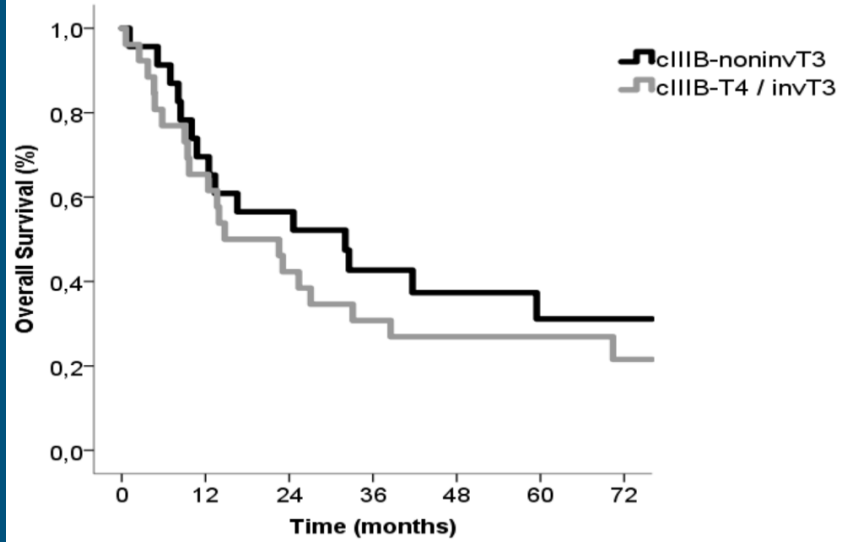
	Thoracic surgeons	Radiation oncologists	Medical oncologists	Respiratory physicians
Surgery + adjuvant chemotherapy	PD-L1 0%: 20%	PD-L1 0%: 12%	PD-L1 0%: 28%	PD-L1 0%: 11%
	PD-L1 ≥1%: 17%	PD-L1 ≥1%: 4%	PD-L1 ≥1%: 17%	PD-L1 ≥1%: 11%
Neoadjuvant chemotherapy + surgery	PD-L1 0%: 17%	PD-L1 0%: 2%	PD-L1 0%: 6%	PD-L1 0%: 7%
	PD-L1 ≥1%: 21%	PD-L1 ≥1%: 0%	PD-L1 ≥1%: 11%	PD-L1 ≥1%: 0%
Trimodality (CRT + surgery)	PD-L1 0%: 10%	PD-L1 0%: 4%	PD-L1 0%: 9%	PD-L1 0%: 14%
	PD-L1 ≥1%: 7%	PD-L1 ≥1%: 0%	PD-L1 ≥1%: 9%	PD-L1 ≥1%: 11%
Concurrent CRT	PD-L1 0%: 23%	PD-L1 0%: 60%	PD-L1 0%: 38%	PD-L1 0%: 36%
	PD-L1 ≥1%: 14%	PD-L1 ≥1%: 2%	PD-L1 ≥1%: 6%	PD-L1 ≥1%: 4%
Concurrent CRT plus durvalumab	PD-L1 0%: 0%	PD-L1 0%: 12%	PD-L1 0%: 11%	PD-L1 0%: 4%
	PD-L1 ≥1%: 14%	PD-L1 ≥1%: 88%	PD-L1 ≥1%: 45%	PD-L1 ≥1%: 54%
All options possible	PD-L1 0%: 13%	PD-L1 0%: 10%	PD-L1 0%: 2%	PD-L1 0%: 14%
	PD-L1 ≥1%: 14%	PD-L1 ≥1%: 6%	PD-L1 ≥1%: 2%	PD-L1 ≥1%: 14%

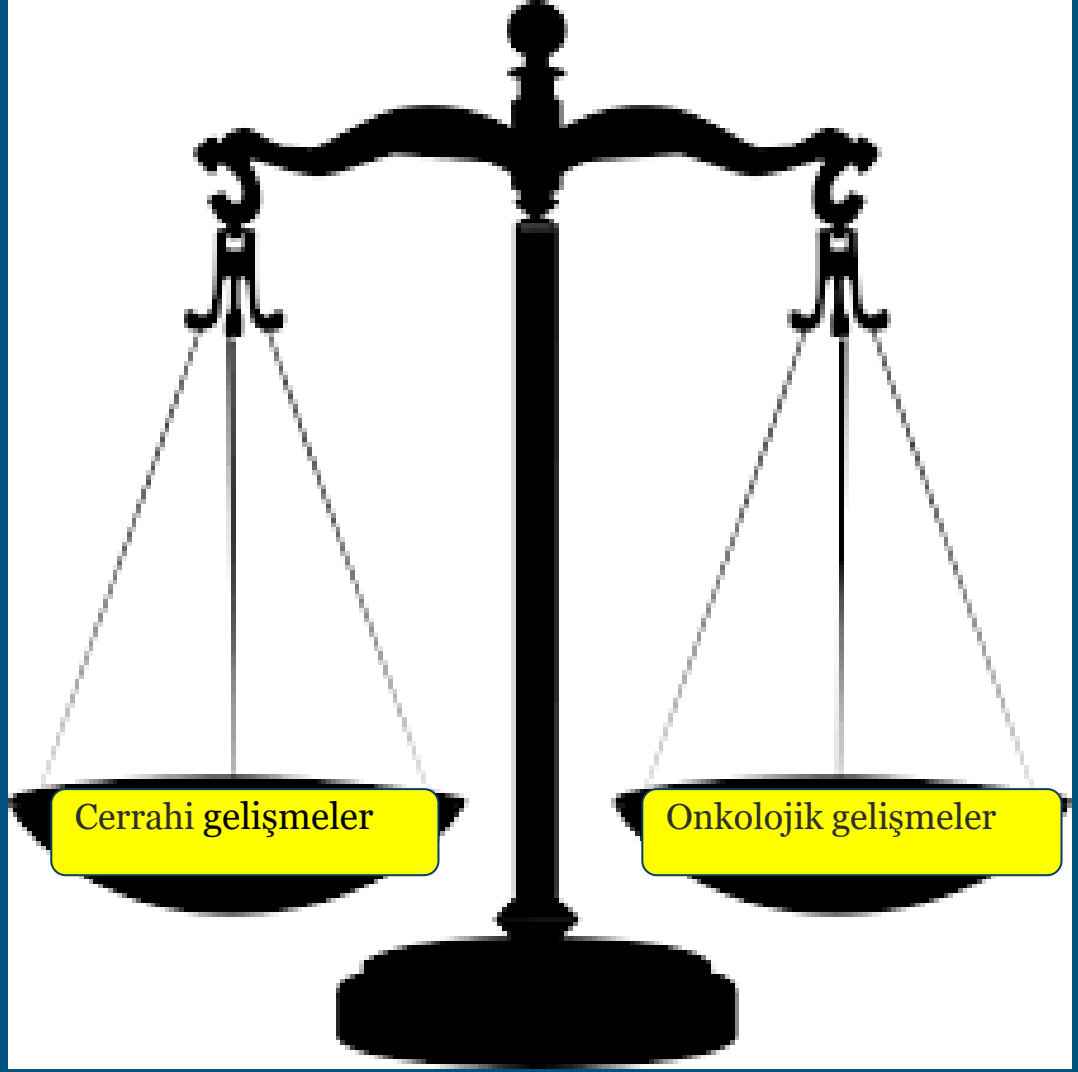
CRT, chemoradiotherapy.

Klinik IIIB subgrup sağkalımlar

Değişkenler	n	5 yıllık OS (ort)	p Değeri
(T3 non-inv)/N2	23	%31,1 (32)	0,506
(T3 inv+ T4)/N2	26	%21,5 (14.7)	
Downstage N2 Grup	37	%33,3 (27)	0,05
Nondownstage N2 Grup	12	%16,7 (10) (3 yıllık OS)	






Cerrahi gelişmeler
Onkolojik gelişmeler

PACIFIC Study: Patient Baseline Characteristics[a]

Characteristic, n (%)		Durvalumab (n=476)	Placebo (n=237)	Total (N=713)
Age	IIIA	T1–T2, N2, M0		
Median, years (range)		T3, N1–N2, M0	64 (23–90)	64 (23-90)
Sex, n (%)		**T4, N0–N1**, M0		
Male			166 (70.0)	500 (70.1)
Female	IIIB	**T4, N2**, M0	71 (30.0)	213 (29.9)
Race, n (%)[b]		T1–T4, N3, M0		
White			157 (66.2)	494 (69.3)
Black or African-American		T1–T4, N0–N3, M1a–M1b	2 (0.8)	14 (2.0)
Asian			72 (30.4)	192 (26.9)
Other			6 (1.3)	12 (1.68)
Not reported			0	1 (0.1)
Disease stage				
IIIA		252 (52.9)	125 (52.7)	377 (52.9)
IIIB		212 (44.5)	107 (45.1)	319 (44.7)
Other[c]		12 (2.5)	5 (2.1)	17 (2.4)
WHO performance status score, n (%)[d]				
0		234 (49.2)	114 (48.1)	348 (48.8)
1		240 (50.4)	122 (51.5)	362 (50.8)
Not reported		2 (0.4)	1 (0.4)	3 (0.4)
EGFR mutation status, n (%)				
Negative				482 (67.6)
Positive				43 (6.0)
Unknown				188 (26.4)

[a]The ITT population included all patients who were … disease stages included 12 patients in the durvalu… IIA, and 2 with stage IB); [b]WHO performance statu… EGFR = epidermal growth factor receptor; ITT = in… Antonia SJ et al. Article and supplementary append… reported previously, patients with other …ebo group (2 with stage IIB, 1 with stage …

5 yıllık OS %42.9

Placebo kolunda %33.4

Comparative Study > Ann Thorac Surg. 2018 Jul;106(1):178-183.
doi: 10.1016/j.athoracsur.2018.02.030. Epub 2018 Mar 14.

Safety and Feasibility of Lung Resection After Immunotherapy for Metastatic or Unresectable Tumors

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- Pacific Çalışmasında **lokal relaps gelişen olgularda salvage cerrahi** uygulansa sağkalımlar nasıl olurdu?
- Marjinal operable IIIA/IIIB olgularda **neoadjuvan KT+İM sonrası cerrahi** sonuçları nasıl olurdu?

- %32 komplet rezeksiyon
- %95 Ro rezeksiyon
- 2 yıllık genel ve hastalıksız sağkalım sırasıyla %77 (Pasifik çalışması %66,3) ve %42

Salvage Surgery Post Definitive Chemoradiotherapy and Durvalumab for Lung Cancer

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Although concurrent chemoradiotherapy (CRT) followed by consolidation immunotherapy considerably improves the duration of survival in patients with unresectable stage III non-small cell lung cancer (NSCLC), few data are available on the management of local relapse after therapy. We present a patient with initially unresectable NSCLC who underwent a right upper lobectomy with reconstruction of the bronchus and pulmonary artery after definitive CRT, followed by consolidation durvalumab. No postoperative complications occurred, and he was recurrence-free at the 10-month follow-up. Salvage surgery might be a viable option for local relapse of NSCLC treated with definitive CRT and durvalumab.

(Ann Thorac Surg 2021;112:e53-5)

Comment

Surgical lung resections after high-dose radiotherapy are technically demanding because of dense fibrotic changes in the hilum, especially in a case of delayed salvage resection. Moreover, the morbidity and mortality of salvage surgery after CRT are high, although recent statistics have shown improvement.[2-5] There are no data about whether durvalumab can make the adhesions more rigid. There is also no clarity about whether consolidative immunotherapy after CRT influences operative outcomes, including survival and complication rates. Moreover, optimal treatment for relapse after CRT and durvalumab has not been established. According to updated results from the PACIFIC trial[1] reported approximately 3 years after the last randomization, no patients in the trial underwent surgery for local relapse or regrowth.[6] Some of those patients might be good candidates for salvage surgery, like the current patient. In the patient in the current report, complete resection was initially difficult because the bulky mediastinal lymph nodes were adjacent to the SVC and trachea on CT. However, after CRT, the lymph nodes dramatically shrank and continued to be stable with durvalumab therapy despite regrowth of the primary tumor.

› Ann Thorac Surg. 2008 Nov;86(5):1632-8; discussion 1638-9.
doi: 10.1016/j.athoracsur.2008.07.042.

Salvage lung resection after definitive radiation (>59 Gy) for non-small cell lung cancer: surgical and oncologic outcomes

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Abstract

Background: Isolated local relapse occurs in 24% to 35% of patients after definitive chemoradiation for locally advanced non-small cell lung cancer. Although originally considered inoperable, select patients are referred for surgical salvage. We describe a series of salvage lung resection after curative-intent radiation.

Methods: Twenty-four consecutive patients from 1997 to 2005 were identified retrospectively. Medical records reviewed. Patients were grouped by surgical indication: A, obvious relapse by computed tomography (CT), 7 patients; B, abnormal fluorodeoxyglucose-positron emission tomography (FDG-PET), 12; C, delayed conversion to trimodality, 4; and D, chronic bronchopleural fistula, 1.

Results: All patients received definitive radiation (median, 63.9 Gray), 22 with concurrent chemotherapy. Original staging included cardiothoracic surgical consultation in 4. Median time from radiation to resection was 21 weeks. Twenty-four patients underwent 25 resections: one wedge, 10 lobectomies, 4 bilobectomies, and 10 pneumonectomies. Nineteen flaps were performed, 16 omental. Fourteen had complications, including one death from adult respiratory distress syndrome. Viable tumor was found in 19 patients. Median overall survival was 30 months (12 months, group A; 43 months, group B). Estimated 3-year survival was 47%. The Kaplan-Meier survival curve for group B was superior to that for group A ($p = 0.019$).

Conclusions: Salvage lung resection after definitive chemoradiation is feasible, with encouraging survival. Surgical indication is predictive, with higher survival among patients undergoing resection for abnormal FDG-PET than for obvious relapse by CT. FDG-PET should be studied prospectively in selecting patients for salvage lung resection. Systematic staging may have increased primary incorporation of surgery, minimizing the need for late salvage.

İlk değerlendirmede inoperable/unrezektabl

Definitif KRT alacak

>12 hafta takipte Bariz relaps (BT de büyüme)

PET-BT cerrahda lokorejyonel canlı tümör varlığı şüphesi (rezidü) uyandıracak. Hipermetabolik anormallik

Cerrahi, küratif tek tedavi şansı olacak. Rezektabl olacak

Erken evre SBRT sonrası relaps

Sabrınız ve dikkatiniz için teşekkür ederim…