Küçük Hücreli Dışı Akciğer Kanserinde Minimal İnvaziv Cerrahi Tedavi (VATS)

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14 Eylül 2019,Rize

Akciğer Kanseri Sıklığı

- DSÖ verilerine göre her yıl yaklaşık 1.2 milyon yeni akciğer kanserli hasta teşhis edilmektedir
- Günümüzde kansere bağlı ölümlerde birinci sırada yer almaktadır
- Akciğer kanserli hastaların **%15'ine erken evrede tanı** konulabilmektedir
- **Bu hastalıkta en iyi tedavi şansı cerrahi rezeksiyondur**

Tarihçe

- 1933 Graham İlk pnömonektomi
- 1947 Price Thomas Sleeve rezeksiyon
- 1950 Abbott Pnömenektomi + Karina Eksizyonu
- 1954 Allison Sleeve lobektomi (CA)
- 1957 Barcley Karinal Lober Sleeve Rezeksiyon
- 1959 Gibbon İlk Sleeve Pnömonektomi
- 1960 Cahan Lober rezeksiyon ile birlikte radikal LND
- 1973 Jensik Segmental Rezeksiyon
- 1989 Yamamoto Karinal Rekonstrüksiyon
- **1990 lı yıllar VATS**
- 2000 li yıllar Robotik cerrahi
- Şimdi VATS daha fazla revaçta (uniportal, 2 port)

Hasta Seçimi:

- *Pulmoner Değerlendirme*
  - Spirometri
  - Karbon monoksit difüzyon testi (DLCO)
  - Arteriyal kan gazı
  - Egzersiz testleri
  - Pulmoner ventilasyon/perfüzyon sintigrafi
- Kardiyak Değerlendirme

S.F.T.	-		Pred	Pre	%Pre/Pred
S.F.T.	FEF 25		6.52	3.38	51.89
S.F.T.	FEF50%			83.09	
S.F.T.	FET			2.37	
S.F.T.	FEV 1		2.53	2.11	83.49
S.F.T.	FEV1%M		72.99	77.51	106.19
S.F.T.	FEV1%6				
S.F.T.	FEV3%E		89.98		
S.F.T.	FEV6				
S.F.T.	FIV1			2.39	
S.F.T.	FIV1%F			99.08	
S.F.T.	FVC		3.40	2.72	80.16
S.F.T.	MEF 25		1.04	0.85	81.18
S.F.T.	MEF 50		3.64	2.26	62.11
S.F.T.	MEF 75		6.52	3.38	51.89
S.F.T.	MMEF		2.60	1.86	71.54
S.F.T.	PEF		7.19	3.65	50.76
S.F.T.	PIF			3.63	

Evreleme:*T (tümör), N (nod), M (metastaz)*

- 8. TNM EVRELEME (2017):T,N,M faktörleri ile sağkalımlar arasındaki ilişkiler irdelenip evrelemedeki değişiklikler yapılmıştır

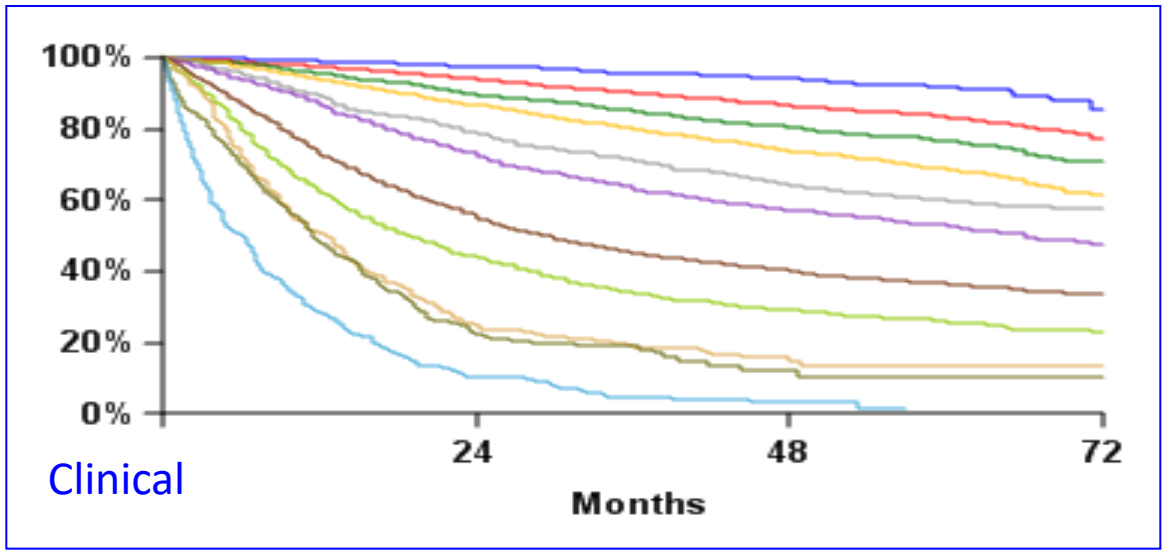
- **cEvreleme (Klinik evreleme);** Fizik muayene, görüntüleme yöntemleri (BT, PET-BT), bronkoskopi, EBUS/EUS ve mediastinoskopi ile yapılan evreleme
- **pEvreleme (Patolojik evreleme);** Rezeksiyon sonrası patoloğun değerlendirmesiyle yapılan evreleme
- **yEvreleme;** Bir kısım ya da tüm tedavi modalitesi sonrası yapılan evreleme
- **rEvreleme;** Nüks tümörlerde yapılan evreleme
- **aEvrelemesi;** Otopsi esnasında yapılan evreleme

8.Sınıflama için database: 19 ülke, 46 merkez

Bölge	Sayı	%
Europe	46,560	49
Asia	41,705	44
North America	4,660	5
Australia	1,593	1.7
South America	190	0.3
TOTAL	**94,708**	**100**

Rami-Porta R et al. J Thorac Oncol 2014; 9: 1618-1624

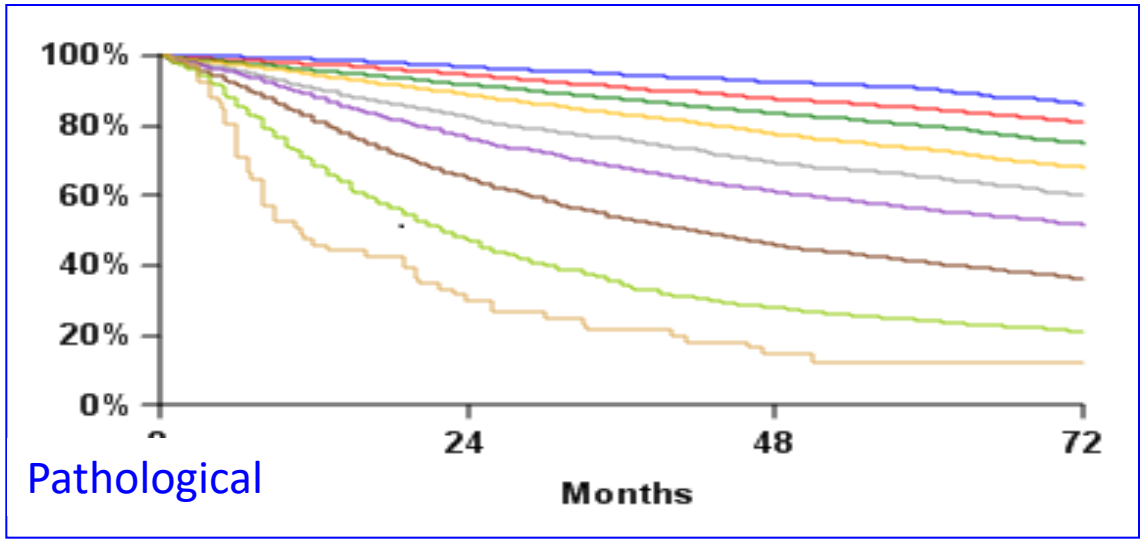
Proposals for stage grouping for the 8th edition



Clinical

	Events/N	MST	24 months	60 months
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%

Goldstraw P et al. J Thorac Oncol 2016; 11: 39-51.



Pathological

	Events/N	MST	24 months	60 months
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%

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Non-Small Cell Lung Cancer

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Table 1. **Definitions for T, N, M**

T		**Primary Tumor**
TX		Primary tumor cannot be assessed, or tumor proven by the presence of malignant cells in sputum or bronchial washings but not visualized by imaging or bronchoscopy
T0		No evidence of primary tumor
Tis		Carcinoma in situ Squamous cell carcinoma in situ (SCIS) Adenocarcinoma in situ (AIS): adenocarcinoma with pure lepidic pattern, ≤3 cm in greatest dimension
T1		Tumor ≤3 cm in greatest dimension, surrounded by lung or visceral pleura, without bronchoscopic evidence of invasion more proximal than the lobar bronchus (i.e., not in the main bronchus)
	T1mi	Minimally invasive adenocarcinoma: adenocarcinoma (≤3 cm in greatest dimension) with a predominantly lepidic pattern and ≤5 mm invasion in greatest dimension
	T1a	Tumor ≤1 cm in greatest dimension. A superficial, spreading tumor of any size whose invasive component is limited to the bronchial wall and may extend proximal to the main bronchus also is classified as T1a, but these tumors are uncommon.
	T1b	Tumor >1 cm but ≤2 cm in greatest dimension
	T1c	Tumor >2 cm but ≤3 cm in greatest dimension
T2		Tumor >3 cm but ≤5 cm or having any of the following features: (1) Involves the main bronchus, regardless of distance to the carina, but without involvement of the carina; (2) Invades visceral pleura (PL1 or PL2); (3) Associated with atelectasis or obstructive pneumonitis that extends to the hilar region, involving part or all of the lung
	T2a	Tumor >3 cm but ≤4 cm in greatest dimension
	T2b	Tumor >4 cm but ≤5 cm in greatest dimension
T3		Tumor >5 cm but ≤7 cm in greatest dimension or directly invading any of the following: parietal pleura (PL3), chest wall (including superior sulcus tumors), phrenic nerve, parietal pericardium; or separate tumor nodule(s) in the same lobe as the primary
T4		Tumor >7 cm or tumor of any size invading one or more of the following: diaphragm, mediastinum, heart, great vessels, trachea, recurrent laryngeal nerve, esophagus, vertebral body, carina; separate tumor nodule(s) in a ipsilateral lobe different from that of the primary

Descriptor	7th Edition T/N/M	8th Edition T/N/M
T component		
0 cm (pure lepidic adenocarcinoma ≤3 cm in total size)	T1a if ≤2 cm; T1b if >2-3 cm	Tis (AIS)
≤0.5 cm invasive size (lepidic predominant adenocarcinoma ≤3 cm total size)	T1a if ≤2 cm; T1b if >2-3 cm	T1mi
≤1 cm	T1a	T1a
>1-2 cm	T1a	T1b
>2-3 cm	T1b	T1c
>3-4 cm	T2a	T2a
>4-5 cm	T2a	T2b
>5-7 cm	T2b	T3
>7 cm	T3	T4
Bronchus <2 cm from carina	T3	T2
Total atelectasis/pneumonitis	T3	T2
Invasion of diaphragm	T3	T4
Invasion of mediastinal pleura	T3	—
N component		
No assessment, no involvement, or involvement of regional lymph nodes	NX, N0, N1, N2, N3	No change
M component		
Metastasis within the thoracic cavity	M1a	M1a
Single extrathoracic metastasis	M1b	M1b
Multiple extrathoracic metastasis	M1b	M1c

T1mi Minimally invasive adenocarcinoma: adenocarcinoma (≤3 cm in greatest dimension) with a predominantly lepidic pattern and ≤5 mm invasion in greatest dimension

Descriptor	7th Edition T/N/M	8th Edition T/N/M
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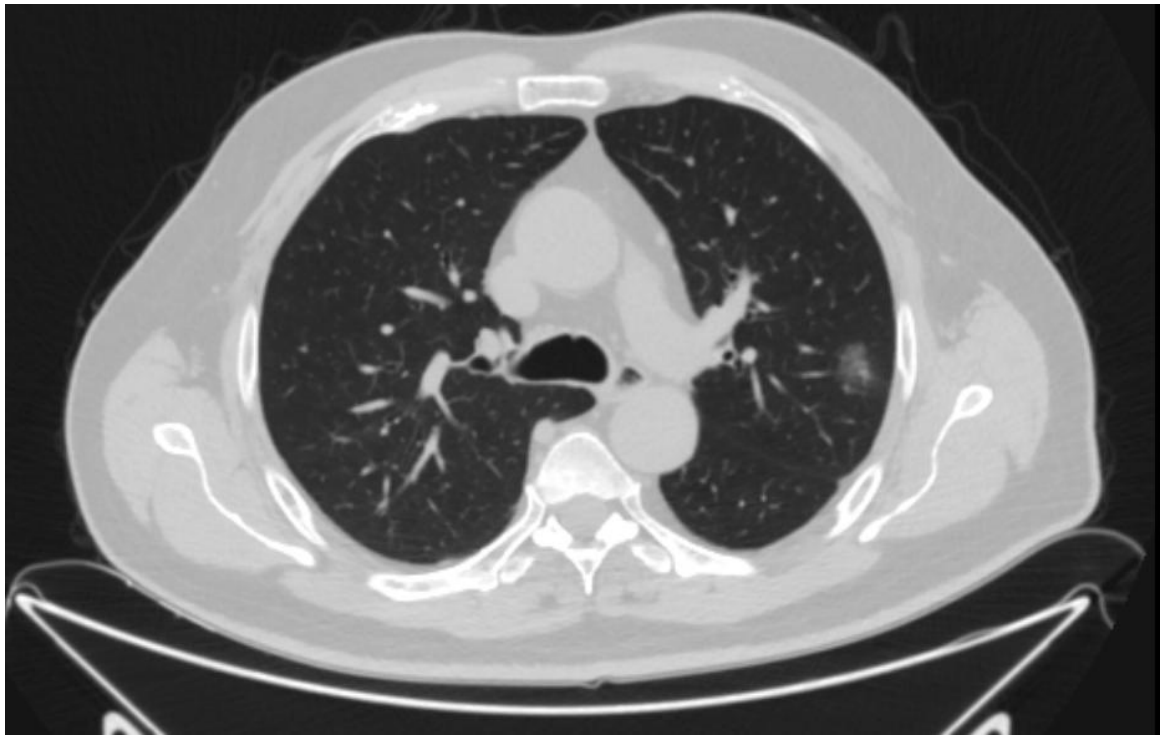
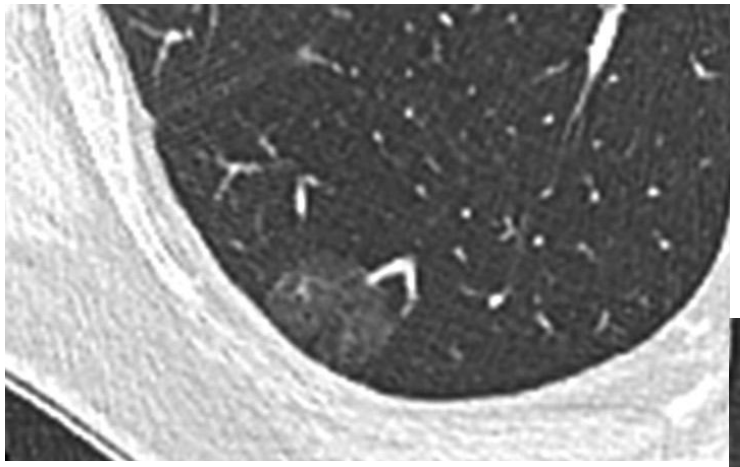
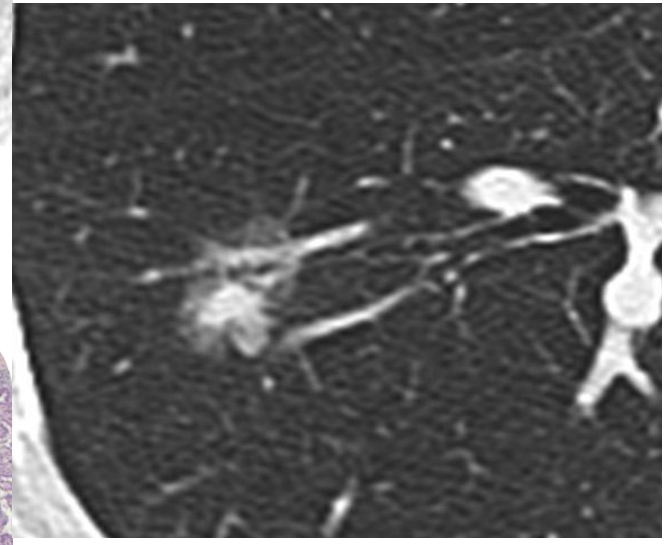
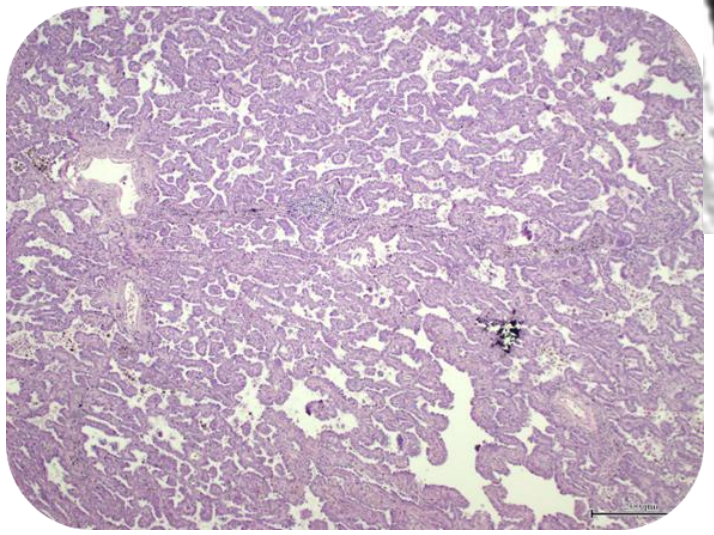
≤1 cm	T1a	T1a
>1-2 cm	T1a	T1b
>2-3 cm	T1b	T1c
>3-4 cm	T2a	T2a
>4-5 cm	T2a	T2b
>5-7 cm	T2b	T3
>7 cm	T3	T4
Bronchus <2 cm from carina	T3	T2
Total atelectasis/pneumonitis	T3	T2
Invasion of diaphragm	T3	T4
Invasion of mediastinal pleura	T3	—
N component		
No assessment, no involvement, or involvement of regional lymph nodes	NX, N0, N1, N2, N3	No change
M component		
Metastasis within the thoracic cavity	M1a	M1a
Single extrathoracic metastasis	M1b	M1b
Multiple extrathoracic metastasis	M1b	M1c



BUZLU CAM GÖRÜNÜMÜ

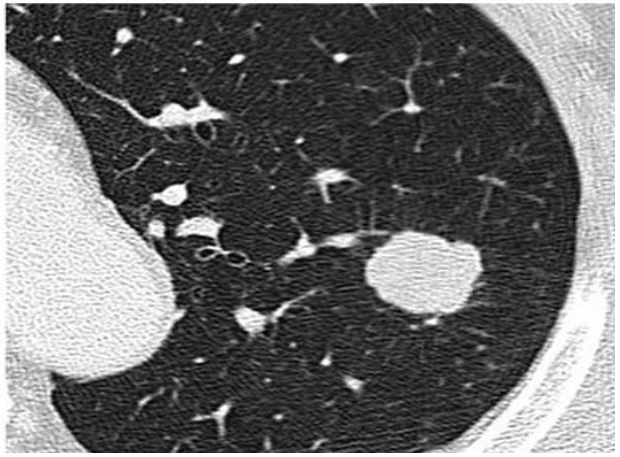


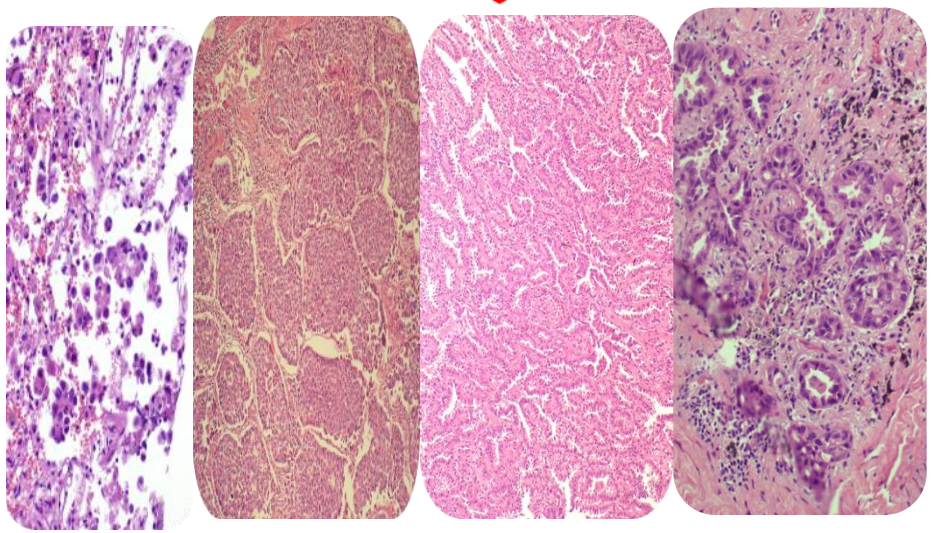




LEPİDİK PATERN

SOLİD PATERN





NONLEPİDİK PATERN: Asiner, Papiller, Solid, Mikropapiller

Tis		Carcinoma in situ Squamous cell carcinoma in situ (SCIS) Adenocarcinoma in situ (AIS): adenocarcinoma with pure lepidic pattern, ≤3 cm in greatest dimension
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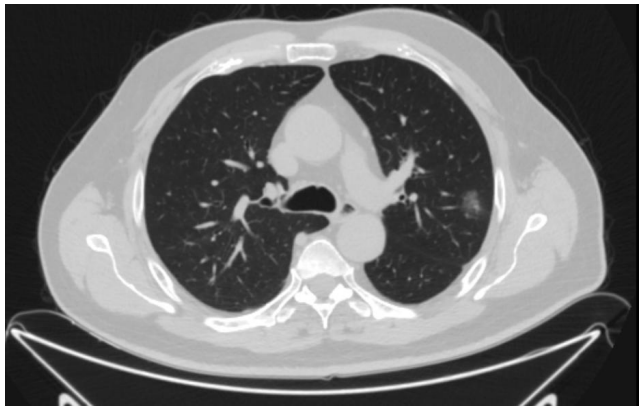
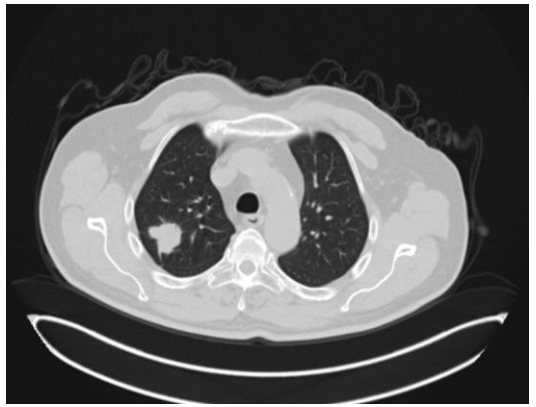
	T2a	Tumor >3 cm but ≤4 cm in greatest dimension
	T2b	Tumor >4 cm but ≤5 cm in greatest dimension



T1mi

T1b



T1c

Table 1. **Definitions for T, N, M (continued)**

N		**Regional Lymph Nodes**
NX		Regional lymph nodes cannot be assessed
N0		No regional lymph node metastasis
N1		Metastasis in ipsilateral peribronchial and/or ipsilateral hilar lymph nodes and intrapulmonary nodes, including involvement by direct extension
N2		Metastasis in ipsilateral mediastinal and/or subcarinal lymph node(s)
N3		Metastasis in contralateral mediastinal, contralateral hilar, ipsilateral or contralateral scalene, or supraclavicular lymph node(s)
M		**Distant Metastasis**
MX		Distant metastasis cannot be assessed
M0		No distant metastasis
M1		Distant metastasis
	M1a	Separate tumor nodule(s) in a contralateral lobe; tumor with pleural or pericardial nodules or malignant pleural or pericardial effusion[a]
	M1b	Single extrathoracic metastasis in a single organ (including involvement of a single nonregional node)
	M1c	Multiple extrathoracic metastases in a single organ or in multiple organs

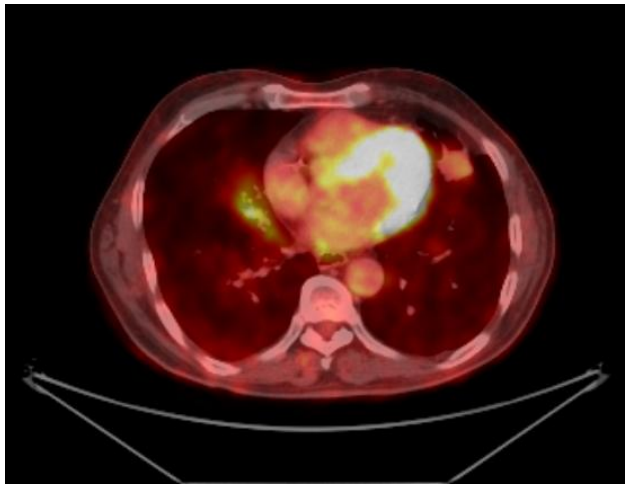
Table 2. **AJCC Prognostic Groups**

	T	N	M
Occult Carcinoma	TX	N0	M0
Stage 0	Tis	N0	M0
Stage IA1	T1mi	N0	M0
	T1a	N0	M0
Stage IA2	T1b	N0	M0
Stage IA3	T1c	N0	M0
Stage IB	T2a	N0	M0
Stage IIA	T2b	N0	M0
Stage IIB	T1a	N1	M0
	T1b	N1	M0
	T1c	N1	M0
	T2a	N1	M0
	T2b	N1	M0
	T3	N0	M0
Stage IIIA	T1a	N2	M0
	T1b	N2	M0
	T1c	N2	M0
	T2a	N2	M0
	T2b	N2	M0
	T3	N1	M0
	T4	N0	M0
	T4	N1	M0
Stage IIIB	T1a	N3	M0
	T1b	N3	M0
	T1c	N3	M0
	T2a	N3	M0
	T2b	N3	M0
	T3	N2	M0
	T4	N2	M0
Stage IIIC	T3	N3	M0
	T4	N3	M0
Stage IVA	Any T	Any N	M1a
	Any T	Any N	M1b
Stage IVB	Any T	Any N	M1c

Tümör Evreleme???

50 yaş
Erkek

- En uygun tedavi
- Sağkalım analizi
- Adjuvan tedavi



VATS sol alt lobektomi

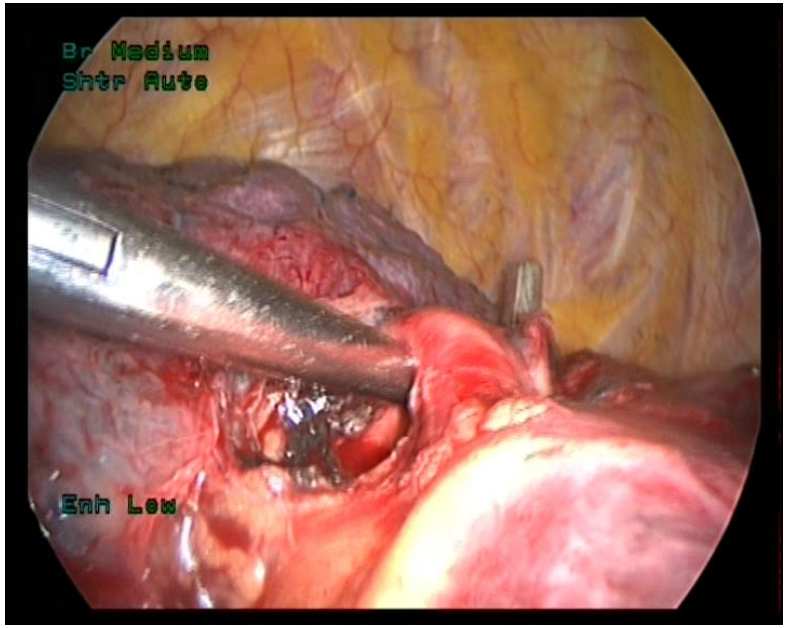
cT2aN0M0
pT2aN0M0
EVRE 1B

3-6 aylık aralıklarla takip

5 yıllık sağkalım %73

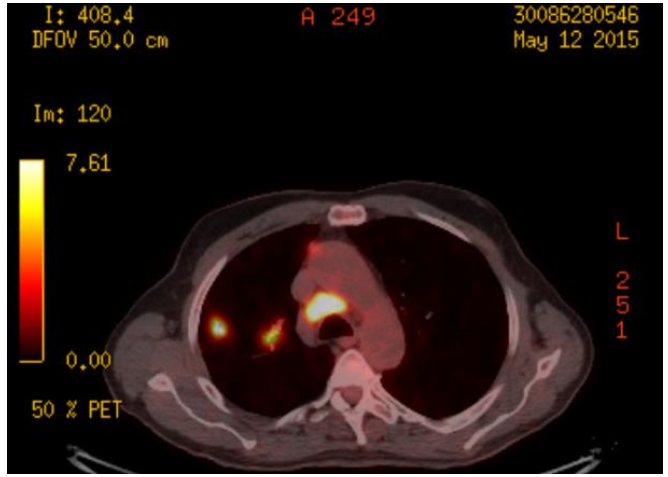
EVRELEME YÖNTEMLERİ

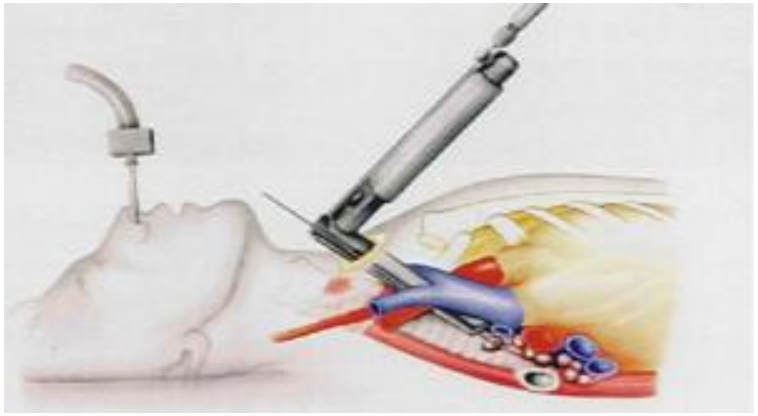
- Preoperatif evreleme (cEvre)
- İntraoperatif evreleme: VATS lobektomi esnasında saptanan tek N2 lerde rezeksiyon tamamlanır (NCCN 2019)
- Postopetratif evreleme (pEvre)



Preoperatif evreleme

- Görüntüleme teknikleri: **T, N, M**
  - BT
  - PET-BT
- Endoskopik teknikler: **N**
  - Konvansiyonel TBİAB
  - EBUS/EUS
- Cerrahi teknikler : **N,T**
  - Mediastinoskopi
  - Ekstended MK/Mediastinotomi
  - VATS
  - VAMLA/TEMLA





- Evre 1A-3A(N1): cerrahi tedavi
- Evre 3A-B (N2): neoadjuvan tedavi+cerrahi
- Evre 3B-4 : onkolojik tedavi

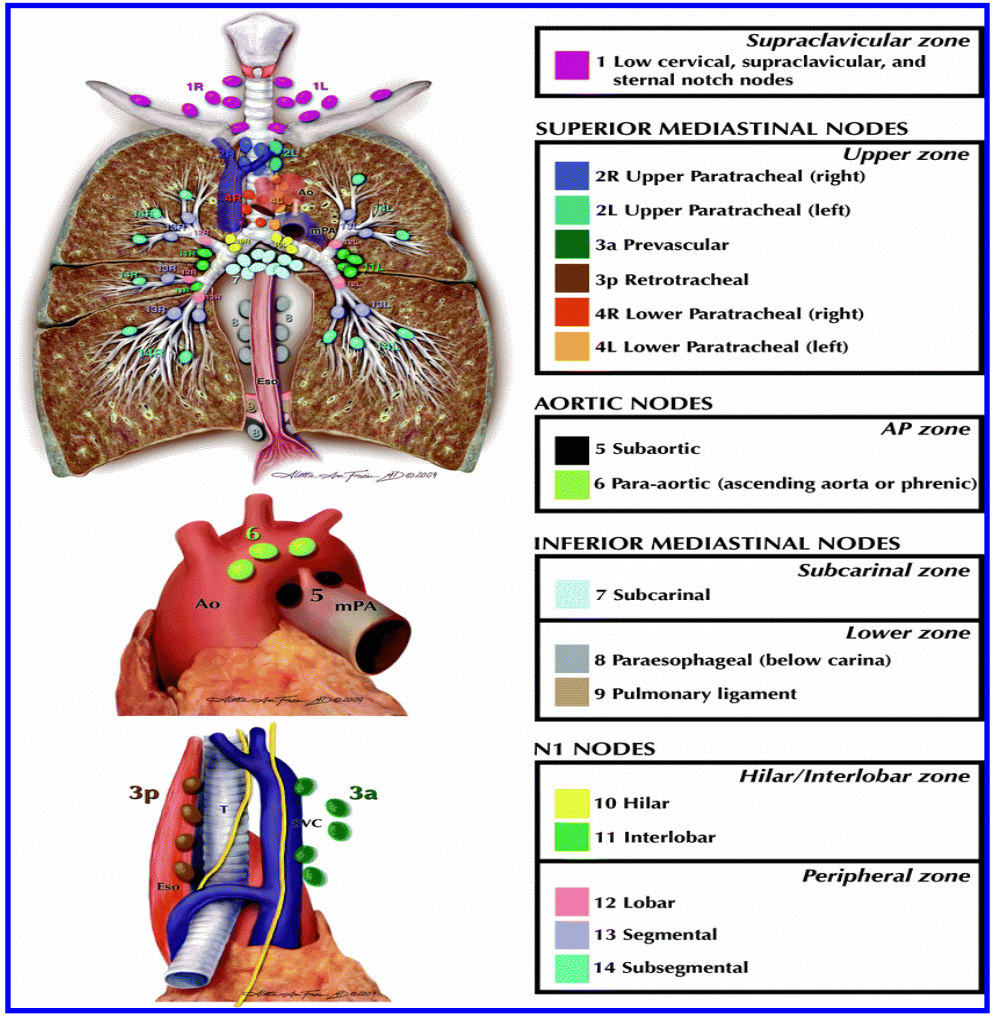
  (soliter beyin ve surrenal metaztazlar hariç)

Proposed Stage Groupings

	N0	N1	N2	N3	M1a any N	M1b any N	M1c any N
T1a	IA1	IIB	IIIA	IIIB	IVA	IVA	IVB
T1b	IA2	IIB	IIIA	IIIB	IVA	IVA	IVB
T1c	IA3	IIB	IIIA	IIIB	IVA	IVA	IVB
T2a	IB	IIB	IIIA	IIIB	IVA	IVA	IVB
T2b	IIA	IIB	IIIA	IIIB	IVA	IVA	IVB
T3	IIB	IIIA	IIIB	IIIC	IVA	IVA	IVB
T4	IIIA	IIIA	IIIB	IIIC	IVA	IVA	IVB

Goldstraw P et al. J Thorac Oncol 2016; 11: 39-51.

IASLC
Lenf Nod Haritası



MLND;

1. **Lenf nodu etrafında bulunan yağlı doku ile birlikte çepeçevre enblok çıkartılmalıdır**
2. ***TNM kurallarına göre, en en az altı lenf nodu 3 adet N1 ve 3 adet N2 istasyonlardan örneklemeli & Subkarinal mutlak olmalı***

(N0 tanısı için asgari gerekliliktir)

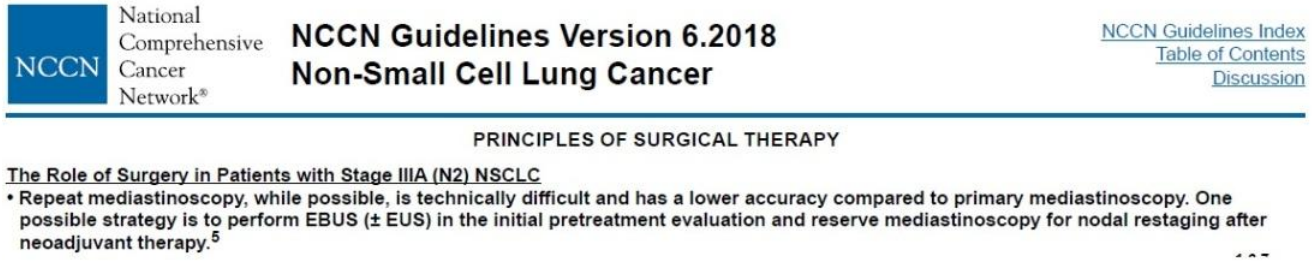
İnvaziv Mediastinal Evreleme

Evre 3A (N2) KHDAK de Cerrahinin Rolü

•Öncelikli işlem EBUS/EUS olmalı

•**Neoadjuvan tedavi sonrası nodal yEvreleme için repeat mediastnoskopi hem zor hem de doğruluk oranı primer MK ye göre daha düşüktür**

•Tek LN (+) ; Multimodal tedavi



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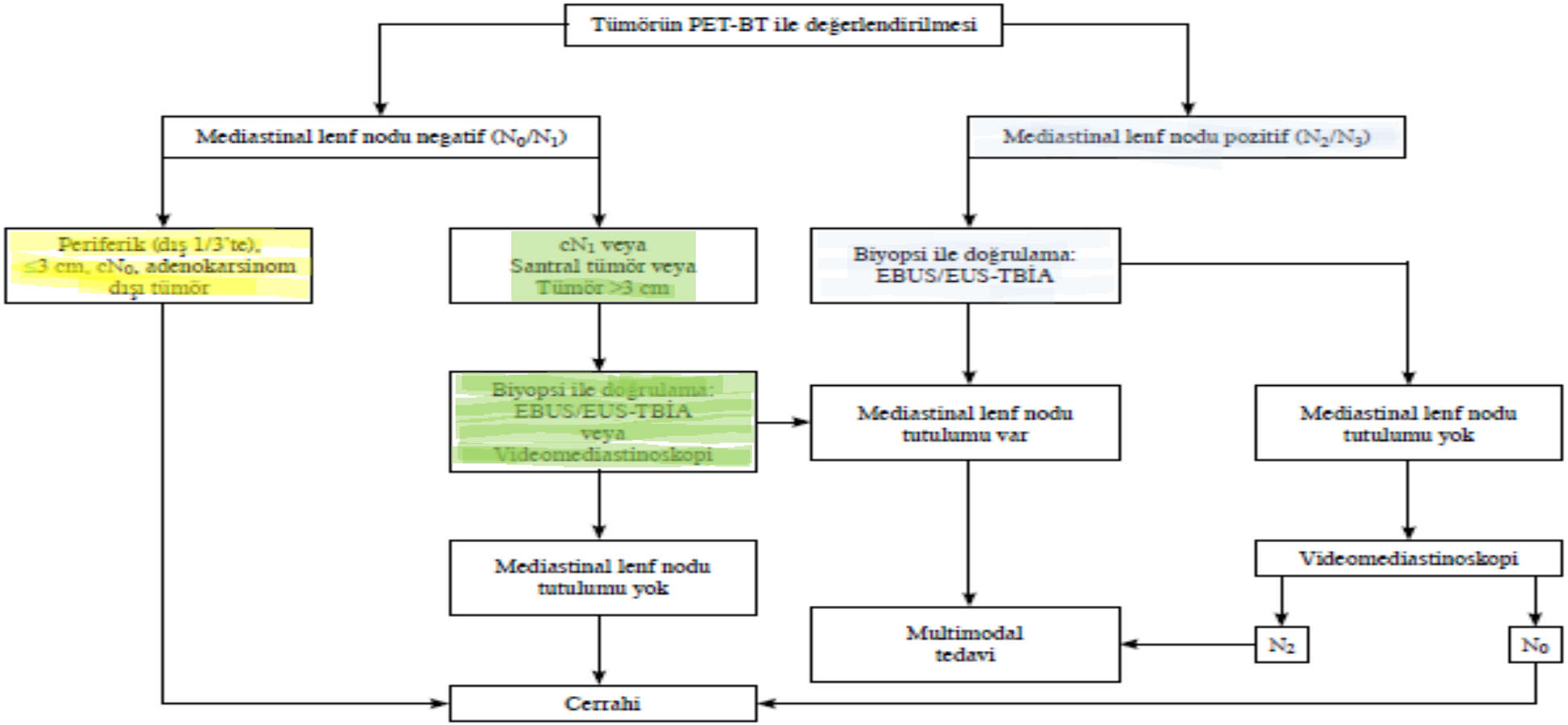
PRINCIPLES OF SURGICAL THERAPY

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]

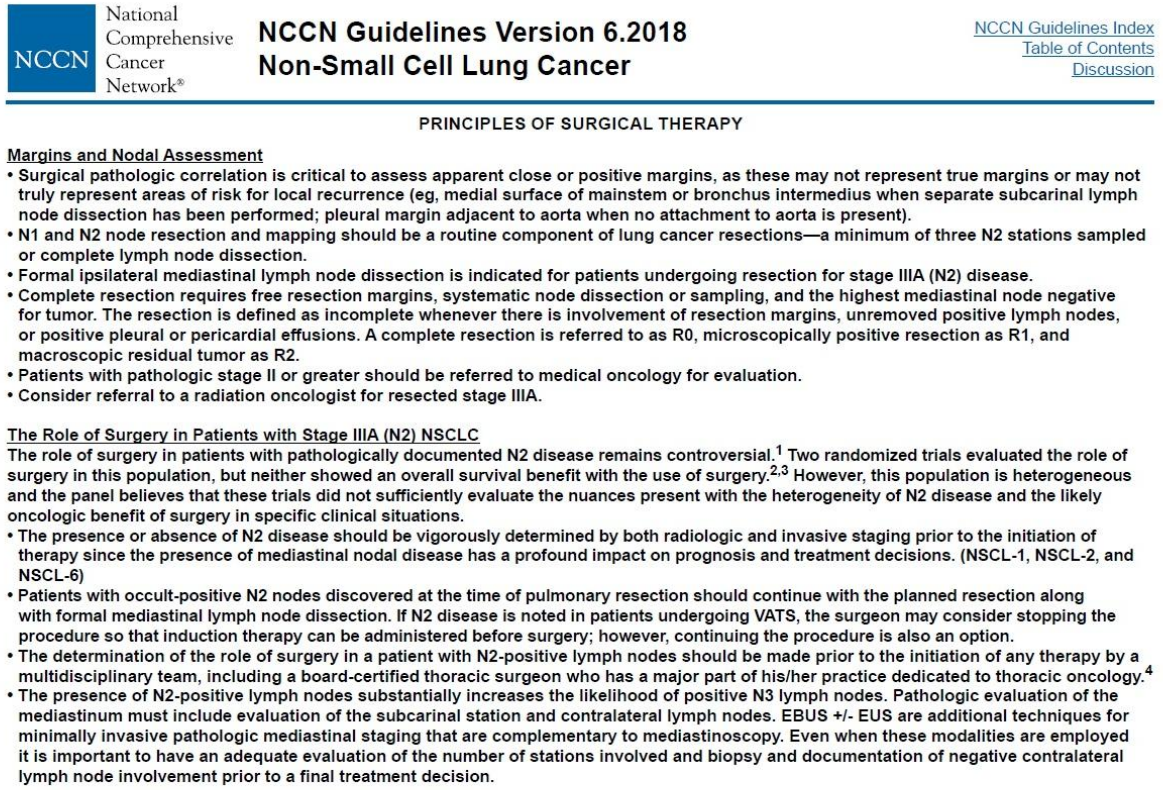
ESTS ALGORİTMA



NCCN 2018

<u>CERRAHİ SINIR& NODAL DEĞERLENDİRME</u>

- **Lokal nüks olacağı için cerrahi sınırlar temiz olmalı**
- **Komplet rezeksiyon: rezeksiyon sınırı temiz, en üst mediastinal LN negatif**
- Komplet MLND veya en az 3 istasyondan LN örnekleme(N2 istasyonları)
- İnkomplet rezeksiyon: rezeksiyon sınırı pozitif, (+)LN, (+)plevral/perikardial effüzyon
- Komplet rezeksiyon R0, mikroskopik pozitif rezeksiyon R1, makroskopik rezidual tümör R2



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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-6)
- 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 board-certified thoracic surgeon who has a major part of his/her practice dedicated to thoracic oncology.[4]
- 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.

Evre 1 KHDAK'lerinde **cerrahi tedavi altın standart yöntemdir**

ACCP- Rezeksiyonlar

- Klinik evre I ve II medikal durumu uygun hastalarda **lobektomi** tercih edilmeli (öneri 1B)

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REZEKSİYON

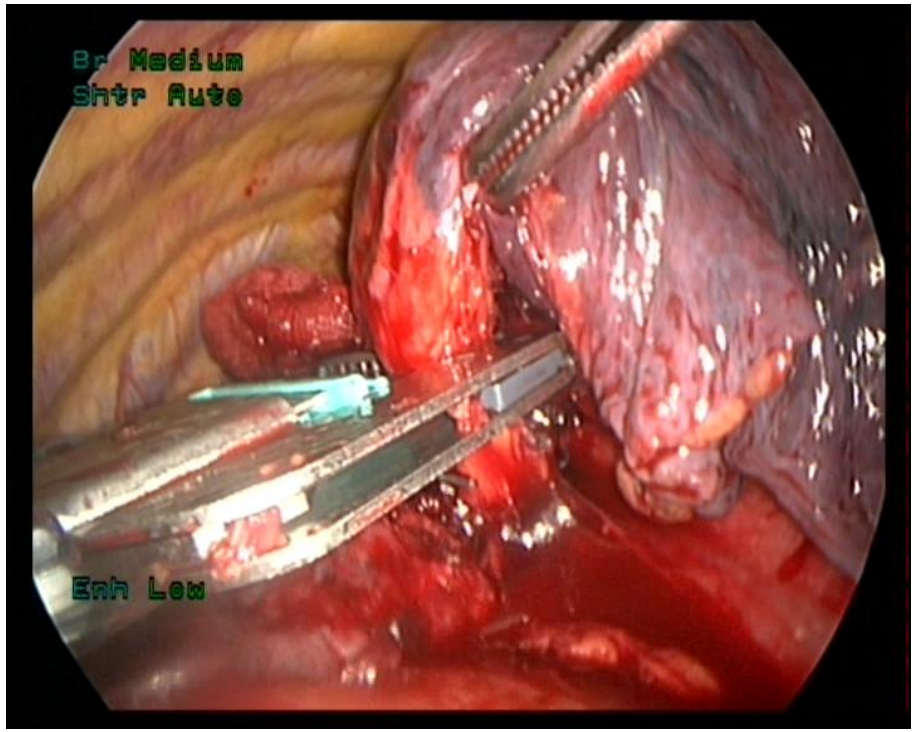
- Anatomik pulmoner rezeksiyon
- Sublober rezeksiyon (segmentektomi/wedge rezeksiyon) da parenkimal sınır > 2 cm
- Sublober rezeksiyonlarda da N1 ve N2 LN ları örneklenmeli

- **Videotorakoskopik Yardımlı Cerrahi (VATS)**

  rezeksiyonlar 1991 yılından itibaren kullanılmaya başlanmıştır

- İlk zamanlarda açık cerrahi ile ilgili yeterli veri olmasa da gelişen teknolojik yöntemler ile günümüzde birçok merkezde yaygın olarak uygulanmaya başlanmıştır

- Birçok yayın VATS lobektominin onkolojik prensiplere uygun ve güvenilir bir yöntem olduğunu belirtmiştir



Avantajları

- kısa yatış süresi (ortalama 3 gün)
- kas fonksiyonlarının korunması
- daha az ağrı
- postoperatif erken taburculuk
- daha az intraoperatif kanama
- morbititelerin daha az olması
- uzun dönem sağkalım ?????

ELSEVIER

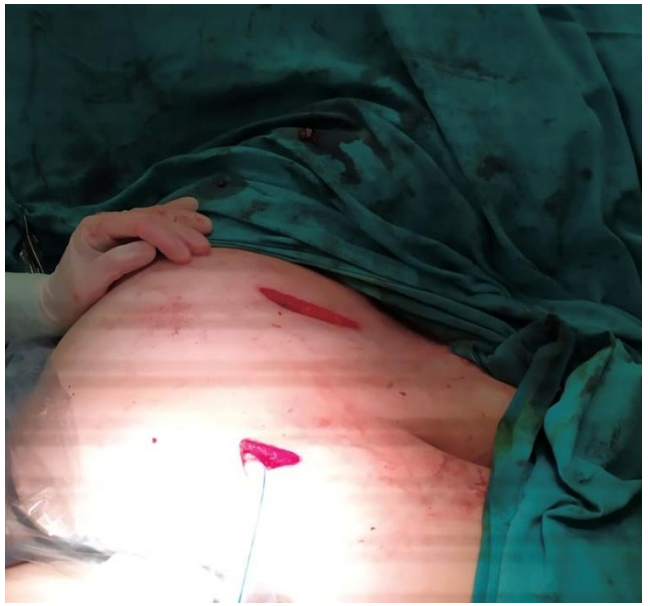
The Annals of Thoracic Surgery
Volume 86, Issue 6, December 2008, Pages 2008-2018

Review

Surgery for Early-Stage Non-Small Cell Lung Cancer: A Systematic Review of the Video-Assisted Thoracoscopic Surgery Versus Thoracotomy Approaches to Lobectomy

Presented at the Forty-fourth Annual Meeting of The Society of Thoracic Surgeons, Fort Lauderdale, FL, Jan 28–30, 2008.

Bryan A. Whitson MD, PhD [a], Shawn S. Groth MD [a], Susan J. Duval PhD [b], Scott J. Swanson MD [c], Michael A. Maddaus MD [a]

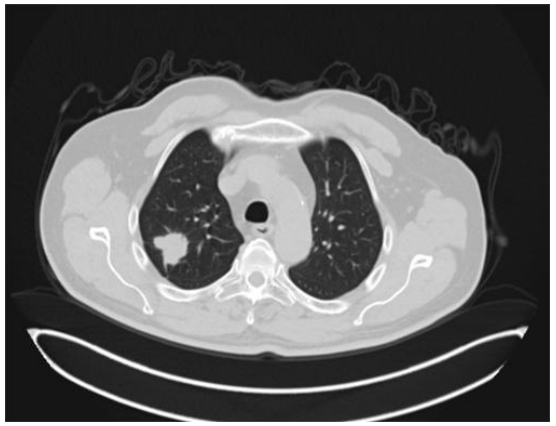


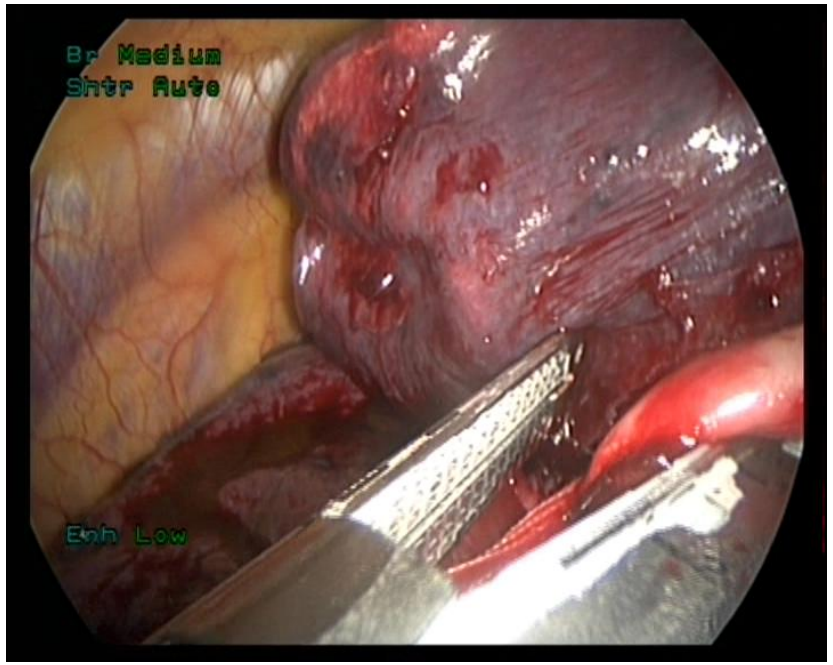
NCCN 2019

MİNİMAL İNVAZİV CERRAHİ

(VATS & Robotik Cerrahi)

- Deneyimli merkez
- Onkolojik prensipler
- Az ağrı, az hastane yatış süresi, az komplikasyon





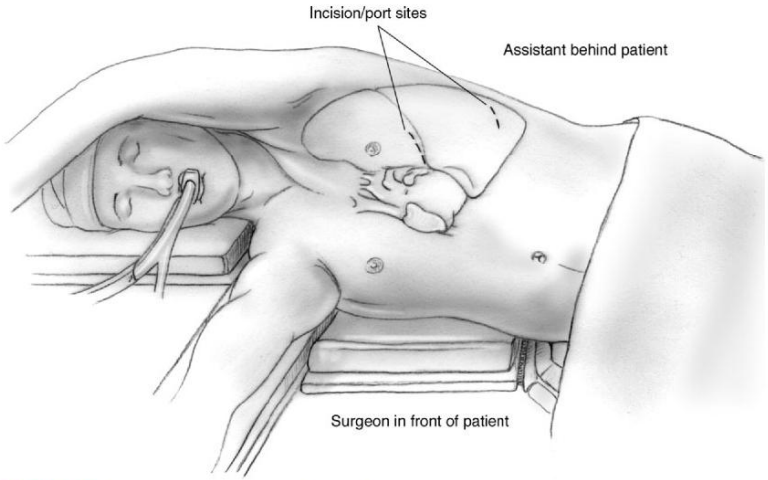
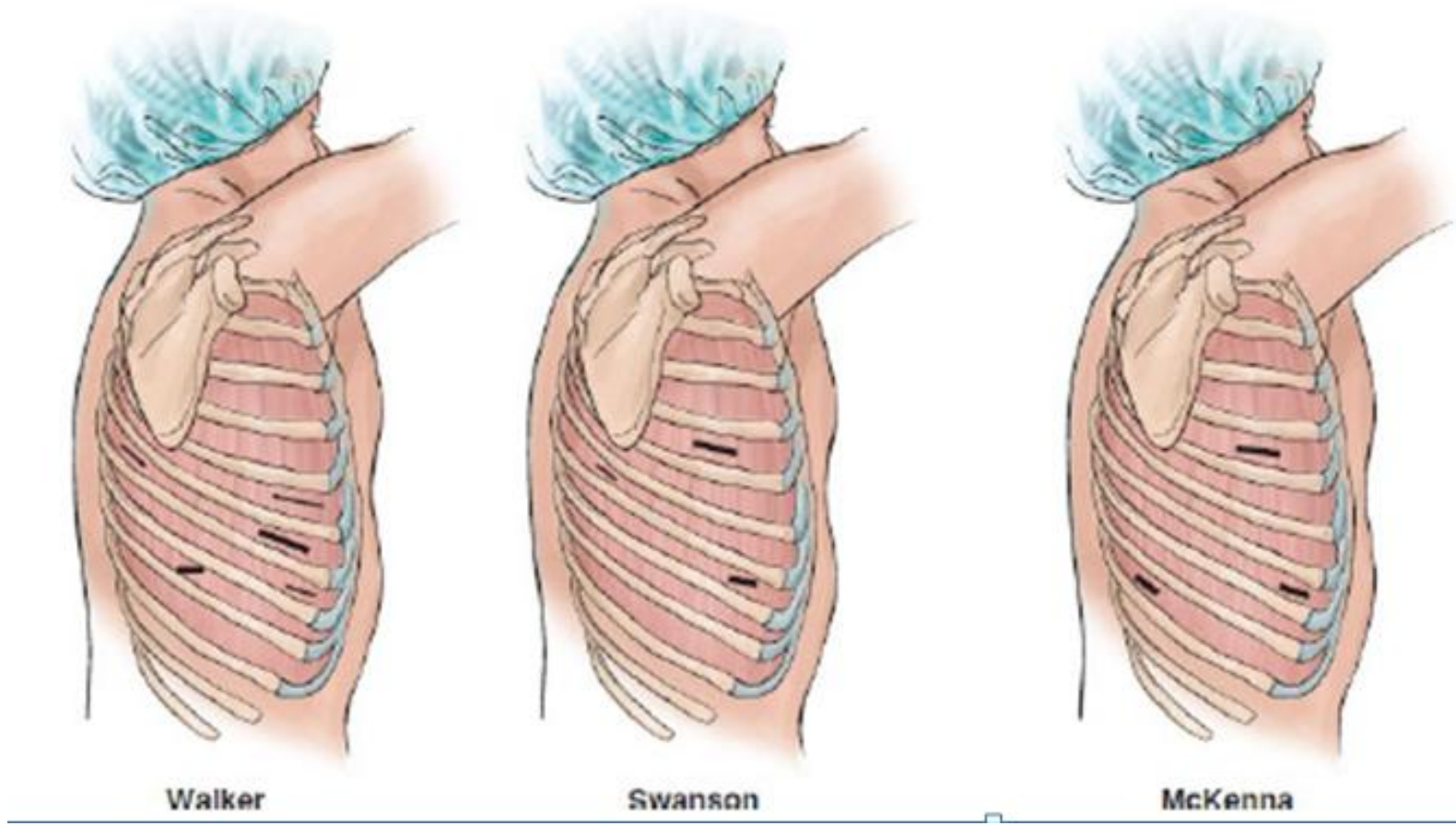


FIGURE 32.2 Positioning and port placement. Patient is placed in the lateral decubitus position. Our approach uses incisions that are placed in (1) the 7th or 8th intercostal space along the posterior axillary line, (2) the 5th or 6th intercostal space anteriorly. (Reprinted from Pham D, Balderson S, D'Amico TA. Technique of thoracoscopic segmentectomy. *Oper Tech Thorac Cardiovasc Surg* 2008;13(3):188–203. Copyright © 2008 Elsevier. With permission.)

Technique	Surgeon/Program	General Approach	Recommended Incision for Stapling of Structures	Comments

Posterior viewing 3–4 incisions[41,78]	Walker/Edinburgh	Bronchus last	• Posterior
			  • Superior pulmonary vein
			  • Upper lobe arteries
			  • Middle lobe artery and vein
			  • Upper lobe bronchus
			• Utility
			• Anterior
			  • Inferior pulmonary vein
			  • Lower lobe arteries
			  • Lower lobe bronchus
				• First report of VATS lobectomy
				• Tools delivered anteriorly while viewing structures from posteriorly
				• Emulates open techniques
				• Good view of posterior structures like left upper lobe segmental arteries

Posterior 3–4 incisions	McKenna/Cedars-Sinai	Bronchus last	• Posterior
			  • Superior pulmonary vein
			  • Upper lobe arteries
			  • Middle lobe artery and vein
			  • Left upper lobe bronchus
			• Utility
			  • Right upper lobe bronchus
			  • Minor fissure
			• Anterior (midclavicular)
			  • Inferior pulmonary vein
			  • Lower lobe arteries
			  • Additional left upper arteries
			  • Major fissure
			  • Lower lobe bronchus
				• Open instruments used for most of operation
				• Viewing from inferior port
				• Port selection critical to proper alignment of non-articulated staplers

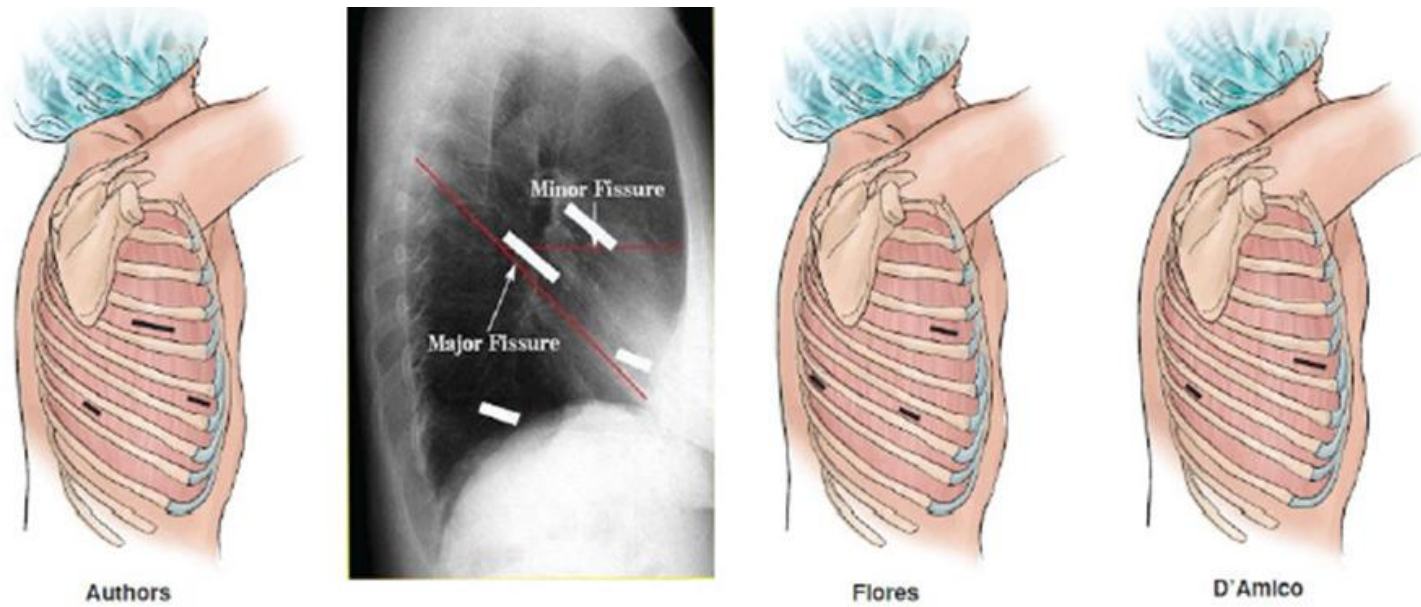


Posterior 3-incision	Swanson/Brigham	Bronchus last	• Posterior
			  • Superior pulmonary vein
			  • Upper lobe arteries
			  • Middle lobe artery and vein
				• Viewing from inferior port while posterior port is used for retraction, dissection, and stapler (nonarticulated) passage
				• Emulates open techniques

			• Upper lobe bronchus
			• Utility
			• Anterior
			  • Inferior pulmonary vein
			  • Lower lobe arteries
			  • Lower lobe bronchus	

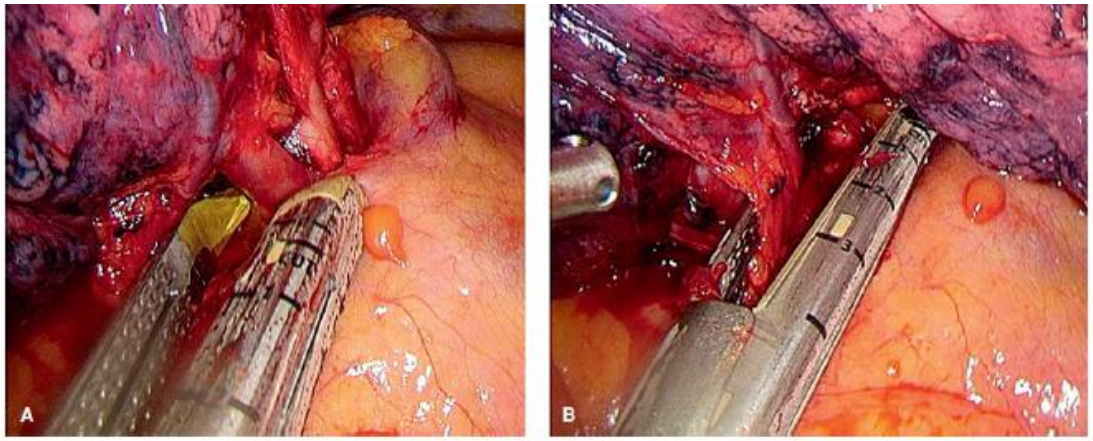
Anterior 3-incision	Authors	Bronchus last	• Inferior
			  • Superior and inferior pulmonary veins
			  • Upper lobe arteries
			  • Upper lobe bronchus
			• Utility
			  • Minor fissure
			• Anterior
			  • Middle lobe artery and vein
			  • Lower lobe arteries
			  • Lower lobe bronchus
			  • Major fissure
				• Viewing from inferior port but also anterior port as necessary for anterior upper lobe structures
				• Articulated staplers used for most maneuvers
				• Emulates open (fissure division techniques)

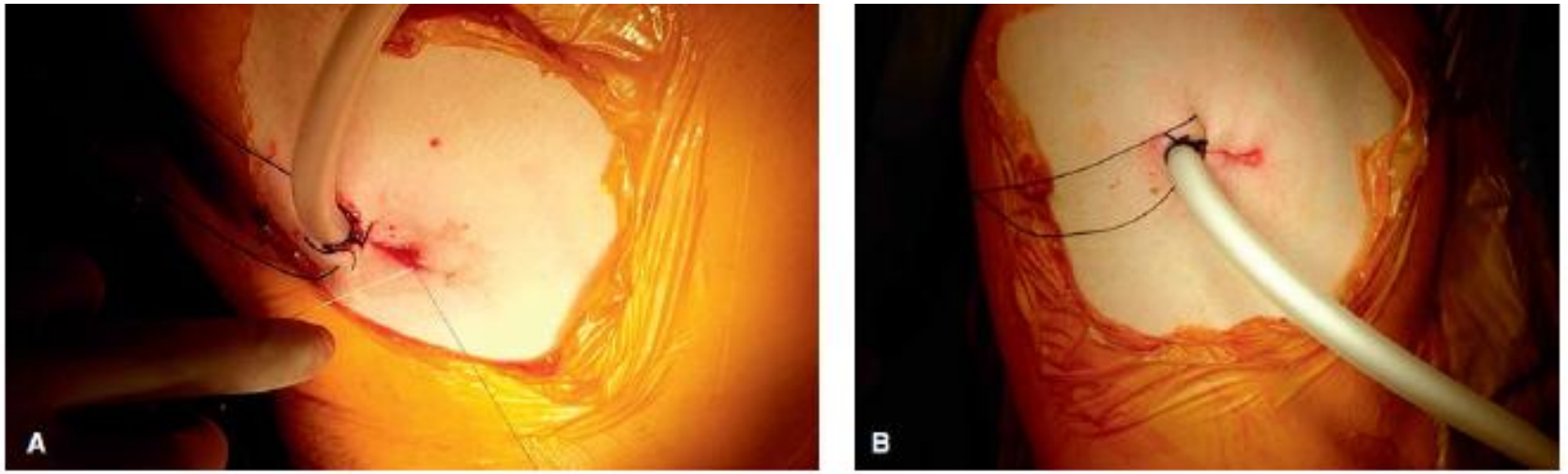
Posterior 3-incision[82]	Flores/Mt. Sinai	Fissure last	• Posterior
			  • Superior pulmonary vein
			  • Upper lobe arteries
			  • Upper lobe bronchus
			  • Fissure
			• Utility
			  • Inferior pulmonary vein
			  • Middle lobe artery and vein
			  • Lower lobe arteries
			  • Lower lobe bronchus
			  • Fissure
				• View from inferior port
				• Utility incision used for stapler passes, particularly in fissure division



Anterior 2-incision[83]	D'Amico/Duke	Fissure last	• Inferior
			  • Superior pulmonary veins
			  • Upper lobe arteries
			  • Upper lobe bronchus
			• Anterior (Utility)
			  • Middle lobe artery and vein
			  • Inferior pulmonary vein
			  • Lower lobe arteries
			  • Lower lobe bronchus
			  • Fissures
				• View from inferior port but switched to utility incision for anterosuperior structures
				• Anterior to posterior approach, to minimize back and forth retraction
				• Stapler passages from either incision depending on the structure

Modified uniportal[46]	Duke	Fissure last	• Camera in satellite incision • All other instruments through single port incision	• All viewing through the satellite incision • All dissection through the port • Requires consideration of camera location relative to other instruments within the portal
Uniportal[40]	Gonzalez-Rivas/Coruña, Spain	Fissure last	• All instruments through single port incision	• All viewing and dissection through a single port • Requires bimanual instrumentation and coordination with the assistant • Camera: posterior part of the incision • Instruments and staplers: anterior part of the incision



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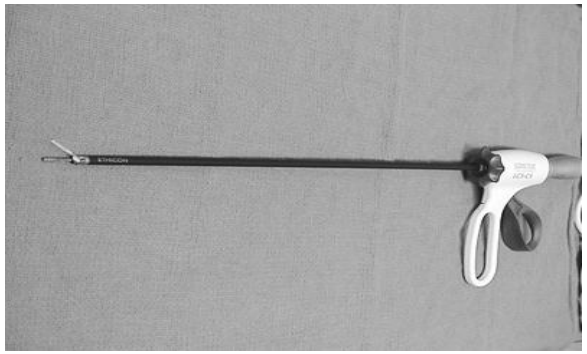


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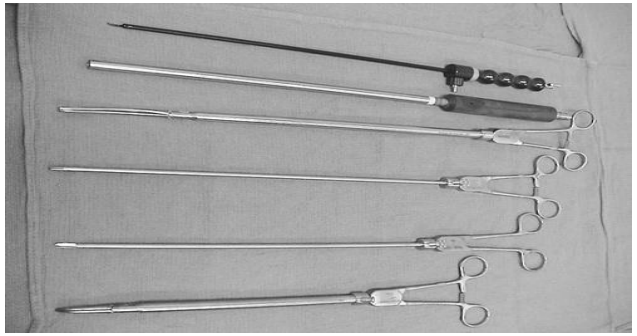


Aleksis

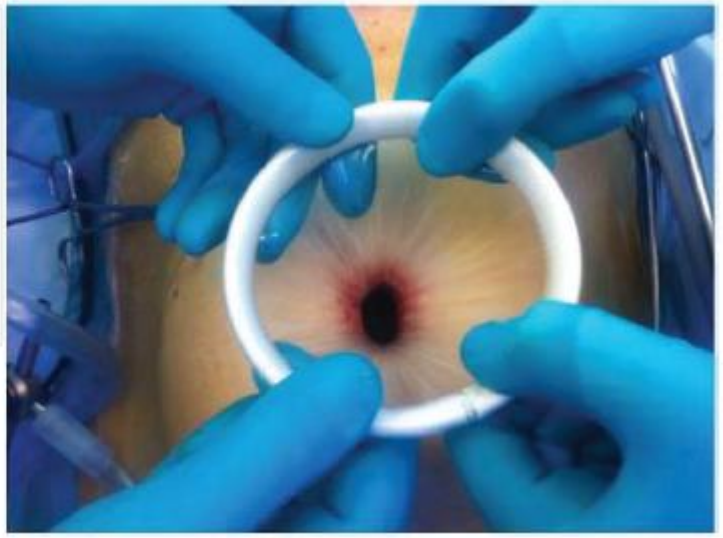


FIGURE 34.6 Multiple-angled, low-profile (5-mm) thoracoscopic retraction instruments can be positioned in a single port site. (Image reproduced with permission from DUFNER Instruments.)

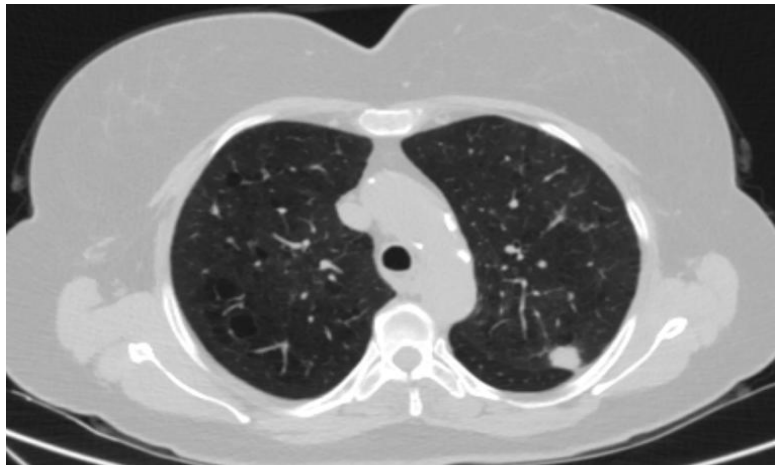
FIGURE 34.5 The flexible-tip thoracoscope allows for various viewing angles (Olympus, USA). (Image courtesy of Todd L. Demmy, MD.)


COVIDIEN
Endo GIA Ultra

Tek port VATS

VATS lobektomi için kabul edilen endikasyonlar;

- Klinik olarak Evre 1 akciğer kanseri
- Tümörün 5 cm küçük olması
- Benign hastalıklar (bronşektazi vs)
- Fizyolojik operabilite

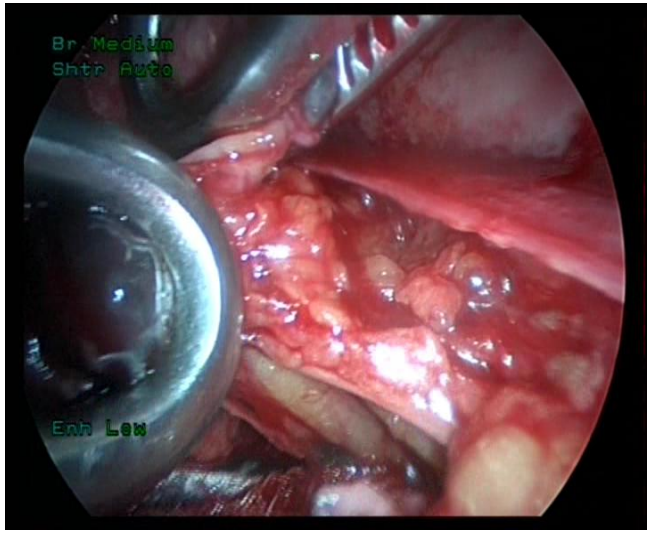


TEK PORT RLL

MLND

ACCP

- KHDAK de cerrahi rezeksiyon ile birlikte sistematik MLNÖ veya komplet MLND yapılması önerilir (öneri 1B)
- Anatomik rezeksiyon sonrası Mediastinal lenf nodu diseksiyonu yapılan hastalar mediastinal örnekleme yapılanlardan daha uzun yaşayabilir (öneri 2B)



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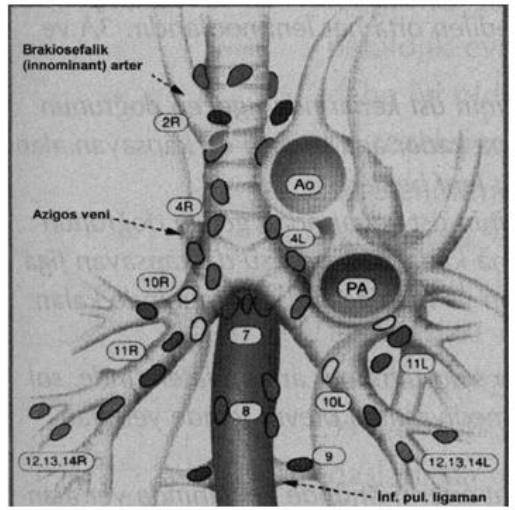
- Doğru evreleme için cerrahi rezeksiyonda en az 6 istasyondan LN çıkartılmalıdır
- Bunların 3 tanesi N1, 3 tanesi N2 istasyonları olmalı **Mutlaka 7**

(AJCC 8th evreleme)



Commentary: Intraoperative lymph node assessment by robotic, video-assisted thoracoscopic surgery, and thoracotomy: None meet the international recommendations

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Diego González-Rivas, MD, FECTS

Central Message

The emphasis on approach in the past 2 decades should not deter us from the oncologic principles of lung cancer resection, of which systematic nodal dissection is a fundamental component.

See Article page XXX.

The article by Kneuertz and colleagues[1] on the comparison of nodal upstaging, number of explored nodal stations, and number of excised lymph nodes in lobectomy by a robotic approach, video-assisted thoracoscopic surgery (VATS), or thoracotomy for clinical (c) N0 and N1 non–small cell lung cancer reveals relevant findings for everyday clinical practice. First, the rate of global nodal upstaging significantly differs among the 3 different approaches, being highest for thoracotomy and lowest for VATS. Second, the rate of N2 upstaging was similar among the 3 approaches. Third, more nodal stations were sampled in the thoracotomy group, although the number of resected lymph nodes was similar in the 3 approaches. These findings indicate that, from the staging point of view, thoracotomy still has some advantage over the endoscopic procedures, because patients undergoing thoracotomy have their tumors better staged; therefore, their prognosis will be more accurate, and postoperative decisions on adjuvant therapy will be more solidly made.

The detail in the number of sampled nodal stations and excised lymph nodes shows that although the total number of excised lymph nodes meets the international recommendations, the total number of nodal stations does not. When systematic nodal dissection was defined in a multidisciplinary and international meeting in 1996,[2] 2 standards were accepted: the complete removal of all mediastinal tissue (fat and lymph nodes) of the involved side and the hilar and intrapulmonary nodes or, alternatively, the removal of at least 6 lymph nodes, 3 from 3 mediastinal stations, always including the subcarinal, and 3 from the hilar and intrapulmonary stations. A few years later, when the definitions of complete, incomplete, and uncertain resections were proposed by the International Association for the Study of Lung Cancer, the alternative standard was qualified depending on tumor location, that is, the 3 mediastinal nodal stations to be sampled depended on the lobe of the primary tumor, always including the subcarinal station.[3] These definitions are not merely the result of a theoretic elaboration. Their prognostic impact has been validated with the International Association for the Study of Lung Cancer database[4] and with external data.[5] In the article by Kneuertz and colleagues,[1] the number of lymph nodes exceeds the minimum of 6 (mean of 11.8, 11.8, and 11.9 for robotic, VATS, and thoracotomy, respectively), but the number of sampled nodal stations do not meet the 6 recommended: 3.8, 3.6, and 4 for robotic, VATS, and thoracotomy, respectively). In addition, in approximately 15% to 22% of patients, depending on the approach, the subcarinal nodal station was not sampled. The immediate result of this suboptimal nodal staging is that some tumors do have nodal disease that remains unnoticed, and the prognosis derived from pathologic staging is inaccurate; the late result is that these patients with nodal disease, untreated because it is unknown, will have nodal recurrence, because it is the case even when lobe-specific systematic nodal dissection is performed.[6]

- Patolojik evrelemede hala torakotomi daha üstün
- VATS ile subkarinal LN örnek almama %15-22

Sistematik MLND;

- Tüm mediastinal yağlı doku ve lenf nodlarının (mediastinal, hiler, intrapulmoner) total çıkartılması
- En az 6 LN nun, 3 mediastinal (subkarinal LN mutlak olmalı) ve 3 hiler ve intrapulmoner LN çıkartılması

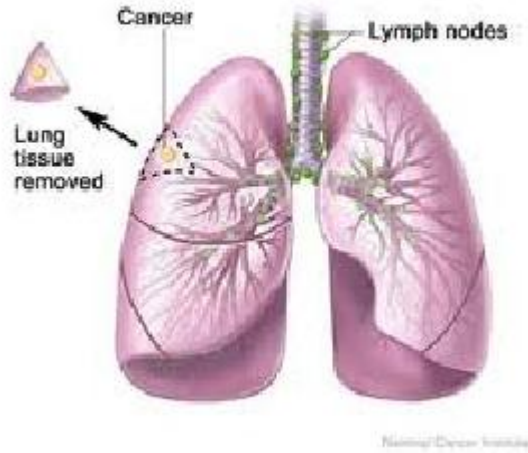
ACCP- Sublobar rezeksiyonlar

- Pulmoner fonksiyonu kötü veya komorbid hastalıkları olan **evre 1 KHDAK** olgular ; **Lobektomiyi tolere edemeyenlerde ise sublober rezeksiyon önerilir**

  (öneri 1B)

  !!!segmentektomi !!!

- Peroperatif mortaliteyi arttıracak durumlarda (yaş veya diğer komorbit durumlar) segmentektomi lobektomiye tercih edilir (öneri 2C)



ACCP- Sublobar rezeksiyonlar

- <2 cm den küçük buzlu cam görünümü olan lezyonlarda (GGO), negatif tömör sınır ile sublober rezeksiyon lobektomiye tercih edilir

  (öneri 2C)
- Tümör çevresine en az 2 cm sağlam alan bırakılması önerilir
- <2 cm lik cerrahi sınırlar pozitif olarak kabul edilmeli

  (öneri 1C)

NCCN 2019

Sublober rezeksiyonlar;

•Segmentektomi tercih edilmeli

•Sublober rezeksiyon (segmentektomi/wedge rezeksiyon) da parenkimal sınır > 2 cm

•Sublober rezeksiyonlarda da N1 ve N2 LN ları örneklenmeli

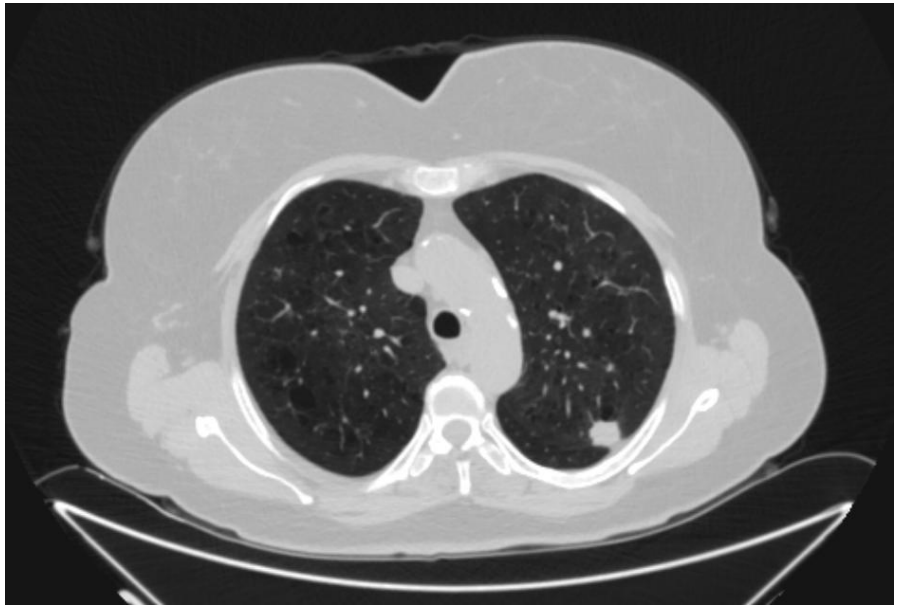
•Düşük pulmoner rezerv veya diğer komorbit hastalıklar

•Periferal nodül, <2cm

- •Pür AIS histoloji
- •BT de >%50 GGO

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.



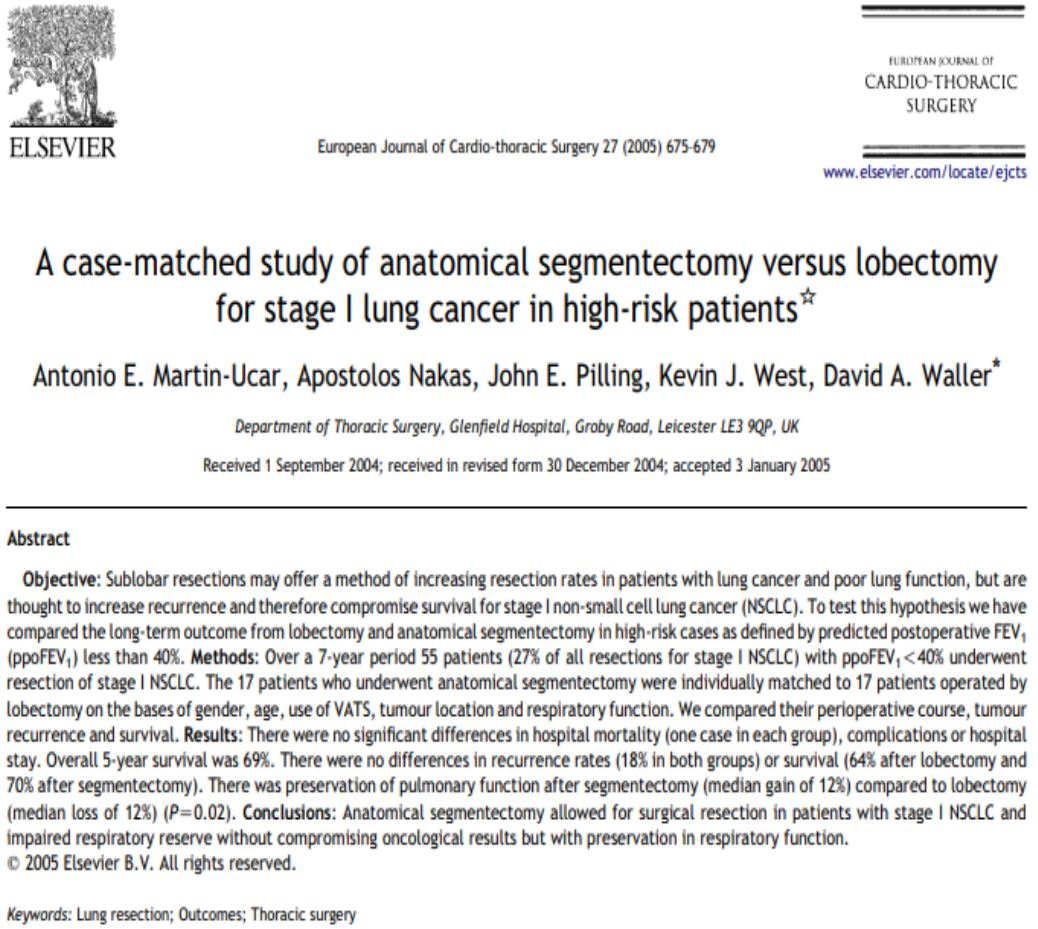
Segmentektomi vs Lobektomi

Martin-Ucar ve ark (2005)

- sublober rezeksiyonlarda 5 yıllık sağkalım oranı %70
- lobektomide 5 yıllık sağkalım oranı %64

El-Sherif ve ark (2006) (n:783)

- 5 yıllık sağkalım oranı segmentektomiler %40
- lobektomilerde %54 (p=0.004).



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European Journal of Cardio-thoracic Surgery 27 (2005) 675-679

EUROPEAN JOURNAL OF CARDIO-THORACIC SURGERY

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A case-matched study of anatomical segmentectomy versus lobectomy for stage I lung cancer in high-risk patients☆

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Received 1 September 2004; received in revised form 30 December 2004; accepted 3 January 2005

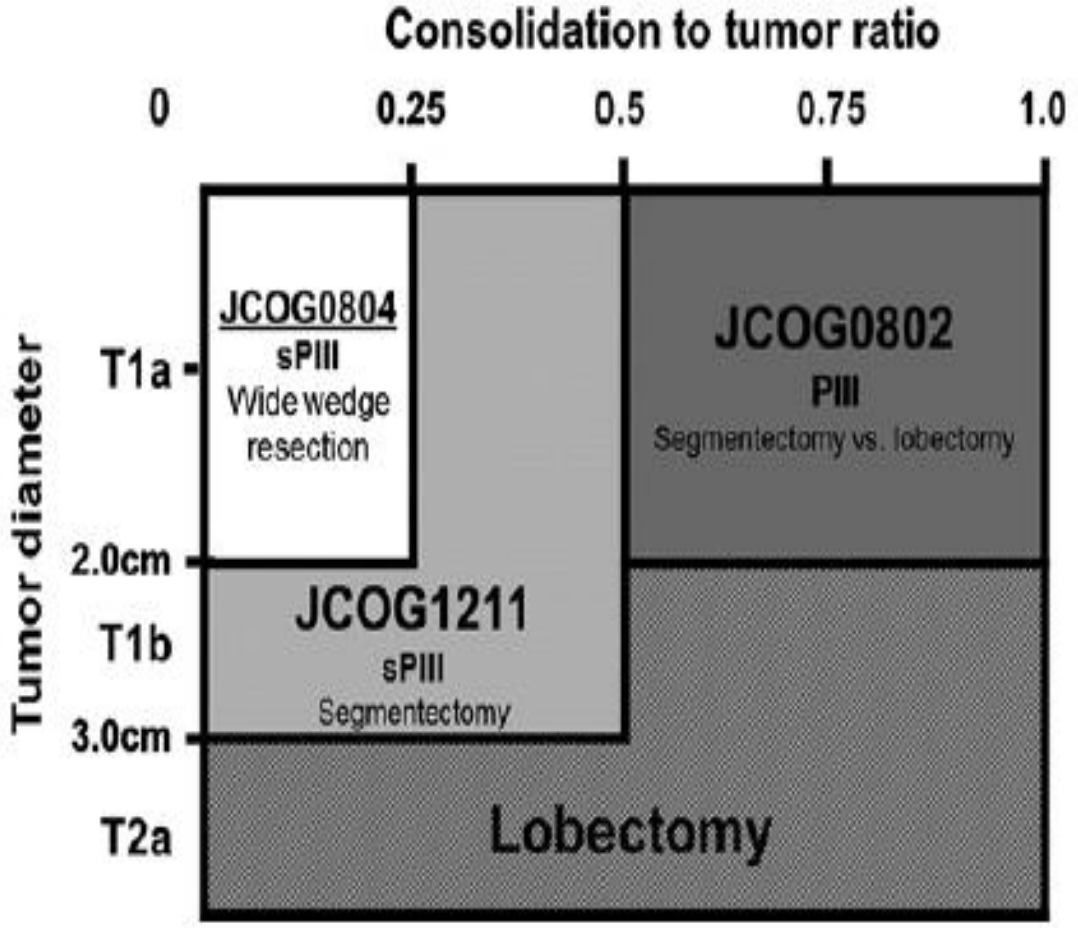
Abstract

Objective: Sublobar resections may offer a method of increasing resection rates in patients with lung cancer and poor lung function, but are thought to increase recurrence and therefore compromise survival for stage I non-small cell lung cancer (NSCLC). To test this hypothesis we have compared the long-term outcome from lobectomy and anatomical segmentectomy in high-risk cases as defined by predicted postoperative FEV_1 ($ppoFEV_1$) less than 40%. **Methods**: Over a 7-year period 55 patients (27% of all resections for stage I NSCLC) with $ppoFEV_1 < 40\%$ underwent resection of stage I NSCLC. The 17 patients who underwent anatomical segmentectomy were individually matched to 17 patients operated by lobectomy on the bases of gender, age, use of VATS, tumour location and respiratory function. We compared their perioperative course, tumour recurrence and survival. **Results**: There were no significant differences in hospital mortality (one case in each group), complications or hospital stay. Overall 5-year survival was 69%. There were no differences in recurrence rates (18% in both groups) or survival (64% after lobectomy and 70% after segmentectomy). There was preservation of pulmonary function after segmentectomy (median gain of 12%) compared to lobectomy (median loss of 12%) ($P=0.02$). **Conclusions**: Anatomical segmentectomy allowed for surgical resection in patients with stage I NSCLC and impaired respiratory reserve without compromising oncological results but with preservation in respiratory function.

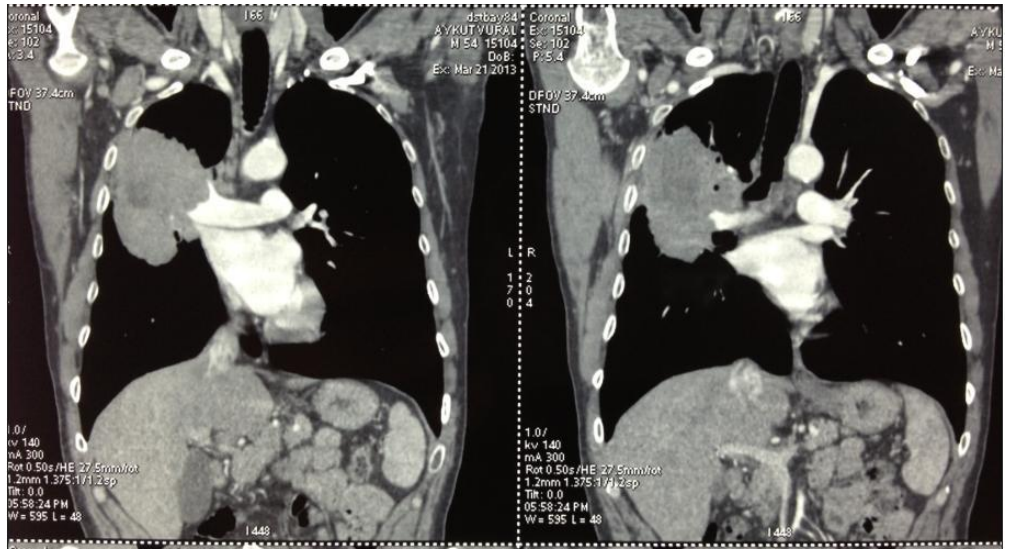
Keywords: Lung resection; Outcomes; Thoracic surgery

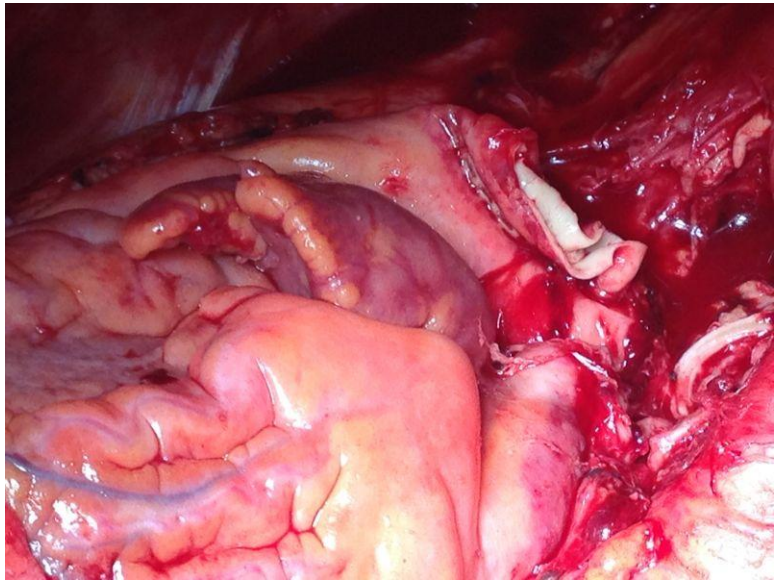
Segmentektominin Başarısı

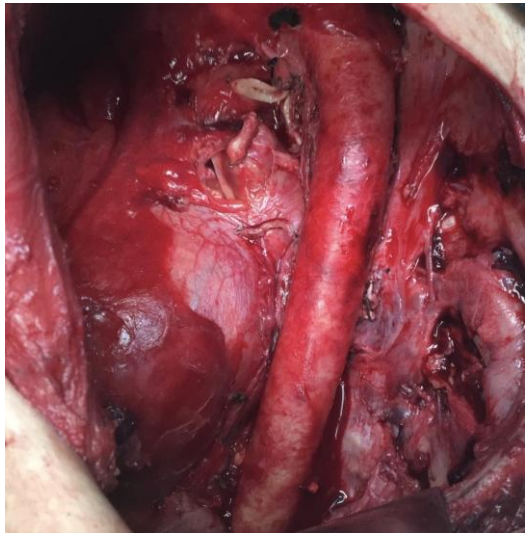
2015 yılında tamamlanan Japan Clinical Oncology Group (JCOG) kohort çalışmasında 2-3cm'de **segmentektominin uzun dönem sonuçları lobektomi kadar başarılı olarak saptanmıştır**



Ne Kadar Agresif Cerrahi Yapılmalı?







ACCP

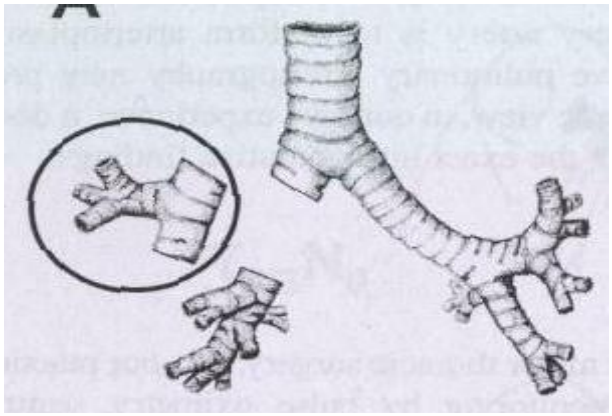
- Klinik olarak santral evre I ve II olan hastalarda duruma göre **sleeve yada bronkoplastik rezeksiyon pnömonektomiye tercih edilir**

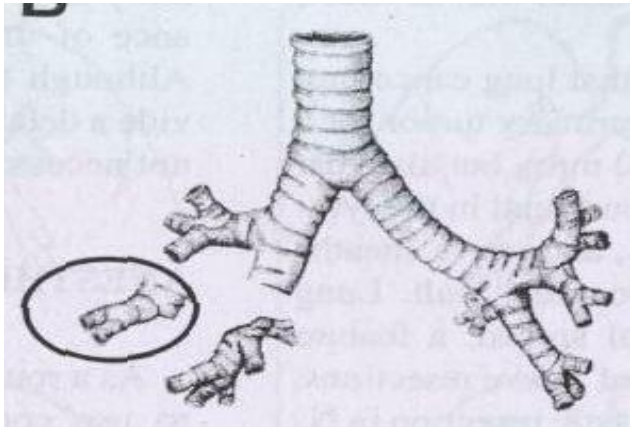
  (öneri 2C)

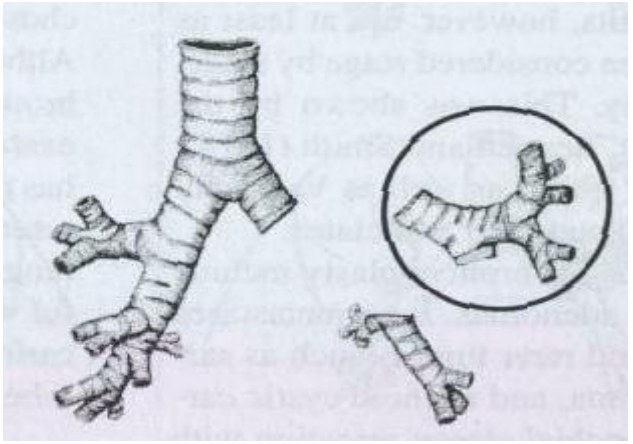
NCCN-2018

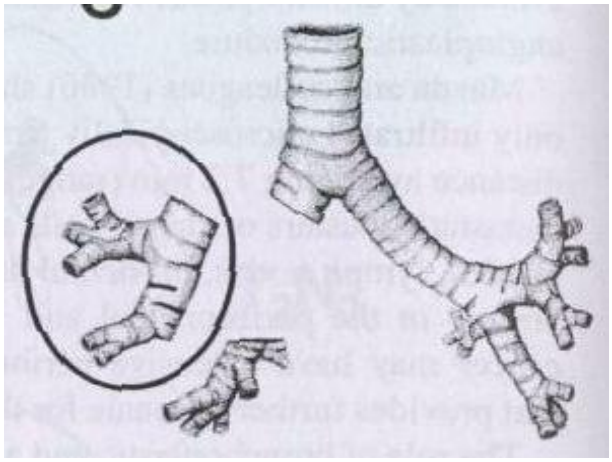
- **Parenkim koruyucu anatomik rezeksiyon (sleeve lobektomi) , pnömonektomiye tercih edilmeli**
- Anatomik olarak uygun ve cerrahi sınır temiz hastalar

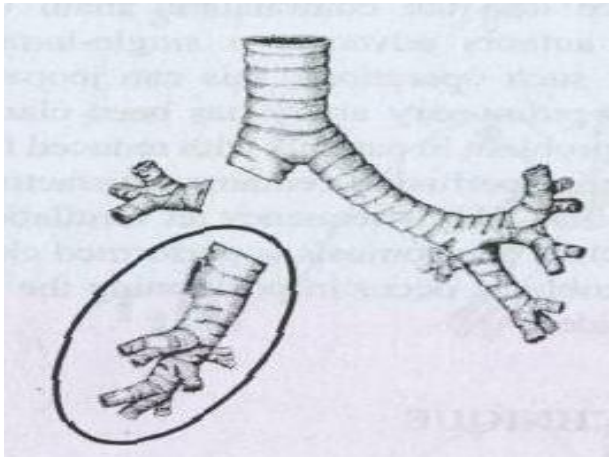
Sleeve lobektomi

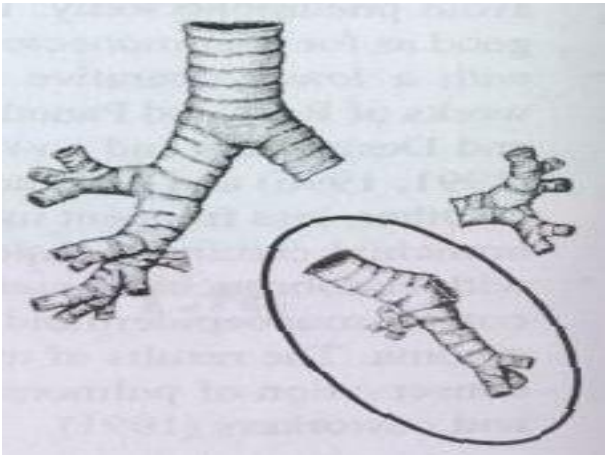




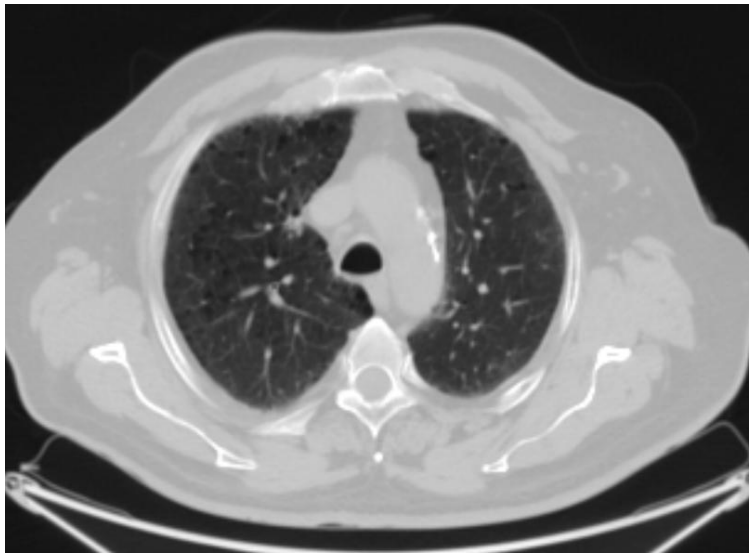








•Mediastinoskopi 4R (+)
•4 kür KT sonrası komplet yanıt
•VATS lobektomi



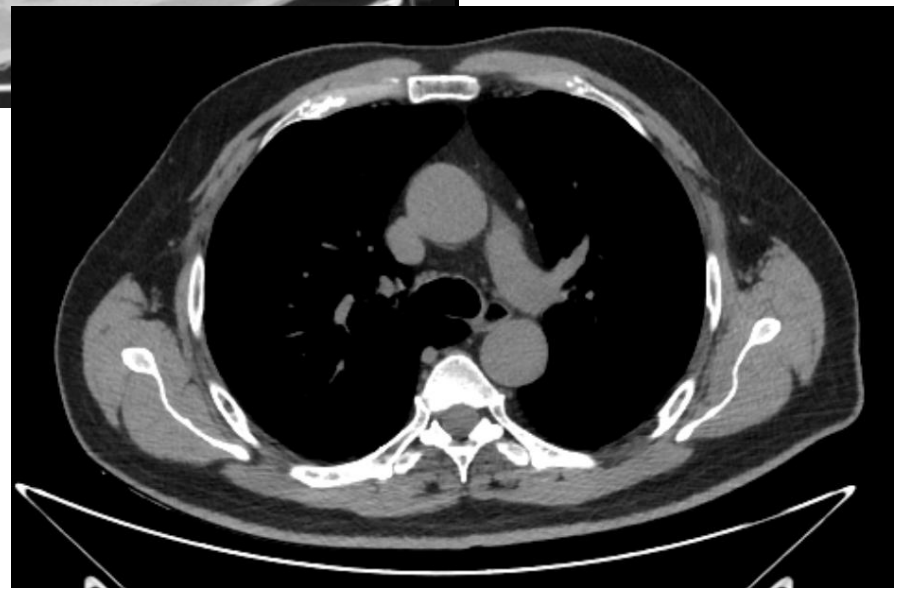
Prognostik Faktörler

- N2 hastalarda sağkalım için iyi prognostik kriter olarak;
  - kapsül invazyonunun olmayışı
  - tek lenf nodu tutulumu
  - fiksasyon yokluğudur
- pN2 hastalık içerisinde en iyi sağkalım sonuçları, intraoperatif tek istasyon saptanan N2'ler dir

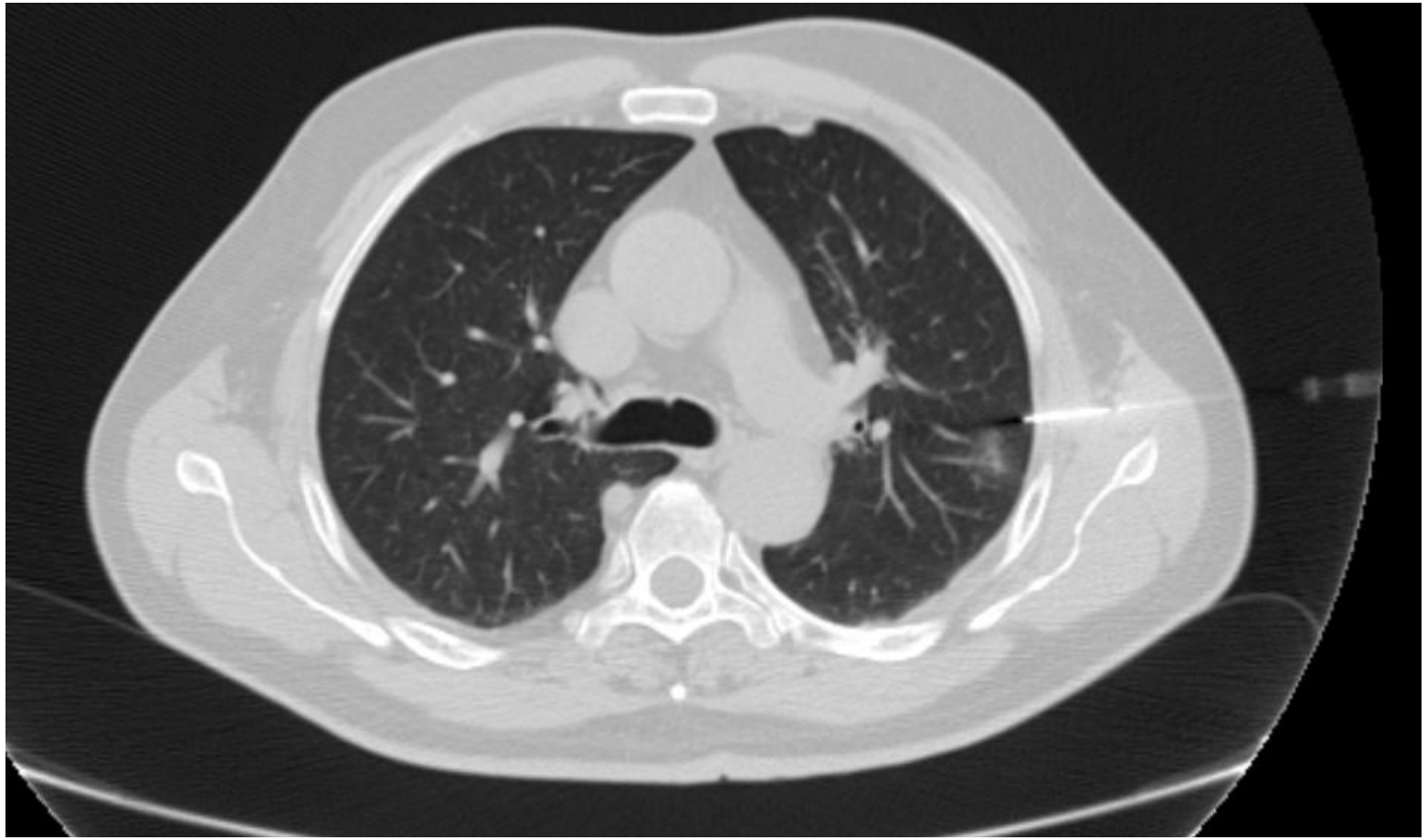
- Funakoshi ve ark 141 hastalık pN2 analizinde; *Multiple N2'nin sağkalım üzerinde prognostik faktör olduğunu ve 5 yıllık sağkalım oranın %24 iken tek istasyonda %58 olduğunu belirtmişlerdir*

Pür GGO: solid komponent yok

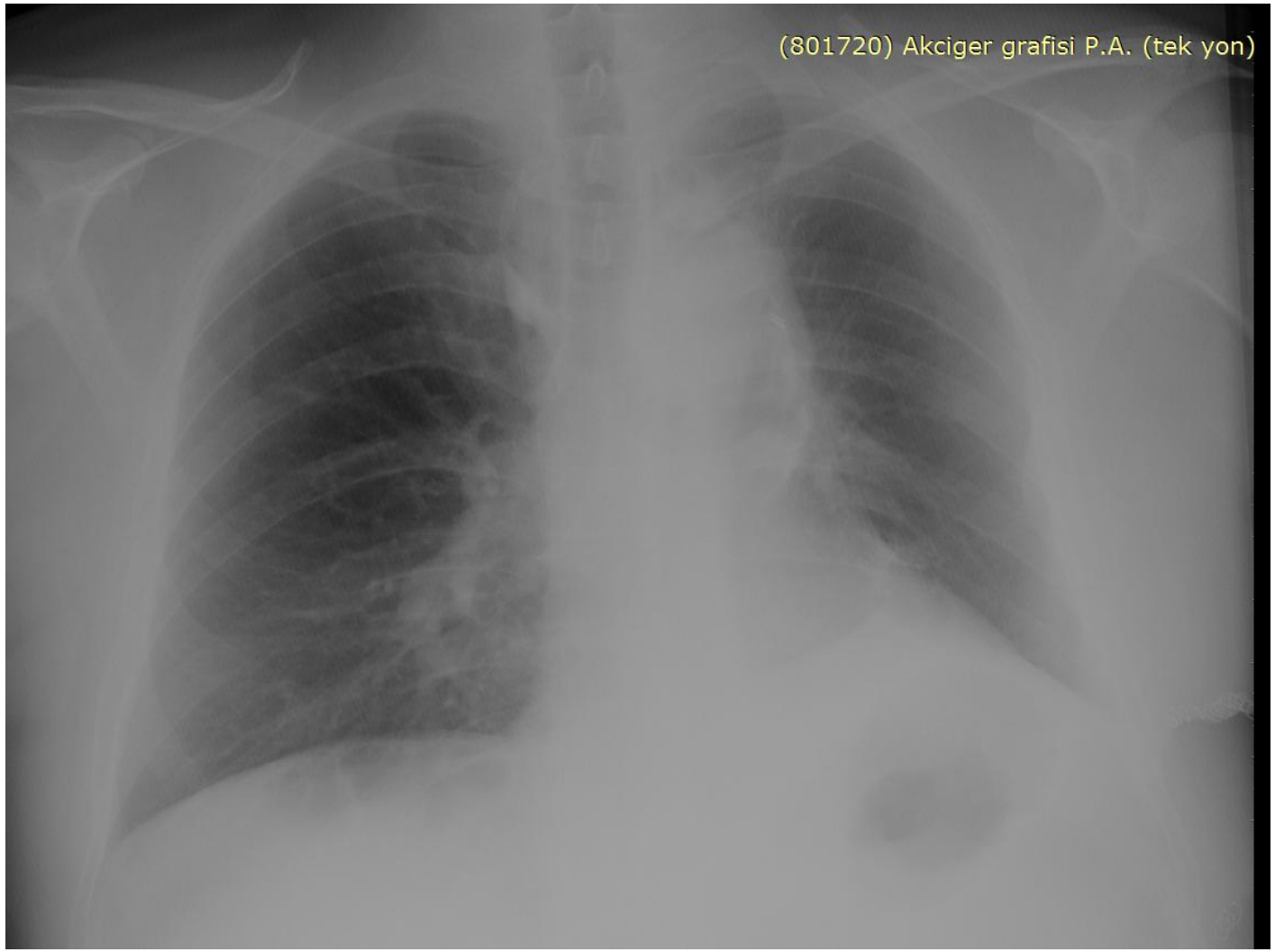
- 30 paket/yıl smoker
- Öz/soygeçmiş özellik yok
- 4 yıldır takipte
- Büyüme yok
- Solid komponent yok
- VATS önerildi
- Frozen: AdenoCA
- Patoloji: 1,2x0,8 cm AdenoCA



GGO: metilen mavisi ile işaretleme



Vats lobektomi



Postop 2.ay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