



IRCCS

Istituto di Ricovero e Cura a Carattere Scientifico

Sacro Cuore - Don Calabria

Ospedale Classificato e Presidio Ospedaliero Accreditato - Regione Veneto



TUMORE DEL POLMONE: dallo screening al trattamento

Venerdì 11 novembre 2022

SEDE: Sala Convegni "Fr. Francesco Perez"

IRCCS Sacro Cuore - Don Calabria

Via Don Angelo Sempreboni, 5

37024 Negrar di Valpolicella - Verona

Il ruolo dell'endoscopia toracica

Simona Paiano

Servizio di Endoscopia toracica
e Fisiopatologia respiratoria

I.R.C.C.S.

Sacro Cuore - Don Calabria

Negrar



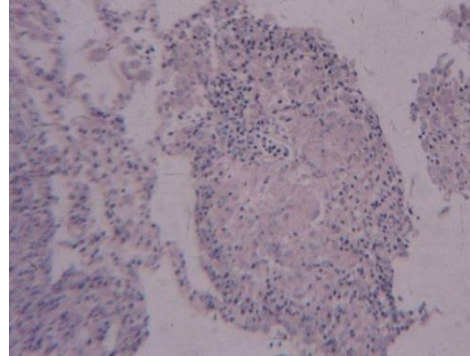
Il ruolo dell'endoscopia toracica

- Endoscopia diagnostica

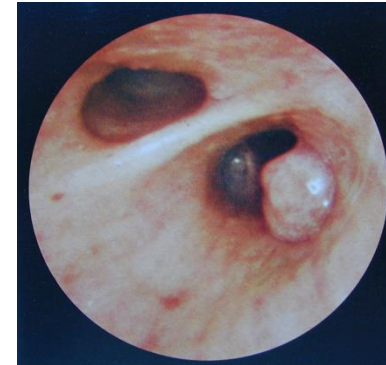
- Endoscopia terapeutica

Endoscopia diagnostica

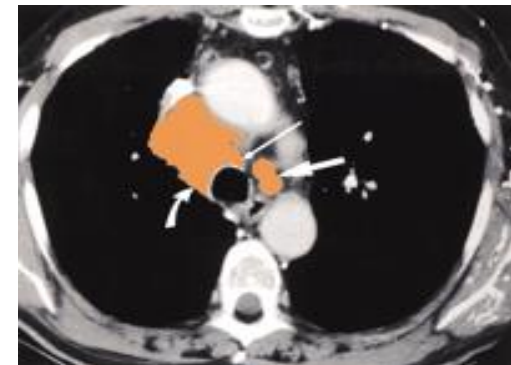
- Tipizzazione Istologica



- Definizione della Sede ed Estensione
(parametro **T**)

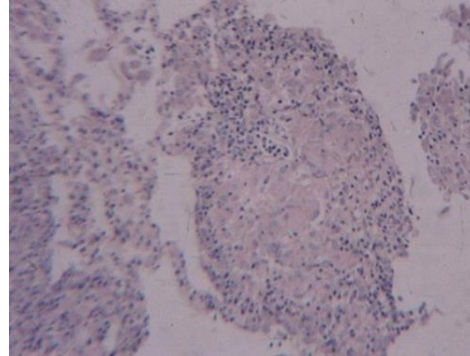


- Coinvolgimento linfonodale mediastinico
(parametro **N**)

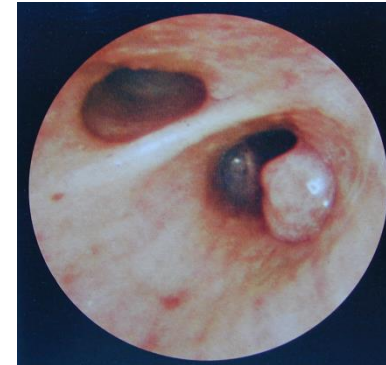


Endoscopia diagnostica

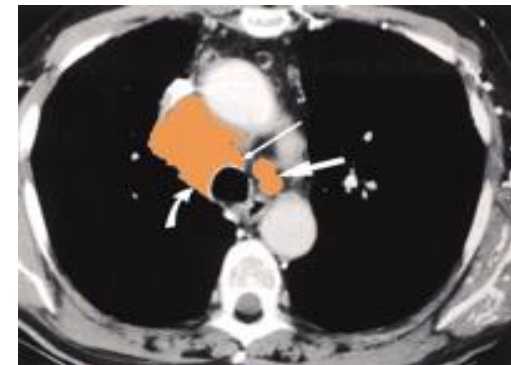
- **Tipizzazione Istologica**



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(parametro **N**)





Lesioni centrali



Lesioni periferiche

Tabella I. Sensibilità delle varie modalità diagnostiche per la diagnosi e la stadiazione di cancro ai polmoni (da McLean et al., 2018 ²², mod.).

Modalità diagnostica	Sensibilità (%)	
	Centrale	Periferica
Citologia su espettorato	71	49
Broncoscopia	88	78
Lavaggio bronchiale	47	43
<i>Brushing</i>	56	54
Biopsia	74	57
TTNA CT guidato	-	90
RP-EBUS	-	73
Navigazione elettromagnetica	-	68
Criobiopsia	95	74
EBUS/TBNA	82	-

Establishing the Diagnosis of Lung Cancer**Diagnosis and Management of Lung Cancer,
3rd ed: American College of Chest Physicians
Evidence-Based Clinical Practice Guidelines***M. Patricia Rivera, MD, FCCP; Atul C. Mehta, MBBS, FCCP;
and Momen M. Wahidi, MD, MBA, FCCP*

FIGURE 5. [Section 3.2.1] Sensitivity of flexible bronchoscopy for the diagnosis of bronchogenic carcinoma by lesion size.

All Methods:		< 2 cm LESION				> 2 cm LESION			
First Author	Year	N	Pos	Neg	Sens	N	Pos	Neg	Sens
Gasparini ¹¹⁰	1995	195	82	113	42	300	169	131	56
Hattori ⁷⁶	1971	17	13	4	76	182	150	32	82
Baaklini ⁸⁸	2000	16	4	12	25	135	93	42	69
Wallace ¹²²	1982	65	3	62	5	78	24	54	31
Bandoh ¹³⁰	2003	25	8	17	32	72	50	22	69
Radke ¹⁰⁶	1979	21	6	15	29	76	49	27	64
Naidich ¹²¹	1988	15	4	11	27	46	26	20	57
Trkanjec ¹²⁹	2003	17	9	8	53	33	27	6	82
McDougall ¹⁰⁵	1981	9	1	8	11	36	21	15	58
Stringfield ¹⁰⁷	1977	3	1	2	33	26	13	13	50
Summary		383	131	252	34	984	622	362	63

Inclusion criteria: studies reporting sensitivity rates of bronchoscopy for peripheral lesions according to size in patients suspected of having lung cancer, up to December 2011.

Sens = sensitivity (%)

Computed Tomography Bronchus Sign and the Diagnostic Yield of Guided Bronchoscopy for Peripheral Pulmonary Lesions

A Systematic Review and Meta-Analysis

Muhammad S. Ali¹, Jaskaran Sethi², Amit Taneja¹, Ali Musani³, and Fabien Maldonado⁴

¹Department of Pulmonary, Critical Care, and Sleep Medicine, Medical College of Wisconsin, Milwaukee, Wisconsin; ²Department of Pulmonary, Critical Care, and Sleep Medicine, University of South Florida, Tampa, Florida; ³Division of Pulmonary Sciences and Critical Care Medicine, University of Colorado School of Medicine, Aurora, Colorado; and ⁴Division of Allergy, Pulmonary, and Critical Care Medicine, Vanderbilt University School of Medicine, Nashville, Tennessee

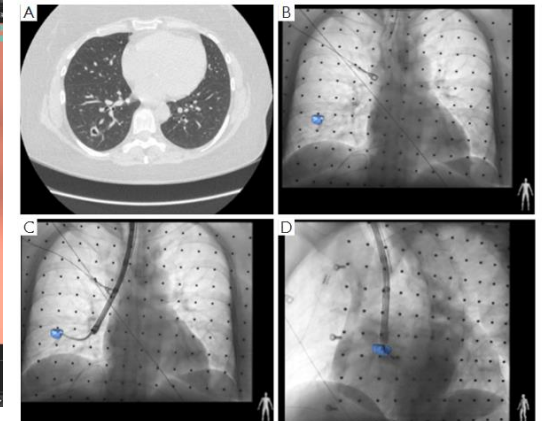
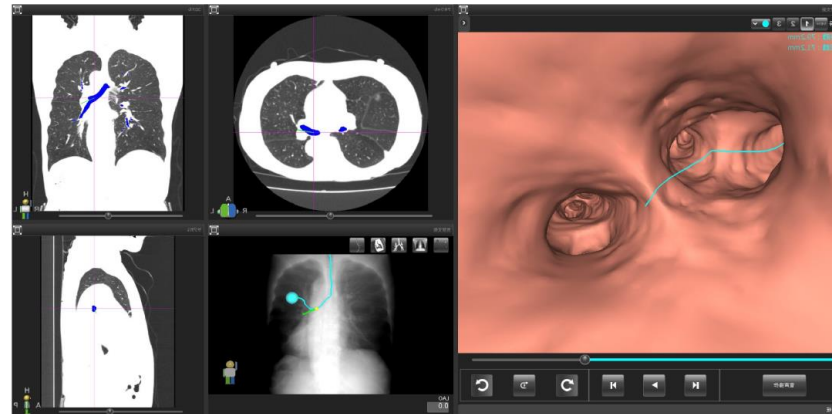
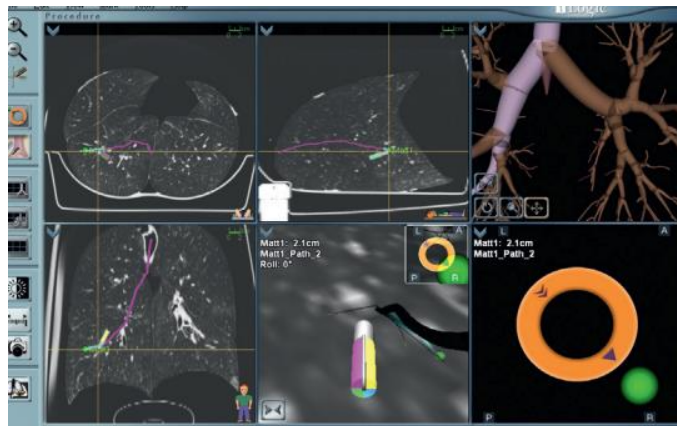
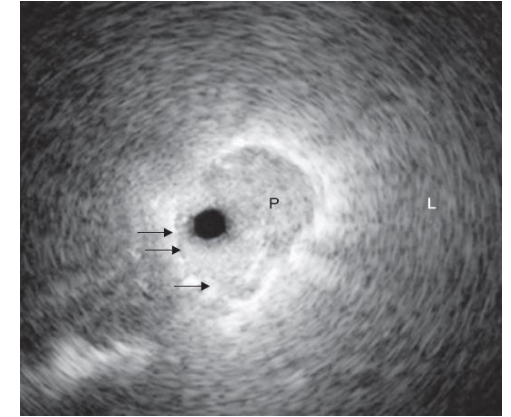
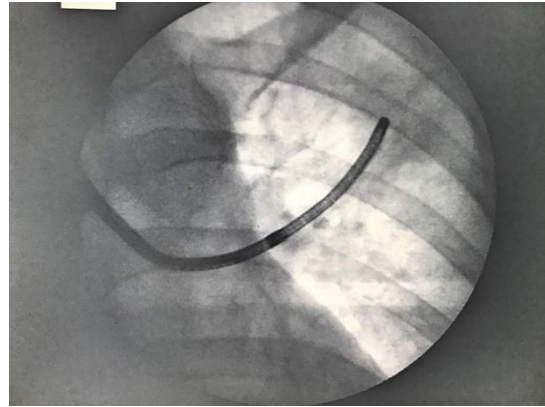
ORCID ID: 0000-0002-9343-1074 (M.S.A.).



Conclusions: PPLs with computed tomography bronchus sign are more likely to be diagnosed with guided bronchoscopy than the lesions without computed tomography bronchus sign. Clinicians should consider this, along with the lesion size and distance from the hilum, when contemplating guided bronchoscopy for PPLs.

INVITED REVIEW SERIES:
INTERVENTIONAL PULMONOLOGY PEARLS
SERIES EDITORS: PHAN NGUYEN, PYNG LEE AND NORIAKI KURIMOTO

Technologies for targeting the peripheral pulmonary nodule including robotics



INVITED REVIEW SERIES:
INTERVENTIONAL PULMONOLOGY PEARLS
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Technologies for targeting the peripheral pulmonary nodule including robotics

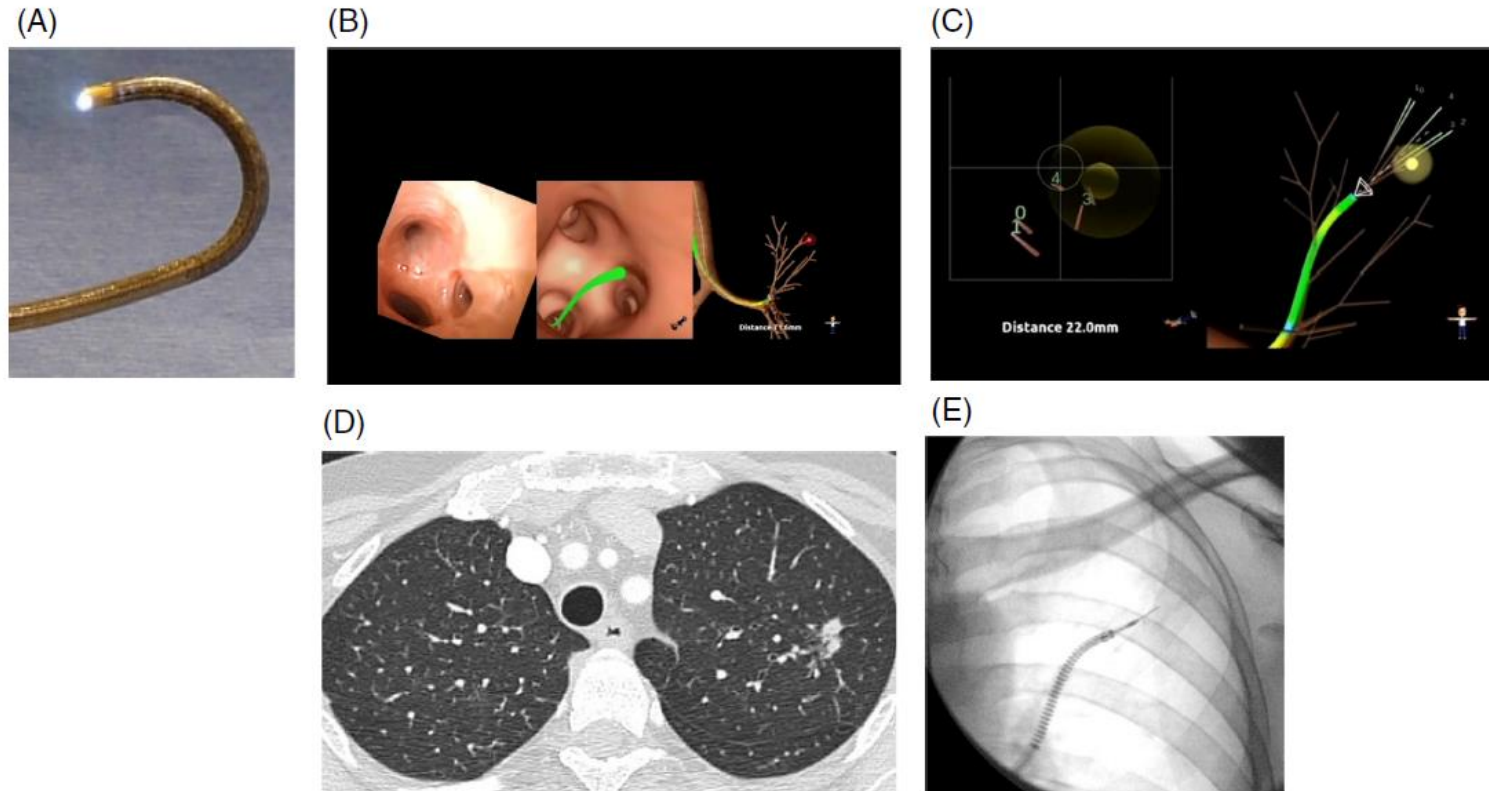


Figure 6 Robotic bronchoscopy apparatus with intuitive bronchoscopic robot. Catheter showing flexion (A) interface showing virtual and real bronchoscopic views seen real-time; (B) bulls-eye representation of biopsy target showing sites of biopsy (left) with image of virtual display of catheter angulation to take those biopsies (right); (C) computed tomography (CT) view of the lesion (D); and fluoroscopy view of catheter in lesion in left upper lobe (segments 1 and 2) with transbronchial needle aspiration (TBNA) needle extended into the lesion (E).

Author	Journal, Year	Guide	Lesion localization	DX YELD
Folch F	J Thorac Oncol	EMN + Fluorocopy	94%	73%
Asano F	BMC Pulm Med 2017	VBN+ r-EBUS	96%	77%
Chen AC	Chest 2021	Robotic + r-EBUS	96%	74%
Verhoevene RL	JOBIP 2021	CBCT + EMN	90%	72%

Comparative effectiveness of radial probe endobronchial ultrasound versus CT-guided needle biopsy for evaluation of peripheral pulmonary lesions: A randomized pragmatic trial

Daniel P. Steinfort ^{a,b,*}, Janette Vincent ^c, Stefan Heinze ^c, Phillip Antippa ^d, Louis B. Irving ^a

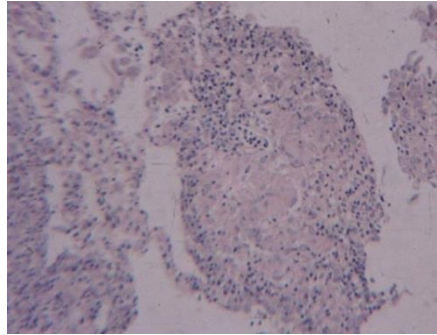
Table 3 Diagnostic performance for detection of lung cancer, and complication rates for the two study groups.

	EBUS-TBLB	CT-PNB	p-value
Diagnostic accuracy % (95%CI)	87.5% (71–96)	93.3% (68–99)	1.0
Sensitivity ^a % (95%CI)	86% (68–95)	92% (62–99)	1.0
Complications			
Overall	1 (3%)	4 (27%)	0.03
pneumothorax	1 (3%)	3 (20%)	
admission	0 (0%)	1 (7%)	
ICC	0	0	
deaths	0	0	

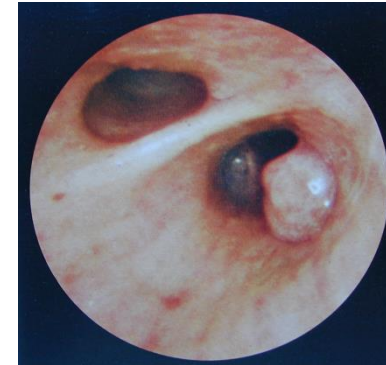
^a sensitivity for the detection of lung cancer.

Endoscopia diagnostica

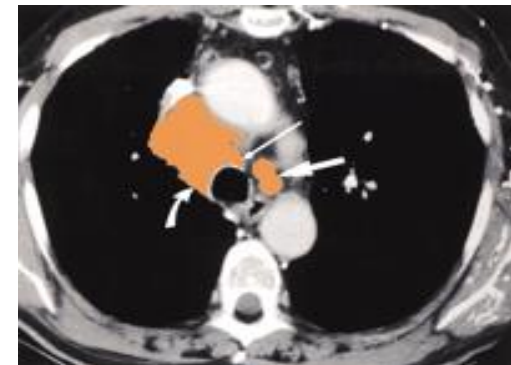
- Tipizzazione Istologica



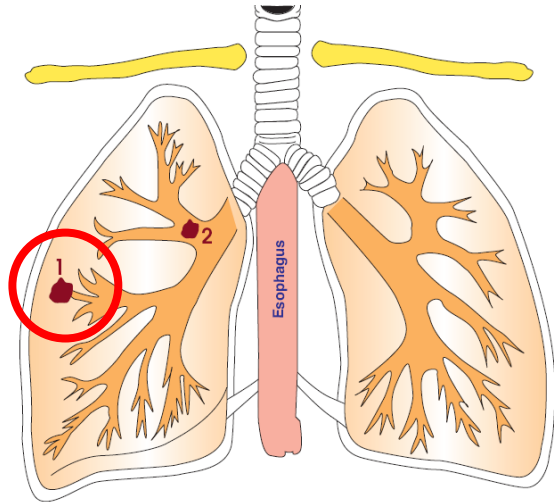
- **Definizione della Sede ed Estensione
(parametro T)**



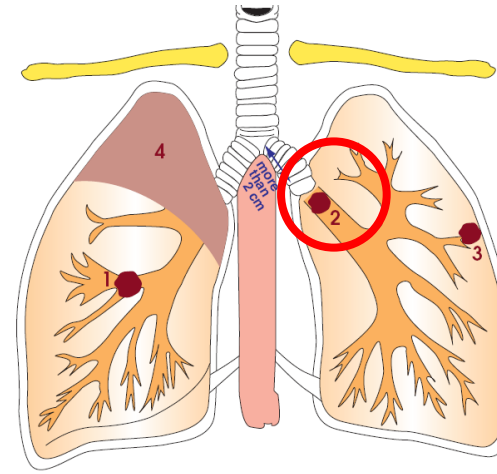
- Coinvolgimento linfonodale mediastinico
(parametro **N**)



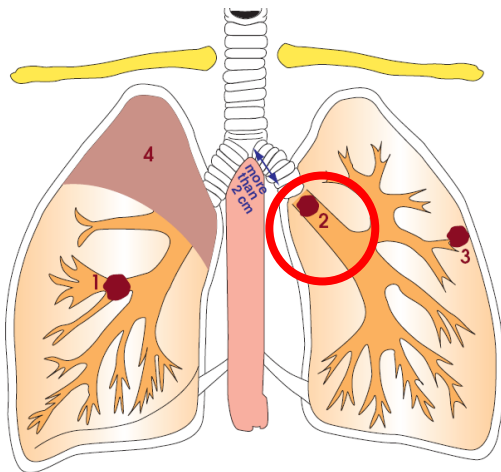
Definizione broncoscopica del Parametro T



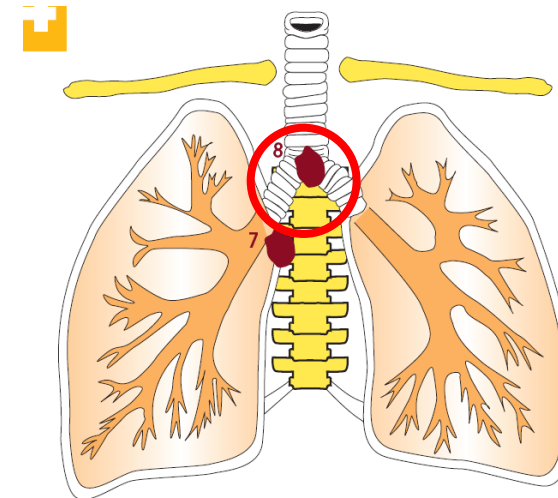
T1



T2



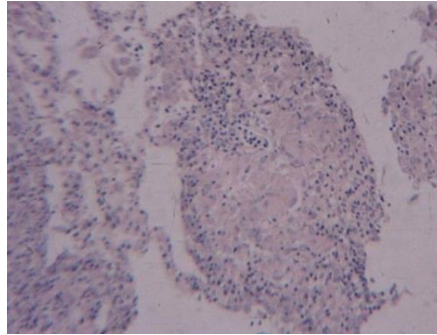
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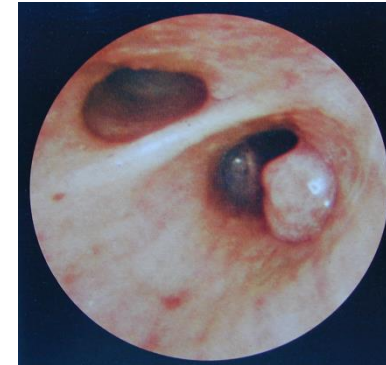
T4

Endoscopia diagnostica

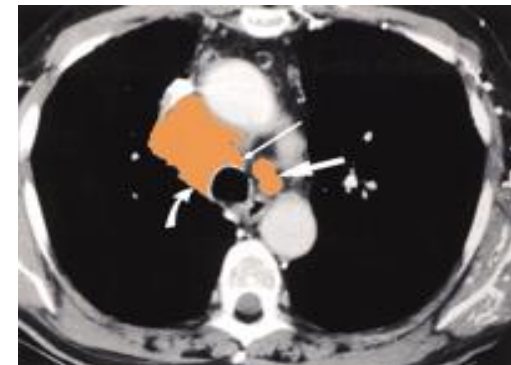
- Tipizzazione Istologica



- Definizione della Sede ed Estensione
(parametro T)

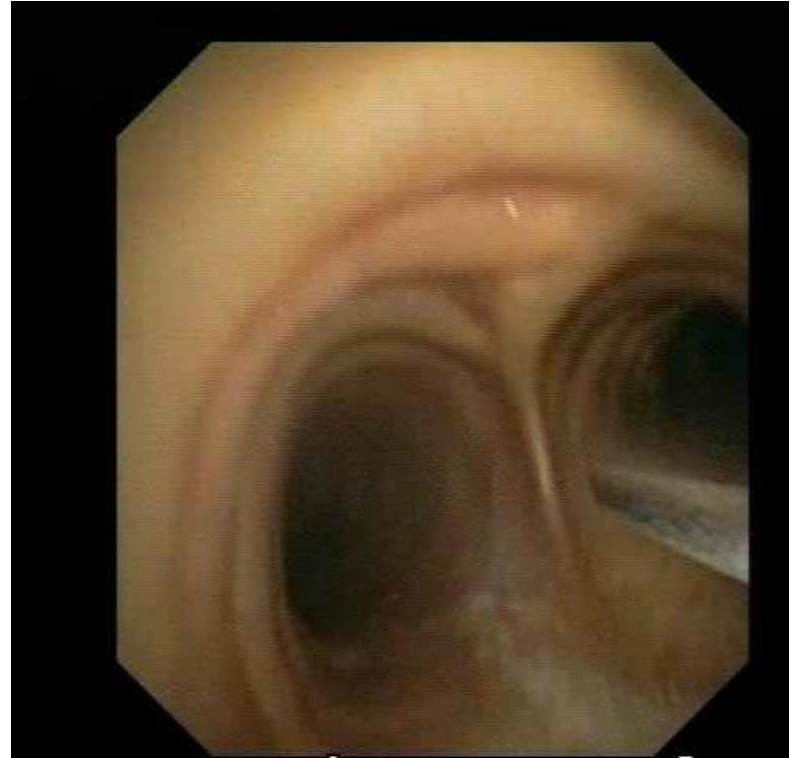


- Coinvolgimento linfonodale mediastinico
(parametro N)



TBNA

(transbronchial needle aspiration)



EBUS-TBNA

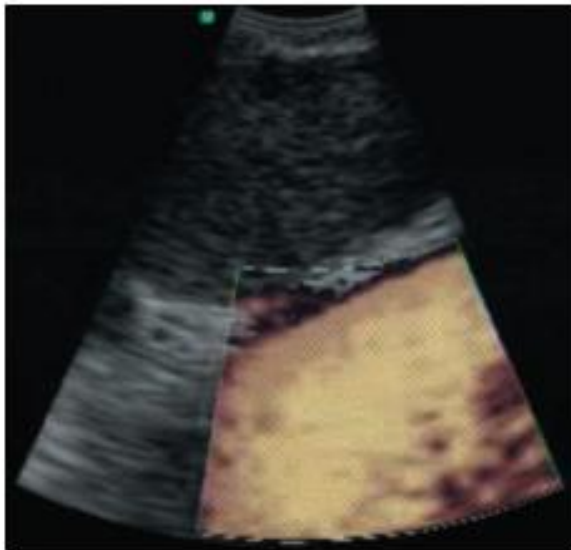
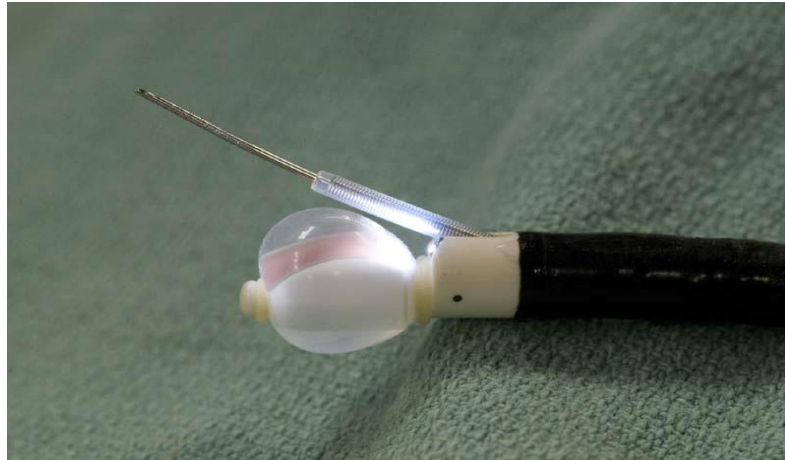


Figure 2 Colour Doppler image for detecting vessels before sampling the node.



Figure 3 Endobronchial ultrasound image of the needle puncture.



Complications, Consequences, and Practice Patterns of Endobronchial Ultrasound-Guided Transbronchial Needle Aspiration

Results of the AQUIRE Registry

Table 2—Complications Following EBUS-TBNA

Outcome	No. Events (N = 1,317)	Complication Rate, % (95% CI)
Any complication within 24 h	19	1.44 (0.87-2.24)
Bleeding requiring intervention ^a	3	0.2 (0.05-0.7)
Pneumothorax	7	0.53 (0.21-1.1)
Clinically significant airway injury	1	0.1 (0.002-0.4)
Sustained hypoxia	4	0.3 (0.08-0.8)
Hypotension	1	0.1 (0.002-0.4)
Cardiac arrest	0	...
Arrhythmia	0	...
Respiratory failure within 24 h	3	0.23 (0.05-0.7)

EBUS = endobronchial ultrasound. See Table 1 for expansion of other abbreviation.

^aOne death occurred in a patient who had bleeding after endobronchial biopsy.

Transoesophageal needle aspiration using a convex probe ultrasonic bronchoscope

BIN HWANGBO,^{1*} HEE SEOK LEE,^{1*} GEON-KOOK LEE,¹ KUN-YOUNG LIM,¹ SOO-HYUN LEE,² HYAE-YOUNG KIM,¹ JONG-YEUL LEE³ AND JAE ILL ZO¹

¹Center for Lung Cancer, and Departments of ²Radiology and ³Gastroenterology, Research Institute and Hospital, National Cancer Center, Goyang, Korea

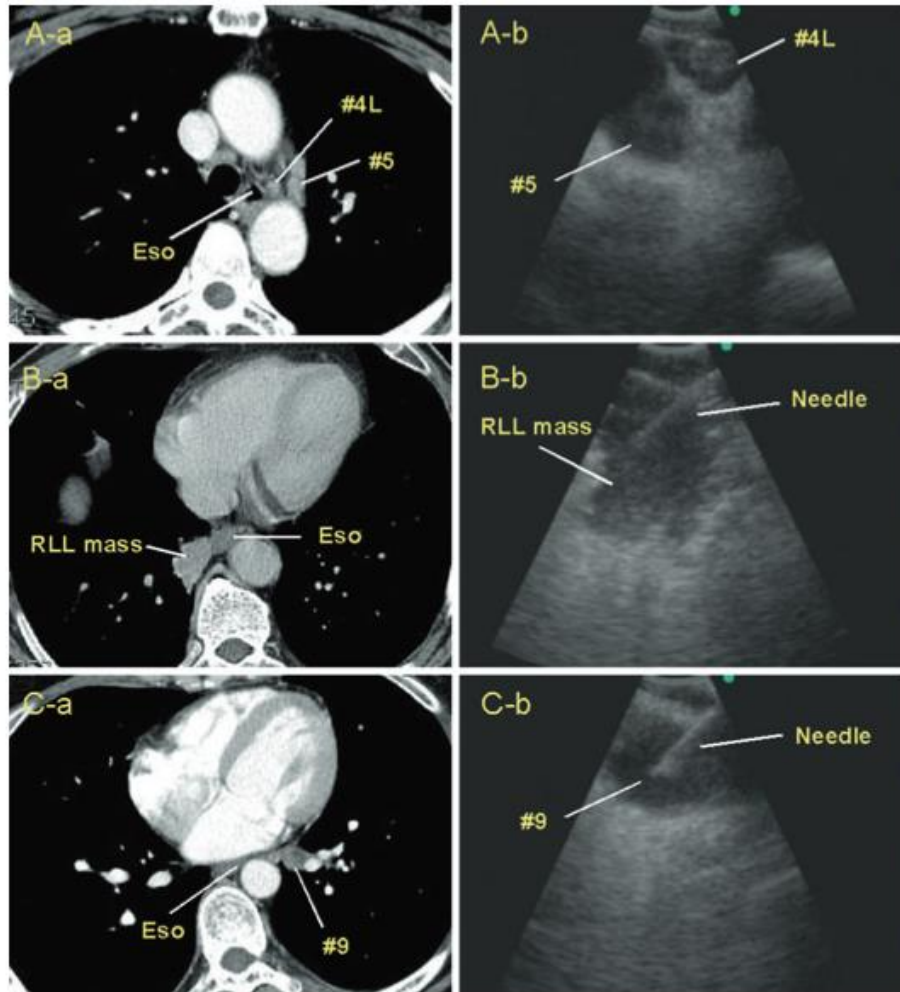


Figure 1 Representative patients with lesions inaccessible by EBUS-TBNA and accessible by EUS-B-FNA. (A) A patient with left upper lobe adenocarcinoma, in whom deep lymph node 4L and lymph nodes 5 are inaccessible by EBUS-TBNA (A-a) but were accessible by EUS-B-FNA (A-b). A lymph node 4L was benign by EUS-B-FNA. Lymph node 5 was malignant by EUS-B-FNA. The cancer was upstaged to N2 by EUS-B-FNA. (B) A mass in the right lower lobe abutting the Eso (B-a) was confirmed to be adenocarcinoma by EUS-B-FNA (B-b). (C) A patient with uterine cervical cancer, in whom a lymph node in station 9 (C-a) was confirmed to be metastatic by EUS-B-FNA (C-b). EBUS-TBNA, endobronchial ultrasound-guided transbronchial needle aspiration; Eso, oesophagus, EUS-B-FNA, endoscopic ultrasound (with bronchoscope)-guided fine needle aspiration; RLL, right lower lobe.

EBUS+EUS=MEDIASTINOSCOPIA MEDICA

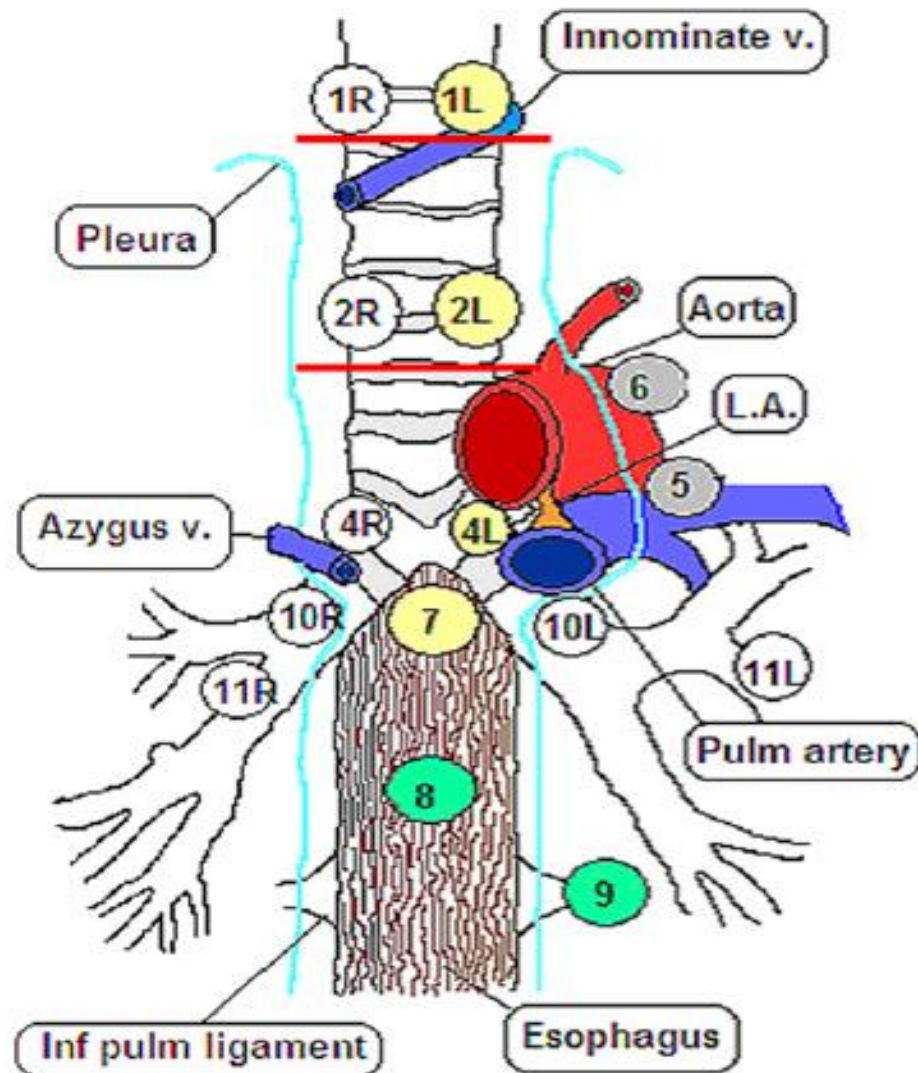


Figure 5. Regional lymph node stations for lung cancer staging accessible by EBUS (white circles) and EUS (green circles). Yellow circles = EBUS + EUS; gray circles = Nonaccessible by EBUS or EUS.



Methods for Staging Non-small Cell Lung Cancer Diagnosis and Management of Lung Cancer, 3rd ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines *G. A. Silvestri et al.*

Mediastinal staging

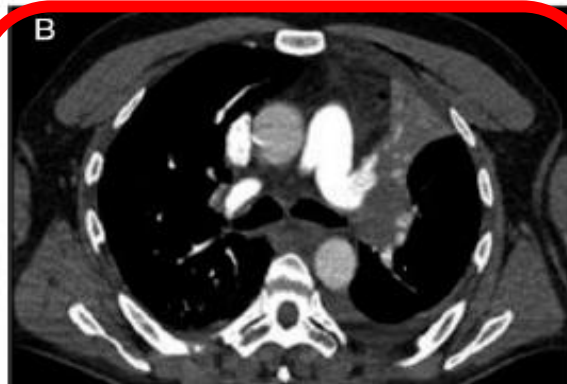
A: Mediastinal infiltration by tumor.



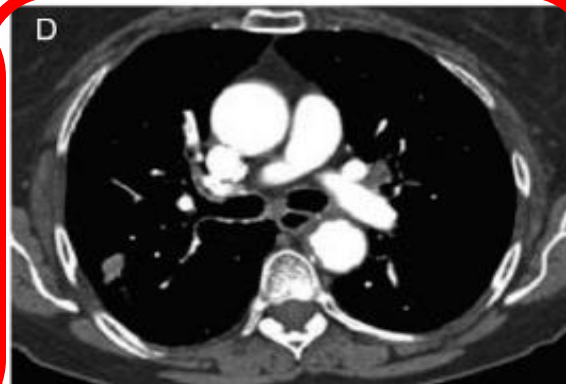
C: Enlarged discrete N2,3 nodes



B: central tumor or a tumor with enlarged N1 nodes, but a normal mediastinum.



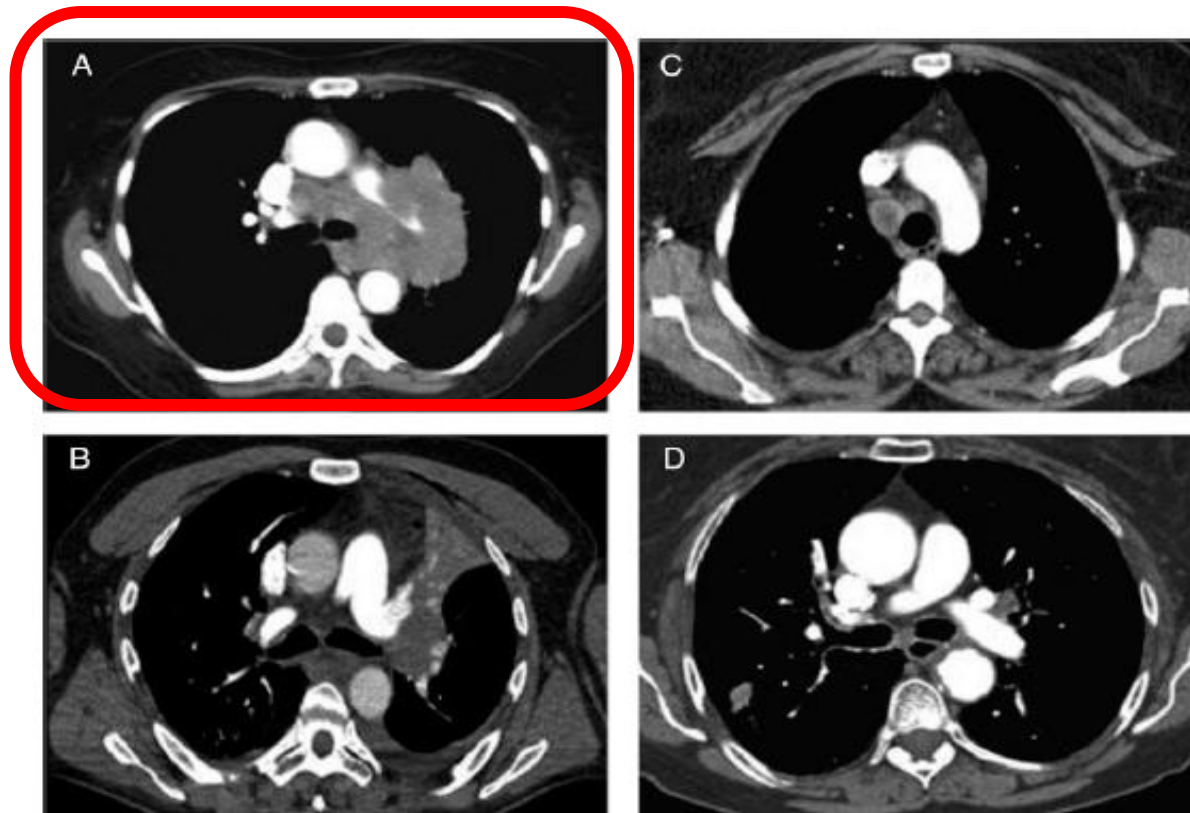
D: Peripheral small tumor (seen in lower left corner of image) with normal-sized lymph nodes





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American College of Chest Physicians Evidence-Based Clinical Practice Guidelines *G. A. Silvestri et al.*

STAGING OF THE MEDIASTINUM





Methods for Staging Non-small Cell Lung Cancer Diagnosis and Management of Lung Cancer, 3rd ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines

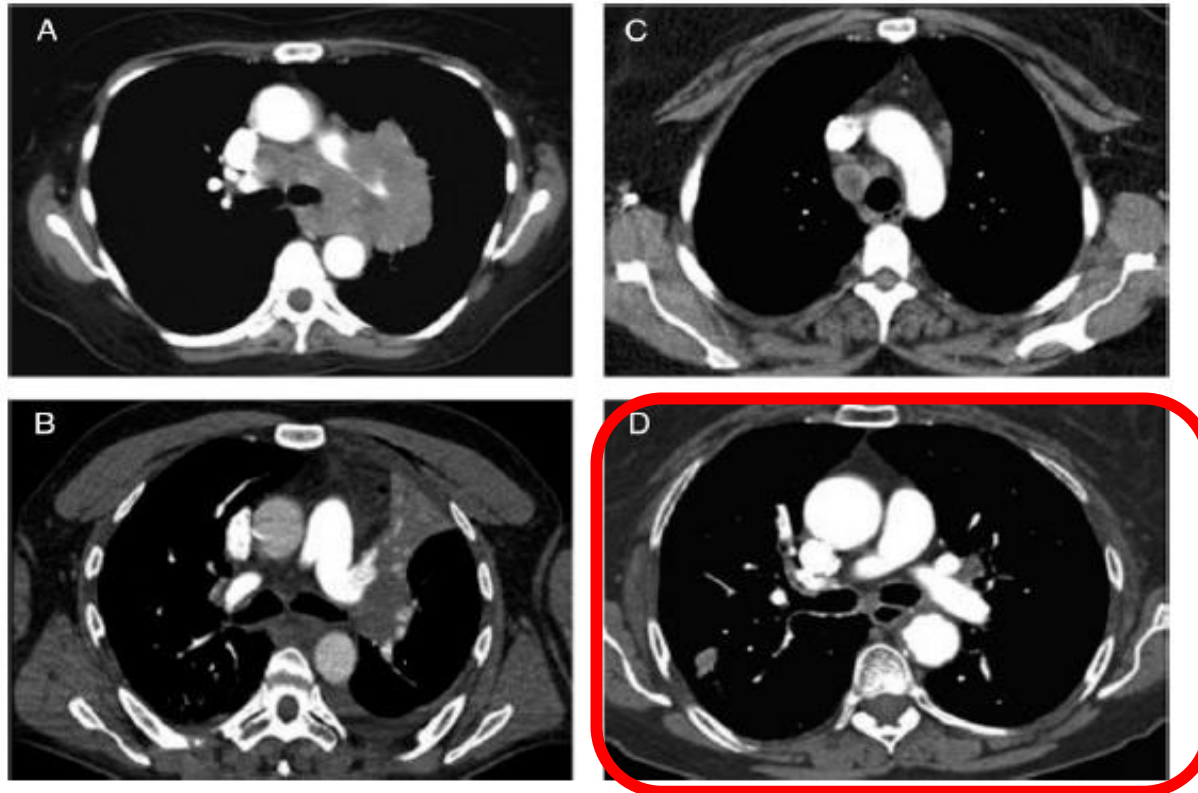
G. A. Silvestri et al.

- For patients with extensive mediastinal infiltration of tumor and no distant metastases, it is suggested that radiographic (CT) assessment of the mediastinal stage is usually sufficient without invasive confirmation (Grade 2C).



**Methods for Staging Non-small Cell Lung Cancer Diagnosis and Management of Lung Cancer, 3rd ed:
American College of Chest Physicians Evidence-Based Clinical Practice Guidelines *G. A. Silvestri et al.***

STAGING OF THE MEDIASTINUM





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Peripheral Stage I Tumors

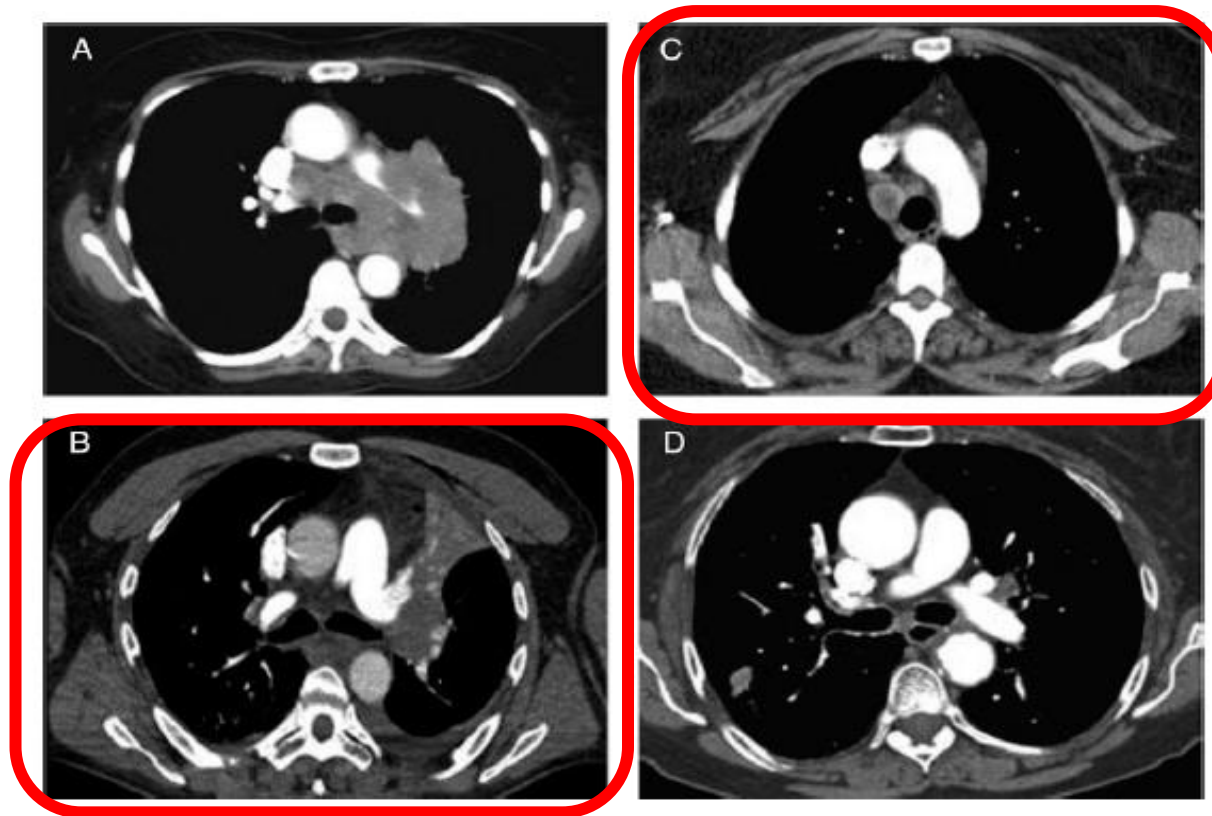
For patients with peripheral tumors in whom there is no enlargement of N1-N3 nodes by CT scan, the FN rate of this radiographic assessment in the mediastinum is approximately 10%.

A negative PET scan in the mediastinum carries an FN rate of approximately 4% (3%-6%) in this group of patients. Thus, invasive staging is probably not needed in this patient group, especially if a PET scan is negative in the mediastinum.



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STAGING OF THE MEDIASTINUM





CT Scanning of the Chest

First Author	Year	No.	Tech	Prev	Sens	Spec	PPV	NPV
Egging ¹³⁷	2002	73	CE	70	82	50	79	55
Wallace ¹⁴³	2001	121	CE	69	87	35	75	54
Marom ⁸⁸	1999	79	CE	56	59	86	84	63
Vansteenkiste ¹⁵⁰	1998	56	CE	50	86	79	80	85
Aaby ¹⁵⁶	1995	57	...	44	72	91	86	81
Schillaci ¹³⁶	2003	83	CE	42	69	75	67	77
Vansteenkiste ¹⁵¹	1998	68	CE	41	75	63	58	78
Primack ¹⁵⁷	1994	159	CE	38	63	86	73	79
Turkmen ¹³⁰	2007	59	CE	36	43	66	41	68
Laudanski ¹⁴¹	2001	92	CE	33	60	73	51	79
Yokoi ¹⁵⁸	1994	113	CE	33	62	80	61	81
Gdeedo ¹³³	1997	100	CE	32	63	57	41	76
Bury ¹⁵⁵	1996	53	CE	32	71	81	63	85
McLoud ¹⁵⁹	1992	143	CE	31	64	62	44	79
Pieterman ⁹⁰	2000	102	CE	31	75	66	50	85
Yen ¹²⁷	2008	96	CE	31	47	80	52	77
Osada ¹⁴⁶	2001	335	CE	30	56	93	77	83
Talbot ¹⁶⁰	1991	336	CE	30	71	86	69	87

	No.	Prev	Sens	Spec	PPV	NPV
Summary: Median	7,368	30	55	81	58	83

Nishimura ¹⁴⁹	2007	203	CE	24	65	77	66	87
Yih ¹⁵⁹	2007	143	CE	24	65	89	65	89
Suzuki ¹⁴⁹	1999	440	CE	23	33	92	56	82
Bury ¹⁵²	1997	64	CE	22	79	84	58	93
De Wever ⁴⁴	2007	50	CE	22	91	72	48	97
Webb ¹⁶²	1991	154	CE	21	52	69	31	84
Cole ¹⁶¹	1993	150	...	21	26	81	26	81
Takamochi ¹³²	2005	71	CE	21	20	89	33	81
Kamiyoshihara ¹⁴⁵	2001	546	CE	20	33	90	46	84
Takamochi ¹⁴⁷	2000	401	CE	20	30	82	30	83
Lee ¹²⁶	2009	182	CE	20	36	79	30	83
Yang ¹²⁸	2008	122	CE	20	52	73	33	86
Kelly ¹³⁴	2004	69	CE	19	46	86	(43) ^a	87
Saunders ¹⁴⁸	1999	84	...	18	20	90	(30) ^a	84
Nomori ¹³³	2004	80	...	18	50	95	(70) ^a	90
Ebihara ¹⁵¹	2006	205	CE	15	32	83	(26) ^a	87
Poncelet ¹⁴²	2001	62	CE	15	56	68	(23) ^a	90
Von Haag ¹⁶⁰	2002	52	CE	12	50	65	(16) ^a	91
Median: prevalence > 30					67	74	62	79
Median: prevalence 21-30					63	87	58	84
Median: prevalence ≤ 20					41	83	30	87
Summary: Median	7,368	30			55	81	58	83

Accuracy of CT scanning for staging of the mediastinum in patients with lung cancer.

CHEST 2013; 143(5)(Suppl):e211S–e250S



PET-CT Scanning

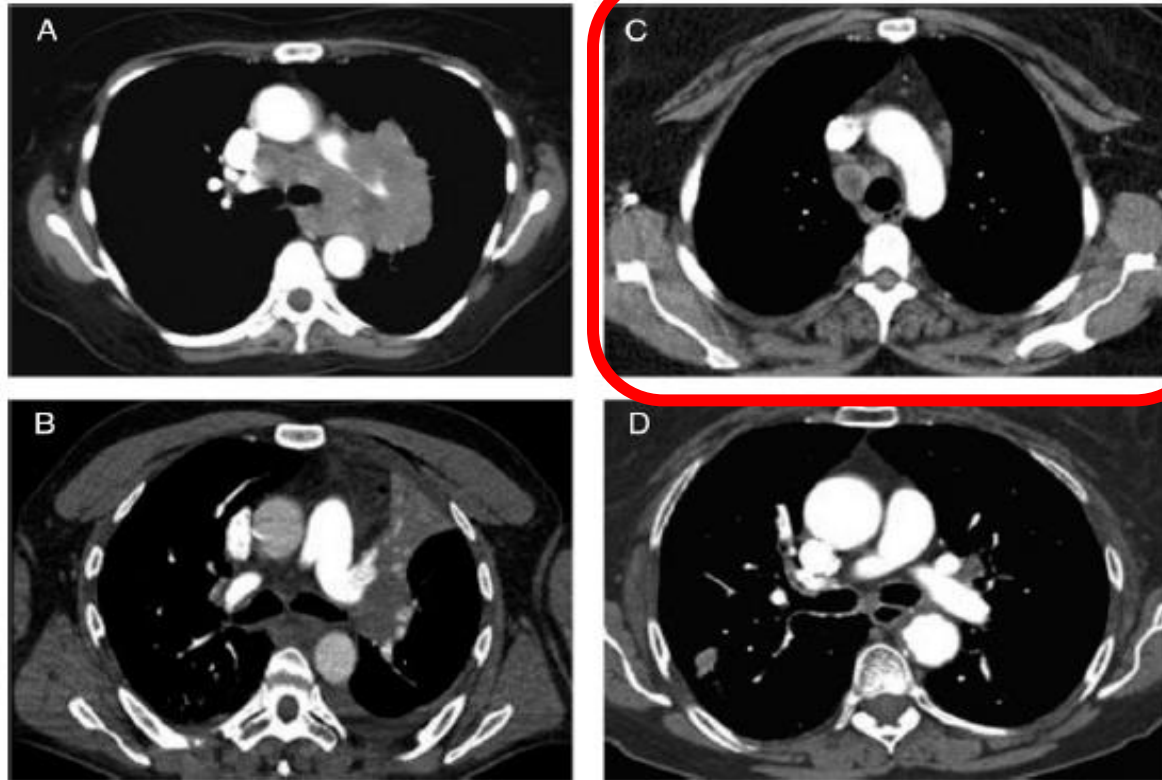
First Author	Year	No.	Prev	Sens	Spec	PPV	NPV
Cerfolio ²⁰⁰	2004	40	100	75
Plathow ²⁰⁴	2008	52	73	100	100	100	100
Fischer ³⁶¹	2011	79	33	85	100	100	93
Lee ²⁰²	2009	41	32	38	89	63	76
Yi ²⁰⁹	2008	150	30	62	94	82	85
Maziak ²⁹	2009	167	29	48	93	74	82
Subedi ⁴⁷	2009	91	26	92	85	69	97
Yi ¹²⁹	2007	143	24	56	100	100	88

	No.	Prev	Sens	Spec	PPV	NPV	
Summary: median	2,014	22	62	90	63	90	
Yang ¹²⁰	2008	122	20	52	73	33	86
Perigaud ²⁰³	2009	51	20	40	85	40	85
Billé ¹⁹⁹	2009	159	19	48	93	(63) ^a	88
Toba ²⁰⁷	2010	42	19	100	88	(67) ^a	100
Usuda ²⁰⁸	2011	63	17	36	92	(50) ^a	87
Sanli ²⁰⁵	2009	78	14	82	90	(56) ^a	97
Shin ²⁰⁶	2008	184	13	48	95	(58) ^a	93
Summary: median	2,014	22	62	90	63	90	

Accuracy of integrated PET-CT scanning for staging of the mediastinum in patients with lung cancer.



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RACCOMANDAZIONI

-In patients with high suspicion of N2,3 involvement, either by discrete mediastinal lymph node enlargement or PET uptake (and no distant metastases), a needle technique (endobronchial ultrasound [EBUS]-needle aspiration [NA], EUS-NA or combined EBUS/EUS-NA) is recommended over surgical staging as a best first test (Grade 1B) .

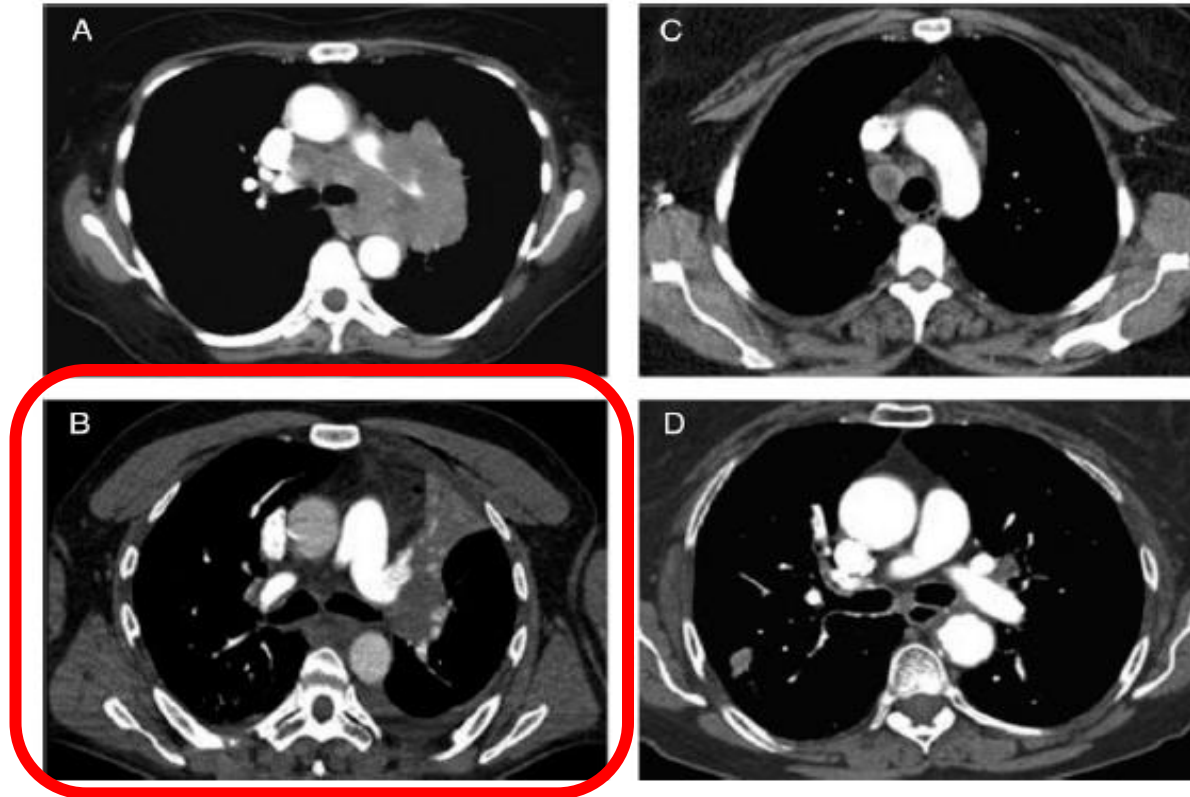
-Remark: This recommendation is based on the availability of these technologies (EBUS-NA, EUS-NA or combined EBUS/EUS-NA) and the appropriate experience and skill of the operator.

-Remark: In cases where the clinical suspicion of mediastinal node involvement remains high after a negative result using a needle technique, surgical staging (eg, mediastinoscopy, video-assisted thoracic surgery [VATS], etc) should be performed.

-Remark: The reliability of mediastinal staging may be more dependent on the thoroughness with which the procedure is performed than by which test is used.



Methods for Staging Non-small Cell Lung Cancer Diagnosis and Management of Lung Cancer, 3rd ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines *G. A. Silvestri et al.*





Methods for Staging Non-small Cell Lung Cancer Diagnosis and Management of Lung Cancer, 3rd ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines

G. A. Silvestri et al.

-In patients with an intermediate suspicion of N2,3 involvement, ie, a radiographically normal mediastinum (by CT and PET) and a central tumor or N1 lymph node enlargement (and no distant metastases), **invasive staging of the mediastinum is recommended over staging by imaging alone (Grade 1C).**

- In patients with an intermediate suspicion of N2,3 involvement, ie, a radiographically normal mediastinum (by CT and PET) and a central tumor or N1 lymph node enlargement (and no distant metastases), **a needle technique (EBUS-NA, EUS-NA or combined EBUS/EUS-NA) is suggested over surgical staging as a best first test (Grade 2B).**

CHEST 2013; 143(5)(Suppl):e211S–e250S



Endobronchial Ultrasound With NA—EBUS-TBNA

Study	Year	No.	Stage	Thoro	Prev	Sens	Spec ^a	PPV ^a	NPV
Fielding ³⁴¹	2009	68	cN1-3	Sel	87	95	(100) ^a	(100) ^a	(67) ^b
Steinfurt ³³⁴	2011	117	cN1-3	Sys	80	97	(100) ^a	(100) ^a	87
Cetinkaya ³³²	2011	52	cN2-3	Sys	80	95	(100) ^a	(100) ^a	83
Rintoul ³⁴⁴	2009	109	cN1-3	Sys	77	91	(100) ^a	(100) ^a	60
Gilbert ³³⁹	2009	67	cN1-3	Sel	70	93	(100) ^a	(100) ^a	83
Yasufuku ³⁴⁹	2005	108	cN1-3	Sys	69	95	(100) ^a	(100) ^a	90
Yasufuku ³⁵⁰	2004	70	cN1-3	Sys	67	96	(100) ^a	(100) ^a	92
Szlabowski ³⁴³	2009	226	cN0-3	Sys	64	89	(100) ^a	(100) ^a	84
Ye ³³³	2011	101	cN1-3	Sel	63	95	(100) ^a	(100) ^a	93
Cerfolio ³³⁶	2010	92	cN2	Sys	63	57	(100) ^a	(100) ^a	79
Lee BE ³²⁹	2012	73	cN0-3	Sys	62	95	(100) ^a	(100) ^a	94
Ramirez ³⁴⁵	2008	106	cN1-3	Svc	58	95	(100) ^a	(100) ^a	91

	No.	Prev	Sens	Spec ^a	PPV ^a	NPV			
Summary: median	2,756	58	89	(100)^a	(100)^a	91			
Wanace ³⁴⁶	2008	138	cN2-3	Sys	30	89	(100) ^a	(100) ^a	88
Lee HS ³⁴⁶	2008	102	cN2-3	Sys	30	94	(100) ^a	(100) ^a	97
Hwangbo ³⁴²	2009	117	cN2-3	Sys	26	90	(100) ^a	(100) ^a	97
Yasufuku ³⁴⁸	2006	102	cN1-3	Sys	25	92	(100) ^a	(100) ^a	97
Szlabowski ³⁴³	2010	120	cN0	Sel	22	46	99	93	86
Herth ²¹¹	2006	100	cN0	Sys	21	92	(100) ^a	(100) ^a	96
Nakajima ³³⁸	2010	49	cN1-3	Sys	18	67	(100) ^a	(100) ^{a,c}	93
Herth ²¹⁰	2008	97	cN0	Sys	10	89	(100) ^a	(100) ^{a,c}	99
Median: Prevalence ≥ 80						96			83
Median: Prevalence 60-79						91			83
Median: Prevalence 40-59						87			89
Median: Prevalence 20-39						87			95
Median: Prevalence < 20						78			96
Median: cN1-3						91			89
Median: cN0						89			96
Summary: median	2,756	58				89	(100)^a	(100)^a	91

Real-time endobronchial ultrasound-guided transbronchial needle aspiration of the mediastinum in patients with lung cancer



Endoscopic Ultrasound With NA— EUS-NA

First Author	Year	No.	Stage	Thoro	Prev	Sens	Spec	PPV	NPV
Nadarajan ³¹⁰	2010	34	cN2-3	Sel	88	100	(100) ^a	(100) ^a	(100) ^b
Tournoy ³¹²	2008	100	cN0-3	Sys	83	95	(100) ^a	(100) ^a	(81) ^b
Wallace ¹⁴³	2001	121	cN2-3	Sel	79	87	(100) ^a	(100) ^a	68
Annema ³²³	2004	36	cN2-3	Sys	78	93	(100) ^a	(100) ^a	80
Wiersema ³⁰⁵	2001	29	cN2-3	Sel	76	100	(100) ^a	(100) ^a	100
Fritscher-Ravens ³⁰¹	2000	35	cN2-3	Lim	74	96	(100) ^a	(100) ^a	90
Annema ³¹⁶	2005	215	cN0-3	Sys	71	91	(100) ^a	(100) ^a	74
Larsen ³²⁴	2002	29	cN2-3	Lim	69	90	(100) ^a	(100) ^a	82
Annema ³⁰⁶	2010	551	cN2-3	Sys	66	83	(100) ^a	(100) ^a	75
Caddy ³²⁰	2005	36	cN0-3	Sel	65	92	(100) ^a	(100) ^a	83
Kalade ³¹¹	2008	33	cN1-3	Sel	64	95	(100) ^a	(100) ^a	92

No.	Prev	Sens	Spec	PPV	NPV				
Summary: median	58	89	(100)^a	(100)^a	86				
Eloubeidi ³¹⁵	2005	104	cN2-3	Sys	41	93	(100) ^a	(100) ^a	96
Eloubeidi ³¹⁸	2005	35	cN2-3	Sys	37	91	(100) ^a	(100) ^a	97
Annema ³¹⁷	2005	100	cN2-3	Sys	36	71	90	86	85
Wallace ³²²	2004	69	cN0	Sys	36	61	(100) ^a	(100) ^a	82
LeBlanc ³²¹	2005	67	cN0	Sel	33	45	(100) ^a	(100) ^a	79
Wallace ²⁹⁶	2008	138	cN2-3	Sys	30	69	(100) ^a	(100) ^a	88
Szlabowski ³⁰⁸	2010	120	cN0	Sel	22	50	99	93	87
Fernandez-Esparrach ³¹⁴	2006	47	cN0	Sys	21	50	(100) ^a	(100) ^a	88
Median: prevalence > 80	% sys	50%				96			90
Median: prevalence 60-79	% sys	40%				92			82
Median: prevalence 40-59	% sys	71%				88			88
Median: prevalence 20-39	% sys	71%				61			87
Median: cN1-3	% sys	47%				92			89
Median: cN0-1	% sys	50%				50			85
Summary: median	2,443				58	89	(100)^a	(100)^a	86

Endoscopic ultrasound-guided needle aspiration of the mediastinum in patients with lung cancer



EUS/EBUS

First Author	Year	No.	Stage	Thoro	Prev	Sens	Spec ^a	PPV ^a	NPV
Vilmann ³⁵³	2005	31	cN0-3	sys	65	100	(100) ^a	(100) ^a	100
Annema ²²⁸	2010	123	cN1-3	sys	54	82	(100) ^a	(100) ^a	80
Herth ³⁰⁷	2010	139	cN1-3	sel	52	96	(100) ^a	(100) ^a	96
Ohnishi ³⁵²	2011	110	cN0-3	sys	35	72	(100) ^a	(100) ^a	87
Wang ³³⁵	2010	150	cN0-3	sys	31	91	(100) ^a	(100) ^a	96

	No.	Prev	Sens	Spec ^a	PPV ^a	NPV
Summary: median	811	33	91	(100)^a	(100)^a	96
Summary: median	811	33	91	(100) ^a	(100) ^a	96

Real-time EBUS-TBNA and EUS-NA of the mediastinum in patients with lung cancer

Combined endoscopic-endobronchial ultrasound-guided fine-needle aspiration of mediastinal lymph nodes through a single bronchoscope in 150 patients with suspected lung cancer.

F. Herth, M. Krasnik, [+2 authors](#) [A. Ernst](#) • Published 1 October 2009 • Medicine • Chest

Sampling Approach	Nodes Sampled, No. (%)	Sensitivity for Cancer Detection, %	Specificity for Cancer Detection, %	Negative Predictive Value, %
Esophageal	229 (37)	89	100	82
Endobronchial	390 (63)	91	100	92
Combined	619 (100)	96	100	96

Table 1— Diagnostic Performance Characteristics of Endobronchial Ultrasound-Guided Transbronchial Needle Aspiration and Endoscopic Ultrasound-Guided Fine-Needle Aspiration in 619 Nodes From 139 Patients With Suspected Cancer [Collapse](#)

Unforeseen N2 Disease after Negative Endosonography Findings with or without Confirmatory Mediastinoscopy in Resectable Non-Small Cell Lung Cancer: A Systematic Review and Meta-Analysis

Jelle E. Bousema, MD,^a Martijn van Dorp, MD,^b Valentin J. J. M. Noyez, MD,^c
Marcel G. W. Dijkgraaf, PhD,^d Jouke T. Annema, MD, PhD,^e
Frank J. C. van den Broek, MD, PhD^{a,*}

Conclusion: The rate of unforeseen N2 disease after negative endosonography findings was similar in patients undergoing immediate lung tumor resection to those undergoing confirmatory mediastinoscopy first, at the cost of 6.0% rate of complications by mediastinoscopy.

Guideline for the Acquisition and Preparation of Conventional and Endobronchial Ultrasound-Guided Transbronchial Needle Aspiration Specimens for the Diagnosis and Molecular Testing of Patients with Known or Suspected Lung Cancer

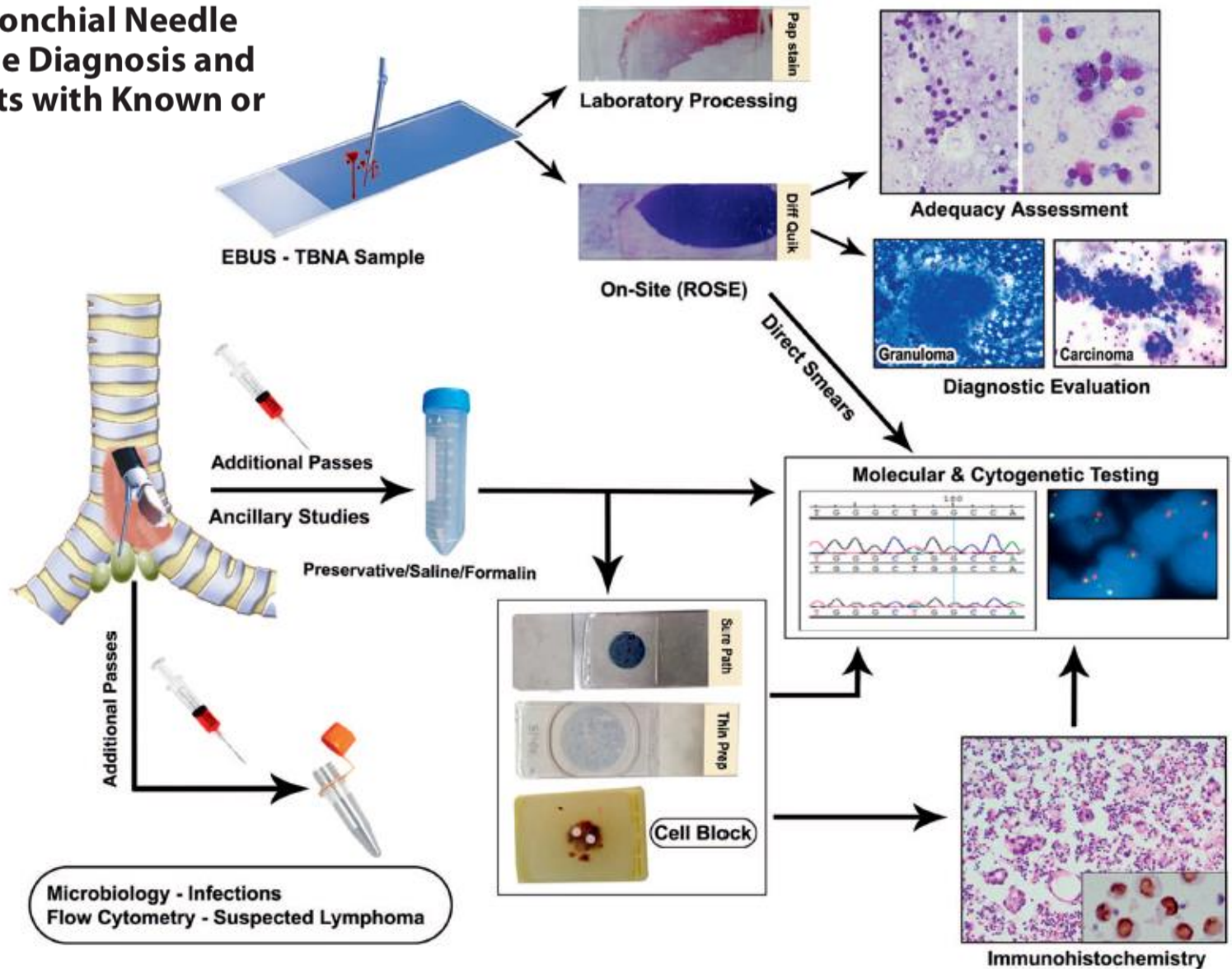


Figure 2. Schematic diagram to show purpose and algorithmic flow of rapid on-site evaluation (ROSE) for endobronchial ultrasound-guided transbronchial needle aspirate (EBUS-TBNA) specimens. Abbreviation: Pap, Papanicolaou.

Take home messages

- *La broncoscopia ha un ruolo fondamentale nella diagnosi e stadiazione del tumore del polmone*
- *Le due metodiche di stadiazione, EBUS ed EUS, utilizzate in combinazione consentono una stadiazione mediastinica sistematica*
- *Nel nodulo polmonare periferico, in assenza di alterazione del mediastino alla TC o alla PET, la stadiazione mediante EBUS/EUS non è necessaria*
- *In caso di tumore centrale o in presenza di linfonodi mediastinici o ilari alla TC o alla PET, l'EBUS e l'EUS sono procedure di scelta nella stadiazione mediastinica in quanto tecniche sicure, efficaci, economiche e sensibili*
- *In caso di malattia avanzata, è auspicabile che la quantità di materiale prelevato consenta tutte le indagini di biologia molecolare*
- *La scelta delle tecniche deve essere fatta sempre da un team multidisciplinare*



“I think I have made an important
discovery”

Grazie per l'attenzione!