Bedeutung der Thorakoskopie für die Diagnostik des Pleuramesothelioms

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Pleuramesotheliom Allgemeines

- **teils extrem lange Latenzzeit**
  - 35 Jahre (10 – 60 Jahre)
  - Mesotheliomtodesfällegipfel 2017
- **Dauer der Asbestbelastung**
  - 15 Jahre (minimal wenige Wochen!)
- **Manifestationsalter**
  - 65 ± 10 Jahre
- **Überlebenszeit**
  - 4 – 18 Monate
  - späte Diagnosestellung, fortgeschrittene Stadien
  - schwierige Diagnose und Therapie

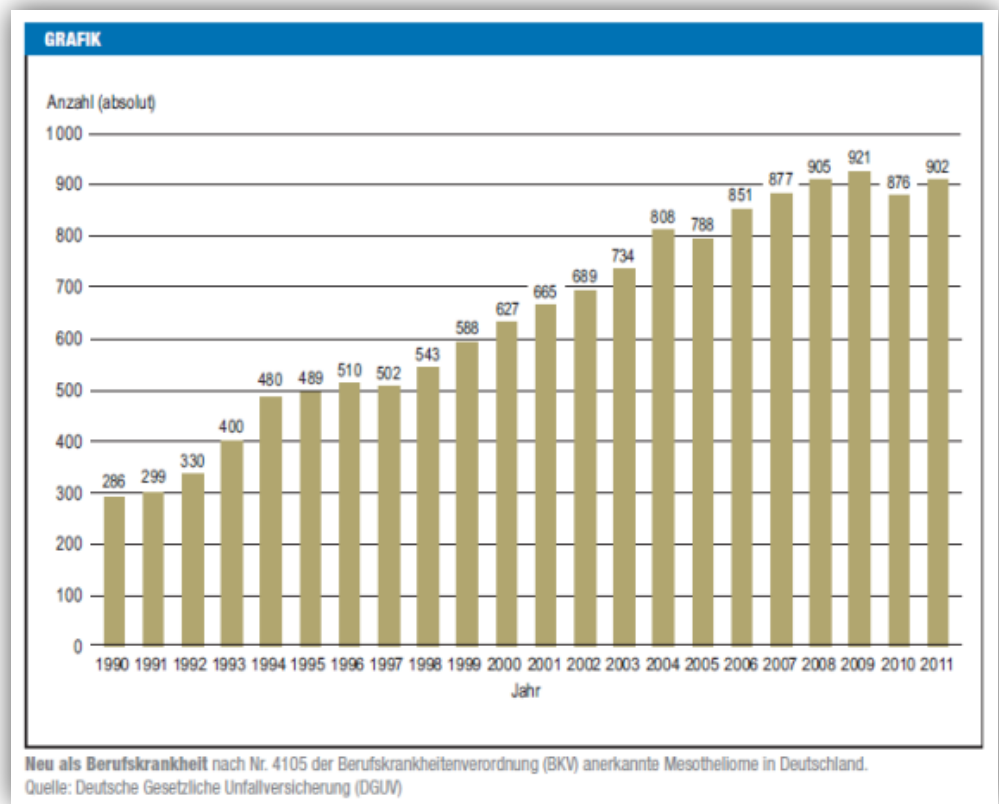


TABELLE 1

Inzidenzen und Häufigkeitsgipfel (Peak) der Mesotheliomerkrankungen weltweit

Land	Inzidenz bei Peak (Erkrankungen pro 1 Million)	Peak (Jahr/Zeitraum)	Erwartete Todesfälle (im Jahr des Maximums)	Studie
Australien	40	2010	1 000	Leigh 2002 (e8)
Großbritannien	38	2016	2 040	Tan 2010 (e9)
Deutschland	20	2015–2020	1 600	Pesch 2010 (e10) Peto 1999 (e11)
Frankreich	20	2020–2040	1 300	Banaei 2000 (e12)
USA	15	2010	2 800	Larson 2007 (e13)
Japan	15	2025–2033	1 200	Azuma 2009 (e14)
Spanien	11	2016	520	Pitarque 2008 (e15)
Niederlande	10	2028	900	Segura 2003 (e16)

Dtsch Arztebl Int 2013; 110(18): 319–26

Pleuramesotheliom
Symptomatik

BTS guideline

Table 3 Symptoms at initial presentation in 90 evaluable cases of malignant pleural mesothelioma[10]

Symptom	No. of cases	%
Pain	62	69
Non-pleuritic	56	
Pleuritic	6	
Shortness of breath	53	59
Fever, chills or sweats	30	33
Weakness, fatigue or malaise	30	33
Cough	24	27
Weight loss	22	24
Anorexia	10	11
Sensation of heaviness or fullness in chest	6	7
Hoarseness	3	3
Early satiety	2	2
Myalgias	2	2
Others*	1 each	1

*Other symptoms included aphonia and dysphagia, abdominal distension, sensation of pressure in right upper quadrant, nausea, bad taste in mouth, perceived tachycardia and headache.

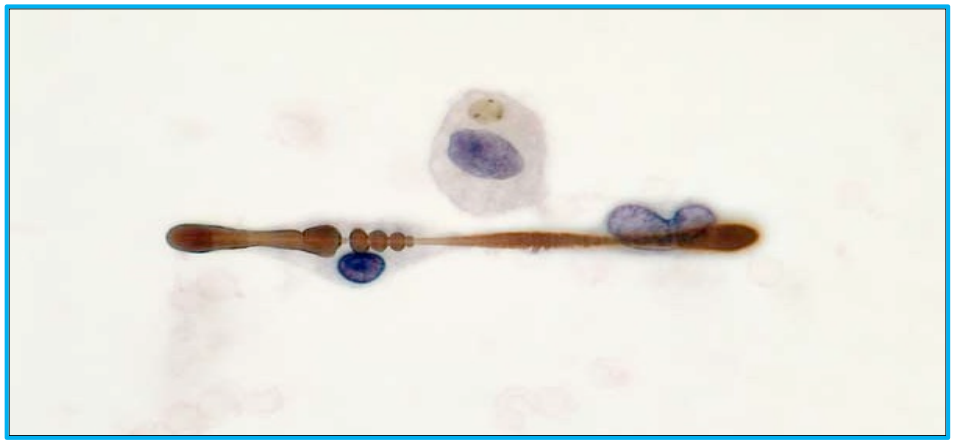
Woolhouse I, et al.

Thorax 2018;**73**:i1–i30. doi:10.1136/thoraxjnl-2017-211321

Pathologie - Makroskopie

- multiple kleine Knötchen
- konfluierende tumoröse Auflagerungen
- Obliteration des Pleuraspaltes mit Einmauerung der Lunge

A. Morresi-Hauf, Pathologie, Gauting



Asbestkörperchen

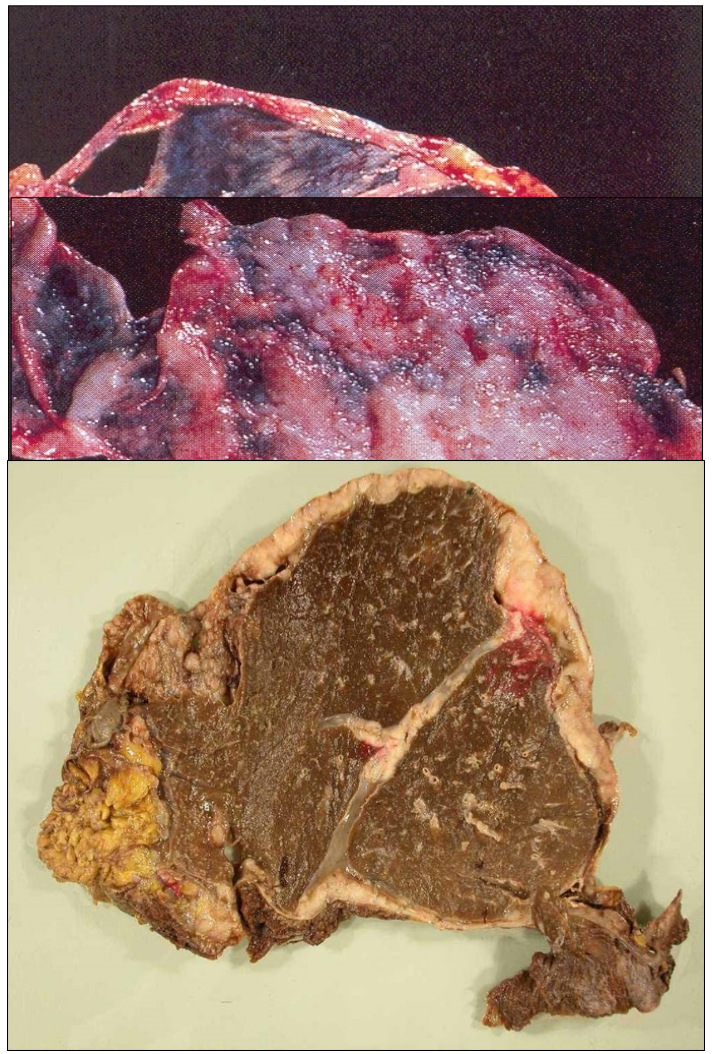


Table 4. Histologic Subtypes and Patterns[a] of Malignant Mesothelioma

- Epithelioid mesothelioma
  - Tubulopapillary
  - Micropapillary
  - Trabecular
  - Acinar
  - Adenomatoid
  - Solid
  - Clear cell
  - Deciduoid
  - Adenoid cystic
  - Signet ring cell
  - Small cell
  - Rhabdoid
  - Pleomorphic
- Sarcomatoid mesothelioma
  - Conventional, spindle cell
  - Desmoplastic
  - Heterologous differentiation (osteosarcomatous, chondrosarcomatous, etc)
  - Lymphohistiocytoid (may also be classified as epithelioid)
- Biphasic/mixed

[a] Subtype must be given in the diagnosis, but histologic pattern, epithelioid or sarcomatous, may be described in a comment or microscopic description.

from Guidelines Update 2012

Hauptkategorien

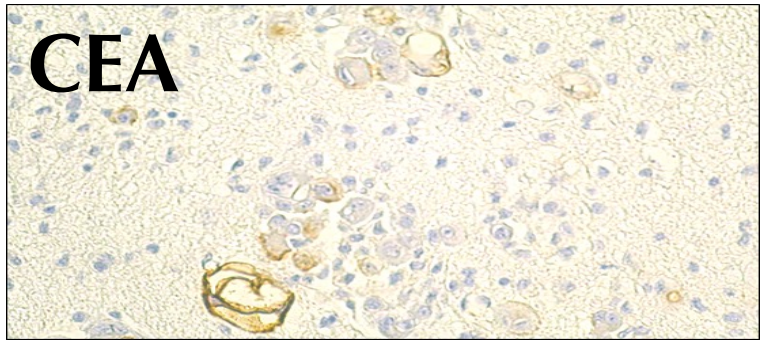
- epitheloid 50 %
- sarkomatoid (Variante: desmoplastisch) 15 %
- biphasisch (gemischt) 25 %
- undifferenziert

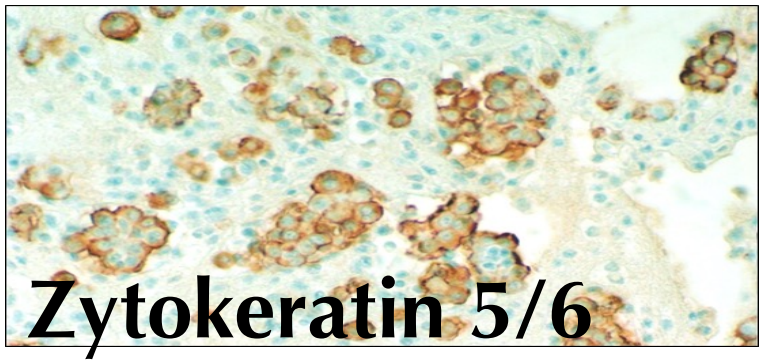
Pathological diagnosis

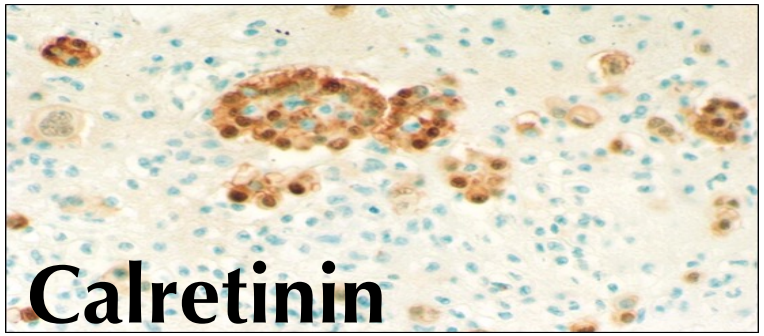
- Immunohistochemistry is recommended for the differential diagnosis of MPM in both biopsy and cytology type specimens. Grade D.
- A combination of at least two positive mesothelial (Calretinin, Cytokeratin 5/6, Wilms Tumour 1, D-240) and at least two negative adenocarcinoma immunohistochemical markers (TTF1, CEA, Ber-EP4) should be used in the differential diagnosis of MPM. (*Markers listed in likely order of value).* Grade D.
- Do not rely on cytology alone to make a diagnosis of MPM unless biopsy is not possible or not required to determine treatment due to patient wishes or poor performance status. Grade D.
- Pathologists should report the histological subtype of MPM in all cases. Grade D.

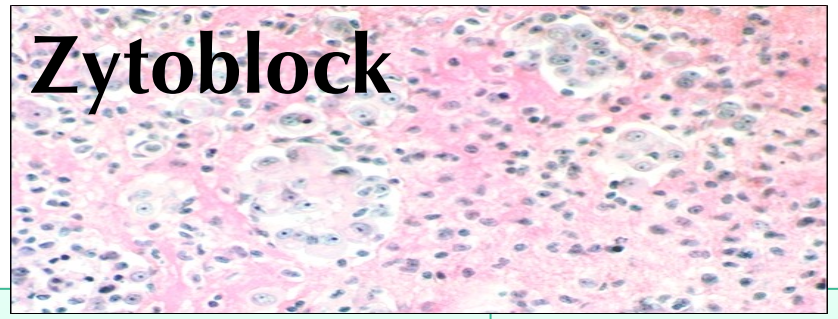
BTS Guidelines 2018

Immunhistochemie (DD AdenoCa)









Mesotheliale Marker	Epitheliale Marker
Calretinin	CEA
Zytokeratin 5/6	Ber-EP4
Thrombomodulin	Leu-M1

TNM für MPM

Table 5 Eighth edition AJCC/UICC staging for malignant pleural mesothelioma

Stage	Definition
Primary tumour (T)	
TX	Primary tumour cannot be assessed
T0	No evidence of primary tumour
T1	Tumour limited to the ipsilateral parietal±visceral± mediastinal±diaphragmatic pleura
T2	Tumour involving each of the ipsilateral pleural surfaces (parietal, mediastinal, diaphragmatic and visceral pleura) with at least one of the following features: ► Involvement of diaphragmatic muscle ► Extension if tumour from visceral pleura into the underlying pulmonary parenchyma
T3	Describes locally advanced but *potentially resectable* tumour. Tumour involving all of the ipsilateral pleural surfaces (parietal, mediastinal, diaphragmatic and visceral pleura) with at least one of the following features: ► Involvement of endothoracic fascia ► Extension into the mediastinal fat ► Solitary, completely resectable focus of tumour extending into the soft tissues of the chest wall ► Non-transmural involvement of the pericardium
T4	Describes locally advanced *technically unresectable* tumour. Tumour involving all of the ipsilateral pleural surfaces (parietal, mediastinal, diaphragmatic and visceral pleura) with at least one of the following features: ► Diffuse extension or multifocal masses of tumour in the chest wall, with or without associated rib destruction ► Direct transdiaphragmatic extension of tumour to peritoneum ► Direct extension of tumour to the contralateral pleura ► Direct extension of tumour to mediastinal organs ► Direct extension of tumour into the spine ► Tumour extending through to the internal surface of the pericardium with or without pericardial effusion, or tumour involving the myocardium
Regional lymph nodes (N)	
NX	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastases
N1	Metastases in the ipsilateral bronchopulmonary, hilar or mediastinal (including the internal mammary, peridiaphragmatic, pericardial fat pad or intercostal lymph nodes) lymph nodes
N2	Metastases in the contralateral mediastinal, ipsilateral or contralateral supraclavicular lymph nodes
Distant metastasis (M)	
M0	No distant metastasis
M1	Distant metastasis present

Reprinted from Journal of Thoracic Oncology, Vol 11, No 12, Rusch V.W et al, THE IASLC Mesothelioma Staging Project: Proposals for the M Descriptos and for Revision of the TNM Stage Groupings in the Forthcoming (Eighth) Edition of the TNM Classification for Mesothelioma. 2112-2119 (2016), with permission from Elsevier.

TNM für MPM

Table 1. TNM staging according to the International Mesothelioma Interest Group (IMIG)/Union for International Cancer Control (UICC) [14]

Stage	TNM	Comments
Ia	T1a N0 M0	Primary tumour limited to ipsilateral parietal pleura
Ib	T1b N0 M0	As stage Ia plus focal involvement of visceral pleura
II	T2 N0 M0	As stage Ia or Ib plus confluent involvement of diaphragm or visceral pleura or involvement of the lung
III	Any T3 M0	Locally advanced tumour
	Any N1 M0	Ipsilateral, bronchopulmonary or hilar lymph node involvement
	Any N2 M0	Subcarinal or ipsilateral mediastinal lymph node involvement
IV	Any T4	Locally advanced, technically unresectable tumour
	Any N3	Contralateral mediastinal, internal mammary, and ipsilateral or contralateral supraclavicular lymph node involvement
	Any M1	Distant metastases

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ESMO Clinical Practice Guidelines

Baas P, et al.

Annals of Oncology 26 (Supplement 5): v31–v39, 2015

doi:10.1093/annonc/mdv199

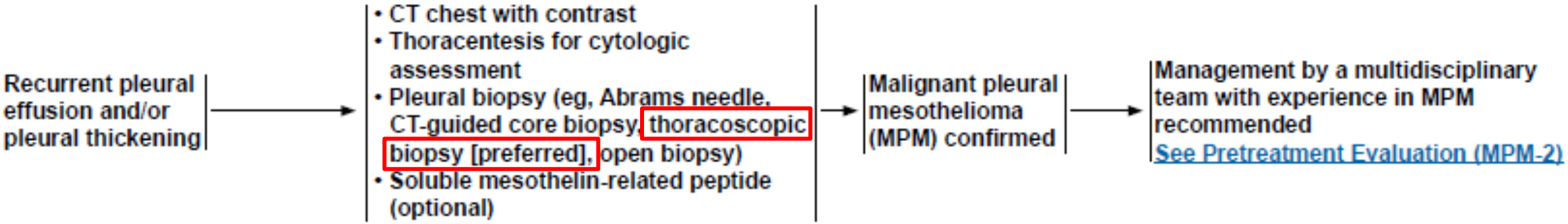
Diagnostischer Ablauf

National Comprehensive Cancer Network®

NCCN Guidelines Version 2.2015
Malignant Pleural Mesothelioma

NCCN Guidelines Index
MPM Table of Contents
Discussion

INITIAL EVALUATION[a]



NCCN Guidelines Version 2.2015
Malignant Pleural Mesothelioma

NCCN Guidelines Index
MPM Table of Contents
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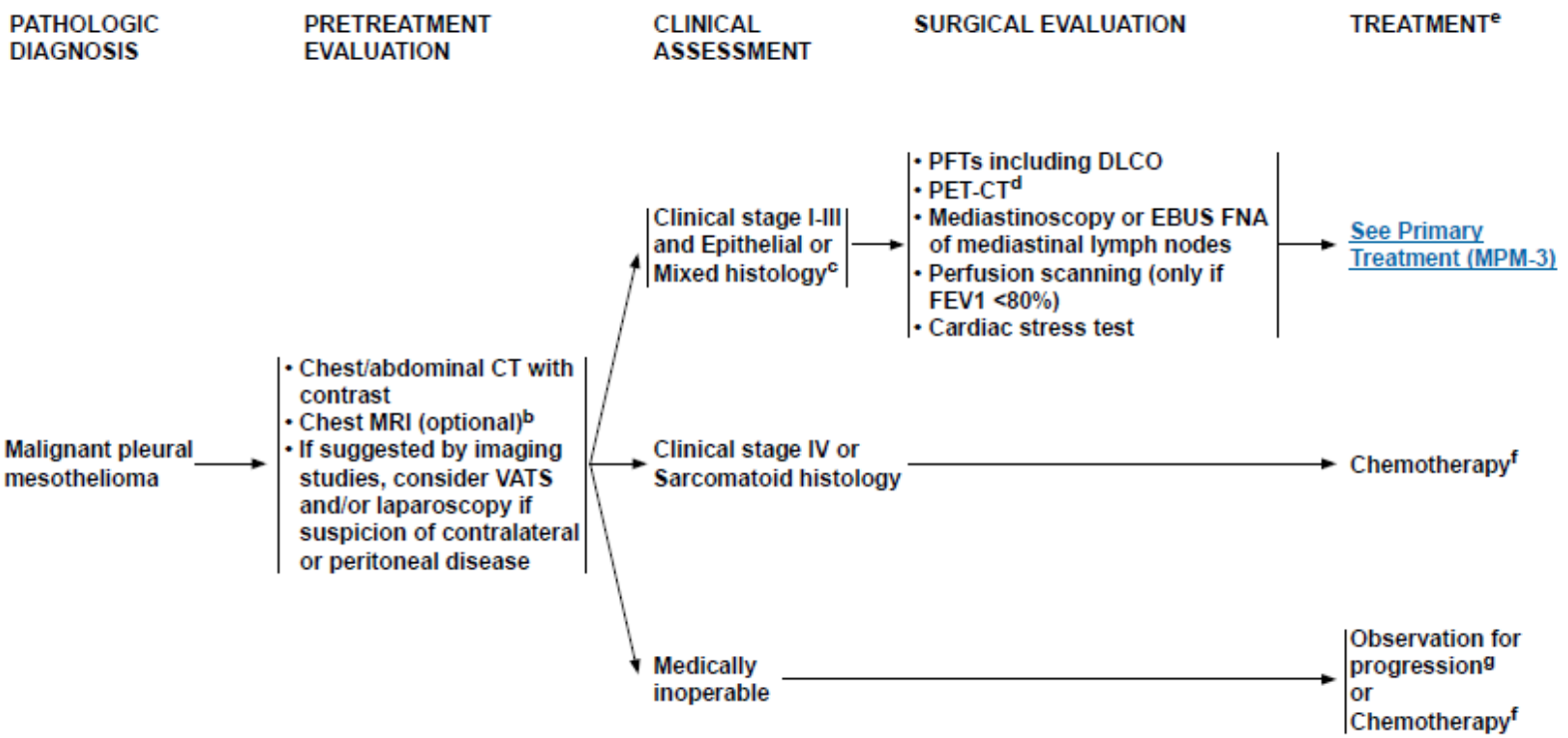

[b]For further evaluation of possible chest, spinal, diaphragmatic, or vascular involvement based on CT imaging.
[c]Assessment by multidisciplinary team with experience in malignant pleural mesothelioma.
[d]PET-CT should be performed before any pleurodesis.
[e]See Principles of Supportive Care (MPM-A).
[f]See Principles of Chemotherapy (MPM-B).
[g]Observation for patients who are asymptomatic with minimal burden of disease.

Note: All recommendations are category 2A unless otherwise indicated.
Clinical Trials: NCCN believes that the best management of any cancer patient is in a clinical trial. Participation in clinical trials is especially encouraged.

MPM ESMO GUIDELINE

Annals of Oncology 26 (Supplement 5): v31–v39, 2015
doi:10.1093/annonc/mdv199
Published online 28 July 2015

Recommendation 1
Diagnostic procedures in MPM should encompass at least

- *Occupational history with emphasis on asbestos exposure [II, A]*
- *CT scanning of the thorax [II, A]*
- *In all patients who have a unilateral pleural thickening, with or without fluid and/or calcified asbestos plaques, efforts should be made to obtain a pathological specimen, as there are no specific clinical features of MPM [II, A]*
- *There is no place for screening of persons exposed to asbestos [IV, B]*
- *Tumour markers cannot distinguish MPM [II, B]*

Recommendation 3
Staging for every patient with a confirmed diagnosis of MPM

- *In the absence of a uniform, robust and validated staging system, experts advocate the use of the most recent TNM-based IMIG/UICC classification [III, B].*
- *The use of MRI is only recommended in special situations when tumour delineation is necessary [II, B].*
- *The use of PET scanning is limited and can be used for localisation of tumour sites, distant metastases or early response to treatment, as part of a study protocol [III, B].*

Recommendation 2
A. Definitive diagnosis of MPM on effusion cytology specimens

- *Effusion cytology for definitive diagnosis of MPM remains a controversial topic and is still generally not recommended [IV, C].*
- *If effusion cytology is frankly malignant, the diagnosis may be strongly suggested but confirmation by biopsy, if possible, is recommended [A, no level of evidence].*
- *IHC is invaluable to characterise the nature of atypical effusion cells and sample preparation to facilitate IHC should be carried out if at all possible [A, no level of evidence].*

B. Definitive diagnosis of MPM on tissue biopsy specimens

- *The recognition of tissue invasion is required for definitive diagnosis of MPM [IV, A].*
- *Larger and directly targeted biopsy samples facilitate definitive diagnosis. Surgical-type samples are preferred for diagnosis [IV, A].*
- *A major subtype diagnosis (epithelioid, biphasic, sarcomatoid) should be given in all cases of MPM [IV, A].*

C. IHC in the diagnosis of MPM

- *IHC is recommended for all primary diagnoses of MPM [IV, A].*
- *At least two 'mesothelial' markers and at least two '(adeno) carcinoma' markers should be used [V, A].*
- *Sarcomatoid MPM often does not express usual 'mesothelial' markers [IV, A].*

Imaging modalities for diagnosing and staging

- **Offer CT thorax with contrast (optimised for pleural evaluation) as the initial cross-sectional imaging modality in the evaluation of patients with suspected MPM. Grade D.**
- **Use of PET-CT for aiding diagnosis of MPM is not recommended in patients who have had prior talc pleurodesis and caution should be employed in populations with a high prevalence of TB. Grade D.**
- **In patients where differentiating T stage will change management consider MRI. Grade D.**
- **In patients where excluding distant metastases will change management, offer PET-CT. Grade D.**

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Bildgebung
BTS Guideline 2018

Table 7 Diagnostic accuracy of different imaging modalities for diagnosing malignant vs benign pleural disease

Morphology	Imaging modality	Sensitivity (%)	Specificity (%)
Pleural thickening > 1 cm	CT	35 – 47	64 – 94
	Ultrasound (US)	42 (95% CI 26% to 61%)	95 (95% CI 74% to 99%)
Pleural nodularity	CT	37–48	86–97
	MRI	48	86
	US	42 (95% CI 26% to 61 %)	100 (95% CI 82% to 100 %)
Infiltration of the chest wall and/or diaphragm	CT	17–29	100
	MRI	44	100
Mediastinal pleural involvement	CT	70–74	83–93
	MRI	77	93
Interlobar fissure nodularity	CT	10	100

i8 Woolhouse I, *et al*. *Thorax* 2018;**73**:i1–i30. doi:10.1136/thoraxjnl-2017-211321

Malignes Pleuramesotheliom
Prognostische Faktoren

TABLE 6 Prognostic scoring systems in malignant mesothelioma

	First author [ref.]	Subjects n	Parameter	Good prognostic group	Poor prognostic group
CALGB	HERNDON [40]	337	Performance status	Good	Poor
			Age	<75 yrs	⩾75 yrs
			Chest pain	Absent	Present
			Platelet count	$<400 \times 10^{12} \cdot L^{-1}$	$\geqslant 400 \times 10^{12} \cdot L^{-1}$
			LDH	<500 IU·L^{-1}	$\geqslant 500$ IU·L^{-1}
EORTC	CURRAN [41]	204	Performance status	0	1–2
			Histological subtype	Epitheloid	Nonepitheloid
			Sex	Female	Male
			Certainty of diagnosis	Definite	Possible
			WBC count	$<8.3 \times 10^{9} \cdot L^{-1}$	$\geqslant 8.3 \times 10^{9} \cdot L^{-1}$
EORTC#	VAN MEERBEECK [42]	250	Stage	I–II	III–IV
			Histology	Epitheloid	Nonepitheloid
			Interval since diagnosis	<50 days	⩾50 days
			Platelet count	$<350 \times 10^{12} \cdot L^{-1}$	$\geqslant 350 \times 10^{12} \cdot L^{-1}$
			Haemoglobin difference¶	<1	>1
			Pain	Absent	Present
			Appetite loss	Absent	Present

CALGB: Cancer and Leukaemia Group B; EORTC: European Organization for Research and Treatment of Cancer; LDH: lactate dehydrogenase; WBC: white blood cell. #: performance status 0–1 was an inclusion criterion for this series; ¶: difference between actual value and 16 g·dL^{-1} and 14 g·dL^{-1} in males and females, respectively.

Eur Respir J 2010; 35: 479–495
DOI: 10.1183/09031936.00063109

Malignes Pleuramesotheliom
Diagnostik allgemein

- **Anfangs unzuverlässig**
  - häufig (geringerer) Erguss, wechselnd
  - 54 – 92 % der Mesotheliomfälle haben initial einen moderaten Erguss[+]*
  - Ergussentfernung ermöglicht bessere Erkennung spezifischerer Zeichen[#]
    - irreguläre oder knotige Pleuraverdickung (CT)

[+]Renshaw AA, Dean BR, Antman KH, Sugarbaker DJ, Cibas ES. The role of cytologic evaluation of pleural fluid in the diagnosis of malignant mesothelioma. Chest 1997;111:106–9.

*Boutin C, Rey F. Thoracoscopy in pleural malignant mesothelioma: a prospective study of 188 consecutive patients. Part 1: diagnosis. Cancer 1993; 72: 389–93.

[#]Whitley NO. Computed tomography and malignant mesothelioma. In: Antman K, Aisner J, eds. Asbestosrelated Malignancy. Orlando, Grune and Stratton, 1987; pp. 265–99.

Malignes Pleuramesothelioms
Zytologie/Histologie

- **Diagnosestellung[#+]**
  - Zytologie 26 %
  - Pleurabiopsie (blind, Abrams) 20.7 %
  - Zytologie + Biopsie 38.7 %

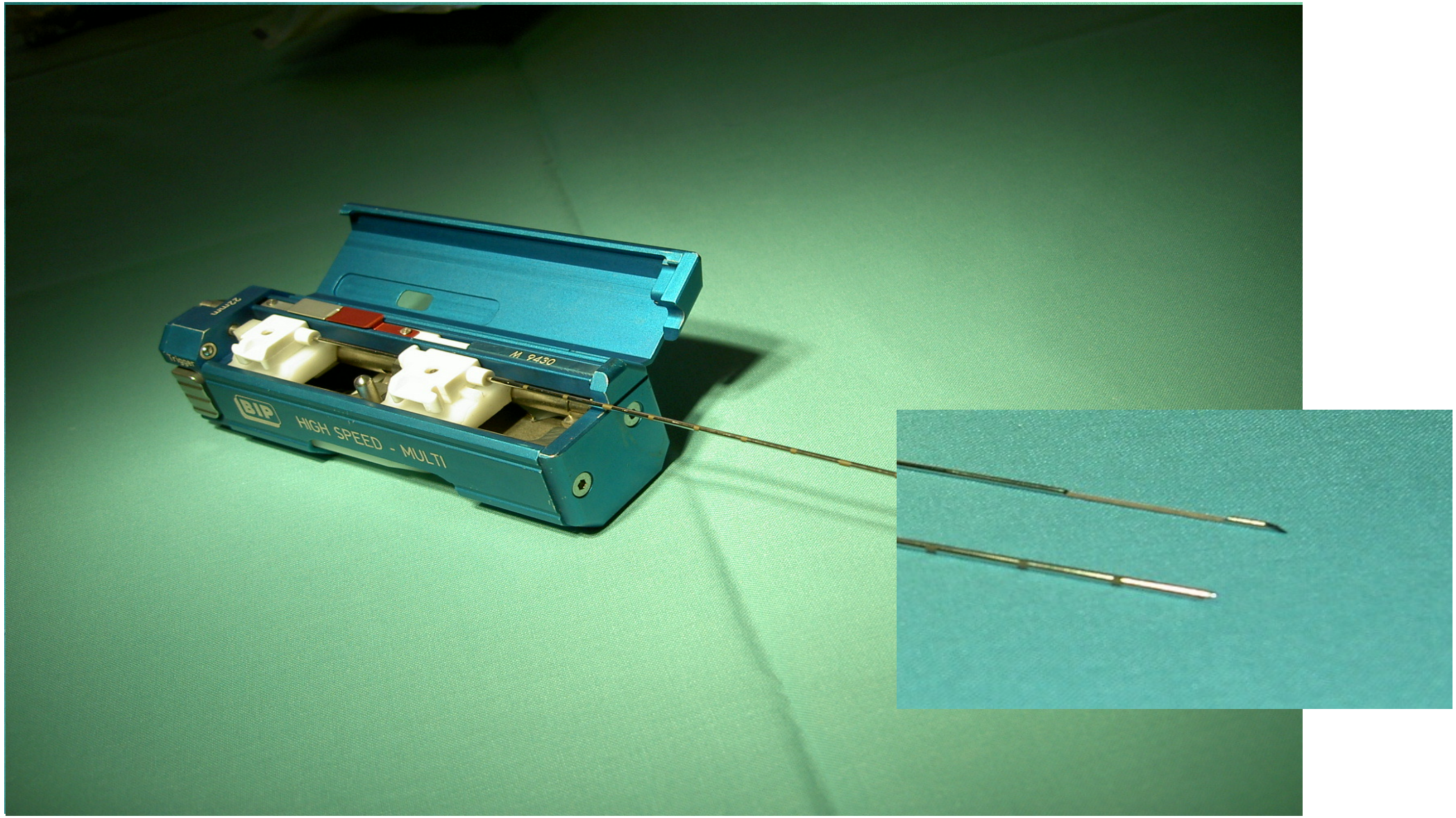
*#Boutin C, Rey F. Thoracoscopy in pleural malignant mesothelioma: a prospective study of 188 consecutive patients. Part 1: diagnosis. Cancer 1993; 72: 389–393.
+Boutin C, Rey F, Gouvernet J, Viallat JR, Astoul P, Ledoray V. Thoracoscopy in pleural malignant mesothelioma: a prospective study of 188 consecutive patients. Part II: Prognosis and staging. Cancer 1993; 72: 394–404.

Percutaneous Image-Guided Cutting Needle Biopsy of the Pleura in the Diagnosis of Malignant Mesothelioma

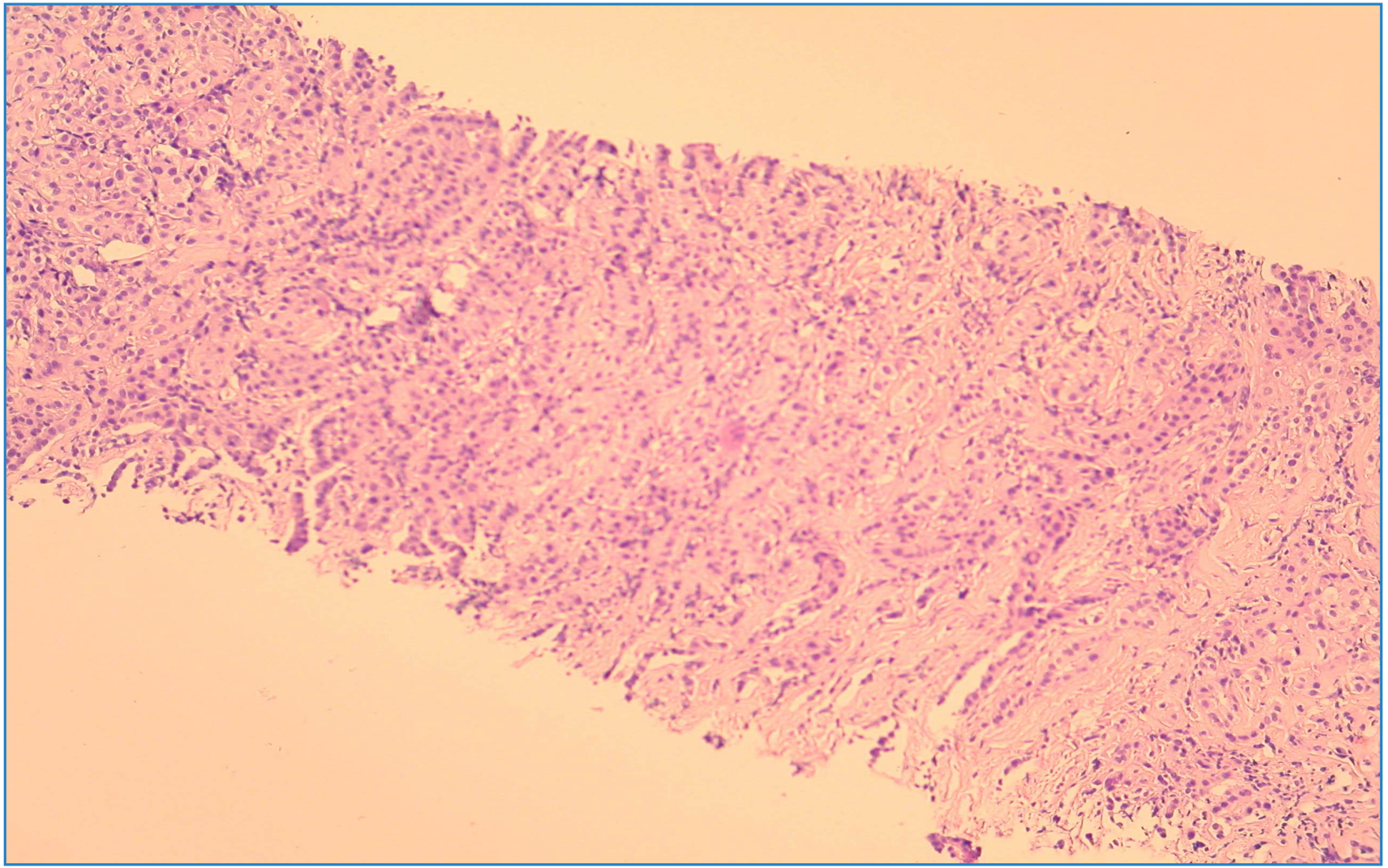
Adams RF, Gray W, Davies RJO, Gleeson FV Chest 2001;120:1798-802

- **21 Pat. mit bestätigtem Mesotheliom**
  - 14 mit Pleuraerguss
- **alle mit Pleuraverdickung in der CT**
- **Schneidnadelbiopsie mit 14/18 gauge**
  - Ultraschall-gesteuert 6 Patienten
  - CT-gesteuert 15 Patienten
- **18 Pat. (86%) histologisch Mesotheliom**
  - 31 Schneidnadelbiopsien (1.5 pro Pat.)
  - Pleuraverdickung 1.5 cm (0.3 – 10)

Automatische Schneidnadel



Automatische Schneidnadel



Malignes Pleuramesotheliom
Thorakoskopie

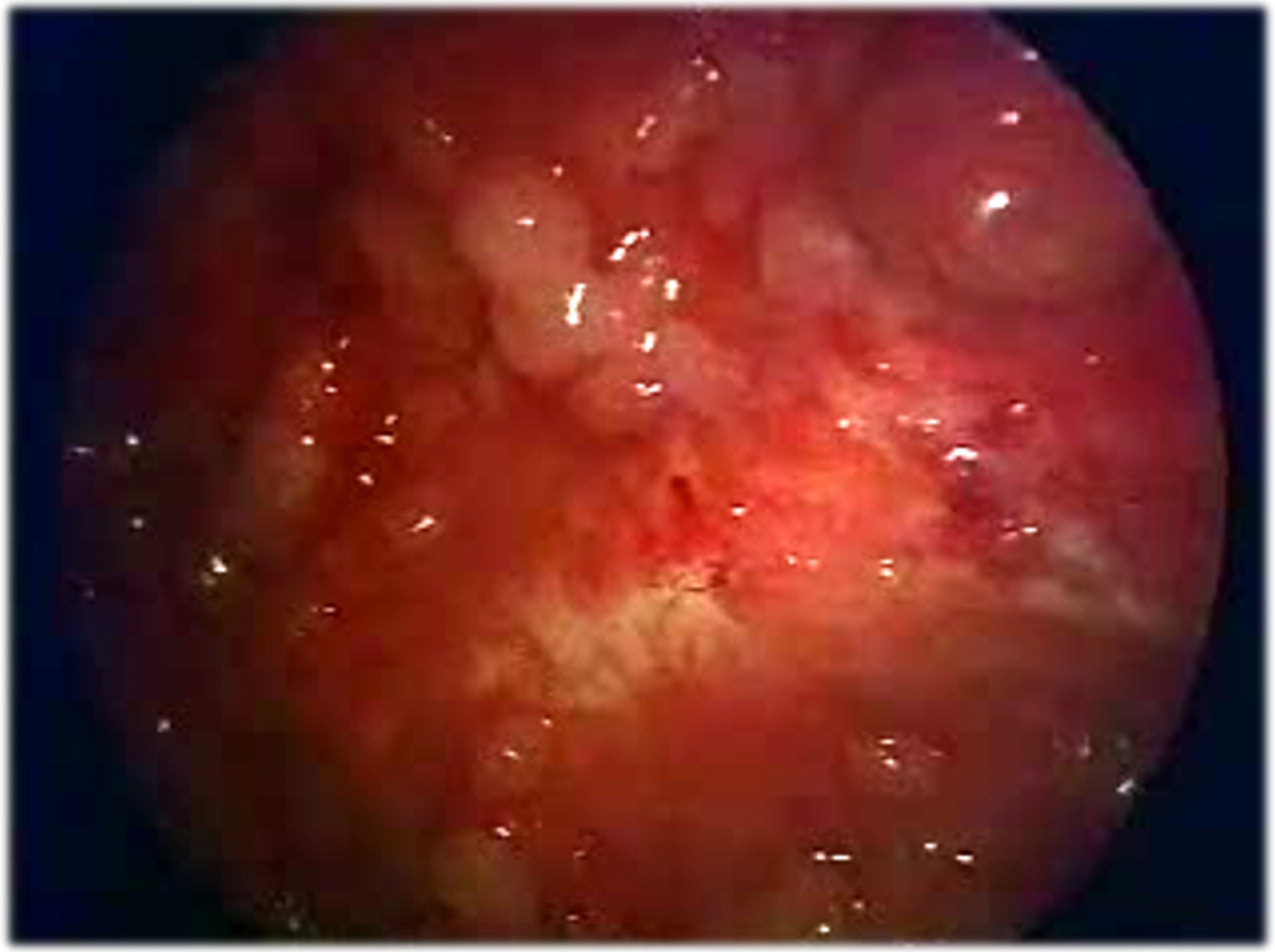
- **frühere Diagnose°**
- **exaktere histologische Klassifikation°**
- **Erfassung von parietalen Veränderungen***
- **Beteiligung der viszeralen Pleura und Lunge[+]**
  - weniger betroffen, kleinere Knoten, weniger zahlreich
- **Möglichkeit der Schnellschnittuntersuchung**
- **hohe Trefferrate (98.4 %)[#]**

°Loddenkemper R. Thoracoscopy – state of the art. Eur Respir J 1998;11:213-21.
*Boutin C, Schlesser M, Frenay C, Astoul Ph. Malignant pleural mesothelioma. Eur Respir J 1998;12:972–81.
[+]Boutin C, Rey F, Gouvernet J, Viallat JR, Astoul P, Ledoray V. Thoracoscopy in pleural malignant mesothelioma: a prospective study of 188 consecutive patients. Part II: Prognosis and staging. *Cancer* 1993; 72: 394–404.
[#]Boutin C, Rey F. Thoracoscopy in pleural malignant mesothelioma: a prospective study of 188 consecutive patients. Part 1: diagnosis. Cancer 1993; 72: 389–93.

Wann Nadelbiopsie?	Wann Thorakoskopie?
kein Erguss	Erguss
Pleuraadhäsionen	Pleura nicht verklebt
lokalisierbare Läsion	diffuse Läsionen
solitäre Makroläsion	disseminierte Mikroläsionen
BW penetrierende Läsion	pleural oberflächliche Läsion
Thorakoskopiehindernisse (technisch-logistisch)	etablierte Technik + interventionelle Option

nach Frank W. Pneumologie 2004; 58: 777-790

Pleuraerguss
Malignes Mesotheliom



Diagnostik des diffusen malignen Mesothelioms
Vergleichende thorakoskopische Befunde

Pattern	Boutin (n=100) in %	Tassi (n=70) in %
Inflammation	8.0	5.7
Isolierte Knoten	35.0	24.3
Pachypleuritis	20.0	18.6
Ausgedehnte multiple Läsionen	23.0	51.4
Lymphangitis	2.0	-
Kombinationen	12.0	-

Boutin C, Rey F et al 1993, Tassi GF, Marchetti GP et al 1997

Malignes Pleuramesotheliom Frühdiagnose (Renshaw et al.)

- **What can be done to diagnose MPM at an early stage?**
  - Diagnostik des symptomlosen Ergusses
  - Verbesserung der niedrigen Sensitivität der Erguss-Zytologie durch ergänzende Techniken
  - Durchführung einer Pleurabiopsie bei
    - Verdacht auf Mesotheliom
    - rezidivierendem exsudativem Erguss
    - verdickter Pleura,

    auch wenn zytologisch negativ!
  - Bestätigung histologisch bei zytologischem Verdacht
    - Pleurabiopsie
    - Thorakoskopie

ERS/ESTS TASK FORCE

Guidelines of the European Respiratory Society and the European Society of Thoracic Surgeons for the management of malignant pleural mesothelioma

A. Scherpereel, P. Astoul, P. Baas, T. Berghmans, H. Clayson, P. de Vuyst, H. Dienemann, F. Galateau-Salle, C. Hennequin, G. Hillerdal, C. Le Péchoux, L. Mutti, J-C. Pairon, R. Stahel, P. van Houtte, J. van Meerbeeck, D. Waller and W. Weder

Eur Respir J 2010; 35: 479–495
DOI: 10.1183/09031936.00063109

Recommendations

Thoracoscopy should be preferred for diagnostic investigation, allowing complete visual examination of the pleura, multiple, deep and large biopsies (preferably including fat and/or muscle to assess tumour invasion) and providing a diagnosis in >90% of cases (grade 1A).

Versagen der Thorakoskopie

- **Technik**
  - schwieriger Zugang
  - schlechte Erreichbarkeit der Läsion(en)
  - Adhäsionen/Segel,…
- **Untersucher**
  - mangelnde Erfahrung, Fehlinterpretation
  - mangelnde Sorgfalt

- **Mesotheliom-Eigenheiten**
  - makroskopisch schwierig (Pachypleuritis, entzündlich,…)
  - histologisch schwierig
  - langsame maligne Transformation

Section 9: Pleural fluid management

Recommendations

- Offer either talc (via slurry or poudrage) or indwelling pleural catheters for symptomatic pleural effusion in MPM, informed by patient choice. **Grade A.**
- Talc slurry or thoracoscopic talc poudrage pleurodesis should be offered to patients with MPM in preference to a video-assisted thoracoscopic surgery partial pleurectomy (VATS-PP) surgical approach for fluid control in MPM. **Grade A.**

Section 10: The role of surgery

Recommendations

- Do not offer VATS-PP over talc pleurodesis in MPM. **Grade A.**
- Do not offer extra-pleural pneumonectomy (EPP) in MPM. **Grade B.**
- Do not offer extended pleurectomy decortication (EPD) outside of a clinical trial. **Grade D.**

BTS guideline for the investigation and management of malignant pleural mesothelioma

Woolhouse I, Bishop L, Darlison L, *et al*.

BTS guideline for the investigation and management of malignant pleural mesothelioma.

BMJ Open Resp Res

doi:10.1136/bmjresp-2017-000266

Research recommendation

The role of VATS-PP and EPD in good prognosis patients should be examined further in clinical trials, which should include robust measurement of quality of life.

Die aktuelle Therapie des asbestassoziierten malignen Pleuramesothelioms – Ein Experten-Konsensuspapier

The Current Therapy of Asbestos-Associated Malignant Pleural Mesothelioma – An Expert Consensus Paper

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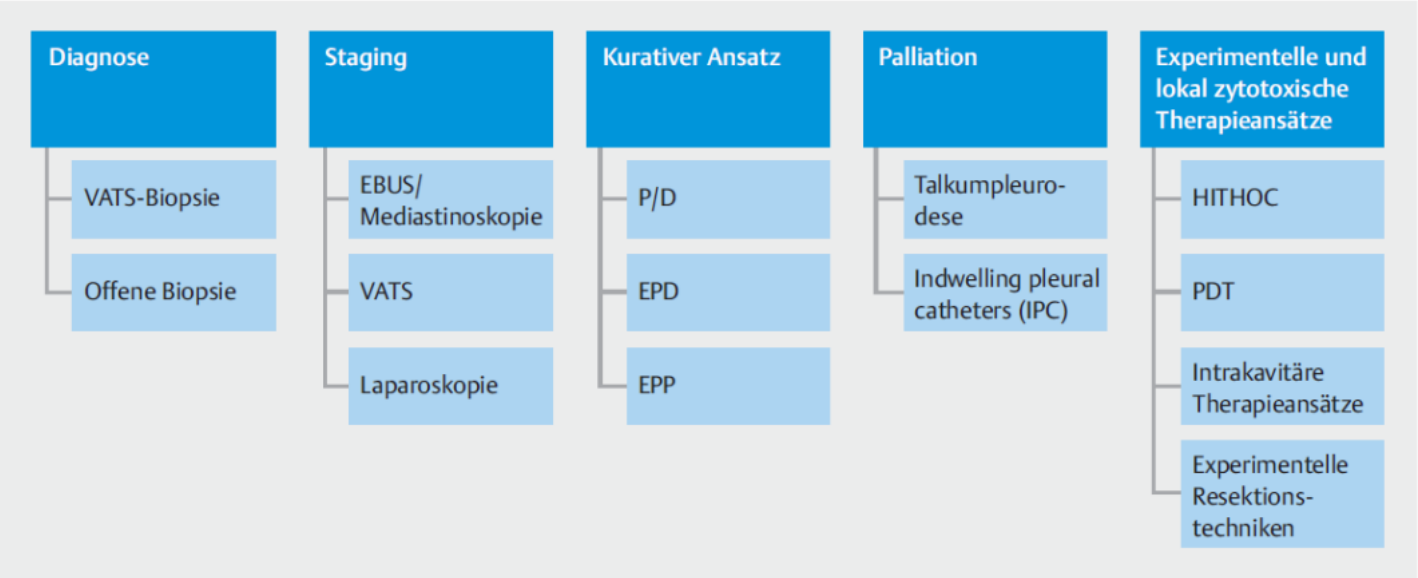

▶ **Abb. 1** Grafische Darstellung der chirurgischen Ansätze bei Diagnostik und Therapie des malignen Pleuramesothelioms.

Malignes Mesotheliom
Endoskopische Palliation

- **Beschwerden im Vordergrund**
  - Erguss bedingte Atemnot
- **Allgemeinzustand**
- **erwartete Überlebenszeit bedenken**

- **Hauptziel: Beseitigung von Atemnot**

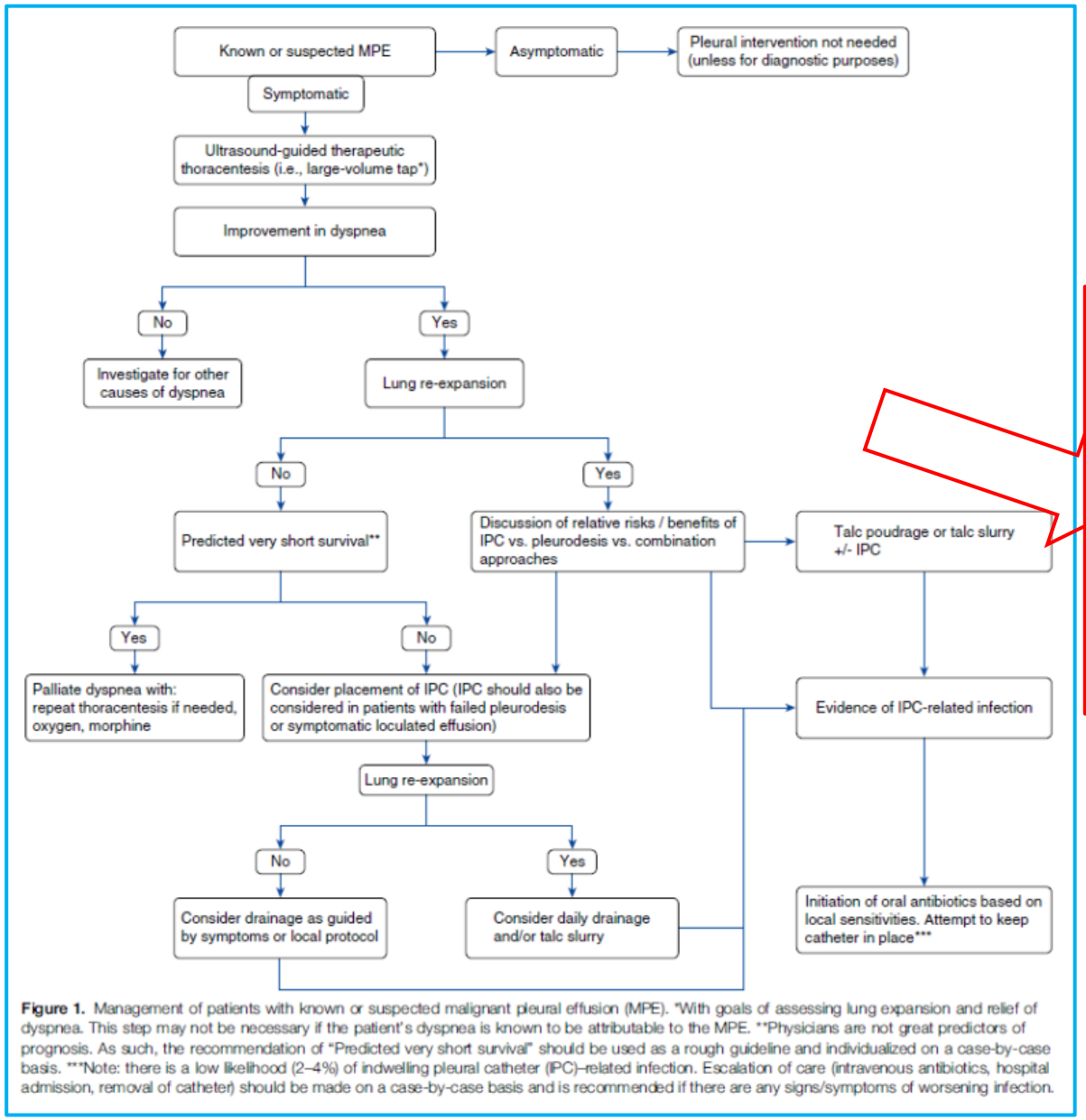

Figure 1. Management of patients with known or suspected malignant pleural effusion (MPE). *With goals of assessing lung expansion and relief of dyspnea. This step may not be necessary if the patient's dyspnea is known to be attributable to the MPE. **Physicians are not great predictors of prognosis. As such, the recommendation of "Predicted very short survival" should be used as a rough guideline and individualized on a case-by-case basis. ***Note: there is a low likelihood (2–4%) of indwelling pleural catheter (IPC)–related infection. Escalation of care (intravenous antibiotics, hospital admission, removal of catheter) should be made on a case-by-case basis and is recommended if there are any signs/symptoms of worsening infection.

Management of Malignant Pleural Effusions

An Official ATS/STS/STR Clinical Practice Guideline

David J. Feller-Kopman*, Chakravarthy B. Reddy*, Malcolm M. DeCamp, Rebecca L. Diekemper, Michael K. Gould, Travis Henry, Narayan P. Iyer, Y. C. Gary Lee, Sandra Z. Lewis, Nick A. Maskell, Najib M. Rahman, Daniel H. Sterman, Momen M. Wahidi, and Alex A. Balekian; on behalf of the American Thoracic Society, Society of Thoracic Surgeons, and Society of Thoracic Radiology

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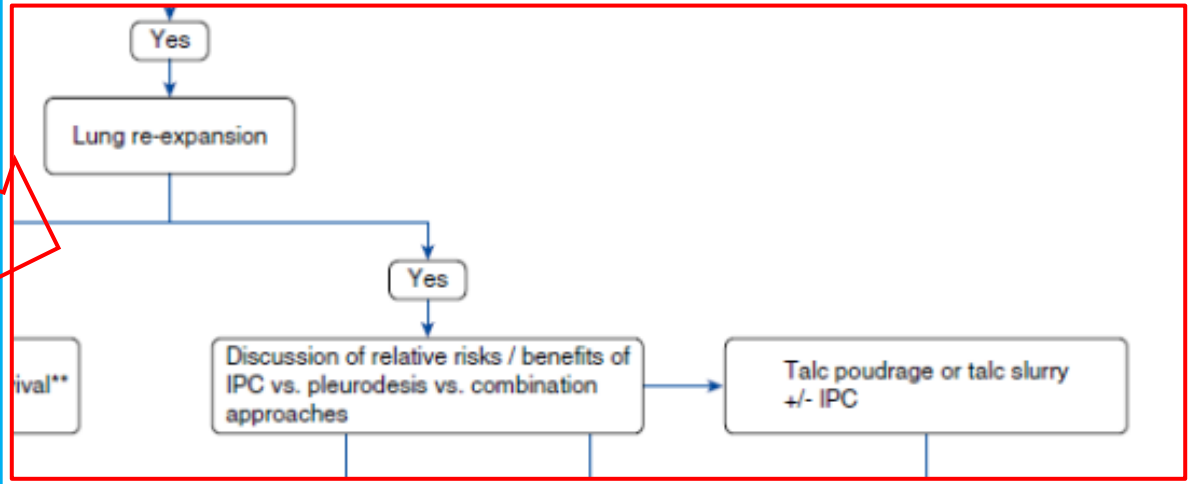

Eur Respir J 2010; 35: 479–495
DOI: 10.1183/09031936.00063109

What is the place of pleurodesis?

Recommendation: Pleurodesis is useful in preventing recurrent effusions. Sterile talc is preferred to other agents (grade 1A).

When should talc pleurodesis be performed?

Recommendation: Pleurodesis is most effective when performed early in the disease process (grade 1C) but it should not be performed before sufficient tissue for diagnosis has been obtained (grade 1A).

Internistische Thorakoskopie
Indikationen beim MPM

- ⊕ **Maligner Pleuraerguß** **ja**
- ⊕ **Diagnostisch MPM ⇧**
- ⊕ **Therapeutisch** **effektive Pleurodese ⇧**

Respiration

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Catheter Tract Metastasis in Mesothelioma Patients with Indwelling Pleural Catheters: A Retrospective Cohort Study. Michael A. Mitchell, et al.

- CTM was identified in 23 of 90 patients (26%).
- Median time from IPC insertion to CTM was 408 days (interquartile range 196–721 days).
- Medical thoracoscopy at the time of IPC insertion did not lead to a significantly increased odds of CTM (OR 2.30; 95% CI 0.66–7.94; p = 0.19).
- Incidence of CTM was not different between mesothelioma subtypes (p = 0.09). Patient-reported dyspnea scores were improved following IPC insertion in 80% of patients.
- **Conclusions: CTM was identified in over a quarter of MPM patients when follow-up imaging was reviewed. Treating physicians should be cognizant of the possibility of CTM at the site of prior IPC.**

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VIELEN DANK!