



le NODULE PULMONAIRE SOLITAIRE

Quoi de neuf en 2015 ?

CLUB THORAX

MARRAKECH

5-6/11/2015

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Nodule Pulmonaire

- Définition du NP
- Imagerie: FP, FN
 - Cliché Thorax
 - CT
- NPS: 3 types
 - “solid (**SN**), Partly solid (**PS**), Non Solid (**pGGN**)
- Critères du NP en Imagerie et Suivi
 - Critères Morphologiques
 - Critères Métaboliques
 - Critères Evolutifs
- Prise en Charge
 - Types de NPS
 - Algorithmes (s) & Modèles prédictifs de Malignité

1. NODULE PULMONAIRE

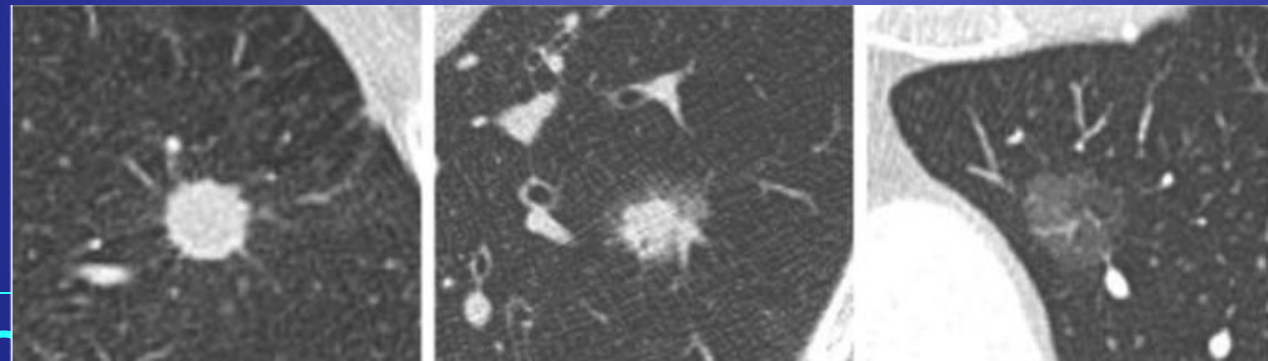
définition

- Qui efface les vx au contact : **Nodule Solide: SN**

- Qui n'efface pas les vx: **Nodule en Verre Dépoli: pGGN**

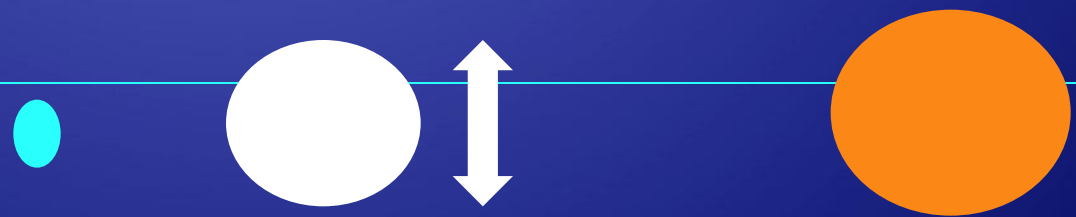
- Mixte: Part Solide et en VD: **PSN**

- **SANS ADP MEDIASTINALE ou LESION PLEURALE**



MICRONODULE = 5 mm < NPS < 50 mm =

MASSE





PROBLEMATIQUE

- Diagnostiquer rapidement les lésions malignes (pronostic / taille) / **Perte de Chance**

NPS solide **NPS** = temps de **doublement**
(Logiciel de **VOLUMETRIE**)

NPS verre dépoli **VD** = temps de **disparition**

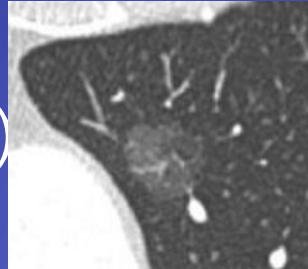
- Éviter procédures agressives pour les lésions bénignes
- Surveillance CT : durée, irradiation
- Proposer Conduite à Tenir: Interval CT, PET CT, Image guided Biopsy, Chir & Résection



MODALITES DE DIAGNOSTIC & SUIVI DU NPS: CT >> RT

Rx THORAX

- Taille > 7 mm (calcifié)
- Facilement manqué (hile, languette pulmonaire postérieure)
- Intérêt majeur : Rx antérieures +



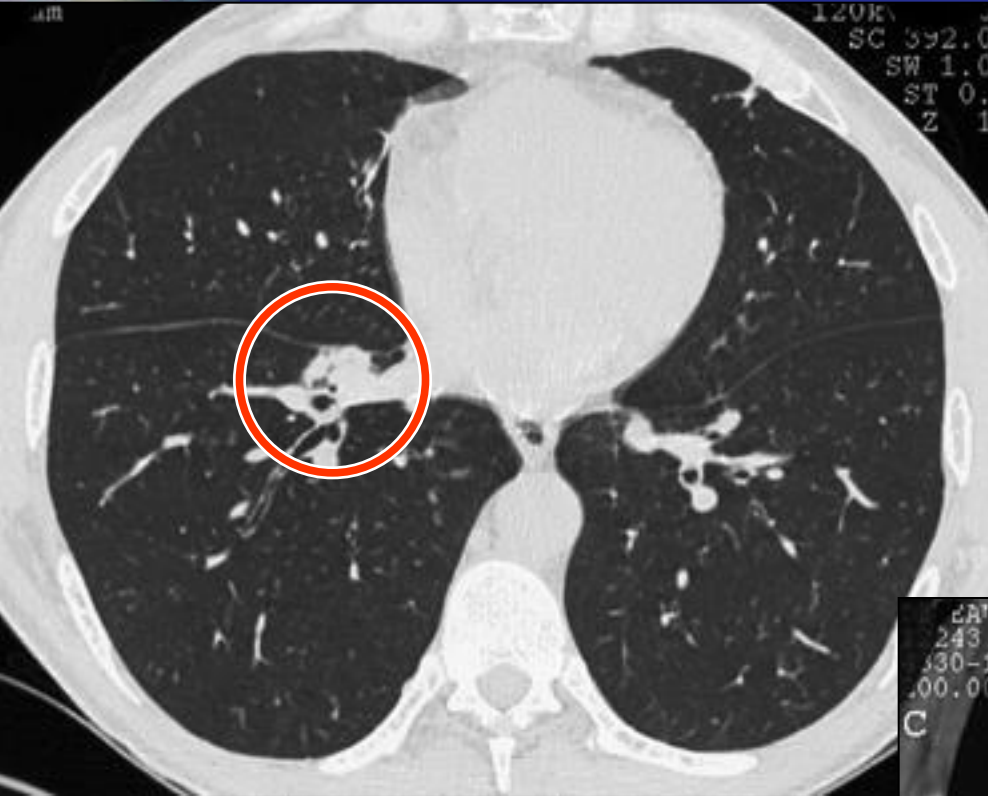
CT

- Irradiation : Protocole *Low Dose*
50% des cancers diagnostiqués en TDM <2cm
- *25% des nodules détectés sont de type PSN mixte ou pGGN = souvent occultés en RT (Mc Williams)*



2.1. SENSIBILITE DIAGNOSTIQUE CLICHE THORAX

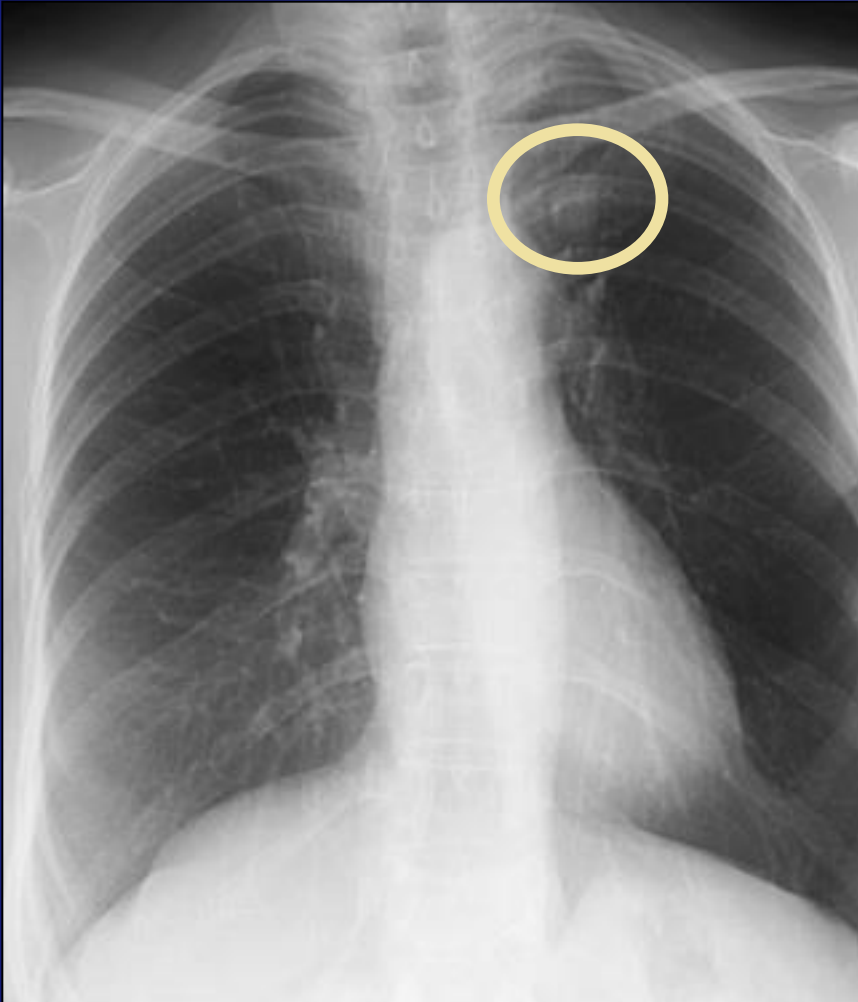




Diagnostic:
CBPC



Toux isolée



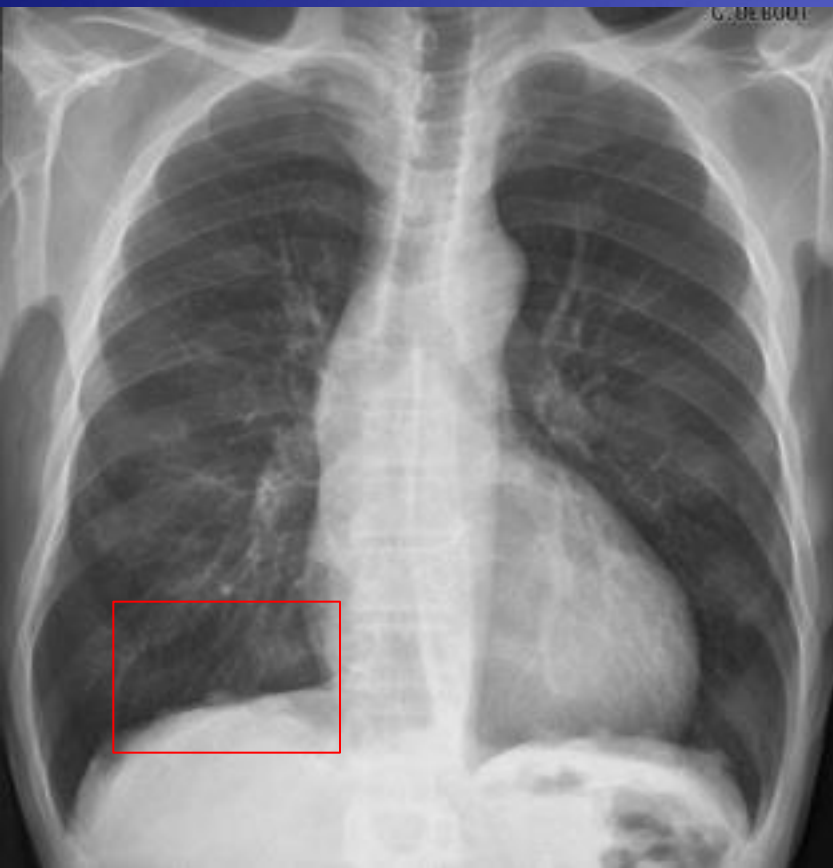
Cliché 1 an après



2.2.1. SENSIBILITE DIAGNOSTIQUE

TDM

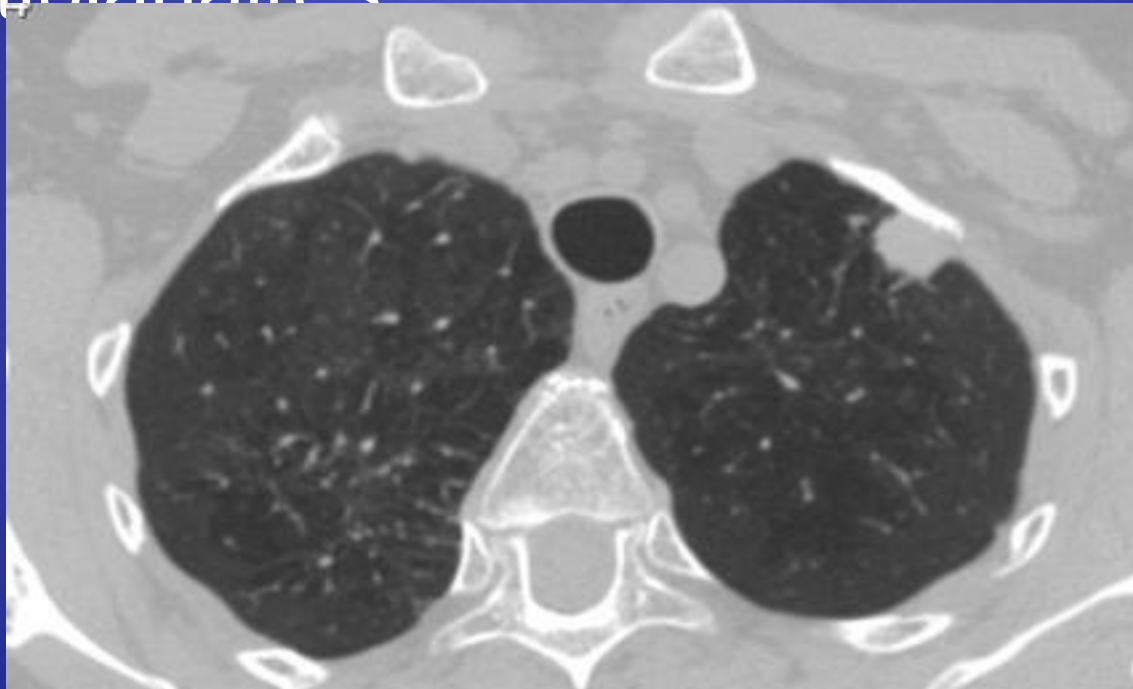
Eliminer les FP de NPS de la RT:
cal, exostose, mamelon , plaque
pleurale...



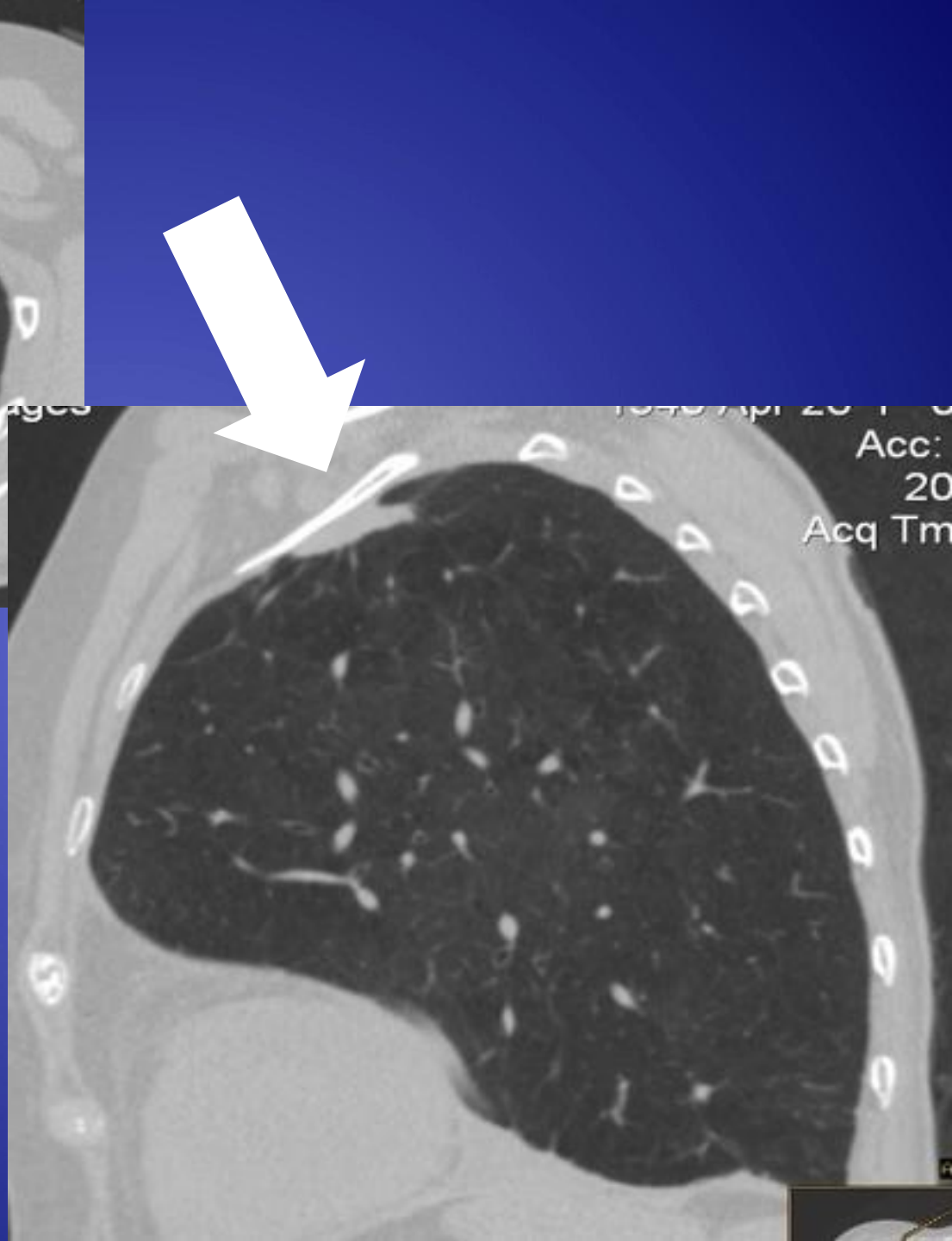


En TDM

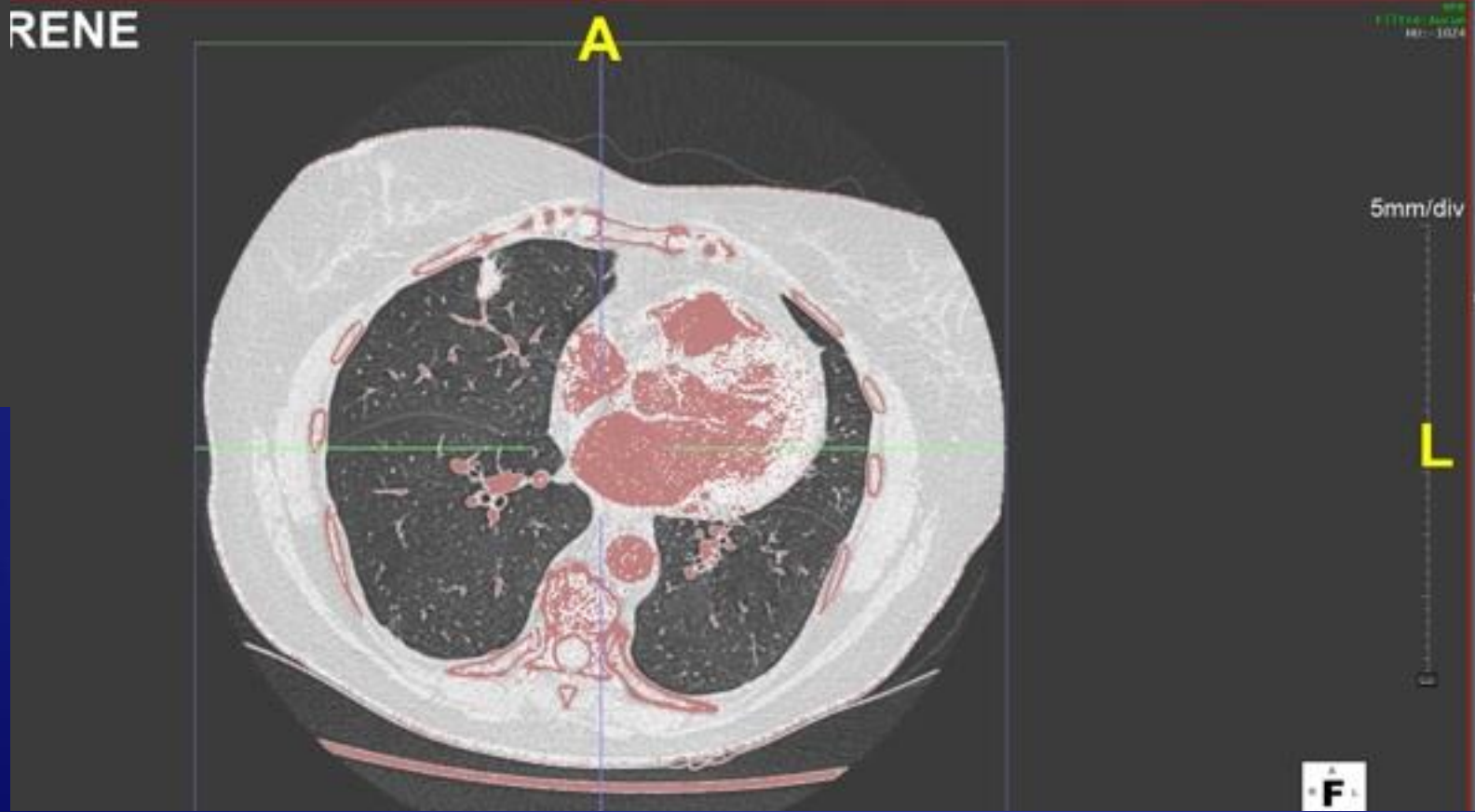
- On peut avoir des faux +
- Intérêt des reconstructions multiplanaires

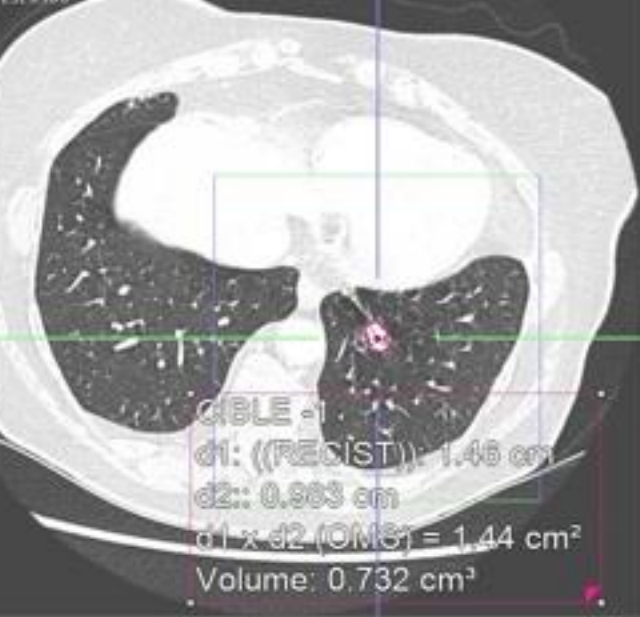


dans les suites d'une lobectomie Inf gauche



Coiffe apicale pseudo
nodulaire déplacée





☆ Valider

+ Ajou...



Album

Outil Findings +



Tronc



ROI



Seuilla



Os



Recon



Nouveau

Modifier

Simple Clic

Seuillage

ROI Manuelle

Sphère

Général ▾

Resserré



1/5



Permissif

Grow within slab

Utiliser le Seuil



Localisateur de...



En TDM on peut avoir des Faux -Négatifs

-White et al, Radiology 1996; 199:109-15

-Kakinuma et al, Radiology 1999; 212: 61-6

-Rusinck et al, Radiology 1998; 209: 243-249

-Li F et al, Radiology 2002; 225: 673-683

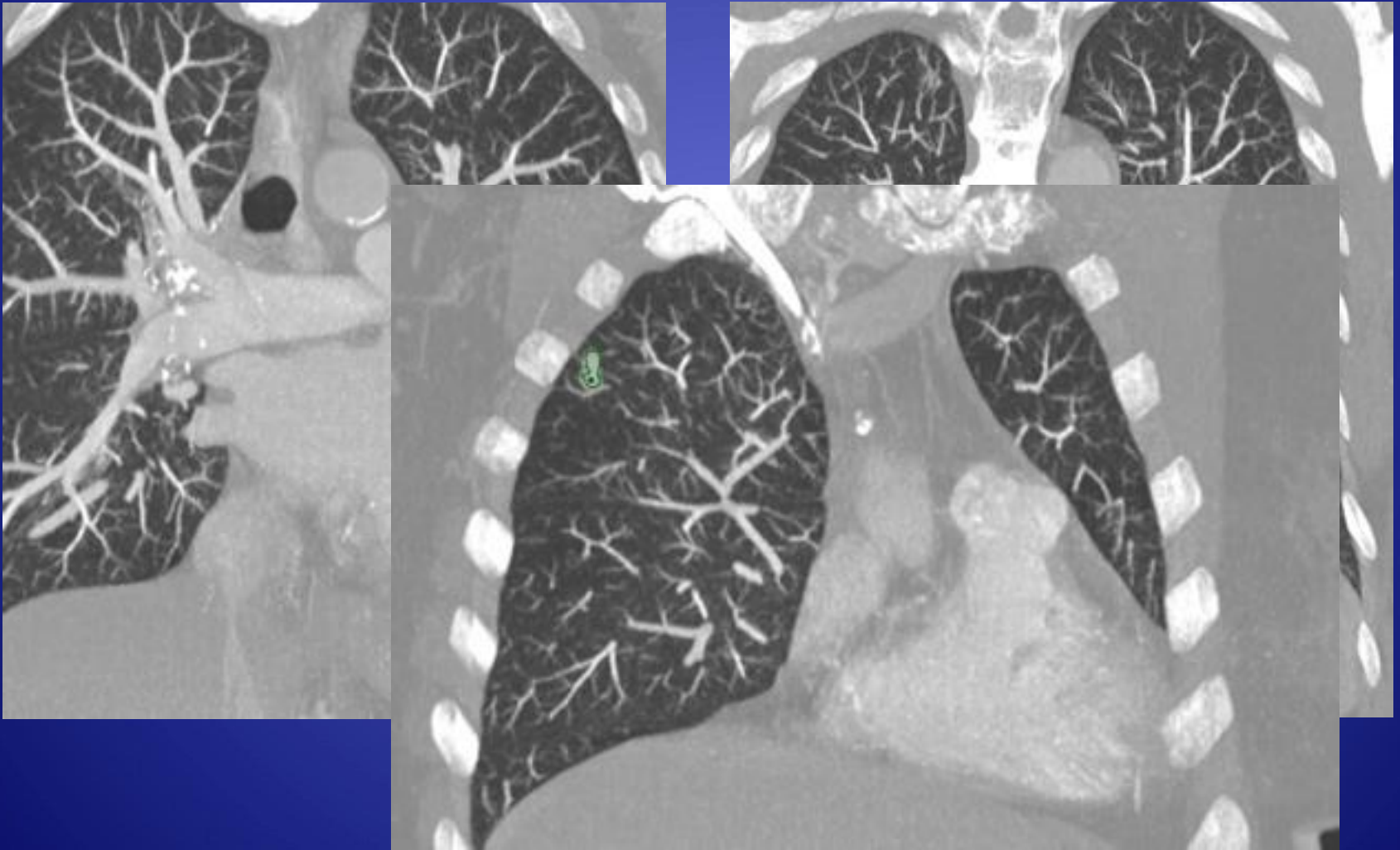


FN= NODULES MANQUES en TDM

- Faible taille (4 - 6 mm)
MODULE MIP MULTI PLAN
- Faible densité (verre dépoli: 69% des cas)
- Forme endobronchique
MODULE MINIP
- Localisation aux lobes inférieurs
- **Adjacents aux vaisseaux**



MIP REFORMATIONS

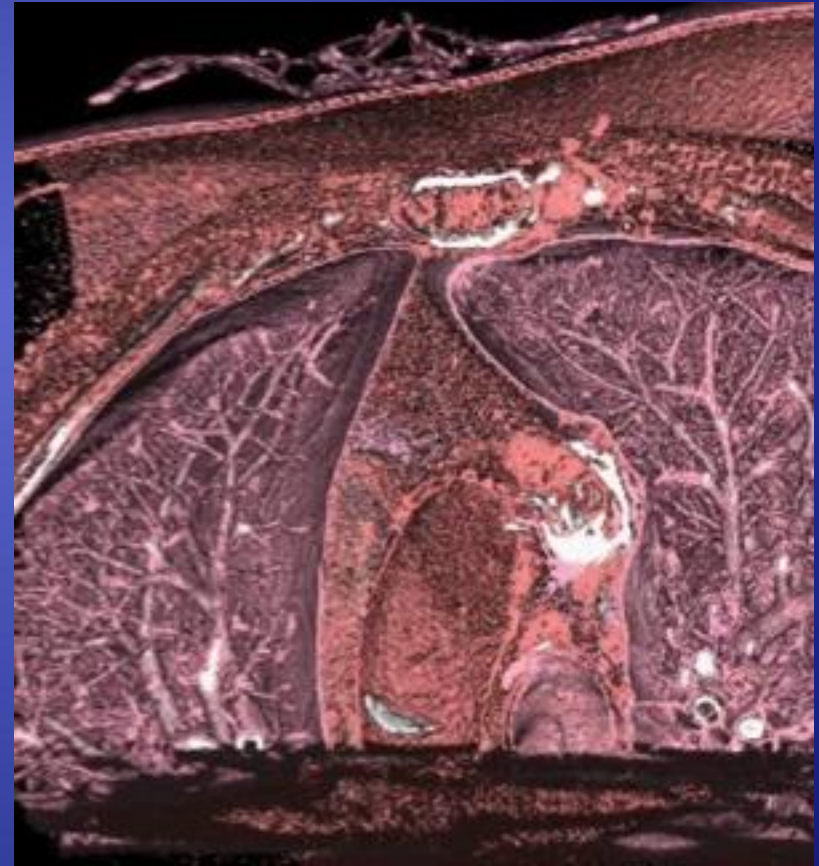
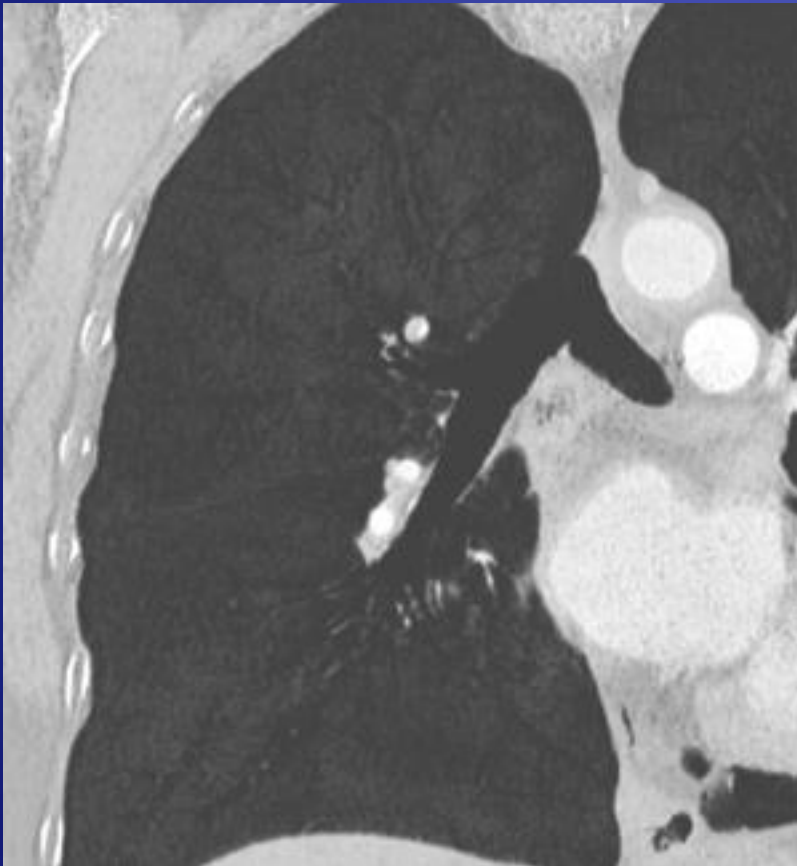




MINIP

ENDOLUMINAL

Emphyseme +++++



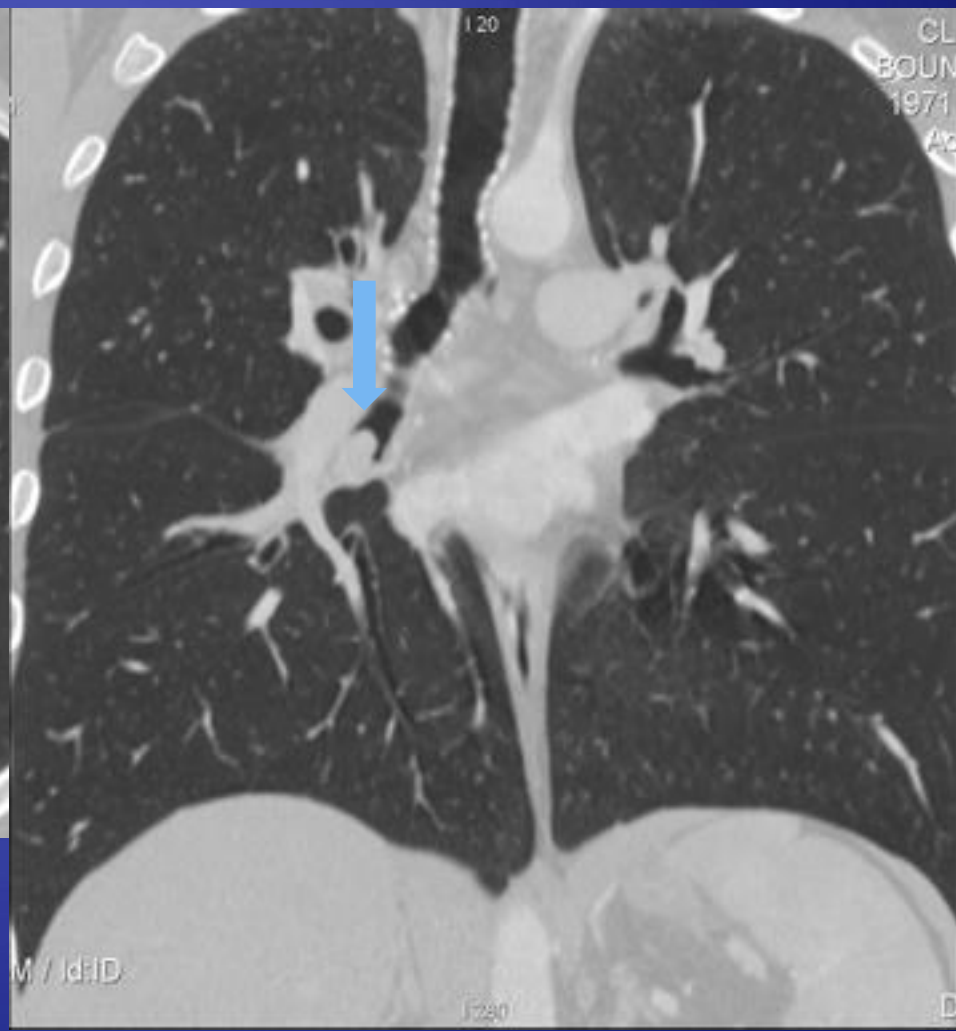
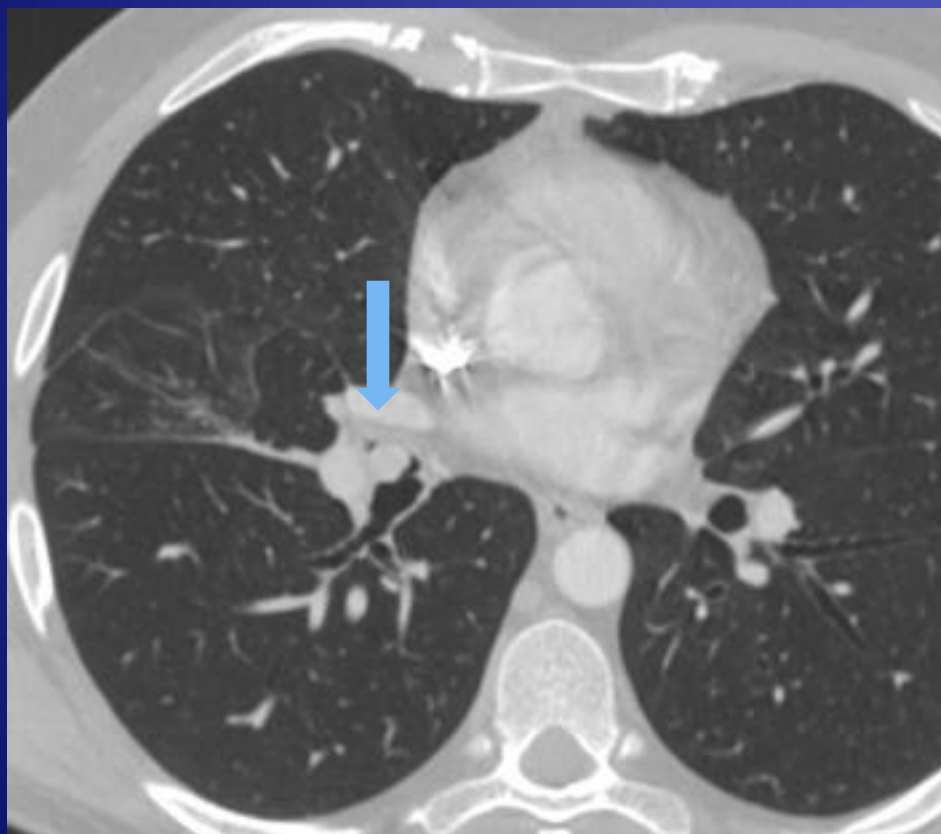
*BTS GUIDELINES FOR THE INVESTIGATION AND MANAGEMENT OF
PULMONARY NODULES; thorax.bmj.com*



- Faible taille (4 à 6 mm)
- Faible densité (verre dépoli: 69% des cas)
- **Forme endobronchique**
- Localisation aux lobes inférieurs
- Adjacents aux vaisseaux



Bourgeon tumoral (tumeur carcinoïde) origine de la lobaire moyenne T1a N0 M0 : stade 1a



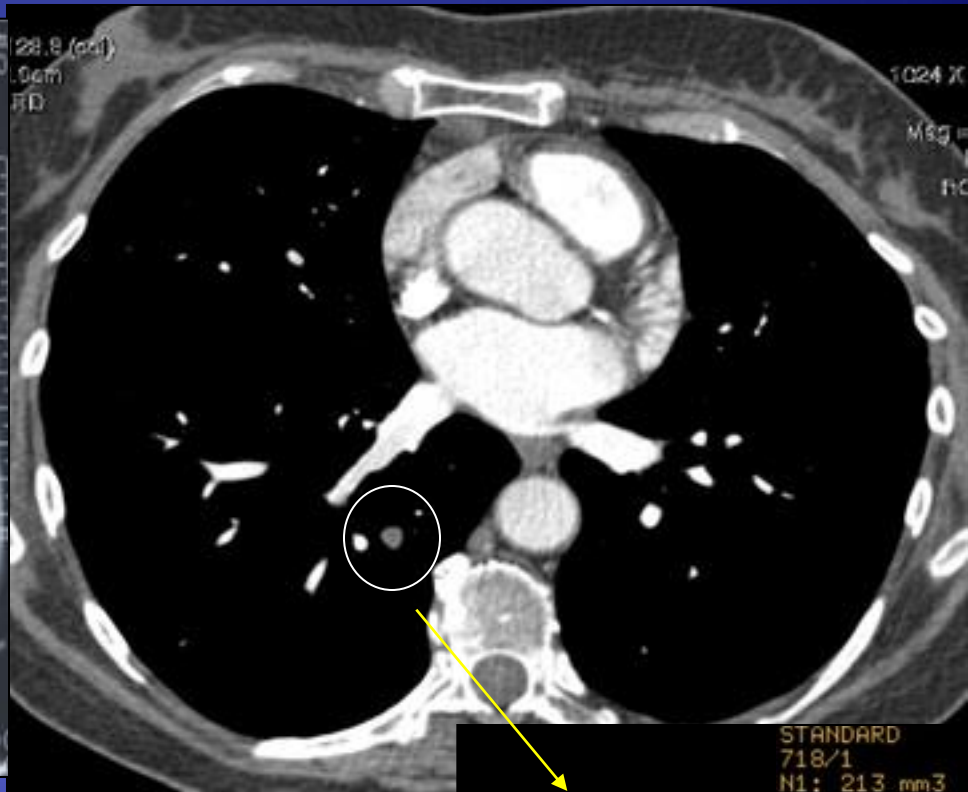
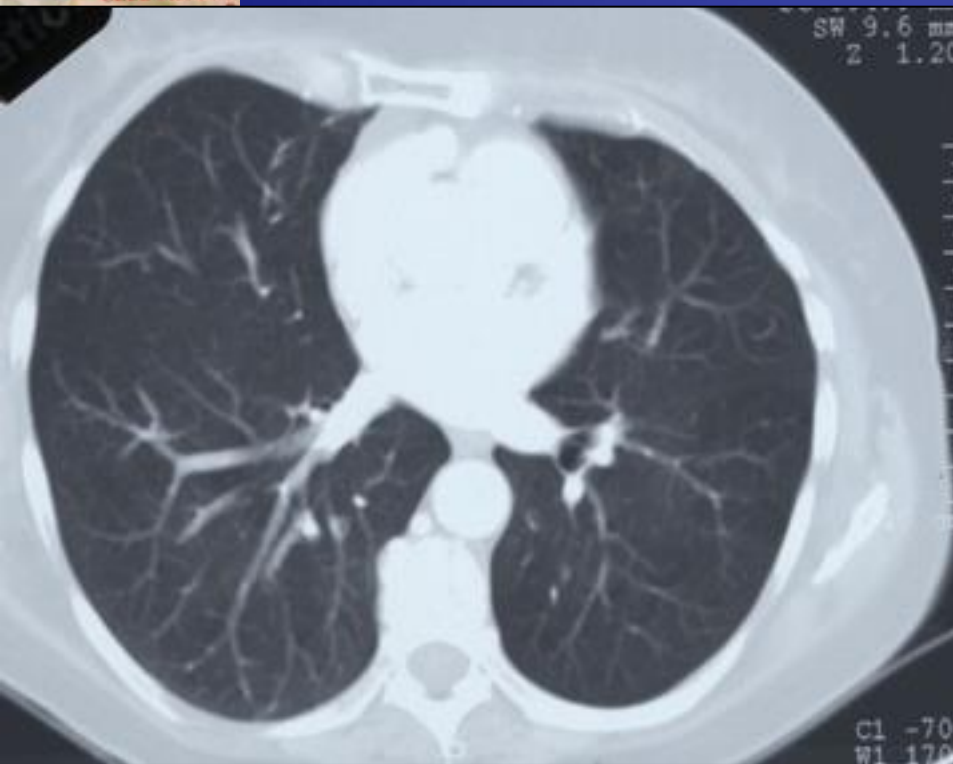


- Faible taille (4 à 6 mm)
- Faible densité (verre dépoli: 69% des cas)
- Forme endobronchique
- Localisation aux lobes inférieurs
- Adjacents aux vaisseaux



Octobre 2003

Mai 2004



Hamartochondrome: STOP SUIVI !

BTS GUIDELINES FOR THE INVESTIGATION AND MANAGEMENT OF PULMONARY NODULES; thorax.bmj.com



2.2.2. INFLUENCE DU TERRAIN

Attention au terrain d'**Emphysème** qui peut donner au NPS un aspect particulier

Nodule Solide: SN

- Prend des formes variables
- Perd ses caractères distinctifs entre b nignit  et malignit 
- Parfois  tiquet  « s quelle »
- A part: cancérisation d'une bulle

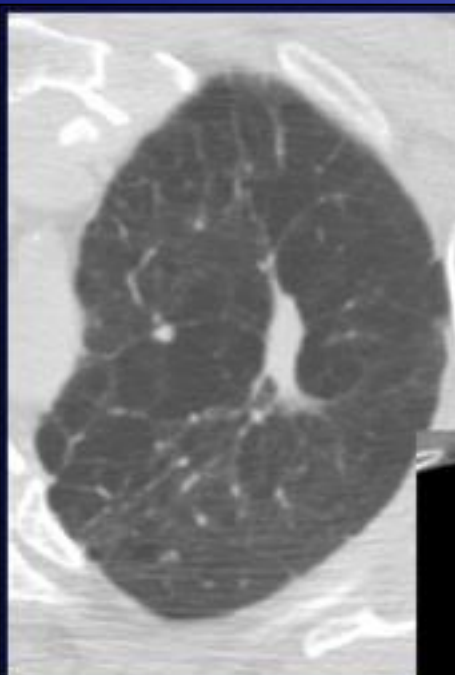
Nodule en VD: pGGN

- Difficile   voir (redistribution vasculaire)
- Difficile   comprendre (infection, encombrement)

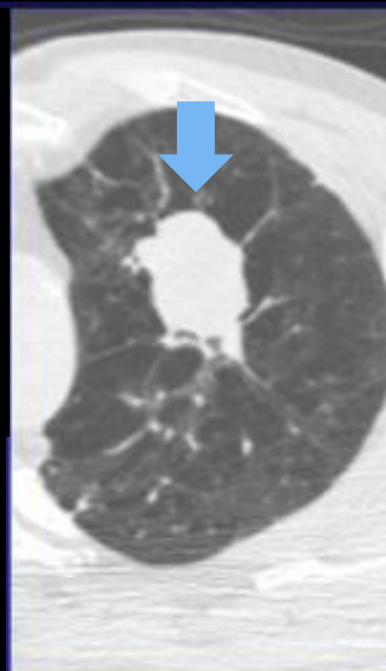
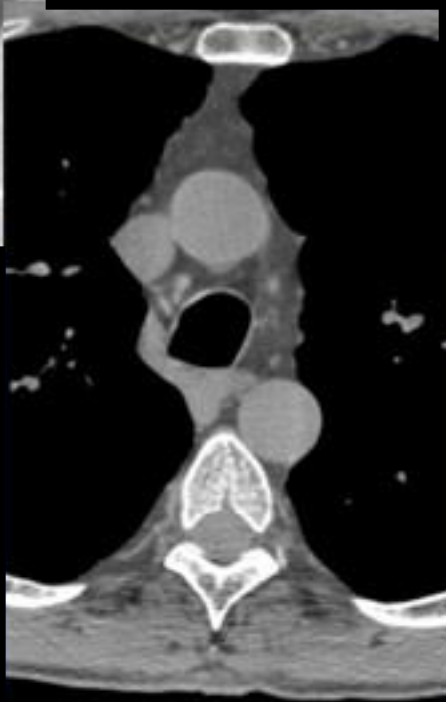


Tassement parenchymateux sur bulle d'emphysème

Evolution à 8 mois avec apparition d'une adénomégalie médiastinale (N2)
Adénocarcinome Bronchique

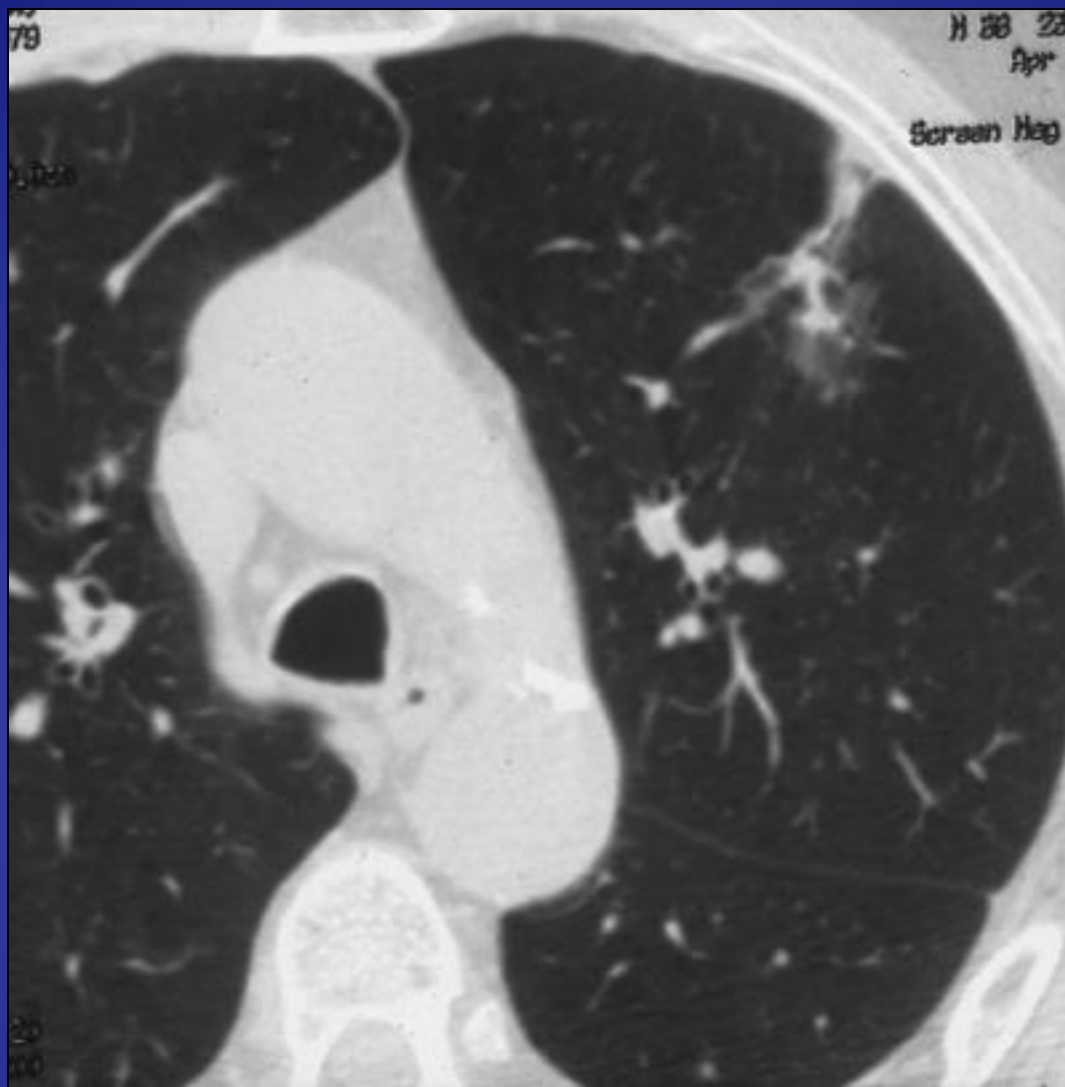


13/04/2000



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Adénocarcinome simulant un aspect séquellaire

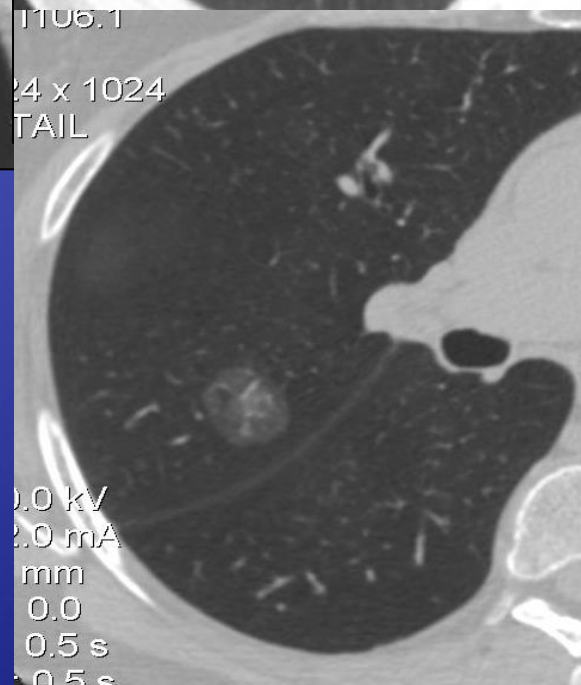
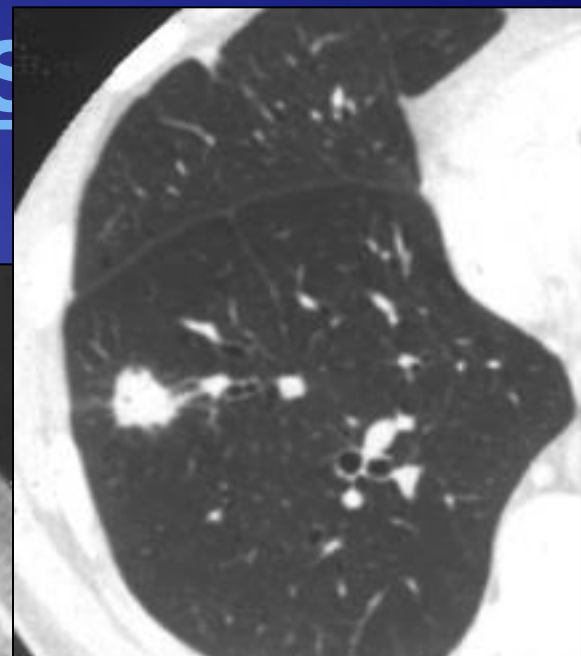
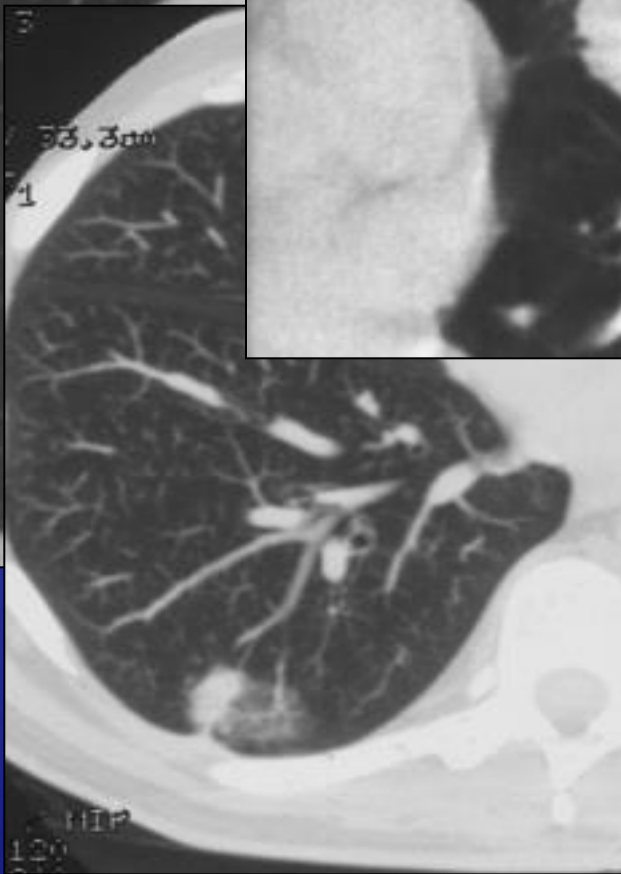
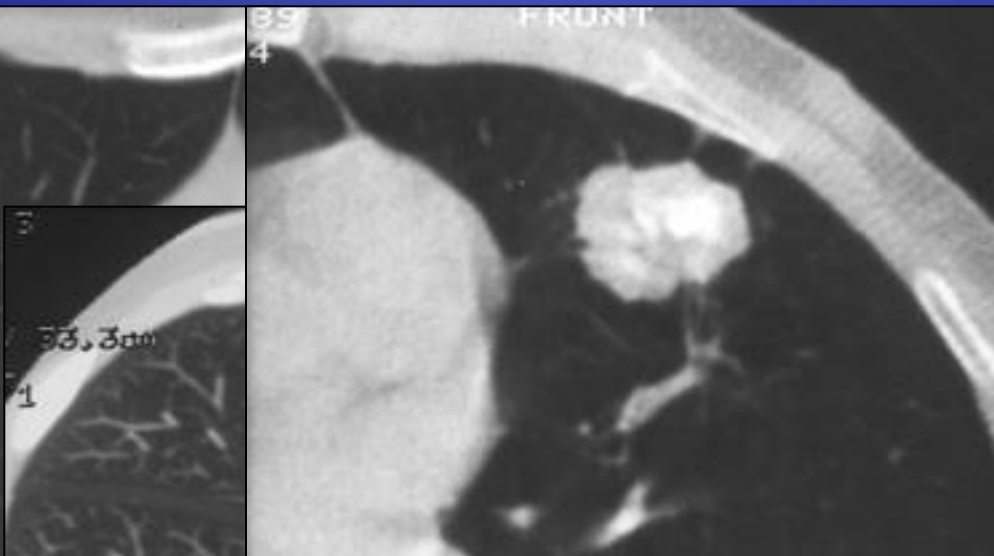
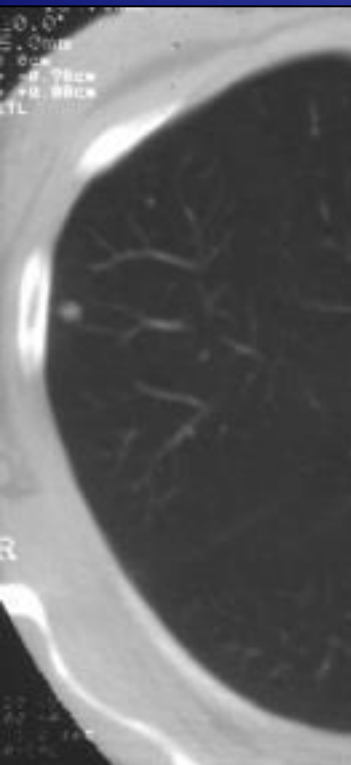


2.2.3.TDM: Dg du NOMBRE

- On affirme le caractère solitaire du NPS
de 1 à 6 nodules
- **> 6 nodules** = Considérer: granulomatose ,
infection , métastases
- Intérêt du MIP systématique dans le bilan TDM du NPS



2.2.4. Aspects TDM du NPS





APPROCHE INITIALE DU NPS NON CALCIFIÉ

- **TYPE**

- SN
- pGGN
- PSN
- SPICULES

- **NOMBRE**

- **SIEGE**

- Lobes sup
- Scissures (= 0, Mc Williams)
- (Sous pleural/ Angio centré)

- **DENSITE**

- Graisse
- Injection Contraste

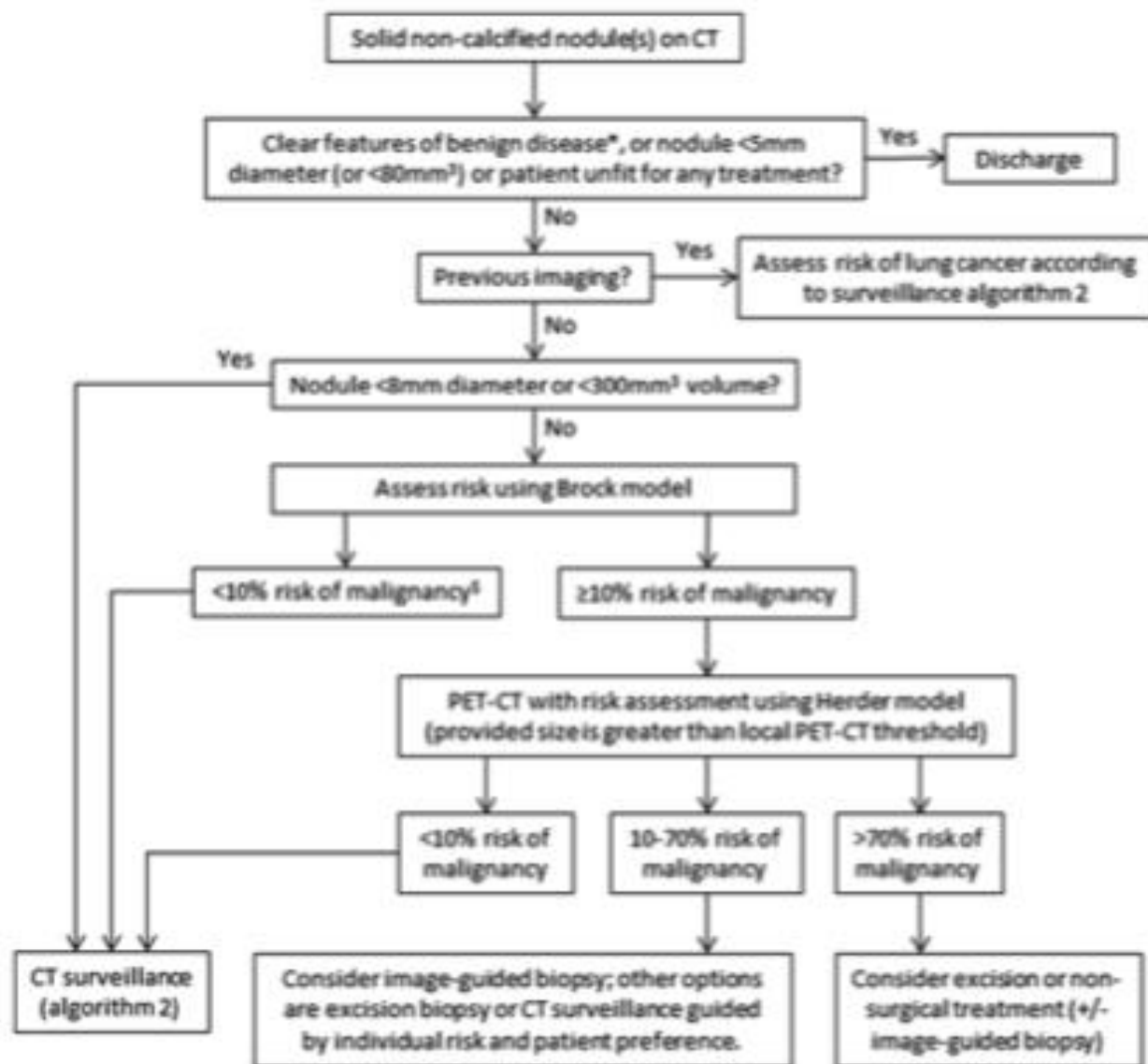
- **VOLUME** +++

- <5mm ou 80mm³: NO Fw Up
- <8mm ou 300mm³ :BROCK MODEL



< ou >10% de Risque de Malignité ?

Mc Williams A, et al. Probability of cancer in pulmonary nodules detected on first screening CT. NEJM 2013; 369: 910-9.



*e.g. hamartoma, typical peri-fissural nodule

[‡] Consider PET-CT for larger nodules in young patients with low risk by Brock score as this score was developed in screening cohort (50-75 years) so performance in younger patients unproven.

Figure 1 Initial approach to solid pulmonary nodules.



Table 3. Distribution of Nodule Variables, According to Lung-Cancer Status, in the Development and Validation Study Data Sets.*

Variable	PanCan Development Cohort				BCCA Validation Cohort			
	Benign Nodule (N=6906)	Lung Cancer (N=102)	Total (N=7008)	P Value	Benign Nodule (N=4979)	Lung Cancer (N=42)	Total (N=5021)	P Value
Nodule size — mm								
Mean	4.1±3.1	15.7±12.2	4.3±3.7	<0.001†	3.6±2.2	13.9±7.4	3.7±2.5	<0.001†
Median	3.4	13	3.5		3	12.8	3	
Range	1-70	2-86	1-86		1-29	3-45	1-45	
Interquartile range	2.7-5.0	8-19	2.8-5.0		2.0-4.5	9-18	2.0-4.8	
Nodule type — no./total no. (%)								
Nonsolid or ground-glass opacity	1084/1105 (98.1)	21/1105 (1.9)	1105/6989 (15.8)		461/467 (98.7)	6/467 (1.3)	467/5021 (9.3)	
Perifissural	70/70 (100)	0/70	70/6989 (1.0)		501/501 (100)	0/501	501/5021 (10.0)	
Part-solid	283/303 (93.4)	20/303 (6.6)	303/6989 (4.3)		35/43 (77.8)	10/45 (22.2)	45/5021 (0.9)	
Solid	5450/5511 (98.9)	61/5511 (1.1)	5511/6989 (78.9)	<0.001‡	3982/4008 (99.4)	26/4008 (0.6)	4008/5021 (79.8)	<0.001‡
Nodule location — no./total no. (%)								
Left lower lobe	1116/1128 (98.9)	12/1128 (1.1)	1128/6964 (16.2)		852/863 (98.7)	11/863 (1.3)	863/5021 (17.2)	
Left upper lobe	1581/1612 (98.1)	31/1612 (1.9)	1612/6964 (23.1)		1277/1285 (99.4)	8/1285 (0.6)	1285/5021 (25.6)	
Right lower lobe	1249/1270 (98.3)	21/1270 (1.7)	1270/6964 (18.2)		829/830 (99.9)	1/830 (0.1)	830/5021 (16.5)	
Right middle lobe	685/687 (99.7)	2/687 (0.3)	687/6964 (9.9)		503/504 (99.8)	1/504 (0.2)	504/5021 (10.0)	
Right upper lobe	2232/2267 (98.5)	35/2267 (1.5)	2267/6964 (32.6)	0.01‡	1518/1539 (98.6)	21/1539 (1.4)	1539/5021 (30.7)	0.002‡
Nodule count at baseline								
Mean	6.2±4.0	4.8±3.3	6.2±4.0	<0.001†	10.3±9.8	4.7±3.7	10.2±9.8	<0.001†
Median	5	4	5		7	4	7	
Range	1-31	1-19	1-31		1-60	1-14	1-60	
Interquartile range	3-9	2-6	3-9		4-13	2-6	4-13	
Spiculation — no./total no. (%)								
No	6739/6811 (98.9)	72/6811 (1.1)	6811/7008 (97.2)					
Yes	167/197 (84.8)	30/197 (15.2)	197/7008 (2.8)	0.001‡				

Histopathological type — no./total no. (%)

Adenocarcinoma	75/102 (73.5)	32/42 (76.2)
Adenocarcinoma in situ¶	5/102 (4.9)	0/42
Squamous cell	14/102 (13.7)	5/42 (11.9)
Non-small-cell lung cancer, not otherwise specified	3/102 (2.9)	3/42 (7.1)
Small-cell	3/102 (2.9)	1/42 (2.4)
Other‡	2/102 (2.0)	1/42 (2.4)

* Plus-minus values are means ±SD. BCCA denotes British Columbia Cancer Agency, and PanCan Pan-Canadian Early Detection of Lung Cancer Study.

† This P value was calculated with the use of Student's t-test with unequal variance.

‡ This P value was calculated with the use of Fisher's exact test.

§ The presence or absence of spiculation was recorded for nodules in the PanCan cohort but not in the BCCA cohort.

¶ Adenocarcinoma in situ (formerly bronchioloalveolar carcinoma) was defined according to the International Association for the Study of Lung Cancer-American Thoracic Society-European Respiratory Society classification of lung adenocarcinoma.¹⁸

‡ Other histologic types included neuroendocrine and mixed small-cell and non-small-cell lung cancers.



NPS SOLIDE

- Caractéristiques morphologiques
- Caractéristiques métaboliques
- Caractéristiques évolutives



1. Caractéristiques morphologiques

- Taille:
 - 5-6mm
 - ≥ 6 mm
- Siège
- Spicules
- Péri scissuraire
- Nombre

- Interval CT

- Volume Doubling Time

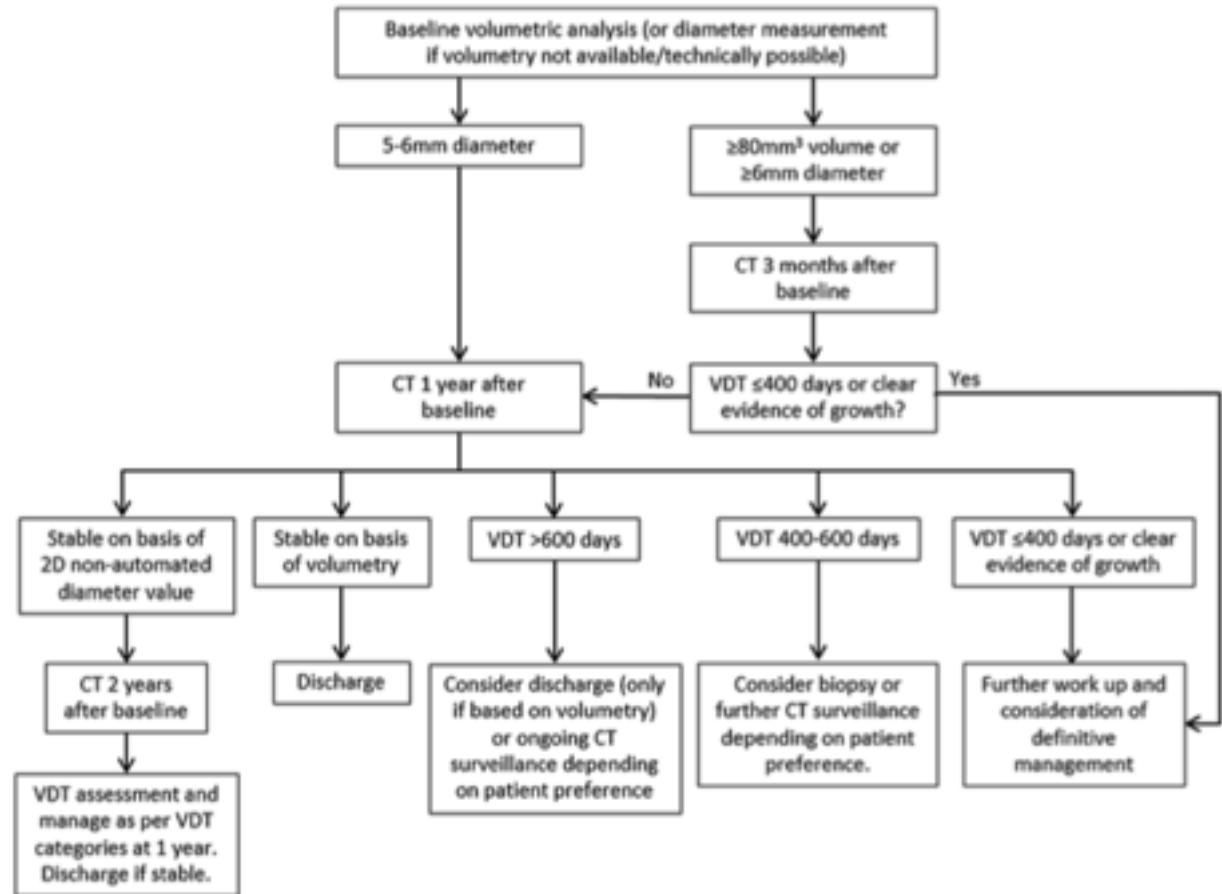
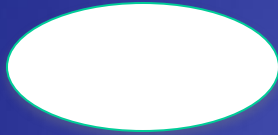
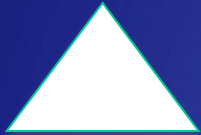


Figure 2 Solid pulmonary nodule surveillance algorithm. VDT, volume doubling time.



Perifissural Nodules Seen at CT Screening for Lung Cancer¹



< 5 mm

Contours nets

< carène

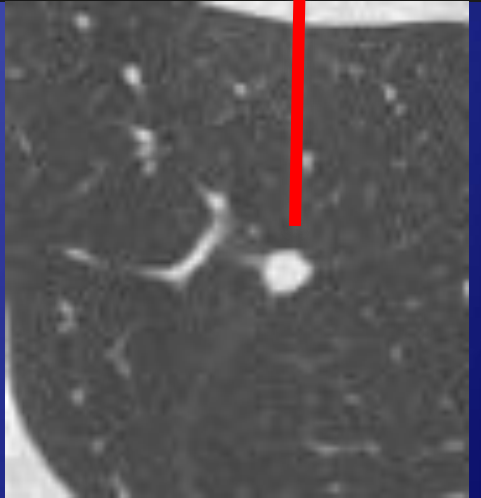
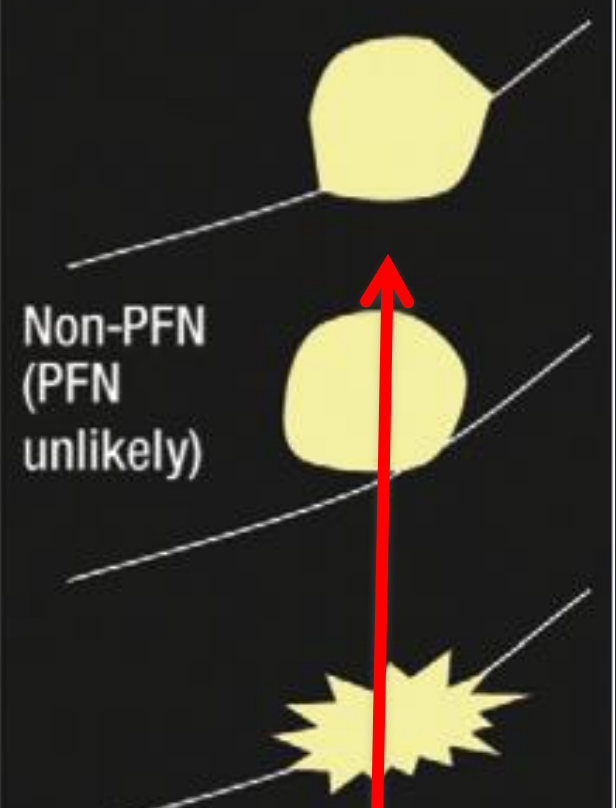
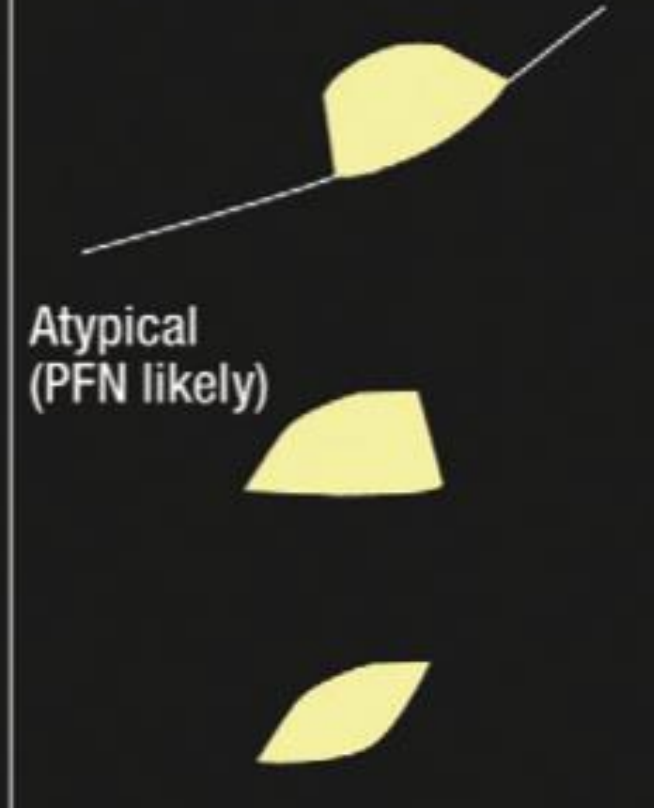
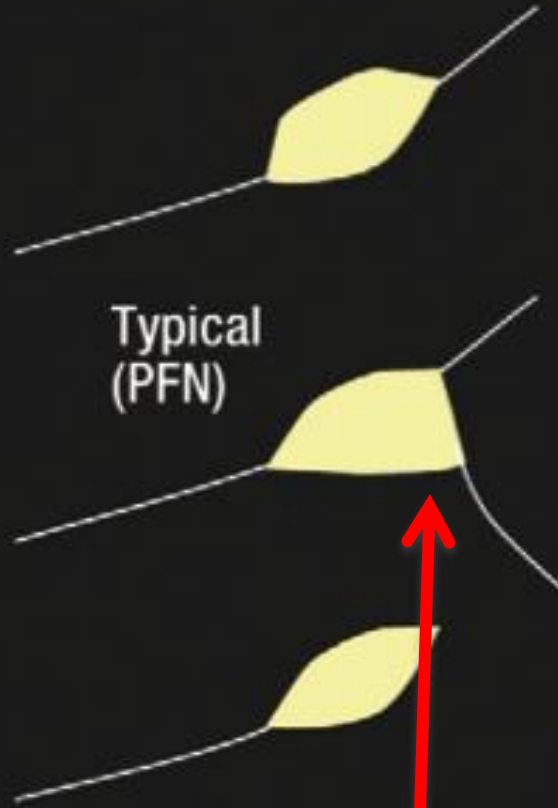
Connexion septale



BENIN

GANGLION INTRA PARENCHYMATEUX

*Peri fissural nodule: nil risk of malignancy: Pan Can Cohort of 7008 nodules
Mc Williams A, et al. Probability of cancer in pulmonary nodules detected on first screening CT. NEJM 2013; 369: 910-9.*

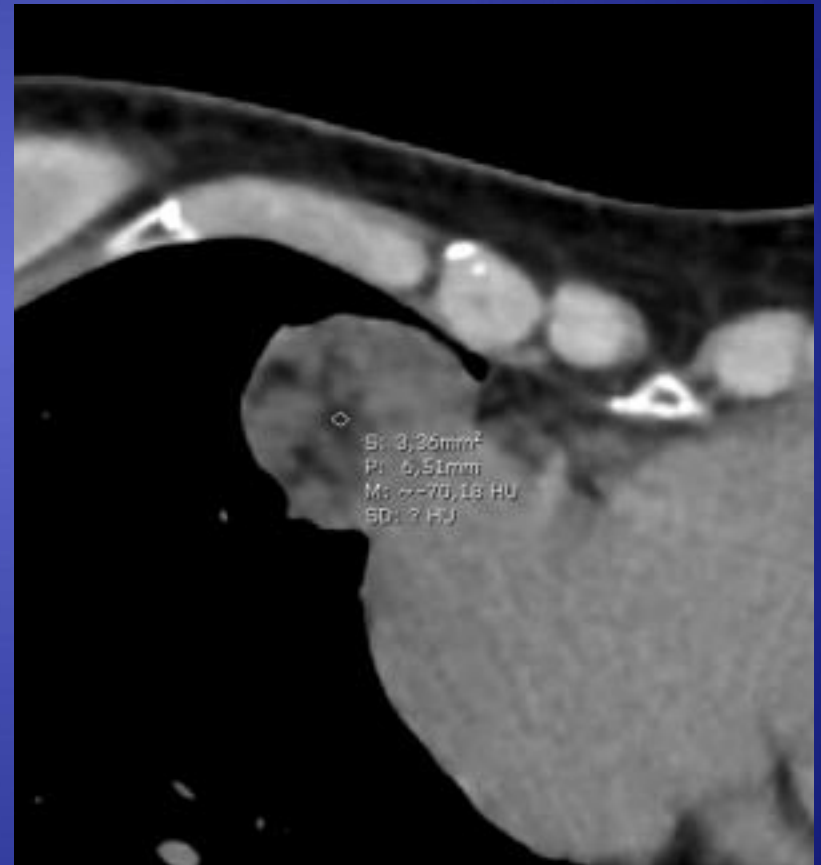
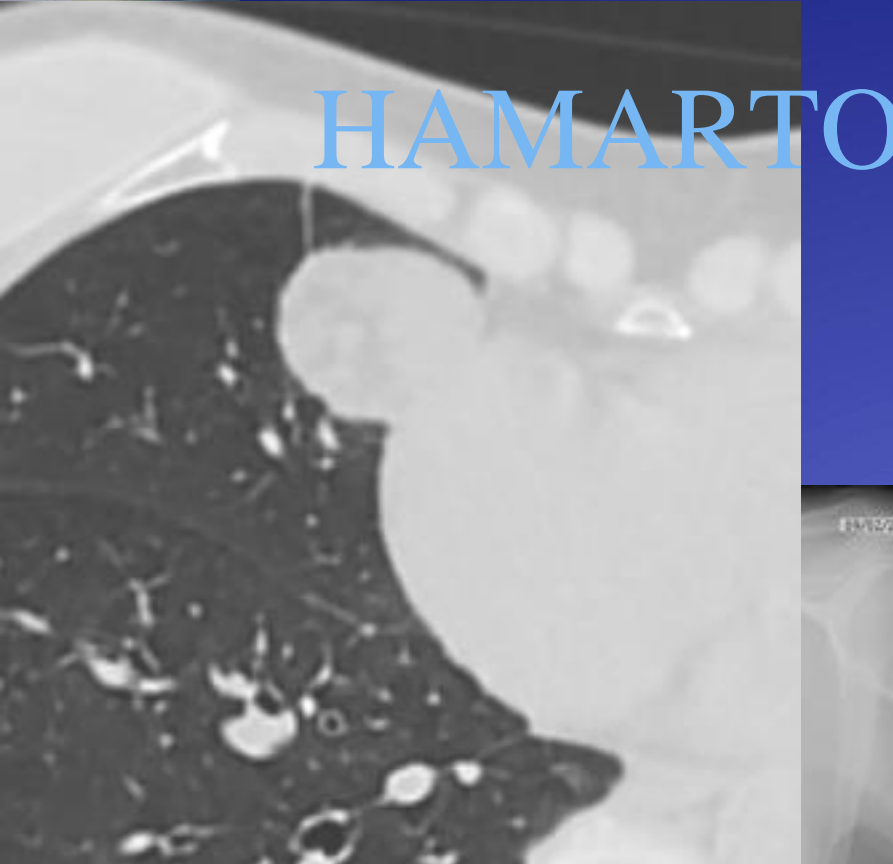




Critères de bénignité

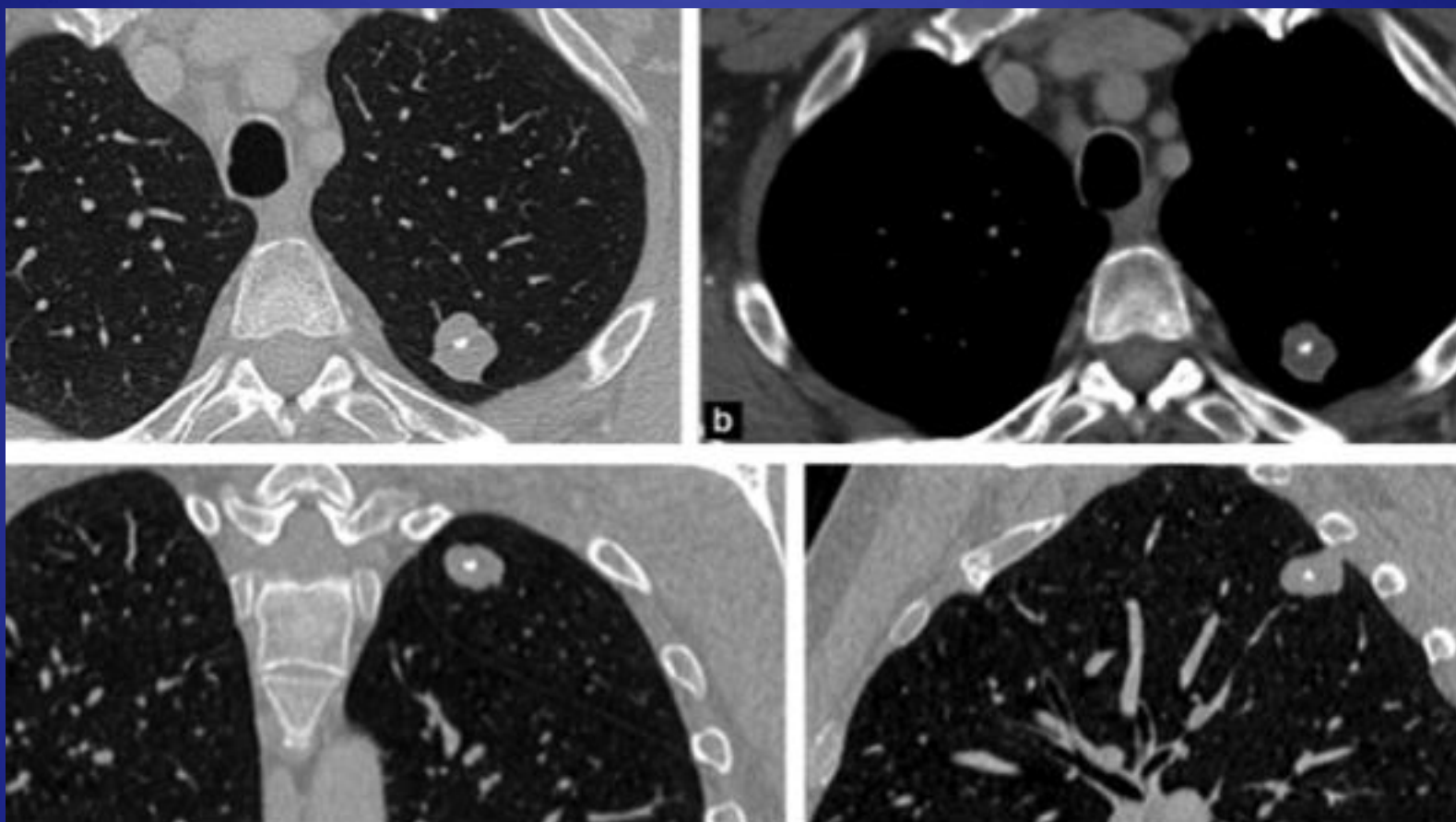
- Plage densité graisseuse: -40 à -80UH (hamartochondrome)
- Nodule totalement calcifié, ou calcifications lamellaires, centrales (granulome), en pop corn (hamartochondrome)
- Aspect du ganglion intra pulmonaire: nodule <10mm, distant de <10mm de plèvre, < carène, forme angulaire
- Absence d'hypermétabolisme (si nodule solide et diam \geq 10mm)
- Critères de Siegelman

HAMARTOCHONDROME





GRANULOME



Calcification centrale sur les trois reformations

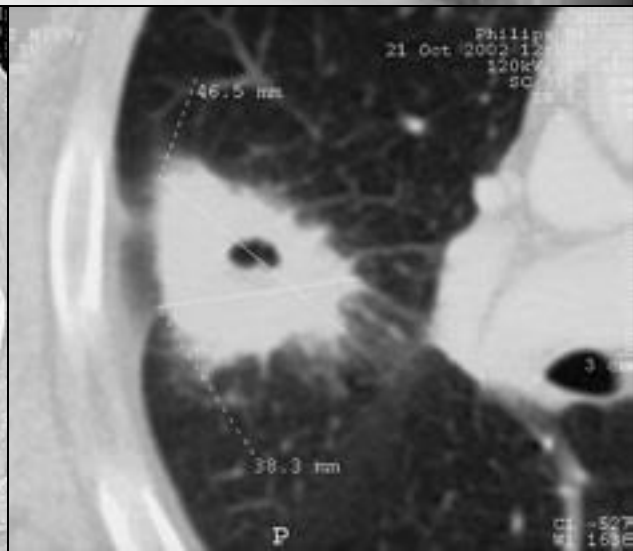


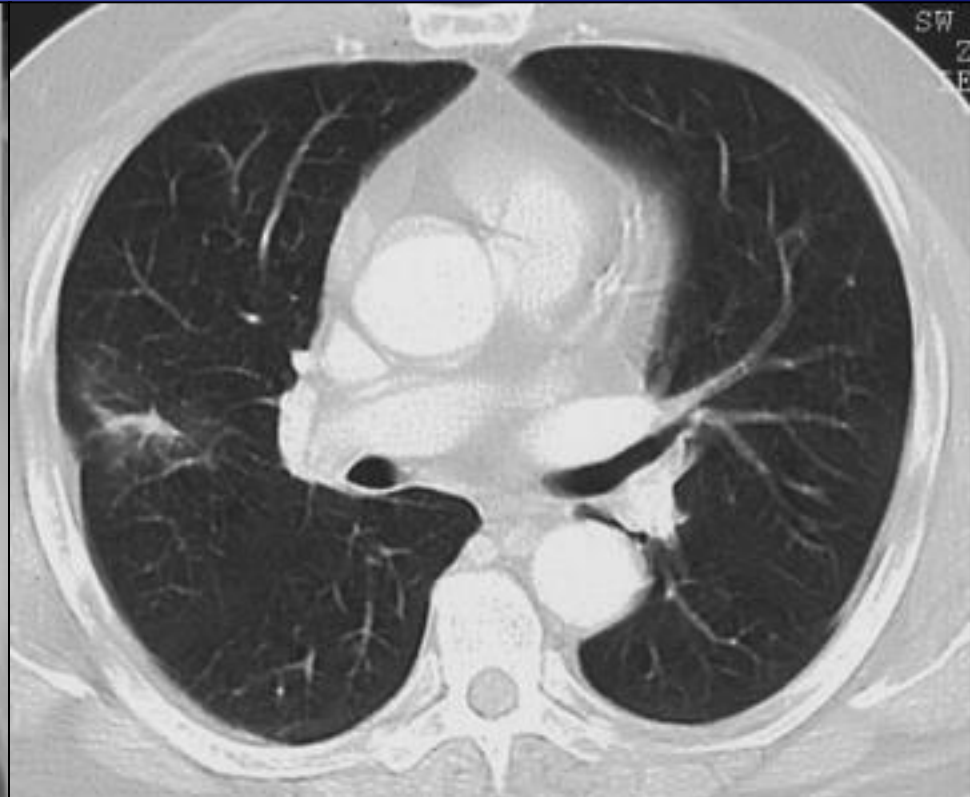
Critères de malignité

- Nodule de diamètre élevé > 10 mm
- Contours spiculés ou lobulés
- Bronchogramme aérien ou bronche dilatée dans environnement NPS
- Cavitation à paroi épaisse
- (Rétraction pleurale)
- Image persistante en VD > 10 mm avec composante solide
- **TERRAIN +++: AGE TABAGISME AUTRE AGENT**



Toux avec AEG depuis 5mois





guérison après antibiothérapie.



2. Caractéristiques métaboliques

- La TEP réalise en même temps un bilan d'extension si probabilité de malignité élevée – PET SCAN INJECTE -
- SUV > 2.5 en faveur de malignité
- VPP 90% & VPN 90%



Faux négatifs

Faux positifs

- Lésions inflammatoires (pseudo tumeur inflammatoire)
- Lésions infectieuses
- Granulomatose

- Taille < à 8 mm
- Métabolisme et nature :
 - ADK (forme en VD)
 - T Carcinoïdes typiques
 - Tumeurs kystiques
 - Autres types histologiques rares: Pronostic évolutif faible



3. Caractéristiques évolutives TEMPS DE DOUBLEMENT MALIN

Le temps de doublement des NPS
malins se situe:

$20j < \text{Volume Doubling Time} < 400 j$

- Récupération de documents antérieurs (PACCS)
- Analyse 2D du nodule (26%) pour NPS > 10 mm
- Volumétrie (variation de 25 % au moins)



3. Caractéristiques évolutives TEMPS DE DOUBLEMENT BENIN

Le temps de doublement des NPS
bénins:

- Stable en taille sur 2 ans
- Temps de doublement > 400 j. , évalué sur 2 scanners réalisés a 3 mois d'intervalle



Prise en charge du NPS solide (RCP)

- Les NPS solides sont les plus fréquents
2% < Risque de Malignité < 7 %

EVALUER:

1. Caractéristiques du NPS

2. Terrain:

2.1. Probabilité de malignité: Age, K familial, Exposition agent cancérigène, emphysème...

2.2. Risque opératoire

3. Choix du patient



Probabilité de malignité

Le modèle de la MAYO Clinic inclut 6 facteurs indépendants de malignité:

- Age
- Tabagisme actif ou passé
- Histoire de cancer extra-thoracique
- Diamètre du nodule
- Spiculations
- Localisation dans les lobes sup



TERRAIN

Penser aussi aux maladies qui favorisent le
KBP :

- Fibrose pulmonaire
- Syndrome d'Immunodéficience
- Exposition à l'amiante
- Primitif connu (mélanome , rein)



FIGURE 3. [Section 4.1] Assessment of the probability of malignancy.

Assessment Criteria	Probability of Malignancy		
	Low (< 5%)	Intermediate (5%- 65%)	High (> 65%)
Clinical factors alone (determined by clinical judgment and/or use of validated model) ^b	Young, less smoking, no prior cancer, smaller nodule size, regular margins, and/or non-upper-lobe location	Mixture of low and high probability features	Older, heavy smoking, prior cancer, larger size, irregular/spiculated margins, and/or upper-lobe location
FDG-PET scan results	Low-moderate clinical probability and low FDG-PET activity	Weak or moderate FDG-PET scan activity	Intensely hypermetabolic nodule
Nonsurgical biopsy results (bronchoscopy or TTNA)	Specific benign diagnosis	Nondiagnostic	Suspicious for malignancy
CT scan surveillance	Resolution or near-complete resolution, progressive or persistent decrease in size, ^b or no growth over ≥ 2 y (solid nodule) or ≥ 3 -5 y (subsoliid nodule)	NA	Clear evidence of growth



Nodule indéterminé > 8 mm

Surveillance si :

1. Probabilité très basse (5%)
2. TEP négative
3. PTT non contributive
4. Patient informé qui préfère 1 approche non agressive

**TDM itératives entre 3 et 6 , 9 et 12 , 18 et 24 mois
avec calcul du Doubling Time**



Nodule indéterminé > 8 mm

Biopsie non chirurgicale si:

1. Probabilité de malignité et TEP discordants
2. Probabilité de malignité basse à modérée
3. On pense à une affection médicale
4. Patient informé qui préfère un diag. avant la chirurgie (patient à risque)



Nodule indéterminé > 8 mm

Diagnostic chirurgical si:

1. Probabilité de malignité élevée
2. TEP positive
3. PTT suspecte de malignité
4. Patient informé qui préfère un diagnostic certain



Problème particulier du micronodule

- Pas de prise de contraste fiable
- TEP négative
- Etude volumique négative si < 5 mm
- Pas de ponction trans-thoracique
- Pas de technique endoscopique
- Intérêt Analyse 3D 3plans de l'espace
- Le problème de la surveillance ne s'applique pas si maladie métastasiente (k. du rein , mélanome)



Nodule indéterminé < 8 mm

Pas de facteur de risque

< 4 mm :

Rien

4 à 6 mm :

Contrôle à 1 an puis stop

6 à 8 mm :

1 puis 2 ans puis stop



Nodule indéterminé < 8 mm

Facteurs de risque présents

< 4 mm :

CTRL à 1 an puis stop

4 à 6 mm

CTRL à 6 -12 mois puis à 18 - 24 mois

6 à 8 mm :

CTRL à 3 - 6 mois puis à 9 - 12 mois
puis à 2 ans



Suivi sur le volume

Vol. <50 mm³ (4.6 mm)

contrôle à un an

Vol. >500 mm³ (9.8mm)

Prise en charge Spécialisée (PET, biopsie, chir)

50mm³ < Vol. < 500mm³

volumétrie à 3 mois

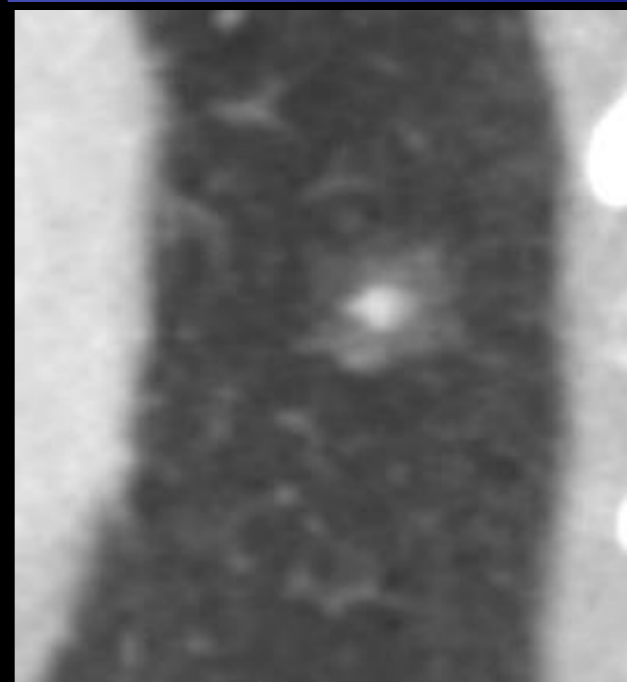
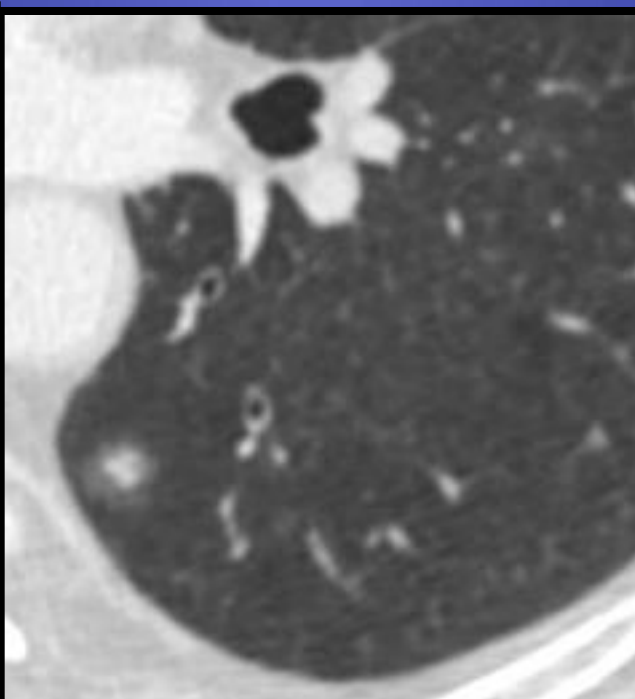
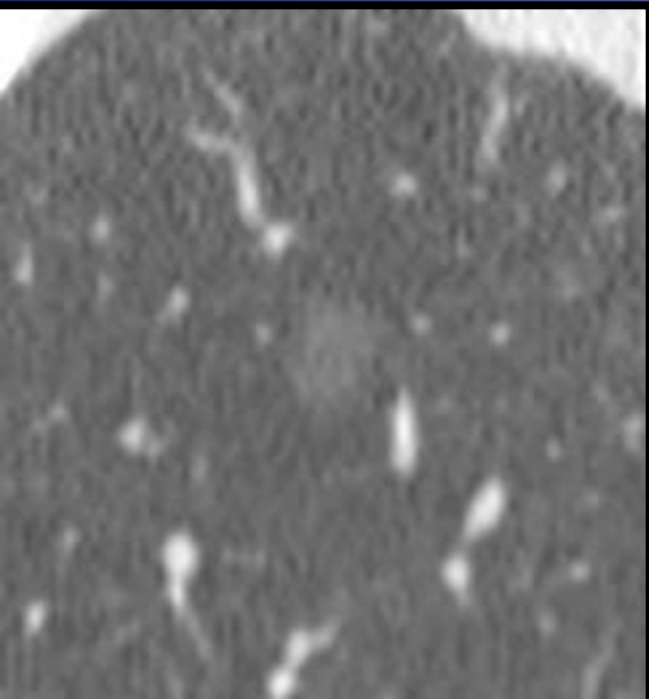
Si <25 % (td > 400j.) = cas 1

Si >25 % (td < 400j.) = cas 2



Prise en charge du NPS en VD

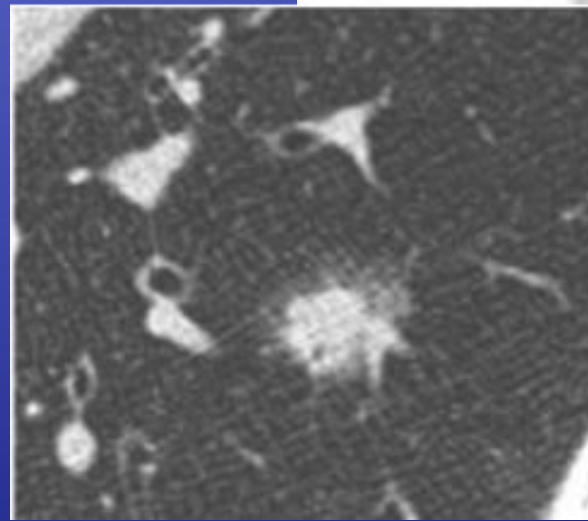
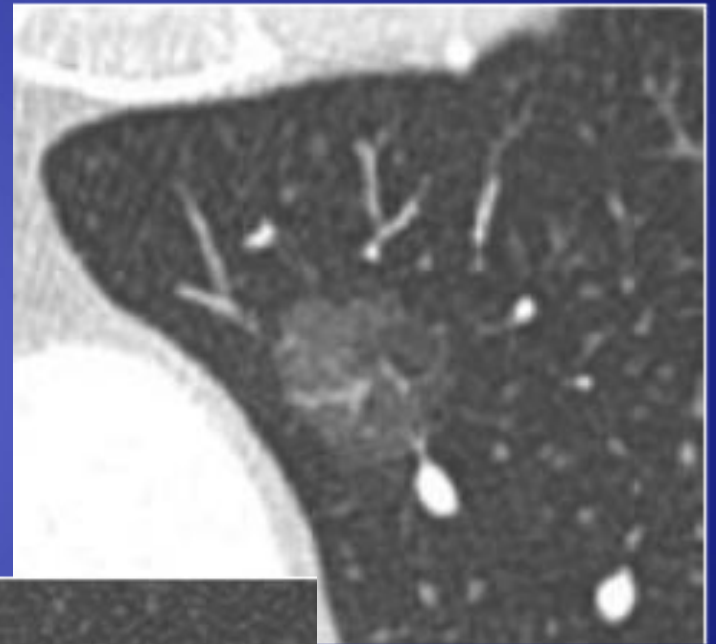
Verre Dépoli: pGGN
pure Ground Glass Nodule





Caractéristiques générales

- Pas visible sur RT
- Pas endoscopique
- PTT inutile
- TEP non utile
excepté nodule
mixte avec zone
dense > 10 mm





Caractéristiques néoplasiques

- Très suspect : 18% pour VD pur , 63 % pour nodule mixte (ELCAP)
- Jamais lésion secondaire (CM Park, Chest 2008)
- Autres diagnostics rares : infection , zone de fibrose localisée , endométriose , contusion , btb , déficit en IgG 4 , lymphome

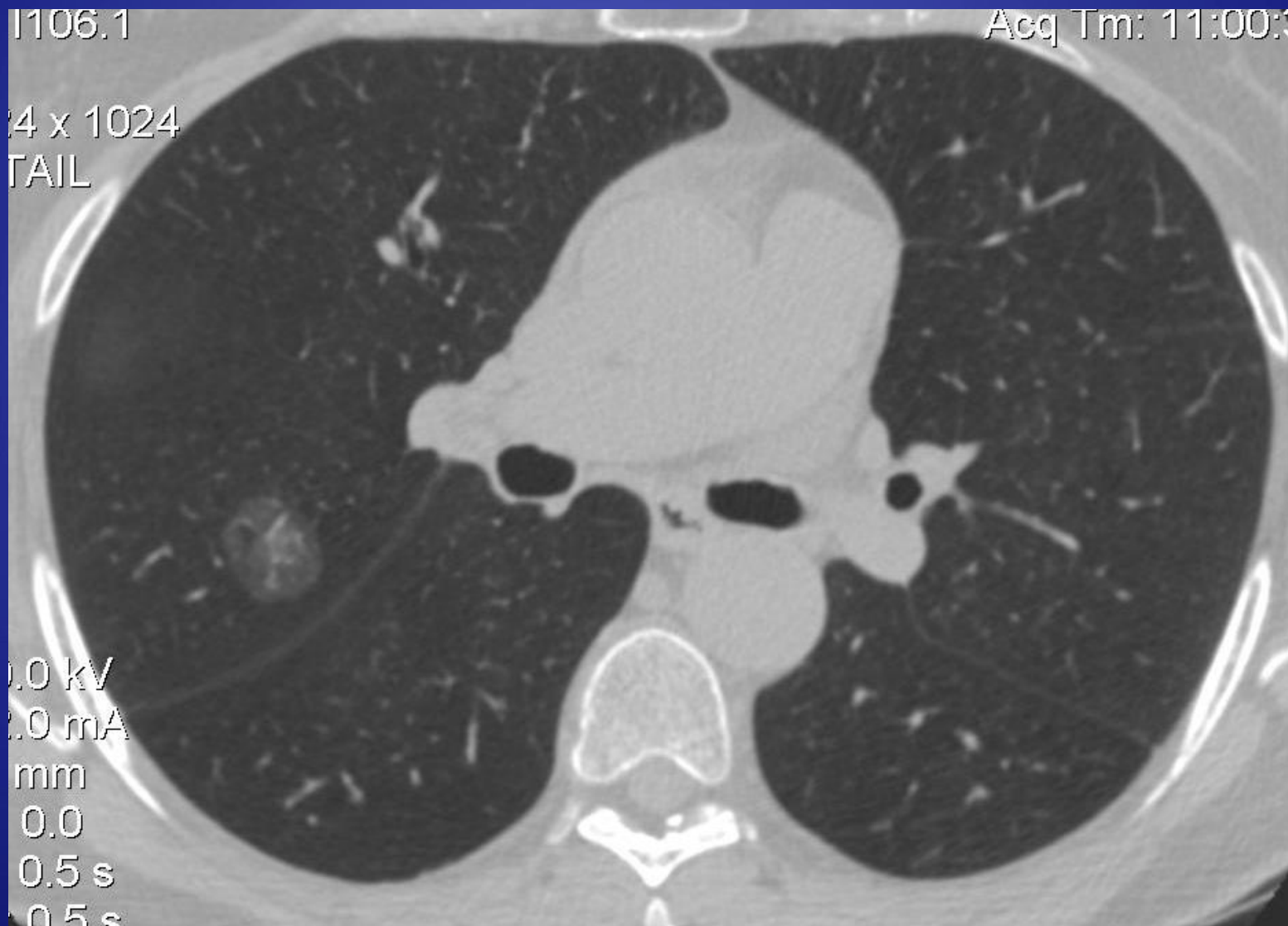


Corrélation radio-histologique (IASLC/ATS/ERS)

Hyperplasie adénomateuse atypique	Verre dépoli pur
ADK in situ	pGGN/ PSN Part solide réduite
ADK mini invasif	pGGN / PSN
ADK invasif lépidique	PSN part solide importante solide
ADK invasif	PSN SN ++

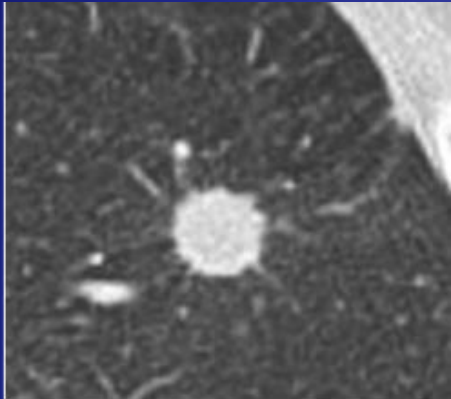


Aspect très caractéristique d'ADK

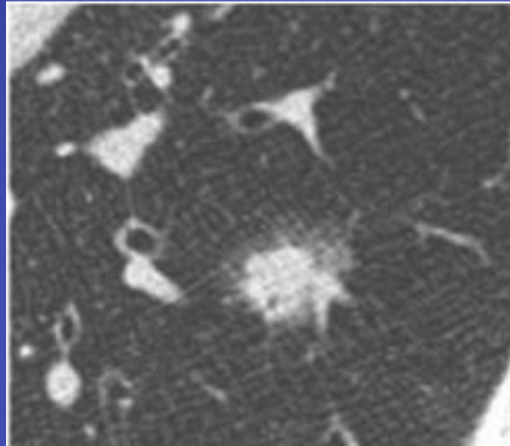




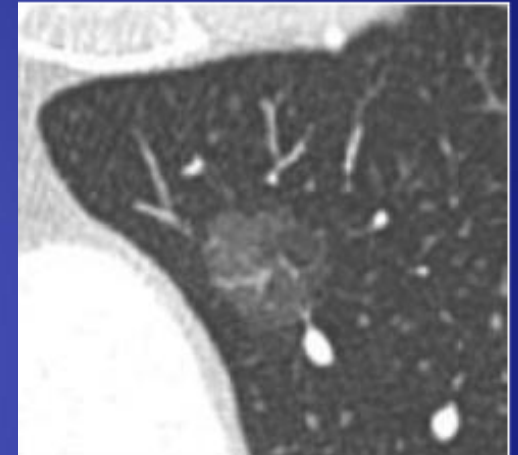
Evolutivité: Volume Doubling Time



SN: 149j



PSN: 457j



pGGN: 813j

Le dogme de la stabilité a 2 ans ne s'applique pas au nodule en VD +++

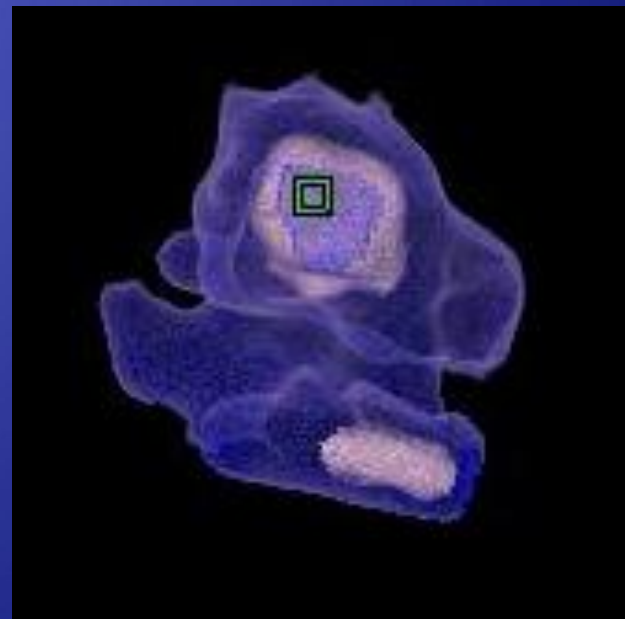
La problématique est celle du temps de disparition

(Hasegawa et al.2000)



Suivi du nodule en verre dépoli

- Idéalement par volumétrie
- Par TDM classique et mesure des dimensions de la lésion
- Par mesure de la **masse tumorale** dans l'avenir ++





Suivi du nodule en verre dépoli SUSPECT SI:

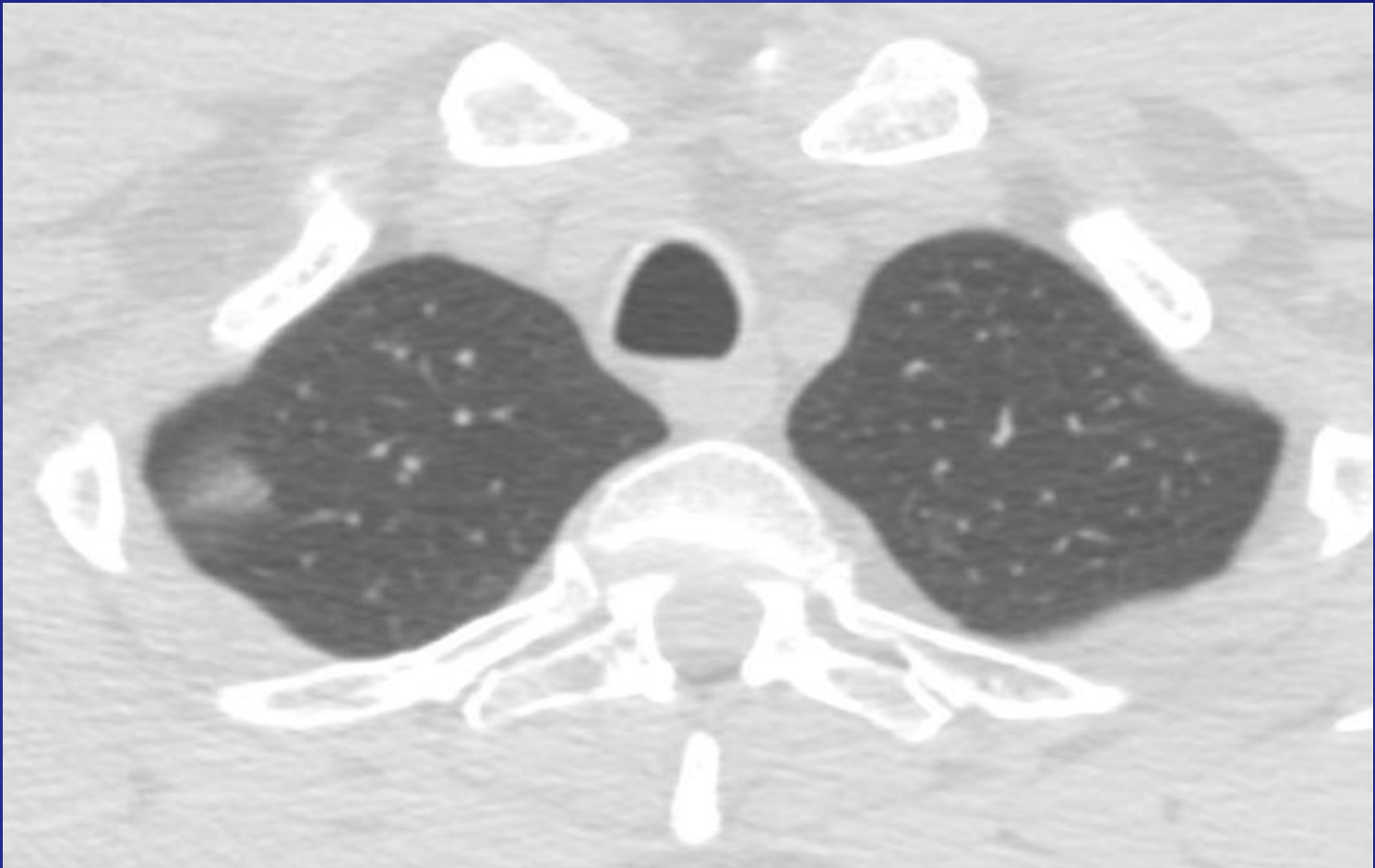
- Persistence
- Augmentation de taille (2 mm) de volume
- Densification centrale (même si taille diminue)



Suivi sur 4 ans



Adénocarcinome !

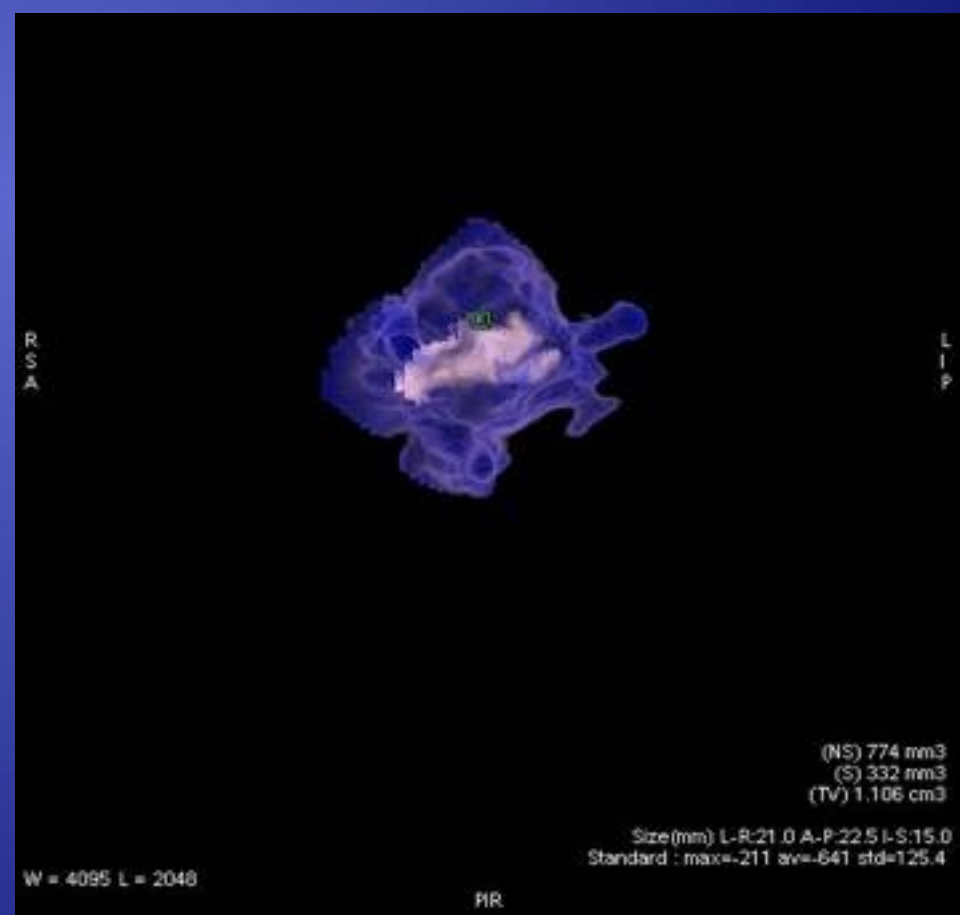
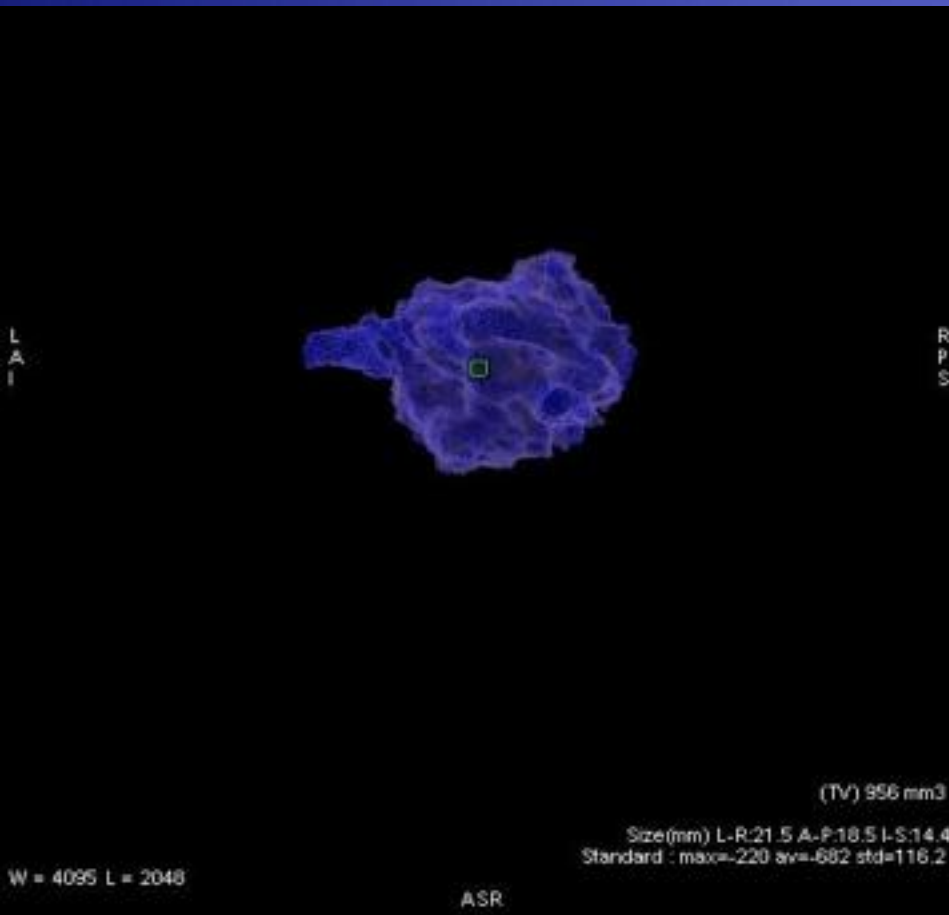


Sujet exposé a l'amiante : opacité en VD du LSD
Stable depuis qq années



2005 : « verre dépoli
pur »

En 2007 apparition
d'une zone dense
centrale **non vue en
tdm**: Adénocarcinome





Recommandations dans la prise en charge du nodule subsolide

Type de nodule	gestion	remarques
<p><u>pGGN</u></p> <p>≤5mm</p> <p>>5mm</p>	<p>Pas de suivi</p> <p>Contrôle a 3 mois (persistence) Puis surveillance annuelle >3 ans</p>	<p>Pas de TEP</p>
<p><u>PSN</u></p>	<p>Suivi a 3 mois</p> <p>Si persiste :</p> <ul style="list-style-type: none"> -composante solide <5mm <p>Surveillance ct > 3 ans</p> <ul style="list-style-type: none"> -composante solide > 5mm <p>Biopsie/chirurgie</p>	<p>TEP si part solide > 10 mm</p>
<p><u>PSN MULTIPLES</u></p> <p>pGGN pur ≤ 5 mm</p> <p>pGGN pur > 5mm</p>	<p>CT a 2 et 4 ans</p> <p>CT a 3 mois puis 1/an pendant 3 ans</p> <p>Suivi a 3 mois Puis biopsie/chirurgie</p>	<p>Penser aux autres causes de nodules en VD si < 5 mm</p> <p>Pas de TEP</p> <p>La lésion est considérée maligne. TEP à</p>

	< 5 mm	5-10 mm	> 10 mm
Pure ground glass	No follow-up (unless multiple nodules: 1 CT/year for 2-4 years)	Follow-up CT at 3 months (\pm after antibiotic therapy): - if stable at 3 months: 1 CT/year for 3-5 years - if growth \geq 2mm or development of a solid component: MDT ^a	
Part-solid <i>(measure the diameter of the solid component)</i>	Follow-up CT at 3 months (\pm after antibiotic therapy): - if stable at 3 months and solid component \leq 5 mm: 1 CT/year for 3-5 years - if growth \geq 2mm or solid component > 5 mm: MDT		
Solid <i>(with no feature of benign disease^b)</i>	- if size < 3mm or no RF ^c : no follow-up - if size = 3-5 mm and RF ^c : CT at 1 year	Follow-up CT at 3 months with nodule volumetry ^d at D ₀ and D ₉₀ : - if VDT \geq 400 days: CT at 1 year - if VDT < 400 days: MDT	MDT

Figure 7. Tabulated summary of the management of lung nodules. CT: computed tomography; MDT: Multidisciplinary Team Meeting with a view to surgery; RF: risk factors; VDT: volume doubling time; a: surgery not performed routinely for pure ground glass nodules, to be considered on an individual case basis; b: criteria for benign disease: (i) complete or central calcification (in two perpendicular planes); (ii) containing a fatty plaque (-40 to -120 HU); (iii) triangular or polygonal nodule with smooth edges, less than 10 mm in size, located beneath the carina, less than 10 mm from a pleural lining or fissure; c: RF: (i) age > 40 years old; (ii) smoking > 30 PA; (iii) exposure to asbestos; (iv) past history of neoplasia; d: if volumetry cannot be performed, an increase in diameter over 2 mm should be considered suspect of malignancy and discussed in the MDT.

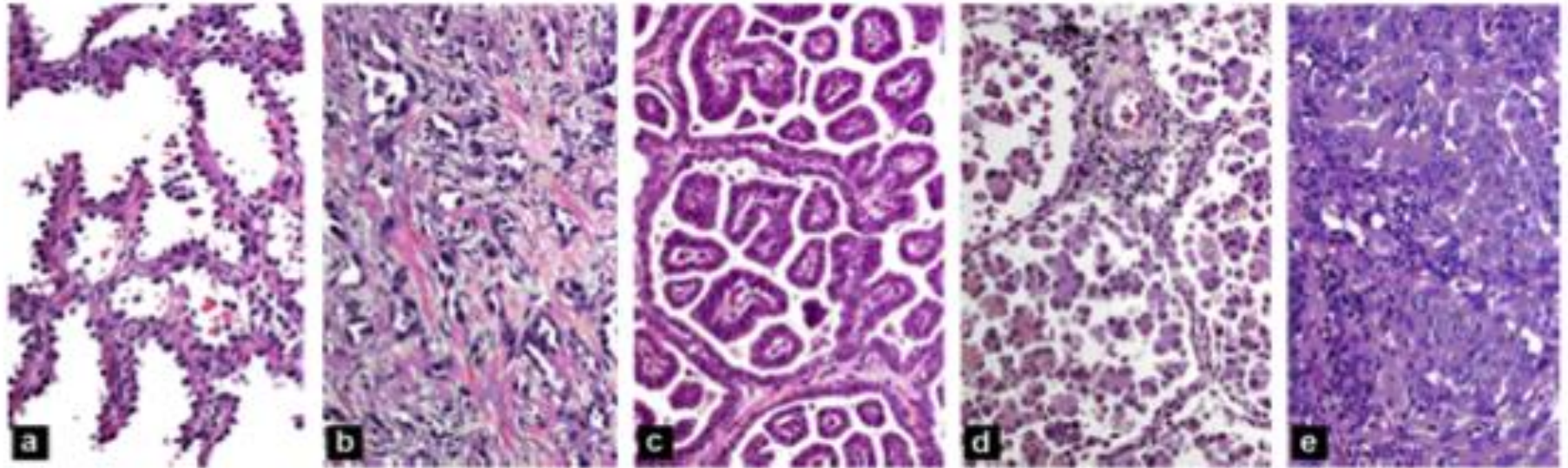


Figure 2. Histological appearance of five components of invasive adenocarcinomas: lepidic (a), acinar (b), papillary (c), micropapillary (d), and solid (e).

	Pure ground glass nodule	Part-solid nodule	Solid nodule
Atypical adenomatous hyperplasia	████████████████████		
Adenocarcinoma in situ	████████████████████████████████		
Minimally invasive adenocarcinoma		████████████████████████████████	
Lepidic predominant invasive adenocarcinoma		██	
Non-lepidic predominant invasive adenocarcinoma (acinar, papillary, micropapillary, solid)			██



Evaluation of Individuals With Pulmonary Nodules: When Is It Lung Cancer?

Diagnosis and Management of Lung Cancer, 3rd ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines

Michael K. Gould, MD, FCCP; Jessica Dunnington, MD; William R. Lynch, MD; Peter J. Mazzone, MD, MPH, FCCP; David E. Mathisen, MD, FCCP; David P. Naidich, MD, FCCP; and Randa Soylemez Wiener, MD, MPW

Objectives: The objective of this article is to update previous evidence-based recommendations for evaluation and management of individuals with solid pulmonary nodules and to generate new recommendations for those with nonsolid nodules.

Methods: We updated prior literature reviews, synthesized evidence, and formulated recommendations by using the methods described in the "Methodology for Development of Guidelines for Lung Cancer" in the American College of Chest Physicians Lung Cancer Guidelines, 3rd ed.

Results: We formulated recommendations for evaluating solid pulmonary nodules that measure >8 mm in diameter, solid nodules that measure ≤8 mm in diameter, and subsolid nodules. The recommendations stress the value of assessing the probability of malignancy, the utility of imaging tests, the need to weigh the benefits and harms of different management strategies (noninvasive biopsy, surgical resection, and surveillance with chest CT imaging), and the importance of eliciting patient preferences.

Conclusions: Individuals with pulmonary nodules should be evaluated and managed by estimating the probability of malignancy, performing imaging tests to better characterize the lesions, evaluating the risks associated with various management alternatives, and eliciting their preferences for management. CHEST 2013; 143(5):Suppl 2:e1025-e1205

Abstract: Diagnostic and Interventional Imaging (2013) 94, 1081-1094

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ELSEVIER MASSON



REVIEW / Thoracic imaging

Management strategy of pulmonary nodule in 2013

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Supplemental content at journals.elsevier.com

IMPORTANCE: Pulmonary nodules are common, and more will be found with implementation of lung cancer screening. How potentially malignant pulmonary nodules are evaluated may affect patient outcomes, health care costs, and effectiveness of lung cancer screening programs. Guidelines for evaluating pulmonary nodules for cancer exist, but little is known about how nodules are evaluated in the usual care setting.

OBJECTIVE: To characterize nodule evaluation and concordance with guidelines.

DESIGN, SETTING, AND PARTICIPANTS: A retrospective cohort study was conducted including detailed review of medical records from pulmonary nodule detection through evaluation completion, cancer diagnosis, or study end (December 31, 2012). The participants included 300 adults with pulmonary nodules from 15 Veterans Affairs hospitals.

MAIN RESULTS AND MEASURES: Resources used for evaluation at any Veterans Affairs facility and guideline-concordant evaluation served as the main outcomes.

RESULTS: Twenty-seven of 300 patients (9.0%) with pulmonary nodules ultimately received a diagnosis of lung cancer: 1 of 57 (1.8%) with a nodule of 4 mm or less, 4 of 154 (3.0%) with a nodule of 5 to 8 mm, and 22 of 109 (20.2%) with a nodule larger than 8 mm. Nodule evaluation entailed 1044 imaging studies, 147 consultations, 76 biopsies, 11 resections, and 21 hospitalizations. Radiographic surveillance (n = 277) lasted a median of 13 months but ranged from less than 0.5 months to 8.5 years. Forty-six patients underwent invasive procedures (range per patient, 1-4); 41.3% (19 patients) did not have cancer and 10.4% (8) experienced complications, including 1 death. Notably, 15 of the 300 (5.0%) received no purposeful evaluation and had no obvious reason for deferral, seemingly "falling through the cracks." Among 157 patients with a nodule detected after release of the Fleischner Society guidelines, 44.7% received care inconsistent with guidelines (20.8% overevaluation, 26.9% underevaluation). In multivariable analyses, the strongest predictor of guideline-inconsistent care was inappropriate radiologist recommendations [overevaluation relative risk, 4.6 (95% CI, 2.3-9.2); underevaluation, 4.3 (2.7-6.8)]. Other system factors associated with underevaluation included receiving care at more than 1 facility (2.0 [1.5-2.7]) and nodule detection during an inpatient or preoperative visit (1.1-2.5).

CONCLUSIONS AND RELEVANCE: Pulmonary nodule evaluation is often inconsistent with guidelines, including cases with no workup and others with prolonged surveillance or unwarranted procedures that may cause harm. Systems to improve quality (eg, aligning radiologist recommendations with guidelines and facilitating communication across providers) are needed before lung cancer screening is widely implemented.

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Nodule pulmonaire fréquent en CT Thorax

BALANCE BENEFICE / RISQUES

TERRAIN

SEMILOGIE TDM
VDT
ALGORITHMES

INVESTIGATIONS
INVASIVES
ANXIETE
IRRADIATION
PATIENT

PROGRESSION
CANCER





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Callister ME, et al: Aug 70 Suppl 2,
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Wiener RS et al JAMA 2014; 174 (6): 871-80
- A practical algorithmic approach to the diagnosis and management of solitary pulmonary nodules (part 1 & 2)
Vishal k. Patel et al; Chest 2013 ; 143 (3) 825-839: 840-846
- Prise en charge du nodule pulmonaire en 2013
M.Lederlin et al; DII 2013 ; 94: 1084-1098
- Evaluation of individuals with pulmonary nodules: when is it lung cancer ?
MK.Gould et al, Chest 2013 ; 143 (5_suppl) :e93S-e120S
- Recommendations for the management of subsolid pulmonary nodules detected at CT: a statement from the Fleischner Society.