

Jan 2024 ONC-BE-2300248



ImmunoScience
Academy

*Partnering for Education & Optimizing
Treatment in ImmunoScience*

Workshop

Imaging for immunotherapy management

François Cousin, MD, PhD

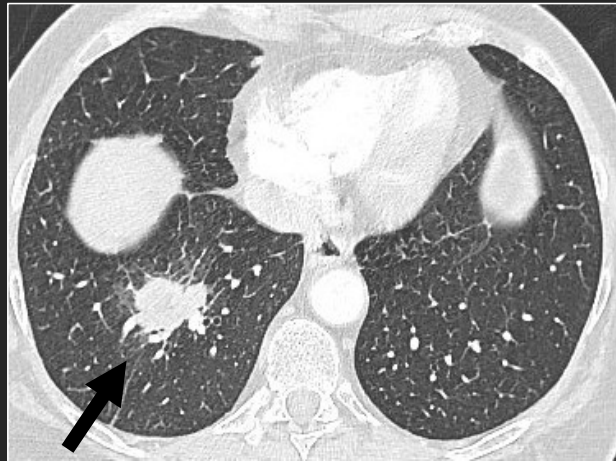
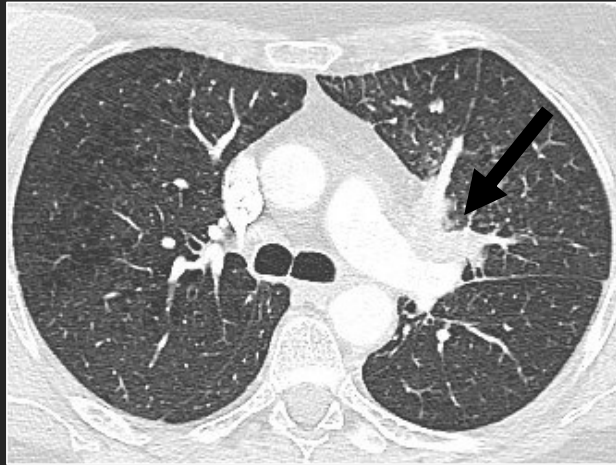


INSTITUT
DE CANCÉROLOGIE
ARSÈNE BURNY

CHU
de Liège

CASE 1

Baseline



- W, 56y
- NSCLC (ADK) cT2N2M1c
- PD-L1 = 50%

Anti-PD-1

9 cycles

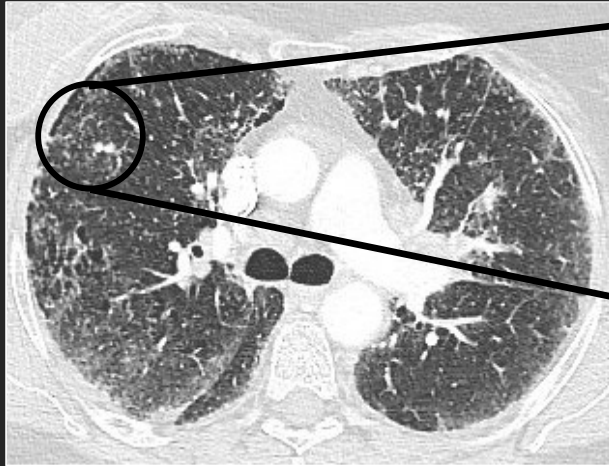
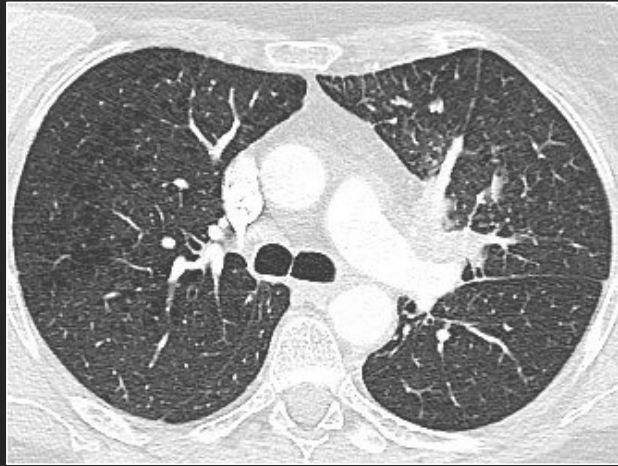
- Cough, dyspnoea
- CRP : 7.5 mg/L
- WBC : 7640/mm³

CASE 1

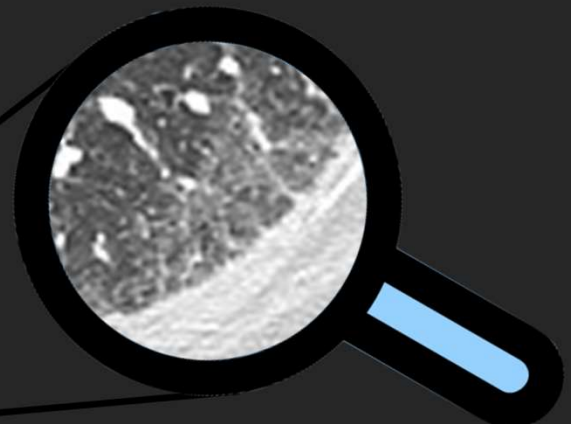
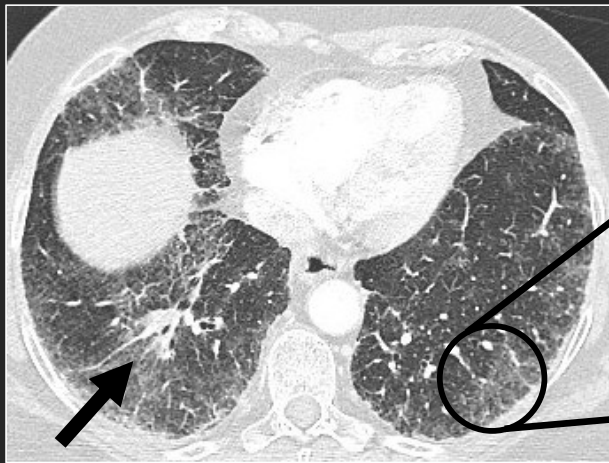
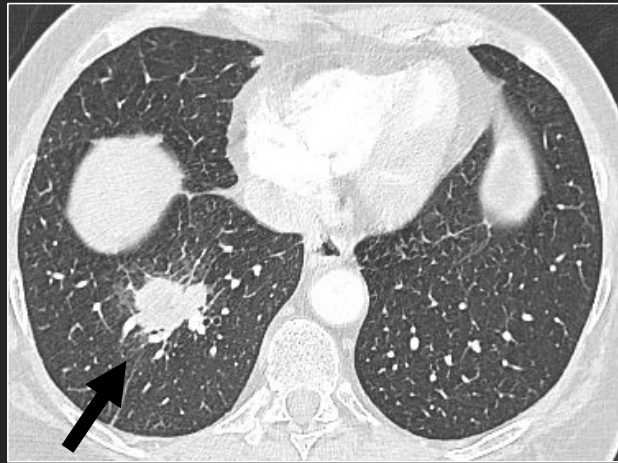
Baseline



4 months



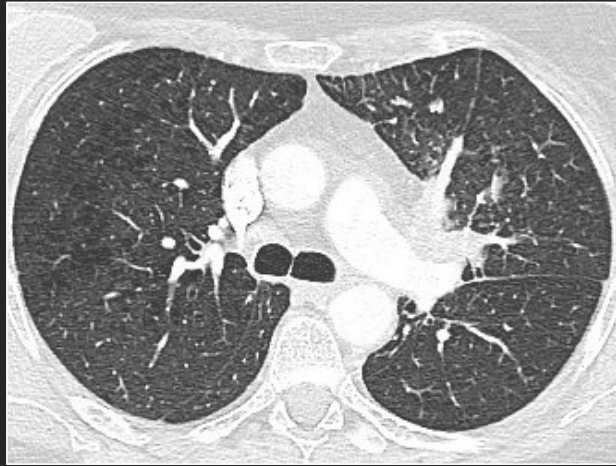
Reticulations



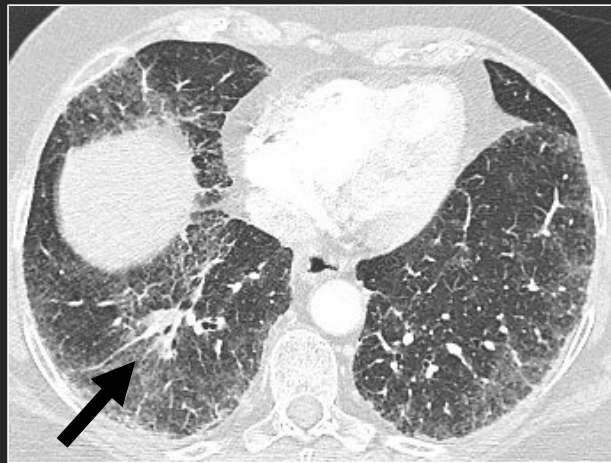
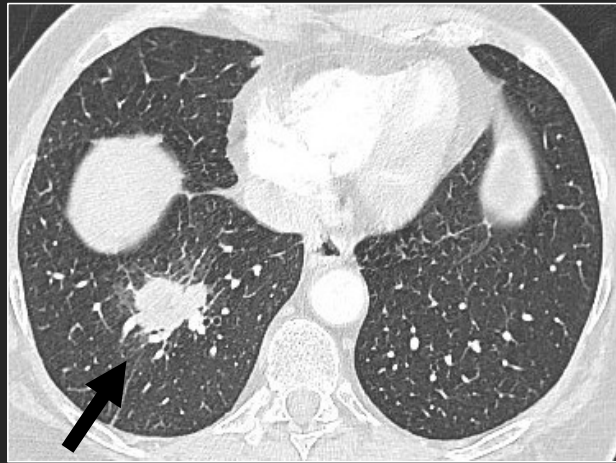
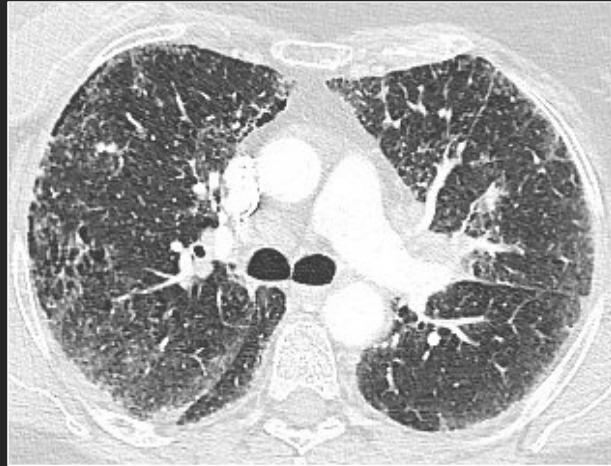
Ground glass

CASE 1

Baseline



4 months



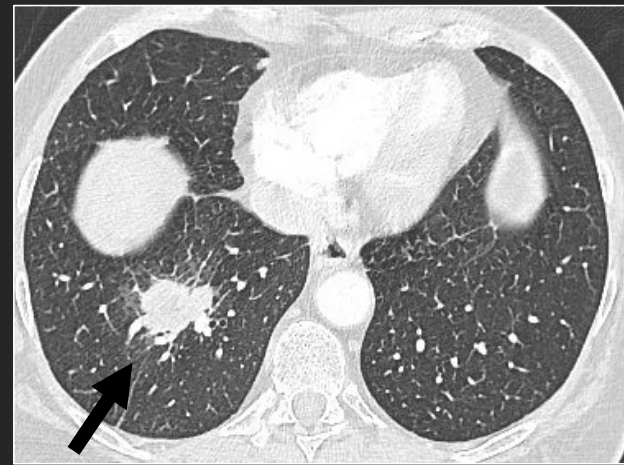
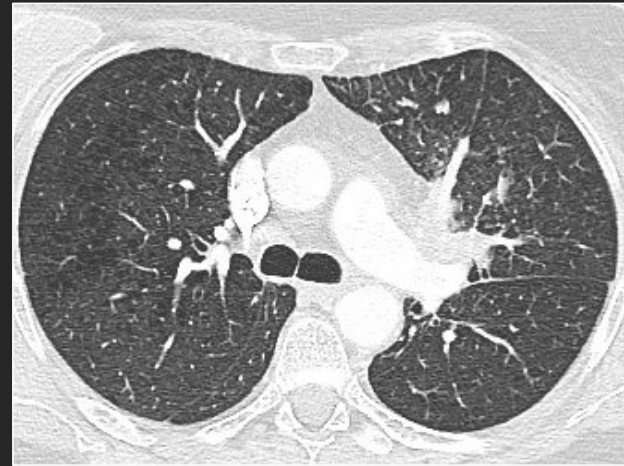
Sputum culture
: negative



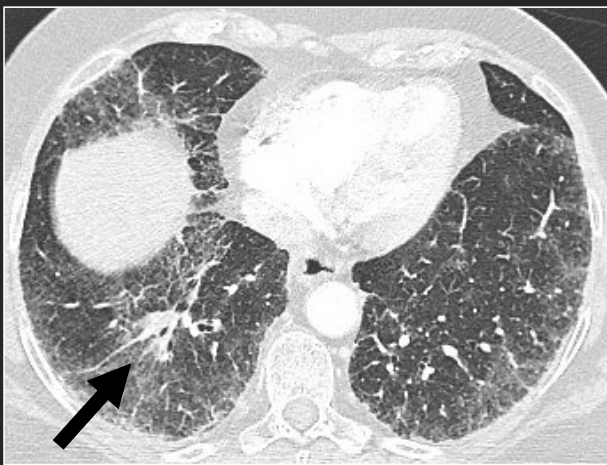
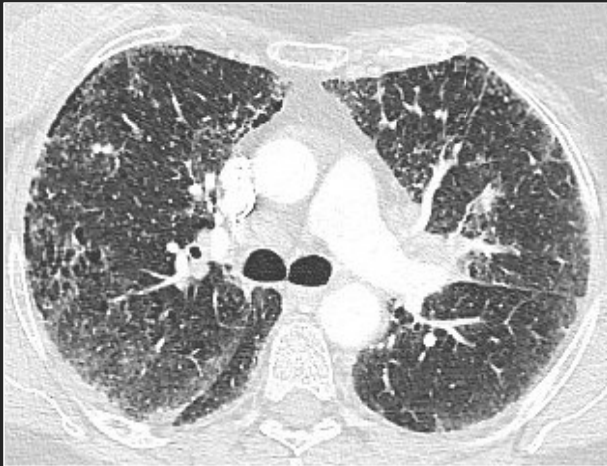
Corticosteroids

CASE 1

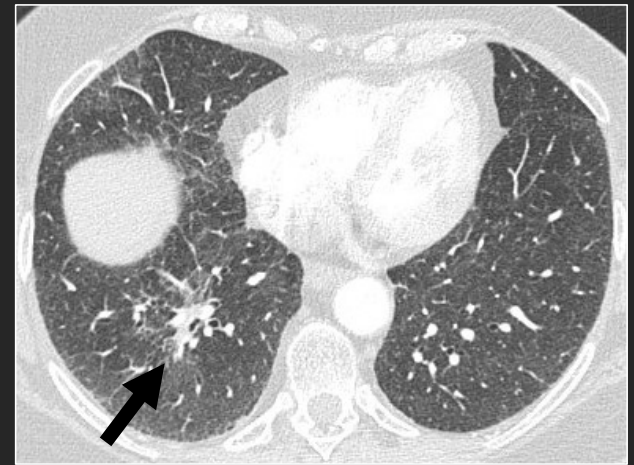
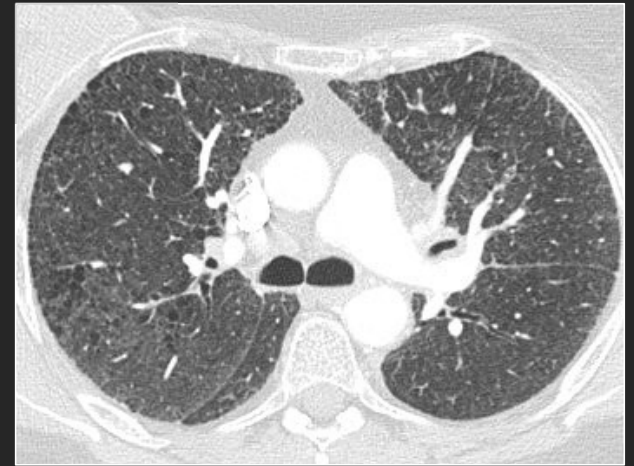
Baseline



4 months



7 months



Immune-related Pneumonitis

- Definition

= immunotherapy toxicity

= auto-immune inflammation of lung parenchyma
(intersitium)

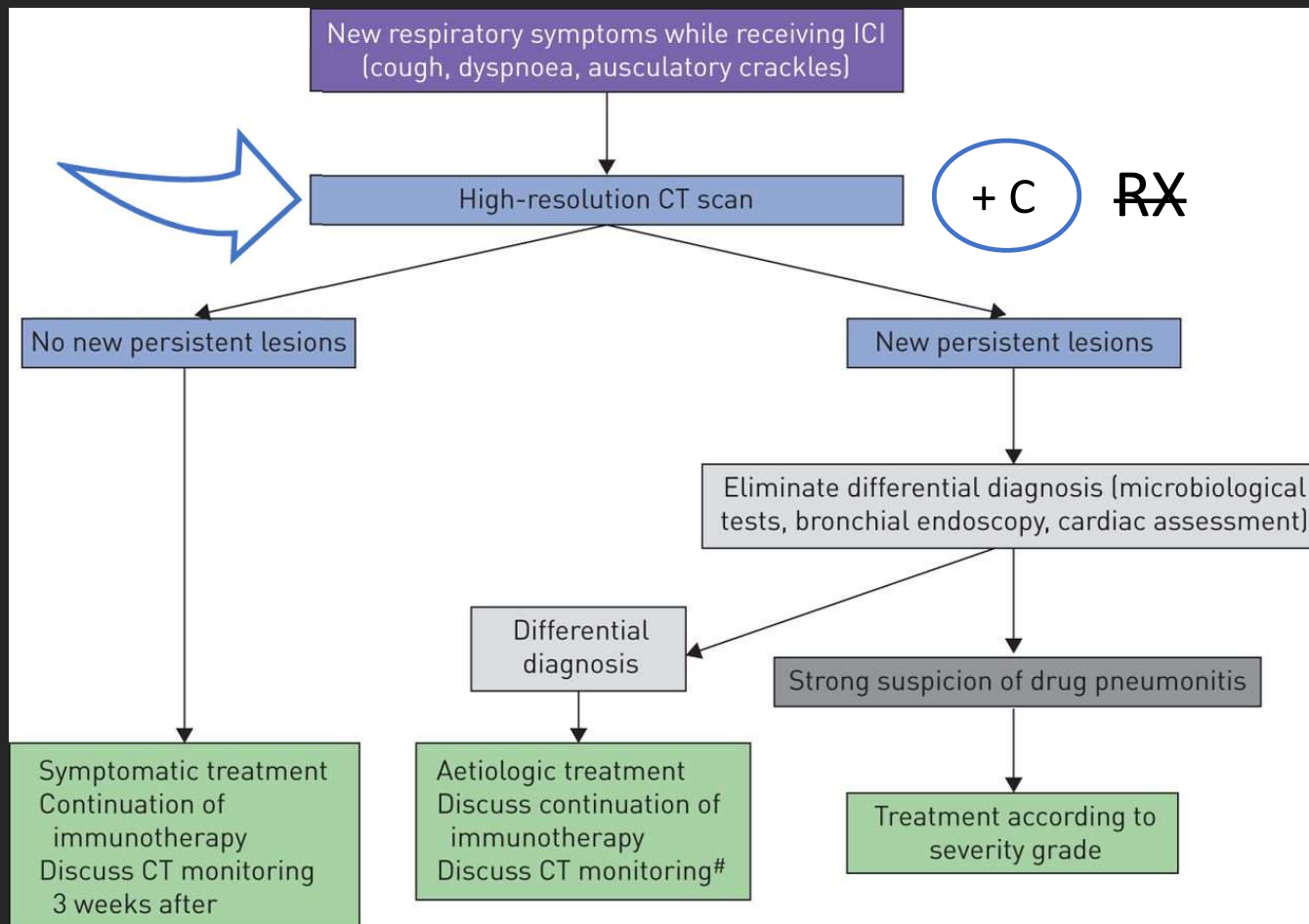
Immune-related Pneumonitis

- Definition
- Diagnosis

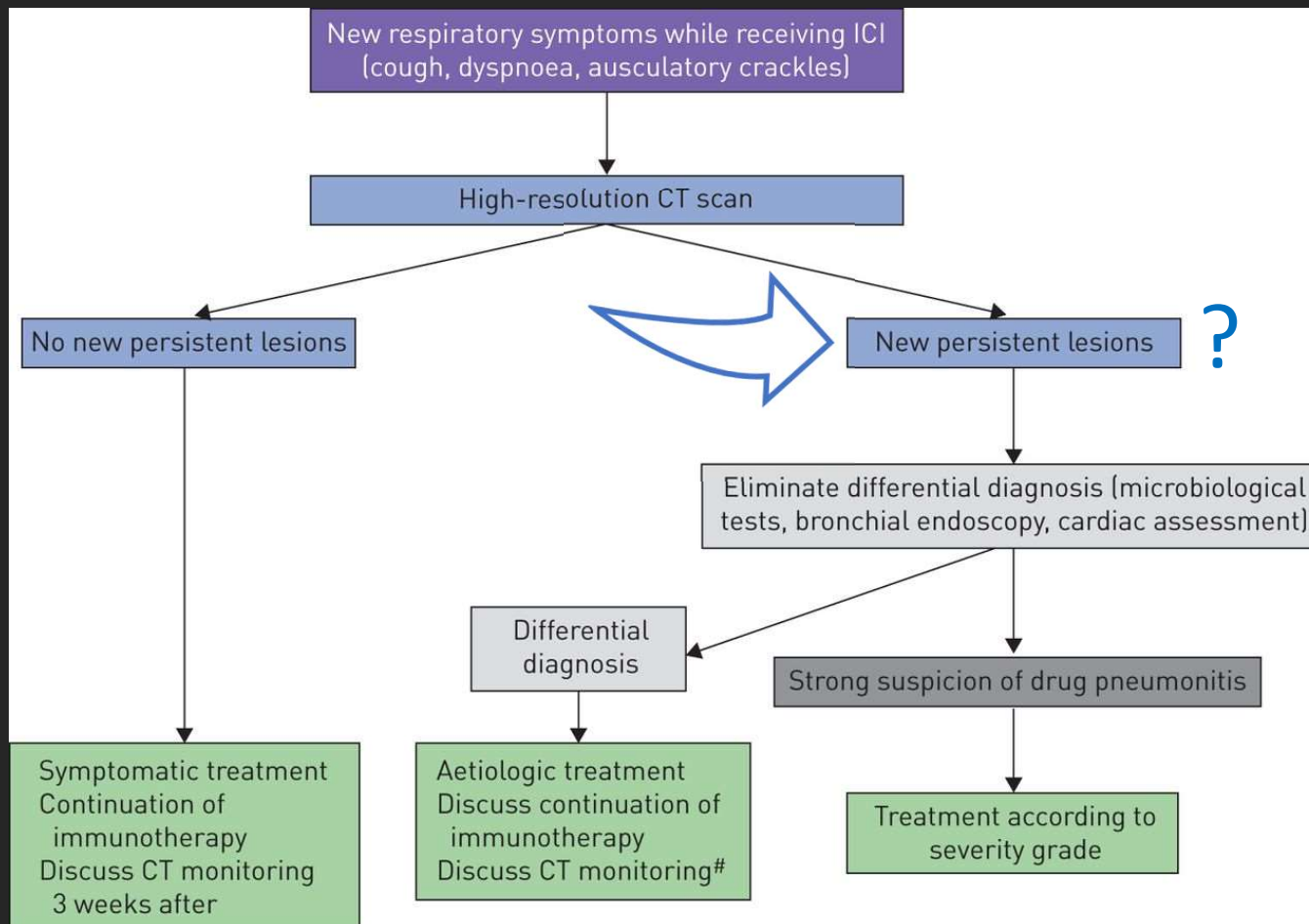
- ✓ New lung opacities on chest imaging
- ✓ Temporal relationship with ICI
- ✓ Exclusion of other causes

= diagnosis of exclusion

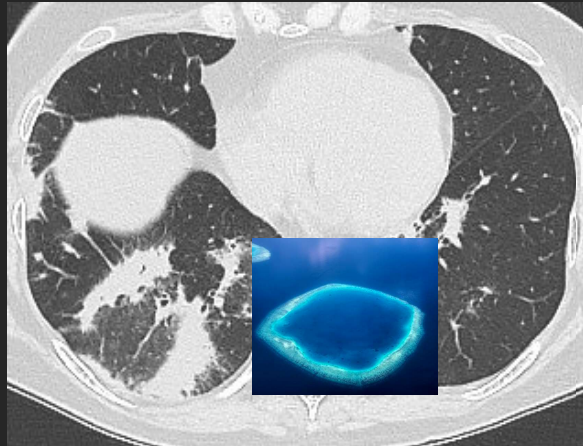
Immune-related Pneumonitis



Immune-related Pneumonitis



Radiological patterns



OP (33-65%)



NSIP (15-17%)



HP (10-15%)



ARDS (10%)



DELAUNAY *et al.* [6]

N=64

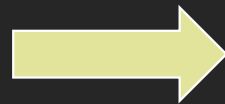
Radiology
patterns



Immune-related Pneumonitis

- If no typical pattern identified

Rule of thumb :



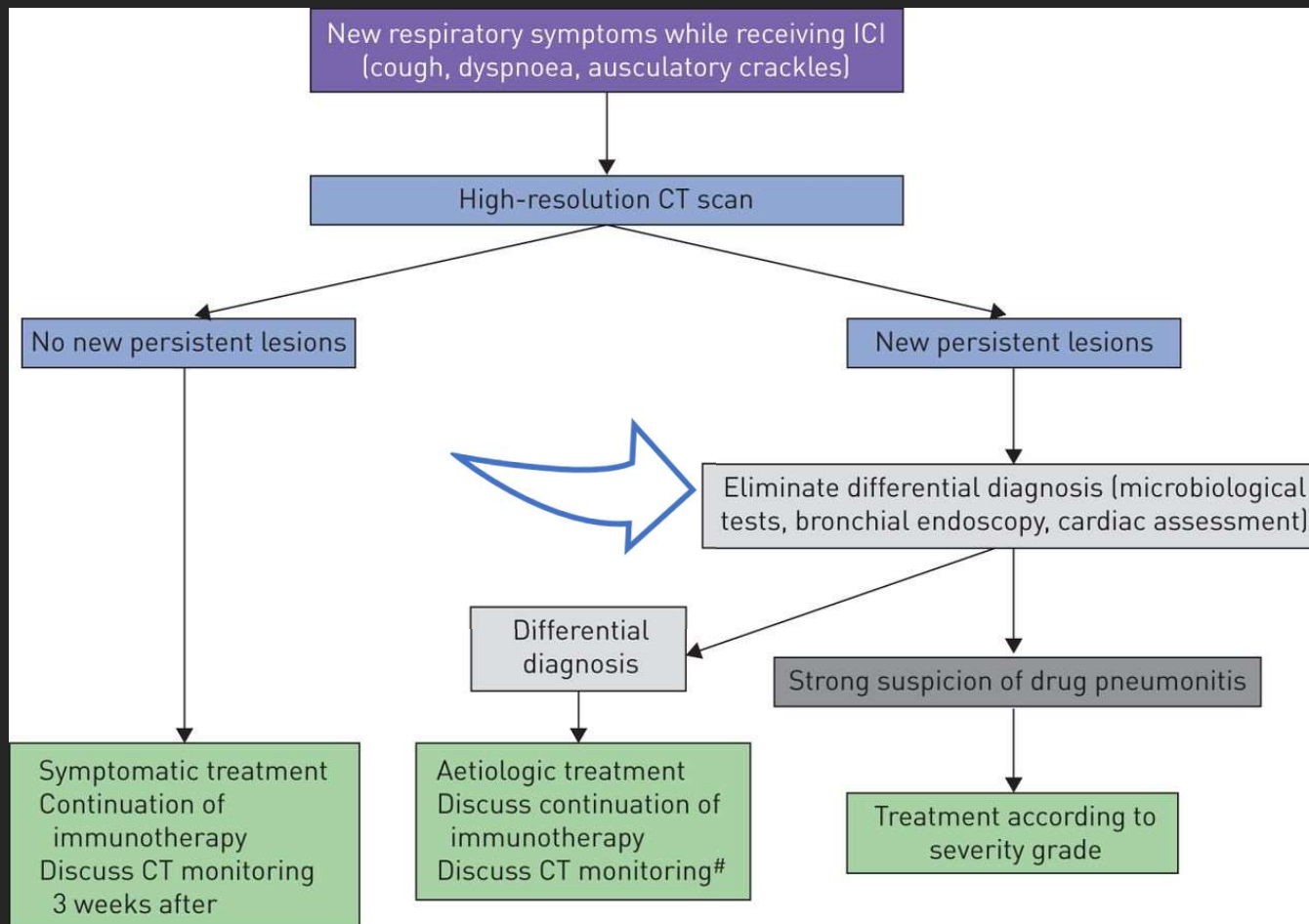
Diffuse,
all lobes involved

- Ground glass opacities (55-100%)
- Reticulations/fibrosis (55-95%)
- Consolidations (32-60%)



Nishino M. et al. (2019) Radiology
Khunger M. et al. (2017) CHEST
Kalisk KR. et al. (2019) Radiographics

Immune-related Pneumonitis



Immune-related Pneumonitis

Differential diagnosis

Infectious pneumonitis

Radiation pneumonitis

Tumour progression or carcinomatous lymphangitis

Pulmonary oedema due to heart failure or myocarditis

Immune-related Pneumonitis

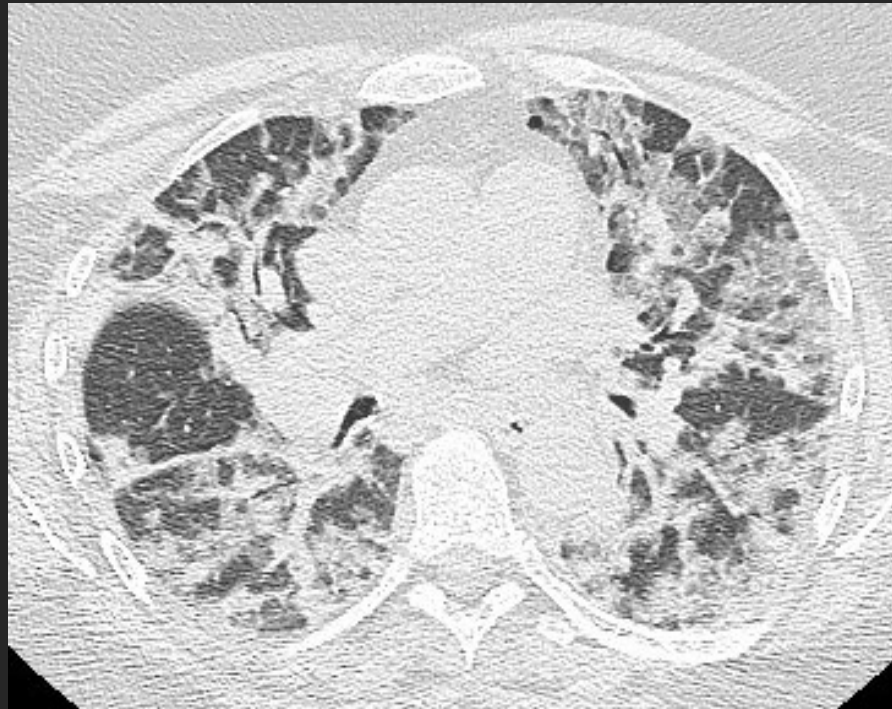
Differential diagnosis

Infectious pneumonitis

Radiation pneumonitis

Tumour progression or carcinomatous lymphangitis

Pulmonary oedema due to heart failure or myocarditis



COVID 19

Immune-related Pneumonitis

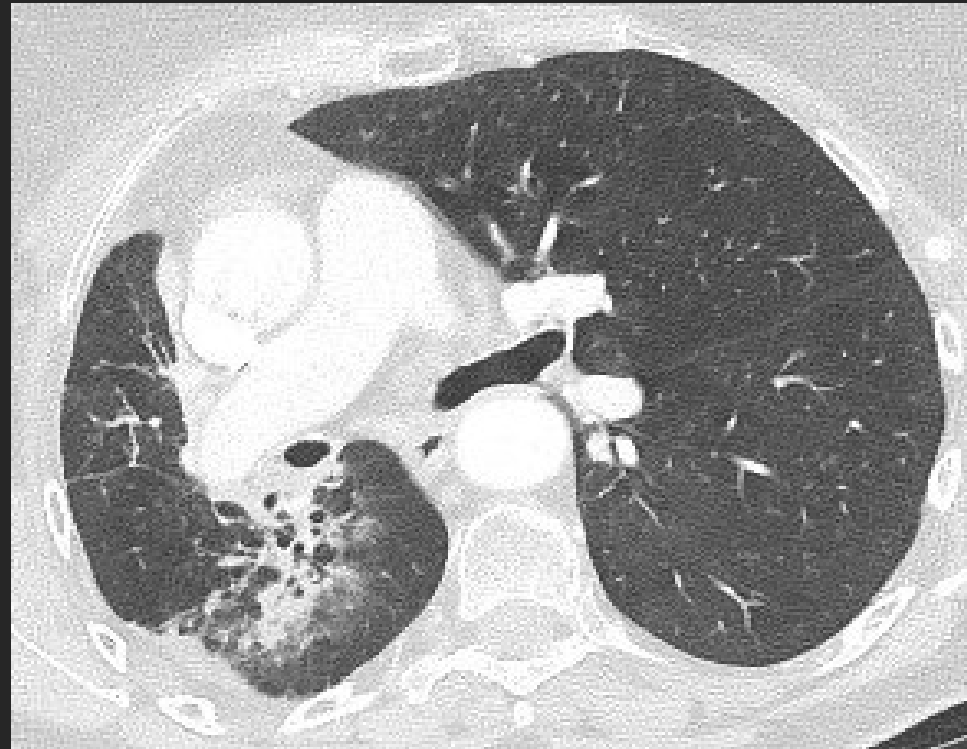
Differential diagnosis

Infectious pneumonitis

Radiation pneumonitis

Tumour progression or carcinomatous lymphangitis

Pulmonary oedema due to heart failure or myocarditis



Immune-related Pneumonitis

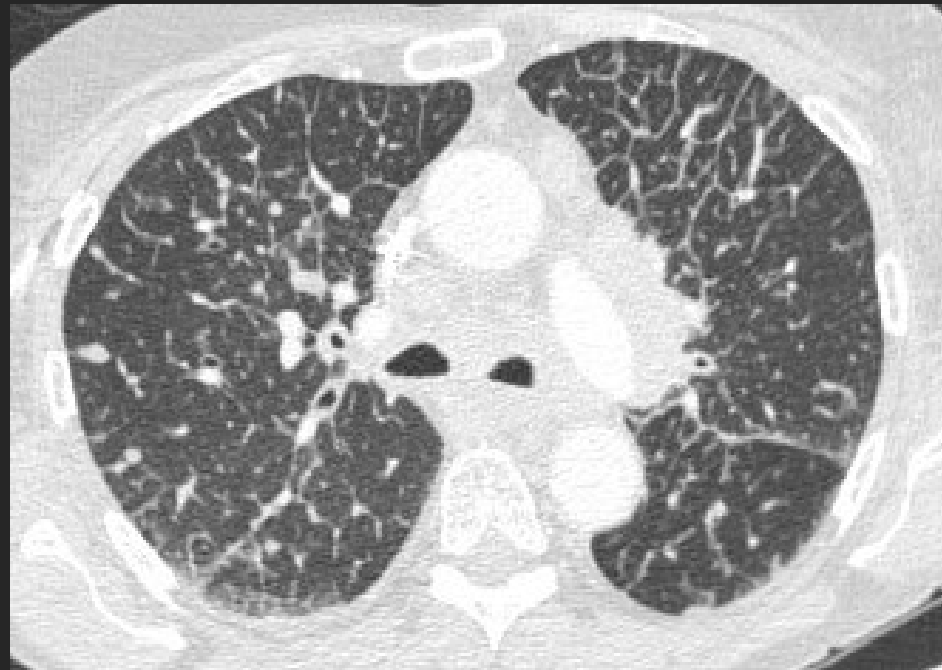
Differential diagnosis

Infectious pneumonitis

Radiation pneumonitis

Tumour progression or carcinomatous lymphangitis

Pulmonary oedema due to heart failure or myocarditis



Immune-related Pneumonitis

Differential diagnosis

Infectious pneumonitis

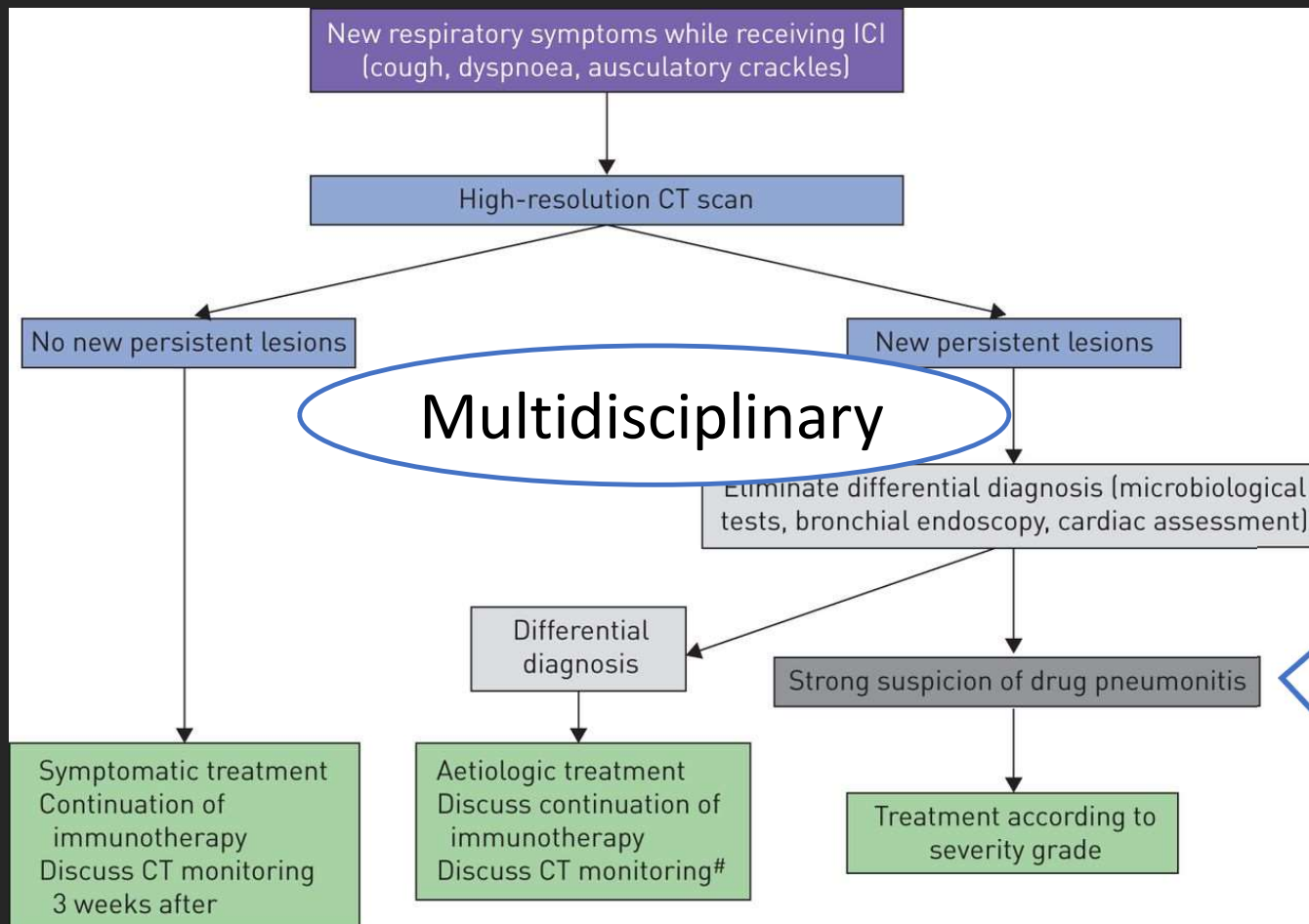
Radiation pneumonitis

Tumour progression or carcinomatous lymphangitis

Pulmonary oedema due to heart failure
or myocarditis

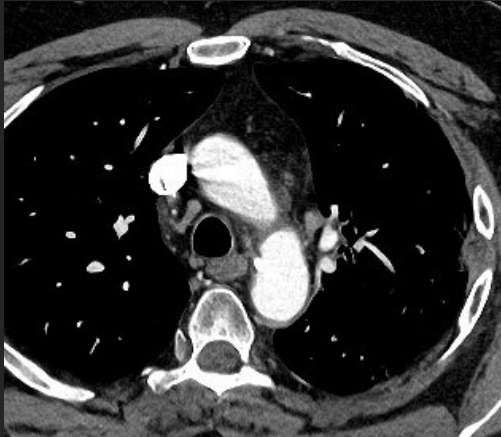


Immune-related Pneumonitis



CASE 2

Before ICI



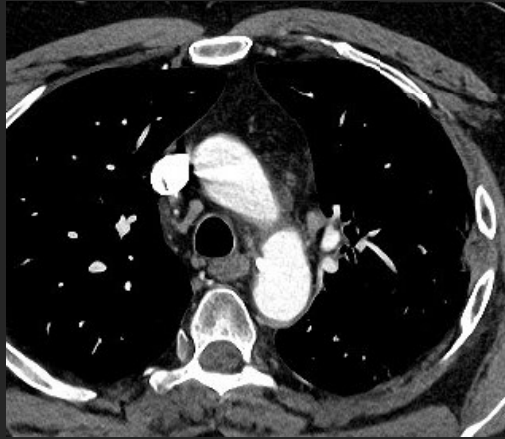
- M, 57y
- NSCLC (SCC) cT3N2M0
- PD-L1 100%

RT-CT

Maintenance
Anti-PD-L1

CASE 2

Before ICI



4 months



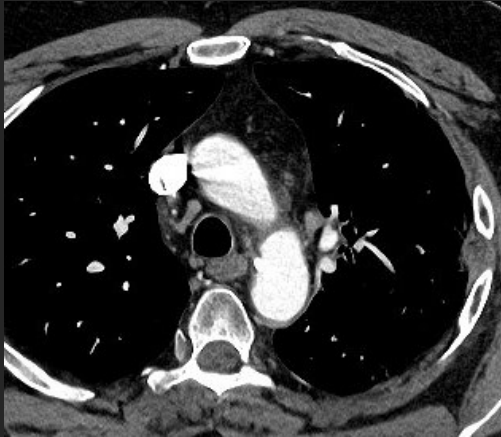
FDG-PET



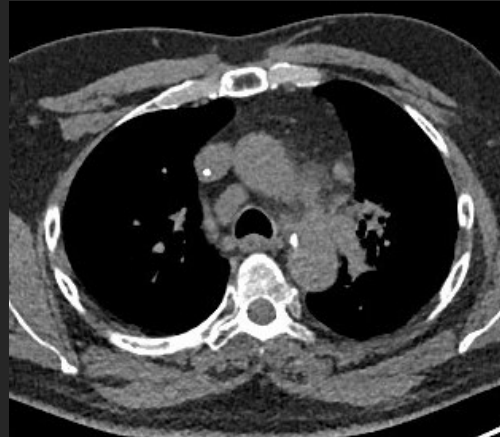
FDG-PET, fluorodeoxyglucose positron emission tomography.

CASE 2

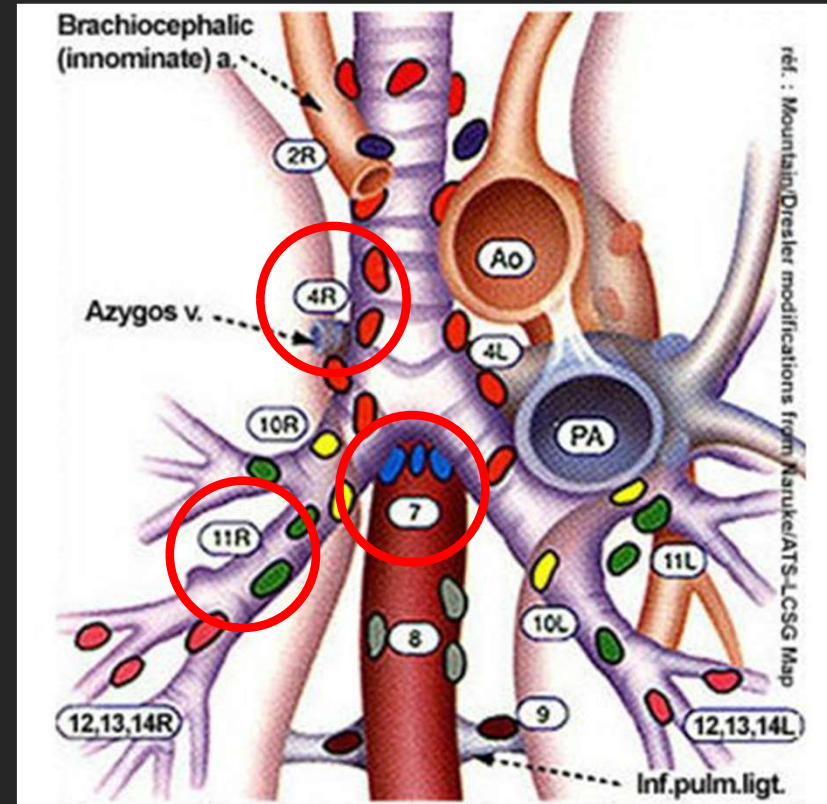
Before ICI



4 months



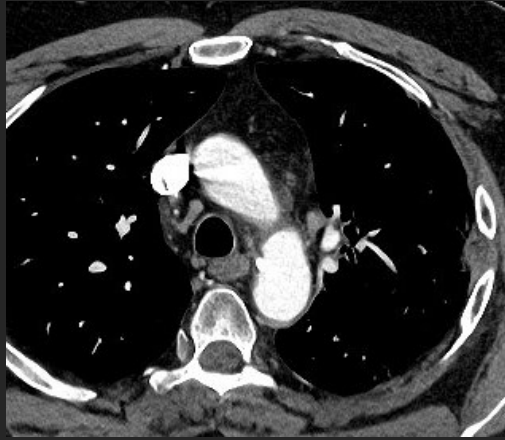
EBUS



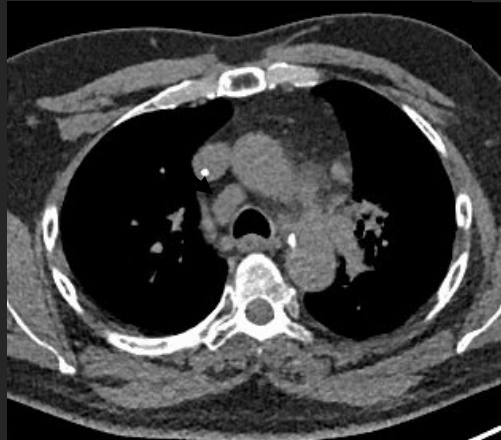
→ Non-necrotizing granulomatous inflammation

CASE 2

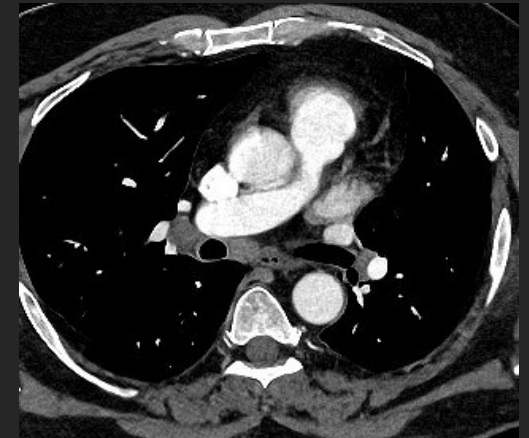
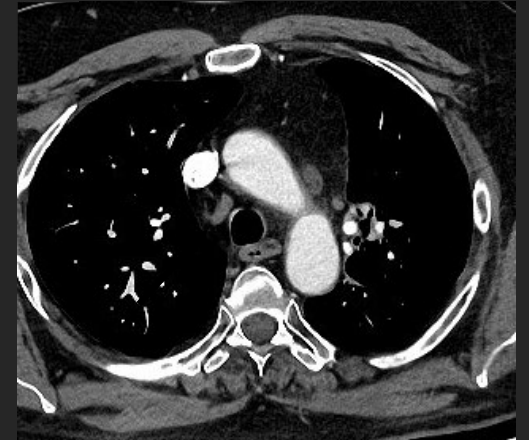
Before ICI



4 months



10 months



Sarcoïd-like Reaction

- Definition = ICI-induced sarcoïdosis
- Incidence : 5% (> anti-CTLA-4)
- Presentation:
 - Mediastinal LN > lungs > skin
- Prognosis :
 - No or few symptoms
 - Good response to CS

Gkiozos I et al. (2018) J Thorac Oncol
Chorti et al. (2020) Eur J Cancer
Chanson N et al. (2021) Eur J Cancer

Sarcoid-like Reaction



Imaging hints

- Symmetrical lymph nodes
- Global tumoral burden

CASE 3

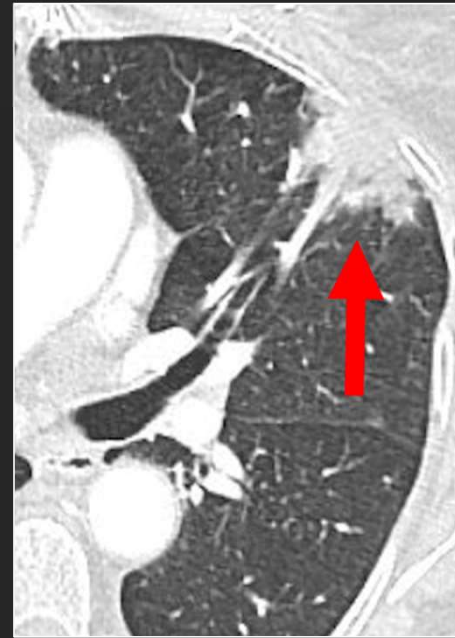
- W 73y
- NSCLC (ADK) M+



Anti-PD-1



Baseline



1 month

CASE 3

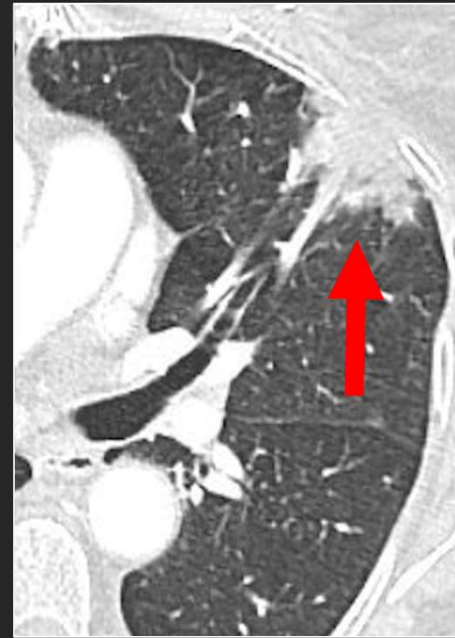
- W 73y
- NSCLC (ADK) M+



Anti-PD-1



Baseline



1 month



8 months

CASE 3

- W 73y
- NSCLC (ADK) M+



Anti-PD-1



Baseline



1 month



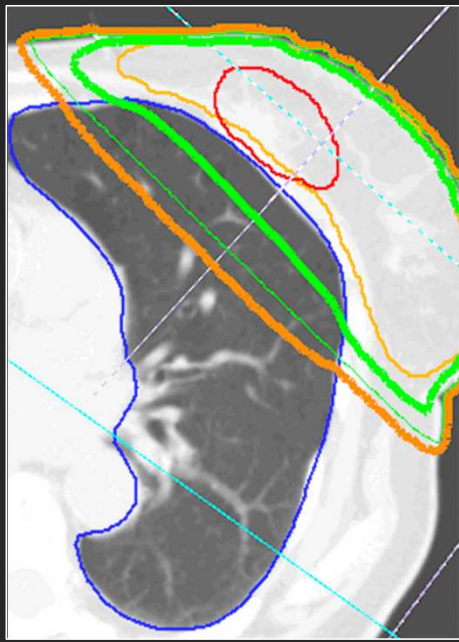
8 months

CASE 3

- W 73y
- NSCLC (ADK) M+



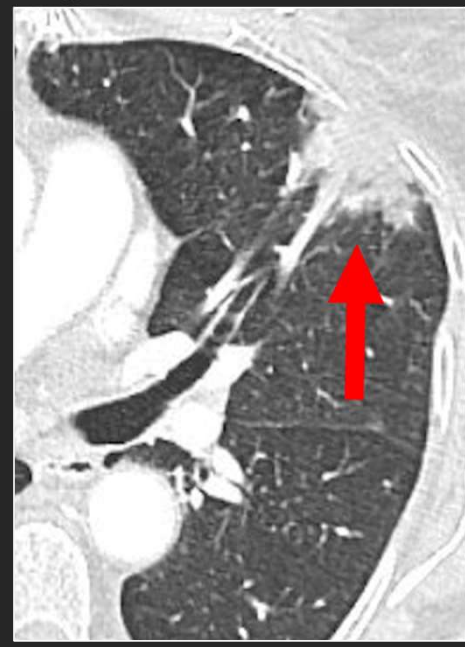
Anti-PD-1



3,5 y ago



Baseline



1 month



8 months

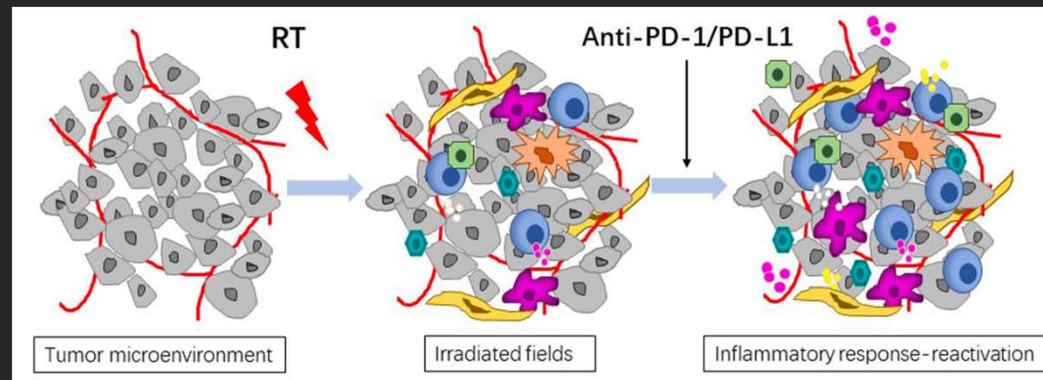


PD-1, programmed death-1.

Radiation recall reaction

= Late reactivation of RT-induced inflammation caused by a systemic treatment

- Irradiated tissues = latent pro-inflammatory state



- Can affect all tissues
- Frequent in lungs



Teng F. et al. (2020) BMC Medicine
Cousin F. et al. (2021) Radiother Oncol

Summary

1. Immune-related pneumonitis
 - Nonspecific radiological changes
 - Affecting all lobes
 - Multidisciplinary diagnosis
2. Sarcoid-like reaction
 - Bilateral and symmetrical thoracic LN
3. Radiation recall reaction
 - Late reactivation of RT-induced inflammation
 - Triggered by ICI
 - Not rare in the lungs





Enjoy the break

18.05-18.20	BREAK			
18.25	<p>18.25 => 19.05 PLENARY 2 Novel concepts in cancer Immunotherapy B ROUTY T KERRE S RAUH (Mod)</p>			
19.10		<p>19.10=>19.50 Patient education: Examples from academics centers T KERRE S STREEL M VANDEVELDE J VANSTEENKISTE (Mod)</p>	<p>19.10=>19.50 CAR T vs Bispecifics : Toxicity and sequencing P VANDENBERGHE J CAERS R SCHOTS (Mod)</p>	<p>19.10=>19.50 Drug Interference during Immunotherapy M ILZKOVITZ B ROUTY A AWADA (Mod)</p>
19.50	<p>19.50 => 20.05 CLOSING P LACANTE & P COULIE</p>			
20.00 - 22.00	WALKING DINNER			