

Radiologische evaluatie van leverziekten

A. Šrámek, radioloog

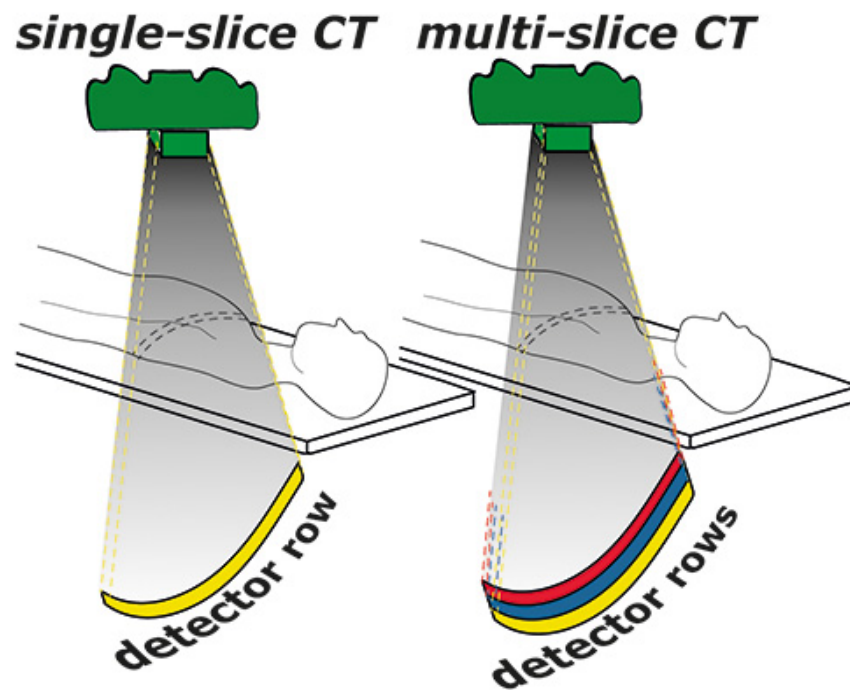
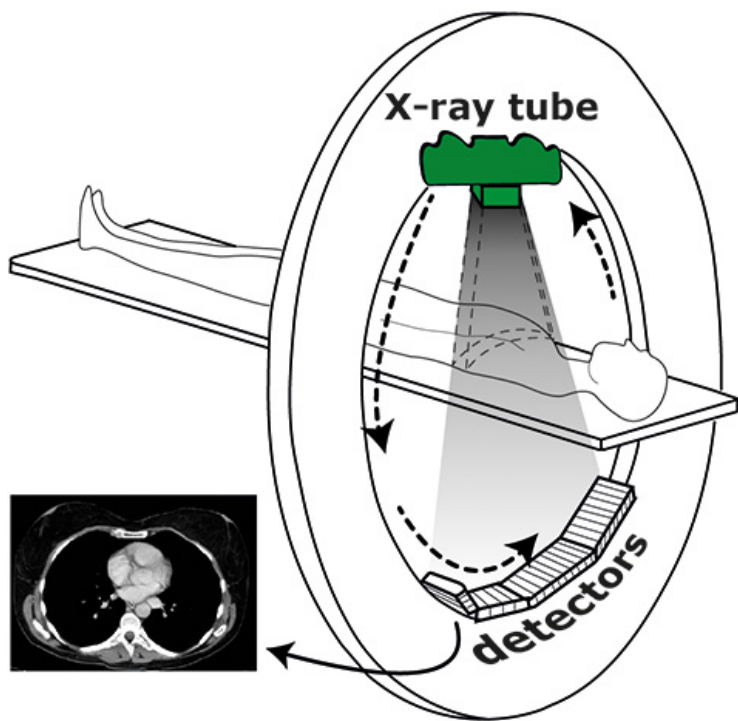
Afd. radiologie

LEIDEN, 21 JUNI 2017



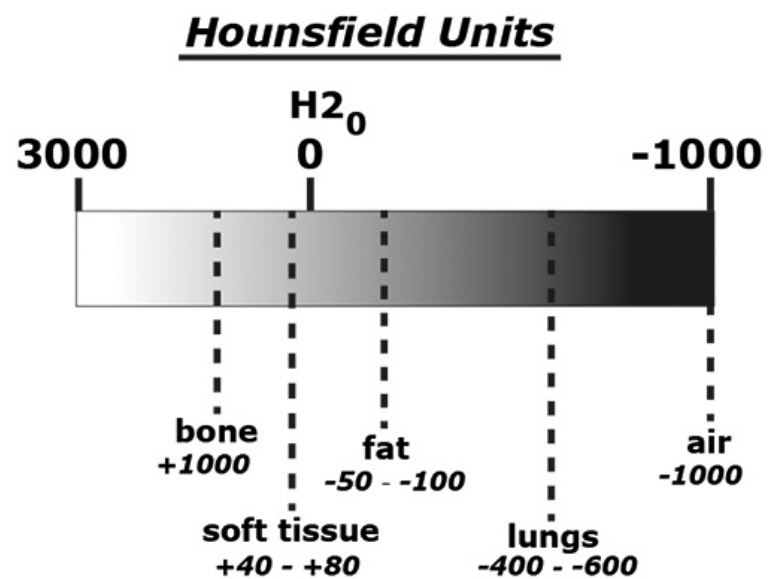
Geen belangenverstrengeling

Röntgenstralen



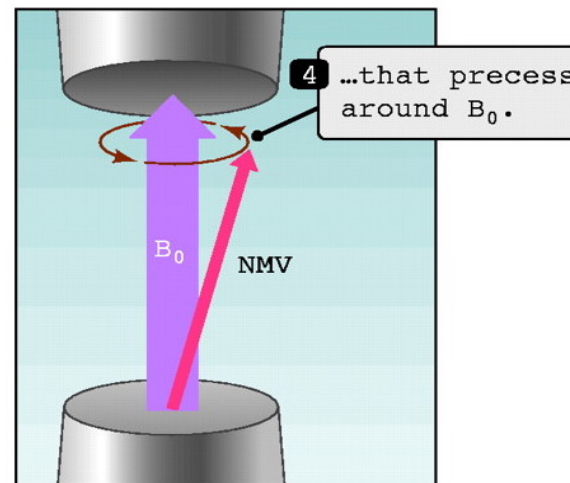
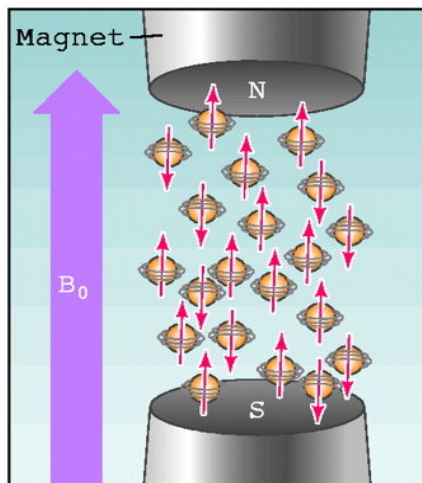
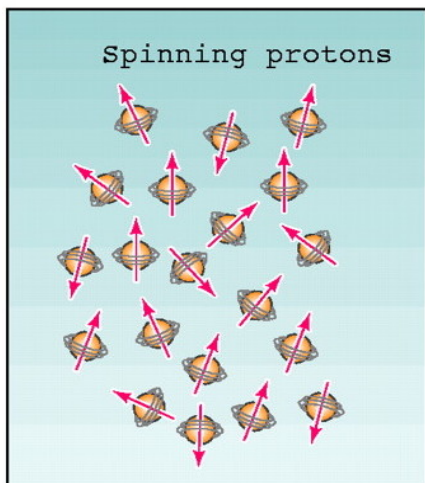
CT

Röntgenstralen

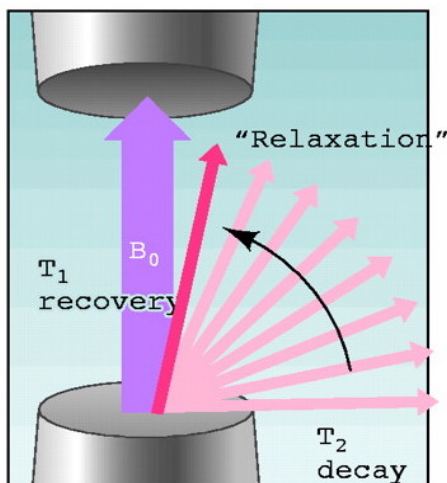
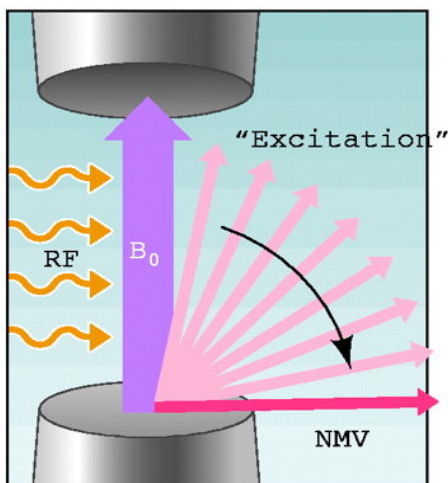


MRI

Magneetvelden en radiopulsen

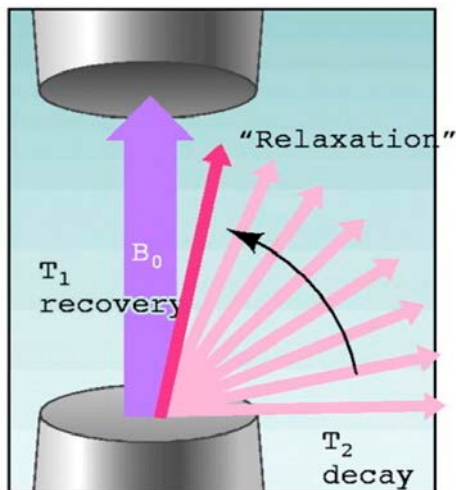


B

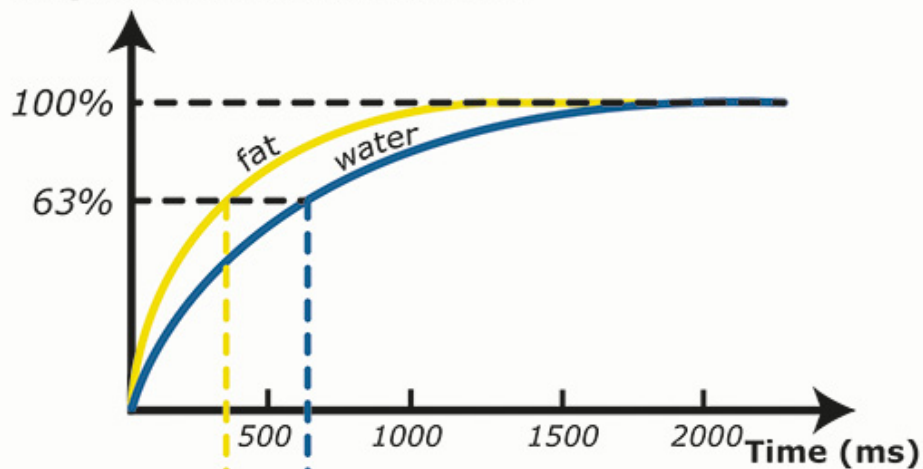


MRI

T1 en T2

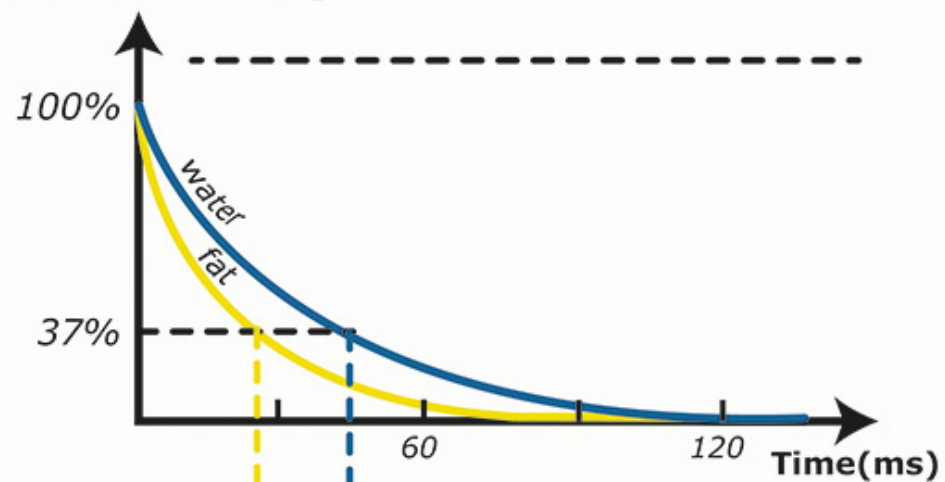


Longitudinal magnetization



= T1 relaxation times

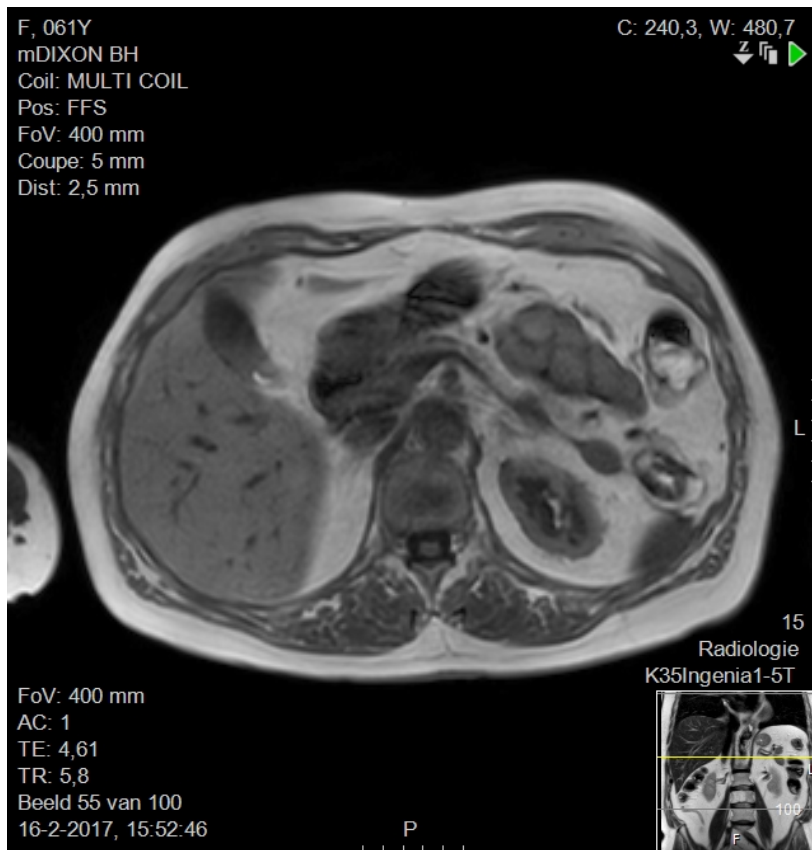
Transversal magnetization



= T2 relaxation times

MRI

T1 en T2 plaatje



T1

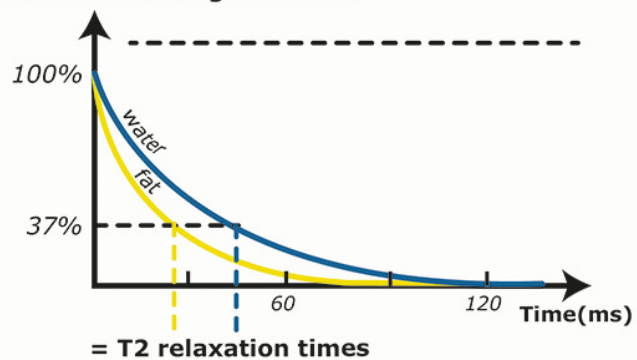


T2

MRI

T2, echotijd

Transversal magnetization



T2 korte echotijd

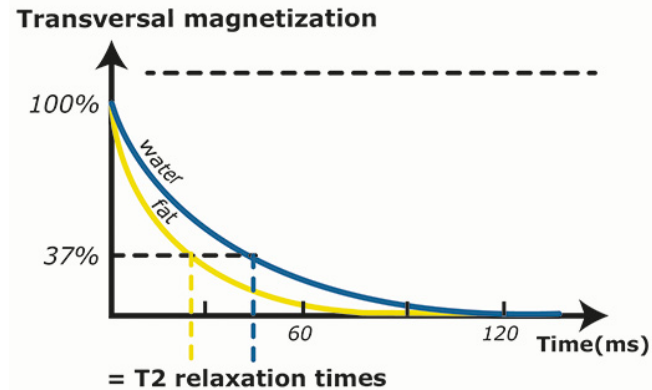


T2 lange echotijd



T2 zeer lange echotijd

T2, lange echotijd



Hoog signaal:

- *Cysten*
- *Hemangiomen*

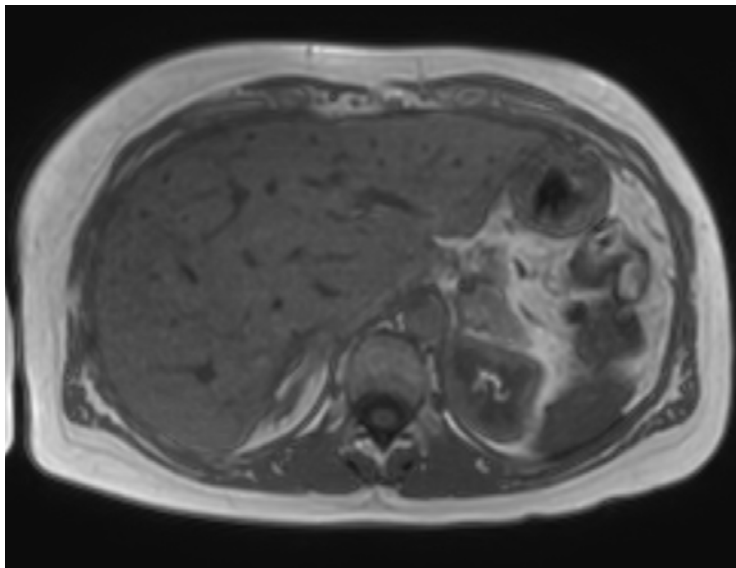
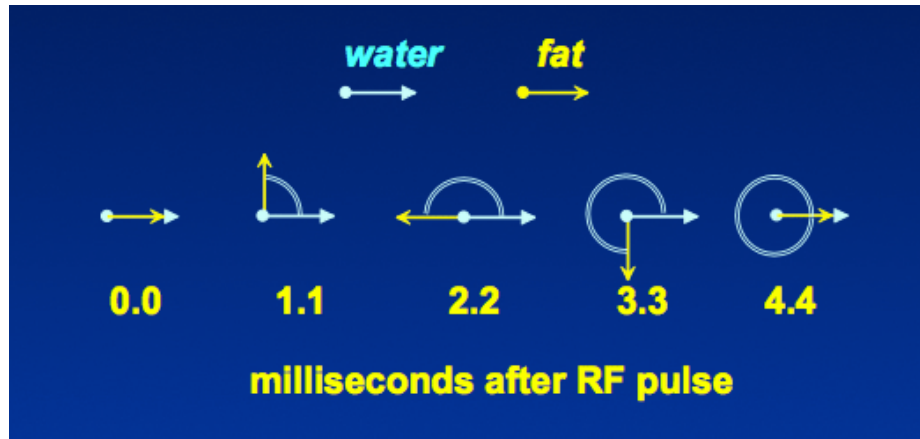


Geen signaal:

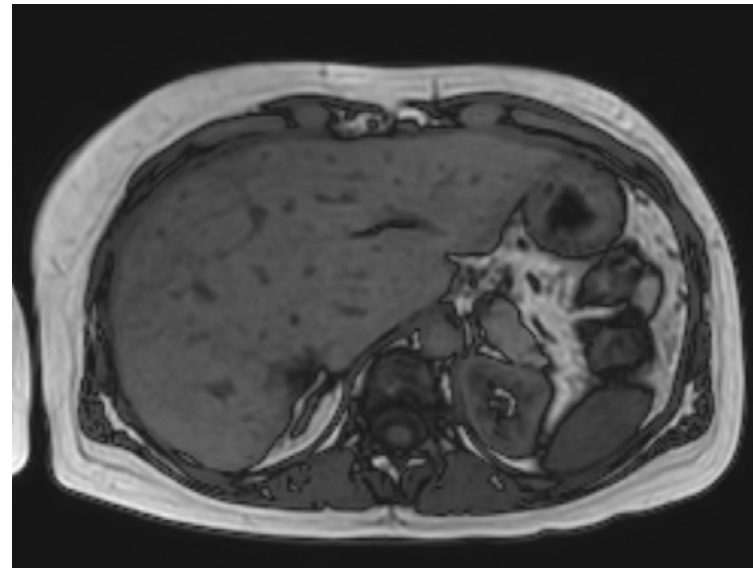
Massieve laesies

MRI

Chemical shift



In-phase

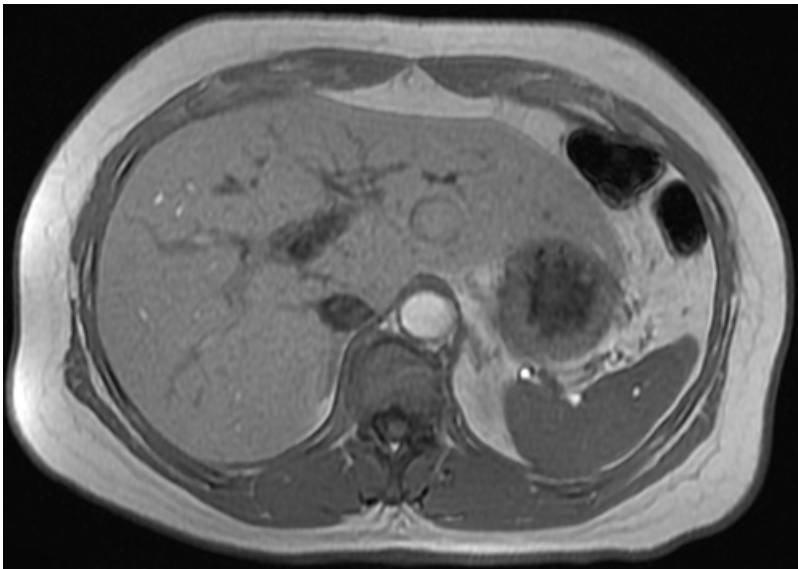
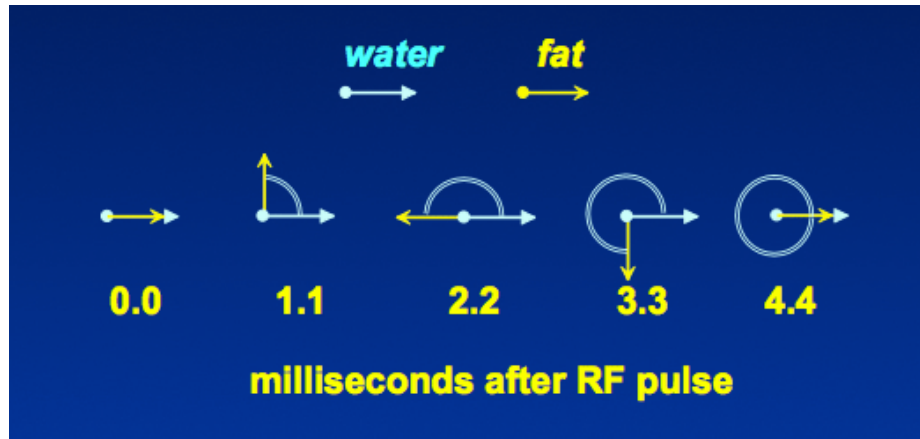


Out-phase

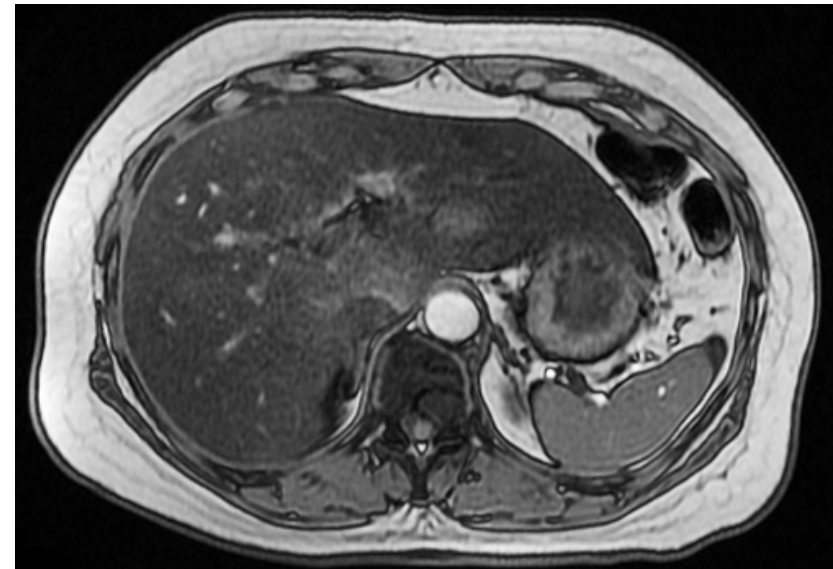
Questions and answers in MRI: www.mri-q.com

MRI

Chemical shift



In-fase



Uit-fase

Questions and answers in MRI: www.mri-q.com

Contrast



Waarom contrast:

- Beoordelen inhoud en wanden holle structuren
- Ontplooiing structuren (bijv. darm)
- Onderscheid structuren
- Beoordelen (afwijkende) aankleuring

Werking intraveneus contrast

- CT contrast

Jodium → absorptie röntgenstralen → hyperdens

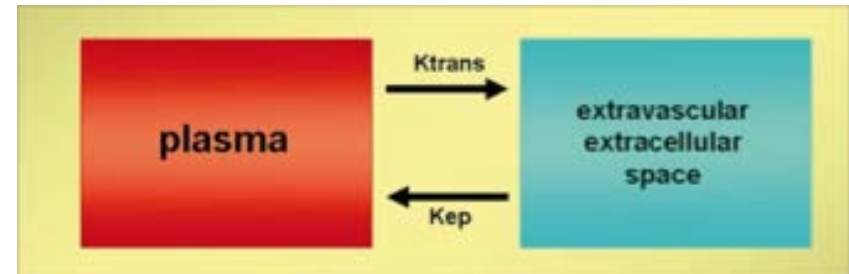
- MRI contrast

Gadolinium → verkorting T1 → hoger signaal op T1

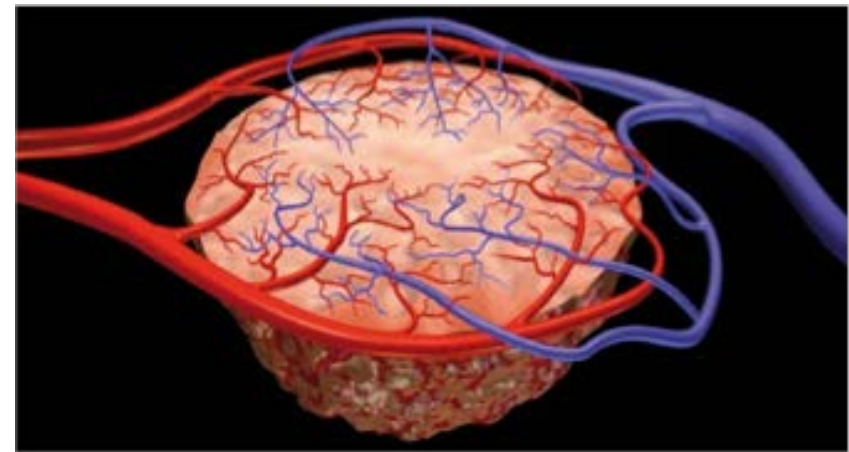
Contrast

Aankleuring:

- Doorbloeding
- Permeabiliteit van de vaten
- Grootte van de moleculen

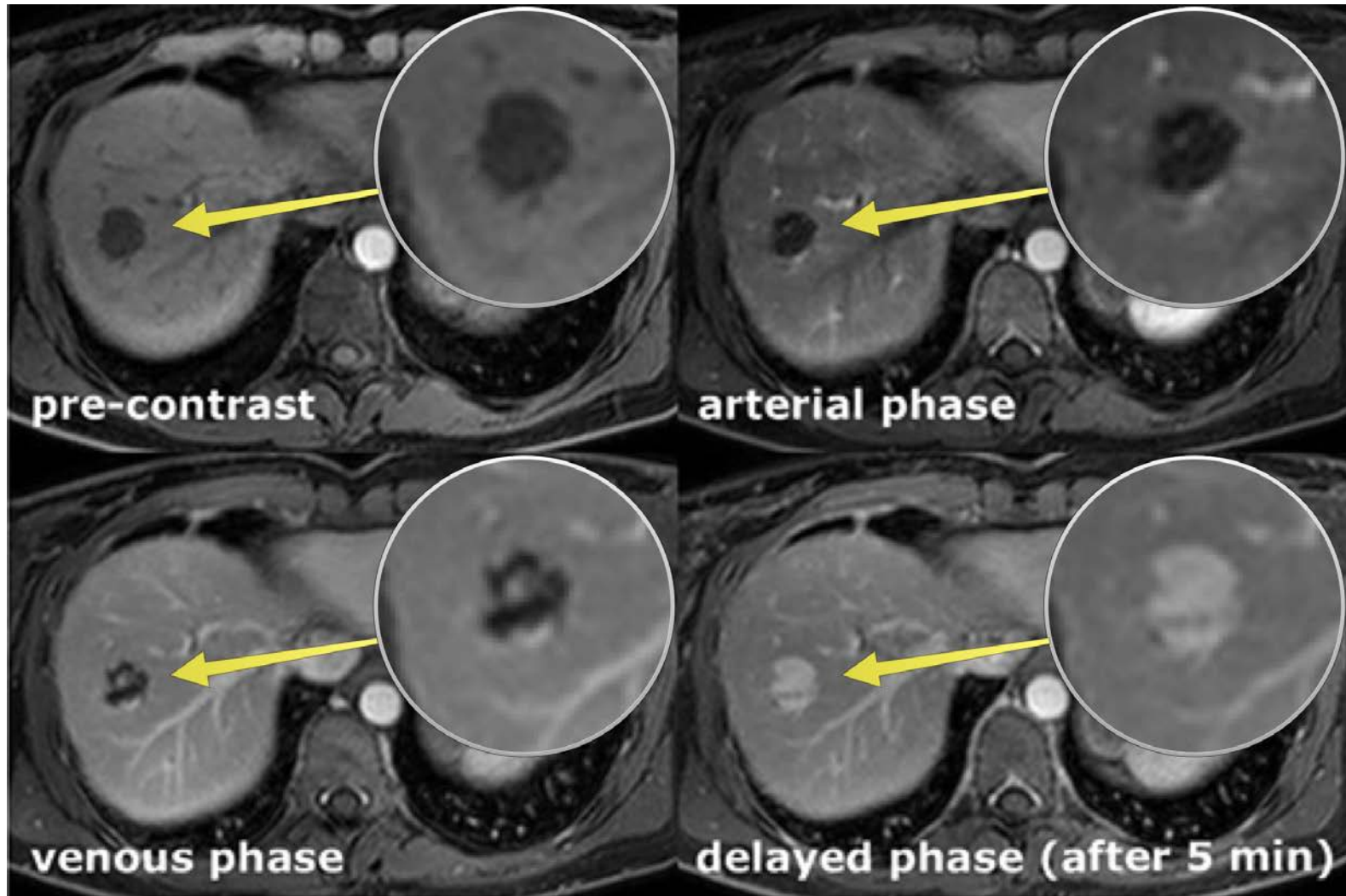


Lever dubbele vascularisatie



Contrast

MRI: contrast in meerdere fasen

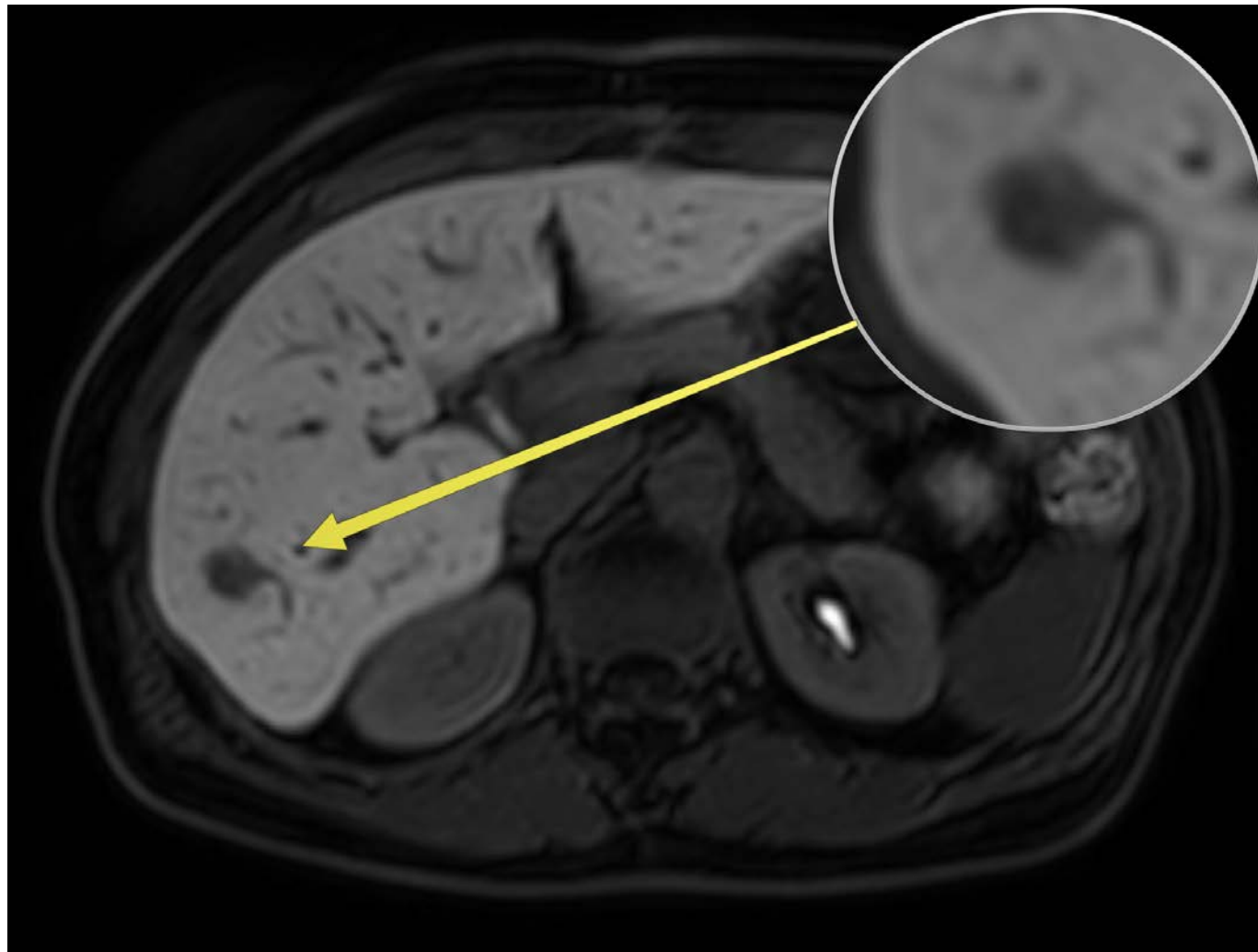


Twee soorten gadolinium contrast:

- Extracellulair gadolinium
(Magnovist, Omniscan, Dotarem)
- Combi extracellulair en hepatobiliair
(Multihance, Primovist)

Contrast

MRI: Primovist hepatobiliaire fase, CRC metastase

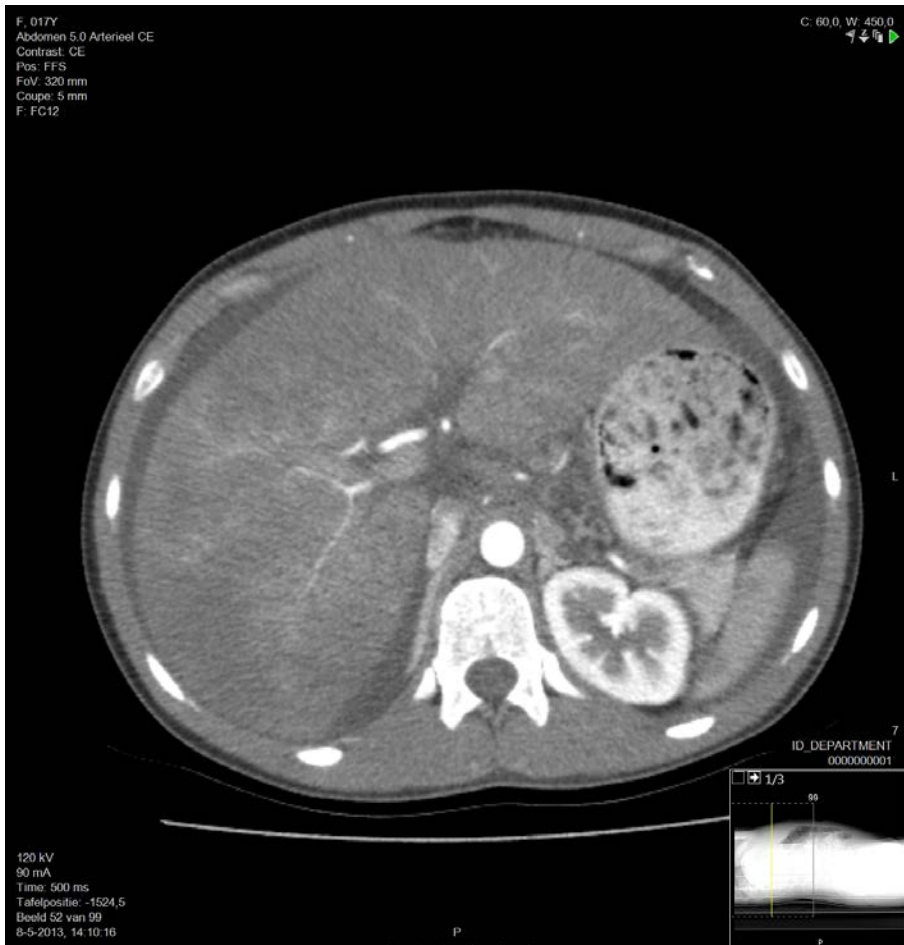


Casuïstiek

Casus 1

Casuïstiek

CT



Arterieel



Portaal-veneus

Casuïstiek

CT, arterieel



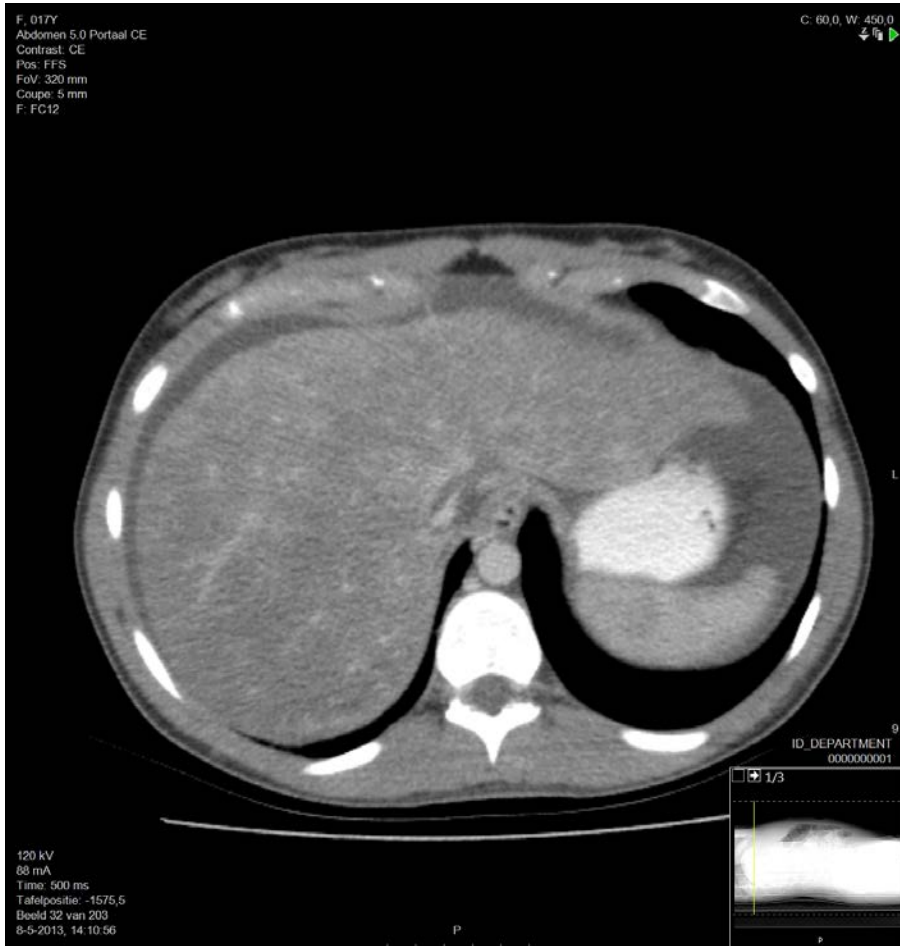
Patiënt



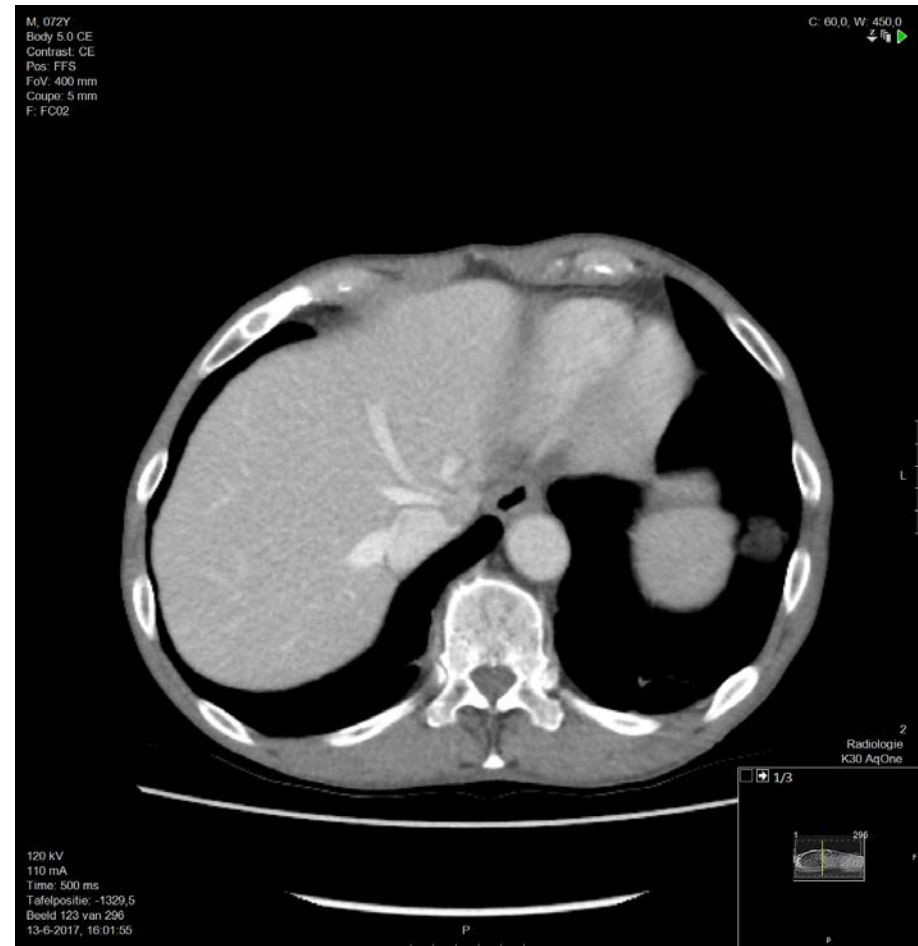
Normaal

Casuïstiek

CT, portaal-veneus



Patiënt



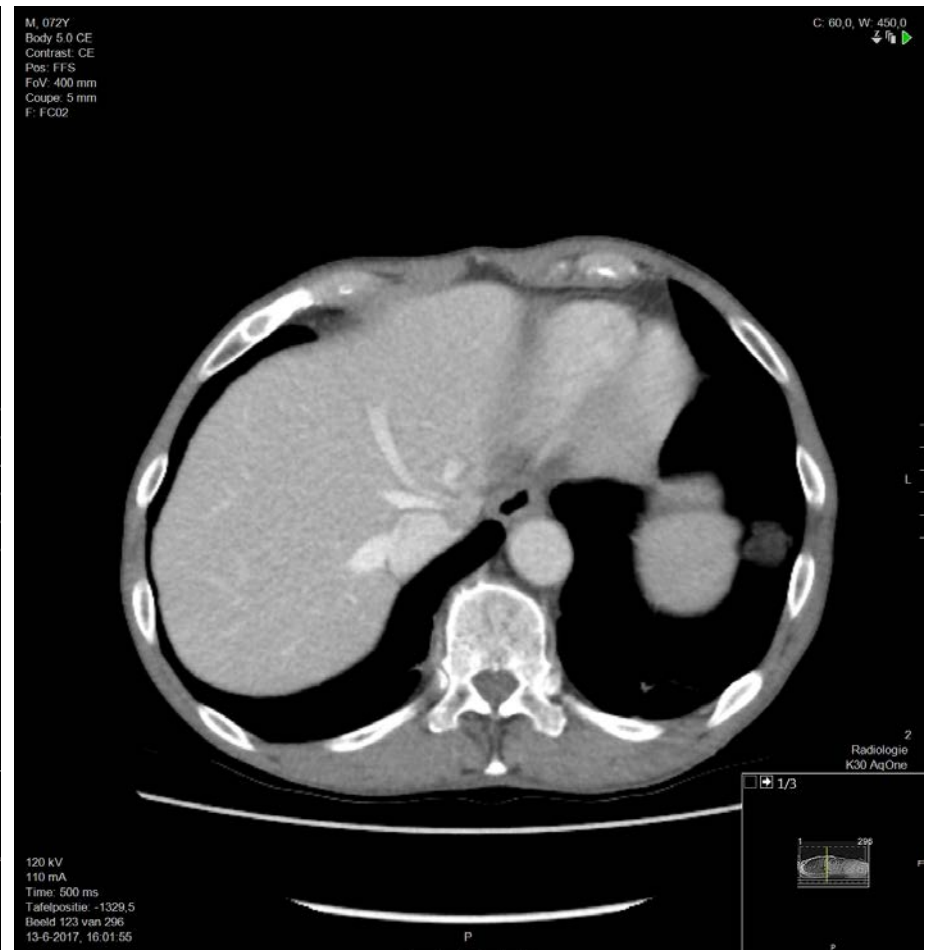
Normaal

Casuïstiek

CT, delayed



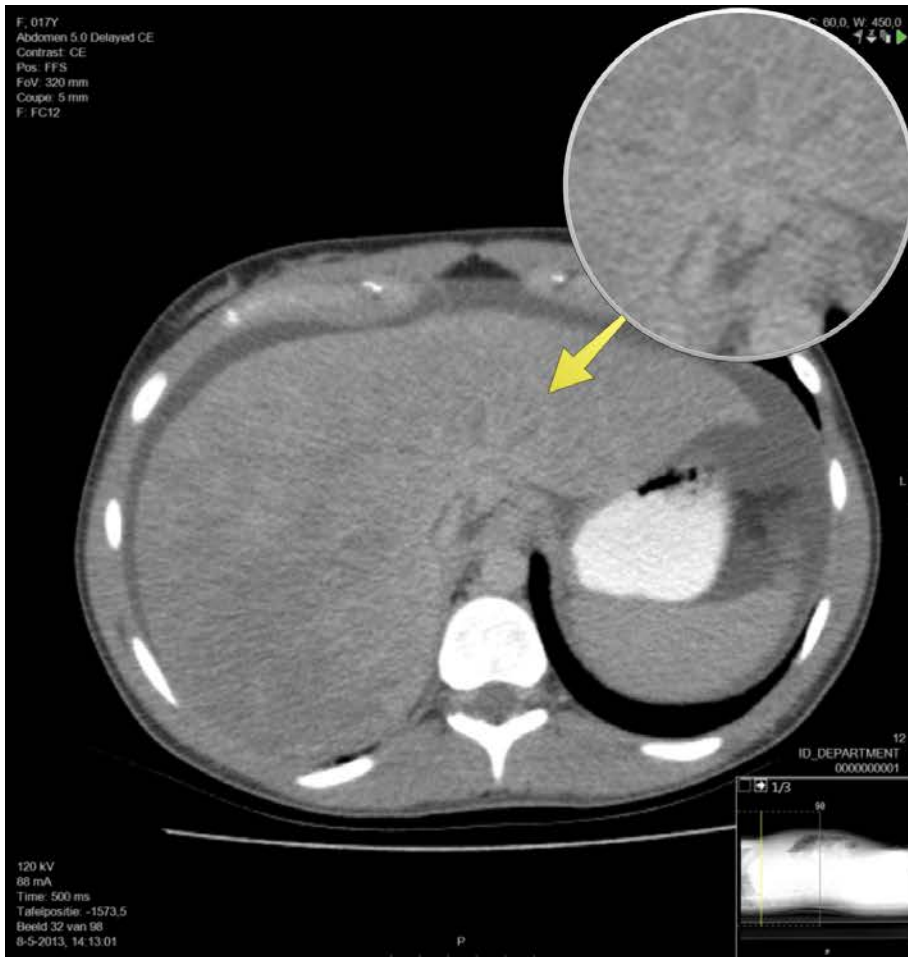
Patiënt



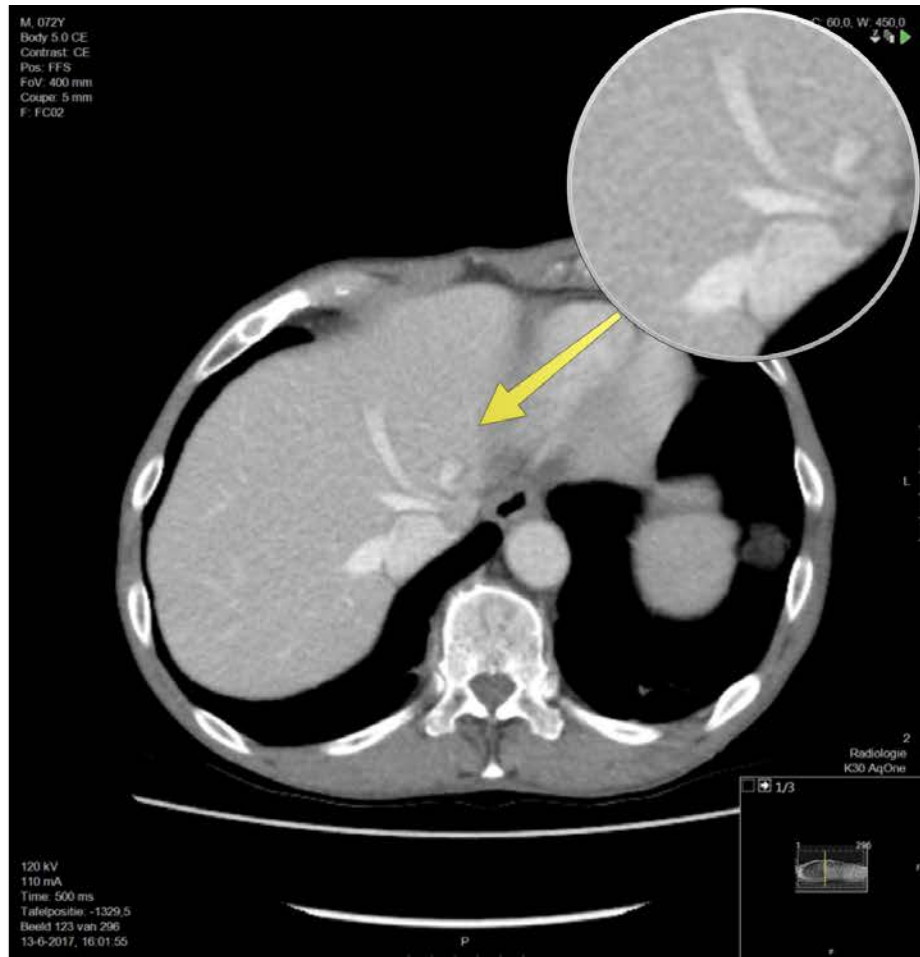
Normaal

Casuïstiek

CT, delayed



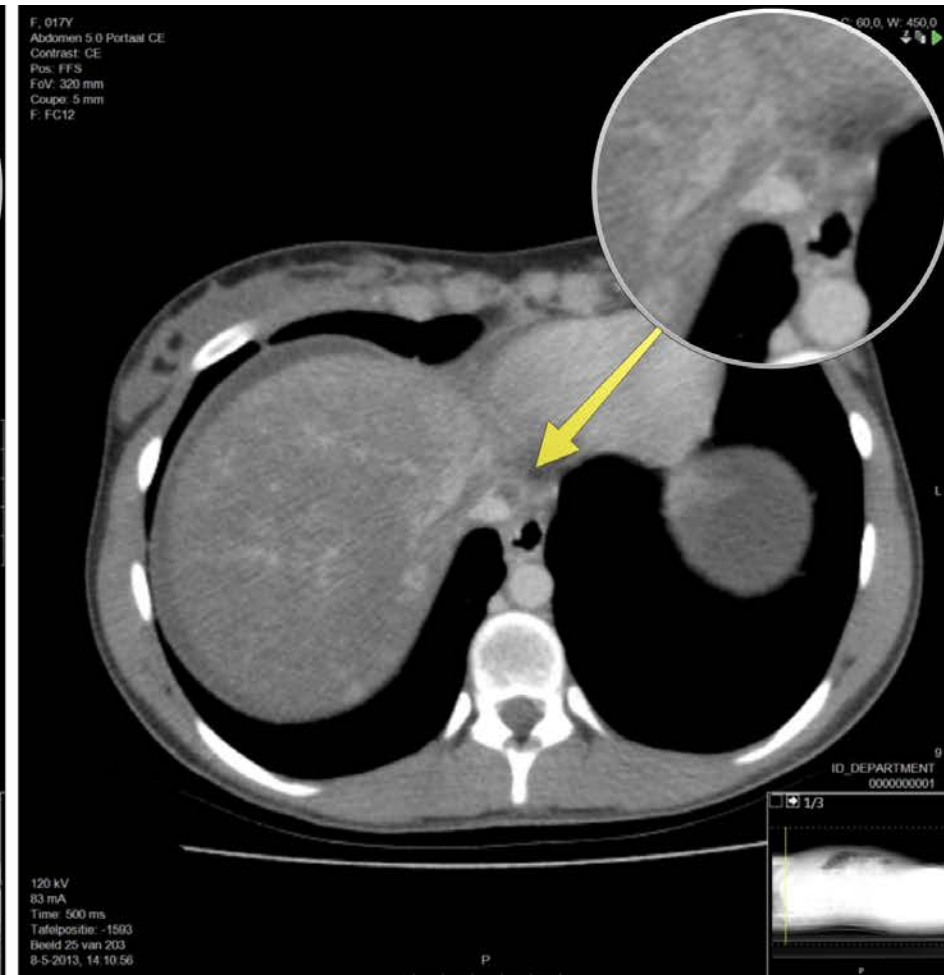
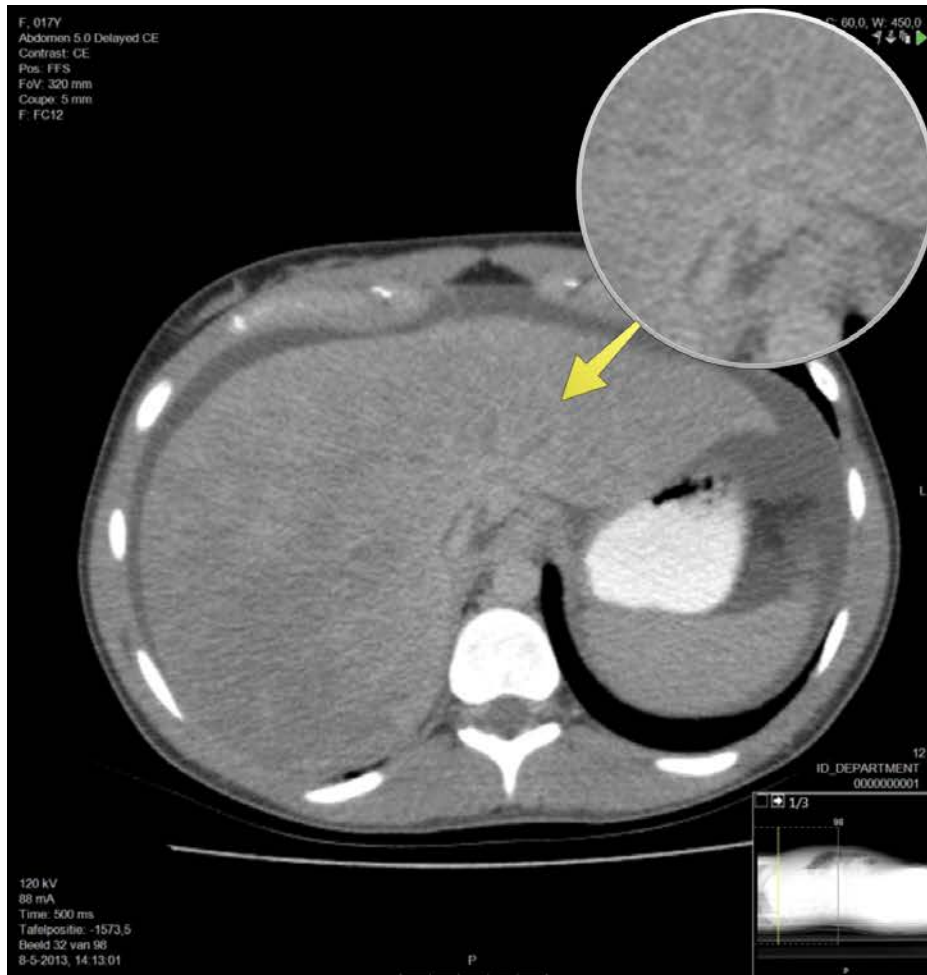
Patiënt



Normaal

Casuïstiek

CT, delayed



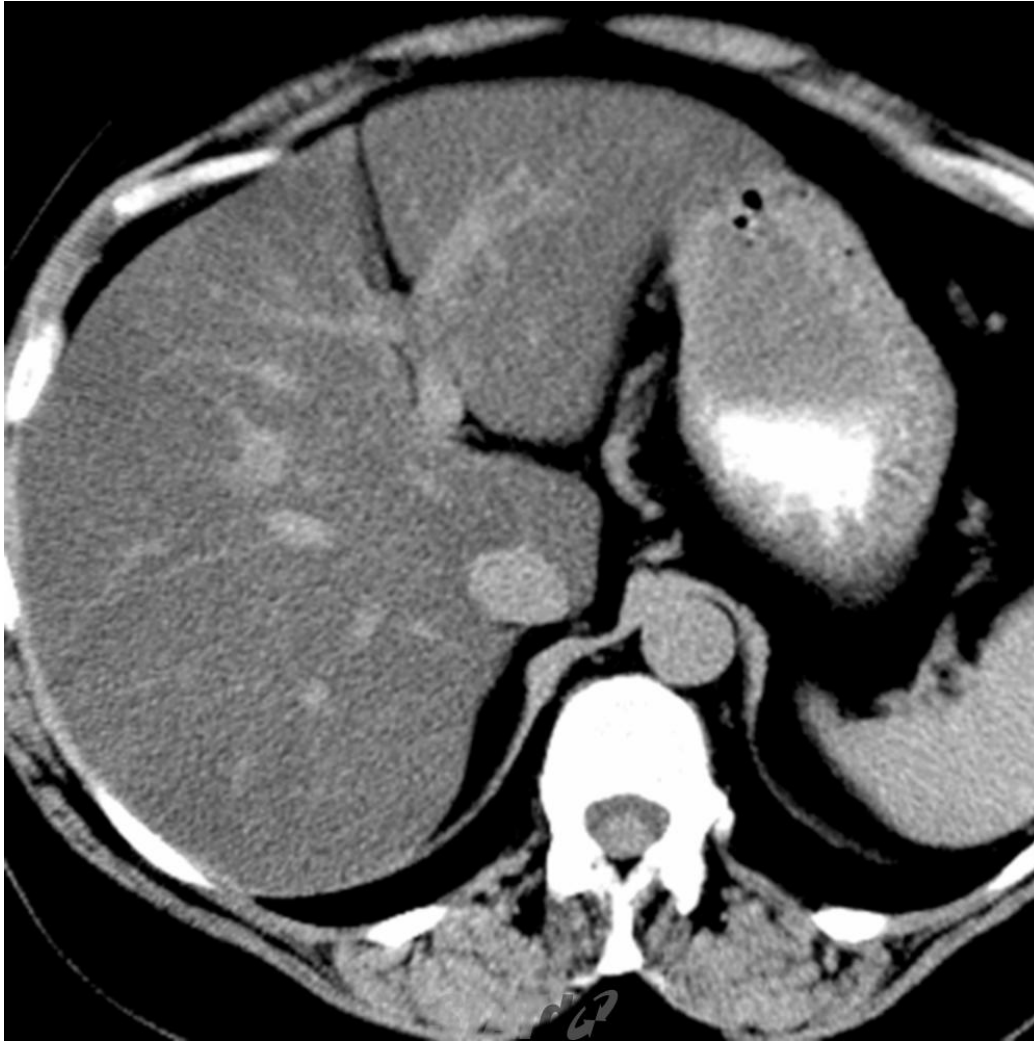
Delayed, trombus levervenen

Delayed, trombus VCI

Casus 2

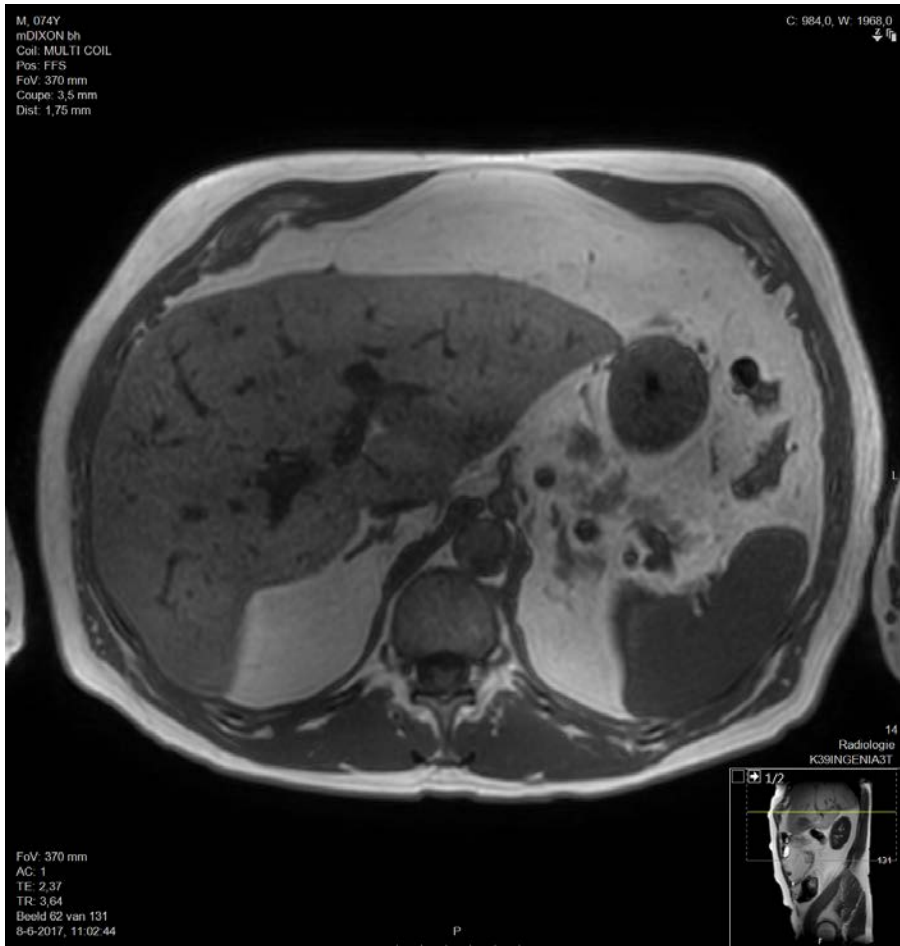
Casuïstiek

CT, leverenzymstoornissen



Casuïstiek

MRI



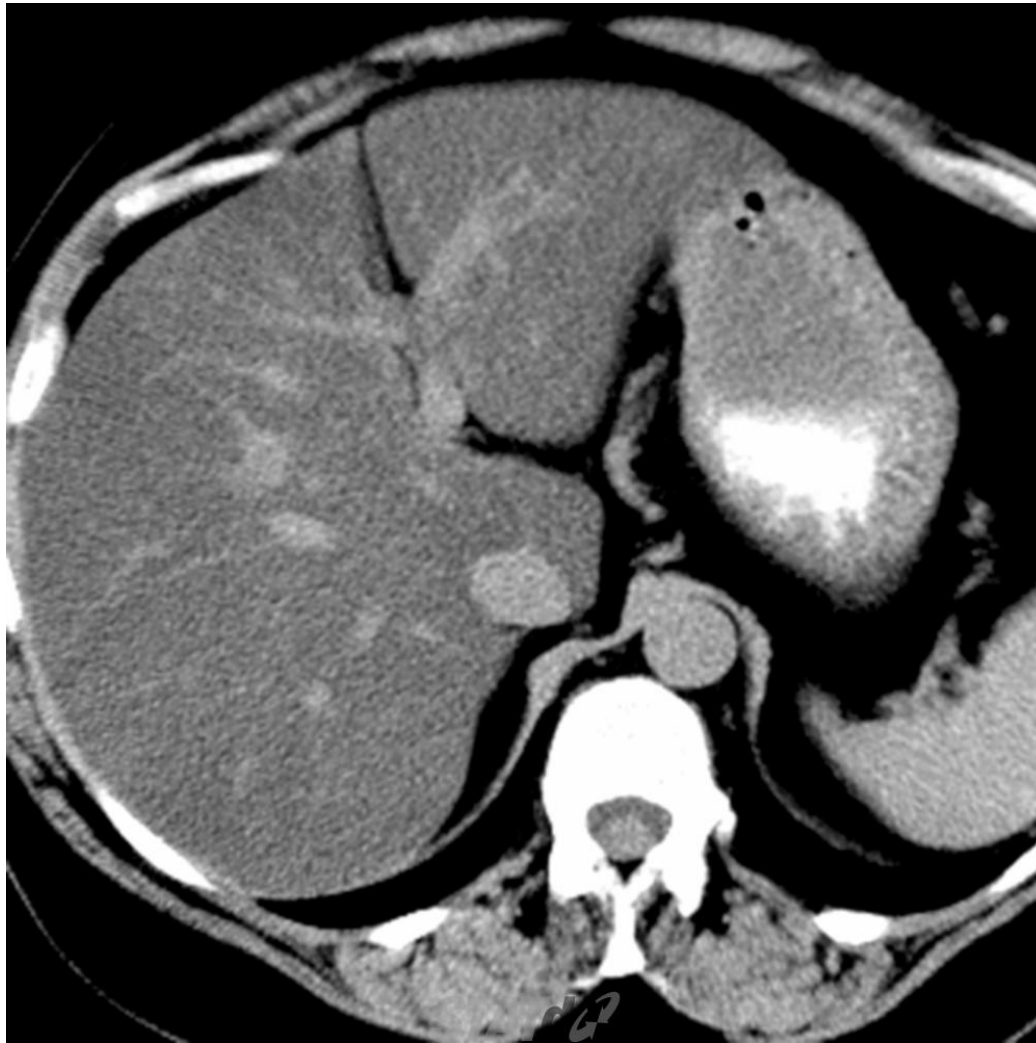
In-fase



Uit-fase

Casuïstiek

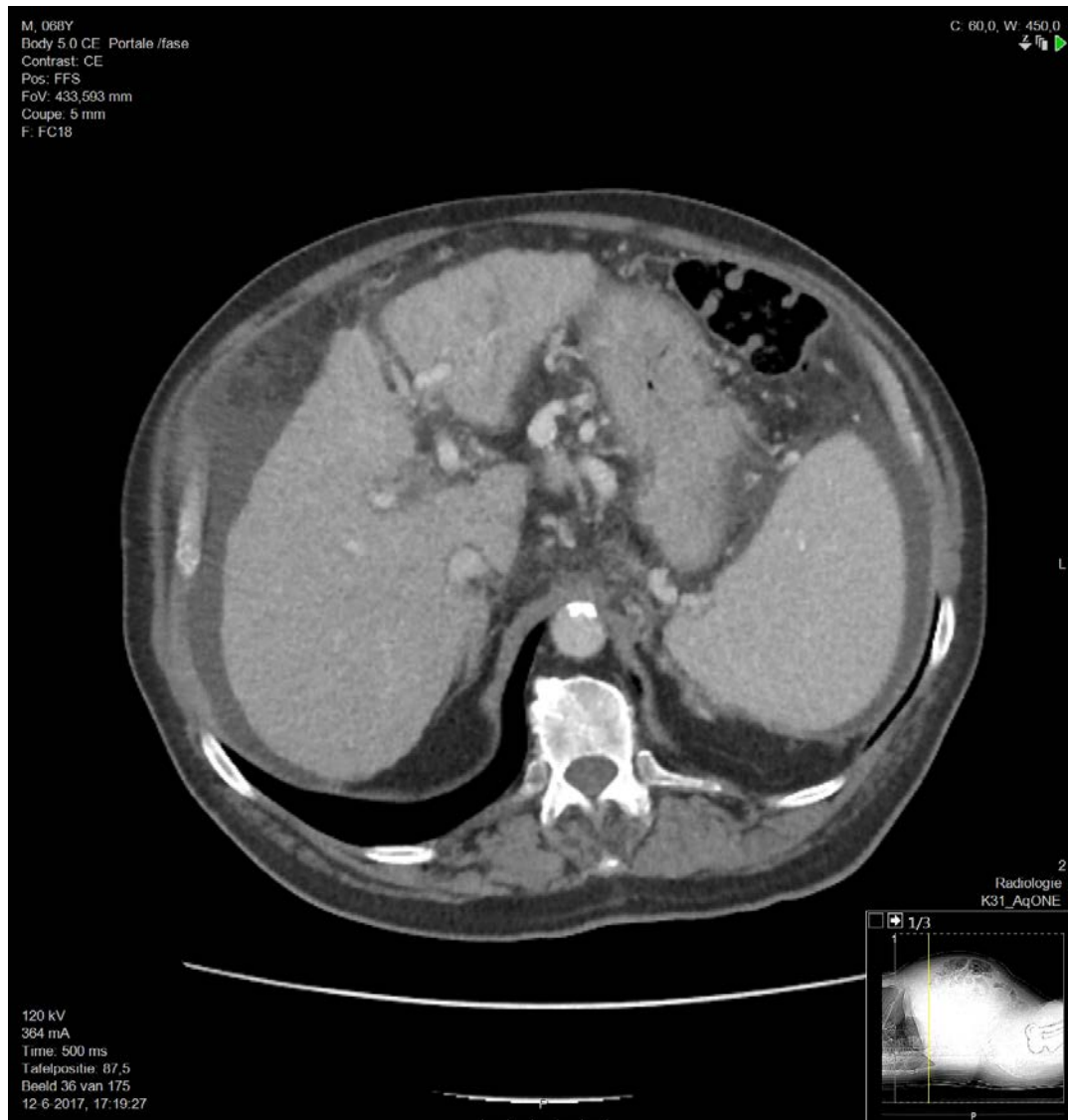
CT



Casus 3

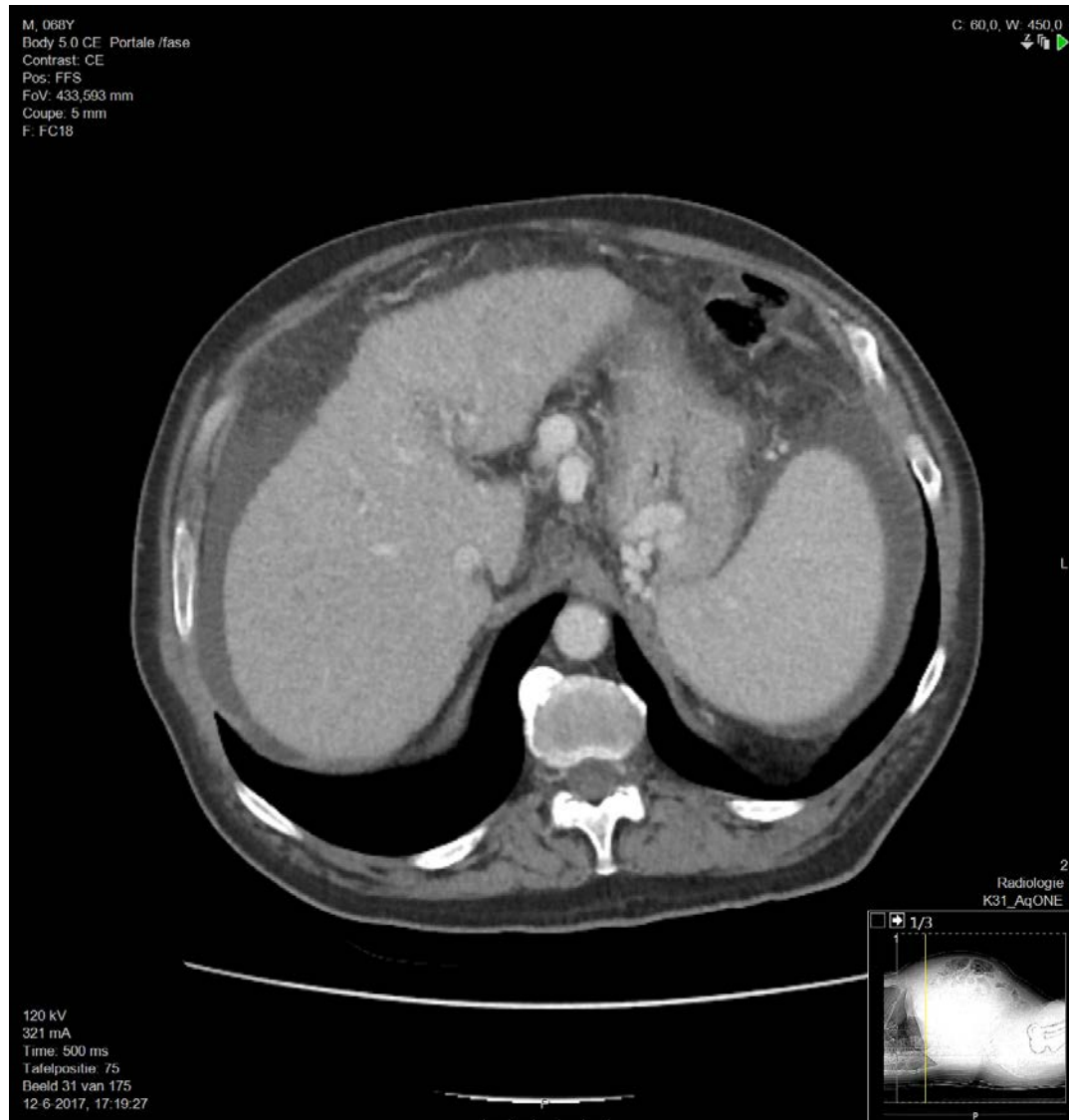
Casuïstiek

CT



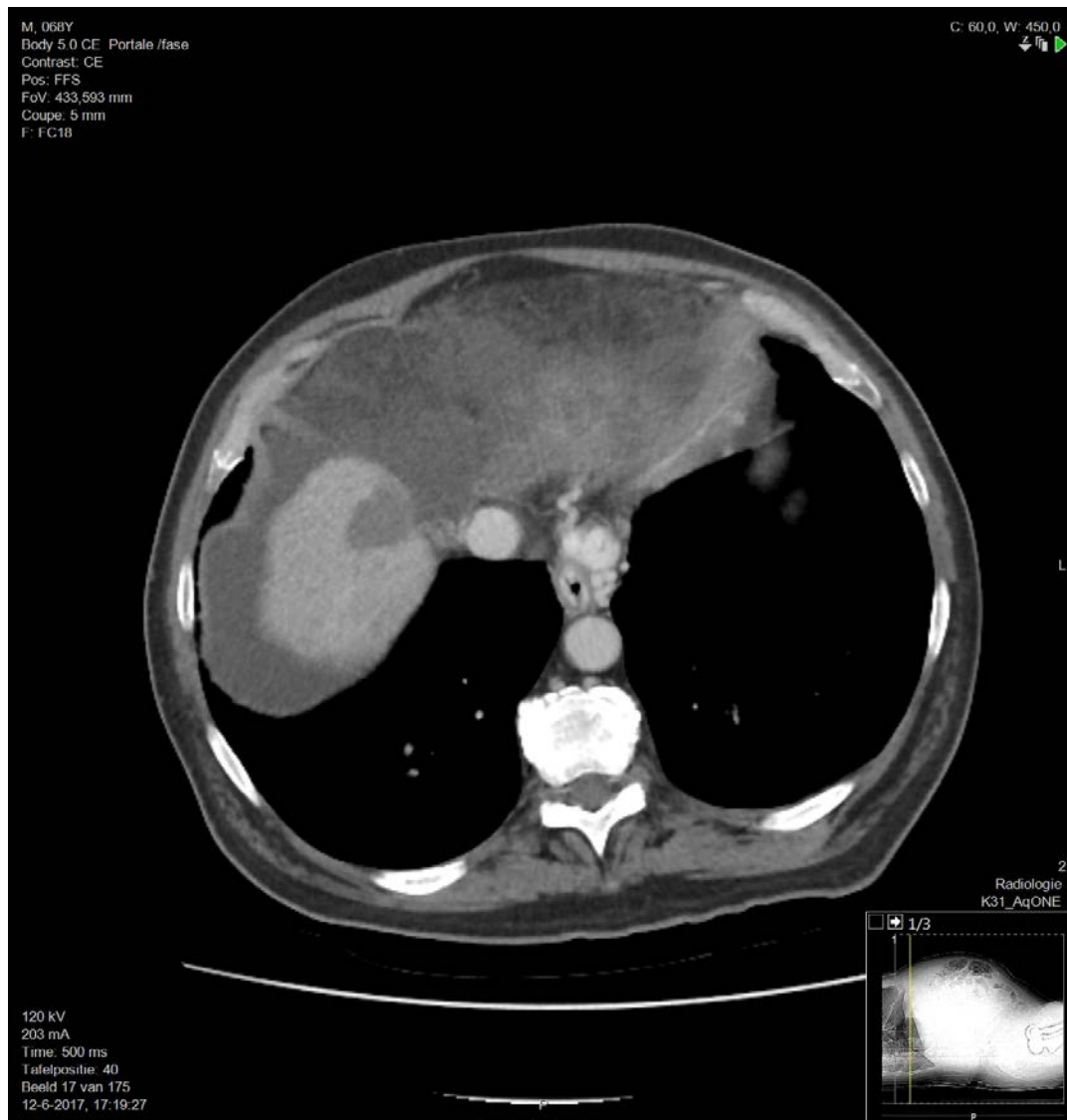
Casuïstiek

CT



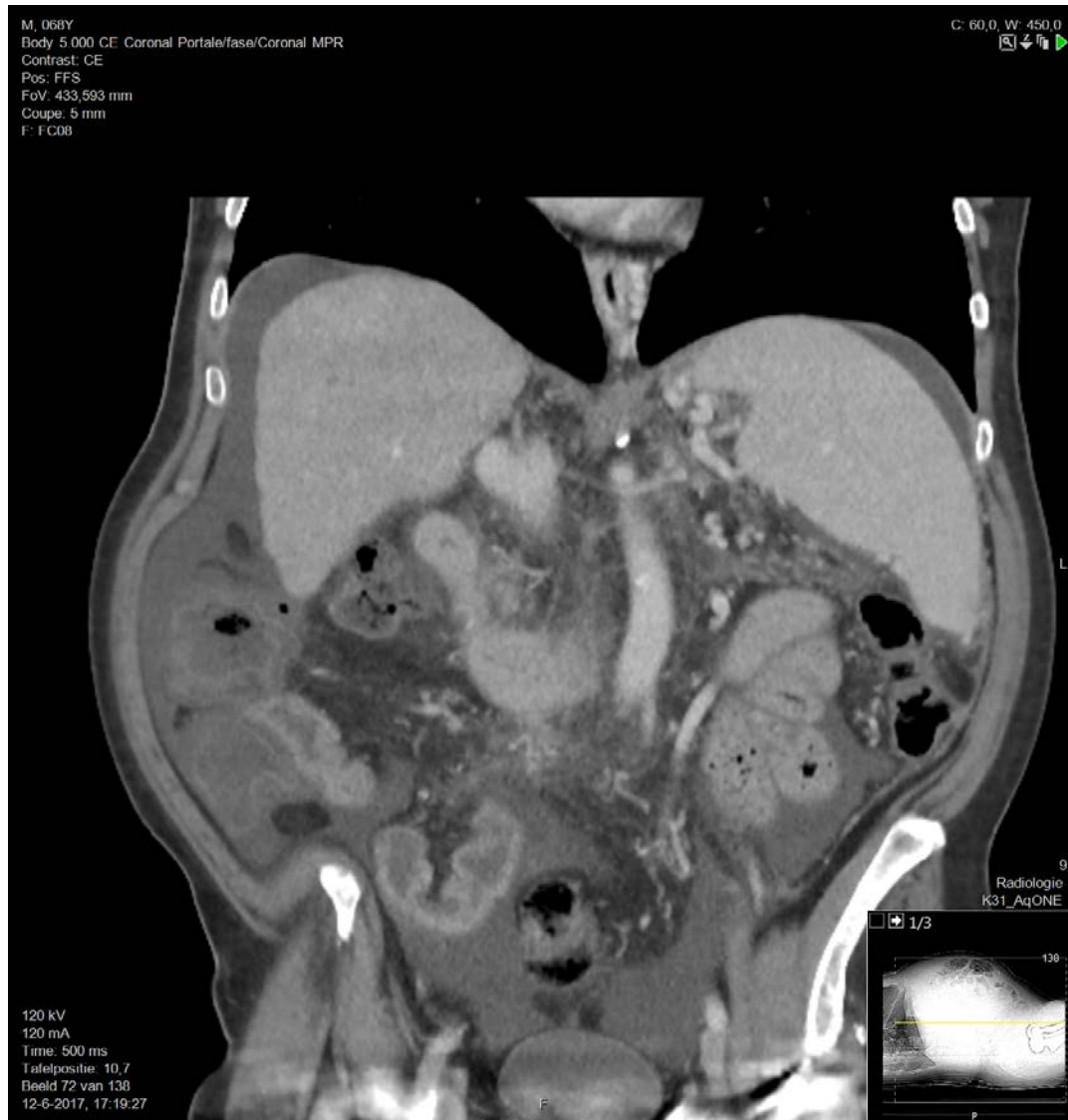
Casuïstiek

CT



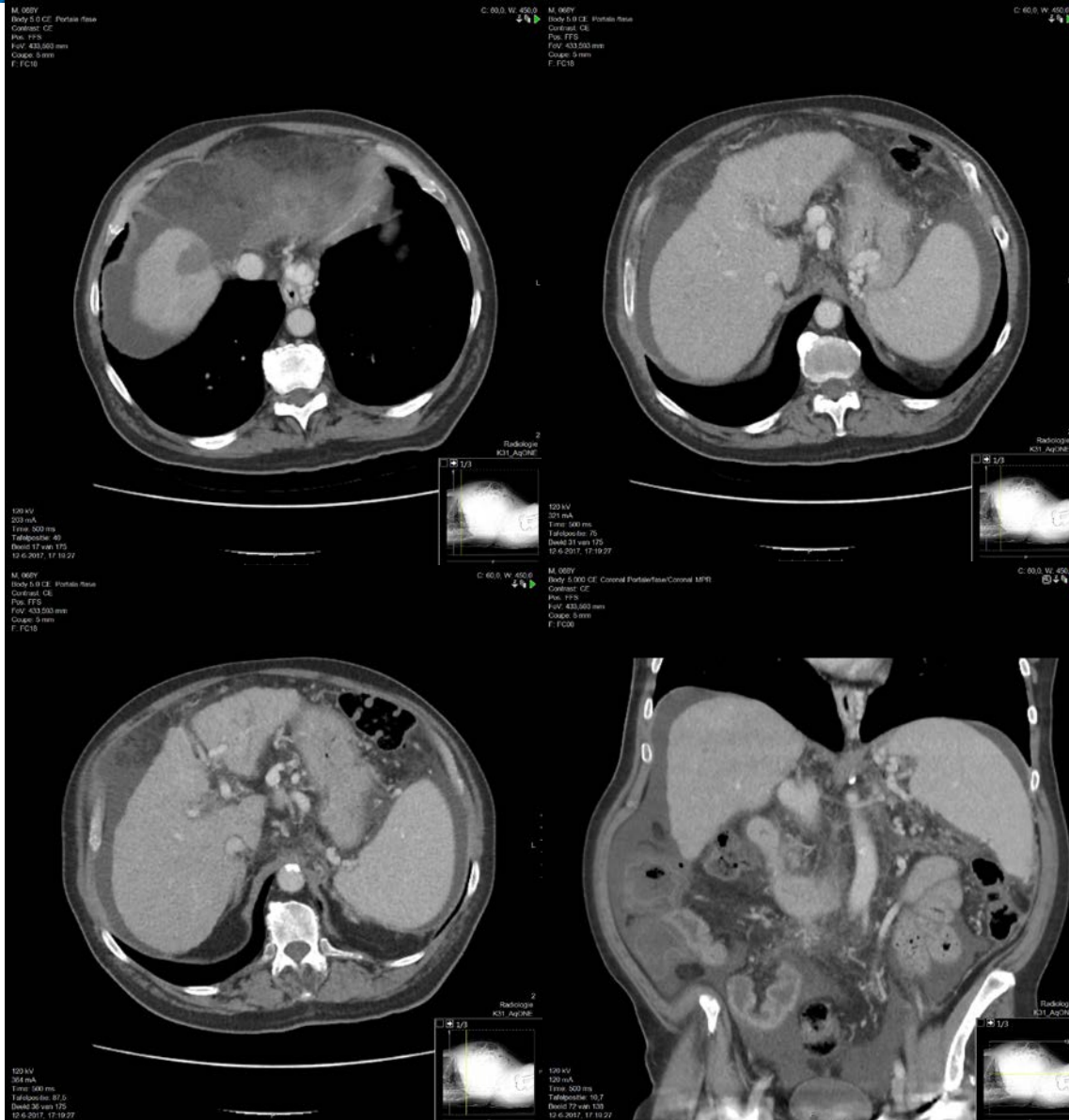
Casuïstiek

CT



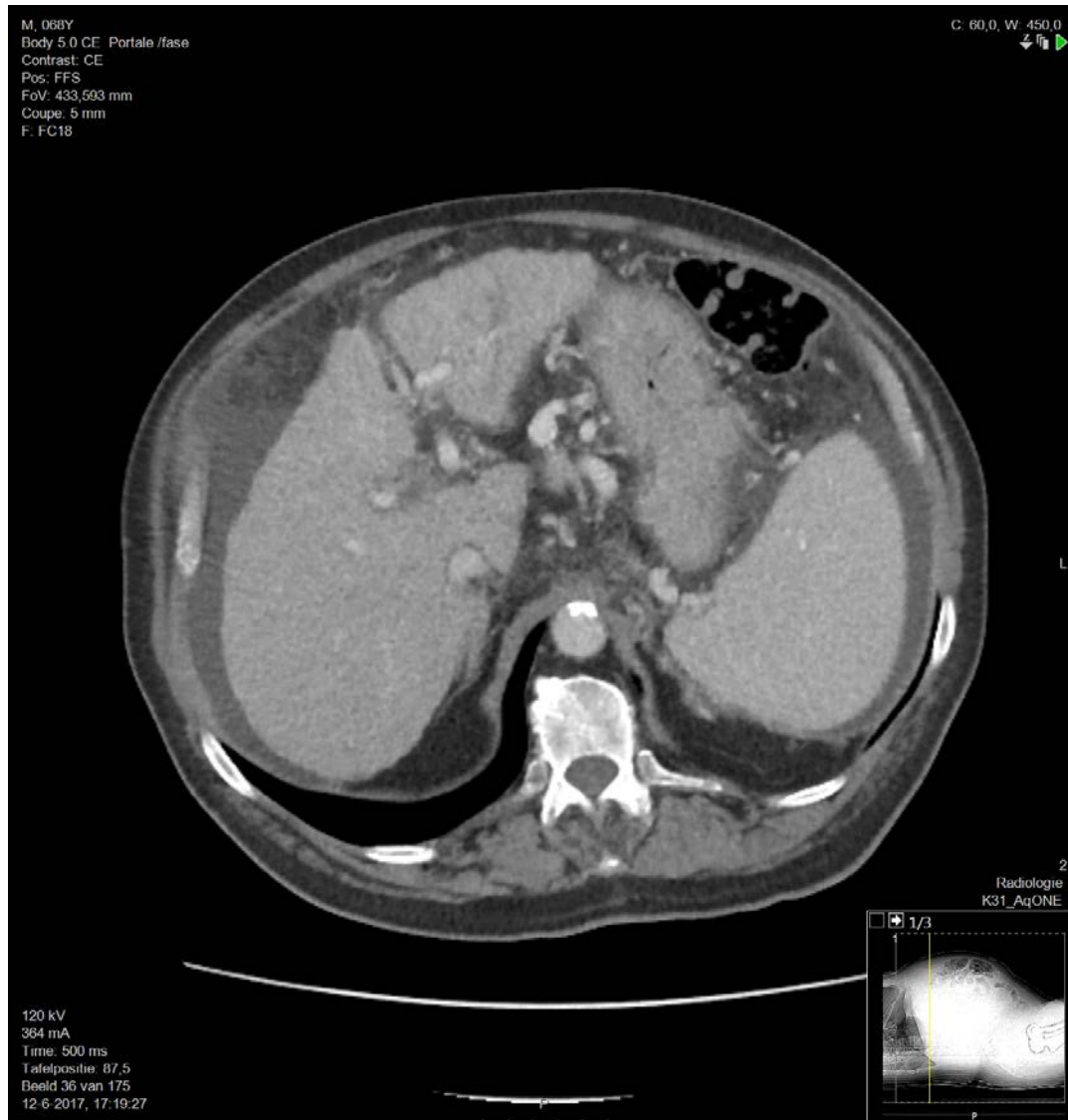
Casuïstiek

CT



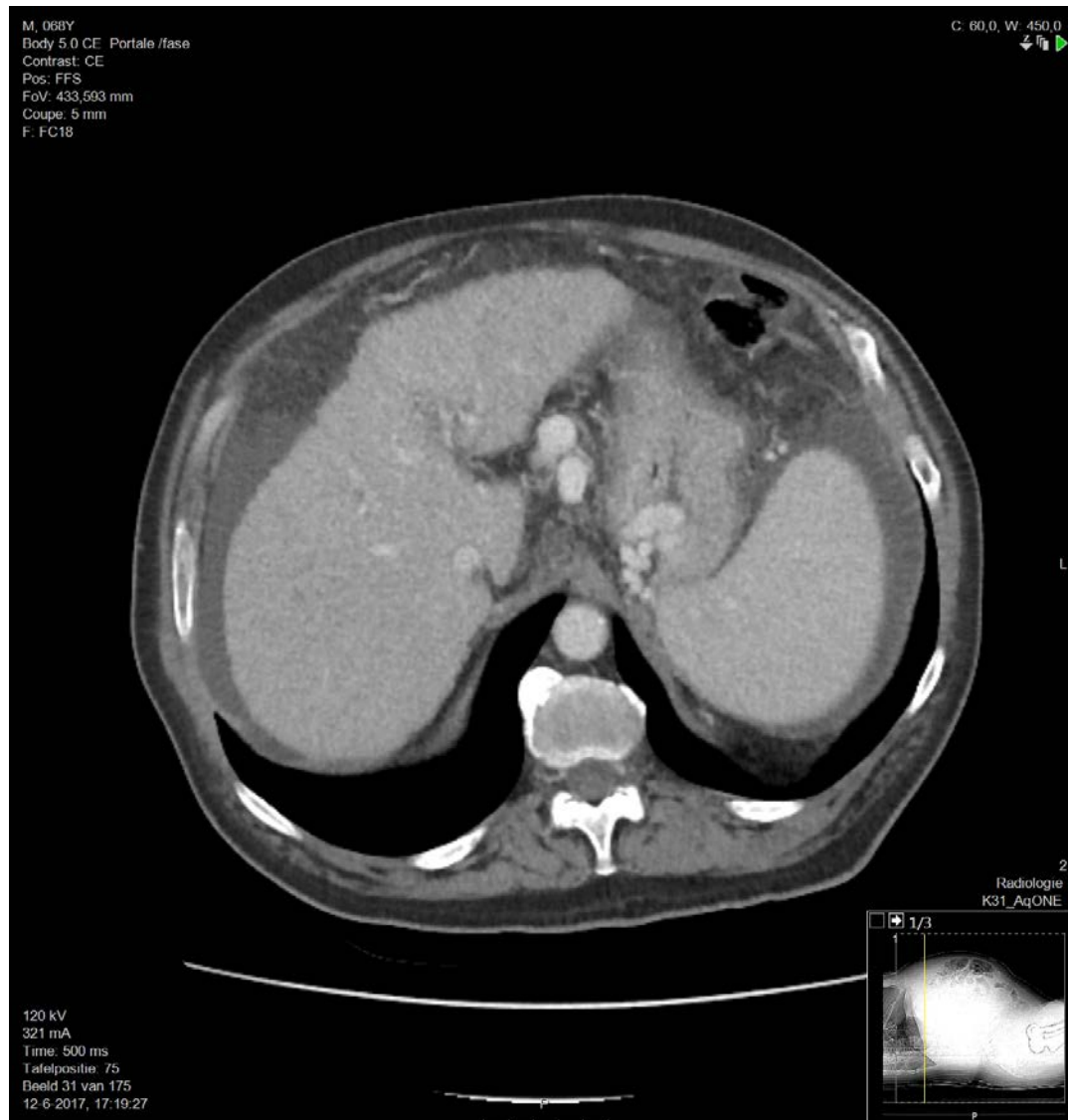
Casuïstiek

CT



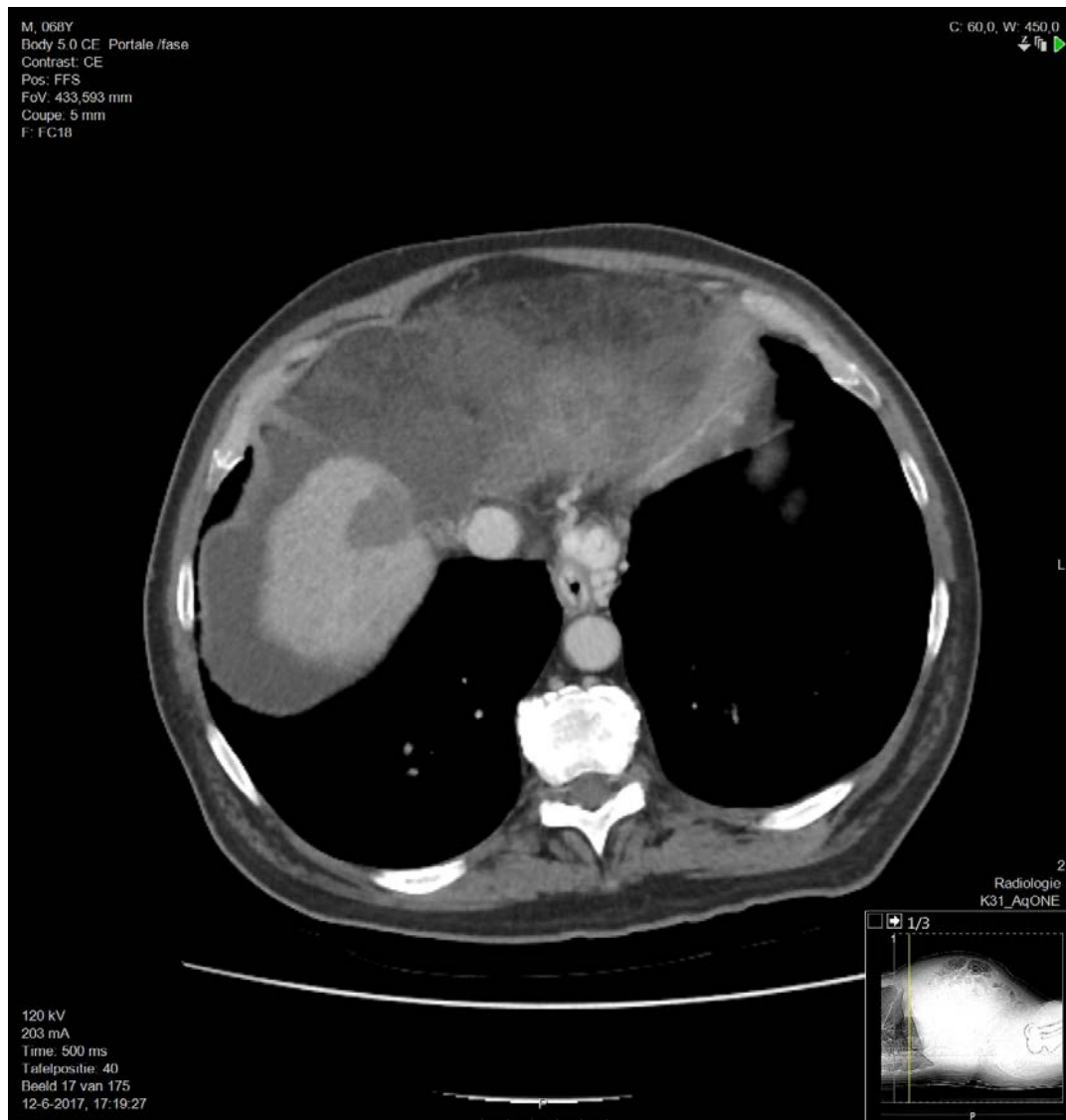
Casuïstiek

CT



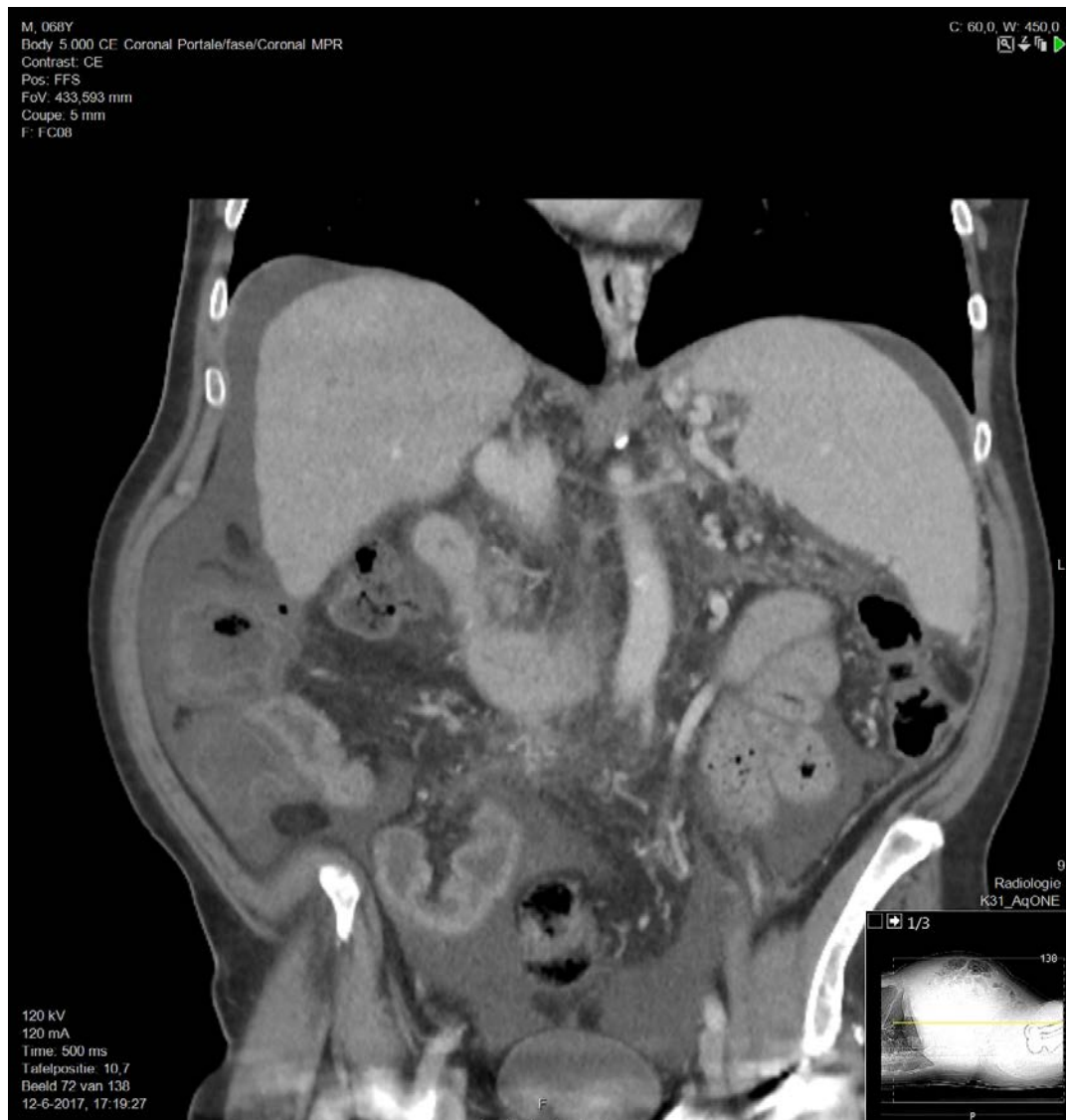
Casuïstiek

CT

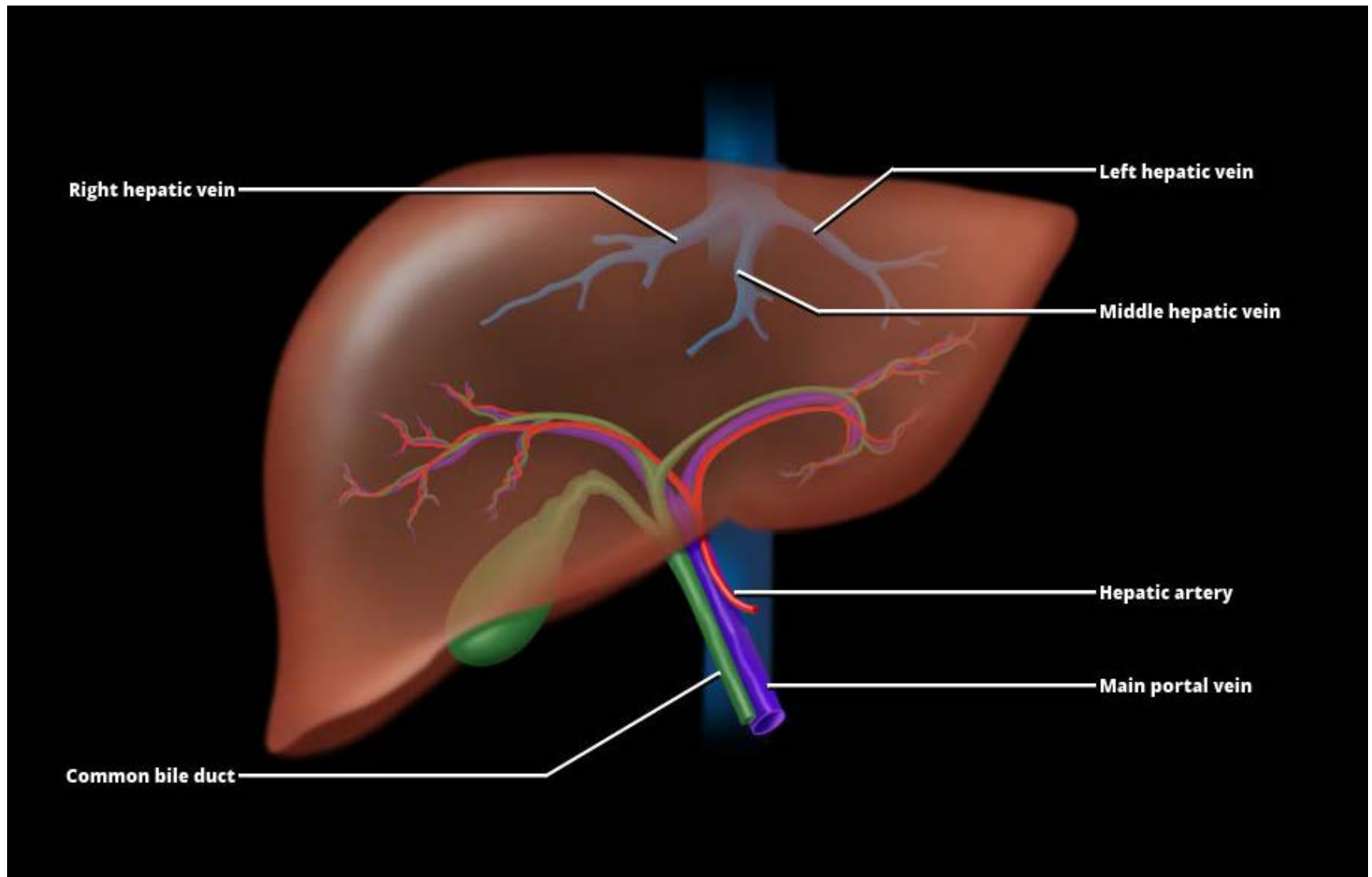


Casuïstiek

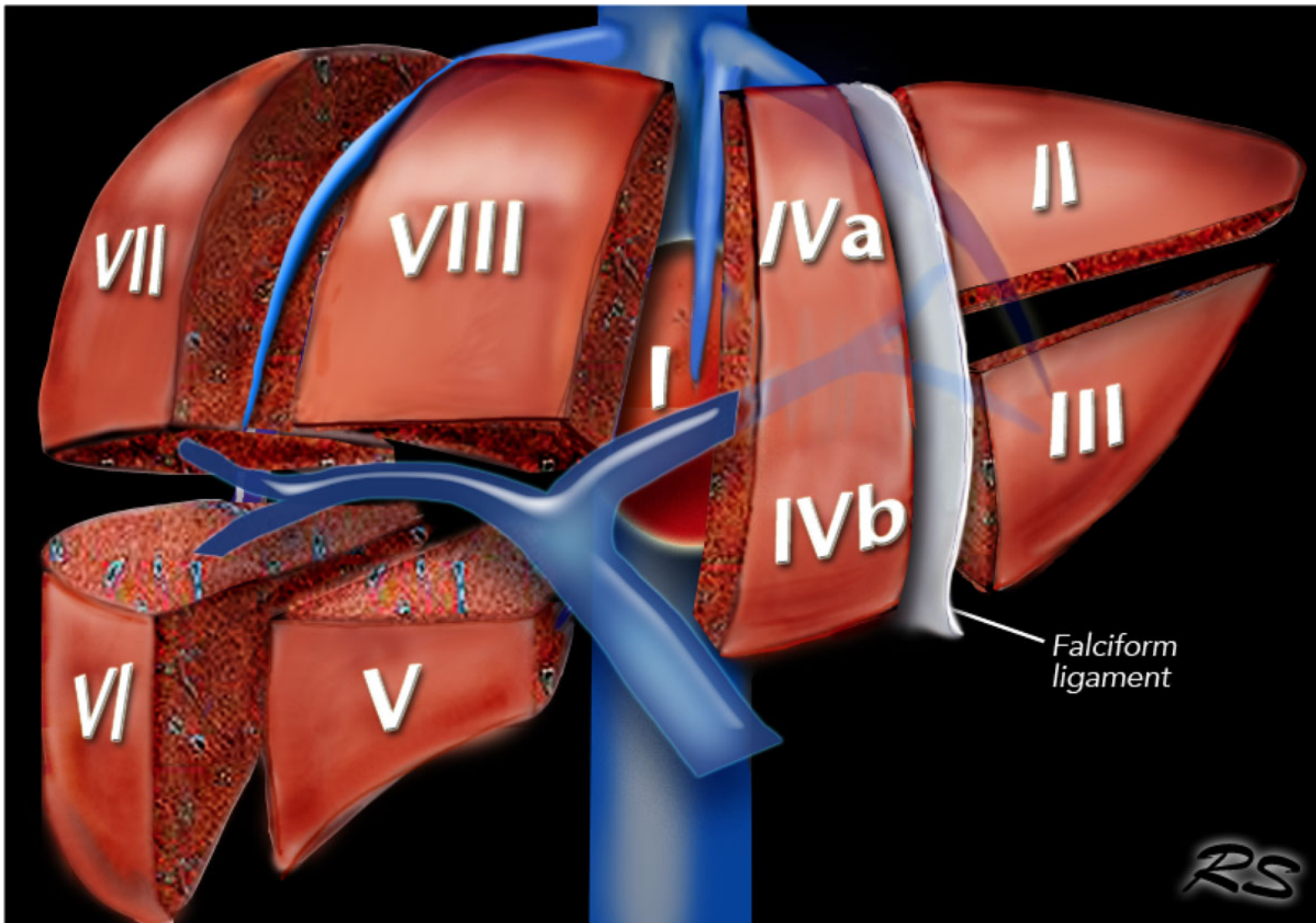
CT



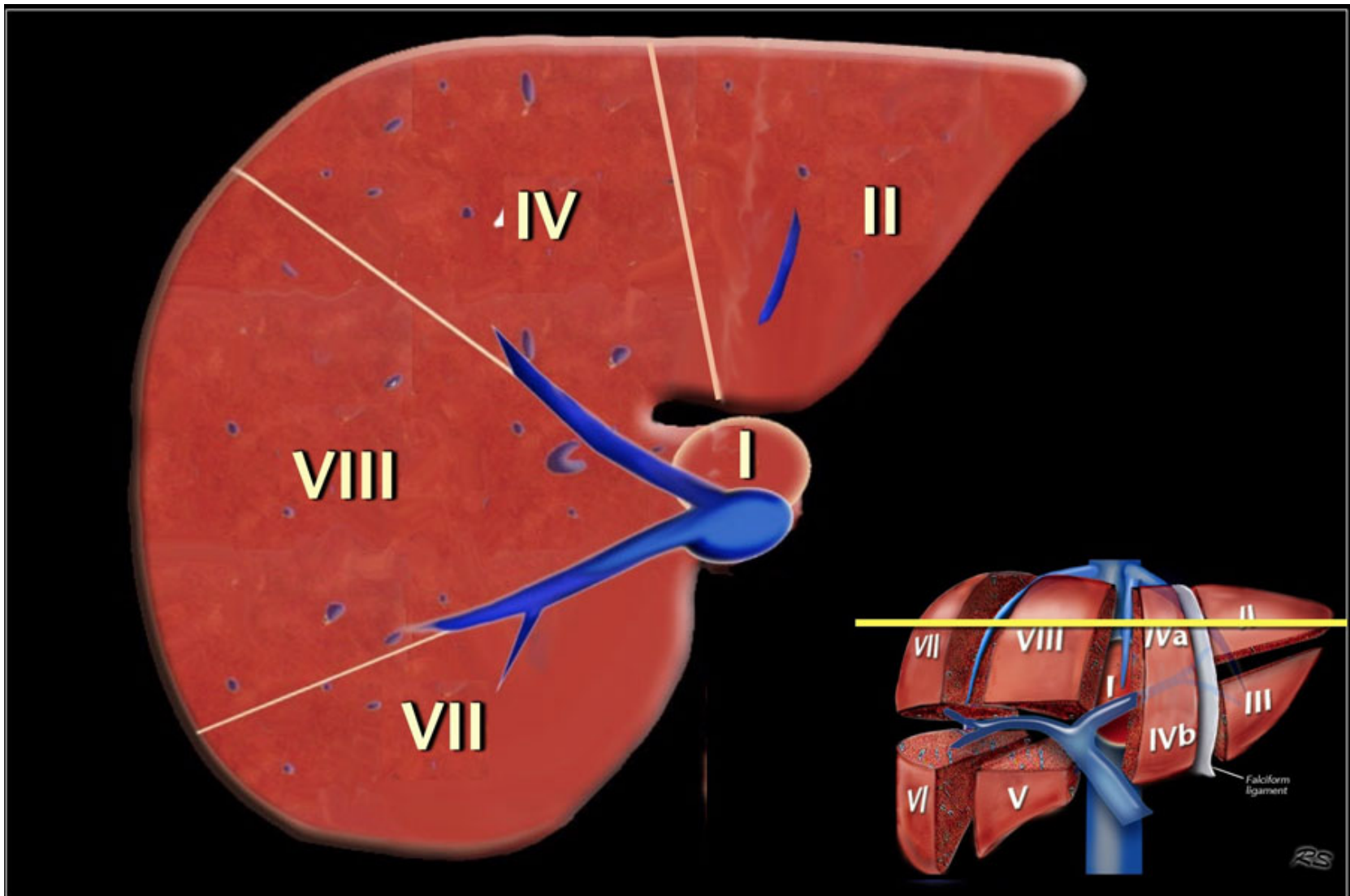
Anatomie, leversegmenten



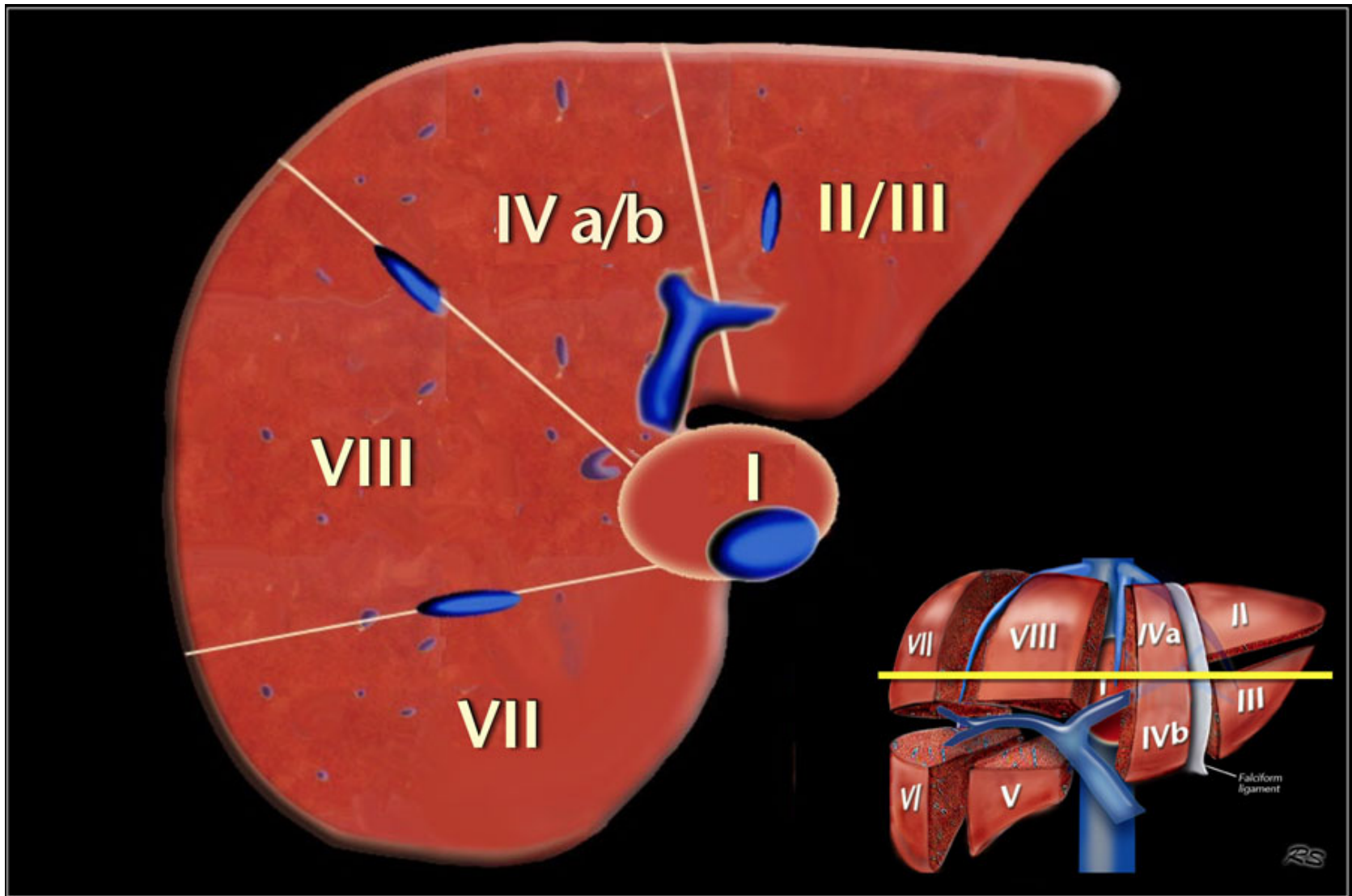
Anatomie, leversegmenten



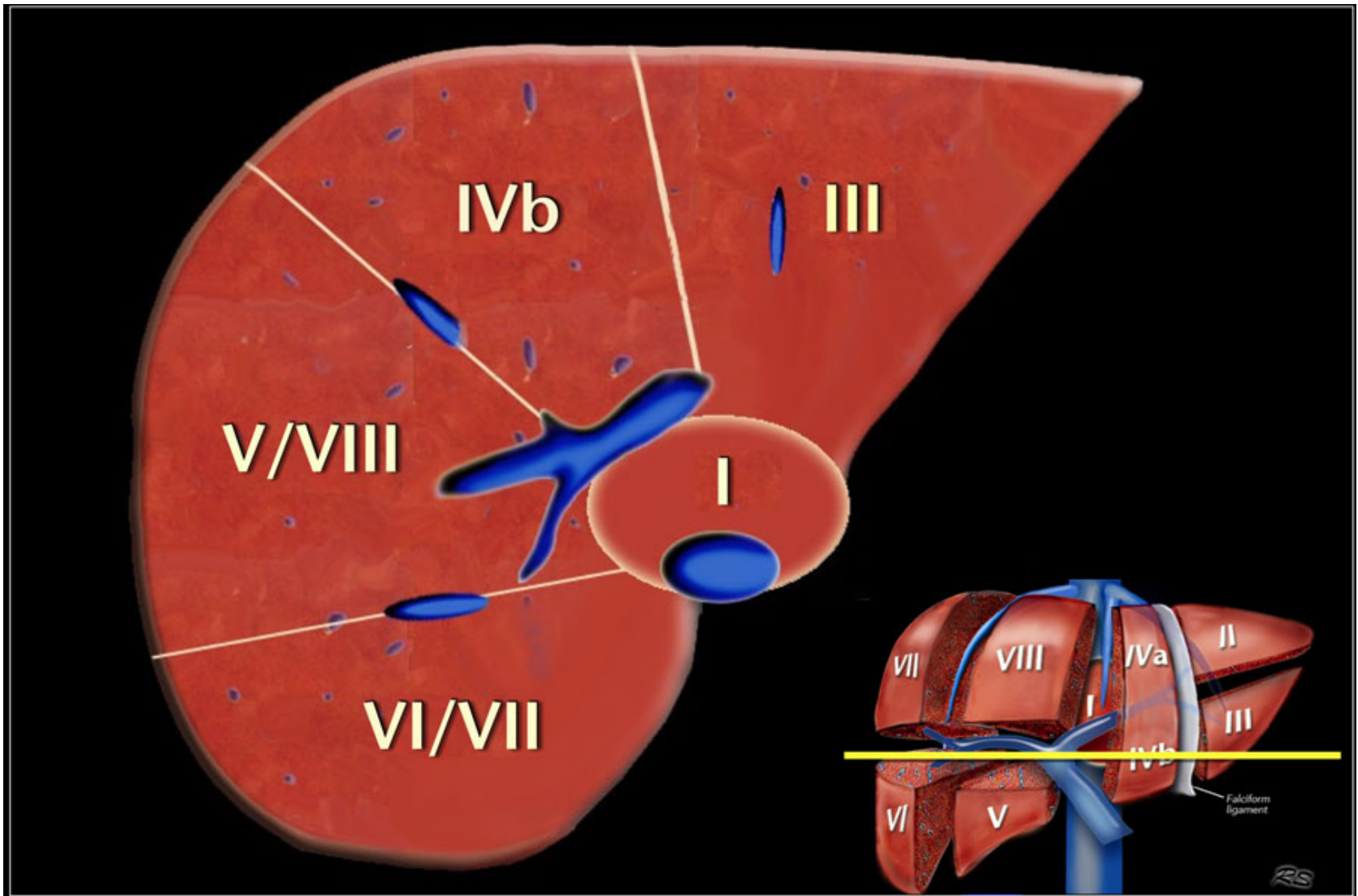
Anatomie, leversegmenten



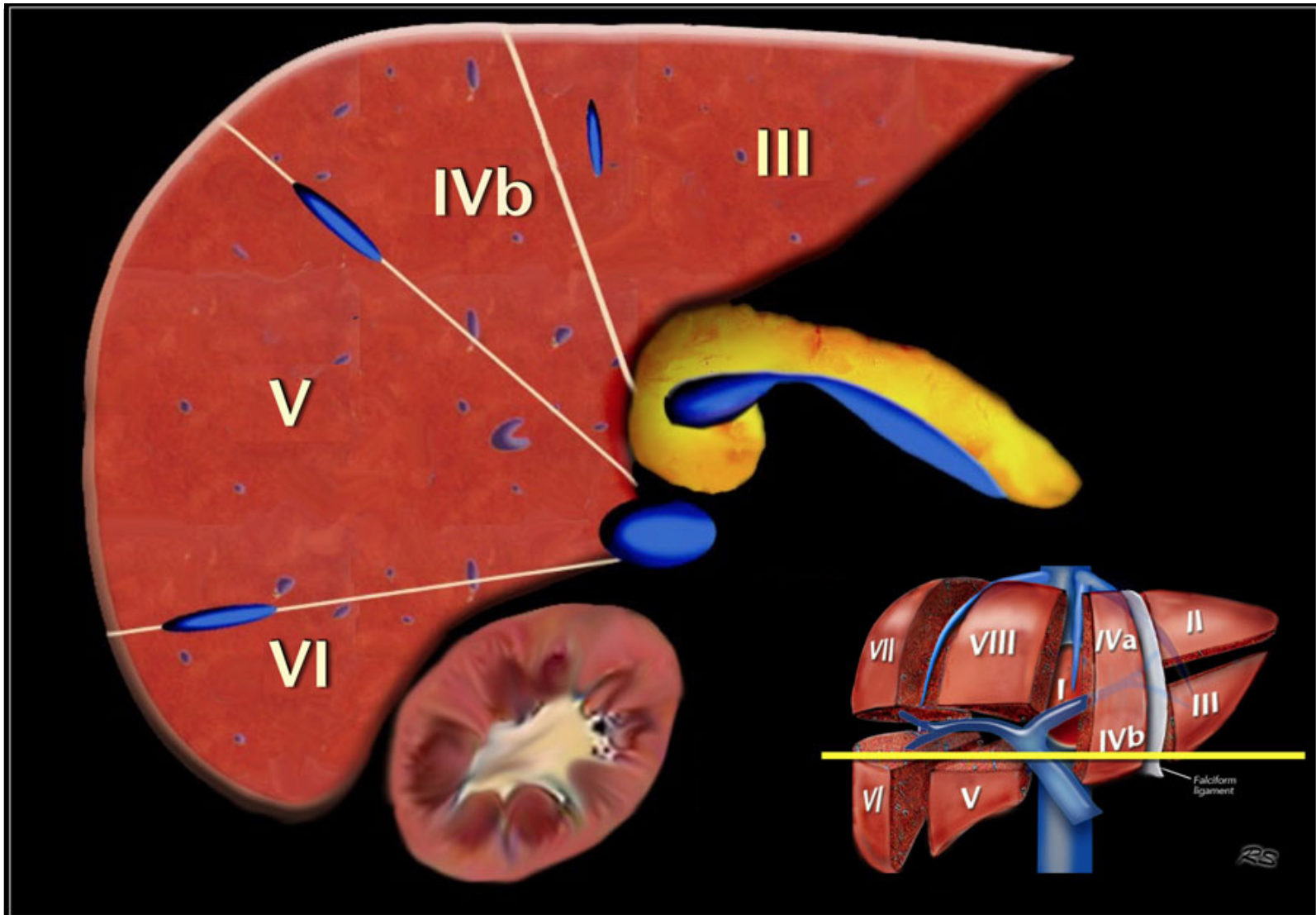
Anatomie, leversegmenten

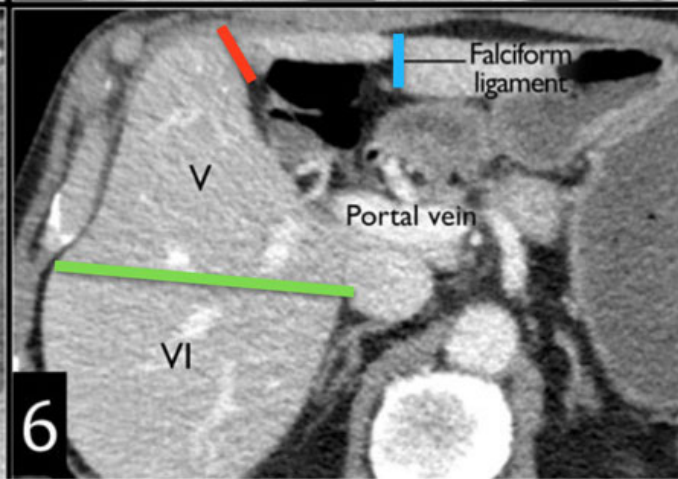
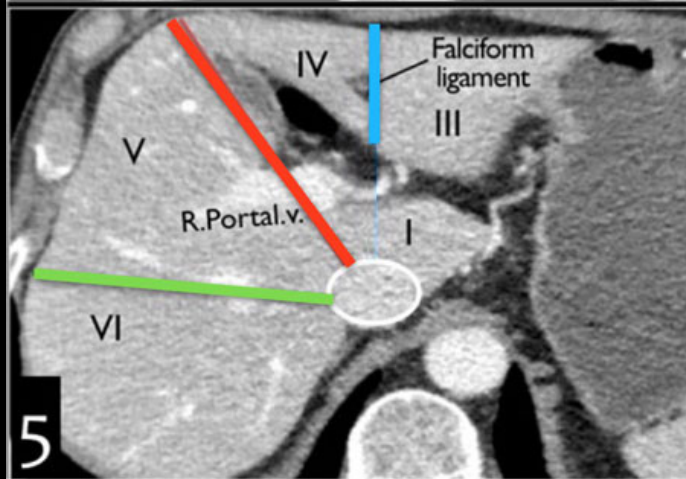
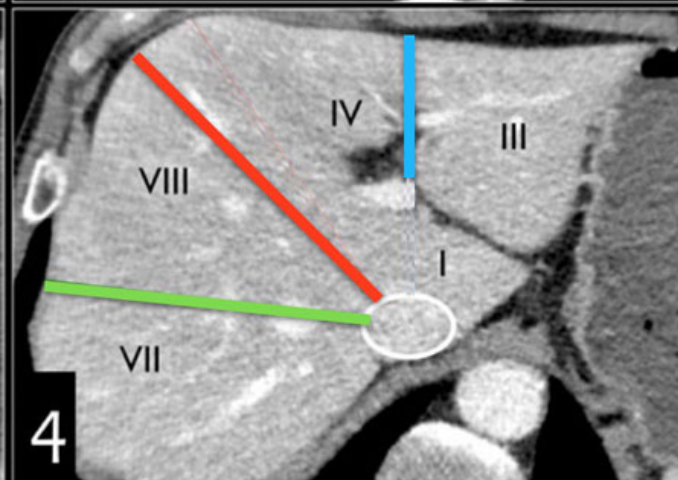
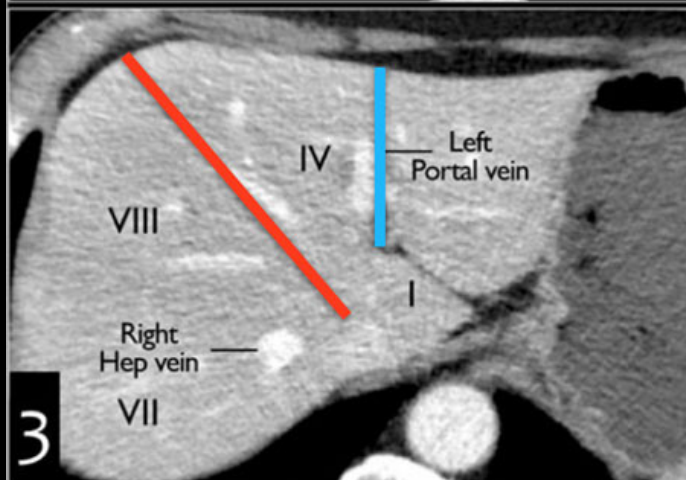
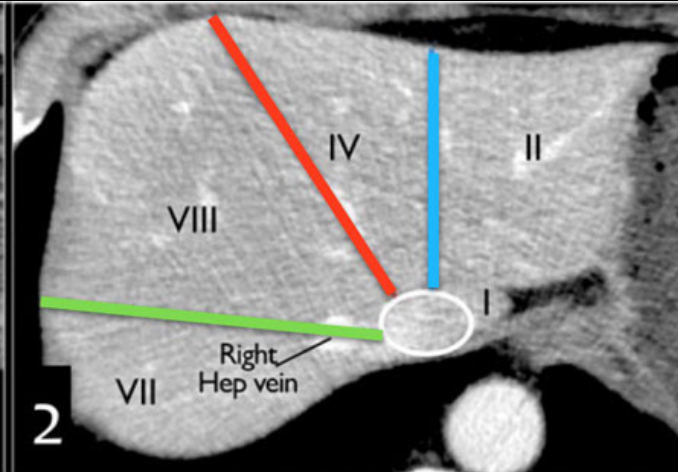
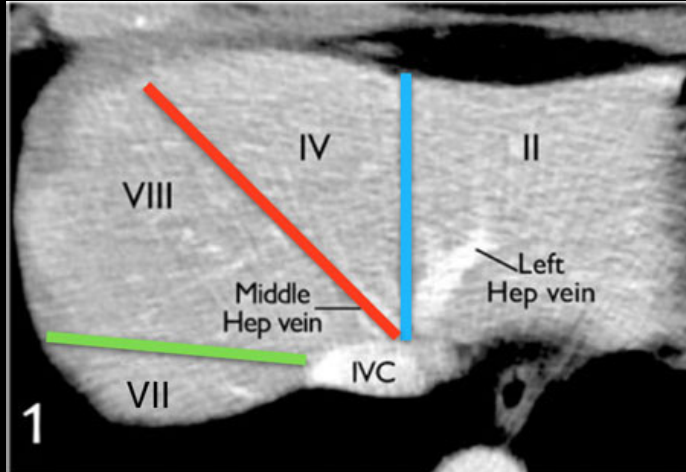


Anatomie, leversegmenten



Anatomie, leversegmenten





Casus 4

Casuïstiek

Echo, toevallsbevinding



Casuïstiek

Echo, focale steatosis

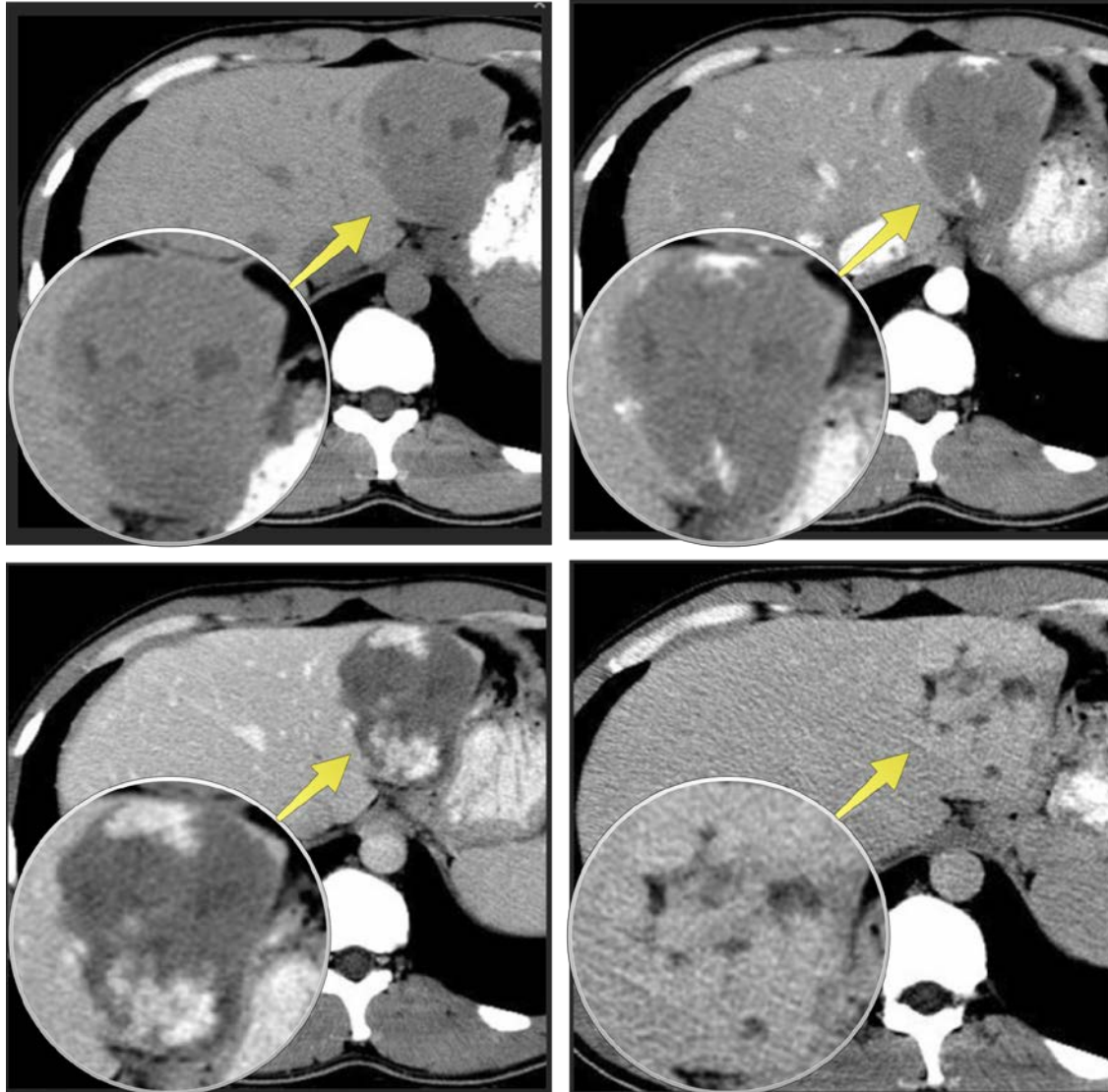


Echo, metastase



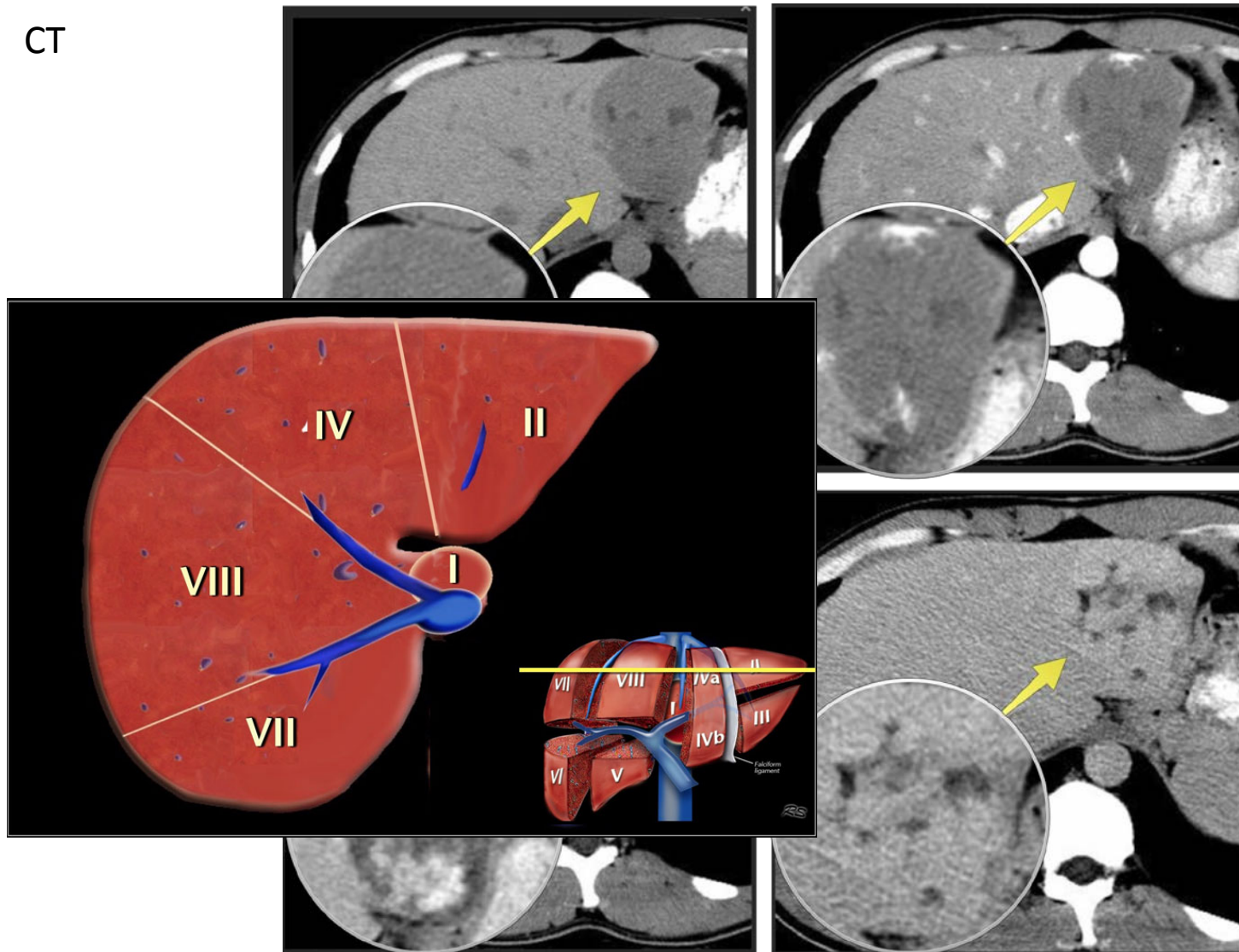
Casuïstiek

CT



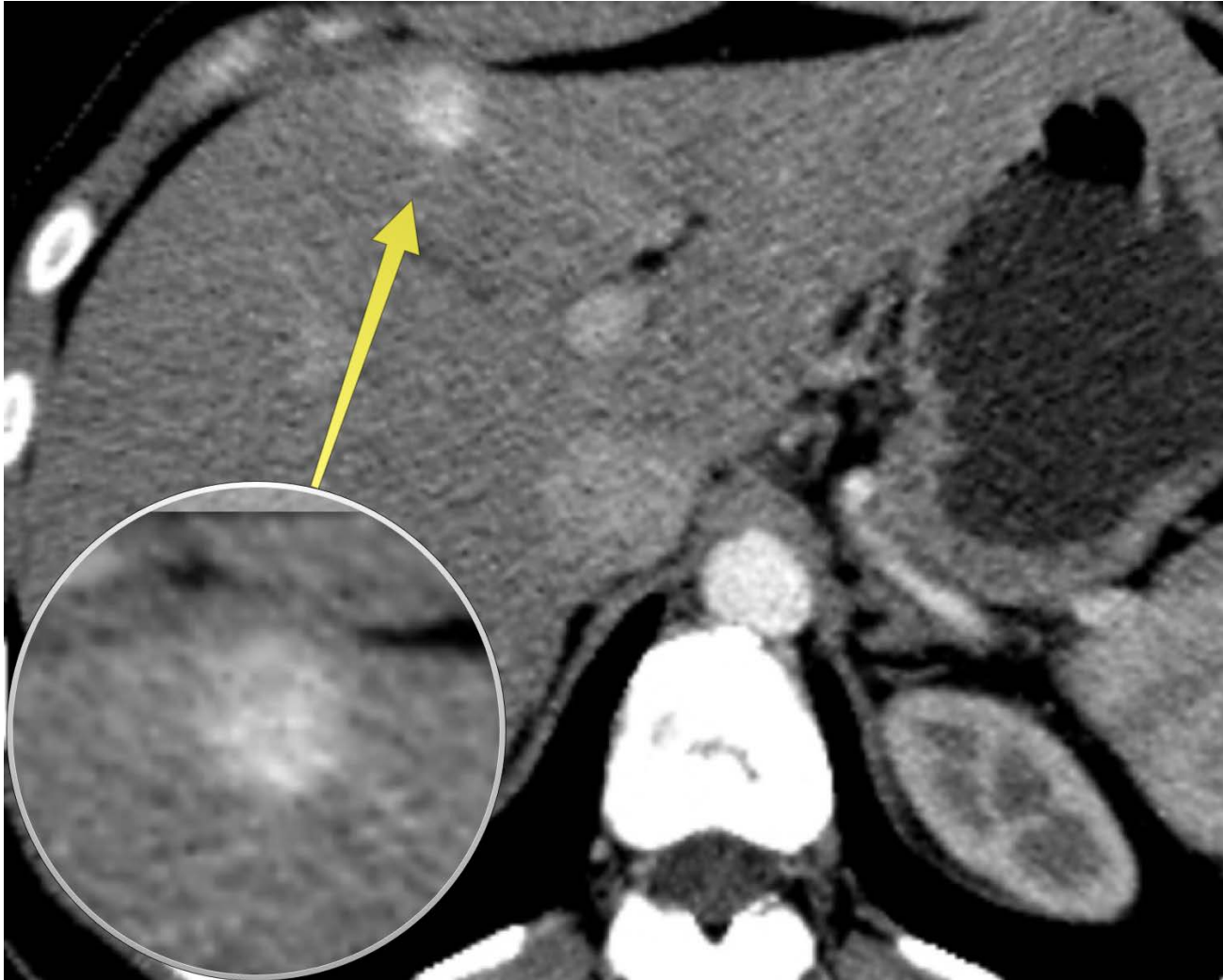
Casuïstiek

CT



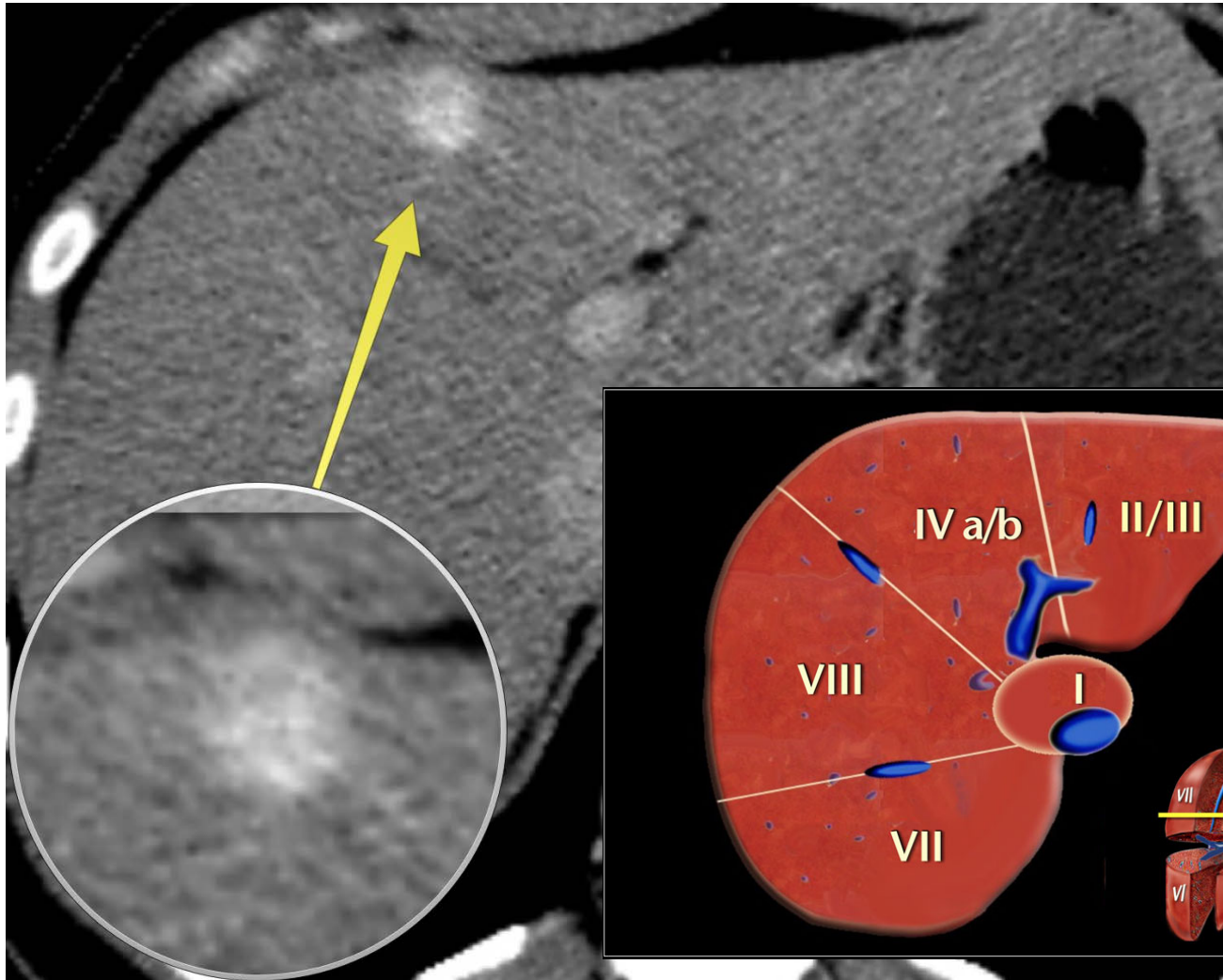
Casuïstiek

CT, “flash filling” hemangioom



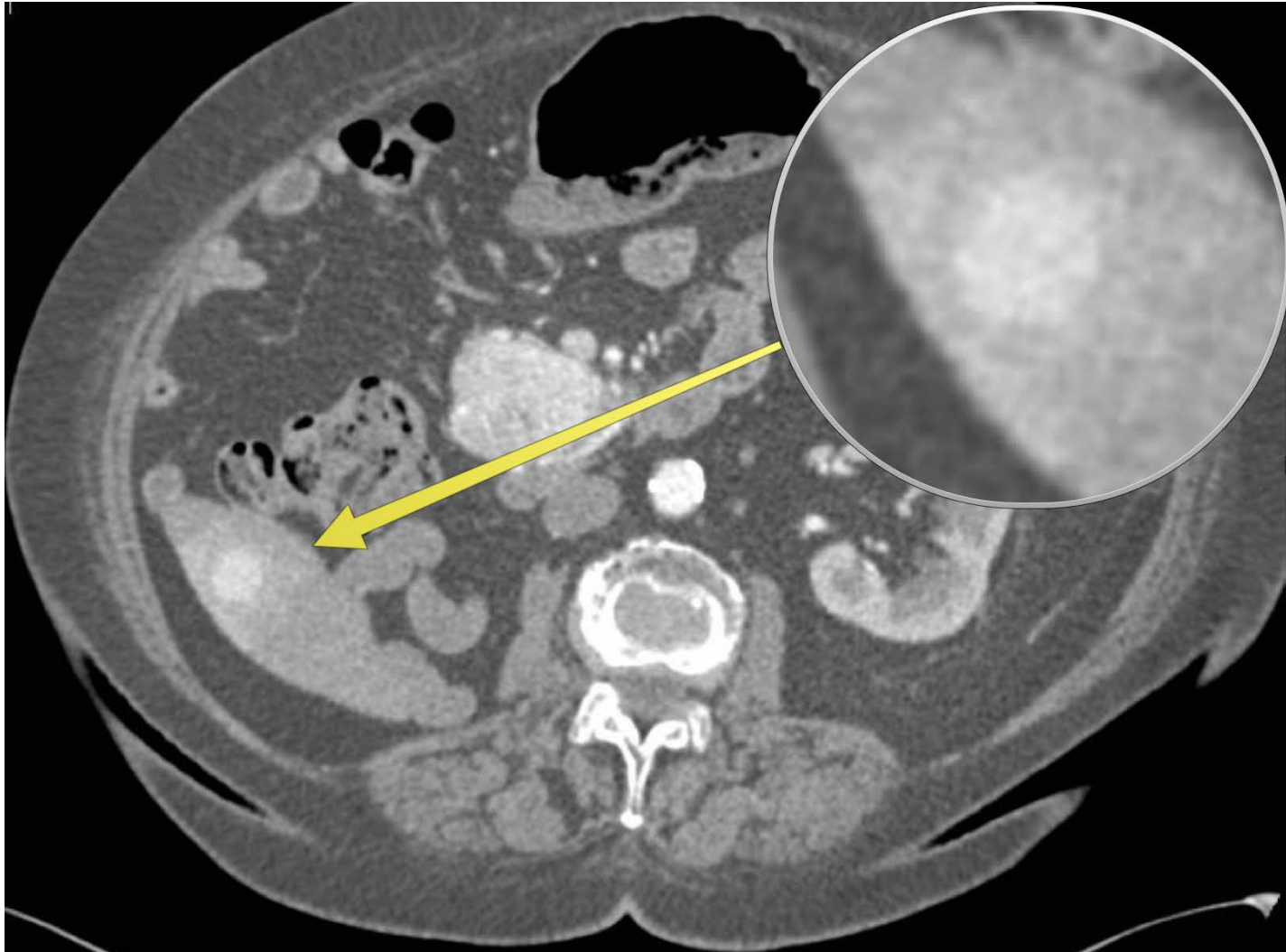
Casuïstiek

CT, “flash filling” hemangioom



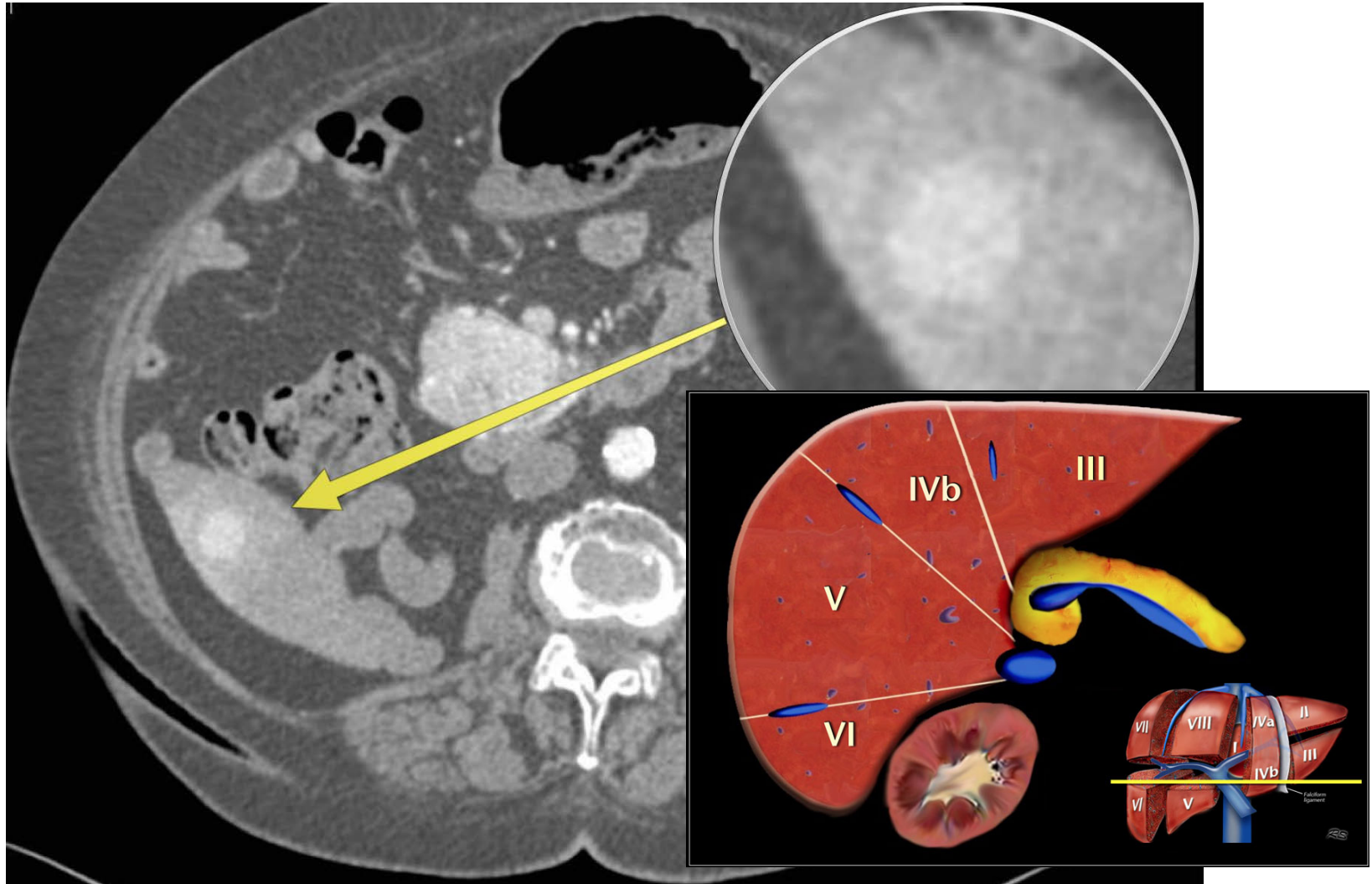
Casuïstiek

CT, melanoom metastase



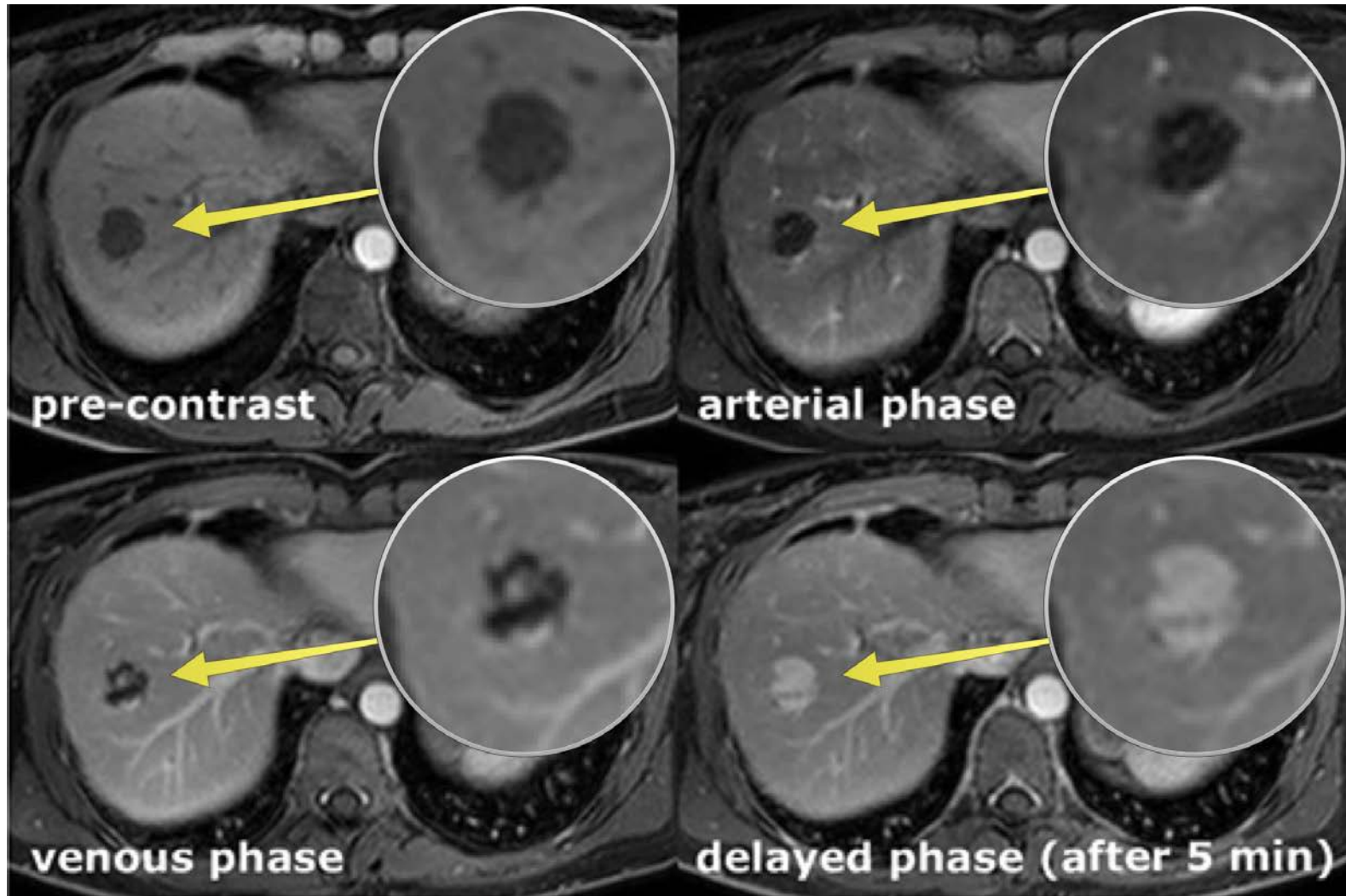
Casuïstiek

CT, melanoom metastase



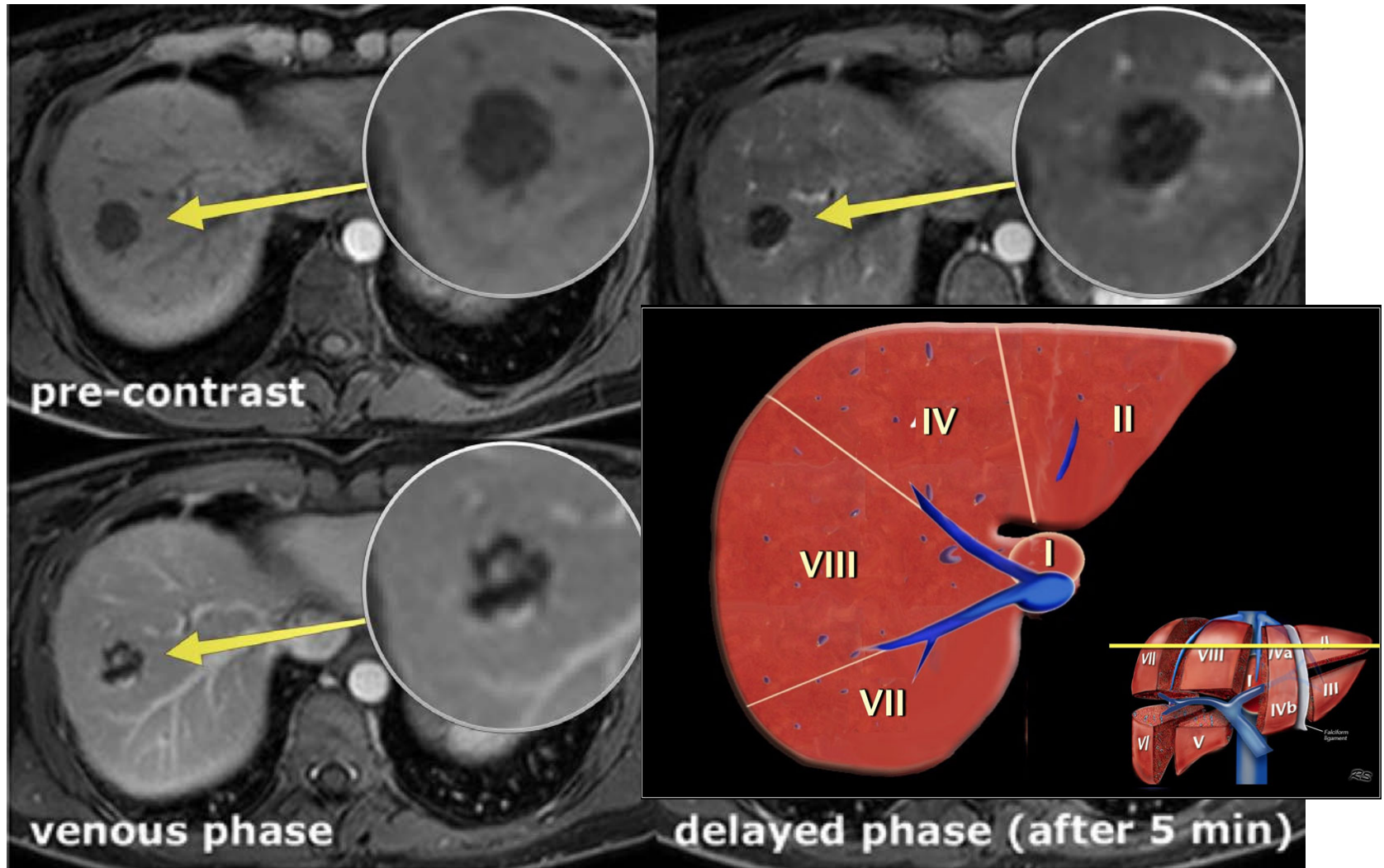
Casuïstiek

MRI, klassiek hemangioom



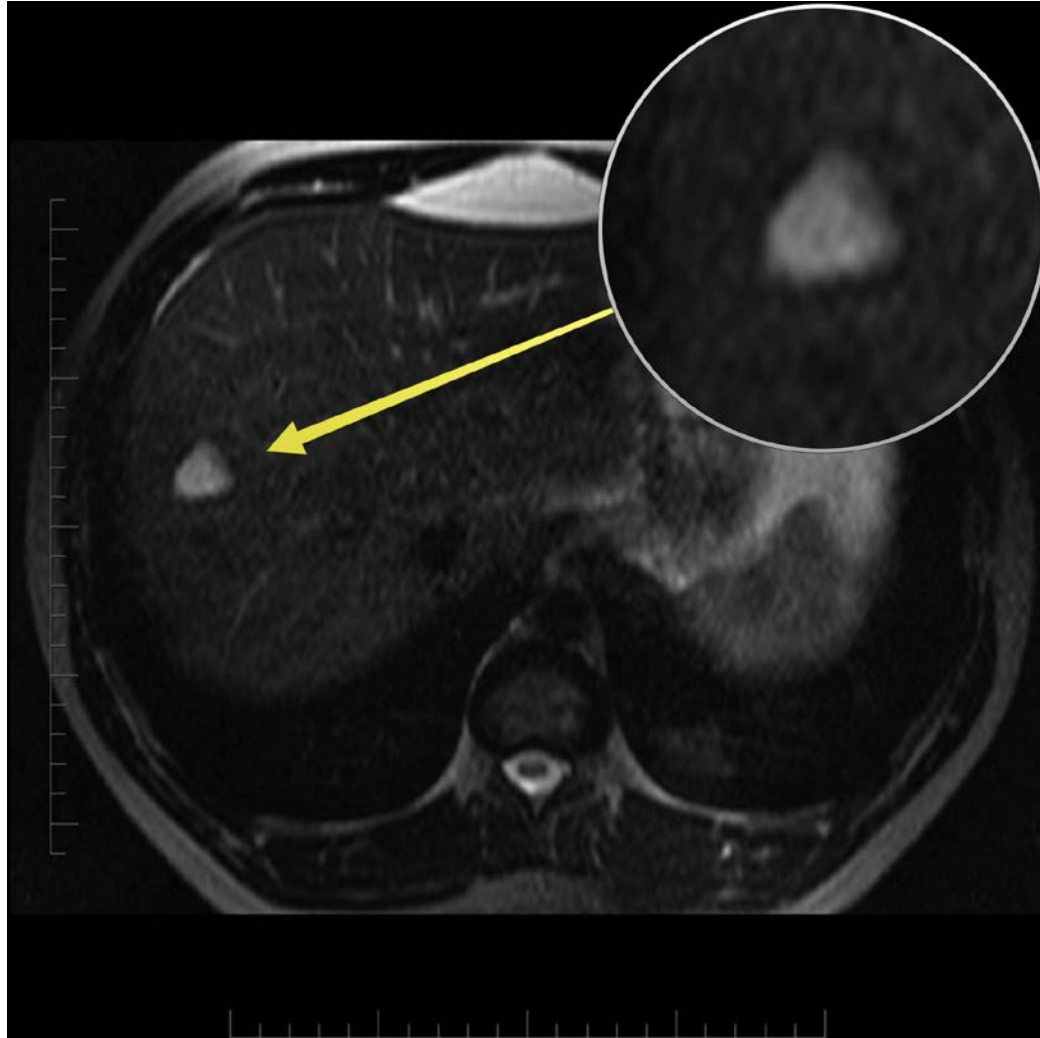
Casuïstiek

MRI, klassiek hemangioom



Casuïstiek

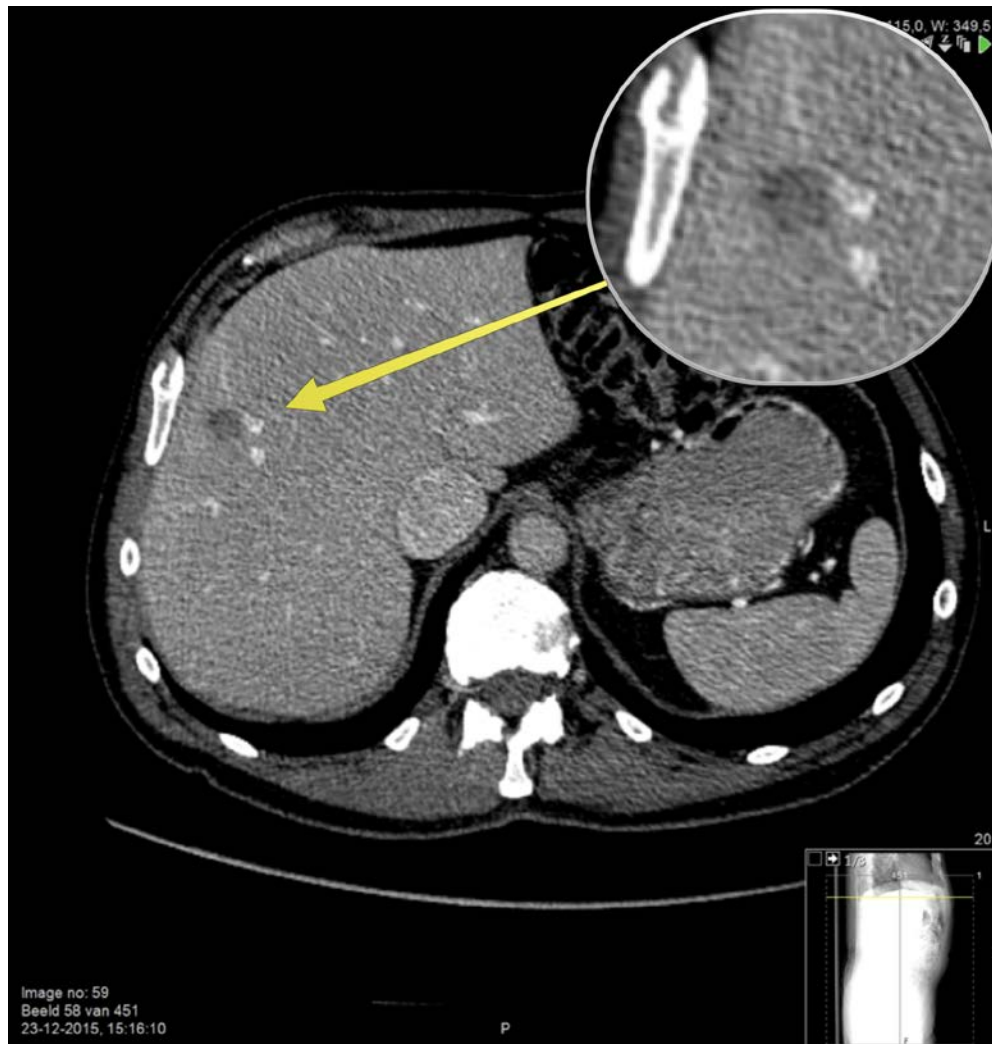
MRI, hemangioom T2 lange echotijd



Casus 4

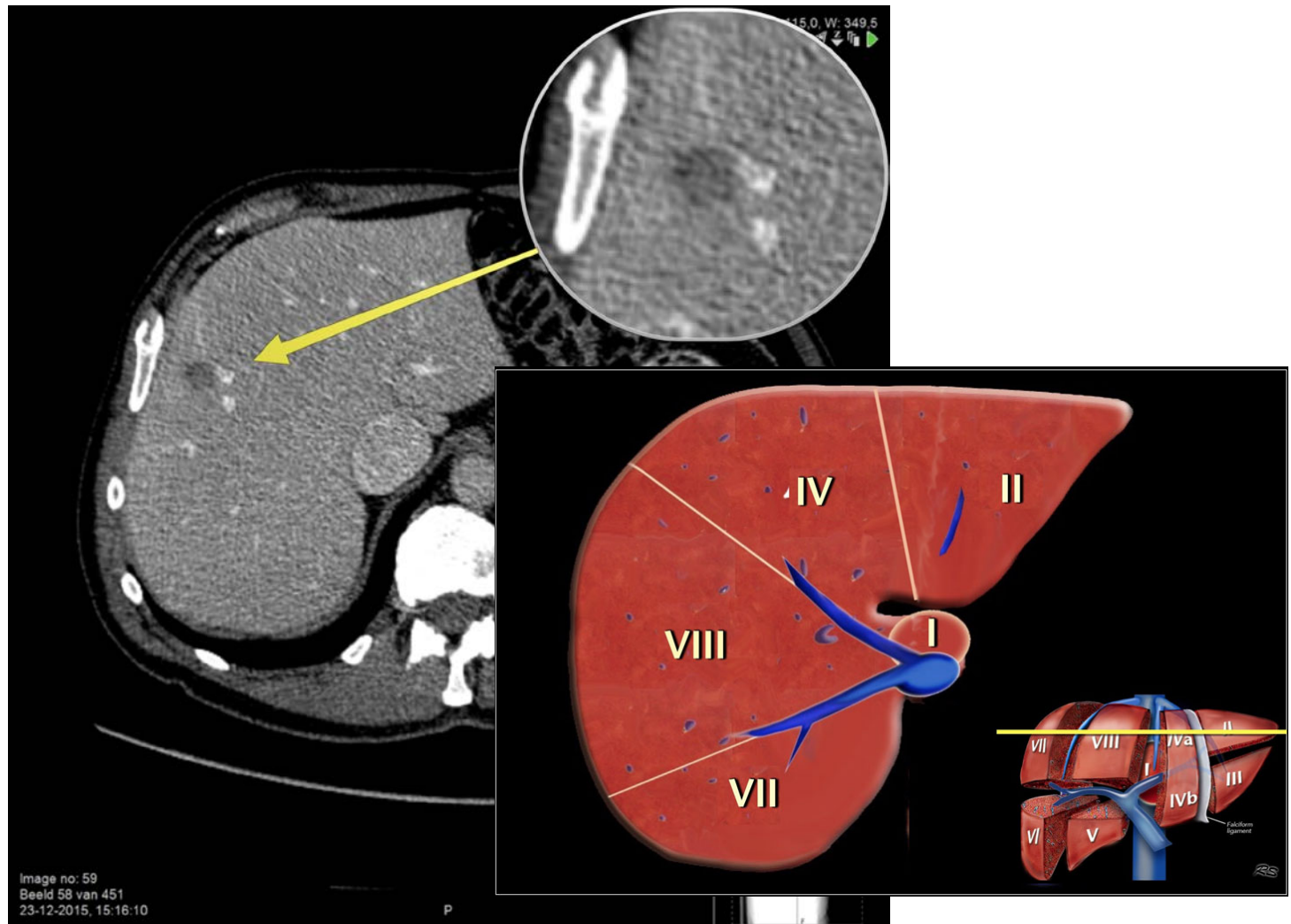
Casuïstiek

CT, metastase?

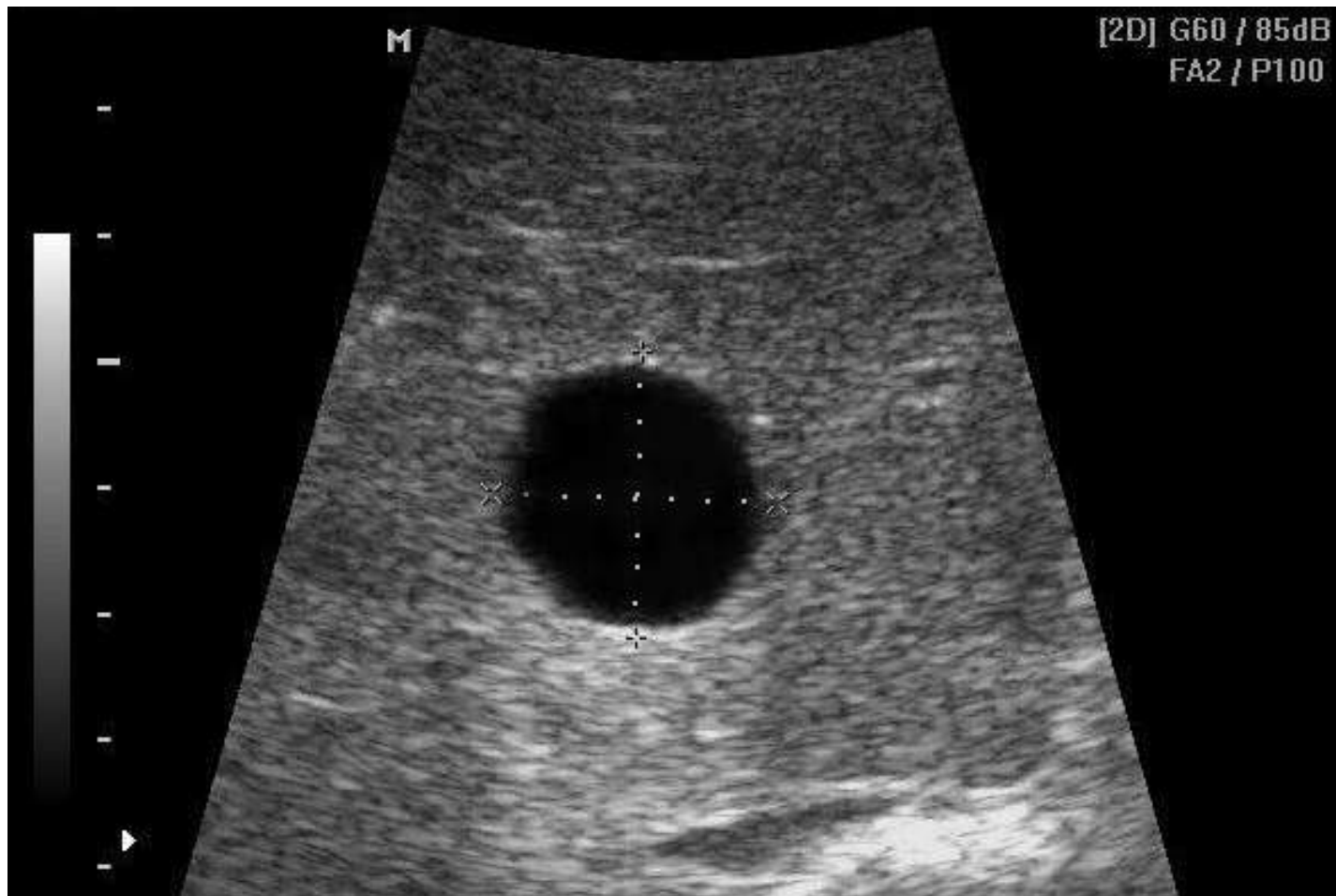


Casuïstiek

CT, metastase?

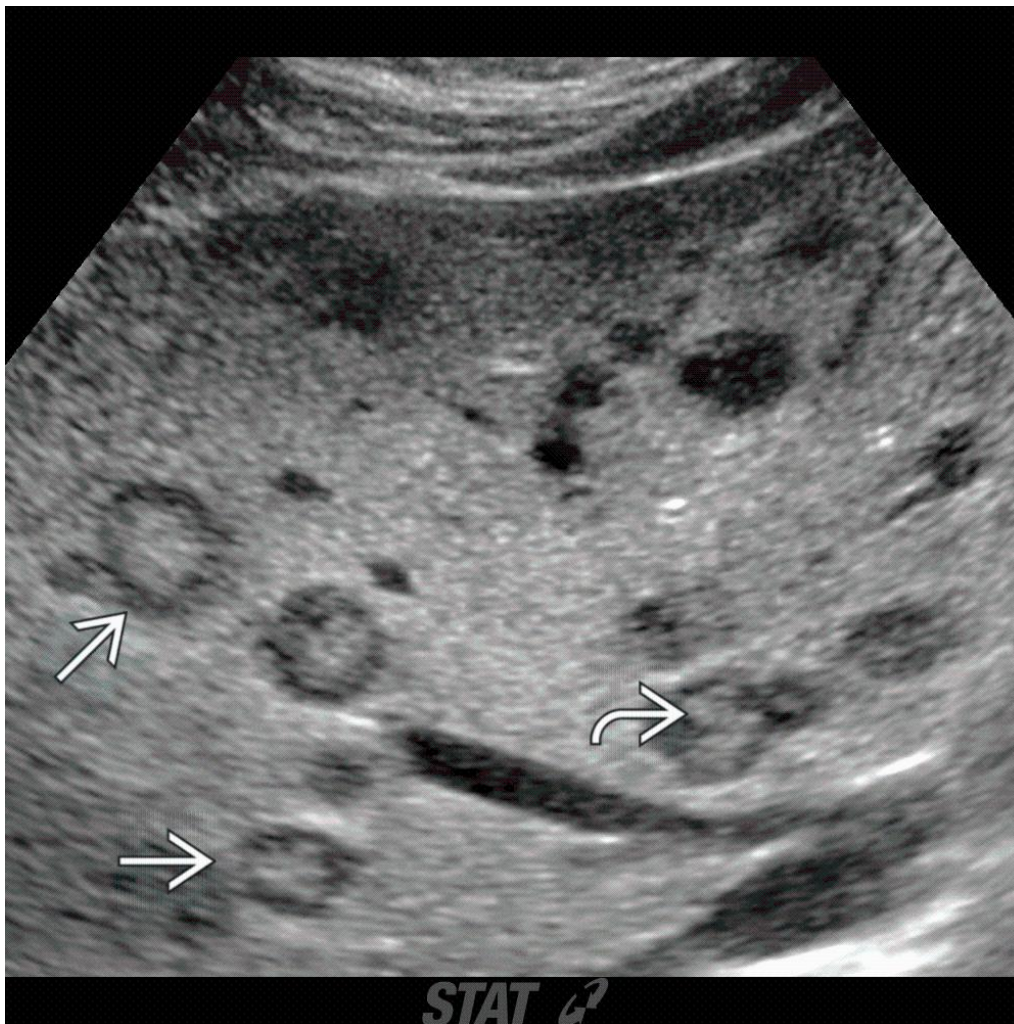


Echo



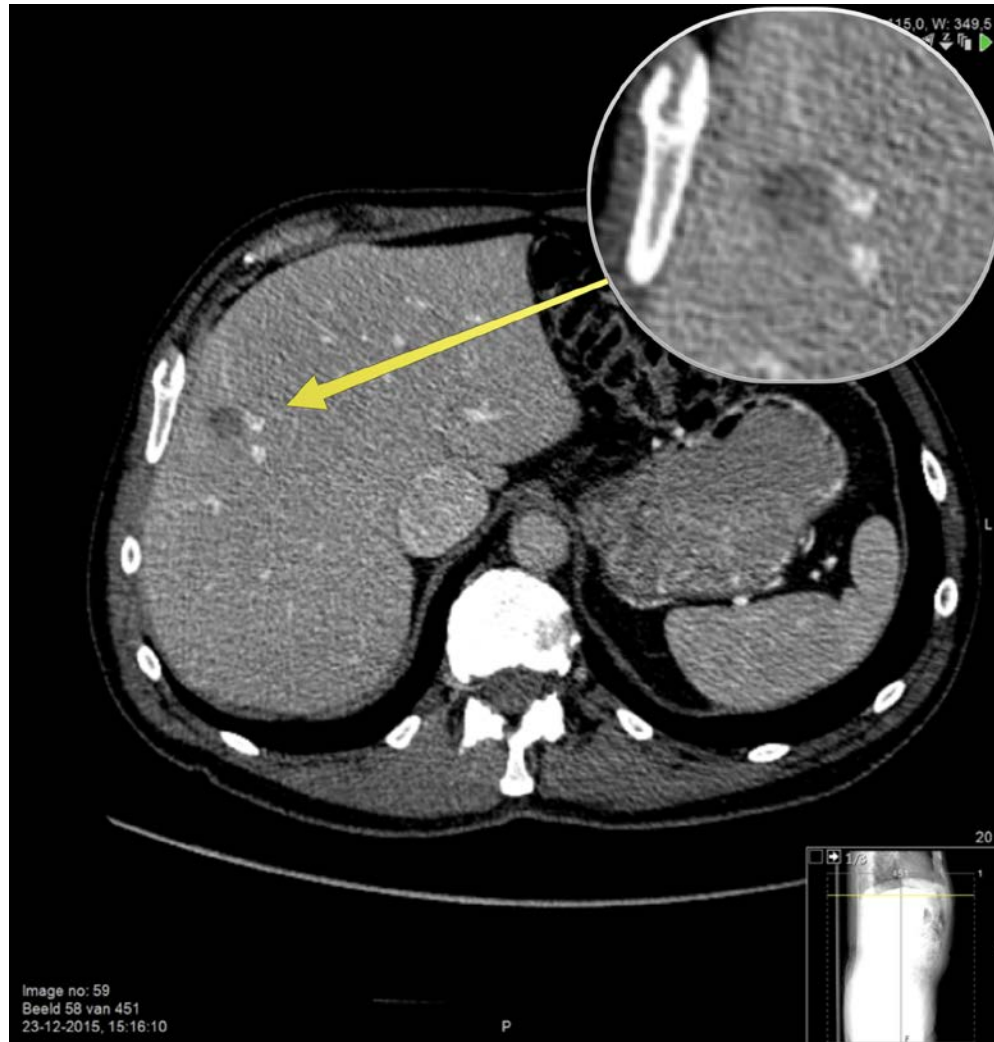
Casuïstiek

Echo, metastasen



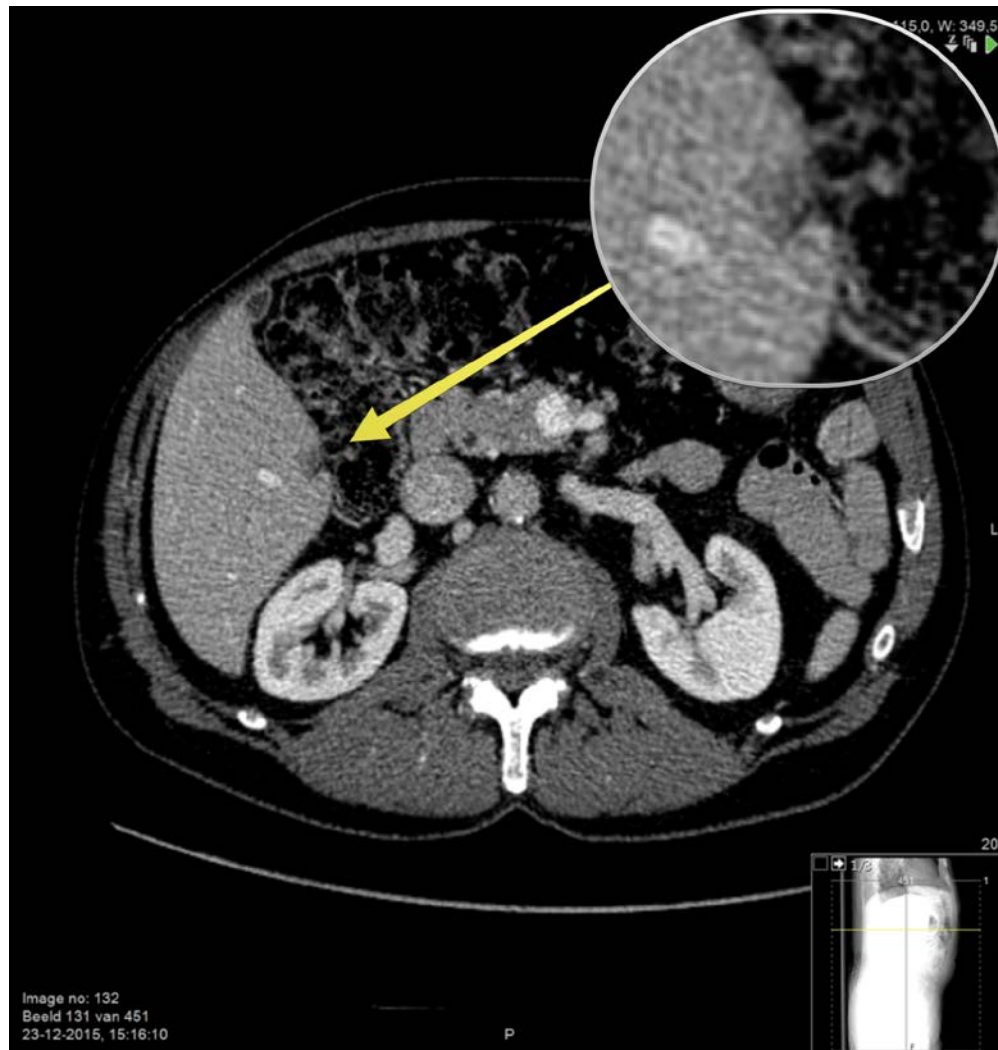
Casuïstiek

CT, metastase?



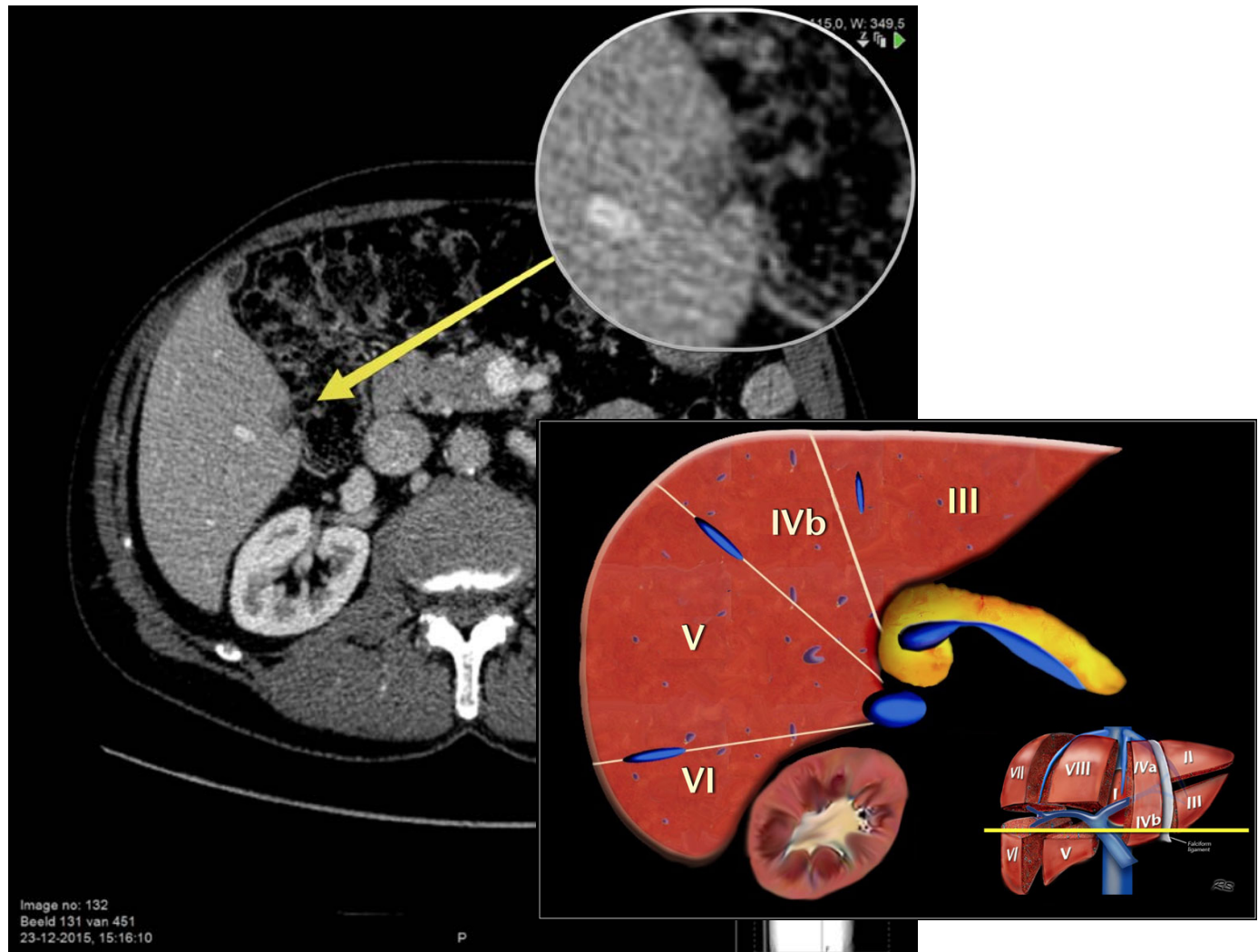
Casuïstiek

CT, metastase?



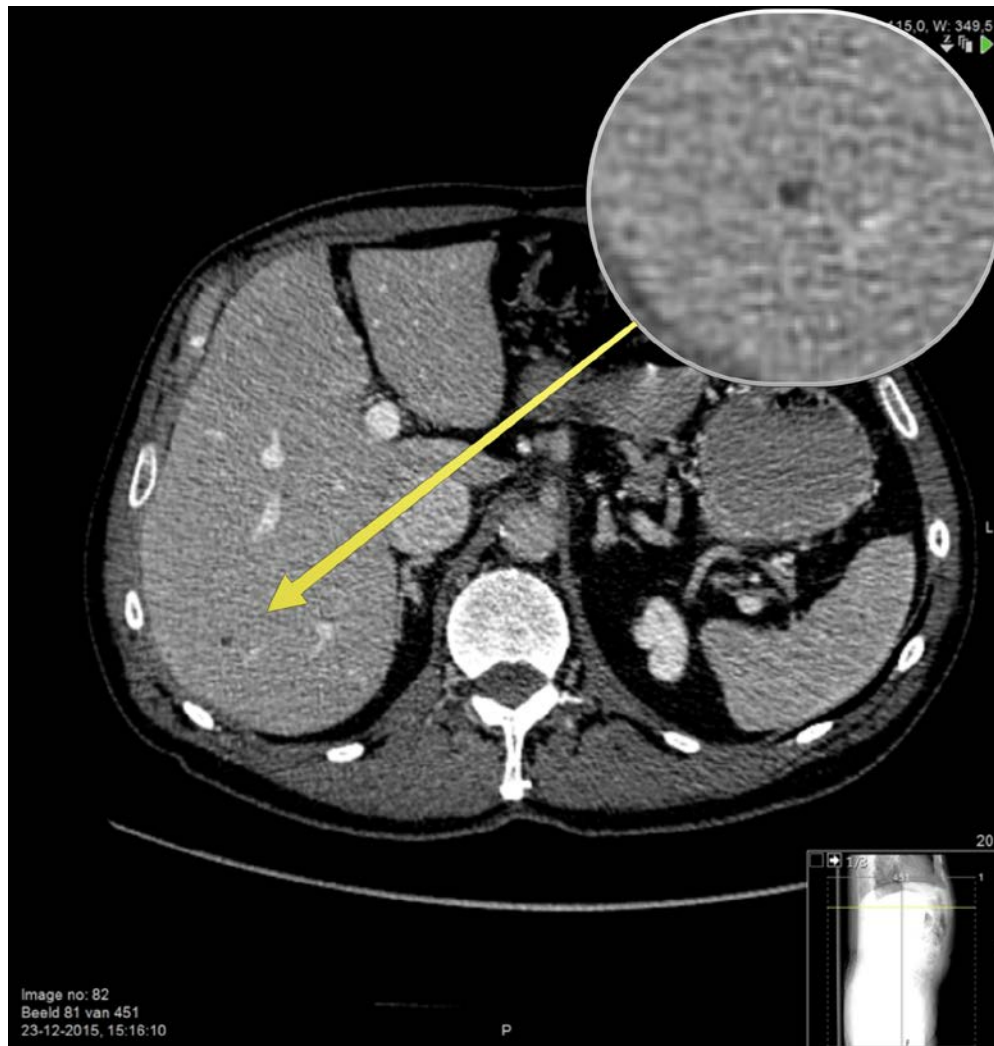
Casuïstiek

CT, metastase?



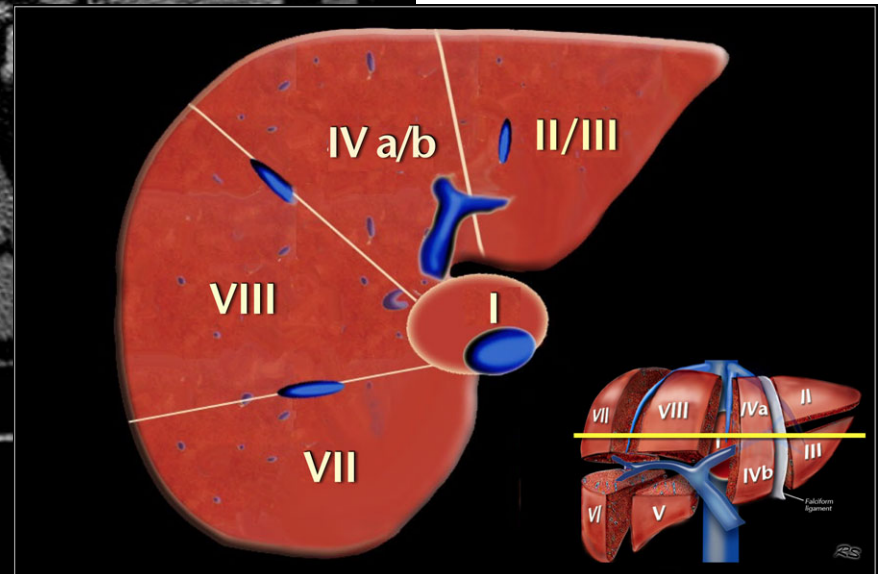
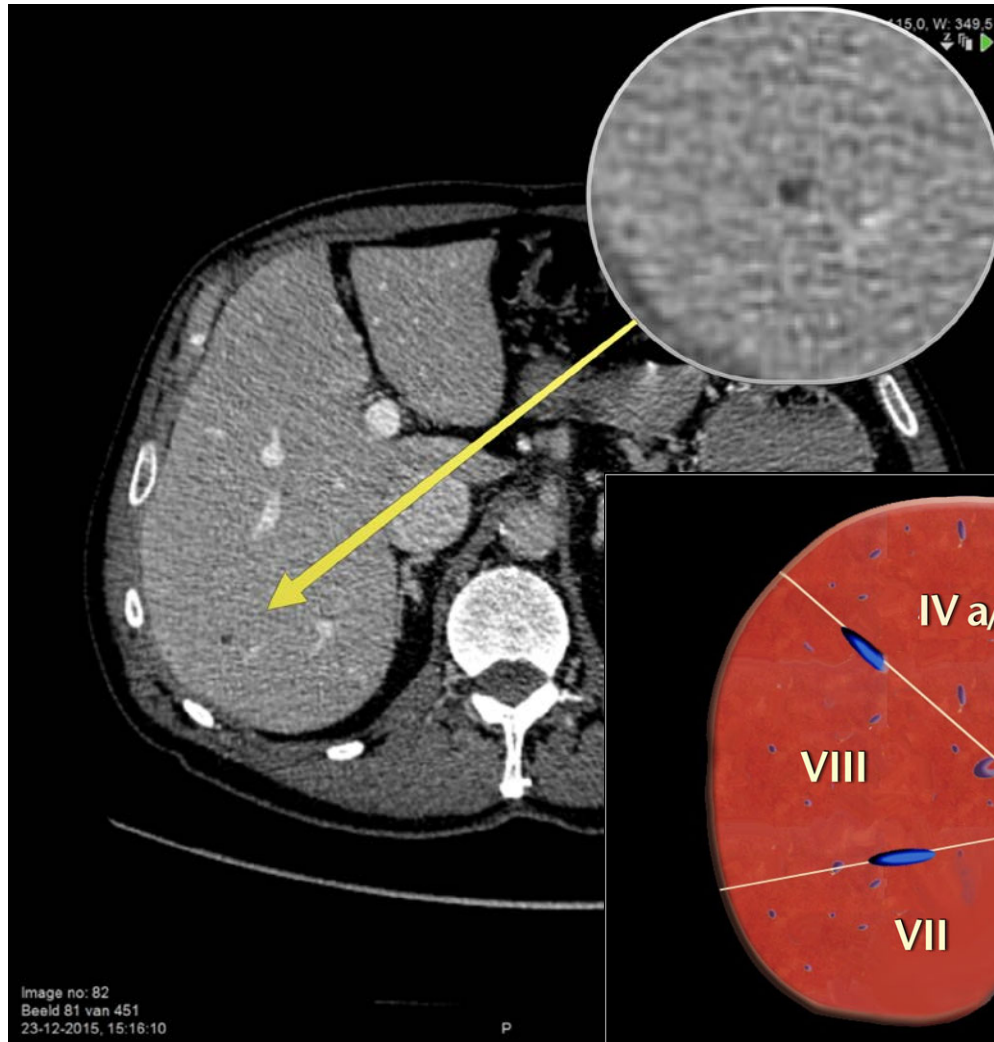
Casuïstiek

CT, metastase?



Casuïstiek

CT, metastase?



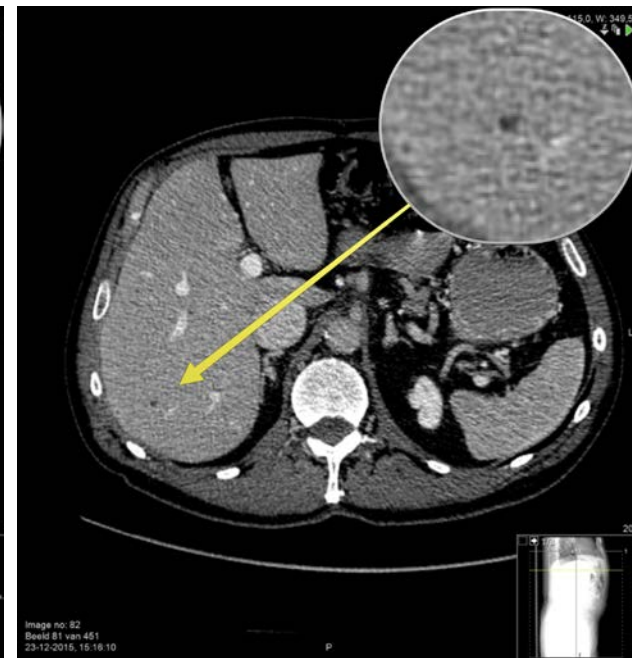
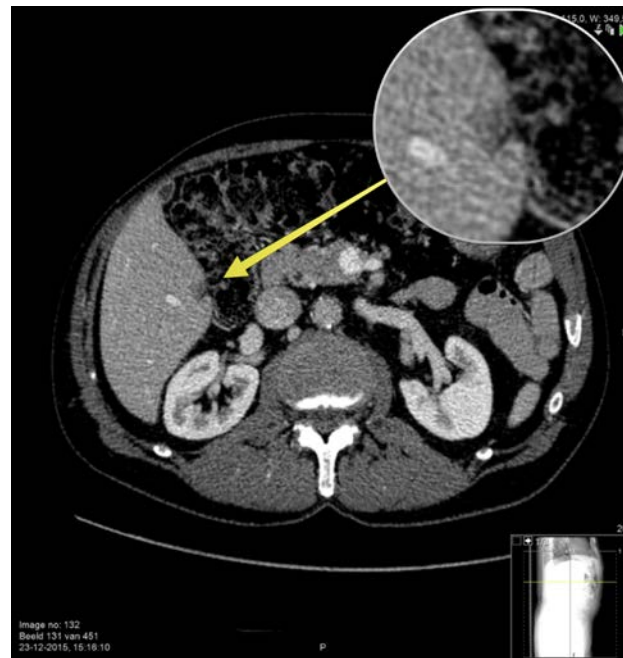
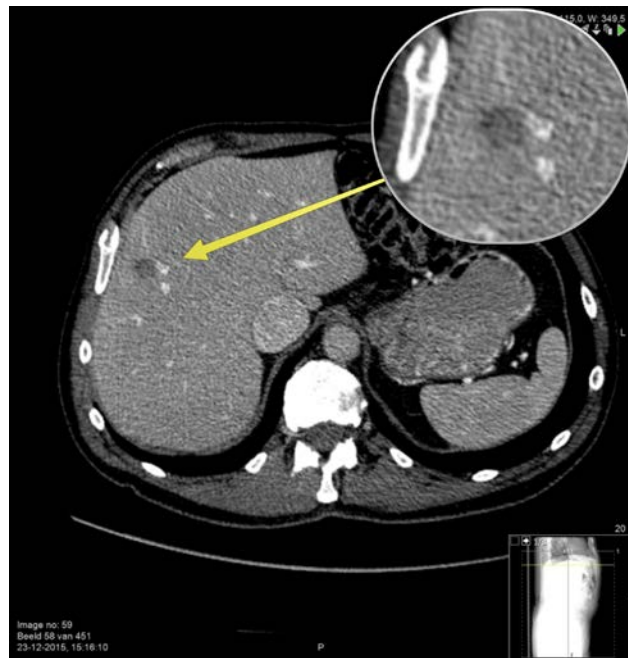
Casuïstiek

CT, metastase?

1 X

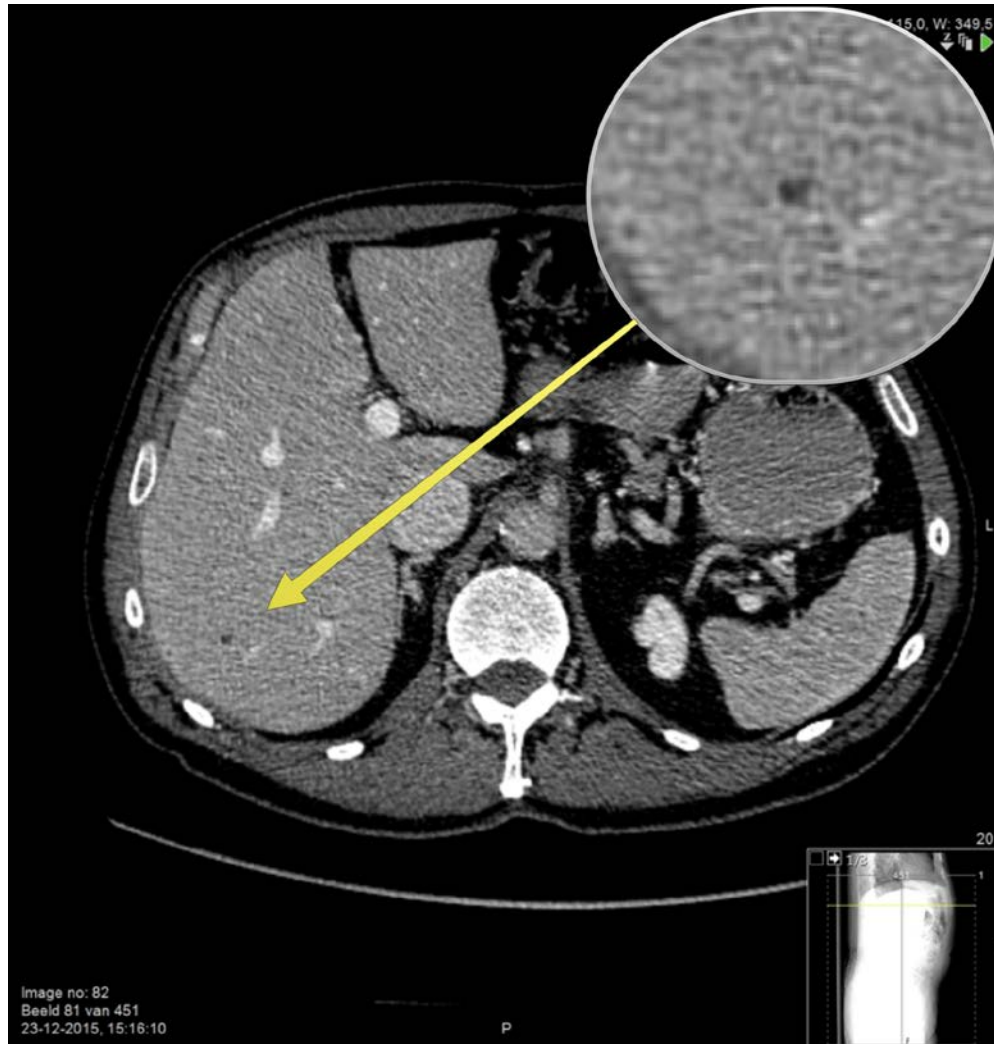
1 X

3 X



Casuïstiek

CT, metastase?

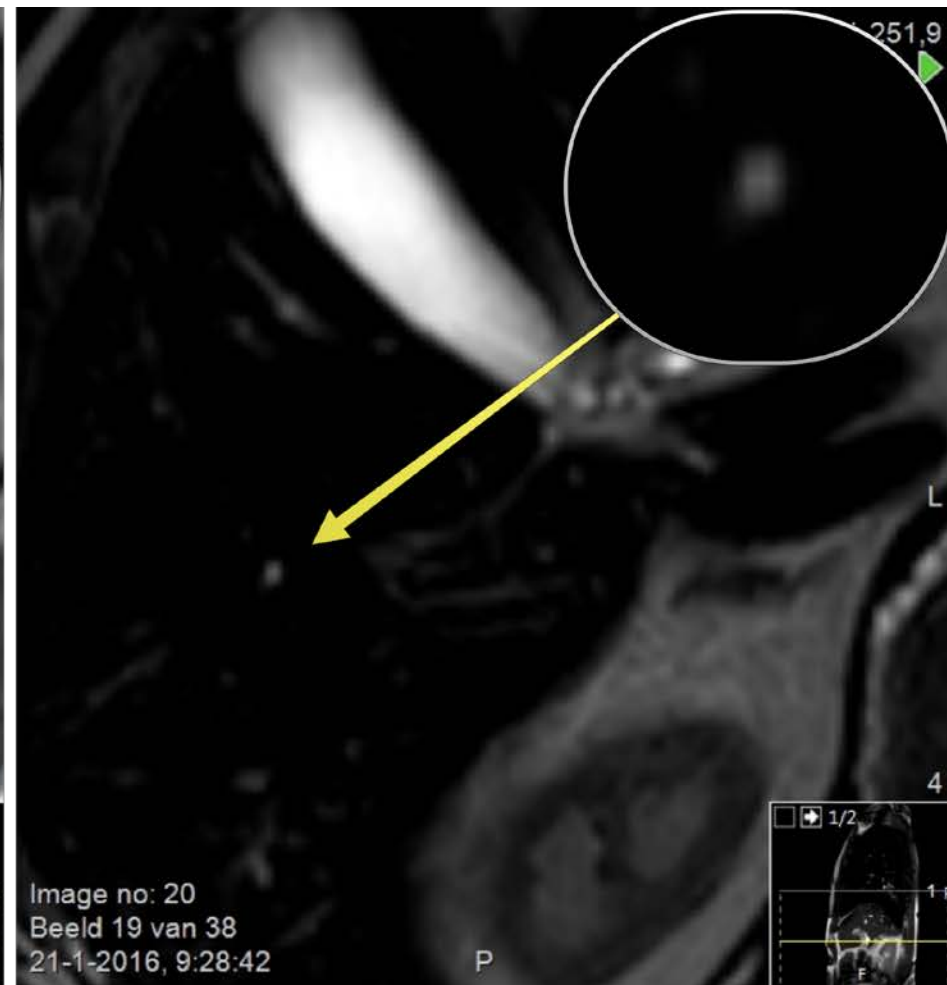


Casuïstiek

MRI T2



T2, korte echotijd



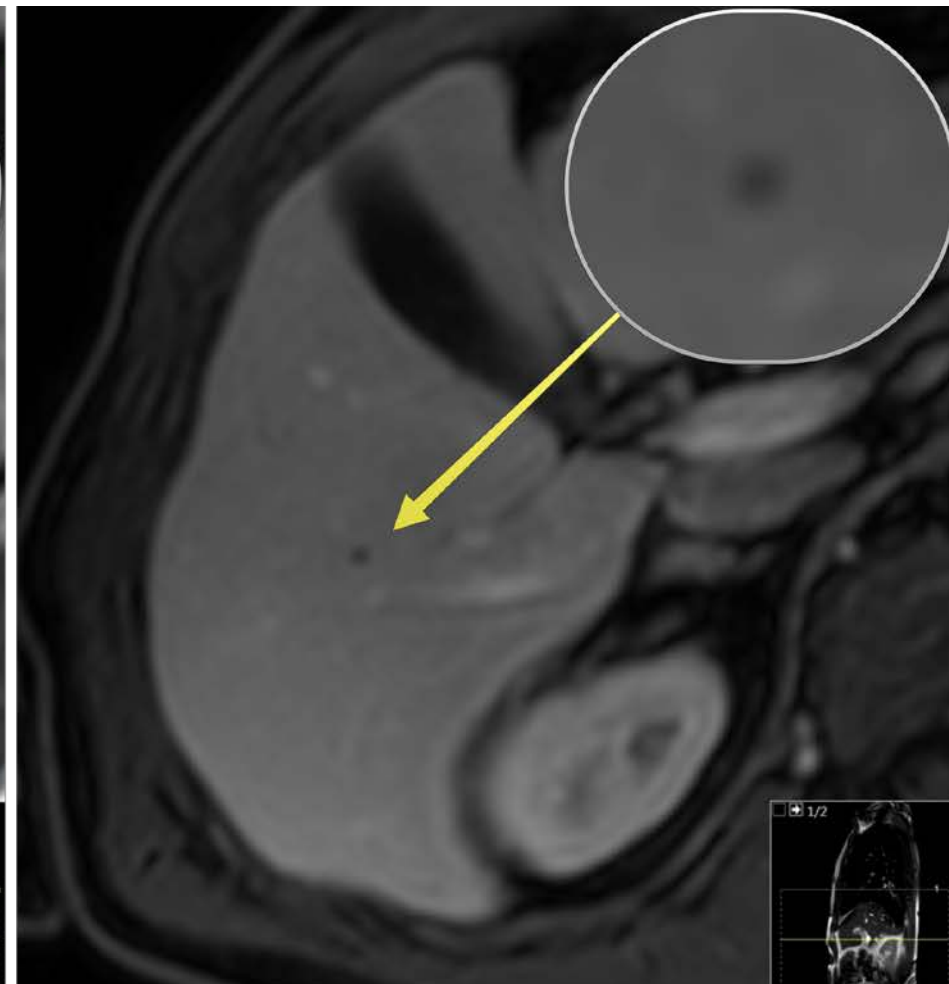
T2, lange echotijd

Casuïstiek

MRI T2 en contrast



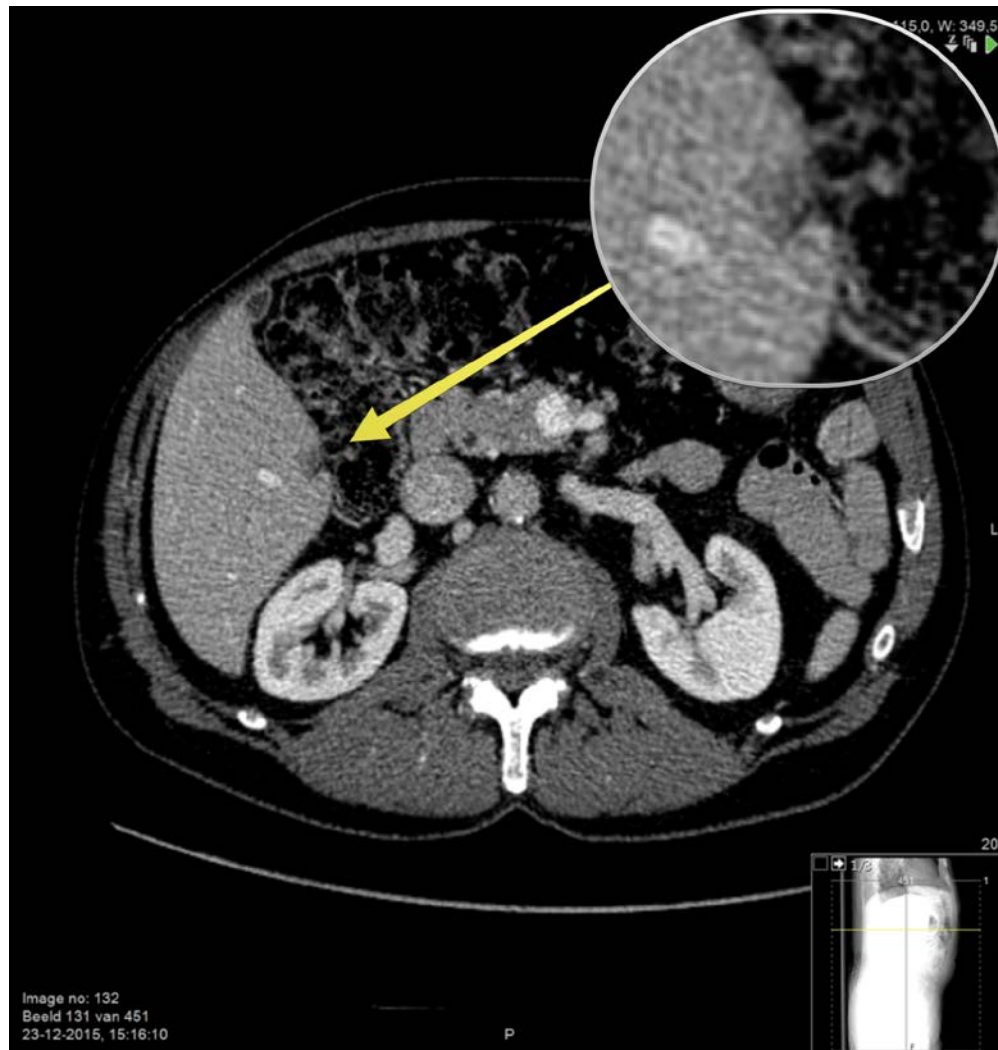
T2, korte echotijd



Contrast, portaal veneuze fase

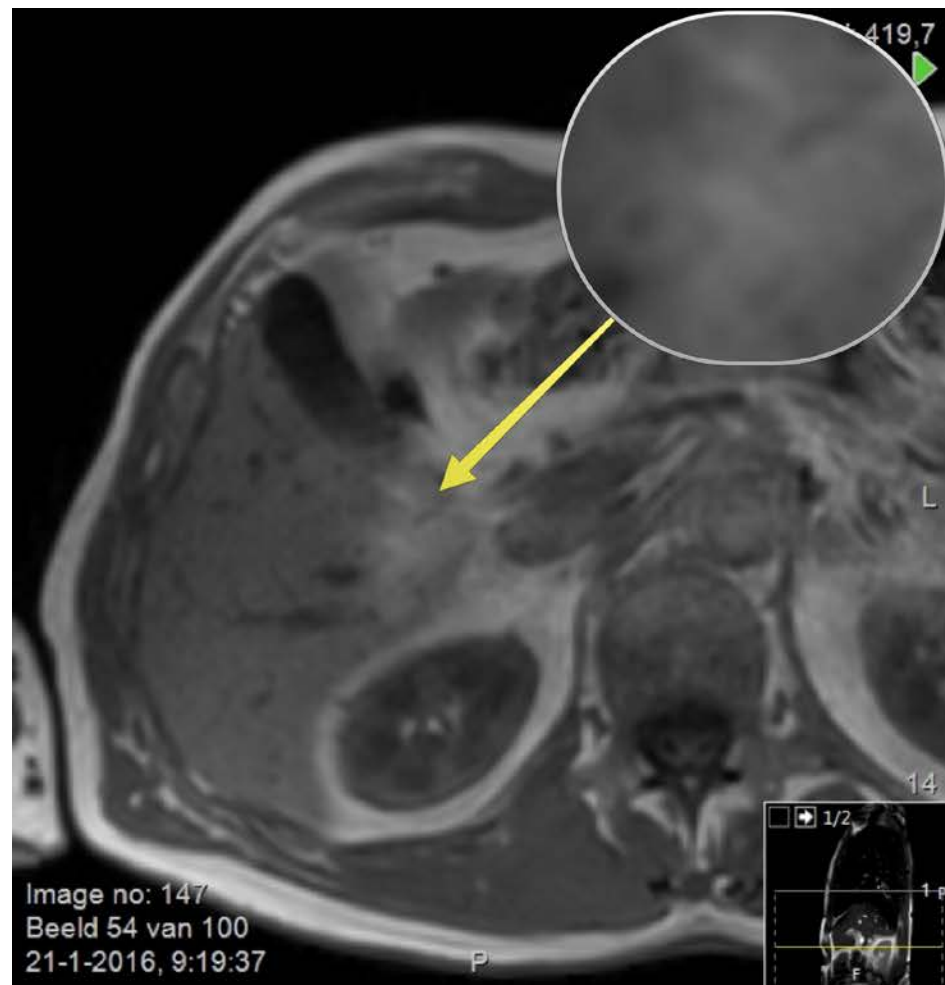
Casuïstiek

CT, metastase?

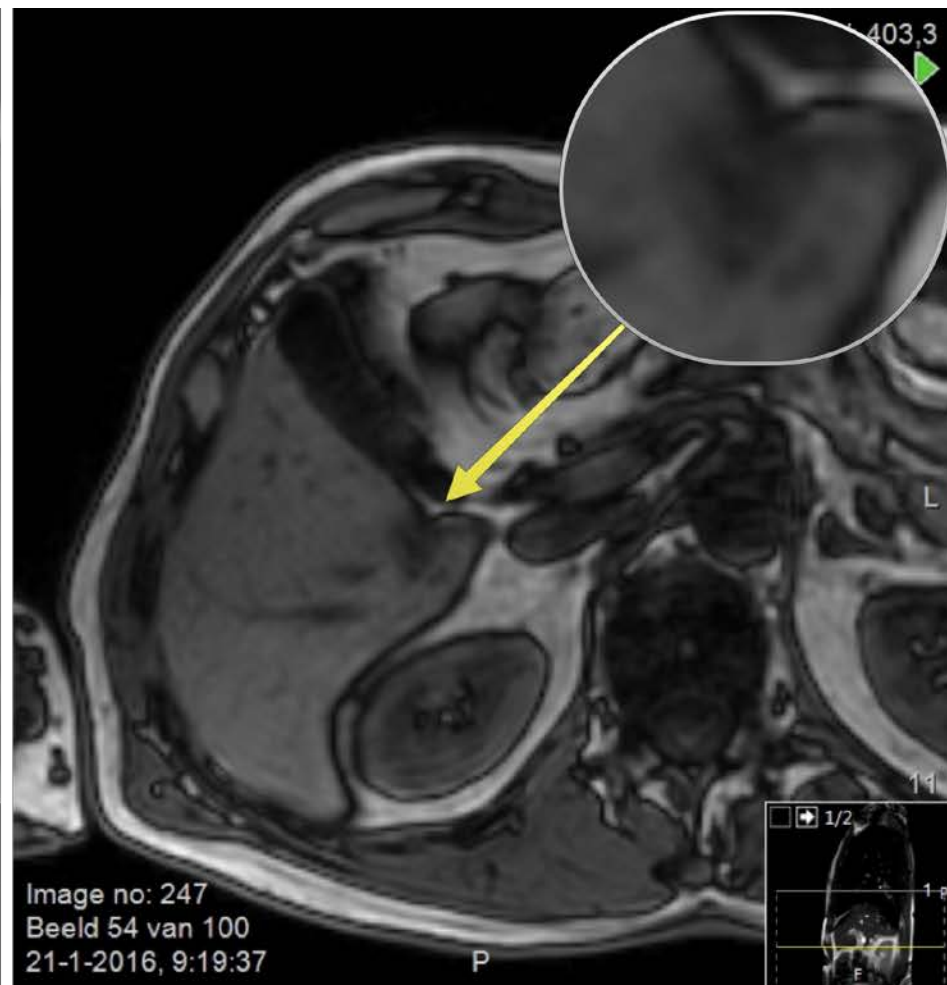


Casuïstiek

MRI, in-fase en uit-fase



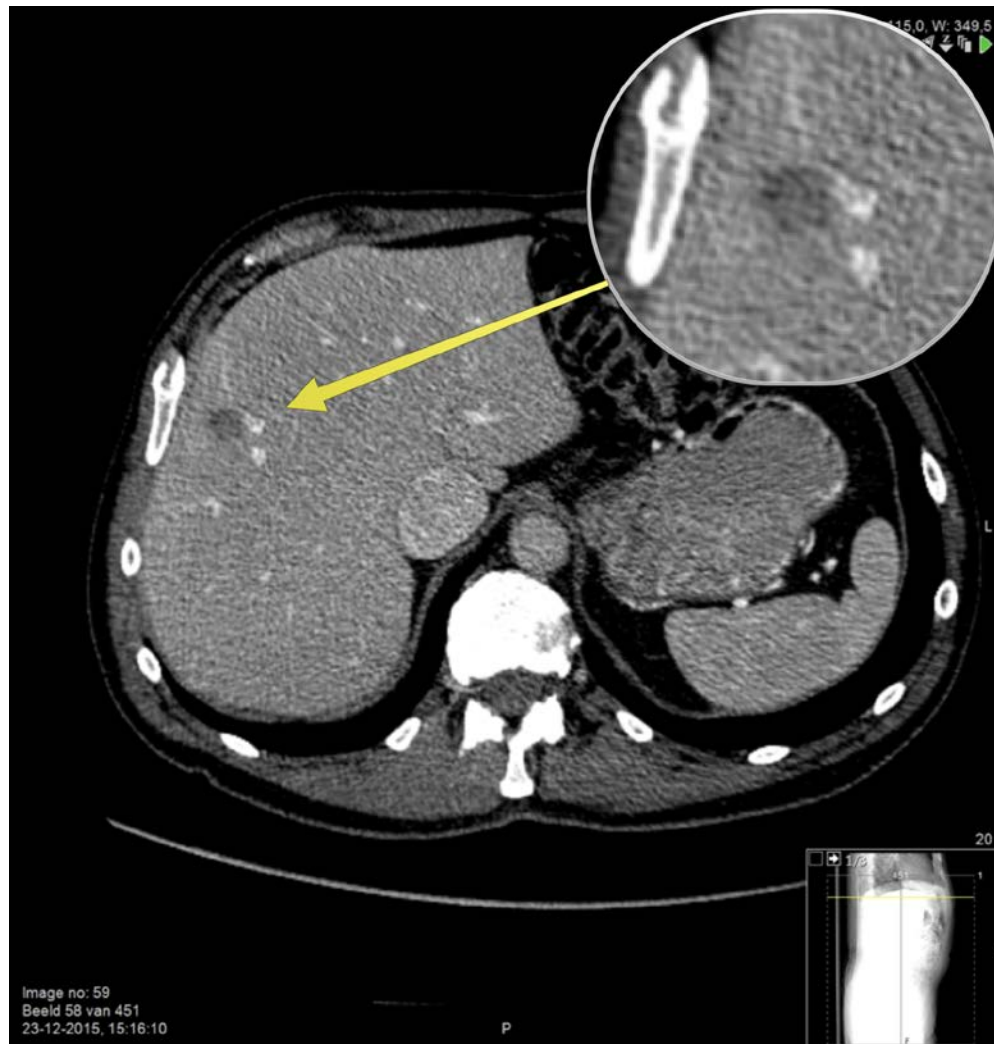
In-fase



Uit-fase

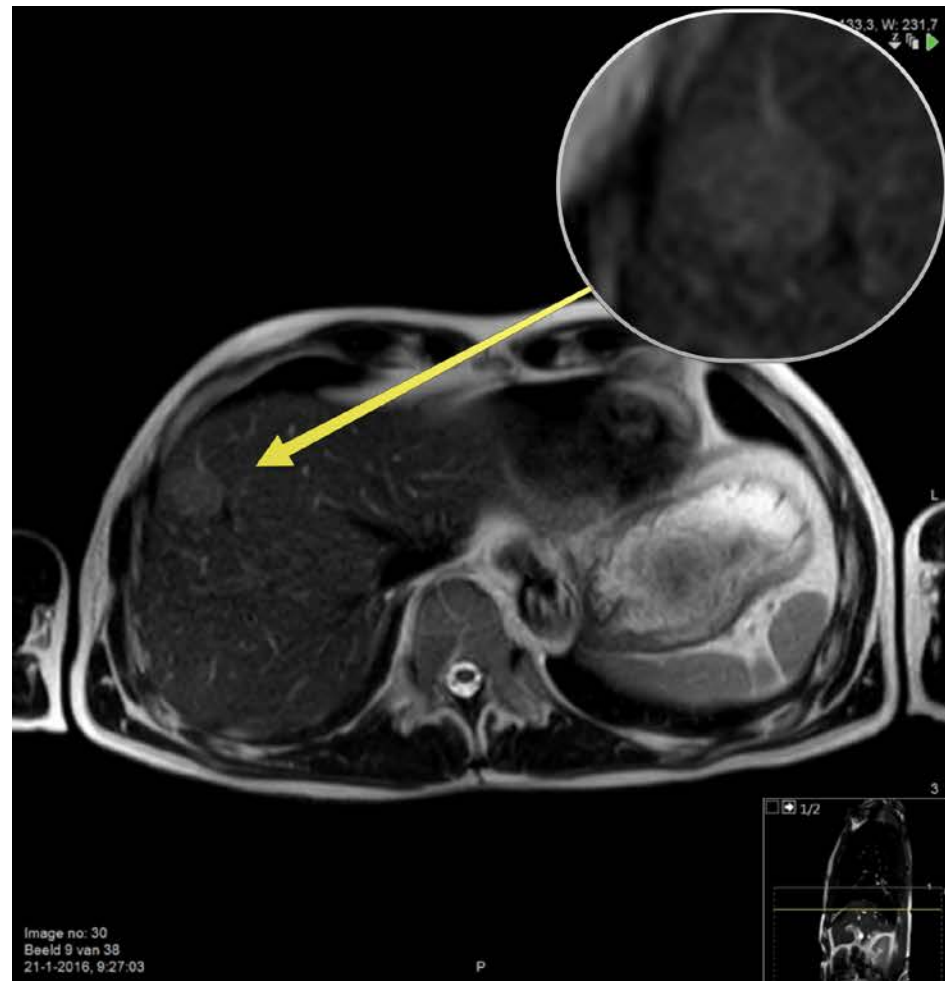
Casuïstiek

CT, metastase?

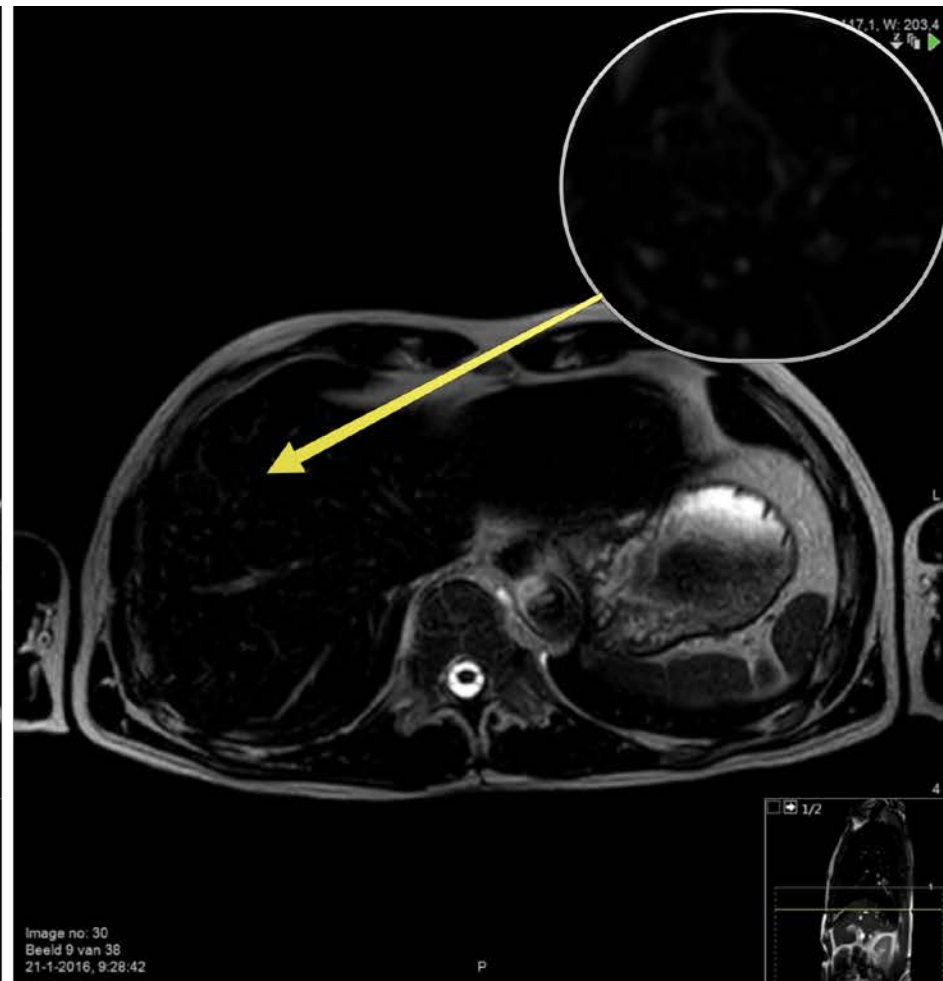


Casuïstiek

MRI T2



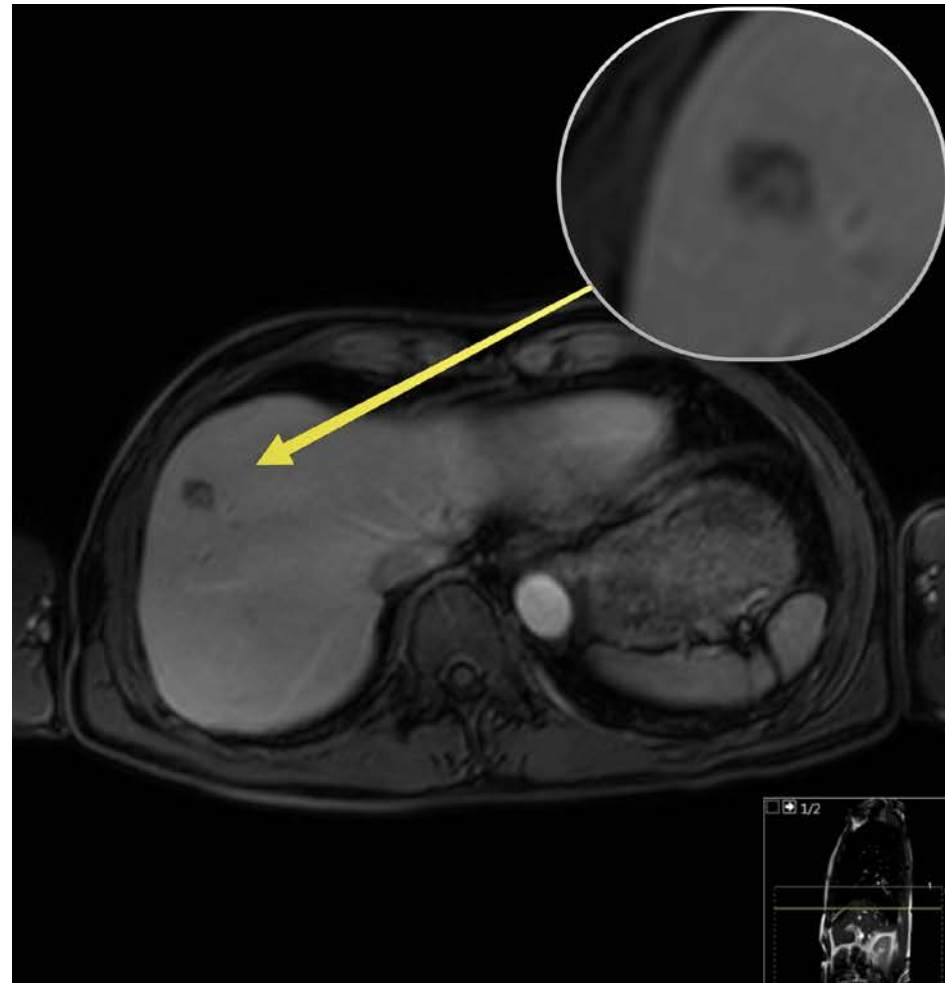
T2, korte echartijd



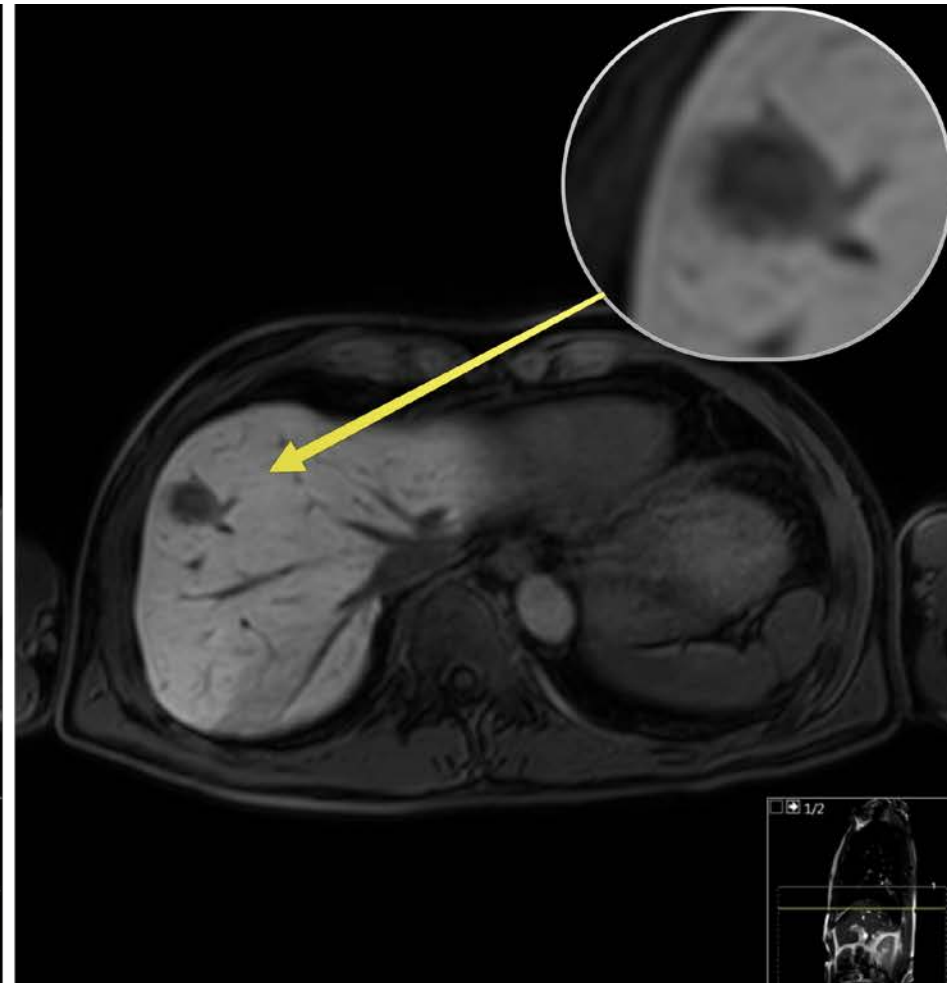
T2, lange echartijd

Casuïstiek

MRI contrast



Portaal veneuze fase



Late fase, "hepatobiliaire fase"

Casus 5

MRI, bij CT toevalsbevinding jonge vrouw (hypervasculaire laesie)



T2 korte echotijd



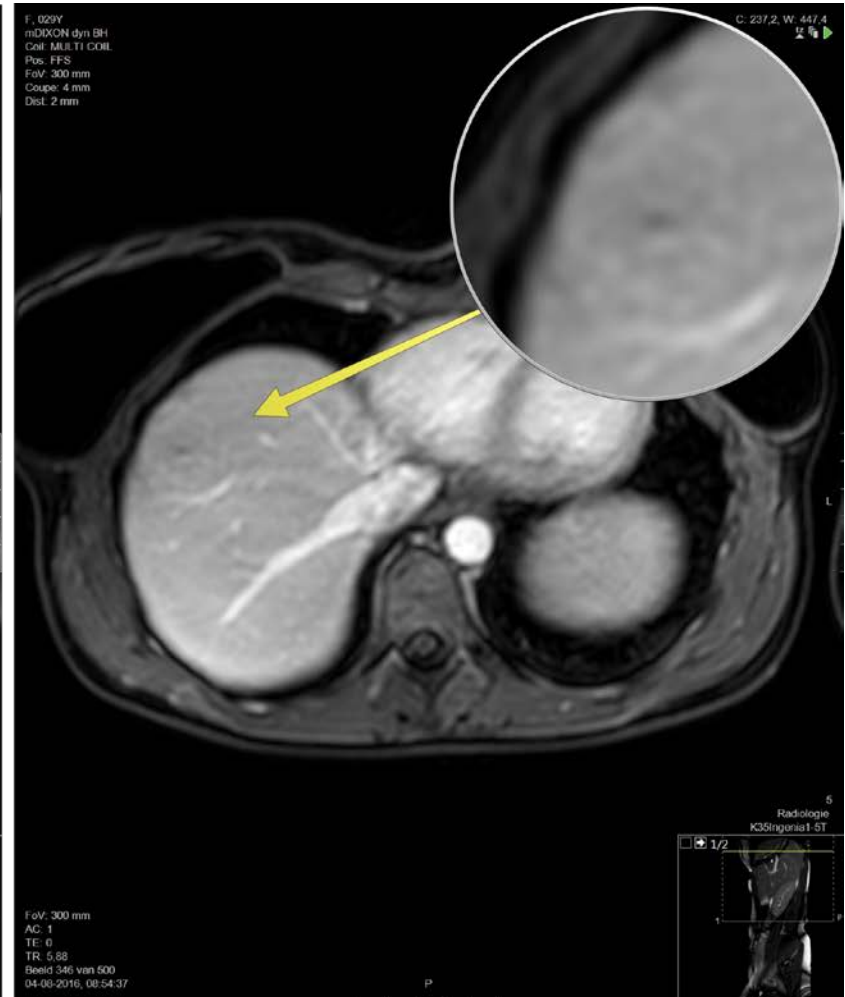
T2 lange echotijd

Casuïstiek

MRI, bij CT toevalsbevinding jonge vrouw (hypervasculaire laesie)



Arteriële fase

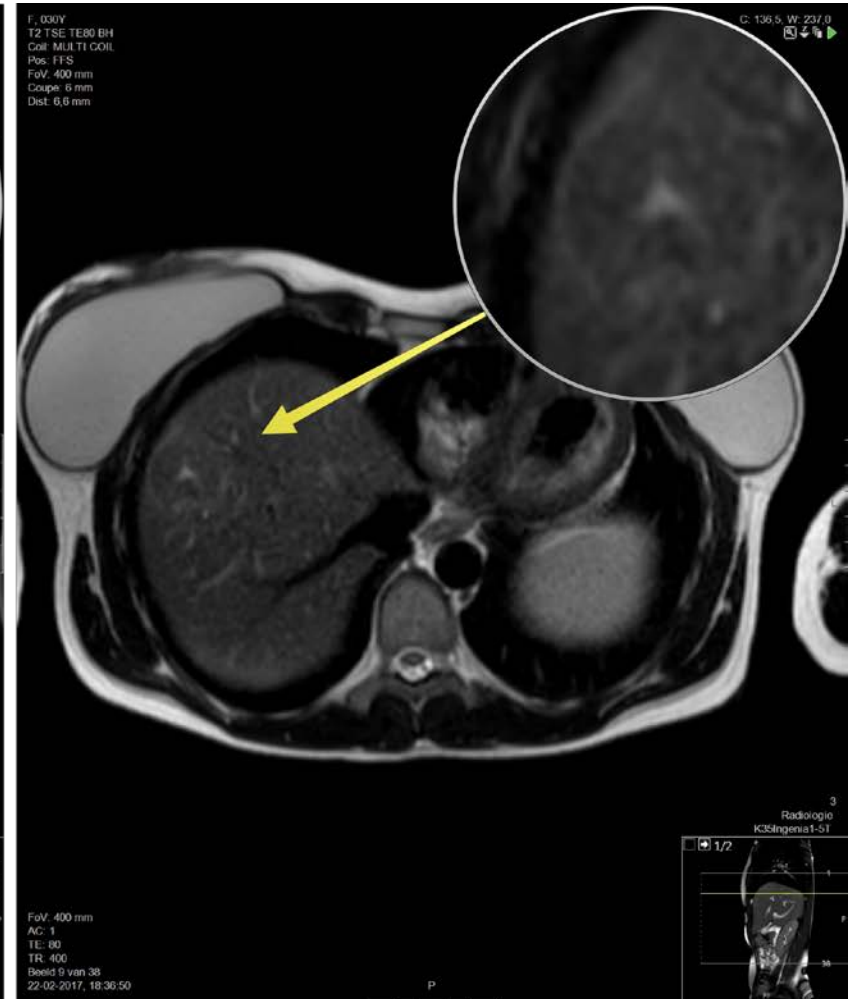


Portaal-veneuze fase

MRI, bij CT toevalsbevinding jonge vrouw (hypervasculaire laesie)



Arteriële fase



T2

Casuïstiek

MRI, bij CT toevalsbevinding jonge vrouw (hypervasculaire laesie)



Arteriële fase



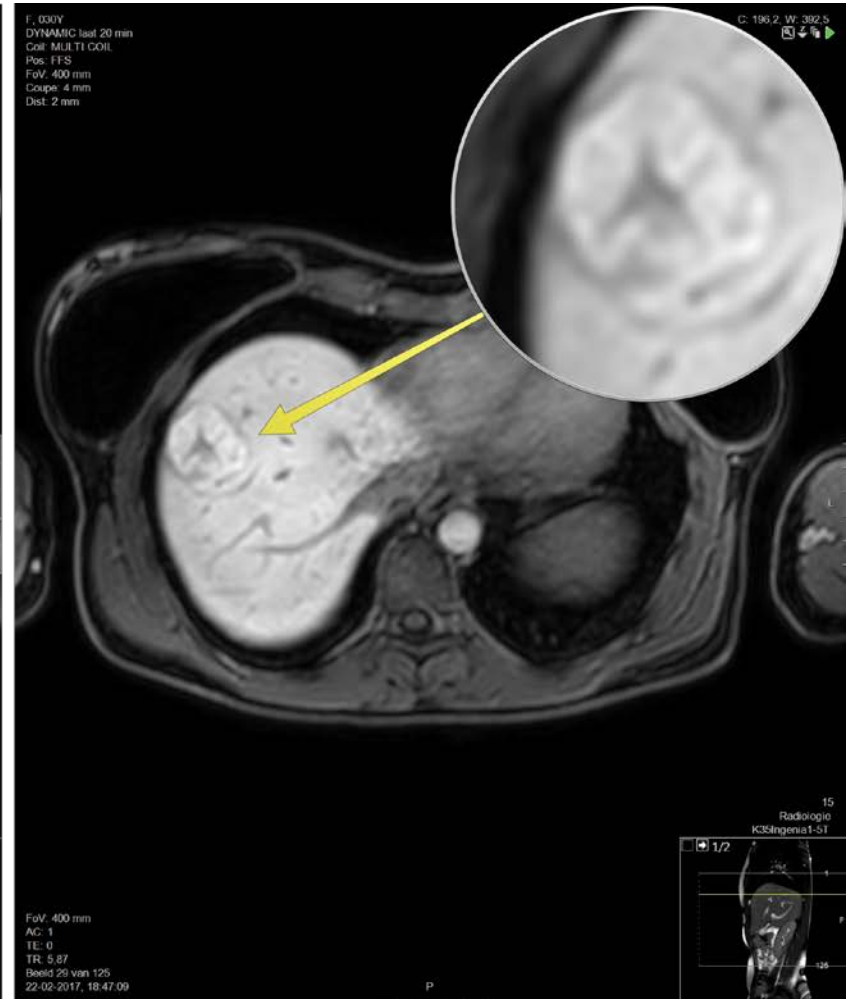
Delayed fase

Casuïstiek

MRI, bij CT toevalsbevinding jonge vrouw (hypervasculaire laesie)



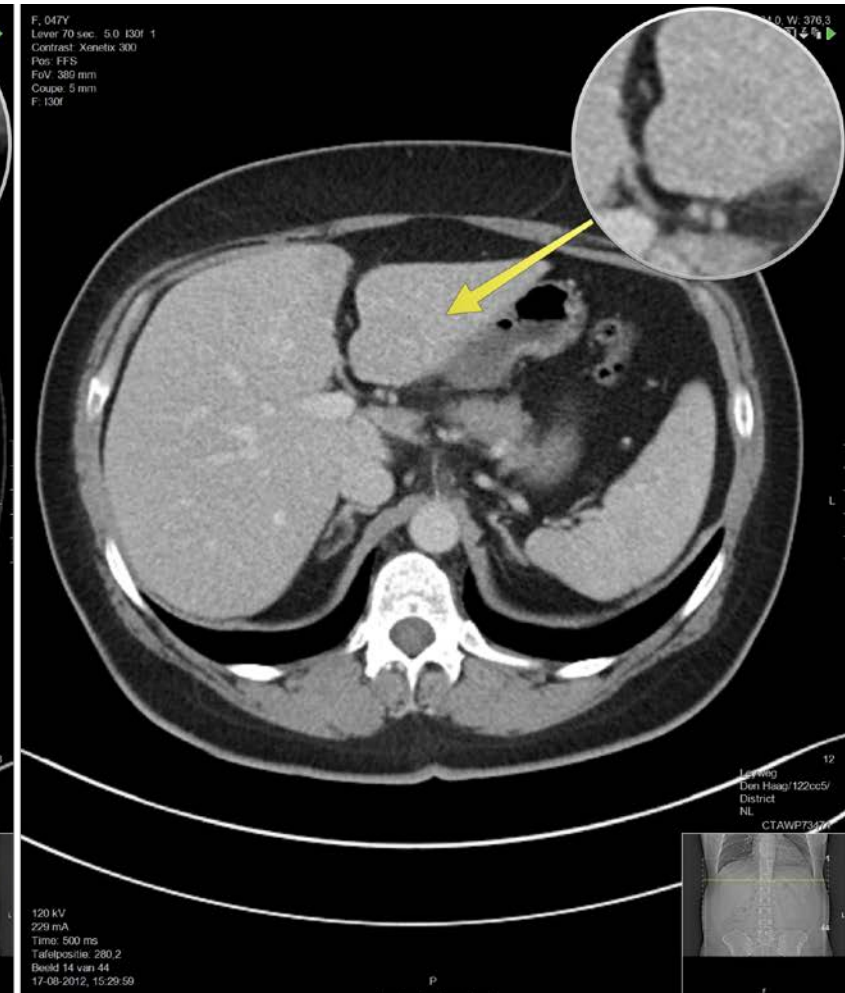
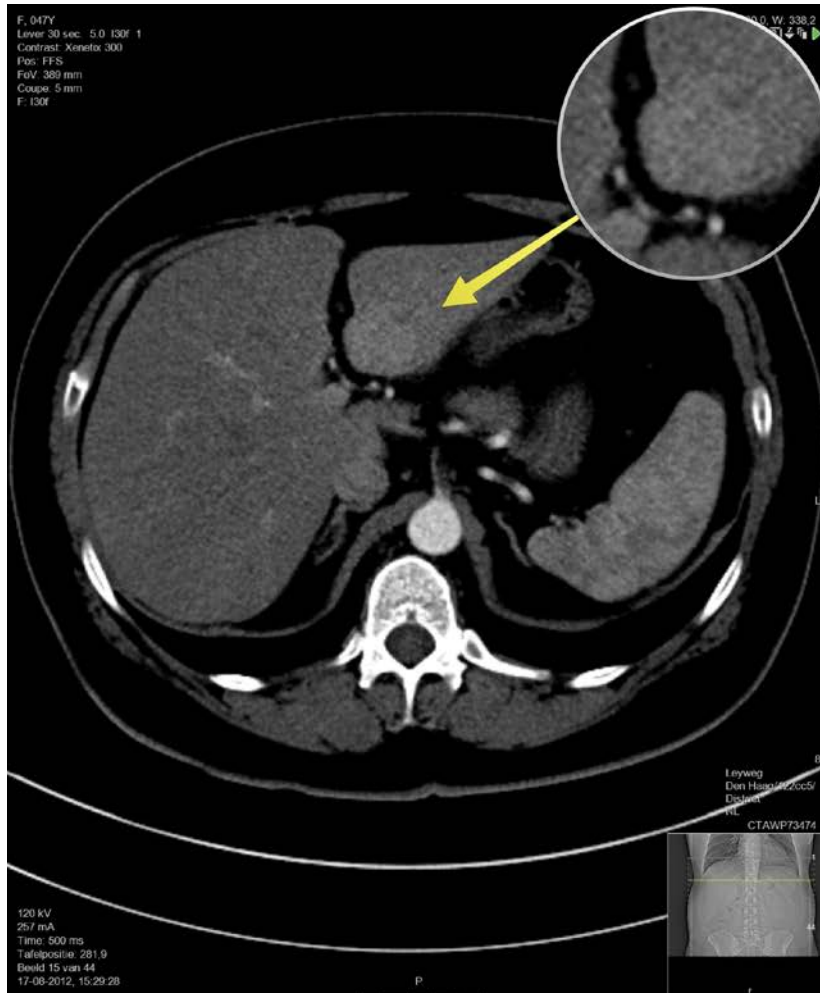
Arteriële fase "normaal" gadolinium



Hepatobiliaire fase Primovist

Casus 6

CT, toevalsbevinding jonge vrouw

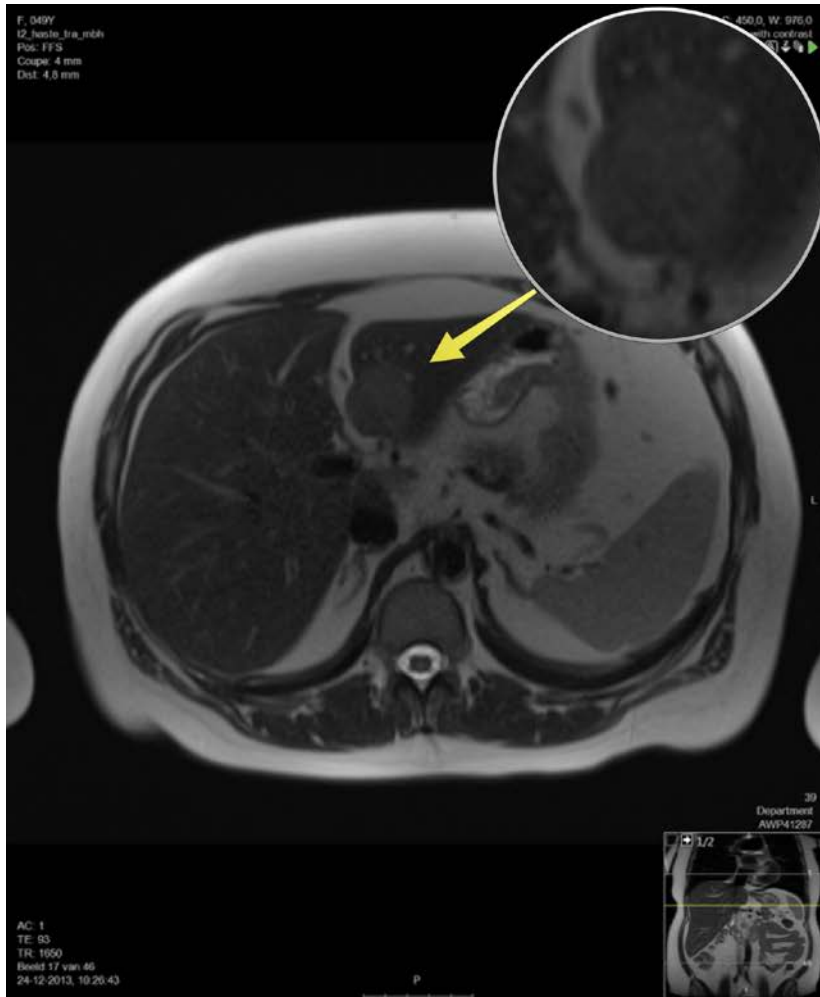


Arteriële fase

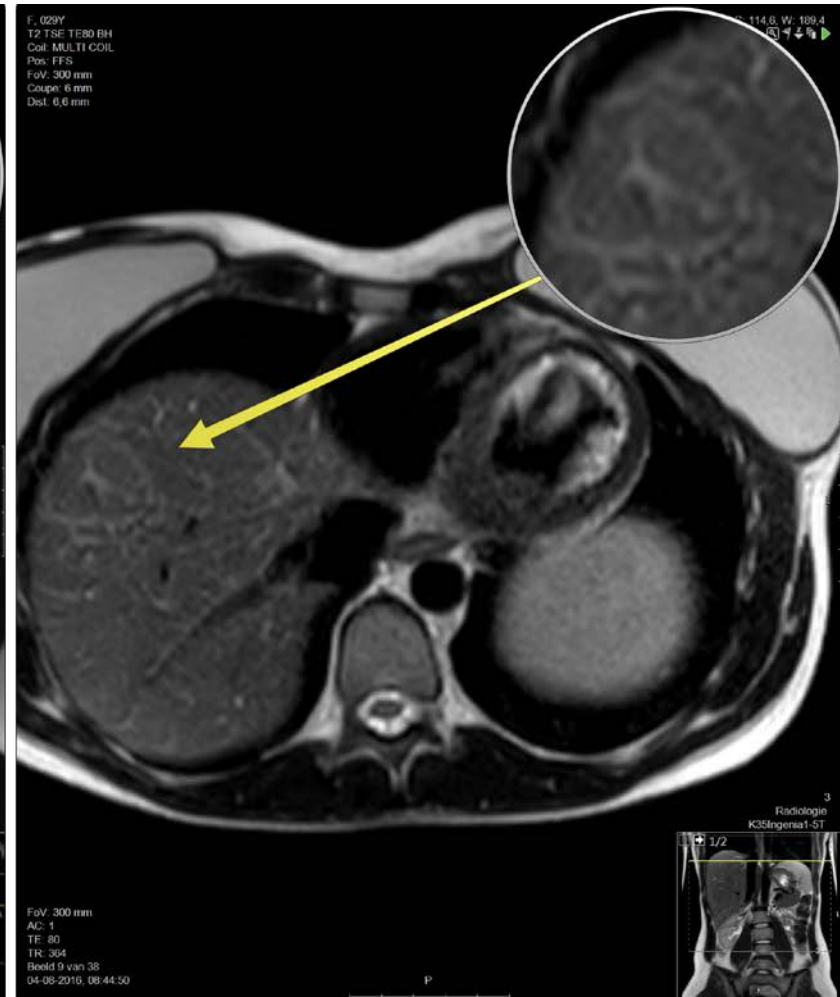
Portaal-veneuze fase

Casuïstiek

CT, toevalsbevinding jonge vrouw



T2

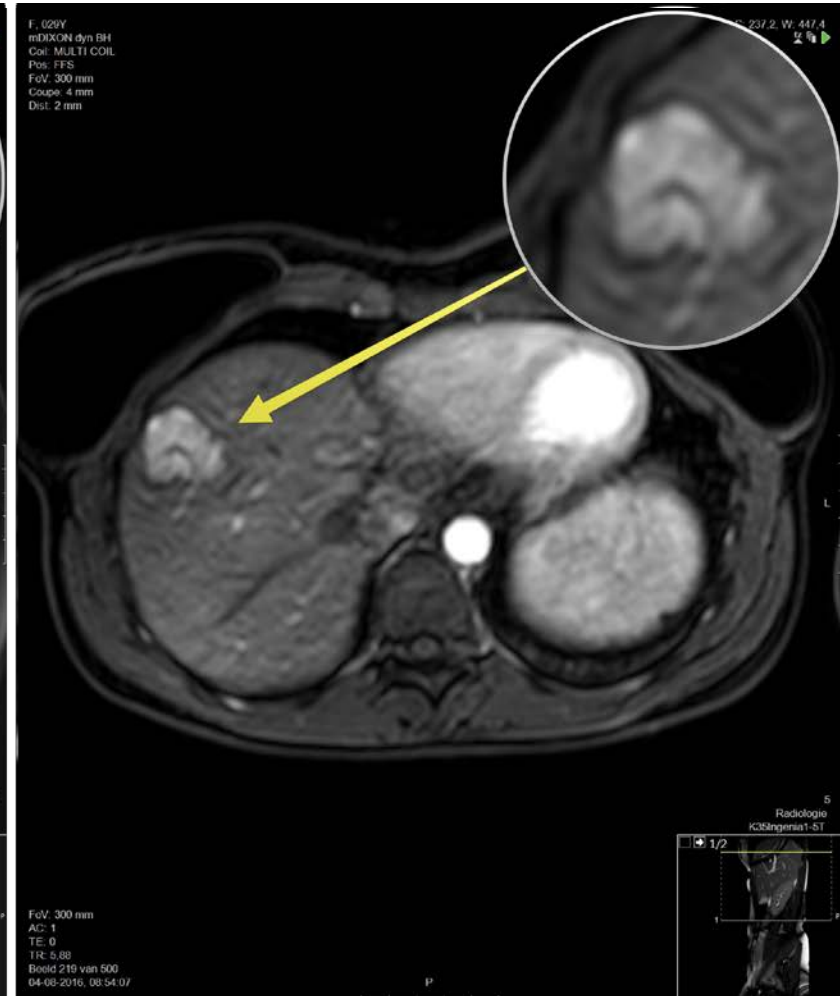


T2 FNH

CT, toevalsbevinding jonge vrouw



Arteriële fase



Arteriële fase FNH

Casuïstiek

CT, toevalsbevinding jonge vrouw



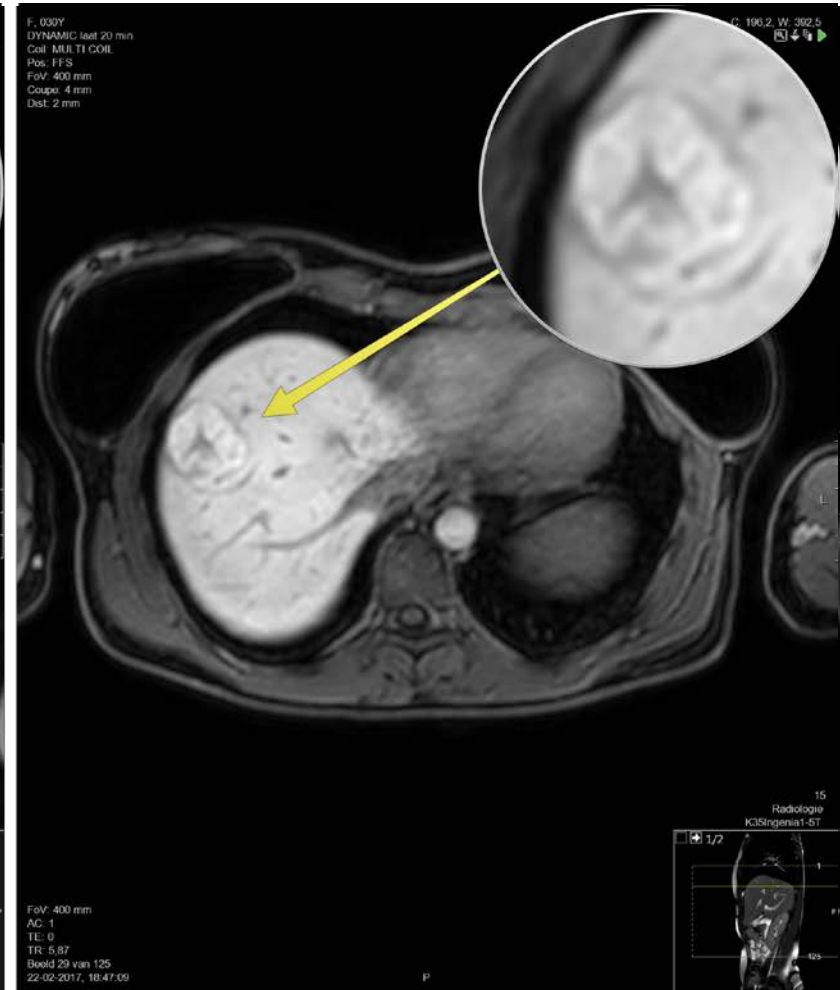
Late fase



Late fase FNH

Casuïstiek

CT, toevalsbevinding jonge vrouw



Hepatobiliaire fase Primovist

Hepatobiliaire fase Primovist FNH

