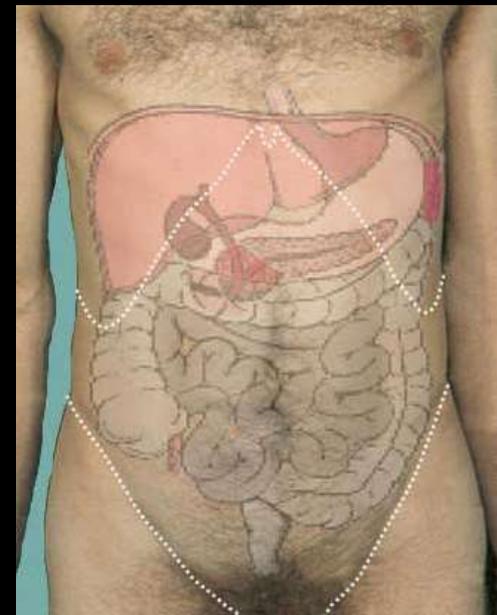


Radio-anatomie hépatique

Frédéric Pigneur



Objectifs

- Connaître la segmentation hépatique
- Savoir reconnaître l'anatomie vasculaire modale
- Savoir reconnaître un foie cirrhotique
- Connaître les implications du double apport vasculaire du foie
- Connaître et explorer l'anatomie fonctionnelle!

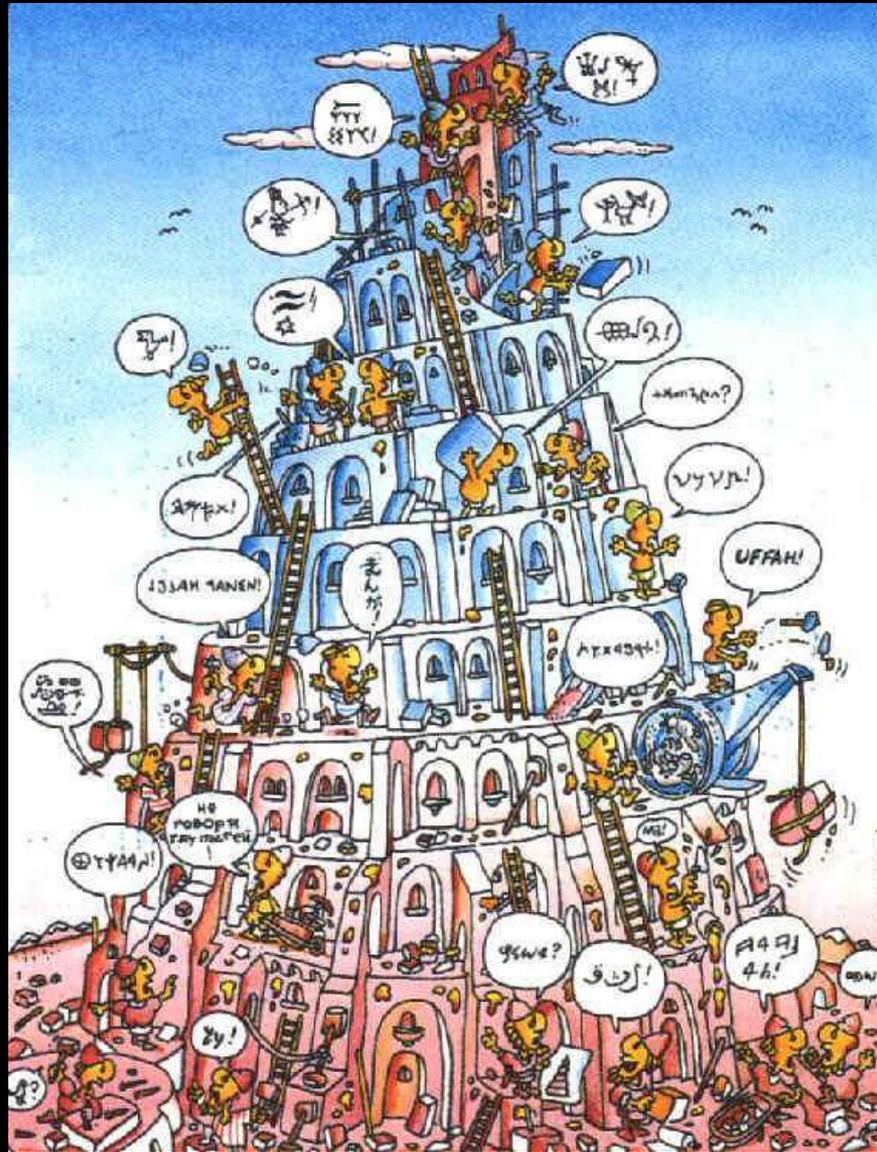
Objectifs

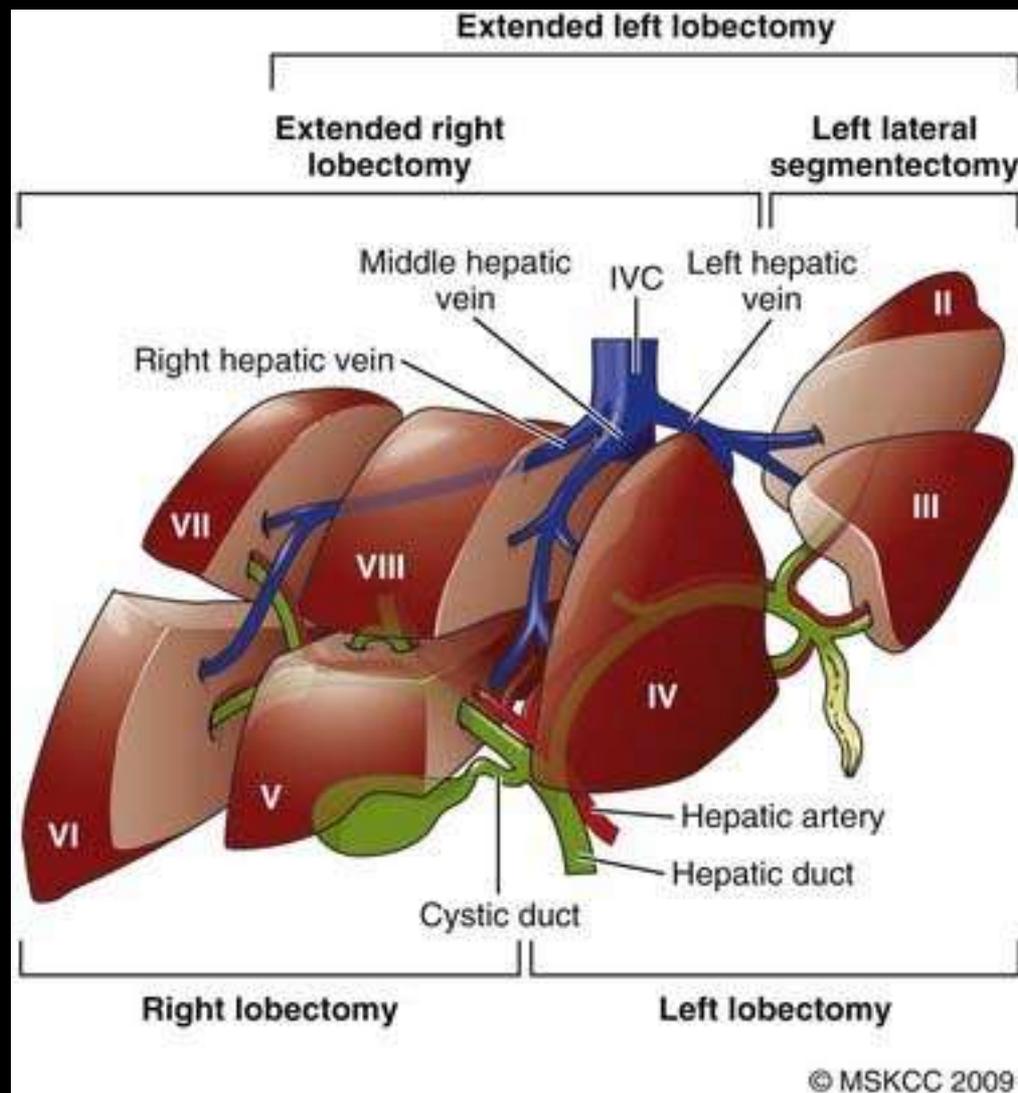
- Connaître la segmentation hépatique
- Savoir reconnaître l'anatomie vasculaire modale
- Savoir reconnaître un foie cirrhotique
- Connaître les implications du double apport vasculaire du foie
- Connaître et explorer l'anatomie fonctionnelle!



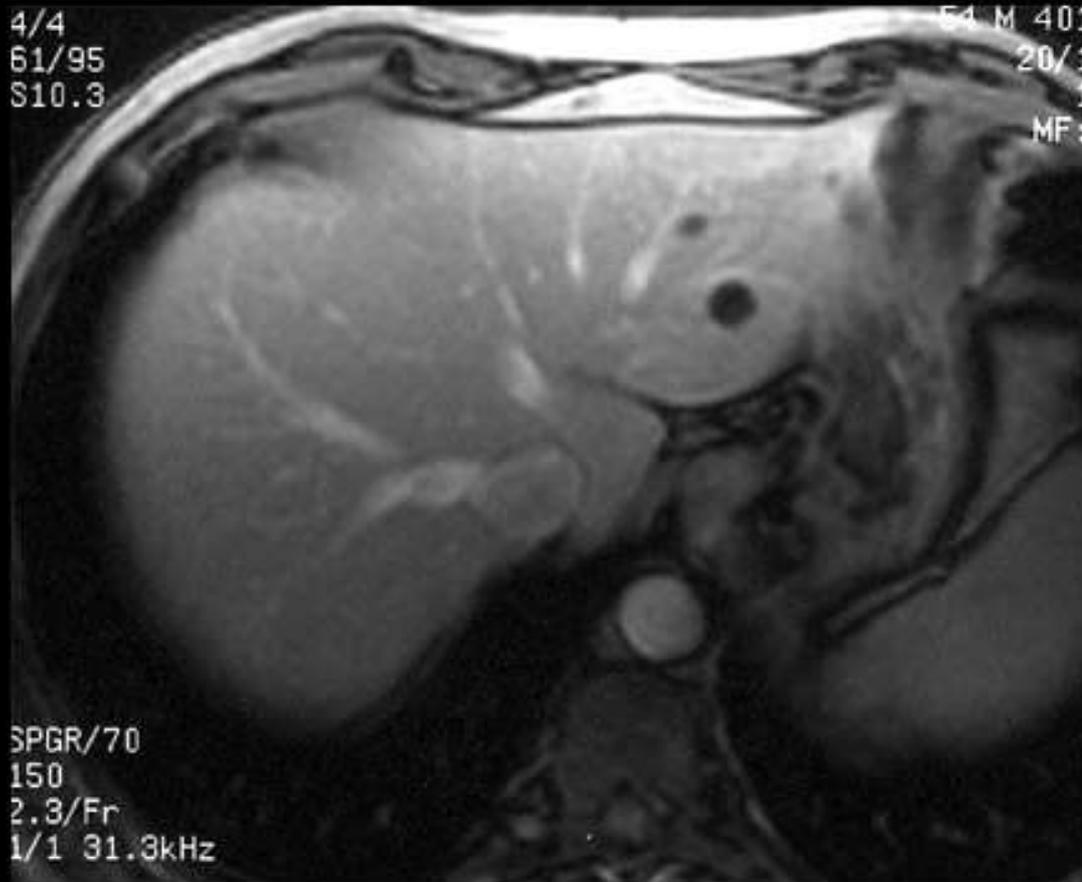








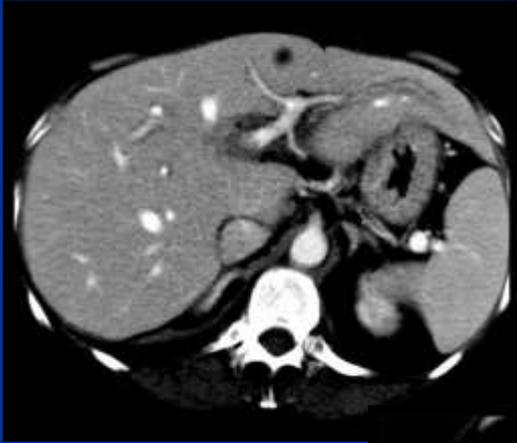
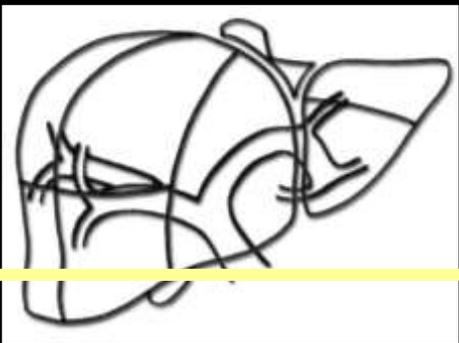
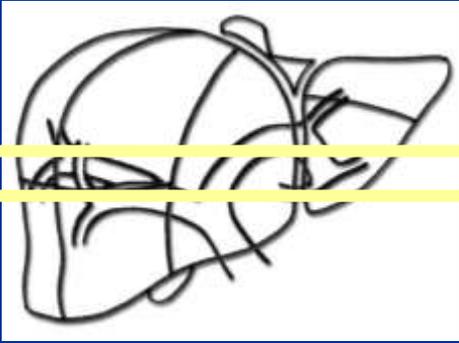
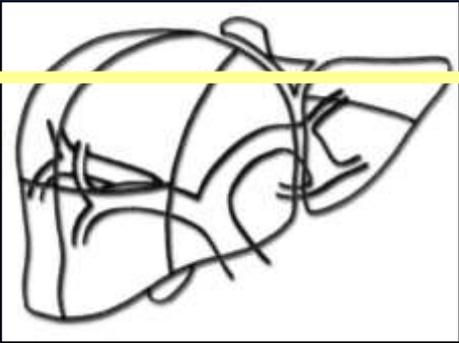
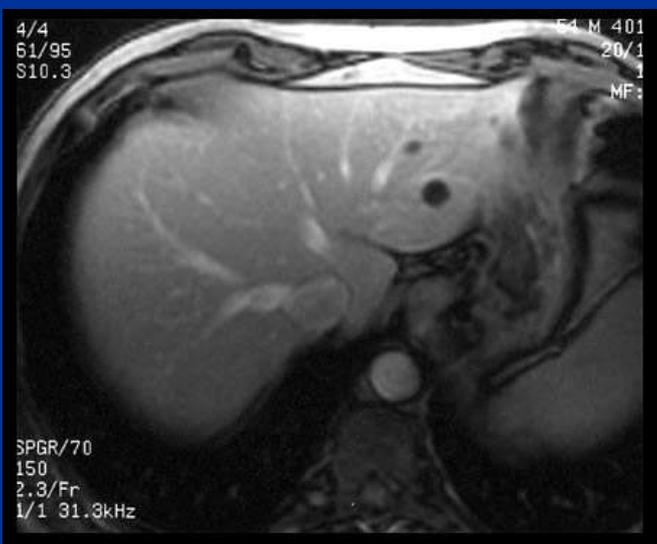
C'est pas si compliqué....



4/4
61/95
S10.3

51 M 401
20/1
1
MF:

SPGR/70
150
2.3/Fr
1/1 31.3kHz



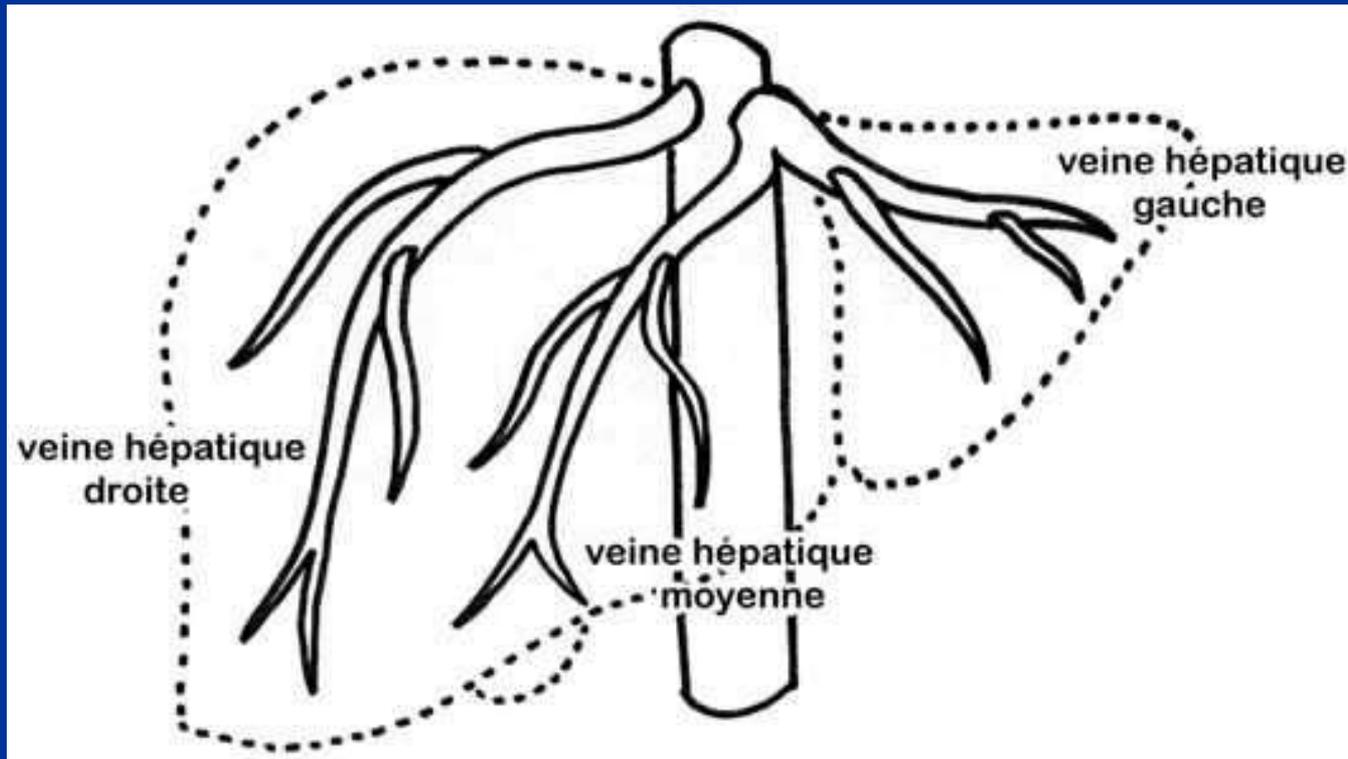
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		Segment VI
	Secteur paramédian droit	Segment VIII
		Segment V
Foie gauche	Secteur paramédian gauche	Segment IV
		Segment III
	Secteur latéral gauche	Segment II
Lobe caudé		Segment I



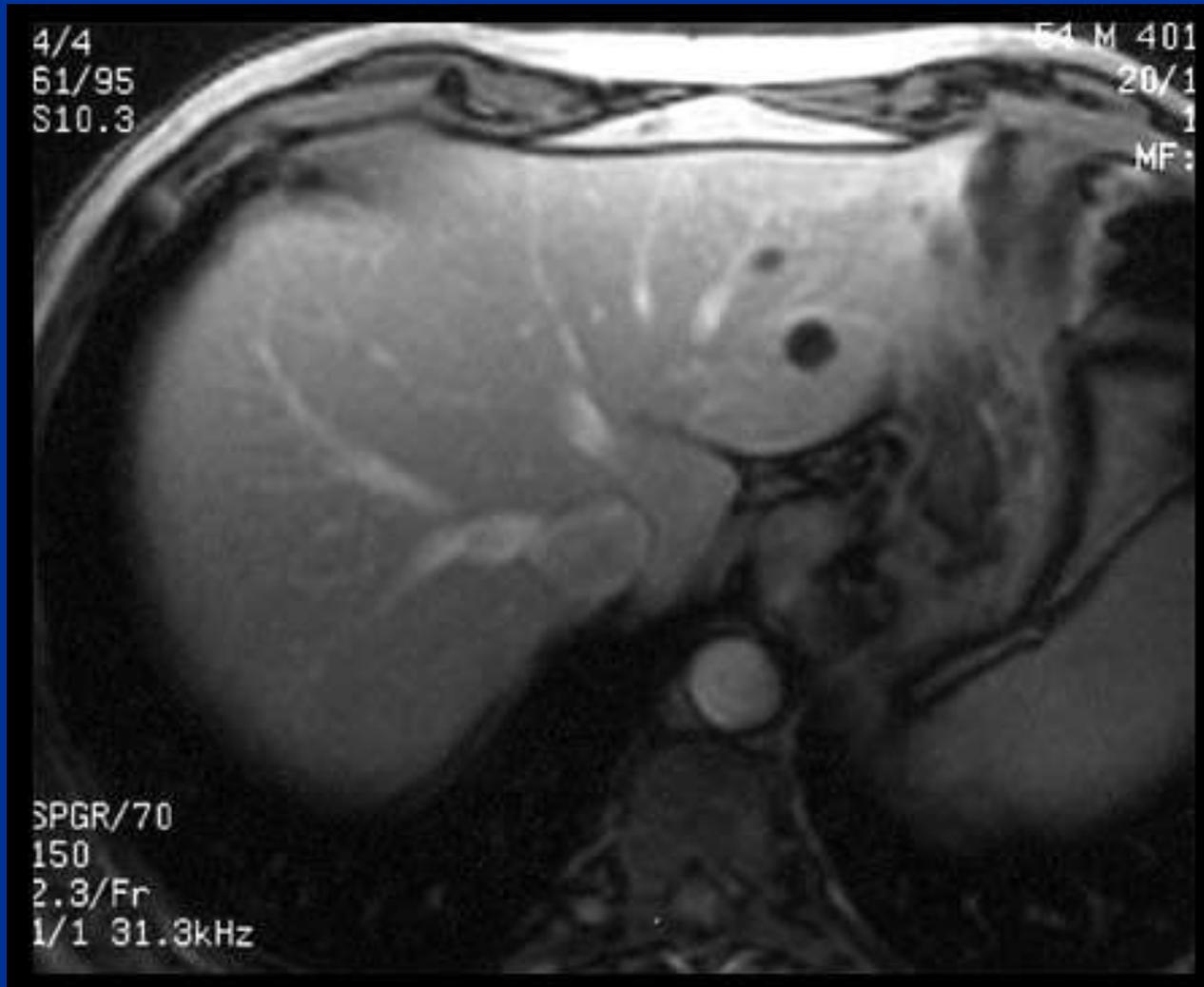
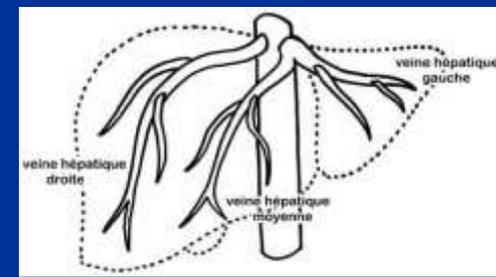
Repères à connaître

- Repères « internes »
 - VH
 - Système porte
- Repères « externes »
 - Sillon d' Arantius
 - Sillon ombilicale
 - Vésicule biliaire

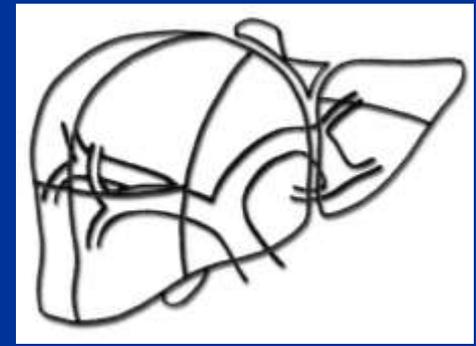
Repères « internes »



Repères « internes »

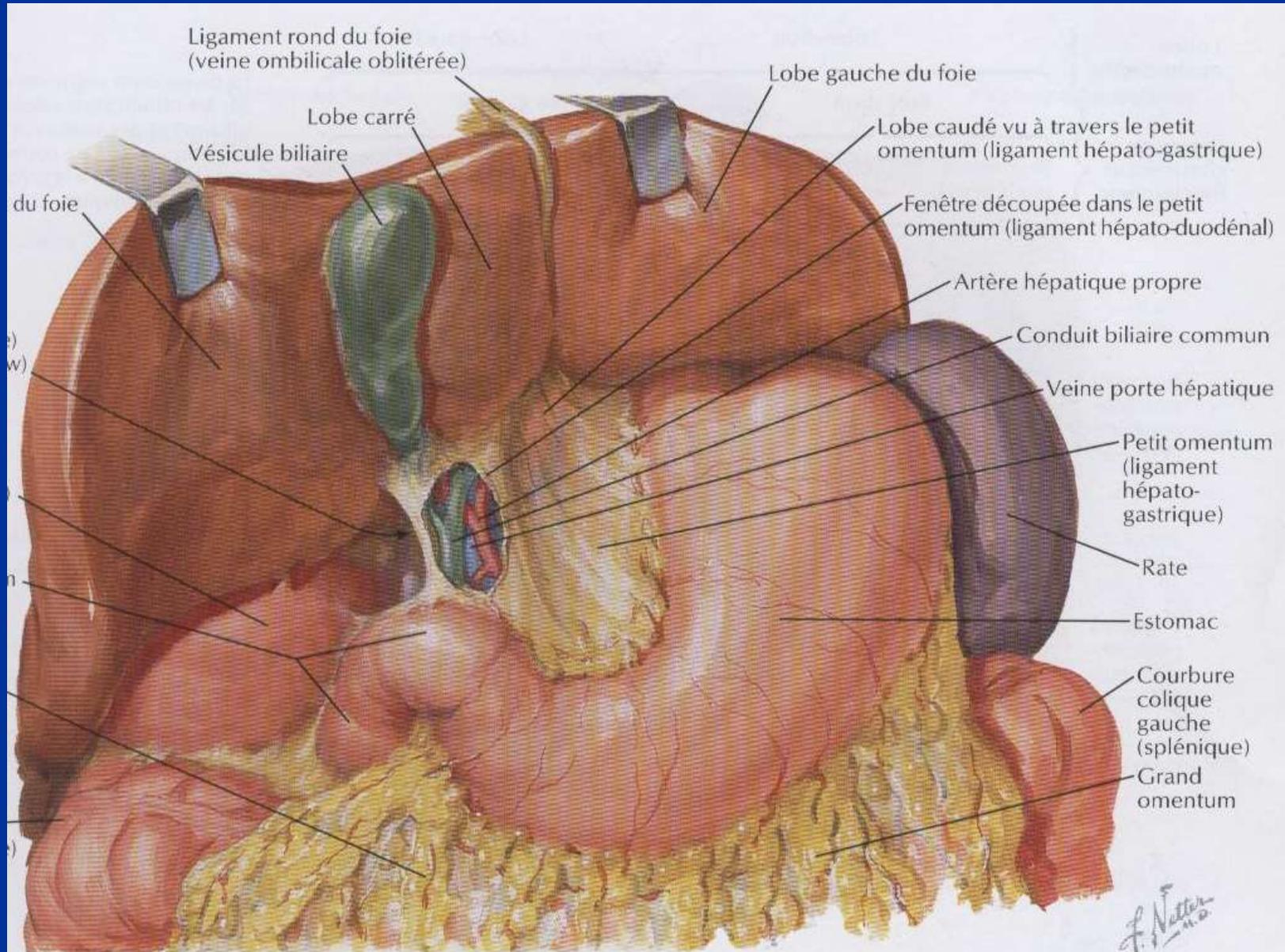


Repères « internes »

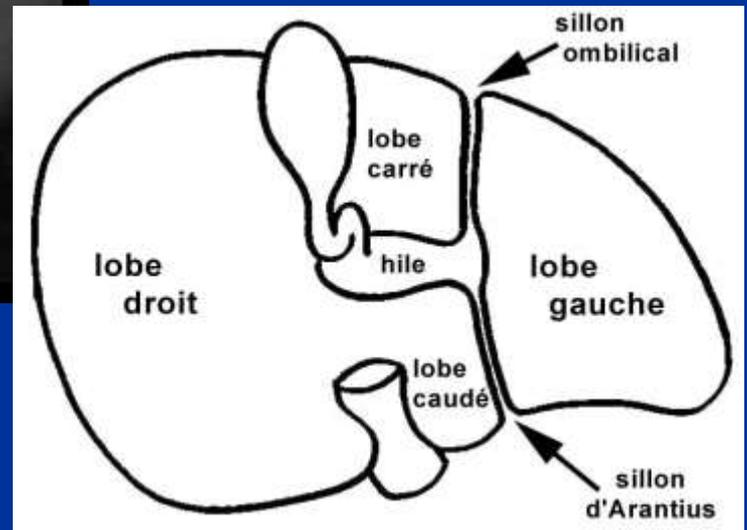
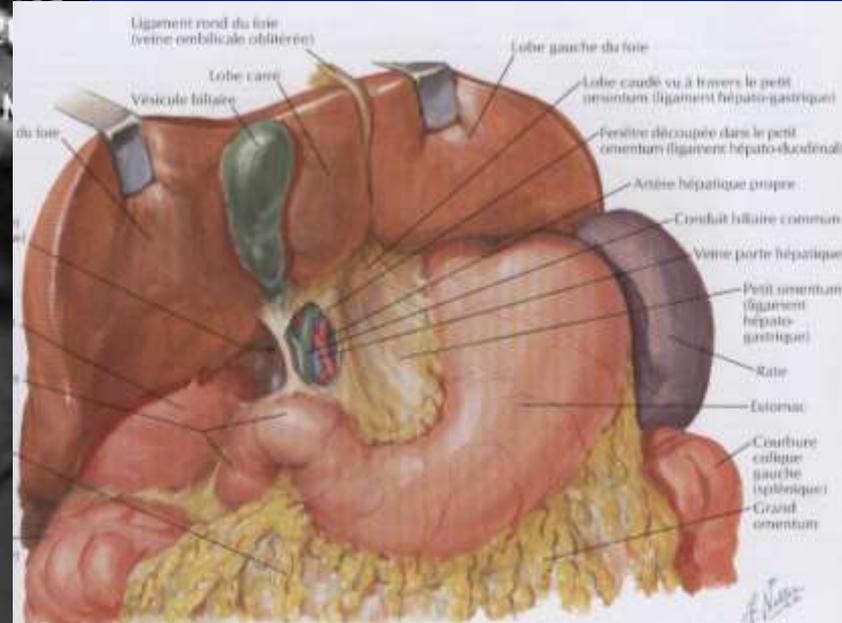
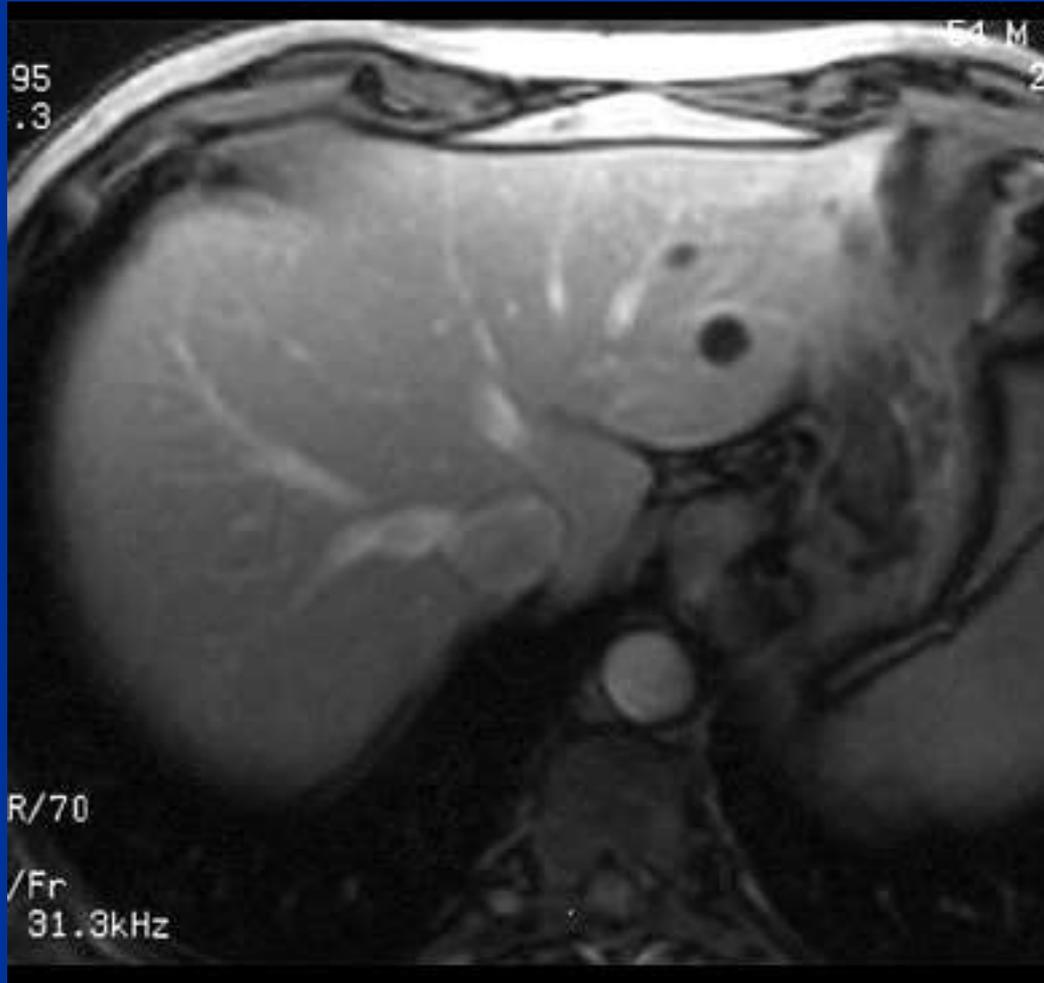


Repères à connaître

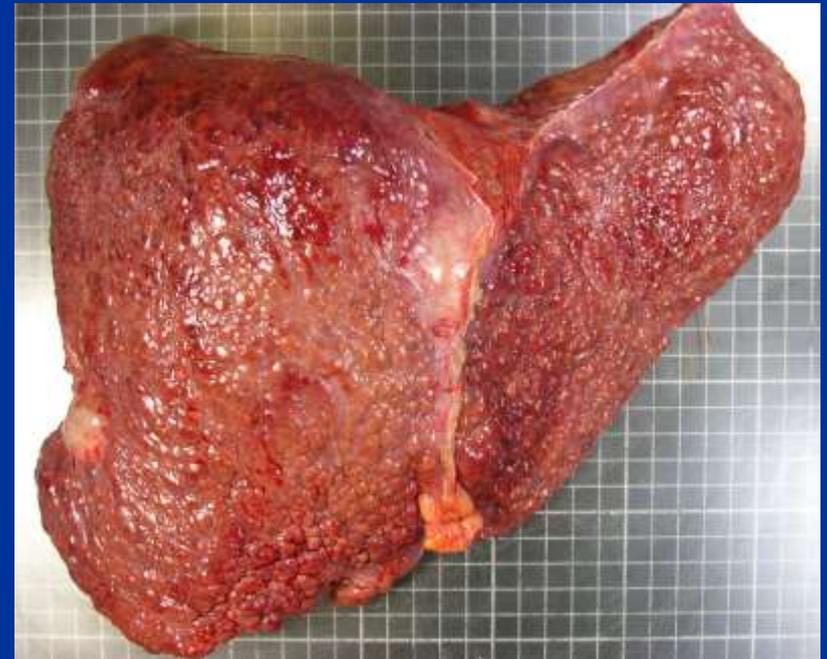
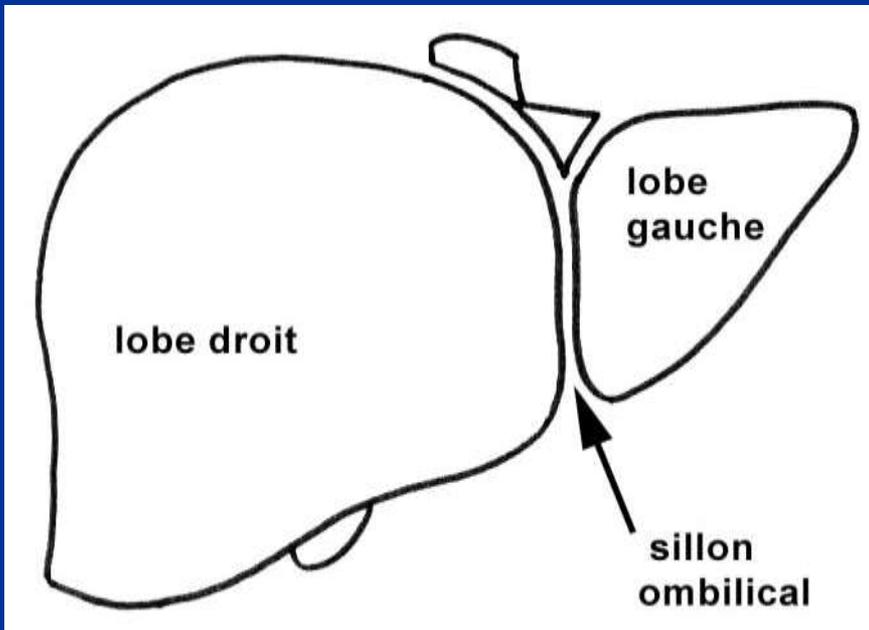
- Repères « internes »
 - VH
 - Système porte
- Repères « externes »
 - Sillon d' Arantius
 - Sillon ombilicale
 - Vésicule biliaire



Repères « externes »



Repères « externes »



Sillon ombilical

Repères « externes »



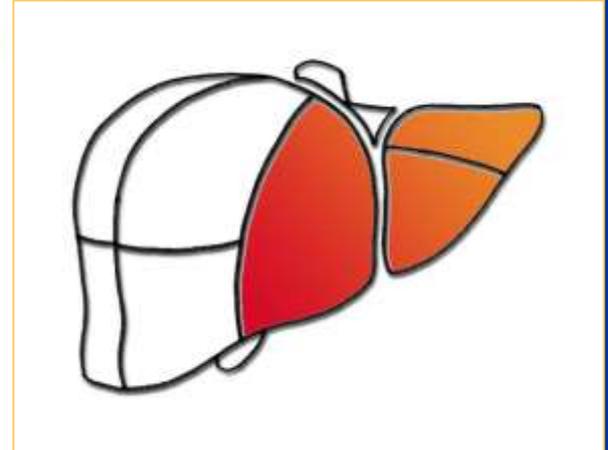
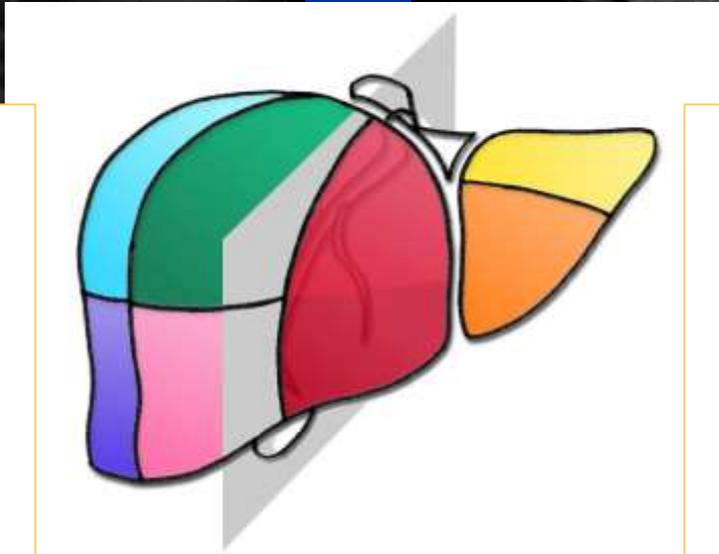
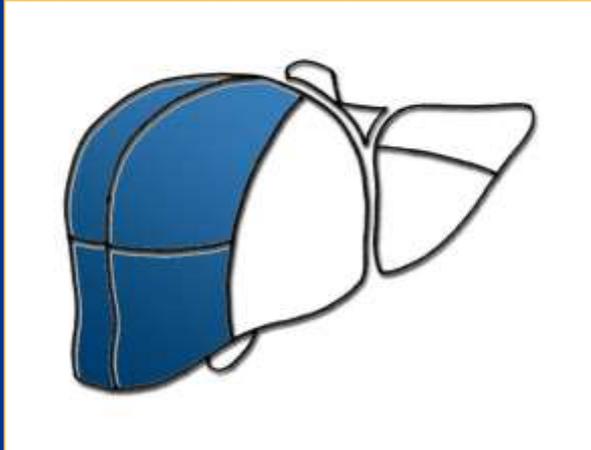
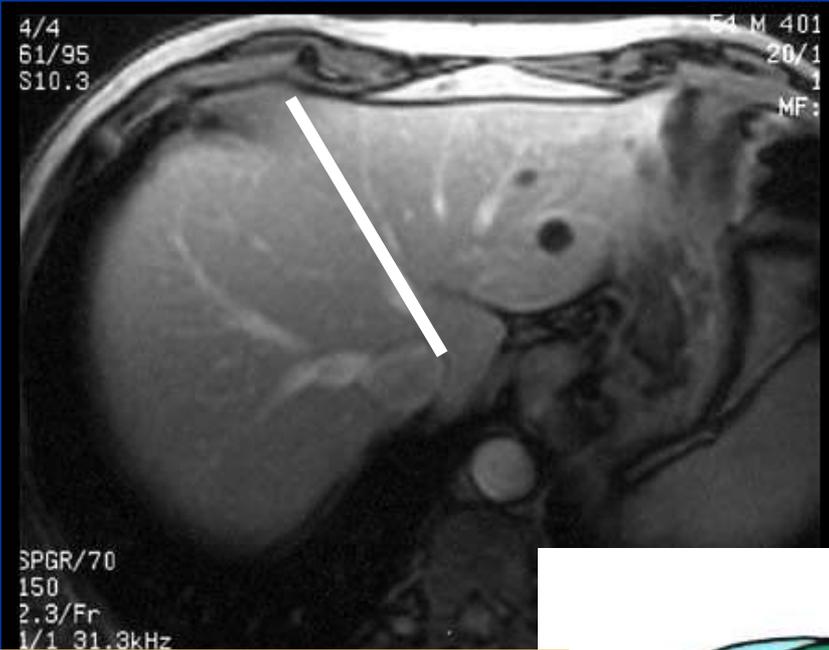
Repères à connaître

- Repères « internes »
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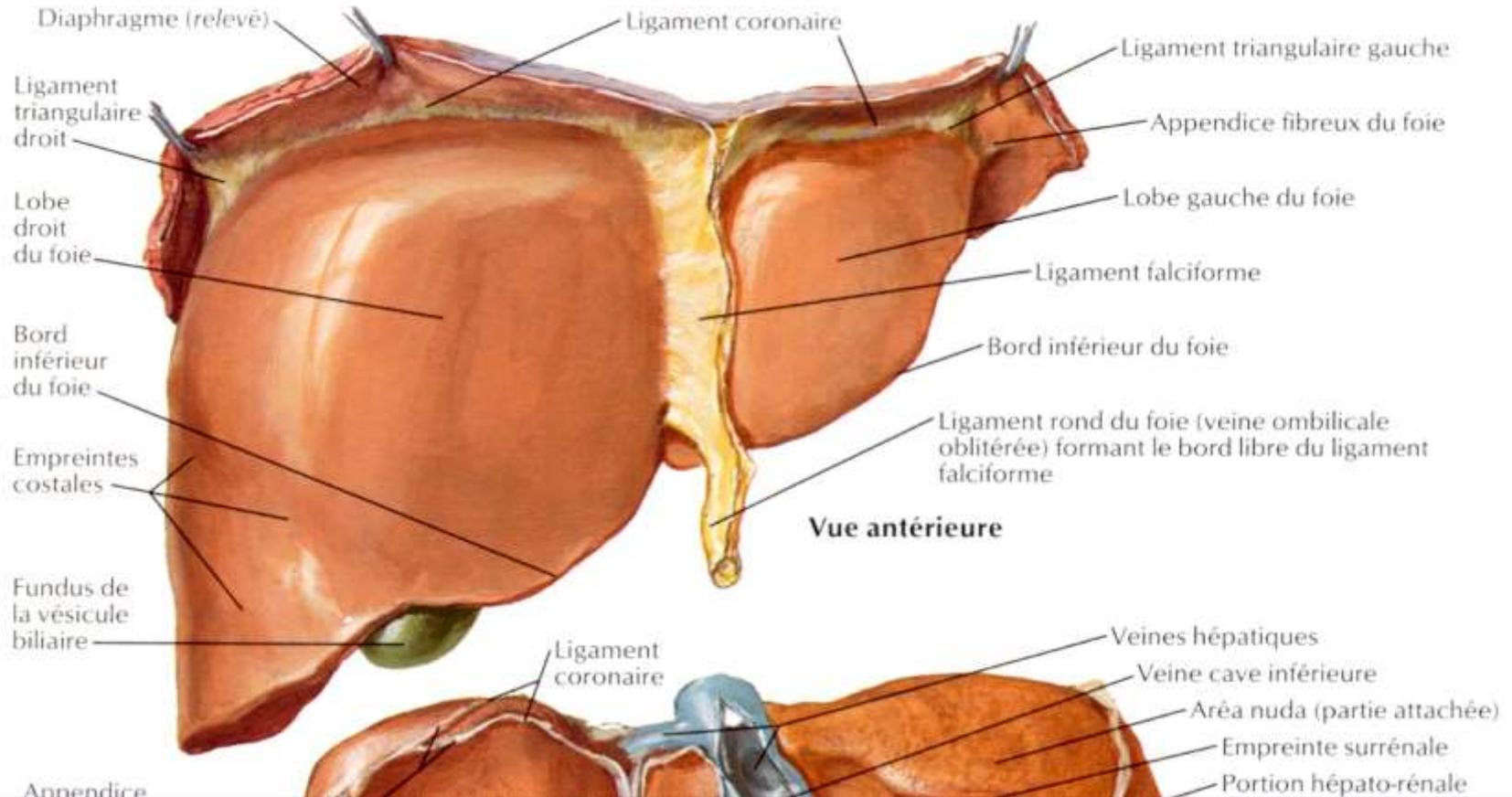
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		Segment VI
	Secteur paramédian droit	Segment VIII
		Segment V
Foie gauche	Secteur paramédian gauche	Segment IV
		Segment III
	Secteur latéral gauche	Segment II
Lobe caudé		Segment I



Foie droit / Foie gauche

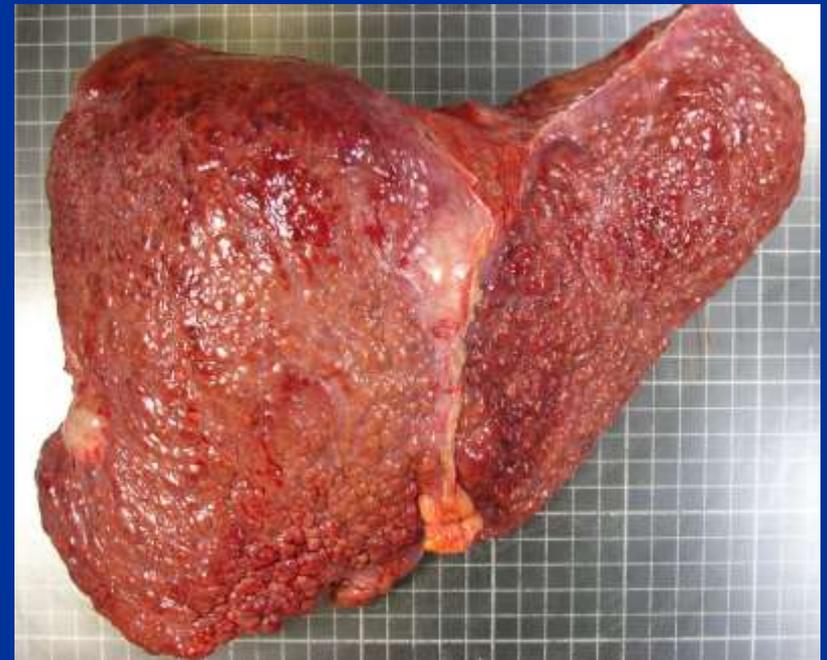
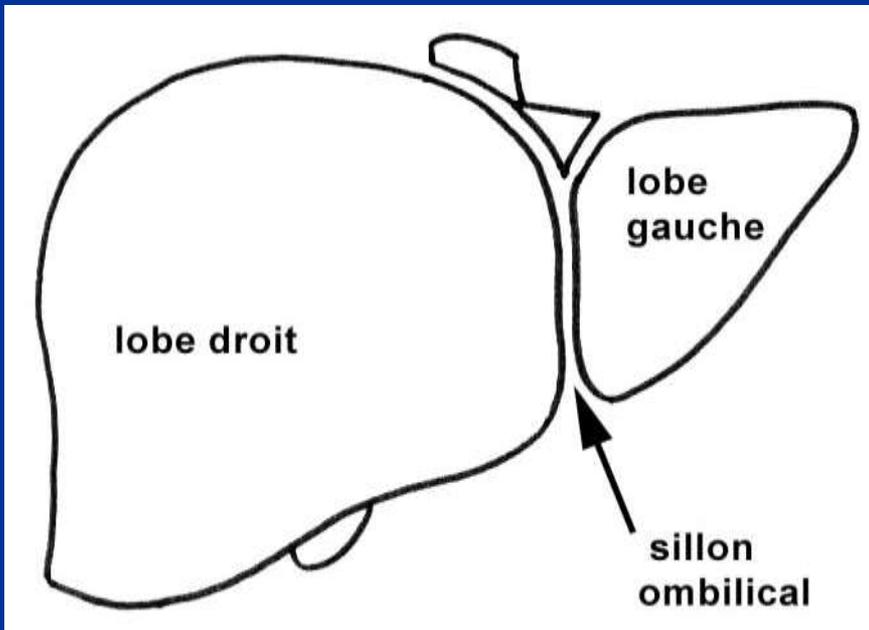


Lobe droit / Lobe gauche



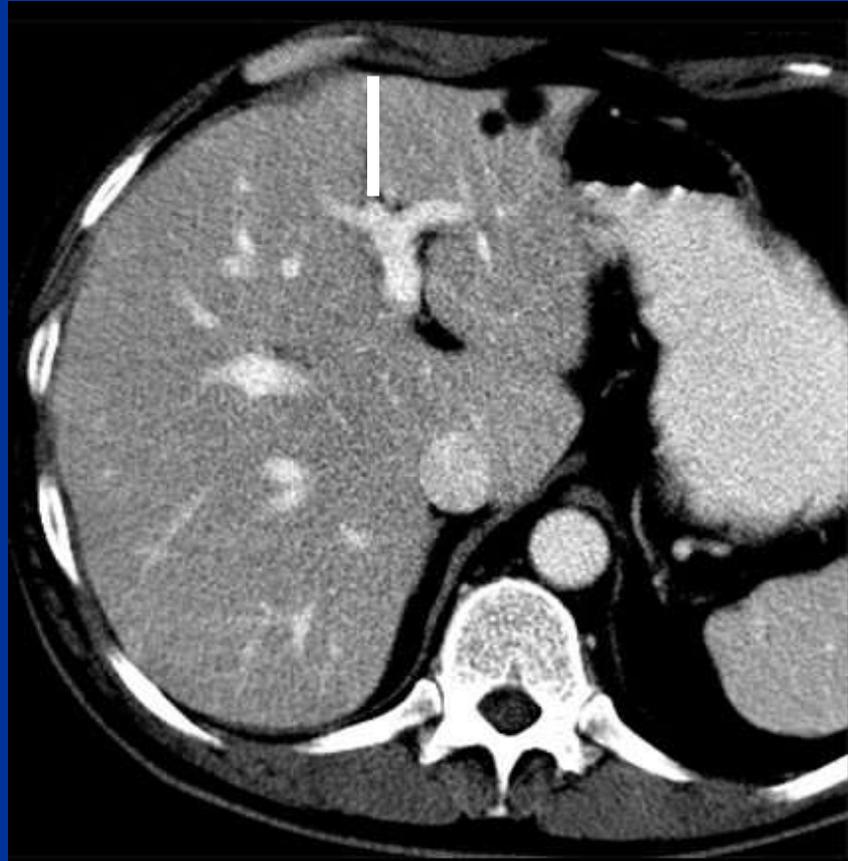
Sillon ombilical

Lobe droit / Lobe gauche



Sillon ombilical

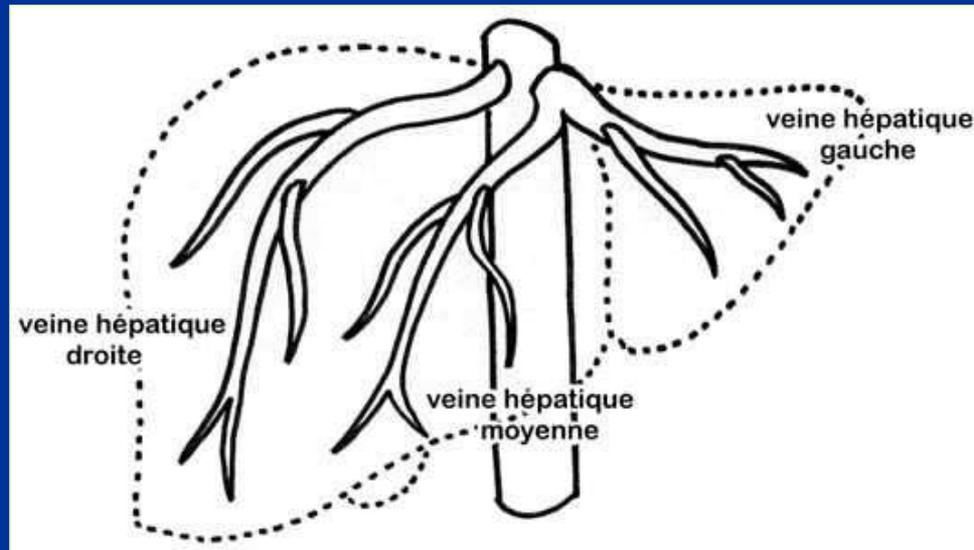
Lobe droit / Lobe gauche



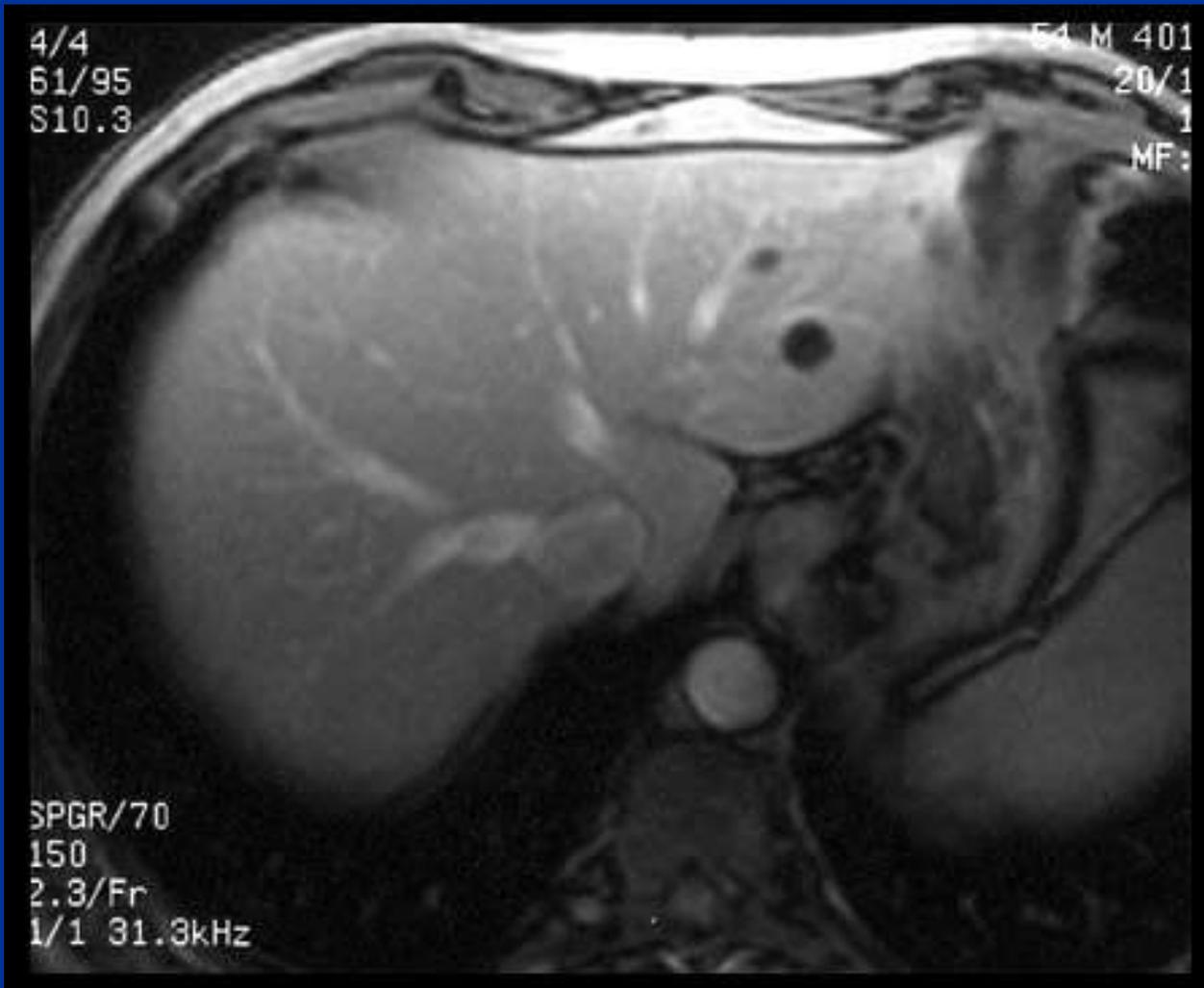
Foie droit	Secteur latéral droit	Segment VII
		Segment VI
	Secteur paramédian droit	Segment VIII
		Segment V
Foie gauche	Secteur paramédian gauche	Segment IV
		Segment III
	Secteur latéral gauche	Segment II
Lobe caudé		Segment I



Secteurs hépatiques



Secteurs hépatiques

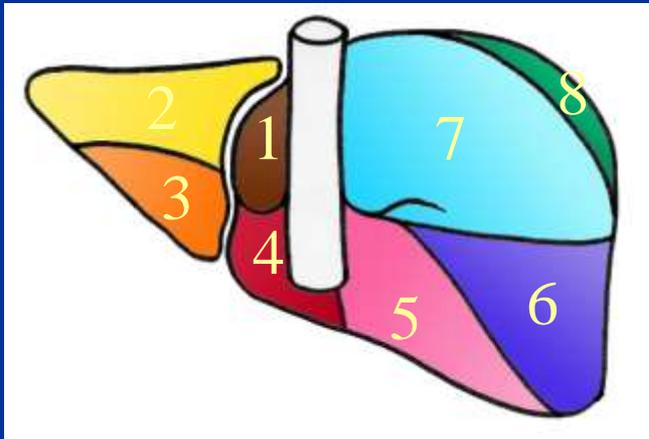
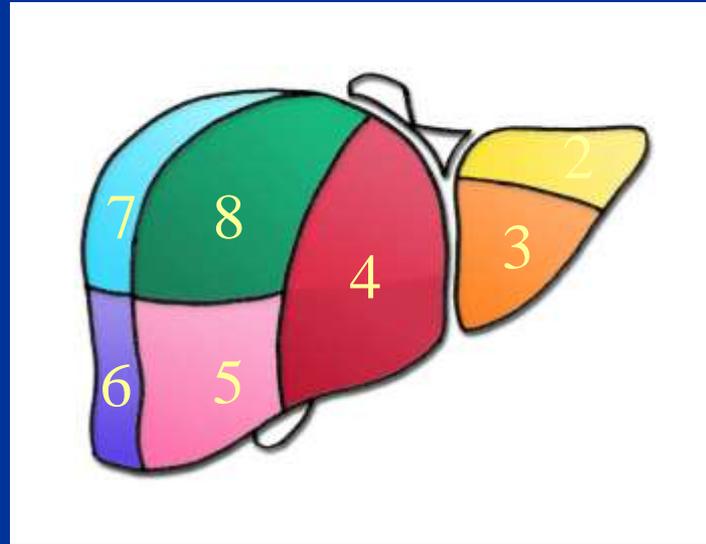


Foie droit	Secteur latéral droit	Segment VII
		Segment VI
	Secteur paramédian droit	Segment VIII
		Segment V
Foie gauche	Secteur paramédian gauche	Segment IV
		Segment III
	Secteur latéral gauche	Segment II
Lobe caudé		Segment I

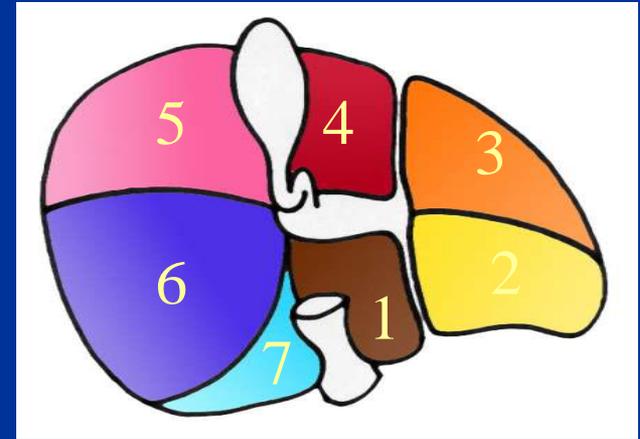


Segments hépatiques

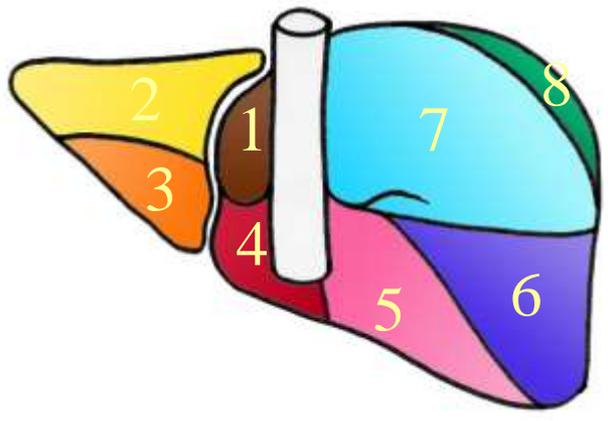
Couinaud		
Foiie droit	Secteur latéral droit	Segment VIII
		Segment VI
	Secteur paramédian droit	Segment VIII
		Segment V
Foiie gauche	Secteur paramédian gauche	Segment IV
		Segment III
	Secteur latéral gauche	Segment II
Lobe caudé		Segment I



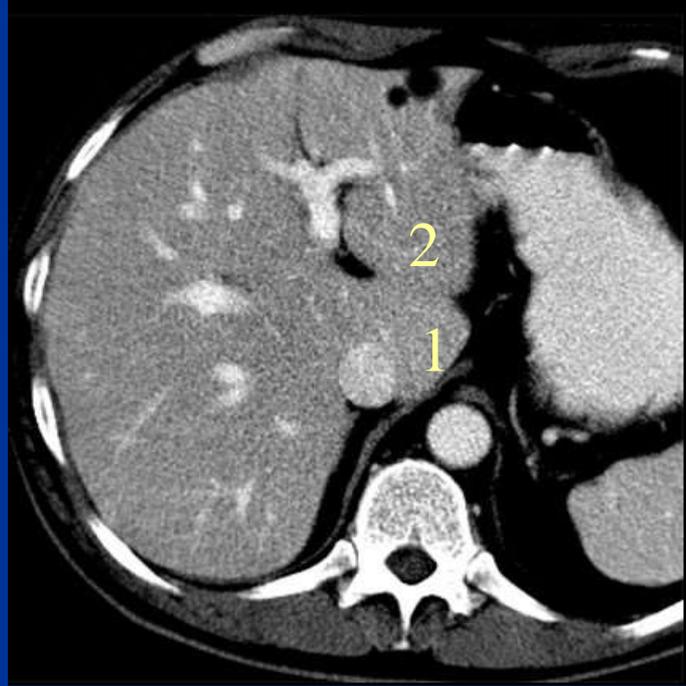
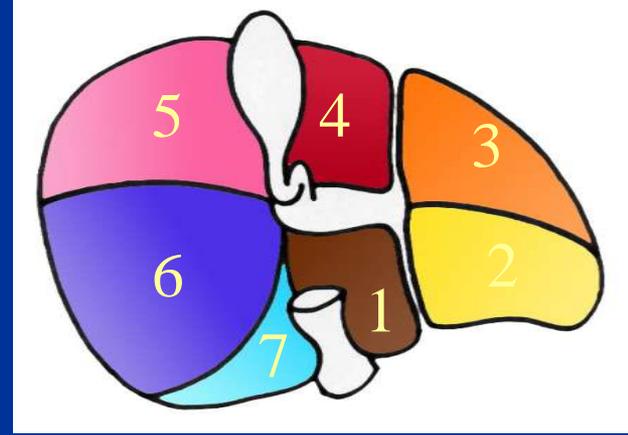
Vue postérieure



Vue inférieure

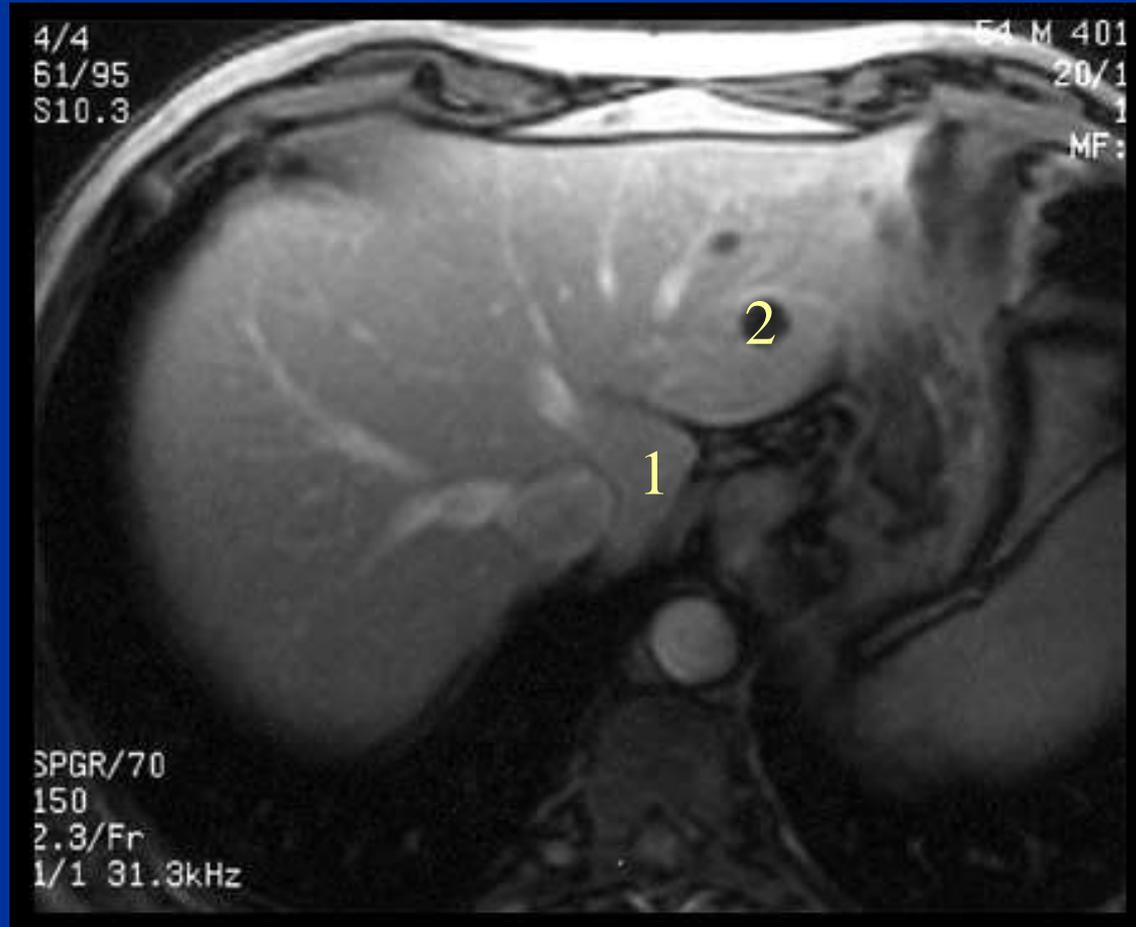
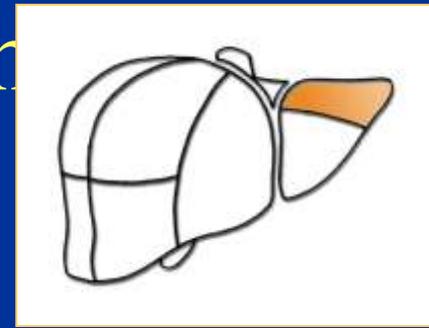
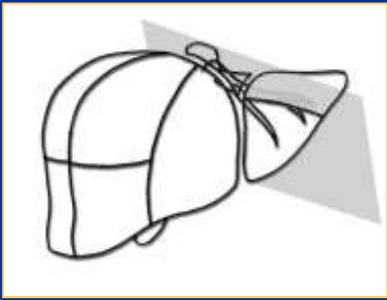


Segments 1

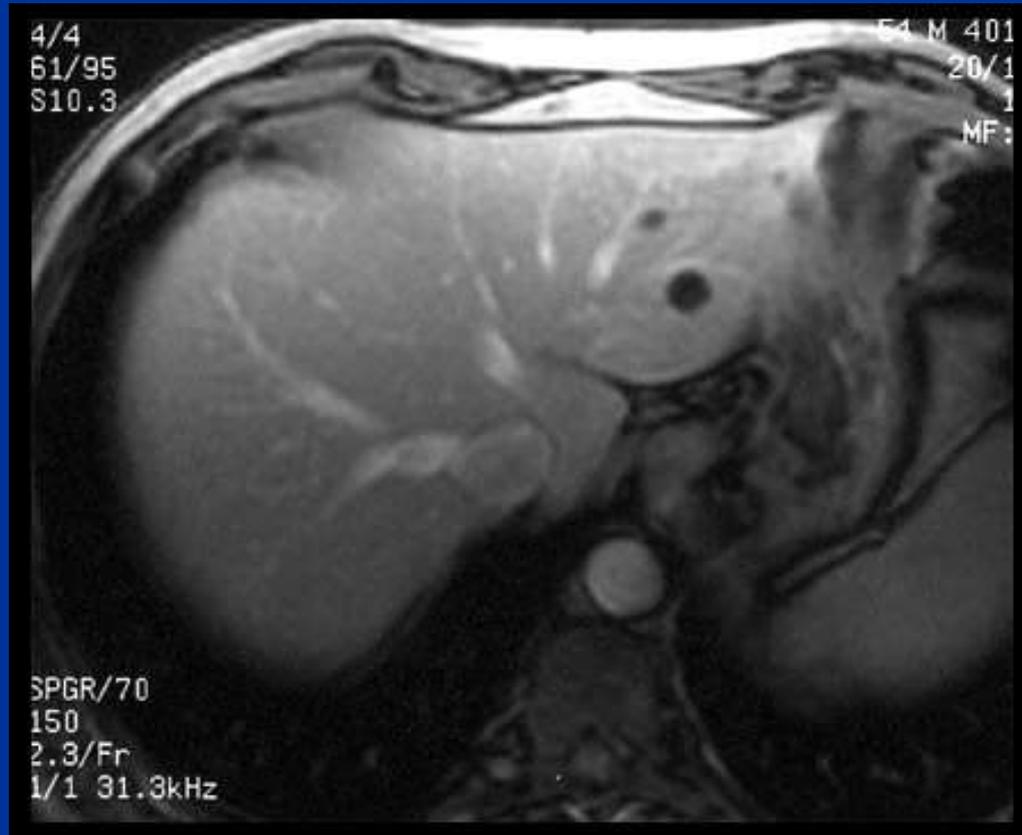
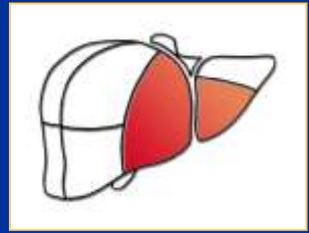


Couinaud		
Foiie droit	Secteur latéral droit	Segment VIII Segment VI
	Secteur paramédian droit	Segment VIII Segment V
Foiie gauche	Secteur paramédian gauche	Segment IV Segment III
	Secteur latéral gauche	Segment II
Lobe caudé		Segment I

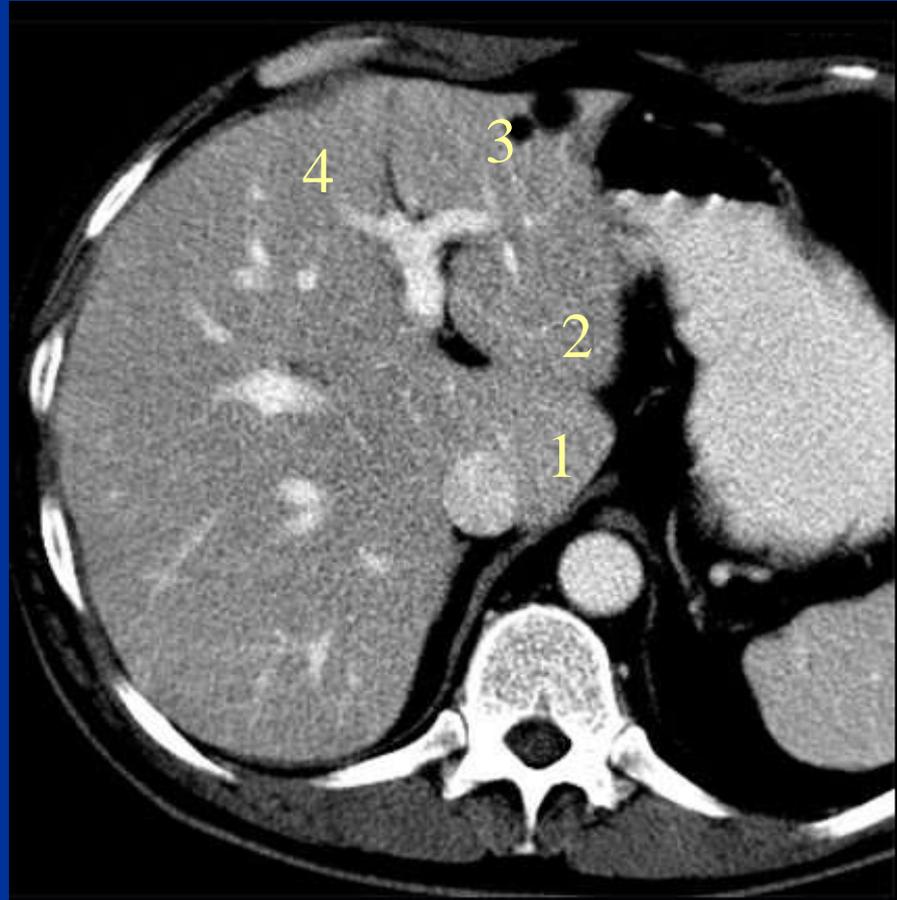
Secteur latéral gauche un seul segment le 2



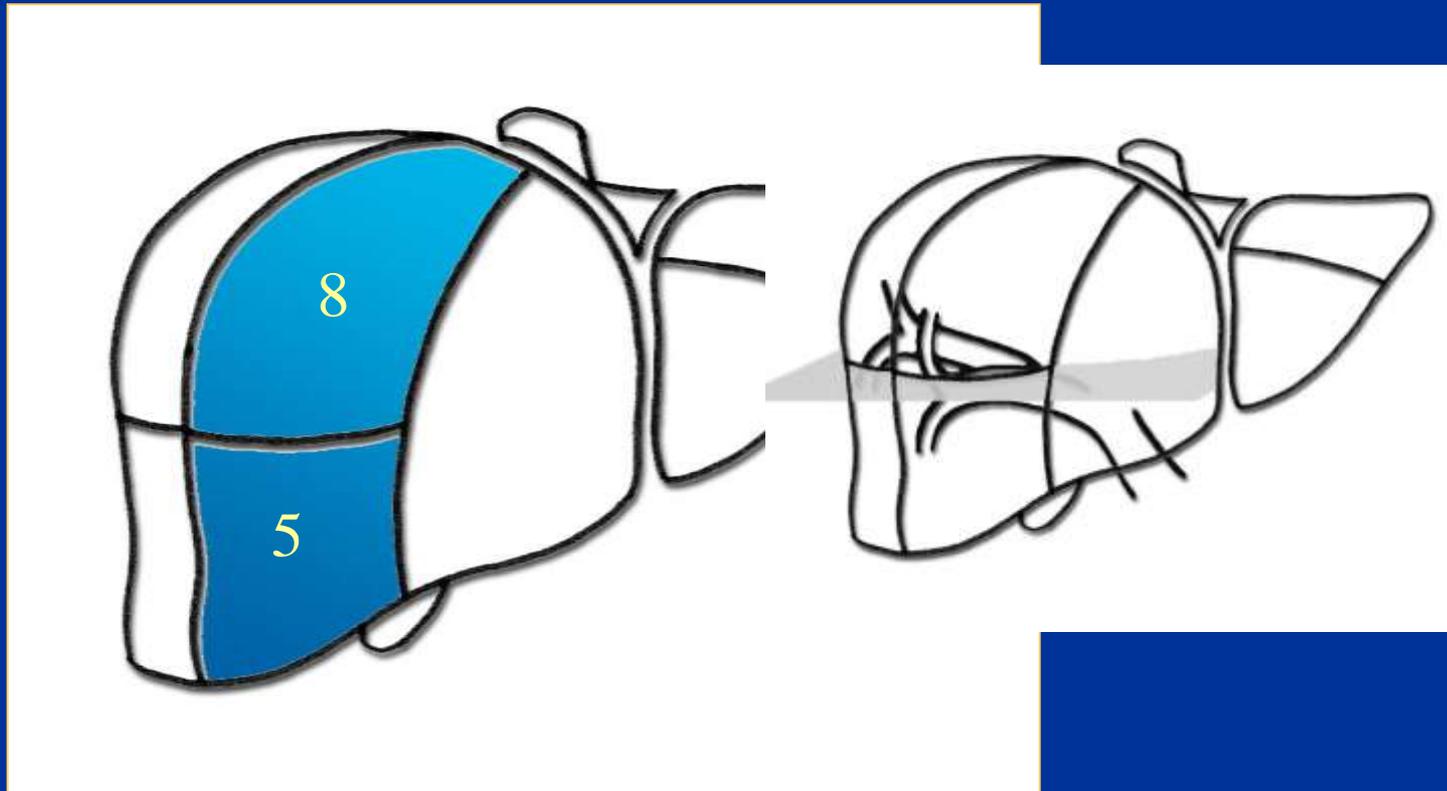
Secteur paramédian gauche: Segments 3 et 4



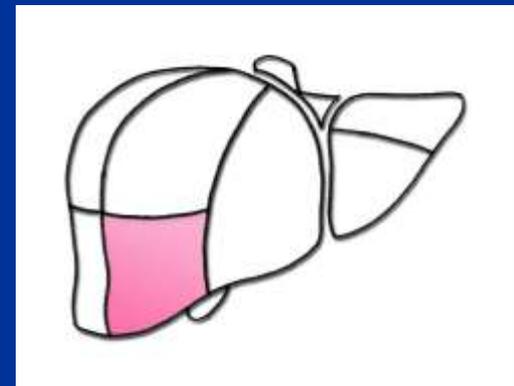
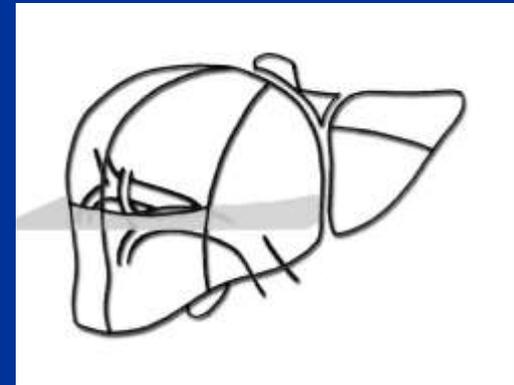
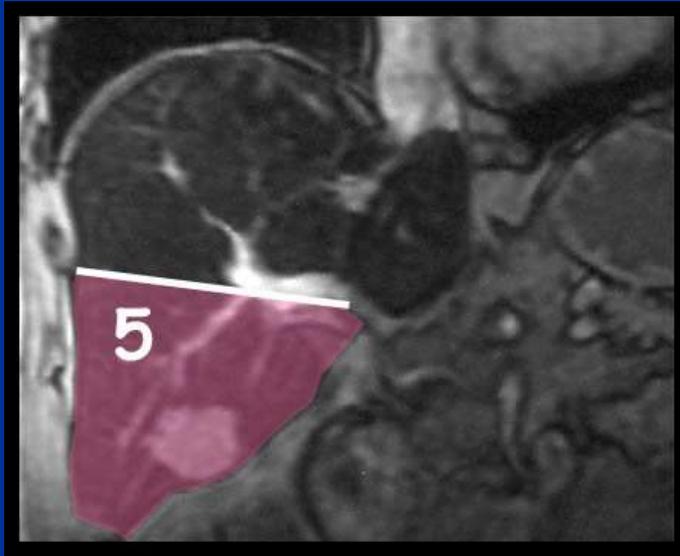
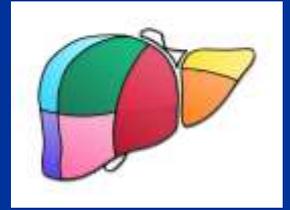
Secteur paramédian gauche: Segments 3 et 4



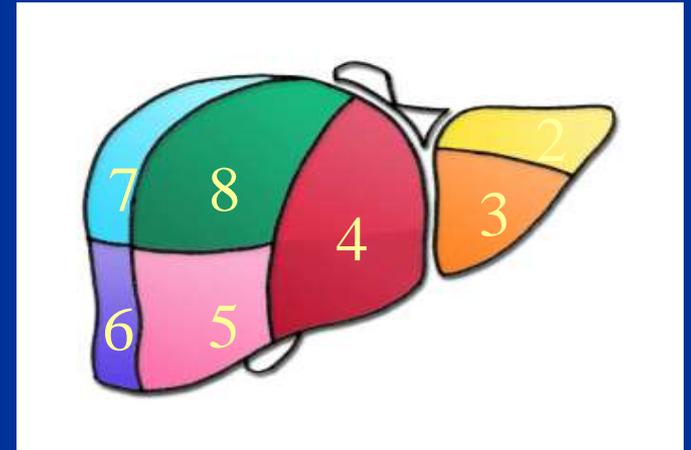
Secteur paramédian droit: Segments 5 et 8



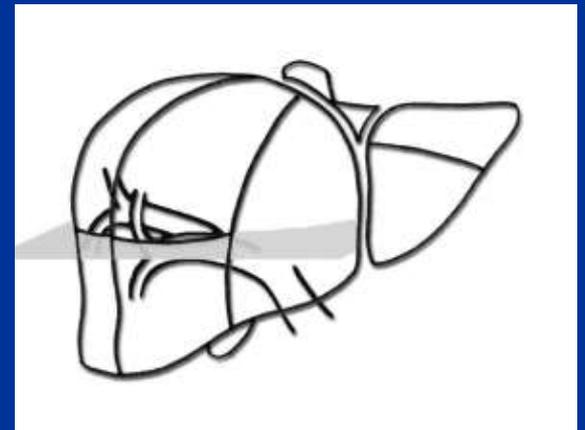
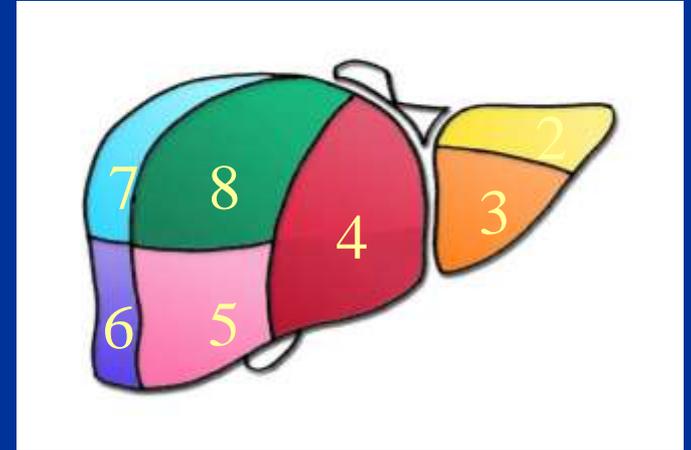
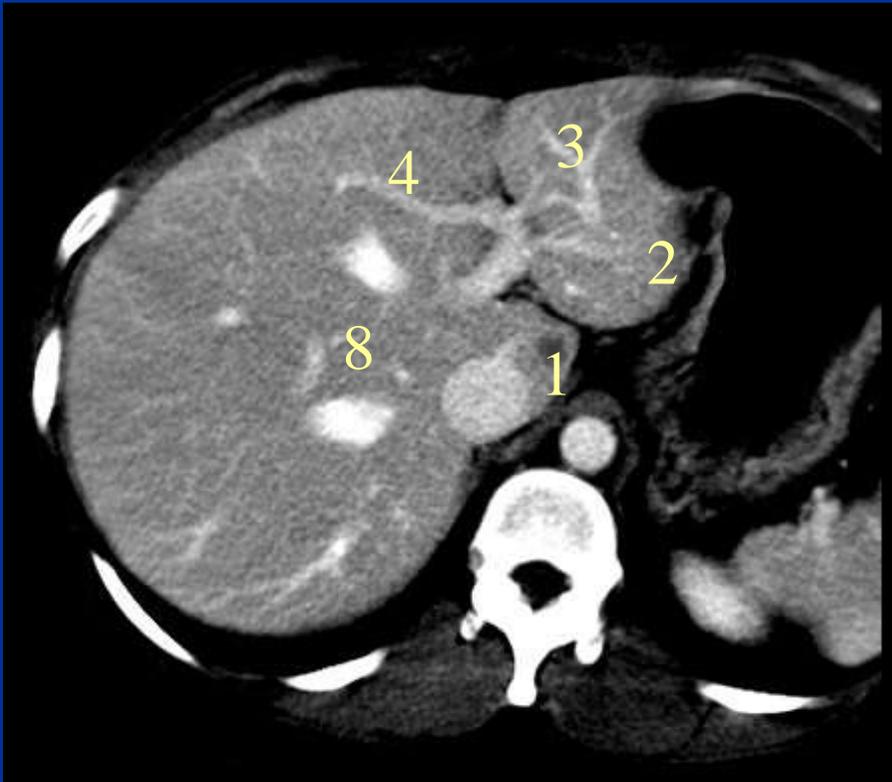
Secteur paramédian droit: Segment 5



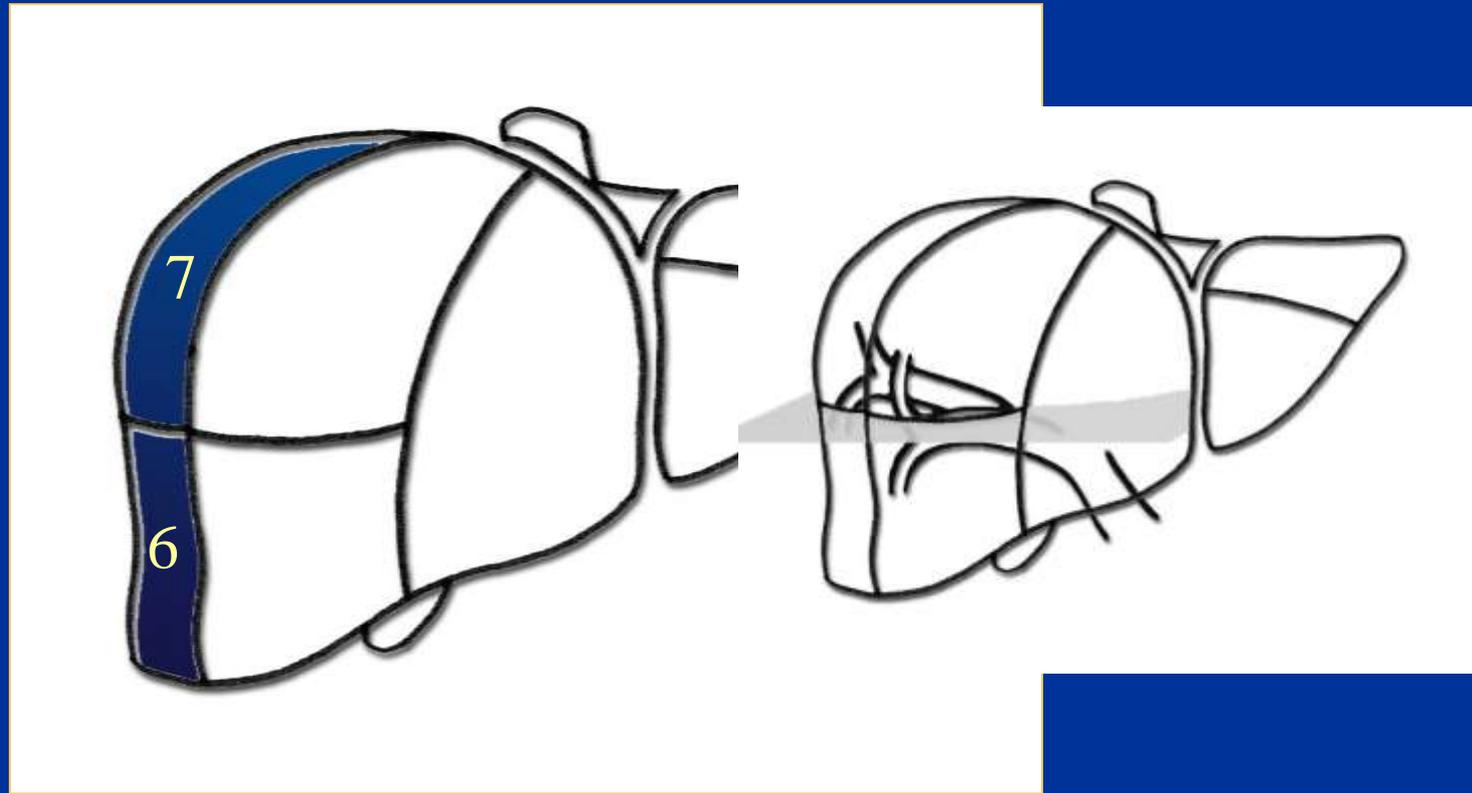
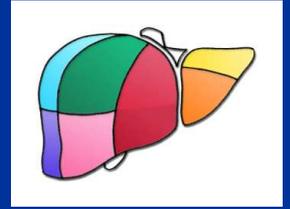
Secteur paramédian droit: Segment 5



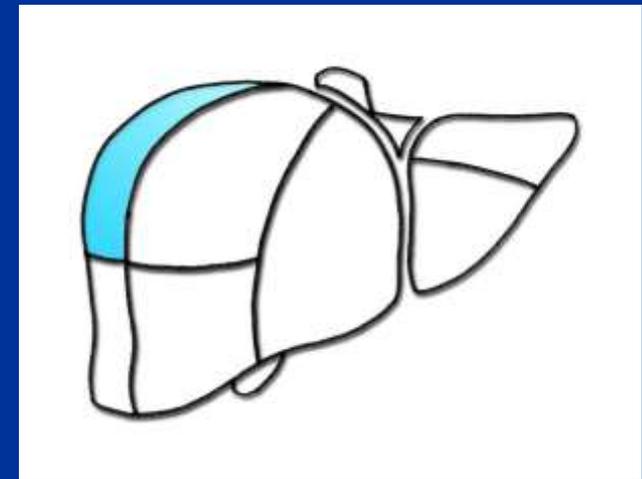
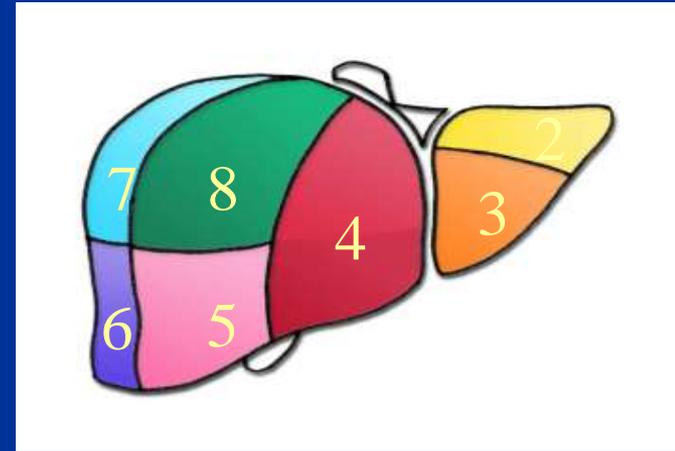
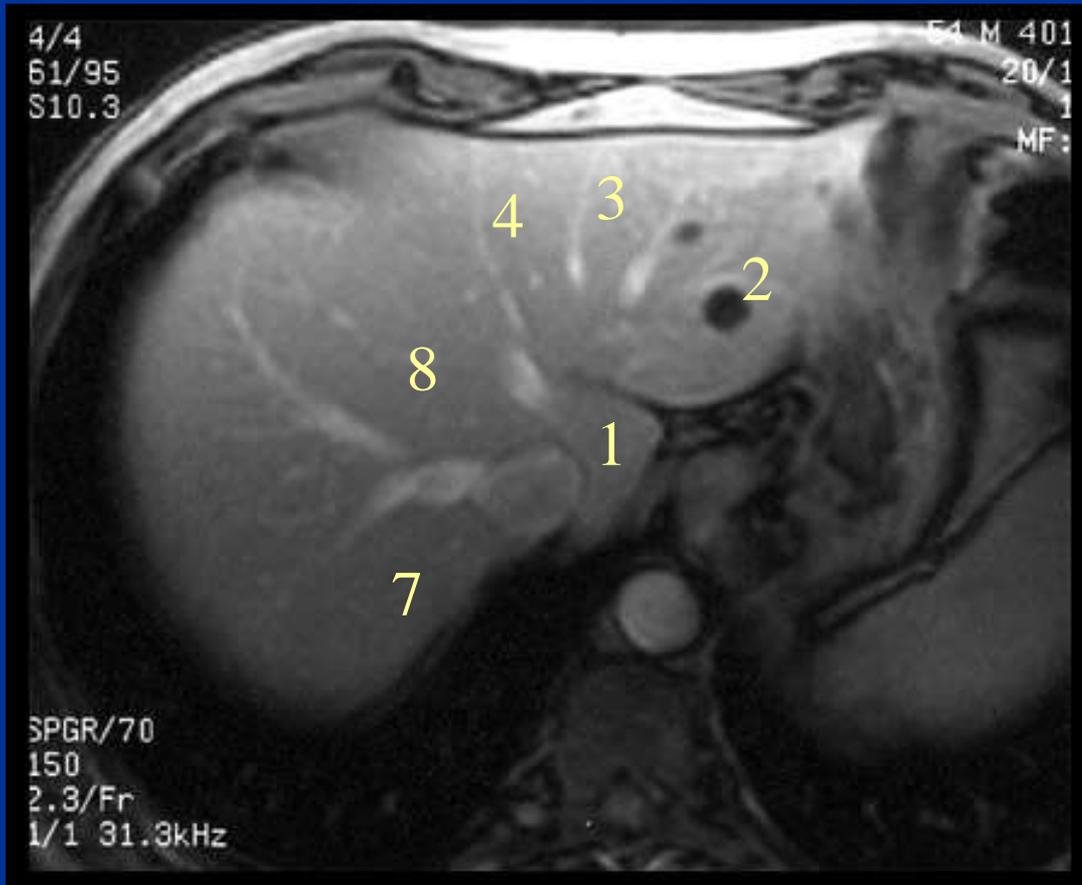
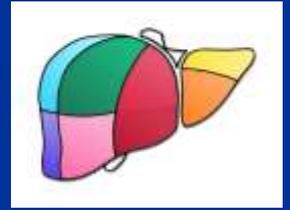
Secteur paramédian droit: Segment 8



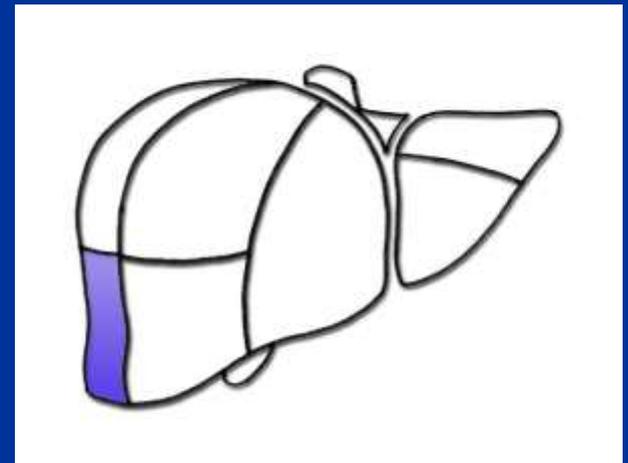
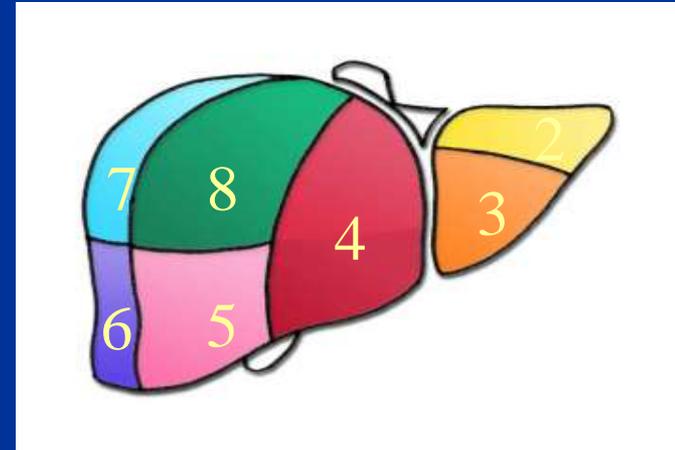
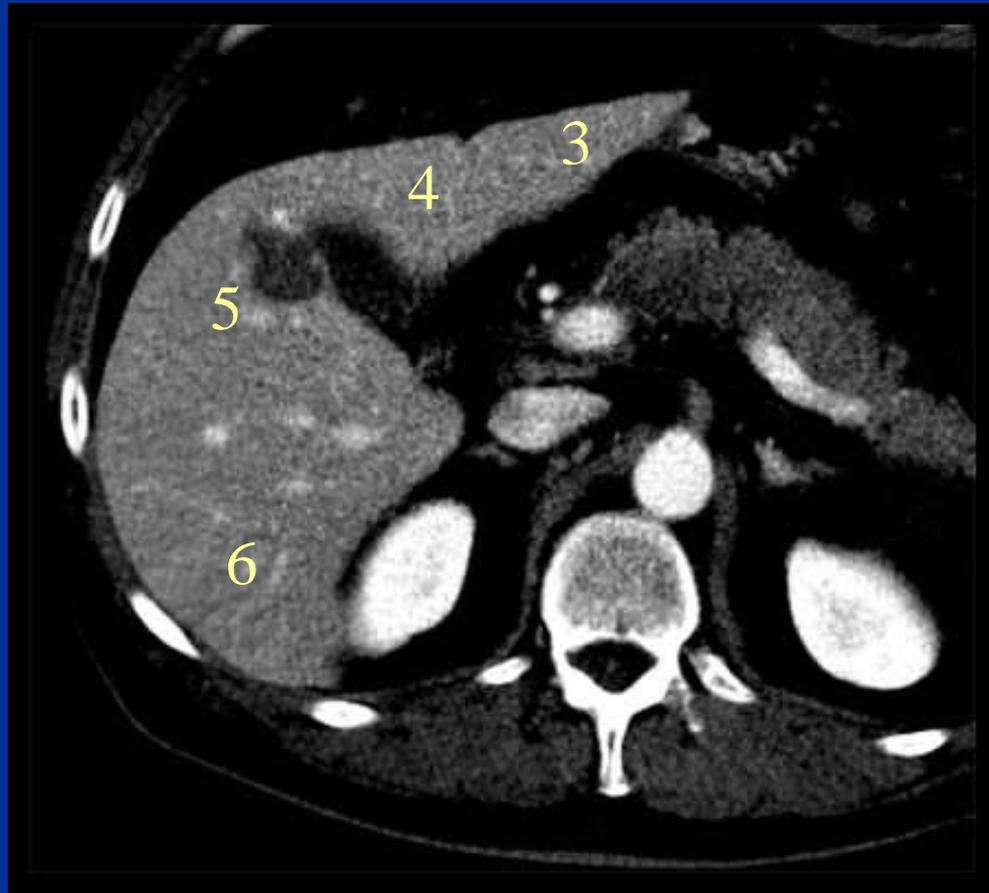
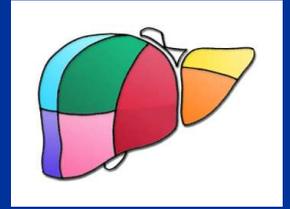
Secteur latéral droit: Segments 6 et 7



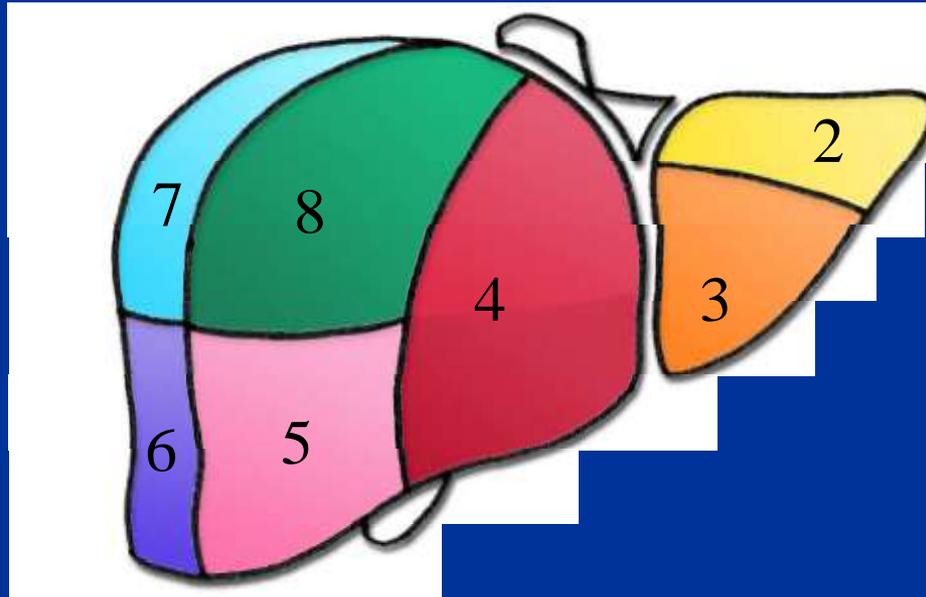
Secteur latéral droit: Segment 7



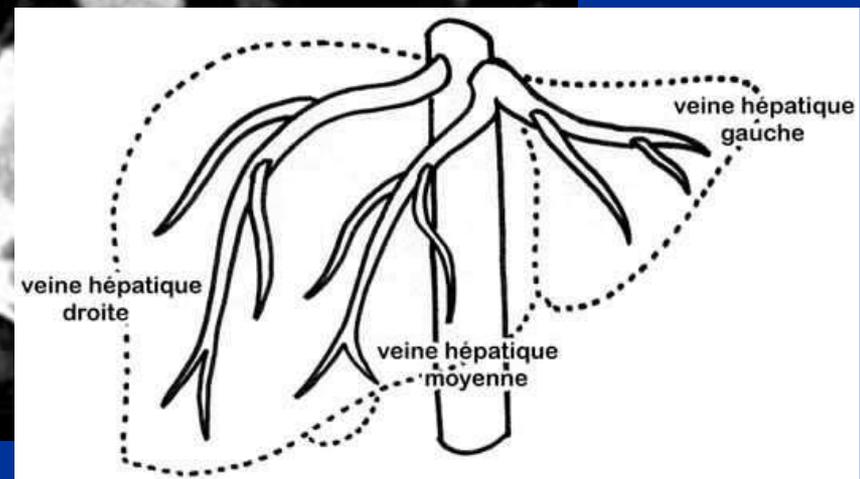
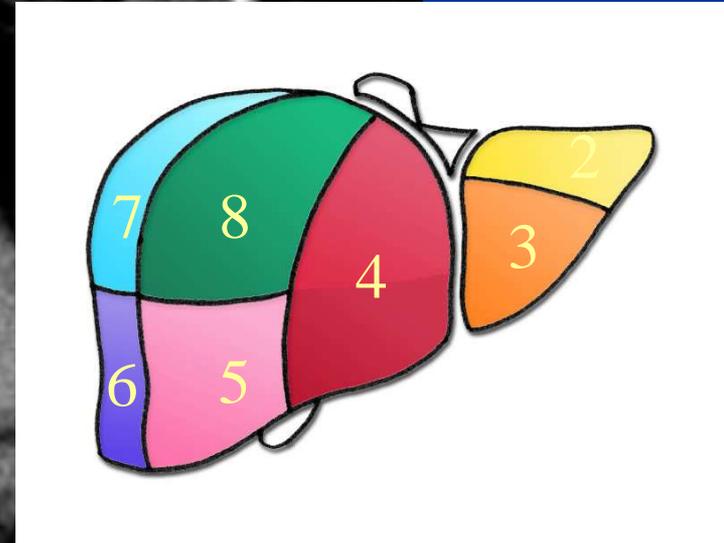
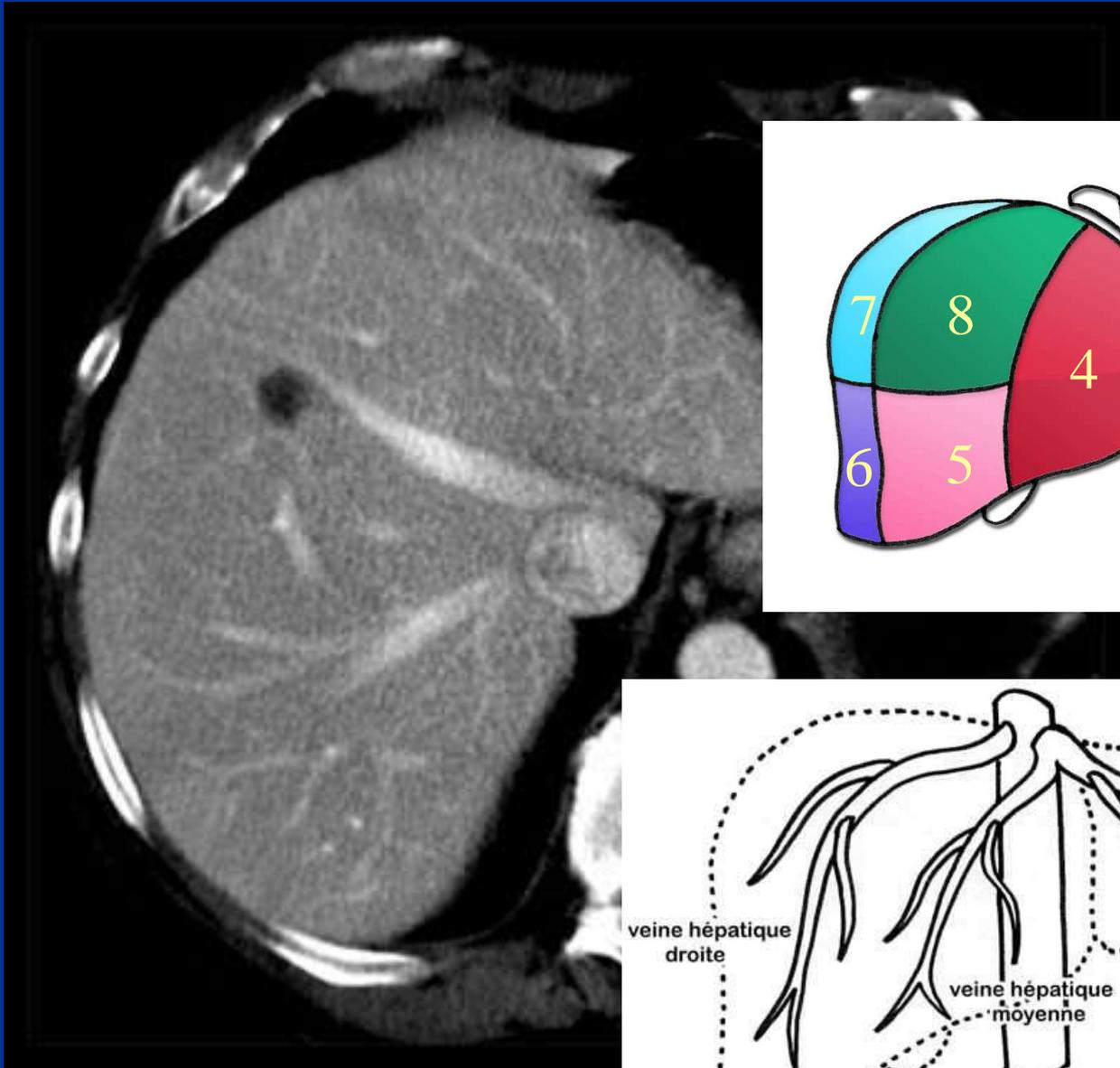
Secteur latéral droit: Segment 6

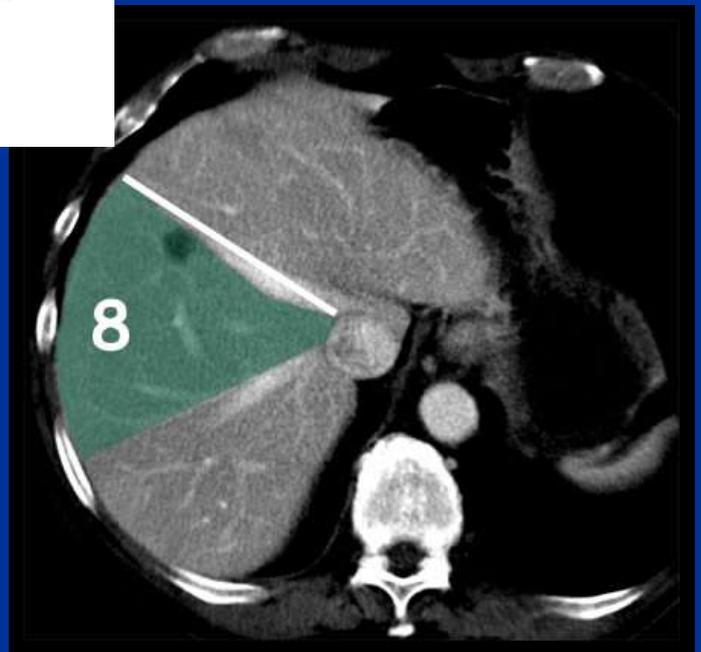
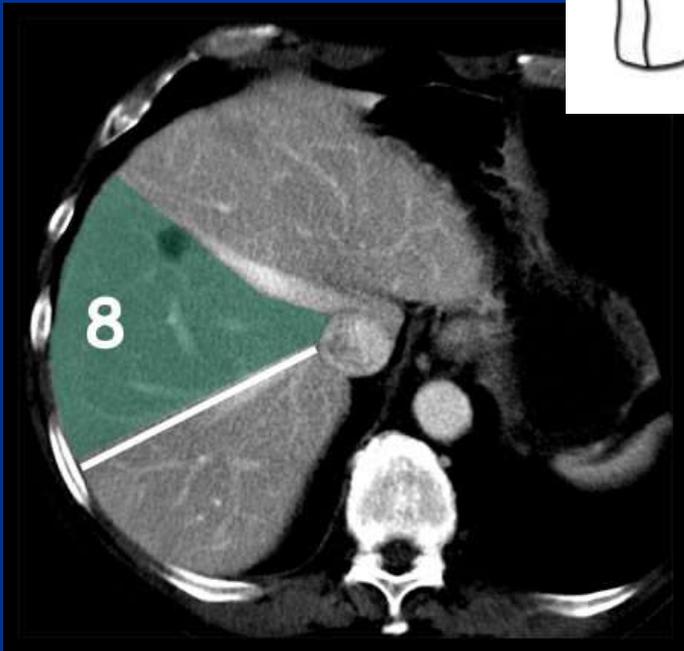
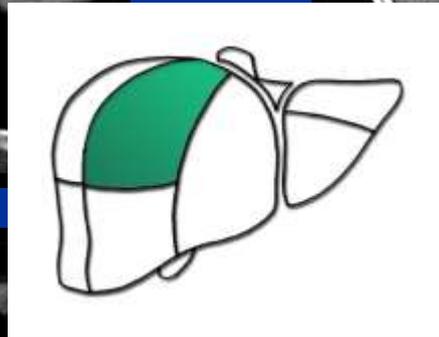
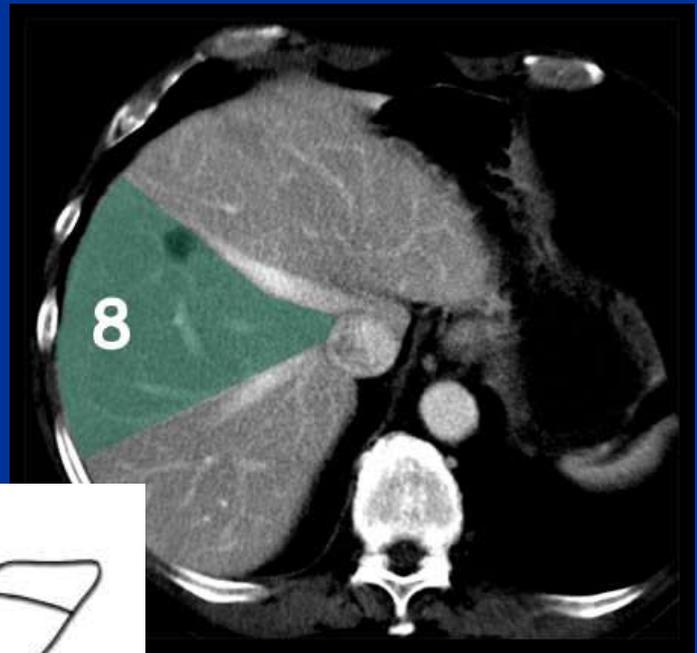
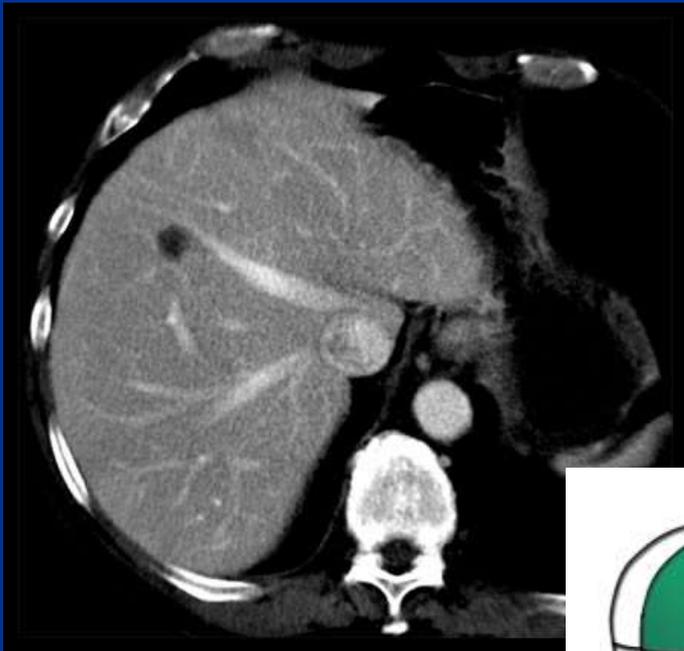


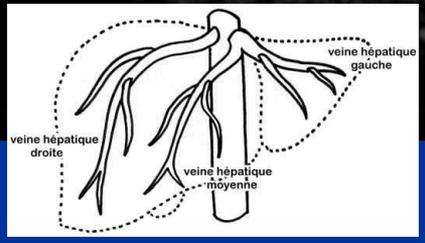
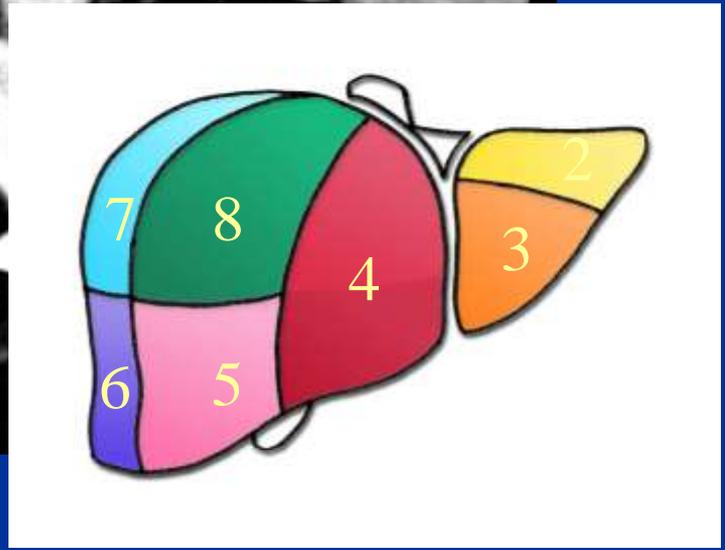
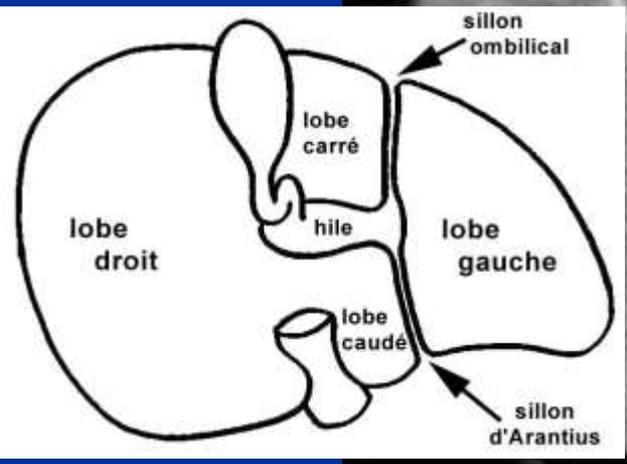
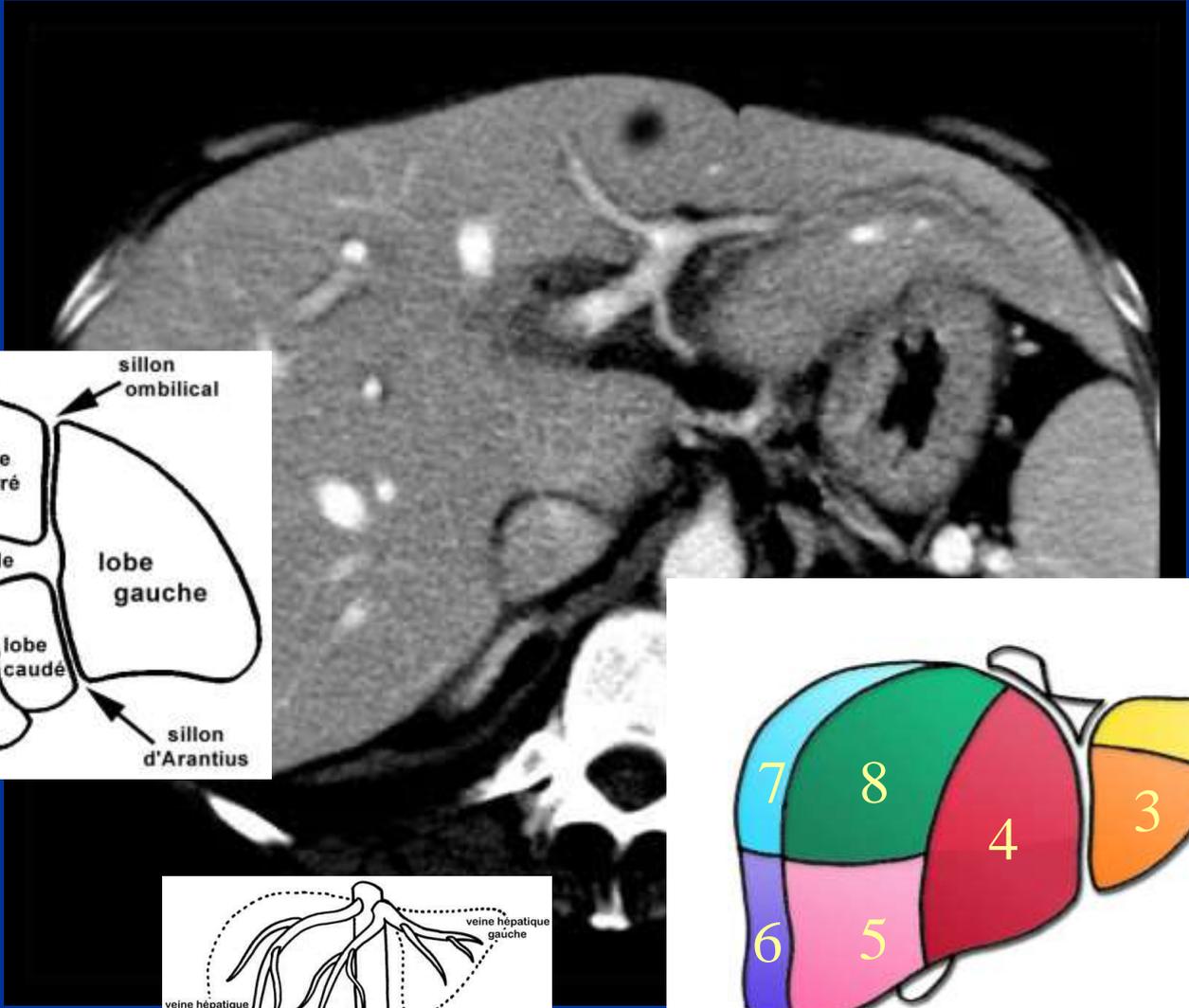
- Foie droit : 5, 6, 7 et 8
- Foie gauche : 2, 3 et 4
- Lobe droit : 4, 5, 6, 7 et 8
- Lobe gauche : 2 et 3

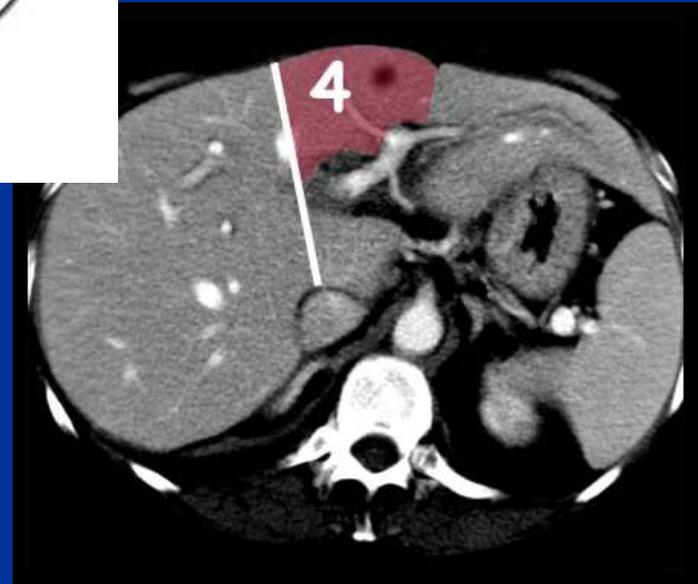
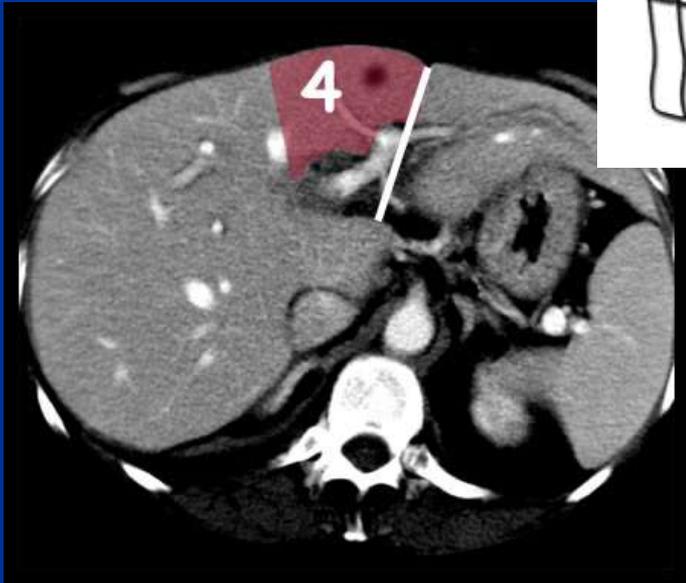
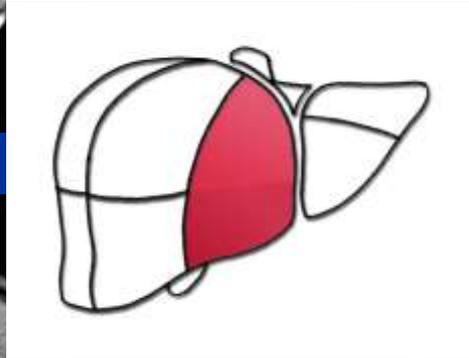


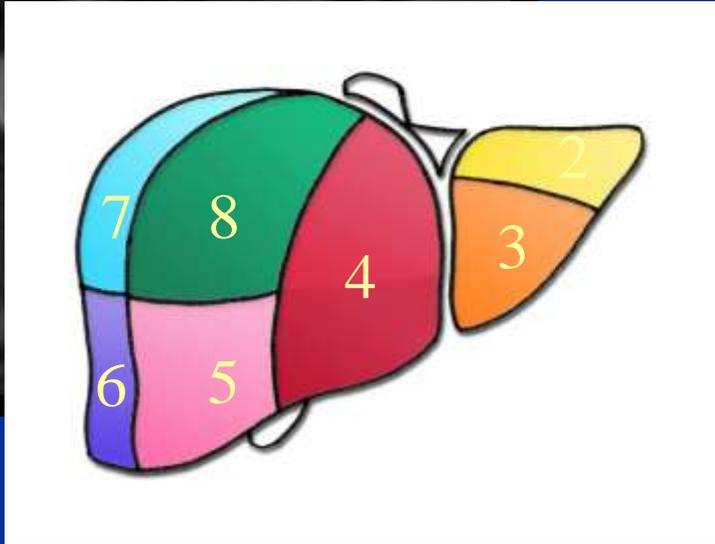
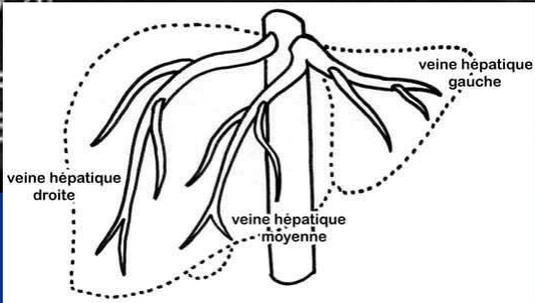
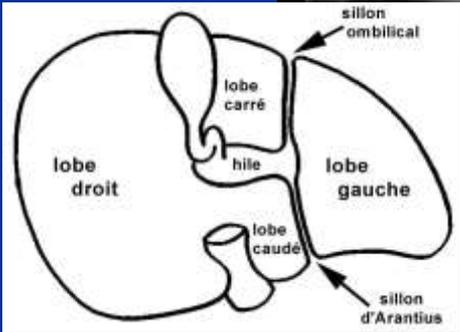
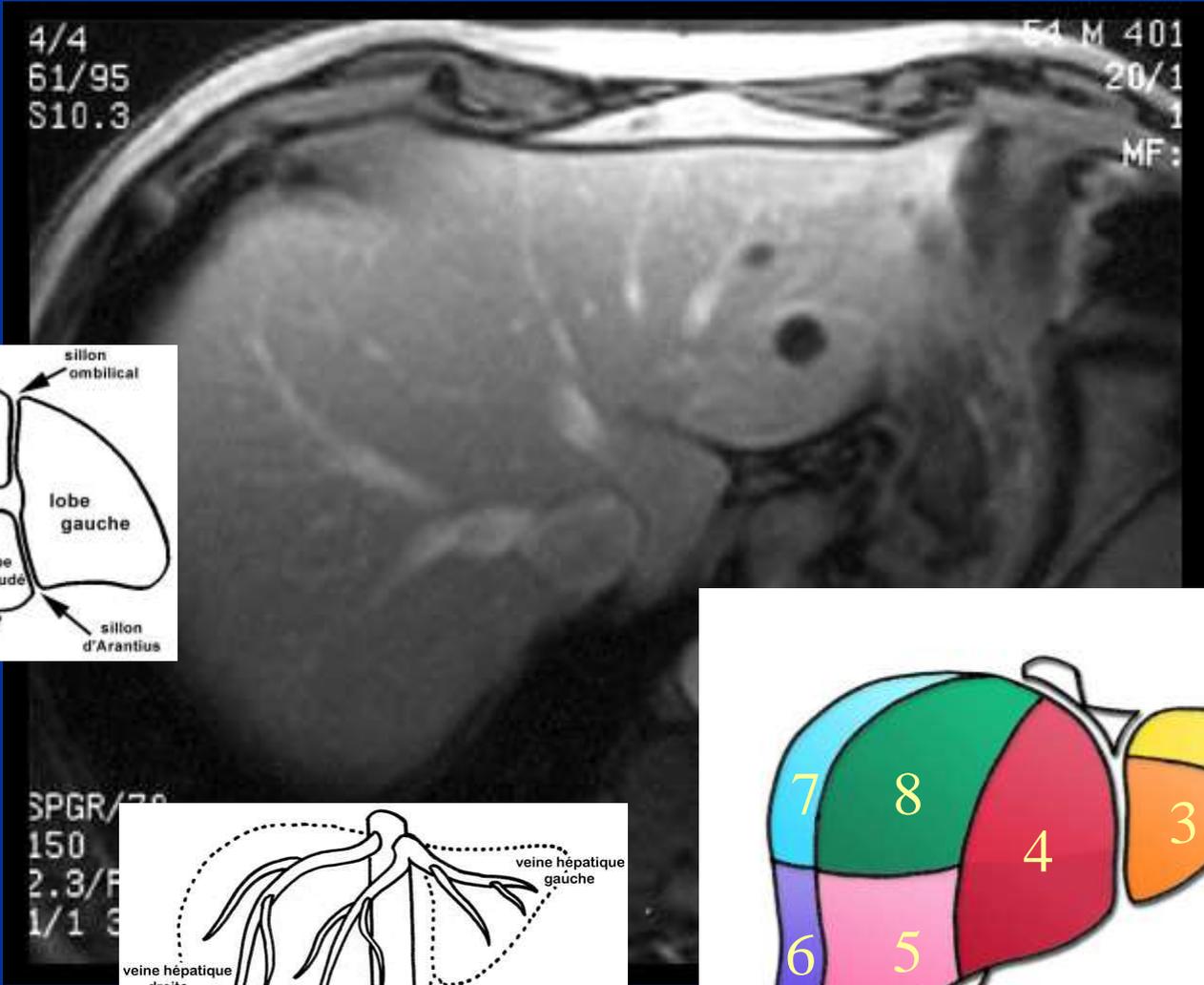
QUIZ

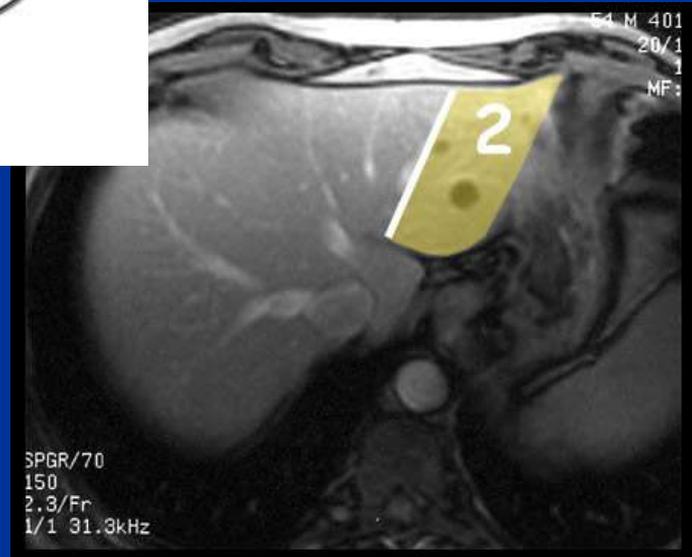
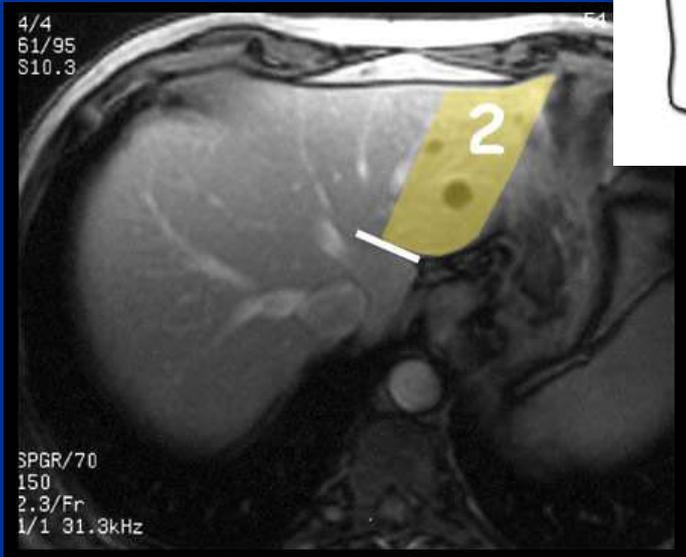
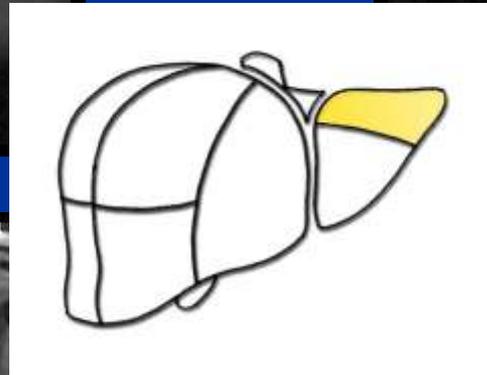
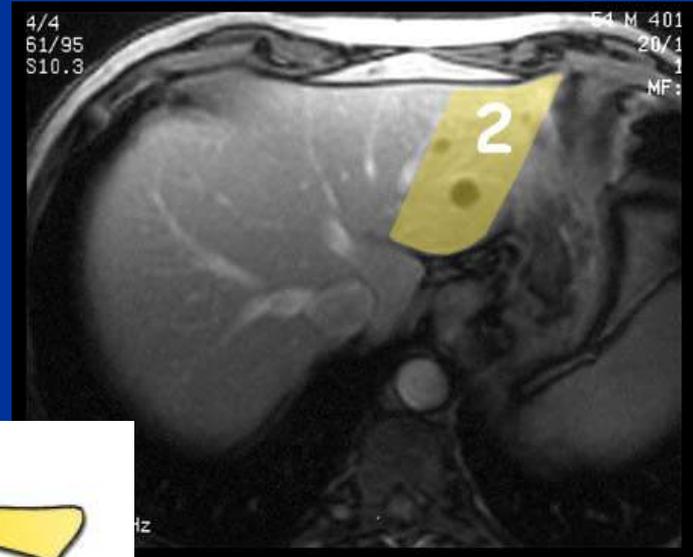
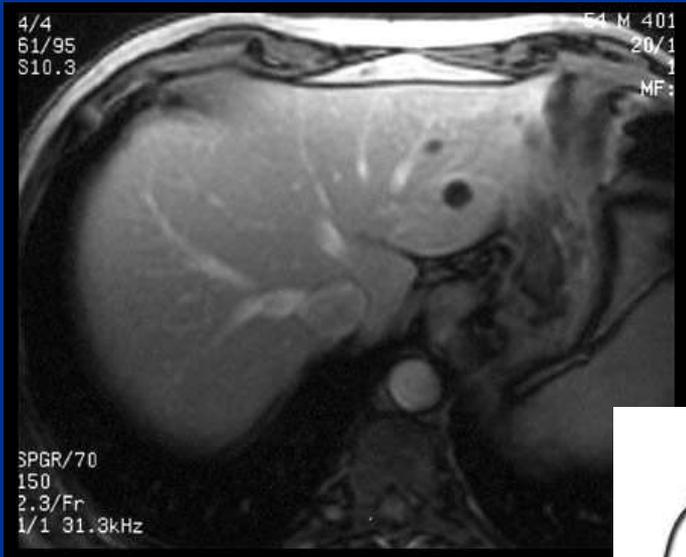


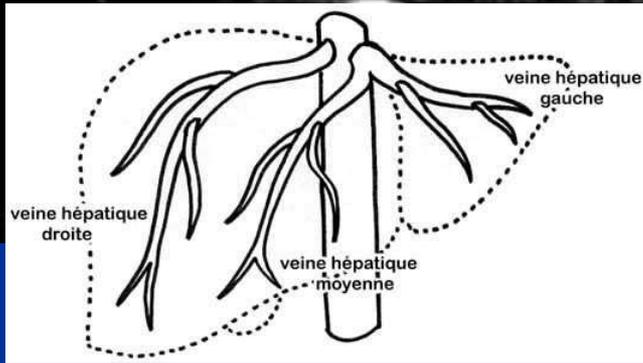
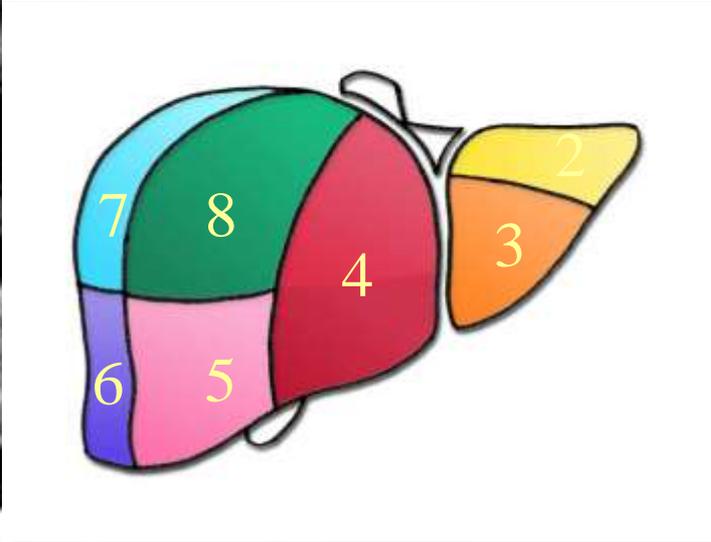
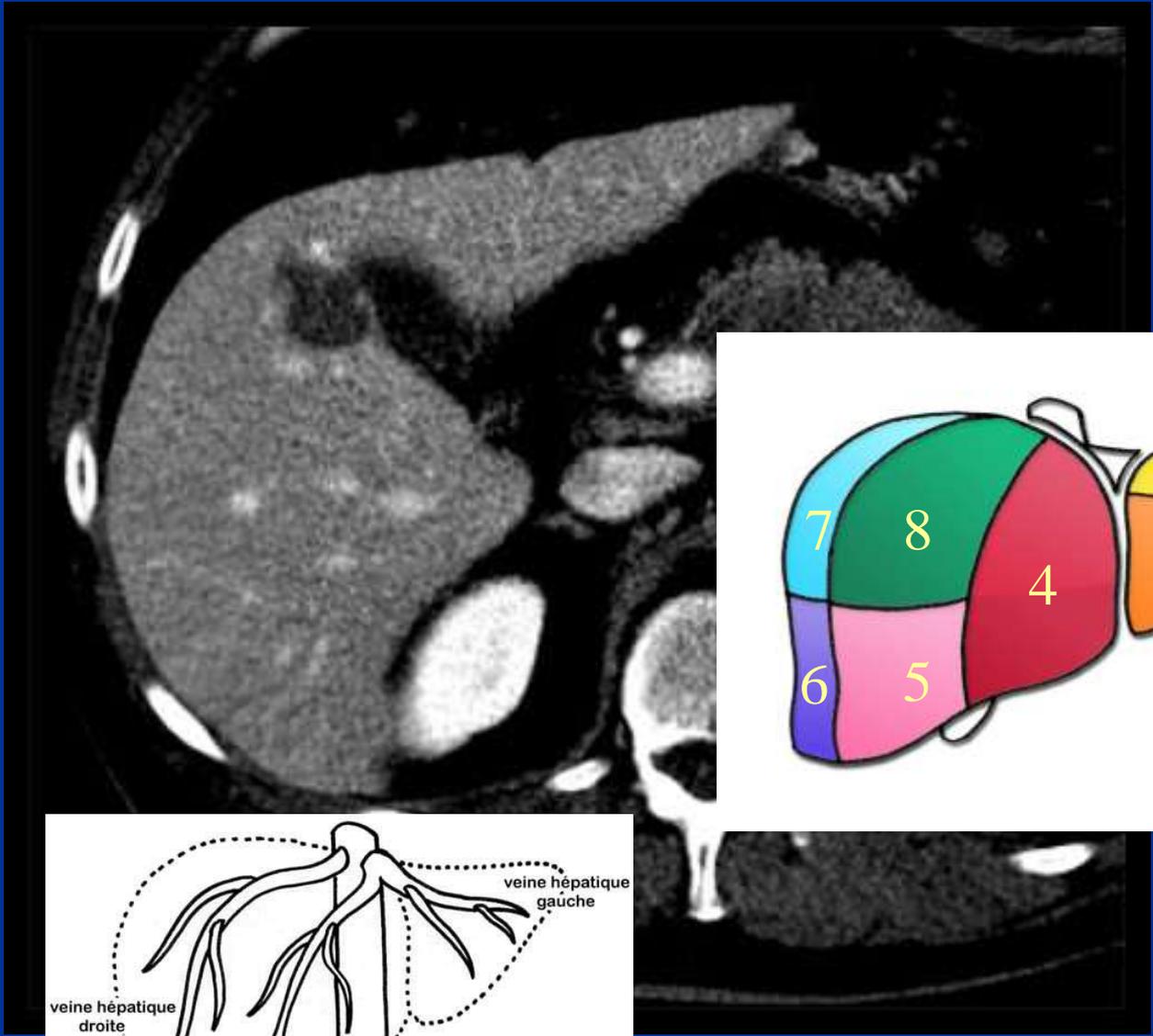


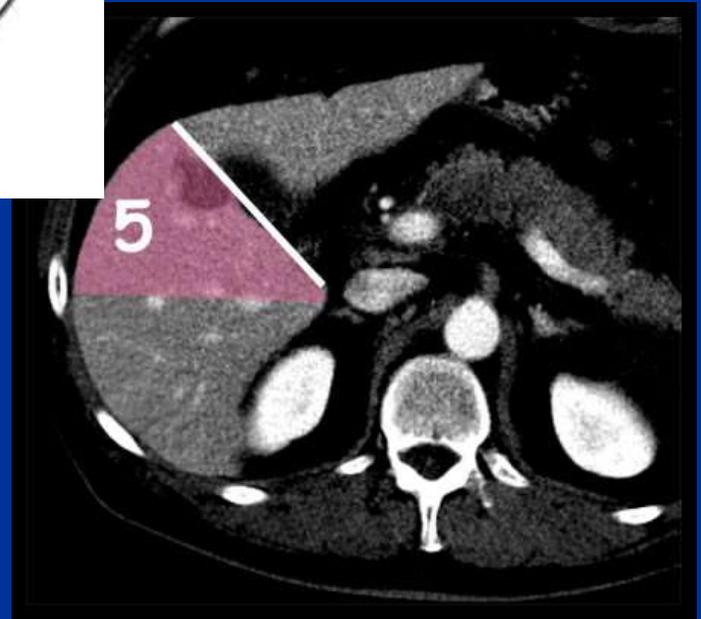
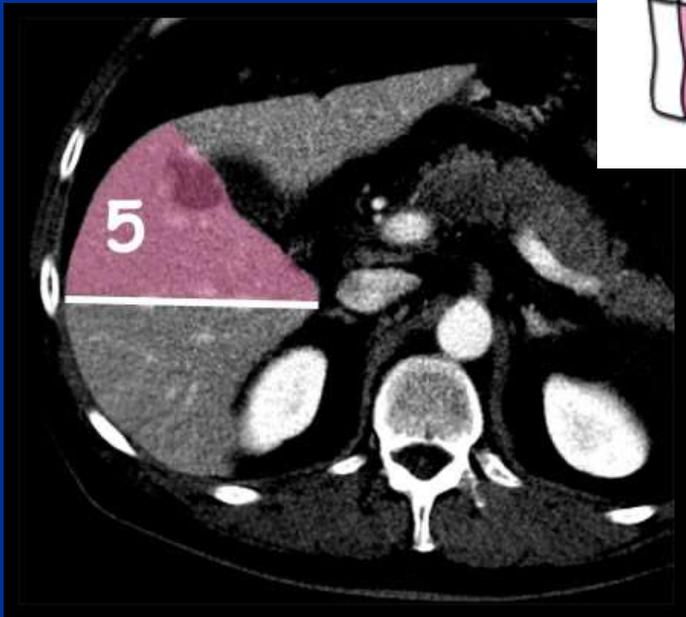
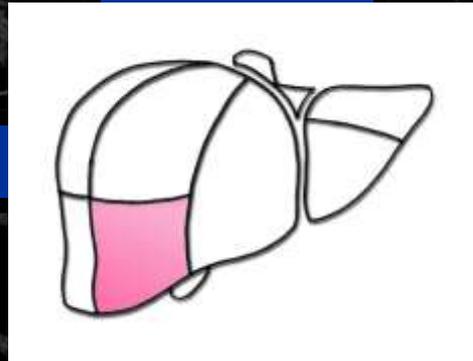
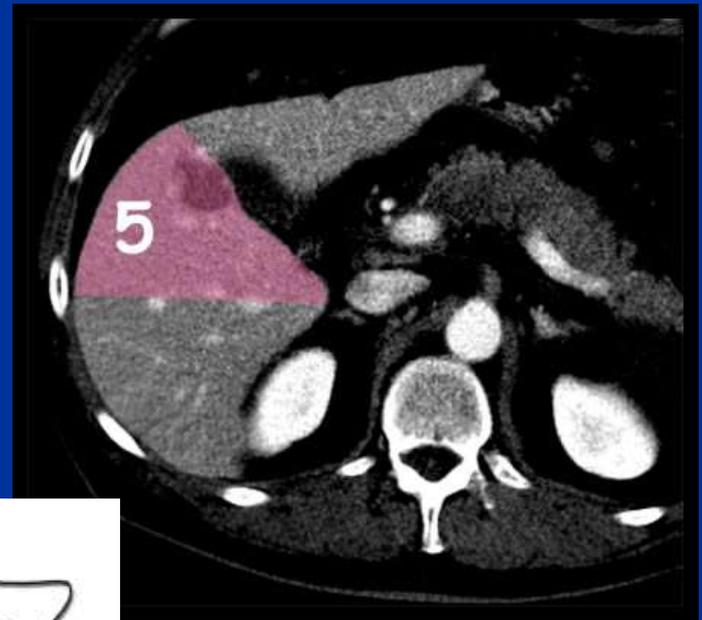


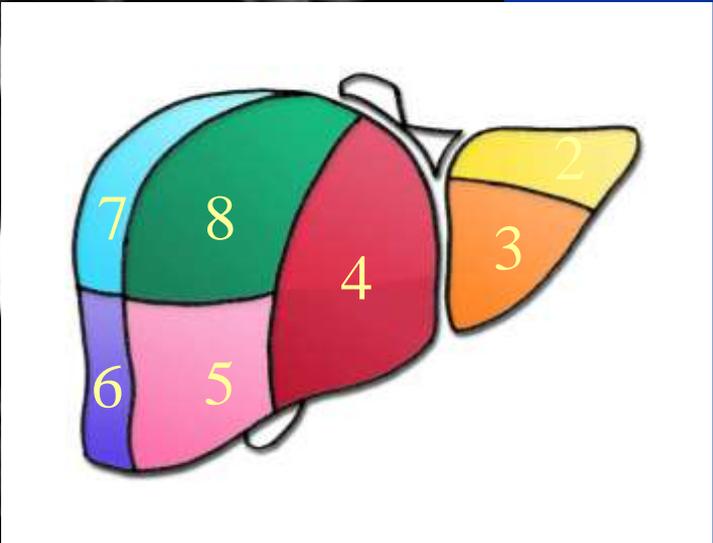
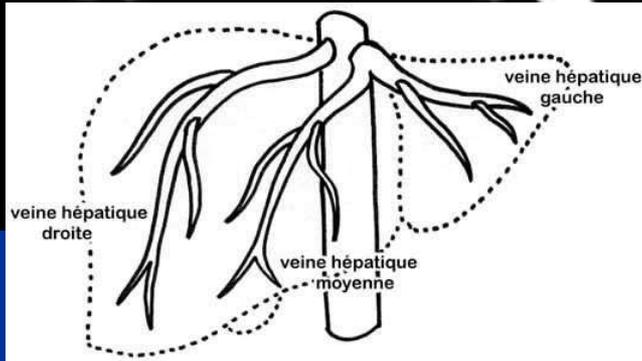
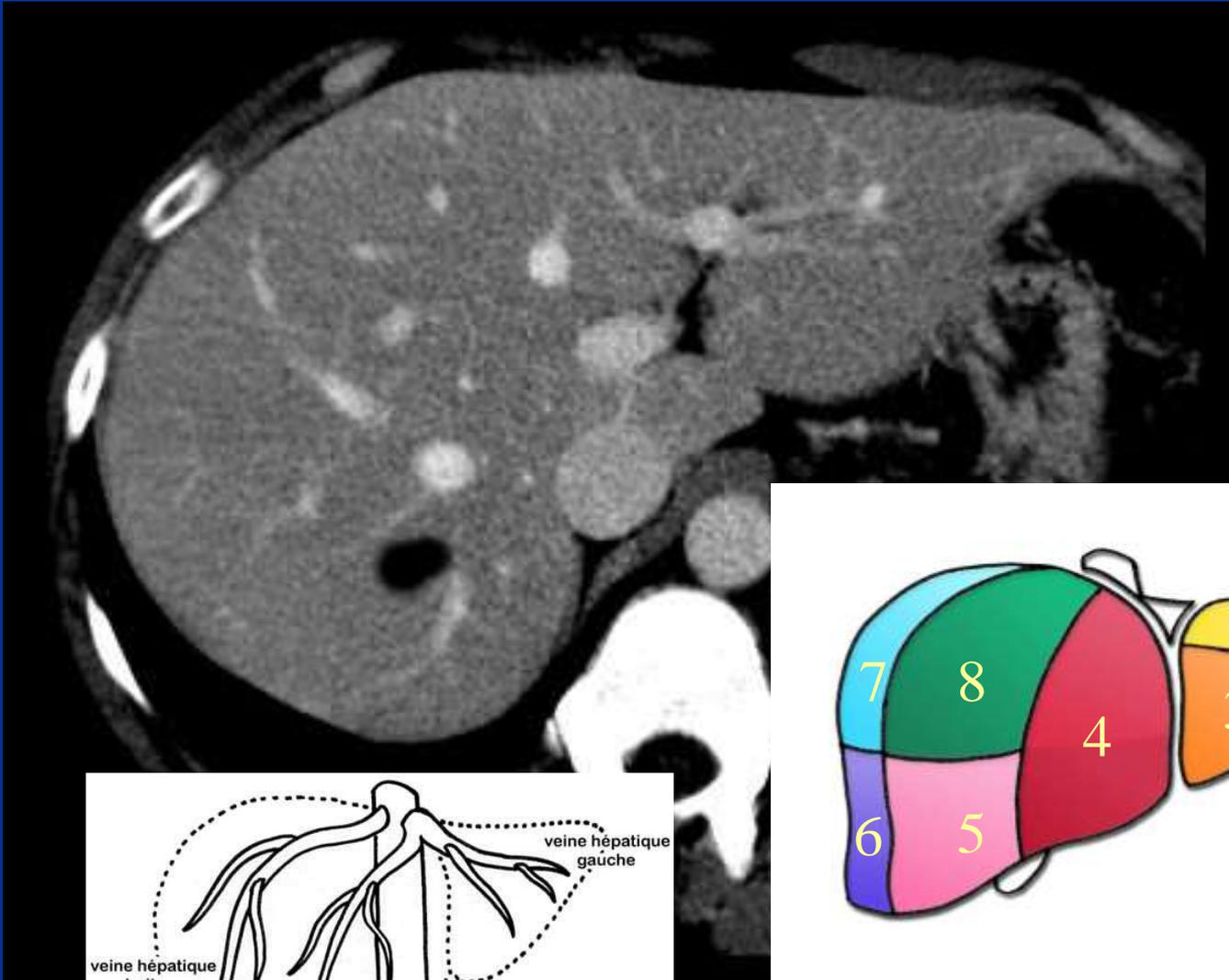


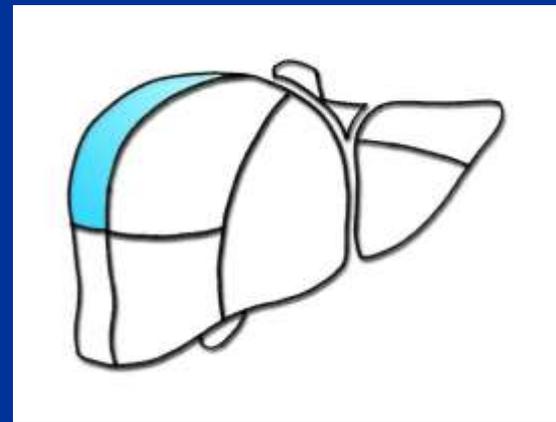
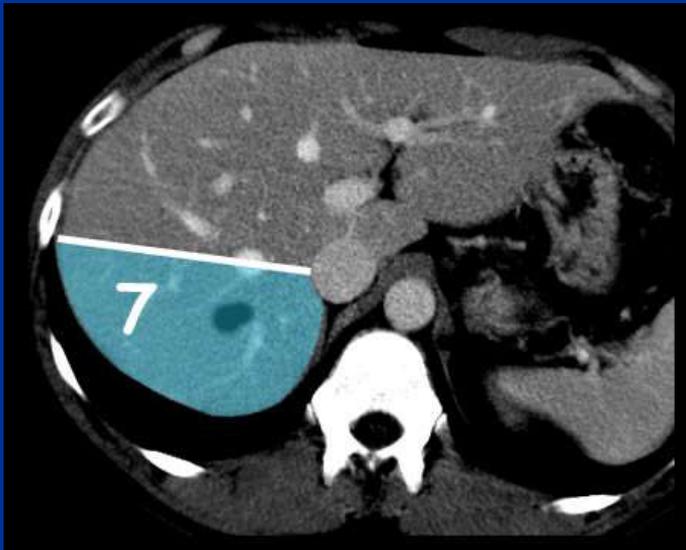
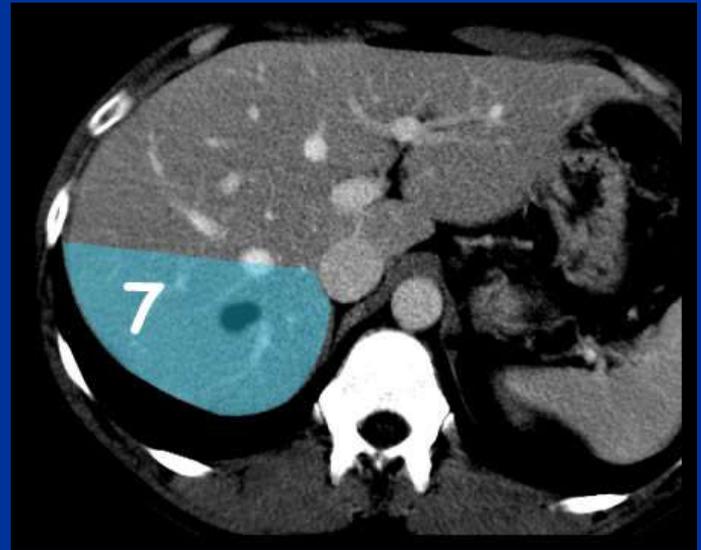


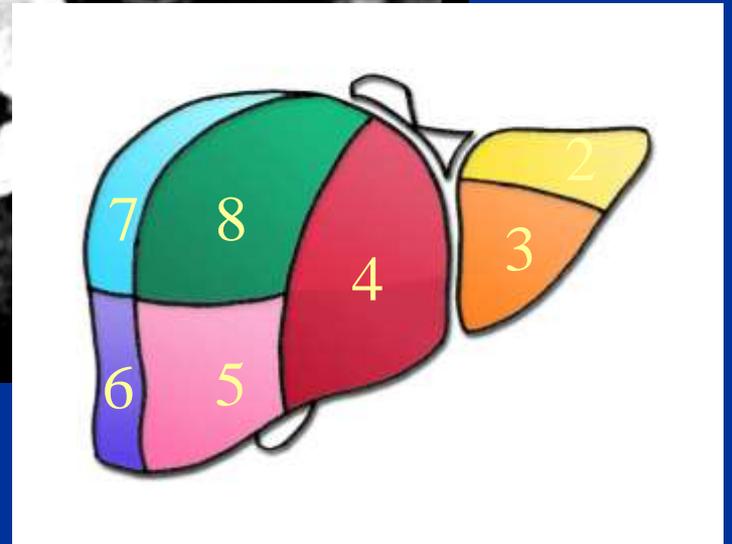
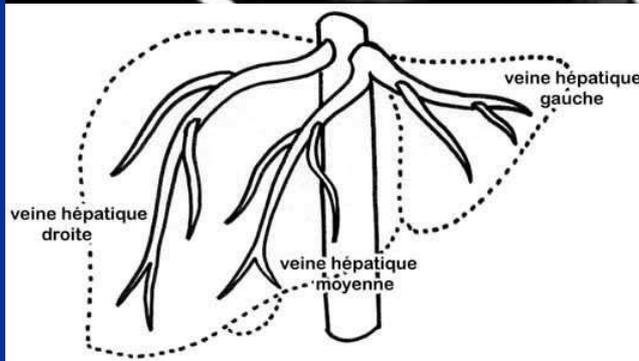
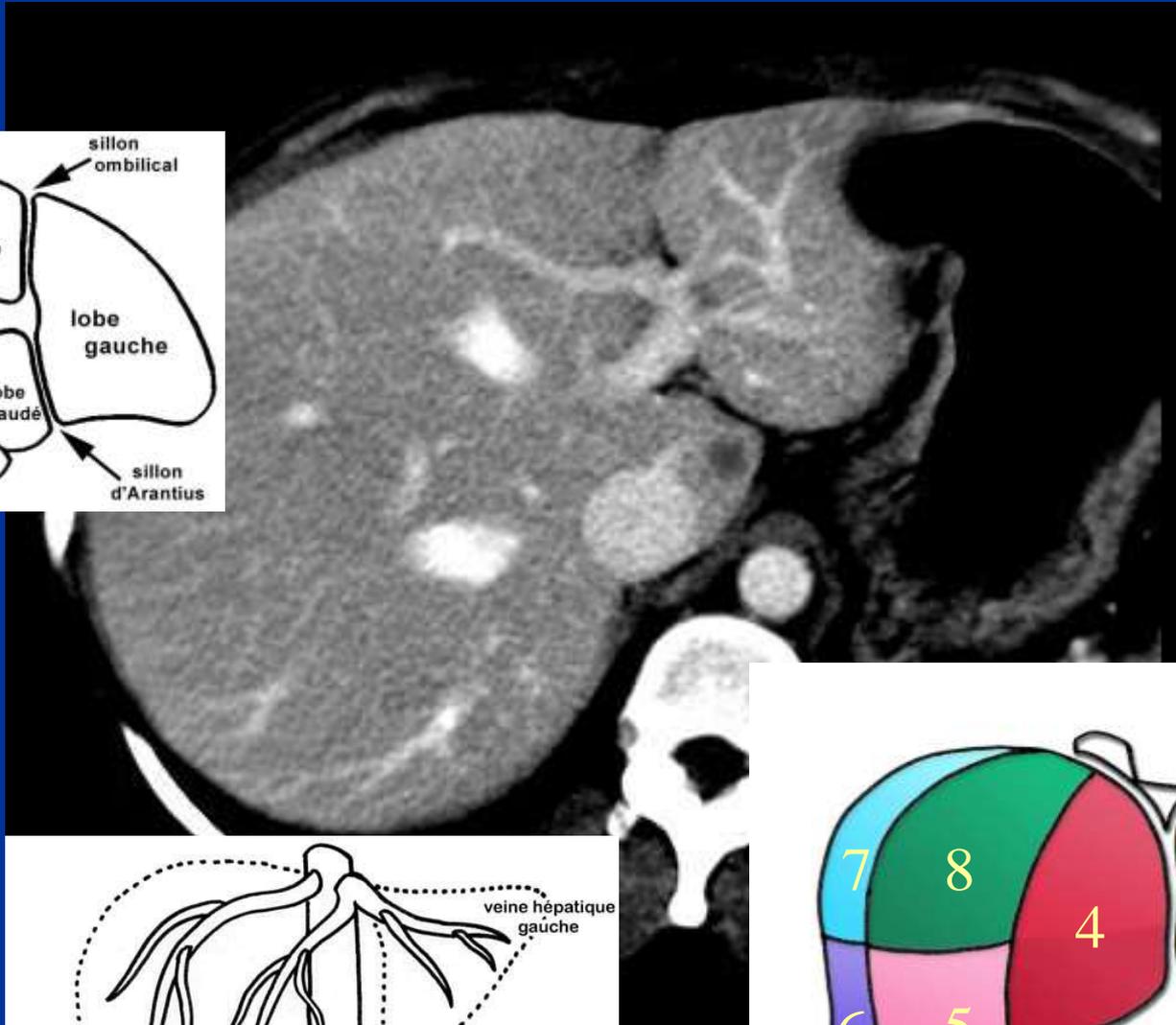
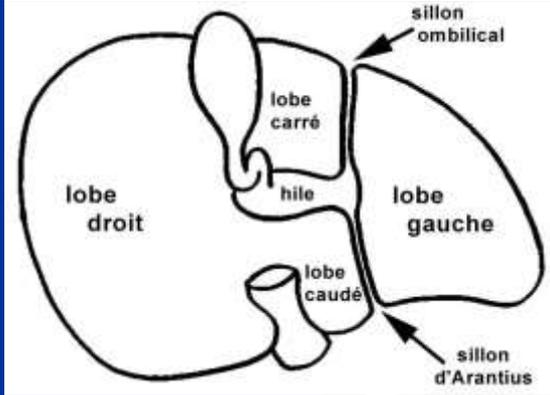


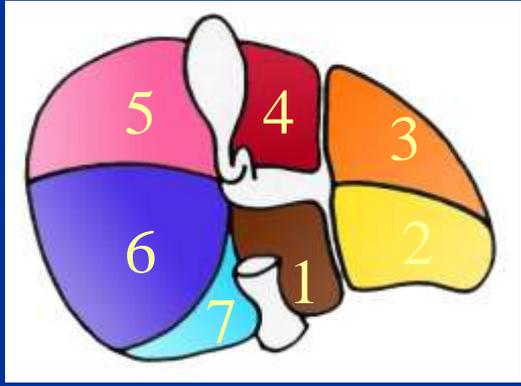


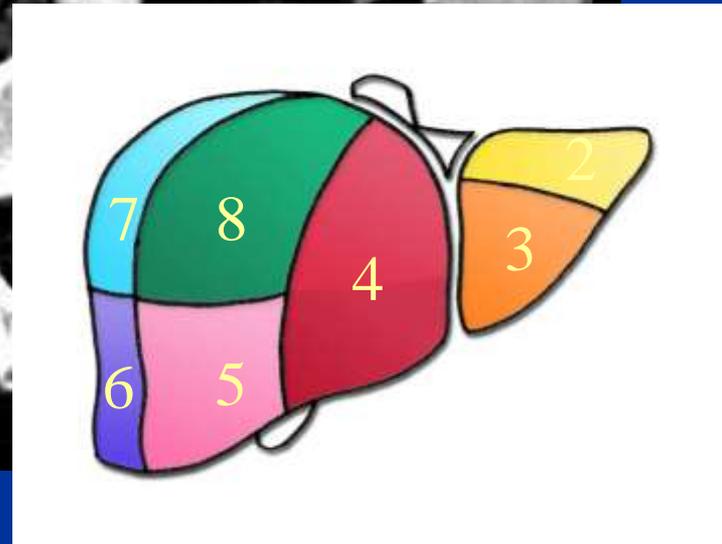
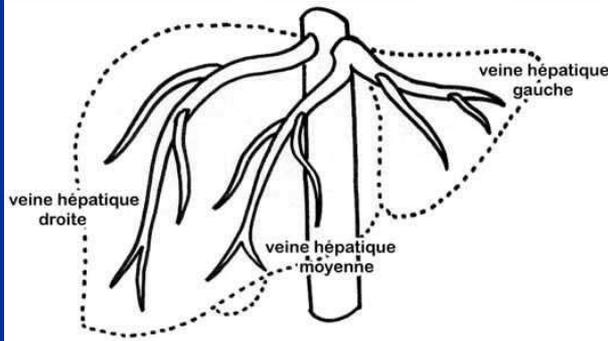
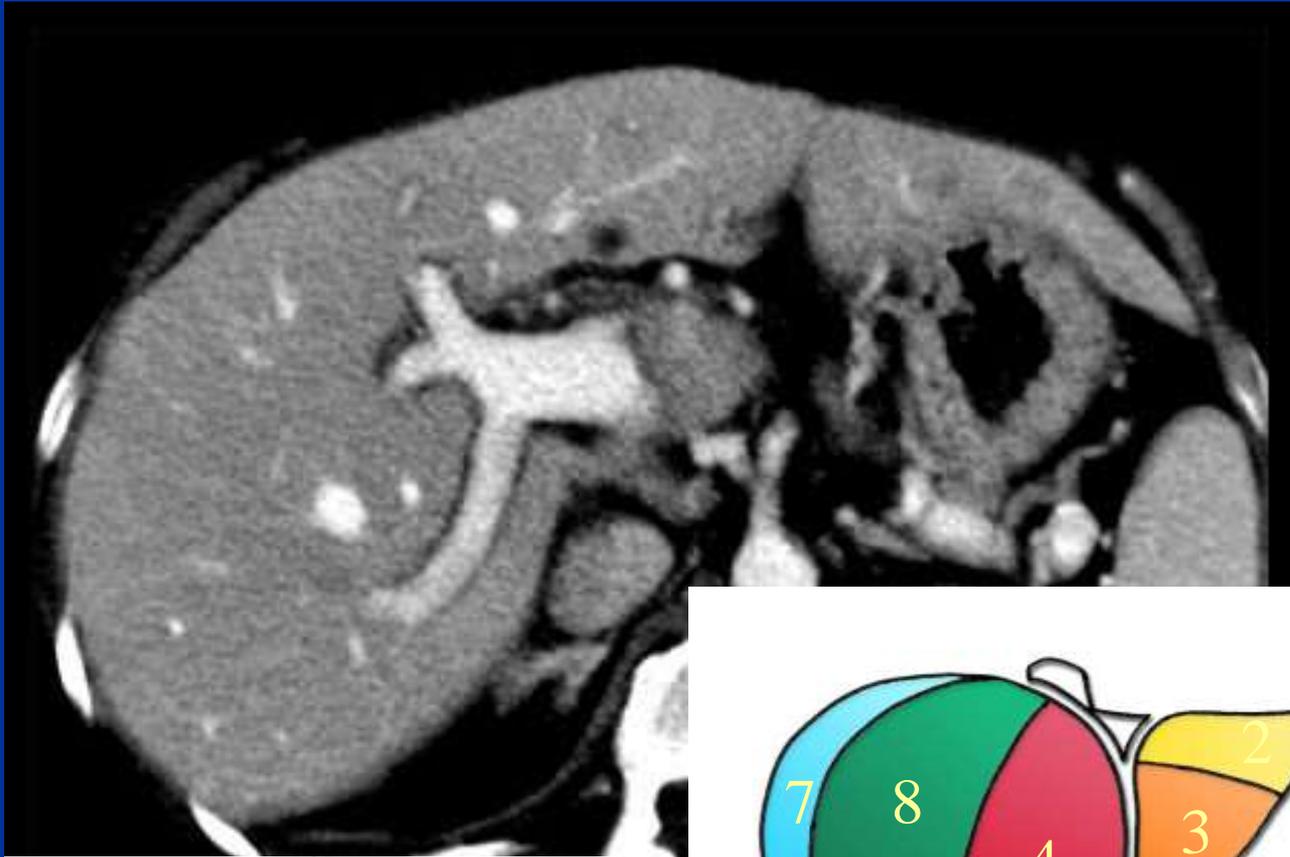


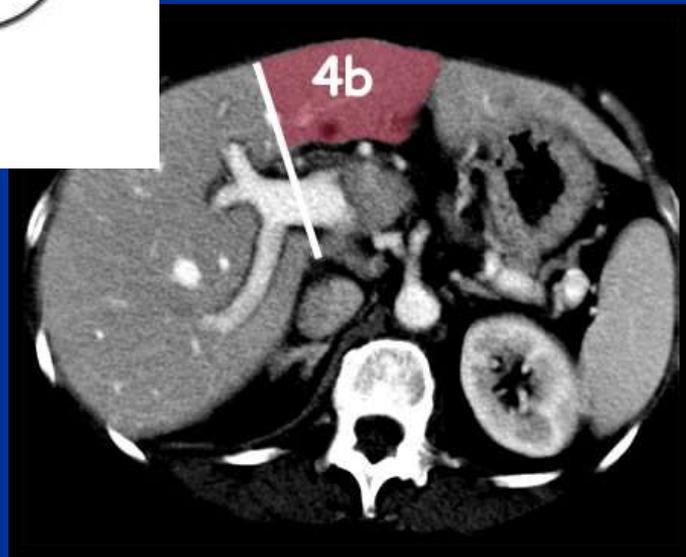
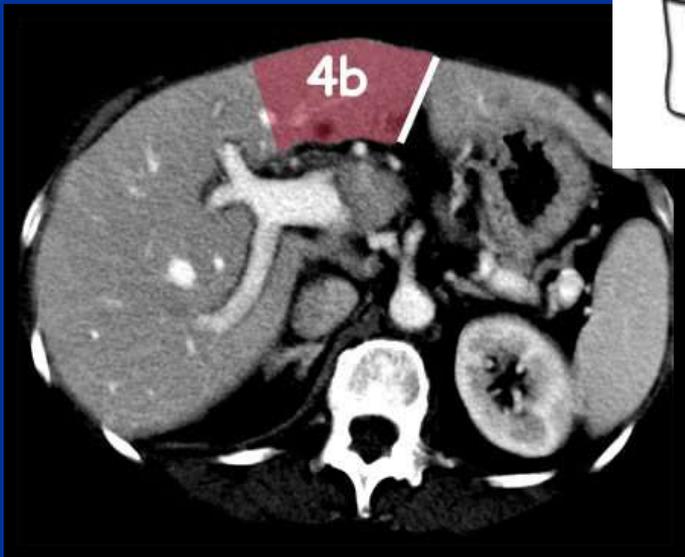
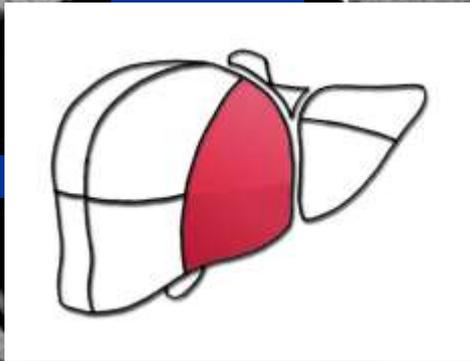
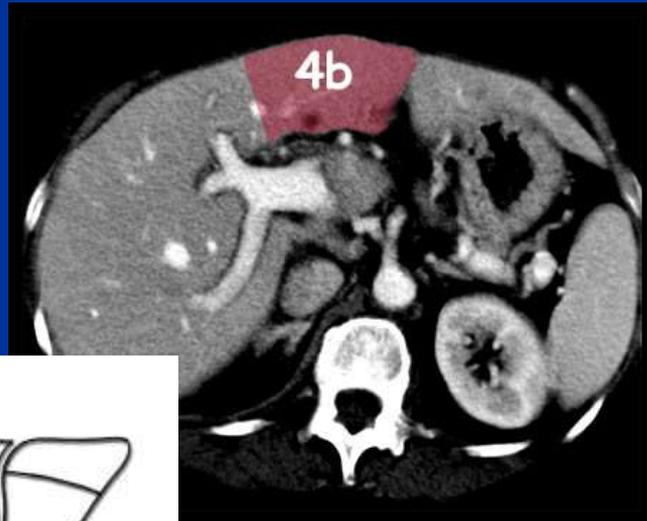


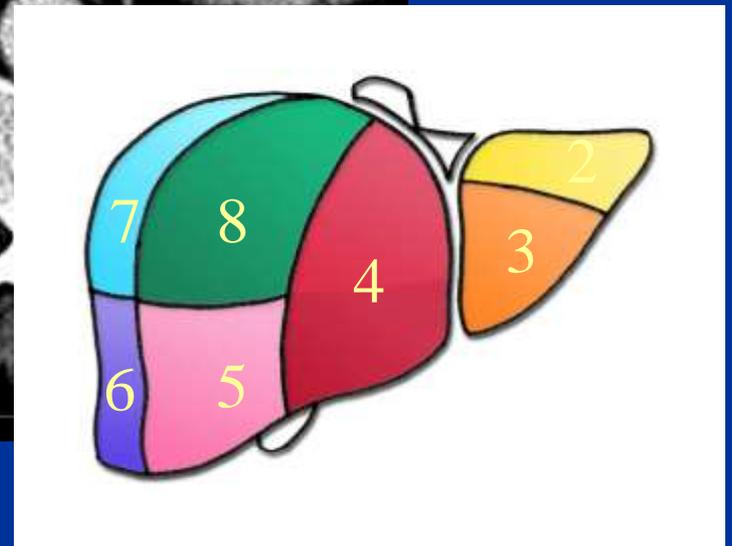
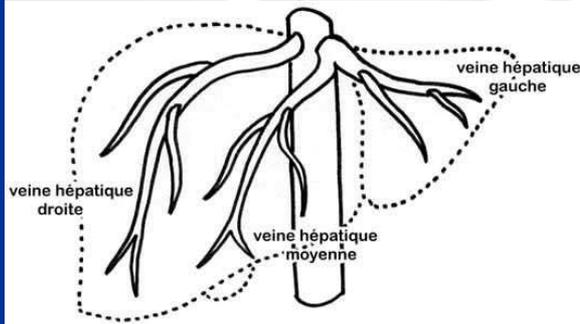


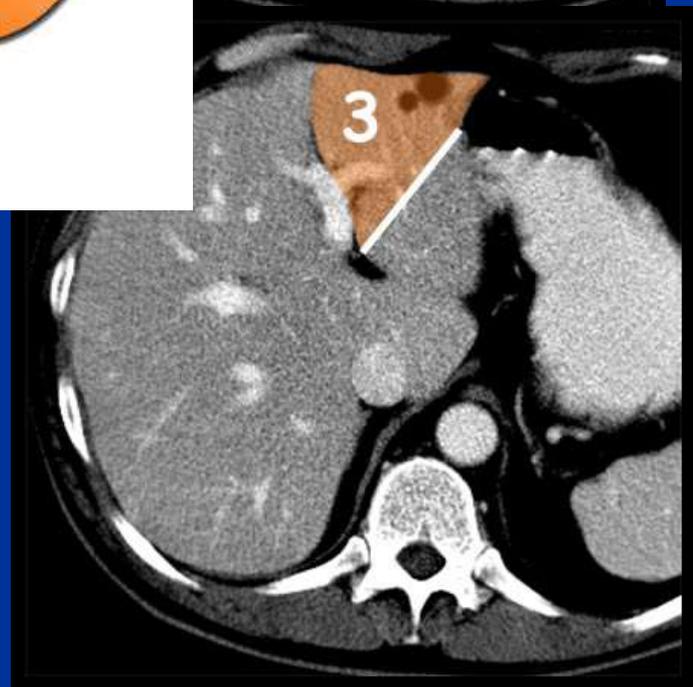
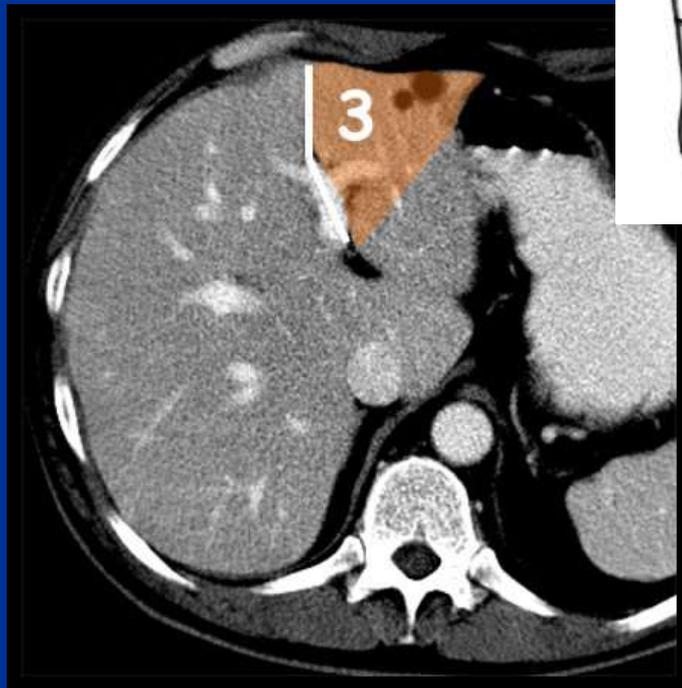
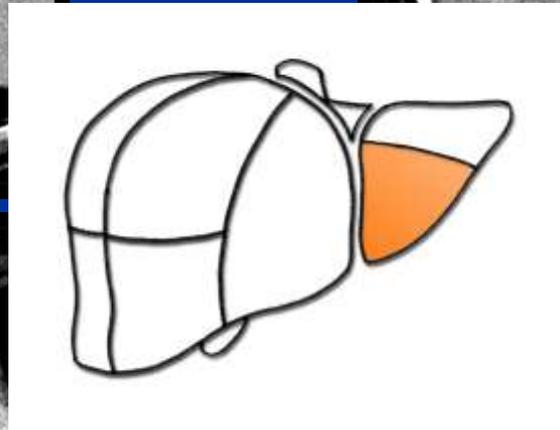
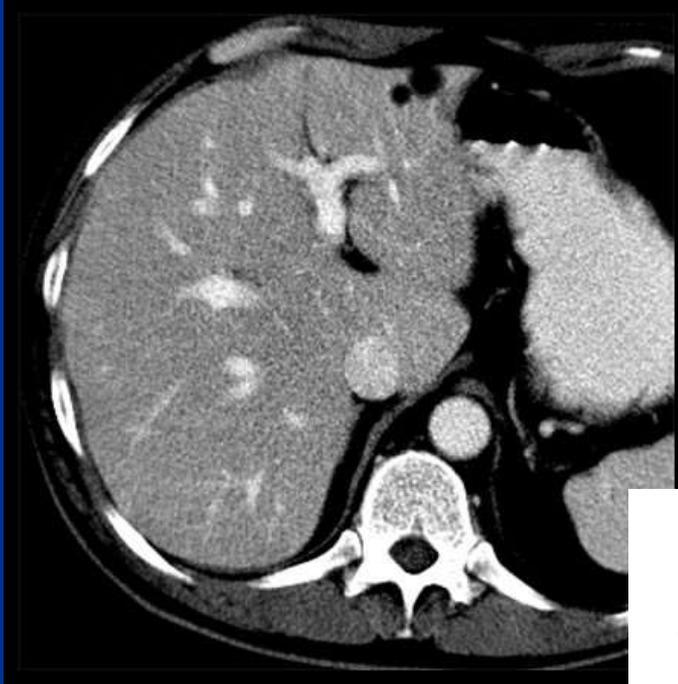


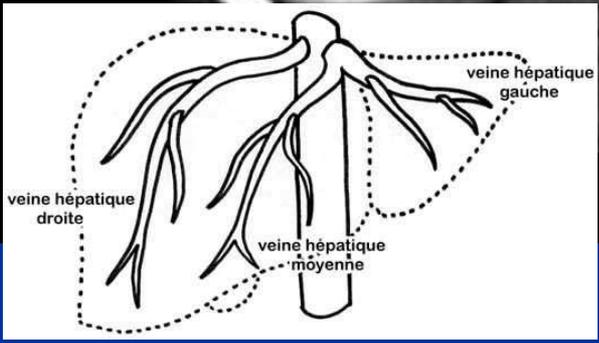
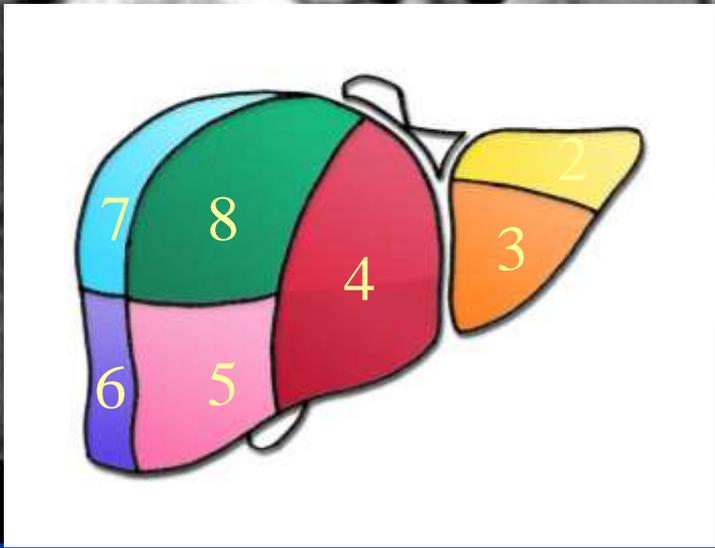
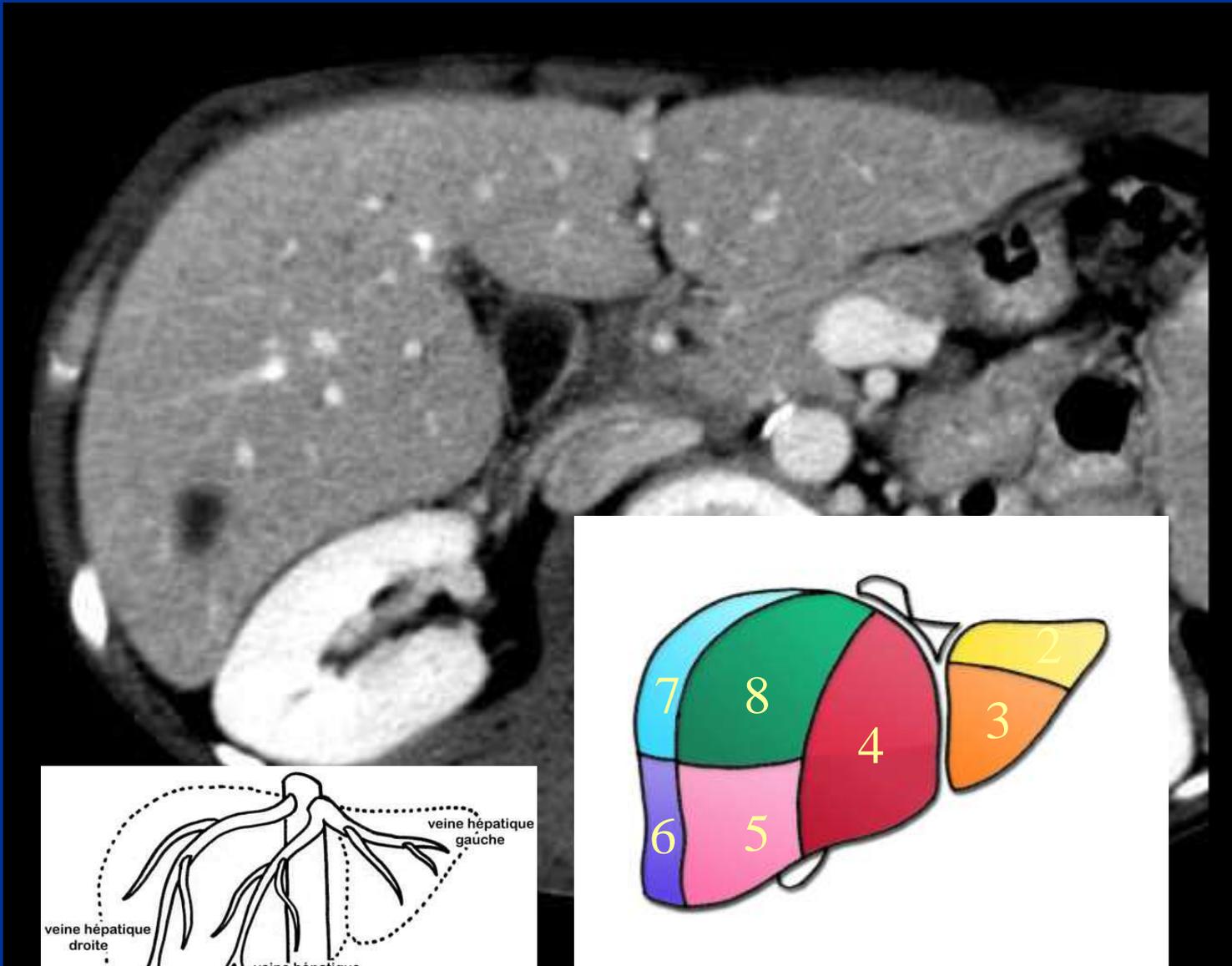


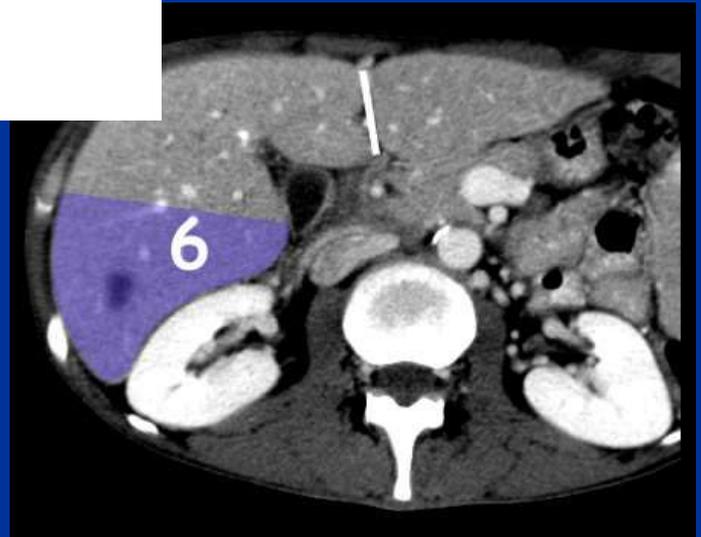
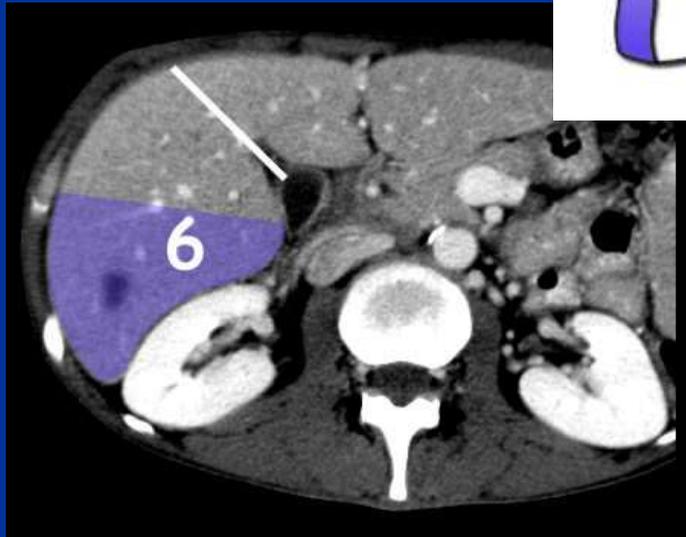
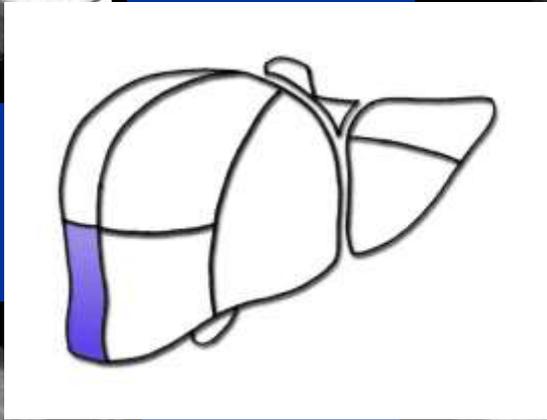


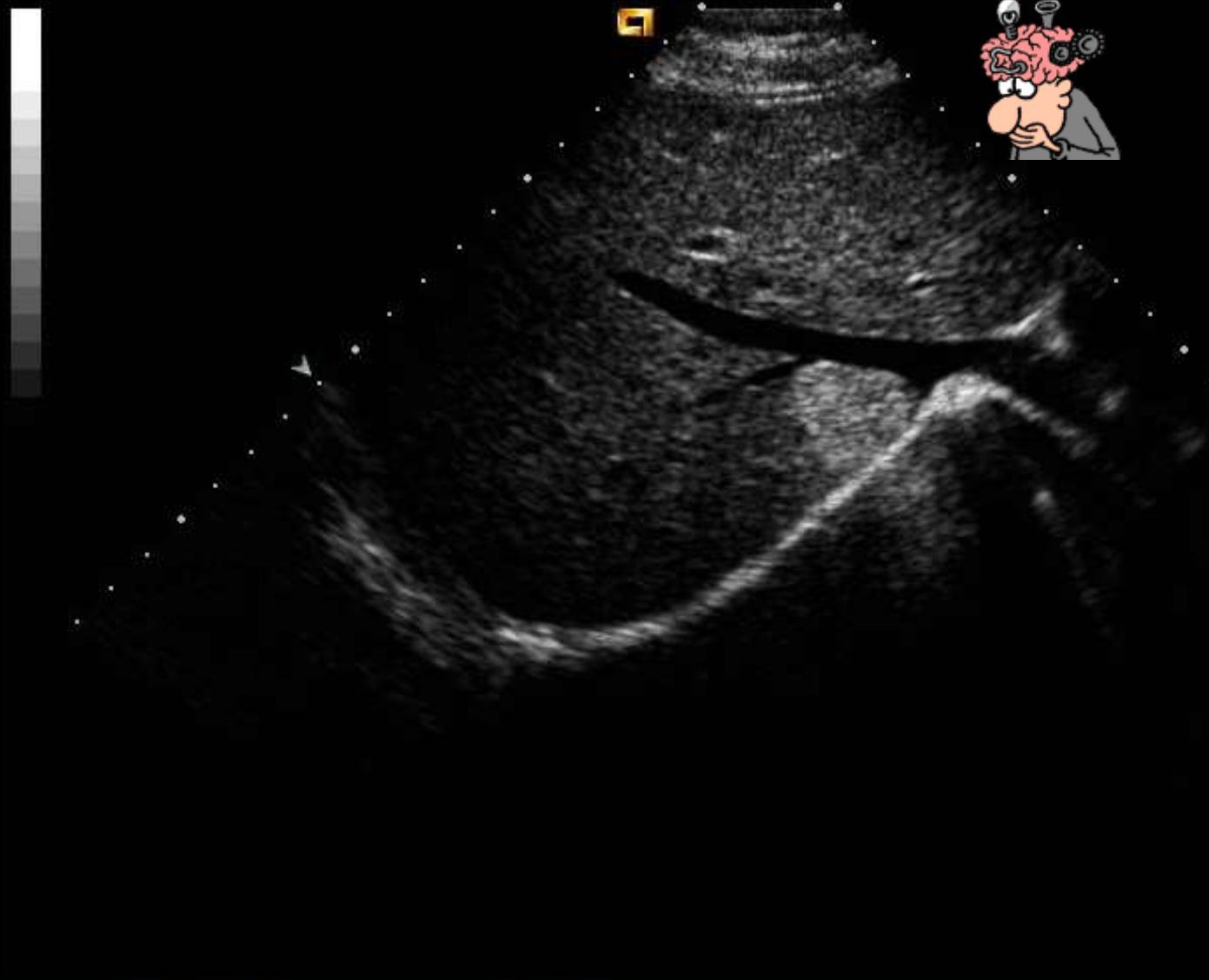












9:03:09 am

4V2 #57

H4.0MHz 180mm

Abdomen

100dB \$1/+3/2/ 4

Gain= 3dB Δ=4

Stock. en cours

T

0

5

10

6C1
diffT5.0

22 fps



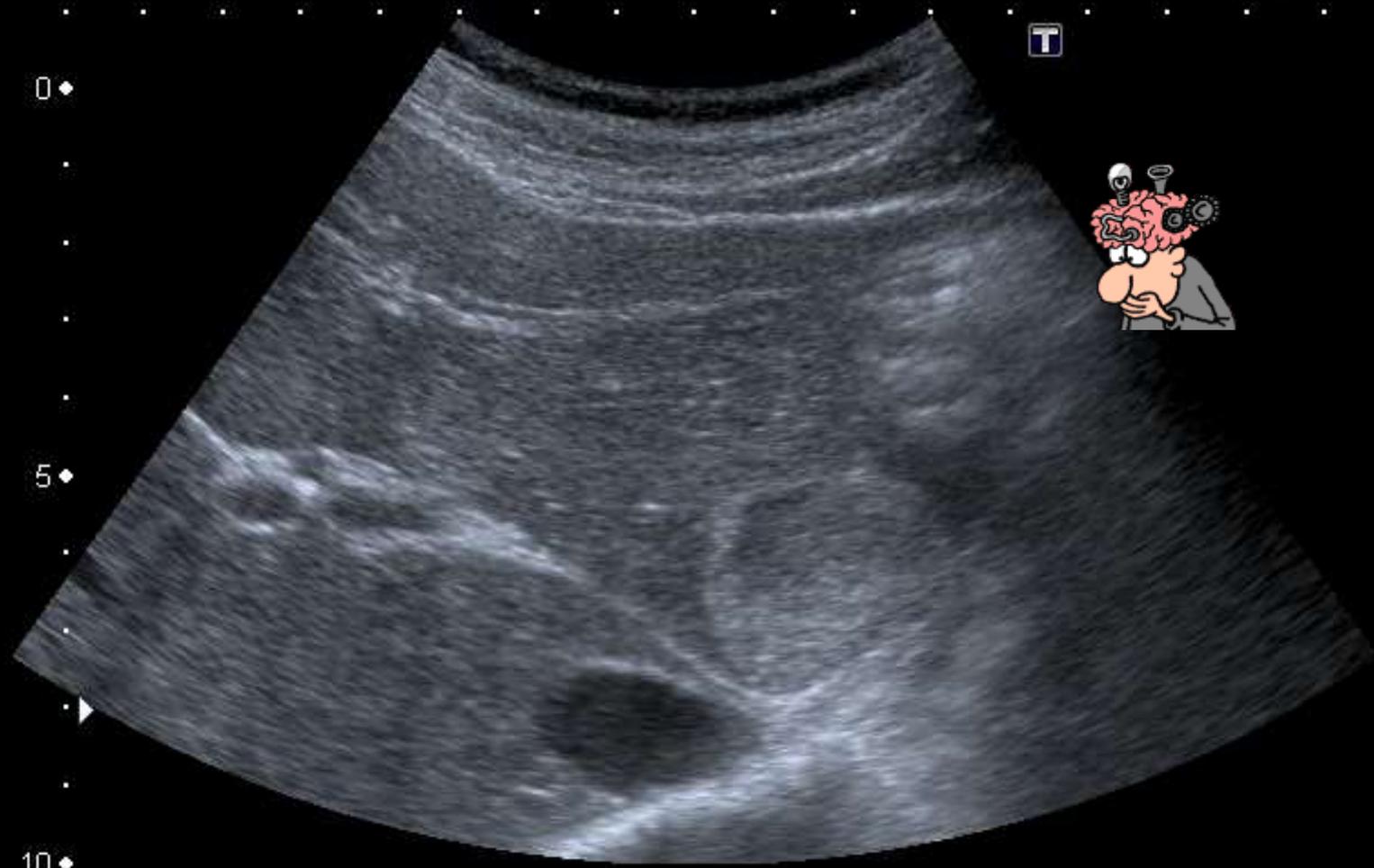
MI: (1.1)

Qscan

82

DR

65

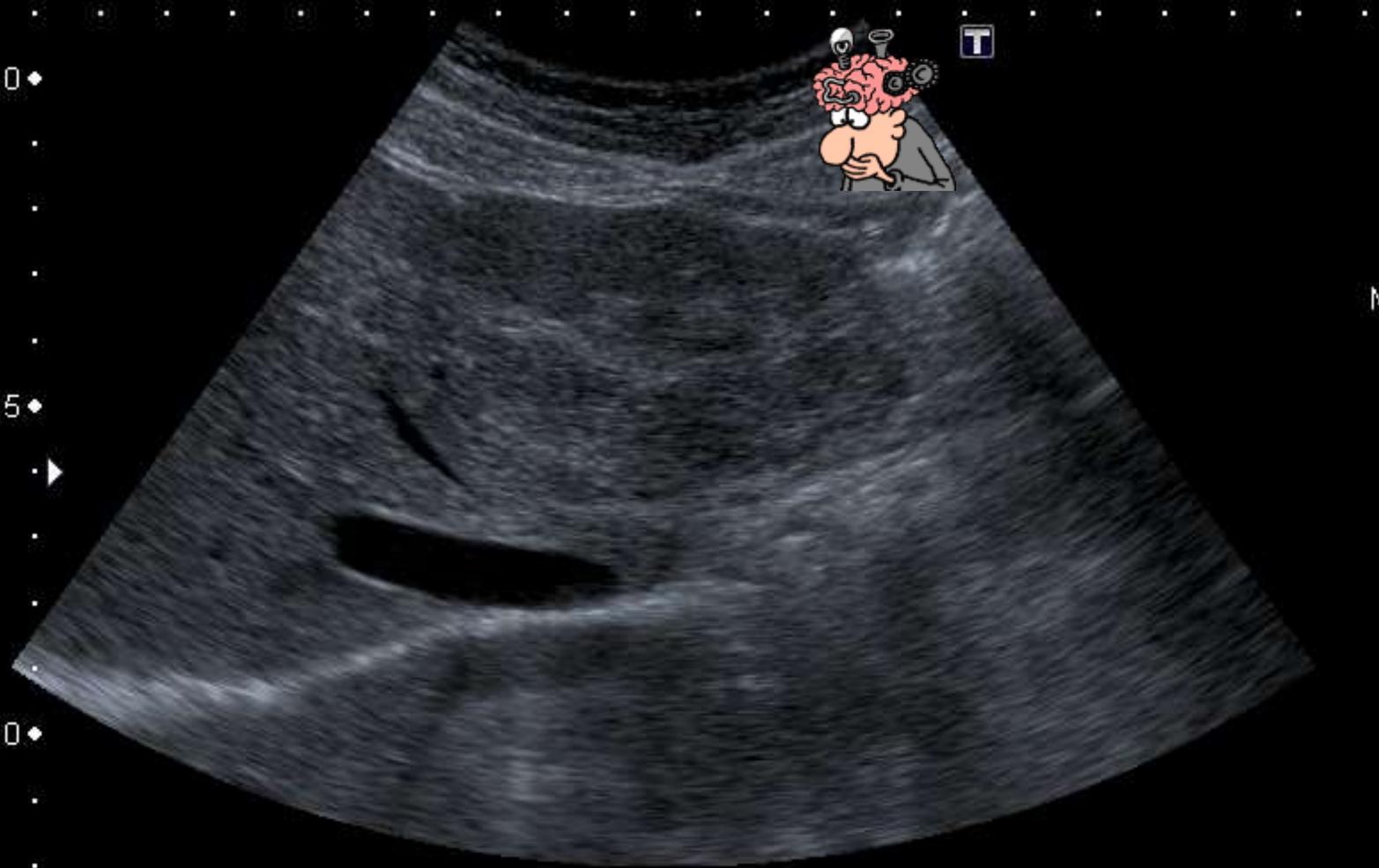




0

5

10



MI: (1.5)

Qscan

74

DR

65

6C1
diffT5.0

21 fps



0 ◆
5 ◆
10 ◆



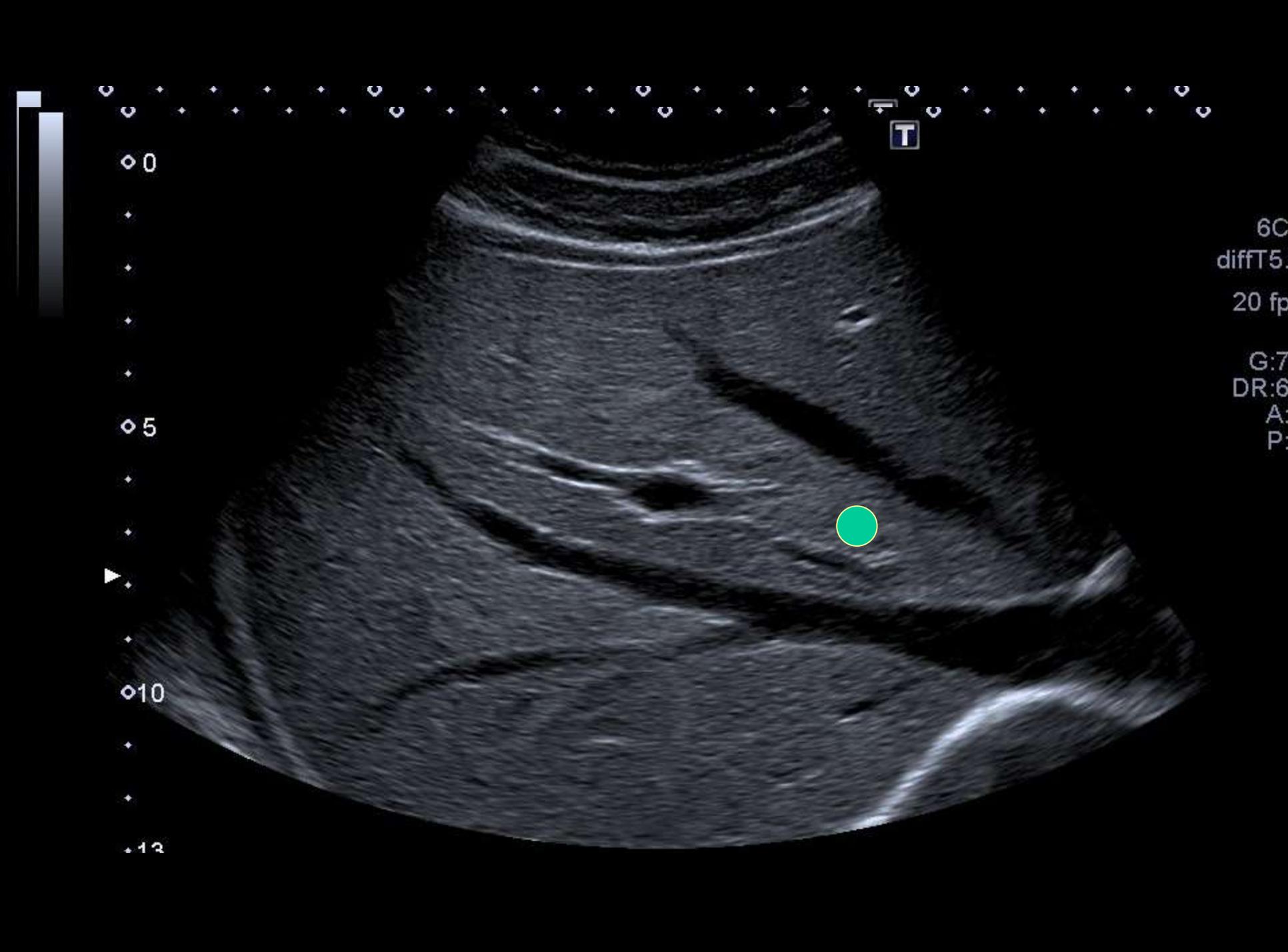
MI: 1.5
2DG
87
DR
65

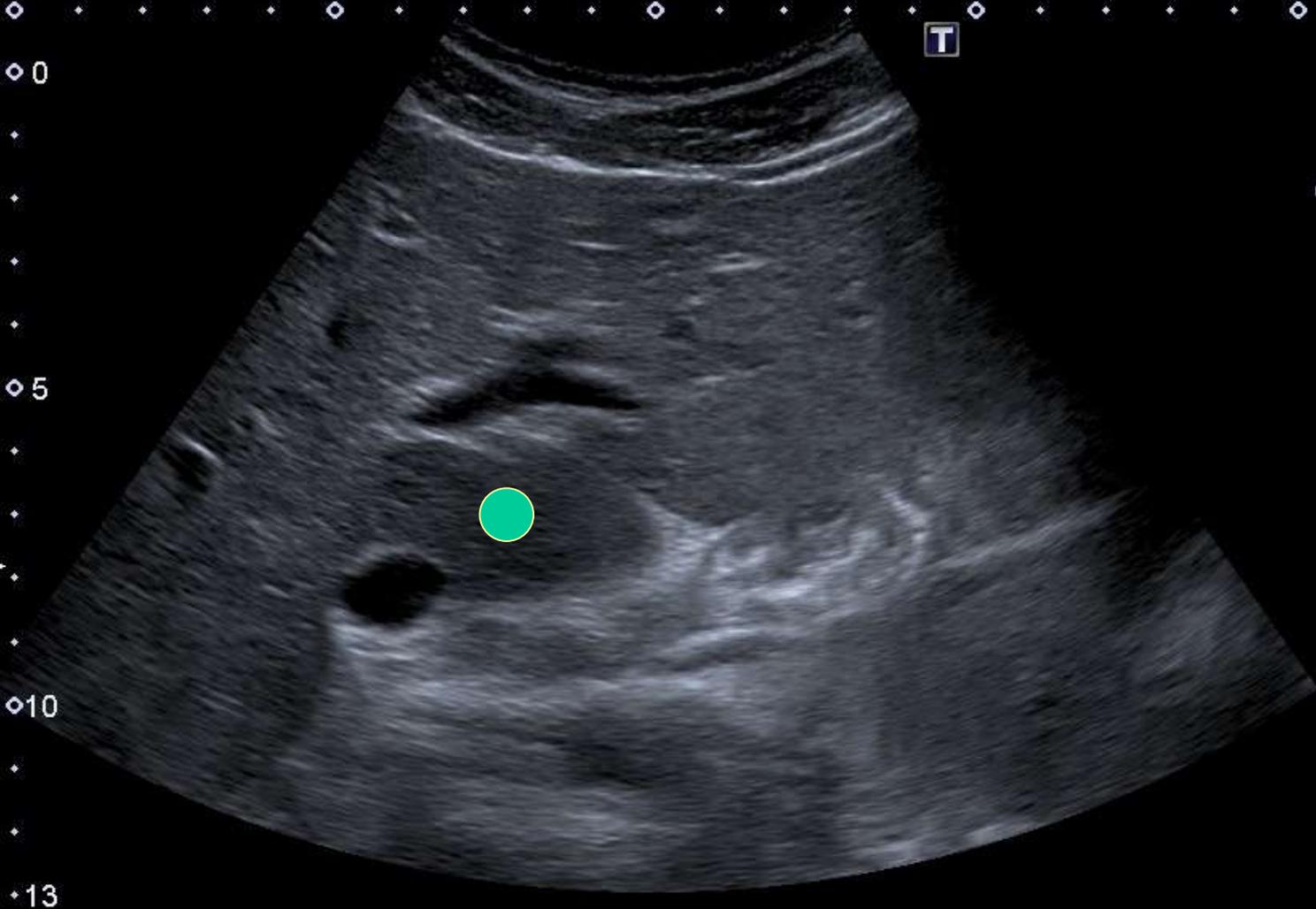
BC1
diffT5.0
17 fps

A 0 IP5

HDD: 59% Free







T

0

5

10

13

6C1
diffT5.0
20 fps

G:78
DR:60
A:2
P:3

T

0

5

10

13

6C1
diffT5.0

20 fps

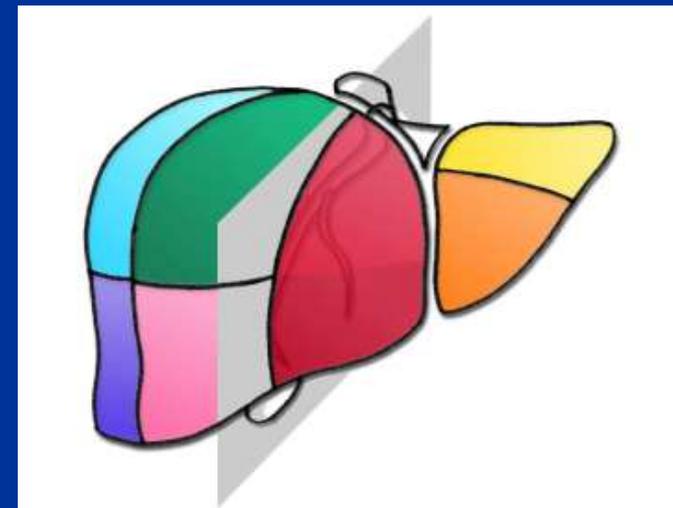
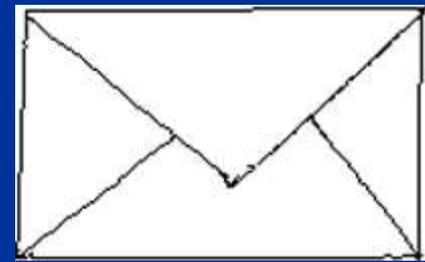
G:78
DR:60
A:2
P:3

357

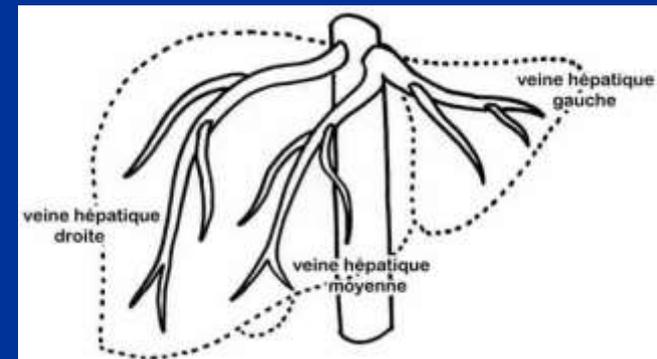
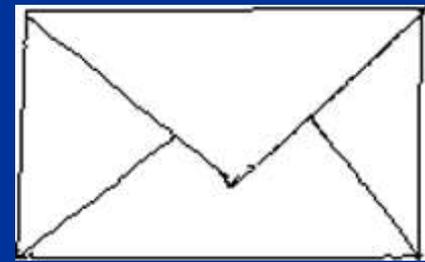


Couinaud

Foie droit	Secteur latéral droit	Segment VII
		Segment VI
	Secteur paramédian droit	Segment VIII
		Segment V
Foie gauche	Secteur paramédian gauche	Segment IV
		Segment III
	Secteur latéral gauche	Segment II
Lobe caudé		Segment I

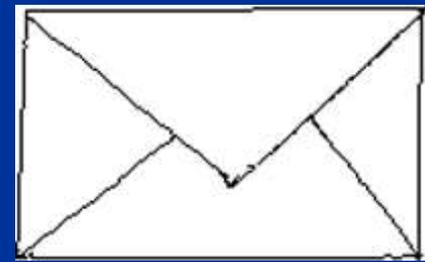


Couinaud		
Foie droit	Secteur latéral droit	Segment VII
		Segment VI
	Secteur paramédian droit	Segment VIII
		Segment V
Foie gauche	Secteur paramédian gauche	Segment IV
		Segment III
	Secteur latéral gauche	Segment II
Lobe caudé		Segment I



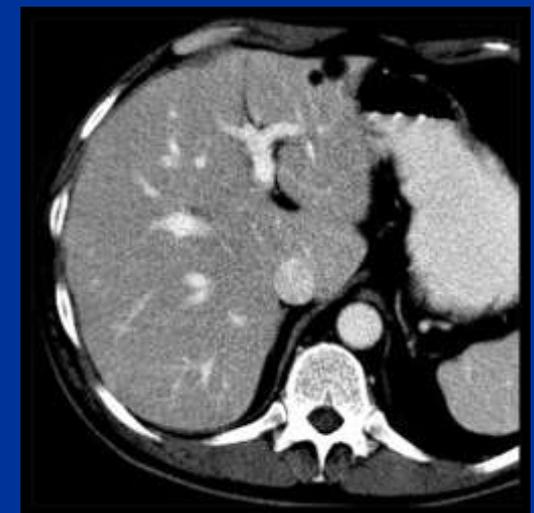
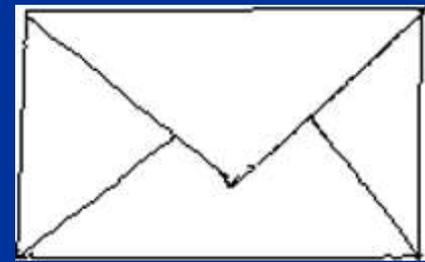
Couinaud

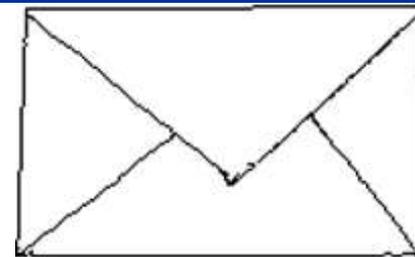
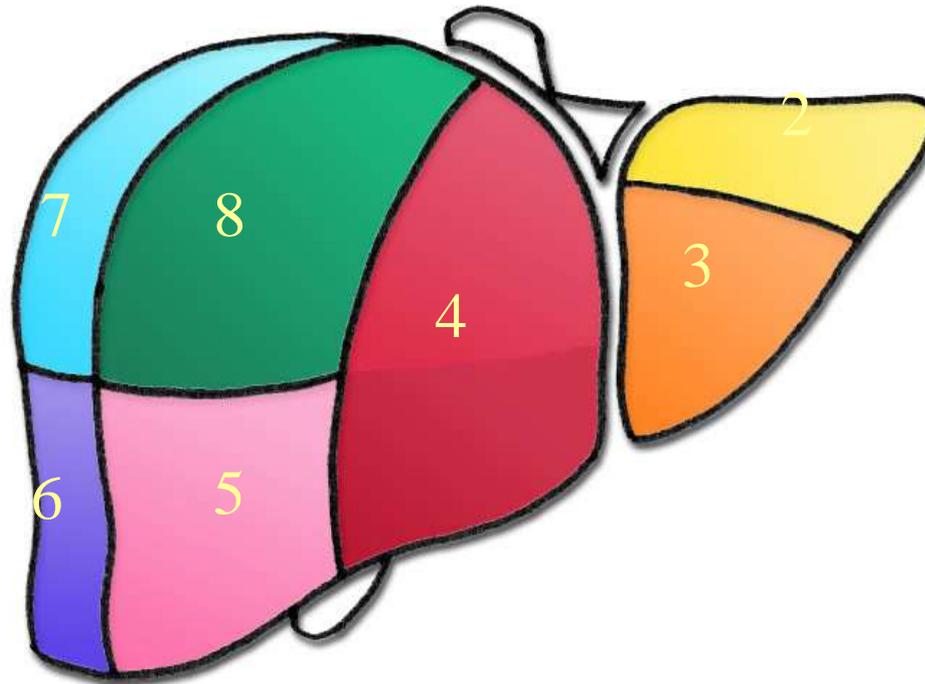
Foie droit	Secteur latéral droit	Segment VII
		Segment VI
	Secteur paramédian droit	Segment VIII
		Segment V
Foie gauche	Secteur paramédian gauche	Segment IV
		Segment III
	Secteur latéral gauche	Segment II
Lobe caudé		Segment I



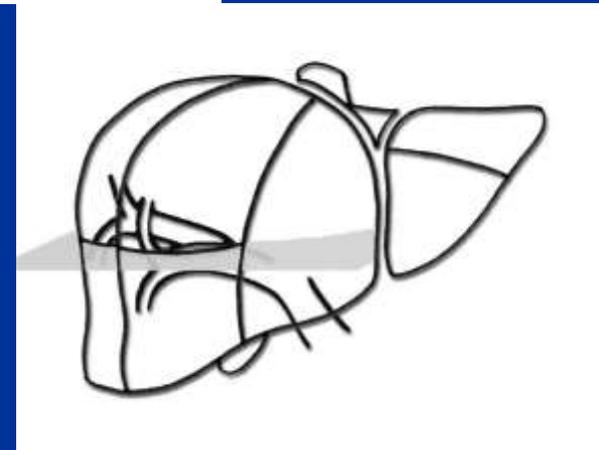
Couinaud

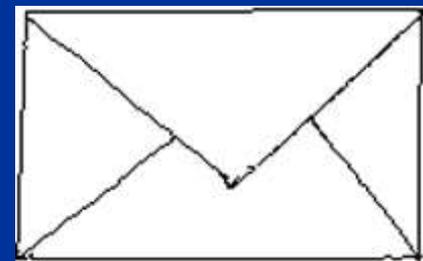
Foie droit	Secteur latéral droit	Segment VII
		Segment VI
	Secteur paramédian droit	Segment VIII
		Segment V
Foie gauche	Secteur paramédian gauche	Segment IV
		Segment III
	Secteur latéral gauche	Segment II
Lobe caudé		Segment I





	Secteur latéral gauche	Segment II
Lobe caudé		Segment I





Nomenclature française

Hépatectomie droite 5, 6, 7, 8

Hépatectomie droite élargie Lobectomie droite
4, 5, 6, 7, 8 ou 1, 5, 6, 7, 8

Hépatectomie droite super élargie 1, 4, 5, 6, 7, 8

Sectoriectomie postéro-latérale 6, 7

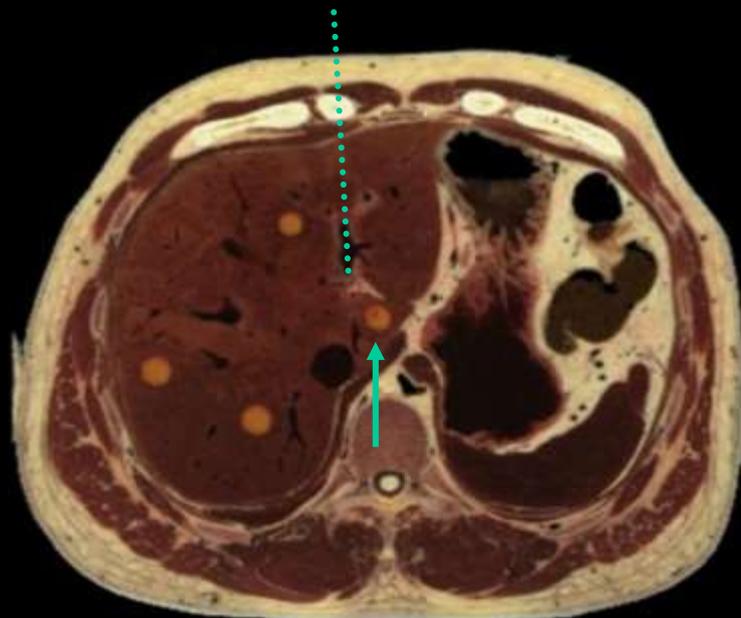
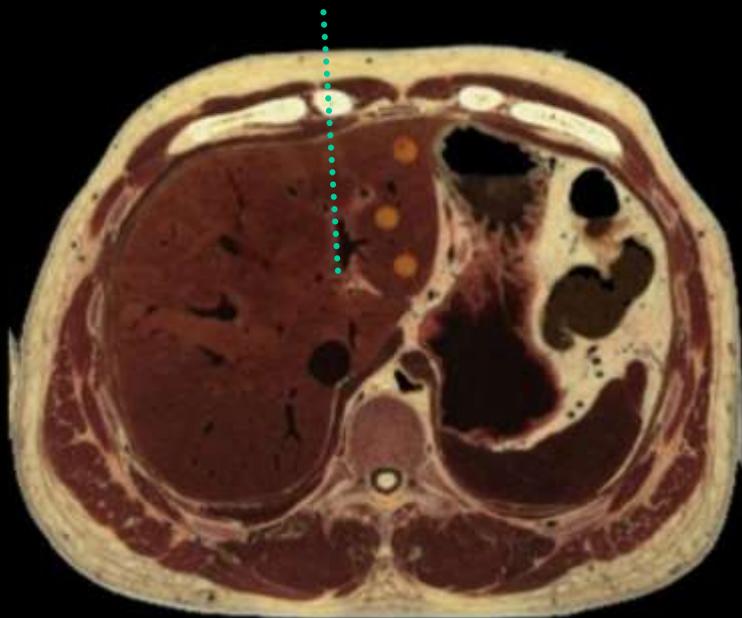
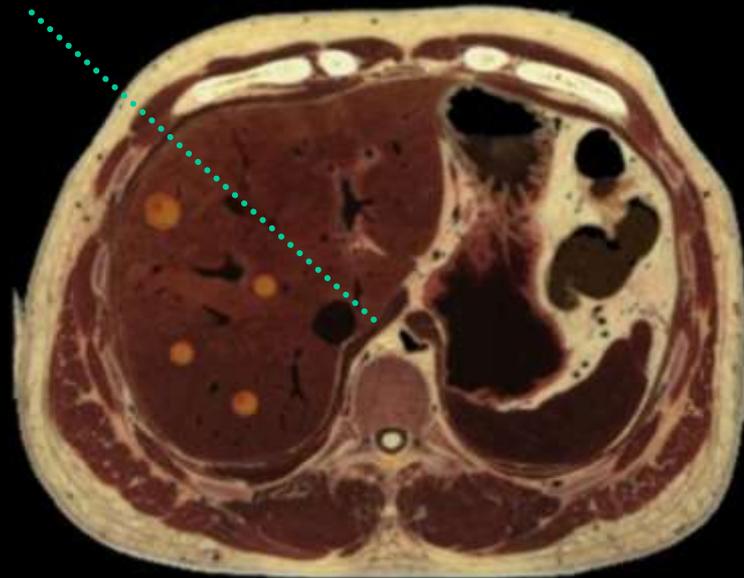
Hépatectomie gauche 2, 3, 4

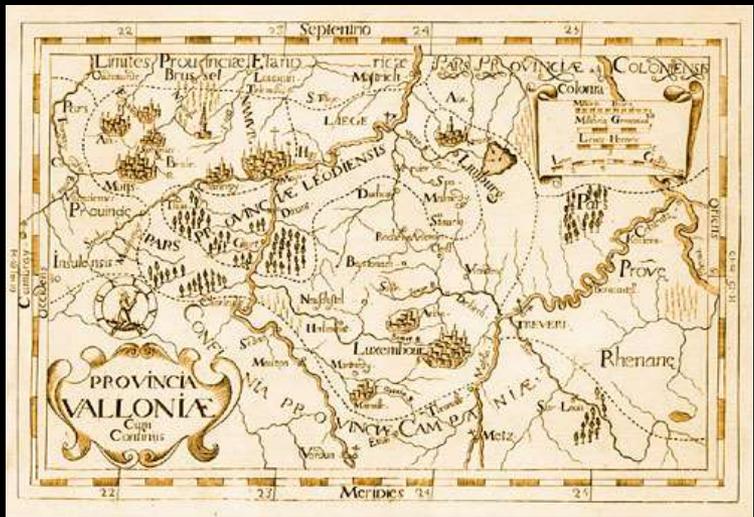
Hépatectomie gauche élargie
2, 3, 4, 5 ou 2, 3, 4, 8 ou 1, 2, 3, 4

Lobectomie gauche 2, 3

Segmentectomie

Sectoriectomie

















de l'imagerie dans la planification du geste opératoire



Objectifs

- Connaître la segmentation hépatique
- **Savoir reconnaître l'anatomie vasculaire modale**
- Savoir reconnaître un foie cirrhotique
- Connaître les implications du double apport vasculaire du foie
- Connaître l'anatomie cellulaire!

Anatomie vasculaire artérielle modale?



Anatomie vasculaire artérielle modale = Artère Hépatique moyenne isolée (75%)



Tronc coeliaque

Artère hépatique
commune

Artère
Gastroduodénale

Artère hépatique
propre

Branche Gauche de
l'artère hépatique

Branche Droite de
l'artère hépatique

Anatomie vasculaire artérielle non modale

Artère Gastrique
Gauche

Artère Hépatique
Gauche

Tronc Coeliaque

Artère Hépatique
Moyenne

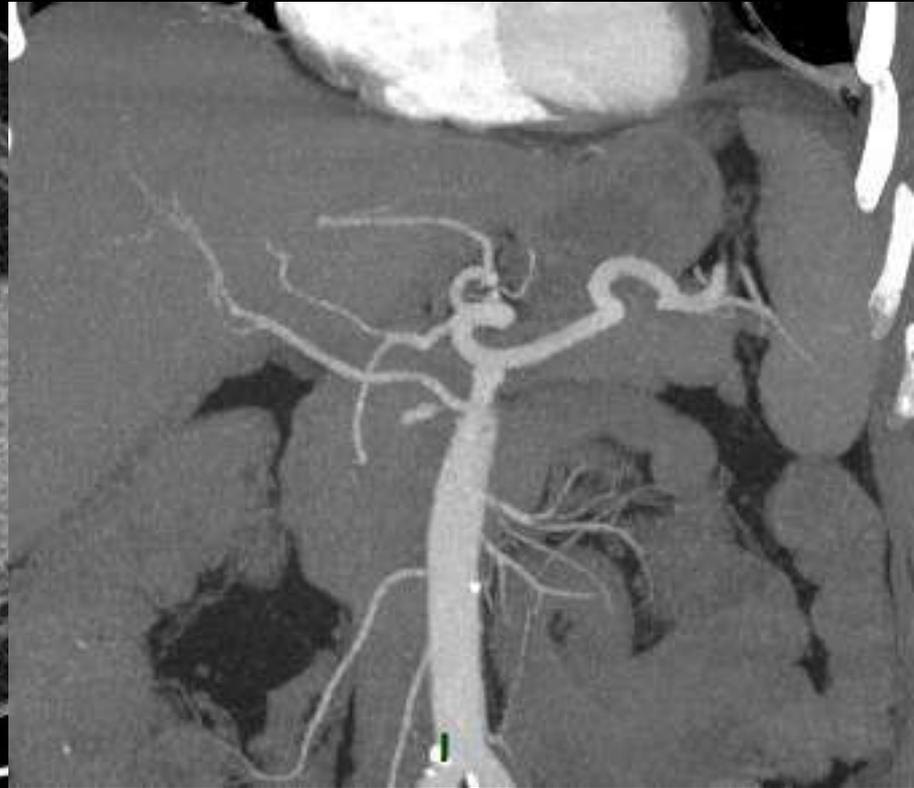
Artère
Mésentérique Sup

Artère Hépatique
Droite

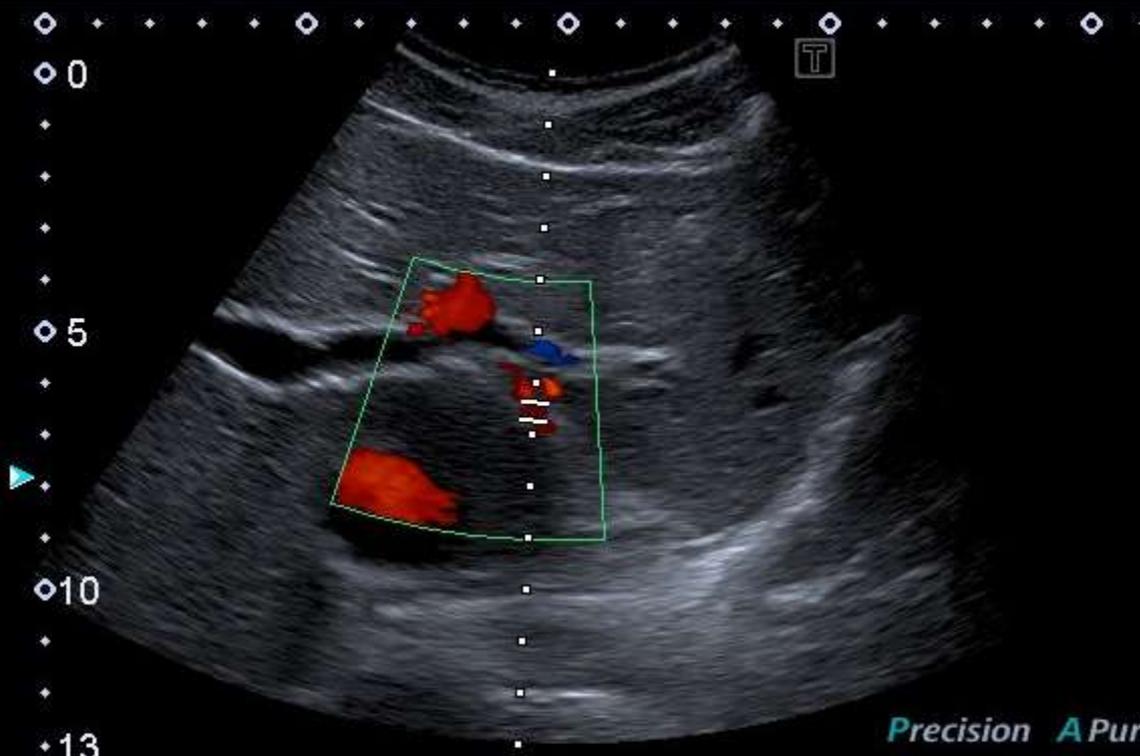
Anatomie vasculaire artérielle non modale

Artère Gastrique
Gauche

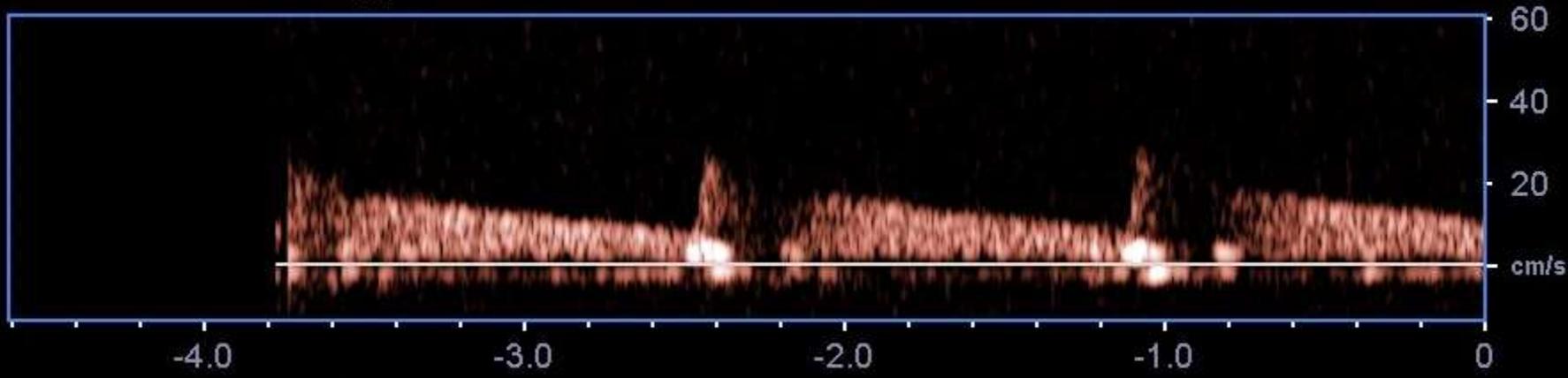
Artère Hépatique
Gauche



98



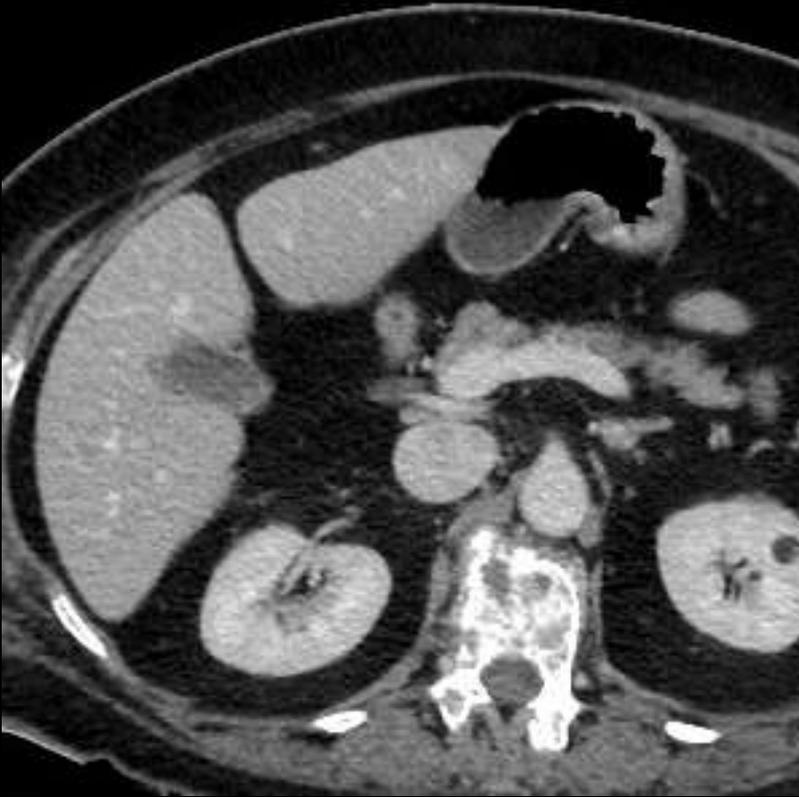
17.1
6C1
diffT5.0
14 fps
G:78
DR:60
CF 2.2
CG:35
5.9k
F:3
3.0
0°
6.5cm



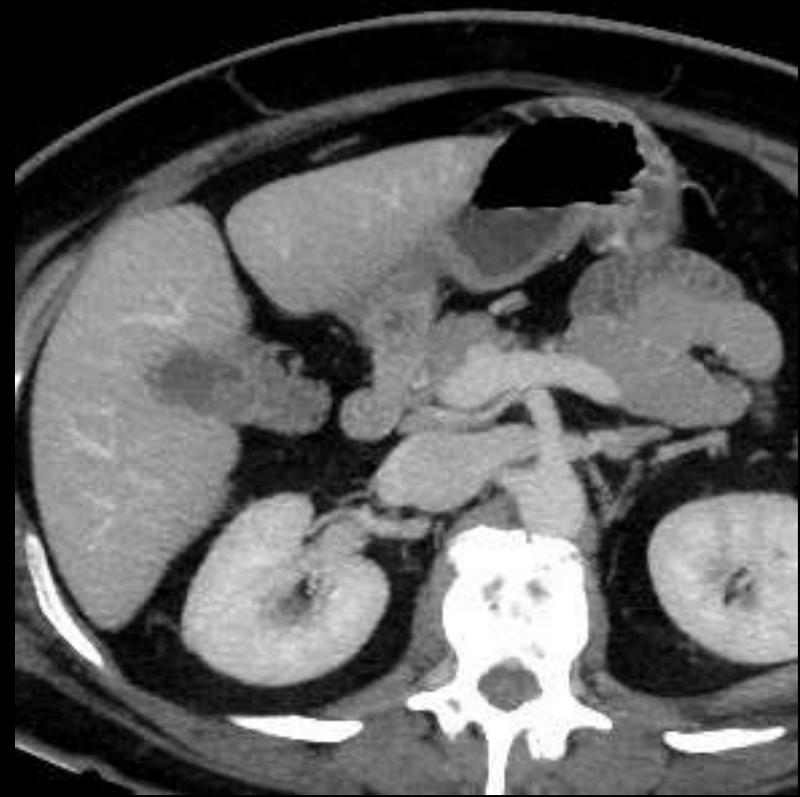
DG:28 / 2.2k / F:68

B 0
C 0

Anatomie vasculaire artérielle non modale



Artère
Mésentérique Sup



Artère Hépatique
Droite

Anatomie vasculaire artérielle non modale

Artère Gastrique
Gauche

Artère Hépatique
Gauche

Tronc Coeliaque

Artère Hépatique
Moyenne

Artère
Mésentérique Sup

Artère Hépatique
Droite

10%

Anatomie vasculaire artérielle non modale

Artère Gastrique
Gauche

Artère Hépatique
Gauche

Tronc Coeliaque

Artère Hépatique
Moyenne

Artère
Mésentérique Sup

Artère Hépatique
Droite

10%

Anatomie vasculaire artérielle non modale

Artère Gastrique
Gauche

Tronc Coeliaque

Artère
Mésentérique Sup



Anatomie vasculaire artérielle non modale

Artère Gastrique
Gauche

Artère Hépatique
Gauche

<1%



Anatomie vasculaire artérielle non modale

Artère
Mésentérique Sup

Artère Hépatique
Droite

3%

Quel impact en pratique clinique?





Attention aux pièges?

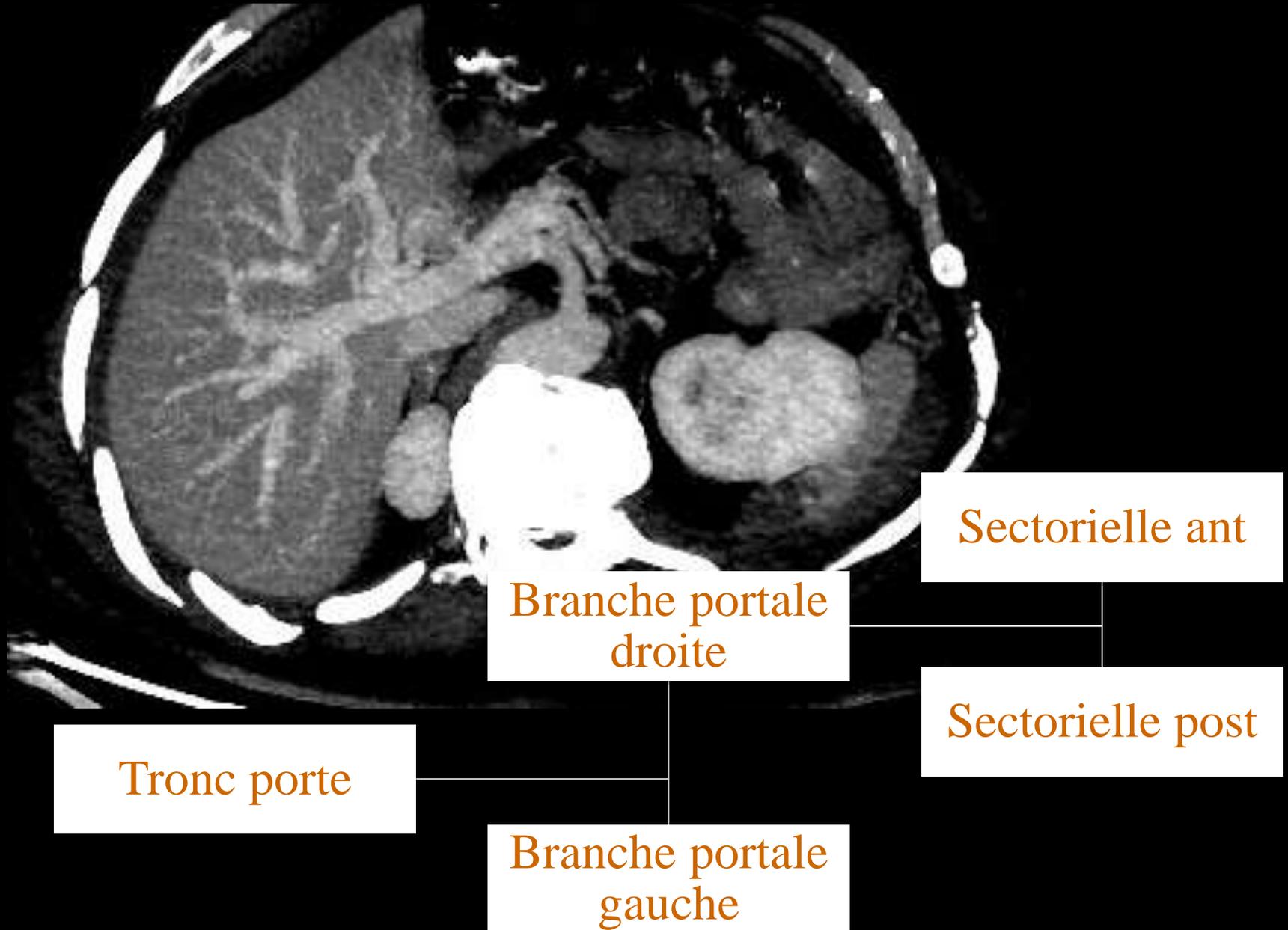




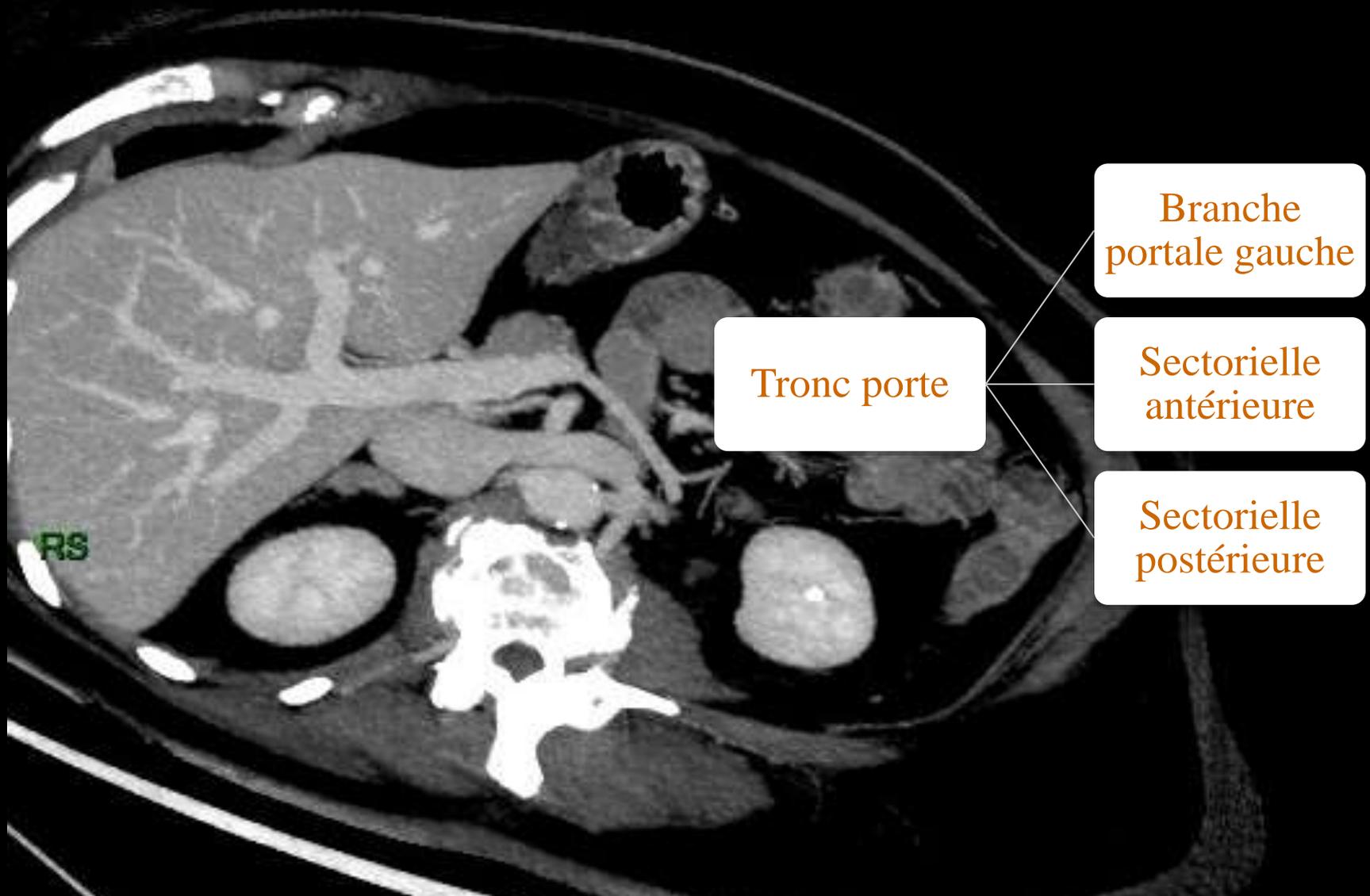
Anatomie vasculaire Portale modale ?



Anatomie vasculaire Portale modale (80%)

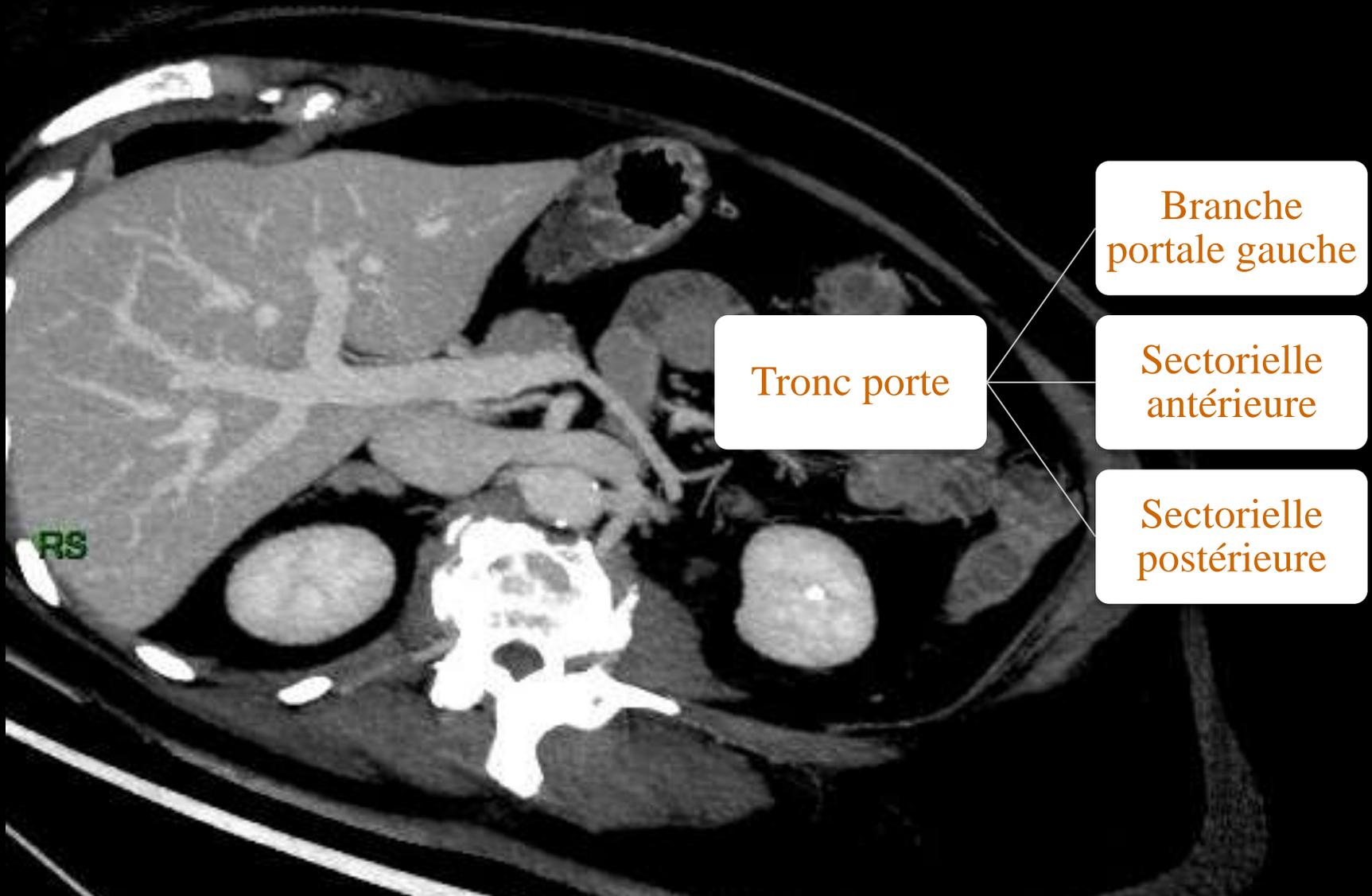


Anatomie vasculaire Portale modale?

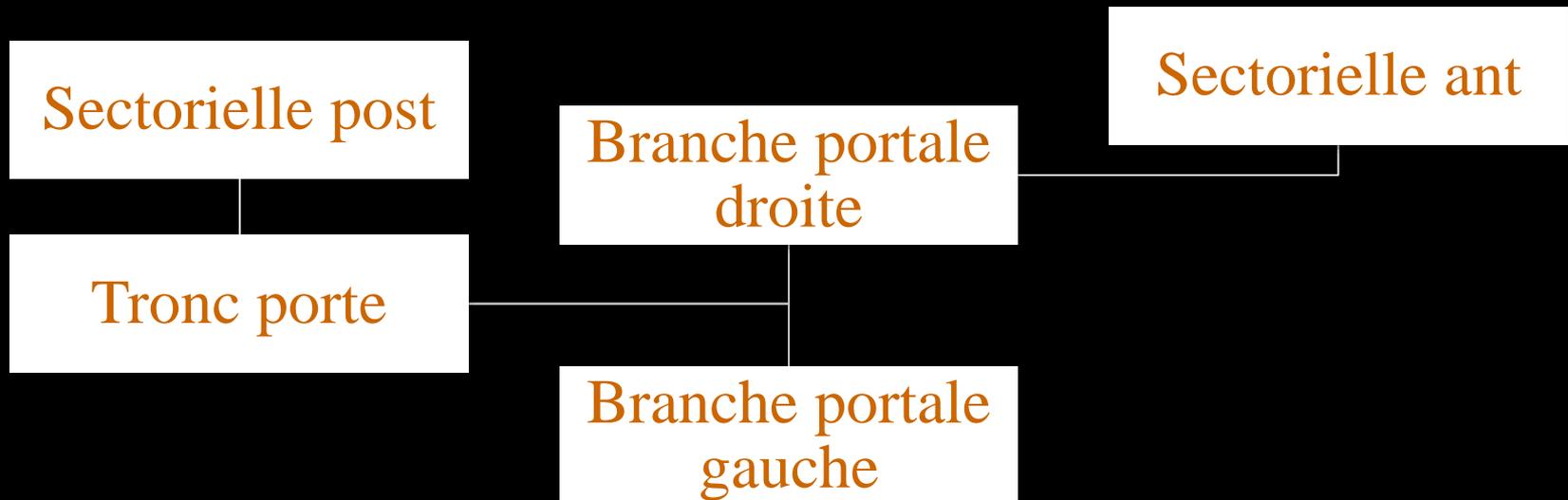


Anatomie vasculaire Portale non modale

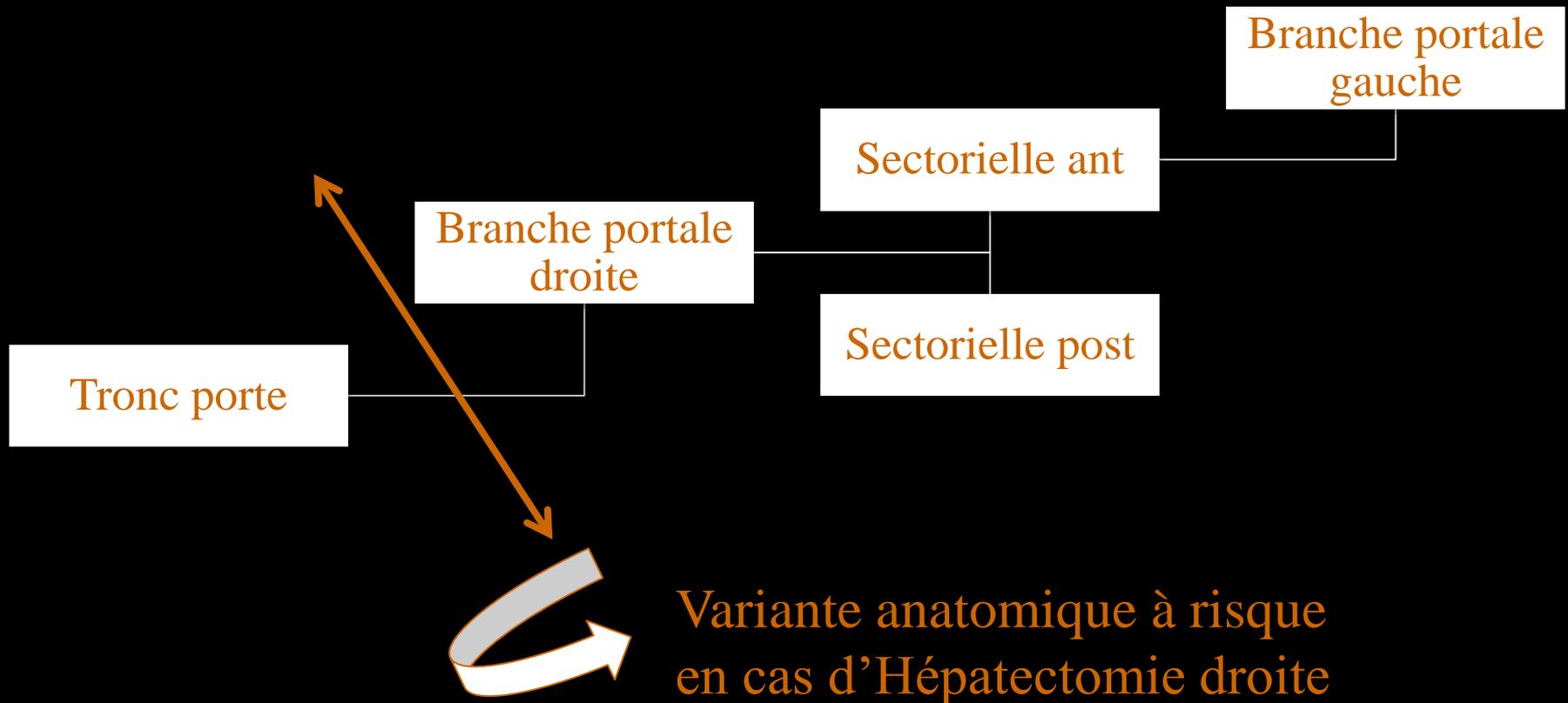
Trifurcation (10%)



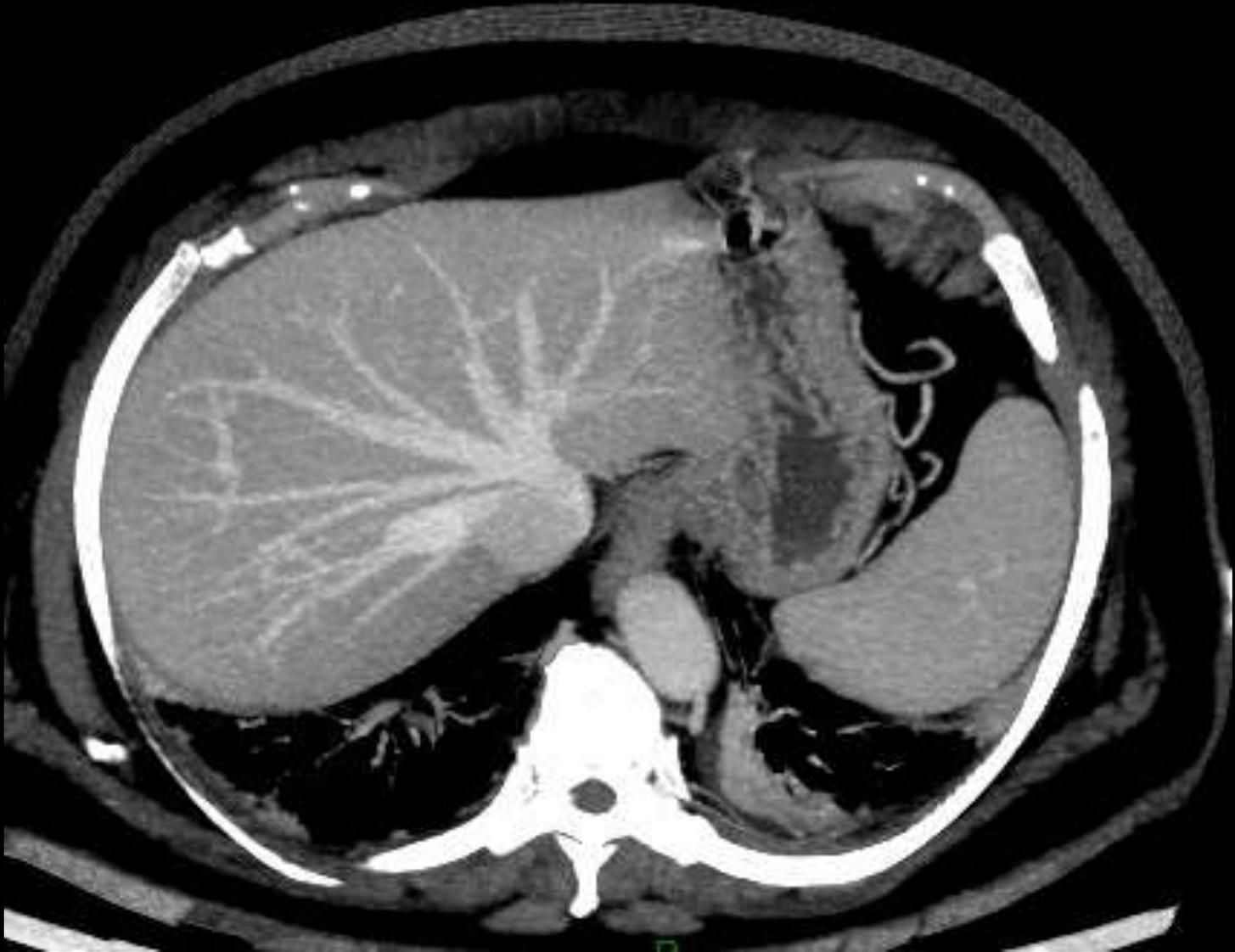
Anatomie vasculaire Portale non modale (5%)



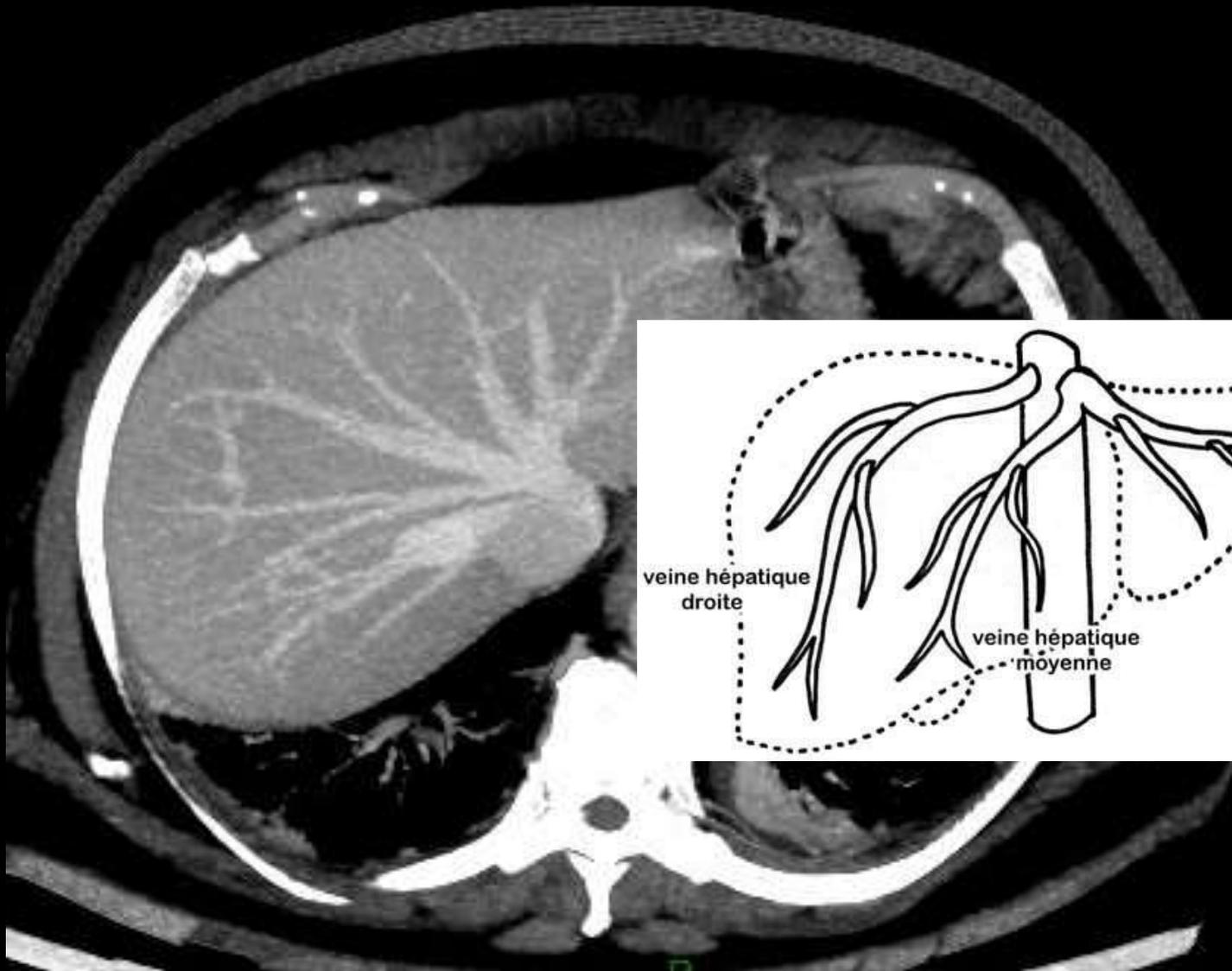
Anatomie vasculaire Portale non modale (2%)



Anatomie vasculaire Veineuse modale?



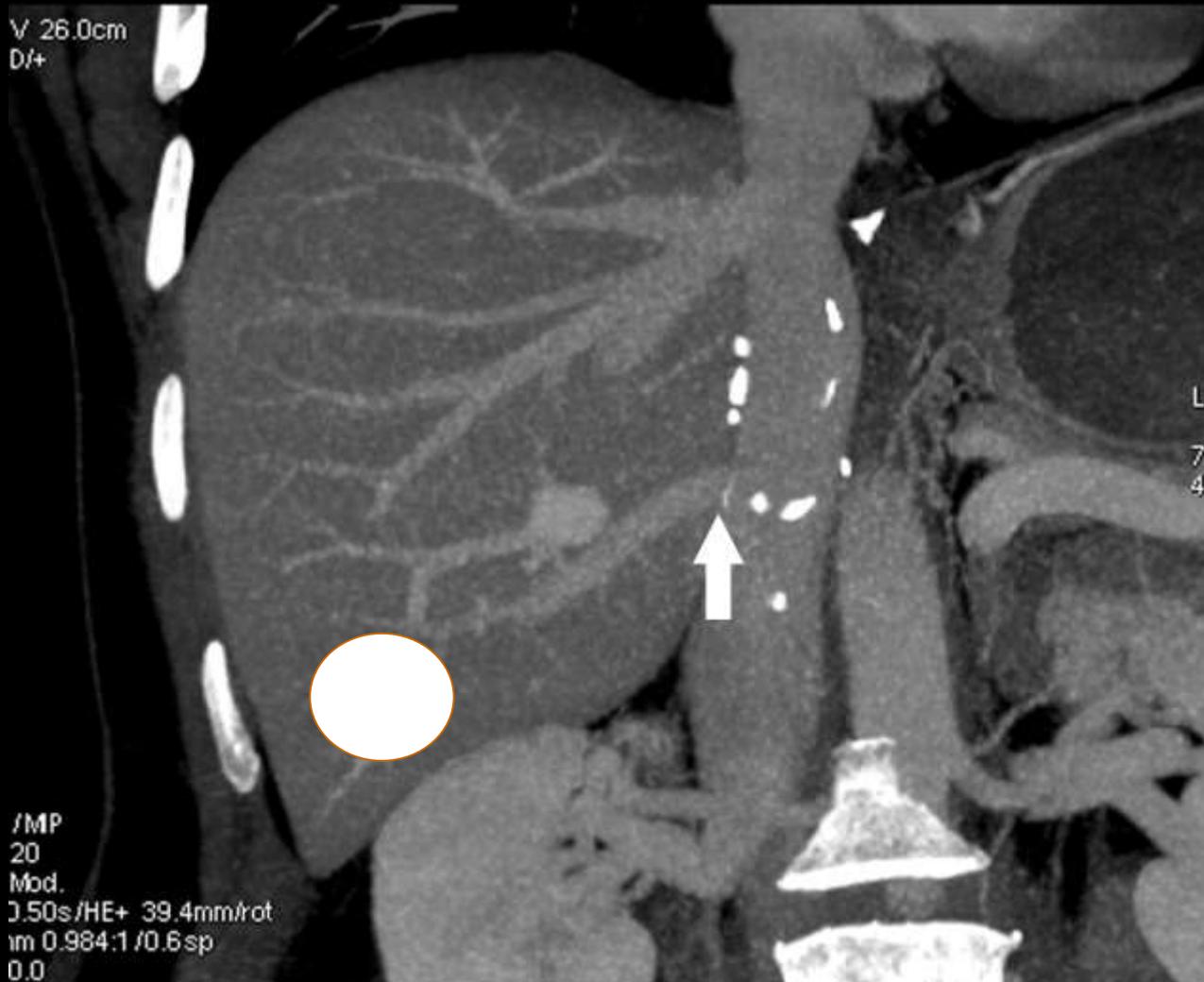
Anatomie vasculaire Veineuse modale



Variante: Pas de Tronc commun entre les VM et VG dans 15% des cas

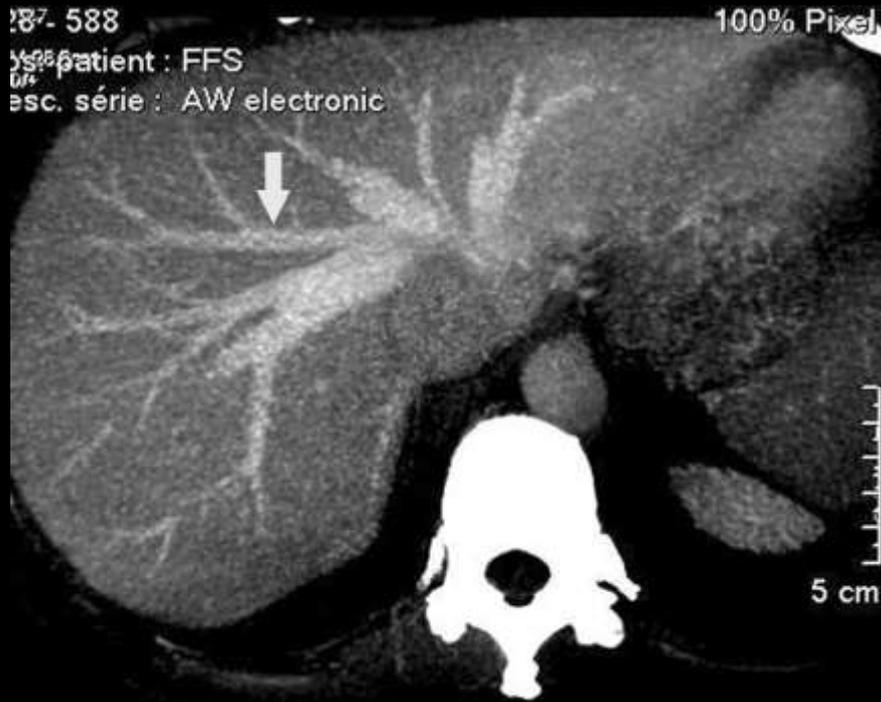
Anatomie vasculaire Veineuse non modale

Veine accessoire du 6 (20%)



Anatomie vasculaire Veineuse non modale

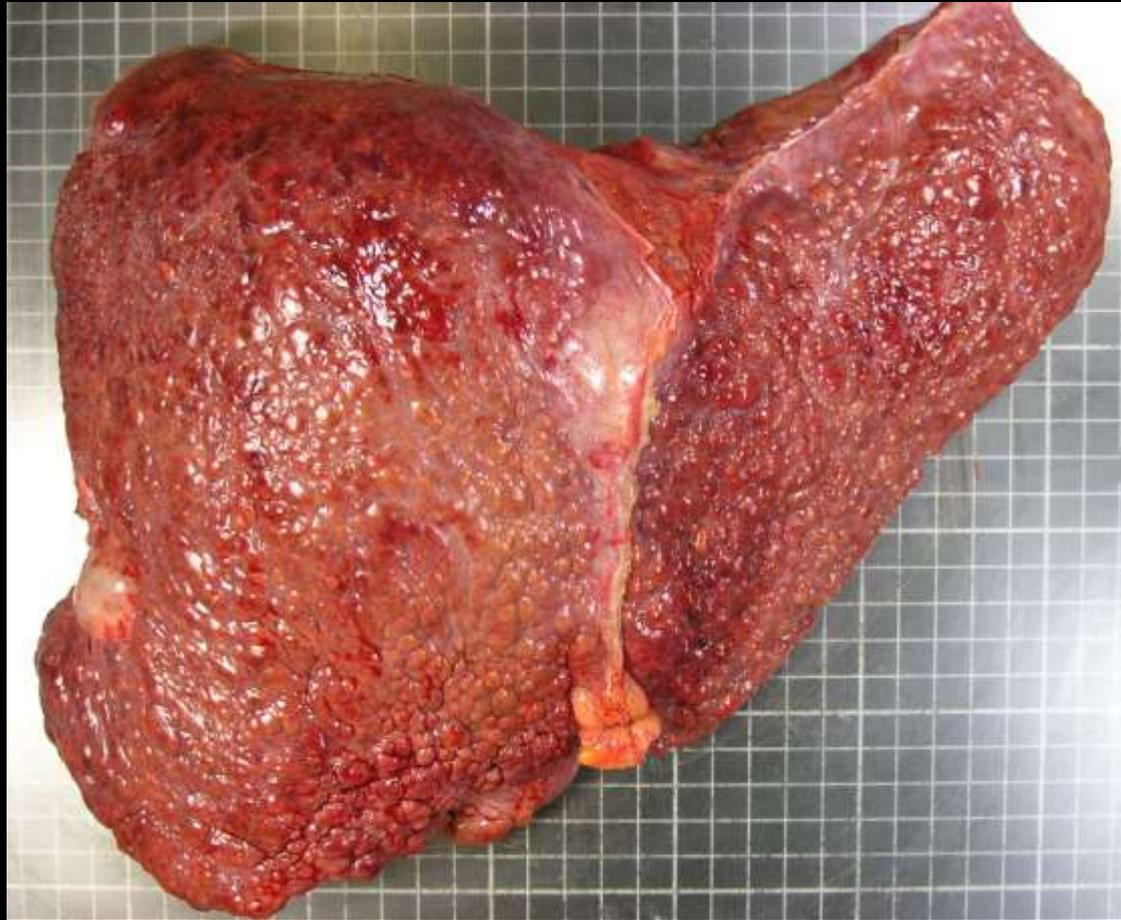
Veine accessoire du 8

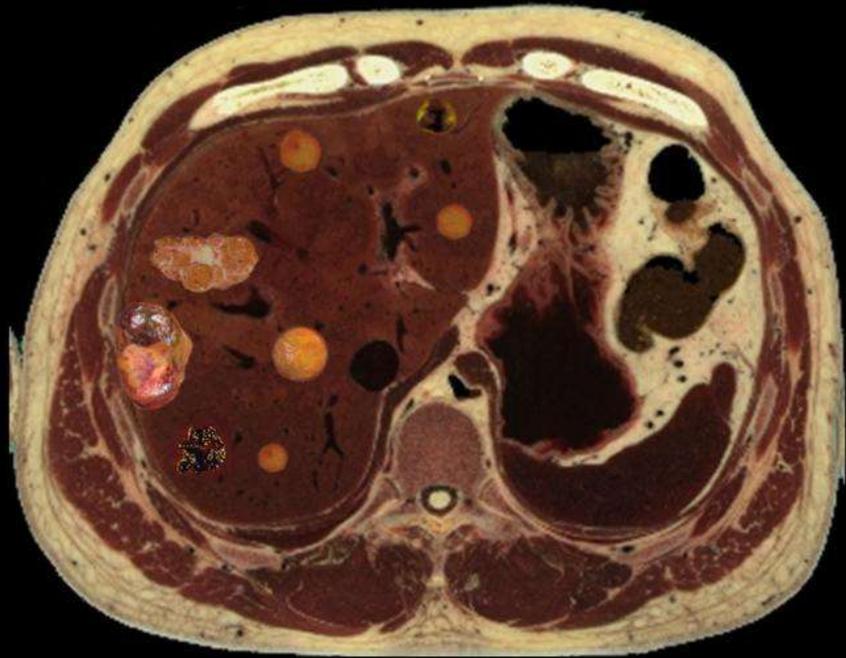


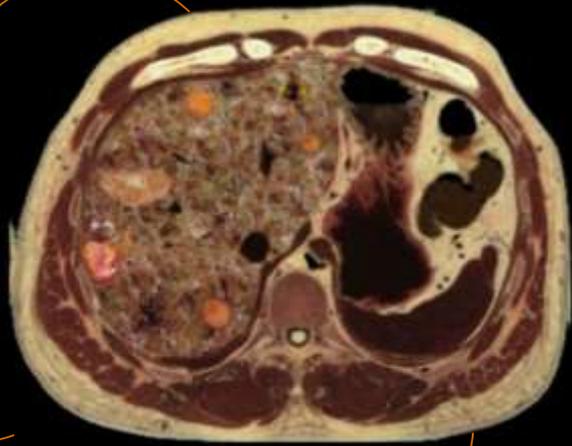
Objectifs

- Connaître la segmentation hépatique
- Savoir reconnaître l'anatomie vasculaire modale
- **Savoir reconnaître un foie cirrhotique**
- Connaître les implications du double apport vasculaire du foie
- Connaître l'anatomie cellulaire!

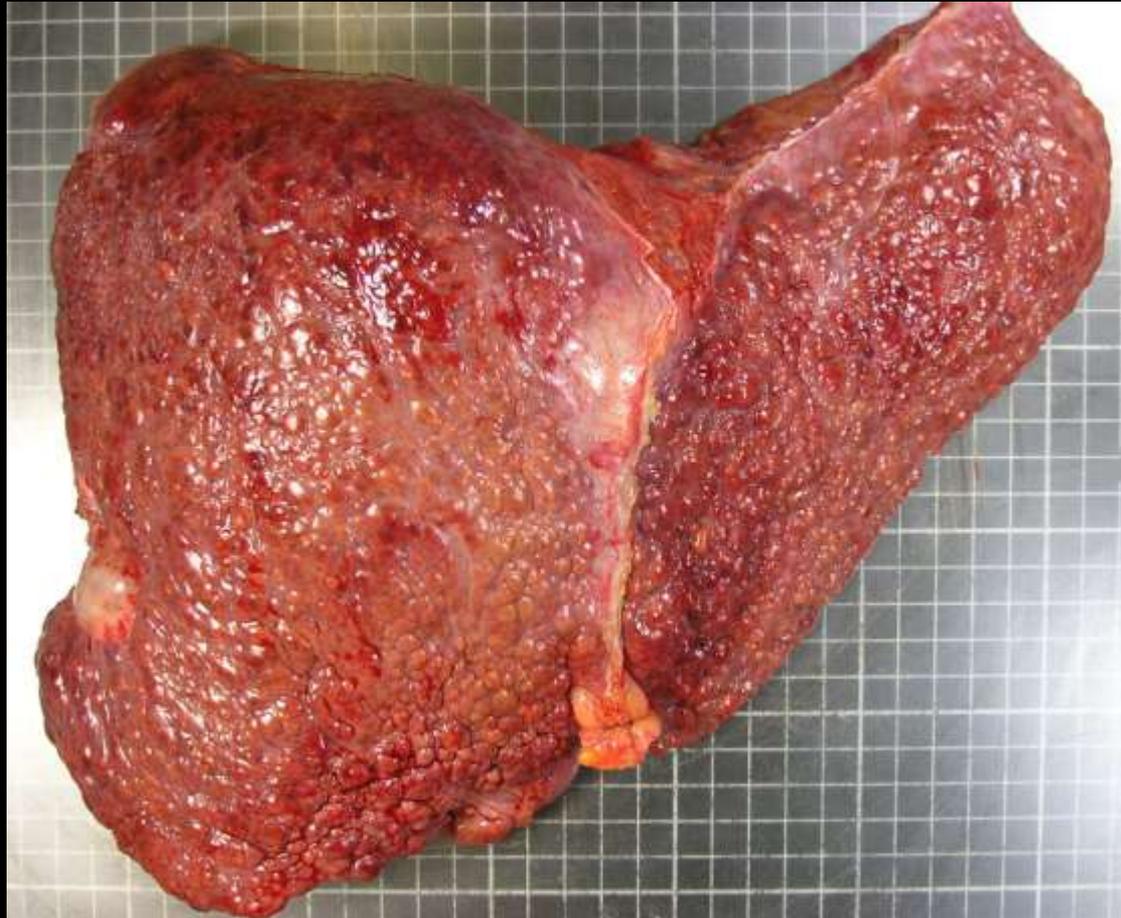
Savoir reconnaître un foie cirrhotique



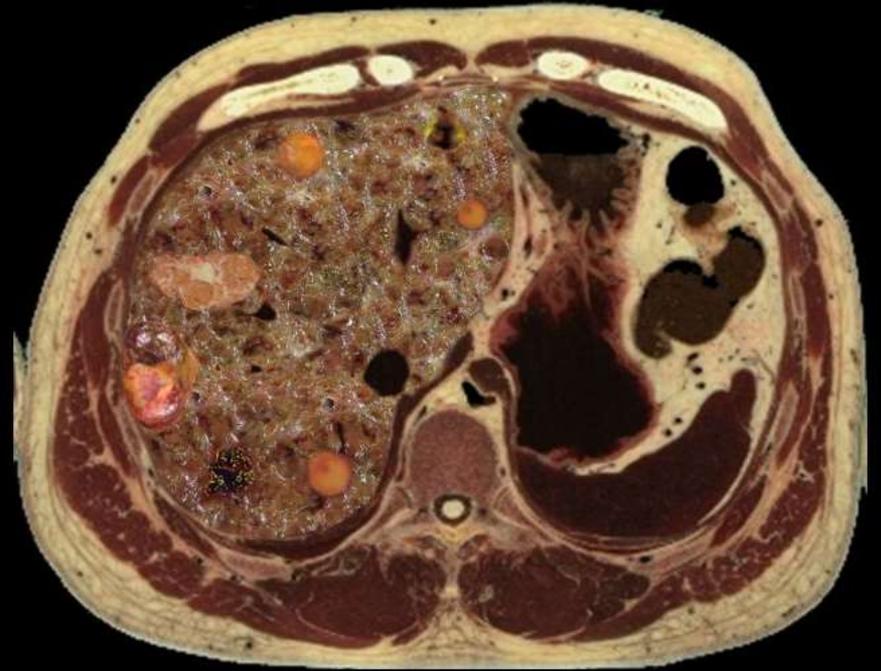




Gamme cirrhose et nodule

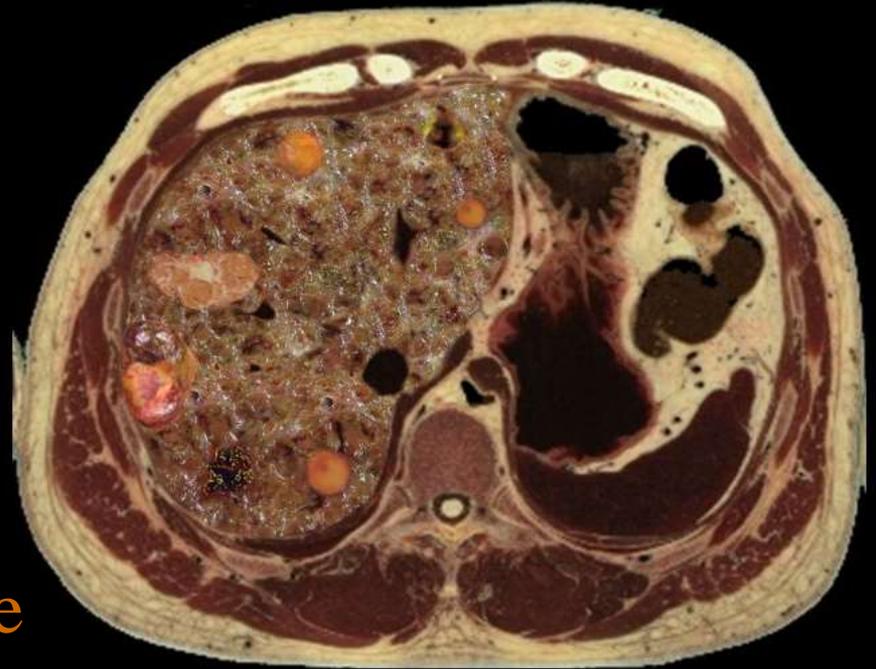


Gamme cirrhose et nodule

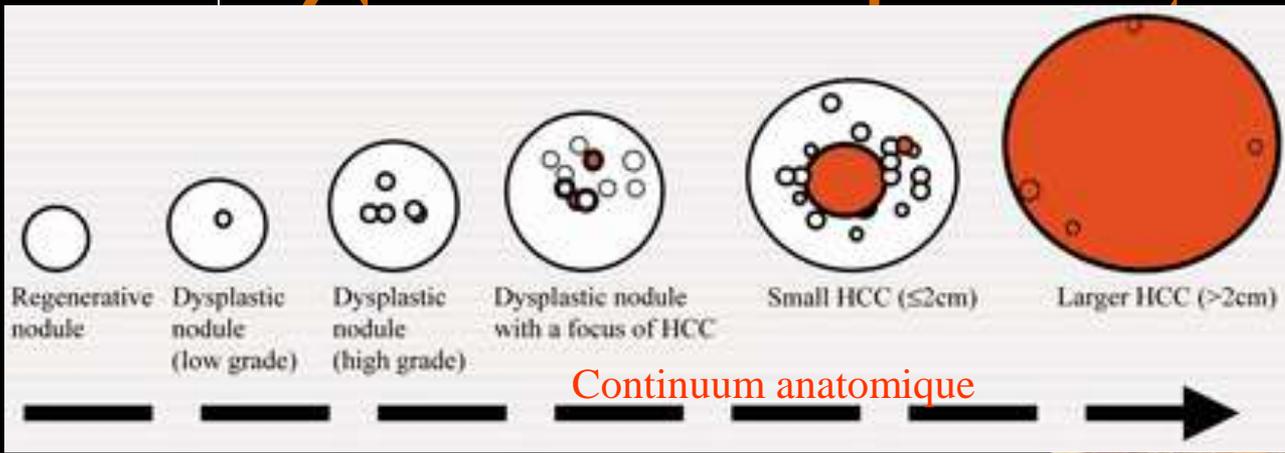


Gamme cirrhose et nodule

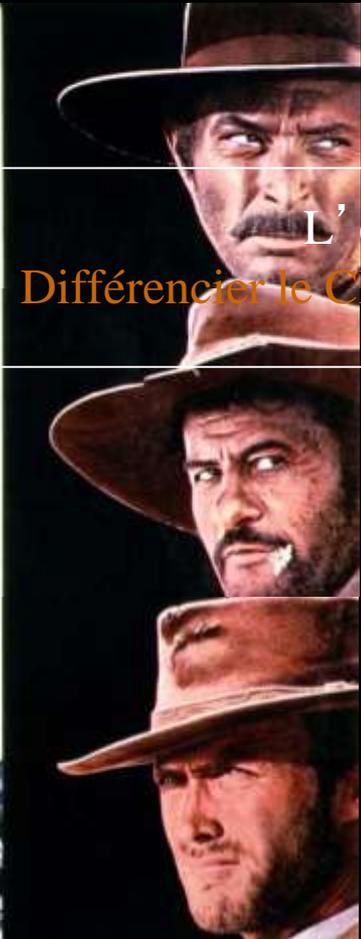
- Nodule de régénération
- Nodule dysplasique
- Carcinome hépatocellulaire



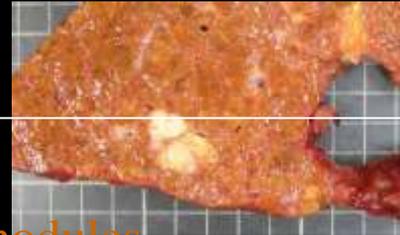
Carcinoma 1 Nodule

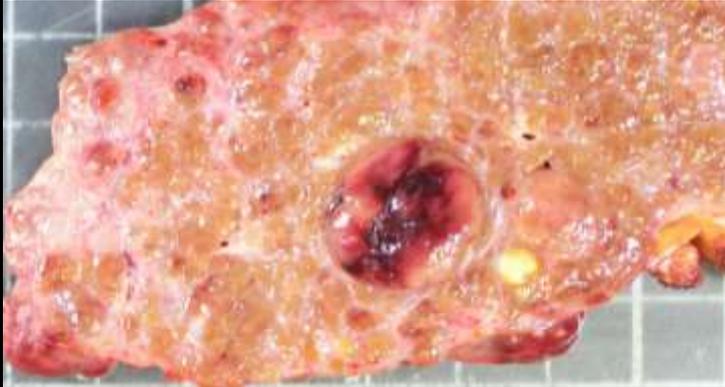


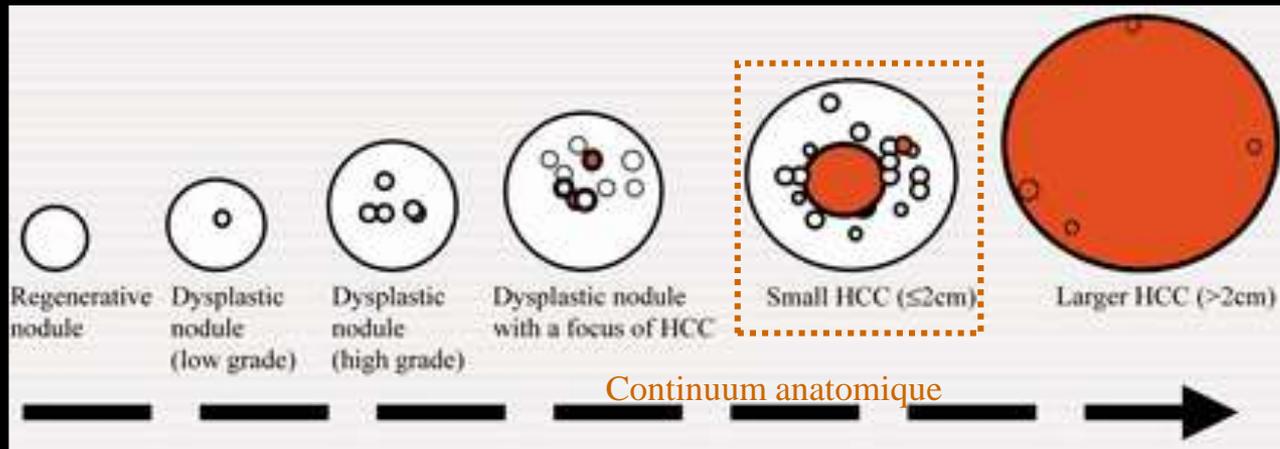
- 
- Nodule de régénération
 - Nodule dysplasique
 - Carcinome hépatocellulaire



L'objectif :
Différencier le **CHC** des autres nodules





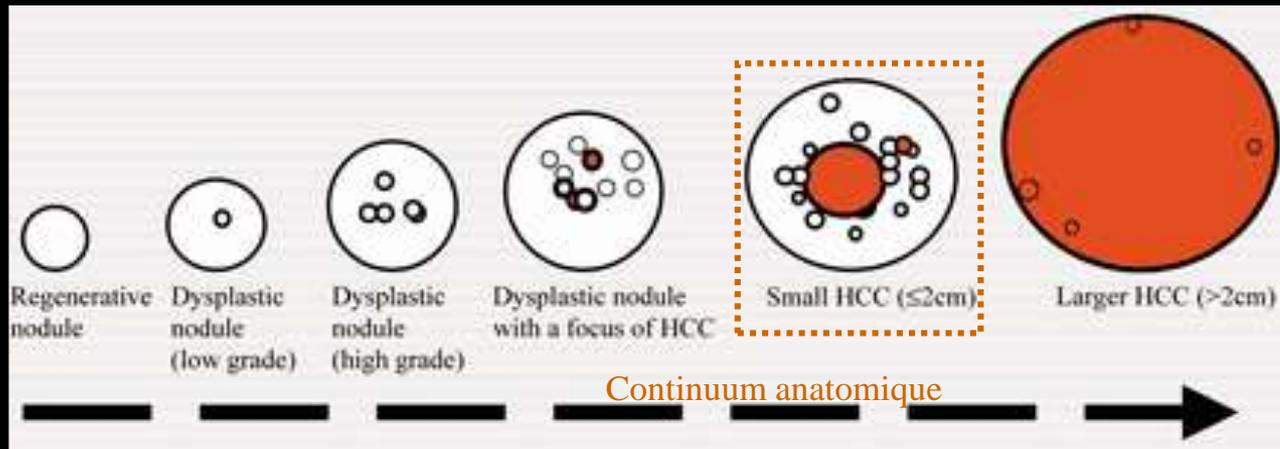


- Taille
- Hyper-intensité T2
- Artérialisation du nodule
- Perte de l'apport portal



Ces transitions s'accompagnent d'une augmentation:

- de la taille
- de la cellularité
- de la néoangiogenèse de ces différents nodules



- Taille

- Hyper-intensité T2

- Artérialisation du nodule

= Wash-in

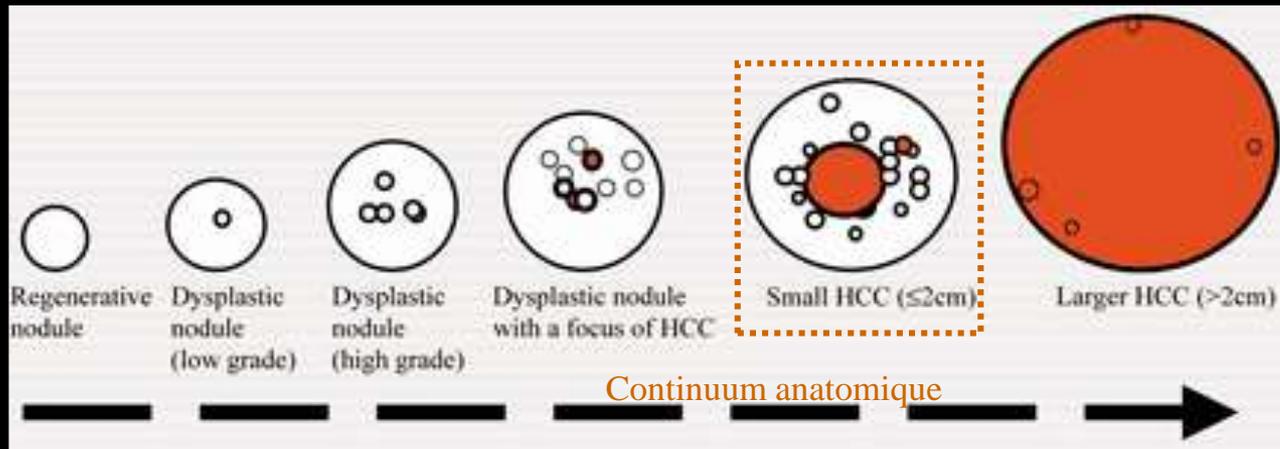
- Perte de l'apport portal

= Wash-out

Profil vasculaire
typique

Ces transitions s'accompagnent d'une augmentation:

- de la taille
- de la cellularité
- de la néoangiogenèse de ces différents nodules



- Taille

- Hyper-intensité T2

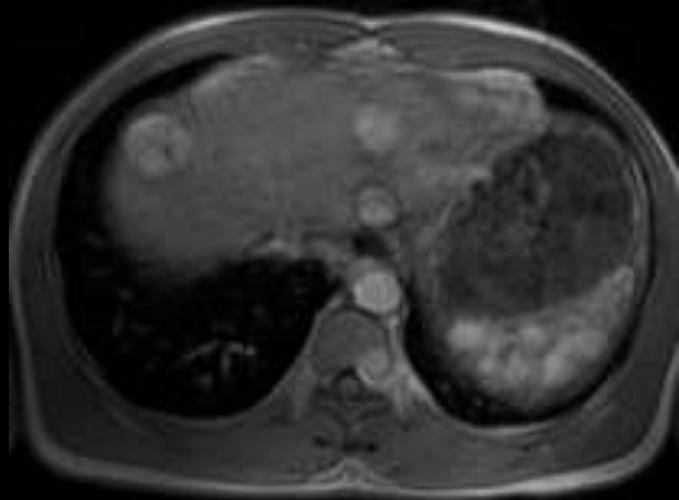
- Artérialisation du nodule

= Wash-in

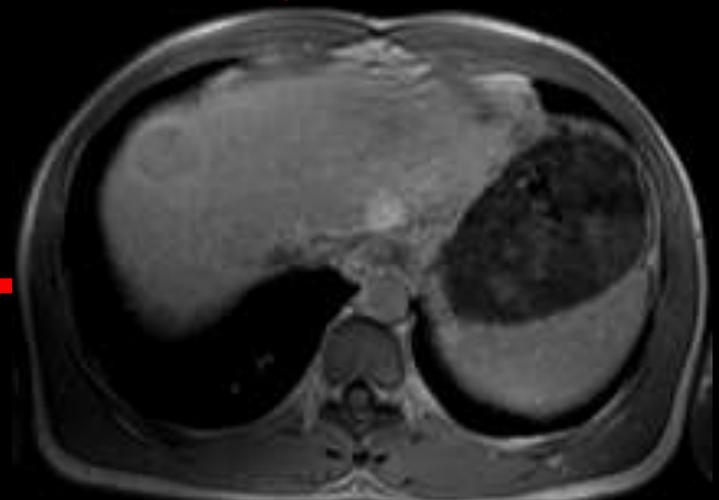
- Perte de l'apport portal

= Wash-out

Profil vasculaire typique

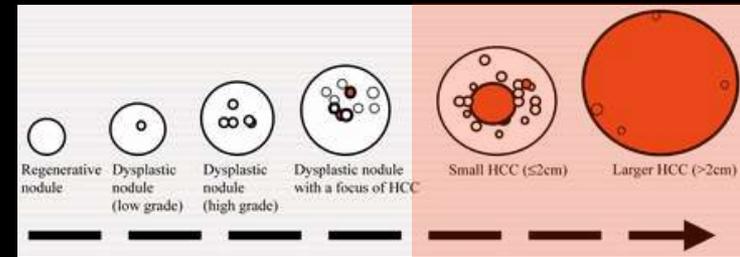


Wash-in

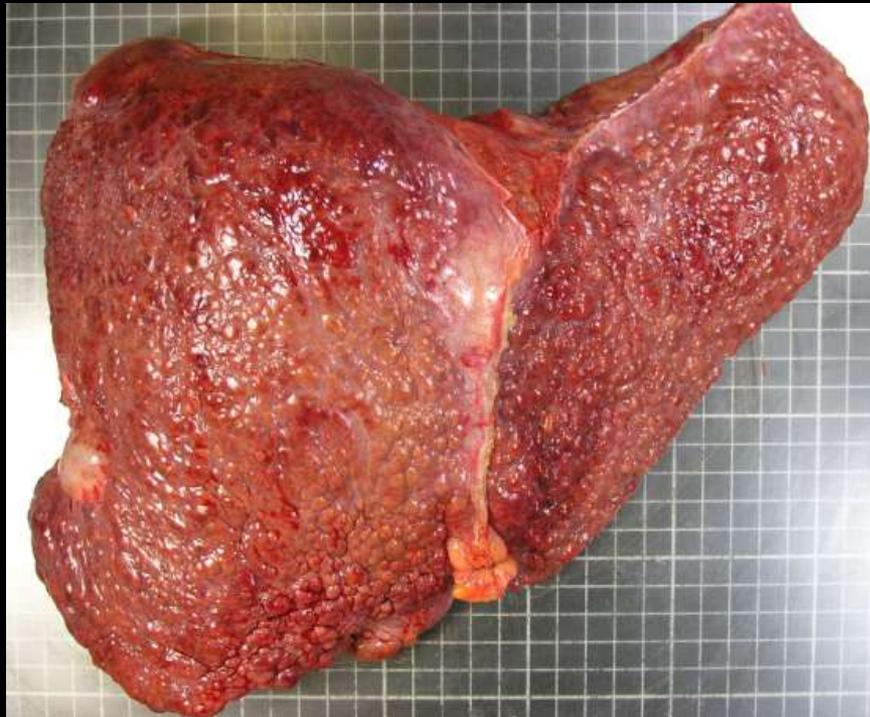


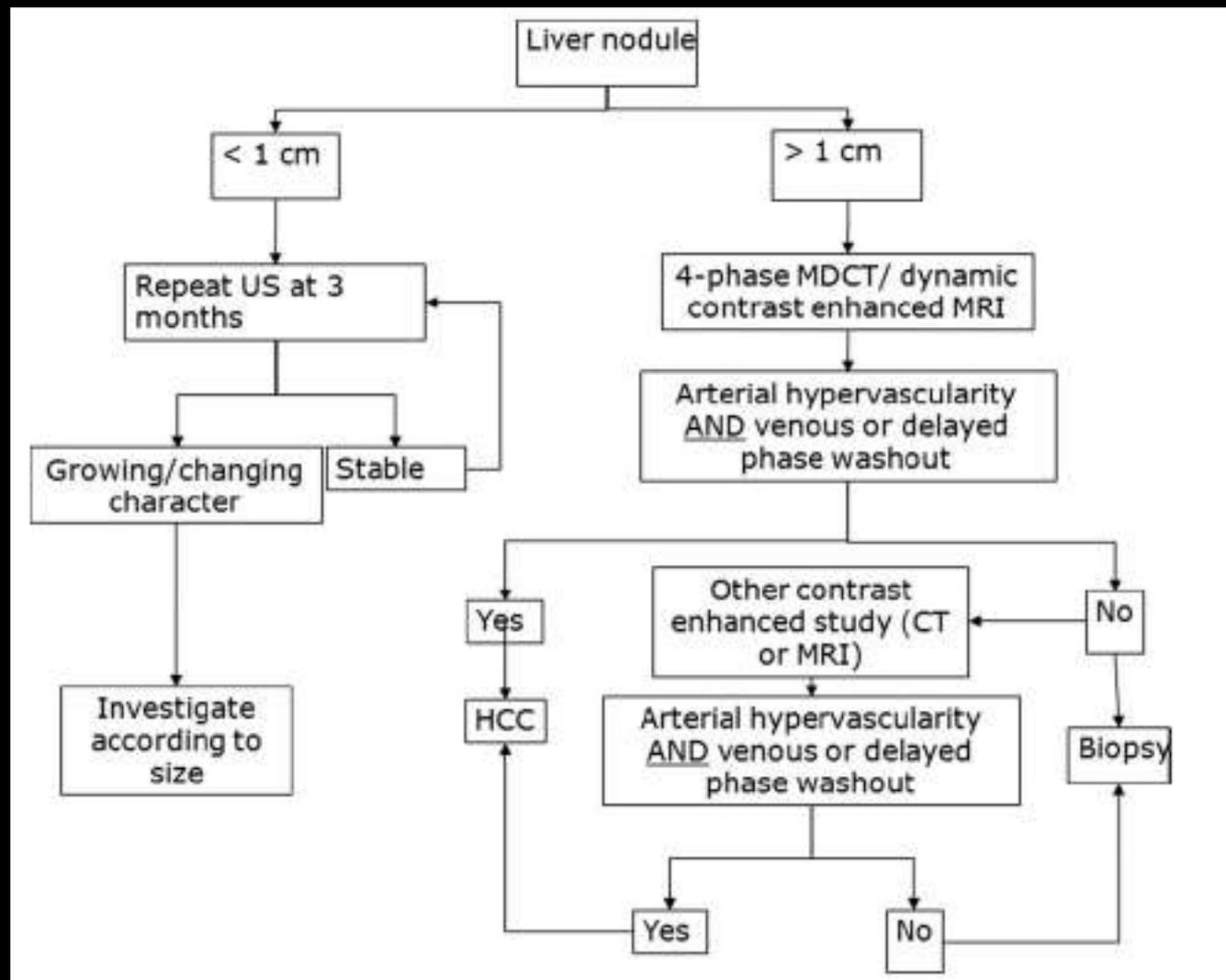
Wash-out

CHC – Caractérisation Echographie



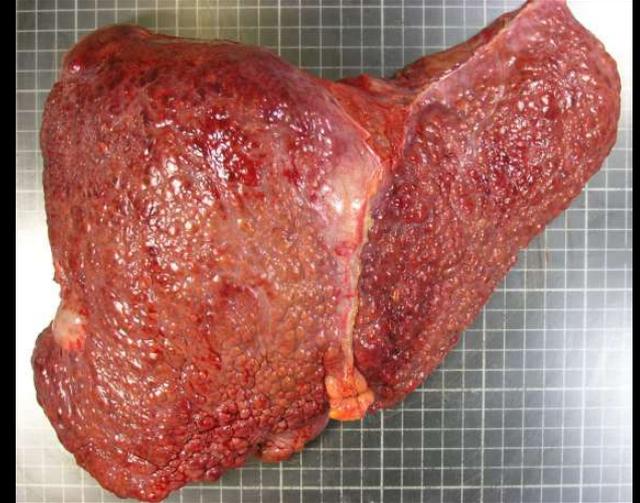
Un algorithme décisionnel existe
uniquement sur foie de cirrhose





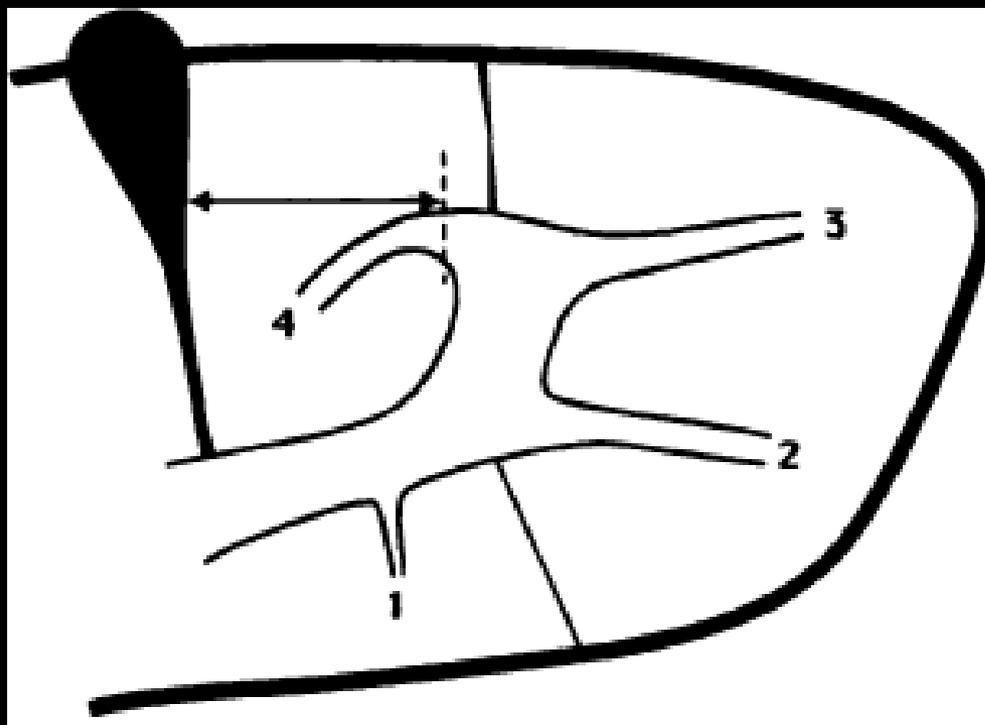
Dysmorphie hépatique (cirrhose)

- Modifications morphologiques :
 - Contours bosselés
 - Hypotrophie du segment 4
 - Hypertrophie du segment 1
 - Hypertrophie du lobe gauche
 - Hypotrophie du lobe droit
- Rechercher des signes d'hypertension portale:
 - Ascite
 - Splénomégalie
 - Voie de dérivation porto-porte et porto-cave
 - Flux porte hépatofuge: uniquement en doppler



Michel Lafortune, MD
Luigi Matricardi, MD
Alban Denys, MD
Maurizio Favret, MD
Renée Déry, MD
Gilles Pomier-Layrargues, MD

Segment 4 (the Quadrato Lobe): A Barometer of Cirrhotic Liver Disease at US¹



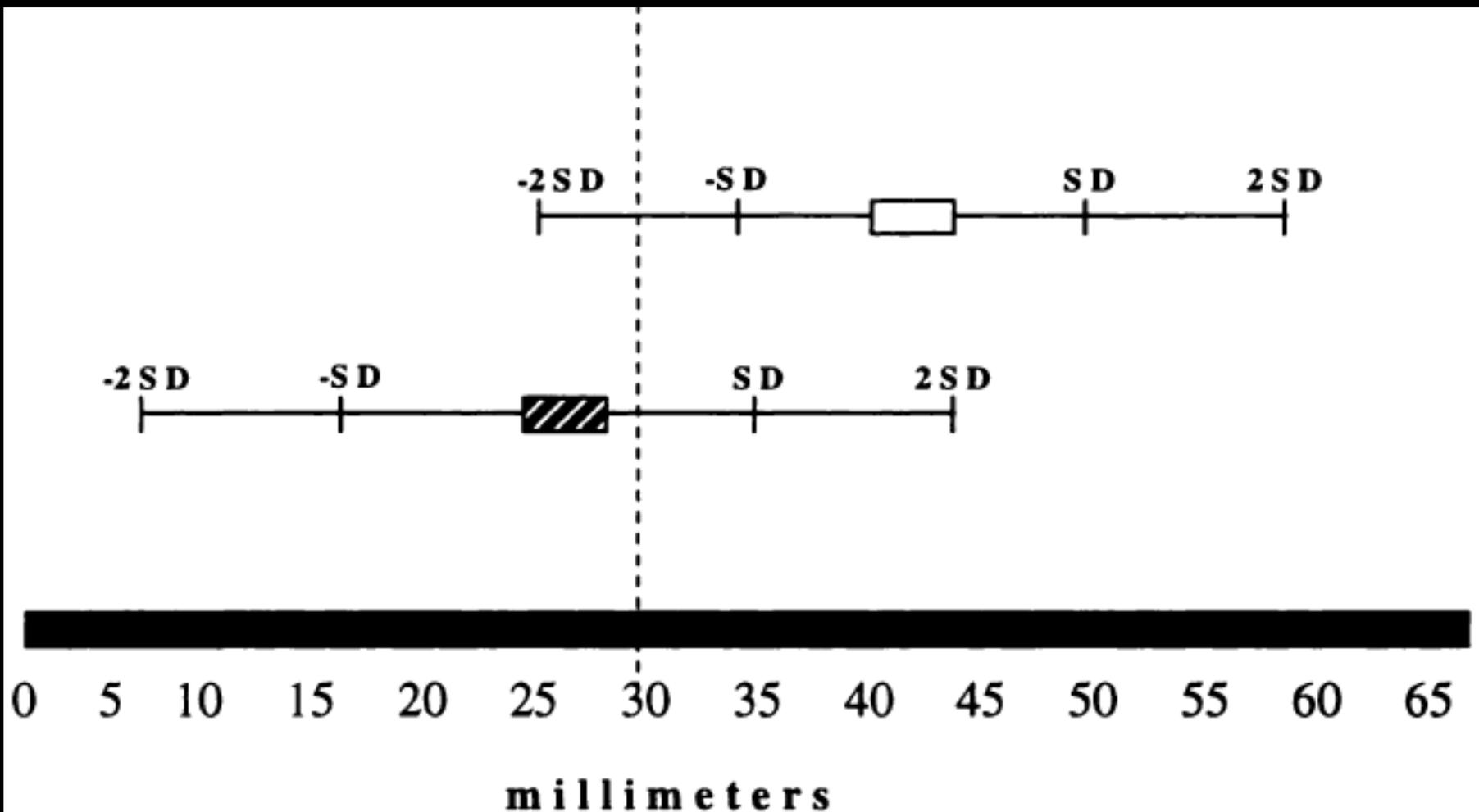


Figure 3. Diameter of segment 4 in control subjects (white box) and in patients with cirrhosis (striped box). The dotted line indicates the cutoff point for the prediction of cirrhosis. $P < .001$ (Mann-Whitney rank-sum test). SD = standard deviation.

Cutoff <30 mm = Se 74,2%, Sp 100%



Dist A 55.2 mm

Precision A Pure

T

0
5
10
13

6C1
diffT5.0
20 fps
G:78
DR:60
A:2
P:3

A

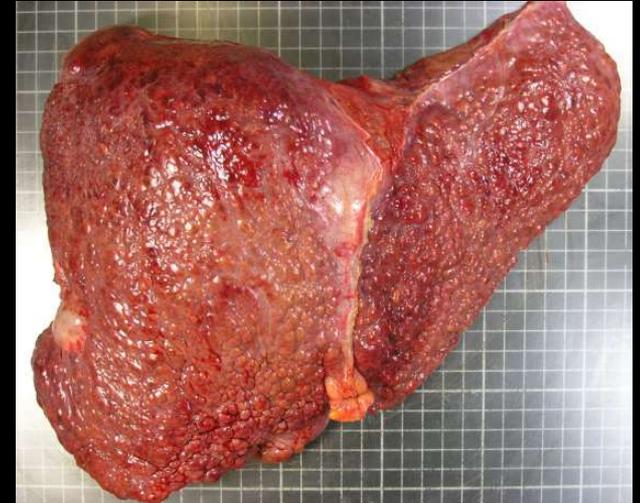
44 B 0
C 0



Dysmorphie hépatique (cirrhose)



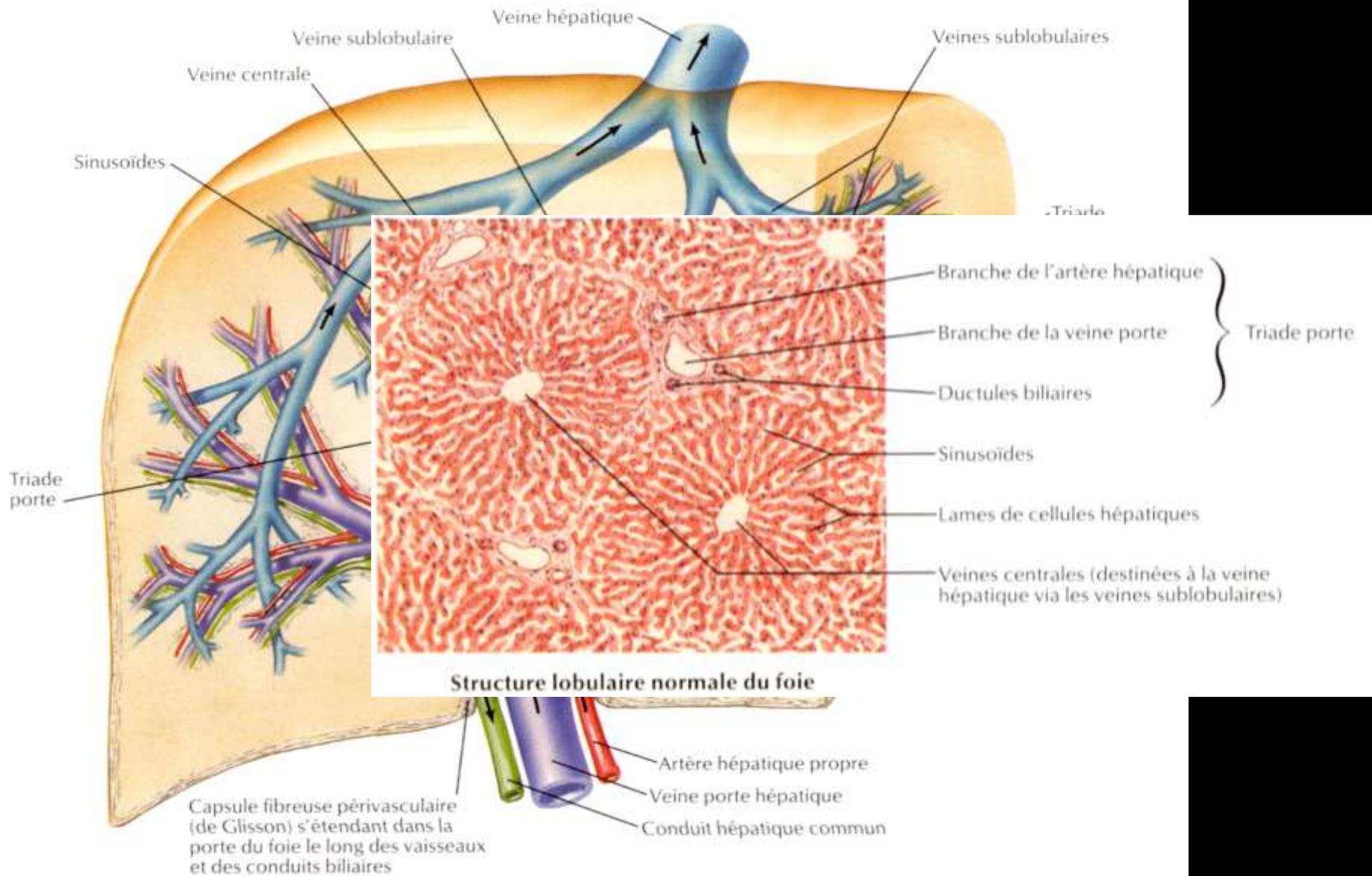
- Modifications morphologiques :
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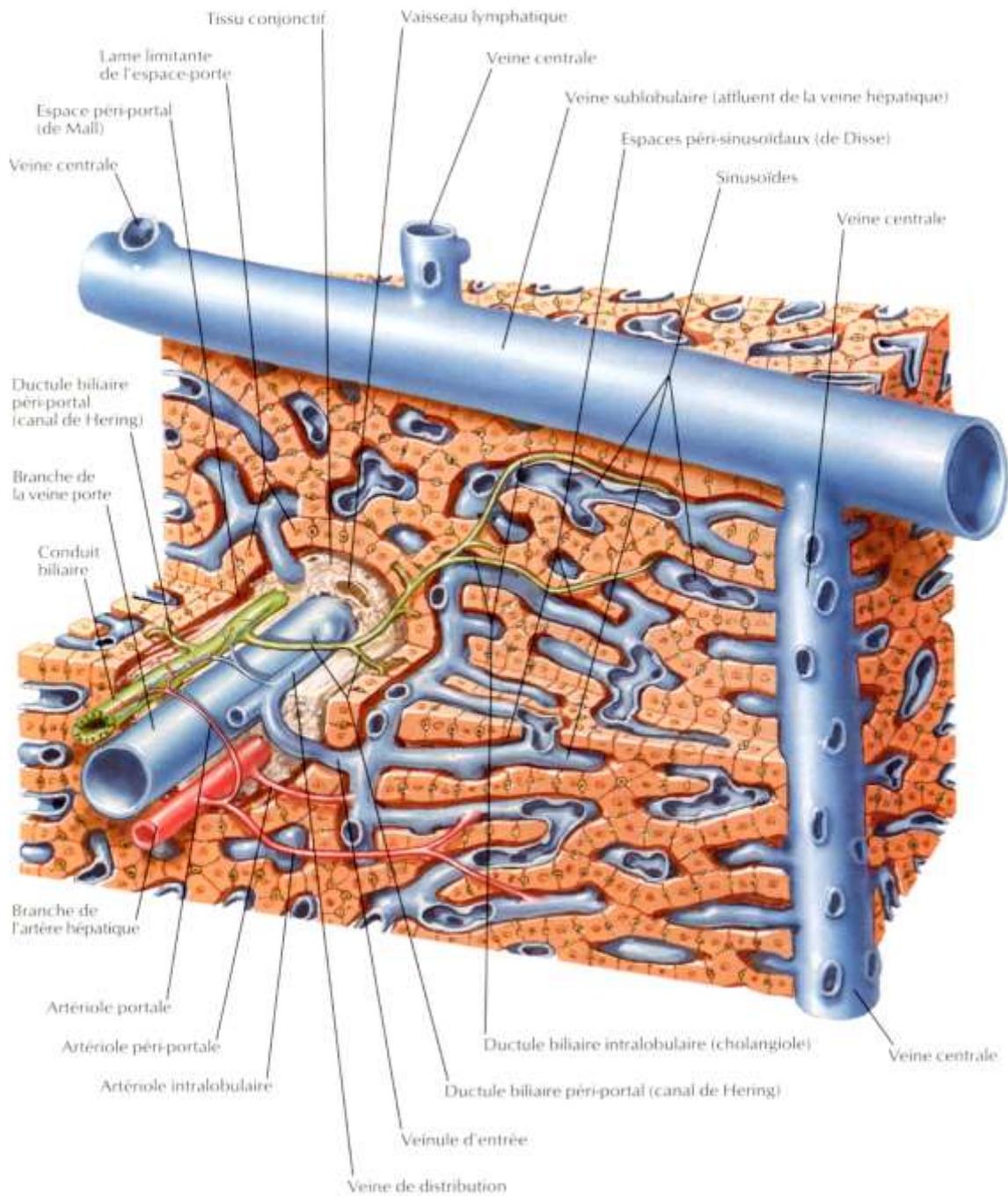


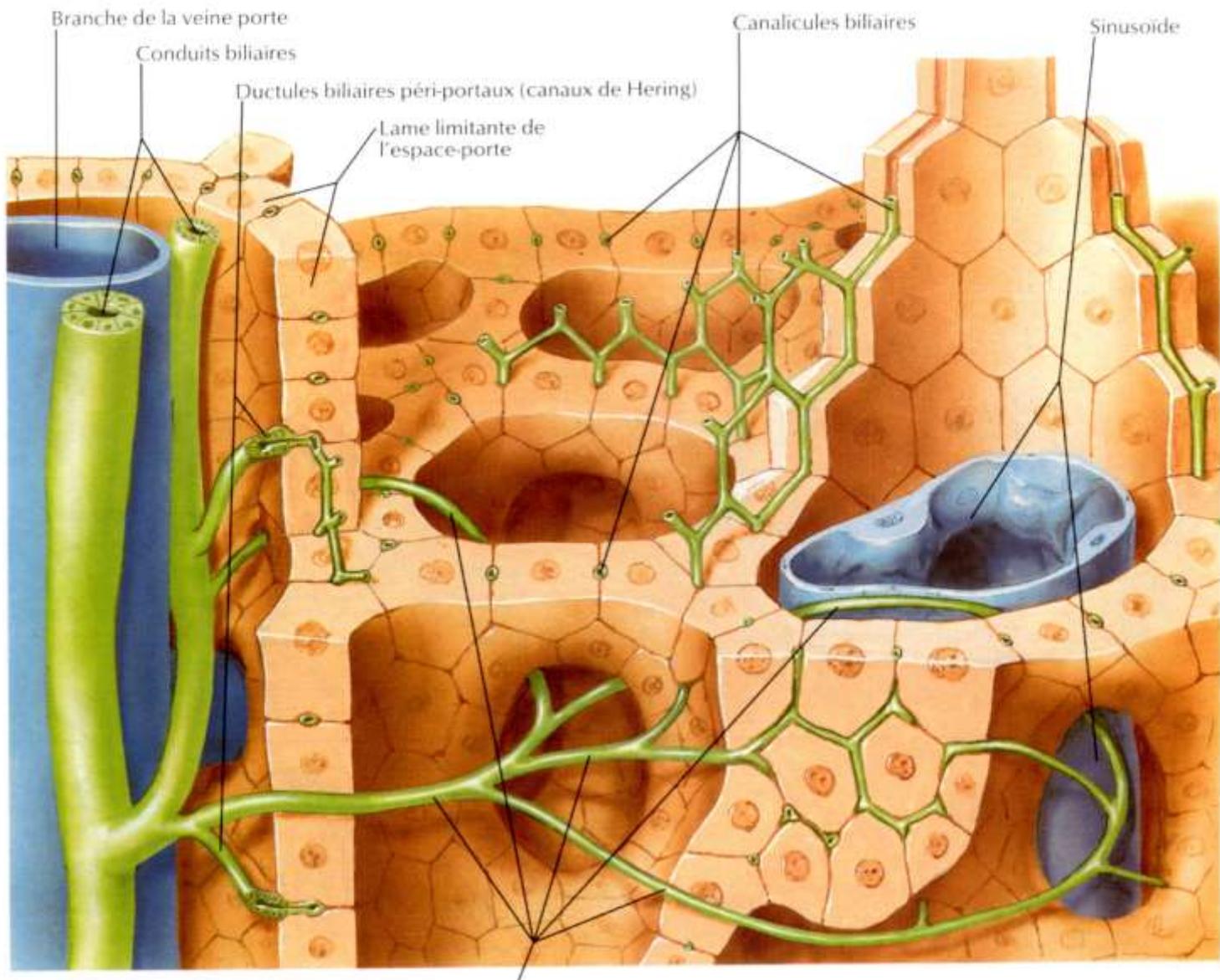
Dépistage du CHC

Objectifs

- Connaître la segmentation hépatique
- Savoir reconnaître l'anatomie vasculaire modale
- Savoir reconnaître un foie cirrhotique
- Connaître les implications du double apport vasculaire du foie
- Connaître l'anatomie cellulaire!







Monsieur G...

- Agée de 57 ans
- Hospitalisé pour sigmoïdite diverticulaire

STND/+

R
1
6
4



kV 120
mA 245
Noise Index: 24.0~

Mag = 1.00
FL:
ROT:

L
1
9
6

Mag = 1.00
FL:
ROT:

R
1
6
5



kV 120
mA 353
Noise Index: 20.0~

L
1
9
5



STND/+

R
1
6
4



kV 120
mA 353
Noise Index: 20.0~

Mag = 1.00
FL:
ROT:

L
1
9
5



E+ 55.0mmrot

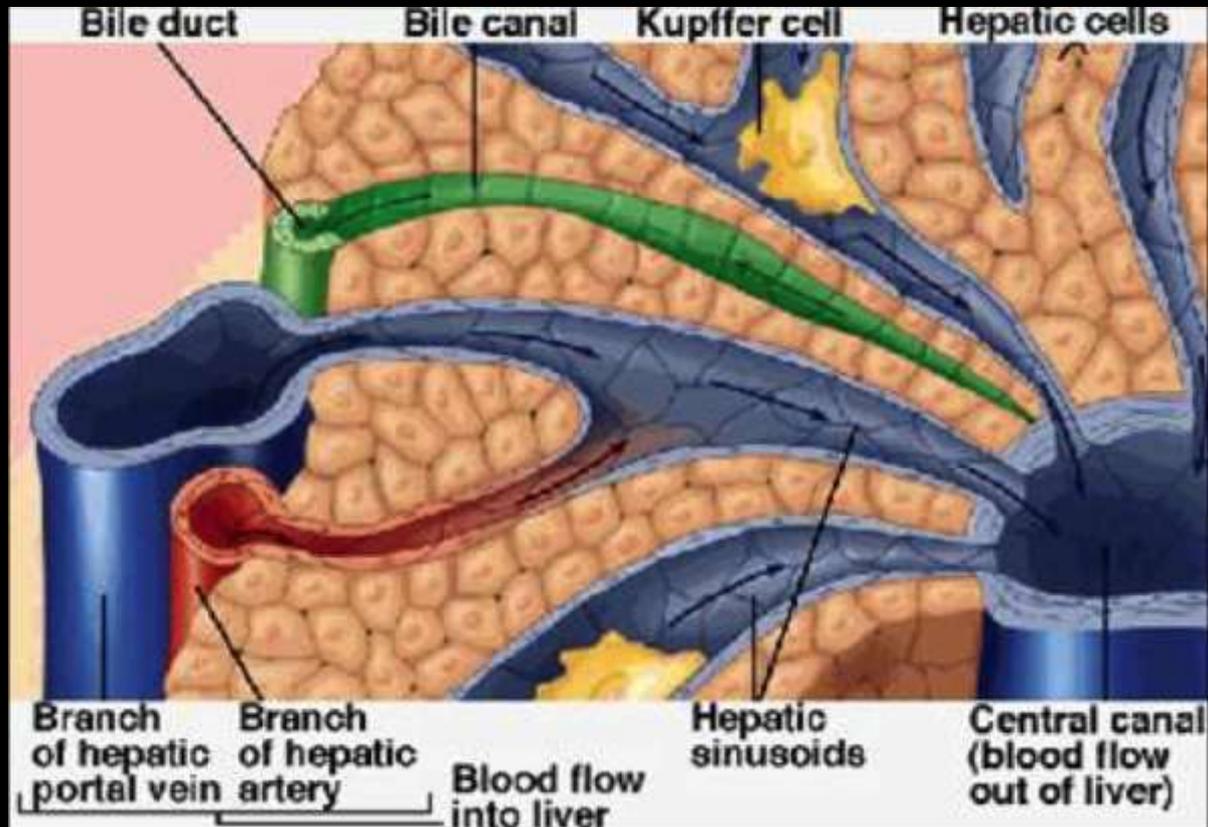
Balance artério-porte

Flux porte



Flux artériel

Balance artério-porte



Comment expliquer le profil vasculaire?



Wash-in

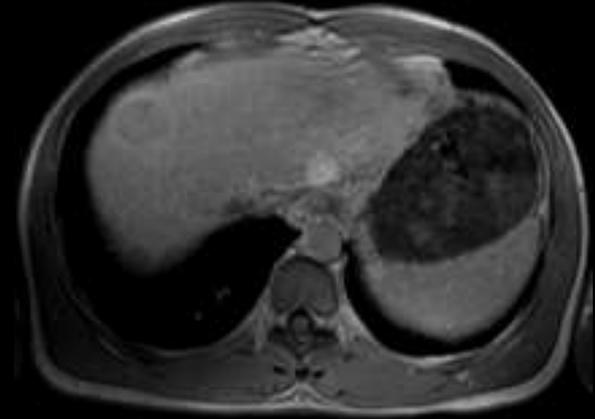
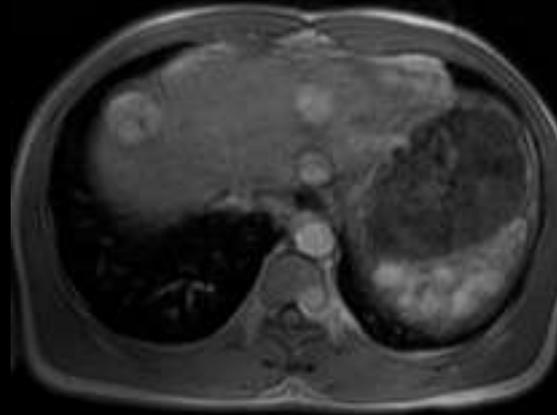
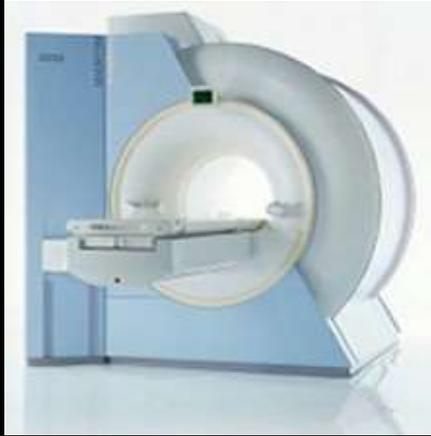


Wash-out

Washin



Washout

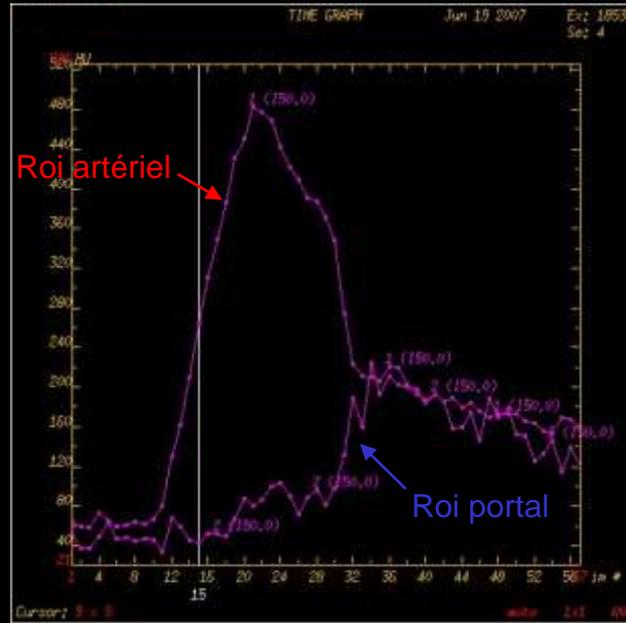


Remerciement au Pr Aubé

Le foie a un double apport vasculaire:

- Artériel 25%
- Portal 75%

Densité



Temps

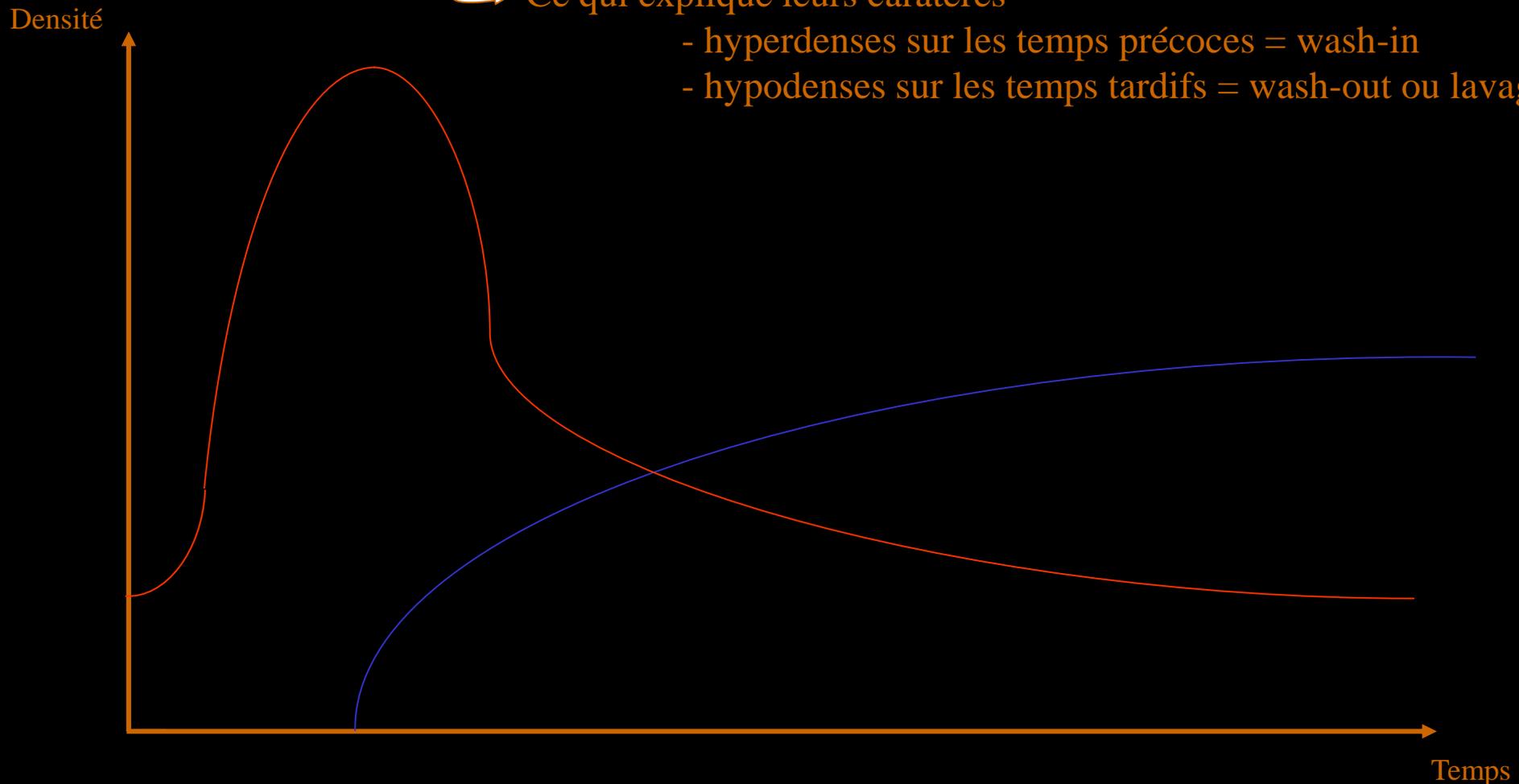
Le foie a un double apport vasculaire:

- Artériel 25%
- Portal 75%

Alors que le CHC ont un apport exclusivement artériel avec perte de l'apport portal

↪ Ce qui explique leurs caractères

- hyperdensés sur les temps précoces = wash-in
- hypodensés sur les temps tardifs = wash-out ou lavage



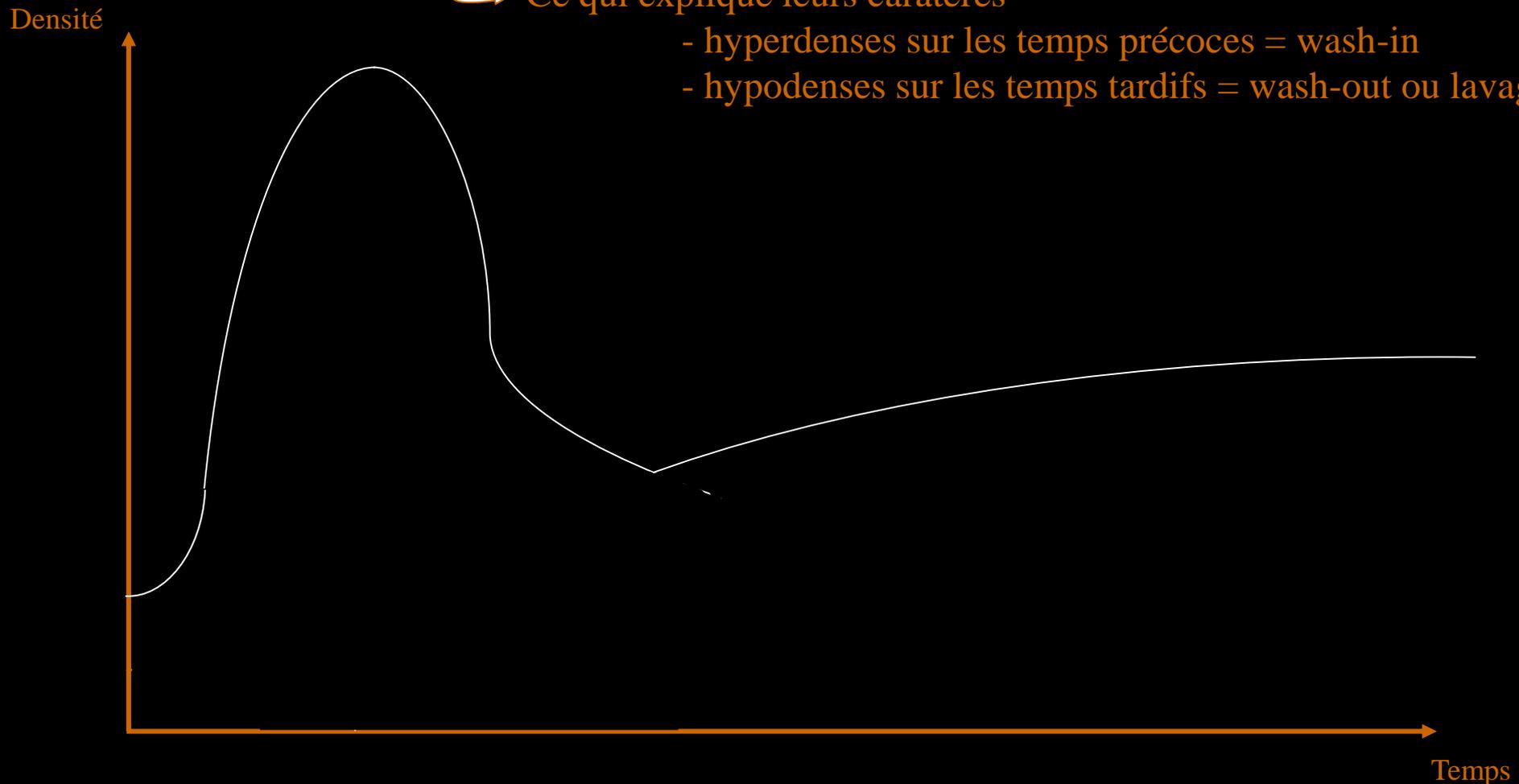
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↪ Ce qui explique leurs caractères

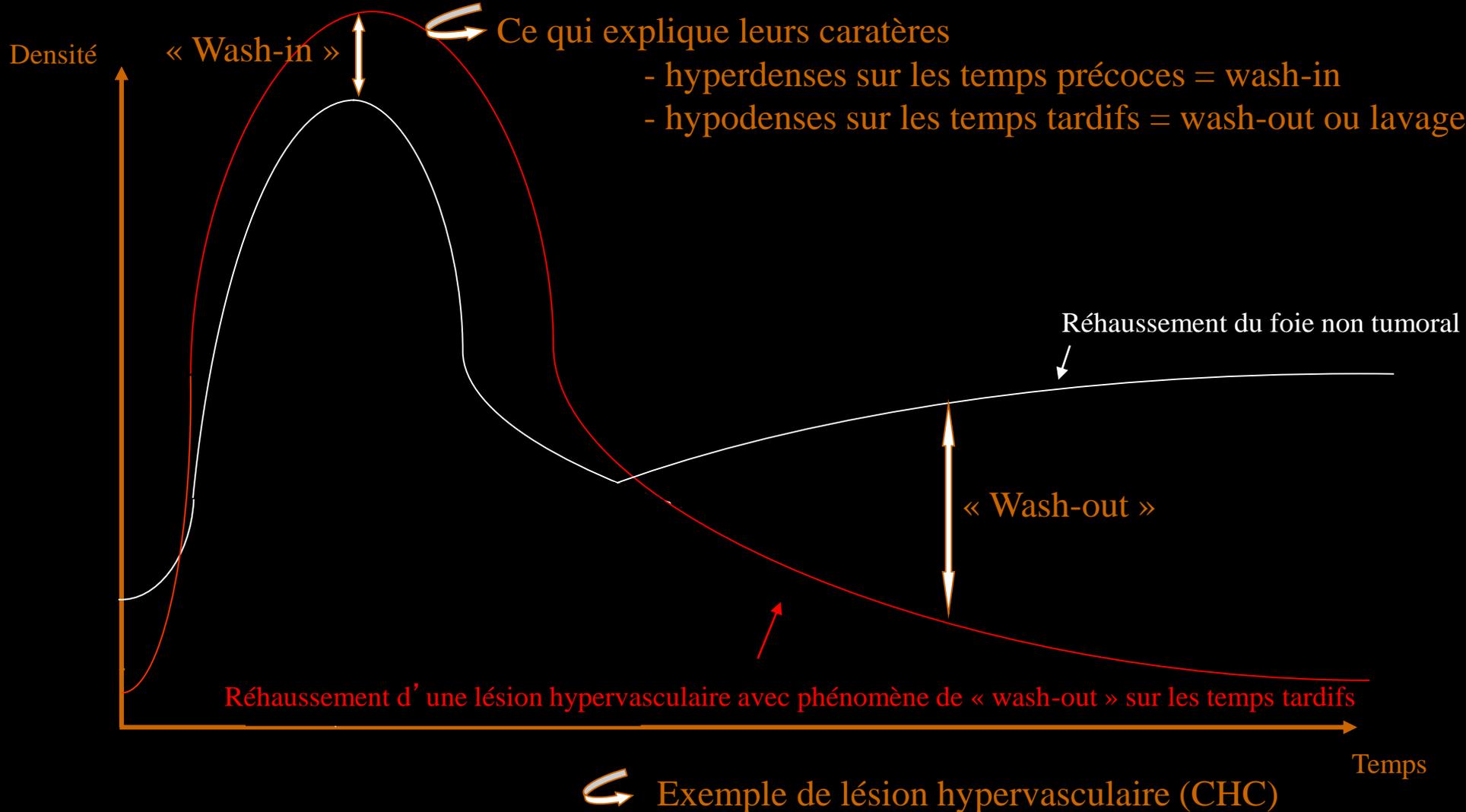
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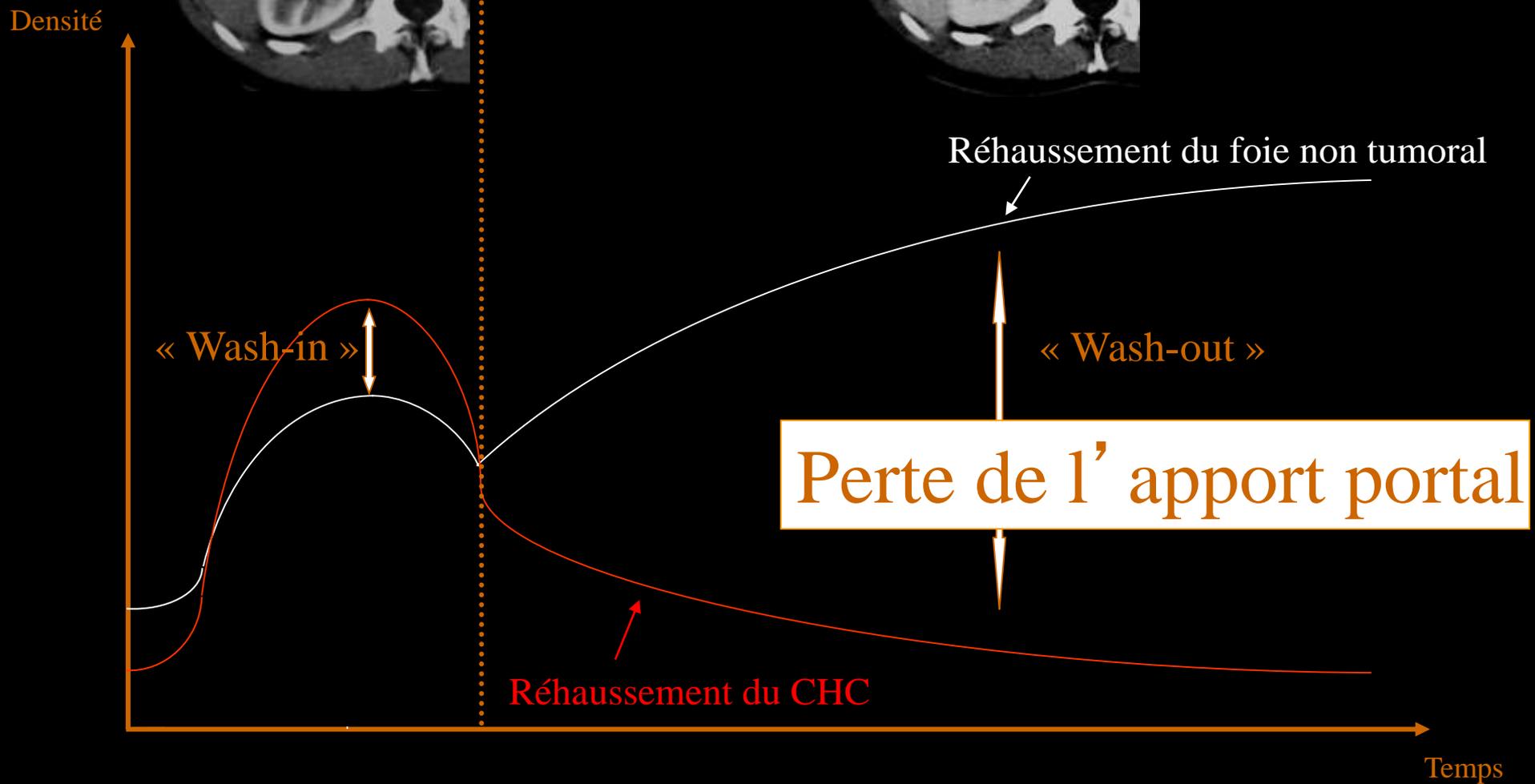


Le foie a un double apport vasculaire:

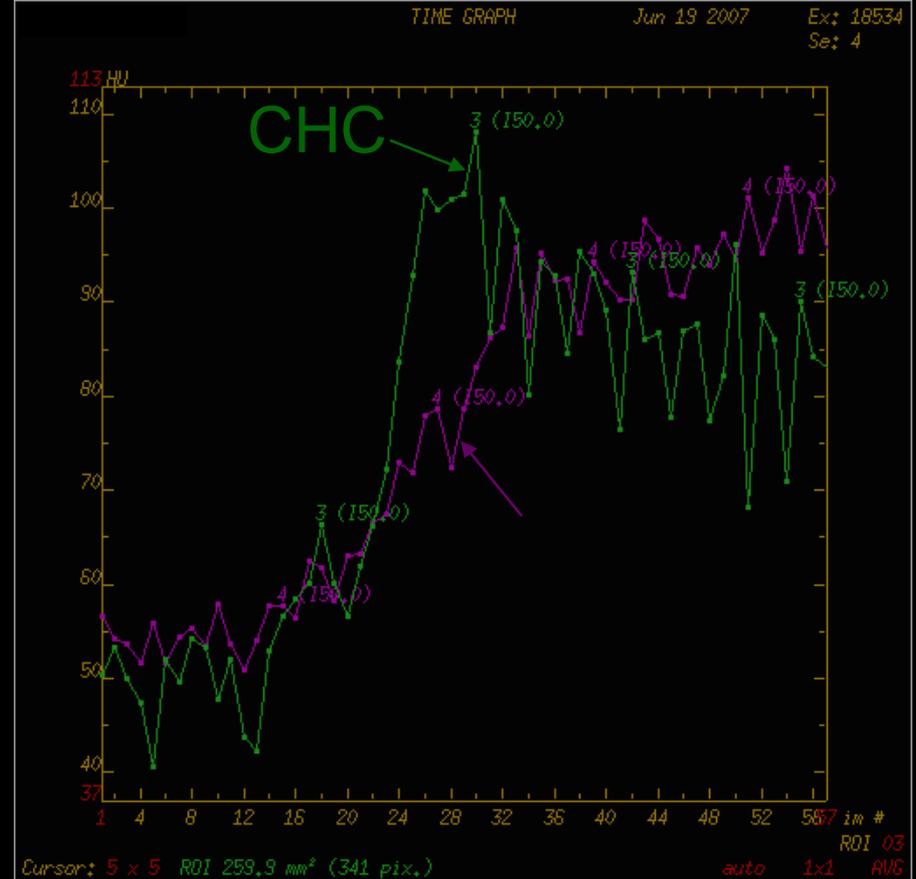
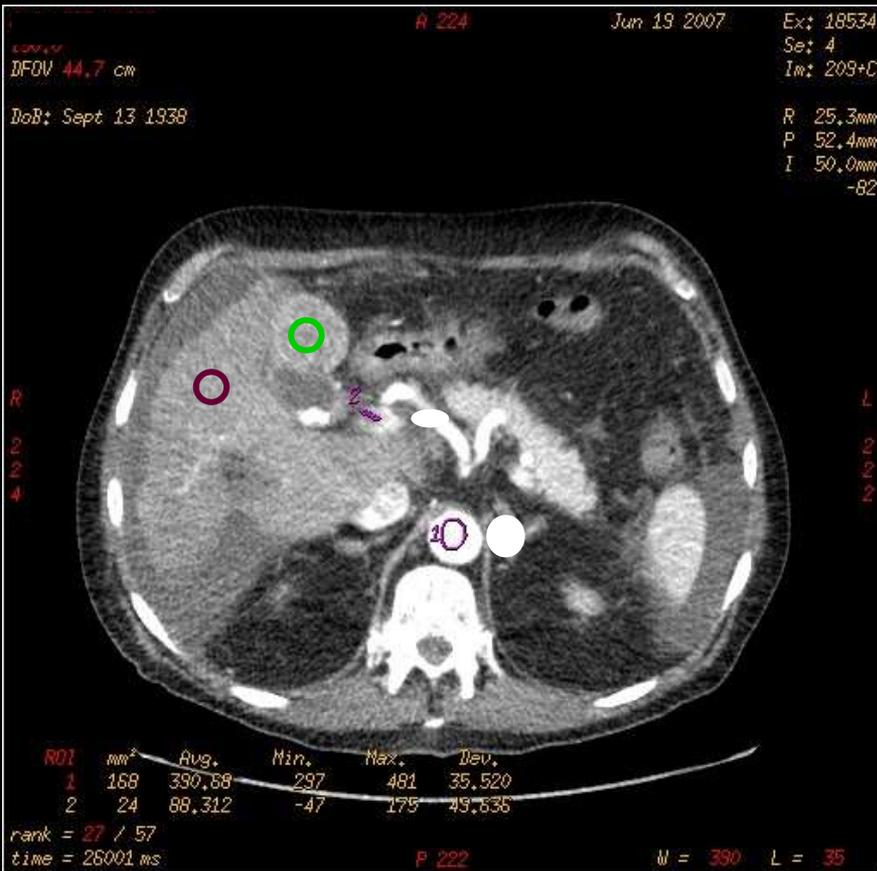
- Artériel 25%
- Portal 75%

Alors que le CHC ont un apport exclusivement artériel avec perte de l'apport portal



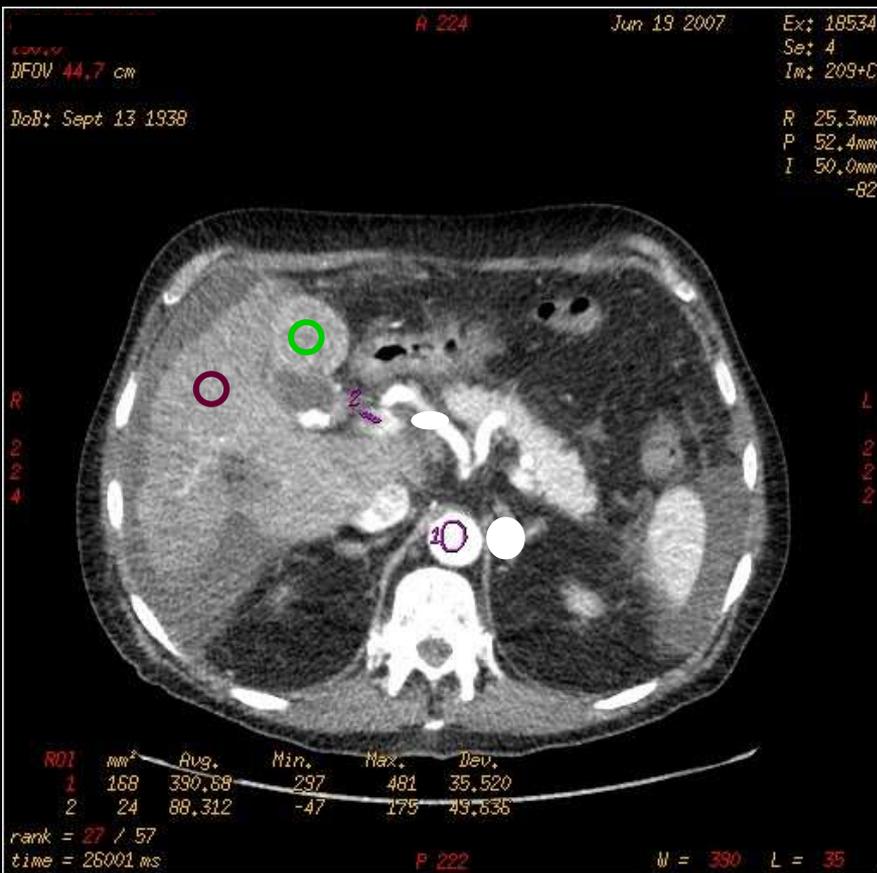


Imagerie de perfusion



CHC multifocal

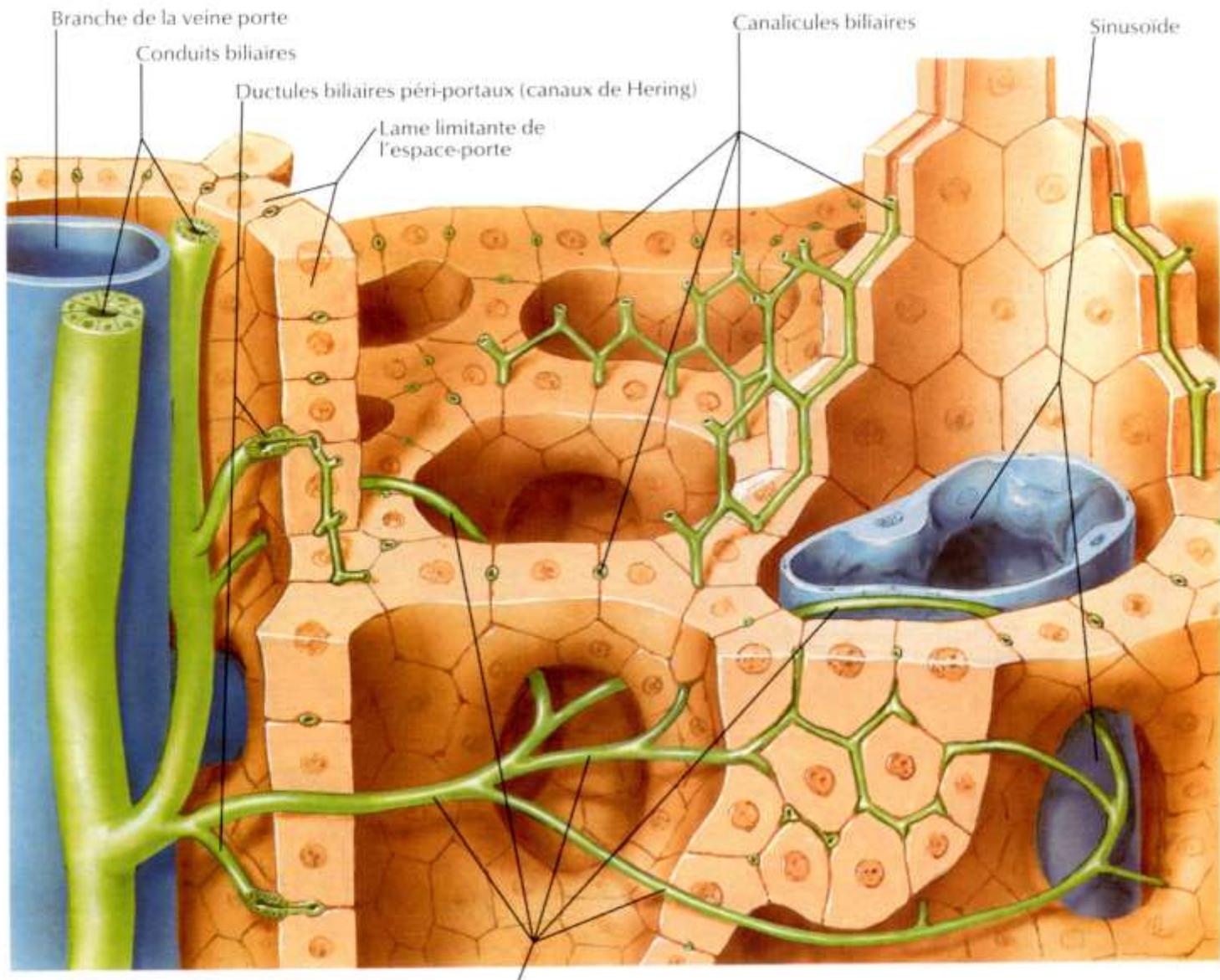
Imagerie de perfusion



CHC multifocal

Objectifs

- Connaître la segmentation hépatique
- Savoir reconnaître l'anatomie vasculaire modale
- Savoir reconnaître un foie cirrhotique
- Connaître les implications du double apport vasculaire du foie
- Connaître et explorer l'« anatomie » fonctionnelle!



Branche de la veine porte

Conduits biliaires

Ductules biliaires péri-portaux (canaux de Hering)

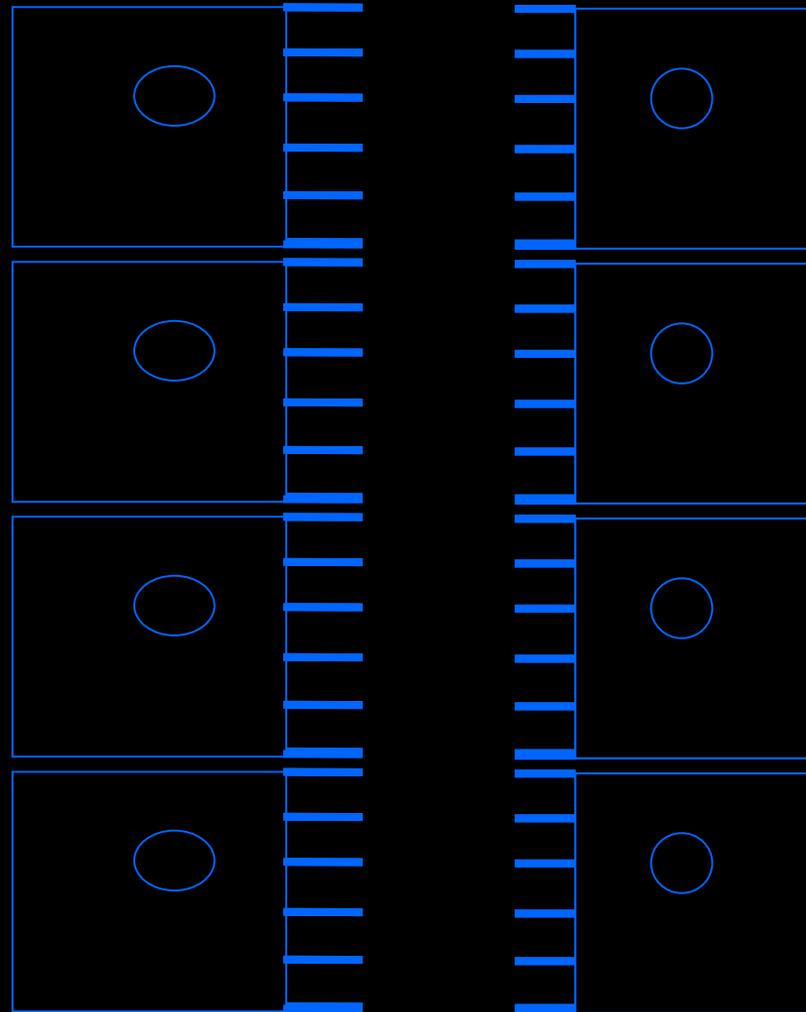
Lame limitante de l'espace-porte

Canalicules biliaires

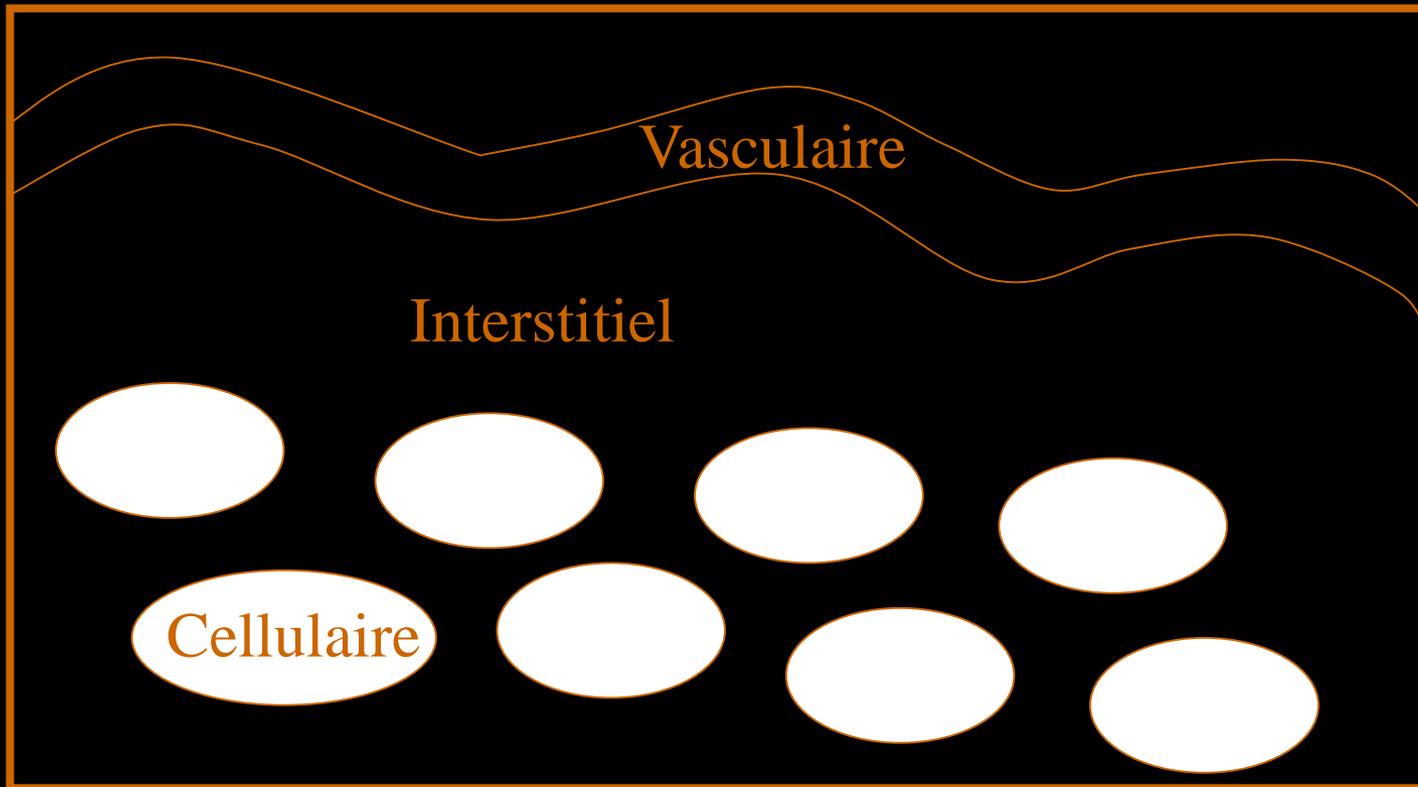
Sinusoïde

Pole biliaire

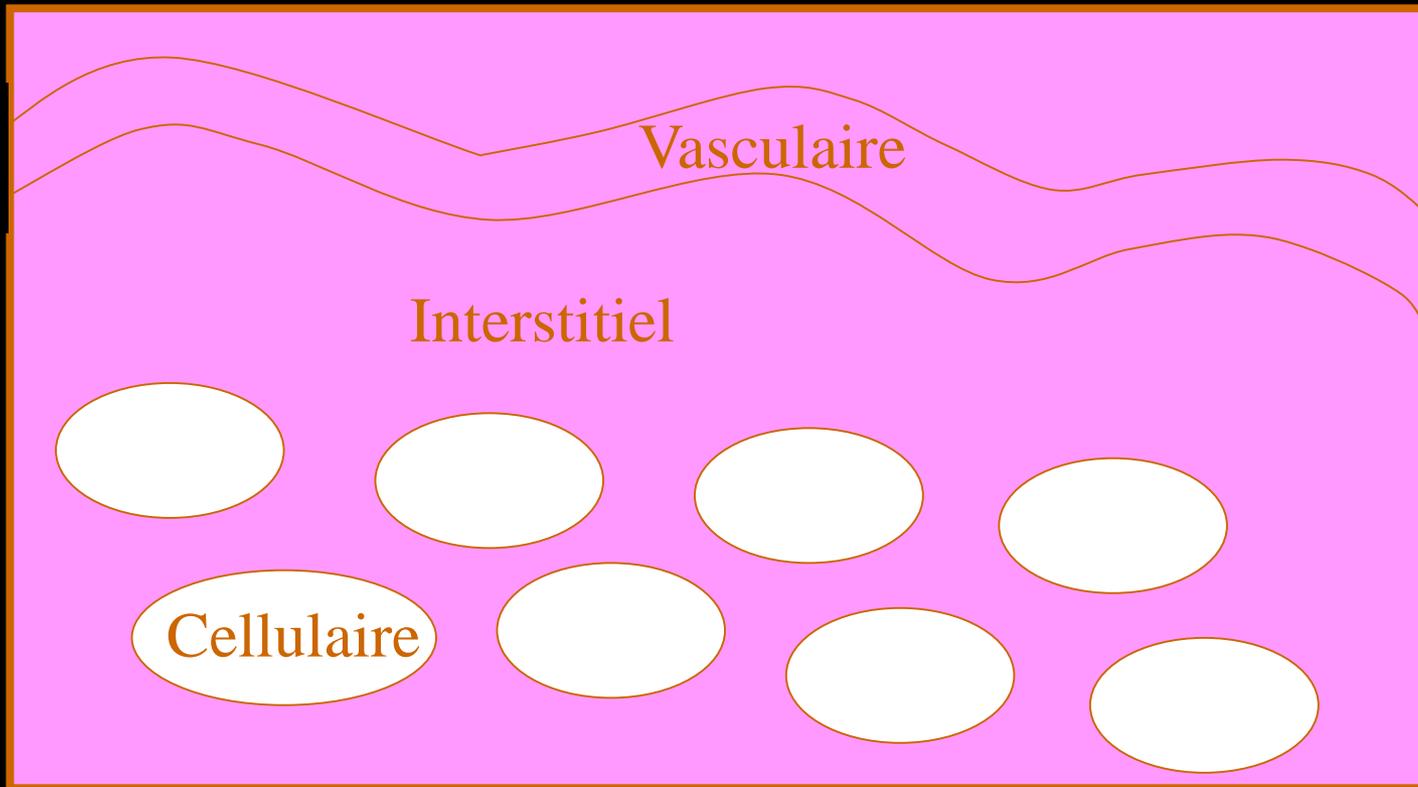
Pole vasculaire



Distribution des PDC hépatospécifiques ?

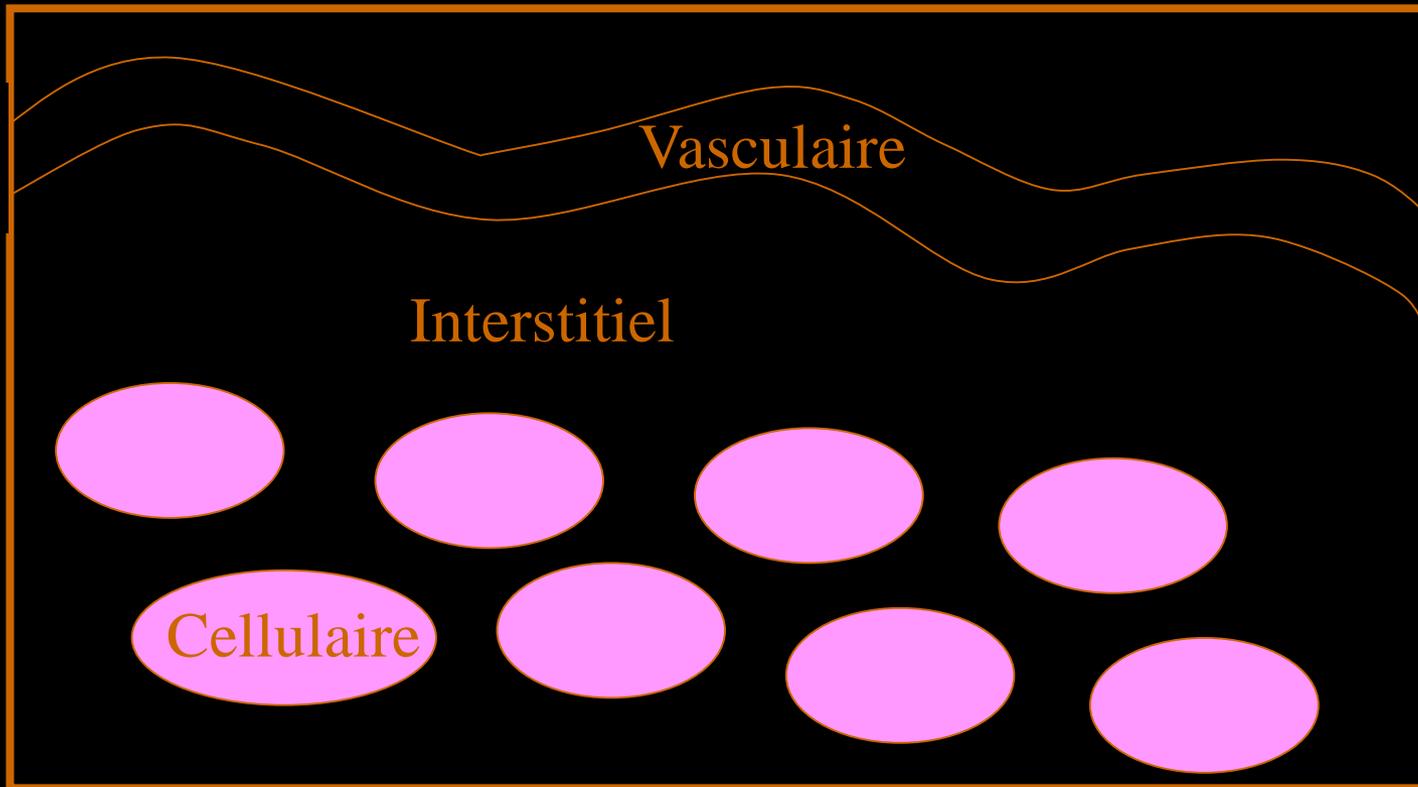


Distribution des PDC hépatospécifiques ?



Phase interstitielle

Distribution des PDC hépatospécifiques ?



Phase hépatocytaire

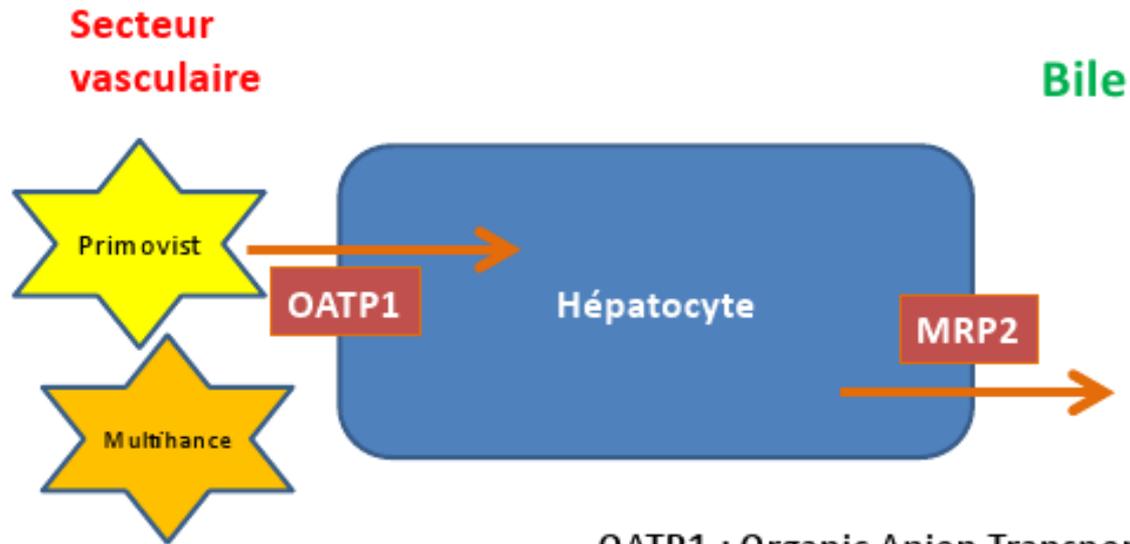
Gd-BOPTA et Gd-EOB-DTPA : comparaison (1)

	Gd-BOPTA	Gd-EOB-DTPA
Noms	Gadobenate dimeglumine Multihance® Bracco Imaging	Acide gadoxetique Primovist®/Eovist® Bayer HealthCare
AMM en France	Oui	Non
Captation	Transporteurs OATP1	Transporteurs OATP1
Excrétion	3-5% biliaire 95-97% rénale	50% biliaire 50% rénale
Dose	0,05 mmol/kg 0,1 ml/kg	0,025 mmol/kg 0,1 ml/kg
Délai phase hépatobiliaire	60 -120 minutes	15 - 20 minutes

Rohrer et al. Invest Radiol 2005

Frydrychowicz et al. J Magn Reson Imaging 2005

Thomsen et al. Eur Radiol 2013



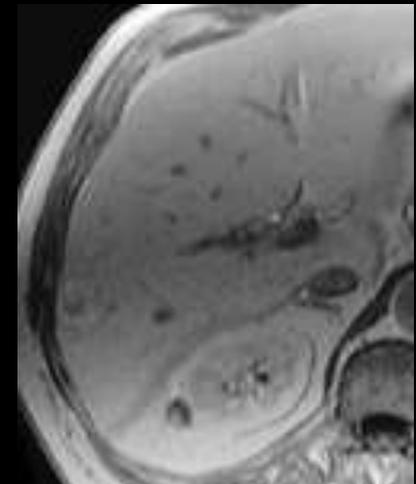
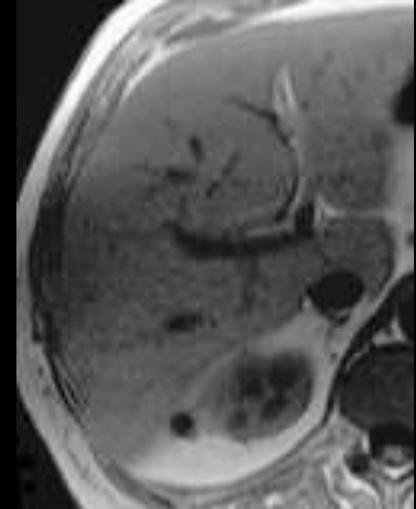
OATP1 : Organic Anion Transporting Polypeptide 1
MRP2 : Multidrug Resistance Protein 2

OATP1 = Organic Anion Transporting Polypeptide 1
MRP2 = Multidrug Resistance associated Protein 2

Planchamps et al. Mol Pharmacol 2000
Pastor et al. Radiology 2010

HNF et Gd-BOPTA (Multihance®)

- HNF: Rehaussement tardif
 - 124/128 (97%): hyper ou isosignal tardif
- Adénome: Pas de rehaussement tardif
 - 100%: hypointense

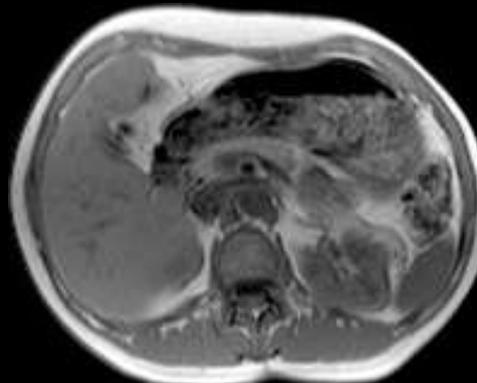


Gd-BOPTA (Multihance ®)

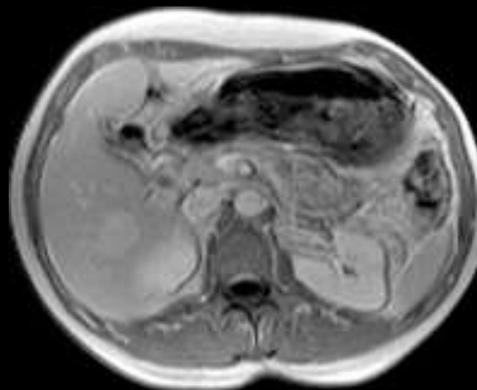
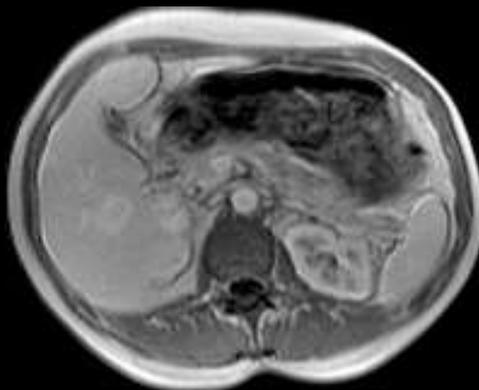
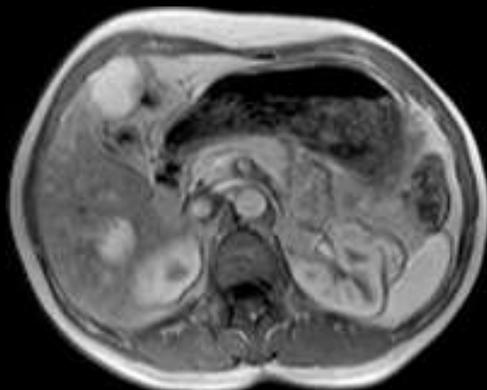
HNF



Adénome

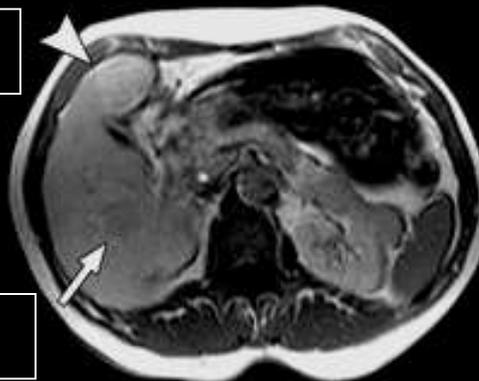


Sans
injection



Phase
vasculaire

HNF



Adénome

Phase
hépatocyttaire

Aw S13.2 (coi)
DFOV 34.4cm

Mar 13 2012
05:40:37 P1
Mag = 1.0
FL:
ROT:

70
2

IR: SP/DSP
TR:159 2D/GR
TE:2.4
EC:1 M 117.2kHz

Average: 2
16

FOV:27x20.3

Aw S16.1 (coi)
DFOV 31.5cm

Mar 13 2012
05:42:53 P1
Mag = 1.0
FL:
ROT:

ET:22
138

R:
1
6
2

L:
1
6
8

SE: SP/DSP
TR:2100 2D/SE
TE:4.0
EC:1 M 40.6kHz

Average: 2
16

FOV:26.8x21.8
5.0mm/1.5sp

28 mm

Aw S17.5 (coi)
DFOV 33.4cm

Mar 13 2012
05:55:54 P1
Mag = 1.0
FL:
ROT:

15
R:
1
7
4

L:
1
7
6

GR: SP
TR:4.3 3D/GR
TE:1.5
EC:1 M 41.6kHz

Average: 1
16

FOV:26.3x19.7
3 mm/1

Im: 26+C
Aw S15.0 (coi)
DFOV 32.5cm

Mar 13 2012
06:00:10 P1
Mag = 1.0
FL:
ROT:

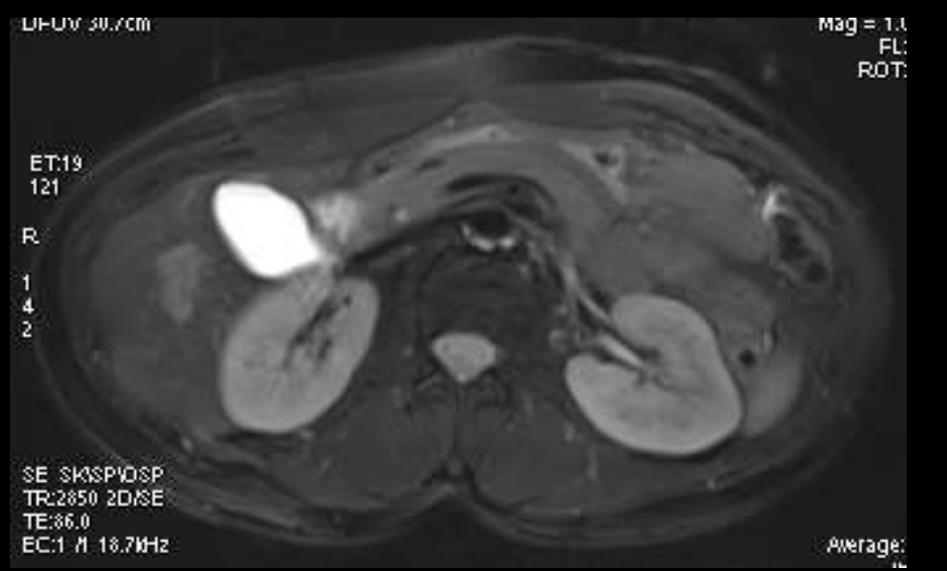
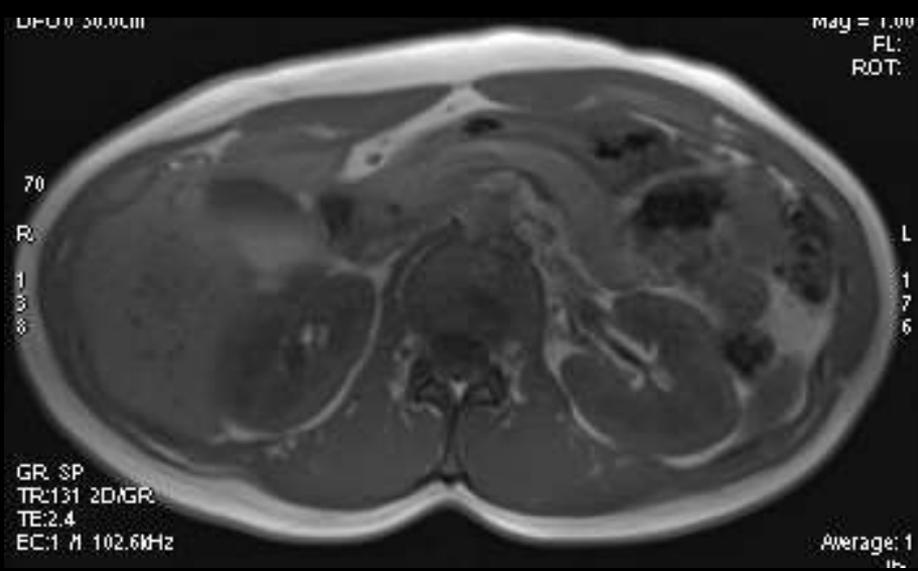
70
R:
1
6
9

L:
1
7
1

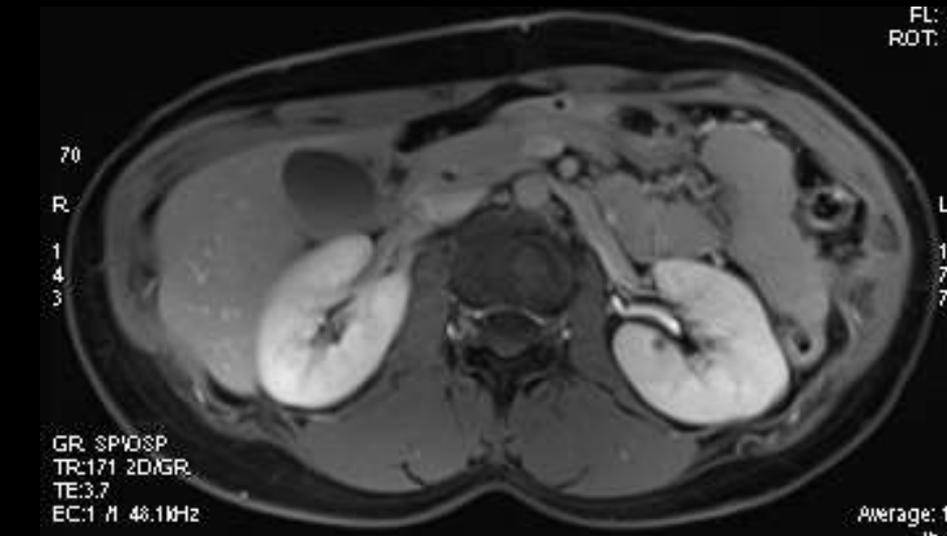
GR: SP/DSP
TR:171 2D/GR
TE:3.7
EC:1 M 48.1kHz

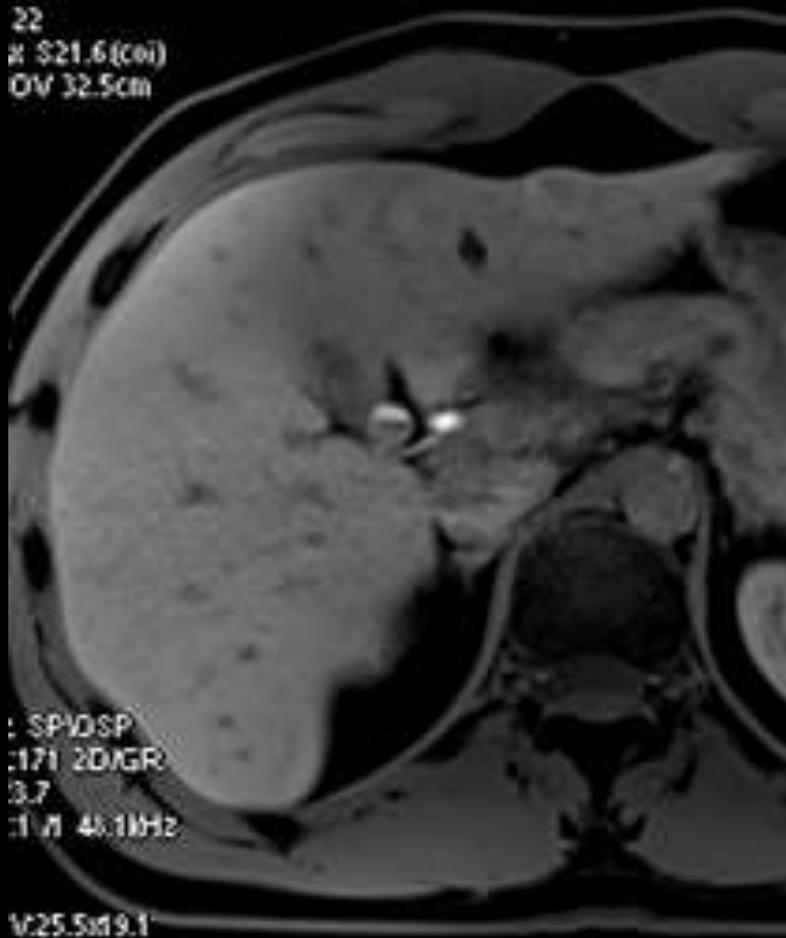
Average: 1
16

FOV:25.5x19.1

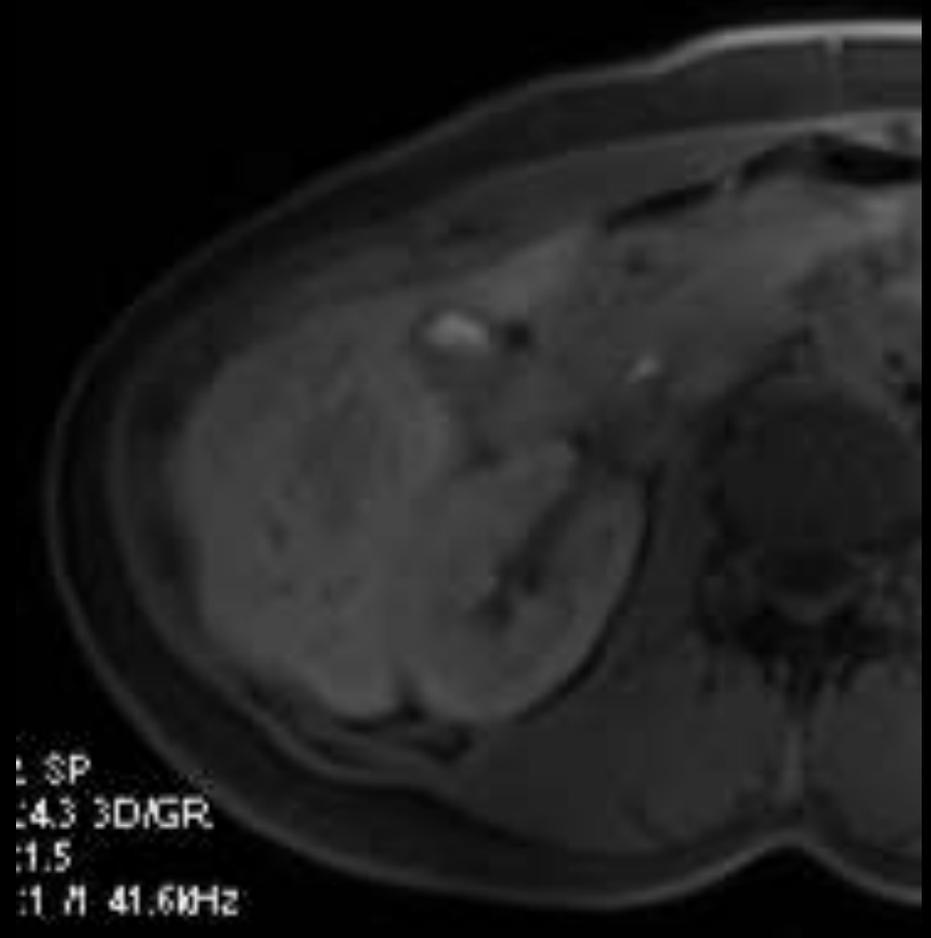


34 mm

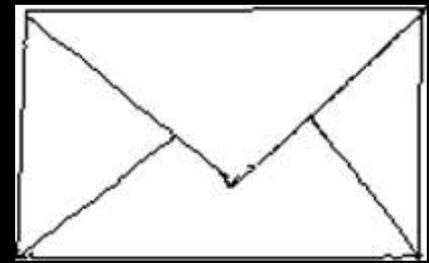




HNF



Adénome
Inflammatoire



Objectifs

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