



IMAGERIE DES LESIONS HEPATOCYTAIRES BENIGNES

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Société Française de Radiologie Rhône-Alpes



Je déclare ne pas avoir de conflit d'intérêt en relation avec ce travail.

Les dossiers présentés proviennent soit de la littérature, du centre hospitalier Alpes Leman ou de l'hôpital Saint André (CHU Bordeaux).

Principaux concepts

- Deux familles distinctes : HNF vs HCA
- Intérêt de les différencier (risques hémorragiques et de dégénérescence)
- Gold Standard : IRM +/- CEUS (combinaison)
- Challenge diagnostique

Hyperplasie nodulaire focale

Epidémiologie

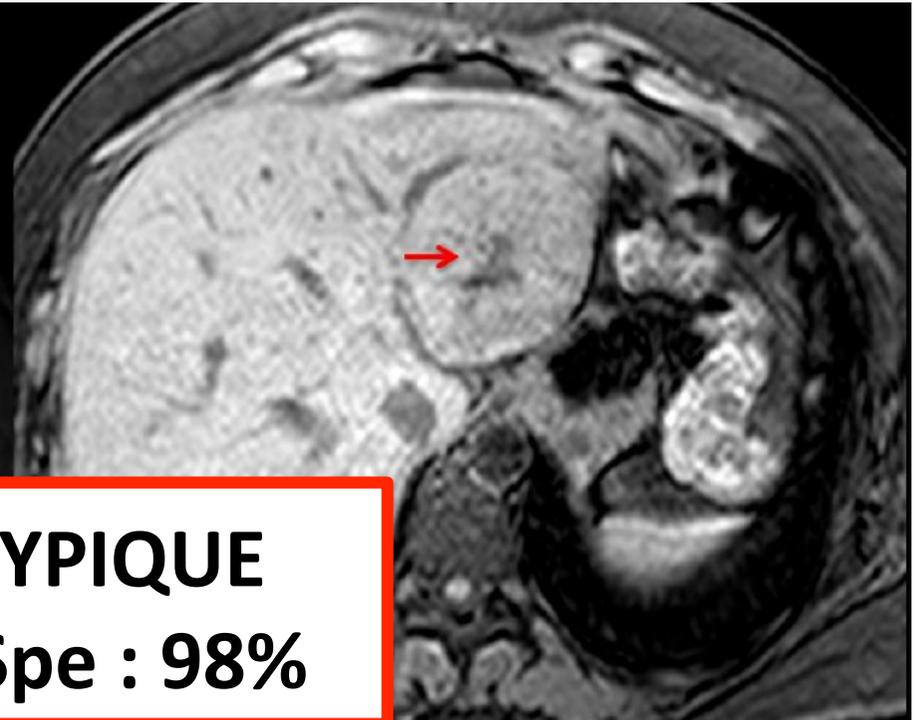
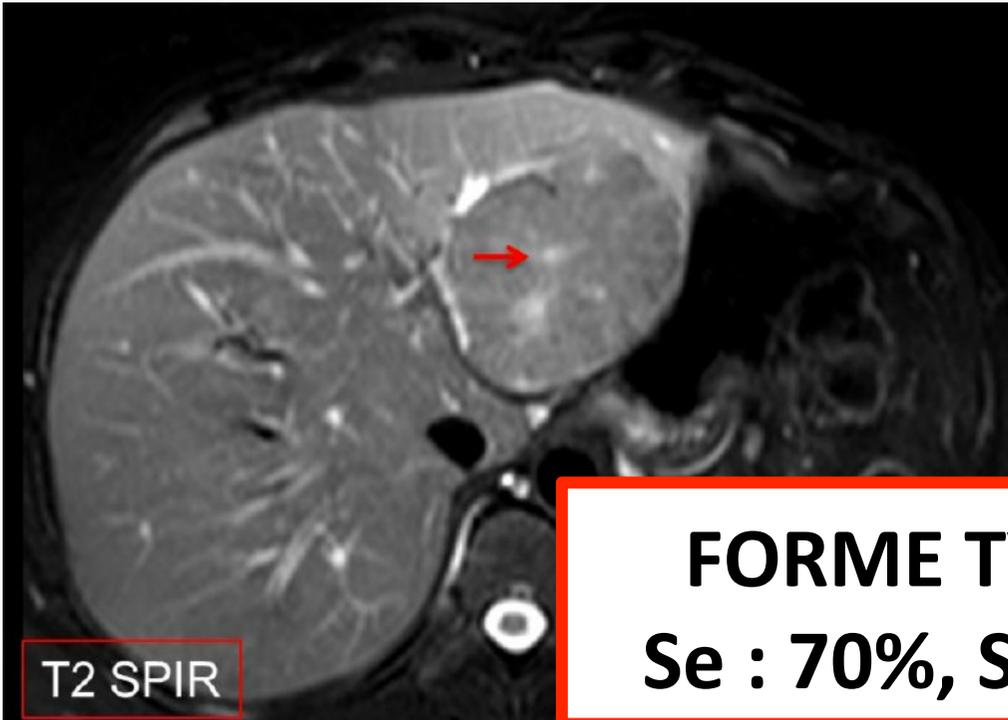
- Lésion régénérative
- 0,8% (série autopsique) / 0,6-3% (population générale)
- F/H: 9/1
- Pas de lien avec les contraceptifs oraux
- Solitaire dans 2/3 des cas
- DO NOT TOUCH LESION

Balabaud C et al. Focal Nodular Hyperplasia and Hepatocellular Adenoma around the World Viewed through the Scope of the Immunopathological Classification. International Journal of Hepatology (2013)

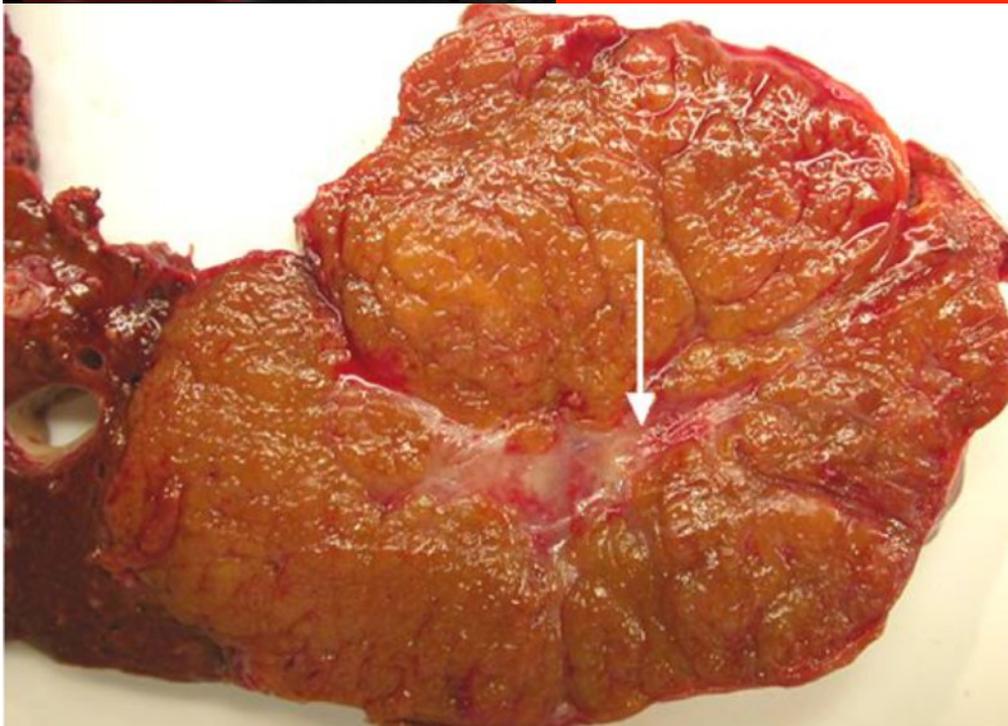
Hyperplasie nodulaire focale IRM

- Foie dans le foie
- Lésion homogène, hypervasculaire à la phase artérielle, s'homogénéisant au temps portal et lors de phases plus tardives, sans lavage
- Cicatrice stellaire : 40%
- Signes importants : aspect lobulé/pas de dysmorphie hépatique

Hussain S et al. Focal Nodular Hyperplasia: Findings at State-of-the-Art MR Imaging, US, CT, and Pathologic Analysis Radiographics (2004). Ronot M, Vilgrain V. Imaging of benign hepatocellular lesions: Current concepts and recent updates. Clin Res Hepatol Gastroenterol (2014)



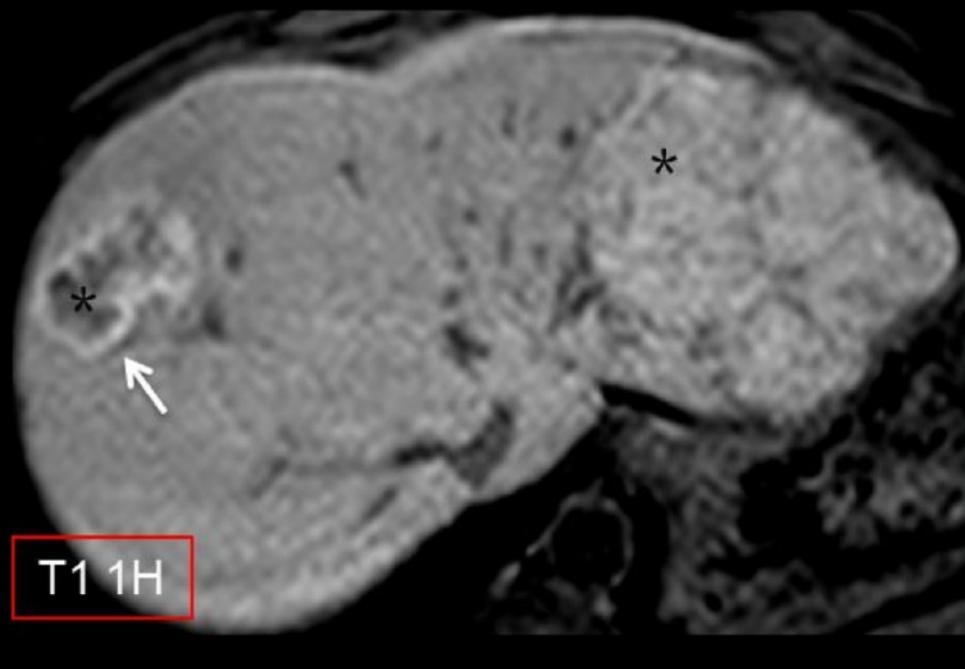
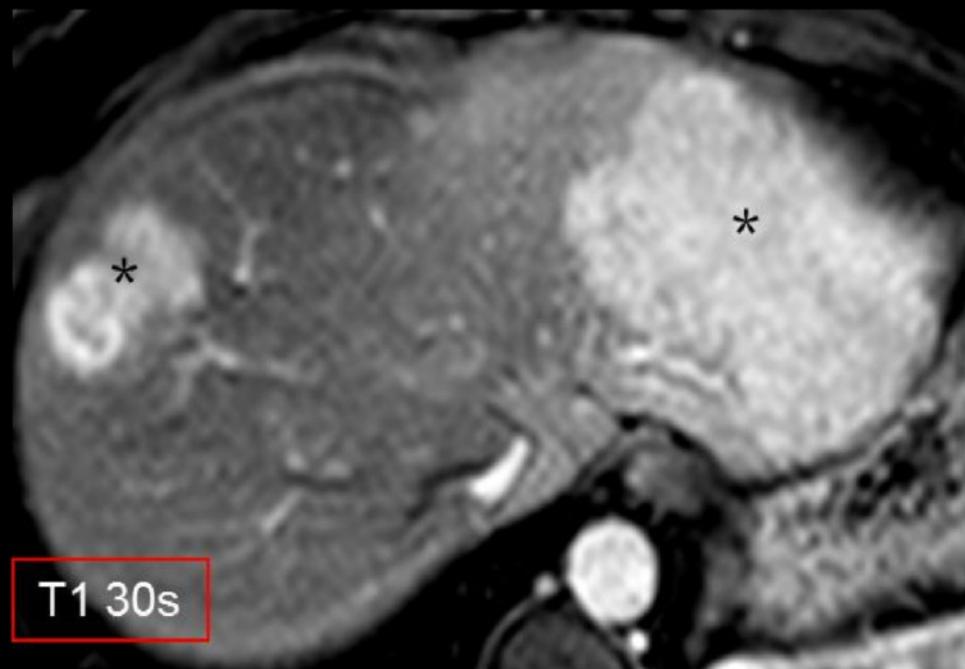
FORME TYPIQUE
Se : 70%, Spe : 98%



Hyperplasie nodulaire focale Phase Hepato-biliaire

- Gadobénate de diméglumine (Multihance, BRACCO)
- Plusieurs pattern possibles:
 - *iso signal
 - *hypersignal homogène
 - *couronne en hypersignal T1

Fujiwara H et al. Ring-like enhancement of focal nodular hyperplasia with hepatobiliary-phase-enhanced magnetic resonance imaging: radiological-pathological correlation. Jpn J Radiol (2011).



Hyperplasie nodulaire focale ECUS

- Sulphur Hexafluoride (Sonovue, BRACCO)
- Deux pattern au temps artériel (25s) :
 - *Remplissage centrifuge (lésion de moins de 3 cm)
 - *Rayon de roue (20%)
- Absence de lavage au temps portal

Wang W et al.: Contrast-enhanced ultrasound features of histologically proven focal nodular hyperplasia: diagnostic performance compared with contrast-enhanced CT. Eur Radiol (2013)

Courtesy of DR HANS PETER WESKOTT - Germany



LOGIQ
E9



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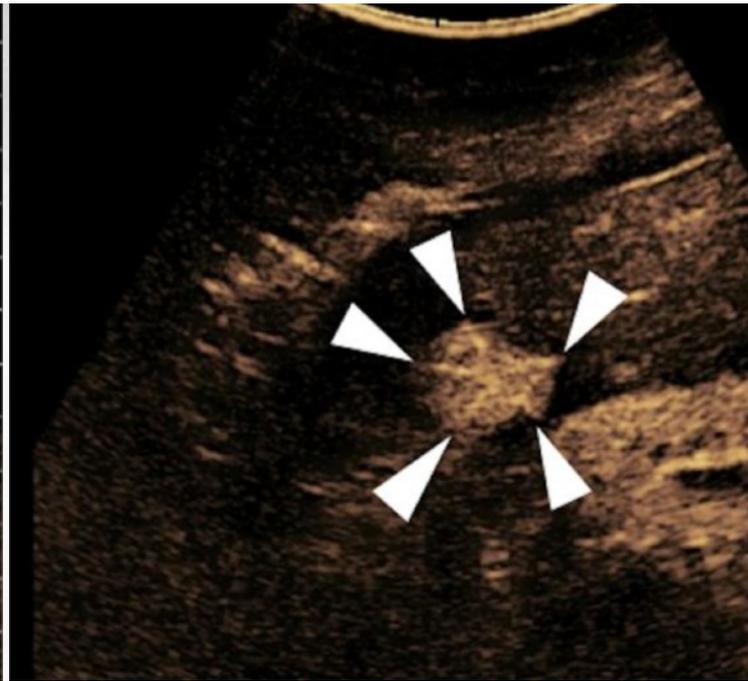
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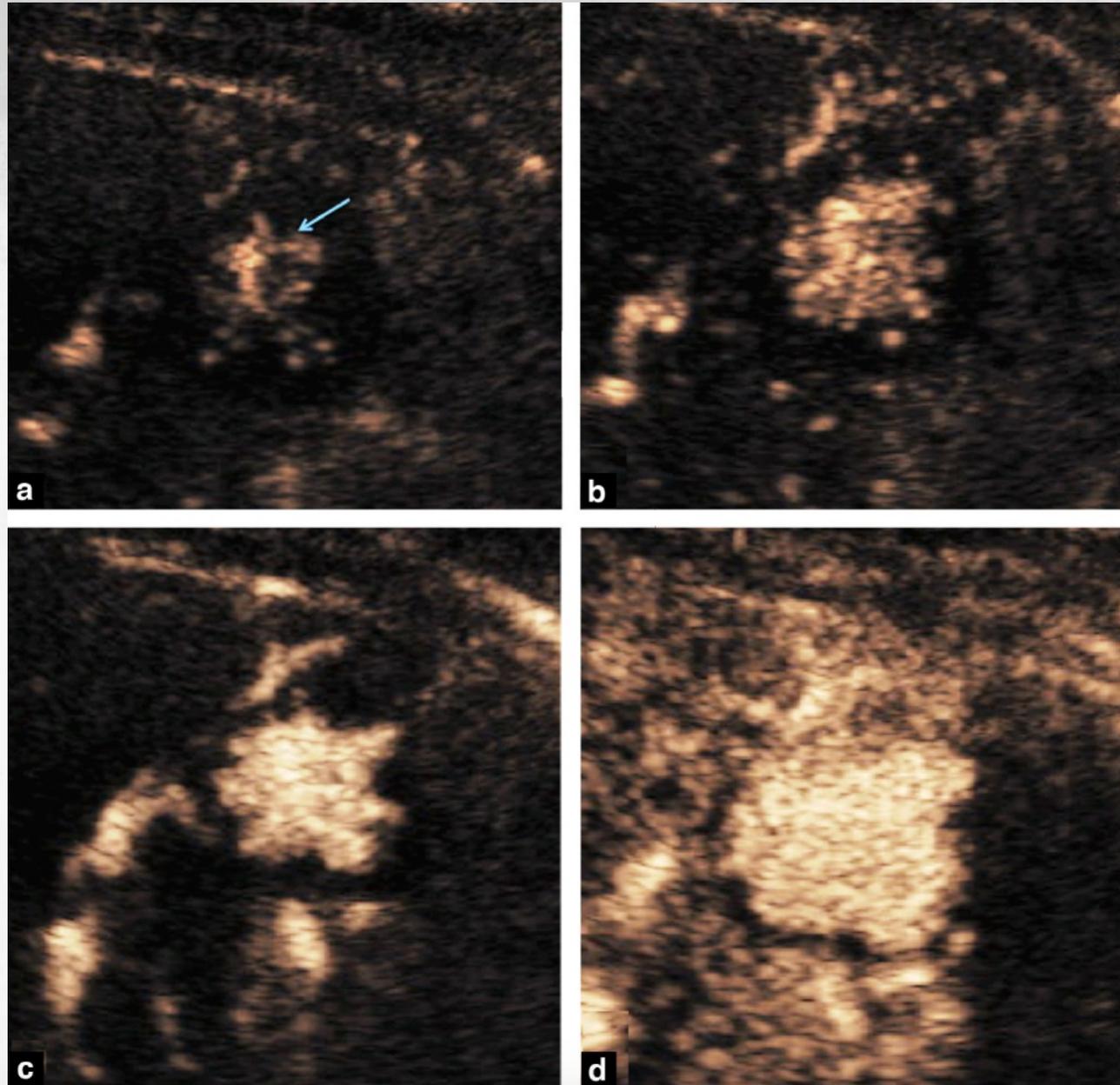
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T1: 0:08

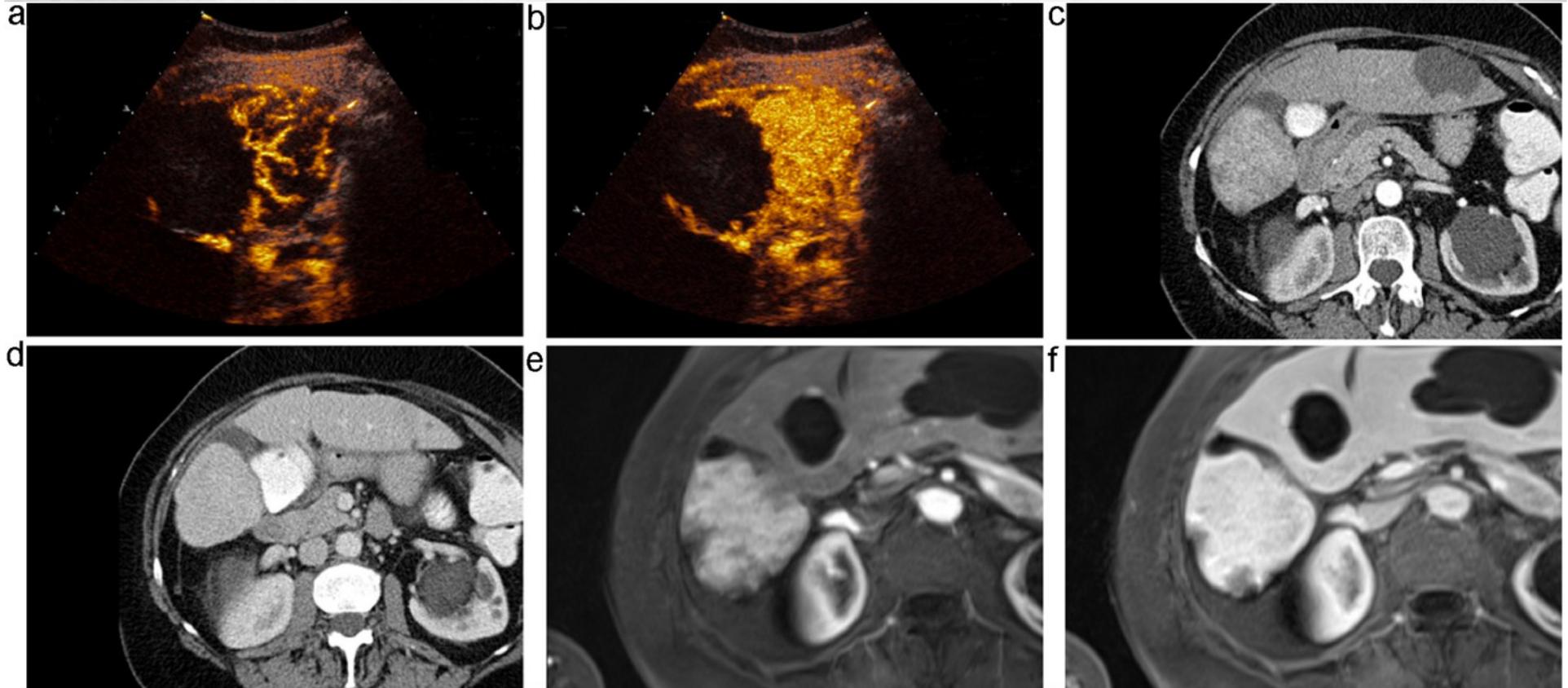


Dioguardi Burgio M et al. Imaging of Hepatic Focal Nodular Hyperplasia : pictorial review and diagnostic strategy. Seminars in ultrasound, CT and MRI (2017)



Alberti N et al. Interest of contrast-enhanced sonography to identify focal nodular hyperplasia with sinusoidal dilatation. DII (2014)

Hyperplasie nodulaire focale ECUS



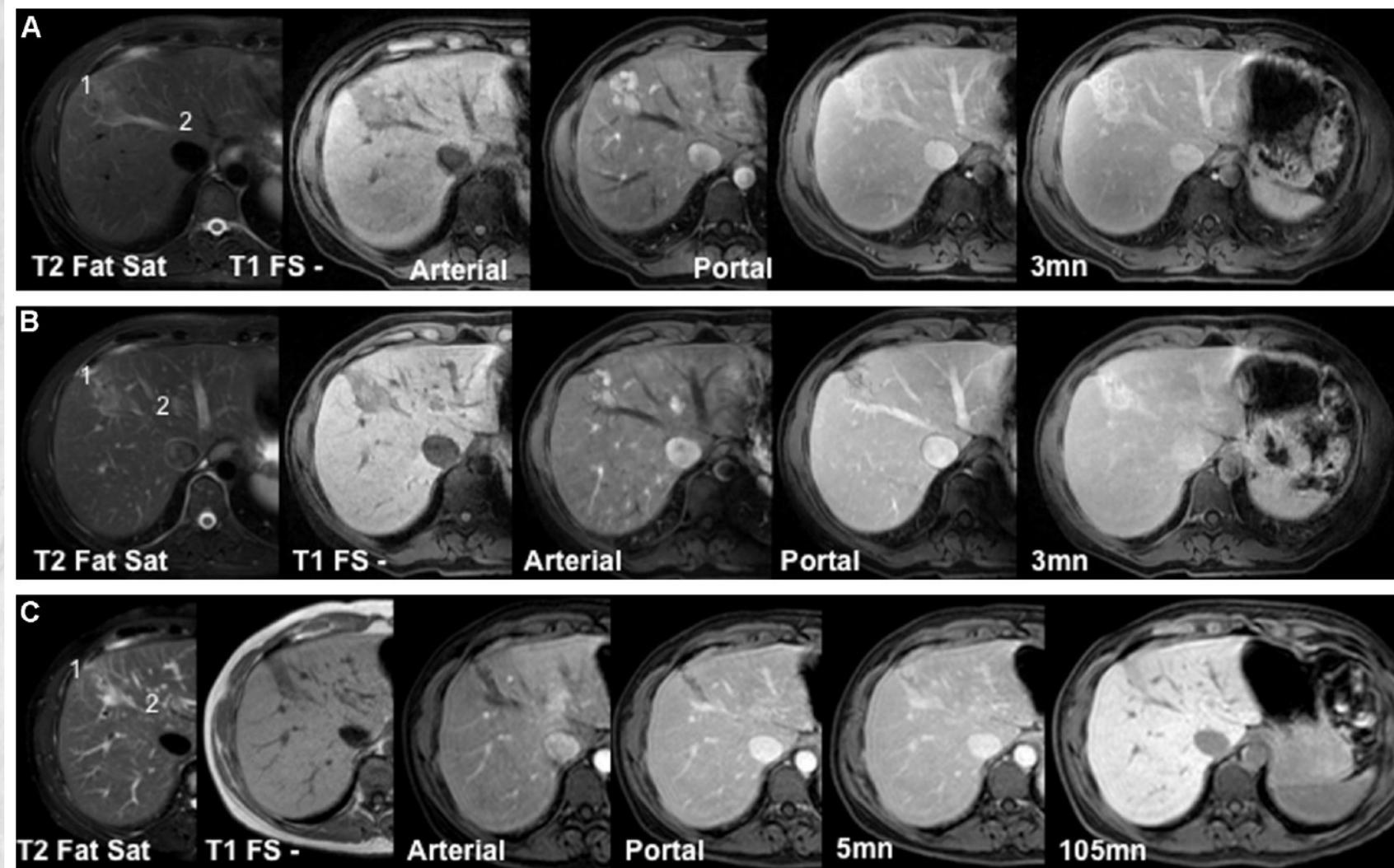
Hyperplasie nodulaire focale

Atypies et phénotypes particuliers

- Variation de taille (20-30%) et évolution fibreuse
- Lésion pédiculée
- Calcifications ou graisse
- Dilatation sinusoidale

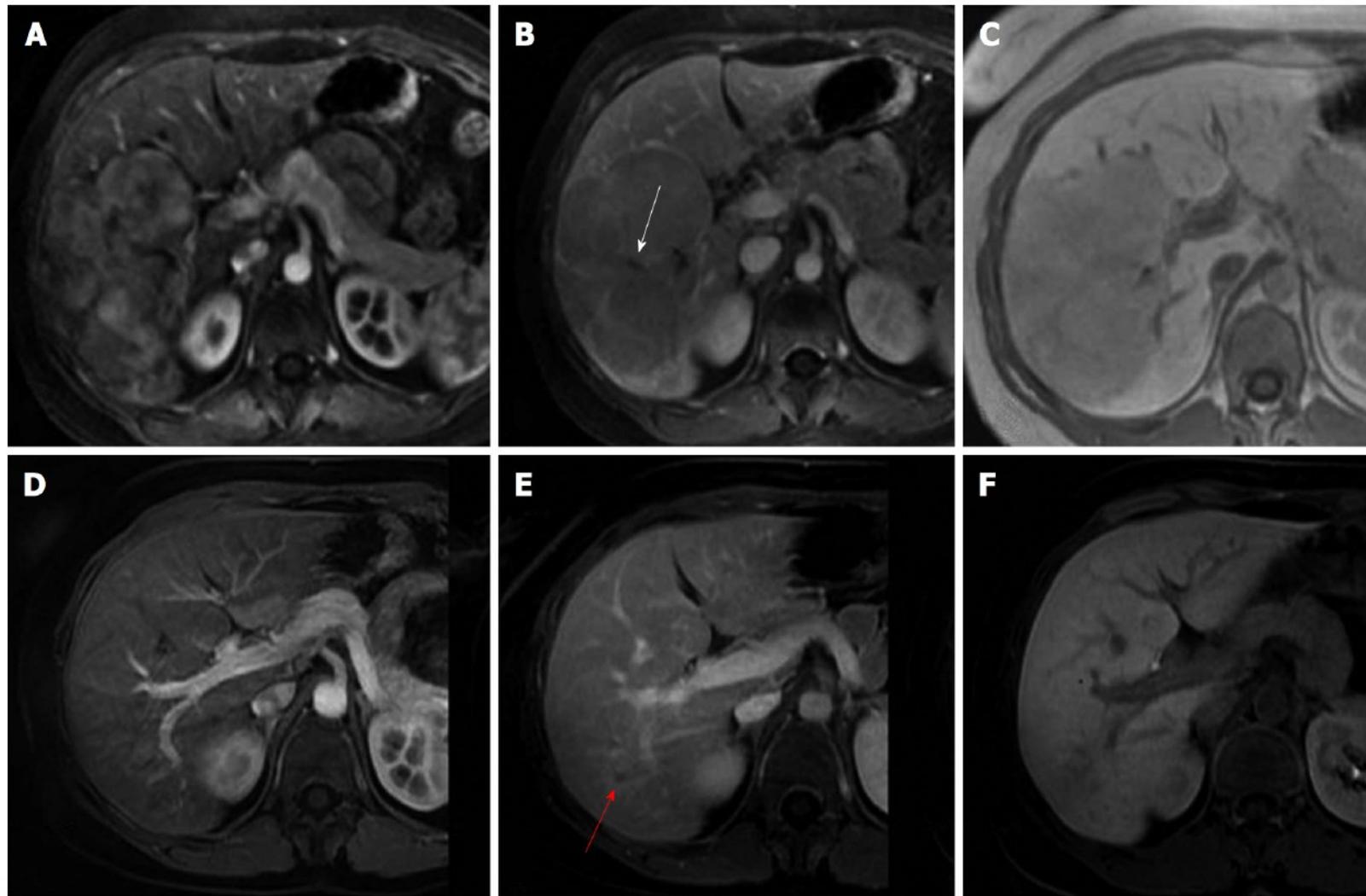
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Hyperplasie nodulaire focale Evolution fibreuse



Crombe A et al. From a typical focal nodular hyperplasia to a fibrotic band with capsular retraction: A case report. DII (2014)

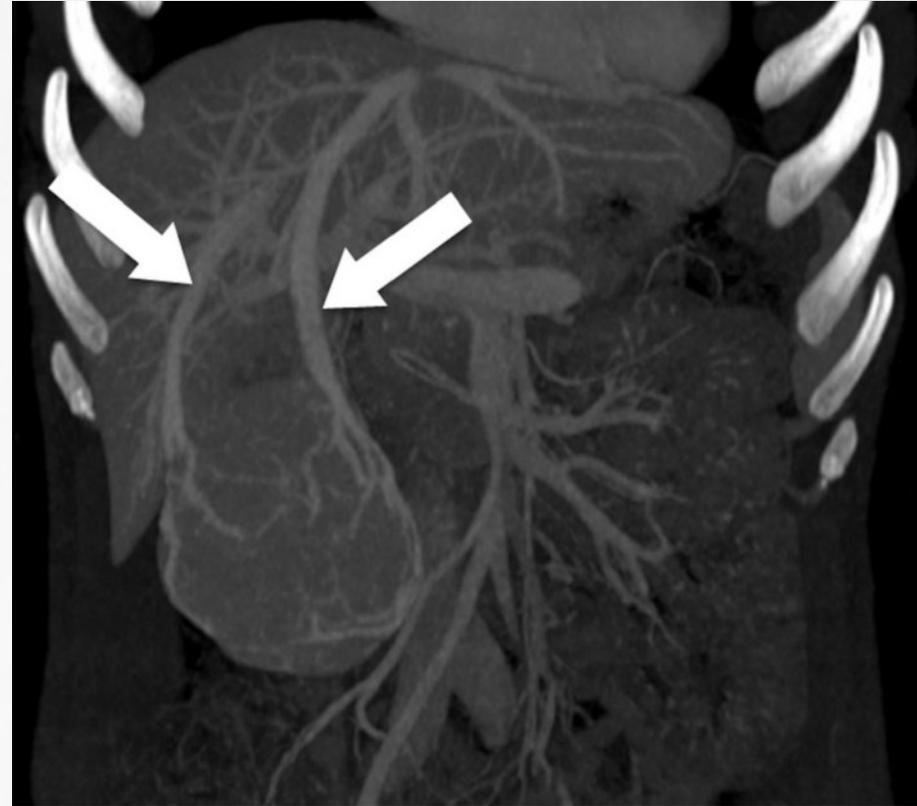
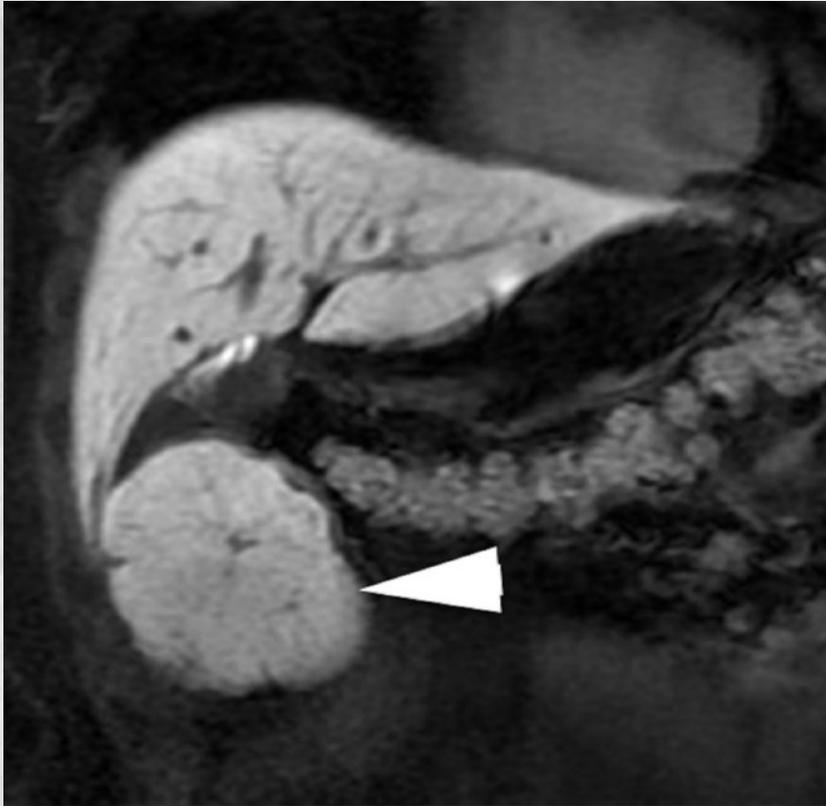
Hyperplasie nodulaire focale Disparition



Mamone G et al. Complete spontaneous regression of giant focal nodular hyperplasia of the liver: Magnetic resonance imaging evaluation with hepatobiliary contrast media. WJG (2016)

Hyperplasie nodulaire focale

Forme pédiculée

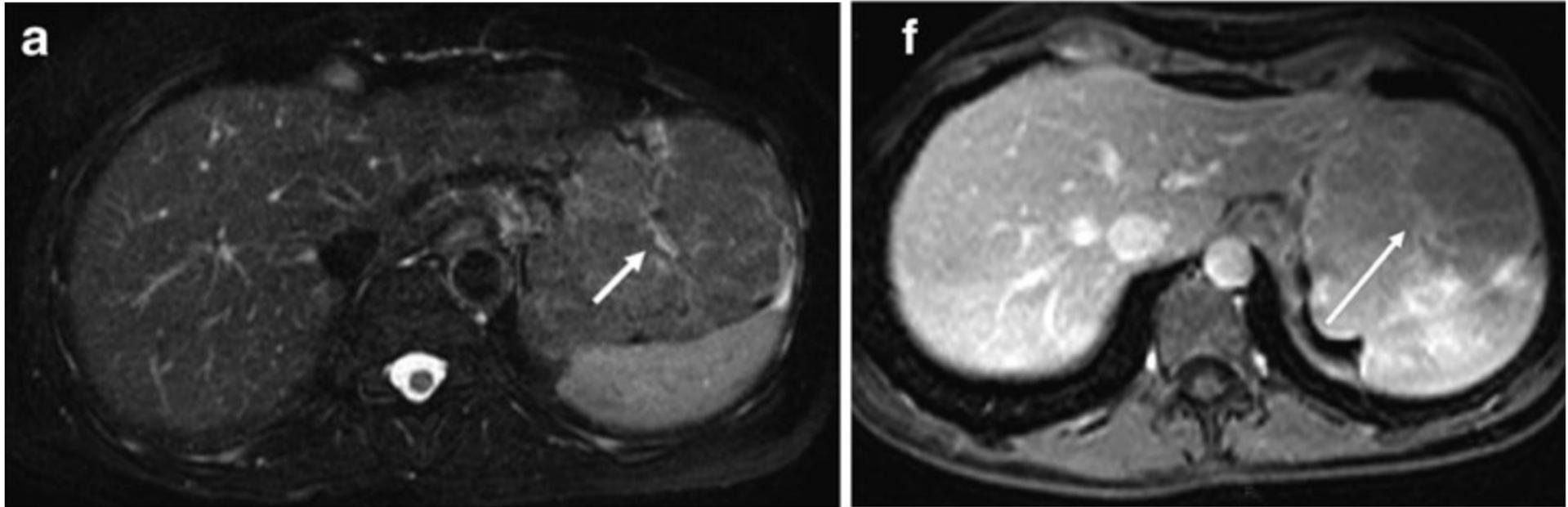


- Deuxième type de lésion pédiculée en fréquence après angiome (9%)
- Asymptomatique dans 80% des cas

Hussain S et al. Focal Nodular Hyperplasia: Findings at State-of-the-Art MR Imaging, US, CT, and Pathologic Analysis Radiographics (2004). Ronot M, Vilgrain V. Imaging of benign hepatocellular lesions: Current concepts and recent updates. Clin Res Hepatol Gastroenterol (2014)

Hyperplasie nodulaire focale

Forme pédiculée

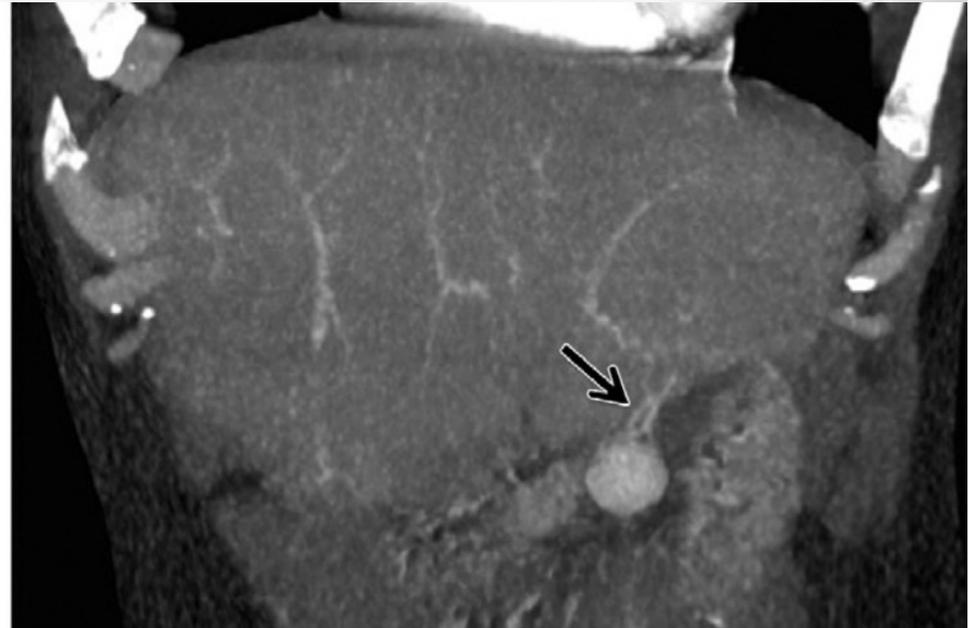


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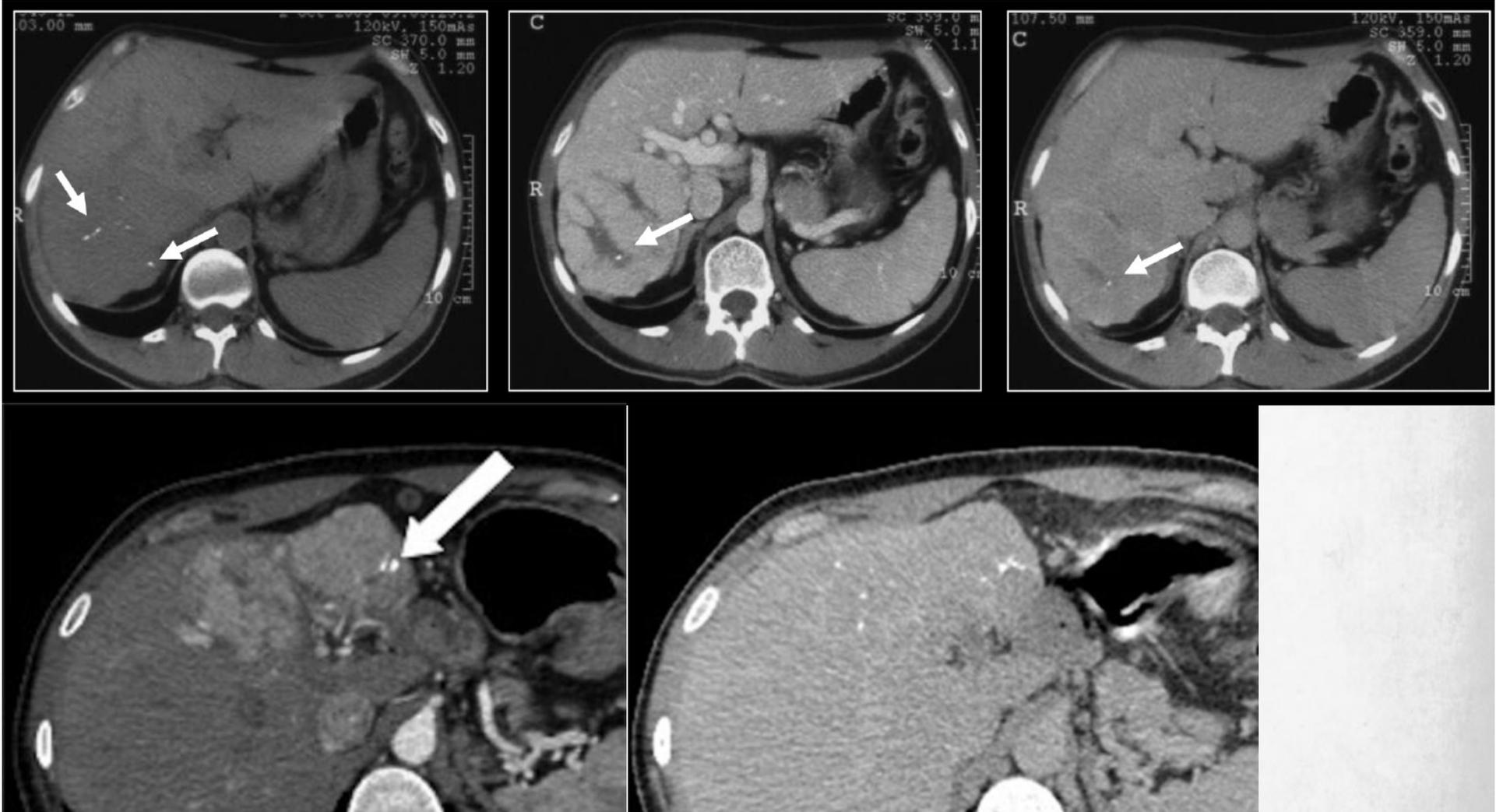
Hyperplasie nodulaire focale

Forme pédiculée



- Deuxième type de lésion pédiculée en fréquence après angiome (9%)
- Asymptomatique dans 80% des cas

Hyperplasie nodulaire focale Calcifications



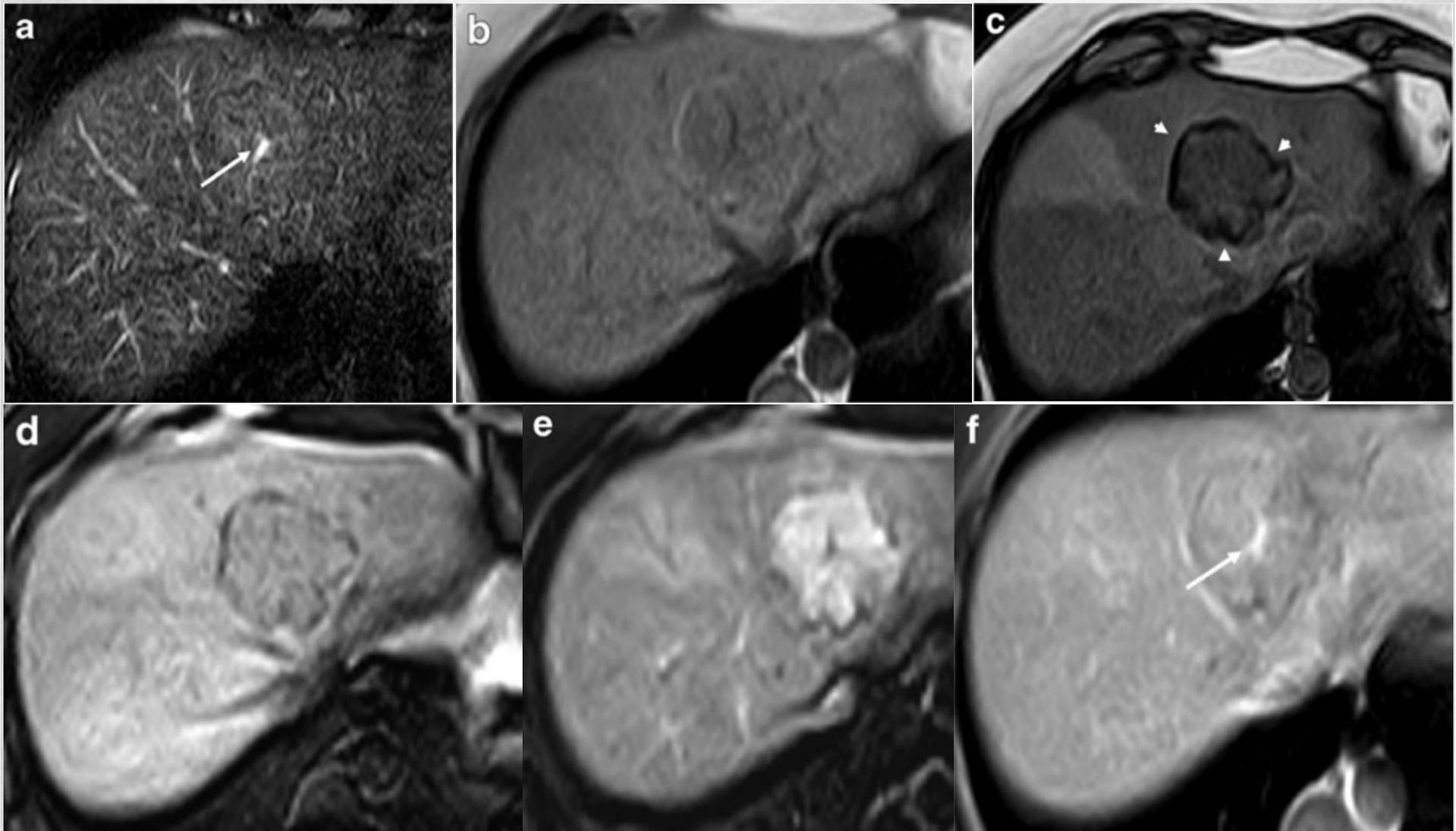
Carlson SK et al. CT of focal nodular hyperplasia of the liver. AJR (2000). Brancatelli G et al. Focal nodular hyperplasia: CT findings with emphasis on multiphasic helical CT in 78 patients. Radiology (2001)

Hyperplasie nodulaire focale Graisse

- Pourcentage important d'HNF stéatosiques (jusqu'à 50 et 85%) dans certaines séries.
- Littérature confuse ! (graisse suspectée sur la présence d'un hypersignal spontané T1 par certains auteurs)
- Graisse intra-lésionnelle= chute de signal sur les séquences en opposition de phase.
- Association statistique : stéatose hépatique/ HNF à contenu graisseux

Ronot M et al. MR findings of steatotic focal nodular hyperplasia and comparison with other fatty tumours. European Radiology (2013)

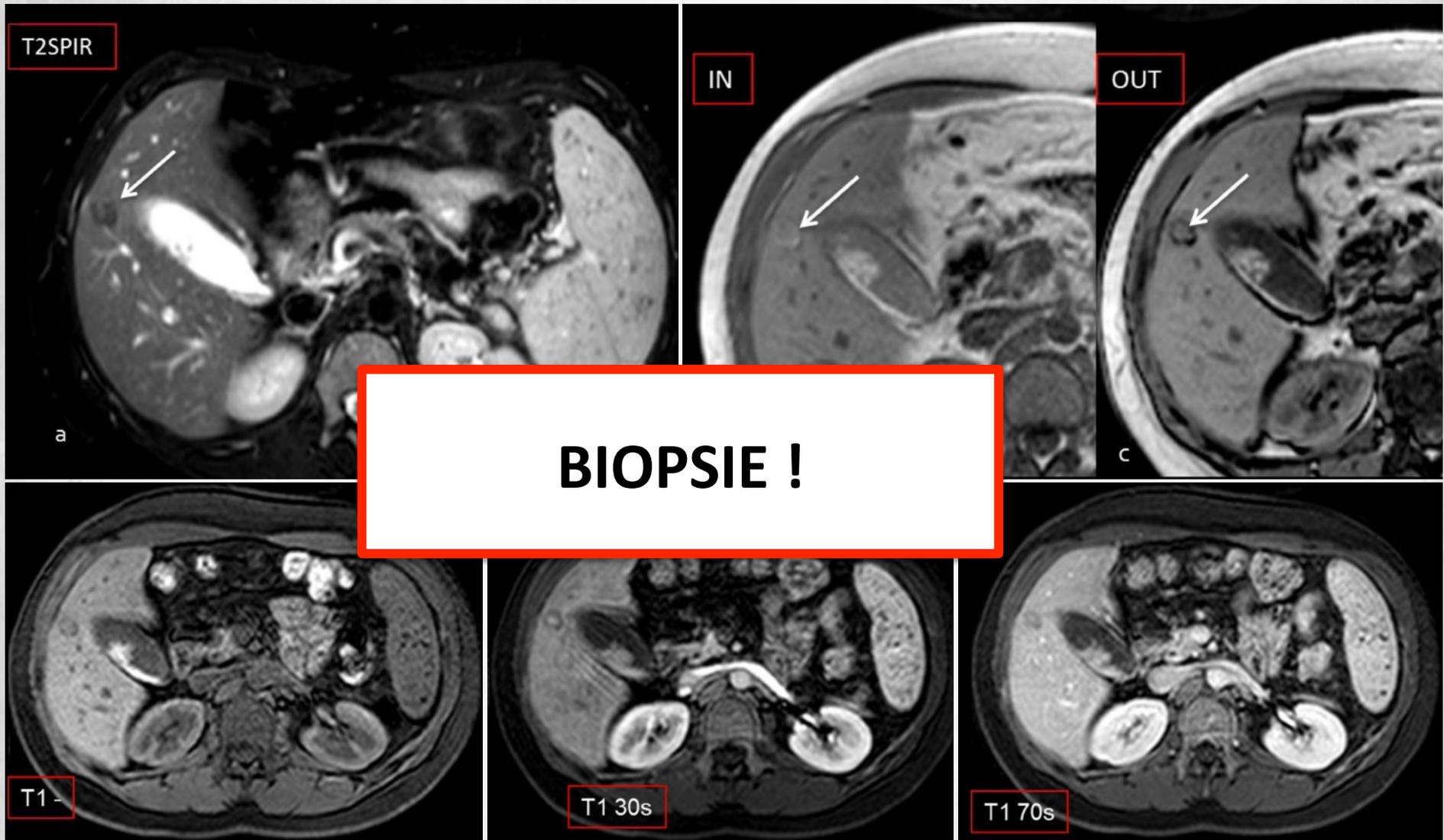
Hyperplasie nodulaire focale Graisse



Ronot M et al. MR findings of steatotic focal nodular hyperplasia and comparison with other fatty tumours. European Radiology (2013)

Hyperplasie nodulaire focale

Graisse : Forme atypique

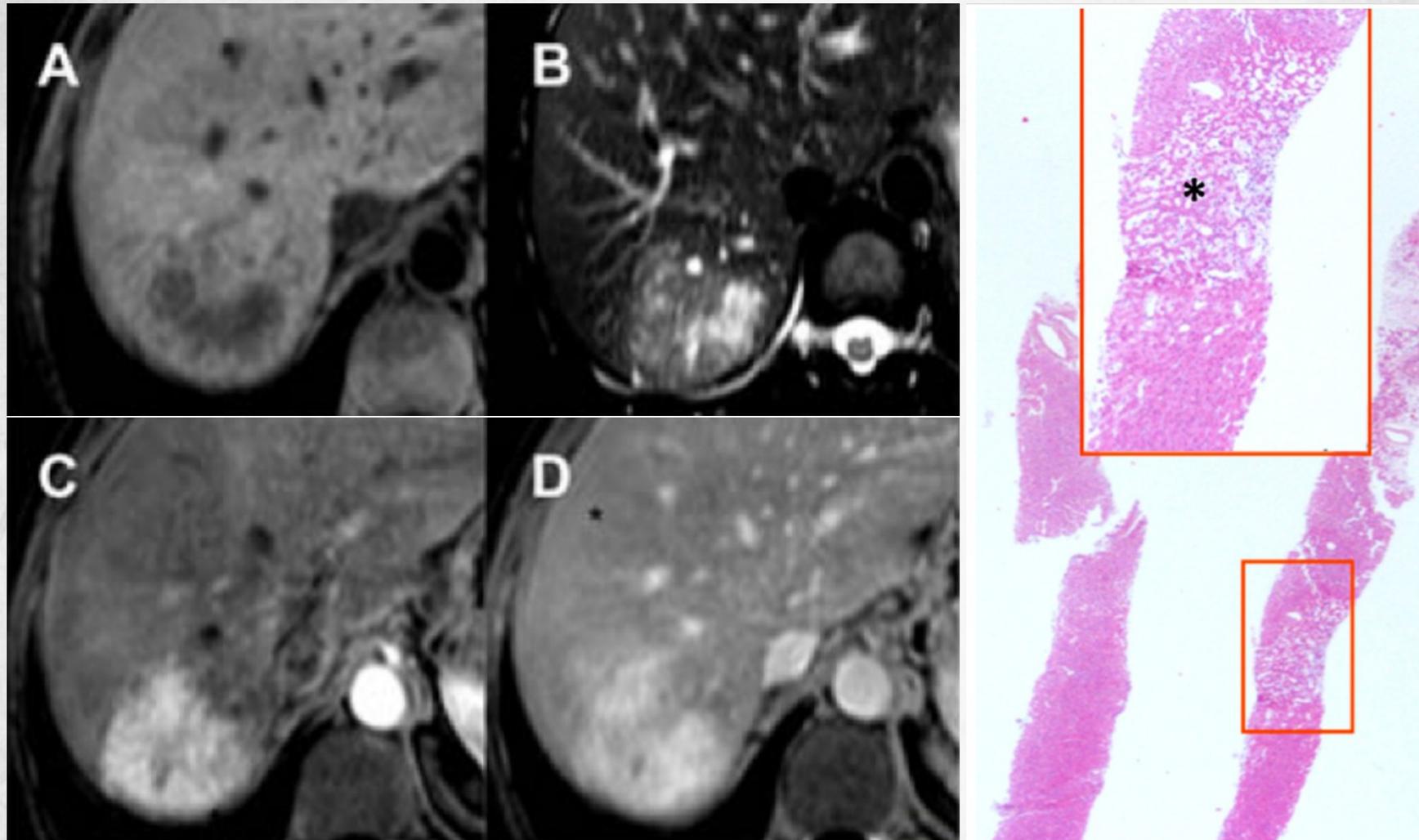


Hyperplasie nodulaire focale Dilatation sinusoidale

- Dilatation sinusoidale , plus ou moins étendue, au sein d'un nodule d'HNF.
- Ancien terme : HNF télangiectasique (terme non approprié).
- Caractéristique majeure des HCA de type inflammatoire
- Intérêt de l'ECUS !!

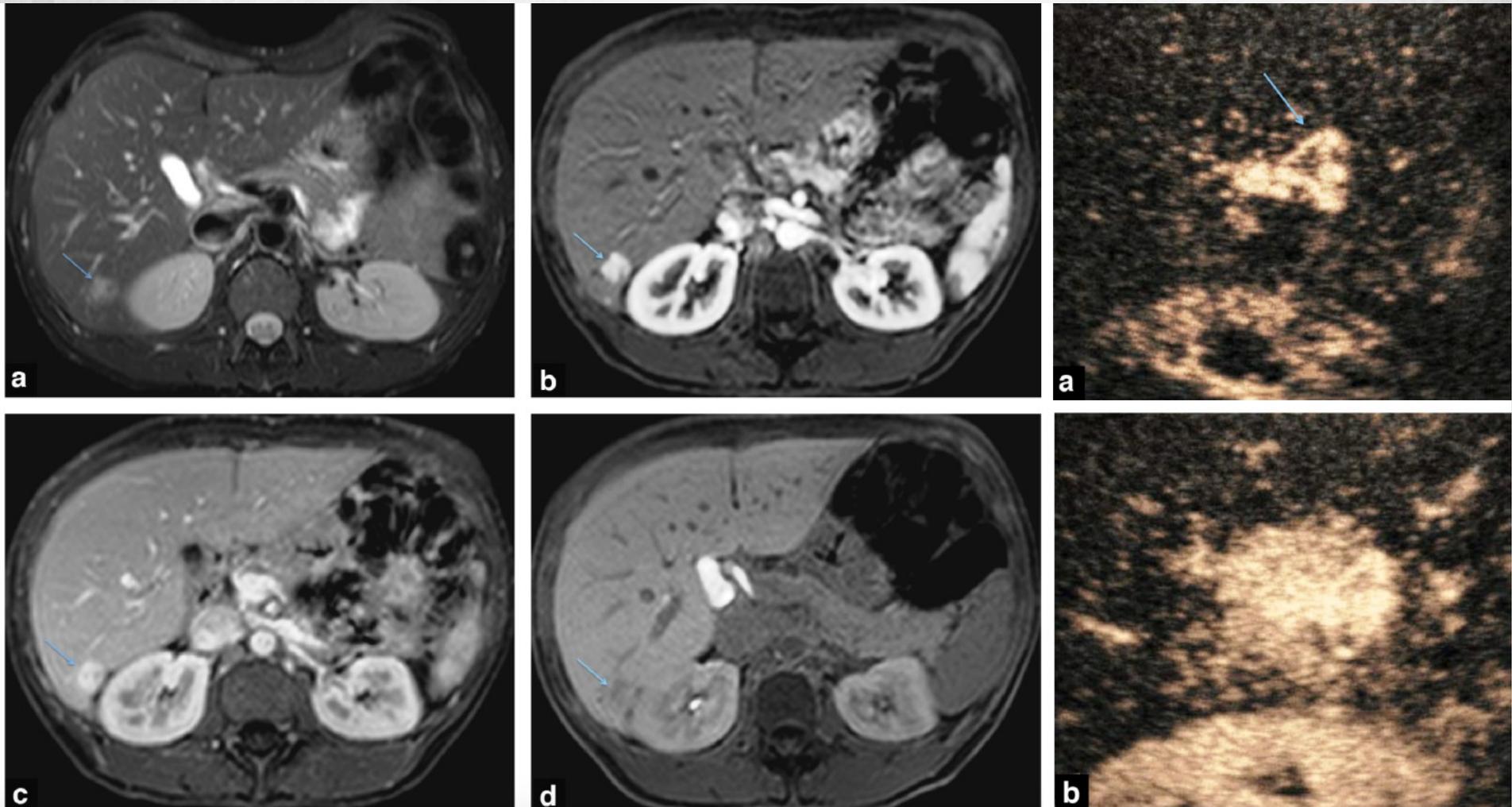
Alberti N et al. Interest of contrast-enhanced sonography to identify focal nodular hyperplasia with sinusoidal dilatation. DII (2014)

Hyperplasie nodulaire focale Dilatation sinusoidale



Laumonier H et al. Focal nodular hyperplasia with major sinusoidal dilatation: a misleading entity. BMJ (2010)

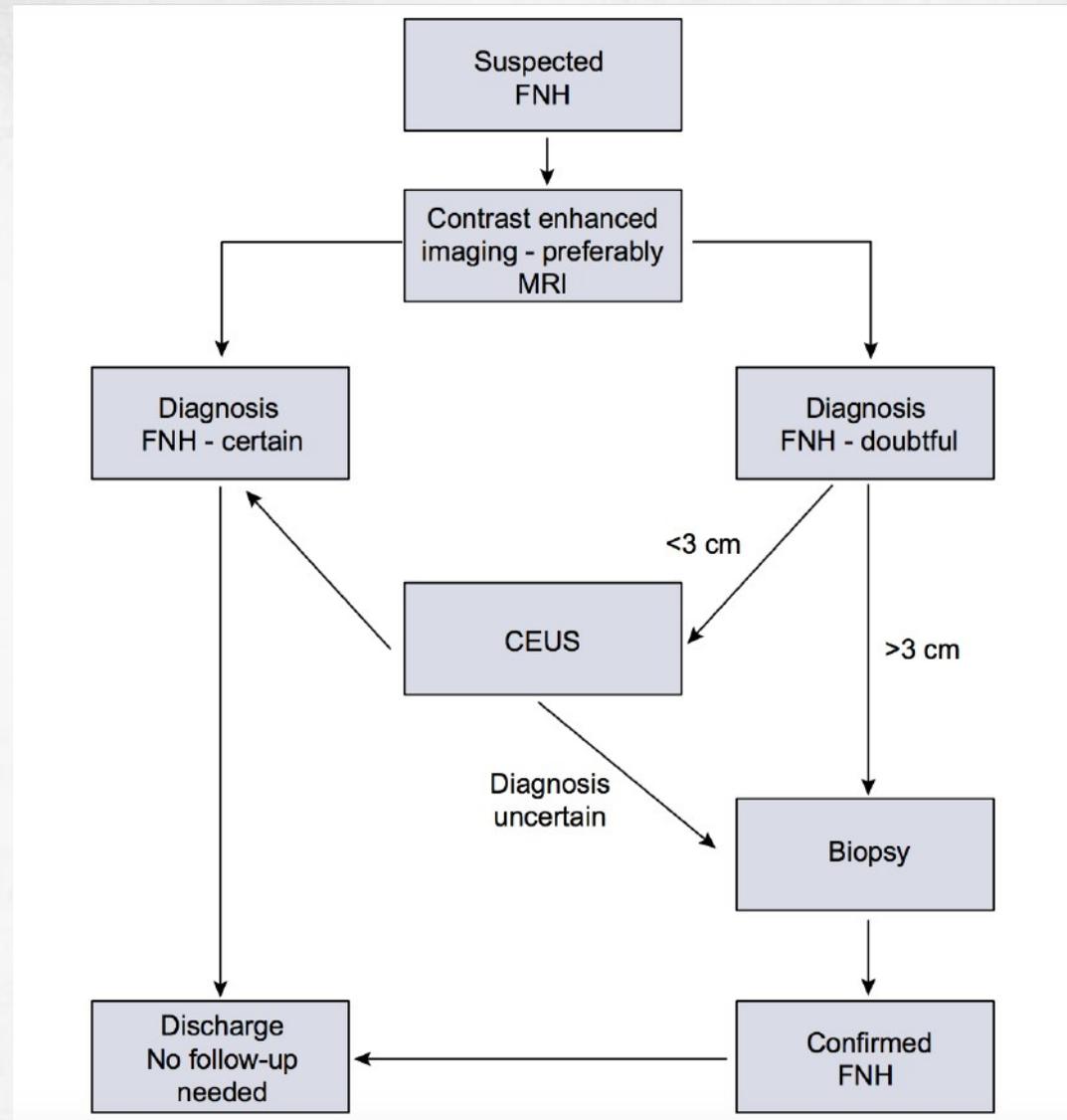
Hyperplasie nodulaire focale Dilatation sinusoidale



Alberti N et al. Interest of contrast-enhanced sonography to identify focal nodular hyperplasia with sinusoidal dilatation. DII (2014)

Hyperplasie nodulaire focale

Recommandations actuelles



Adénome Hépatocellulaire

Epidemiologie

- Lésion néoplasique
- 1/1000
- Femme +++
- Lien avec les contraceptifs oraux
- Association avec des maladies métaboliques (glycogénose, galactosémie)
- Symptomatique dans 20% des cas

Balabaud C et al. Focal Nodular Hyperplasia and Hepatocellular Adenoma around the World Viewed through the Scope of the Immunopathological Classification. International Journal of Hepatology (2013)

Hepatocellular Adenoma Management and Phenotypic Classification: the Bordeaux Experience

Paulette Bioulac-Sage,^{1,2} Hervé Laumonier,³ Gabrielle Couchy,⁴ Brigitte Le Bail,^{1,2} Antonio Sa Cunha,⁵ Anne Rullier,^{1,2} Christophe Laurent,⁶ Jean-Frédéric Blanc,^{2,7} Gaelle Cubel,² Hervé Trillaud,³ Jessica Zucman-Rossi,⁴ Charles Balabaud,^{2,7} and Jean Saric⁶

Characteristic	HCA				
	LFABP(−) HCA	SAA/CRP(+) HCA*	β-Catenin HCA	Without Specific Marker	Not Suitable for Immunohistochemistry
Number of cases (women)	46 (44)	63 (53)	7 (7)	6 (6)	6 (6)
Median age (extremes)	40 (23/65)	41 (25/59)	35 (21/66)	28 (24/48)	47 (35/52)
BMI ≥ 25	7	27†	1	1	3
Steatosis (nontumoral liver)	5	24†	2	3	2
Bleeding (tumor, liver, peritoneum)	4	10	1	2	6
HCC/death related to HCC/death unrelated	0/0/2	2/2/0	3/0/0	0/0/0	0/0/0
Number of nodules (unique/>5)	22/5	42/6	4/1	5/0	5/0
Median size (cm) of the largest HCA (extremes)	5.5 (1/14)	7 (2.8/18)	8 (3.8/10)	5.5 (2/8)	8.5 (2.2/15)
Resected HCA (≥5 cm/<5 cm)	26/20	50/13	5/2	5/1	4/2
Complete resection	31	47	6	6	6
Outcome (>1 year) after complete resection	25	41	6	6	5
No HCA	16	40	5	6	5
New HCA/HCC/nodules noncharacterized	7/0/2	0/0/1	0/1/0	0	0
Outcome (>1 year) after incomplete resection	13	13	1	0	1
No HCA	0	4	0	0	1
HCA/HCC/nodules noncharacterized	13/0/0	7/2/0	0/0/1	0	0

*There were 54 cases of SAA/CRP(+) (47 women) and 9 cases of SAA/CRP(+) β-catenin (+) (6 women).

† $P < 0.005$.

Adénome Hépatocellulaire

Sous types

INFLAMMATOIRE (50%)

HNF1 ALPHA (35%)

BETA CATENIN (10%)

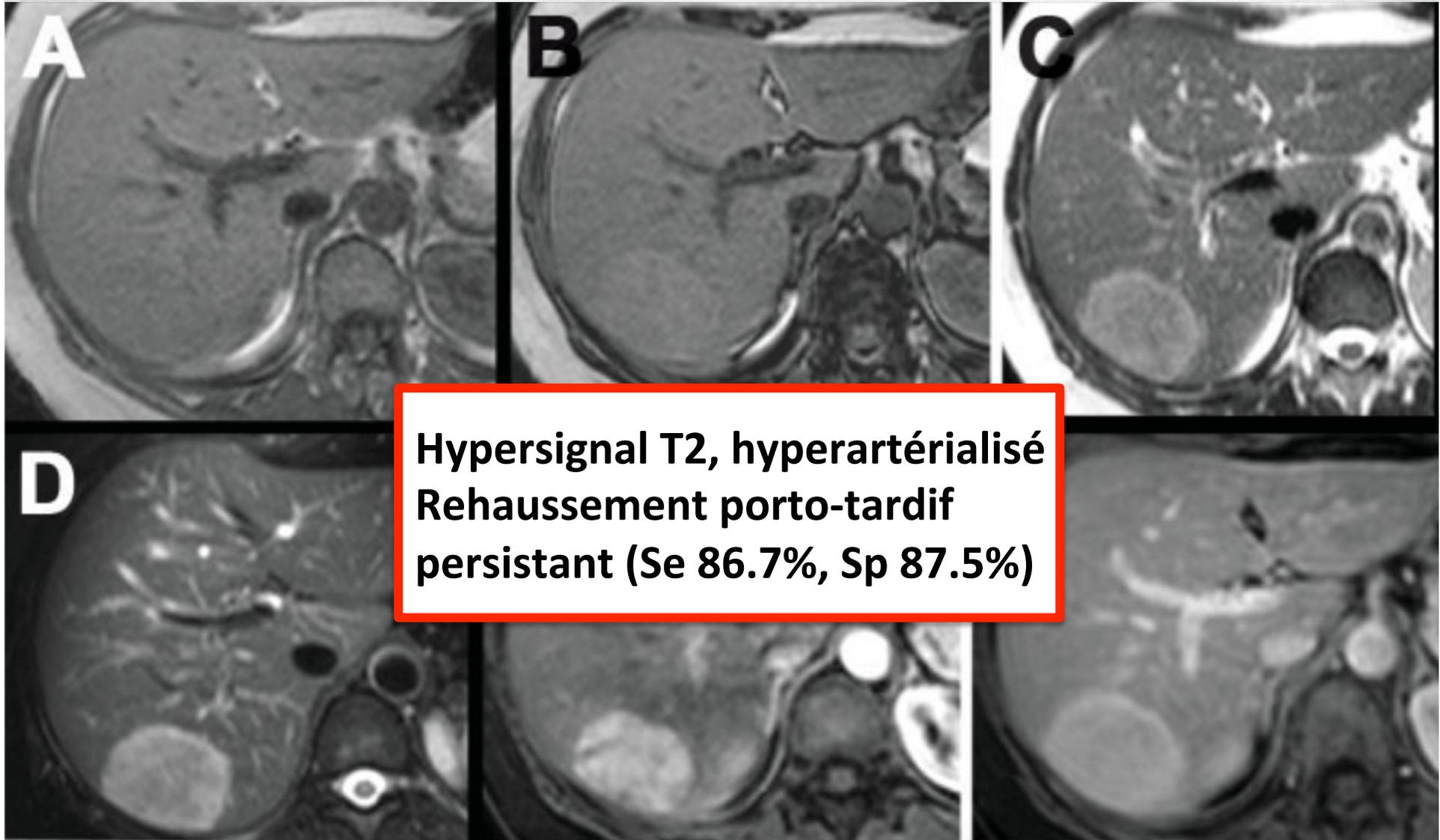
INCLASSE (5%)

Balabaud C et al. Focal Nodular Hyperplasia and Hepatocellular Adenoma around the World Viewed through the Scope of the Immunopathological Classification. International Journal of Hepatology (2013)

Adénome Hépatocellulaire Inflammatoire

- Mutation IL6 (chromosome 5q11)
- Obésité +++
- Anémie et syndrome inflammatoire
- Association à la mutation Beta Catenin dans 10% des cas

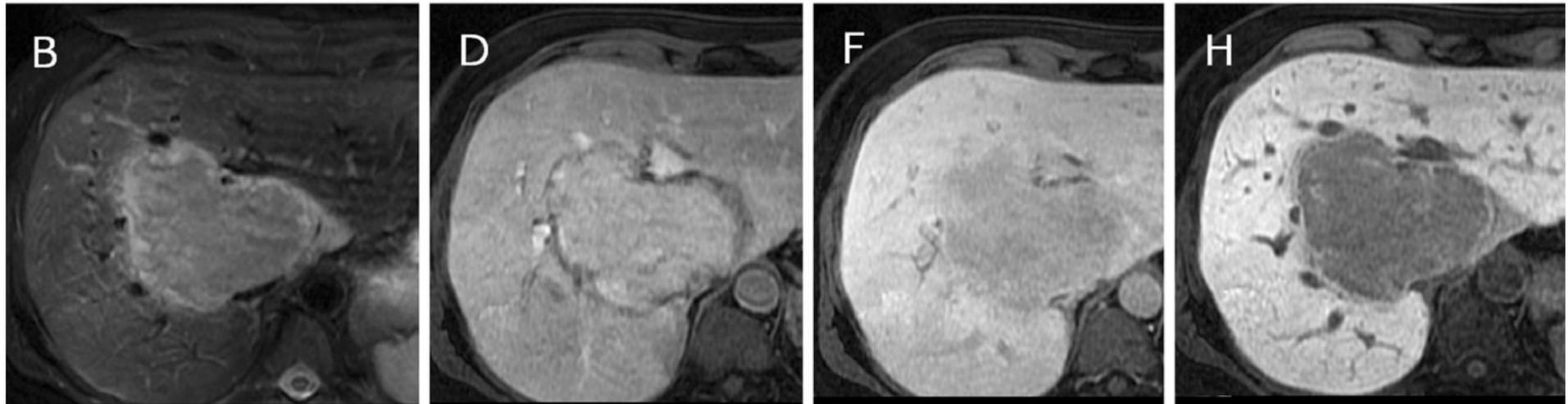
Adénome Hépatocellulaire Inflammatoire



**Hypersignal T2, hyperartérialisé
Rehaussement porto-tardif
persistant (Se 86.7%, Sp 87.5%)**

Laumonier H et al. Hepatocellular Adenomas: Magnetic Resonance Imaging Features As a Function of Molecular Pathological Classification. Hepatology (2008).

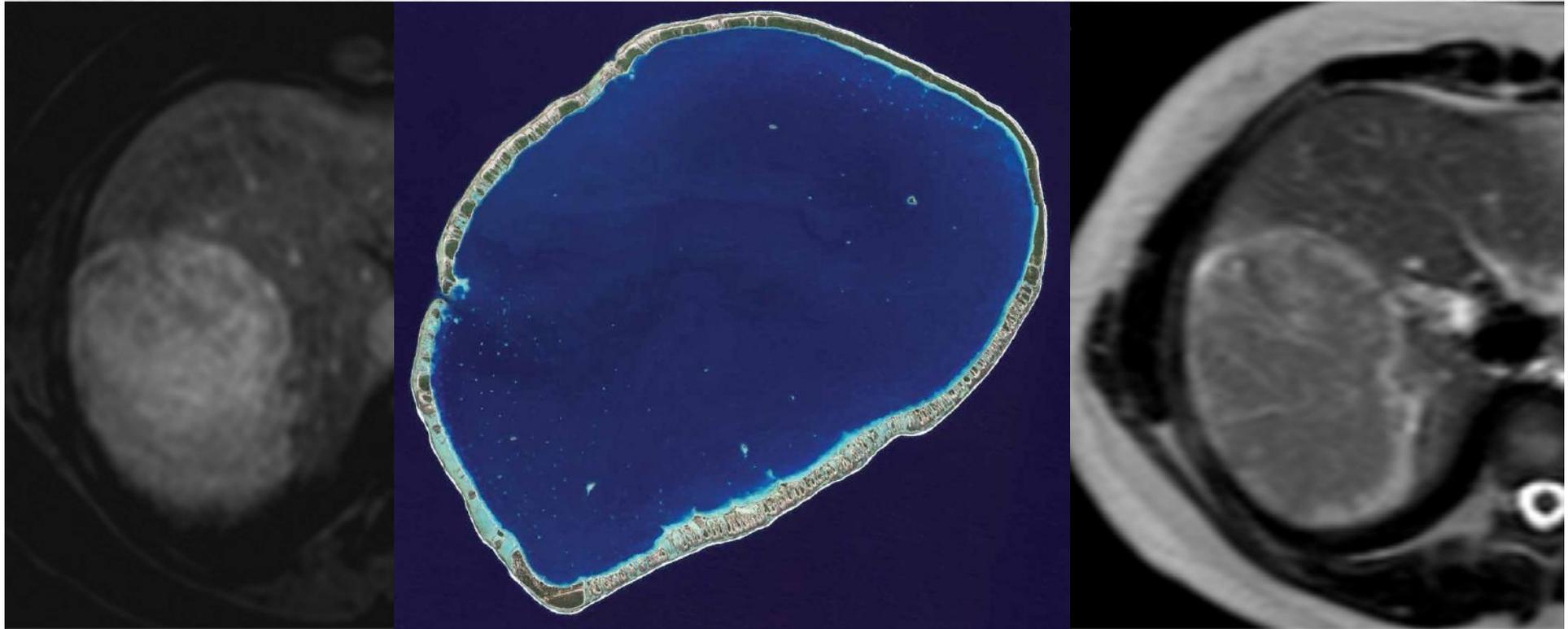
Adénome Hépatocellulaire Inflammatoire



**HYPOSIGNAL SUR LA
PHASE HEPATO-BILIAIRE**

Grieser C et al. Gadoteric acid enhanced MRI for differentiation of FNH and HCA: a single centre experience. Eur Radiol (2014)

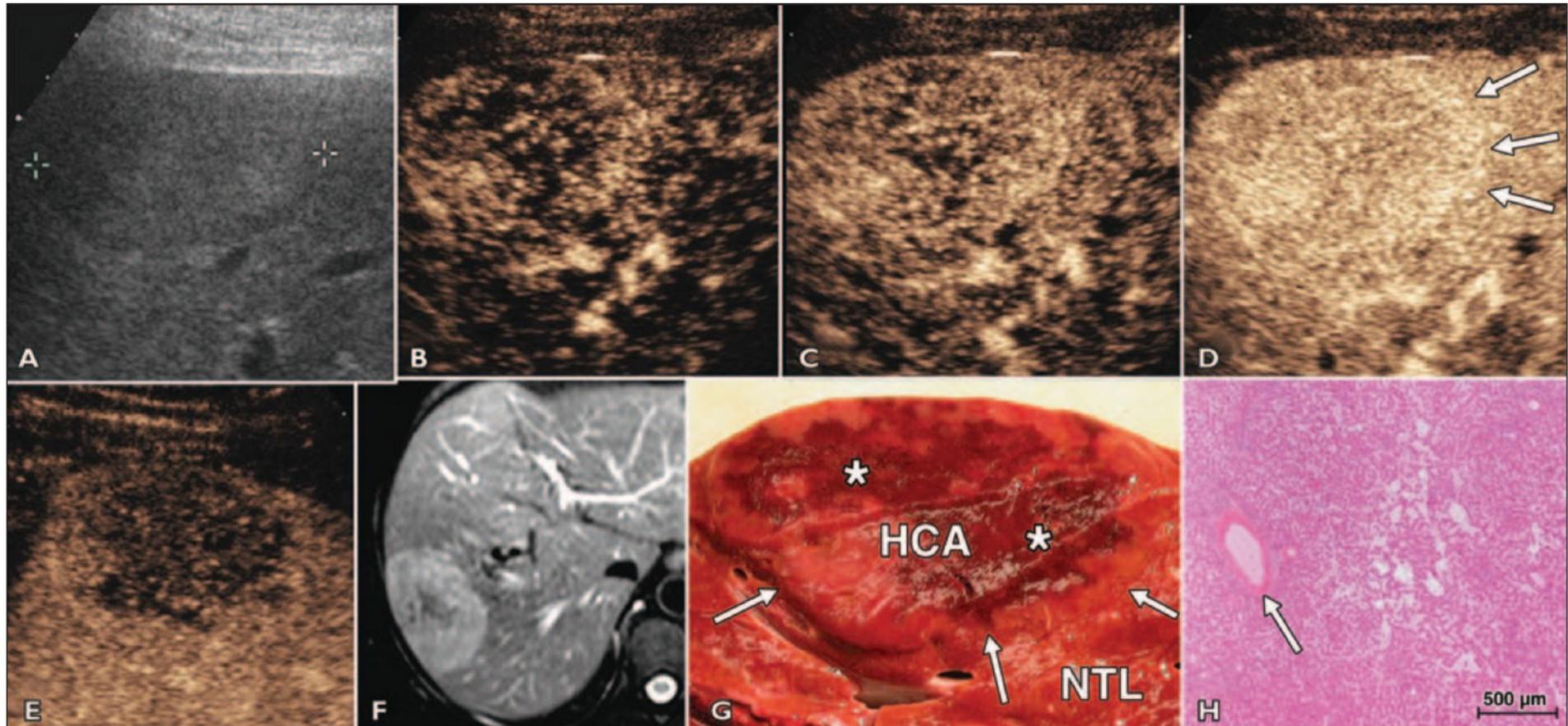
Adénome Hépatocellulaire Inflammatoire



ATOLL SIGN
SPECIFICITE : 100%

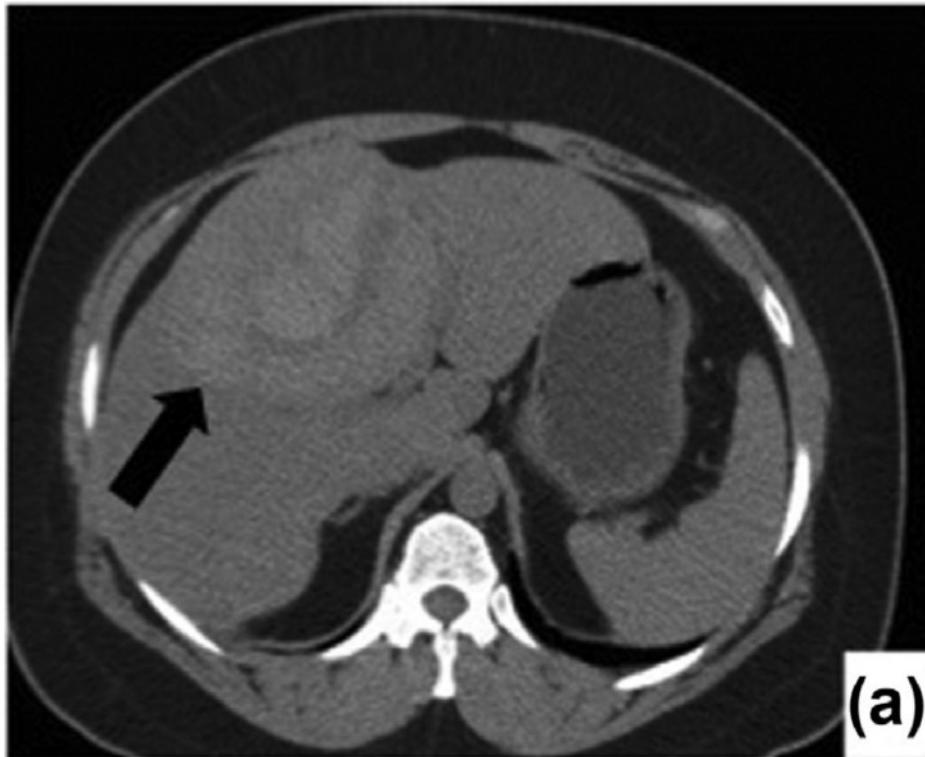
Van Aalten et al. Hepatocellular Adenomas: Correlation of MR Imaging Findings with Pathologic Subtype Classification. Radiology (2011)

Adénome Hépatocellulaire Inflammatoire



Laumonier H et al. Role of Contrast-Enhanced Sonography in Differentiation of Subtypes of Hepatocellular Adenoma: Correlation with MRI Findings. AJR (2011). Manichon AF et al. Hepatocellular Adenoma: Evaluation with Contrast-Enhanced Ultrasound and MRI and Correlation with Pathologic and Phenotypic Classification in 26 Lesions . HPB surgery (2012)

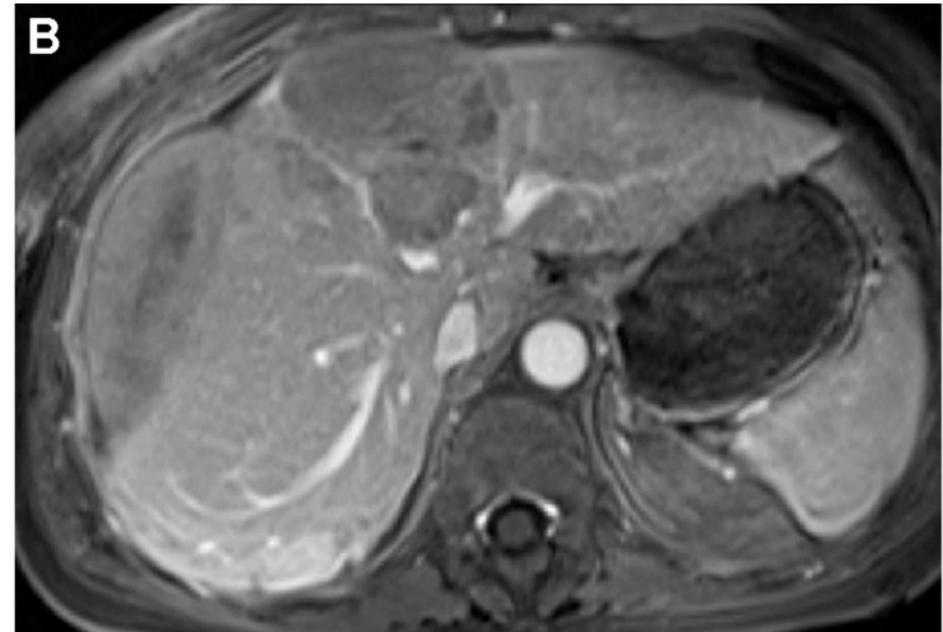
Adénome Hépatocellulaire Inflammatoire



**RUPTURE
HEMORRAGIQUE**

Dharmana H, et al., Hepatocellular adenoma: imaging review of the various molecular subtypes. Clinical Radiology (2017).

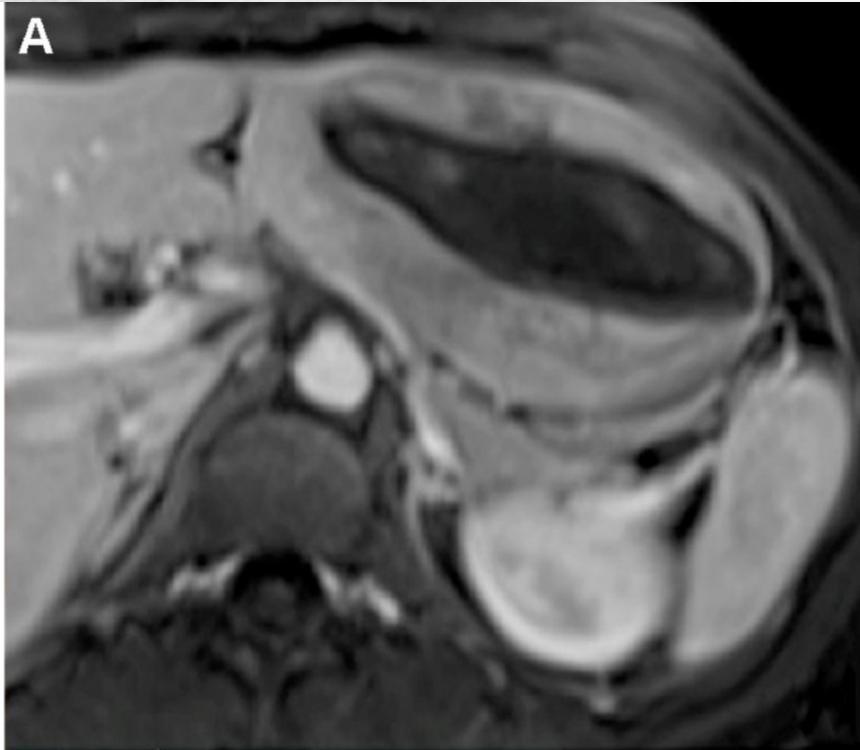
Adénome Hépatocellulaire Inflammatoire



**RUPTURE
HEMORRAGIQUE**

Darnis B, et al. Management of bleeding liver tumors. Journal of Visceral Surgery (2014).

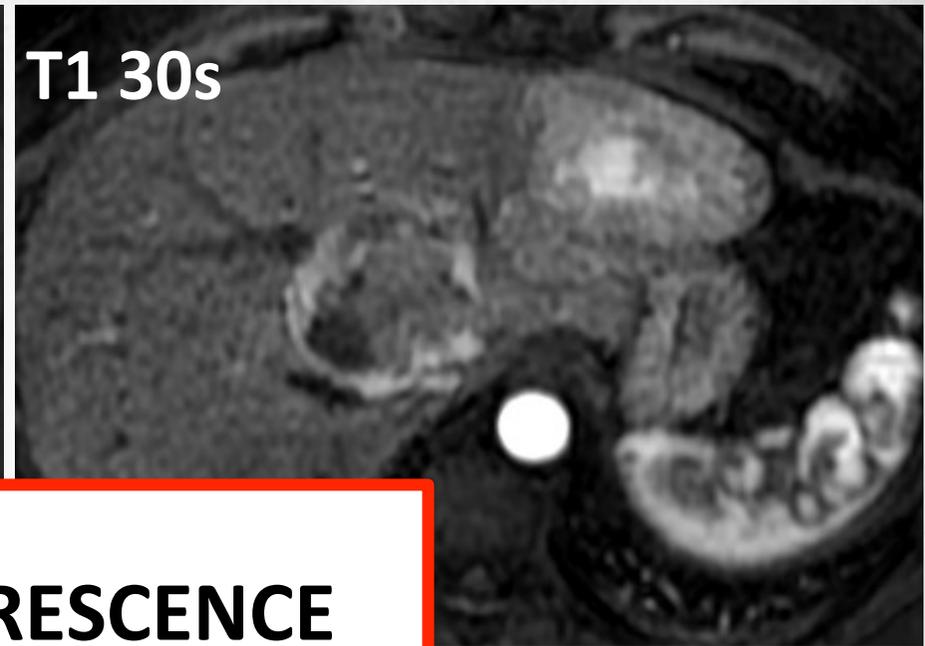
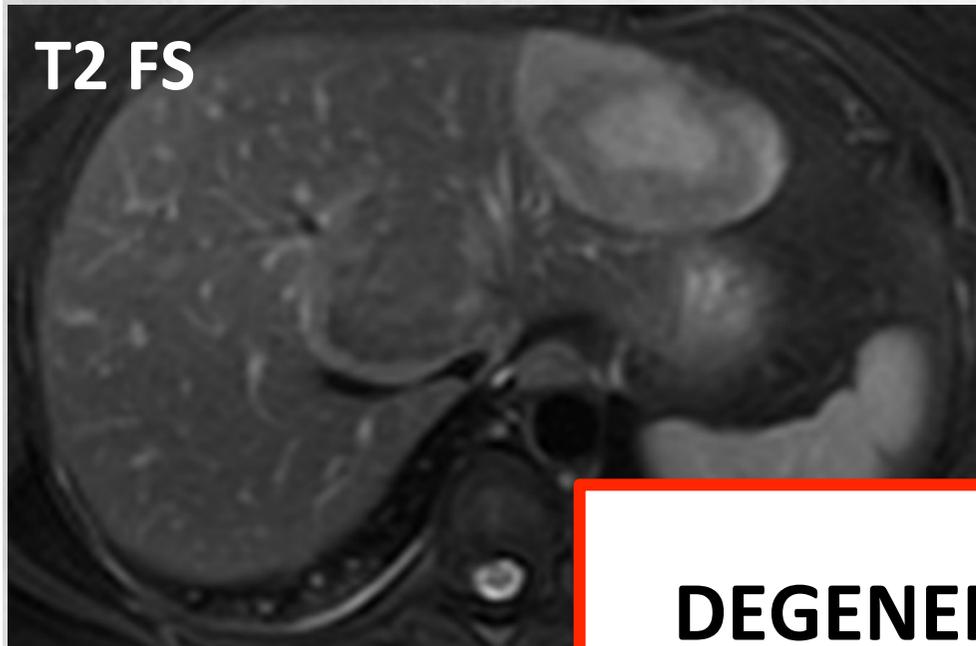
Adénome Hépatocellulaire Inflammatoire



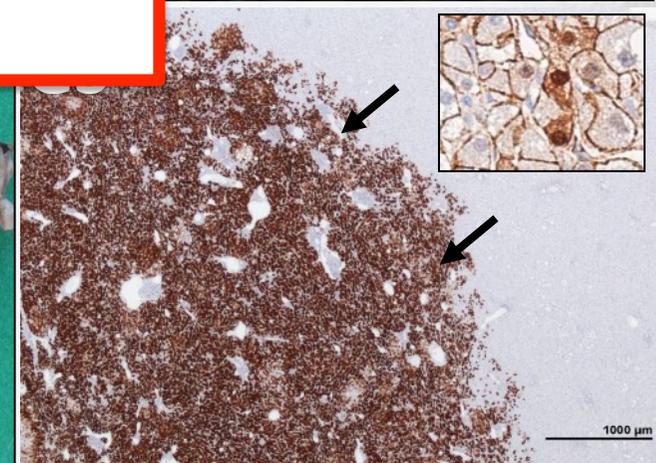
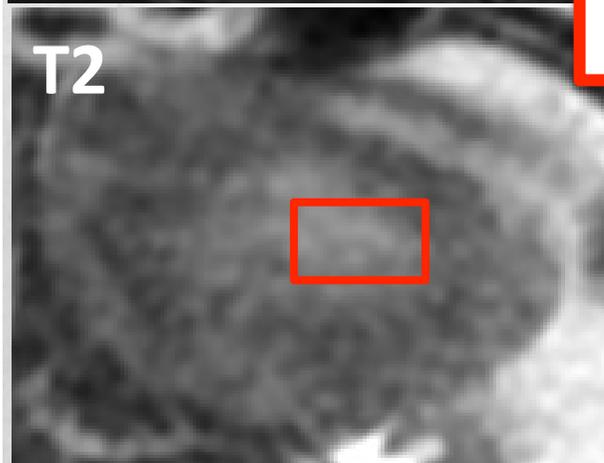
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Dharmana H, et al., Hepatocellular adenoma: imaging review of the various molecular subtypes. Clinical Radiology (2017).

Adénome Hépatocellulaire Inflammatoire



DEGENERESCENCE



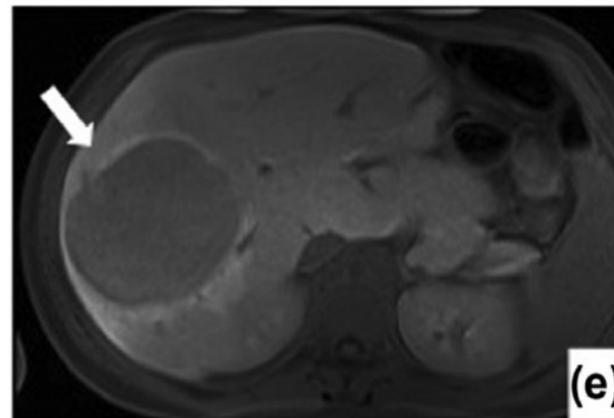
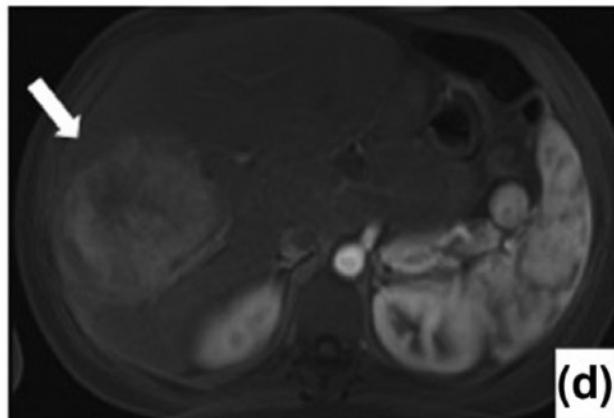
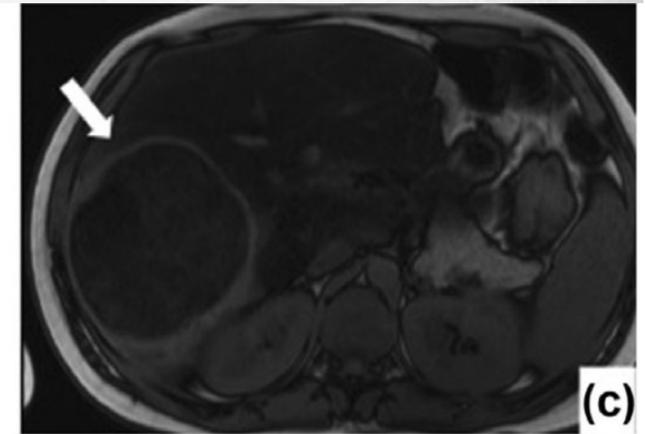
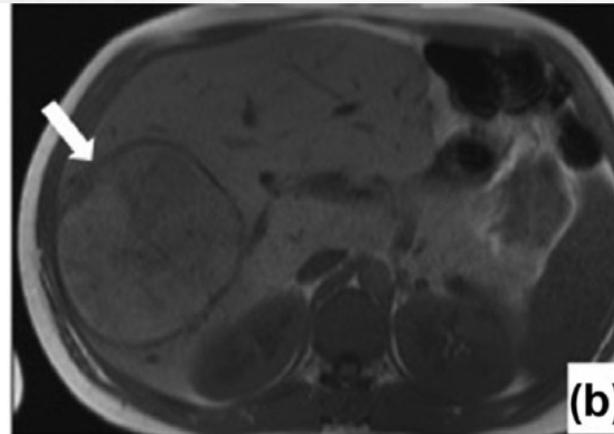
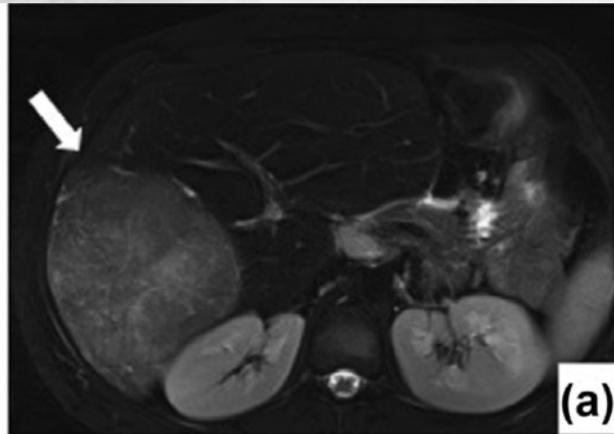
***Alberti N et al. Steatotic hepatocellular adenomas with different phenotypic subtypes:
A case report. CLINRE (2015)***

Adénome Hépatocellulaire HNF1 ALPHA

- Mutation TCF1 (chromosome 12q24)
- MODY3
- Dégénérescence exceptionnelle
- Asymptomatique

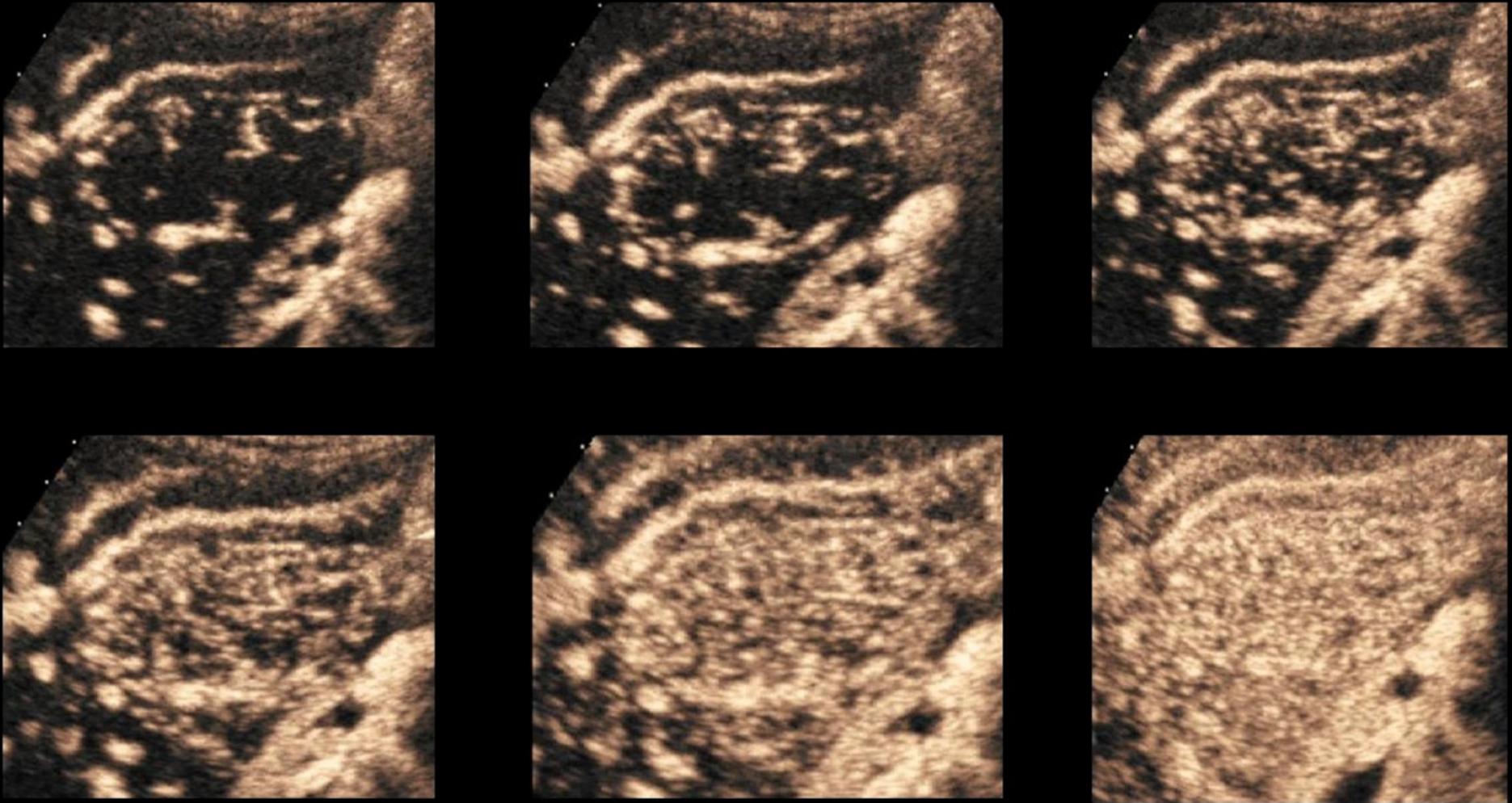
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Adénome Hépatocellulaire HNF1 ALPHA



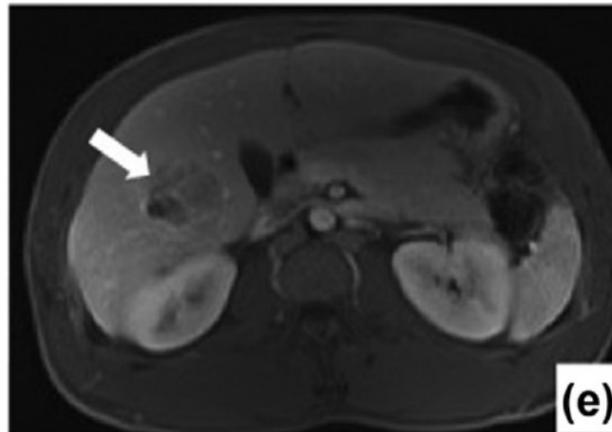
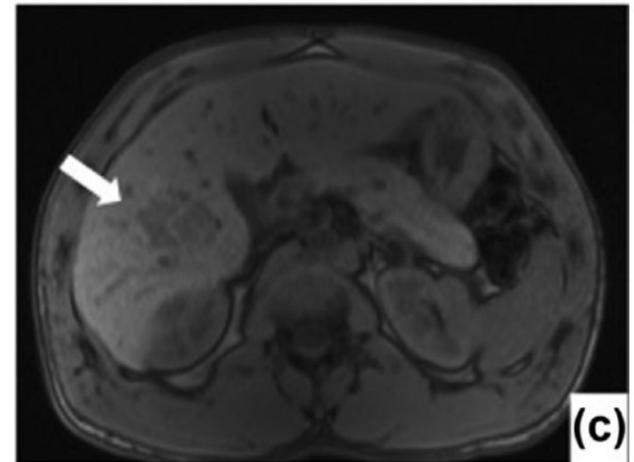
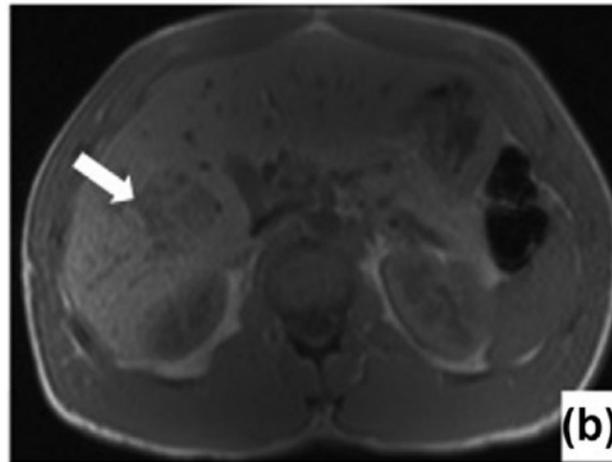
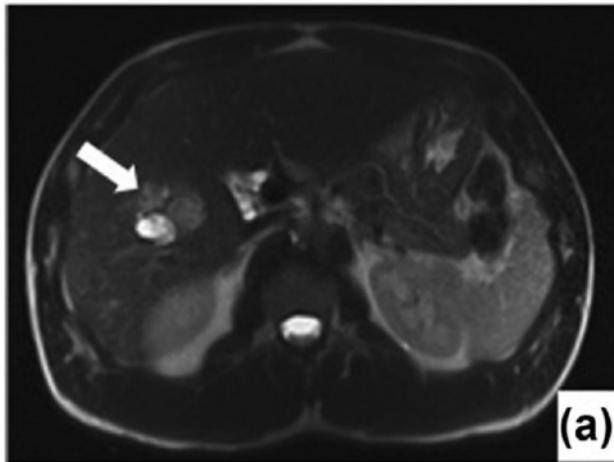
**Chute homogène
et diffuse du signal
en Out Phase (Se
86.7% , Sp 100%)**

Adénome Hépatocellulaire HNF1 ALPHA



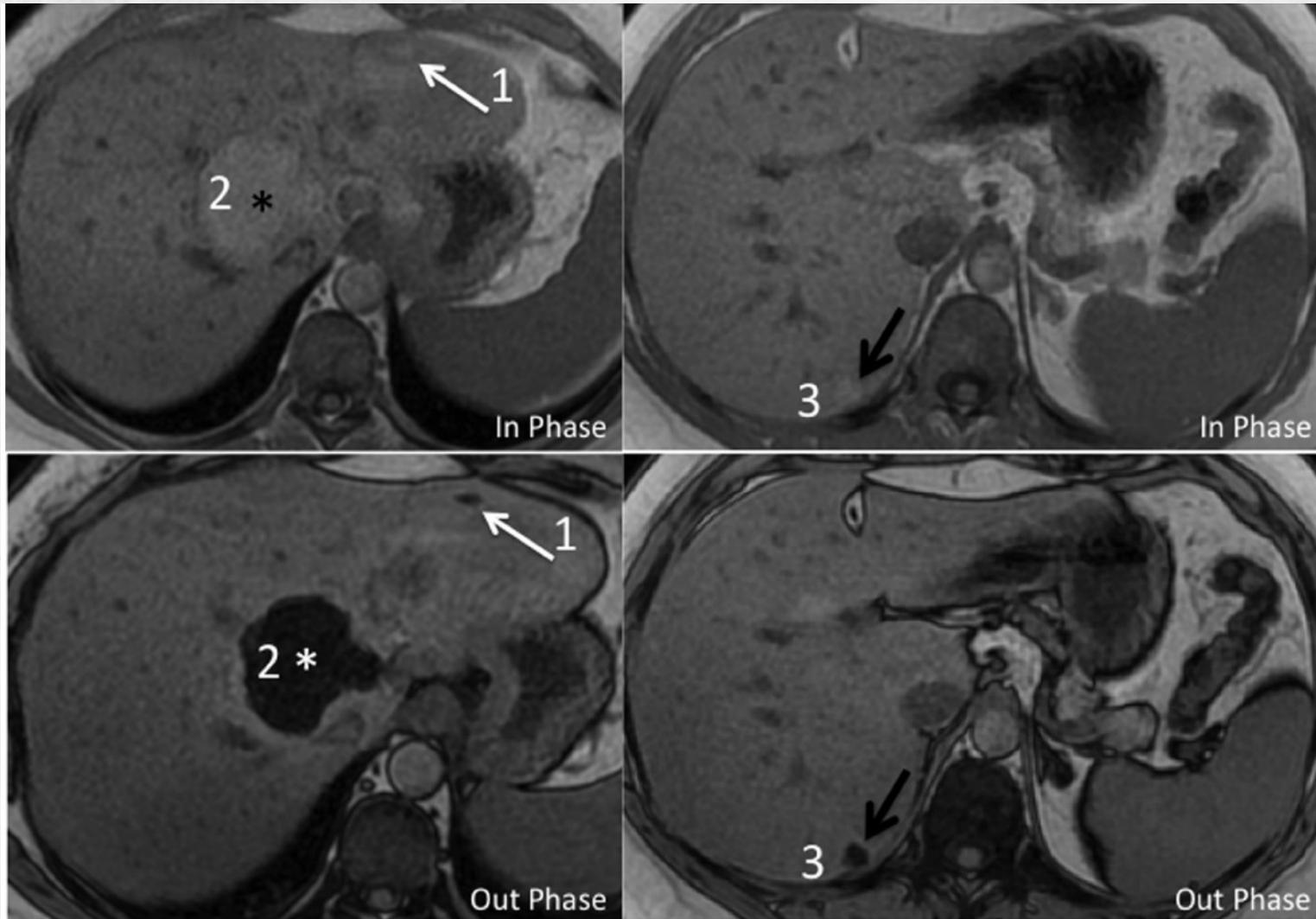
Laumonier H et al. Role of Contrast-Enhanced Sonography in Differentiation of Subtypes of Hepatocellular Adenoma: Correlation with MRI Findings. AJR (2011)

Adénome Hépatocellulaire Beta Catenin



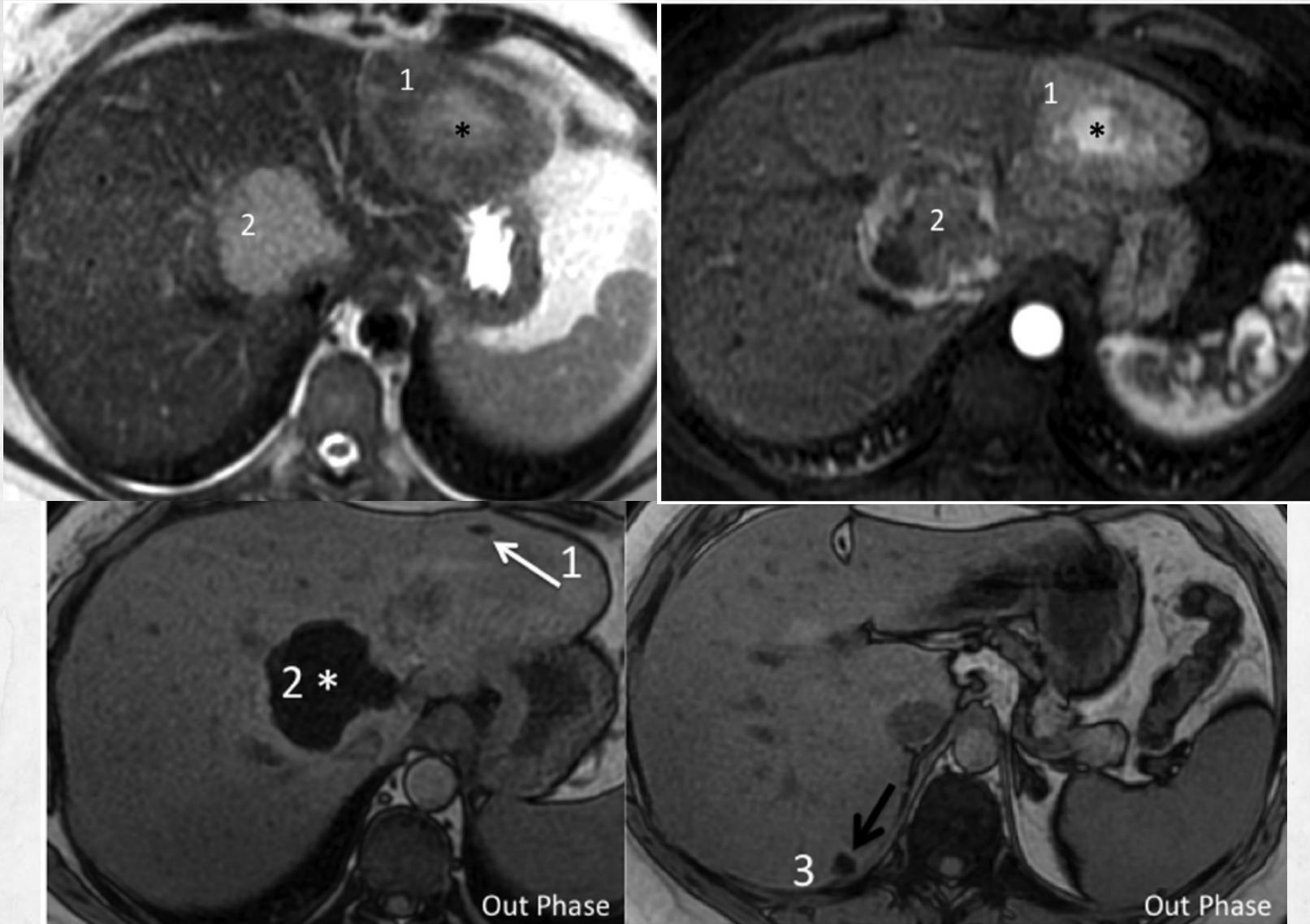
Dharmana H, et al., Hepatocellular adenoma: imaging review of the various molecular subtypes. Clinical Radiology (2017).

Attention au terme d'adénome stéatosique !



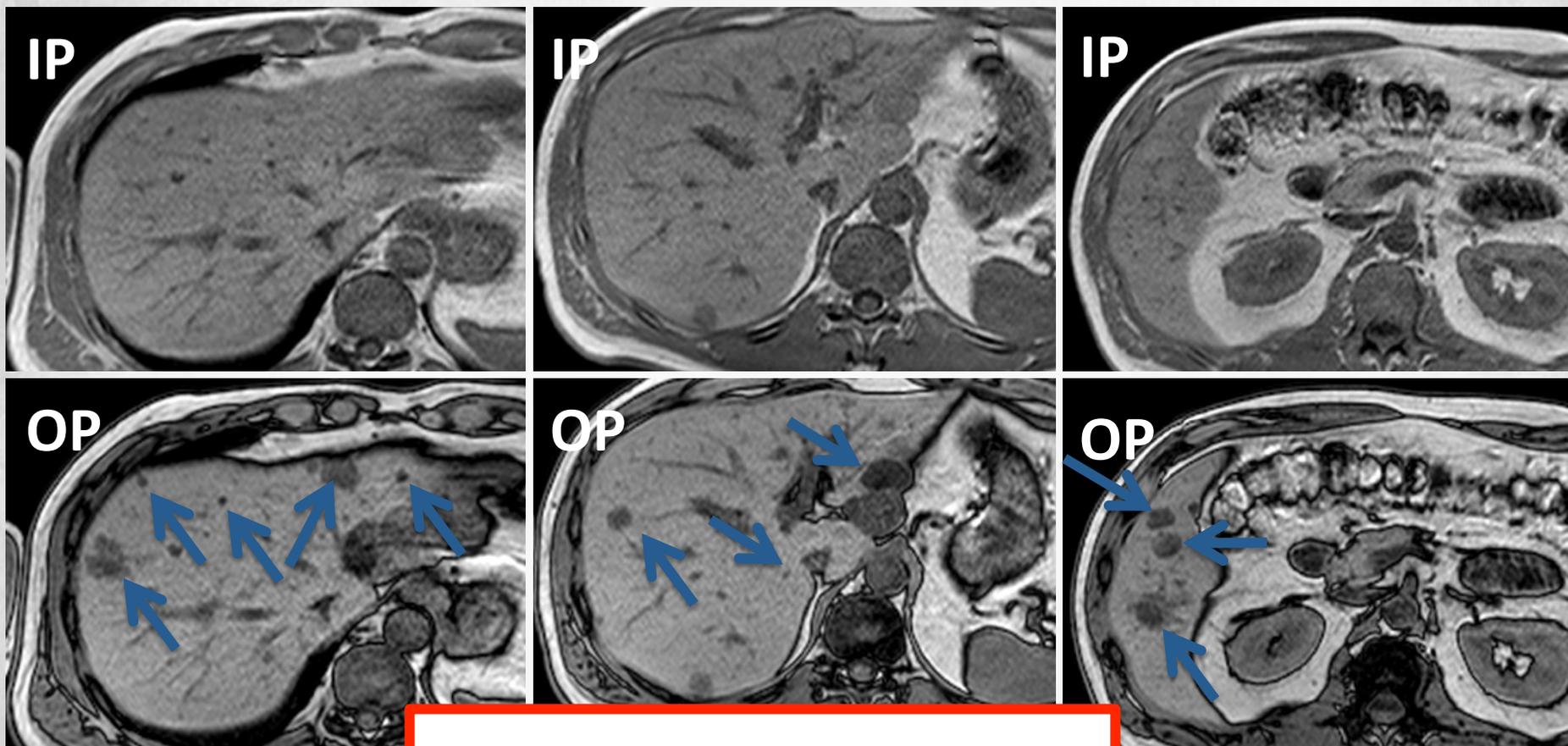
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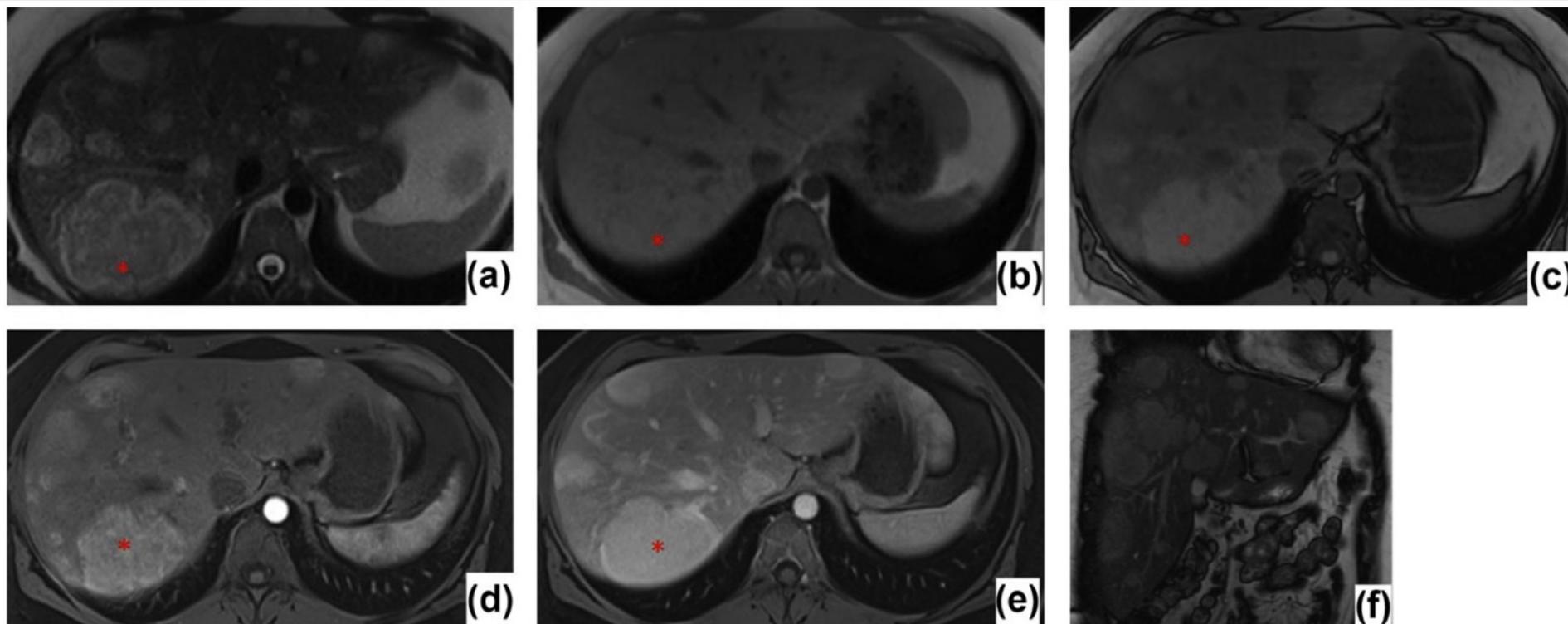
Alberti N et al. Steatotic hepatocellular adenomas with different phenotypic subtypes: A case report. CLINRE (2015)

Adénomatose HNF1 ALPHA



+ de 10 adénomes

Adénomatose Inflammatoire

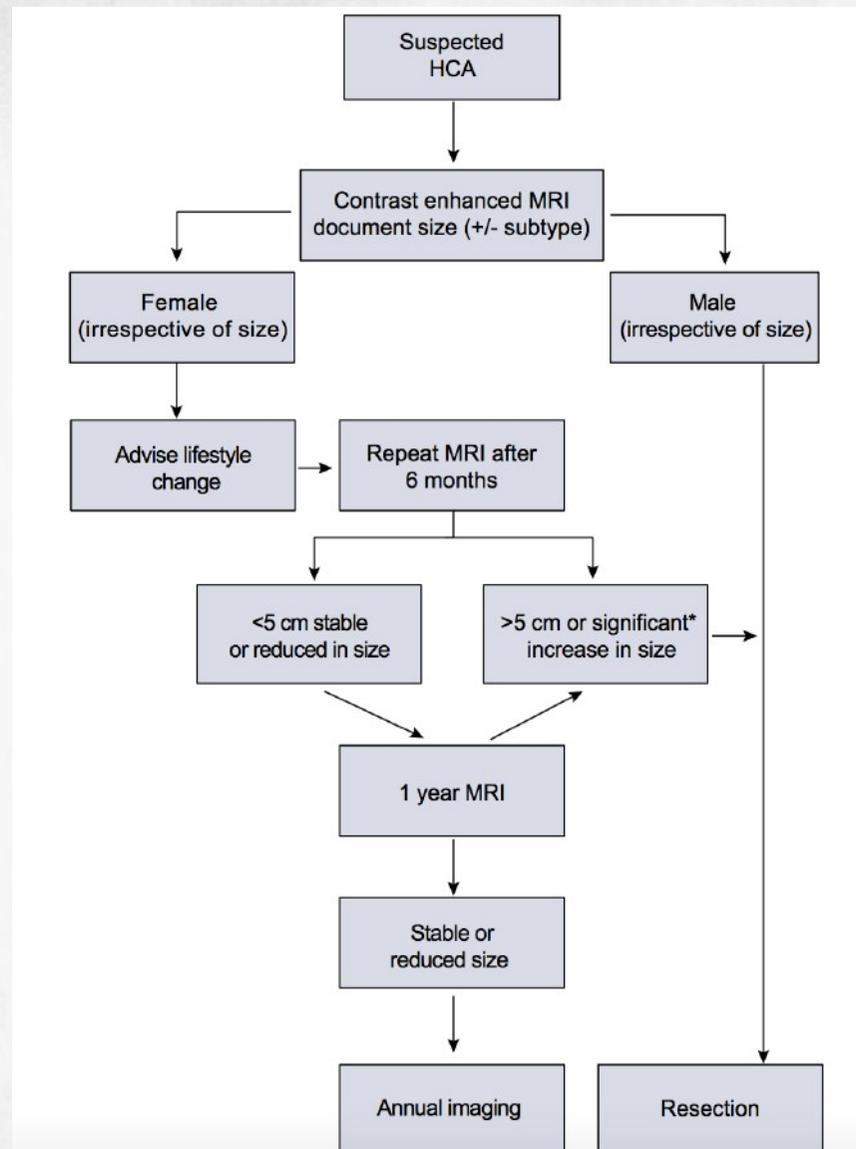


+ de 10 adénomes

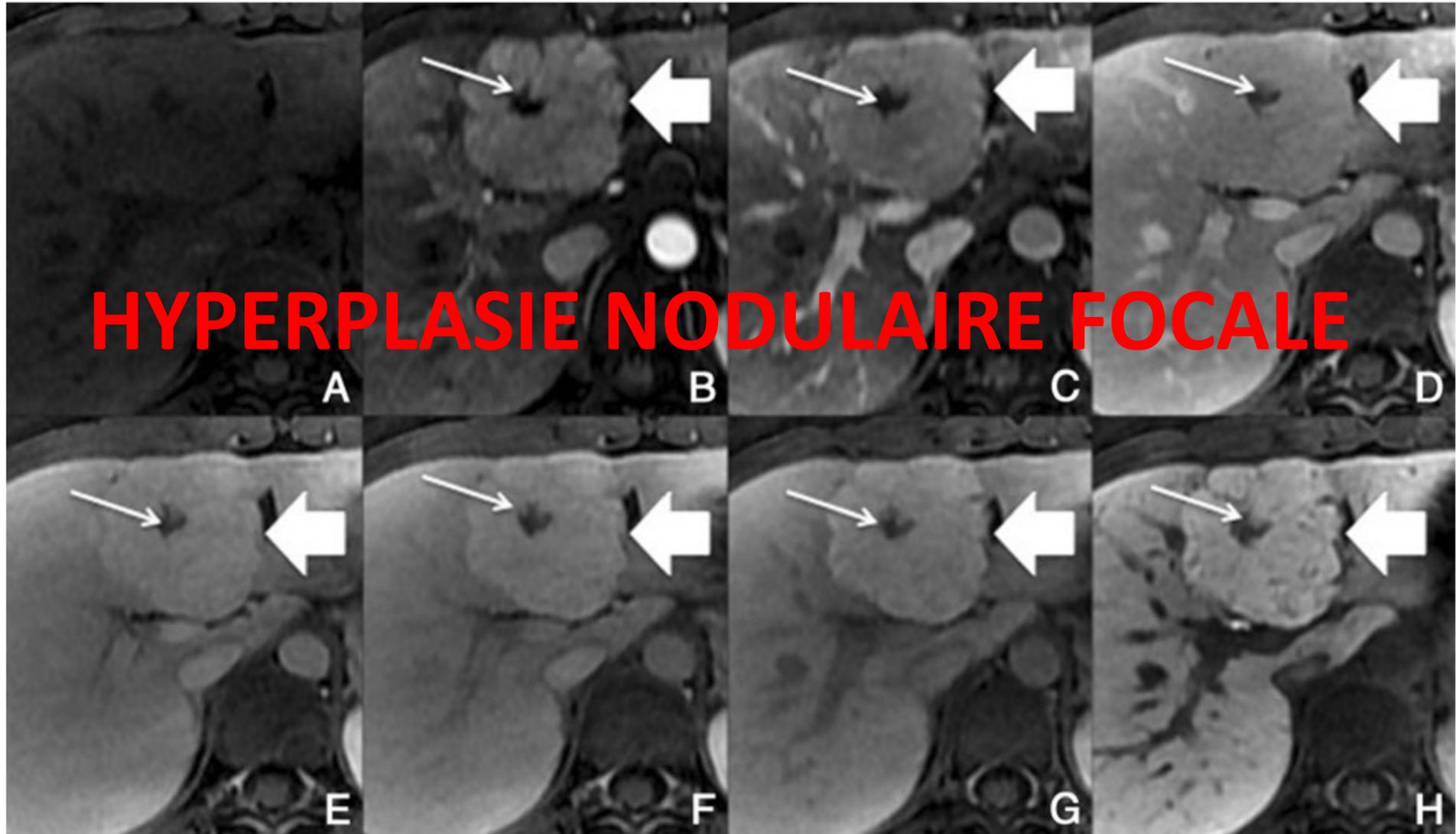
Frulio N et al. Hepatocellular adenomatosis: what should the term stand for ! CLINRE (2014)

Adénome Hépatocellulaire

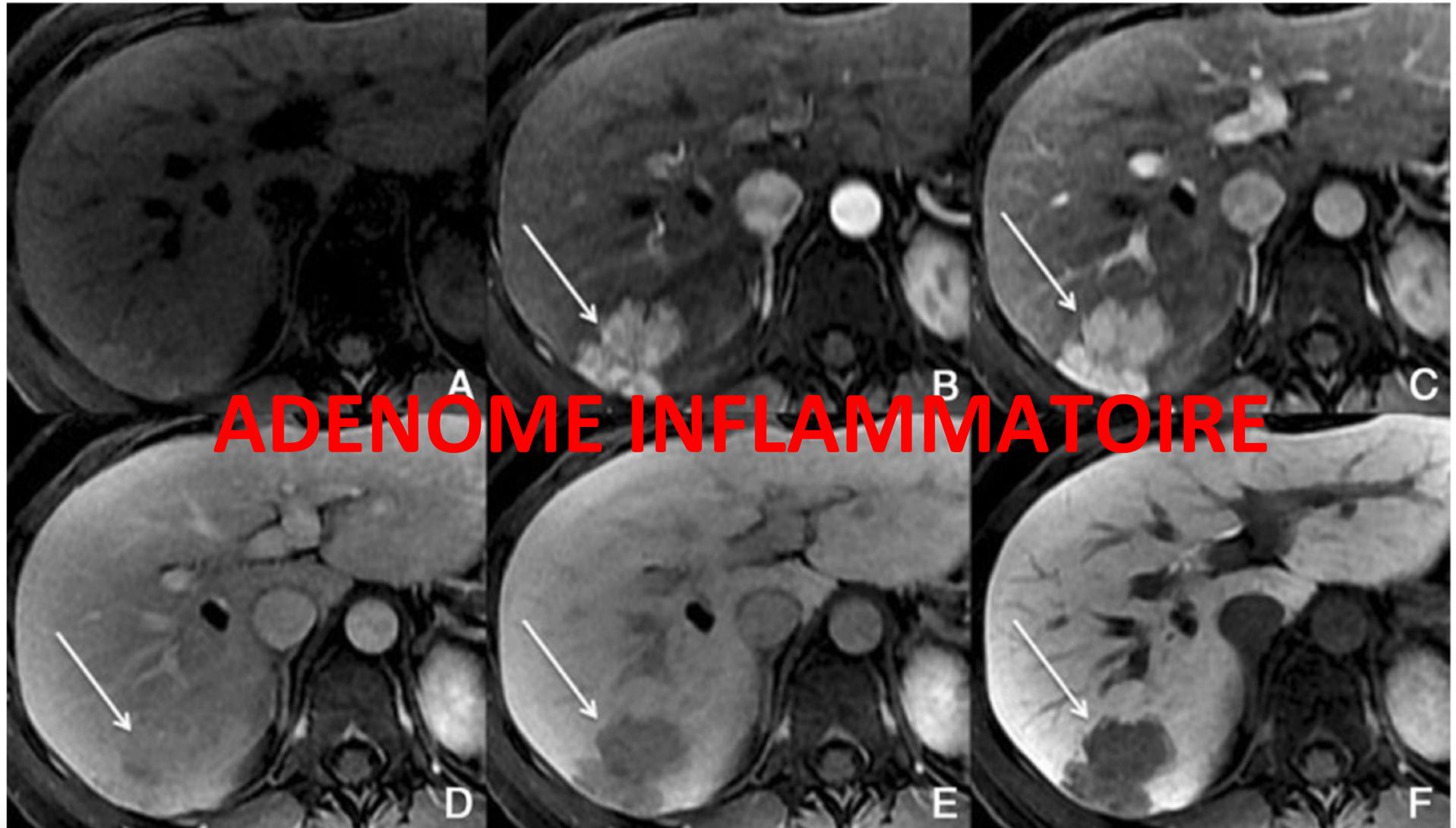
Recommandations actuelles



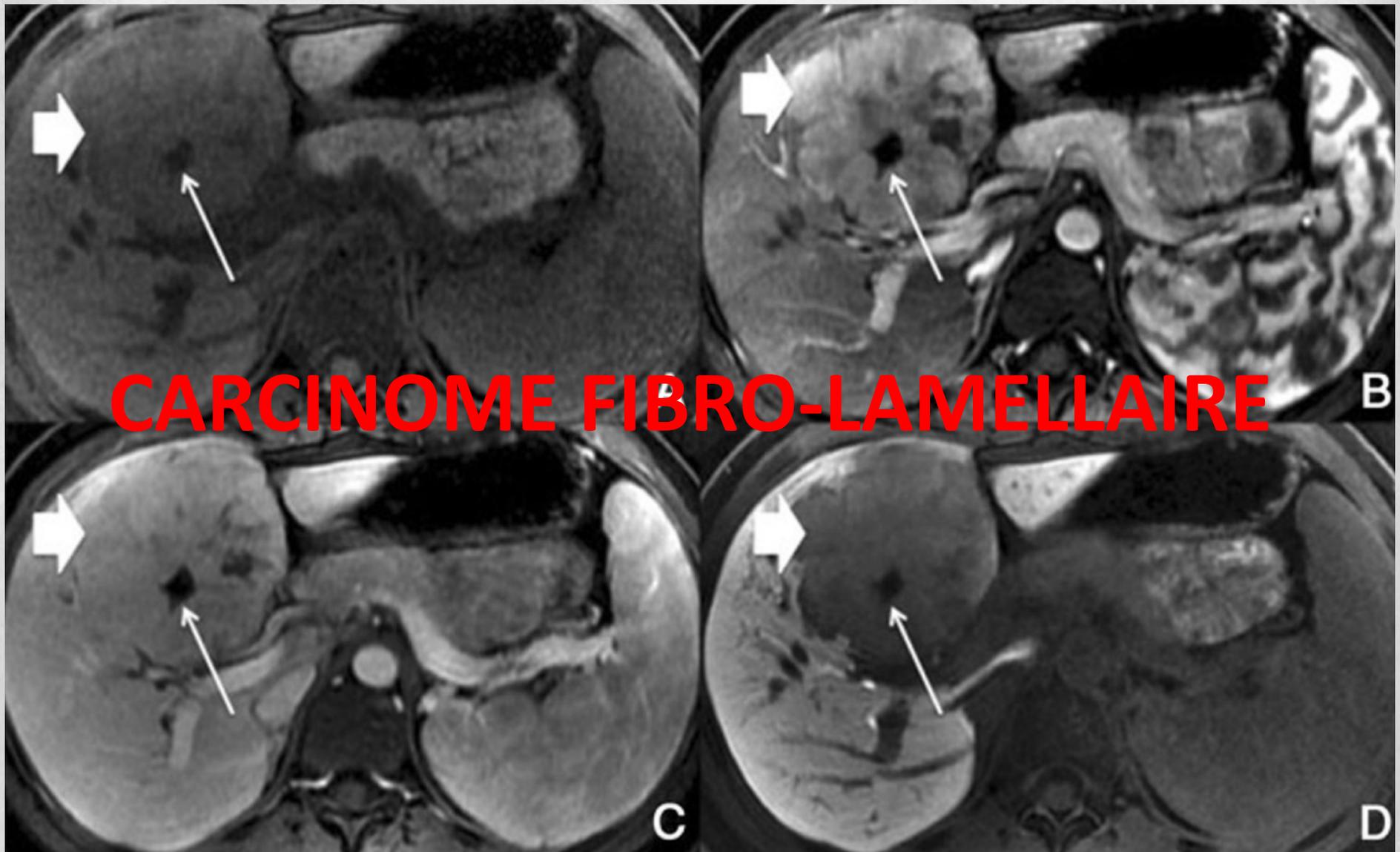
Comment différencier HNF et HCA ? Phase hepato-biliaire



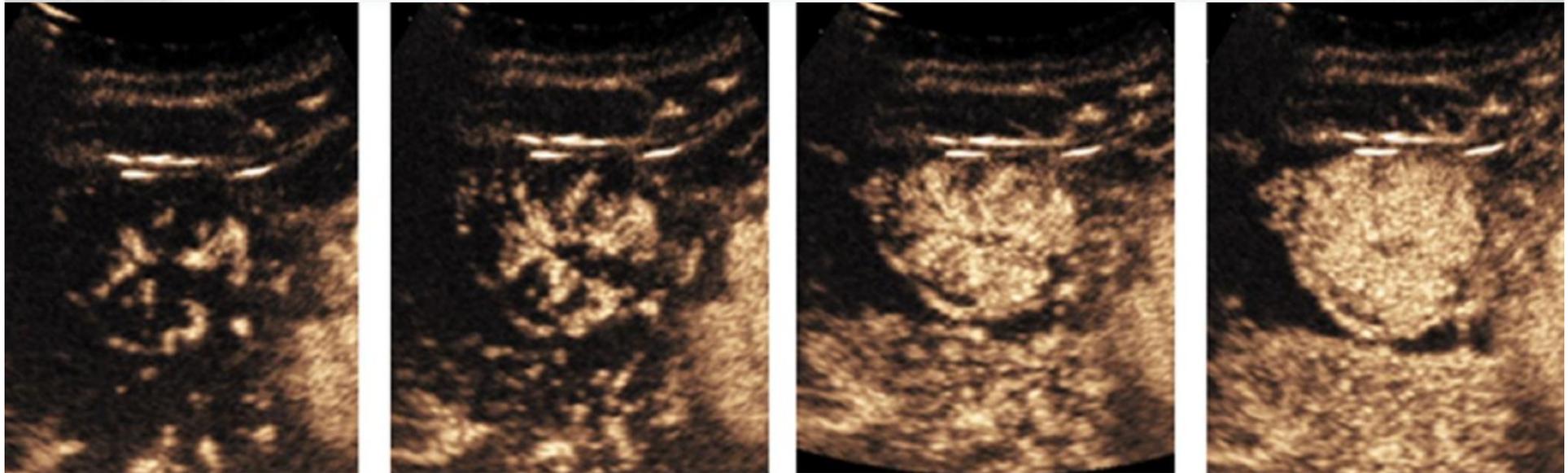
Comment différencier HNF et HCA ? Phase hepato-biliaire



Comment différencier HNF et HCA ? Phase hepato-biliaire



Comment différencier HNF et HCA ? Echographie de contraste

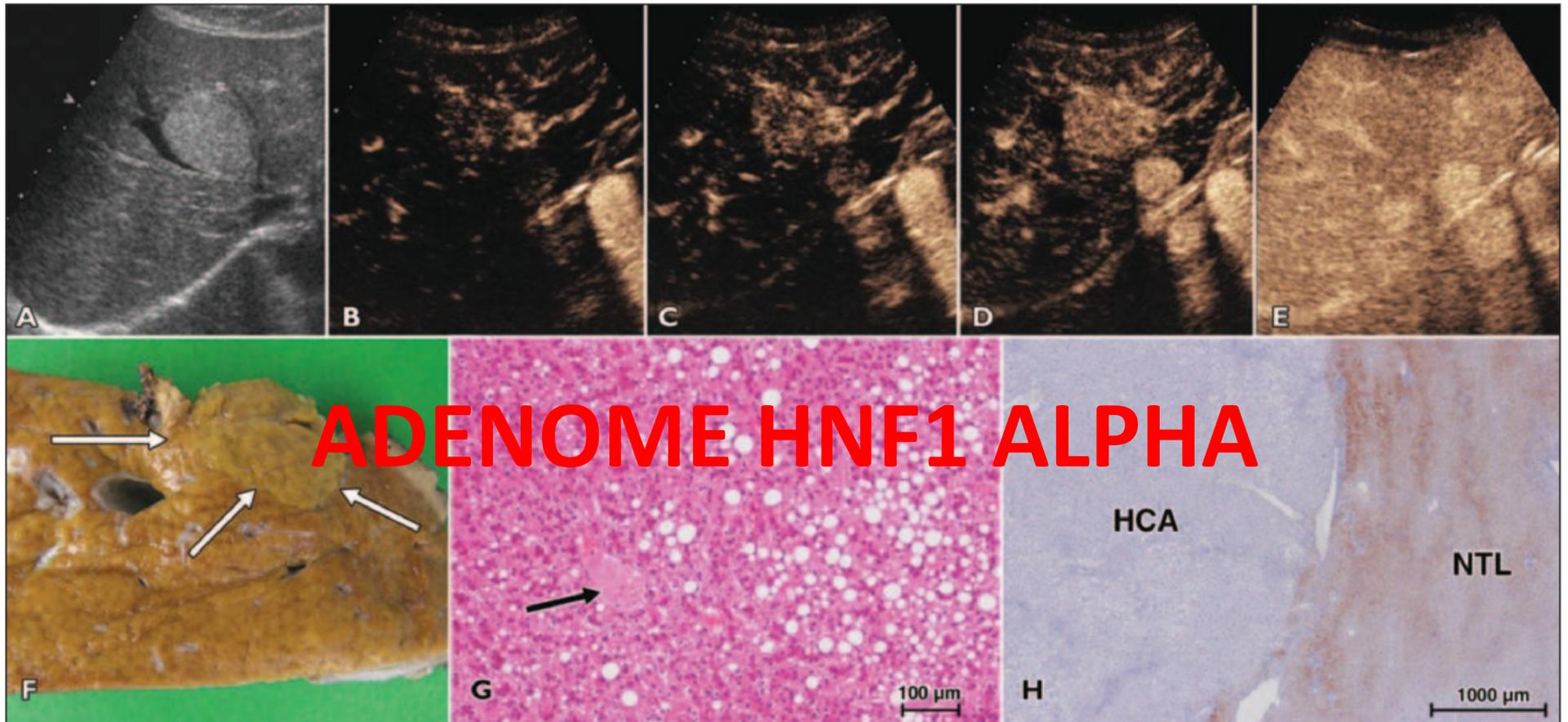


HYPERPLASIE NODULAIRE FOCALE

D'Onofrio M et al. Contrast-Enhanced Ultrasound of Focal Liver Lesions. AJR (2015)

Chiorean L, et al. Focal masses in a non-cirrhotic liver: The additional benefit of CEUS over baseline imaging. Eur J Radiol (2015)

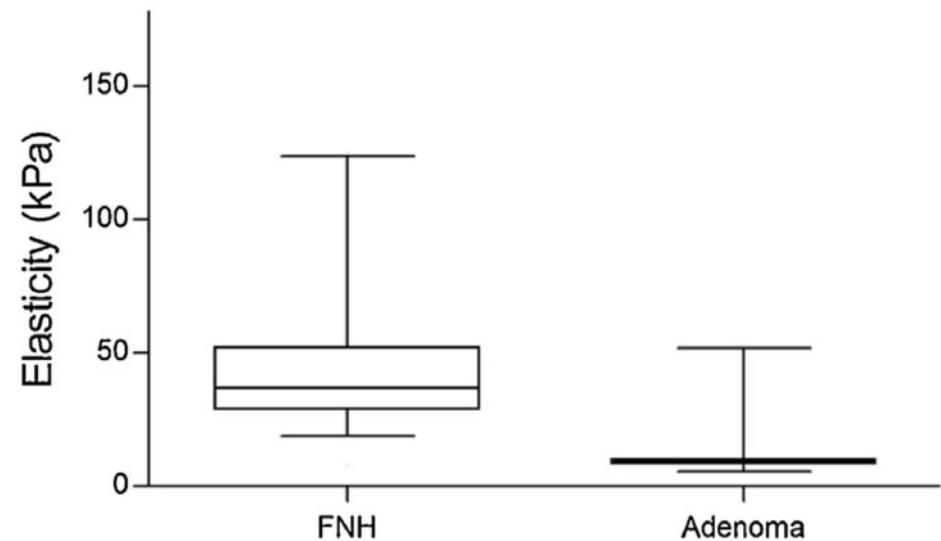
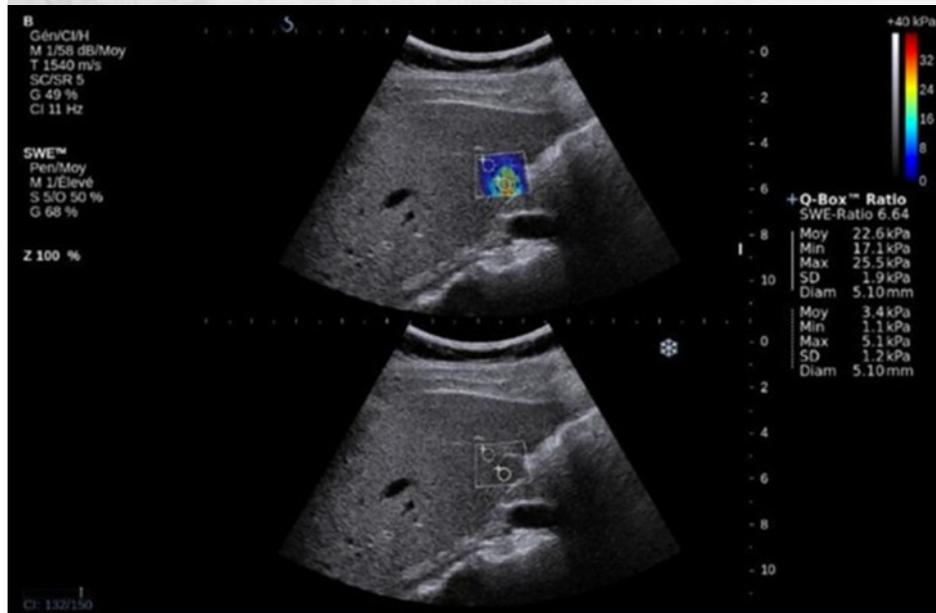
Comment différencier HNF et HCA ? Echographie de contraste



Chiorean L, et al. Focal masses in a non-cirrhotic liver: The additional benefit of CEUS over baseline imaging. Eur J Radiol (2015). Laumonier H et al. Role of Contrast-Enhanced Sonography in Differentiation of Subtypes of Hepatocellular Adenoma: Correlation with MRI Findings. AJR (2011)

Comment différencier HNF et HCA ?

Autres techniques : Elastographie

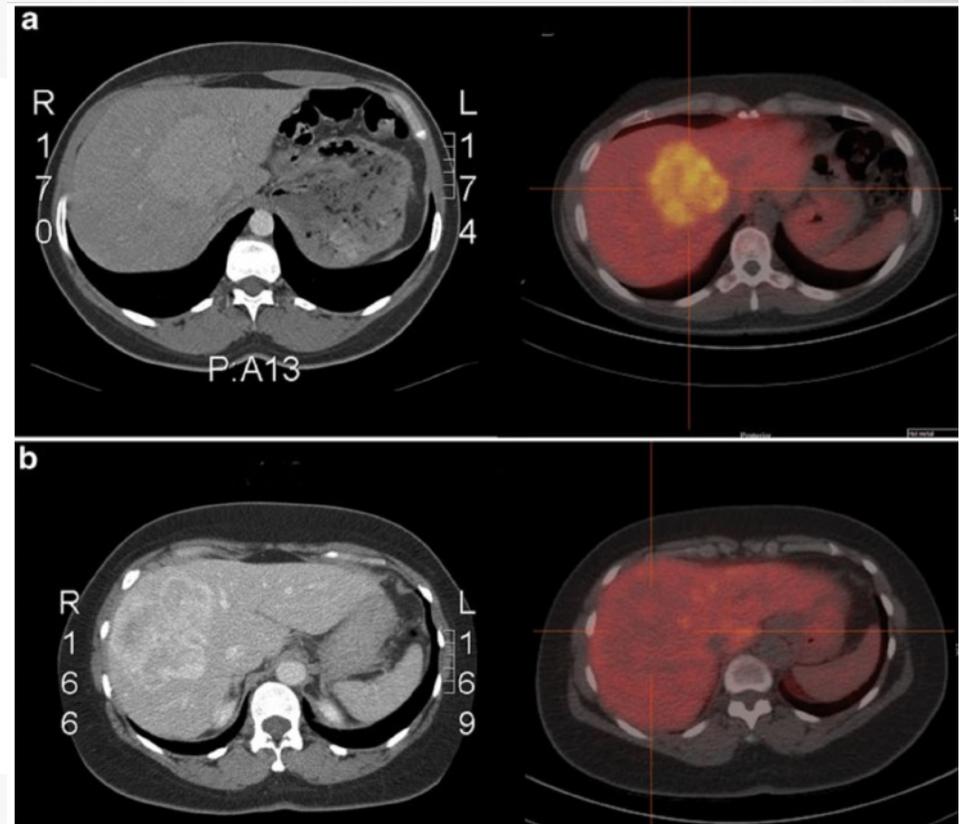
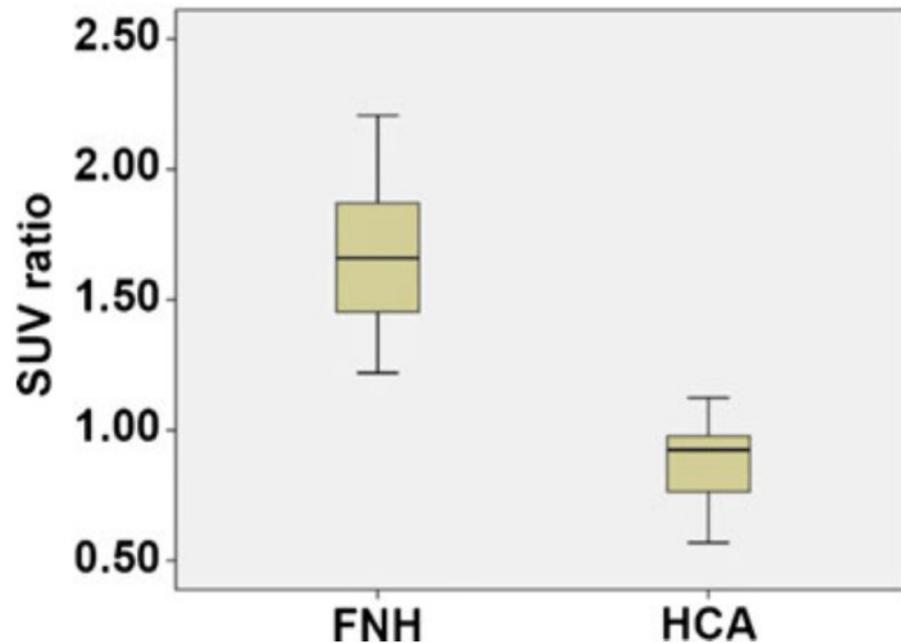


Results: The mean elasticity value was 46.99 ± 31.15 kPa for FNHs and 12.08 ± 10.68 kPa for HAs ($p < 0.0001$). The mean relative elasticity ratio values were 7.94 ± 6.43 and 1.91 ± 1.70 , respectively ($p < 0.0001$). The ROC analysis showed a maximal accuracy of 95% for identification with a cut-off of 18.8 kPa for lesion elasticity (accuracy of 96% with a cut-off of 1.98 for the relative elasticity ratio). A total of 68 CEUS were performed, and 17 lesions (25%) were classified as “undetermined” after CEUS. With these cut-off values 16 lesions (94.1%) were correctly reclassified as FNHs.

Conclusion: SWE is a useful adjunctive tool for differentiation between FNH and HA during ultrasound examination.

Brunel T et al. Focal nodular hyperplasia and hepatocellular adenoma: The value of shear wave elastography for differential diagnosis. Eur J Radiol (2015)

Comment différencier HNF et HCA ? Autres techniques : PET CT



Van Den Esschert J et al. Differentiation of hepatocellular adenoma and focal nodular hyperplasia using 18F-fluorocholine PET/CT. Eur J Nucl Med Mol Imaging (2011)



MERCI DE VOTRE ATTENTION

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