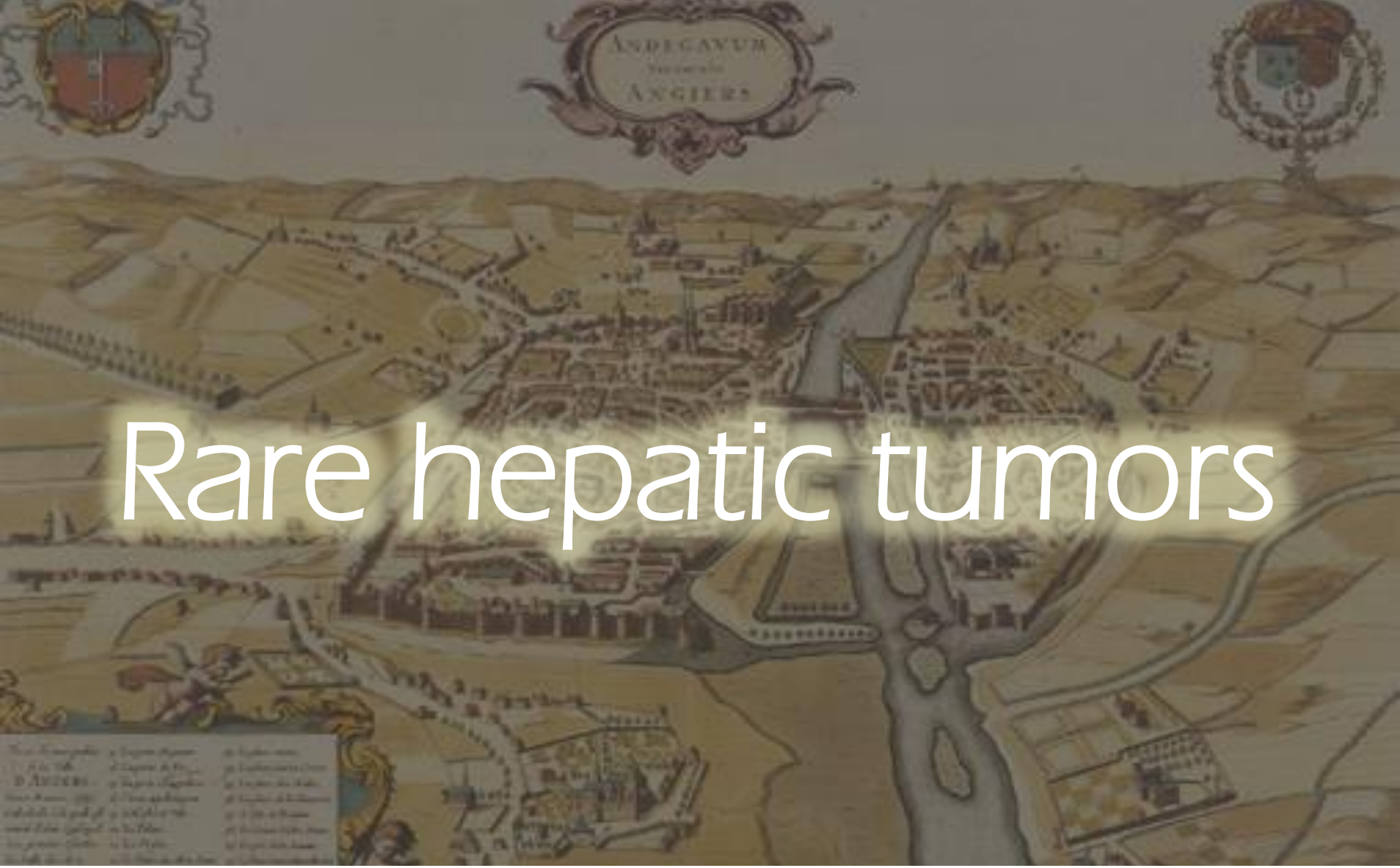


Rare hepatic tumors

Christophe Aubé

Département de Radiologie
CHU Angers

What is a rare tumor ?

Exceptional tumor

- Nobody saw it, just in the journal
- Primitive neuroectodermal tumor (PNET) or primitive Malignant melanoma of the liver

Rare tumor

- Rarely evocated - Often misdiagnosed
- Can be met

Exclusion pseudo tumors, infection, parasites

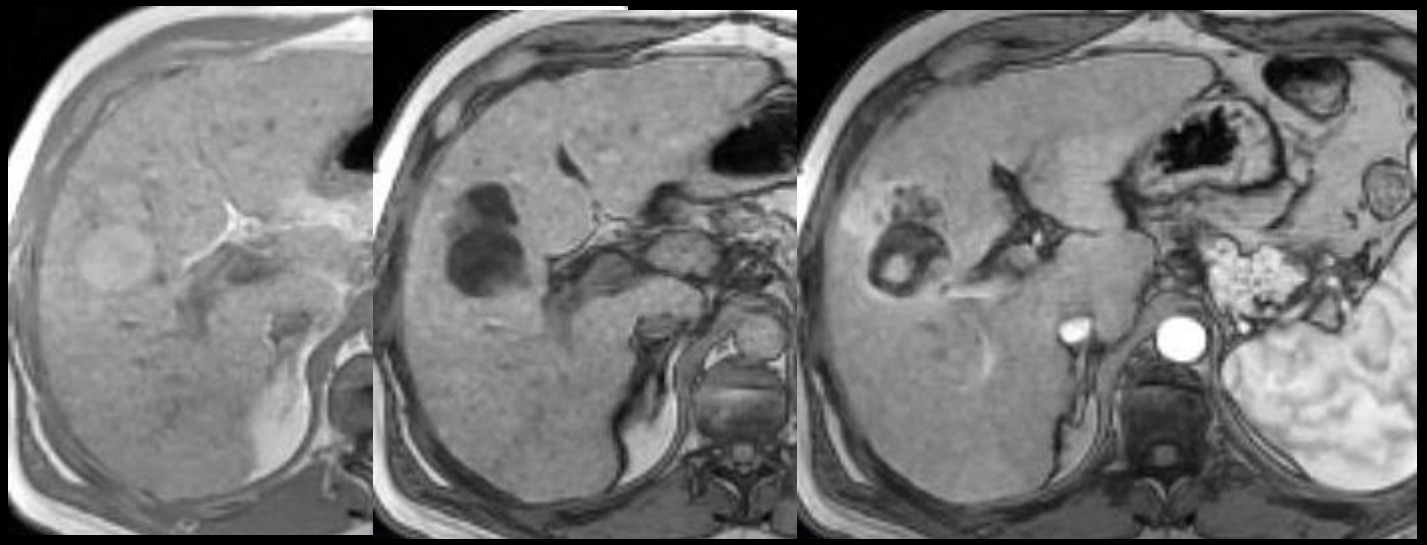
Fatty tumor

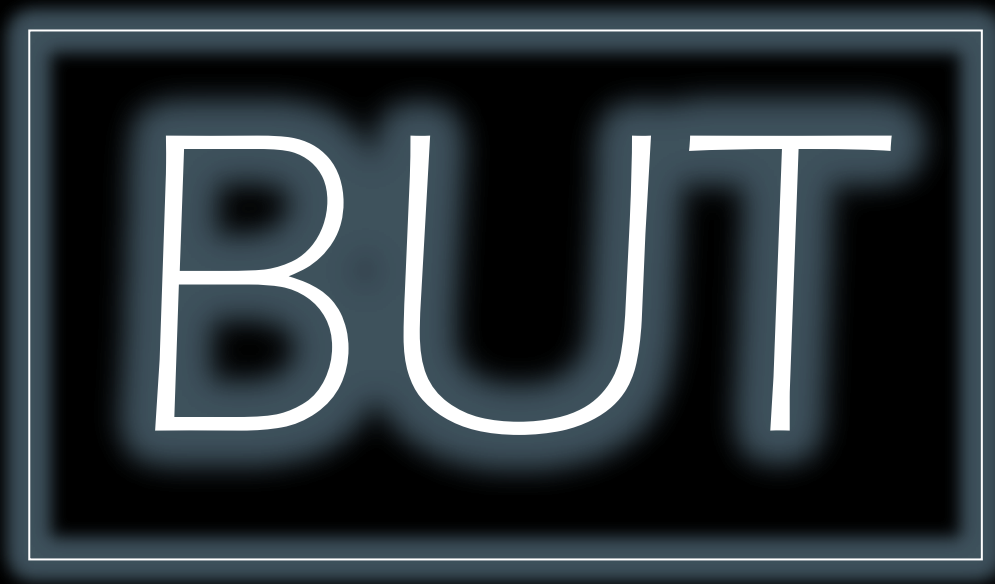
You think first

Hepatic adenoma

Hepatocellular carcinoma

(in chronic liver diseases)




BUT

Angiomyolipoma

From perivasculaar epithelioid cells (PEComas)

Female 70-80% - middle age (40-45y)

Asymptomatic patients – abdominal pain

No risk factor – No blood marker

No specific association with renal angiomyolipoma

Angiomyolipoma

Well limited single tumor (capsula – 60 - 80%)

Heterogeneous hyperechoic feature on US exams
Always enhanced on arterial phase (heterogeneous) With visible tortuous vessels
Possible area of wash out

Rare calcification (10%)

Cai P et al Abdom imaging 2013;8:482–489
Kim R et al. Abdom Imaging (2015) 40:531–541

Angiomyolipoma

Misdiagnosis in 80% of cases = HCC

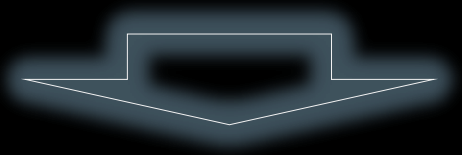
Hepatic Adenoma - Sarcoma

Tani A et al. J Nippon Med Sch 2011
Chang ZG et al. J Gastrointestin Liver Dis 2011; 20:65-69
Kim R et al. Abdom Imaging (2015) 40:531–541

Angiomyolipoma

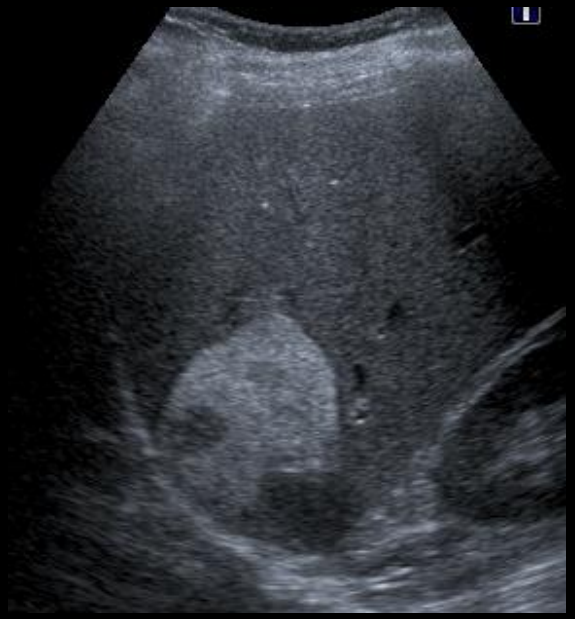
Variable proportions

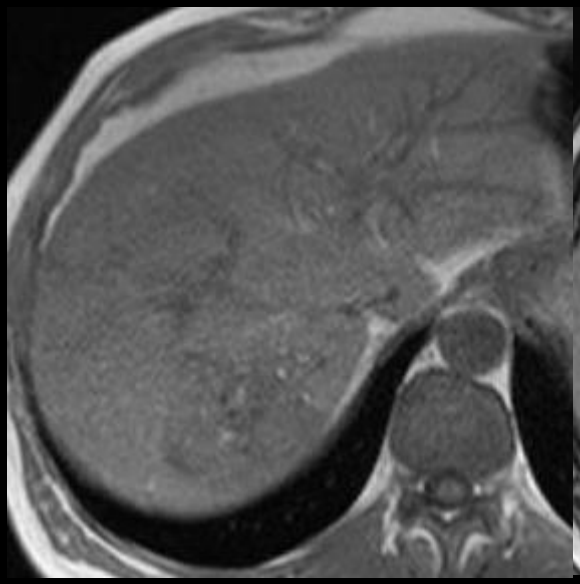
Smooth muscle cells,
Thick-walled blood vessels
Mature adipose tissue (5 to 90%)

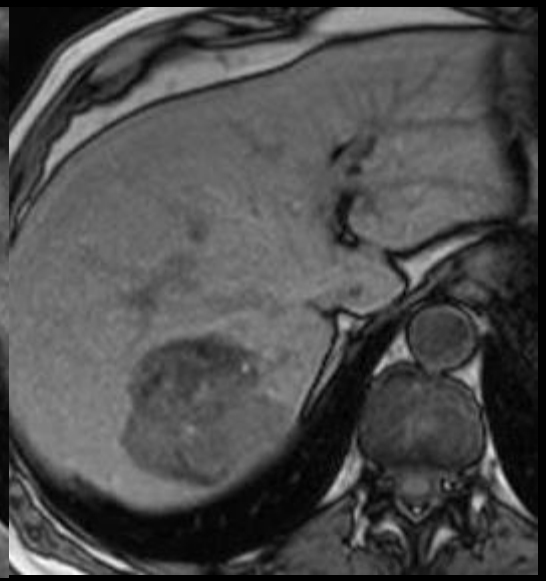


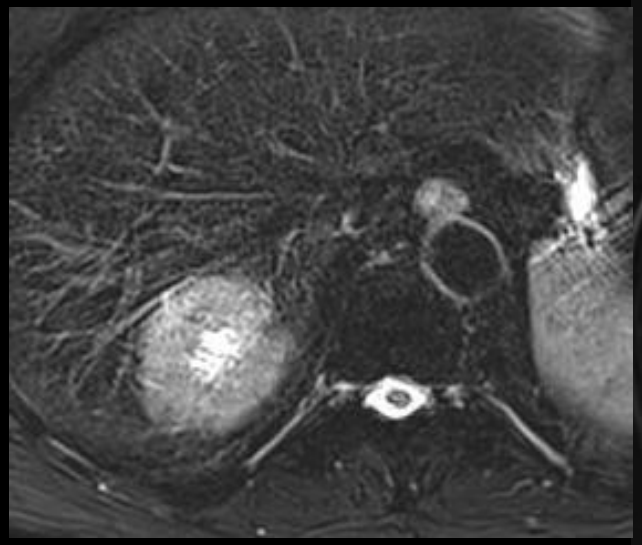
Different morphological sub types of AML

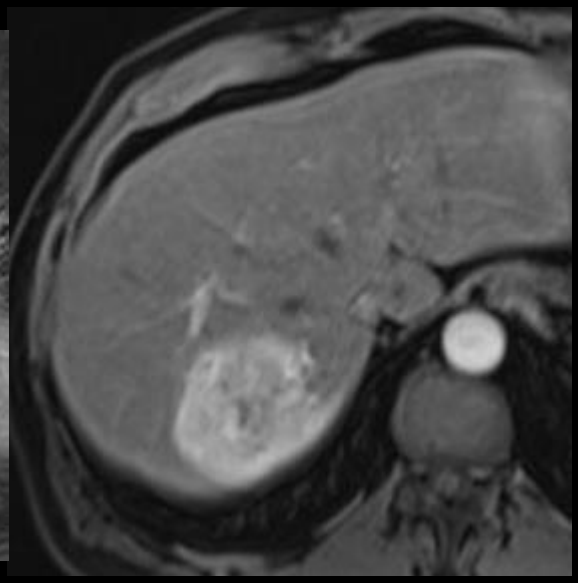
Angiomyolipoma

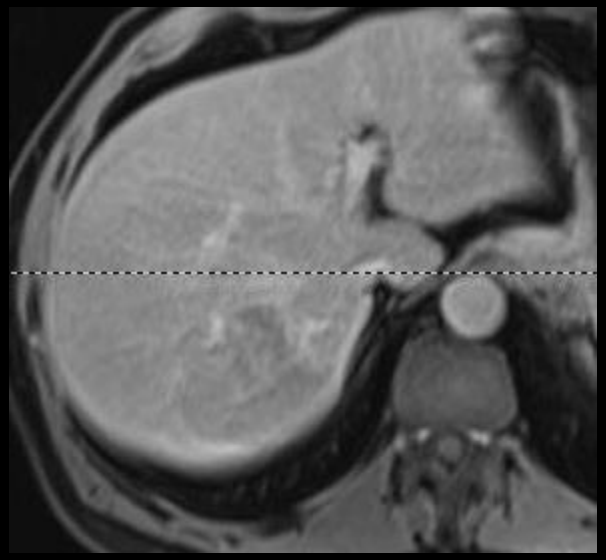




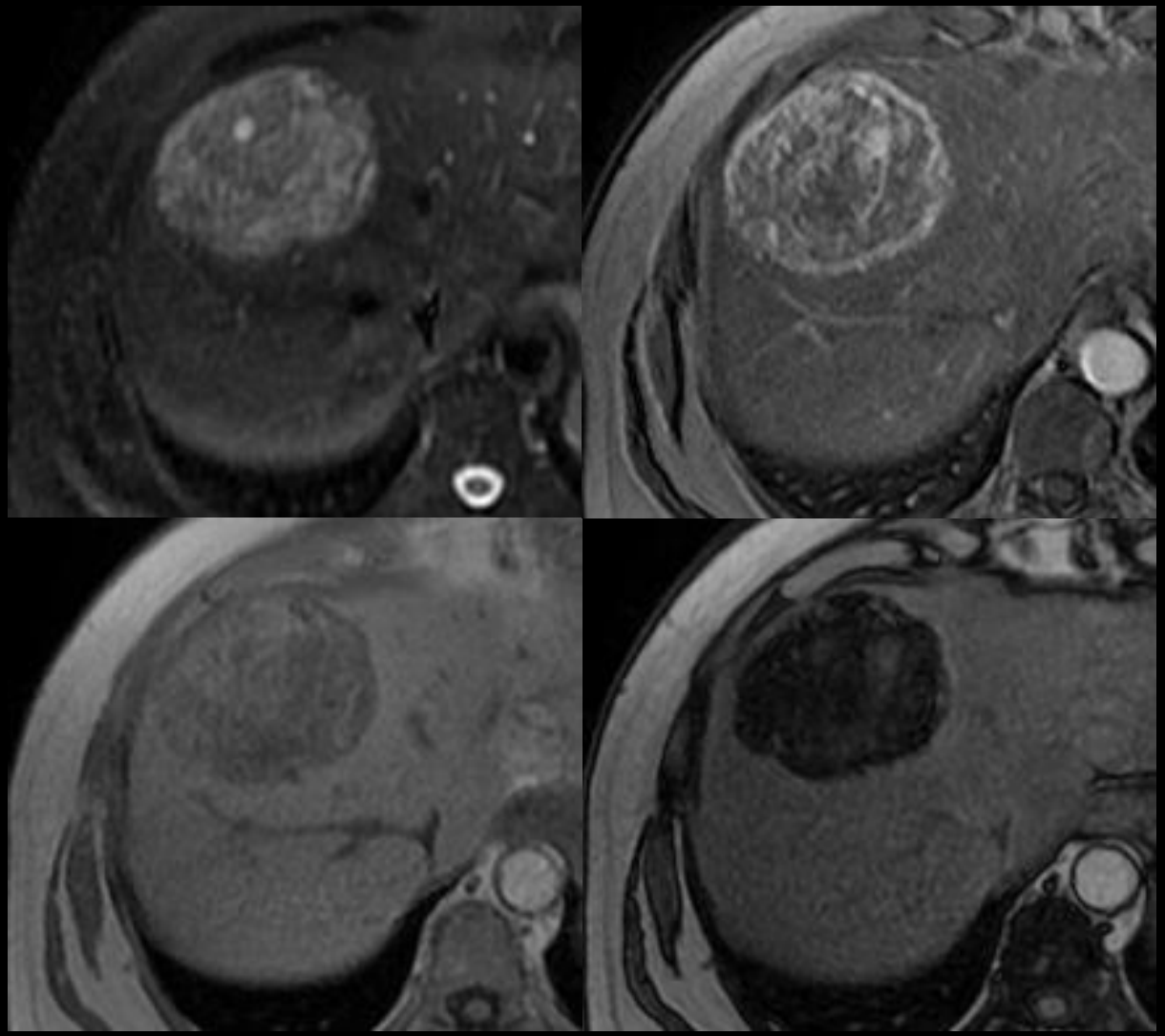








Angiomyolipoma



Angiomyolipoma

Different proportion of cell types

epithelioid,
spindle

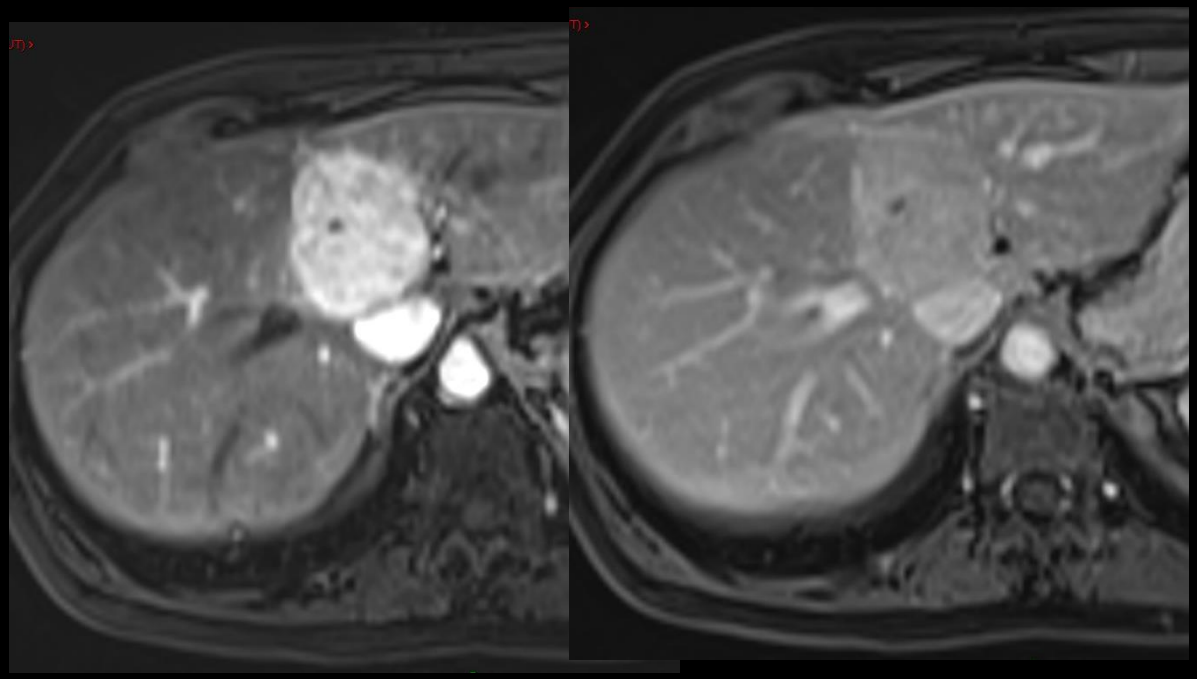
Epithelioid AML
was first described in the liver in 2000

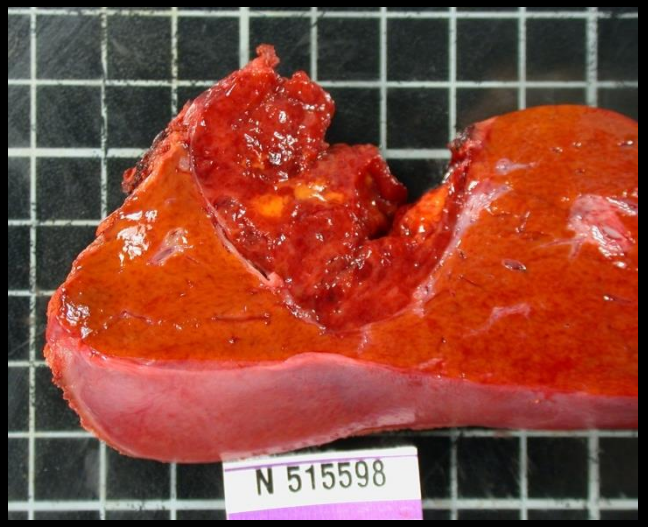
Histological diagnosis of Epi-AML could be difficult from HCC and the metastatic sarcomatoid variant of renal cell carcinoma. It should be considered to have ***malignant potential*** *and treated by resection*

Xu PJ et al. World J Gastroenterol 2009;15: 4576-4581

Angiomyolipoma

The only specific feature of Epi AML is its frequent poor fat proportion

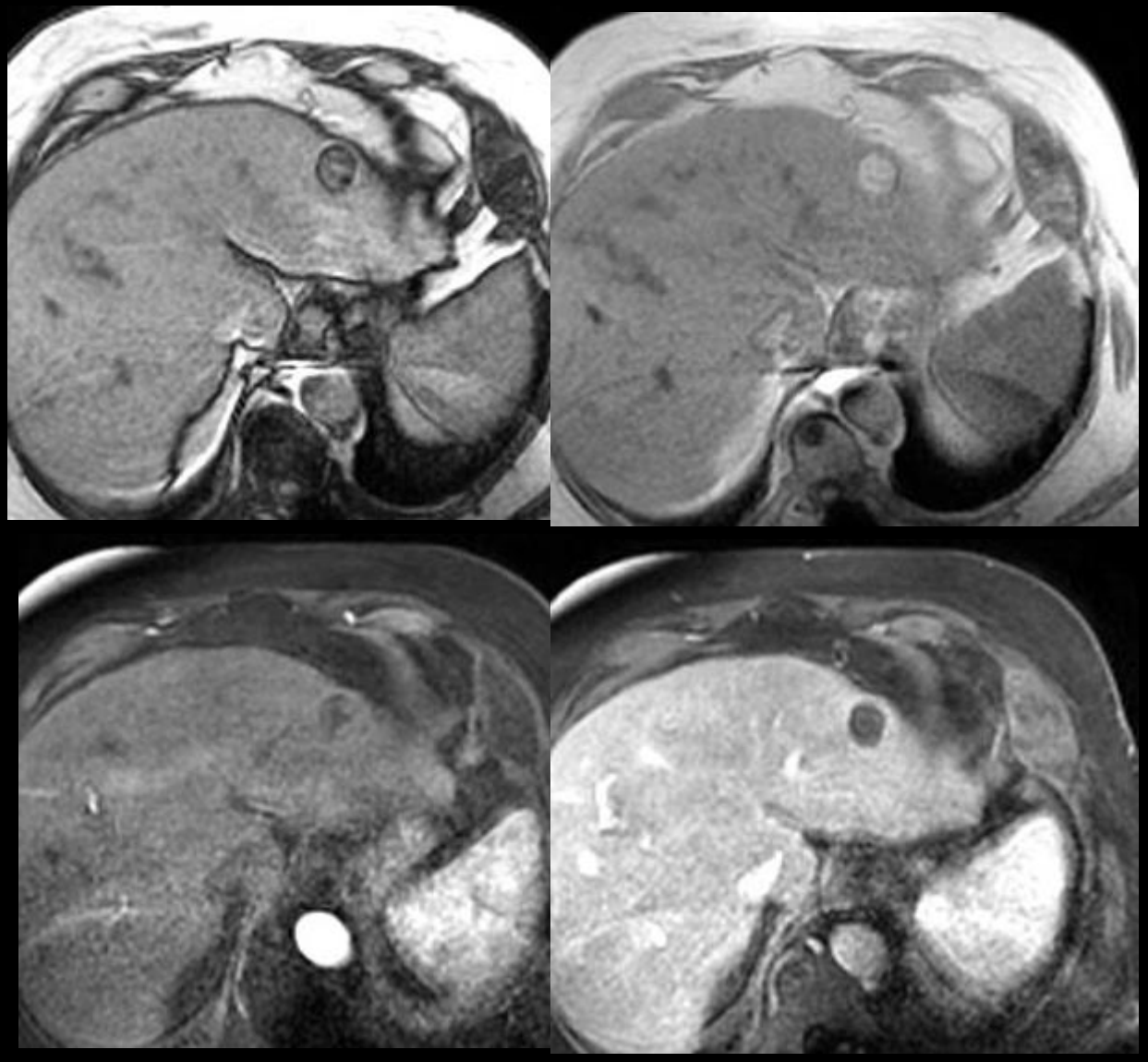




Courtesy Valérie Vilgrain

Xu PJ et al. World J Gastroenterol 2009;15: 4576-4581

Angiomyolipoma

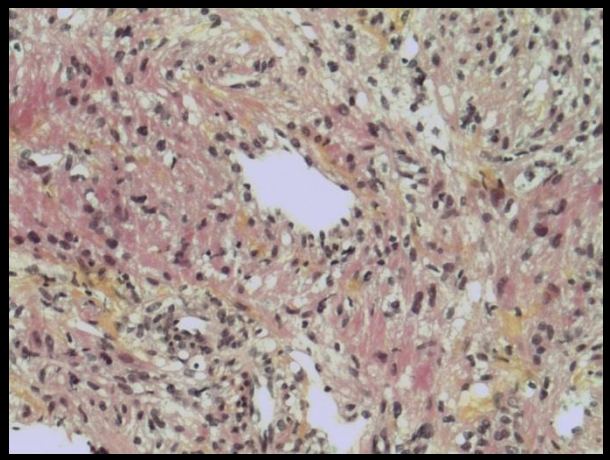


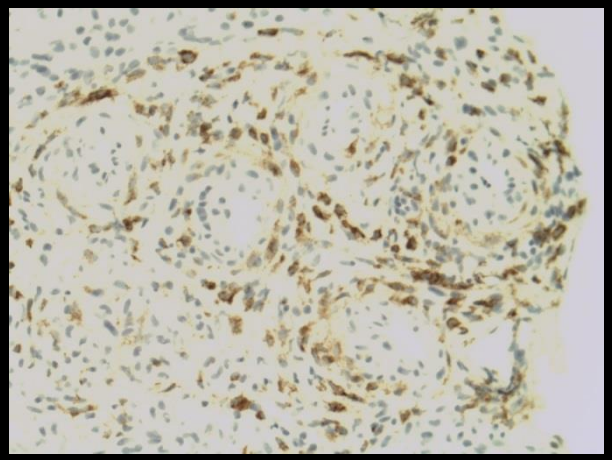
Epi AML

Angiomyolipoma

Specific Immuno staining

Homatropine methylbromide 45 (HTMB 45)





Final diagnosis must be achieve by biopsy and specific immunostaining

Tani A et al. J Nippon Med Sch 2011
Chang ZG et al. J Gastrointestin Liver Dis 2011; 20:65-69
Kim R et al. Abdom Imaging (2015) 40:531–541

Angiomyolipoma

Proper treatment is controversial
Conservative management
Surgical resection could be discussed

First malignant transformation described in 2000

Subtype epithelioide AML (poor fat content)
Size (4-5cm) number of mitoses

Surgical resection

Dalle I et al. Histopathology 2000;36:443-450
Chang ZG et al. J Gastrointestin Liver Dis 2011; 20:65-69

Fatty focal nodular hyperplasia

Steatosis within FNH assessed on histology is not uncommon

Detection rate of steatosis on MRI is lower
33% of FNH with steatosis on pathology displayed a typical feature of FNH and no steatosis on MRI

No specific abnormalities associated with fatty FNH except maybe liver steatosis

Ronot M et al. Eur Radiol 2013; 23:914–923
Hussain SM et al. RadioGraphics 2004; 24:3–17

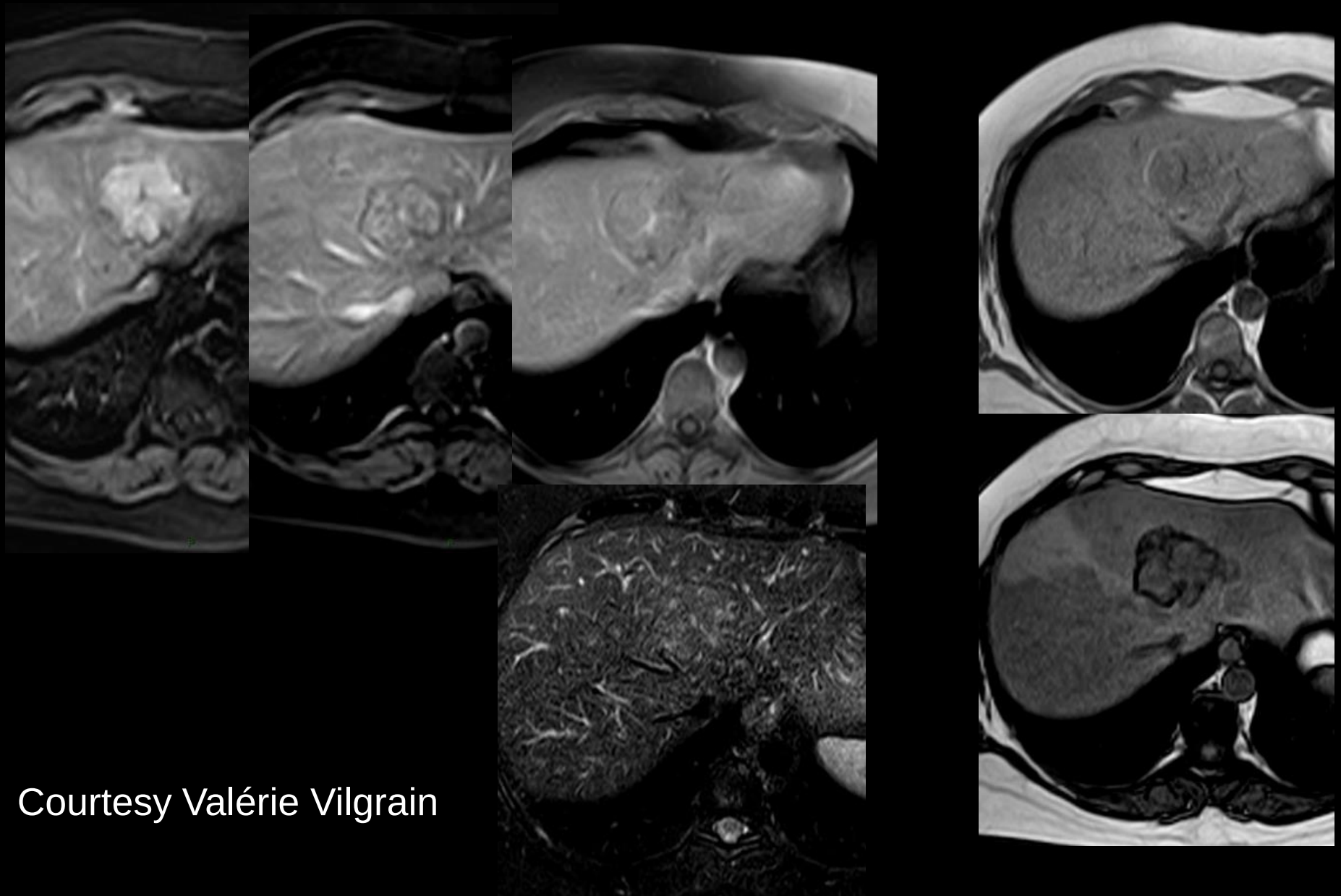
Fatty focal nodular hyperplasia

Lesion with a typical aspect of FNH on MRI even with steatosis is a FNH

If we show on MRI typical aspect of FNH with or without fat content we can affirm the diagnosis of FNH and do not perform biopsy

Ronot M et al. Eur Radiol 2013; 23:914–923

Fatty focal nodular hyperplasia



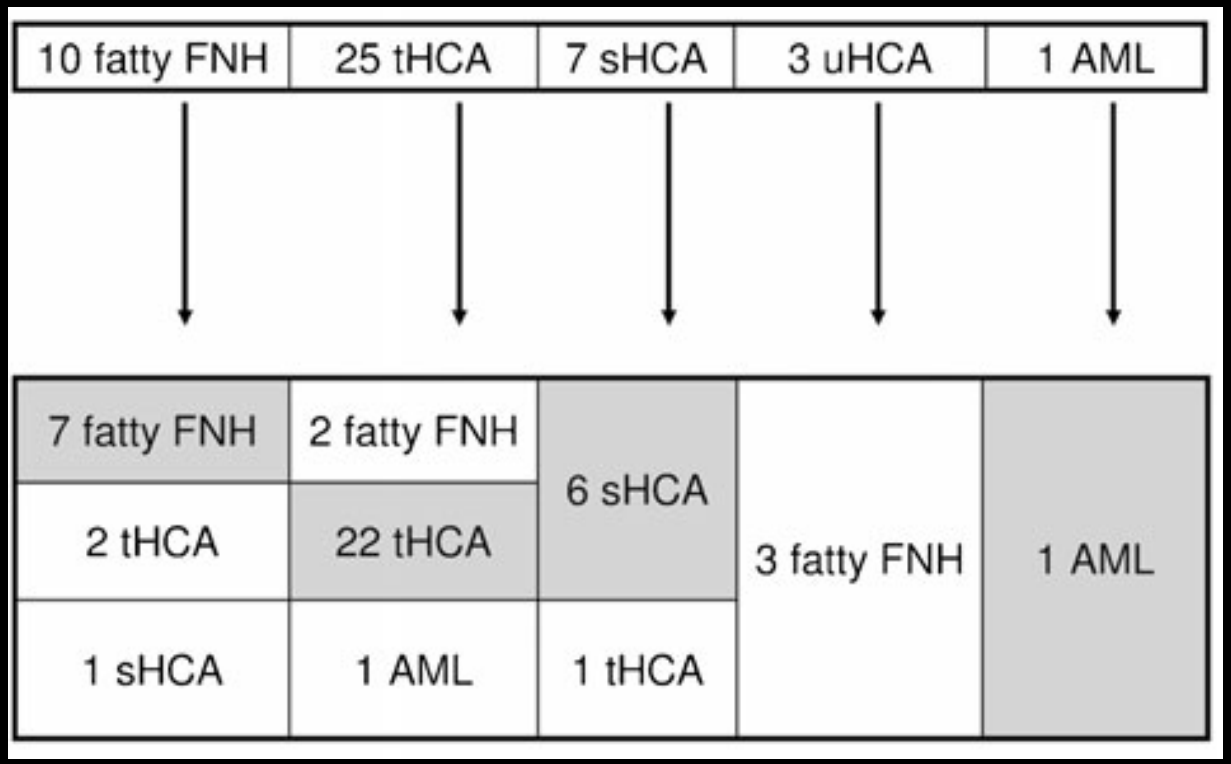
Courtesy Valérie Vilgrain

Fatty focal nodular hyperplasia

In case of atypical feature of FNH

MR diagnosis

Pathology



Ronot M et al. Eur Radiol 2013; 23:914–923

Fatty focal nodular hyperplasia

Atypical FNH

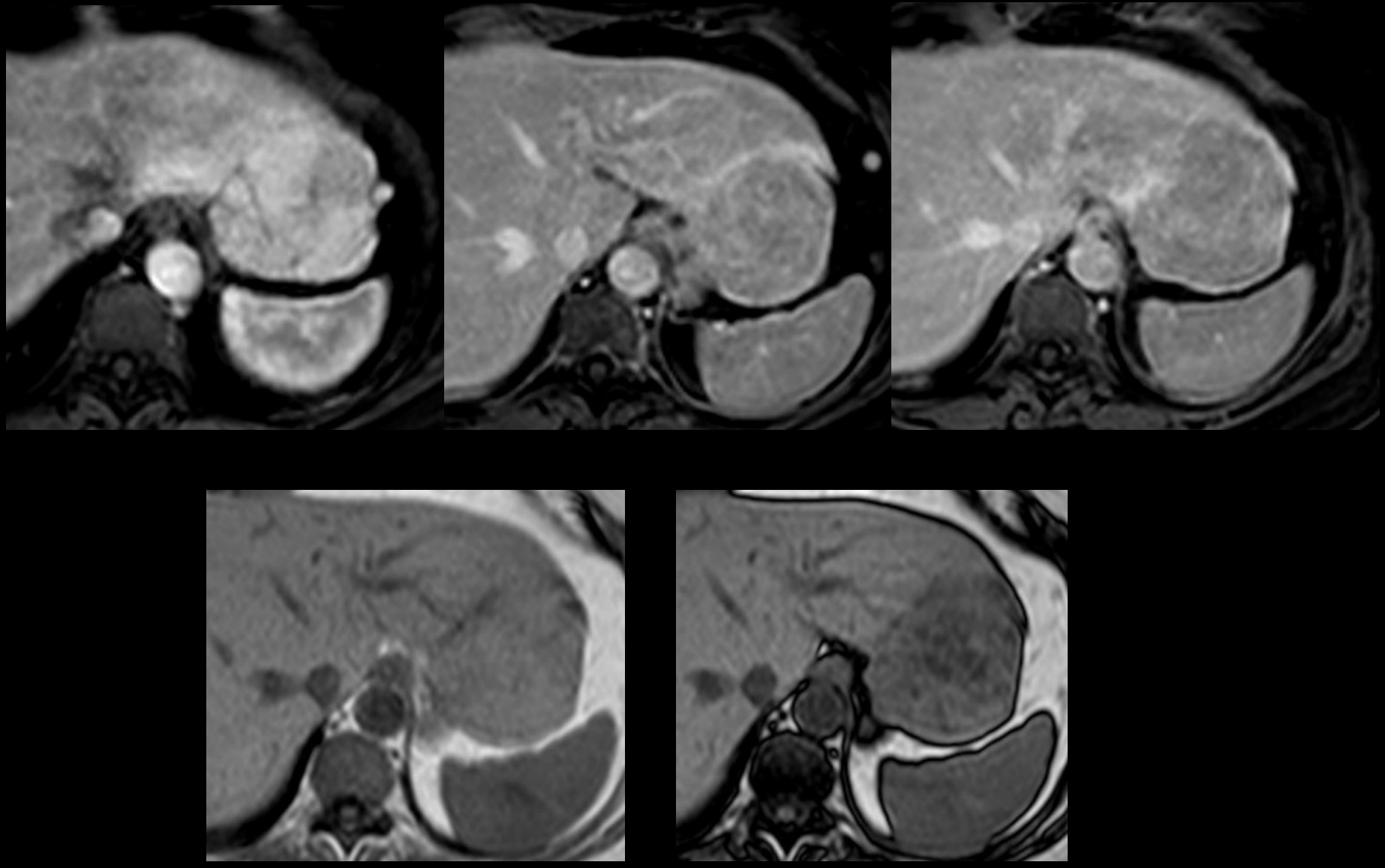
Use of hepatobiliary specific contrast agent could be useful to differentiate FNH from HCA

But fat contains seems to be a limitation

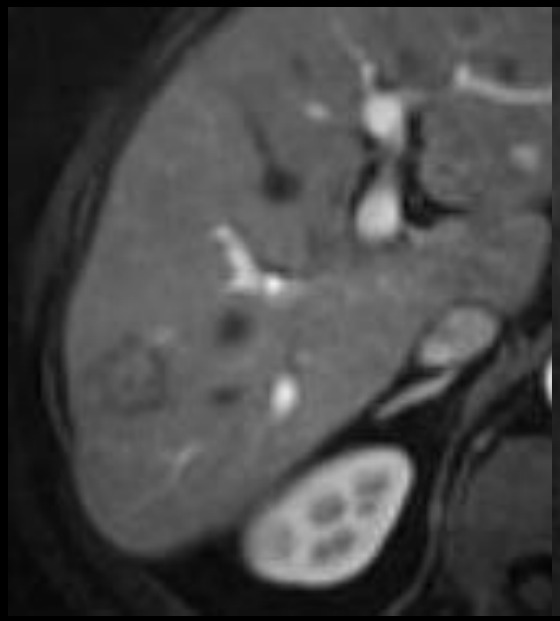
Atypical FNH with steatosis if after HB specific contrast agent FNH remains atypical biopsy is recommended as in all fatty liver lesion

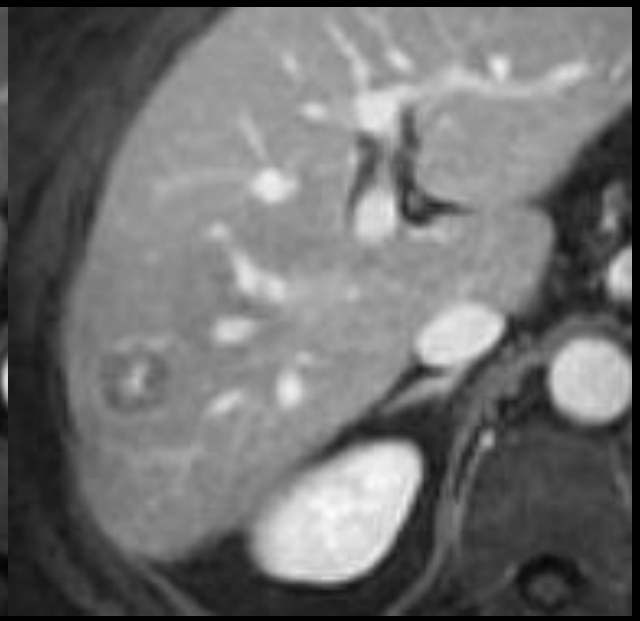
Grazioli L et al. Radiology 2012;262:520–529

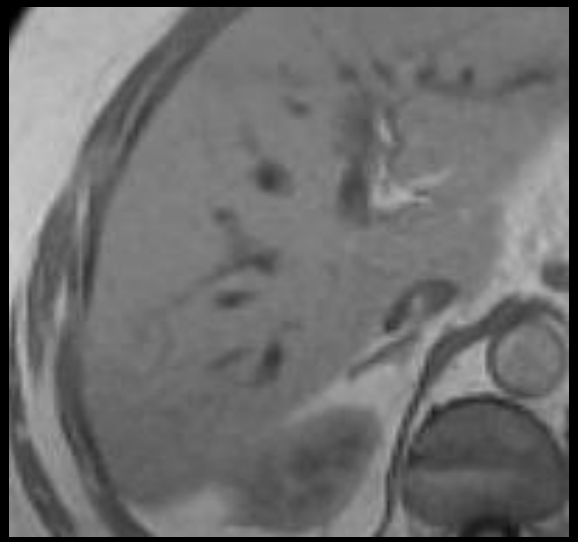
Fatty focal nodular hyperplasia

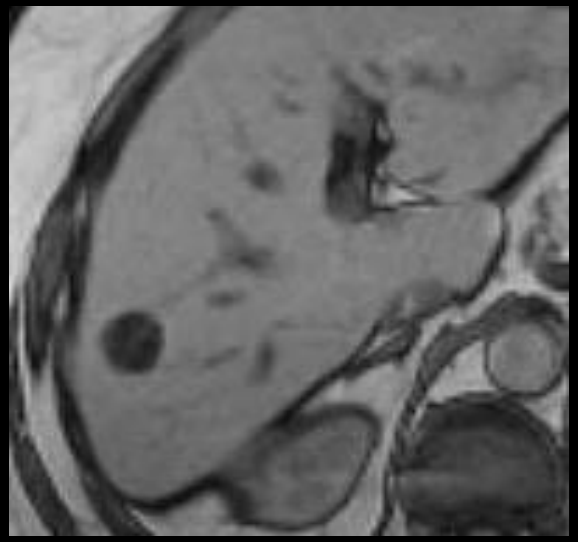


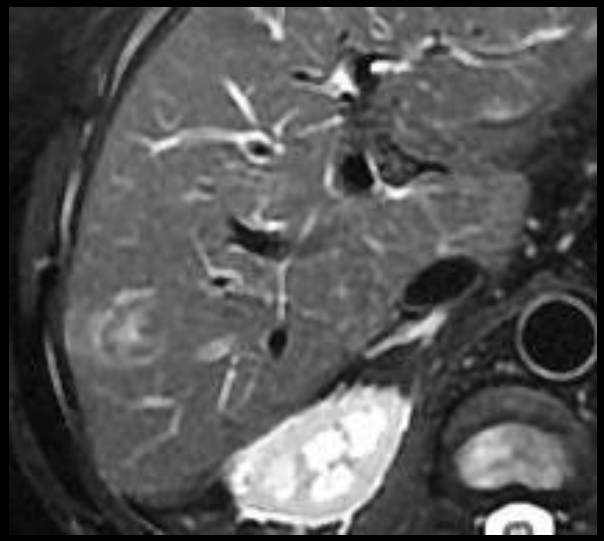
Fatty focal nodular hyperplasia



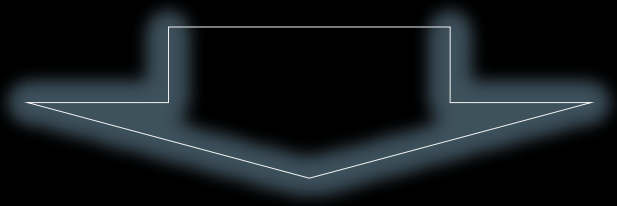








Atypical Focal nodular hyperplasia



Fibrolamellar hepatocellular carcinoma

Fibrolamellar hepatocellular carcinoma

0.8% of primary hepatic tumor in a US review

14% of patients before 40 years old

Fibrolamellar carcinoma must be evocated in young (no children) patients (m.age27 years)

No difference in sex ratio

Ganeshan D et al. AJR Am J Roentgenol. 2014;202(3):544-52
El-Serag HB et al. Hepatology 2004;39:798–803
Stipa F et al. Cancer. 2006;106(6):1331-8

Fibrolamellar hepatocellular carcinoma

No hepatic disease associated

Elevation of AFP in only 7% of patients

Diagnosis = Imaging

Ganeshan D et al. AJR Am J Roentgenol. 2014;202(3):544-52
El-Serag HB et al. Hepatology 2004;39:798–803
Stipa F et al. Cancer. 2006;106(6):1331-8

Large single masse, lobulated, well-circumscribed

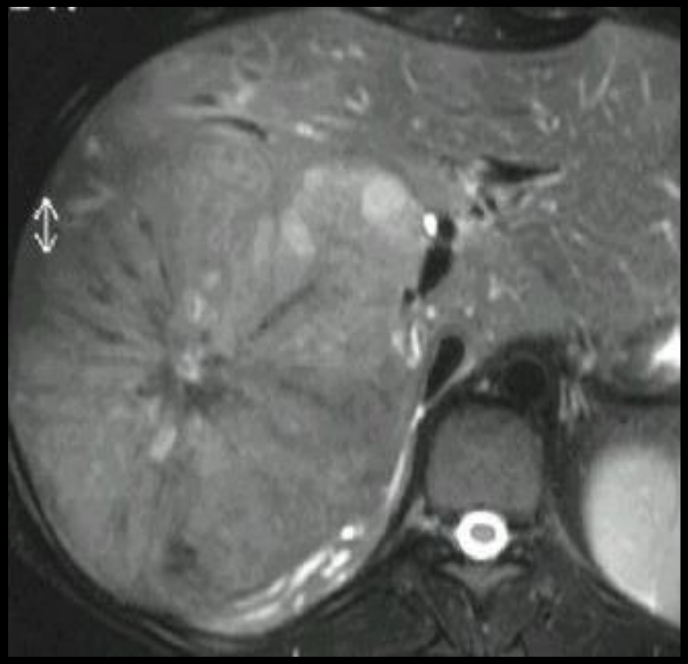
Central stellate scar (fibrous tissue) in 20 to 75%
Radiating fibrous bands

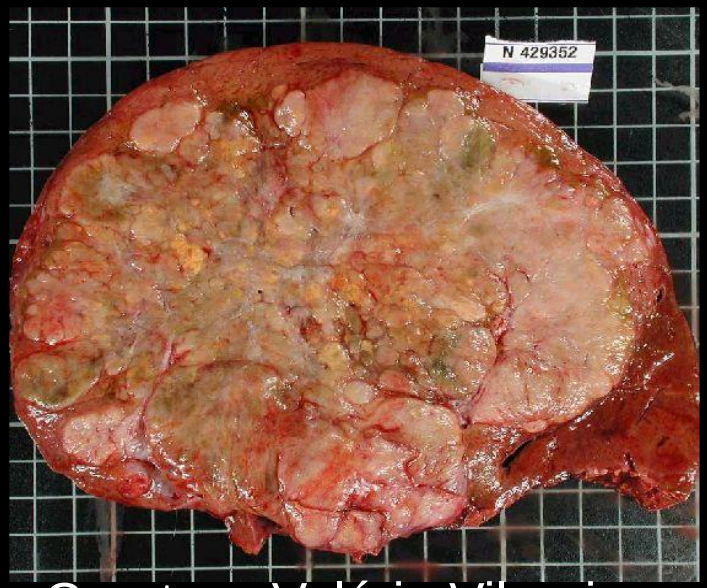
Central scare is hypo T1 and T2
Enhancement of the central scare is rare

Capsule is possible, but often incomplete

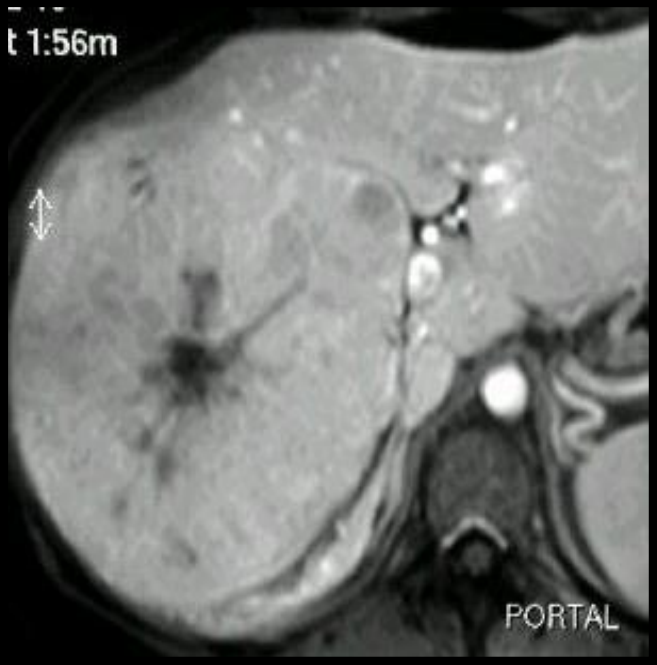
Small focal calcifications (40–68%) in the central scar or radiating fibrous bands

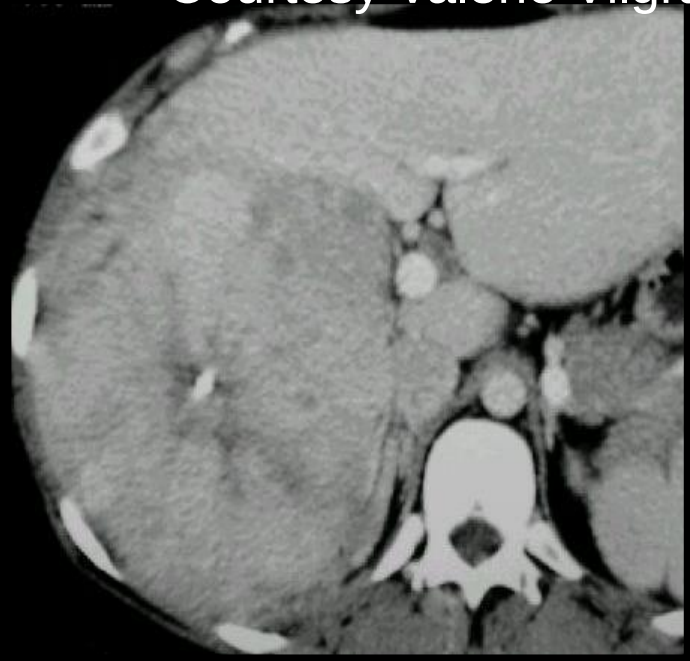
Ganeshan D et al. AJR Am J Roentgenol. 2014;202:544-52
Ichikawa T et al. Radiology 1999; 213:352–361

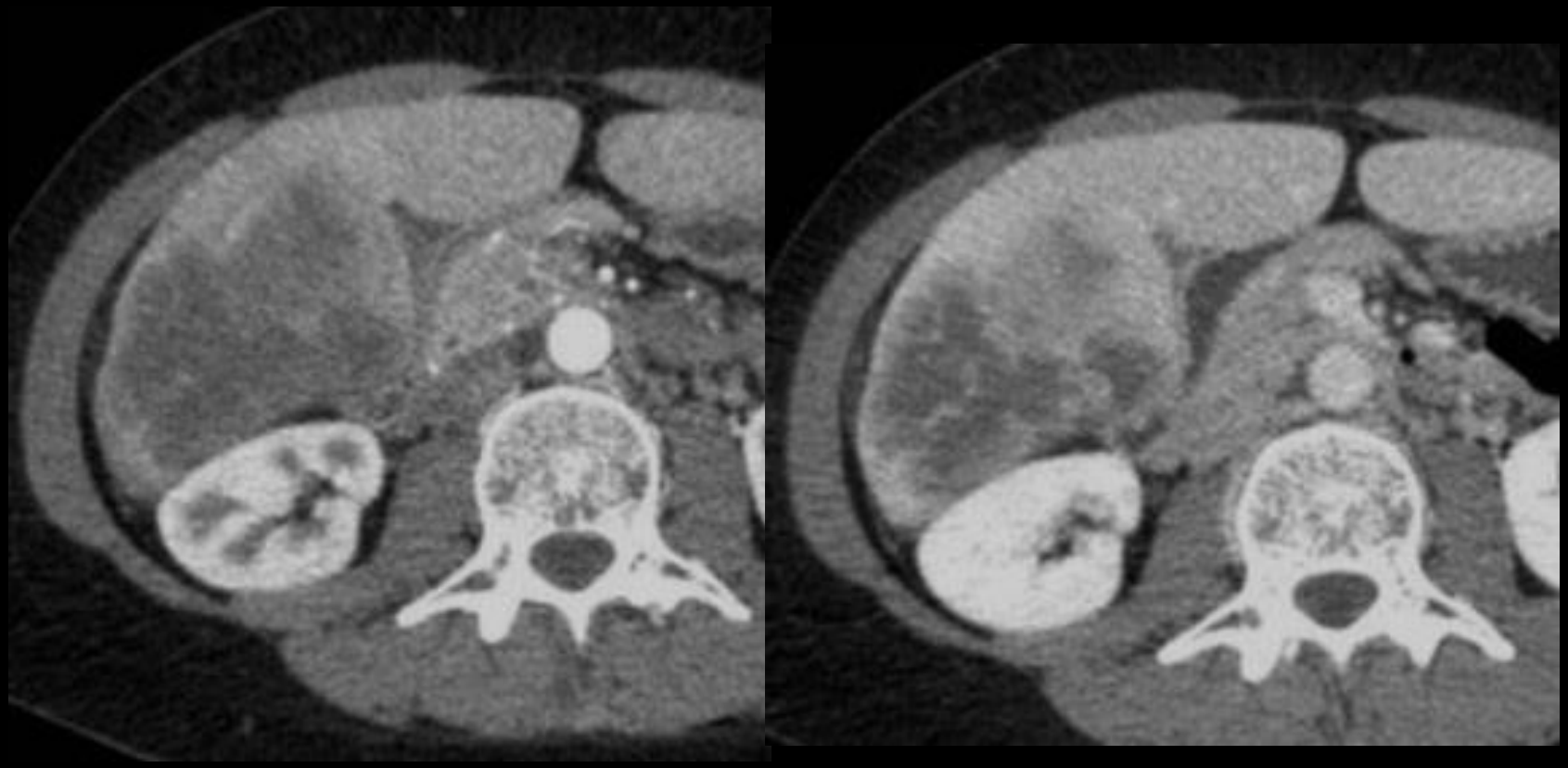




Courtesy Valérie Vilgrain







Lymphatic involvement are frequent (50–65%) whereas it is rare in classical HCC

This is an important point of the prognosis

Study (n=28 FHCC), 100% 5-year survival in lymph node–negative patients compared with 45% in lymph node–positive patients

Distant metastases have been reported in 20–30% (lung, peritoneum, and adrenal gland)

Stipa F et al. Cancer. 2006;106(6):1331-8
Ichikawa T et al. Radiology 1999; 213:352–361

The only adequate treatment of FHCC is surgical resection with lymph node dissection

Systematic review analyzing 575 patients, the 5-year overall survival rate after partial hepatectomy was 70% compared with 0% after nonsurgical treatment

Recurrence after surgical treatment is frequent (60–70%)

Mavros MN et al. J Am Coll Surg 2012; 215:820–830
Stipa F et al. Cancer. 2006;106(6):1331-8
Ichikawa T et al. Radiology 1999; 213:352–361

Prognosis of fibrolamellar HCC is debated

- Fibrolamellar HCC has a better prognosis than conventional HCC

- The better prognosis of FHCC is due to lack of underlying cirrhosis and youth of the patients

In the review of Mavros It seems that even when matched with age, sex, race, stage of disease, and curative intent of treatment, fibrolamellar HCC is associated with a better overall survival

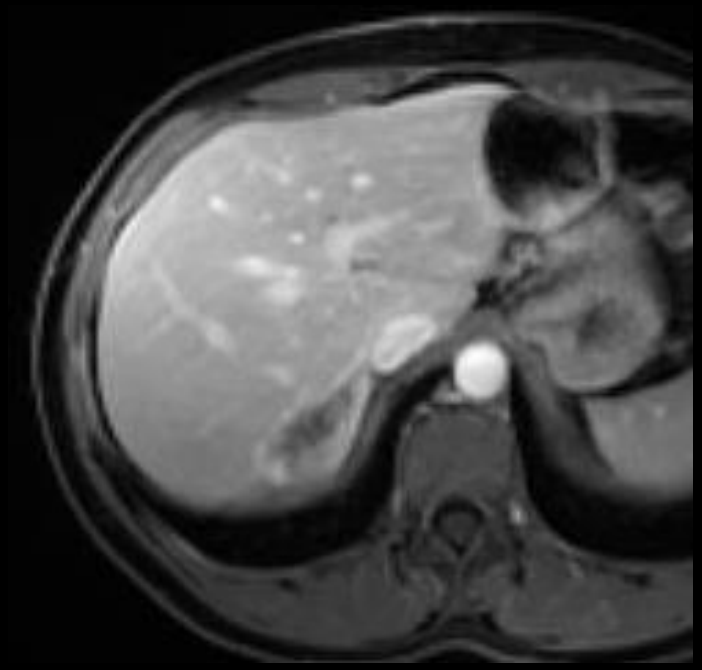
Mavros MN et al. J Am Coll Surg 2012; 215:820–830

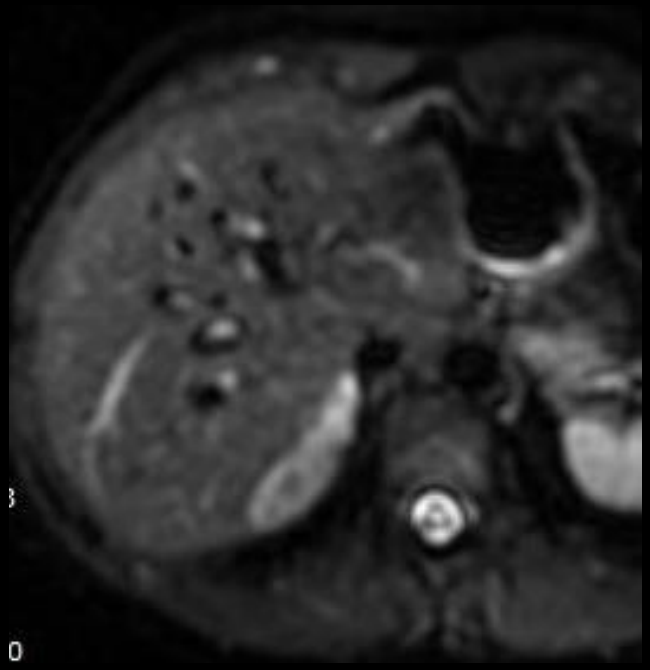
Angiomatous tumor

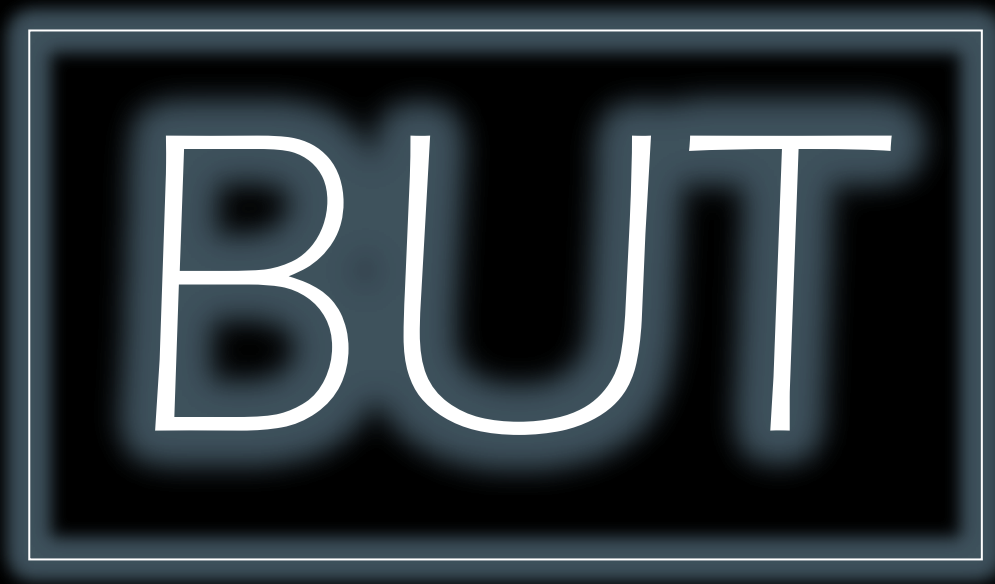
You think first

Hemangioma

Atypical hemangioma






BUT

Epithelioid hemangioendothelioma

Rare **borderline tumor** composed of epithelioid, endothelial or dendritics cells in fibroid and myxoid stroma

Variable malignant potential. The clinical outcome of HEH is unpredictable, ranging from a rapid fulminant course to long-term survivors even with no therapy

Makhlouf HR et al. Cancer 1999; 85: 562-582
Kim EH et al. Abdom Imaging 2015; 40:500–509

Epithelioid hemangioendothelioma

Female 60.3%

No specific age (12 to 86 years)

Nodular (Single or multiple) type (90%)

Diffuse type (10%)

No clear risk factor (oral contracetion, PVC) have been reported but not confirmed

No blood marker of the tumor

Harada J et al. J Nippon Med Sch 2011;78:246-251
Nagase M et al. J Hepatobiliary Pancreat Surg 2000;7:443–447

Epithelioid hemangioendothelioma

Hepatic masses with **peripherical location**,

Poor arterial enhancement
Peripherical and delayed contrast enhancement
(mimic Cholangiocarcinoma or metastasis)
Rare nodular enhancement (mimic hemangioma)
Target-like configuration (19%)

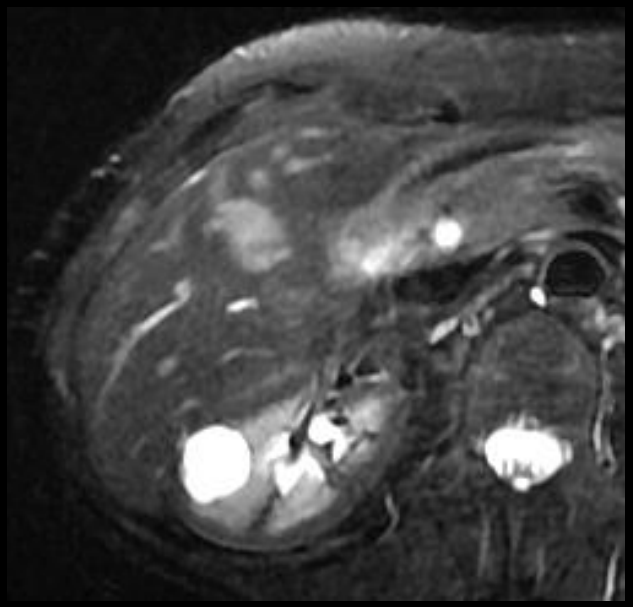
Coalescence of nodules

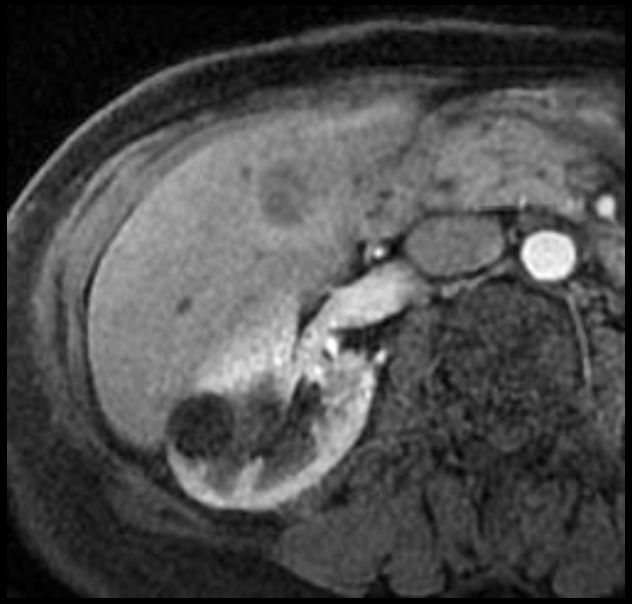
Capsular retraction for multinodular or diffuse types

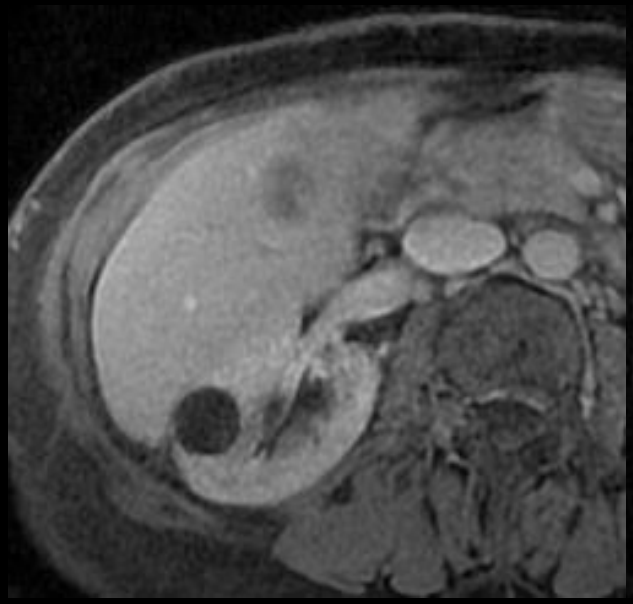
Calcification 20%

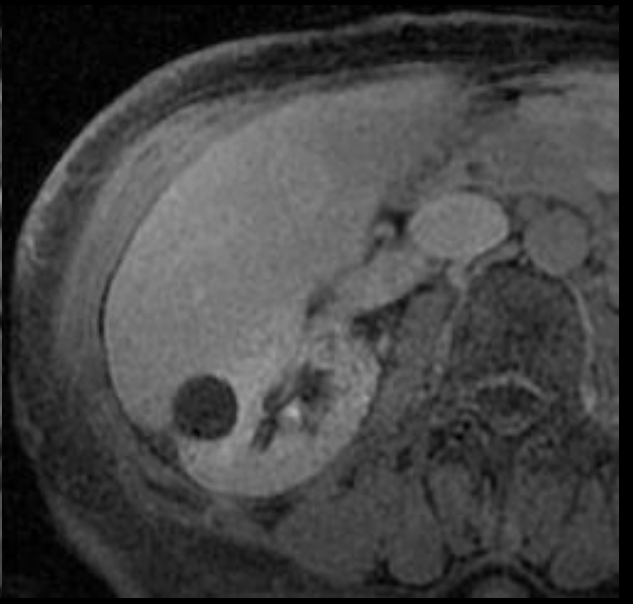
Kim EH et al. Abdom Imaging 2015; 40:500–509

Epithelioid hemangioendothelioma

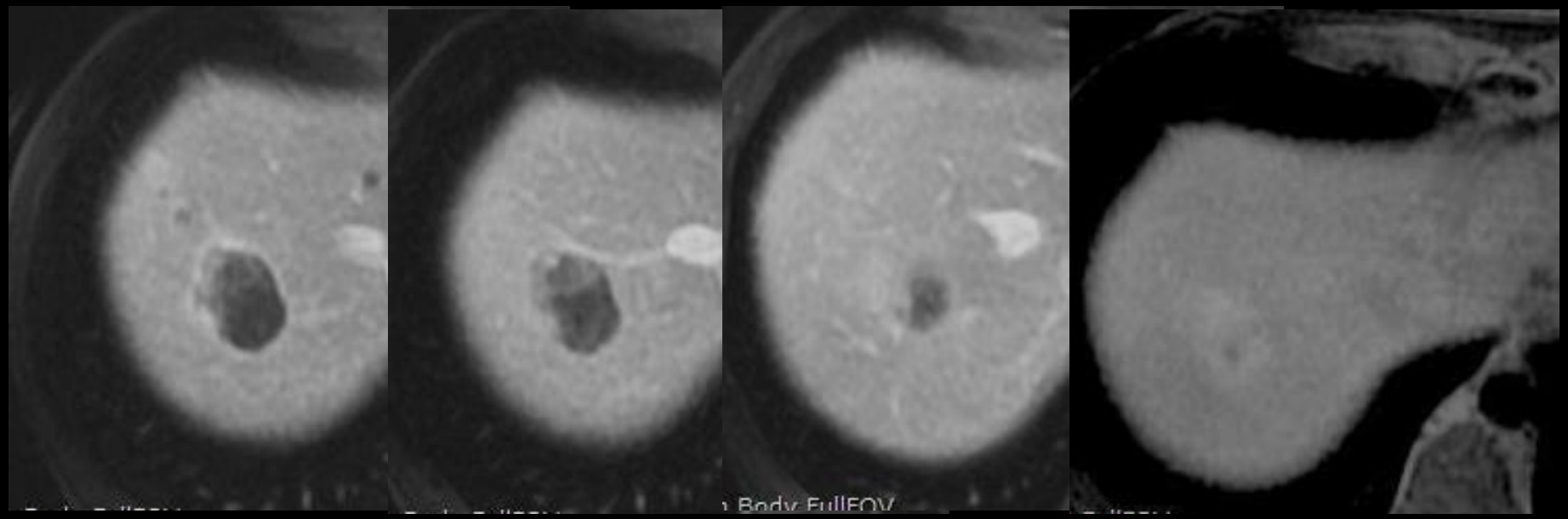




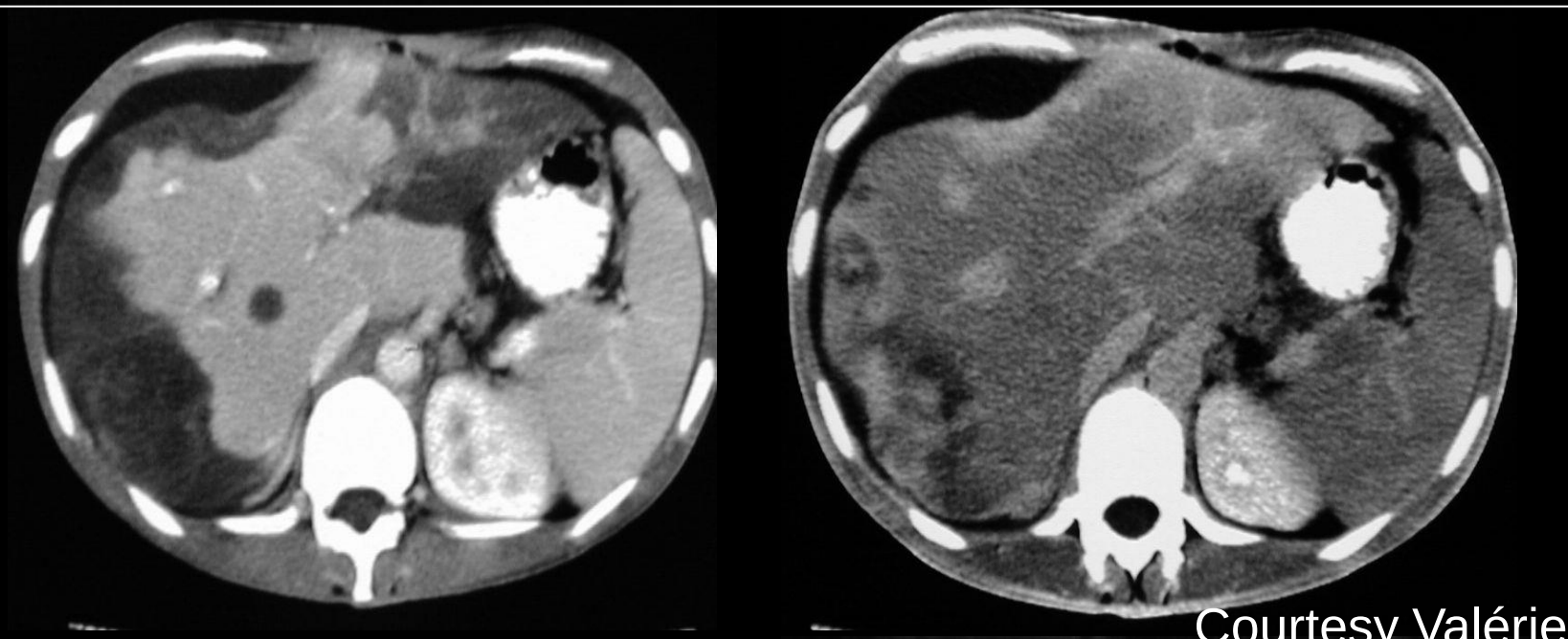




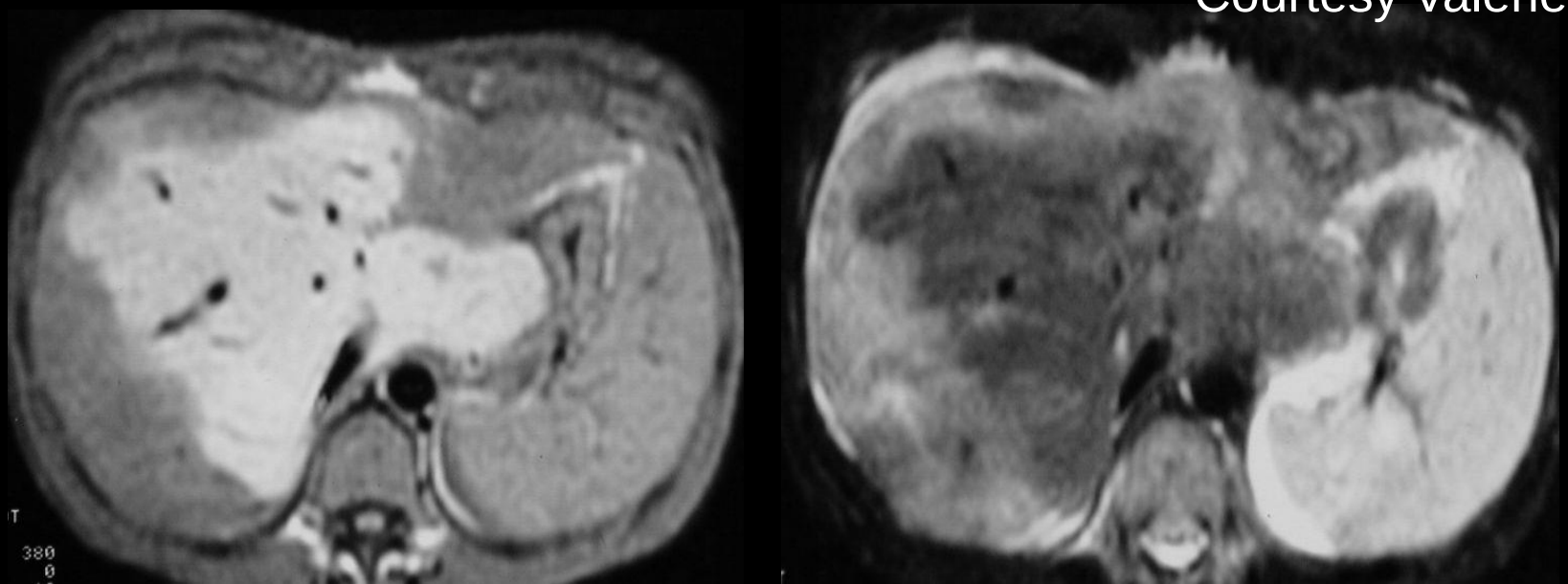
Epithelioid hemangioendothelioma



Epithelioid hemangioendothelioma



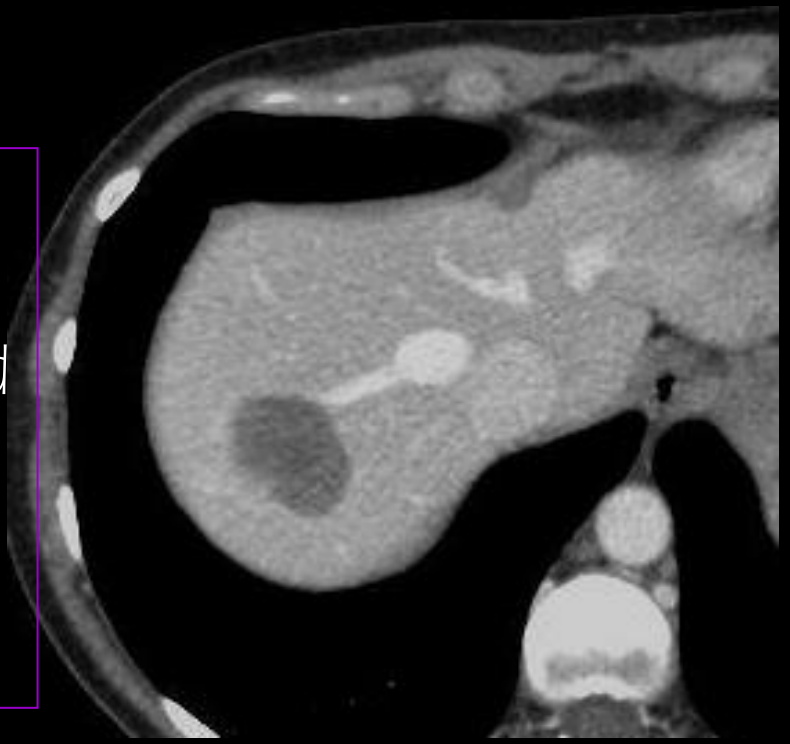
Courtesy Valérie Vilgrain



Epithelioid hemangioendothelioma

Lollipop sign

This sign is a combination of two structures: the hypodense **well defined tumor mass** on enhanced images (the candy) and the **histologically occluded vein** (the stick)



Alomari AI et al. Eur J Radiol 2006;59:460-464

Epithelioid hemangioendothelioma

Single nodule form more difficult to diagnose

cholangiocarcinoma, metastasis, inflammatory lesion, or atypical hemangioma can be evocated

However, distinguishing HEH from other hepatic tumors is crucial, *since long-term survival is achievable through appropriate treatment such as surgical resection, liver transplantation*

Makhlouf HR et al. Cancer 1999; 85: 562-582
Kim EH et al. Abdom Imaging 2015; 40:500–509

Epithelioid hemangioendothelioma

Biopsy - histology confirm the diagnosis

Immuno staining important to diagnose (that could be difficult with hemangioma, angiosarcoma, even cholangio carcinoma) **but no specific** positive for at least one endothelial marker CD31, CD34, factor VIII-related antigen

Factor predictive of unfavorable evolution:
Only **cellularity** but not the number of mitoses

Makhlouf HR et al. Cancer 1999; 85: 562-582

Epithelioid hemangioendothelioma

Transplantation and resection are the recommended treatment for non metastasis lesion

Chemotherapy (Doxorubicine, 5FU) for the diffuse, advanced disease (poor results)

5 ys survival rate

Transplantation: 55-75%
Resection: 75%
Other treatments: 30%
No treatment: 4.5%

Harada J et al. J Nippon Med Sch 2011;78:246-251
Mehrabi A et al. Cancer 2006;107:2108-2121
Makhlouf HR et al. Cancer 1999; 85: 562-582

Angio sarcoma

Men 4:1 – Age 60-70y

Risk factors

Vinyl chloride and arsenic
In some cases is related to hemochromatosis and use of anabolic steroids
But often no risk factor have been found

Pedrassa BC et al. Radiol Bras. 2014;47:310–316
Koyama T et al. Radiology. 2002;222:667–73.
Kim KA et al. Am J Roentgenol. 2006;187:481–9.

Angio sarcoma

Often large dominant masse with small distant nodules

Heterogeneous

Possible hemorrhage (hyperintense T1 foci representative of intratumoral hemorrhage, spontaneous hypertattenuation on CT)

Necrosis are frequent

Calcifications are rare

Tan Y et al. Abdom Imaging 2013;38:511–526
Kayama A et al. Semin Ultrasound CT MRI 2009;30:387-407
Koyama T et al. Radiology 2002; 222:667–673

Angio sarcoma

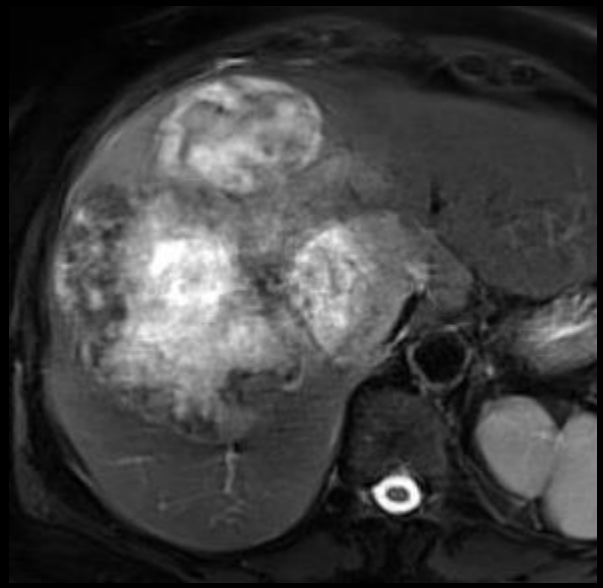
Progressive nodular irregular enhancement mainly centripedal but **never complete**

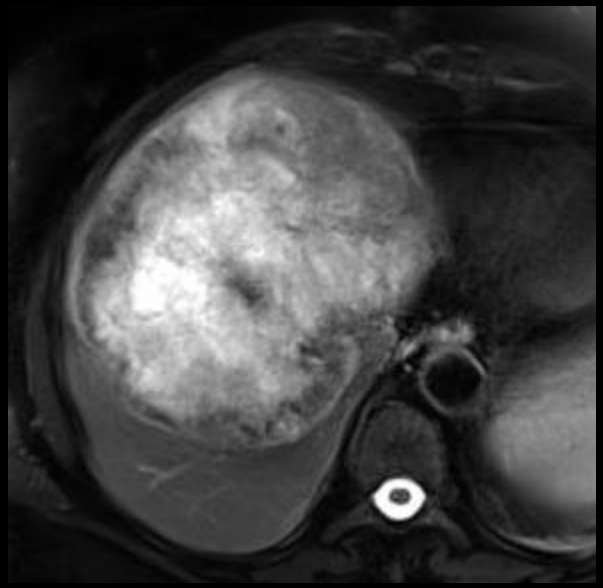
More **often continue rim**

Strong hyper signal on **T2 sequence but heterogeneous**

Tan Y et al. Abdom Imaging (2013) 38:511–526

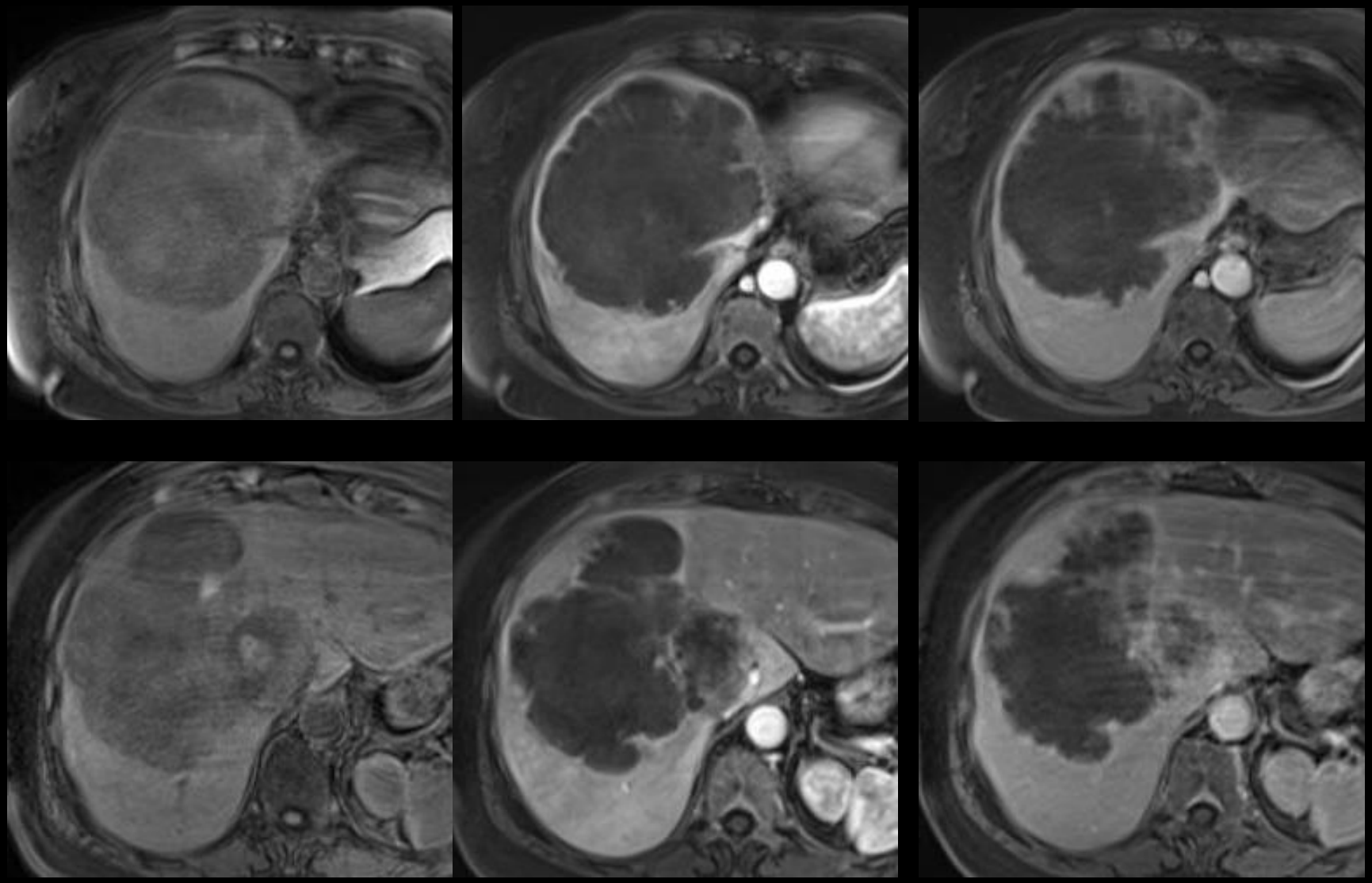
Angio sarcoma





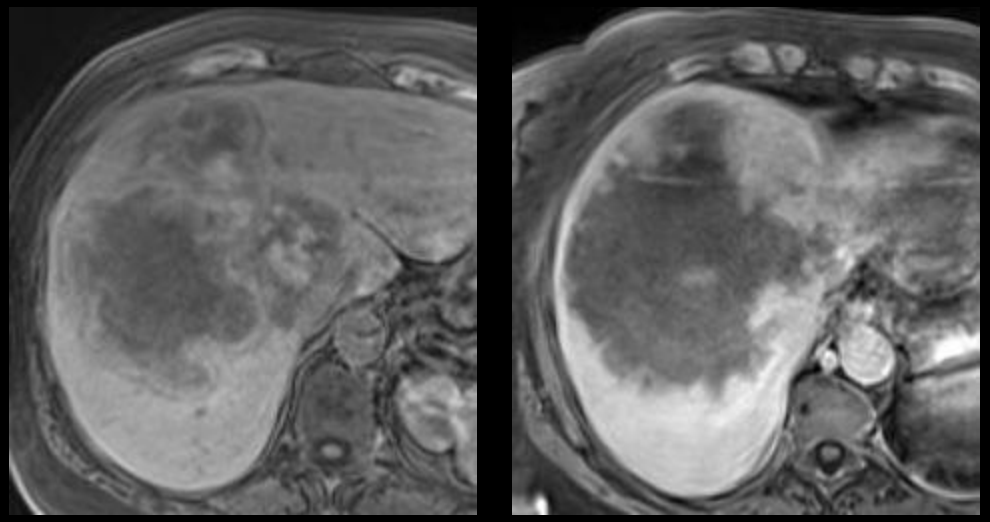
T2 Fat sat

Angio sarcoma

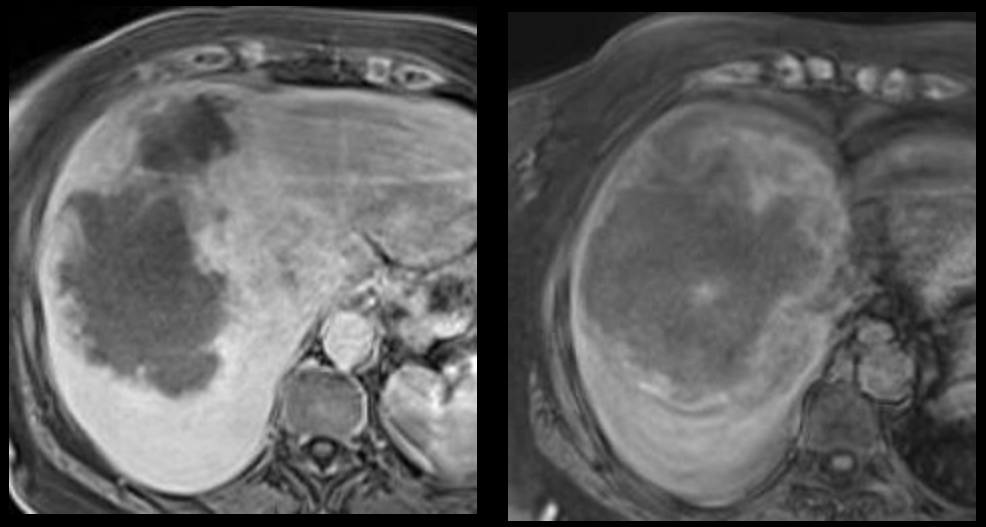


Angio sarcoma

1h15 post injection



6h post injection



Angio sarcoma

Metastasis

At least **50% of patients** have metastatic disease

Lung, spleen, and bone are the most common

Prognosis

Local excision alone or combination with adjuvant therapy allows a median survival time of 17 months

Median survival time is 5 months

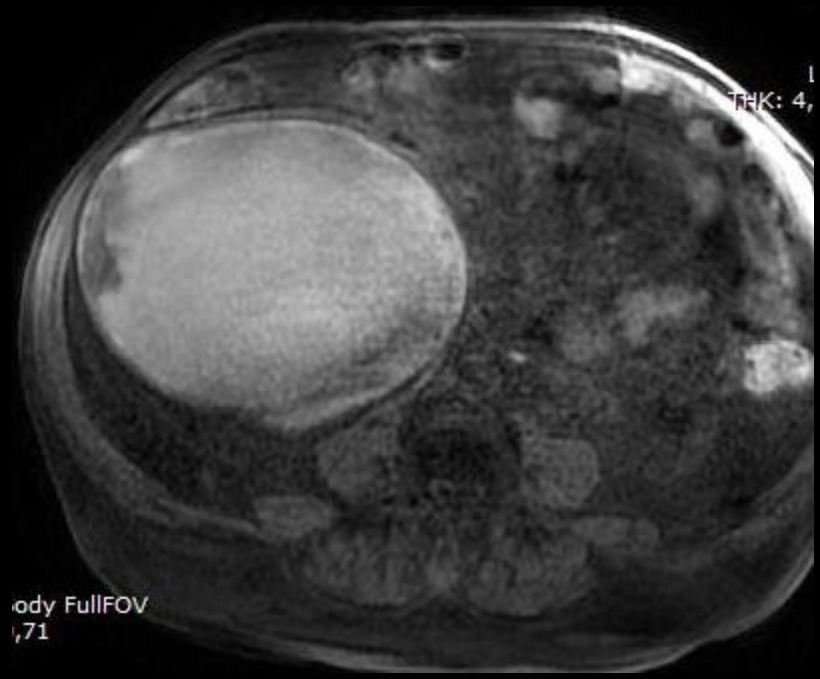
Tan Y et al. Abdom Imaging 2013; 38:511–526
Zheng YW et al. J Gastroenterol Hepatol. 2014;29:906-11

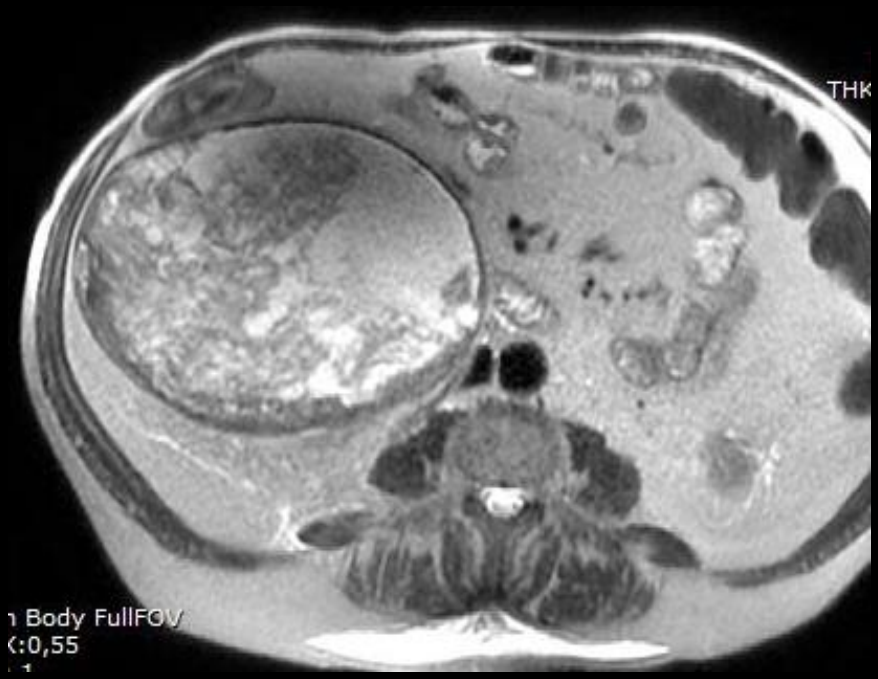
Cystic tumor

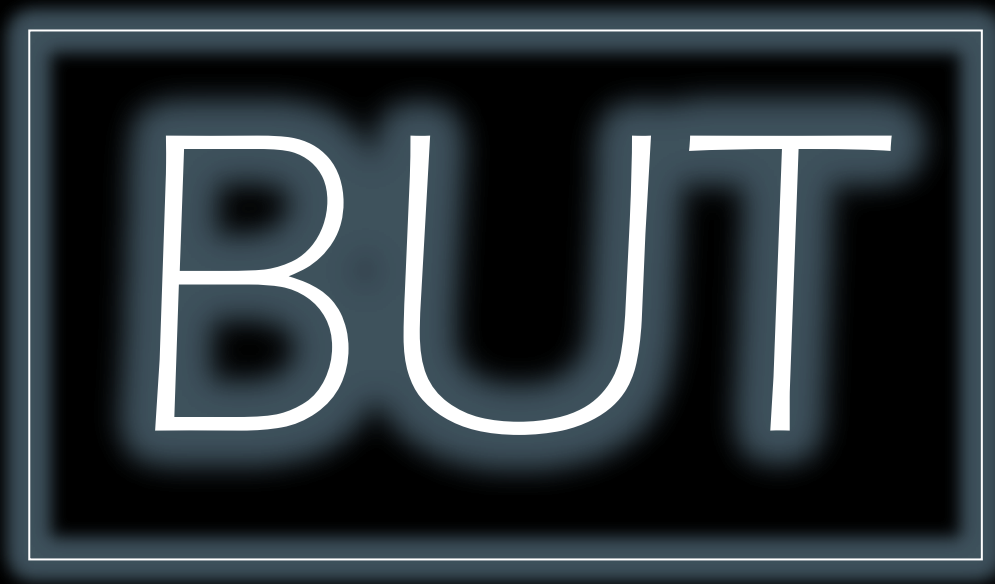
You think first

Hepatic cyst

Complicated(hemorrhagic)






BUT

Cystadenoma – Cystadeno carcinoma

5% of cystic tumor
Female 80% - Age 50-70y
Often asymptomatic or abdominal pain possible

DePoggio P et al. World J Gastroenterol 2008;14: 3616-3620

Cystadenoma – Cystadeno carcinoma

Solitary tumor often large (> 5cm)
Possible 2or 3

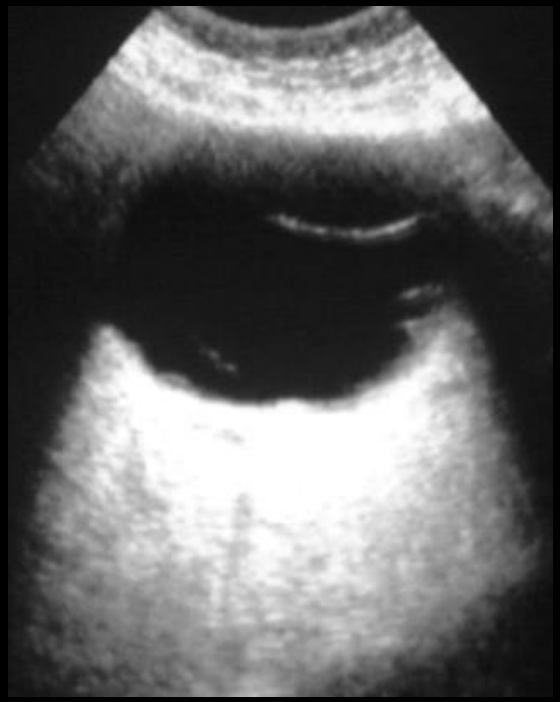
Internal septa (Interest of MRI)

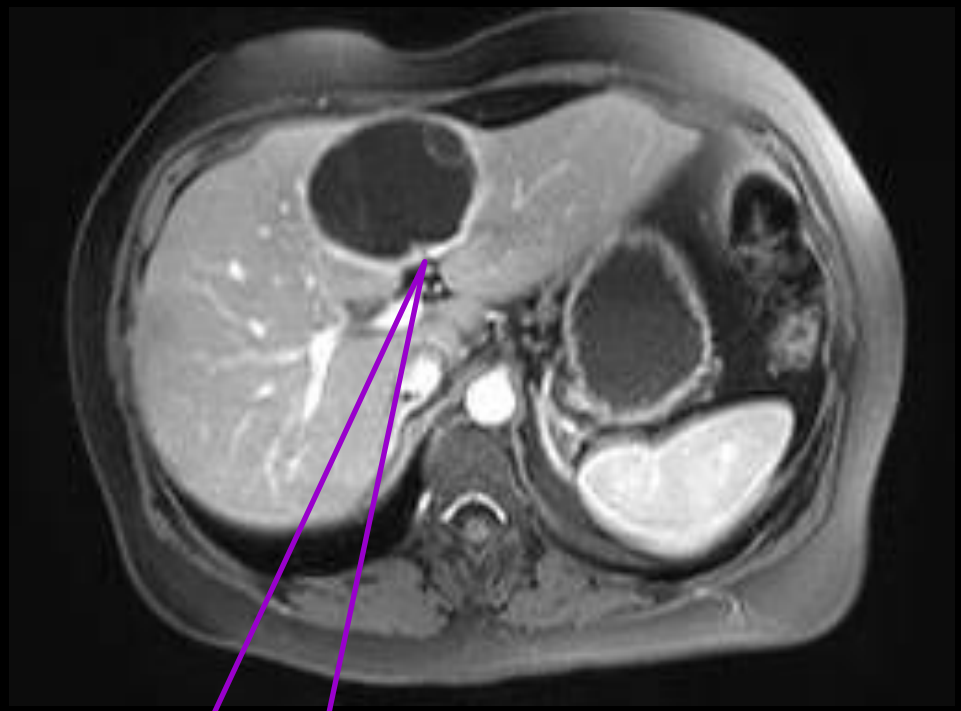
Papillary projections (enhanced)

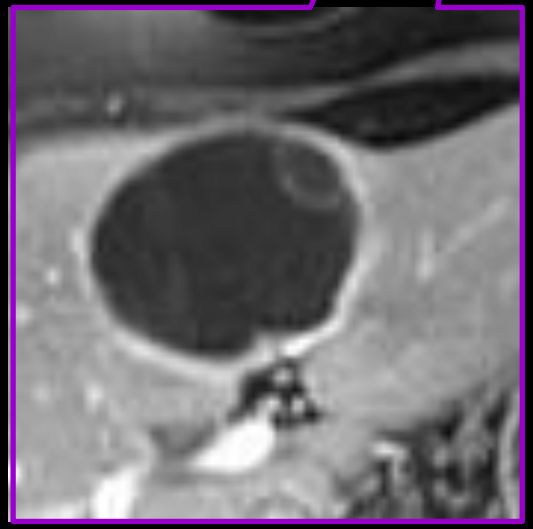
Irregular and **thick walls**

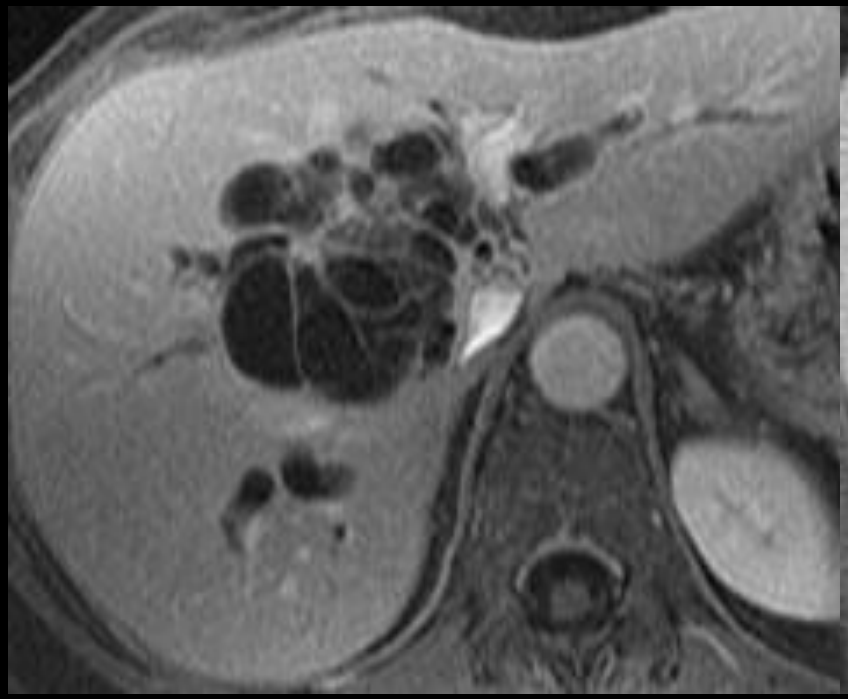
Possible thin calcification

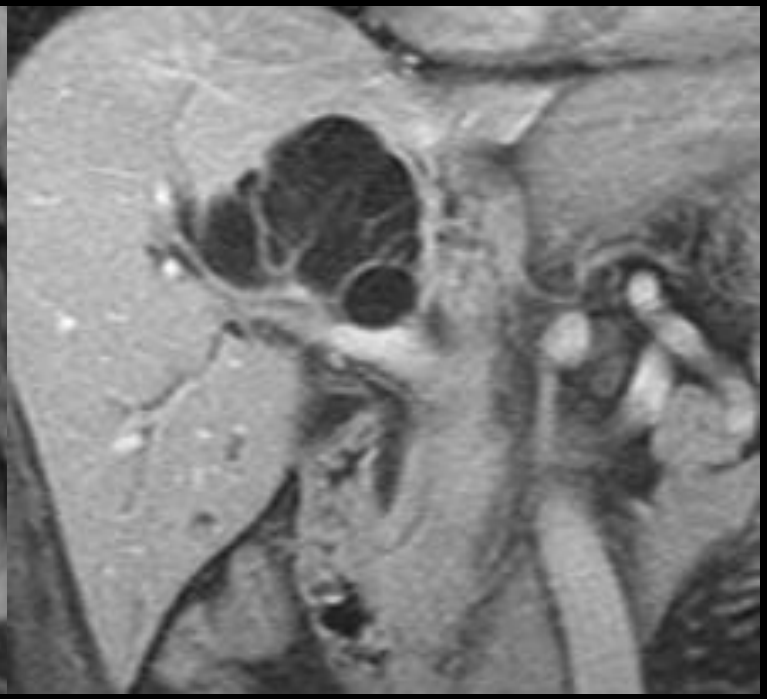
DePoggio P et al. World J Gastroenterol 2008;14: 3616-3620
Precetti S et al. J Radiol 2007;88:1061-72



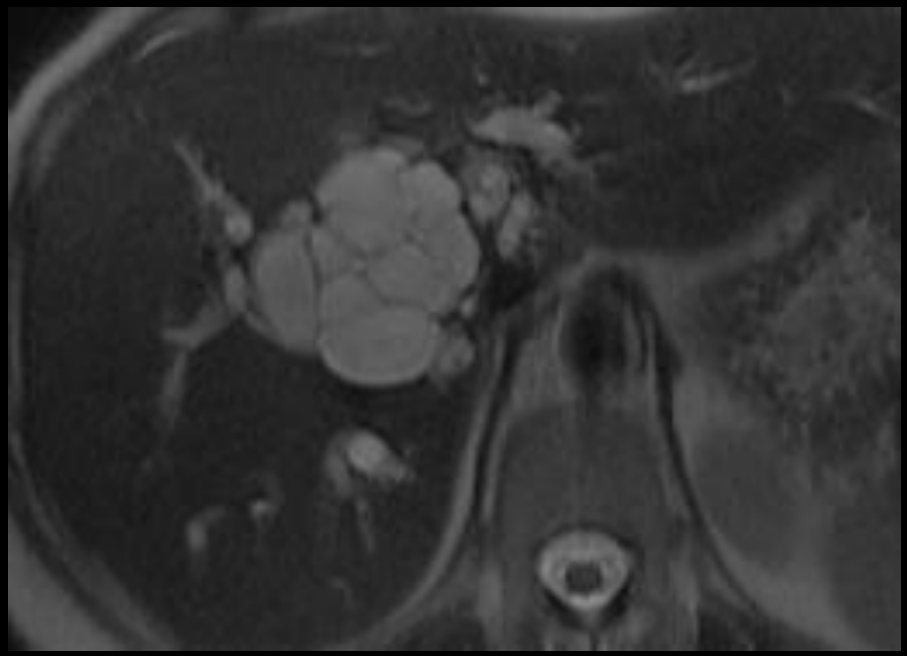






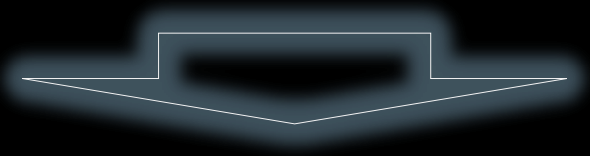


Courtesy Valérie Laurent



Cystadenoma – Cystadeno carcinoma

Potential risk of malignant transformation
(up to 30% in some series)



Cystadeno carcinoma

Transformation or de novo

DePoggio P et al. World J Gastroenterol 2008;14: 3616-3620

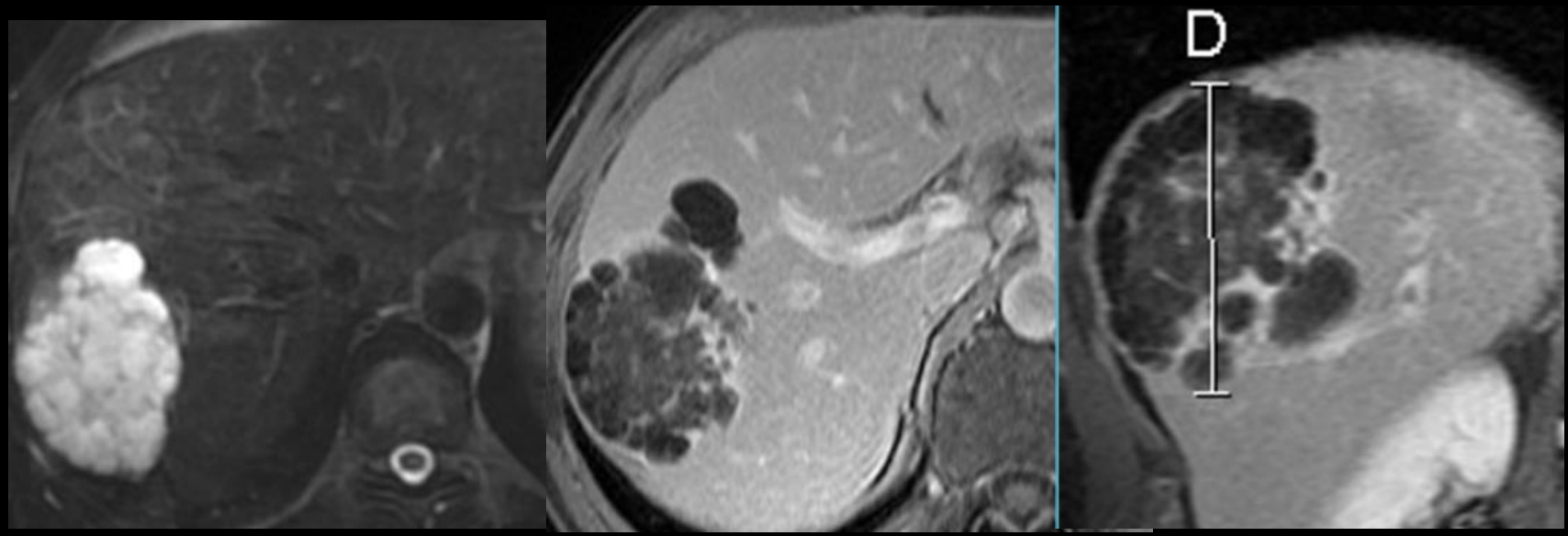
Cystadenoma – Cystadeno carcinoma

Difference between cystadenoma and cystadeno carcinoma difficult

Thicker walls and septa, papillary projections are in favour of carcinoma

Presence or absence of mesenchymal ("ovarian-like") stroma do not change the evolution

DePoggio P et al. World J Gastroenterol 2008;14: 3616-3620
Precetti S et al. J Radiol 2007;88:1061-72
Vogt P et al. J Am Coll Surg. 2005; 200:727-33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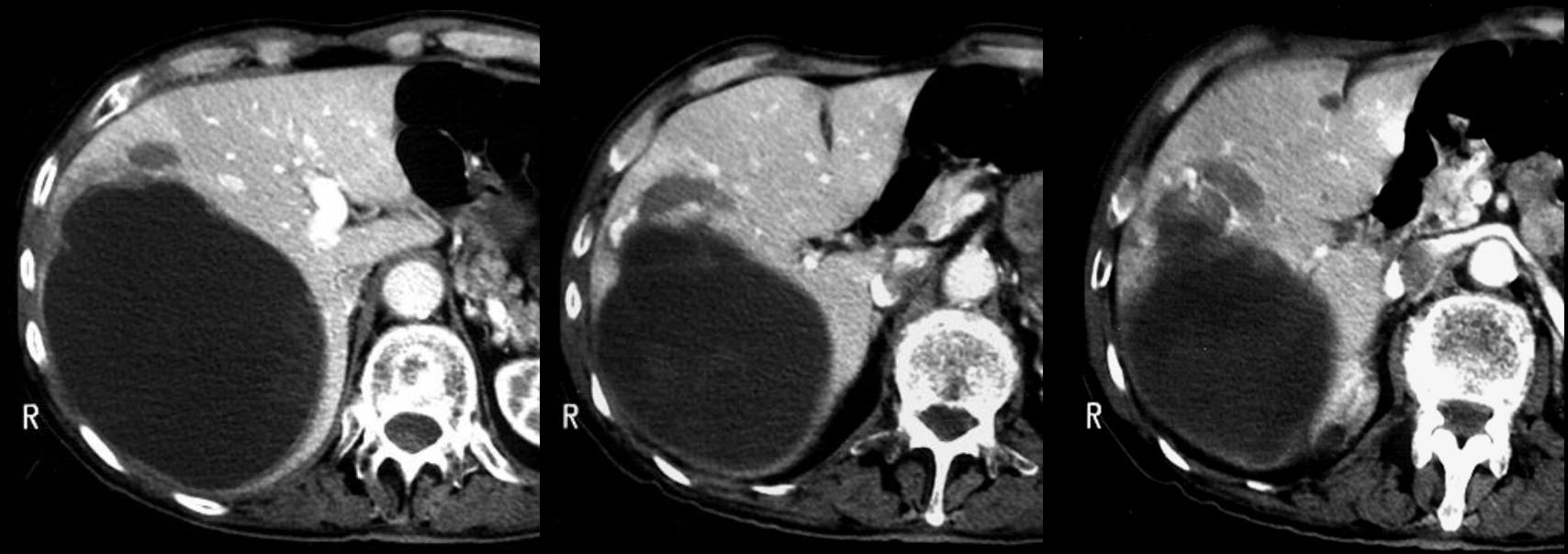
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Cystadenoma Cystadeno carcinoma / Atypical (complicated) hepatic cyst

Fine needle liquid aspiration

Presence of **atypical cells, mucinous** material are possible but not obligatory

Elevated levels of CEA and CA19-9 in the cystic fluid has been observed in cystadenoma, in cystadenocarcinoma and in simple (or complicated) hepatic cysts

DePoggio P et al. World J Gastroenterol 2008;14: 3616-3620

Cystadenoma Cystadeno carcinoma / Atypical (complicated) hepatic cyst

Fine needle liquid aspiration

Tumour-associated glycoprotein (TAG 72) is able to differentiate hepatic simple cysts from biliary cystadenoma, biliary cystadenocarcinoma or intraductal papillary mucinous neoplasms of the bile duct

Fuks D et al. BJS 2014; 101: 408–416

Cystadenoma – Cystadeno carcinoma

Blood marker

To differentiate cystadeno to cystadenocarcinoma elevated levels of CA 125 and CA19-9 are in favor of cystadenocarcinoma but are poorly sensible

et al. World J Gastroenterol 2014;20: 12595-12601
Arnaoutakis et al. Ann Surg 2015;261:361–367

Cystadenoma – Cystadeno carcinoma

Treatment

Surgical complet resection is mandated for both cystadenocarcinoma and cystadenoma

Cystadenocarcinoma even after resection has a poor prognosis with reccurrence and metastasis

Vogt P et al. J Am Coll Surg. 2005; 200:727-33
Alobaidi M et al. Curr Probl Diagn Radiol 2004;33:254-68

Ciliated Hepatic Foregut Cyst

benign liver lesions – congenital malformation

Originating in the **foregut** Histological similarities to bronchogenic and esophageal cysts

Ciliated cyst is always localized in the **segt IV** (or in contact to) because of canal pleuro peritoneal and segt IV was the initial bulk of the liver

Sharma S et al. Dig Dis Sci (2008) 53:2818–2821

Ciliated Hepatic Foregut Cyst

Finding in the 6th decade with a 3.5 cm diam. - Because of slow growth

Right upper pain (50% of cases)

Unilocular cysts

Segment IV

Sharma S et al. Dig Dis Sci (2008) 53:2818–2821

Ciliated Hepatic Foregut Cyst

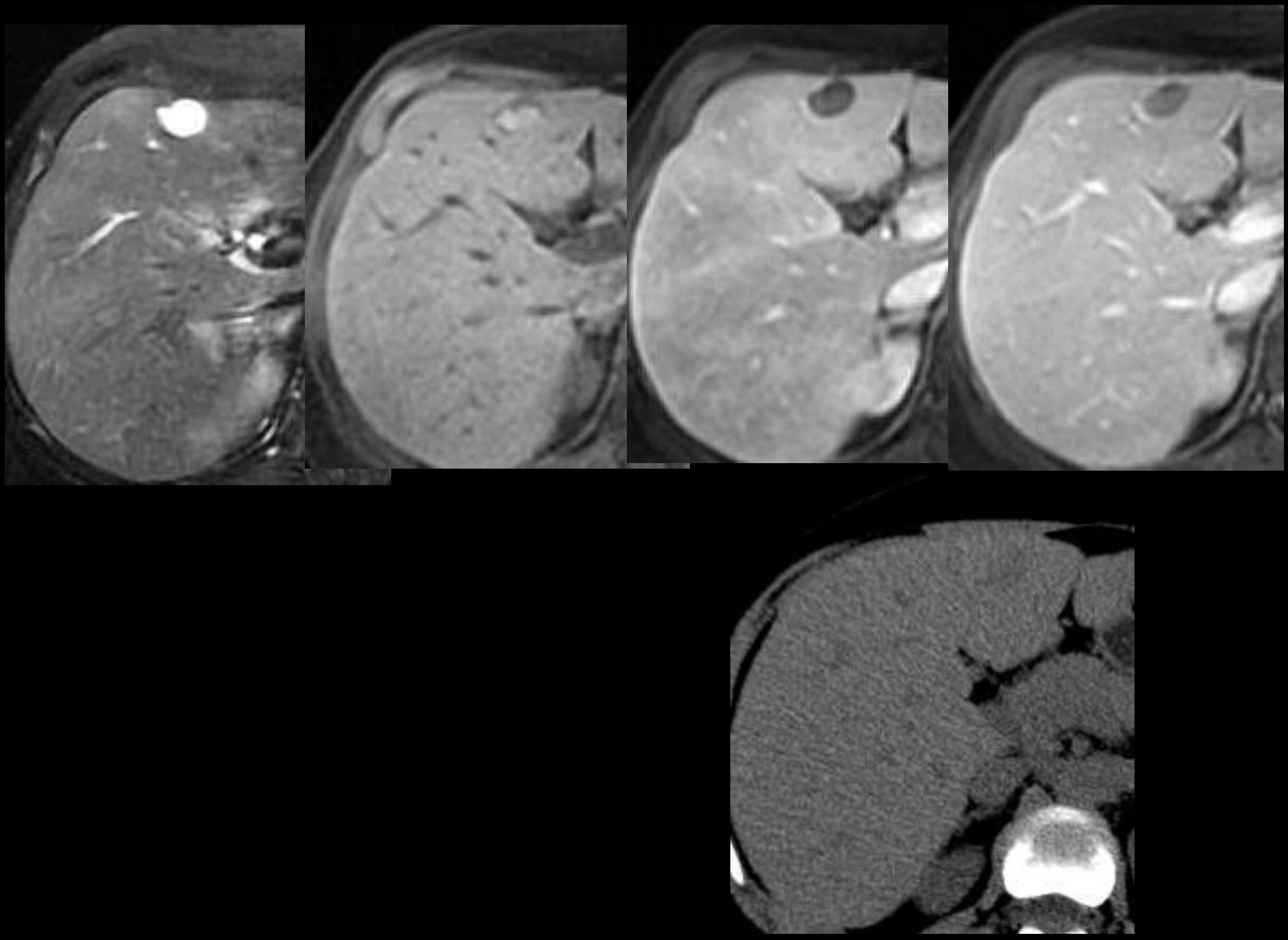
Hypoechoic but possibly not transosnore

Not enhanced wathever the technique used

Often slightly **hyper T1** homogeneously on MRI

Fine needle aspiration = presence of ciliated columnar, but lacks sensitivity

Sharma S et al. Dig Dis Sci (2008) 53:2818–2821



Ciliated Hepatic Foregut Cyst

Evolution

Mainly benign

Malignant transformation in squamous cell carcinoma (3%)

Treatment

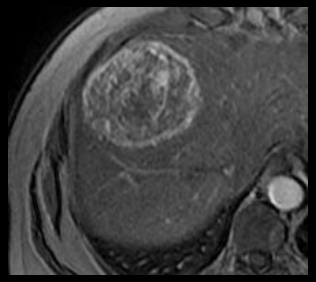
Therefore cysts should be excised or enucleated irrespective of the size of the cyst

De Lajarte-Thirouard AS et al. Pathol Res Pract 2002; 198:697–700

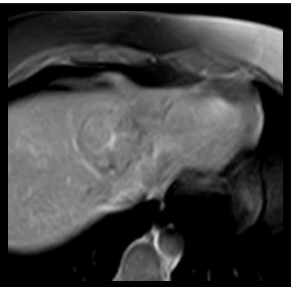
Summary

Fatty

- Angiomyolipome

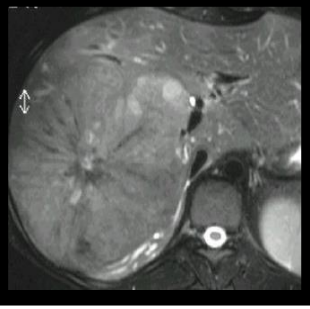


Misdiag = HCC
Diag = HTMB45
Epitheliod form = poor fat



- FNH

If typical feature = FNH
If no typical = biopsy



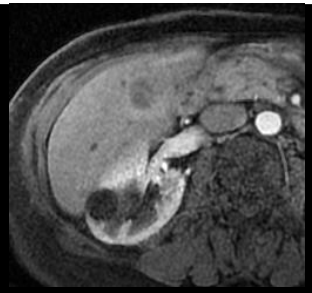
- Fibrolamellar HCC

Young patients
ADP
Treatment = Surgery

Angio

- Epithelioid hemangio..

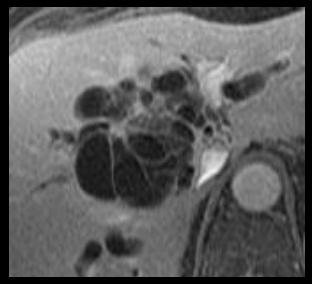
Female
Make the diag because of early ttt



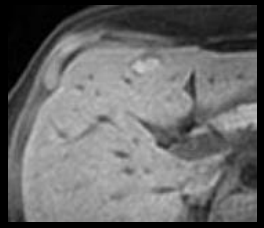
Cyst

- Cystadeno(carci)ma

Female
Septa – irregular wall
TAG 72



- Ciliated cyst



Pain
Segt IV - hyper T1
Surgery

Brussel – November 13th 2015

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