

# North Carolina Society of Gastroenterology 2024 Annual Meeting



## Benign Liver Lesions Gone Wild

Neil Shah, MD

Assistant Professor of Medicine

UNC School of Medicine

Joint Providership



American Society for  
Gastrointestinal Endoscopy

# DISCLOSURES

- I have no relevant disclosures to this topic

# WARNING

This Talk Contains Extreme Presentations  
of Benign Liver Masses

**Provider Discretion is Advised**

# TODAY'S OBJECTIVES

1. Classify liver lesions utilizing basics of radiologic interpretation
2. Review typical and atypical presentations of benign liver lesions including hepatic cysts, hepatic hemangioma, focal nodular hyperplasia and hepatic adenoma
3. Discuss management strategies for complications of benign liver lesions
4. Discuss role of surveillance of benign liver lesions

# RADIOLOGY 101 FOR LIVER MASSES

- Obtain contrast enhanced imaging
  - MRI Abdomen W/Wo Contrast\*\*
  - “Triple Phase” CT
  - Contrast-Enhanced U/S (CEUS)
- Consider Liver-Specific MRI Contrast
  - Gadoteric Acid (Eovist) or Gadobenate (Multihance)
  - Taken up preferentially into hepatocytes via biliary transport system
  - “Non-hepatocytes” appear more dark (i.e. HCC, malignancy or adenomas) on delayed phase



Clin Liver Dis (Hoboken). 2014 Nov

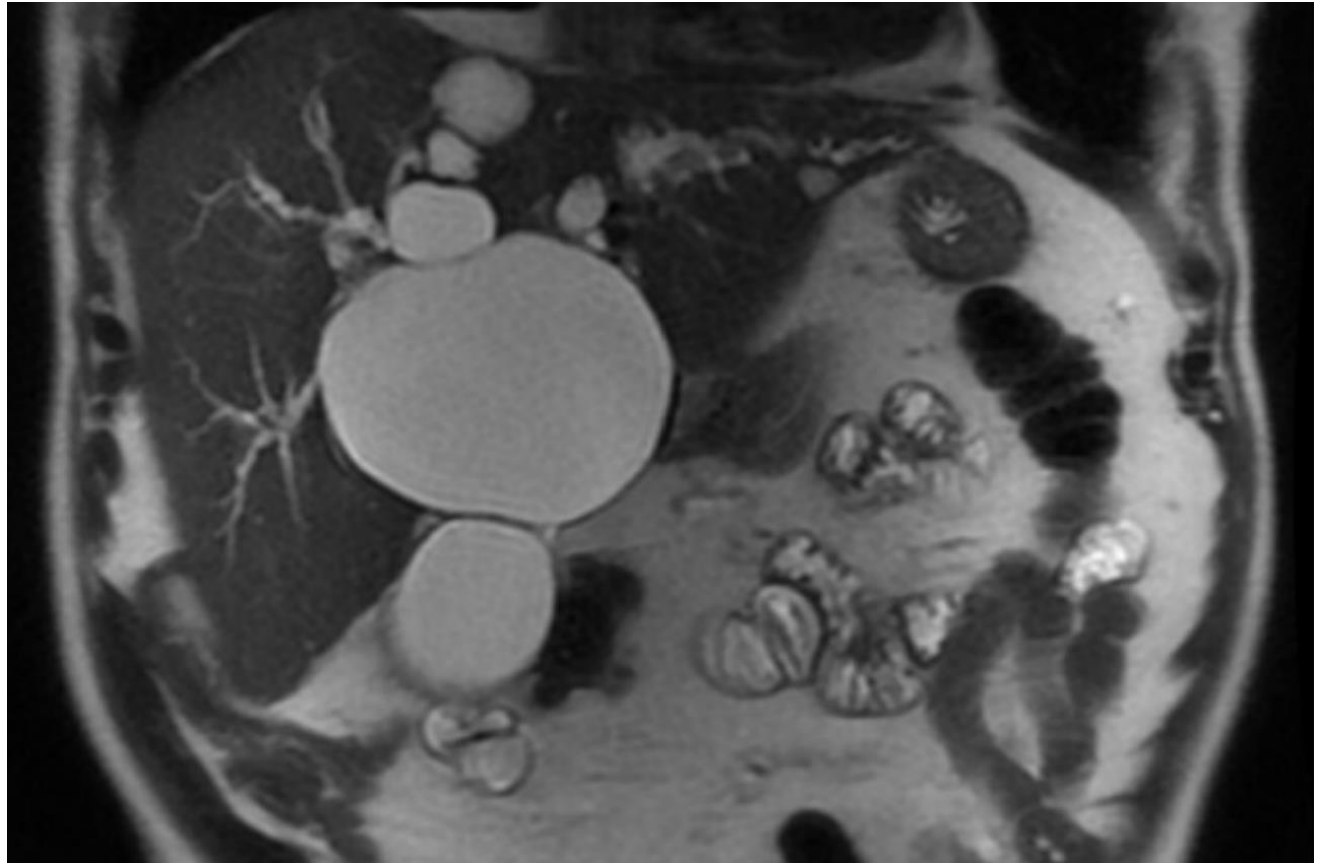
# CASE PRESENTATION #1

- 80 year old M with history of only HTN who presented with a 2 month history of pruritus
- Failed diphenhydramine, hydroxyzine and cholestyramine
- Liver enzymes are as follows:

|              |                 |
|--------------|-----------------|
| AST 49       | Tbili 0.9       |
| ALT 56       | Direct Bili 0.5 |
| Alk Phos 235 | GGT 427         |

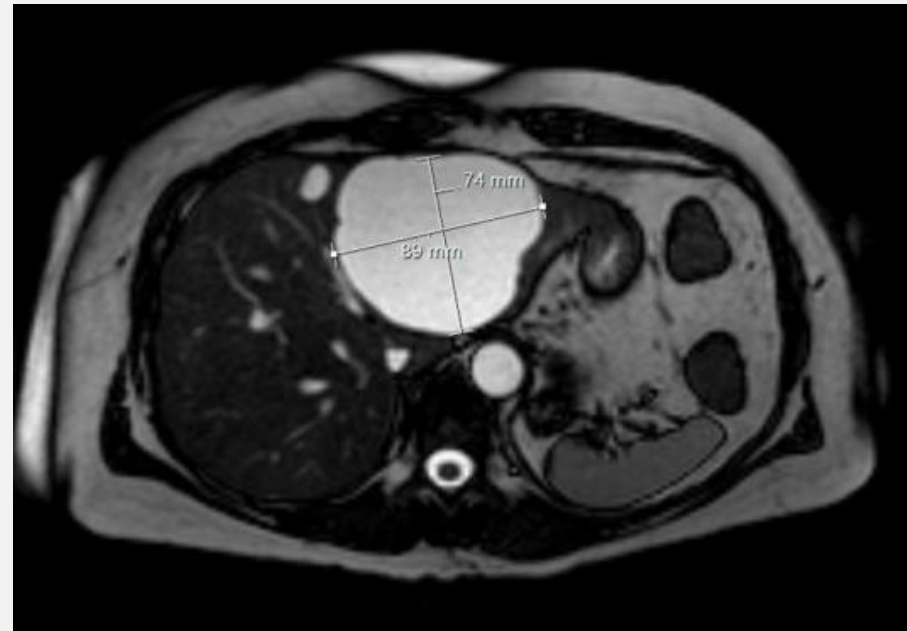
## CASE #1 CONTINUED

- MRI/MRCP is obtained to evaluate for biliary obstruction shown to the right



# SIMPLE HEPATIC CYSTS

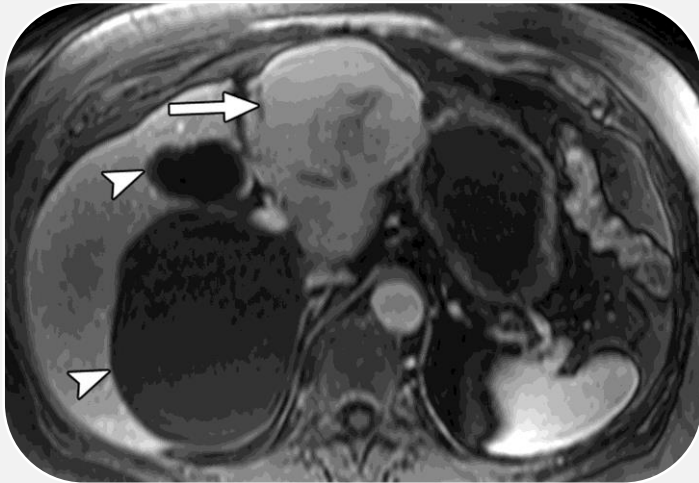
- Simple biliary malformations with no communication with biliary tree
- Prevalence: ~18-20%
- Slight female predominance (1.5:1)
- Do not typically require treatment/surveillance UNLESS
  - Multiple septations
  - Epithelial nodularity
  - Solid components



BMJ Case Rep. 2019; 12

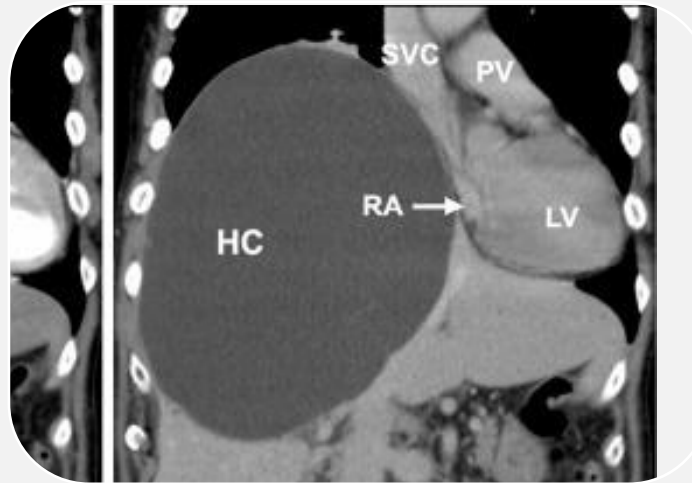


# COMPLICATIONS OF HEPATIC CYSTS



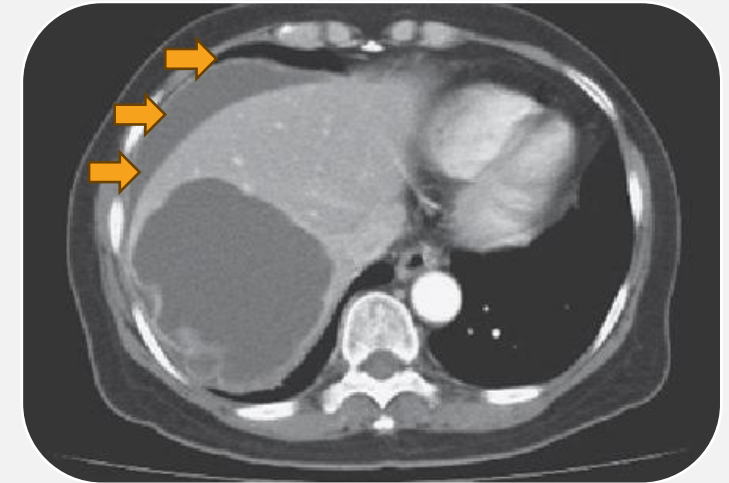
## Hemorrhage

- Rare, 2-5% incidence
- Presents with severe abdominal pain



## Mass Effect

- Portal Vein Compression
- Biliary Compression
- Other (i.e. stomach, pulmonary)



## Rupture

- VERY rare, < 30 cases in literature
- Can be life-threatening

# MANAGEMENT OF HEPATIC CYST COMPLICATIONS

## Aspiration

- ↑ risk re-accumulation
- Can be used as proof of concept

## Sclerotherapy

- Ethanol, ethanolamine or minocycline
- ~20% recurrence rate

## Fenestration (“Unroofing”)

- Laparoscopic or Open
- More durable

## CASE #1 EPILOGUE

- Underwent aspiration, pruritus improved within 2 days, liver enzymes normalized by 2 weeks
- Re-accumulated rapidly in 4 months with only mild pruritus, no enzyme elevations
- Patient deferred fenestration due to mild symptoms

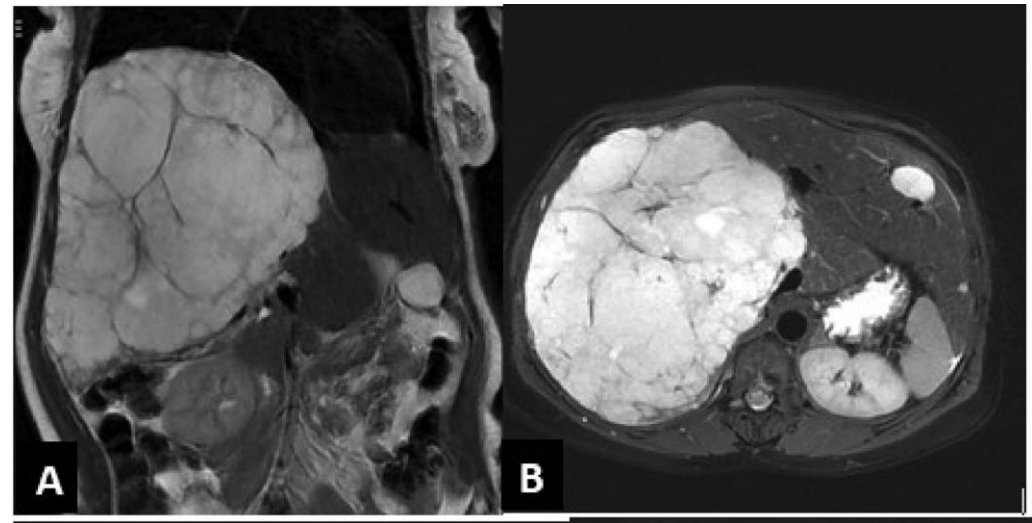
## CASE PRESENTATION #2

- 59 year old F with no prior history presented with 1 mo of RUQ pain with abdominal distention and easy bruising
- Labs showed:

|            |               |
|------------|---------------|
| Hgb 9 g/dL | Fibrinogen 96 |
| PLT 65,000 | D-Dimer ↑     |
| INR 1.3    | Normal LFTs   |

## CASE #2 CONTINUED

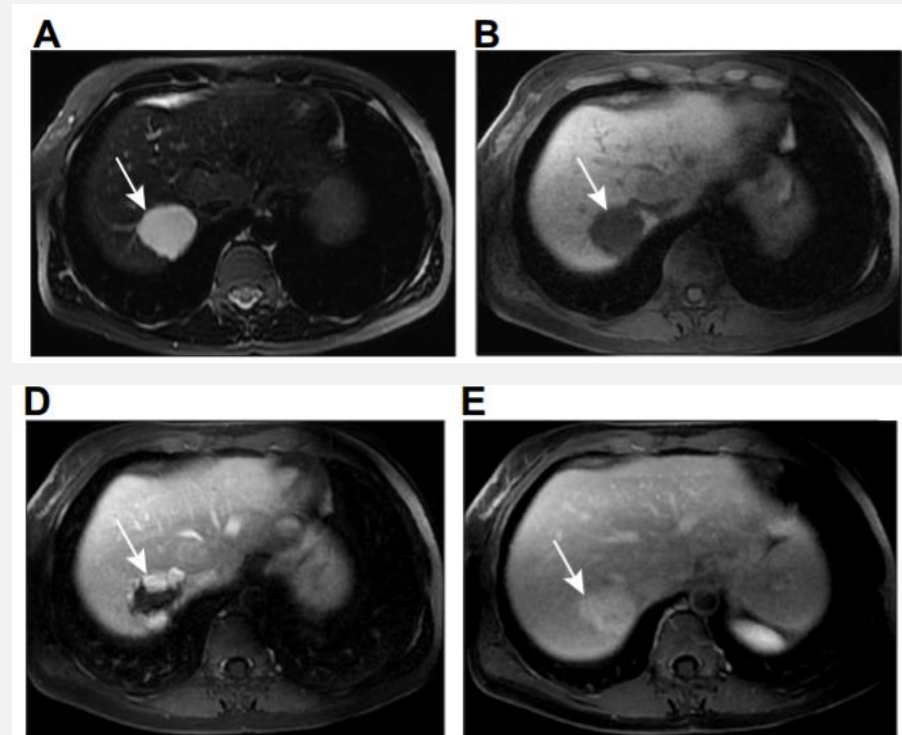
- RUQ U/S showed large R hepatic lobe mass
- Subsequent MRI revealed: “18 x 17 x 15 cm liver mass with multiple tubular vascular structures”



Radiol Case Rep. 2023 Jun; 18(6): 2183–2185

# HEPATIC HEMANGIOMA

- MOST common benign liver lesion
- Prevalence: 20%; Female predominance 5:1
- Frequently small (< 3 cm) and solitary
  - > 10 cm known as “giant hemangioma”
  - Most do not grow
- Imaging shows early peripheral and globular enhancement followed by central “filling-in” on delayed sequence



# PRESENTATIONS OF HEPATIC HEMANGIOMAS



Asymptomatic

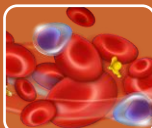
- Most common, even for giant hemangiomas



Bleeding



Mass Effect



Kasabach-Merritt syndrome

- 0.3% risk in adults; more common in giant hemangiomas

# MANAGEMENT OF COMPLICATED HEMANGIOMAS

## Surgery

Hepatectomy

Enucleation

## Embolization

Coils

Gelfoam

Cyanoacrylate

Bleomycin-lipiodol

## Ablation

Percutaneous

Laparoscopic

## Liver Transplantation

< 30 cases ever

Reserved if no other options possible



## CASE #2 EPILOGUE

- Started steroids and salicylic acid with no improvement
- Underwent R hepatectomy with no complication and no recurrence

## CASE PRESENTATION #3

- 26 year-old transman comes in for evaluation of liver masses
- First diagnosed in 2013 in workup for chronic abdominal pain
  - RUQ U/S showed left lobe masses
  - Was taking OCPs at that time
- Annual CT showed stable liver lesions
- Started testosterone therapy (and stopped OCPs) in November 2015
- Annual imaging performed, both # and size of lesions increasing

## CASE #3 CONTINUED

- MRI Abdomen (with Eovist) March 2017: “Multiple mildly T2 bright, early enhancing lesions with later fading and persistent enhancement on the hepatocyte phase images at 20 minutes”
  - Multiple left liver; largest is 3.2 x 2.5 cm
  - Multiple right lobe; largest is 2.0 x 1.6 cm
  - No microscopic fat, no washout liver lesions

# FOCAL NODULAR HYPERPLASIA (FNH)

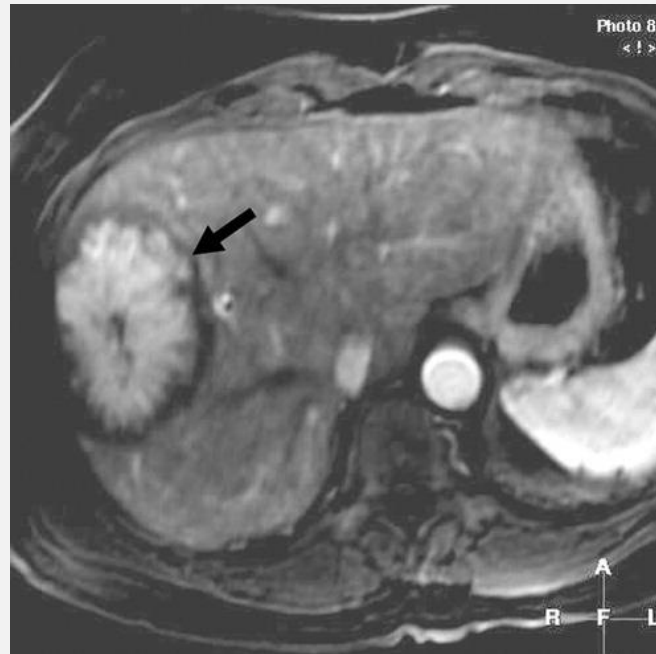
2<sup>nd</sup> most  
common benign  
liver mass

Age 30-40 years

Female  
predominance  
(9:1)

Often solitary  
and < 5 cm

Central Stellate  
Scar



FNH considered a hyperplastic,  
regenerative response to arterial  
hyperperfusion

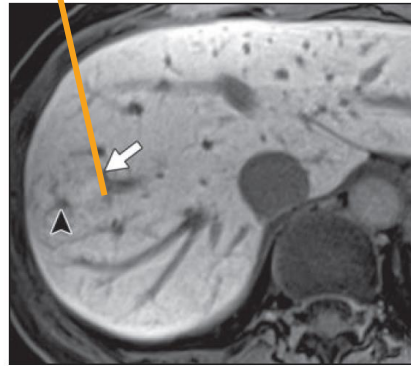
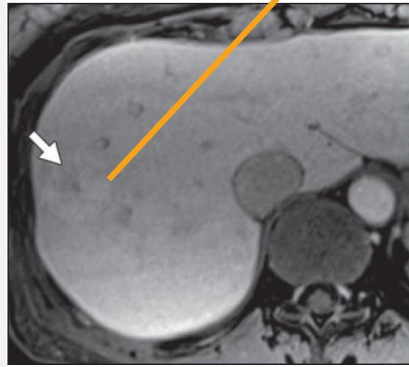
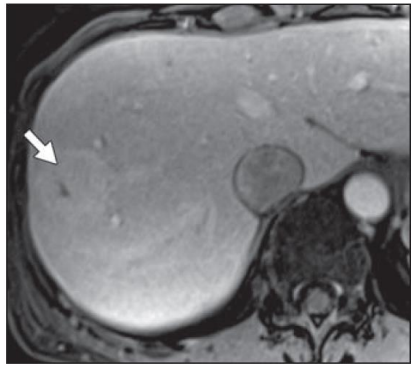
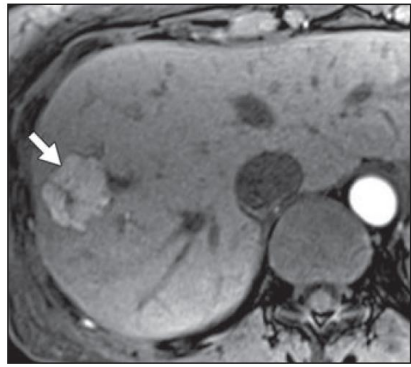
- Contains nodules of hepatocytes without portal triads
- Some association with HHT and Budd-Chiari Syndrome
- Seen with portal venous thrombosis or other vascular injury

Radiographics. 2004 Jan-Feb;24

# FNH WITH HEPATOBILIARY CONTRAST

Central scar highlighted

Retains contrast, remains iso or hyperintense to liver parenchyma



Arterial

Portal

Delayed

20-min Hepatobiliary

AJR:198, January 2012

# MANAGEMENT OF FNH

- Not typically followed/monitored
  - No malignant potential
- Resection only if symptomatic
- Hormone responsive?
  - Some FNH have been found to have estrogen receptors
  - Female predominance suggests hormone role
  - No current guidance to stop hormonal therapy, but can be considered

## CASE #3 EPILOGUE

- Confirmed FNH on Eovist study, no further imaging surveillance performed
- Patient with strong desire to continue testosterone therapy, so continued
- Monitoring for symptoms, none to date

## CASE PRESENTATION #4

- 24 year old F with Trisomy 21 and chronic OCP use presented with acute on chronic abdominal pain
- History also significant for Class III obesity, OSA and hypothyroidism
- Liver enzymes normal
- RUQ U/S showed multiple liver masses



## CASE #4 CONTINUED

- MRI performed:
- Hepatomegaly with multiple (around 10-15) mildly enhancing hepatic lesions
  - -A 6.5 x 4.6 cm segment II/III lesion
  - -A 5.1 x 2.8 cm segment III lesion
  - -A 2.4 x 2.2 cm caudate lobe lesion
  - -A 4.1 x 2.4 cm segment IVb lesion
- Segment II/III lesions were hemorrhagic



## CASE #4 CONTINUED

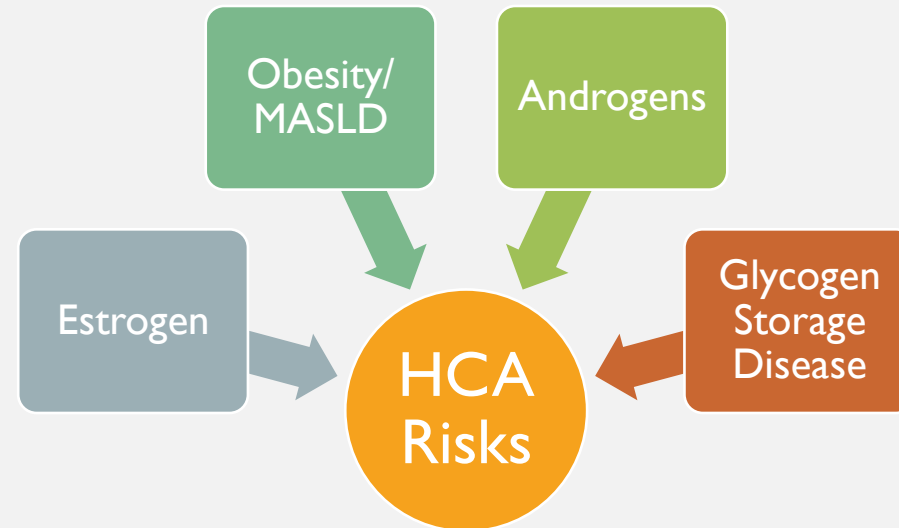
- Patient taken to OR for L hepatectomy
- Histologic analysis reveals:

**A: Liver, left lateral segment, partial hepatectomy**

- Well differentiated hepatocellular carcinoma forming 2 nodules (6.3 and 5.1 cm) and possibly due to transformation of hepatocellular adenomas (see synoptic and comment)
- All surgical margins free of tumor

# HEPATIC (HEPATOCELLULAR) ADENOMA

- Female predominant 10:1
- Typical age 35-40 years old
- **Strong link to estrogens/OCPs**
- Have potential for hemorrhage AND malignant transformation
  - Lesion > 5 cm
  - Exophytic lesions



# HEPATIC ADENOMA CLASSIFICATION

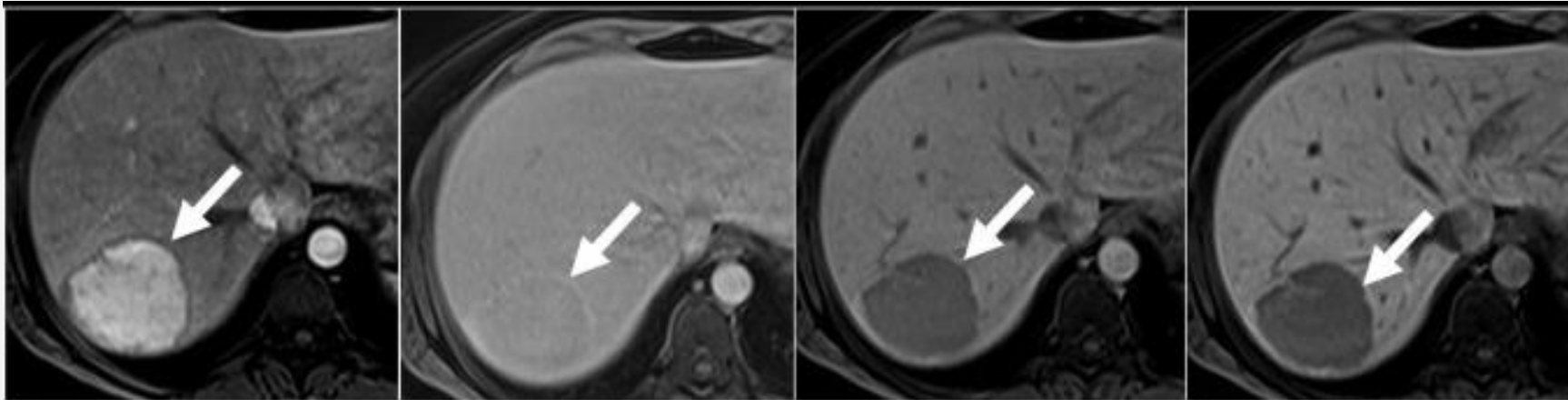
| Classes 2017 [52]                                         | Frequency, % | Risk factors                                          | Epidemiology                     | Symptoms/ complications  |
|-----------------------------------------------------------|--------------|-------------------------------------------------------|----------------------------------|--------------------------|
| HNF1A inactivated                                         | 40–50        | Oral contraception                                    | Female, liver adenomatosis       |                          |
| $\beta$ -Catenin exons 7/8                                | 3            | Oral contraception, high alcohol consumption, obesity | Young age, solitary tumor        |                          |
| $\beta$ -Catenin exon 3                                   | 7            | Androgen, liver vascular disease                      | Male, young age, solitary tumor  | Malignant transformation |
| Inflammatory (mixed forms with $\beta$ -catenin subtypes) | 30–35        | Oral contraception                                    | Older age, inflammatory syndrome | Elevated GGT and ALP     |
| Sonic hedgehog                                            | 4            | Oral contraception, obesity                           | –                                | Bleeding                 |
| Unclassified                                              | 7            | –                                                     | –                                |                          |

Visc Med 2020;36:292–303

# ADENOMA WITH HEPATOBILIARY CONTRAST

HCAs contain no  
hepatocytes

Does NOT retain contrast, remains  
hypointense to liver parenchyma



Arterial

Portal

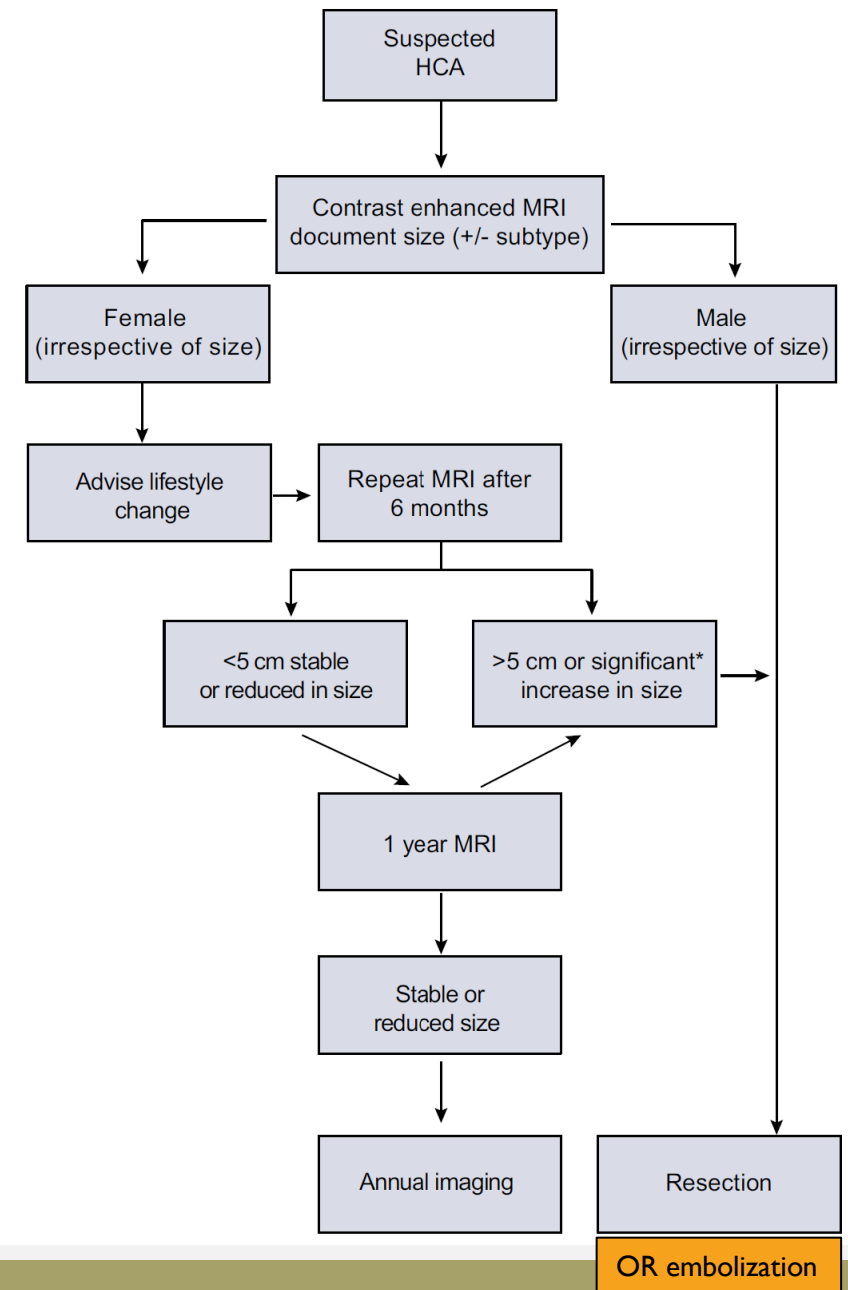
Delayed

20-min Hepatobiliary

Eur J Radiol. 2019 Oct;119

# MANAGEMENT OF ADENOMAS

- Adenoma in a male? → Resect
- Symptomatic or > 5-cm? → EASL says resect
  - Especially prior to pregnancy
- All others
  - 1) Lifestyle changes: STOP OCPs and Lose Weight
  - 2) First follow up MRI in 6 months
  - 3) Subsequent annual surveillance
    - Consider stopping if 2 years of stability/shrinking OR when reaching menopause



## CASE #4 EPILOGUE

- Stops OCPs and counseled on weight loss
- Undergoes MRI exams q3 months
- After 1 year, patient has lost > 100 pounds and all adenomas have shrunk or disappeared

# CONCLUSIONS

- Don't Panic. Most liver lesions don't need follow up
  - Don't monitor simple hepatic cysts, hemangiomas or FNH
  - Consider "on-demand" imaging for symptoms
- Management of complications is multi-disciplinary
  - Hepatology, Interventional Radiology and Surgery



## CME QUESTION

- A 31 year old F discovers an incidental right hepatic lobe mass when being evaluated for abdominal pain on an ultrasound. She undergoes multiphase MRI Abdomen with gadoxetic acid. Which of the following benign liver lesions would appear hypointense on 20-minute delayed sequence?
  - A. Hepatic Hemangioma
  - B. Hepatocellular Carcinoma
  - C. Hepatocellular Adenoma
  - D. Focal Nodular Hyperplasia
  - E. Nodular Regenerative Hyperplasia

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  - C. **Hepatocellular Adenoma**
  - D. Focal Nodular Hyperplasia
  - E. Nodular Regenerative Hyperplasia



UNC  
SCHOOL OF MEDICINE



Photo credit: Sam Kittner '85

QUESTIONS?

[ndshah@med.unc.edu](mailto:ndshah@med.unc.edu)

Twitter: @ndshah85