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Liver Incidentalomas

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Disclosures

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Disclosures

Vicki Shah PA-C, DMSc, MMS
Advisory Board: AbbVie, Clinical Area – HCV
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Objectives

• Review common hepatic lesions with radiology findings and terminology
• Discuss the treatment recommendations based on lesion
• Differentiate between benign and malignant liver lesions
The differential diagnosis is broad

- **Cirrhosis-associated hepatocellular nodules**
  - RN
  - LGDN
  - HGDN
  - eHCC
  - pHCC

- **Non-HCC malignancy**
  - ICC
  - CC-HCC
  - MetS (rare)
  - Lymphoma (rare)

- **Non-hepatocellular benign**
  - Cysts
  - Hemangiomas

- **Confluent fibrosis**

- **Treated lesion**

- **Non-mass lesion**

**Pseudolesions**
- Artifact
- Vascular pseudolesion
- Hypertrophic pseudomass

- Fat deposition or sparing
- Iron deposition or sparing
- Hemorrhage or edema

Courtesy of Dr. Claude Sirlin.
Common Benign Liver Lesions

• Hepatic Cysts
• Hepatic Hemangioma
• Focal Nodular Hyperplasia (FNH)
• Hepatocellular Adenoma (HCA)
Liver Cysts

- Clinical presentation
  - Generally asymptomatic, found incidentally on imaging studies
  - Clear fluid-filled cavities
  - Most prevalent in the female population and increase with age
- Simple hepatic cysts are the most common type
- Manage conservatively
- Most do not require any treatment
Liver Cysts

- Rare incidence of cystadenoma – solid component on MRI
  - 10% lifetime risk of malignant transformation into cystadenocarcinoma
- Other: liver metastases, infectious, congenital
- However, cysts > 4 cm should be monitored with ultrasound. If the cyst is stable for 2 to 3 years, no need for follow-up
- If large, symptomatic
  - Percutaneous aspiration
  - Laparoscopic deroofing
  - Complete cyst resection
Benign Liver Lesion Distribution

- Review of US for over 45,000 patients
  - Hepatic cysts 5.8%
  - Hepatic hemangioma 3.3%
  - FNH 0.2%
  - Hepatic adenoma 0.04%


Hemangioma

- Most common benign vascular lesion (0.4-20%) also referred to as cavernous hemangiomas of unknown etiology
  - Thought to arise from congenital hamartomas that increase in size
  - Or dilation of existing blood vessels in normally developed tissue
- Often solitary lesions. 40% of patients may present with multiple lesions in both lobes
- Size range: < 1 cm to > 5 cm, well circumscribed discrete lesions
- Found in all ages; typically discovered between 30-50 years of age
- Male/Female: 1:2/6
- Estrogen sensitivity: possible

Hemangioma

Clinical presentation

- Typically found incidentally and majority of patients are asymptomatic
- Lesions > 4 cm may cause symptoms RUQ discomfort or abdominal pain, nausea, early satiety and anorexia
- Acute abdominal pain from thrombosis or bleeding & may last up to 3 weeks
- Hepatic biochemical tests: WNL

Hemangioma

- **Ultrasound**
  - Hyperechoic
- **CT**
  - Early progressive centripetal enhancement
  - Delayed venous phase

Courtesy of Claude Sirlin, MD.
Hemangioma

Clinical course

- No evidence of malignant transformation
- No treatment needed in most
- If large size, symptomatic
  - Surgical resection
  - Arterial embolization

Focal Nodular Hyperplasia (FNH)

- Second most common benign liver lesion
- Incidental findings in majority of cases
- All ages, women: 50-80%
- Asymptomatic: 50-90%
- OCP: may grow
- Location: often sub-capsular
- Size: majority < 5 cm
- Number: 7-20% multiple
- Hepatic biochemical tests: WNL

Focal Nodular Hyperplasia

Imaging

• Abdominal ultrasound: variably hyper, hypo, or isoechoic
  Difficult to differentiate from adenoma vs malignant lesion

• CT w/wo contrast:
  – Pre-contrast: hypo or iso-dense
  – Arterial phase: hyper-dense lesion
  – Portal venous phase: iso-dense with central scar hyper-dense
  – Popcorn like appearance

• MRI abd w/wo contrast
  – T-1 weighted imaging appears iso-intense
  – T-2 weighted imaging: to hyper-intense with central scar on delayed phase
  – Popcorn like appearance

Focal Nodular Hyperplasia

Clinical course
• Enlargement in setting of OCP and during pregnancy are reported
• No evidence of malignant transformation

Manage conservatively
• Referral to a hepatologists to rule out liver disease and confirm liver lesion
• OCP not contraindicated
• 6-12 month f/u imaging study in women who continue OCP

Hepatocellular Adenoma (HCA)

- Uncommon, typically occurs in women
- Oral contraceptive steroids (OCP), causally related, duration > 5 yrs
- Other associated conditions: anabolic androgen use, GSD, fatty liver, obesity, DM and pregnancy.
- Number: usually single, may be changing
- Hepatic biochemical tests: general WNL unless bleeding
- Have been associated with malignant transformation, spontaneous hemorrhage, and rupture
Hepatocellular Adenoma

Imaging:

- **Abdominal ultrasound:**
  - Features non-specific hyper-echoic lesions
  - Hypo-echoic central region noted on lesions that have bled

- **CT abd w/wo contrast**
  - Non-contrast: iso-dense, well-demarcated lesions
  - Arterial phase: peripheral enhancement in early phase
  - Portal venous phase: centripetal flow is characteristic
  - Late phase: iso-dense to hypo-dense

- **MRI abd w/wo contrast**
  - Well-demarcated but highly variable
  - T1-weighted image appears hyper-intense d/t fat and glycogen content of hepatocytes
  - T2-weighted image appears heterogeneous

## HCA Subtypes by Molecular and IHC Markers

<table>
<thead>
<tr>
<th></th>
<th>HNF-1α: stain</th>
<th>Inflammatory (IHCA)</th>
<th>β-catenin: stain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prevalence</strong></td>
<td>36-46%</td>
<td>18-44%</td>
<td>13-14%</td>
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<tr>
<td><strong>Genetic mutation</strong></td>
<td>Mutations in <em>TCF1, FABP1 &amp; UGT2B7</em> down-regulated</td>
<td>Not known</td>
<td>Mutations in <em>CTNNB1, GLUL &amp; GRP49</em> over-expressed</td>
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<td><strong>Pathological characteristics</strong></td>
<td>Intramural steatosis, lobulated contours</td>
<td>Tumoral peliosis, inflammatory infiltrate, sinusoidal dilatation, dystrophic vessels</td>
<td>Cytological abnormalities, acinar pattern (pseudo-glandular formation)</td>
</tr>
</tbody>
</table>
| **MRI characteristics** | • T1W chemical shift sequence: diffuse signal dropout  
• T2W: iso- or slightly hyperintense signal  
• Gd: moderate arterial enhancement; without persistence during delayed phase | • T1W chemical shift sequence: no or focal signal dropout  
• T2W: marked hyperintense signal  
• Gd: strong arterial enhancement; with persistence during delayed phases | • Inflammatory subtype has same appearance as IHCA  
• Non-inflammatory: heterogeneous with no signal dropout on chemical shift  
• T1W/T2W: strong arterial enhancement and delayed washout |
| **Background liver steatosis** | +/- | ++ | +/- |
| **Risk for HCC** | Low | Low | High (esp. in men) |

Hepatocellular Adenoma

Clinical course:
- Typically asymptomatic but may have abdominal discomfort with larger lesions.
- Symptoms: sudden abd pain with hypotension may be a result of rupture and peritoneal bleeding.

Management controversial
- Referral to a hepatologists to rule out liver disease.
- Depends upon HCA subtype, symptoms, location, size, number and certainty of diagnosis.
- Small lesions < 5 cm in asymptomatic women on OCP:
  - d/c OCPs and repeat imaging in 6 months with tumor markers.
- Advised against pregnancy since behavior of adenoma is unpredictable.
- Symptomatic with large adenomas:
  - Surgical resection for lesions > 5 cm and/or pt's with symptoms.
  - Transarterial embolization or ablation.
  - Liver transplant: rare.

Malignant Liver Tumors

Primary

• Hepatocellular carcinoma (HCC)
• Intrahepatic cholangiocarcinoma (ICC)
• Combined HCC-CC
• Fibrolamellar

Metastatic

• Hypovascular: GI tract, lung, breast and head/neck tumors
• Hypervascular: RCC, carcinoid, sarcomas, breast, melanoma, insulinomas and carcinoid
HCC Diagnosis

- Imaging is important
  - Majority of HCCs are diagnosed by imaging without biopsy
- Imaging is challenging
  - Cirrhotic liver with regenerative nodules
  - Not all HCCs are the same
- Major Criteria:
  - APHE (arterial phase hyper-enhancement) and washout
  - LI-RADS (Liver Imaging Reporting and Data System)
  - BCLC

Biopsy Needed?

- No: If hemangioma, FNH or HCA diagnosed clinically and radiologically
- Imaging studies reliable in ~ 95% of cases
- If uncertain, follow with imaging studies
- Biopsy: often a small core or only cytology; may miss the malignancy; risk of bleeding or beading

Summary

• Most common benign liver lesions: Cyst, Hemangioma, FNH and HCA

• The most common malignant liver lesion is HCC

• Imaging reliable for diagnosis
  – Correct Imaging Modality
  – Interpreted by a trained radiologist
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Thank You

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