MESENCHYMAL TUMORS OF THE LIVER: WHAT’S NEW AND UNUSUAL (MY PERSPECTIVE)

CURRENT ISSUES IN ANATOMIC PATHOLOGY
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Mesenchymal Tumors

Focus on Vascular Tumors

- **Benign and the “Probably Benign”**
  - Newly-described and variant lesions

- **Malignant**
  - Distinction of benign/low grade lesions from Angiosarcoma
  - What is NOT Angiosarcoma

Focus on Angiomyolipoma: *Problem* variants that still lead to diagnostic errors

- Epithelioid, inflammatory, trabecular
VASCULAR TUMORS

The Benign and Probably Benign
HEMANGIOMA VARIANTS
VASCULAR MALFORMATIONS
Cavernous Hemangioma
Variants
Cavernous Hemangioma (CH)

- Not true arterial or venous architecture
- No organized muscle bundles
- No elastic laminas
- Not capillary-like
Cavernous Hemangioma

Incidental (Autopsy finding)

Giant CH, with organized thrombosis and sclerosis
Sclerosis within Cavernous Hemangioma

Sclerosis of thrombosed, ischemic zones with scar formation.

“Neo-vessels”
Recanalized channels
Cavernous Hemangioma:
What is often “not seen”…..

- Hemangioma-like vessels (HLV) in adjacent liver commonly seen with giant CH


- Low mitotic/proliferative rate <5%
- Present in almost 80% (16/19) of CH >5 cm
- Retain composition of vascular walls in CH
Giant Cavernous Hemangioma
Cavernous Hemangioma-like vessels in adjacent liver
Giant Cavernous Hemangioma

Explant, right lobe

38 yr old woman, in liver failure.
Giant Cavernous Hemangioma

Left Lobe:
Smaller, irregularly shaped CHs and transitional areas with HLVs admixed with liver
Giant Cavernous Hemangioma

Right Lobe CH

Left lobe HLV
“Metatastatic” and “Invasive” Cavernous Hemangioma

Lesion extending into hilum around arteries, nerves and ducts

Omental Lesion
Cavernous Hemangioma Variant

Diagnoses: Giant Cavernous Hemangioma and Cavernous Hemangiomatosis

- CH-like vessels throughout liver, involving hilum
- Lung, spleen, omentum involved with CH-like lesions

Vascular Malformations

- Hereditary Hemorrhagic Telangiectasia (HHT) arterial-venous malformations
  - also known as Osler-Weber-Rendu

- Other Arterial and Venous Malformations with similar features
  - (may or may not be HHT)
Vascular Malformations

Contributors and co-authors of 2 abstracts:


Vascular Malformations

Spectrum:
Early, mild
To
Late, severe

Early or mild lesions can look much different than advanced or severe lesions probably primarily due to thrombosis and ischemic effects.
Vascular Malformations:
Early Lesions or Mild Involvement

Periportal fibrosis, Elastochrome stain

Periductal fibrosis (as early ischemic lesion)
Vascular Malformations:
More Severe or Advanced Lesions

Extension of lesions into sinusoids

Thrombosis within vessels and sinusoids
Vascular Malformations
Severe sinusoidal changes
Vascular Malformations: More Severe or Advanced Lesions

Hemangioma-like changes, extensive sinusoidal dilation

Cavernous hemangioma-like transformation
Small Vessel Hemangioma

- Rare
- Newly described

- Small vascular channels with thin walls
- Bland endothelial cells with low proliferative rate \(<10\%\) (CH \(<5\%\))
- Intermediate tumor cell density
- Irregular “infiltrative” growth pattern at border
  - Abnormal liver architecture mimics HCC
  - Scaffolding effect mimics angiosarcoma
Small Vessel Hemangioma

- Small channels, thin walls, bland nuclei
- Only focal fibrotic areas (no wide walls as in CH)
Small Vessel Hemangioma

Small channels with thin walls, no organized muscle

Low Mib1 (Ki-67) rate
Small Vessel Hemangioma

Center of lesion, bland endothelial cells

Edge of lesion, with altered cell plate width
Small Vessel Hemangioma

- Edge of lesion, trichrome
- Edge of lesion, reticulin
Small Vessel Hemangioma

- Small vessel hepatic hemangioma (SVH): Exact outcome not definitive, so now recommending excision and followup.

- *Differentiation from angiosarcoma:* AS has higher proliferative rate (>15%) and subset + for P53 and GLUT1, but negative in small vessel hemangioma

References


Malignant Vascular Tumors

Epithelioid Hemangioendothelioma
Epithelioid Hemangioendothelioma
Epithelioid Hemangioendothelioma

Central vein invasion

Elastochrome stain*, central vein invasion

*Elastochrome: trichrome plus EVG stain; highlights vein wall elastic fibers
Epithelioid Hemangioendothelioma

Angiosarcoma-like pattern of scaffolding growth
Angiosarcoma
Angiosarcoma

- Most aggressive form of vascular malignancy
- Highest proliferative rate
- Epithelioid or spindle cell forms
- Cystic and/or solid
- Known for the typical feature of “scaffolding” growth pattern
Angiosarcoma
Angiosarcoma

Epithelioid pattern

High MiB1 (Ki-67) rate
Angiosarcoma

Scaffolding growth pattern along sinusoids

CD34 and expanded sinusoidal growth
Angiosarcoma

Cystic change
Congestion
Necrosis
Sinusoidal growth
Angiosarcoma (higher magnification)

- Cystic change (upper right)
- Congestion
- Necrosis
- Sinusoidal growth
Angiosarcoma

Scaffolding pattern of growth surrounds hepatocytes
Angiosarcoma

Scaffolding pattern of growth surrounds hepatocytes
Angiosarcoma

Scaffolding pattern of growth with fibrosis of cell plate areas
Angiosarcoma

Sinusoidal growth results in anastomosing channels and pseudopapillary pattern
Angiosarcoma: Highlights

- High proliferative rate and cytologic atypia
- Early pattern of growth typically along sinusoids (scaffold-like); Atypical endothelial cells, dilated sinusoids
- Later pattern of growth can be pseudopapillary to solid; irregularly-shaped blood filled spaces
- Lacks the stromal prominence of epithelioid hemangioendothelioma, but overlapping cases may be seen
What else is NOT angiosarcoma

Undifferentiated (Embryonal) Sarcoma of the Liver
Undifferentiated (Embryonal) Sarcoma

Typically younger patients; tumor of uncertain etiology

Can be cystic due to necrosis/degeneration with irregular edges!!
(Pattern similar to angiosarcoma scaffolding)

Immunohistochemistry

- Reactive with alpha-1-antitrypsin, alpha-1-antichymotrypsin, vimentin
- Occasional cytokeratin positivity
- Some CD10 and p53 positivity
- Negative hepatocyte-Ab, muscle, S-100 and CD34
- Glypican-3 can be positive in giant cells (personal observation)
Undifferentiated (Embryonal) Sarcoma

Cystic areas common
Related to extensive necrosis
(right upper area)
Undifferentiated (Embryonal) Sarcoma
Undifferentiated sarcoma, tumor edge with growth along sinusoids

PASD + globules

Also Alpha-1-antitrypsin +
Undifferentiated Embryonal Sarcoma

Problem with Literature Search


- **THIS IS NOT THE CORRECT DIAGNOSIS** as per three expert consultants

- Authors got confused about peripheral growth
Angiomyolipoma

Problem variants
Epithelioid, Trabecular, and Inflammatory
Problem Case

- 37-year-old woman
- 11 cm pedunculated mass
- No cirrhosis or other risk factors for HCC
- Mass noted during routine gynecologic exam, no symptoms
HCA, HCC?
Reticulin Stain
Reticulin Stain: too much loss for HCA
HCC or Not?
Keratin and HMB-45
Angiomyolipoma, epithelioid variant

Angiomyolipoma

Classic features:

- Fat,
- Epithelioid,
- Spindle cells
Angiomyolipoma

Epithelioid Cells

Spindle Cells
Angiomyolipoma

HMB-45: stains stronger on epithelioid cells

SMA: usually stains spindle cells
Problem Case:
Trabecular Angiomyolipoma

HMB-45
Problem case:
Inflammatory Angiomyolipoma

Focal dense to scattered diffuse T-cell infiltrate
Problem case: Angiomyolipoma
Inflammatory and Trabecular

Case with both inflammatory and “trabecular” background
Problem case: Angiomyolipoma, Inflammatory and Trabecular

HMB-45

SMA
Angiomyolipoma, Mixed variant

Fatty areas

Trabecular areas
Angiomyolipoma, Mixed variant

Inflammatory areas, 10x
Angiomyolipoma, Mixed variant

HMB-45
Inflammatory foci with absent staining
(SMA only rare + cell, not shown)
SPECIAL THANKS TO ALL WHO HAVE CONTRIBUTED TO THE REFERENCED STUDIES: WE WOULDN’T HAVE THIS DATA WITHOUT THESE COLLABORATION