Choroidal Melanoma: diagnosis and treatment strategies
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Choroidal Melanoma
- Most common primary intraocular malignancy in adults
- 5-7 / 1,000,000 → 1,200 to 1,500 /yr in the US
- No observed increase in incidence
- Light complexion (white skin, blue eyes)
- Rare in African-Americans and Asians
  – Rule out other etiology

Clinical features – symptoms
- Asymptomatic
- Metamorphopsia
- Photopsias/Floaters
- Scotoma
- Painful red eye

Clinical features – ext exam
- Ocular melanosis
  – Slate blue/gray
  – Immobile (vs PAM)
  – Darker iris/fundus
- Nevus of Ota
Ocular Melanosis

1:400 risk of uveal melanoma

Clinical features – ext exam

- Sentinel episcleral vessels
  - Ciliary body or anterior mass
- Subconjunctival pigment

Clinical features – SLE

- Iris: erosion of root, forward displacement
- Hyphema, NVG
- Sectoral cataract
- Lenticular astigmatism

Clinical features - DFE

- Elevated mass – dome v. collar-button
- Variable pigmentation
- Blocks transillumination (vs hemangioma)
- Estimating lesion size:
  - Field of view with 20D – 12 mm, 28D – 13 mm
Clinical features - DFE

• Nevus vs. Melanoma ≤ 3mm
  – T – thickness >2 mm
  – F – fluid, subretinal
  – S – symptoms
  – O – orange pigment - AF
  – M – margin at the ONH
  – Absence of Drusen

• Risk for growth
  – 4% if none
  – 60% if all

1x6x6 to 9.4x17.4x16.5
Lesions in the differential

- CHRPE
- Metastases
- CNVM/Subretinal hemorrhage
- Melanocytoma
- Choroidal hemangioma
- Choroidal osteoma

Imaging modalities

- FA – limited utility – not pathognomonic
  - Double (intrinsic) circulation (medium-large)
  - Hot spots - RPE leaks, min. enlarge, late stain
  - Late leakage – if absent, unlikely MM
  - May ID other cause: heme
- Fundus photography
Imaging modalities - US

• B-Scan:
  - Collar button v. dome shaped
  - Spontaneous fast pulsations
  - Acoustically quiet centrally
• A-scan
  - Low-medium reflectivity
  - Regular
• UBM - anterior lesions

Internal reflectivity & DDx

Choroidal melanoma:
Homogenous tumor = Low reflectivity, regular internal structure

Cavernous hemangioma:
Small vascular spaces = High reflectivity, regular internal structure

Metastases:
Nonhomogenous arrangement of cells = Medium-high reflectivity, irregular internal structure

Treatment guidelines

Collaborative Ocular Melanoma Study
• Small
  – Apex: 1-2.4
  – Base: 4-8
• Medium
  – a≤10, b≤16
• Large
  – a>10, b>16
Treatment guidelines

- COMS: main conclusions
  - Small – 1% melanoma mortality at 5 years
  - RF: thickness/base, OP, no Drusen, FA changes
  - Medium – 5 yr met death 9-11%, 12y: 17-21%
    - VA 20/200 in 43% at 3 years
  - Large – 5 yr all deaths 38-43%, 10y mm: 40-45%

Treatment options

- Observation – for small lesions
- TTT – treat to 3.5 mm, 25% recur in 3 yrs
- Radioactive plaque brachytherapy
  - I-125, treat apex to 85 gy, 2mm margin
- Proton beam radiotherapy – NVG 10%
- Gamma Knife
- Excision
- Enucleation

Complications of brachytherapy

1. Dry Eye
2. Cataract
3. Radiation retinopathy
   - >45 Gy, 2-3 yrs
4. Radiation neuropathy
   - >50 Gy, 1-2 yrs
5. Neovascular glaucoma
6. Scleral necrosis/scleromalacia
7. Local recurrence
8. Loss of the eye
Prognostication - Histopathology

- Stain: S-100, HMB-45, Melan-A
- Collander classification
  - Spindle A
  - Spindle B
  - Epithelioid
  - Mixed type
- Mean of 10 largest nuclei / DNA content
- Tumor infiltrating lymphocytes
- Vascular patterns
  - complexity – tumor aggressiveness

Prognostication

- Chromosomal abnormalities
  - monosomy 3 / loss of heterozygocity
    - Metastases 50% at 3 years, 80% at 5
  - trisomy 8
- Profiles of gene expression on biopsy
  - Class 1 - protective
  - Class 2
    - High risk of metastasis
    - Seen in tumors with Monosomy 3

Gene expression profile analysis

- 15 genes – the magic number?
- Prospective validation in 446 cases
- Metastasis in 1.1 % of class 1 and 25.9% class 2 (median follow-up 17 months)
- More accurate classification than ch 3 analysis
  - 20.8% discordance

UM DECISION Dx
(Castle Biosciences, Phoenix)

- The only commercially available UM genetic test
- Sensitivity 85%, Specificity 93%

http://www.castlebiosciences.com/test_UM_HPI.htm
Metastatic disease

- Liver, lung
- Metastatic workup q6 mo
  - Physical exam
  - Chest X-ray
  - Liver function tests
  - Liver imaging
    - US
    - PET/CT
    - MRI
- No good therapy

Summary

- CMM
  - High death rates from metastatic disease
  - Consider treating/referring smaller lesions

Thank you

- Images courtesy of Drs Wilson and Haik