Getting Started With OCT

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Outline:

1. **Ocular Anatomy Review** (40 minutes)

   Visualization of each distinct retinal layer on OCT scan and its correlation with retinal histology

   a. **Vitreous**

      i. Posterior hyaloid/posterior cortex

      ii. Most anterior structure on OCT

      iii. Useful in evaluation of posterior vitreous detachment, vitreomacular traction, vitreomacular adhesion, asteroid hyalosis, vitreopapillary traction, neovascular disease

   b. **Neurosensory Retina: Inner Retina**

      i. Inner Limiting Membrane (ILM)
         A. Innermost layer of the retina

      ii. Retinal Nerve Fiber Layer (RNFL) and Ganglion Cell Layer (GCL)

A. Axons and cell bodies of ganglion cells
B. Abnormalities associated with Glaucoma

iii. Inner Plexiform Layer (IPL) and Inner Nuclear Layer (INL)
A. IPL: Ganglion cells meet bipolar cells
B. INL: Nucleus of bipolar cells
1. Abnormalities linked with retinal vascular disease including diabetes and vascular occlusion

c. **Neurosensory Retina: Outer Retina**

i. Outer Plexiform Layer (OPL), Outer Nuclear Layer (ONL), External Limiting Membrane (ELM)
A. OPL: Junction between bipolar cells and photoreceptors
B. ONL: Nucleus of photoreceptors
C. ELM: Situated at base of rods and cones

ii. Inner Segment/Outer Segment Junction; Photoreceptor Integrity Line
A. Tightly packed rods and cones
B. Correlation with Visual Acuity

iii. Cone Outer Segment Tips (COST) or Interdigitation Zone (IZ)

iv. Retinal Pigment Epithelium
A. Blood retinal barrier

d. **Choroid/Bruch's Membrane**

i. Correlation between thickness and disease states
A. Pachychoroid spectrum
1. Central serous chorioretinopathy
2. Polypoidal choroidal vasculopathy
B. "Thinner" Choroid
1. Age Related Macular Degeneration
2. Age

2. **<u>Characterization of Abnormal OCT Findings</u>** (60 minutes)

a. Vitreoretinal Interface Disease

A. Posterior Vitreous Detachment
   1. Stages of Posterior Vitreous Detachment
      a. Stages 1-3 (incomplete)
      b. Stage 4 (Complete; Weiss Ring)

B. Vitreomacular Adhesion/Vitreomacular Traction
   1. VMT: Anatomic abnormality within 3 mm of fovea
      a. Focal versus broad
      b. Size; <1500 microns, >1500 microns
      c. Isolated versus concomitant

C. Epiretinal Membrane (ERM)
   1. Proliferation of glial cells; result of anomalous PVD
   2. Partial Thickness Holes
      a. Pseudohole
      b. Lamellar Hole
         i. Degenerative versus tractional

D. Full Thickness Macular Hole (FTMH)
   1. International Vitreomacular Traction Study Group Definition
      a. Size: Small, Medium, Large
      b. Vitreous involvement (primary versus secondary)

b. Retinal Vascular Disease (Inner Retinal Disease)

A. Diabetic Retinopathy
   1. Non-Proliferative
      a. Exudates, hemorrhages, macular edema
   2. Proliferative
      a. Neovascularization of disc/elsewhere
   3. Diabetic Macular Edema
      a. Center-Involving
      b. Non-Center Involving

B. Vascular Occlusive Disease
   1. Branch/Central Retinal Vein Occlusion
   2. Artery Occlusion

c. Diseases of the RPE/Choroid

A. Macular Degeneration; Non-Neovascular (DRY)
1. Drusen
    a. Reticular
2. Geographic Atrophy

B. Macular Degeneration; Exudative (WET)
1. Type 1 (Occult) Choroidal Neovascular Membrane
    a. Sub-RPE
    b. Non-Exudative Occult CNVM
2. Type 2 (Classic) Choroidal Neovascular Membrane
    a. Sub-Retinal
3. Type 3 (Retinal Angiomatous Proliferation)
    a. Intraretinal angioma

C. Pigment Epithelial Detachment
1. Drusenoid
2. Serous
3. Fibrovascular

D. Choroidal Nevus/Melanoma
1. Drusen versus lipofuscin
2. Characteristic differentiating features

d. Optic Nerve Head

A. Drusen
B. Papilledema