OCT and OCTA for diabetic retinopathy

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Course Outline

I. Background
   I. Diabetes background/review
      I. Continued increase in US and global prevalence
      II. Increased in diabetic retinopathy
      III. Continued push for retinal imaging technology to aid in early
detection and diagnosis

II. Diabetic retinopathy
   I. Review traditional clinical grading
      I. Early treatment diabetic retinopathy study
         (ETDRS)/International diabetic retinopathy grading scale
         I. Based on fundus photos/fundus examination
      II. Diabetic macular edema (DME) and Clinically significant
         macular edema (CSME) grading (ETDRS)
         I. Based on fundus photos/fundus examination

II. OCT classification of DME
   I. Morphology classification
      I. Diffuse vs. Focal (qualitative OCT)
   II. Quantification of retinal thickness
   III. Non-center involved (Non-CI) vs. Center involved (CI) DME
      I. CI-DME
         I. Central subfield (1mm) thickness of >= 250 microns
         I. Preserved visual acuity
         II. Visual acuity loss
      II. Summary of DCDR.net clinical trials that restrict to CI-DME
      III. Protocol V and VA in CI-DME (DRDC.net protocol V)
         I. Does CI-DME with good vision (20/25 or better) benefit from
            treatment vs. observation?

IV. Optometric management and considerations for DME
   I. Access to OCT
   II. What if they have CSME?
   III. Do they have CI or NonCI-DME?
      I. CI-DME \rightarrow Good VA?
         I. May be able to monitor before referral to retina/OMD
   IV. Ability to monitor closely
   V. Level of diabetic retinopathy
      I. Consider referral regardless if severe NPDR or worse

V. Case examples
   I. CI-DME w/ good visual acuity but diffuse and severe NPDR
      I. Refer
   II. Non-CI-DME

III. OCTA in diabetic retinopathy
I. Review OCTA concepts
   I. Quick, non-invasive tool
   II. Motion contrast images
      I. Repeated b-scans → detection of movement → blood flow or perfusion mapping
   III. Depth resolution
      I. Superficial vs. deep vascular complex
IV. Review OCTA report

II. OCTA use in diabetic retinopathy
   I. Subclinical lesions
      I. Microaneurysms, etc
   II. Can aid in detection of perfusion vs. non-perfusion
      I. Vessel density mapping
         I. Blood vessel area/measured area
      II. Foveal avascular zone
         I. Can be enlarged
         II. Highly variable in normal population
      III. Macular ischemia
   III. NVE and NVE
IV. Anterior segment OCTA
   I. Iris NV and NVG in diabetes
V. OCTA impact on management of DR
   I. We are still learning...
      I. Likely that findings may impact diagnosis, management, etc. in the future, but currently no accepted change on clinical management of diabetic retinopathy
      II. Anecdotal evidence
         I. Non-perfusion → great risk of progression to PDR?

VI. Case examples
   I. Healthy, young pt with enlarged FAZ despite no clinically detectable DR
   II. Examples of non-perfusion associated with DR

IV. Conclusions
   I. OCT allows better localization and assessment of truly vision threatening (foveal threatening) macular edema
      I. Still an evolving topic; does not mean the CSME is not high risk but may impact when we are referring patients for treatment
   II. OCTA provides promise in helping us obtain a better picture of DR quickly and non-invasively