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) an 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 → 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-CIDME
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