Chapter 3

Vitreoretinal Interface Disorders

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- Idiopathic Epiretinal Membrane
- Vitreomacular Traction Syndrome
- Idiopathic Macular Hole
- Full-Thickness Macular Hole
- Lamellar Macular Hole

Abnormalities of the vitreoretinal interface are involved in the pathogenesis of several macular conditions. In idiopathic epiretinal membrane (ERM) formation, a layer of abnormal tissue develops on the surface of the retina usually following posterior vitreous detachment. Contraction of this membrane can result in retinal distortion and/or vascular leakage with associated vision loss. In other conditions, such as vitreomacular traction syndrome or idiopathic macular hole, there are abnormal attachments between the vitreous and retina. The resulting traction exerted on the retina causes alterations in retinal anatomy and subsequent loss of vision.

Optical coherence tomography (OCT) has become a powerful tool in the evaluation of these conditions. The vitreoretinal changes that characterize these conditions are often subtle and difficult to distinguish on biomicroscopic examination. By providing a high resolution cross-sectional image of the retina and vitreoretinal interface, OCT can provide valuable information not visible on biomicroscopy. In addition, OCT can provide a more objective means to monitor the natural history and therapeutic response of these conditions.

**Idiopathic Epiretinal Membrane**

Idiopathic ERMs occur in approximately 6% of patients over the age of 60 with the incidence increasing with age. Symptoms vary from minimal to severe depending on the location, density, and contraction of the membrane. On slit-lamp biomicroscopy, a mild ERM appears as a glistening layer on the retinal surface. Denser membranes may be seen as a gray sheet overlying the retina. Contraction of these membranes can result in retinal distortion, often affecting the course of adjacent retinal vessels. Traction on the vessels may also cause increased permeability and associated retinal edema. Fluorescein angiography highlights the retinal vascular distortion and leakage.

OCT has become a useful diagnostic technique in evaluating ERMs. ERMs are visible on the OCT image as a highly reflective layer on the inner retinal surface. In most patients, the membrane is globally adherent to the retina. In approximately 25% of patients, the membrane is separated from the inner retina, enhancing visibility. In this situation, the ERM must be distinguished from a detached posterior hyaloid face, which can also appear as a reflective band above the retinal surface. The posterior hyaloid usually has a thin, patchy reflection compared to the denser reflection of an ERM. Additionally, the degree of separation from the inner retina is usually greater for the posterior hyaloid.

By providing qualitative and quantitative information about retinal anatomy, OCT can identify factors contributing to vision loss in patients with ERMs. Quantitative measurements of membrane thickness and reflectivity can be used to establish the degree of membrane opacity. Loss of the normal foveal contour is an early sign of retinal distortion from mild membrane formation. More advanced membranes can result in variable retinal thickening that can be quantified on the OCT image. Studies have shown that OCT measurements of retinal thickness correlate with visual acuity in patients with ERMs.

ERMs also frequently cause retinal distortion that creates a pseudohole appearance. OCT can effectively distinguish macular pseudohole from lesions that may appear similar on clinical exam. ERM with macular pseudohole...