

Keeping Your Eye on Diabetes Complications: Diabetes and Retinopathy

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Objectives

- I. Learn the types of retinopathy and suggested monitoring intervals for different levels of retinopathy
- II. Learn concerning signs and symptoms of complications of diabetic retinopathy that should prompt referral
- III. Become more familiar with available treatment options and be able to discuss prognosis with patients

Diabetic Retinopathy

- Leading cause of blindness in patients 20-64
- Hyperglycemia leads to biochemical changes that cause endothelial damage in retinal vasculature:
 - Capillary non-perfusion (ischemia)
 - Serum leakage (retinal tissue edema)

Diabetic Retinopathy Subtypes

Non-proliferative (NPDR)

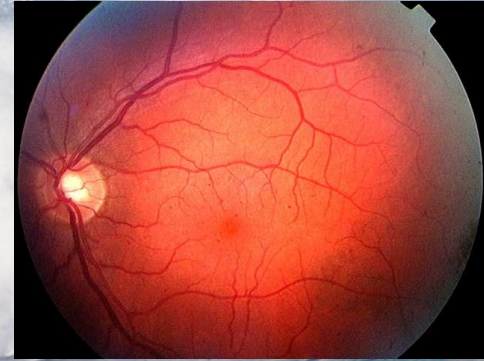
- Microaneurysms
- Flame-shaped and blot hemorrhages
- Dilated retinal venules
- Yellow exudates
- Cotton-wool spots

Proliferative (PDR)

- All NPDR findings!
- **Retinal neovascularization**
- Vitreous hemorrhages
- Retinal detachment

NPDR Subtypes

- Mild
 - Microaneurysms only
- Moderate
 - Microaneurysms PLUS blot hemorrhages,
 - Venous dilation
 - Lipid exudates
 - Cotton wool spots
- Severe
 - 4:2:1 rule



Mild Non-proliferative diabetic retinopathy



Moderate Non-proliferative diabetic retinopathy



Severe Non-proliferative diabetic retinopathy

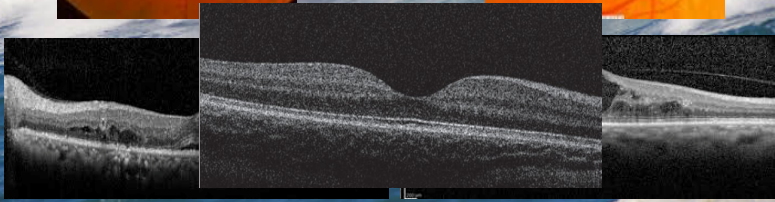
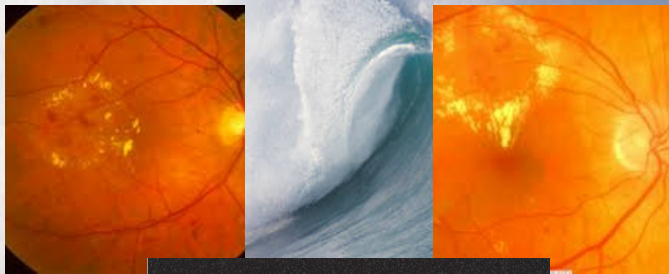
Vision Loss in NPDR

- Two mechanisms:
 - Diabetic Macular Edema
 - Macular Ischemia

Diabetic Macular Edema (DME)

- Symptoms: **Gradually** worsening blurry vision
- Diagnosis made clinically (OCT and Fluorescein angiography are helpful adjuncts)
- May be focal or diffuse
- ETDRS established focal laser as standard of care...other treatment options now include anti-VEGF injections
- DME may worsen following PRP and Cataract surgery

DME



Macular Ischemia



NPDR Treatment

- *BLOOD GLUCOSE control optimization is the mainstay of therapy for NPDR without DME.*
- DME: Injections and laser
- Macular Ischemia: No available treatment
- Regular monitoring for stability vs regression vs worsening of DR is crucial...involves a concerted effort with both specialist and PCP
- Other suboptimally controlled vascular diseases can contribute to retinopathy progression

Monitoring Intervals¹

- Mild NPDR: ANNUALLY
- Moderate NPDR: BI-ANNUALLY/6-months
- Severe NPDR: Every THREE months

¹-Preferred Practice Patterns, AAO. 2013.

Diabetic Retinopathy Subtypes

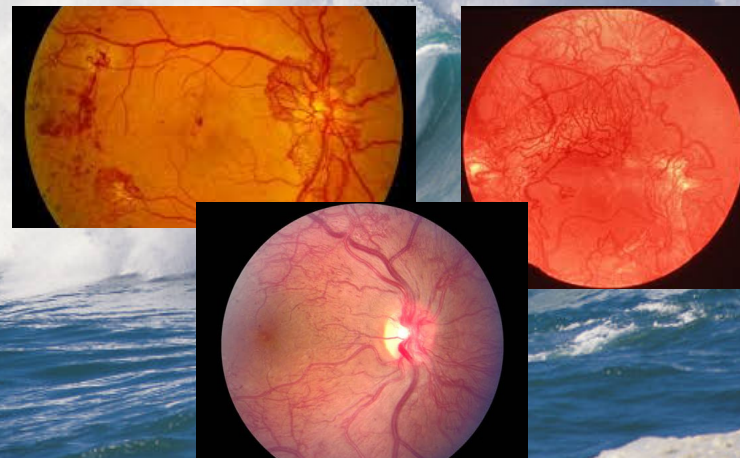
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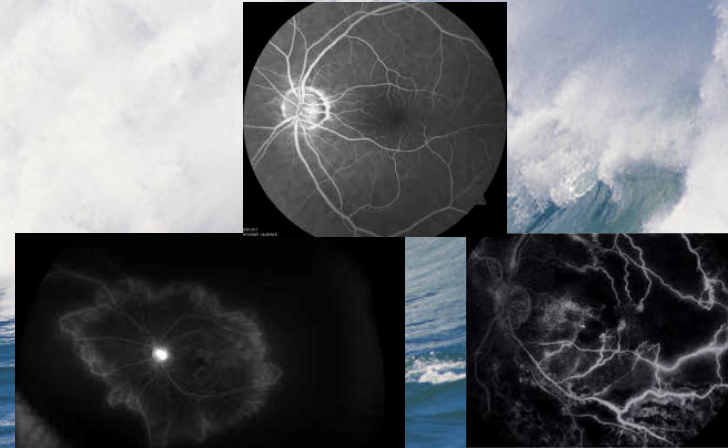
PDR



Proliferative Diabetic Retinopathy (PDR)

- Sequela of chronic diabetic retinopathy (often suboptimally controlled)
- Ischemia → VEGF release → Neovascularization
- Neovascularization → Vitreous hemorrhages, TRDs

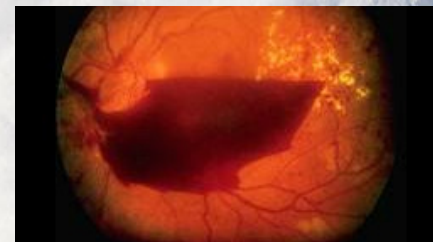
Capillary Nonperfusion



Vision Loss in PDR

- Vitreous hemorrhage
- Tractional retinal detachment
- Macular edema
- Macular Ischemia
- Neovascular Glaucoma

Vitreous Hemorrhage



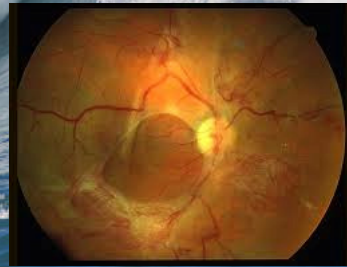
Symptoms: Sudden onset floaters (or flashes), oftentimes upon awakening



Tractional Retinal Detachment (TRD)

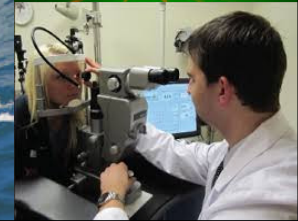


Decreased vision, flashes/floaters, visual field changes, may be asymptomatic

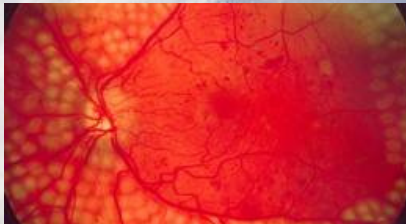


PDR Treatment

- Pan-retinal photocoagulation
- Surgery/Vitrectomy
- Anti-VEGF therapy



Panretinal Photocoagulation (PRP)



Surgical Management of Diabetes

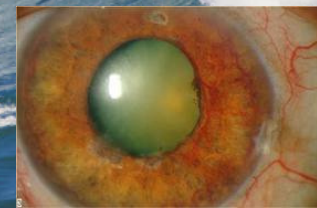
- Indications for surgery (PPV) in diabetic patients:
 - Non-clearing vitreous hemorrhage (NCVH)
 - Tractional detachment threatening macula
 - Combined tractional and rhegmatogenous retinal detachment
 - Recurrent vitreous hemorrhages despite adequate PRP

Monitoring Intervals

- Active or recently treated PDR: 2-4 months
- Quiescent, Treated PDR: 6 months-ANNUALLY

Other

- Cataracts
 - Present earlier and progress faster in diabetic pts
- Neovascular Glaucoma
 - Angle-closure glaucoma, elevated IOP, may be painful
 - Often difficult to treat medically



Prognosis

- With reasonably timely examination and follow-up, most patients enjoy excellent vision for most of their lives.
- Poor visual outcomes are most often associated with delay in diagnosis of DR, chronically suboptimal glycemic control, and noncompliance with follow-up

Key Points

- Concerted effort with both specialist and PCP is important
- Optimization of glucose control is paramount
 - BP control important also
- Suboptimally controlled patients should be counseled regarding concerning symptoms
- With reasonably timely examination and follow-up, most patients enjoy excellent vision for most of their lives.

