

Diabetic Retinopathy

Diabetic retinopathy is the leading cause of blindness in American adults. It is a condition where high blood sugar levels damage blood vessels located in the retina. The vessels become damaged and can start to leak blood and fluid. As the disease progresses, it can lead to vision changes and even blindness. Those at risk for diabetic retinopathy included both type 1 and type 2 diabetes mellitus. The longer the duration of diabetes, the higher the risk. Other risk factors include race (African Americans and Hispanics), high blood pressure, high cholesterol, pregnancy, and tobacco. Symptoms vary based on the severity of the disease, and can include blurry vision, impaired color vision, floaters, poor night vision, and blindness. There are 2 main stages of the disease, Non-Proliferative Diabetic Retinopathy (NPDR) and Proliferative Diabetic Retinopathy (PDR). NPDR is considered the early stage as it is less severe with only few or no symptoms at all. Since patients can remain asymptomatic at this stage, many of them are unaware of the presence of the disease. At this point, the retinal blood vessels are beginning to weaken, swell, and leak. This can lead to the formation of hard exudates (deposits of fat into the retina), microaneurysms, hemorrhages, and macular edema. PDR is the more severe, advanced stage. During this time vessels begin to close off leading to chronic hypoxia. This then results in the formation of new blood vessels, also called neovascularization. Yet, these new blood vessels are fragile and may leak blood and fluids into the vitreous of the eye as well as lead to scar tissue. This scar tissue can cause the retina to detach. Patients at this stage may report vision loss in both central and peripheral fields. Because of the severity of the disease, it is important to diagnose early via screening. Screening is indicated 5 years after the diagnosis of Type 1 Diabetes Mellitus and at the time of diagnosis for those with Type 2 Diabetes Mellitus. There are several ways for a physician to diagnose Diabetic Retinopathy including a comprehensive dilated eye exam, Fluorescein Angiography, Optical Coherence Tomography (OCT), and even artificial intelligence technologies are promising. With these exams and imaging available, the physician may look for abnormalities such as swelling, floaters, new blood vessels, and more. Complications may arise from disease progression such as Diabetic Macular Edema. The damaged blood vessels in the retina leak fluid and blood causing swelling in the macula. Another complication is Neovascular Glaucoma, in which new blood vessel formation in the front of the eye can block fluid from draining out and thus increasing the pressure in the eye. As mentioned previously, scar tissue may form with PDR, which may cause retinal detachment. Lastly, blindness is another severe complication of Diabetic Retinopathy. Although there is no cure, treatment options are available to stop and delay progression of the disease as well as reverse some of the vision loss. For patients with NPDR, the optimal treatment is blood sugar control. In PDR, medications such as anti-VEGF drugs (vascular endothelial growth factor inhibitors) and steroids may be given to reduce swelling of the macula and inhibit the growth of new blood vessels. Photocoagulation, a type of laser surgery,

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can reduce the leakage of blood and fluid into the eye and even shrink the abnormal blood vessels. Lastly, vitrectomy is a surgery where blood is removed from the vitreous as well as the scar tissue.