MODULE 4.0
Role of Blood Vessels

Healthy retinal blood vessels are essential for maintaining eye tissue and good vision.[1] In this Module, you will learn about:

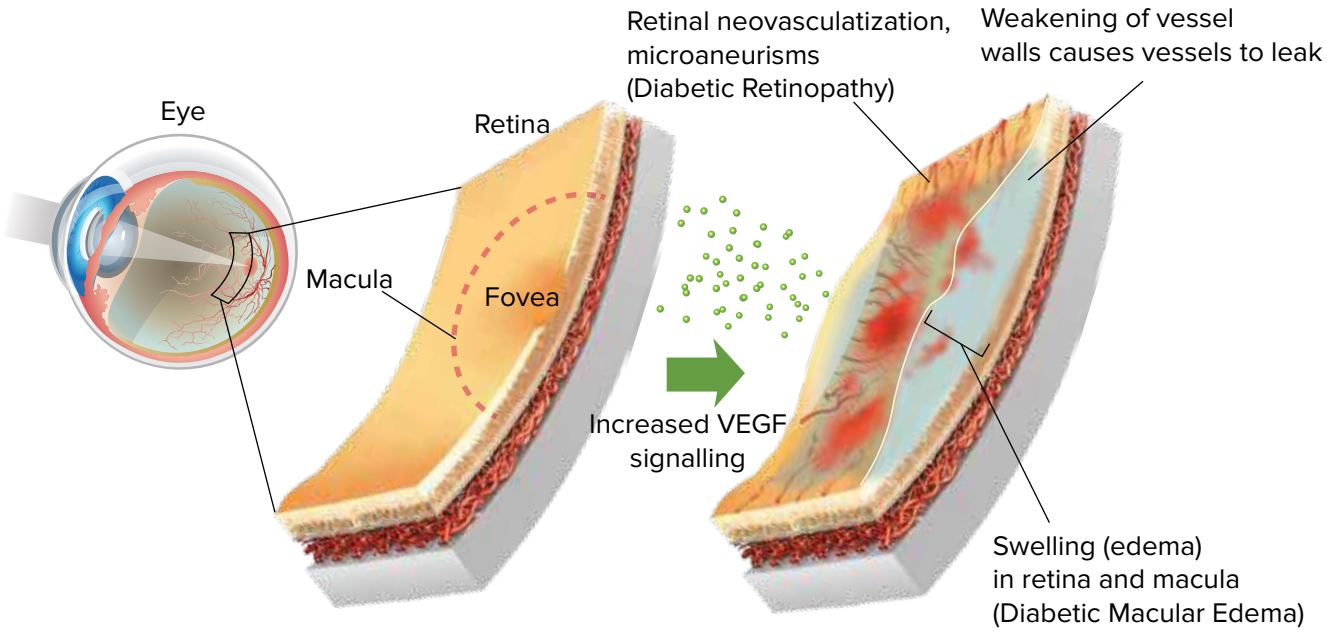
- Healthy Blood Vessels
- The Process of Stimulating Blood Vessel Growth
- VEGF and Vessel Permeability
- The Role of Blood Vessels in Ocular Disease

Introduction

The body controls blood vessels by producing a precise balance of growth and inhibitory factors in healthy tissues. Vascular endothelial growth factor (VEGF) is a glycoprotein that plays an important role in maintaining healthy blood vessels, but excessively high levels of VEGF can have harmful effects.

Excessively high levels of VEGF have been found in diabetic retinopathy (DR)[1] and diabetic macular edema (DME).[2] When retinal blood vessels become weak or blocked in DR, the retina cannot receive enough blood or oxygen and sends signals to the body for nourishment. VEGF is then released in the retina at abnormally high levels, which increases vascular permeability. This contributes to the rupture of the blood vessel wall and consequential swelling of the vessels,[3] resulting in damaged vessels that leak fluid into the central retina.[3] As fluid accumulates in the macula, the macula swells and thickens, resulting in swelling of the macula and, ultimately, DME.

Research has shown that overexpression of VEGF plays a significant role in DME and is an important target for treating the condition.[2]



References

1. Costa PZ, Soares R. Neovascularization in diabetes and its complications. Unraveling the angiogenic paradox. *Life Sci.* 2013;92:1037-1045.

2. Javey G, Schwartz SG, Flynn HW Jr. Emerging pharmacotherapies for diabetic macular edema. *Exp Diabetes Res*. 2011;2012:548732.

3. Nguyen QD, Tatlipinar S, Shah SM, et al. Vascular endothelial growth factor is a critical stimulus for diabetic macular edema. *Am J Ophthalmol*. 2006;142:961-969.