Nonproliferative Diabetic Retinopathy

Nonproliferative diabetic retinopathy (NPDR) occurs due to increased capillary permeability, progresses silently, and is generally asymptomatic. Hence, screening tests are performed periodically for prevention. On fundoscopic evaluation, retinal microaneurysms, flame-shaped hemorrhages, cotton wool spots, hard exudates, and macular edema can be seen. Treating diabetes slows down disease progression. Treatment options include laser photocoagulation and VEGF inhibitors such as bevacizumab.

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Characteristics

Increased Capillary Permeability and Leakage
Up-arrow Caterpillar Leaking
Accumulation of glycated proteins causes the endothelial permeability to increase, which leads to exudation of plasma and proteins.

Often Asymptomatic
Thumbs-up
NPDR progresses slowly over a decade and is mostly asymptomatic.

Fundoscopic Findings

Retinal Microaneurysms
Red-tin Microscope-aneurysm
Retinal microaneurysms are outpouchings at the retinal capillary wall which occur at the inner nuclear layer. Intraretinal microvascular anomalies (IRMA), are sinusoidal dilations in the blood vessels of the retina.

Flame-shaped Hemorrhages
Flame Shaped Hemorrhage-Hammer
Flame-shaped hemorrhages are due to rupture of aneurysms at the outer plexiform layer. These can be visualized on fundoscopy as small, red, flame-shaped spots on the retina.

Cotton Wool Spots
Cotton Wool-Sheep with Spots
Cotton wool spots are white spots in the superficial retina caused by axoplasmic stasis in the retinal nerve fiber layer.

Hard Exudates
Yogurt
Lipo-proteinaceous deposits present in the outer plexiform layer are called hard exudates. They are a common feature of NPDR.

Macular Edema
Macula-Dracula with Edamame
Macular edema occurs when fluid and protein deposits collect on or under the macula of the eye and cause it to thicken and swell. This is an ominous finding.

Management

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Treat Diabetes

Dyed-bead-pancreas with Treat-pill

Patients with HbA1c level greater than 7.5% are at a higher risk for microvascular complications. Glycemic control can prevent disease progression.

Laser Photocoagulation

Laser with Photo-Clogs

Laser photocoagulation is a procedure that uses a high-powered, pulse laser to reduce retinal angiogenesis.

Bevacizumab

Beaver-scissor-mob

Bevacizumab is a monoclonal antibody against vascular endothelial growth factor (VEGF) and is given as an intravitreal injection.

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