Proliferative Diabetic Retinopathy

Proliferative Diabetic Retinopathy (PDR) is an ocular disease that can occur in patients with longstanding or poorly managed diabetes. Retinal angiogenesis is the hallmark of this disease and occurs due to upregulation of VEGF. It is usually asymptomatic until later stages. Fundoscopic findings include vitreous hemorrhage, retinal detachment, glaucoma and findings of non-proliferative diabetic retinopathy (like cotton wool spots and macular edema). Management options include laser photocoagulation, surgery, and bevacizumab, a VEGF inhibitor.



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Characteristics

Angiogenesis
Angel-jeans Generating Capillaries
Angiogenesis within the eye can lead to visual abnormalities and impaired vision. Although new vessels may arise anywhere in the retina, they are most commonly seen at the posterior pole. Neovascularization near the disc carries a worse prognosis than neovascularization elsewhere.

Increased VEGF
Up-arrow Vegetable-Farmer
Vascular Endothelial Growth Factor (VEGF) causes neovascularization and is upregulated due to hypoxia.

Asymptomatic Until Late-stage
Thumbs-up
The disease progression is slow and remains asymptomatic for an extended period. By the time the patient experiences visual impairment, the disease will have likely progressed significantly.

Fundoscopic Findings

Vitreous Hemorrhage
Fit-tree Hemorrhage-hammer
Vitreous hemorrhage is defined as the extravasation of blood into one of the several potential spaces formed within and around the vitreous body. This is a notable finding in PDR.

Retinal Detachment
Detached Red-tin-man
Eventual fibrosis of vitreal vessels will pull on the retina, predisposing these patients to retinal detachment. Patients will often report that "a curtain fell" over their vision, and must be treated urgently.

Glaucoma
Glock-eye
Glaucoma is a disease that causes progressive optic atrophy. It is usually due to increased intraocular pressure (IOP). In this subset of patients, neovascularization can impair the outflow of aqueous humour, leading to increased IOP and glaucoma.

Findings of Nonproliferative Diabetic Retinopathy
Nun with Pro-lifter Dyed-bead-pancreas Red-tin-party-hat
Findings characteristic of non-proliferative diabetic retinopathy (NPDR) like soft exudates, hard exudates, hemorrhages and a macular star may be present.

Management

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Laser Photocoagulation

Laser with Photo-Clogs

Laser photocoagulation causes the newly formed vessels to regress by inducing ischemia. Panretinal photocoagulation is achieved using a Nd:YAG laser (neodymium-doped yttrium aluminum garnet).

Surgery

Surgeon

Surgical procedure depends on the severity of the patient's condition. Options include iridotomy, vitrectomy, and retinal repair, among others.

Bevacizumab

Beaver-scissor-mob

Bevacizumab is an anti-VEGF drug. It is given via intravitreal injection and slows angiogenesis.

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