

DIABETIC RETINOPATHY

Retinal disease that can occur in patients with diabetes mellitus.

Risk Factors:

- Diabetes
- Uncontrolled glucose or blood pressure levels are associated with increased risk

PATHOLOGY

The main types of diabetic retinopathy are non-proliferative and proliferative diabetic retinopathy. The main distinguishing feature between these two categories is the presence (proliferative) or absence (non-proliferative) of abnormal new (neovascular) blood vessels (retinal neovascularization).

PREVENTION:

Control of glucose and blood pressure. Each 1% reduction in average HbA1c was associated with reductions in risk of 21% for any end point related to diabetes.

SYMPTOMS

- decreased vision or fluctuating vision,
- presence of floaters,
- flashes of light (photopsias) or
- defects in the field of vision.

It is important to know the haemoglobin A1c and whether the patient's blood pressure is under control.

Slit lamp examination and dilated fundus examination should be performed by an ophthalmologist.

Clinical diagnosis

The central retina area that located between the main branches (superior and inferior arcades) of the central retinal vessels (central retinal artery and central retinal vein) in the eye is known as the "macular area". The retina beyond this is considered "peripheral retina". The central retinal area can develop abnormal findings in diabetic retinopathy. These findings can be present in the non-proliferative or the proliferative forms of the disease. These changes in the macula include the presence of abnormally dilated small vessel outpouchings (called micro aneurysms), retinal bleeding (retinal haemorrhages) and yellow lipid and protein deposits (hard exudates). The macula can get thicker than normal- referred to as macular oedema. Non-proliferative retinopathy can be classified into mild, moderate or severe stages based upon the presence or absence of retinal bleeding, abnormal venous beading of the vessel wall (venous beading) or abnormal vascular findings (intraretinal microvascular anomalies or IRMA). No treatment is usually done at this stage.

Proliferative retinopathy is progressive and requires treatment to prevent bleeding and scar tissue formation.

Diagnostic procedures

Ocular coherence tomography (OCT) is indispensable to determine the retinal thickness measurements. The OCT can be sequentially obtained to determine whether the macular thickening is responding (swelling/ oedema is decreasing) to therapy.

Fluorescein angiography may occasionally be used to determine the degree of ischemia or the presence of retinal vascular abnormalities.

Laboratory test

Haemoglobin A1c (HbA1c) is a measure of the degree of glycaemic control over the past 3 months. A goal of 5.5 % - 6.0 % is ideal.

TREATMENT

Medical therapy and follow up

Treatment of macular oedema is usually needed in order to prevent loss of vision or to try to improve vision. Treatment includes the use of lasers or injection of drugs that cause the swelling (from leaking blood vessels) to resolve. Patients are seen monthly if being injected or every 3 months **post-laser for macular oedema. Several studies indicate that anti-VEGF drugs are more effective than focal laser** (DRCR, READ2, RIDE, RISE, DAVINCI). A recent study by the DRCR network has shown all three drugs (bevacizumab, ranibizumab and aflibercept) are effective for macular oedema therapy.

Treatment of Proliferative Diabetic Retinopathy is laser photocoagulation of the peripheral retina. If successful and managed early in the disease, bleeding and scarring is averted. Sometimes the proliferative disease is advanced and there is bleeding in the eye (thus preventing laser to be done) or scar tissue that wrinkles the retina or pulls it off the eyewall surface. In these situations, surgery is necessary. In cases of **NVD (New Vessels at the Disc)/ NVE (New Vessels Elsewhere on the retina)** with **NVI (New Vessels on the Iris/Rubeosis Iridis)**, anti-VEGF injections into the eye can also be used. The use of anti-VEGF drugs in PDR is being investigated by the DRCR network. Anti-VEGF injections are sometimes used in concert with laser when rubeosis and neovascular glaucoma are present. Anti-VEGF are also given prior to vitrectomy surgery in selected cases.

Surgery and Surgical follow up

Surgery is only recommended when blood and scar tissue needs to be removed from the retinal surface and to place laser treatment as needed. Surgery may not always be able to repair damage to the retina that has been long-standing and severe. Intraoperatively, intraocular gas or silicone oil may be needed to reattach the retina to the underlying layers and eyewall.



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Complications of Treatment of Diabetic Retinopathy

There is always the low, but real, risk of infection of the eyeball (endophthalmitis) with any injection of drugs into the eye or with eye surgery. There is also the risk of cataract progression with retinal surgery as vitrectomy accelerates the rate of cataract formation.