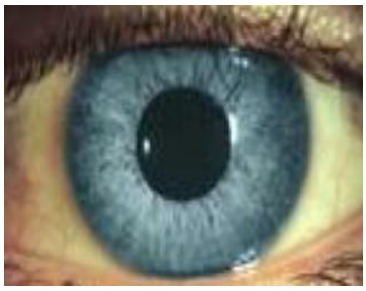
Chronic Visual Loss

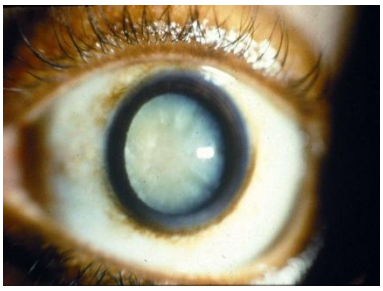
Cataract:

Defenition:

Opacity of the crystalline lens.



Normal Lens



Cataract

Causes:

A. Age related:

- Subcapsular cataract: ocuurs just beneath the lens capsule:
  a. Anterior subcapsular cataract.
  b. Posterior subcapsular catarct.
- Nuclear cataract: due to diffuse lens hardening and discoloration from deterioration of of older central (nuclear) fibers.
- Cortical cataract: caused by swelling, degeneration and liquifaction of the younger outer (cortical) fibers.

B. Traumatic:

Usually posterior subcapsular, unilateral cataract.

C. Metabolic:

- Diabetic
- Galactosemia
- Glacokinase defiency
- Mannosidosis
- Fabrys disease
- Lowes syndrome
- Hypocacemic syndrom

D. Cataratogenic drugs:

- Chlorpromazine
- Miotics
- Myleran
- Amiodarone
- Gold

- Most common cause of cataract is age related, the nuclear of the lens will increase in size after the age of 40 , which is called nuclear sclerosis and when this sclerosis increase the patient get opacity (cataract).
- Posterior subcapsular cataract is the most dangerous type because of refraction to retina & we call it nodal point, so even small amount of opacity can decrease vision dramatically.

E. **Complicated cataract:**
   - Uveitis
   - Retinal dystrophy,retinitis pigmentosa
   - High myopia
   - Acute glaucoma

F. **Intrauterine causes:**
   - rubellatoxo,cmv.

G. **Syndromes:**
   - dowen syndrome,wernerrothman.

H. **Hereditary.**

Classification:

A. morphologic

- nuclear, subcapsular,cortical

B. maturity

- immature, mature,itumescent,hypermature

C. age of onset

- cong ,infantile, presenile.senile

Signs:

- Decreased visual acuity.
- Color vision defect (especially blue color discrenination).
- Lens opacification.

Evaluation:

- **History:**
  - Systemic diseases.
  - Medications (steroids).
  - Ocular trauma.
  - Surgery.
  - Radiation expousure.
  - Other ocular diseases.
- **Complete visual examination.**

Management:

Initially: vision may be improved with glasses or contact lenses.

Indication of surgery:

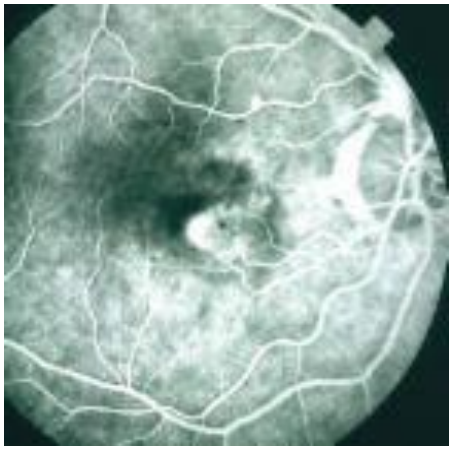
- Patient's needs.
- Decreased visual acuity

Surgery:

1. ICCE (intra capsular cataract extraction): removal of the whole lens, not done any more.
2. ECCE (extra capsular cataract extraction): capsule removal, delivering of the nucleus and aspirating the cortex.
3. ECCE: as above with intra ocular lens insertion.
4. PHACO IOL: micro incision cataract surgery.

Macular degeneration





Macular Anatomy:

- The macula is an oval area situated about 2 disc diameters temporal to the optic disc. The macula is composed of both rods and cones and is the area responsible for detailed, fine central vision.
- The central macula is a vascular and appears darker than the surrounding retina. The fovea is an oval depression in the center of the macula.there is a high density of cones but no rods are present.
- The central depressionof the fovea may act like a concave mirror during ophthalmoscopy, producing a light reflection (i.e., foveal reflex).

Test for macular function

- V/A
- Pupillary light reaction
- Color vision
- Ophthalmoscopy
- Amsilar grid
- Phtosterss test
- Laser inferometry
- Flourescine angiography

Definition of macular degeneration:

Some degree of visual loss associated with drusen, atrophy of Retinal pigmented epithelium (RPE) and subretinal neovascularization (CNV).

RELEVANCE:

- In the United States, age-related macular degeneration is the leading cause of irreversible central **visual loss** (20/200 or worse) among people aged 52 or older.
- Because certain types of macular degeneration are treated effectively with laser, it is important to recognize this entity and to refer for appropriate care.
- It is important to distinguish between the possible causes of **visual loss**, whether cataract (surgically correctable), glaucoma (medically or surgically treatable), or macular degeneration (potentially laser treatable).

Types:

A. Non-exudative (dry) 90%: slow progressive atrophy of Retinal pigmented epithelium (RPE) and photoreceptors

- Most patients are asymptomatic, and those with atrophy may notice metamorphopsia (visual distortion).

B. Exudative (wet) 10%: characterized by choroidal neovascularisation and Retinal pigmented epithelium (RPE) detachment**.**

- Drusen are hyaline nodules (or colloid bodies) deposited in Bruch's membrane, which separates the inner choroidal vessels from the retinal pigment epithelium. Drusen maybe small and discrete or larger, with irregular shapes and indistinct edges. Patients with drusen alone tend to have normal or near normal **visual** acuity ,with minimal metamorphopsia (change in the size of objects)
- As the most common cause of vision loss among people over the age of 60, macular degeneration impacts millions of older adults every year. The disease affects central vision and can sometimes make it difficult to read, drive or perform other activities requiring fine, detailed vision.

Risk factors (imp):

A. Non-modifiable:

- Age.
- Race.
- Gender.
- Genetics.

B. Modifiable:

- Smoking.
- High Blood Pressure.
- High Cholesterol.
- Poor Nutrition.
- Unprotected Exposure to Sunlight.
- Ultraviolet (UV) light has been .
- Excessive Sugar Intake.
- Obesity.
- Sedentary Lifestyle.

Clinical features:

- Variable degree of central visual loss
- Metamorphopsia (distorted vision characterized by straight parallel lines appearing convergent or wavy) due to macular edema.

Investigation:

- Amsler grid: hald at normal reading distance with glasses on, assesses macular function
- Fluorescein angiography (FA): assess degree of neovascularization – pathologic new vessels leak dye.

Non-exudative (dry)	Exudative (wet)
• Most common type. • Slowly progressive loss of visual function. • Dursen: pale, yellow-white deposits between the retinal pigment epithelium (RPE) and Bruch's membrane (area separating inner choroidal vessels from RPE)	• 10% only. • Sever visual loss. • Choroidal neovascularization: dursen predeispose to breaks in Burch'e membrane causing subsequent growth and proliferation of choroidal capillaries. • May get serous detachment of overlying RPE and retina, hemorrhage and lipid precipitates into subretinal space. • Can also get an elevated subretinal mass due to fibrous metaplasia of hemorrhagic retinal detachment. • Leads to disciform scarring and severe central visual loss.
Treatment: • Monitor, Amsler grid allows patients to check for metamorphopsia. • Low vision aids (magnifier, closed-circuit television). • Anti-oxidants, green leafy vegetables. • Sunglasses, visors.	**Treatment:** • Laser photo coagulation for neovascularization. • 50% of choroidal neovascularization cannot be treated initially. • No definitive treatment for disciform scarring. • photodynamic therapy with verteporfin • intravitreal injection of anti-angiogenesis growth factor.

Diabetic retinopathy

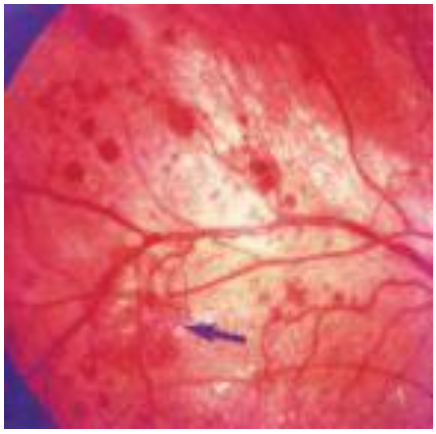
Definition:

- Progressive dysfunction of the retinal blood vessels caused by chronic hyperglycemia.

Risk Factors:

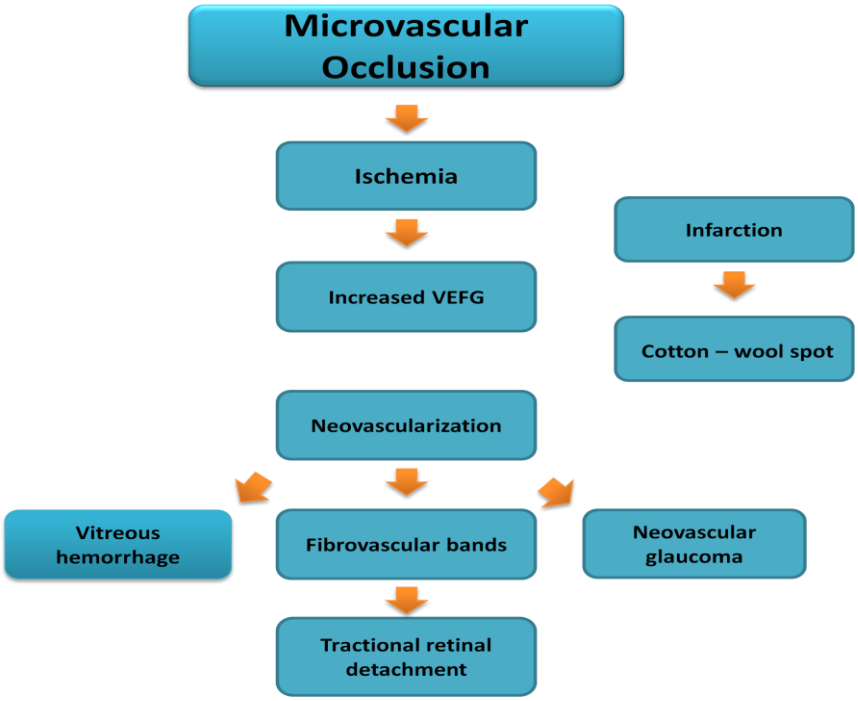
- Duration and type of diabetes mellitus.
- Metabolic control: chronic hyperglycemia increase the risk of developing diabetic retinopathy.
- Hypertension
- Renal diseases.
- Yperlipidemia
- pregnancy

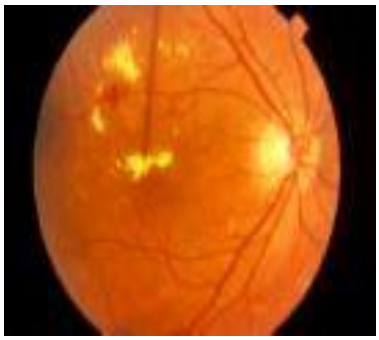
Pathogenesis



1. **Microvascular occlusion:** is caused by:

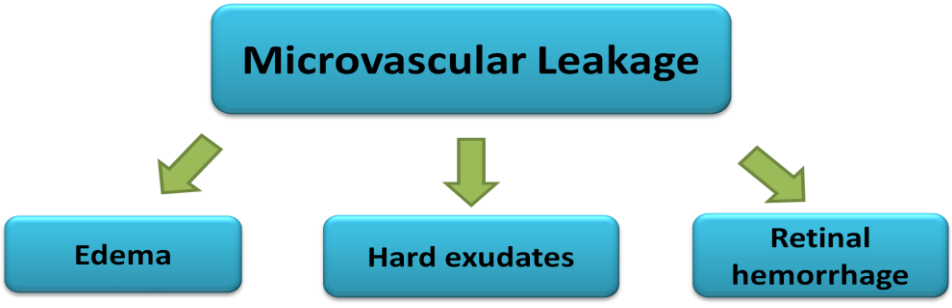
- Thickening of capillary basement membranes.
- Abnormal proliferation of capillary endothelium.
- Increased platelet adhesion.
- Increased blood viscosity.
- Defective fibrinolysis.





2. **Microvascular leakage:** is caused by:

- Impairment of endothelial tight junctions.
- Loss of pericytes.
- Weakening of capillary walls.
- Elevated levels of vascular endothelial growth factor (VEGF).



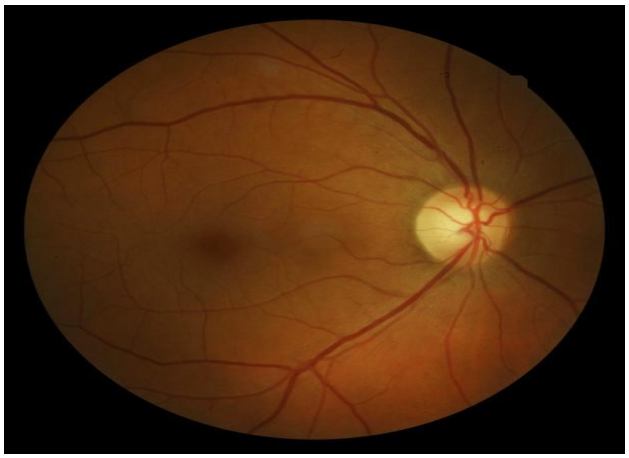
Types:

1. Non proliferative
2. Proliferative
3. Macular oedema

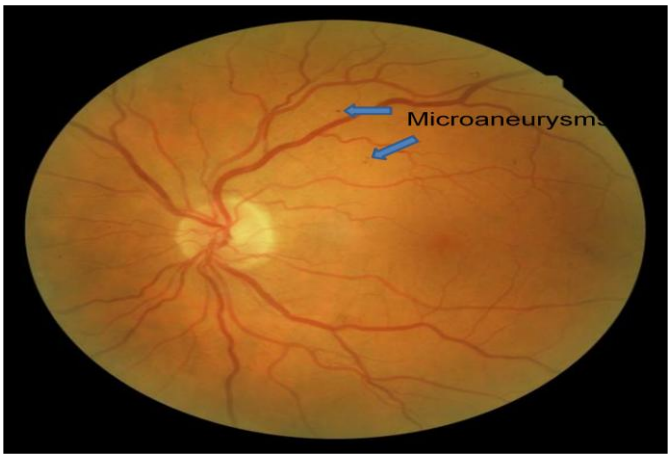
Non-proliferative DR	Proliferative DR
• Characeterized in early stages by bilateral dot\blot intraretinal hemorrhages,hard and soft exudates, microanurysms, and cotton wall spots • If the retinopathy worsen, venous beading and loops and itraretinal microvascular abnormalities can be seen	• The hallmark is the presence of neovascularization (either in the disc-NVD- or elsewhere in the retina-NVE) • Preretinal and vitreous hemorrhages • Fibrovascular proliferation on the posterior vitreous suface. • Traction retinal detachments.

Management:

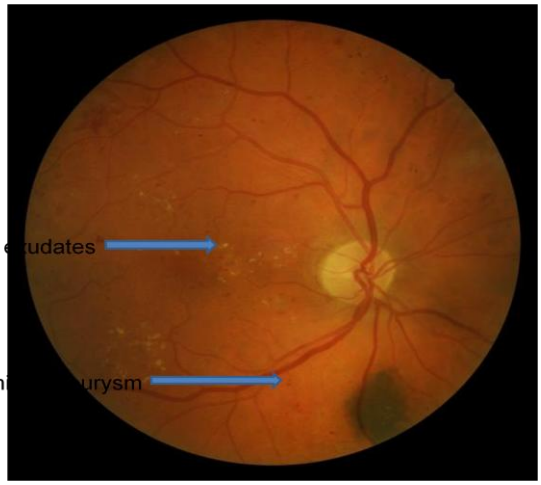
- NPDR: Observation.
- PDR: Panretinal photocoagulation (PRP).
- MACULAR OEDEMA: Focal and grid laser.



No retinopathy

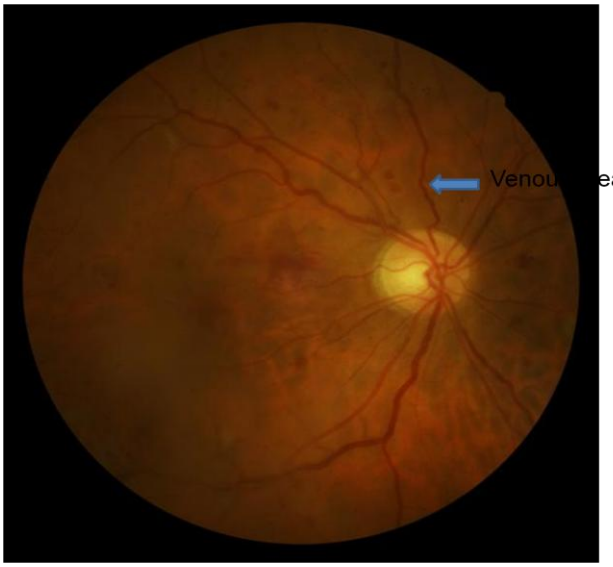


Microaneurysm

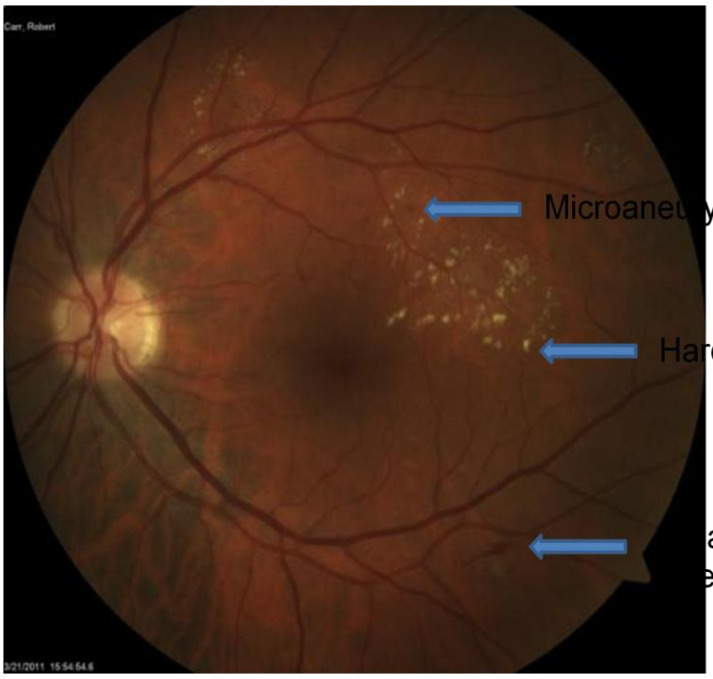


Hard exudates

microaneurysm



Venous bleeding



Microaneurysm

Hard exudates

Flamed shaped hemorrhage

Done By:

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