WHAT YOU NEED TO KNOW ABOUT DIABETES AND THE EYE

DR LUSOBYA
REBECCA CLAIRE

DIABETES MELLITUS

Is a chronic metabolic disorder characterized by chronic elevation of blood sugar level resulting from defects in insulin secretion, utilization or both

CLASSIFICATION OF DIABETES MELLITUS

- Type 1 – pancreatic beta cell destruction usually autoimmune process(first decade of life)
- Type 2– predominant insulin resistance with relative insulin deficiency
- Gestational Diabetes – Glucose intolerance with onset

DIAGNOSTIC CUT OFF POINTS

- Fasting plasma Glucose > 7.0 mmol/l
- Glycated hemoglobin HbAIC 6.5%(in adults)
- Factors that can affect HbAIC –Anaemias, SCD, Hemoglobinopathies, liver disease
- Hyperglycemia is considered to play an important role in the pathogenesis of retinal microvascular damage.

Ocular complications of DM

- Diabetic retinopathy
- diabetic papillopathy
- glaucoma
- cataract
- ocular surface diseases

Diabetic Retinopathy

- It is the “disease of the retina” caused by **microangiopathy** due to long term effect of diabetes leading to progressive damage of the retina & blindness.

- Most common cause of severe bilateral visual loss in working age group.

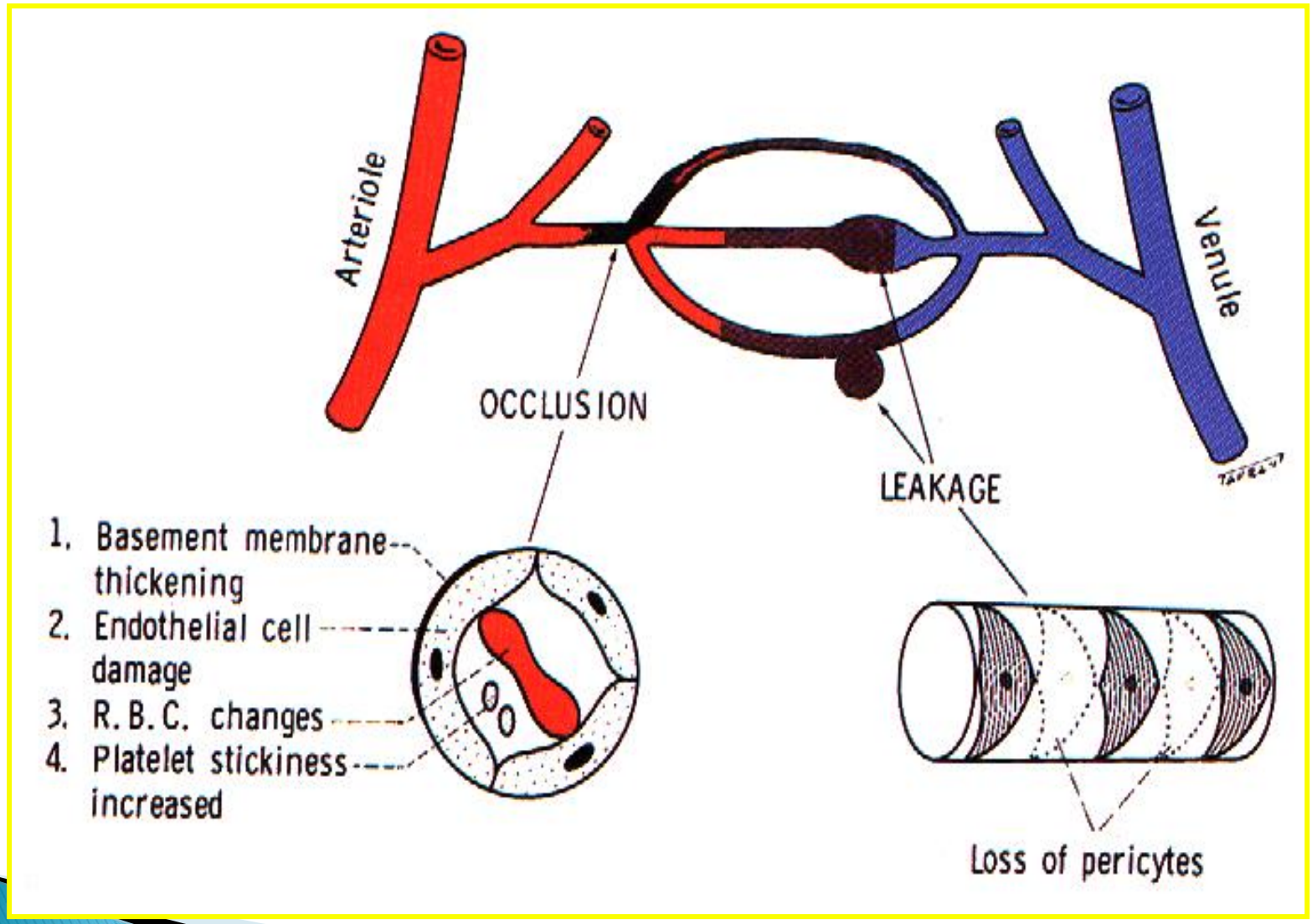
DIABETIC RETINOPATHY

1. Adverse risk factors
2. Pathogenesis
3. Background diabetic retinopathy
4. Diabetic maculopathies
   - Focal
   - Diffuse
   - Ischaemic
5. Clinically significant macular oedema
6. Preproliferative diabetic retinopathy
7. Proliferative diabetic retinopathy

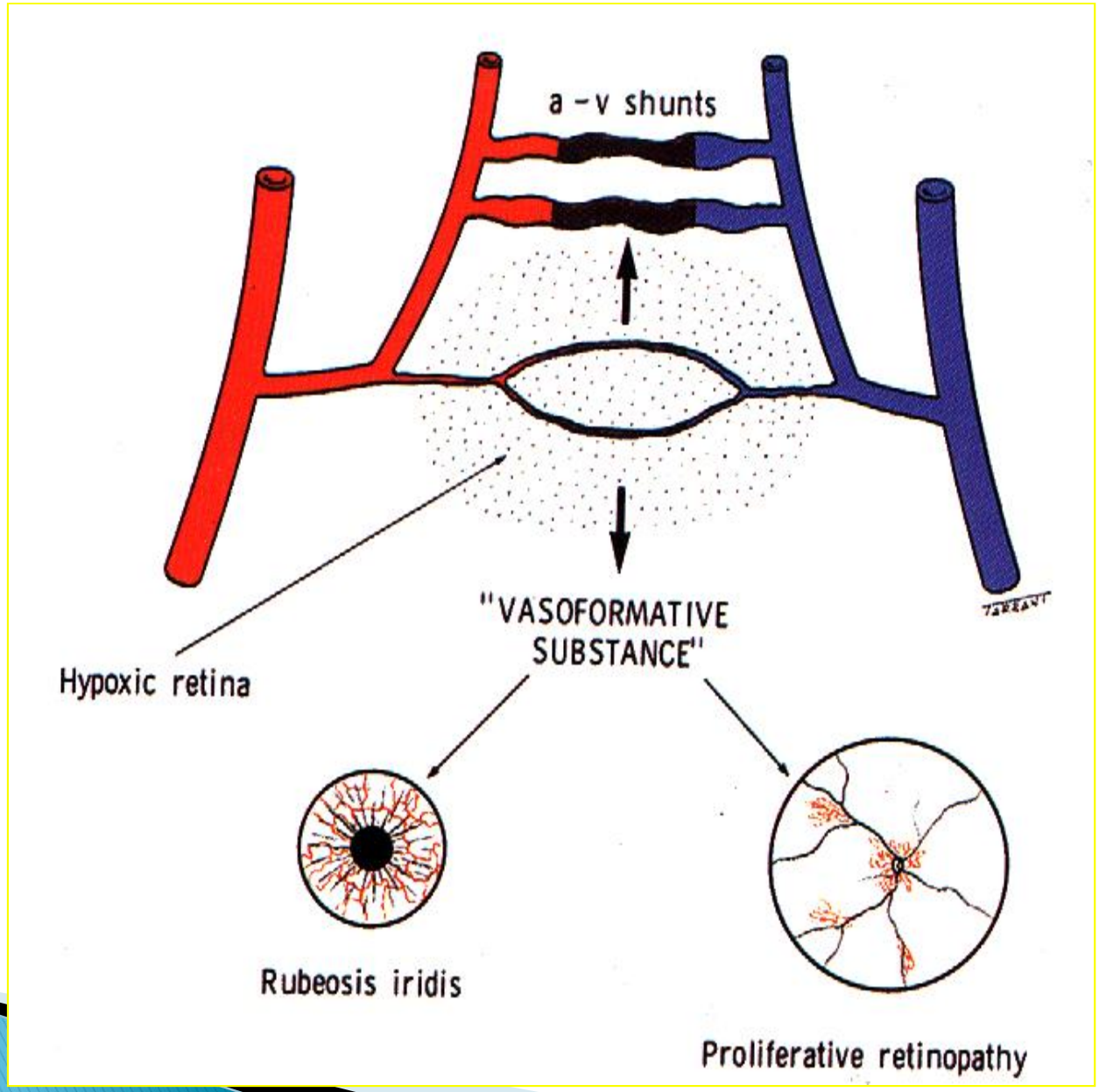
Adverse Risk Factors

1. Long duration of diabetes
2. Poor metabolic control
3. Pregnancy
4. Hypertension
5. Renal disease
6. Other
   - Obesity
   - Hyperlipidaemia
   - Smoking
   - Anaemia

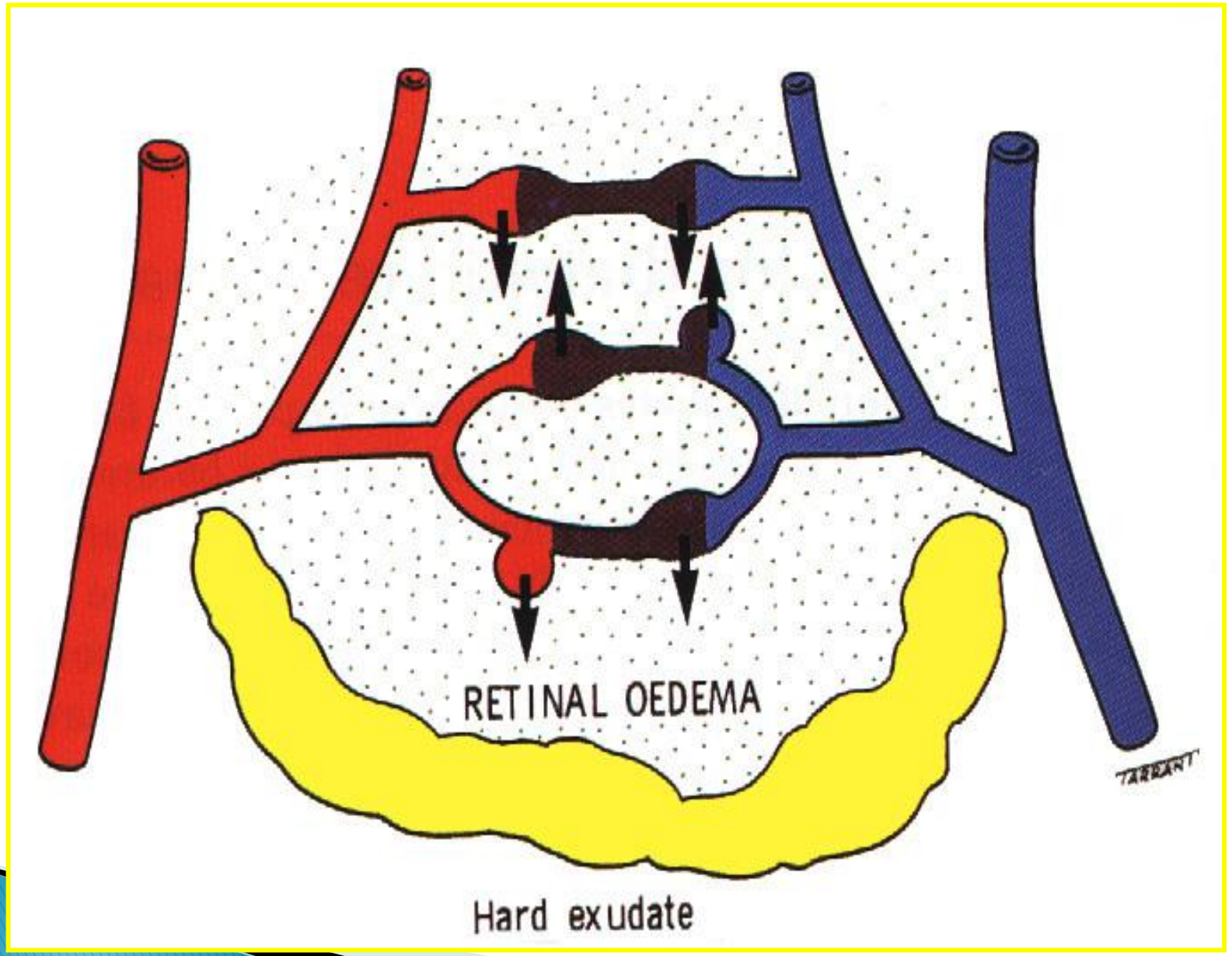
Pathogenesis of diabetic retinopathy



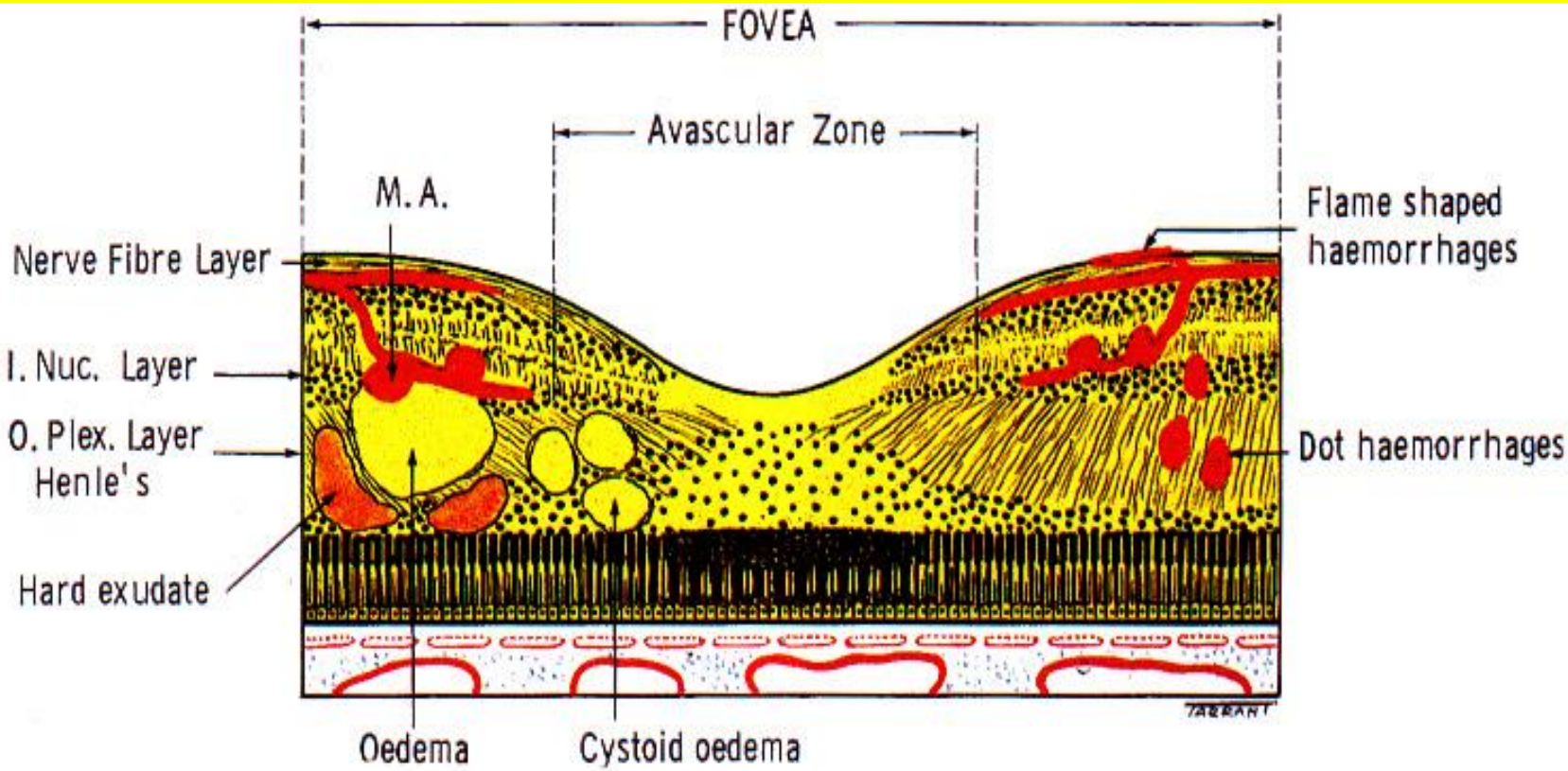
Consequences of retinal ischaemia



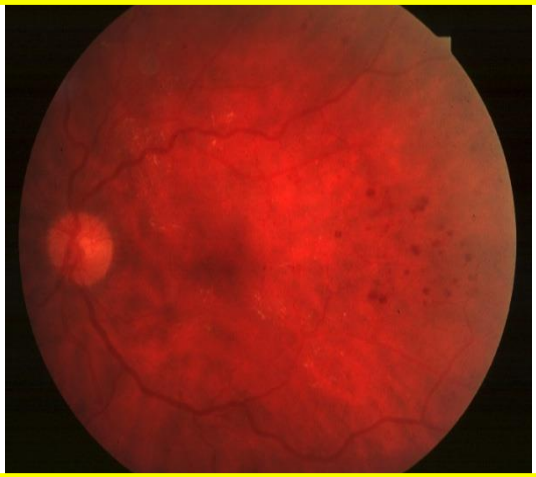
Consequences of chronic leakage



Location of lesions in background diabetic retinopathy



Signs of background diabetic retinopathy



Microaneurysms usually temporal to fovea

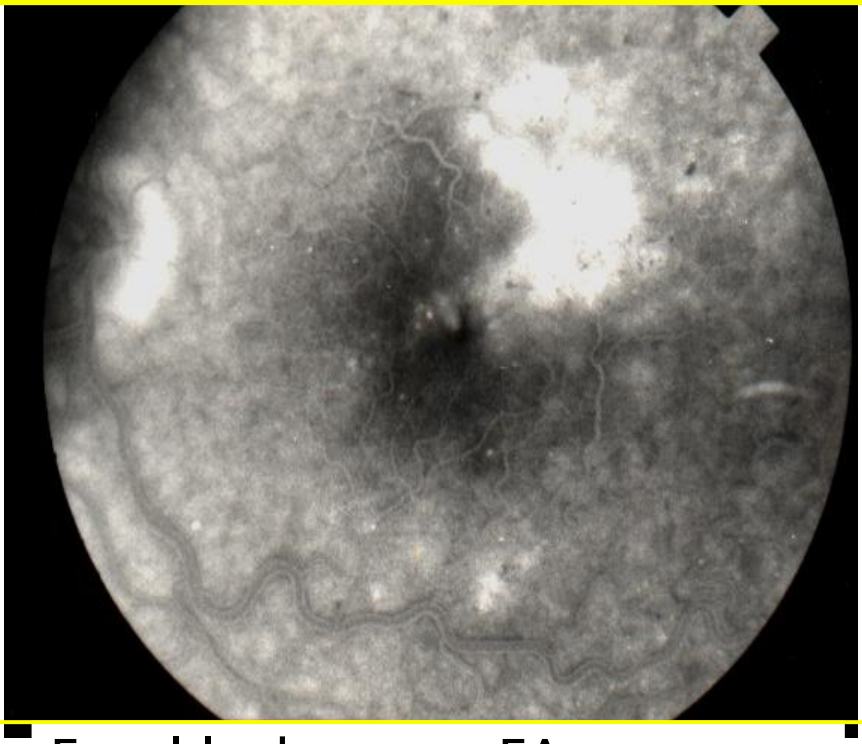
Intraretinal dot and blot haemorrhages

Hard exudates frequently arranged in clumps or rings

Retinal oedema seen as thickening on biomicroscopy

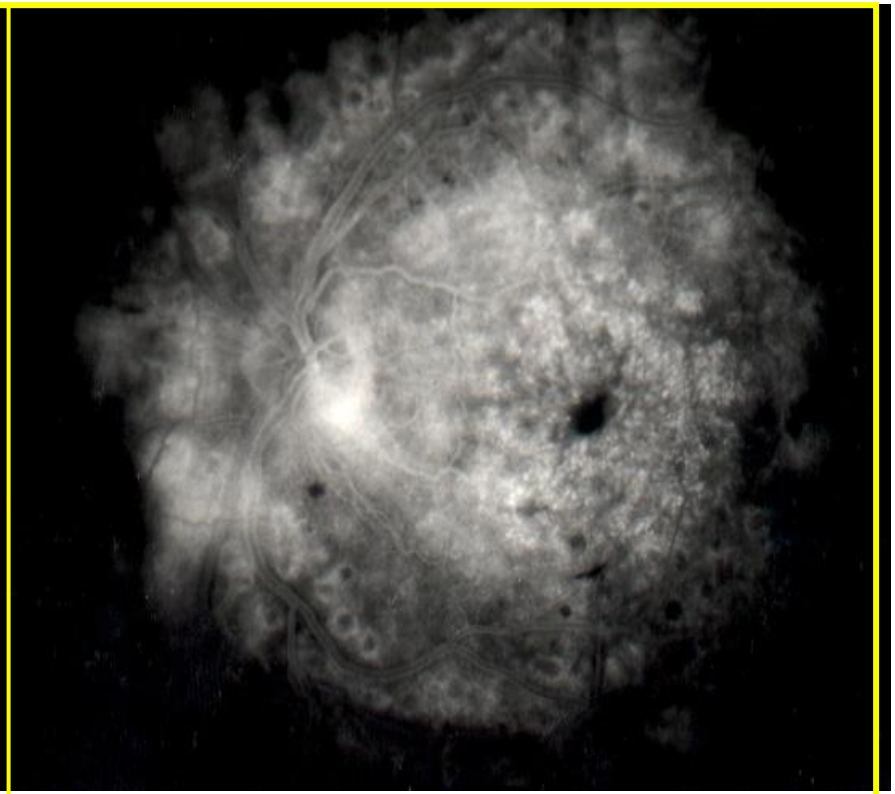
Focal diabetic maculopathy

- Circumscribed retinal thickening
- Associated complete or incomplete circinate hard exudates



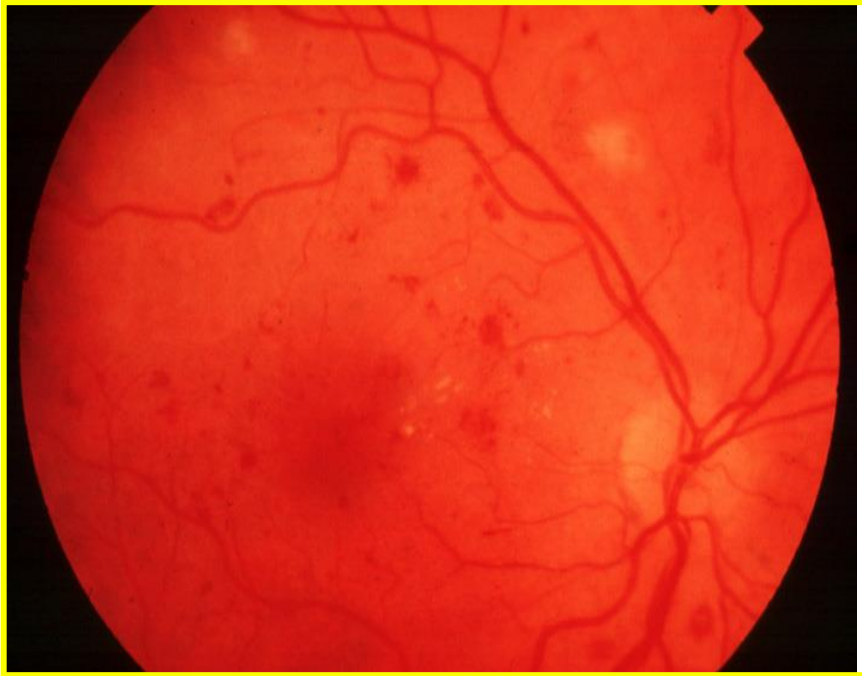
- Focal leakage on FA
- Focal photocoagulation
- Good prognosis

Diffuse diabetic maculopathy

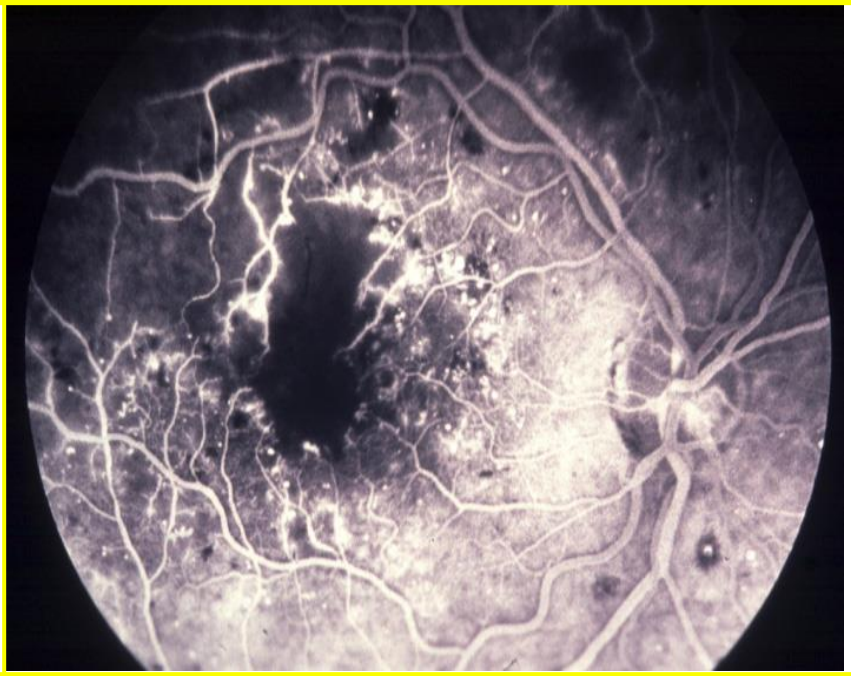


- Diffuse retinal thickening
- Frequent cystoid macular oedema
- Variable impairment of visual acuity
- Generalized leakage on FA
- Grid photocoagulation
- Guarded prognosis

Ischaemic diabetic maculopathy



- Macula appears relatively normal
- Poor visual acuity



Capillary non-perfusion on FA

- Treatment not appropriate

Clinically significant macular oedema

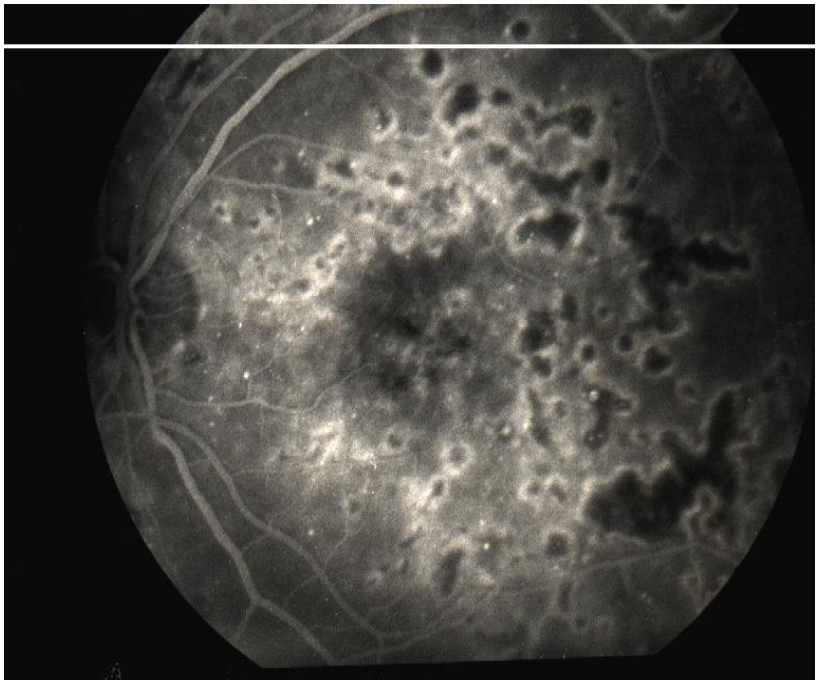
Retinal oedema within 500 μm of centre of fovea

Hard exudates within 500 μm of centre of fovea with adjace oedema which ma be outside 500 μ limit

Retinal oedema one disc area or larger any part of which is within one disc diameter (1500 μm) of centre of fovea

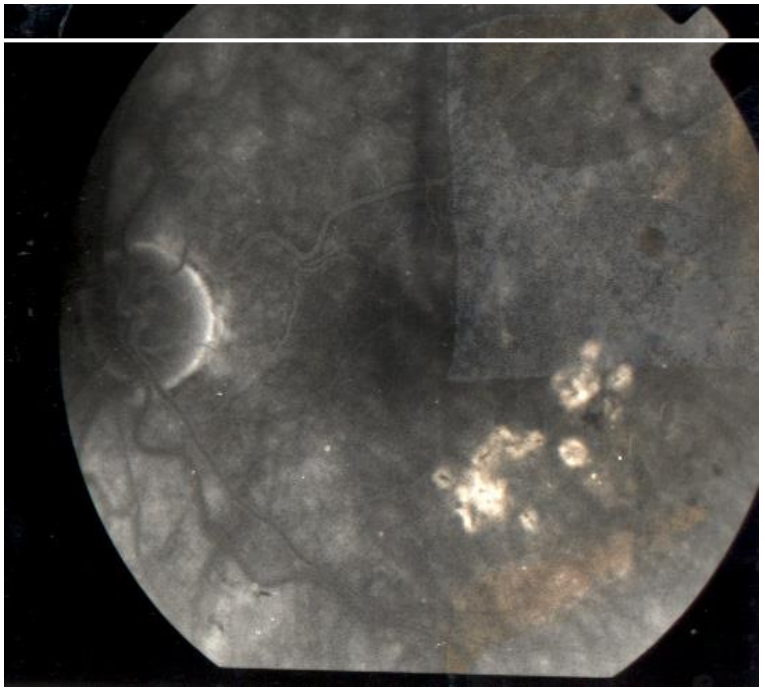
Treatment of clinically significant macular oedema

Grid treatment



- For diffuse retinal thickening located more than 500 μm from centre of fovea and 500 μm from temporal margin of disc

Focal treatment



- For microaneurysms in centre of hard exudate rings located 500-3000 μm from centre of fovea

Preproliferative diabetic retinopathy

Signs

- Cotton-wool spots
- Venous irregularities

- Dark blot haemorrhages
- Intraretinal microvascular abnormalities (IRMA)

Treatment – not required but watch for proliferative disease

Proliferative diabetic retinopathy

- Affects 5-10% of diabetics
- IDD at increased risk (60% after 30 years)

Neovascularization

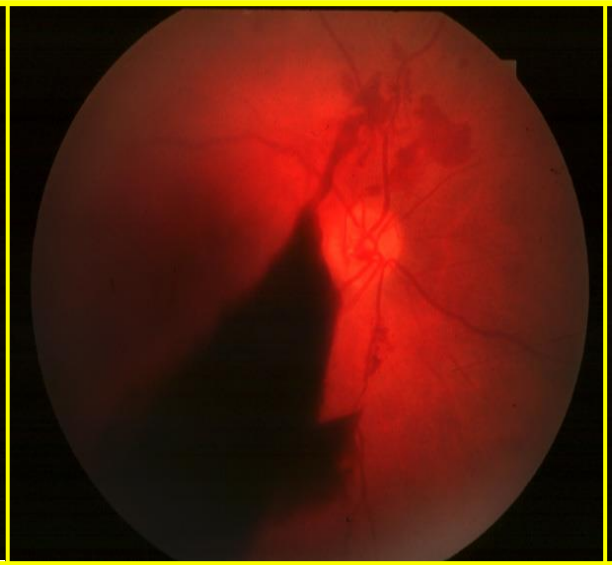
- Flat or elevated
- Severity determined by comparing with area of disc

Neovascularization of disc = NVD

Neovascularization elsewhere = NV

Indications for treatment of proliferative diabetic retinopathy

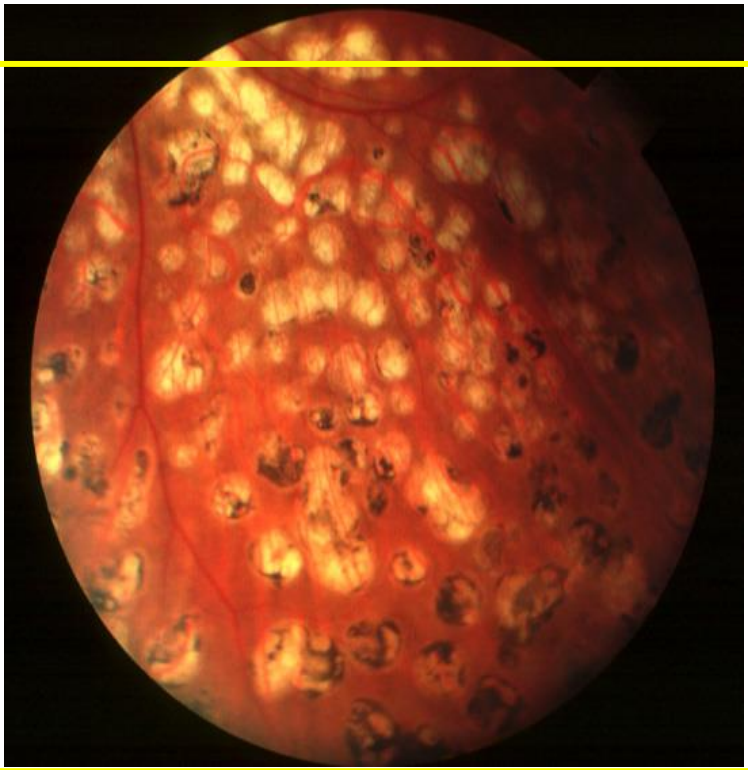
NVD > 1/3 disc in area

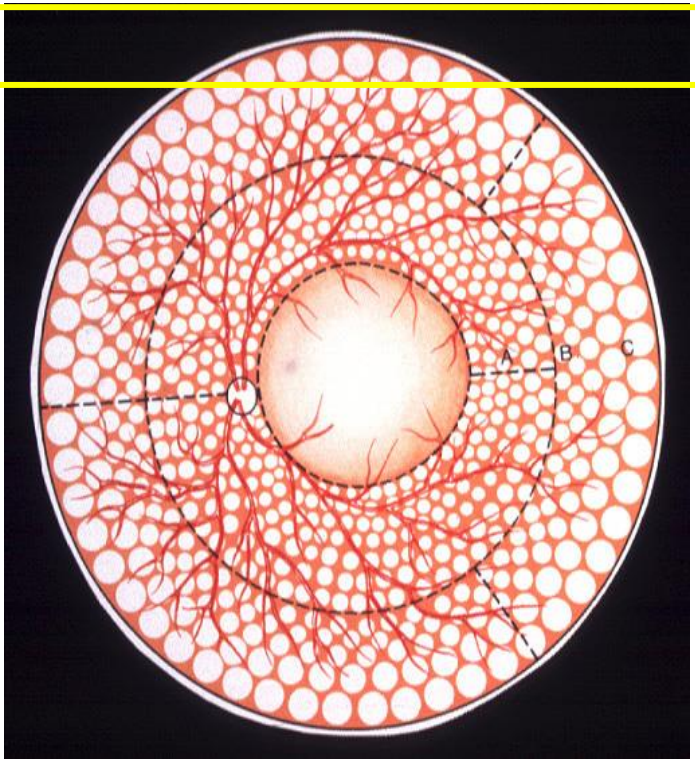


Less extensive NVD + haemorrhage

NVE > 1/2 disc in area + haemorrhage

Laser panretinal photocoagulation

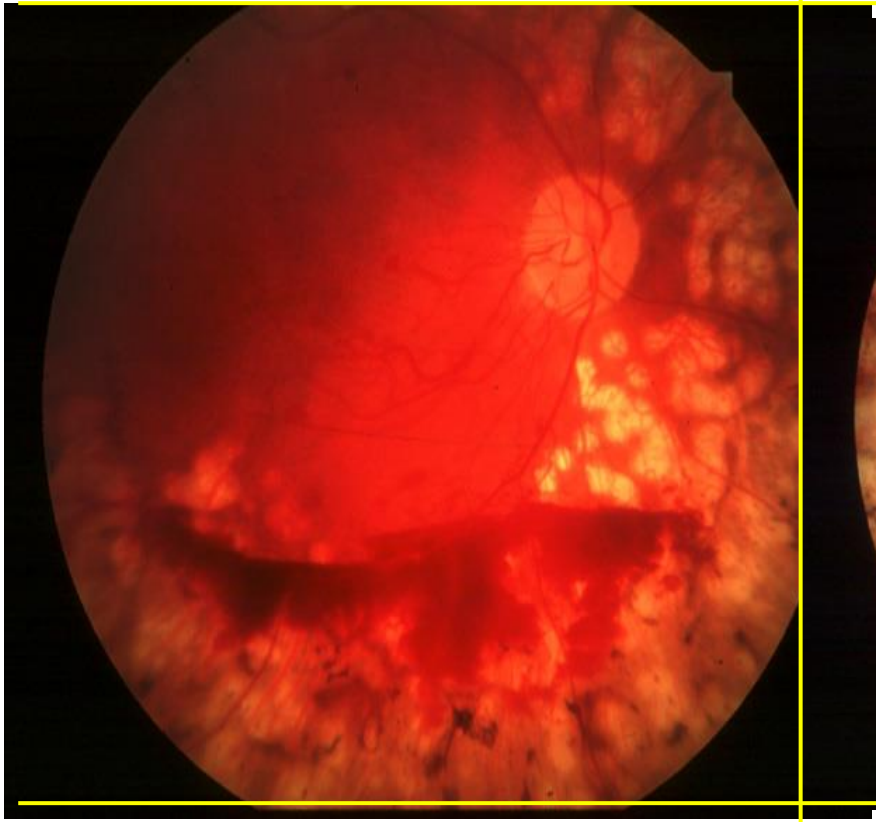




- Initial treatment is 2000-3000 burns
- Spot size (200-500 μm) depends on contact lens magnification
- Area covered by complete PRP
- Follow-up 4 to 8 weeks

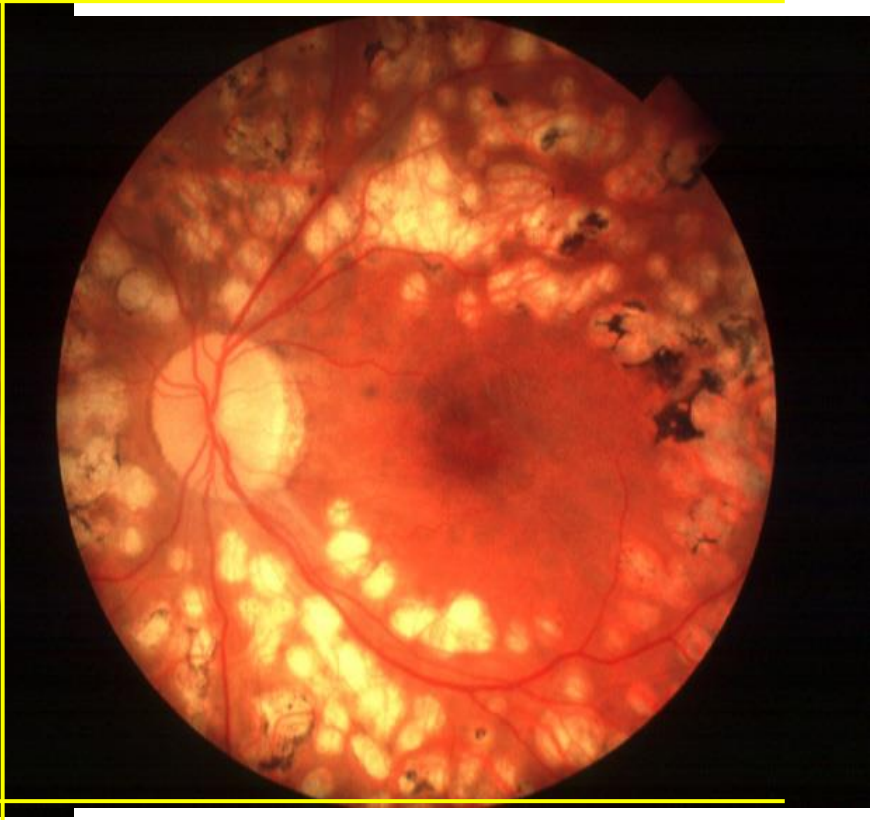
Assessment after photocoagulation

Poor involution



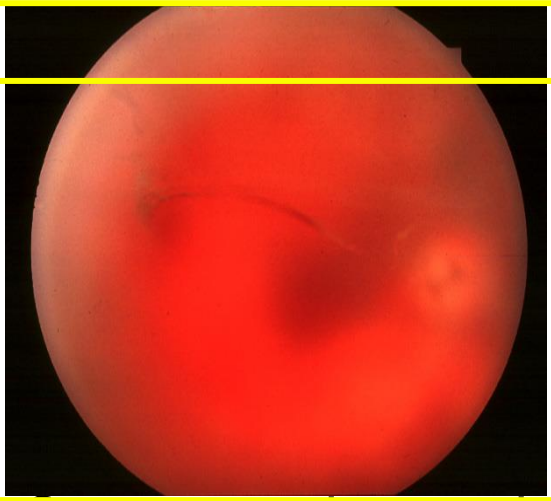
- Persistent neovascularization
- Haemorrhage
- Re-treatment required

Good involution

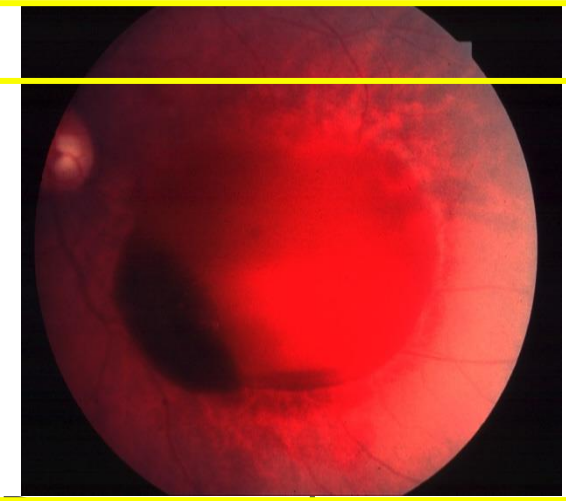


- Regression of neovascularization
- Residual ‘ghost’ vessels or fibrous tissue
- Disc pallor

Indications for vitreoretinal surgery



Severe persistent vitreous haemorrhage



Dense, persistent premacular haemorrhage

Progressive proliferation despite laser therapy

Retinal detachment involving macula

Anti-VEGF Drugs

- pegaptanib (Macugen),
- Ranibizumab (Lucentis),
- Aflibercept (EYLEA)
- Bevacizumab (Avastin

However, limitations and adverse effects of anti-VEGF therapy are also of great concern.

- short half-life time of anti-VEGF agents, monthly or bimonthly injections are needed to ensure efficacy.
- endophthalmitis

Prevention

- Good glycemic control
- Early detection of symptoms increases the effectiveness of the treatment.
- Hypertension treatment
- Regular ocular screening

Life style changes

- reaching or maintaining a moderate body weight
- quitting smoking
- moderating their alcohol intake
- eating a healthful and balanced diet
- exercising regularly

TAKE HOME MESSAGE

- Ocular complications associated with diabetes mellitus (DM) are progressive and rapidly becoming the world's most significant cause of morbidity

- These are preventable with early detection and timely treatment.

- A comprehensive dilated eye exam at least once a year is mandatory

- Controlling diabetes and managing early symptoms are the most effective ways to prevent diabetic retinopathy.

THANK YOU

FOR LISTENING