

Diabetic Retinopathy

The silent killer of vision.....

Presented By

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Non Resident(DO)

3rd batch

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Particulars of the patient

- ▶ Name : Golapi Begum
- ▶ Age : 77 years
- ▶ Gender : Female
- ▶ Religion : Islam
- ▶ Occupation : House wife
- ▶ Present address : Rajarhat, Jashore
- ▶ Permanent address : Jashore
- ▶ Date of examination : 15/06/2025



Chief complaints

- ▶ **Gradual dimness of vision of both eyes for 2 years .**

History of present illness

- ▶ According to the statement of patient she was reasonably well 2 years back. She has developed gradual dimness of vision of both eyes but mark dimness of vision for last 1 year which was painless in nature. Not associated with redness and no history of ocular trauma . No history of headache and unconsciousness associated with it. She also gave history of flashing of light in her eyes occasionally.

History of present illness

- ▶ With this above complaints she went to the local hospital 6 months back and the attendant doctor referred her to a tertiary eye hospital along with some topical medications but the patient did not mention the name. Than she came to NIO&H for better management.

History of past ocular illness

- ▶ **Past ocular surgery : H/O PE with PCIOL under LA (B/E) – 7 years back.**

History of medical illness

- ▶ She is a known case of DM and HTN for 10 years . H/O irregular intake of medicine and her Blood sugar was not in control with medication.
- ▶ No H/O Bronchial asthma

Drug history

- ▶ She is on medication for HTN and take insulin for DM.
- ▶ The name of medicine, she can't mentioned .

Family history

- ▶ No Family history of DM, HTN .

Personal history

- ▶ Non smoker
- ▶ Non alcoholic
- ▶ Has habit of chewing betel nut with tobacco

Allergy history

- ▶ She has no known allergy to any particular drugs or foods

Menstrual history

- ▶ Menopause for last 25 years

Socioeconomic history

- ▶ She is from low socio-economic condition

General examination

- | | |
|------------------|--------------------|
| ▶ Appearance : | •Normal |
| ▶ Body Built : | Average |
| ▶ Co-Operation : | •Co –
operative |
| ▶ Anaemia : | Absent |
| ▶ Jaundice : | Absent |
| ▶ Cyanosis : | Absent |
| ▶ Oedema : | Absent |

General examination cont..

- ▶ **Blood Pressure :** 130/80 mmHg
- ▶ **Pulse :** 68 Beats/min
- ▶ **Respiratory Rates :** 18 per minutes
- ▶ **Temperature :** 98.0° F
- ▶ **Lymph nodes:** Not palpable

Ocular examination

Visual Acuity	Right Eye	Left Eye
Distance		
Unaided	CF 1 Ft	CF 2 Ft
With pin hole	No improvement	No improvement
Aided	-----	-----
Near		
Unaided	Can't read N18	Can't read N18
Aided	-----	-----

Ocular examination

	Right Eye	Left Eye
Colour vision	Not possible	Not possible
Hirshburg reflex	Central	Central
Pupillary light reflex	Direct – Brisk Consensual – Brisk	Direct – Brisk Consensual – Brisk
RAPD	Absent	Absent
Ocular motility	Full in all gazes	Full in all gazes

Ocular examination

► Slit lamp examinations :

	Right Eye	Left Eye
Eye lids	Normal	Normal
Eye lashes	Normal	Normal
Conjunctiva	Normal	Normal
Cornea	Clear	Clear
Anterior Chamber	Normal in depth	Normal in depth

Ocular examination

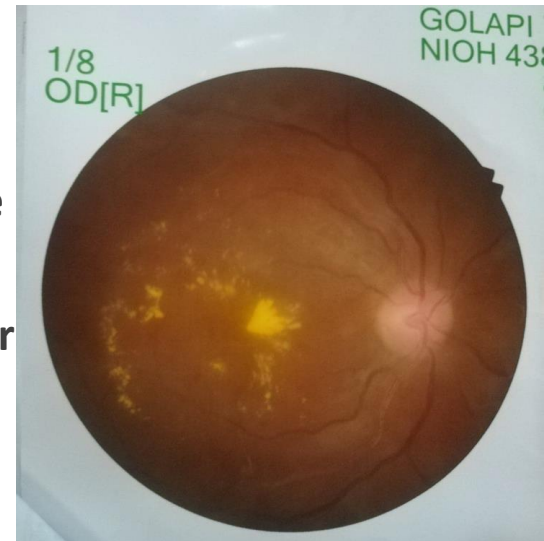
	Right Eye	Left Eye
Iris	Normal in colour	Normal in colour
Pupil	Round ,regular ,reacting to light	Round, regular , reacting to light
Lens	PCIOL	PCIOL
Anterior vitreous	Vitreous degenerat ion	Vitreous degenerat ion
IOP (GAT) at 10 a.m (15/06/2025)	14 mm of Hg	15 mm of Hg

Posterior Segment Examination



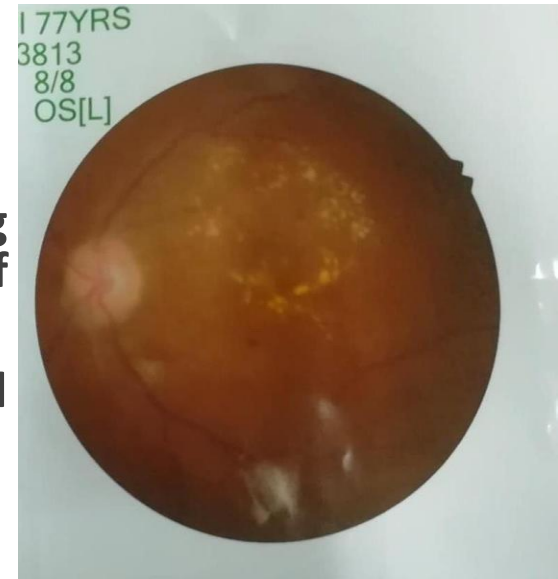
Fundus examination

- Media – Clear .
- Vitreous – Degenerative change present .
- Optic disc ratio : 0.3:1 , colour pink .
- There is dot blot haemorrhage in all 4 quadrants . Ring shape hard exudate present with in 1 disc diameter of macula.
- New vessels present in superior & inferior temporal vascular arched which is 3 disc diameter away from disc .
- Inferior temporal arteriolar silver wiring present .
- Venous dilatation and tortuosity present .
- Macular reflex absent .



Fundus examination

- Media – Clear .
- Vitreous – Degenerative change present .
- Optic disc ratio – 0.3:1 , colour pink .
- There is dot blot haemorrhage in all 4 quadrants . Ring shape hard exudate present with in 1 disc diameter of macula.
- New vessels present in inferior temporal vascular arched 4 disc diameter away from disc.
- Inferior temporal Arteriolar silver wiring present .
- Venous dilatation and tortuosity present .
- Macular reflex absent .



Systemic Examination

- ▶ **Nervous system :**
- ▶ **Higher psychic function : Normal**
- ▶ **Cranial nerves function : Normal**
- ▶ **Sensory & motor system : Normal**
- ▶ **Cerebellar function : Normal**
- ▶ **Sign of meningeal irritation : Absent**

Systemic Examination :

- ▶ **Musculoskeletal system : Normal**
- ▶ **Cardiovascular system : Normal**
- ▶ **Respiratory system : Normal**
- ▶ **Gastrointestinal system : Normal**

Salient Feature

- ▶ **Mrs. Golapi Begum 77 years old female diabetic ,hypertensive patient , hailing from Jashore with the complaints of gradual dimness of vision in both eye for last 2 years , and mark dimness of vision for last 1 year. Which was painless in nature not associated with ocular pain and redness. She also gave history of flashing of light in her eyes occasionally. She under went PE with PCIOL both eye 7 years back and after surgery her vision was satisfactory .**

Salient feature cont...

She is hypertensive and diabetic for last 10 years with irregular medications and poor control. Her blood sugar was uncontrolled with oral medication for this she took insulin for last 5 years but blood sugar was not controlled. On systemic examination her BP -130/80 mm of Hg and other reveals with in normal limit. Slit lamp examination ,anterior segment looks normal. IOP normal in both eyes. Fundus examination reveals , media clear. Optic disc is pink in colour ,C: D ratio 0.3: 1.

Salient feature cont....

- ▶ There is dot blot haemorrhage , microaneurysm in all 4 quadrants. Ring shaped hard exudates present with 1 disc diameter of macula. In right eye new vessels present at superior temporal vascular arcade and in left eye inferior temporal arcade 4disc diameter away from disc. Arteriolar silver wiring and venous dilatation also present . Macular reflex is absent in both eye.

Provisional Diagnosis



Provisional diagnosis

- ▶ Proliferative diabetic retinopathy (Mild - moderate) with clinically significant macular oedema (B/E).

Differential diagnosis

- ▶ Hypertensive retinopathy
- ▶ OLD RVO (Bilateral rare)

Investigations

- ▶ **Systemic investigation :**

- ▶ **Complete blood count**

- ▶ **Blood sugar profile**

RBS

2HABF

HbA1C

- ▶ **S. creatinine**

- ▶ **S. lipid profile**

Systemic Investigations

পশ্চিমবঙ্গ সরকার
জাতীয় চক্ষু বিজ্ঞান ইনস্টিটিউট ও হাসপাতাল
National Institute of Ophthalmology & Hospital
শের-ই-বাংলা নগর, ঢাকা-১২০৭।

প্যাথলজী, রেডিওলজী ও অন্যান্য পরীক্ষার ফর্ম

পациент: Golapi Begum বয়স: 77 লিঙ্গ: 24.66
রেসিডেন্স নং: 04383 তারিখ: 7/10
রোগের বিবরণ: FBS & 2HrABF
প্রয়োজনীয় পরীক্ষা: FBS & 2HrABF
পরীক্ষার ফলাফল:

ডাক্তারের স্বাক্ষর: 20/07/20

Plasma Glucose (Fasting): 4.6 mmol/L
Normal Value (4.2-6.40) mmol/L
Plasma Glucose 2HrABF: 9.2 mmol/L
Normal Value: ≤ 7.8 mmol/L

Patient Name	: Golapi Begum	Age	: 77 Years
Address	: OPD	Phone	:
Ref. by	:		

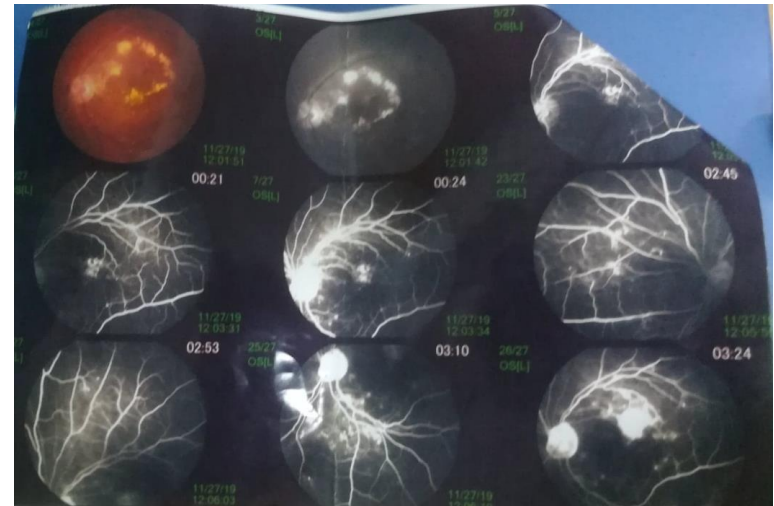
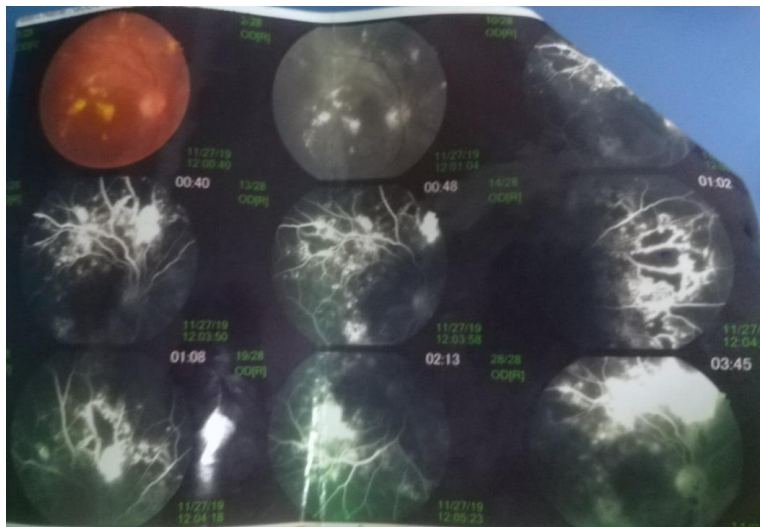
Biochemistry Report

Investigation	Results	Unit	Ref. Values
HbA1c	8.0	%	3.5-5.7

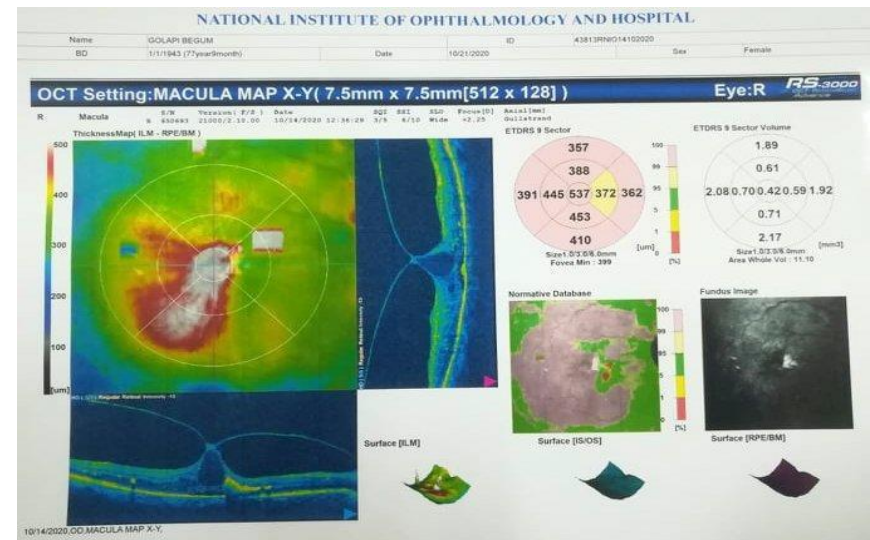
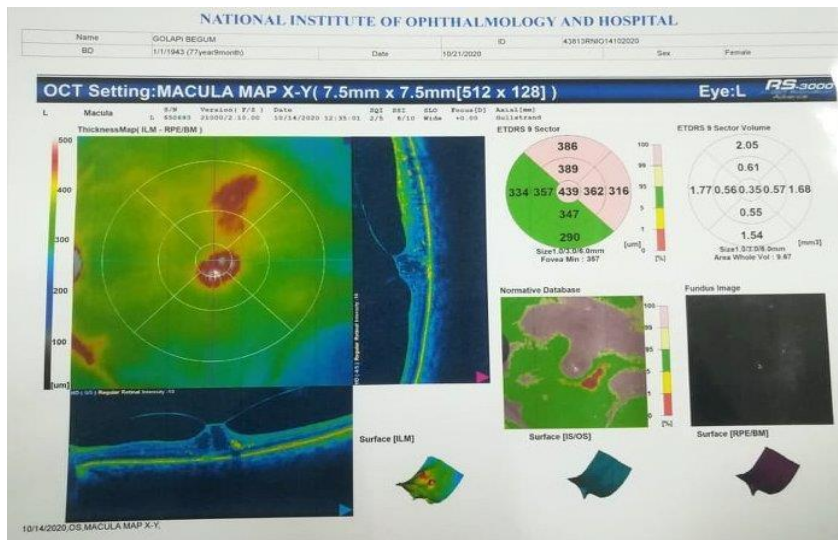
Ocular investigations

- ▶ CFP – B/E
- ▶ FFA – B/E
- ▶ OCT macular (B/E)

FFA



OCT – Macula



Confirmatory diagnosis

- ▶ **PDR(mild-moderate) with CSME with VMT(Stage 1a impending macular hole) with pseudophakia both eye with DM and HTN .**

General measures for diabetic retinopathy

- A. Patient education
- B. Strict control of DM
- C. Treatment of risk factors
- D. Fenofibrate 200mg daily has been shown to reduce the progression of DR
- E. Anaemia and renal failure should be treated
- F. Smoking should be discontinued

Current approach in the management of DR

1. Laser photocoagulation

- a) Argon laser
- b) Micro-pulse diode laser

2. Intravitreal anti-VEGF

- 1. Ranibizumab (lucentis)
- 2. Bevacizumab (avastin)
- 3. Pegaptanib (macugen)

Continued...

3. Intravitreal corticosteroid

Triamcinolone

4. Pars plana vitrectomy

Diabetic Retinopathy

It is predominantly a microangiopathy in which small blood vessels are particularly vulnerable to damage from sustained hyperglycaemia of variable severity.

Prevalence of Diabetic Retinopathy

- Type -I diabetes
 - > 10 years duration : 50% have retinopathy
 - > 30 years duration : 90 % have retinopathy
- Type – II diabetes
 - At presentation : 5% have retinopathy
- It is more common in type-1 than type-2 diabetes mellitus.

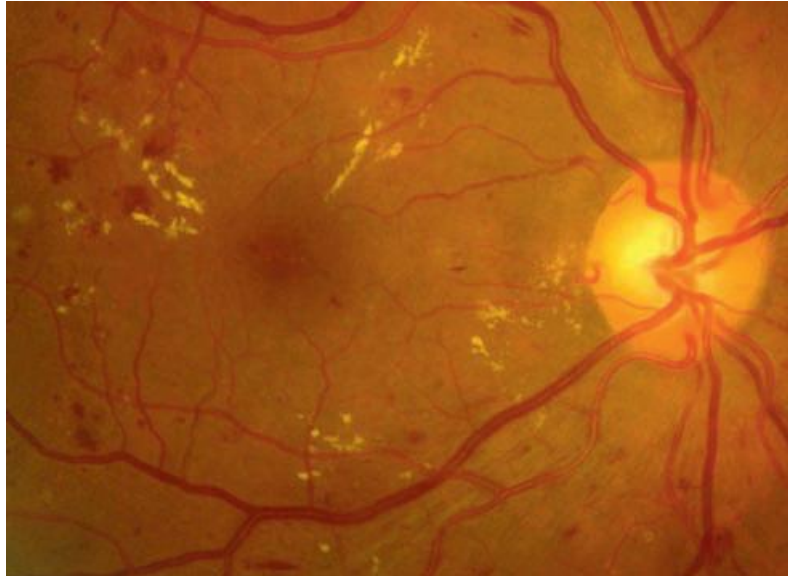
Risk Factors of Diabetic Retinopathy

- A. Duration of diabetes
- B. Poor metabolic control of diabetes
- C. Pregnancy
- D. Hypertension
- E. Nephropathy
- F. Others

Clinical Classification

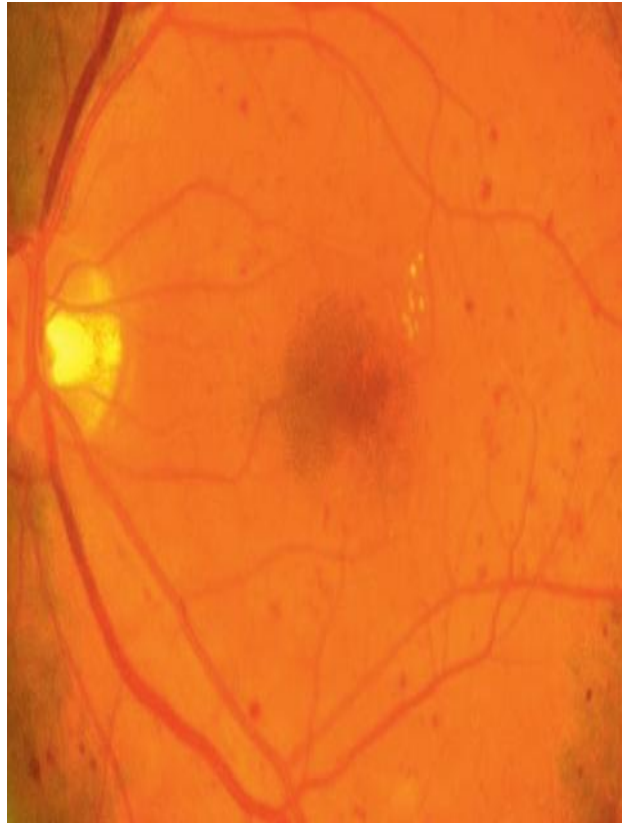
1. Background diabetic retinopathy
2. Diabetic maculopathy
3. Preproliferative diabetic retinopathy
4. Proliferative diabetic retinopathy
5. Advanced diabetic eye disease

Microaneurysms & exudates



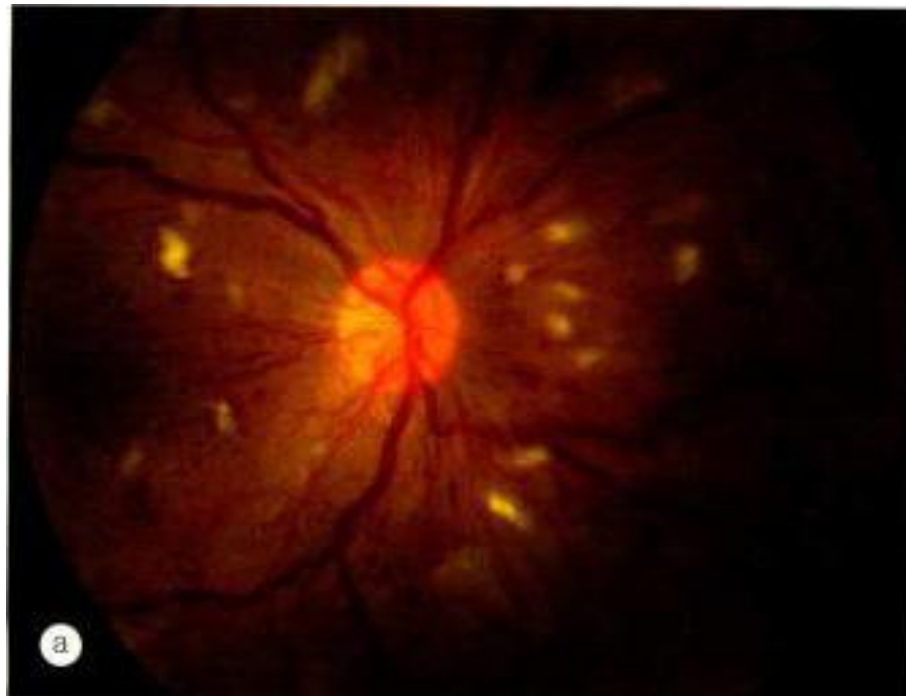
Extensive exudates, some associated with microaneurysms

Retinal haemorrhages



a) retinal nerve fibre layer (flame) haemorrhages; (b) dot and blot haemorrhages
c) deep dark haemorrhages

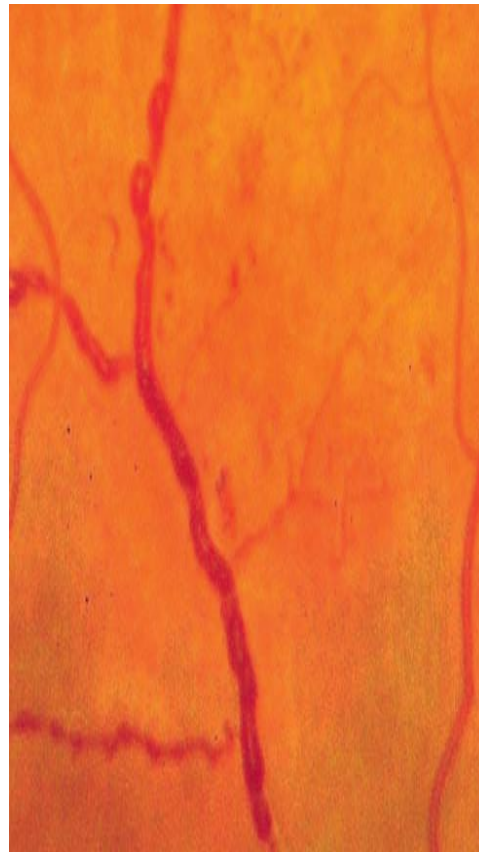
Cotton wool spots



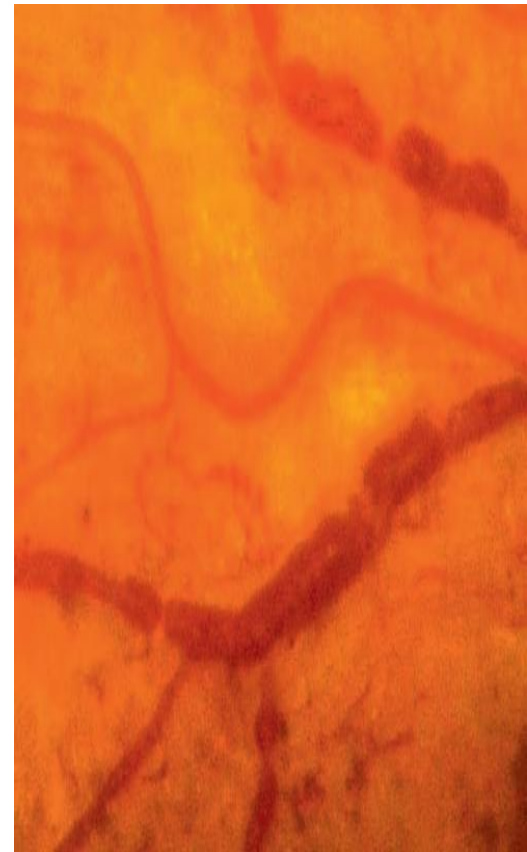
Venous changes



(A) *Looping;*

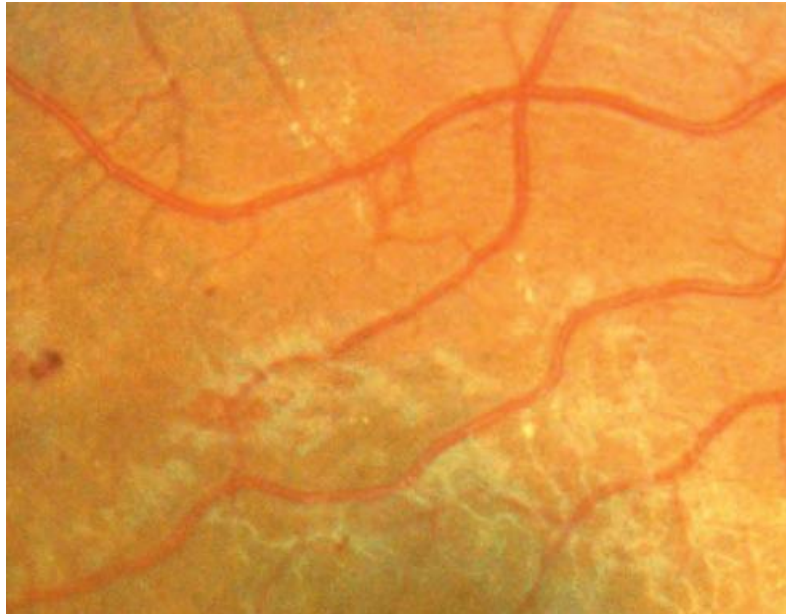


(B) *beading;*



(C) *severe segmentation*

Intraretinal microvascular abnormalities (IRMA)



ETDRS Classification of diabetic retinopathy

A. Non-proliferative diabetic retinopathy

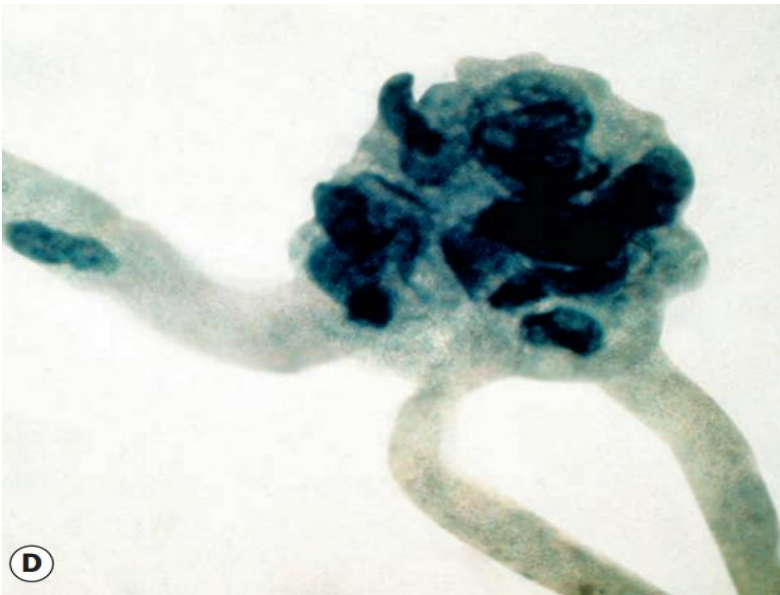
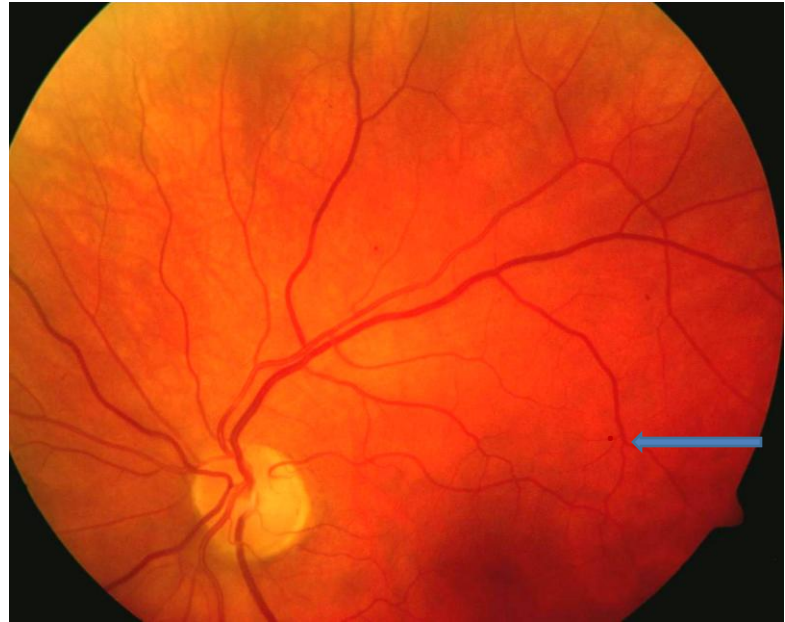
- I. No DR
- II. Very mild NPDR
- III. Mild DR
- IV. Moderate NPDR
- V. Severe NPDR
- VI. Very severe NPDR

B. Proliferative diabetic retinopathy

- I. Mild-Moderate PDR
- II. High risk PDR
- III. Advanced diabetic eye disease

Very Mild NPDR

Only microaneurysms



Mild NPDR

Any or all of:

1. Microaneurysms
2. Retinal haemorrhages
3. Exudates
4. Cotton wool spots, up to the level of moderate NPDR.
 - No intraretinal microvascular anomalies (IRMA) or significant beading.

Moderate NPDR

- 1. Severe retinal haemorrhages (about 20 medium–large per quadrant) in 1-3 quadrants or mild IRMA
- 1. Significant venous beading can be present in no more than 1 quadrant
- 1. Cotton wool spots commonly present

Moderate NPDR



Severe NPDR

The 4–2–1 rule; one or more of:

- Severe haemorrhages in all 4 quadrants
- Significant venous beading in 2 or more quadrants
- Moderate IRMA in 1 or more quadrants

Severe NPDR



Severe NPDR



Very Severe NPDR

- Two or more of the criteria for severe NPDR

Very severe NPDR



Classification of PDR

1. Mild-moderate PDR

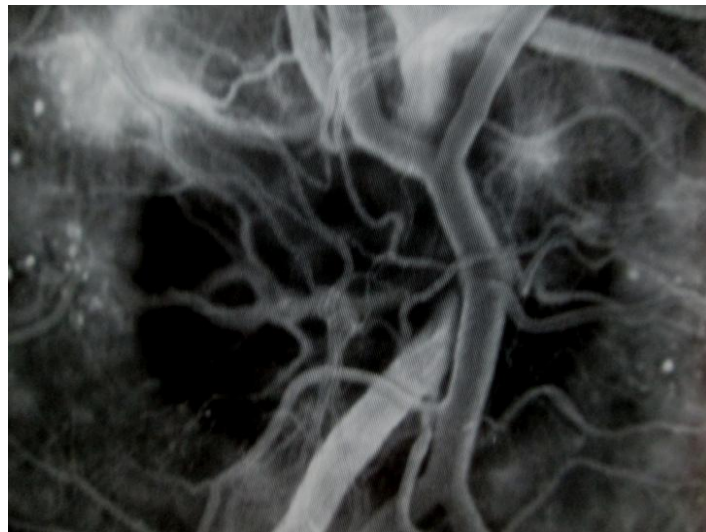
- New vessels at the disc (NVD)
- New vessels elsewhere (NVE)

2. High risk PDR

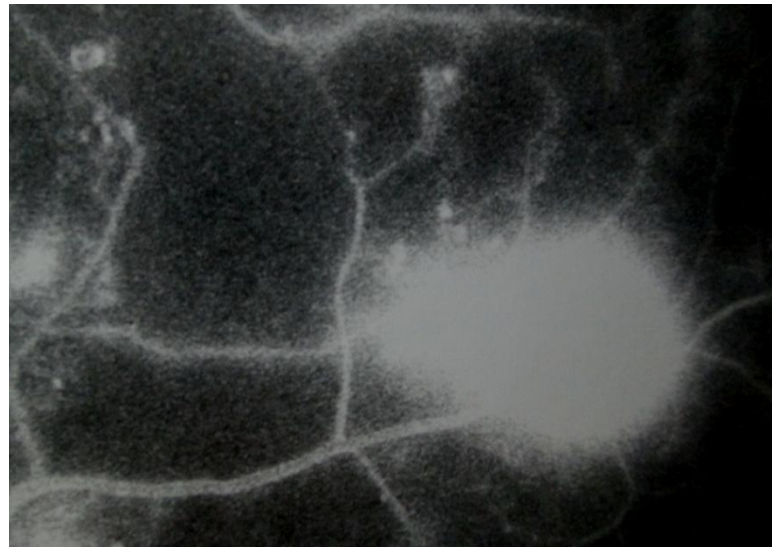
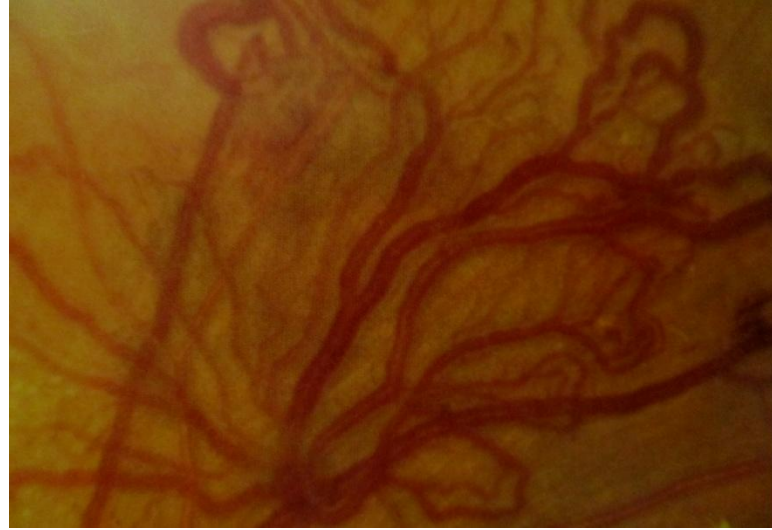
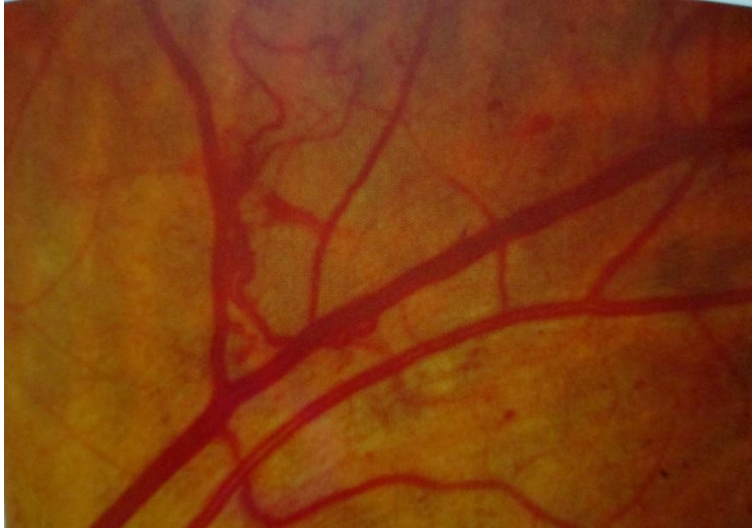
- NVD greater than $\frac{1}{3}$ disc area
- Any NVD with vitreous haemorrhage
- NVE greater than $\frac{1}{2}$ disc area with vitreous haemorrhage

3. Advanced diabetic eye disease

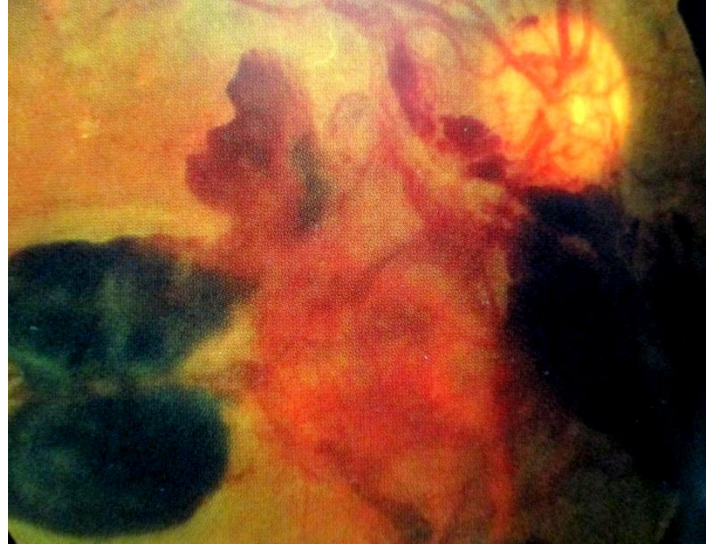
Neovascularization on the disc



Neovascularization Elsewhere



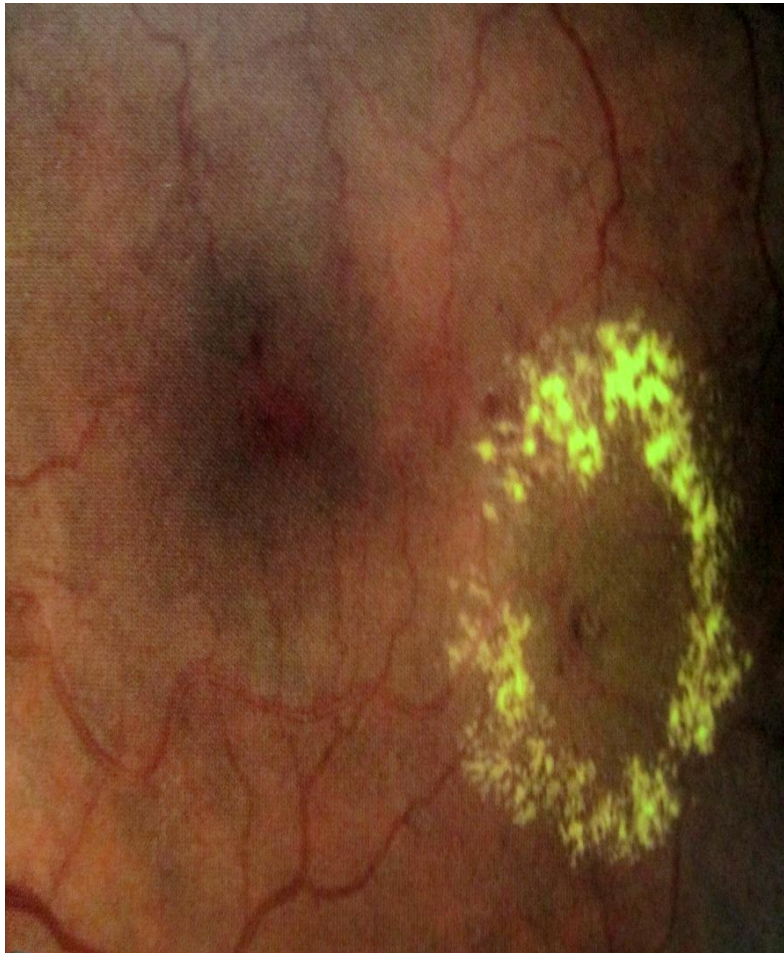
Advanced diabetic eye disease



Diabetic Maculopathy

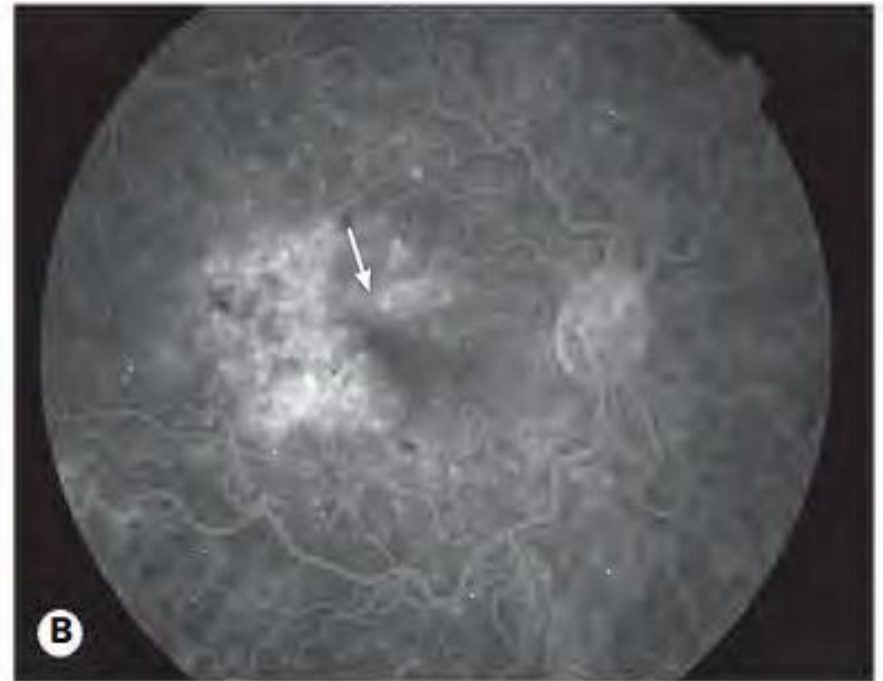
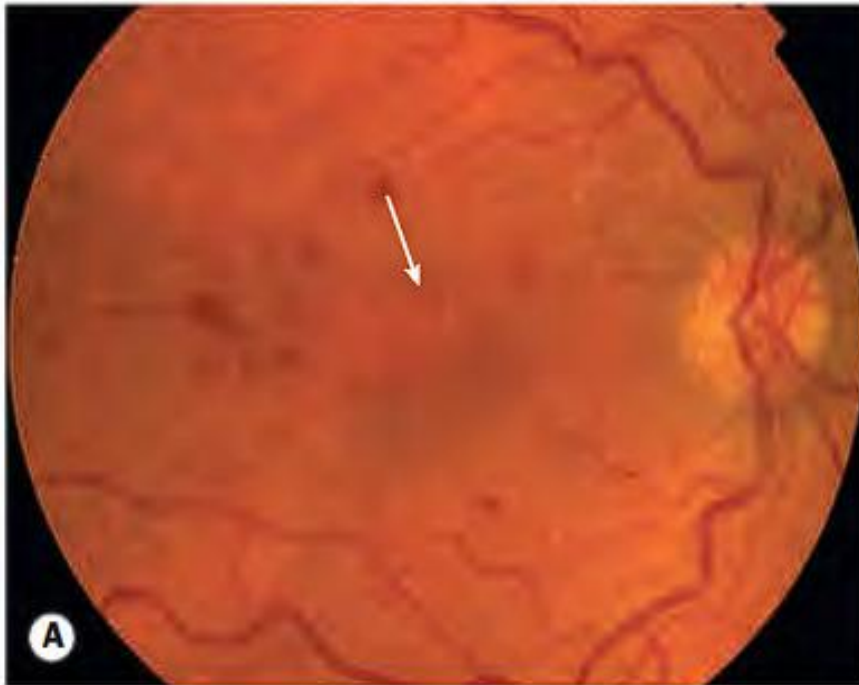
- Most common cause of visual impairment in diabetic patient (particularly affects type-II DM)
- Classification :
 - a. Focal maculopathy
 - b. Diffuse maculopathy
 - c. Ischemic maculopathy
 - d. Clinically significant macular oedema

Focal Diabetic Maculopathy



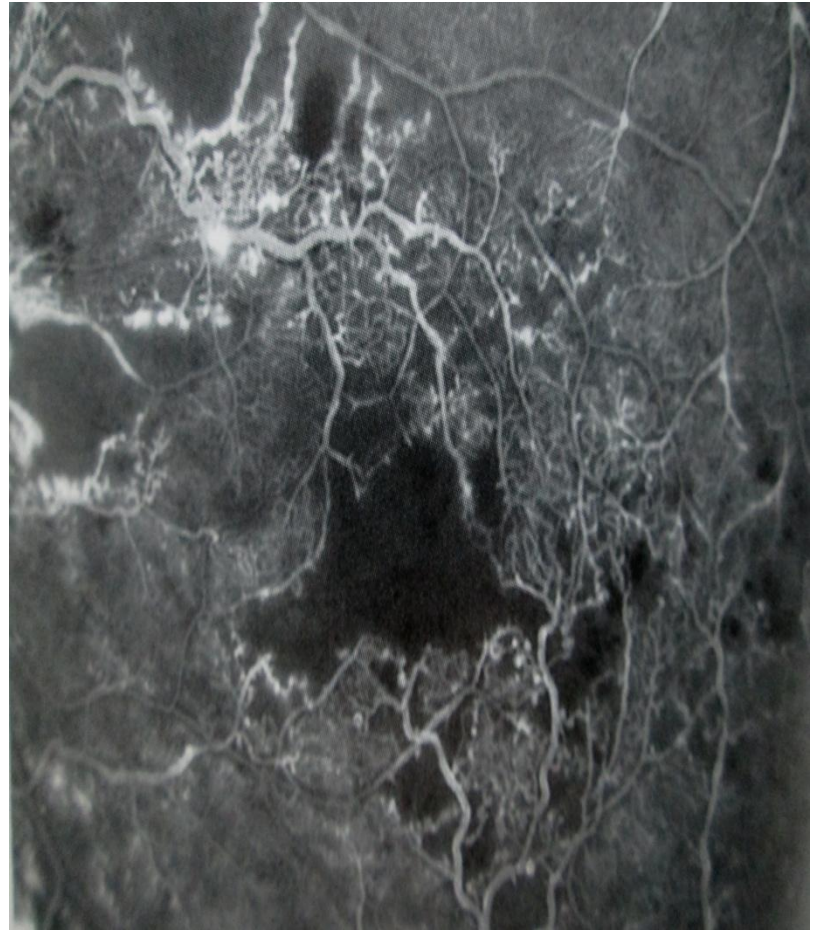
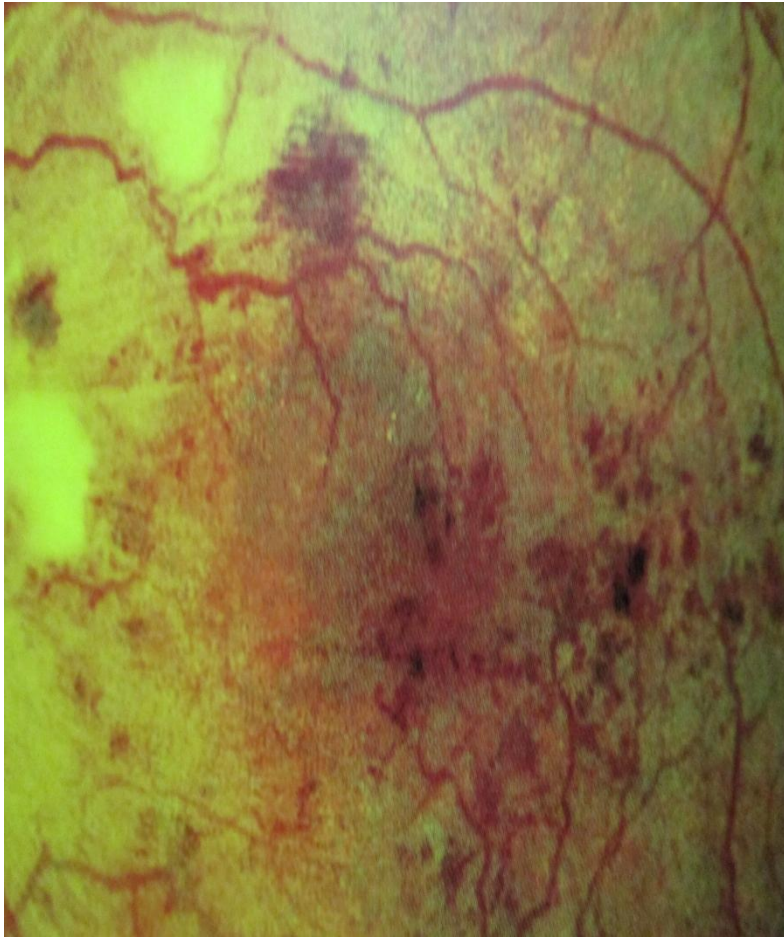
(A) A ring of hard exudates temporal to the macula; (B) FA late phase showing focal area of hyperfluorescence due to leakage corresponding to the centre of the exudate ring

Diffuse Diabetic Maculopathy



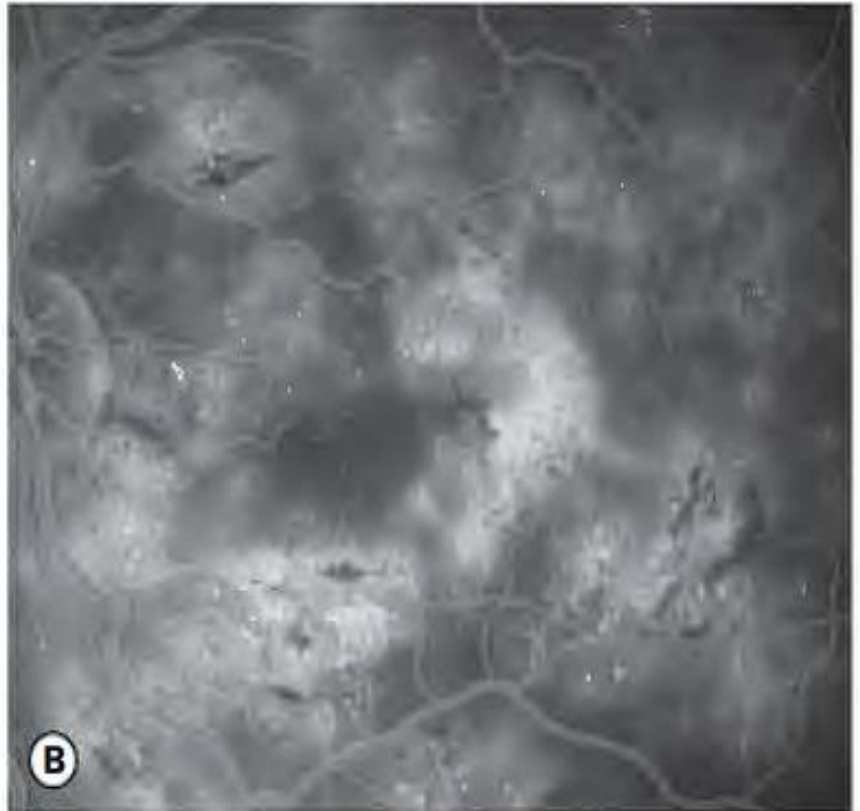
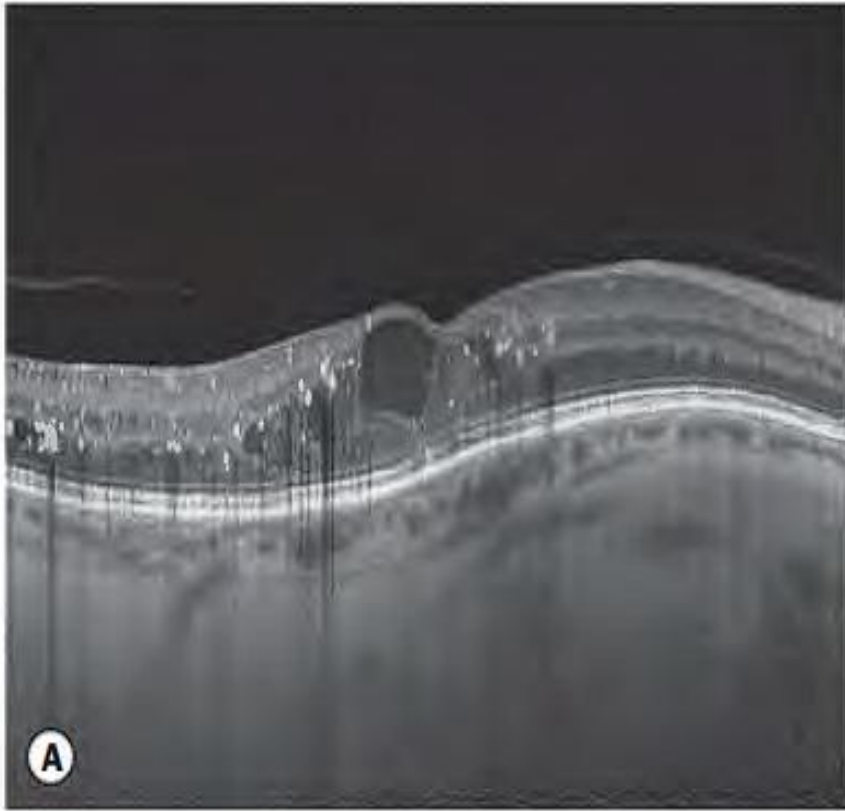
(A) Dot and blot haemorrhages – diffuse retinal thickening is present (arrow), which can be difficult to see clinically; (B) late phase FA showing extensive hyperfluorescence (arrow) at the posterior pole due to leakage

Ischemic Diabetic Maculopathy



(A) Dot and blot haemorrhages and cotton-wool spots; (B) FA venous phase showing hypofluorescence due to capillary non-perfusion at the macula and elsewhere

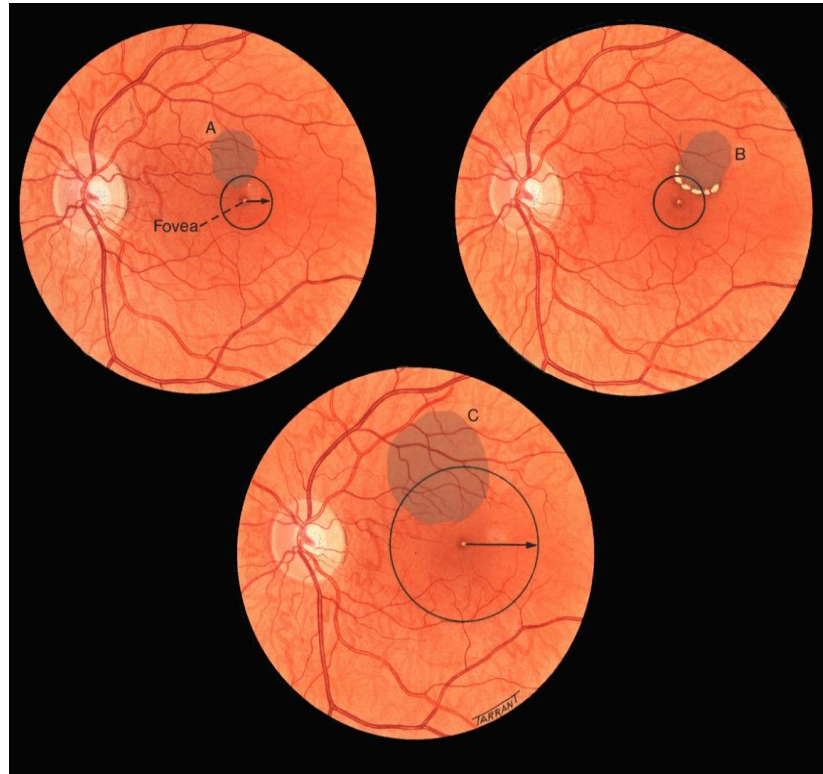
Cystoid Macular Oedema



OCT showing retinal thickening and cystoid spaces , FA showing leaking microaneurysms and central diffuse hyperfluorescence with a flower petal configuration

Clinically significant macular oedema

➤ Retinal thickening within 500 μm of the centre of fovea

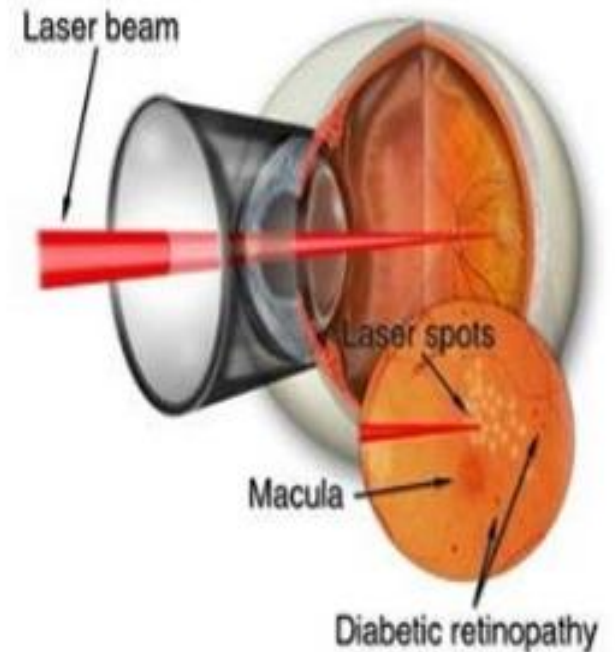
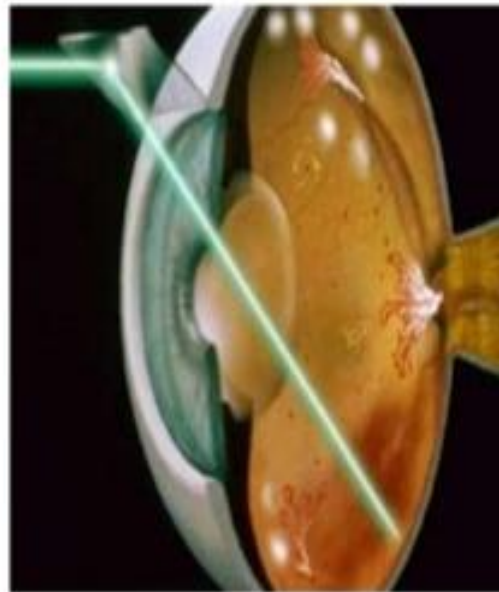


➤ Hard exudates within 500 μm of the centre of fovea or if RT present it can be >500 μm

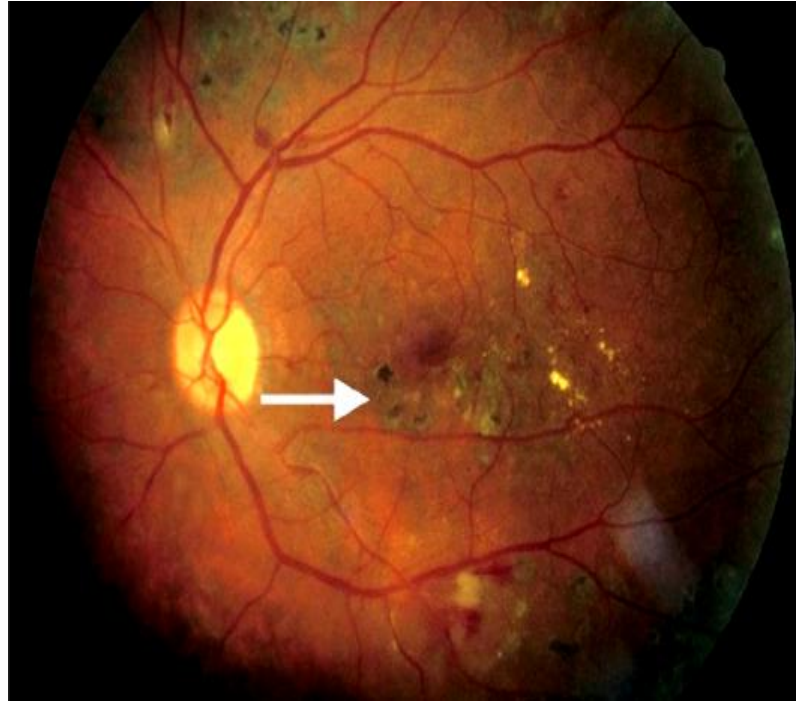
➤ Retinal thickening one disc area or larger, any part of which is within one disc diameter of the centre of fovea

Laser photocoagulation

- 1. Focal laser photocoagulation
- 1. Grid laser photocoagulation
- 1. Pan retinal photocoagulation



Focal Laser Photocoagulation



- Burns are applied to microaneurysms or lesions in the centre of ring of exudates 500-3000 μm away from the macula
- Spot size - 50-100 μm
- Duration – 0.05 to 0.1sec
- Attempt to whitening or darkening the microaneurysms

Grid Laser Photocoagulation

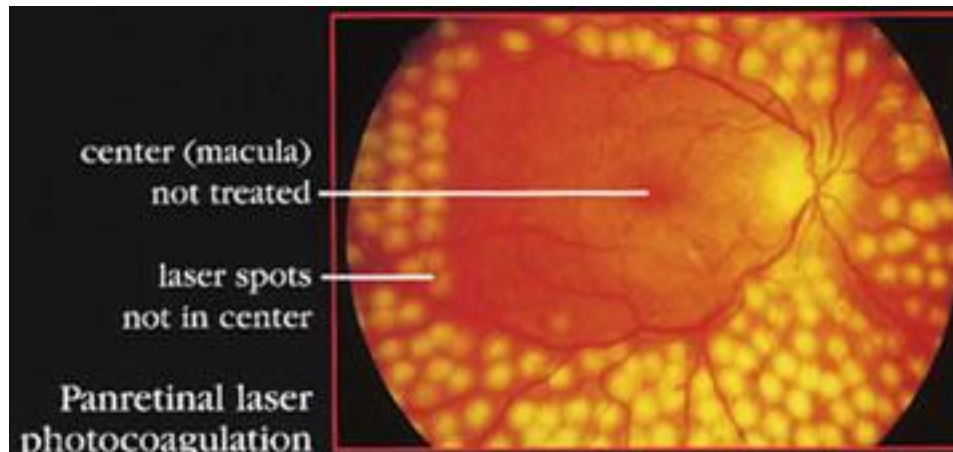


- Burns are applied to diffuse retinal thickening more than 500 μ m away from the centre of macula & from the temporal margin of optic disc
- Spot size -50 to 100 μ m
- Duration – 0.05 to 0.1 sec
- Spot spaced –one burn width apart

Pan Retinal Photocoagulation

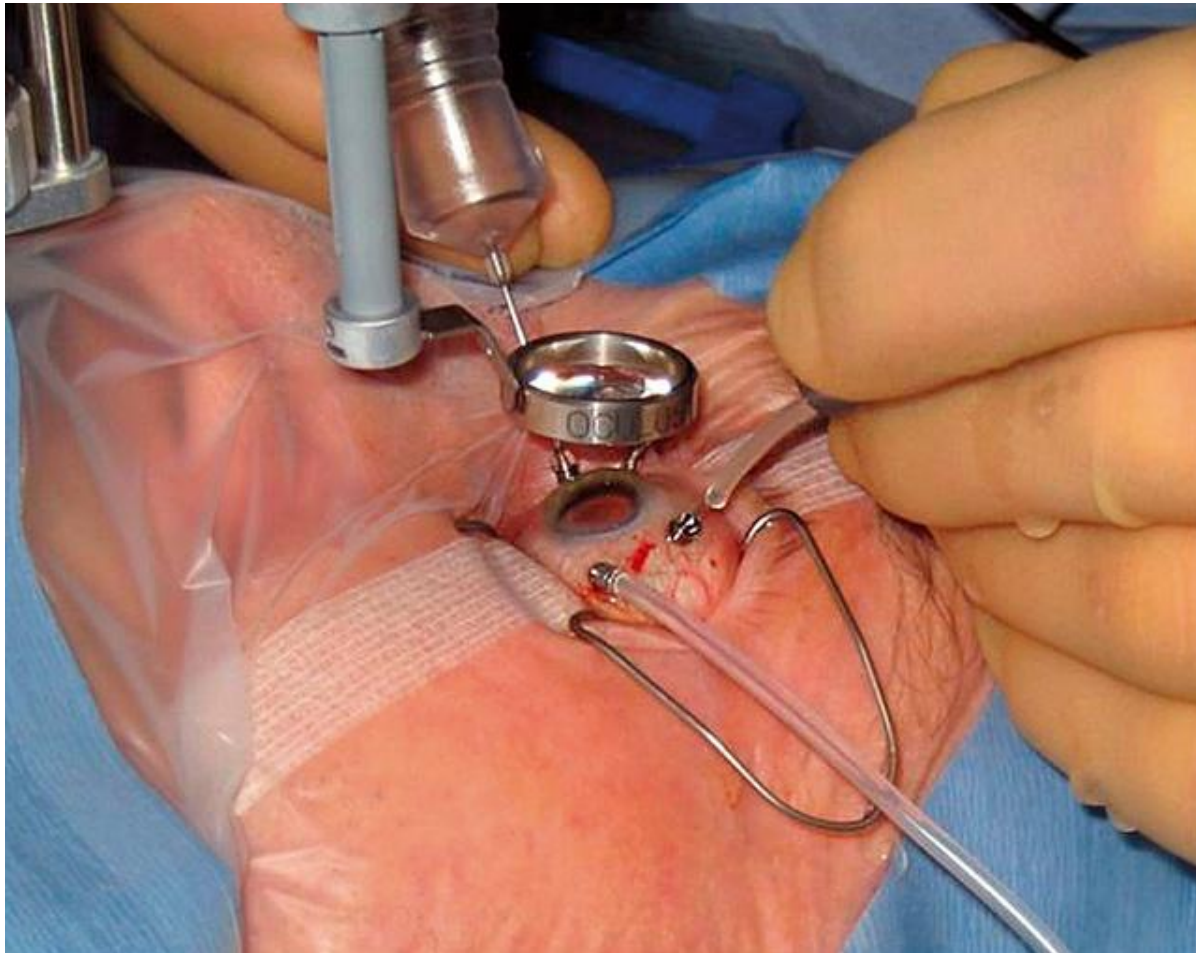
Macula not treated

Laser spots



- Initially 1500 burns are applied in scatter pattern away from macula
- Spot size-depends on contact lens used (400 μ m is desired)
- Duration- 0.05-0.1 sec (Newer Laser=0.01-0.05sec)
- Follow up-after 4-6 wks

Pars Plana Vitrectomy



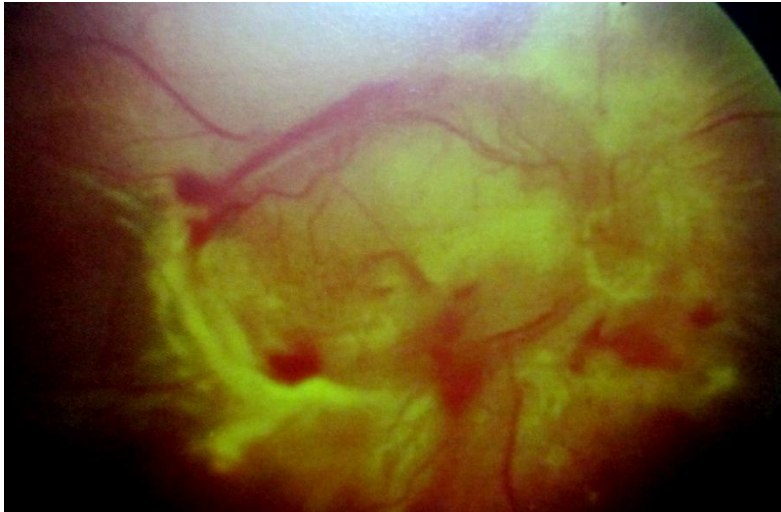
Indications Of Pars Plana Vitrectomy



Persistent Vitreous Haemorrhage



Progressive Neovascularization Despite
Laser Therapy



Tractional RD

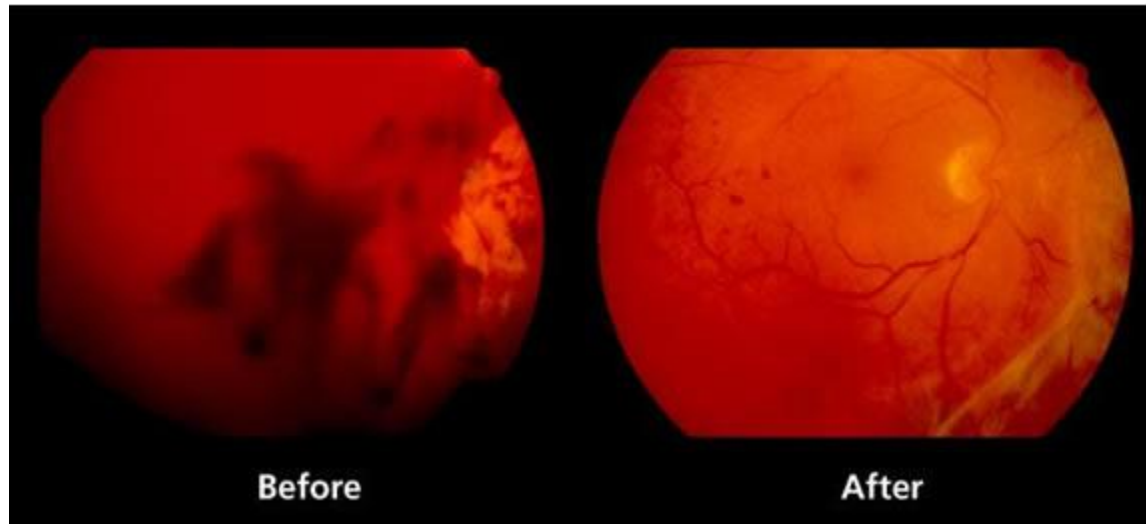


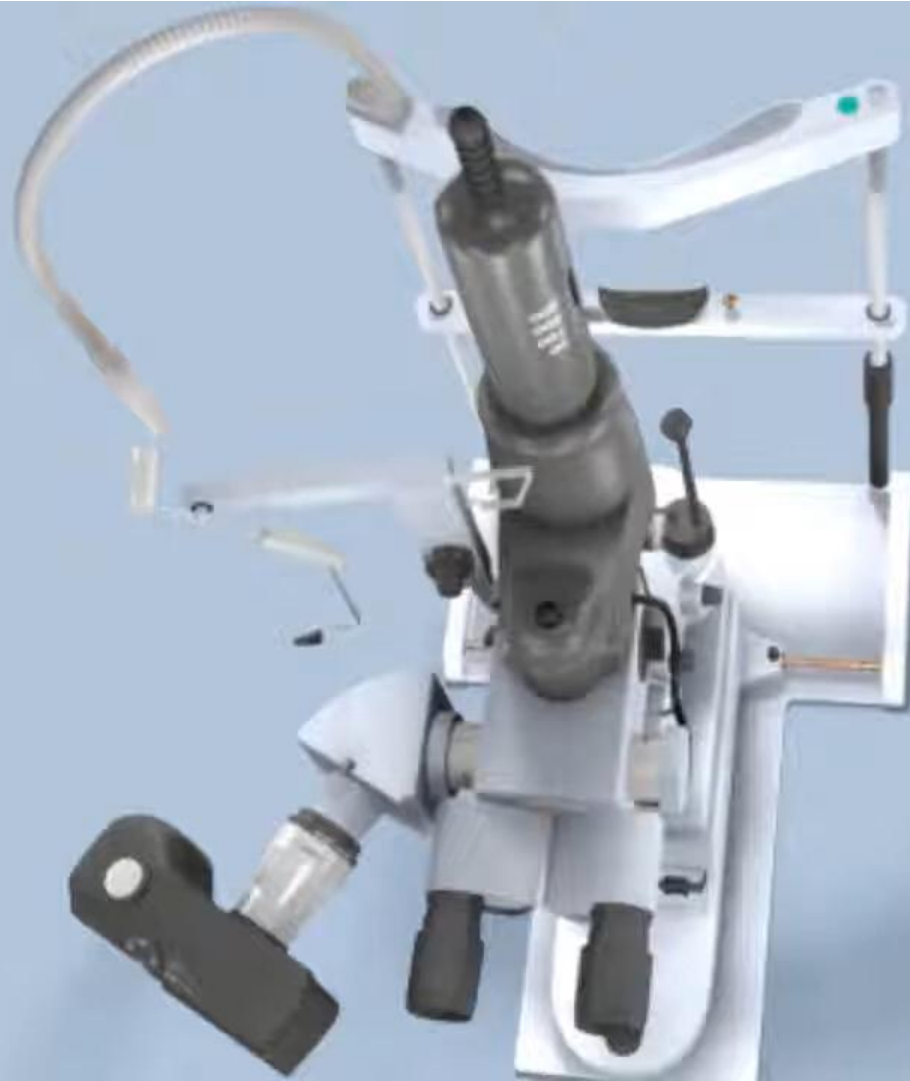
Subhyaloid Haemorrhage

Pars Plana Vitrectomy

- Complications:
 - Raised IOP
 - Cataract
 - Band keratopathy
 - Postoperative endophthalmitis

Pars Plana Vitrectomy





Rendia



THANKS