# Retinal Detachment

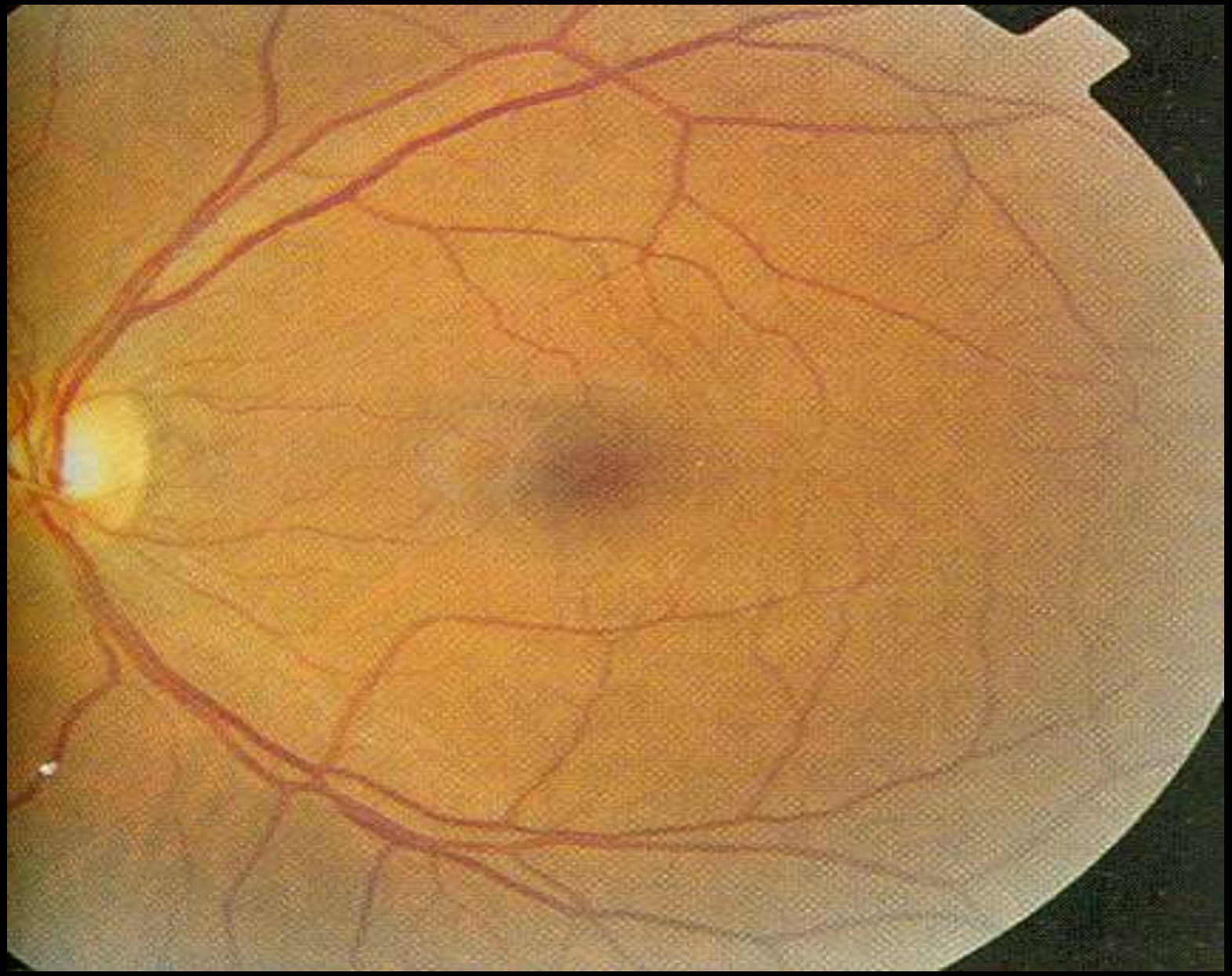
Dr.R.P.Gupta

# Retina

- Inner most coat of Eye
- Extends from optic disc to ora serrata
- Highly sensitive part – Macula

Microscopic-

- Pigment Epithelium
- Neurosensory retina( 10 Layers)
- Potential space between two layers



# RETINAL DETACHMENT

- Separation of Neuro sensory retinal from pigment epithelium
- Two types – Primary ( Rhegmatogenous)
  - Secondary
    - Tractional
    - Exudative

# RETINAL DETACHMENT

Rhegmatogenous Retinal Detachment

Factors resposible

- Usually due to  hole in the retina
- Vitreous Degeneration
- Vitreous Detachment

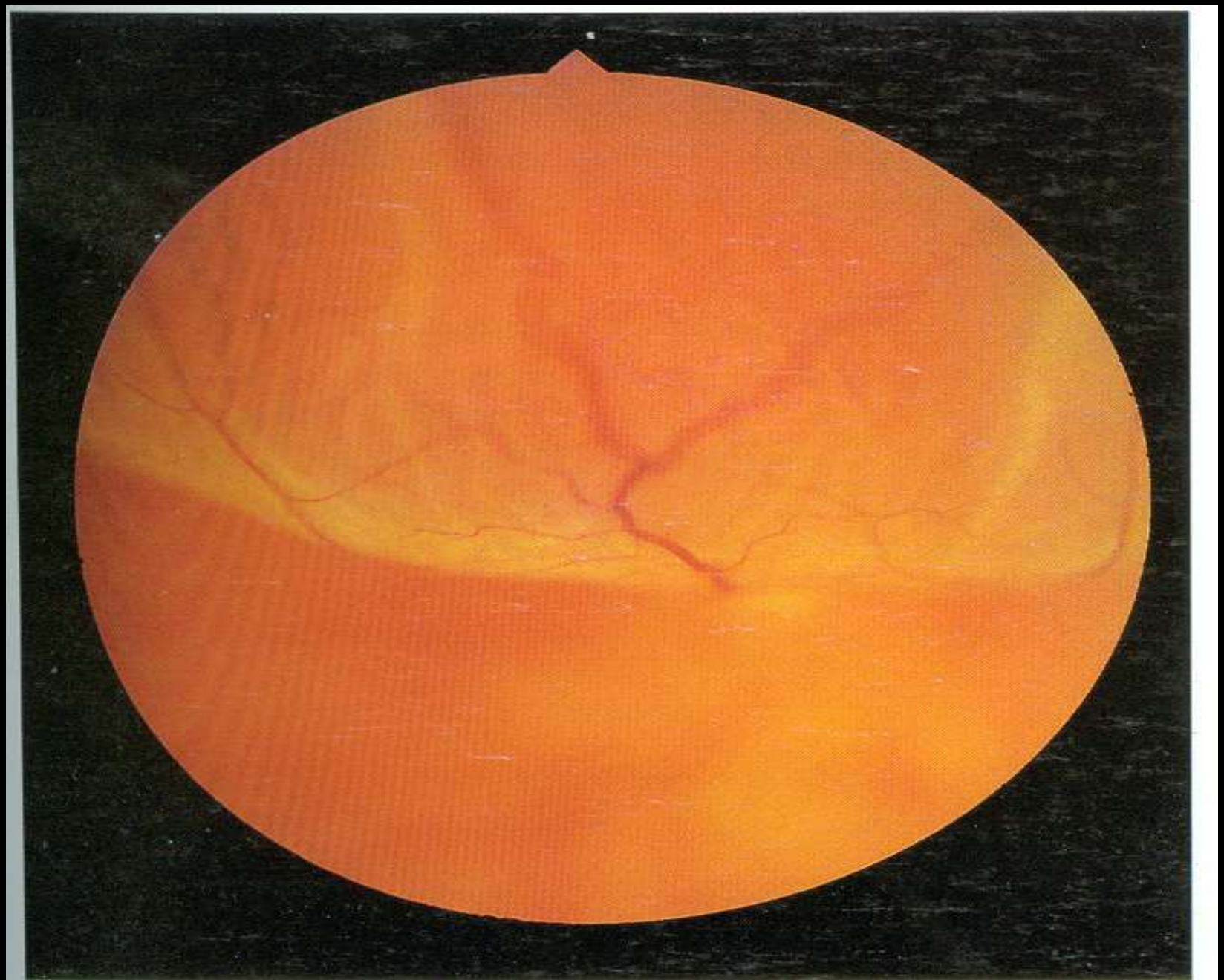
# RETINAL DETACHMENT

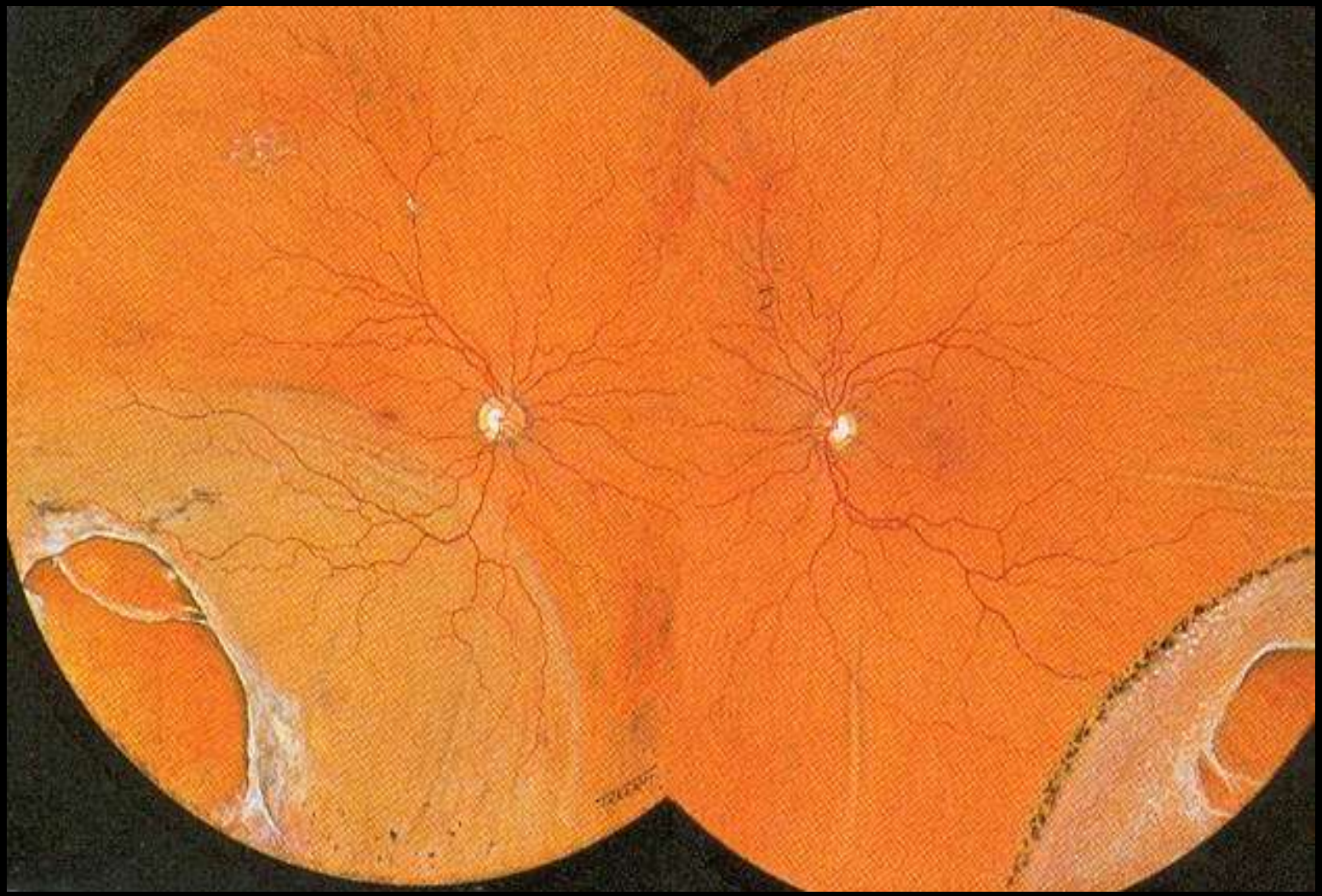
Symptoms

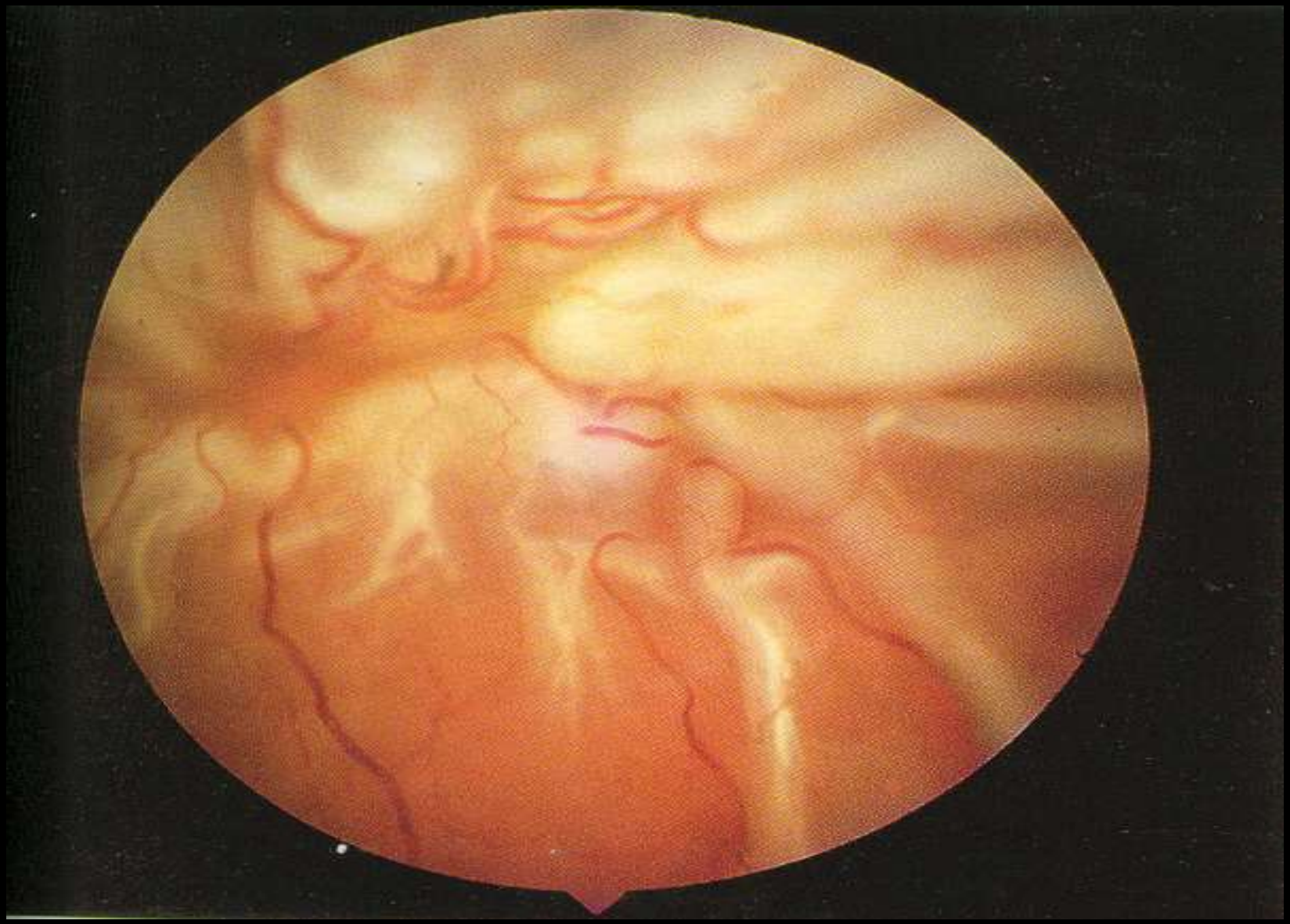
- Flashes of Light( Photopsia)
- Floaters
- Cloud / Veil in the field of vision
- Sudden  painless diminution of vision

# Retinal Detachment

- Vision grossly diminished
- Detached retina appears greyish white, ballooned(Convex) , shows undulation on movement
- Retinal vessels appears dull
- Retinal hole may be seen







# Retinal Detachment

- Detailed examination of Fundus done with the help of Indirect Ophthalmoscope
- Routine investigation for surgery

# Retinal Detachment

- Treatment is always surgical
- Treatment should be early
- Delay causes damage to macula and reduces visual recovery

# RETINAL DETACHMENT

Treatment

- Cryopexy
- Sceral Buckling
- Sub Retinal Fluid Drainage

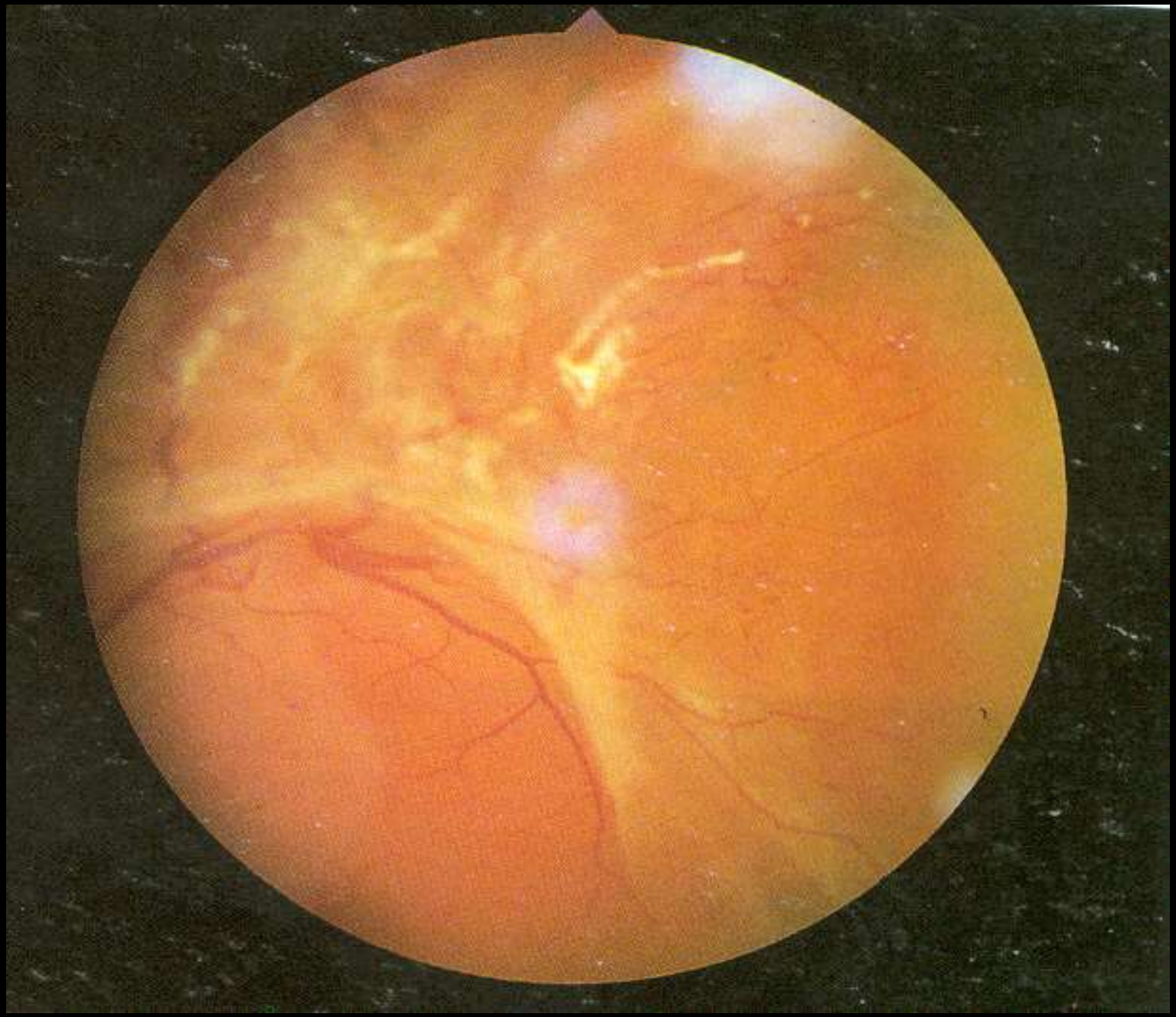
# RETINAL DETACHMENT

Traction Retinal Detachent

- Detachment of Retina due to pull by fibro glial bands

  -Proliferative  Diabetic Retinopathy

  -Retinal Vasculitis
- Detached retina is shallow, concave And fixed
- Fibrovascular bands seen



# Traction Retinal Detachment

Tretament

- Vitrectomy, cutting of bands
- Endolaser
- Internal Tamponade
- Silicon oil

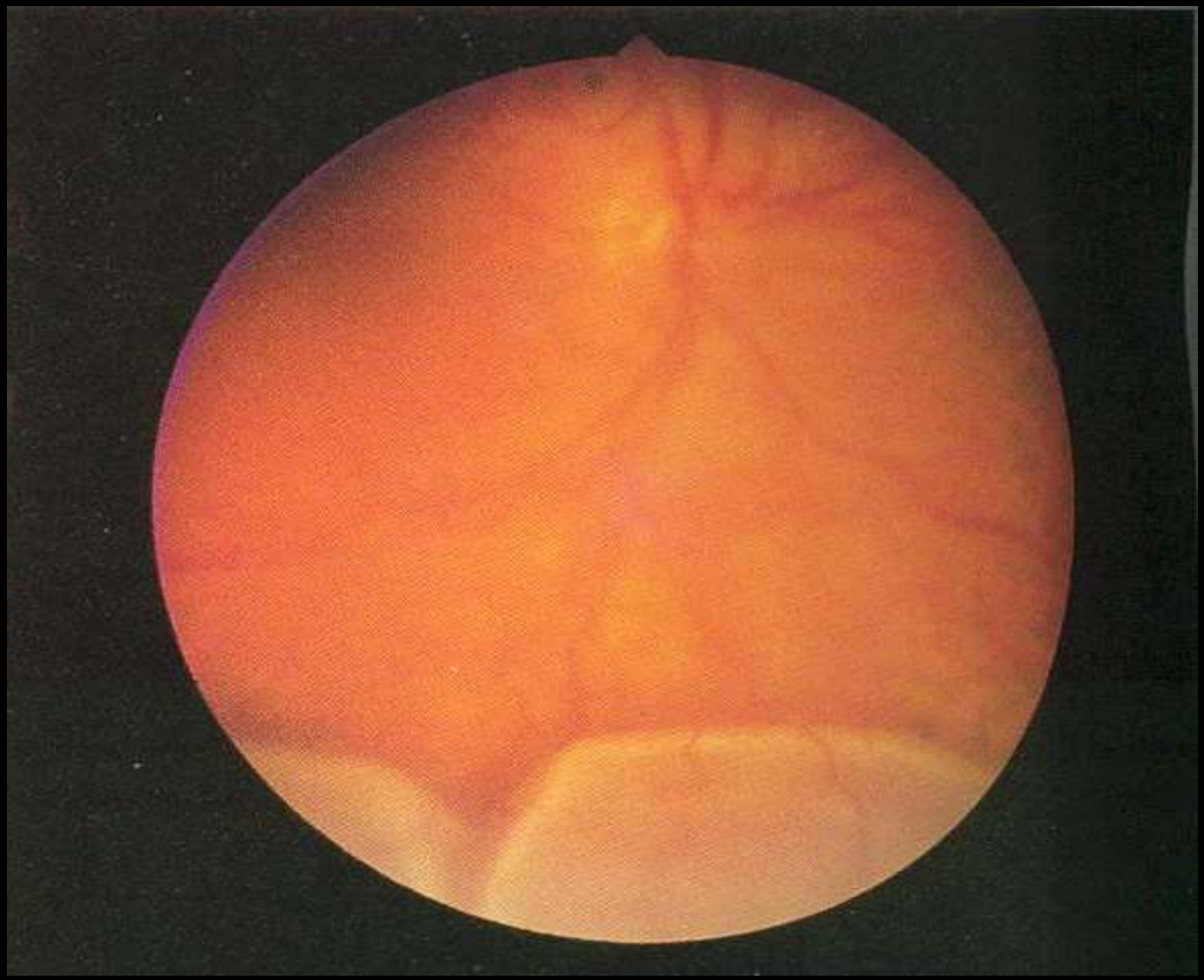
# Exudative Retinal Detachment

Aetiology

- Choroiditis
- Tumours
- Toxaemia of Pregnancy
- Coats Disease/ Angiomatosis

- Detached retina is elevated, smooth surface with shifting fluid
- Local causes like tumours/ angiomatosis can be seen

Treatment – Treatment of cause



# RETINITIS PIGMENTOSA

# RETINITIS PIGMENTOSA

- Degenerative condition of Retina
- Hereditary condition
  - Autosomal Recessive- common
  - Autosomal Dominant
  - X Linked –least common
- Usually Bilateral
- Starts in childhood

# RETINITIS PIGMENTOSA

- Primarily affects Rods
- Starts at equator
- Spreads anteriorly & posteriorly
- Macula affected last

<u>Presenting Symptoms-</u>

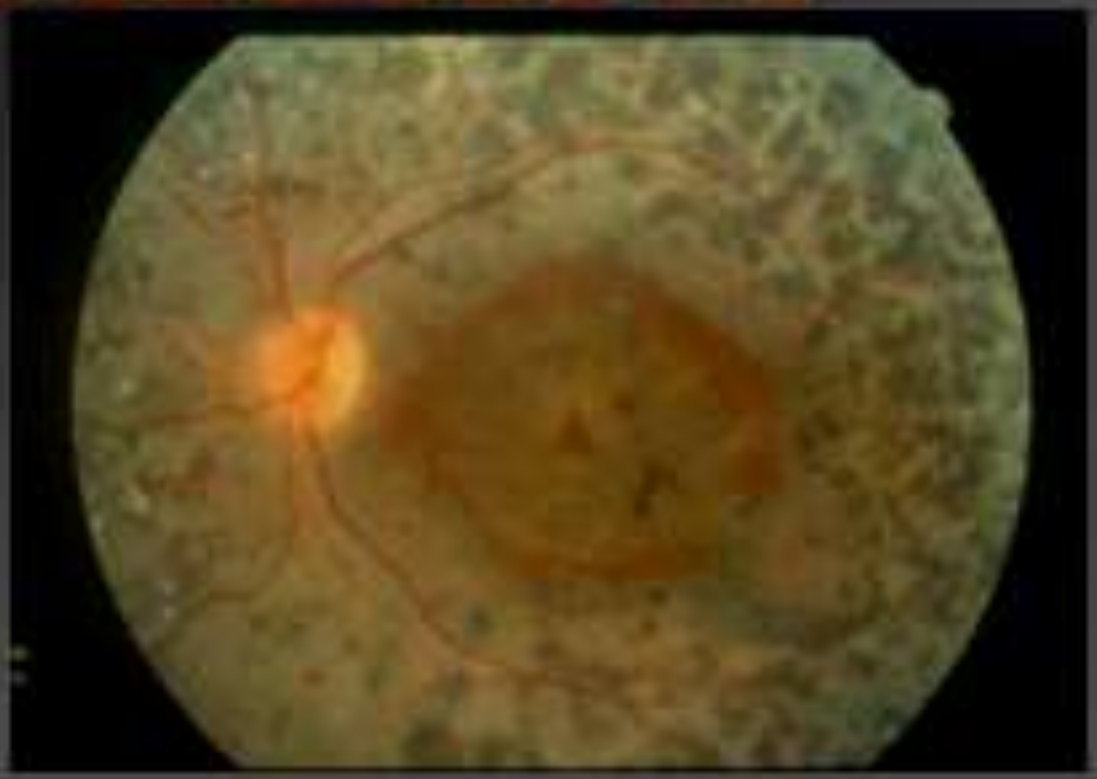
Night Blindness

# RETINITIS PIGMENTOSA

Clinical Feature

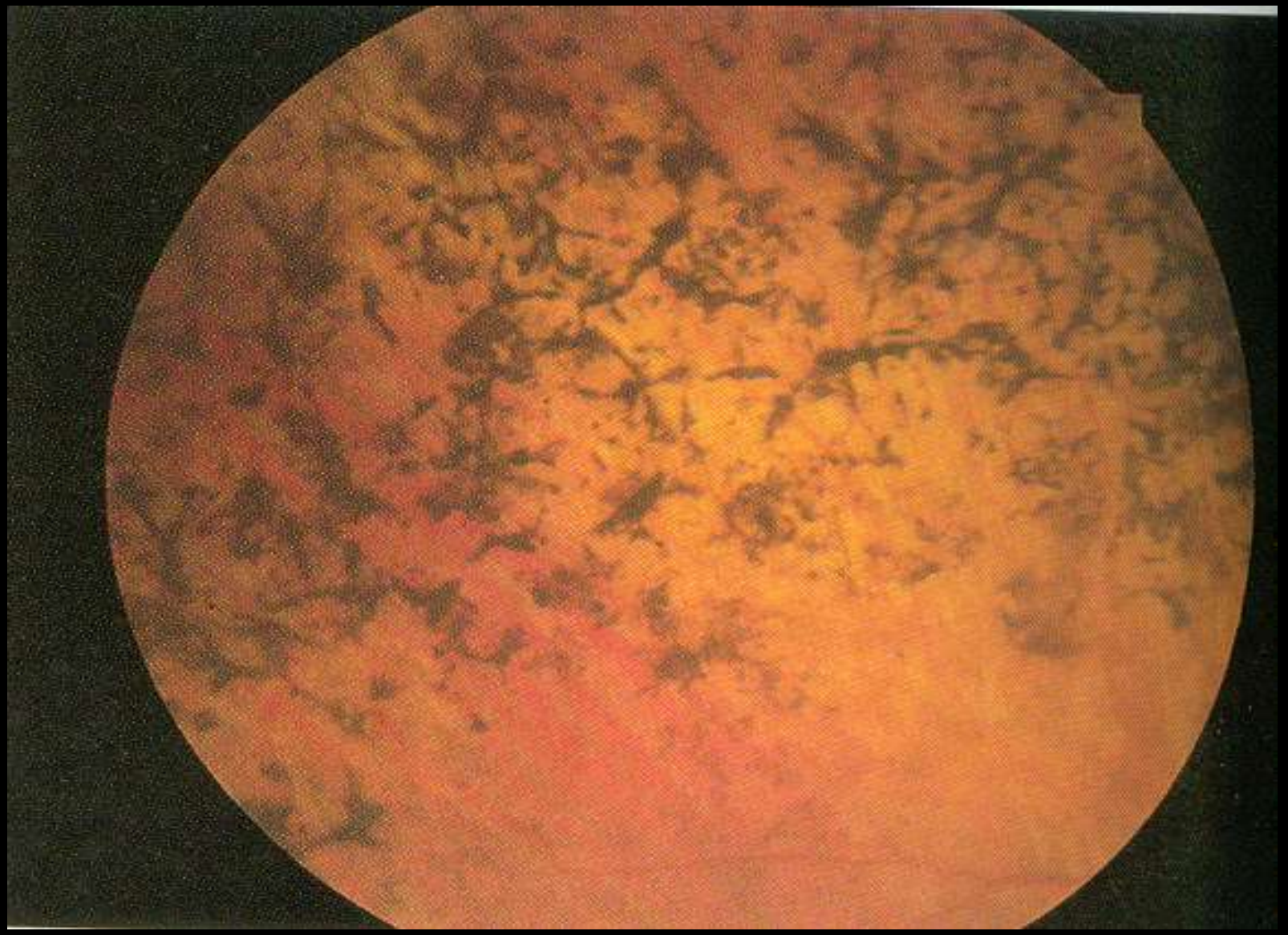
- Anterior Segment – Normal
- Fundus Exam shows – Jet Black Bone Corpuscular pigmentation in equatorial region
- Arteriolar attenuation
- Waxy pallor of disc

# Retinitis Pigmentosa



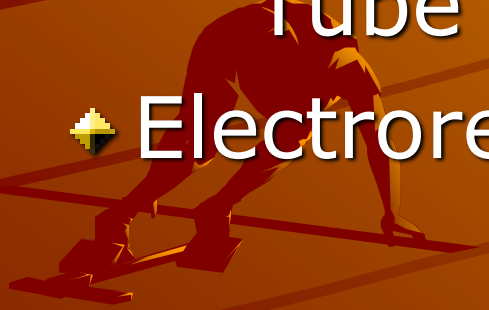
Note the typical features of RP

- Waxy pallor of disc
- Attenuation of arterioles
- Areas of RPE hyperpigmentation that alternate with atrophic regions in the form of bone spicules



# RETINITIS PIGMENTOSA

- Perimetry –
  - Ring Scotoma
  - Peripheral constriction of Fields
  - Tube vision
- Electroretinogram- Subnormal



# RETINITIS PIGMENTOSA

- Complication-
  - Maculopathy
  - Cataract

Open angle Glaucoma- usually associated

# RETINITIS PIGMENTOSA

- Treatment

  No specific treatment available

-Visual Rehabilitation

-Low vision aids

-Genetic Counseling

# RETINAL VEIN OCCLUSION

- Most common vascular disorder

## Aetiology

- Increased Blood Viscosity
  - Leukemia, Polycythemia
  - Macroglobulinaemia
  - Oral contraceptive pills

# RETINAL VEIN OCCLUSION

- Disease of Vessel wall-
  - Vasculitis
  - Eales Disease
- Pressure over veins from outside
  - Arteriosclerosis
  - Hypertension
  - Open angle glaucoma

# RETINAL VEIN OCCLUSION

- Pathophysilogy

Vein occlusion

↓

Stagnation of Blood flow

↓

Hypoxia

↓

oedema

Haemorrhage

Neovascularisation

# RETINAL VEIN OCCLUSION

- Clinical Features
- Two Types-
- Central Retinal Vein Occlusion
- Branch Retinal Vein Occlusion

# RETINAL VEIN OCCLUSION

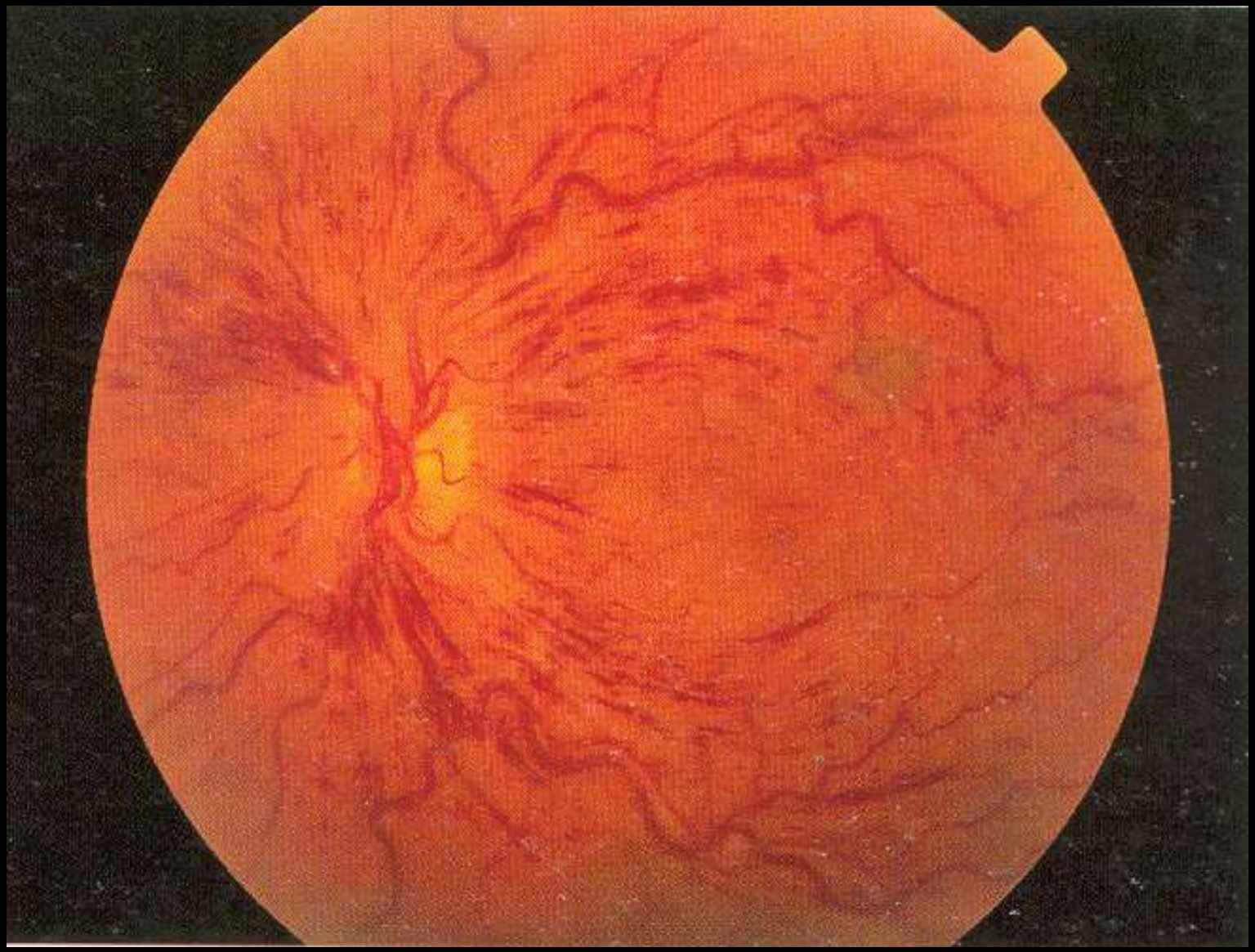
Clinical Features

Sudden Gross Diminution of vision

RAPD may be present

Fundus Exam :-

- Optic Disc Congested, Margins Blurred
- Veins engorged & Tortuos
- Multiple Retinal Haemorrhages
- cotton wool spots



# RETINAL VEIN OCCLUSION

Clinical Features (BRVO)

- Changes Limited to area drained by the obstructed vein
- Occlusion of Upper Temporal Branch is more common

# RETINAL VEIN OCCLUSION

- Investigation
- Recording of Blood Pressure
- Recording of IOT
- Haemogram
- Blood Sugar estimation
- STS & Mantoux Test in young patients

# RETINAL VEIN OCCLUSION

Complications

- Neovascularisation of Retina
- Rubeosis iridis
- Neovascular Glaucoma

Vision affected due to

- Macular oedema
- Vitreous Haemorrhage

# RETINAL VEIN OCCLUSION

Treatment:-

- Treat the predisposing conditions
- In young patient a course of steroids if vasculitis is suspected
- Wait for 6 – 8 weeks
- Pan Retinal Photocoagulation If NVE / NVD occurs
- Macular Grid – Macular oedema

# CENTRAL RETINAL ARTERY OCCLUSION

- Ocular Emergency
- Often leads to Blindness
- May be presenting symptom of systemic disease
- Central Retinal artery is an End artery
- Ganglion cells can withstand ischemia for only 5 min

# CENTRAL RETINAL ARTERY OCCLUSION

Aetieology

- Embolization – Heart/carotid artery
- Vaso –obliteration
  - Giant Cell Arteritis
  - Takayasu disease
  - Polyarteritis Nodosa
- Pressure from Outside
  - Increased IOT/ Pressure over Globe

# CENTRAL RETINAL ARTERY OCCLUSION

Clinical Features-

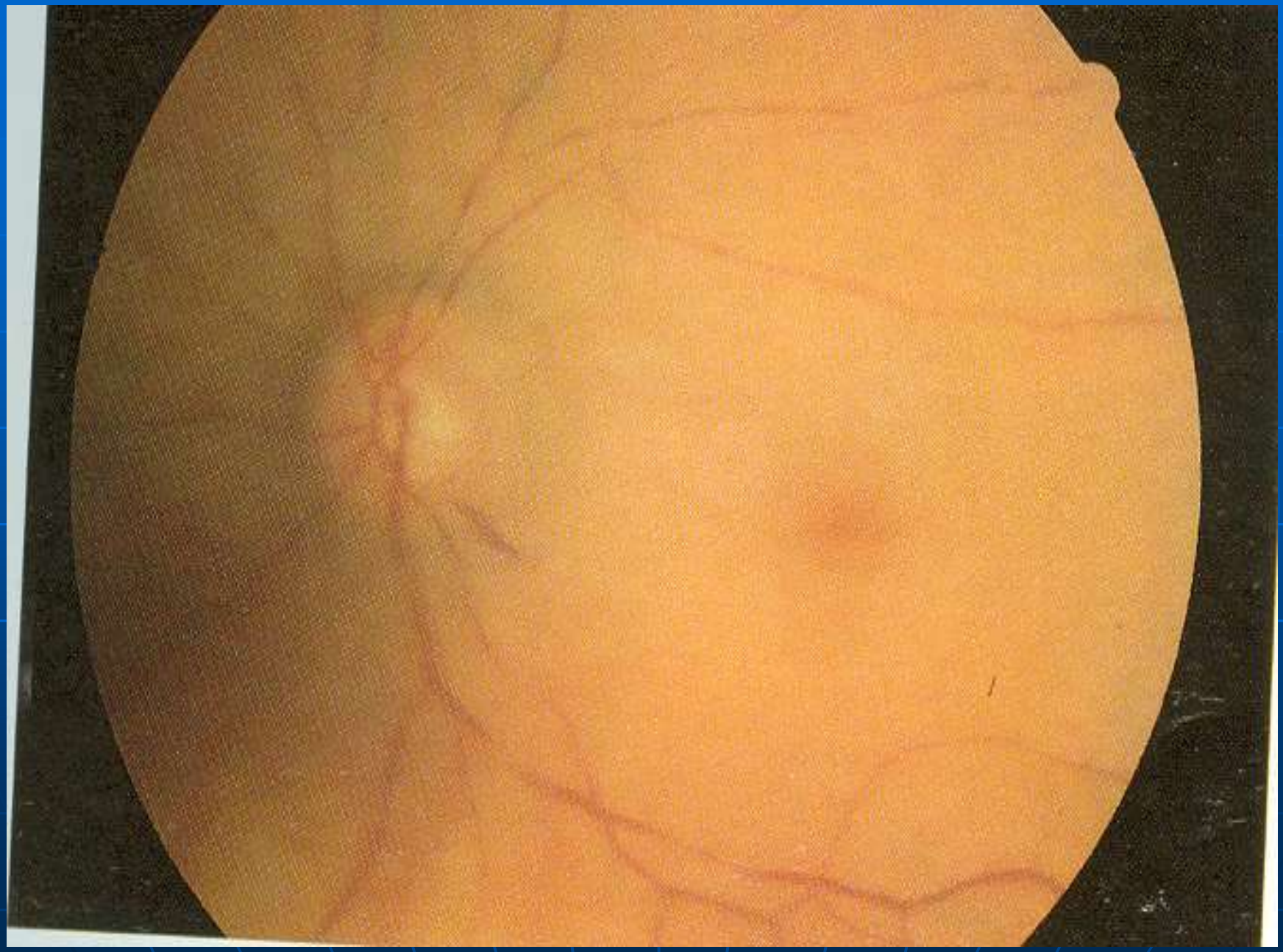
- Sudden painless loss of vision in affected eye
- No perception of light
- Afferent Pupillary defect

# CENTRAL RETINAL ARTERY OCCLUSION

Fundus Exam-

- Retina oedematous, looks white
- Cherry spot at Fovea
- Marked narrowing of retinal arterioles
- Segmentation of Blood column on pressure over globe

End result – Optic atrophy



# CENTRAL RETINAL ARTERY OCCLUSION

## Treatment

- Ocular Massage
- IV Acetazolamide 500mg
- Inhalation of 95%O2 + 5% CO2
- Paracentesis

# CENTRAL RETINAL ARTERY OCCLUSION

- All patients with CRAO should be investigated fully
- Lipid Profile
- Carotid artery doppler
- Examination of Heart – Echo
- Temporal Artery biopsy
- ESR

# DIBETIC RETINOPATHY

- Microangiopathy affecting retinal precapillry arterioles , capillaries and venules

# DIBETIC RETINOPATHY

- Approximately 2% of all Diabetics become blind
- Incidence blindness is 20 times greater in Diabetics
- Incidence of Diabetic Retinopathy is related to duration Diabetes Usually occurs after 15 – 20 years of  Diabetic age

# DIBETIC RETINOPATHY

## Pathogenesis

Microvascular Occlusion

Thickening of Capillary Basement Mn

Endothelial damage & proliferation

Changes in RBCs

Increased stickiness of Platelets

AV Shunts

Neovascularization

# DIBETIC RETINOPATHY

## Pathogenesis

Microvascular Leak

(Loss of Pericytes)

↓

Retinal Haemorrhage

Retinal Oedema

Hard exudates

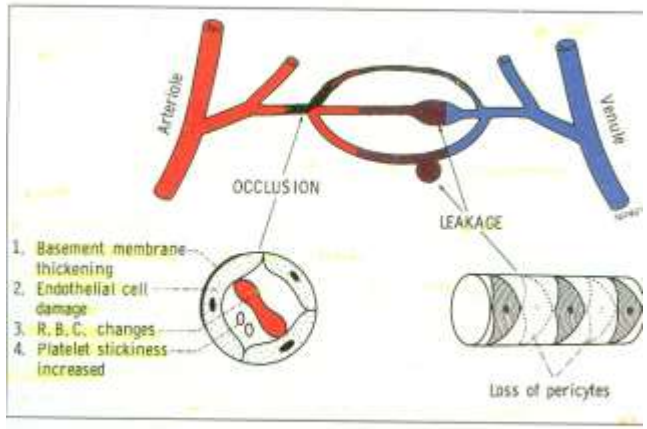



**Figure 12.1** Pathogenesis of diabetic retinopathy

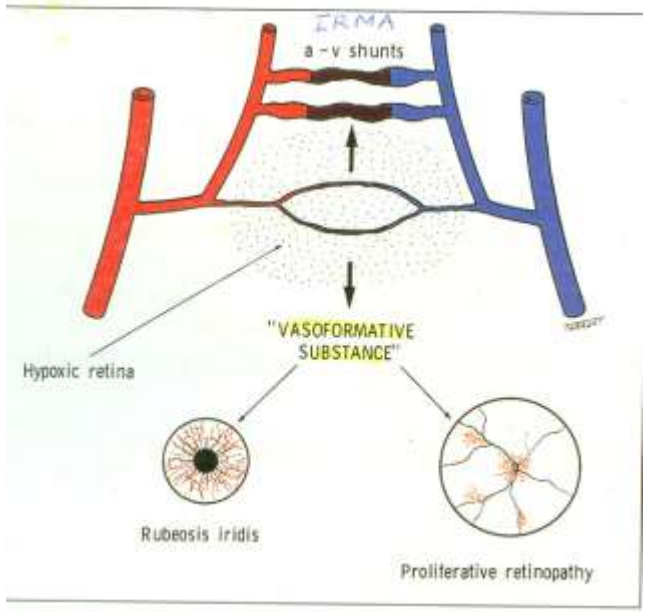
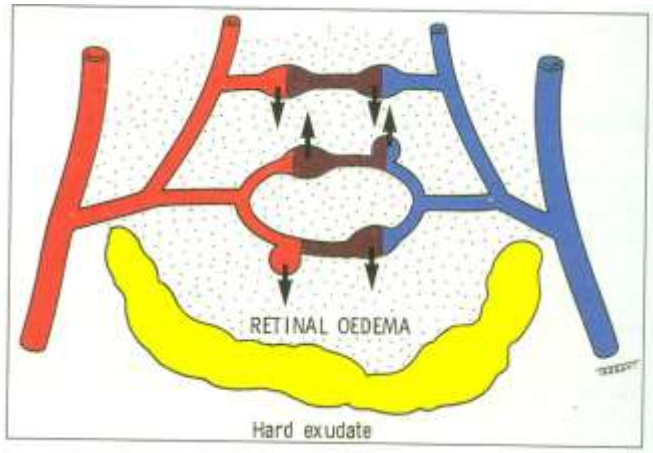



**Figure 12.2** Consequences of retinal ischaemia in diabetic retinopathy



# DIBETIC RETINOPATHY

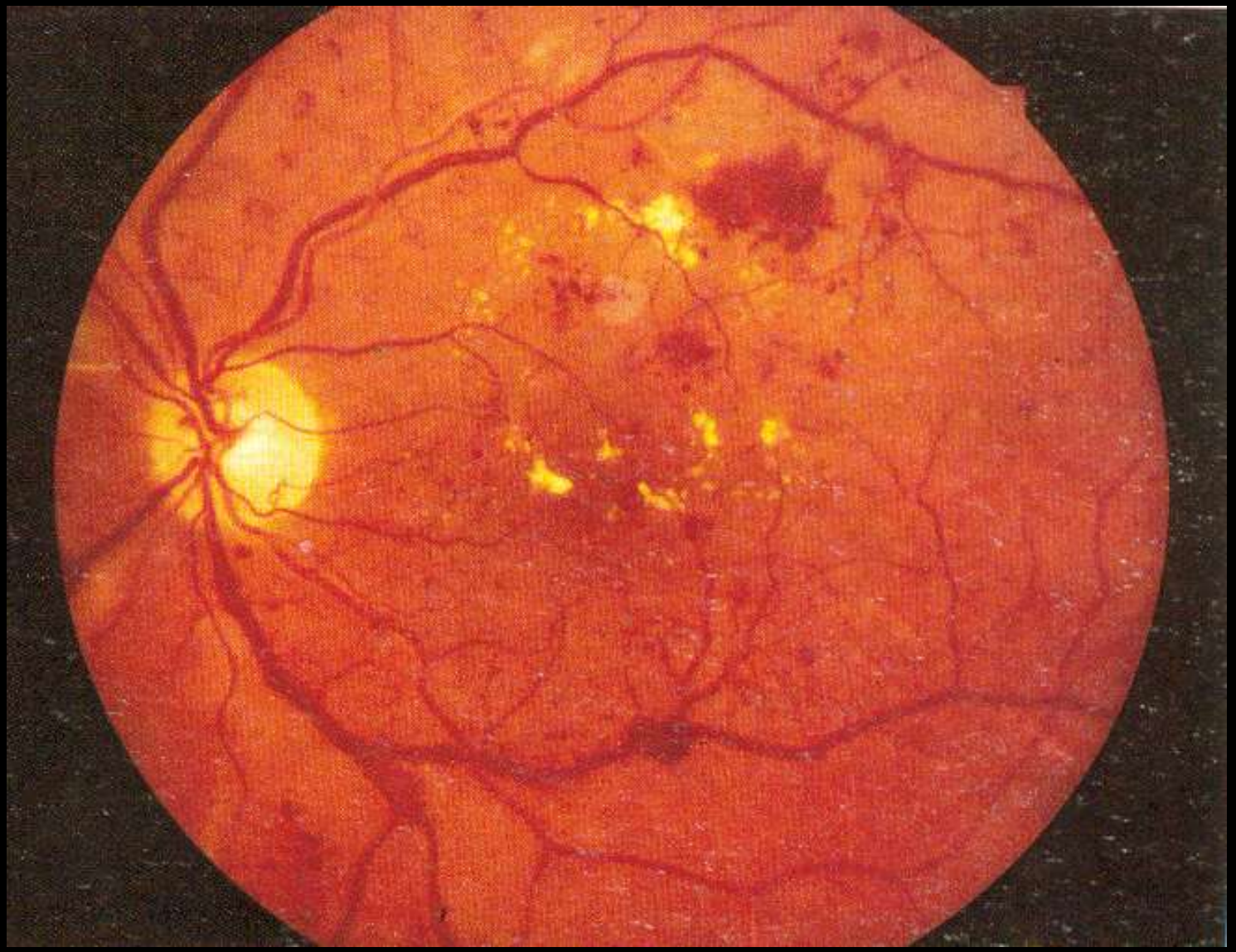
Classification:-

- Non Proliferative Diabetic Retinopathy
  (Mild, Moderate & Severe)
- Proliferative Diabetic Retinopathy
- Diabetic Maculopathy
- Advanced Diabetic Eye disease

# Non Proliferative Diabetic Retinopathy

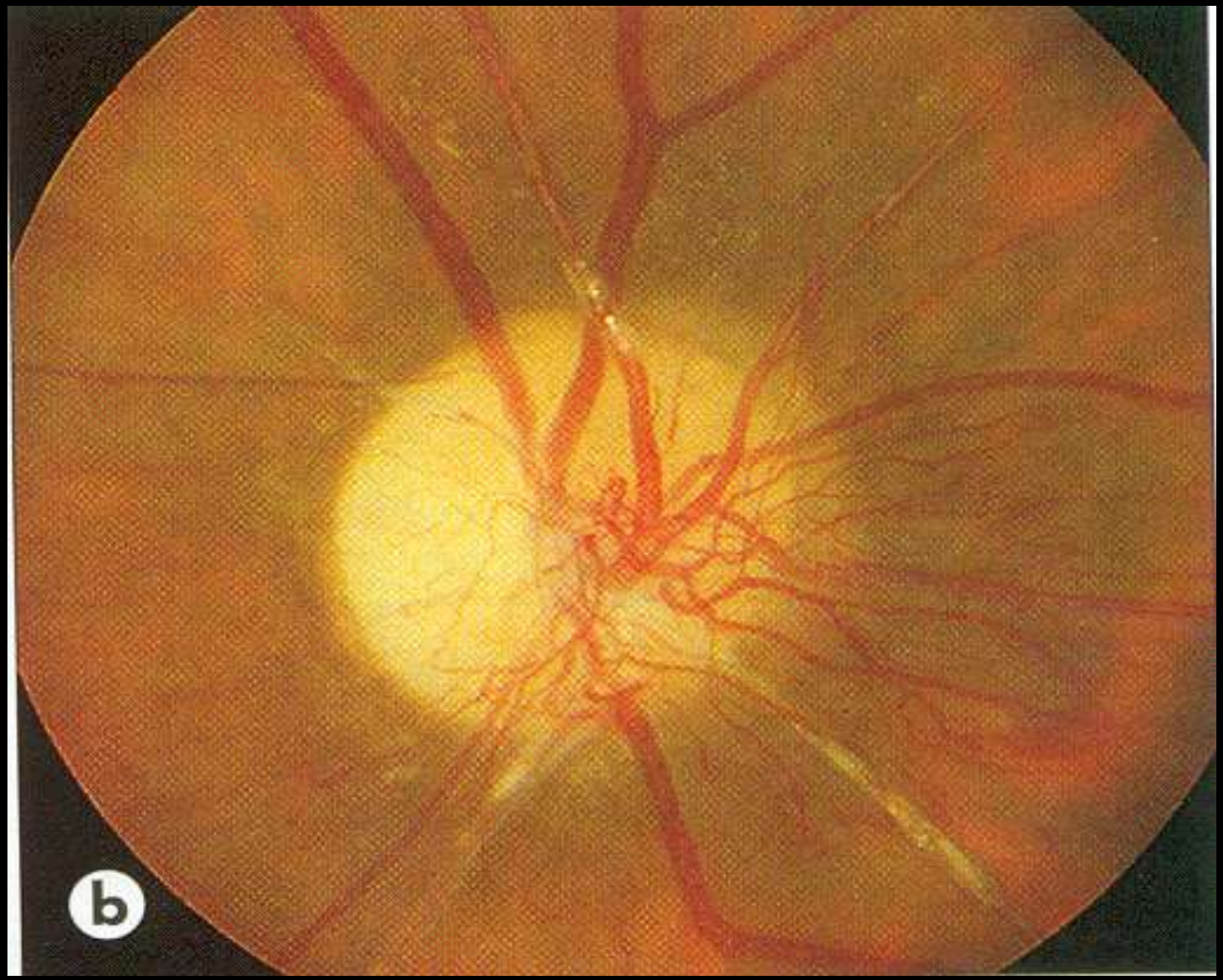
Clinical Features –

- Microaneurysms
- Dot & Blot Haemorrhages
- Hard Exudates
- Flame Shaped Haemorrhages } In severe
- Soft Exudates } cases



# Proliferative Diabetic Retinopathy

- Characterized by Neovascularisation
- NVD / NVE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# Diabetic Retinopathy

Complication:-

- Vitreous Haemorrhage
- Traction Retinal Detachment
- Neovascular Glaucoma

Called as Advanced Diabetic Eye Disease

# Diabetic Retinopathy

Treatment

NPDR

- Good Diabetic control
- Regular Fundus examination
- Macular Grid photocoagulation for macular oedema

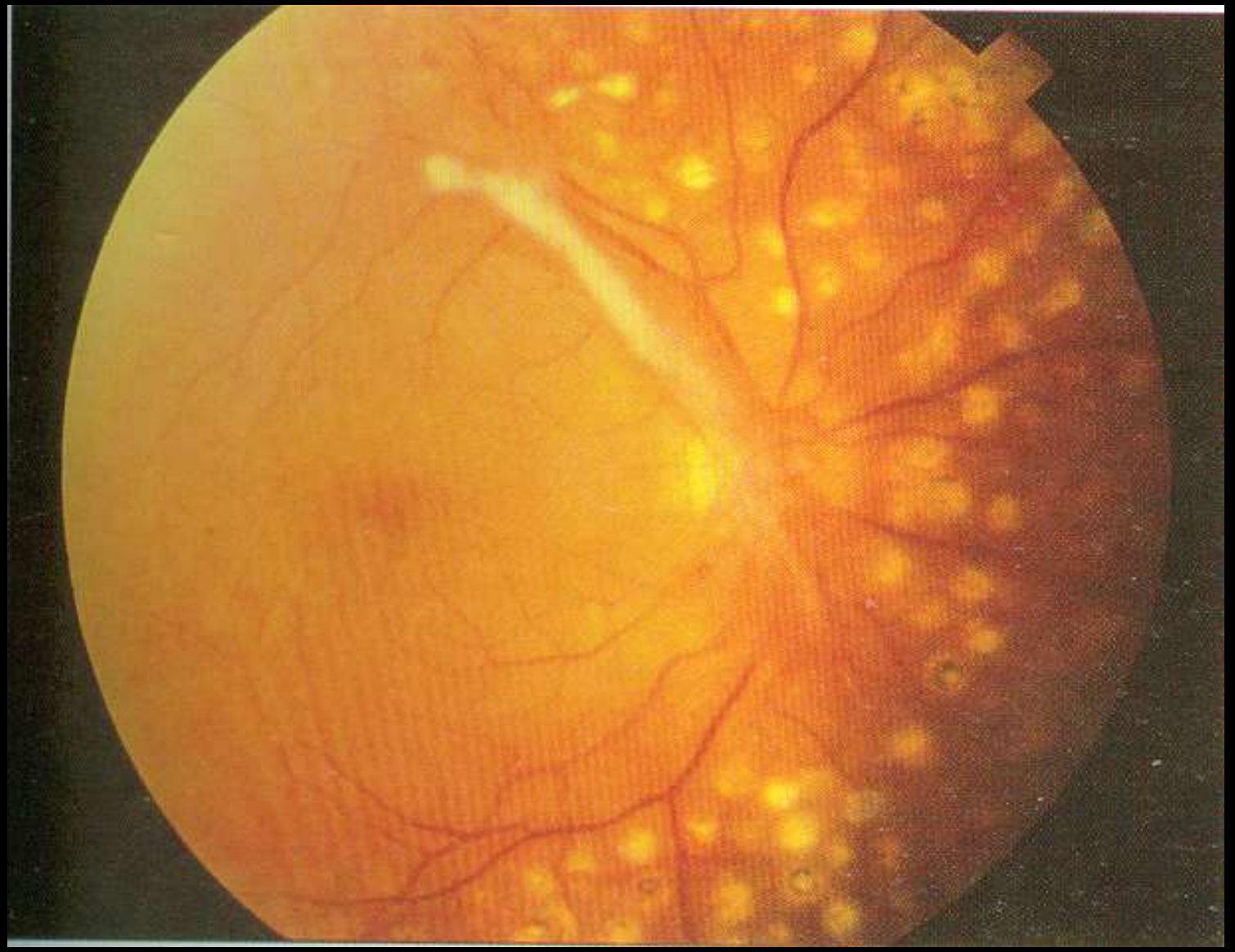
# Diabetic Retinopathy

Treatment

Proliferative Diabetic Reatinopathy

Pan Retinal Photocoagulation

Treatment of vitreous haemorrhage/ traction RD – Vitreo Retinal surgery



# HYPERTENSIVE RETINOPATHY

- Central Retinal artery is a branch of ophthalmic artery which is a branch of Internal Carotid artery
- Mirrors the cerebral circulation
- Medium sized artery which can be visulized

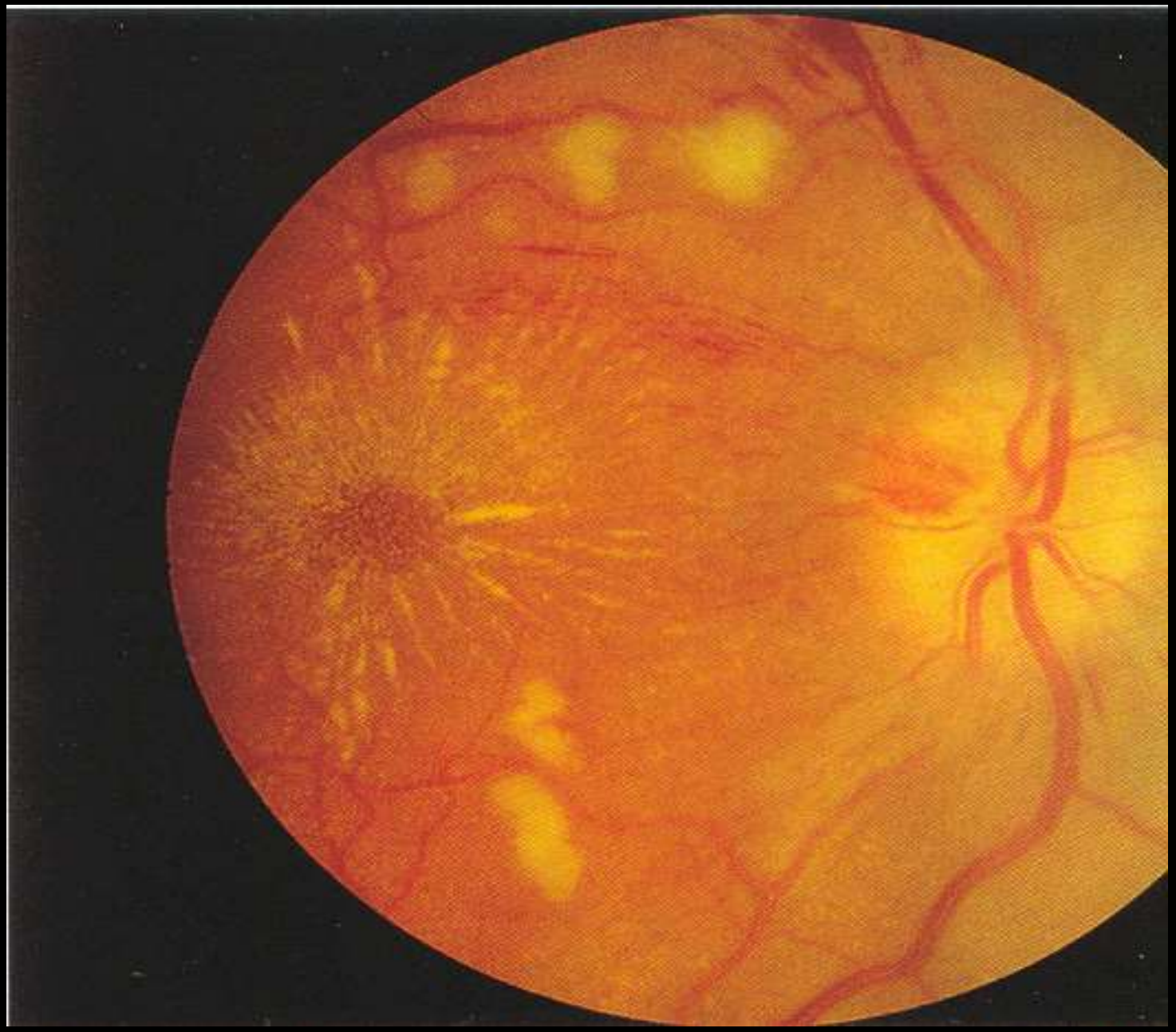
# HYPERTENSIVE RETINOPATHY

- Response of arteries to increased blood pressure
- In young individual , recent hypertension
- Spasm of arterioles
- Long standing Hypertension - Arteriosclerosis

# HYPERTENSIVE RETINOPATHY

Fundus Picture

- Generalized narrowing & Focal Narrowing of arterioles
- Flame shaped haemorrhages
- Hard Exudates – Macular star
- Cotton wool spots
- Papilloedema – Malignant hypertension
- Ischemic Choroidal Infarct- Elschnigs spots



# HYPERTENSIVE RETINOPATHY

Arteriosclerotic changes

-Broadening of light reflex

-Artereo venous crossing change

Concea;ment of vein-

deflection of vein- Salus sign

Banking of vein- Bonnet sign

Tapering of veins on either side- Gunns sign

-Copper wire arteries

-Silver wire arteries

# HYPERTENSIVE RETINOPATHY

Classification

Keith Wagner Classification

| | |
|---|---|
| Grade- I | Generalised narrowing of arterioles |
| | Concealment of Veins |
| Grade-II | Focal narrowing of arterioles |
| | Deflection of Veins- Salu's sign |
| Grade-III | Marked AV crossing changes |
| | Copper / silver wire arteries |
| | Retinal haemorrhages, Hard exudates |
| | Cotton wool spots |
| Grade – IV | Papilloedema |

# HYPERTENSIVE RETINOPATHY

Classification ( Scheies Classification)

Hypertensive Retinopathy

Grade- I Generalised narrowing of arterioles

Grade-II Focal narrowing of arterioles

Grade-III Retinal haemorrhages, Hard exudates

Soft exudates(Cotton wool spots)

Grade – IV Papilloedema

# HYPERTENSIVE RETINOPATHY

Arteriosclerotic changes

Grade – I Increased of light reflex
Concealment of vein

Grade – II Marked AV crossing change

Grade – III Copper wire arteries

Grade - IV Silver wire arteries

# HYPERTENSIVE RETINOPATHY

- Complications – BRVO/ CRVO
- Treatment – Good control of Hypertension

# Retinopathy of Toxemia of Pregnancy

- Characteristic Hypertensive retinopathy found in cases of PIH
- Usually occurs at 6-9 months of Pregnancy
- May lead to blindness

# Retinopathy of Toxemia of Pregnancy

Clinical Features

- Narrowing of Retinal arteries
- Retinal haemorrhages & Exudates
- Marked retinal oedema
- Exudative retinal Detachment

# Retinopathy of Toxemia of Pregnancy

Treatment

- Control of hypertension
- Severe Retinopathy – Termination of Pregnancy

# Albumunuritic Retinopathy

- Found in cases of Renal failure
- Characterized by more of soft exudates then hard exudates
- Macular star is a common feature

# OPTIC NEURITIS

# OPTIC NEURITIS

- Inflammation of Optic Nerve
- Clinically two types :-

  -Papillitis- Inflammatopn of Optic Nerve Head

  - Retobulbar Neeuritis- Inflammation of Optic Nerve Behind the globe

# OPTIC NEURITIS

**Aetiology :-**

Mutiple Sclerosis

Herpes Zoster Infection

Poliomyelitis

Encephalitis

**Local** – Uveitis

Meningitis'

Orbital Cellulitis

Sinusitis

# OPTIC NEURITIS

**Aetiology (contd)**

- Endogenous – Acute Infectious Disease
  ( Measles , Mumps )
- Metabolic – Diabetes
  Anaemia
  Thiamine Deficiency

# OPTIC NEURITIS

- Symptoms-
  - Sudden Onset
  - Rapid Deterioration of Vision
  - Pain on moving the Eye

# OPTIC NEURITIS

- **Signs**

  -Vision grossly diminished

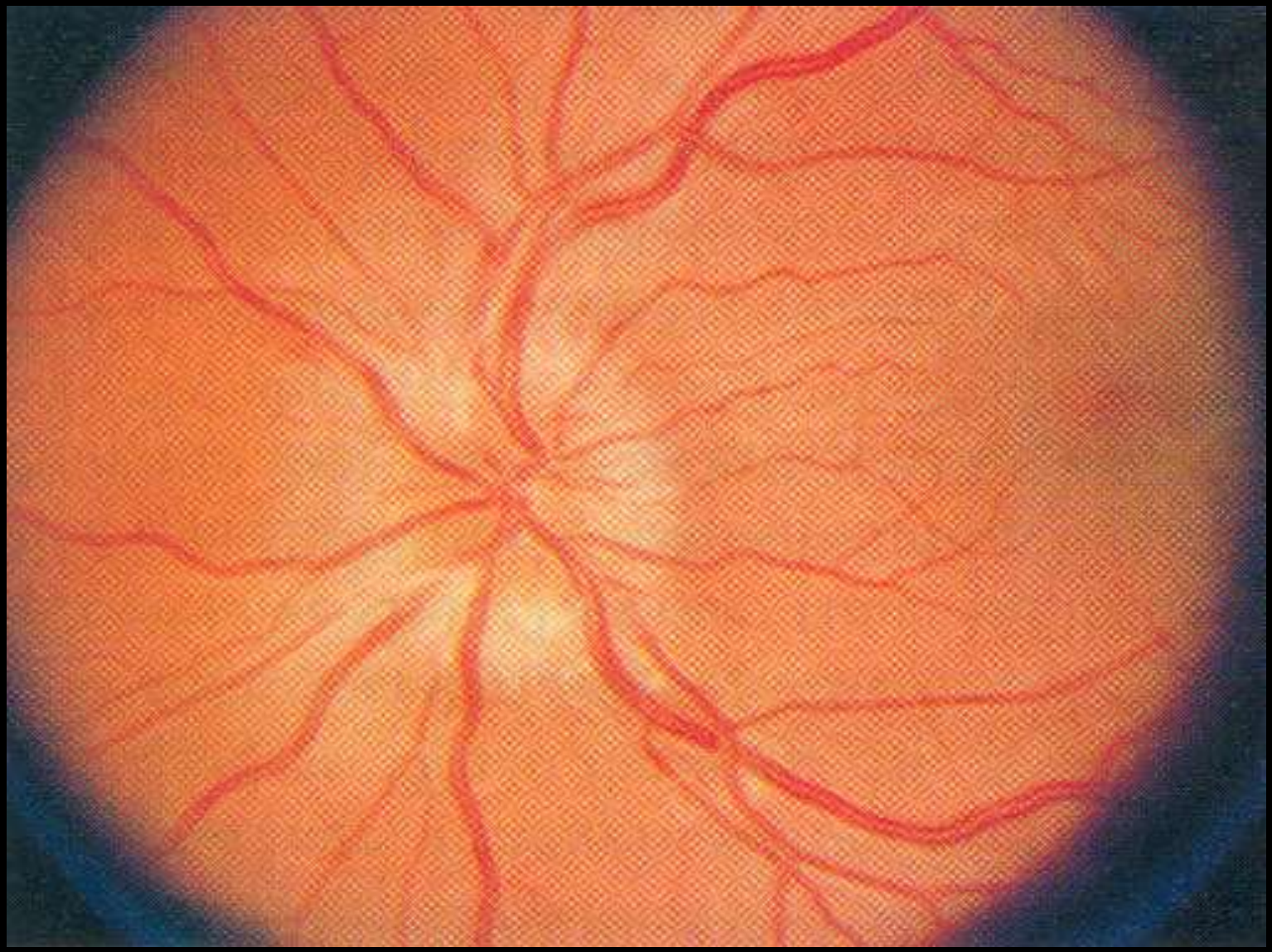
  -Tenderness over insertion of superior Rectus Muscle

  -Illusutained pupillary Reaction to Light

  -Some cases Mracus Gunn pupil

# OPTIC NEURITIS

- Signs (Contd)
- Fundus (In Papillitis)
  - Disc Hyperaemic
  - Margins Blurred
  - Oedema of surrounding Retina
  - Macular Fan
- ***Fundus Normal in cases of Retrobulbar Neuritis***



# OPTIC NEURITIS

Investigation;-

- Perimetry-
  - Central Scotoma
  - Peripheral Constriction of Fields
- Visual Evoked Potential
  - Increased Latency

# OPTIC NEURITIS

Treatment:-

-Pulse Steroid Therapy-

Methyl prednisolone

250 mg IV x 6 hrly For 72 hrs

Followed by Oral Steroids for 2 weeks

-In Optic neuritis of Infective aetiology

Treatment of the cause

# PAPILLOEDEMA

- Oedema of Optic Nerve Head ( Optic Disc)
- Purely Hydrostatic , Non Inflammatory

Pathophysiology

- Axoplasmic Stasis
- Compression of Central Retinal vein

# PAPILLOEDEMA

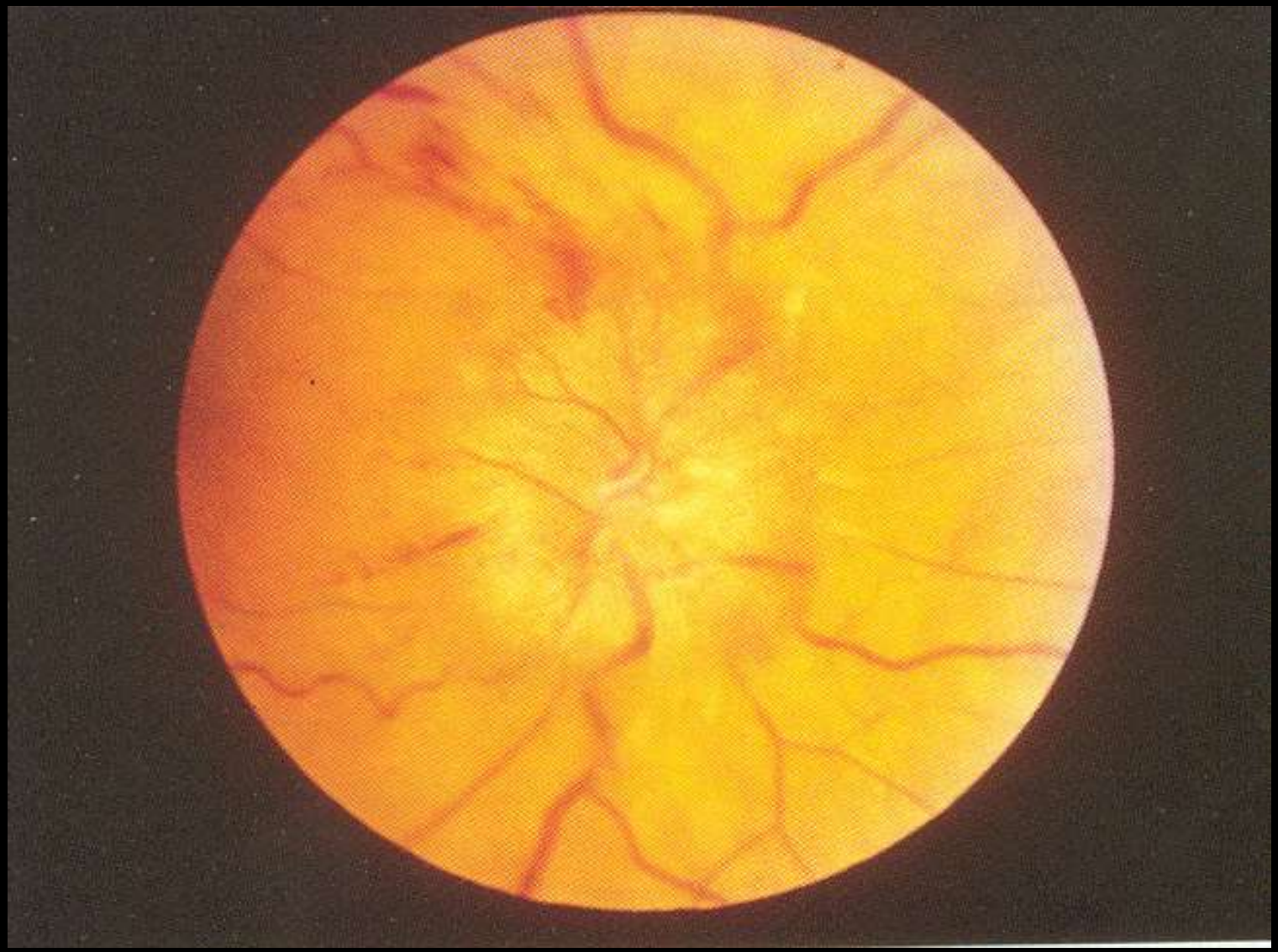
- Aetilogy
  -Raised Intracranial Pressure
    Intracranial Tumour
    Cerebral Abscess
    Cavernous Sinus Thrombosis
    Subarachnoid Haemorrhage
  -Malignant Hypertension
  -Benign Intracranial Hypertension

# PAPILLOEDEMA

- Clinical Picture
- Asymptomatic
- May complain of Transient Blurring of Vision
- Vision is Normal
- Anterior Segment Normal

# PAPILLOEDMA

- Fundus- Blurring Of disc Margin
  Congestion of Disc
  Filling up of Physiological Cup
  Retinal Veins Engorged
  Venous pulsations absent
  Haemorrhges over disc
  Oedema of surrounding retina
  Macular Fan



# PAPILLOEDEMA

## Differential Diagnosis

- Optic Neuritis
- Drusen of optic Disc
- Pseudoneuritis

# PAPILLOEDEMA

Investigation

- Perimetry – Enlargement of Blind Spot
- CT Scan / MRI

# PAPILLOEDEMA

**Treatment**

Treatment of Cause

# TOXIC AMBLYOPIA

- Damage to the Optic Nerve due exogenous toxins
- Tabacco
- Methyl Alcohol
- Chloroquine
- Quinine
- Ethambutol
- Lead
- Arsenic
- Oral Contraceptive

# TOXIC AMBLYOPIA

## Tobacco Amblyopia

- Common in heavy cigar smokers
- Symptoms – fogginess of Vision
- Vision diminished
- Fundus shows Temoporal pallor
- Perimetry- Caeco Central Scotoma

# TOXIC AMBLYOPIA

- Treatment
- Stop Smoking
- Inj B12  1000µg once in 5 days x 5 Inj

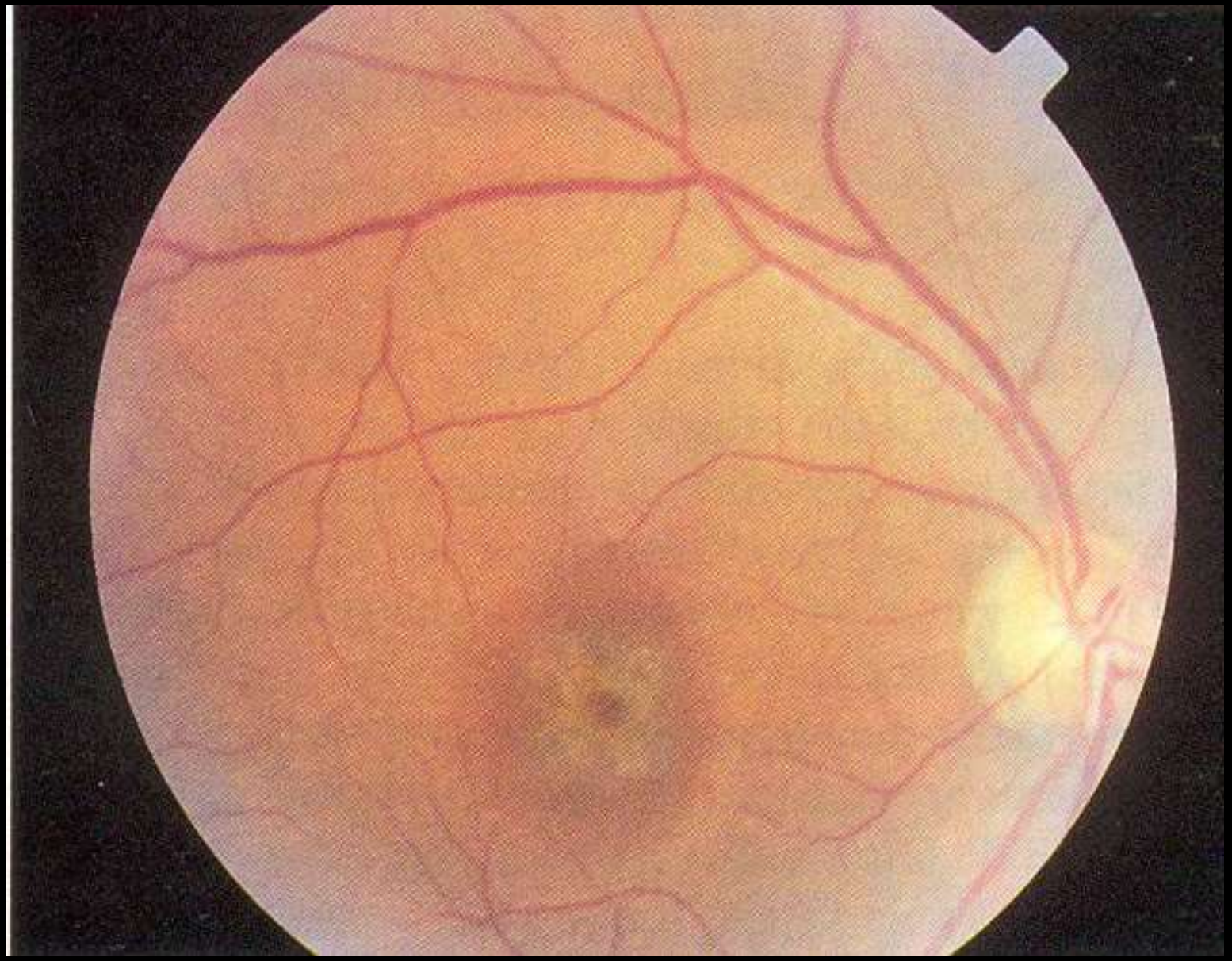
# TOXIC AMBLYOPIA

- Methyl Alcohol
- Toxic to Gangion cells
- Wide spread degeneration of ganglion cells
- Leads to Bilateral Optic Atrophy

# TOXIC AMBLYOPIA

Chloroquine

- Seen in patients who are on long term Chloroquine therapy
- Initially pimentation at macula -Bulls Eye Maculopathy
- In advanced cases widespread Retinal degeneration similar to retinitis pigmentosa
- Optic Atrophy



# TOXIC AMBLYOPIA

- Treatment
- Early cases recover if chloroquine therapy is stopped
- Advanced cases no effective therapy
- All cases who are on long term chloroquine therapy must undergo regular ocular check up
- Any sign of toxicity stop chloroquine
- Scotoma in central 5° field with red target

# Optic Atrophy

- Degeneration of Optic Nerve

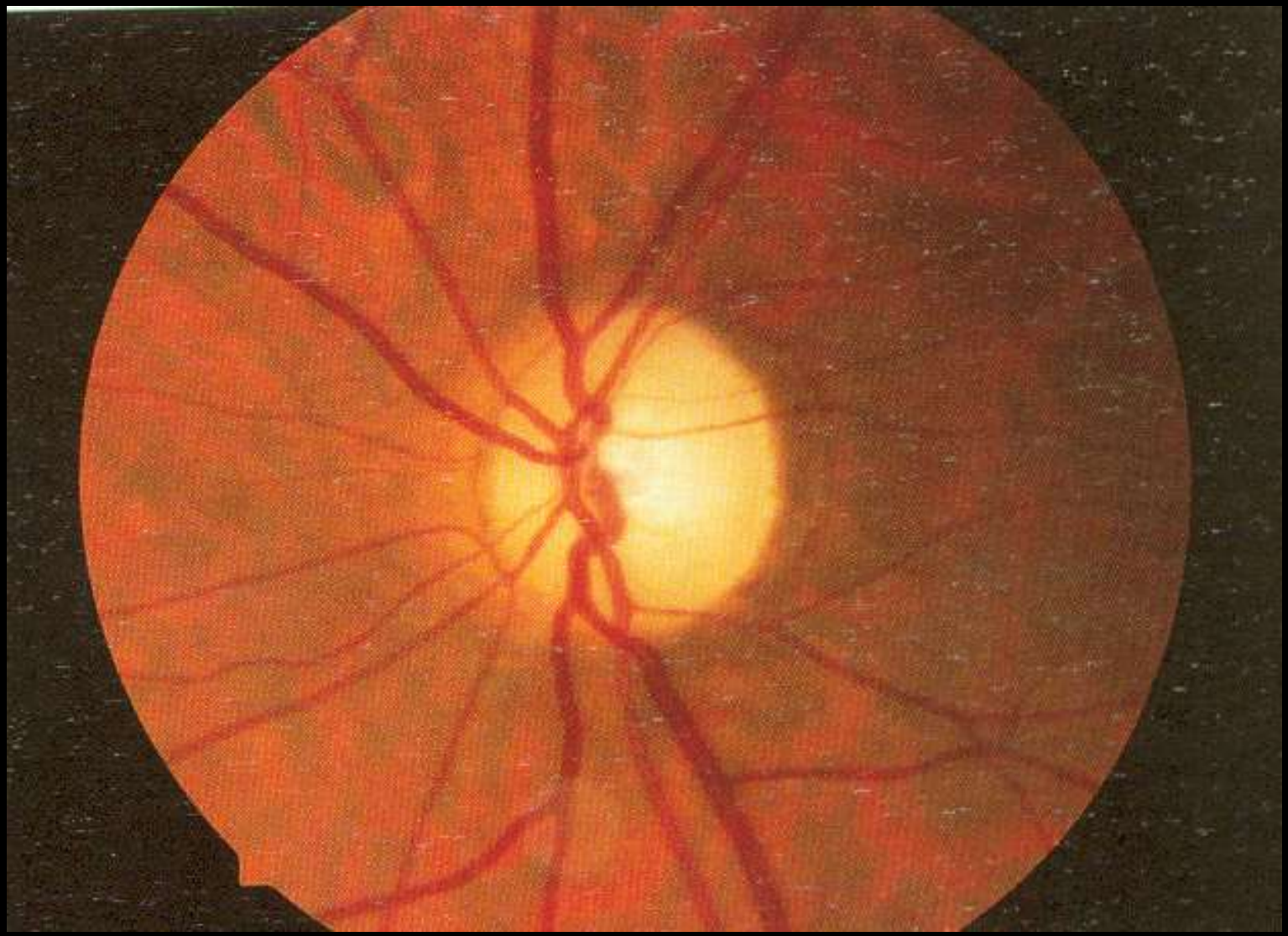
Classification

- Primary
- Secondary
- Consecutive
- Glaucomatous

# Primary Optic Atrophy

Fundus picture

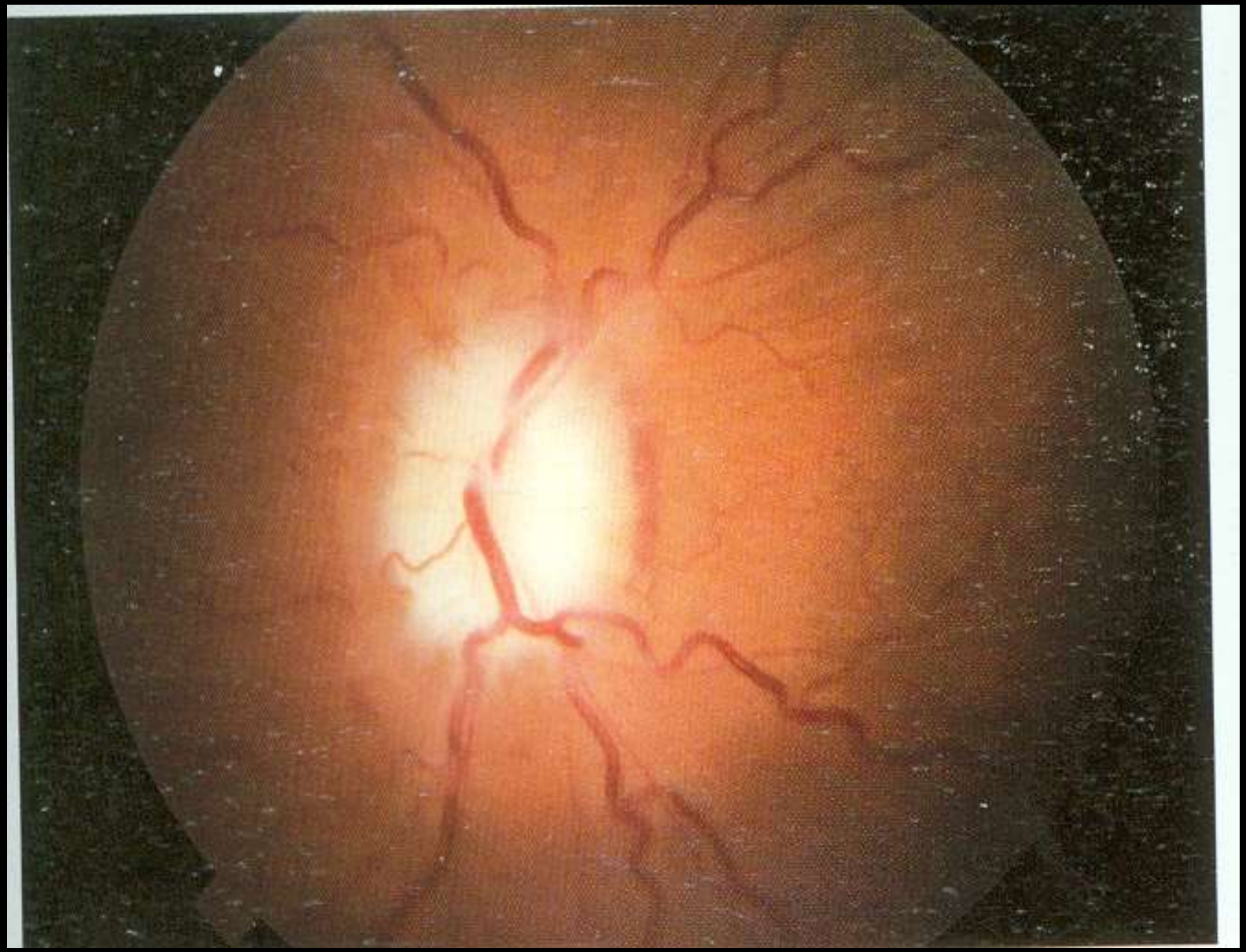
- Disc appears white
- Disc Margins well defined
- Physiological cup normal
- Blood vessels normal
- Aetiology
- Pressure over Optic Nerve by Tumour
- Meningitis
- Retrobulbar Neuritis



# Secondary Optic Atrophy

Fundus Picture

- Disc margin Blurred
- Disc appears dirty grey
- Physiological cup filled up
- Sheathing of vessels at disc
- Aetiology
- Optic Neuritis



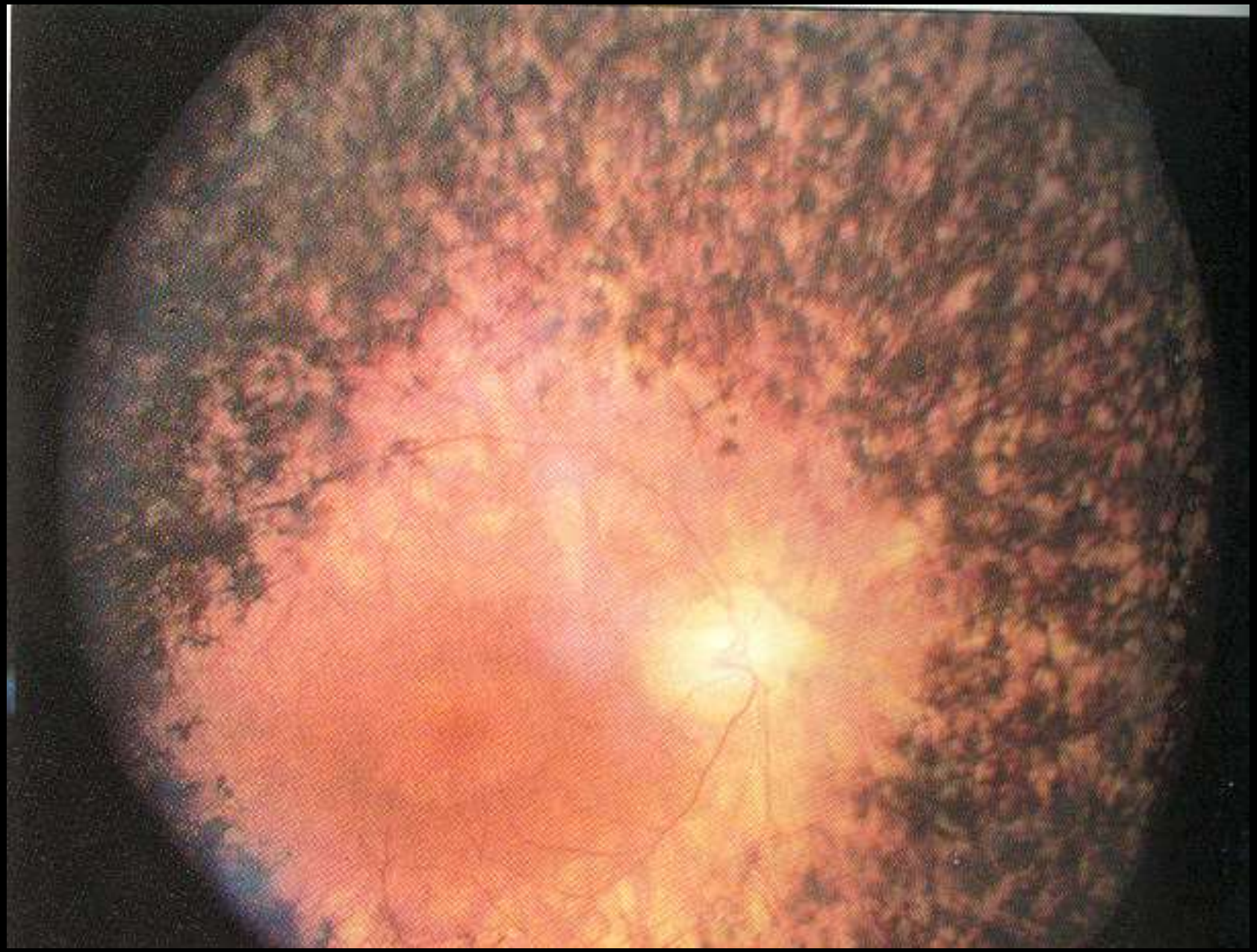
# Consecutive Optic Atrophy

- Optic Atrophy as a consequence of degeneration of retina
- Fundus Picture
- Waxy pallor of disc
- Attenuation of vessels
- Associated Retinal pathology can be seen

# Consecutive Optic Atrophy

Aetiology

- Retinitis pigmentosa
- CRAO / CRVO
- Long Standing Retinal Detachment
- Wide spread choroidal atrophy
- Extensive Pan retinal Photocoagulation



# Glaucomatous Optic Atrophy

- Long standing Glaucoma

Fundus Picture

- Disc pale with deep enlarged cup reaching upto disc margin
- Lamellar dot sign seen
- Also called as cavernous optic atrophy