Retinal Venous Occlusions

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Never reply when you are angry. Never make a promise when you are happy. Never make a decision when you are sad.

RETINAL VEIN OCCLUSION

Predisposing Factors:

SYSTEMIC:

Age: Increasing age – {6th –7th decades }

Diabetes / B.P

Blood dyscrasia: Hyper viscosity – chronic leukemia, Polycythemia, Changes in plasma proteins – macroglobulinaemia , Sickle cells disease –BRVO

❖If bilateral CRVO – check for blood dyscrasia

Drugs – Oral contraceptives

RETINAL VEIN OCCLUSION

Predisposing Factors

OCULAR:

Raised IOP

Hyperopia

Congenital anomaly of CRV – usually young pts

Periphlebitis – Sarcoidosis, Behcet's disease, retinal vasculitis

Trauma

RVO: Pathogenesis

- **Venous blockage----**
- **Back pressure on capillaries/ Stagnation---**
- **Hypoxia (Retinal ischemia) -----**
- **Endothelial junction dysfunction____**
- **Leakage of fluid & blood------**
  (edema / hemorrhages)
- **Severe non-perfusion leads to ischemia**

CENTRAL RENTINAL VEIN OCCLUSION

- **NON ISCHEMIC CRVO**
- **ISCHEMIC CRVO**
- **PAPILLO PHLEBITS**

CENTRAL RENTINAL VEIN OCCLUSION

NON ISCHEMIC CRVO:

Most common – 75%

- **Painless – sudden – Marcus Gunn pupil – slight**
- **Venous dilation and tortuosity – mild visual loss**
- **Retina hemorrhages (dot – blot and flame shaped) – all over – also in periphery**
- **Cotton wool spots – few**
- **Disc edema – macular edema (Mild to Moderate)**

CENTRAL RENTINAL VEIN OCCLUSION

Non-Ischemic

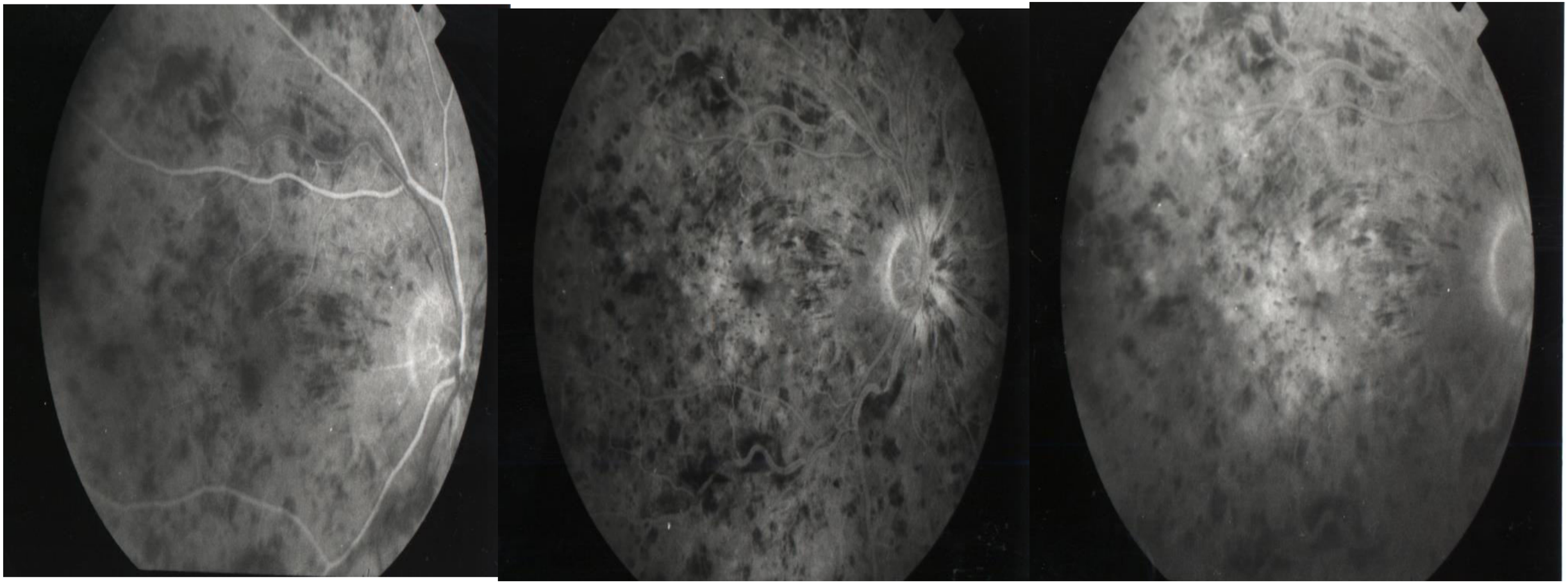
❖**Features severity:** **mild to moderate severity**

→ Hemispheric or Hemi central RVO

- **F.F.A** Retinal stasis + good capillary perfusion. (less than 10DD of capillary non perfusion)

- → Acute signs – resolves – 6 – 12 months
- →**Hard exudates, Disc collaterals + Epiretinal membrane formation + pigmentary changes at macula**

FA of non-ischemic Central Retinal Vein Occlusion



Good retinal capillary perfusion

• CENTRAL RENTINAL VEIN OCCLUSION
Non-Ischemic

COMPLICATIONS:

❖Vision decreased – macular edema

❖Conversion to ischemic CRVO

15% - 4 months,

34 %- 3 years

PROGNOSIS:

- Recovery – Normal / Near normal – 50%
- Poor vision – mainly chronic cystoid macular edema
- Initial V.A – good – better recovery

Rx: Treat the cause/risk factors, Anti VEGF, No laser to macular edema, Laser induced chorio-retinal anastomosis

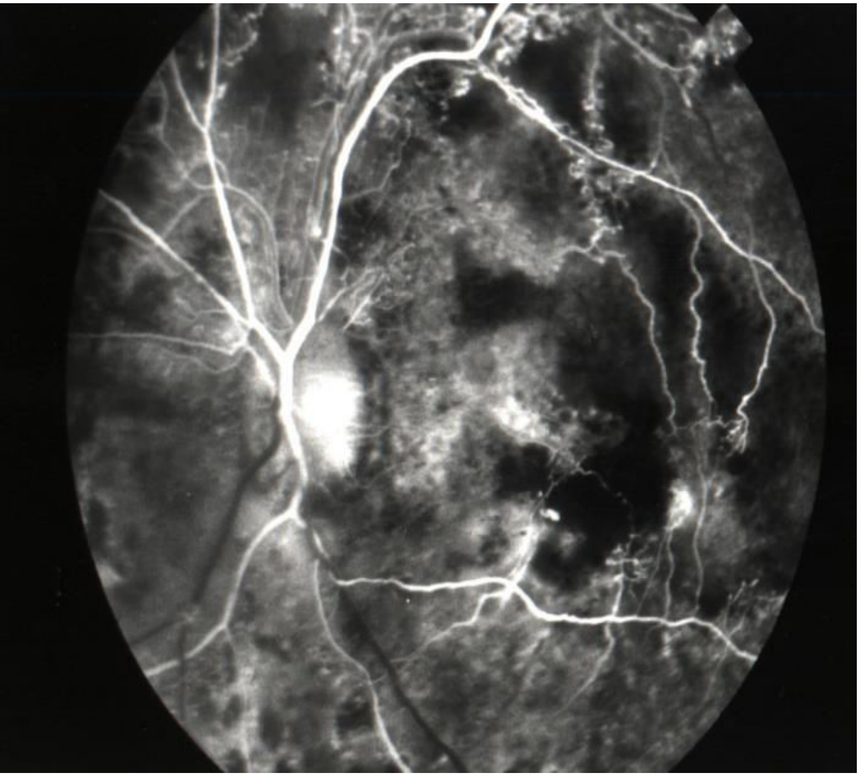
CENTRAL RENTINAL VEIN OCCLUSION

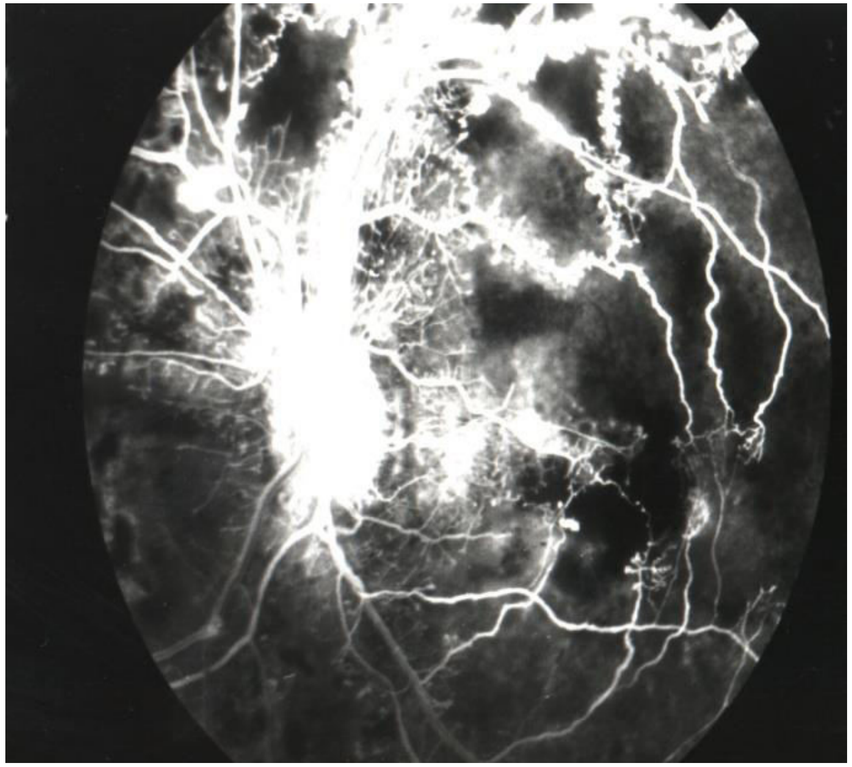
Ischemic

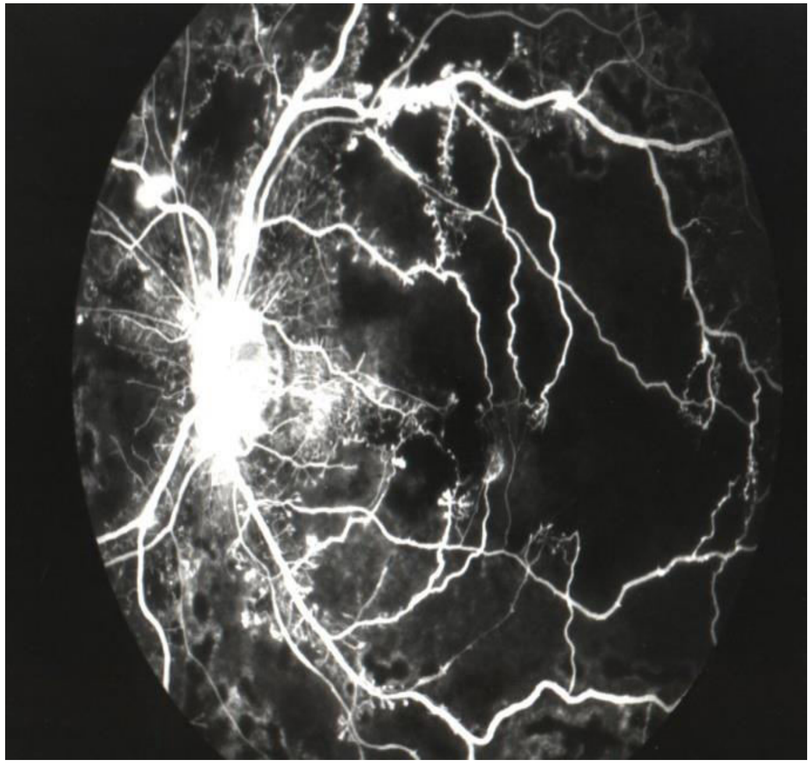
- Less common
- Severe visual loss (usually < 6/60)
- Sudden – painless

- **SIGNS:** All are Severe

FA of ischemic central retinal vein occlusion







F.F.A **Central masking of retinal vascular bed – by hemorrhages + Extensive capillary non perfusion > 10 Disc diam**

CENTRAL RENTINAL VEIN OCCLUSION

Ischemic

Complications:

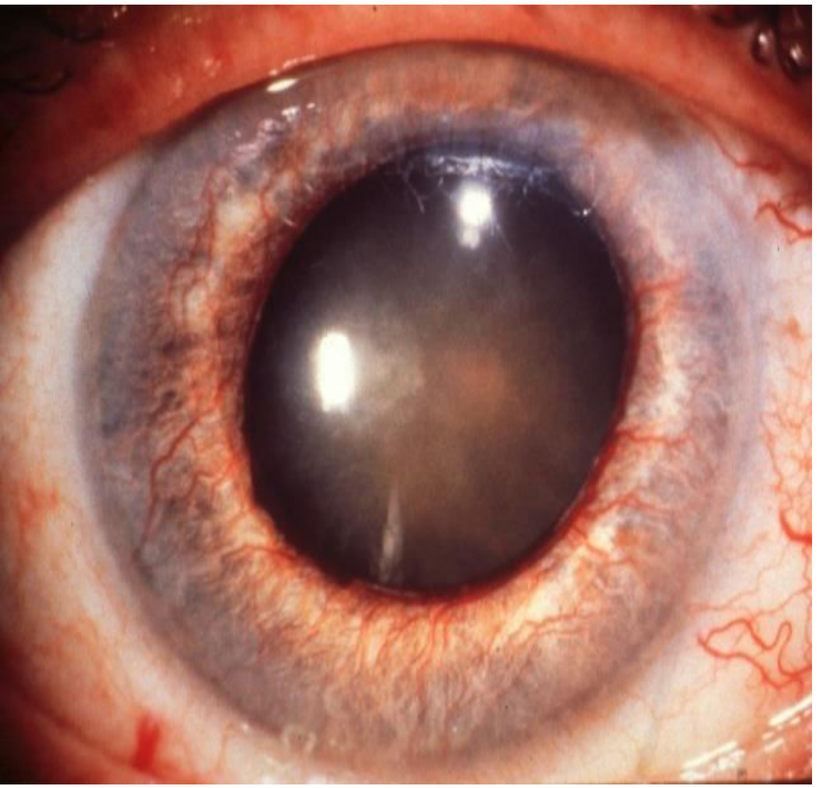
- Macular ischemia – Visual compromise (Permanent)
  (Macular edema, Ischemic maculopathy)

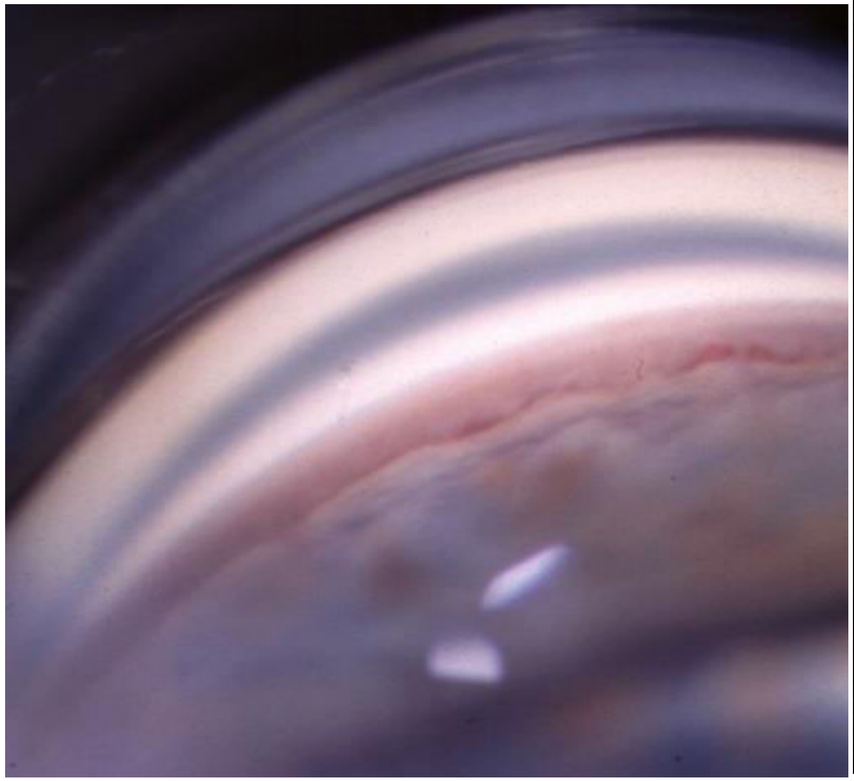
- Rubeosis 50% - **90/100 day glaucoma** – NVG

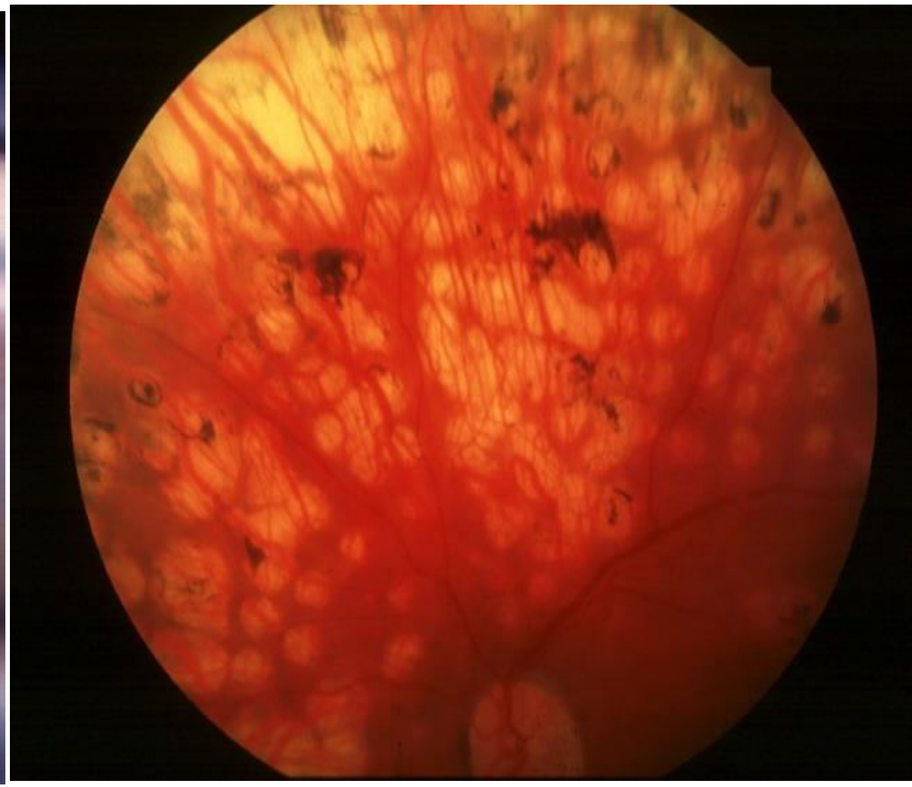
- **15% NVE / NVD**, Vitreous haemorrhage, Tractional R/D.

Ischemic central retinal vein occlusion:

Management: Anti VEGF / PRP Laser







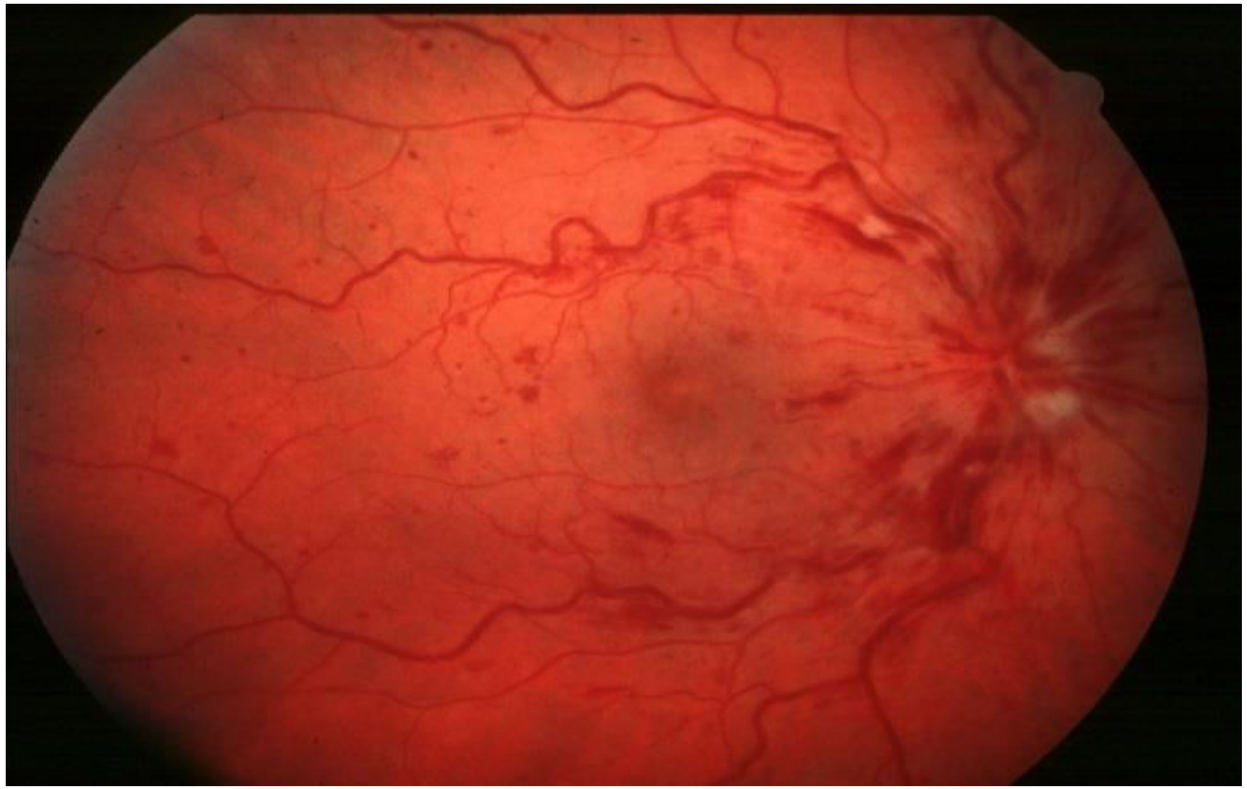
- Check every month for 6 months
- Look for rubeosis and angle new vessels

Treat neovascularization by panretinal photocoagulation

CRVO: Papillophlebitis

Uncommon – young adult Optic disc vasculitis / CRVO in young.

Affects healthy patients < 50 years



Mild blurring – worse in morning

- **VA – slight decrease**
- **RAPD - absent**
- **Venous tortuosity and dilatation**
- **Variable cotton-wool spots and haemorrhages**
- **Severe disc edema**
- **Very good prognosis in 80% (6/12 and better)**

CRVO: Treatment options

- Lasers
- Steroids
- Thrombolytic therapy
- Surgical Options

- Anti-VEGF

- Combination therapy

TREATMENT OPTIONS

- Anti-VEGF: Lucentis (Ranibizumab),

Avastin (Bevacizumab), Eylea (Aflibercept)

- **Ozerdex (Dexamethasone implant)**
- **Flucinolone acetate implant**
- **IVTA: Intra-Vitreal Triamcinolone**
- **Lasers**

- **Optic nerve sheathotomy / Neurotomy with PPV (Non-ischemic CRVO, ? Ischemic CRVO).**

- **PPV with cannulation & infusion of tPA in Non-ischemic CRVO.**

CRVO:TREATMENT OPTIONS

- LASERS:
  - (CVOS)
    - **Grid Laser reduced macular edema but no effect on vision**
    - **PRP (Angle/rubeosis/NVD/NVE)**
    - **Prophylactic PRP (Poor Compliance)**

Steroids

- **SCORE study: (Standard Care vs Corticosteriods for REtinal VO study)**

Observation vs 1mg IVTA vs 4mg IVTA (4mnthly)..

(BCVA gain of 15 letters or more…12 mnths)……. 7% vs 27% vs 26%

- **GENEVA Trial** (Global Evaluation of implaNtable dExamethasone in RVO with macular edemA):

  0.7mg vs 0.35mg dexamethasone implant vs sham.

  41% vs 40% vs 23% .. 15 letters improvement…. 90th day

  (Efficacy not sustained …… 180th day)

Ip MS et al. A randomized trial comparing the efficacy & safety of IVTA with observation to treat vision loss associated with ME secondary to CRVO:the Standard care vs Corticosteriods for RVO(SCORE) study report 5. Arch Ophthalmol 2009;127

Haller JA et al. Dexamethosone intravitreal implant in patients with ME related to BRV or CRVO 12 months study results.Ophthalmology2011;118

Treating CRVO: Anti-VEGF Ranibizumab

CRUISE study (Central R V occlUsIon Study: Evaluation of efficacy and safety).

Ranibizumab

HORIZON STUDY: Extension trial of CRUISE study (87% CRUISE patients) … **0.5mg** Ranibizumab (PRN)

RETAIN study (Ranibizumab 0.5mg)

- **Extension trial of Horizon {32 eyes (10.5%) of CRVO}**

Good <250 microns / Partial <10 % / Poor responders <1%
(Early AntiVEGF better outcome)

- **Brown Dm et al. Ranibizumab for ME following CRVO: 6mnths primary endpoint results of a phase III study. Ophthalmology 2010;117**
- **Heier JS et al. Ranibizumab for ME following CRVO: long term followupg in HORIZON trial. Ophthalmology 2012;119**

Treating CRVO: Anti-VEGF (VEGF Trap-Eye)

COPERNICUS Trial:

Ischemic & non ischemic / APD/duration 9mnths

Gain of 15 letters or more (2yr)

56% (treated) vs 12% (observed) / Decrease 457u vs 145u

GALILEO Trial (General Assesment Limiting InfiLtration of Exudates in CRVO with VEGF Trap-Eye:

60% (treated) vs 22% (sham) / Decrease 449u vs 169u

Boyer D et al. VEGF Trap-Eye for ME secondary to CRVO: 6mnth results of phase 3 COPERNICUS study. Ophthalmology 2012;119

Holz FG et al. VEGF Trap-Eye for ME secondary to CRVO: 6mnth results of phase 3 GALILEO. Br J Ophthalmol 2013; 97

Treating CRVO: Anti-VEGF (Bevacizumab)

- **Systemic associations**

  HTN (47%)

  DM = (23.5%)

Good Visual outcome = 58.8%

Stable Visual outcome= 41.2%

Mean BCVA (Initial)= 1.79 SD 0.87

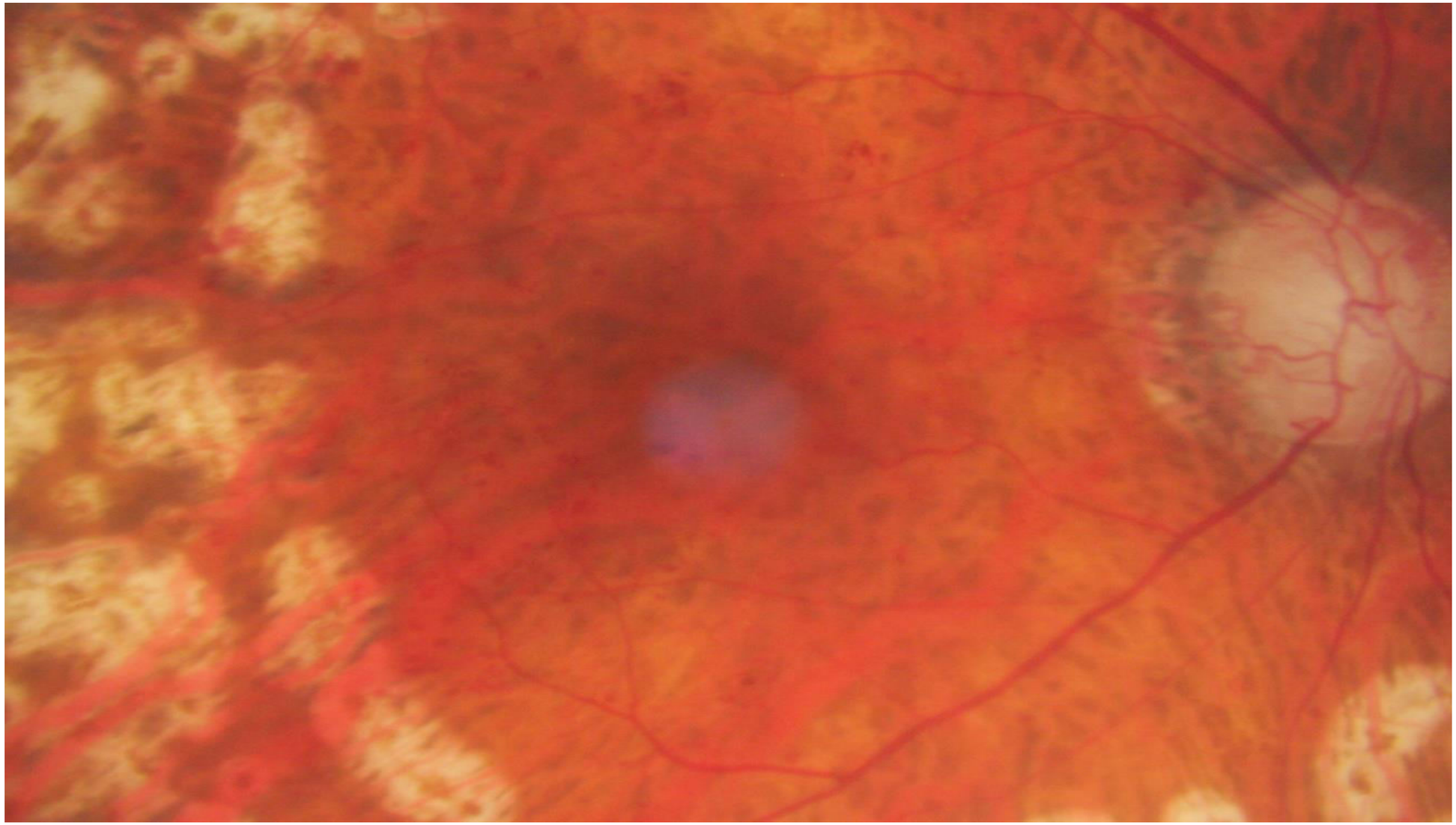
Mean BCVA (Final)= 1.18 SD 0.77

Mean Improvement = 0.63 SD 0.84 (P-value 0.008)

Jan S et al. Anti VEGF (Bevacizumab) in CRVO: An interventional case series. Pak J Med Research 2010; 49 (2):39-43

Treating CRVO: Anti-VEGF

Disc Collaterals



On the mountains of truth you can never climb in vain: either you will reach a point higher up today or you will be training your powers so that you will be able to climb higher tomorrow
“Friedrich Nietzsche”

BRANCH RETINAL VEIN OCCLUSION

- 6th – 7th decade
- Sudden onset – usually blurred vision
- Meta-morphosia
- Peripheral – occlusion – occasionally – No visual effects

Nasal BRVO may be asymptomatic

Mahsood YJ, Nazim M**, Sanaullah Jan**. **Comparison of visual outcome after intravitreal bevacizumab with standard and alone management protocol in branch retinal vein occlusion. Ophthalmology Update.** January-March 2016; 14 (1): 27-32.

Branch retinal vein occlusion (BRVO)

Signs of acute BRVO

- Most common Supero temporal
- Venous tortuosity and dilatation
- Retinal Edema
- Flame-shaped and ‘dot-blot’ haemorrhages
- Cotton-wool spots and retinal oedema

All in part of retina drained by affected vein

Branch retinal vein occlusion (BRVO)

LATER ON:

Hemorrhages start resolving --- Hard exudates start forming

OLD OCCLUSION:

- Vascular sheathing – Collaterals - Hard exudates
- Cholesterol crystals deposition may be present
- RPE degeneration at macula

Initially V.A decrease – hemorrhage / macular edema

Risk of CRVO/ BRVO in 2nd eye – 10%

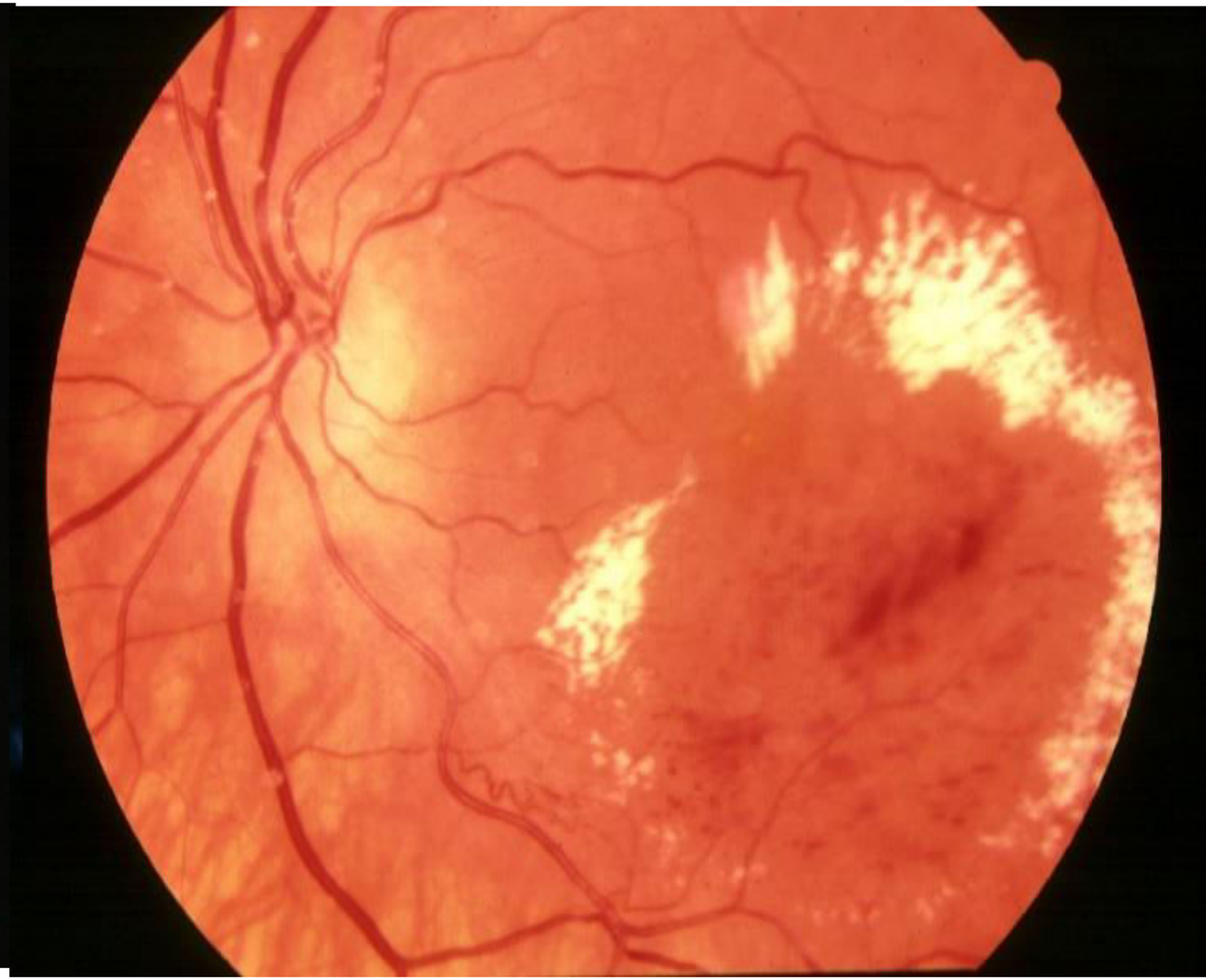
COMPLICATIONS: Chronic macular edema, Upto 60% of BRVO-Neovascularization

May Present with floaters & defective vision

With 6 months – 50% eyes develop collaterals with return of V.A to 6/12 or better

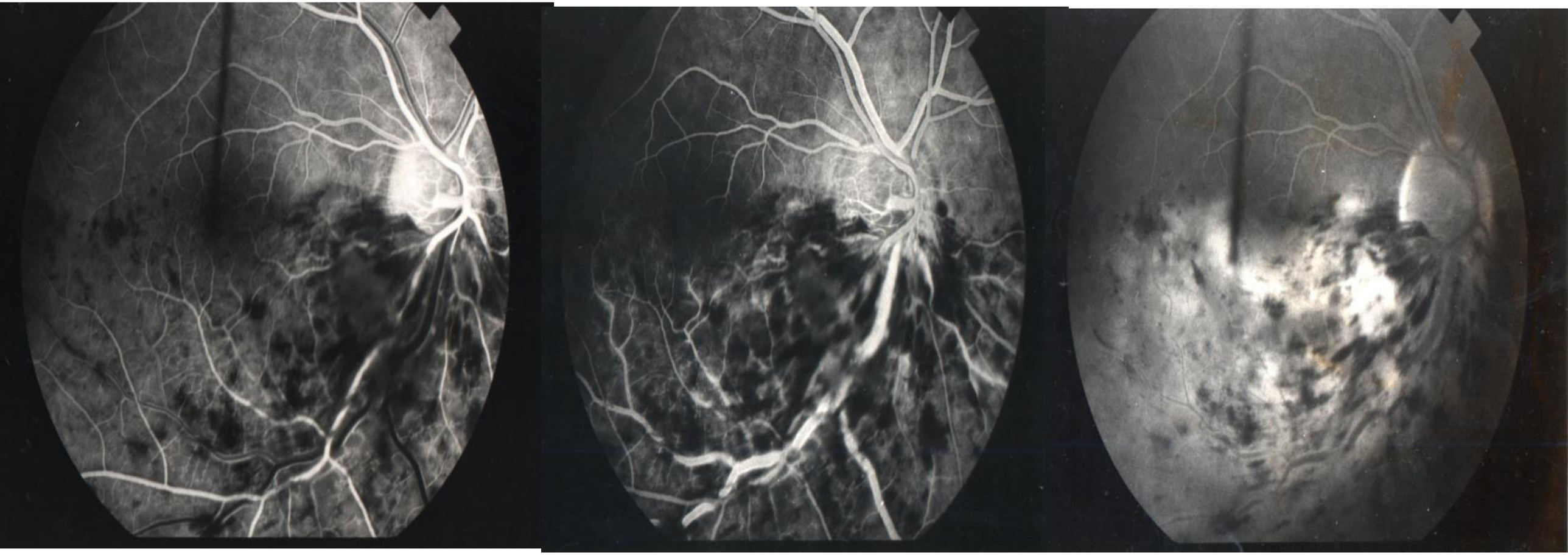
Signs of old branch retinal vein occlusion

Vascular sheathing and collaterals



Hard exudates

FA of branch retinal vein occlusion



Early - blocked background fluorescence due to haemorrhage

Late – hyperflurorescence due to diffuse edema

Branch retinal vein occlusion

CHRONIC MACULAR EDEMA:

Most common cause of persistent V.A decrease after BRVO

Now standard treatment is Anti VEGF

B V O Study

→ Wait for 6 – 12 wks F.F.A

→ If macular non-perfusion – No Rx.

→ If macular edema with VA 6/12 or worse at 3mnths

→ Grid laser / laser leaking areas

→ Don’t Rx collaterals.

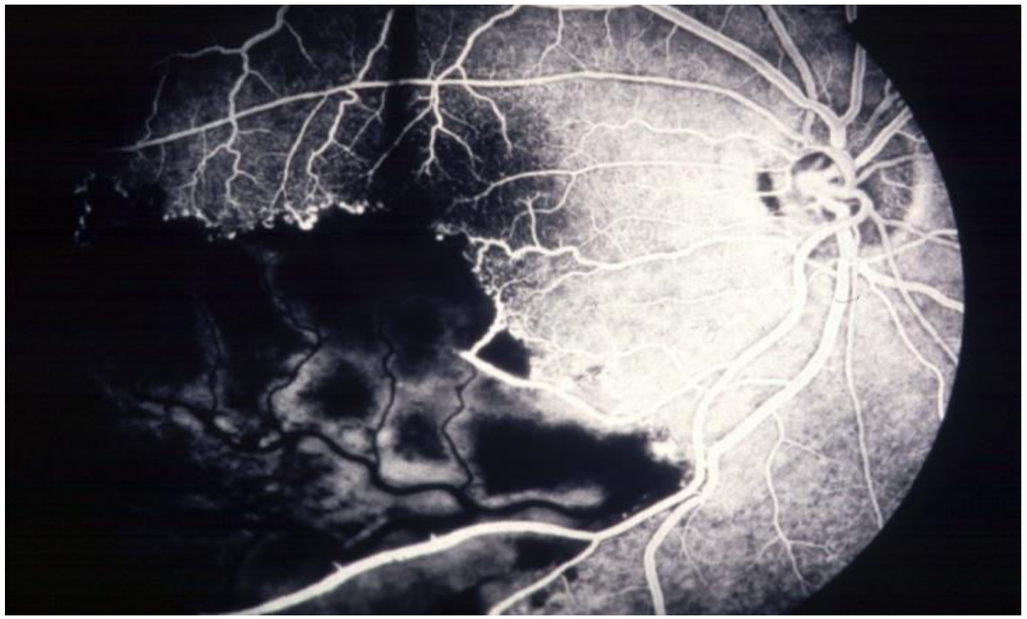
Follow up after 3mnths – if macular edema persists – Re Rx.

Management of chronic macular oedema

- **BVOS**

•Most common cause of persistent poor VA

- **Wait 6-12 weeks and perform FA**



Macular non-perfusion - no treatment

Good macular perfusion and VA 6/18 or worse after 3 months - consider laser photocoagulation

NEOVASCULARIZATION: NVD/NVE 30-50%

ISCHEMIC BRVO: > 5 disc diam non-perfusion

NON-ISCHEMIC BRVO: < 5 disc diam non-perfusion

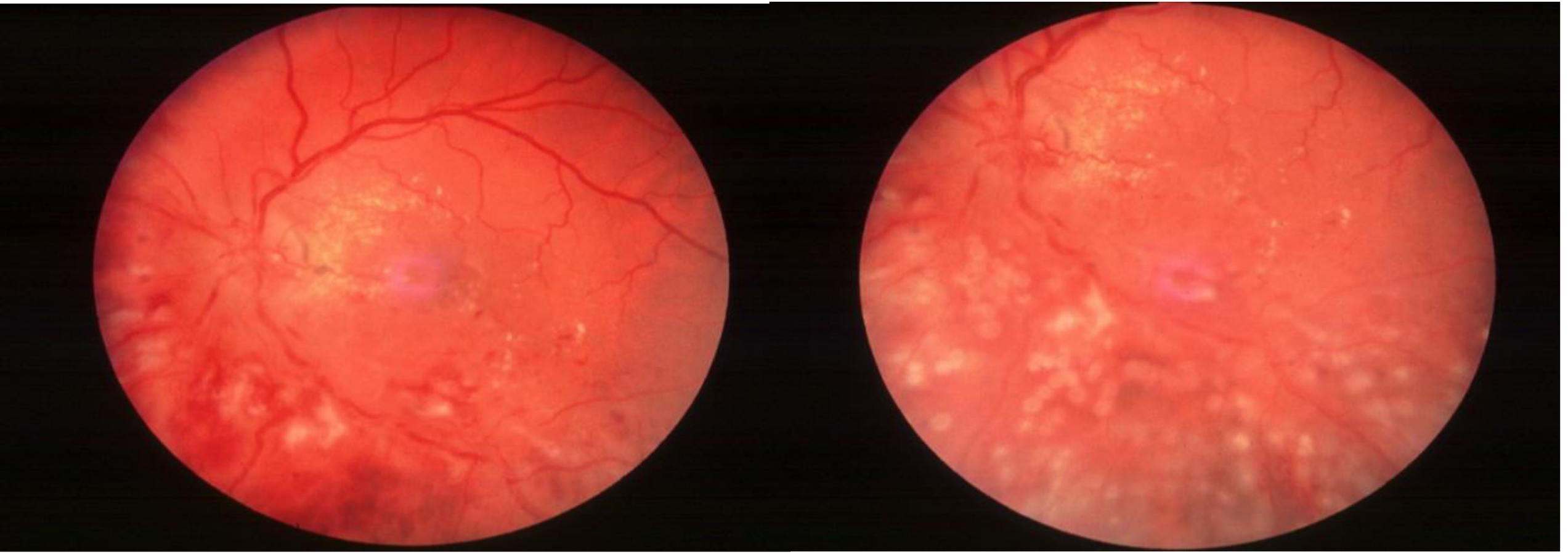
NVD – Eye with extensive non-perfused area

Neo-vessels – usually during initial 6-12months but any time with in first 3 years

F.F.A Ischemic BRVO – 4 monthly follow up

If NVD, NVE, Rubeosis :
Argon laser to affected segment / Anti VEGF.

Management of neovascularization



- Occurs in about 30-50% of eyes
- Most frequently after 6-12 months

- Perform laser photocoagulation to involved segment

TREATMENT OPTIONS

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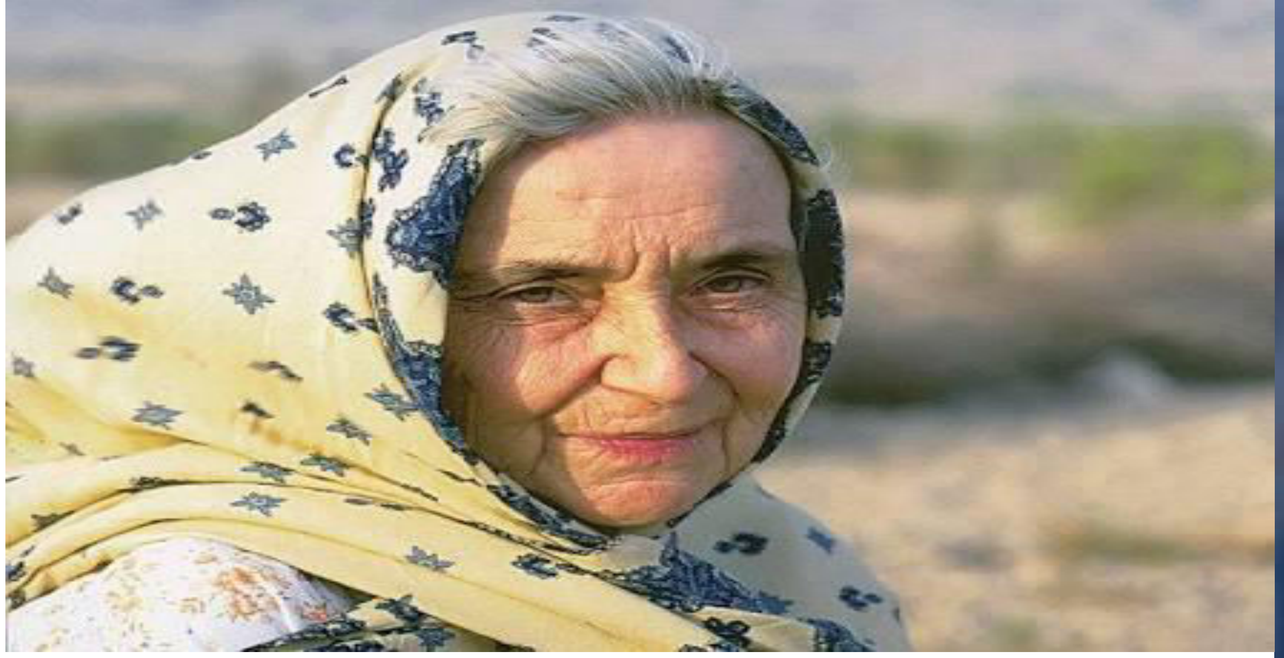

Thanks