

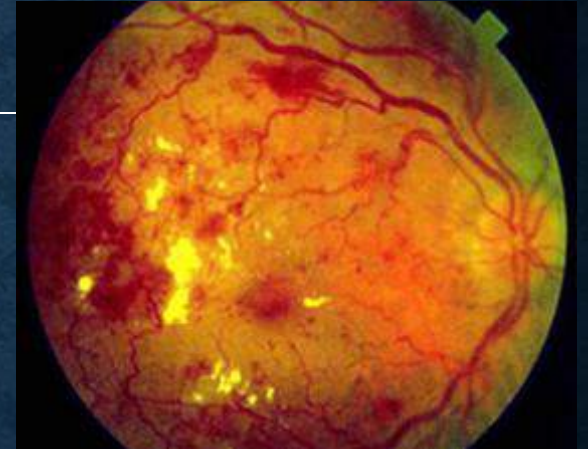
SYSTEMIC DISEASES AND DRUGS AFFECTING EYE



Presented by

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Registrar (DO,MCPS)



Department of Ophthalmology



INTRODUCTION

- The eyes are frequently involved in disease affecting the rest of the body.
- Ocular manifestations in certain multisystem disorders may offer a diagnostic clue.
- Sometime the eye involvement may be subtle enough to avoid detection unless the clinicians know to look for it.

SYSTEMIC DISEASES AFFECTING EYE ...

- Diabetes Mellitus
- Hypertension
- Tuberculosis
- Thyroid dysfunction
- Cranial Nerve Palsy
- Demyelinating disease
- Leukaemia
- SLE
- Sarcoidosis
- Toxoplasmosis

DRUGS AFFECTING EYE

- Steroid
- Anti TB
- Chlorpromazine
- Tamoxifen
- Topiramate
- Hydroxychloroquine

DIABETES MELLITUS

- Can lead to several ocular complications such as diabetic retinopathy, cataract, multiple cranial nerve palsy, glaucoma
- **Diabetic Retinopathy(DR)** is a chronic progressive sight threatening disorder of retinal vasculature (micro vascular angiopathy)
- A common complication of DM associated with prolonged hyperglycemia and other condition linked with Diabetes such as Hypertension, CKD & Dyslipidaemia

PREVALANCE

- In 2024, one in nine adults worldwide was living with diabetes. The number of adults with diabetes in 2024 exceeded 500 million and is projected to rise to close to 900 million by 2050
- Diabetic retinopathy is a leading cause of irreversible blindness and vision loss worldwide, particularly affecting working-age adults
- Over 1 in 3 people living with diabetes will develop some form of vision loss during their lifetime

Lancet Diabetes Endocrinol

. 2026 Feb;14(2):149-156.

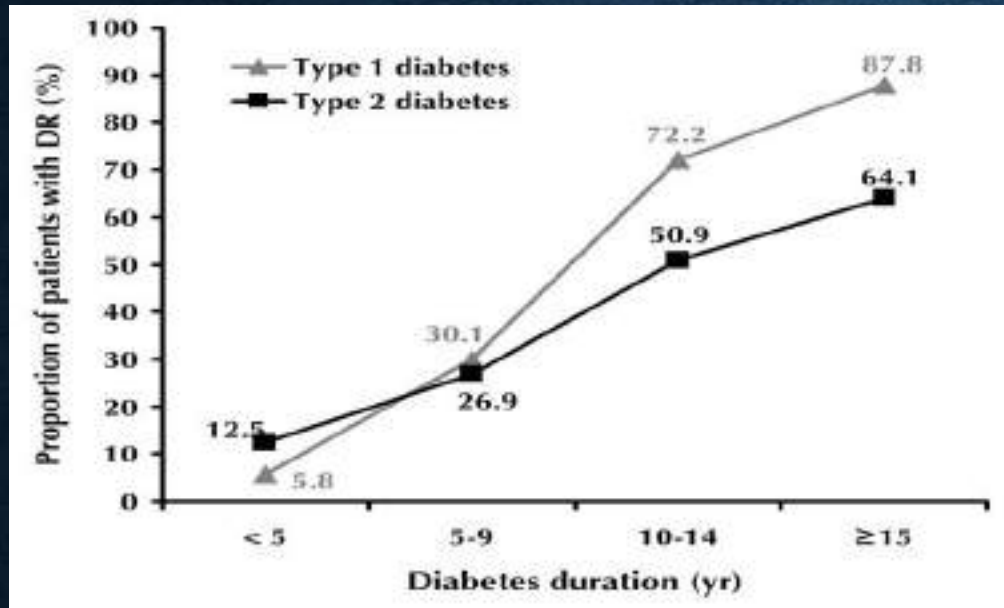
doi: 10.1016/S2213-8587(25)00299-2. Epub 2025 Dec 15.

11th edition of the IDF Diabetes Atlas: global, regional, and national diabetes prevalence estimates for 2024 and projections for 2050

Diabetes Obes Metab

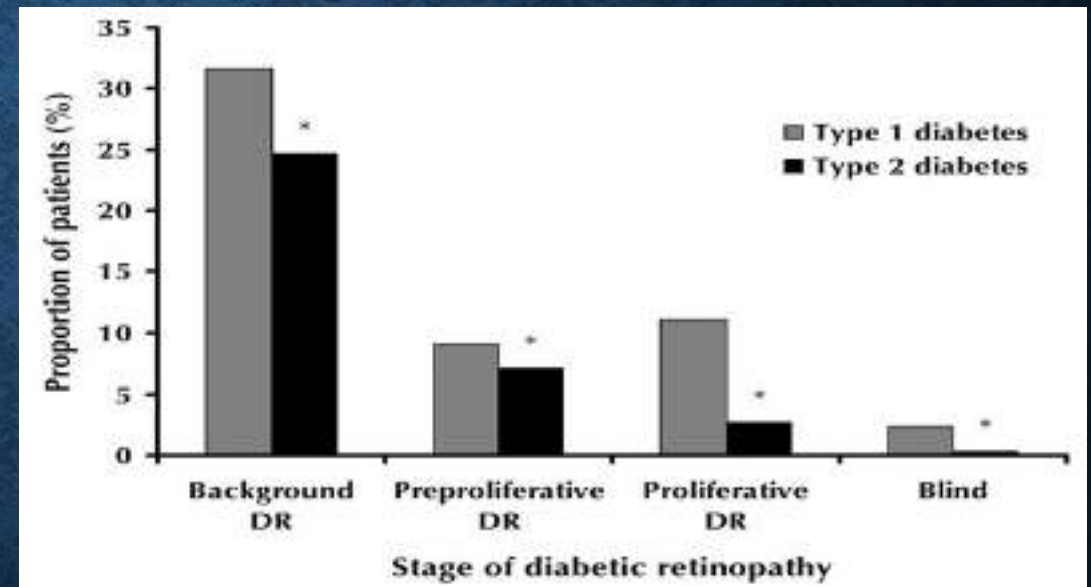
. 2025 Jul 22;27(10):5464–5477. doi: [10.1111/dom.16589](https://doi.org/10.1111/dom.16589)

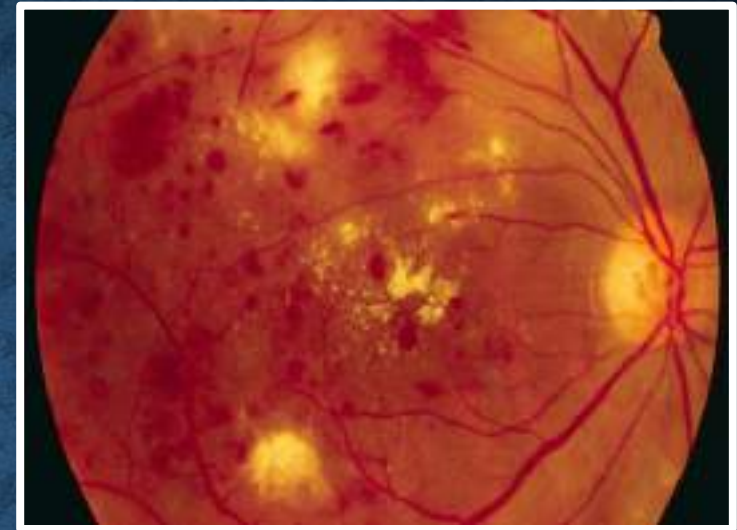
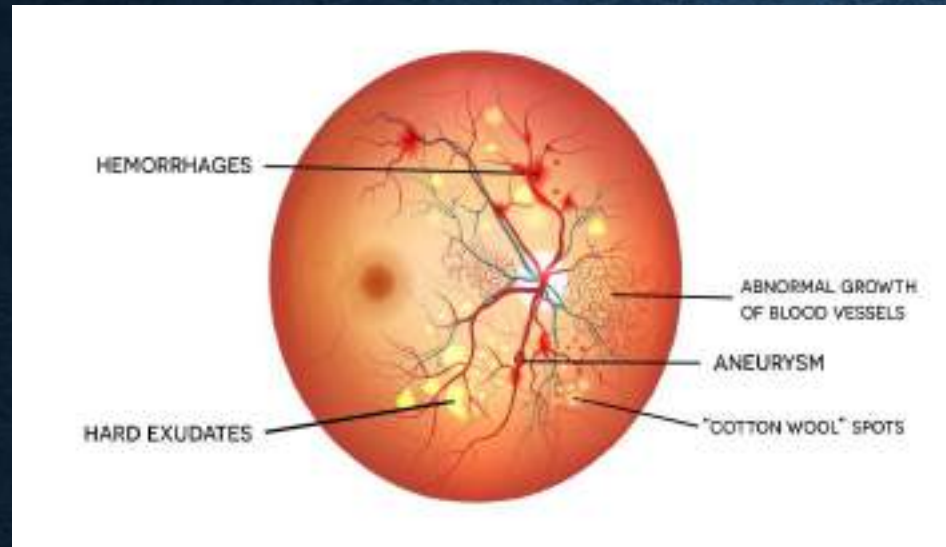
Global, regional and national burden of blindness and vision loss attributable to diabetic retinopathy, 1990–2021: A systematic analysis for the Global Burden of Disease Study 2021
Eye complications, such as diabetic retinopathy, can affect people living with diabetes. These complications cause vision loss, which can lead to blindness. Over 1 in 3 people with diabetes will develop some form of vision loss during their lifetime.



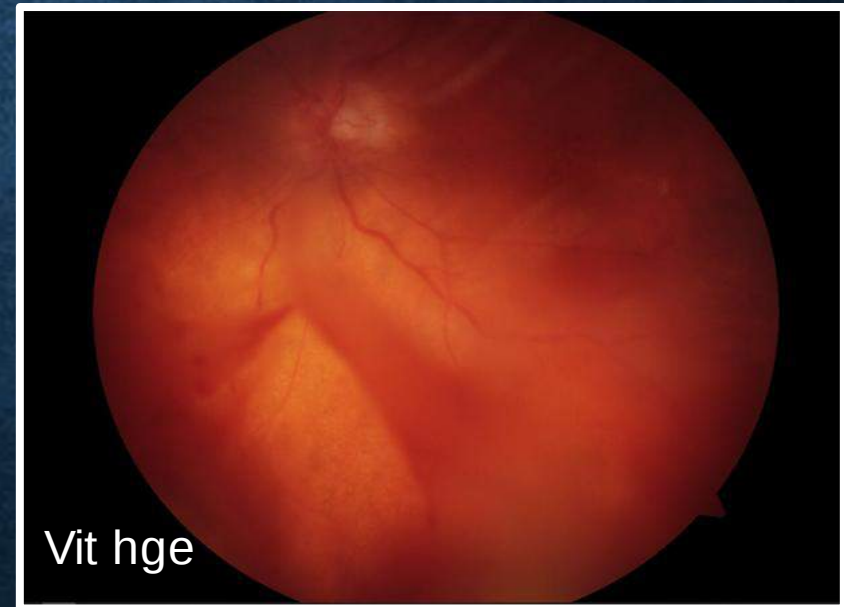
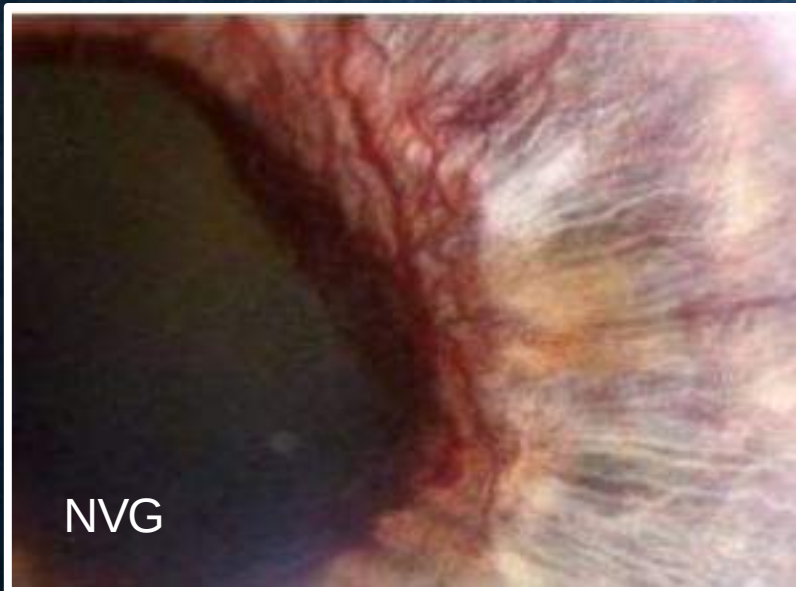
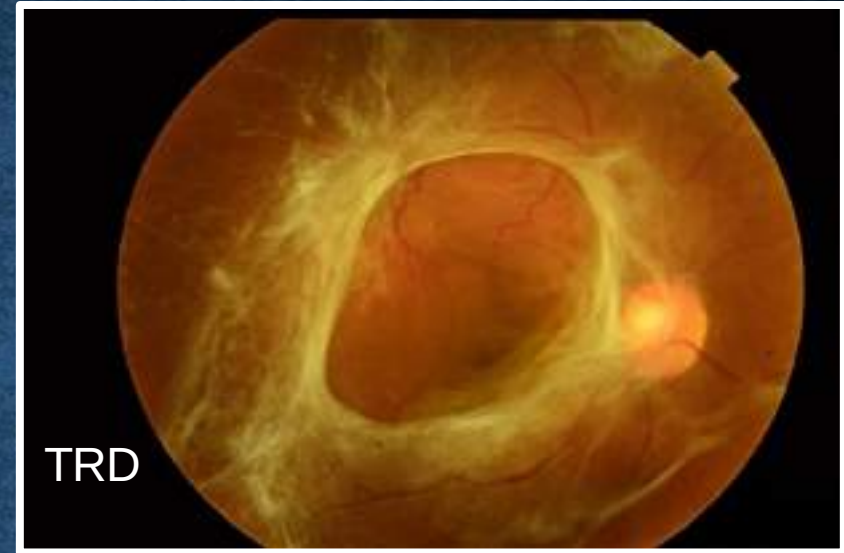
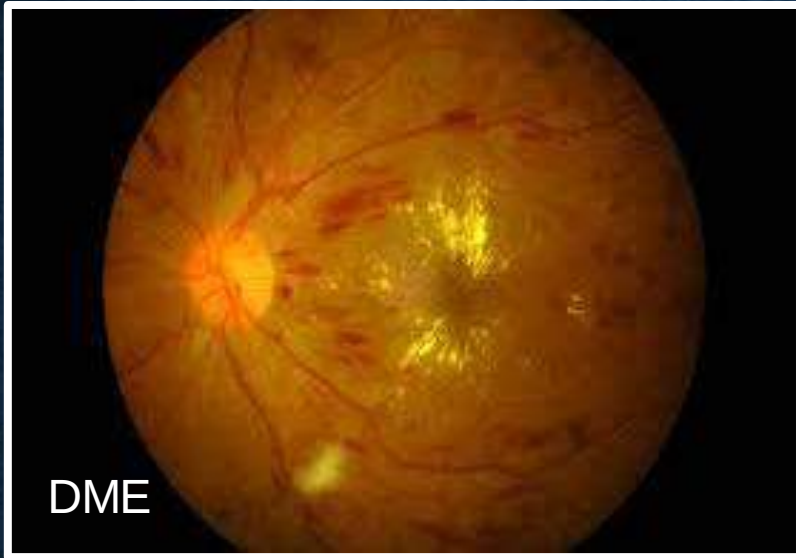
Prevalence of diabetic retinopathy according to diabetes type and duration.

Prevalence of stages of diabetic retinopathy in diabetes patients by diabetes type. * $p < 0.001$.

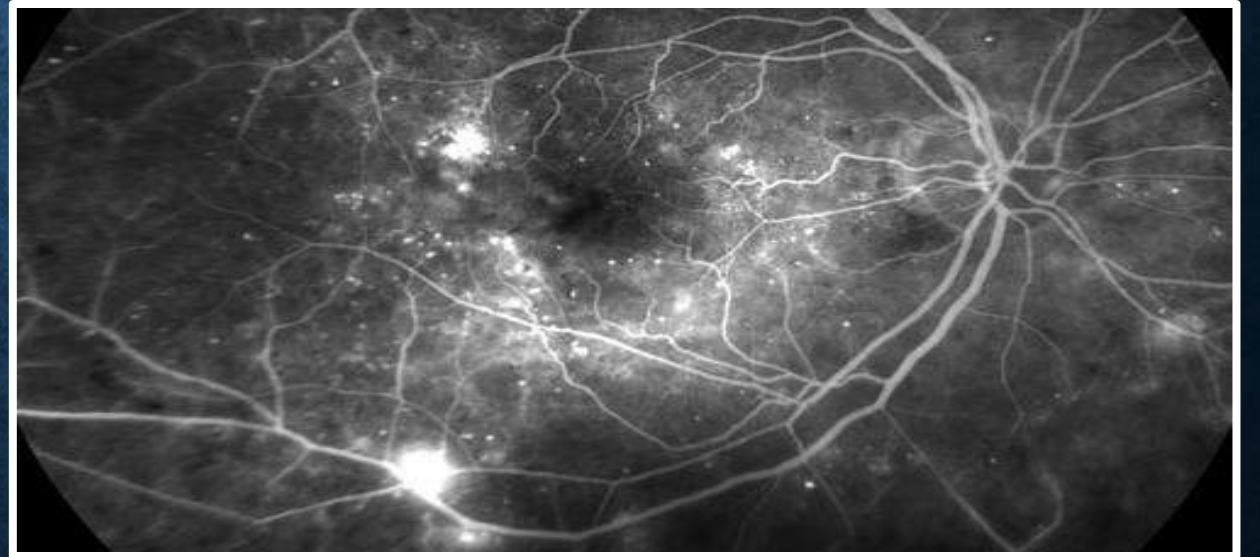
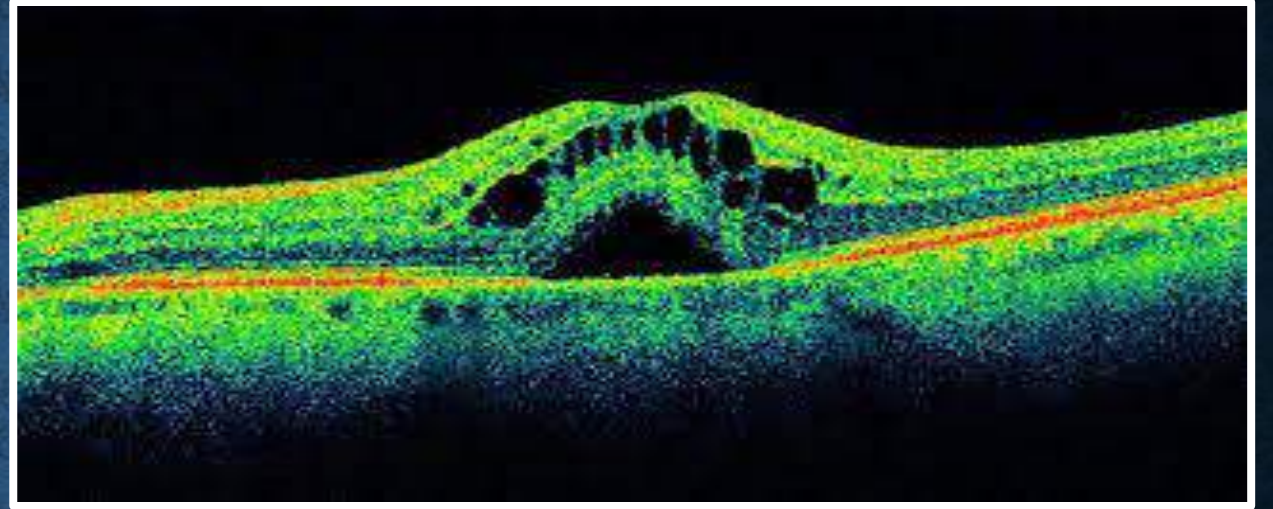
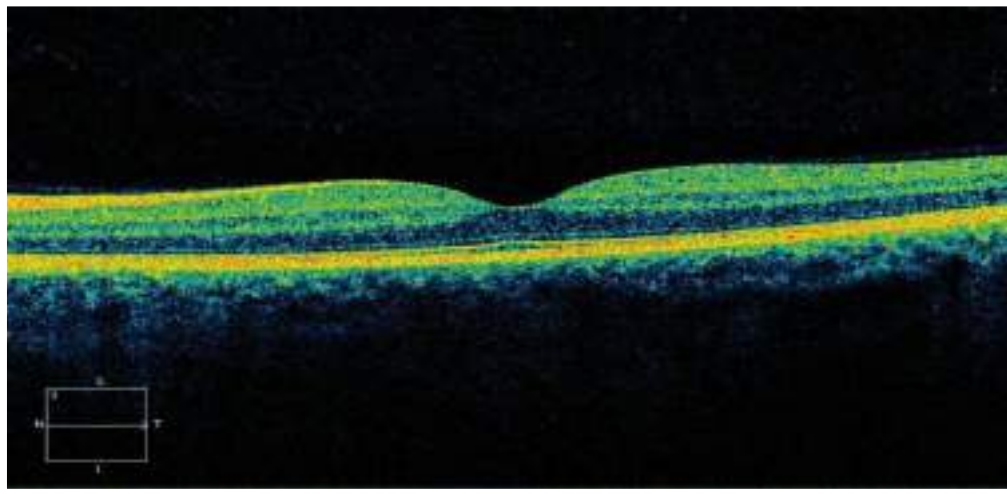




Diabetic Retinopathy



Vision threatening complications of DM



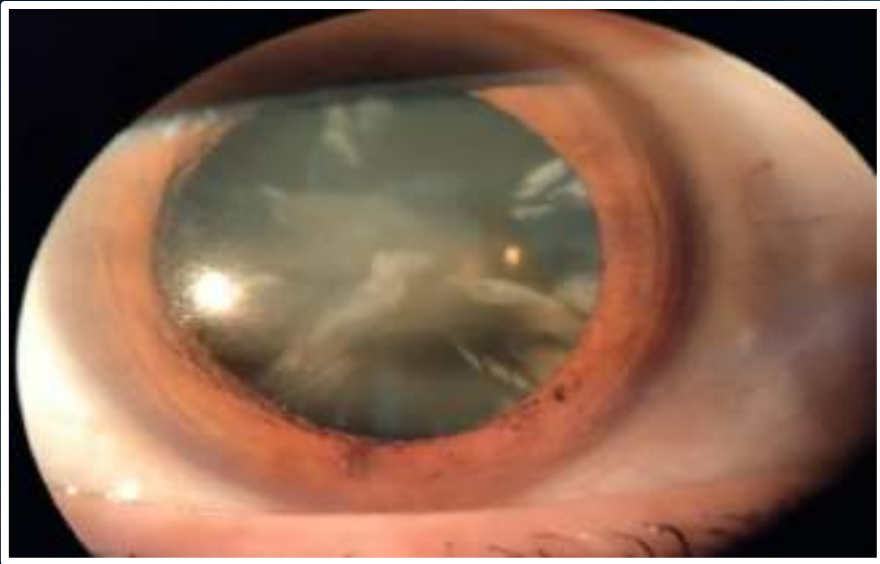
Normal OCT & FFA

Macular edema

ETDRS CLASSIFICATION AND FOLLOW UP OF DIABETIC PATIENTS

Retinal findings	Follow up
No DR	Annually
Very mild NPDR	Annually
Mild NPDR	6-12 months
Moderate NPDR	6 months
Severe NPDR	4 months
Very severe NPDR	2-3 months
PDR	Upto 2 months

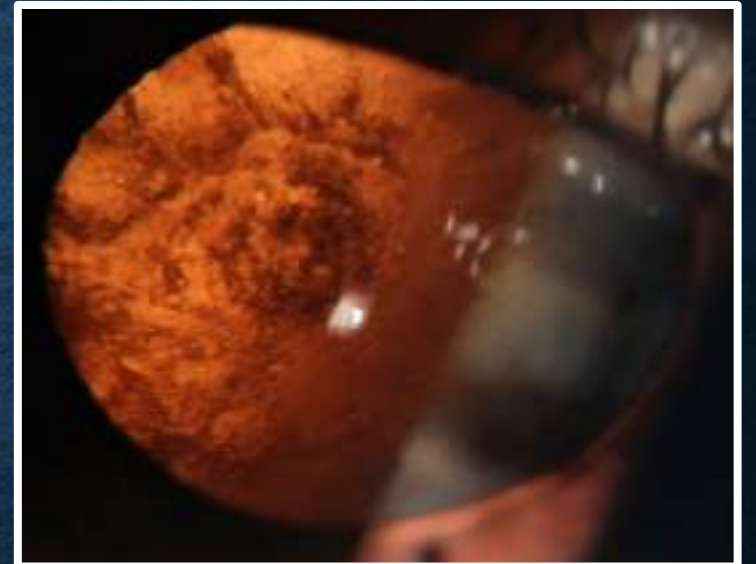
CATARACT IN DIABETES MELLITUS



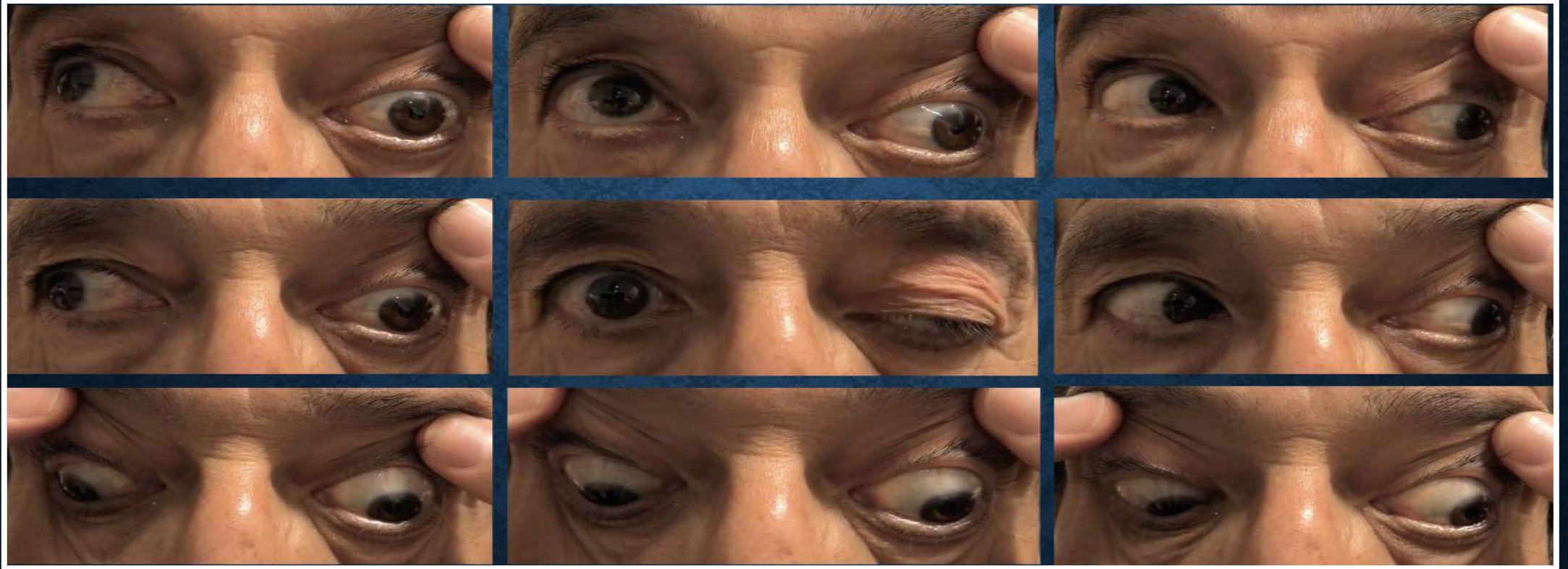
Cortical cataract



Posterior subcapsular cataract



3RD CRANIAL NERVE PALSY (THE OCULOMOTOR NERVE)



HYPERTENSION AND DYSLIPIDAEMIA

- Hypertensive Retinopathy
- Xanthelesma
- CRAO
- CRVO
- BRVO
- Arcus senilis

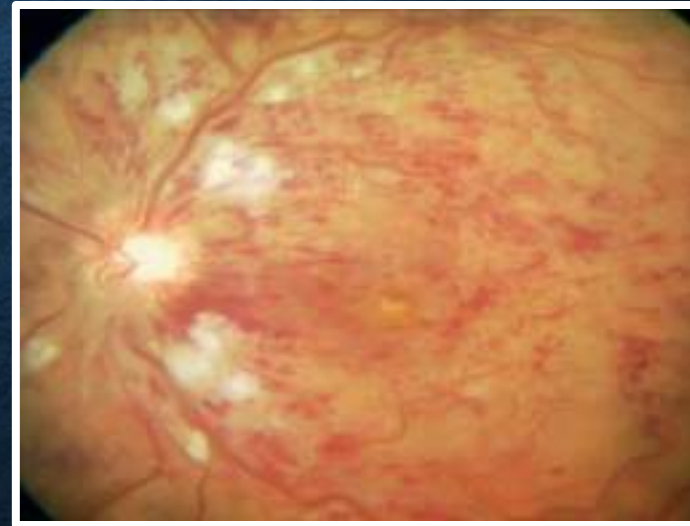
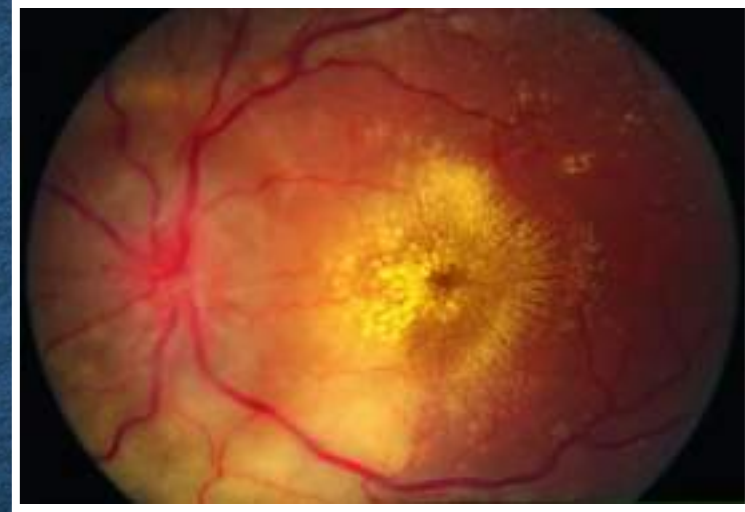
HYPERTENSIVE RETINOPATHY

- Hypertensive retinopathy consists of a series of retinal microvascular signs ...
 - Retinal arteriolar narrowing
 - Arterio-venous nicking
 - Retinal haemorrhages
 - Microaneurysms/soft exudates



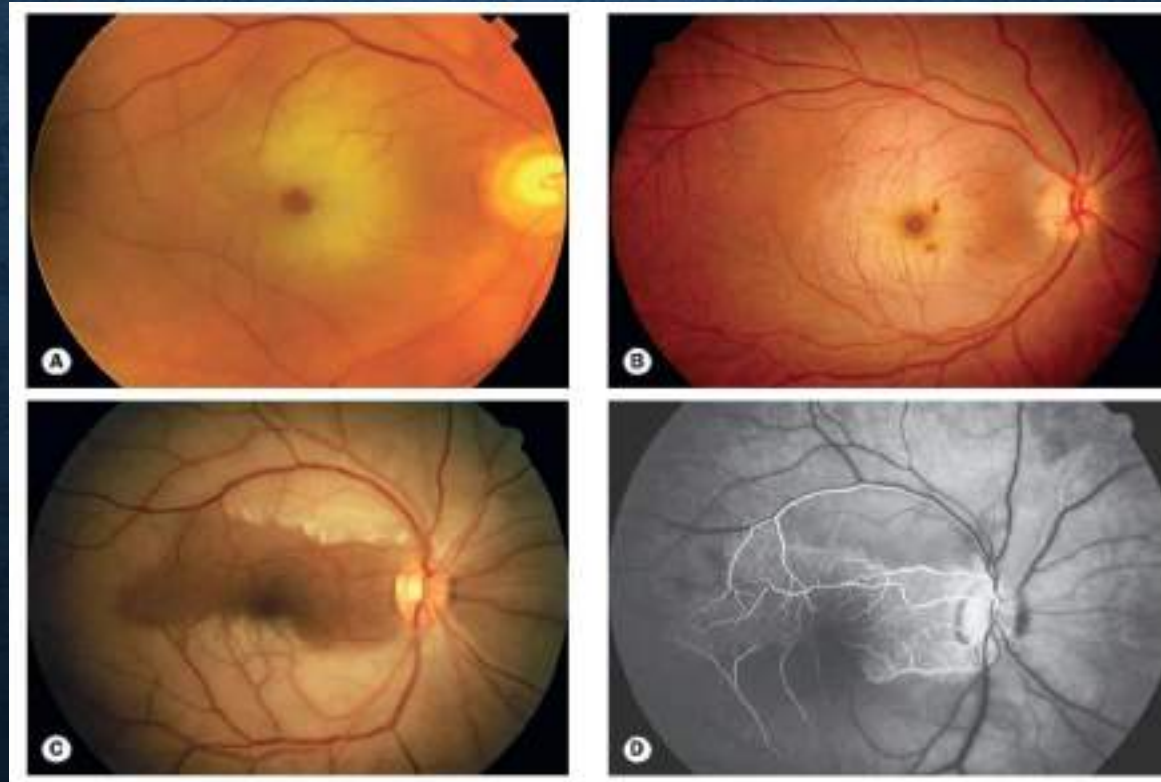
HYPERTENSIVE RETINOPATHY

- Papilloedema and macular oedema, (in severe cases).
- BRVO and CRVO appear as a complications of hypertensive retinopathy



CENTRAL RETINAL ARTERY OCCLUSION

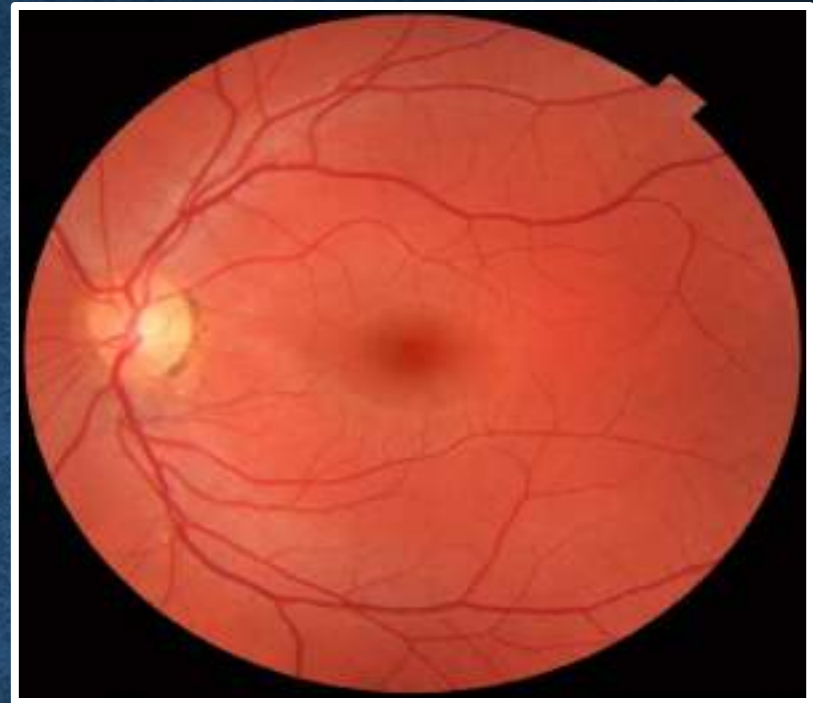
Happens as a complication of hypertension, dyslipidaemia & thromboembolic disorder.

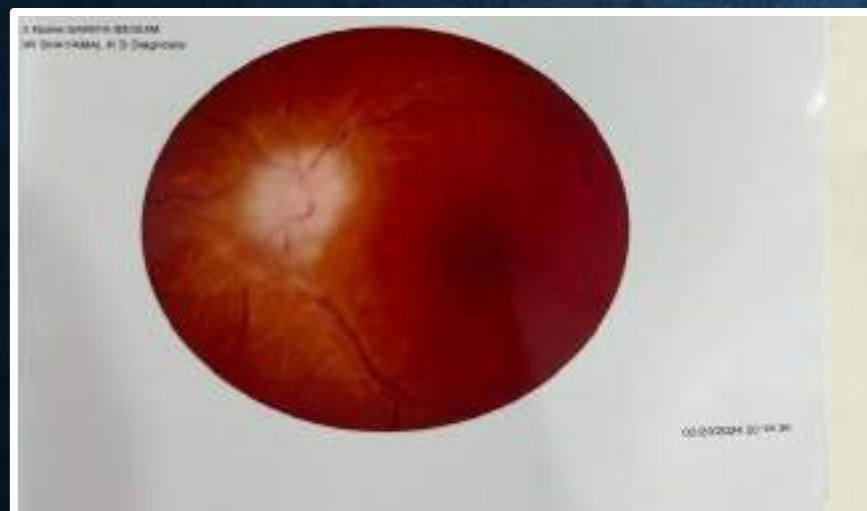
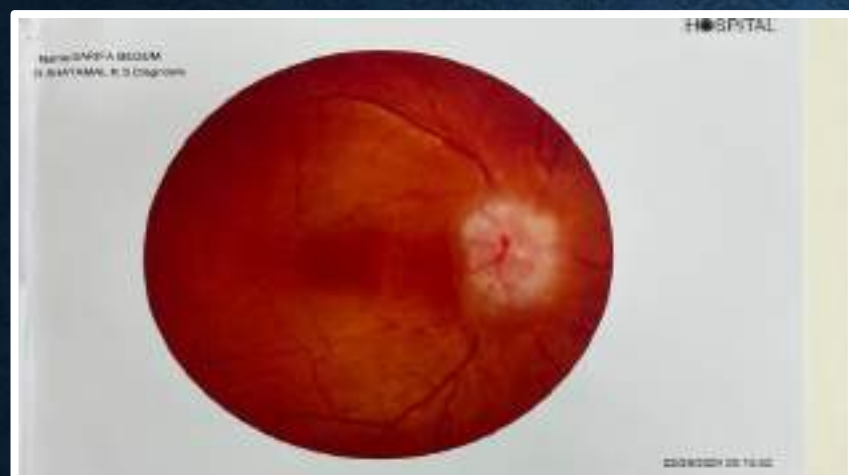


PAPILLEDEMA

Papilledema is passive swelling of optic disc secondary to.....

- Elevated intracranial pressure
- ICSOL
- Meningitis



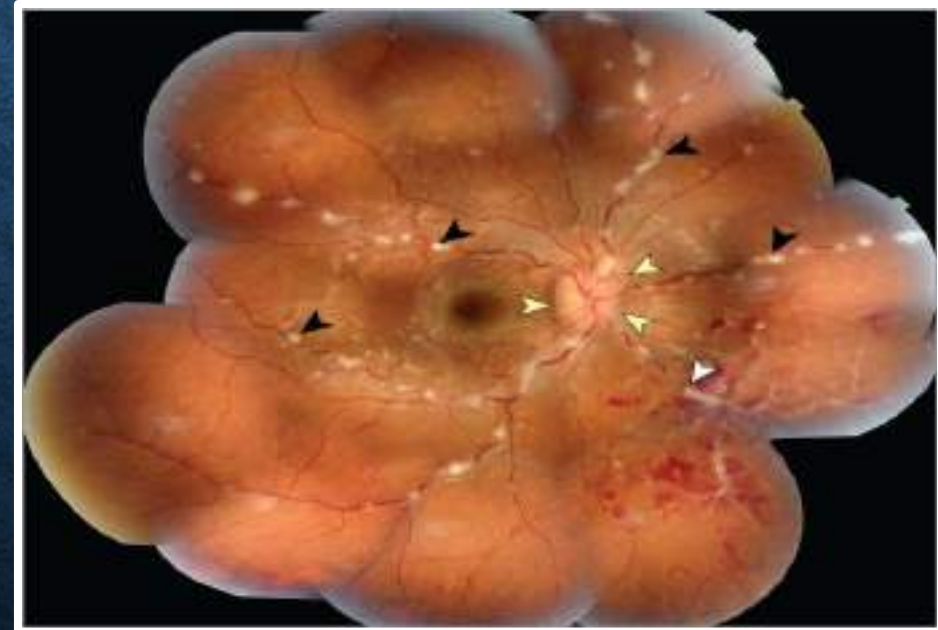
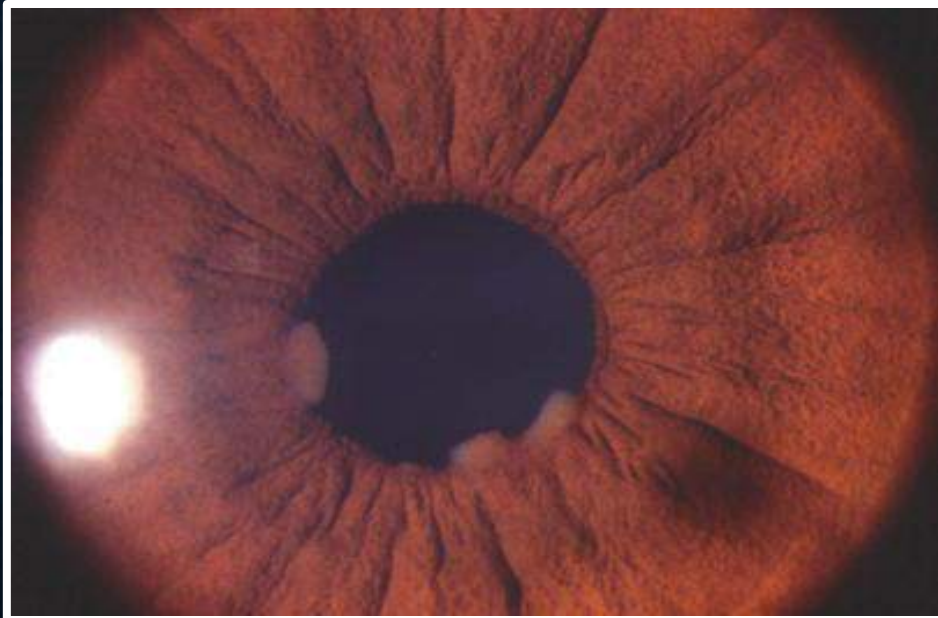
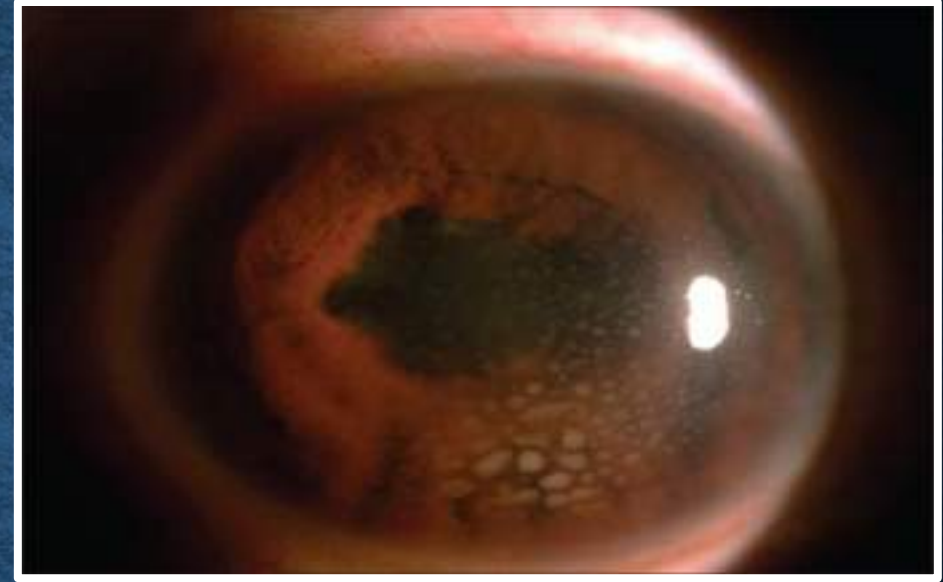


SARCOIDOSIS

- Sarcoidosis is one of the leading causes of inflammatory eye disease
- Ocular involvement in 20–30% of patients
- Can involve any part of the eye and its adnexal tissues
- Episcleritis/scleritis, eyelid abnormalities, conjunctival granuloma, nerve palsies, optic neuropathy, lacrimal gland enlargement and orbital inflammation

SARCOIDOSIS

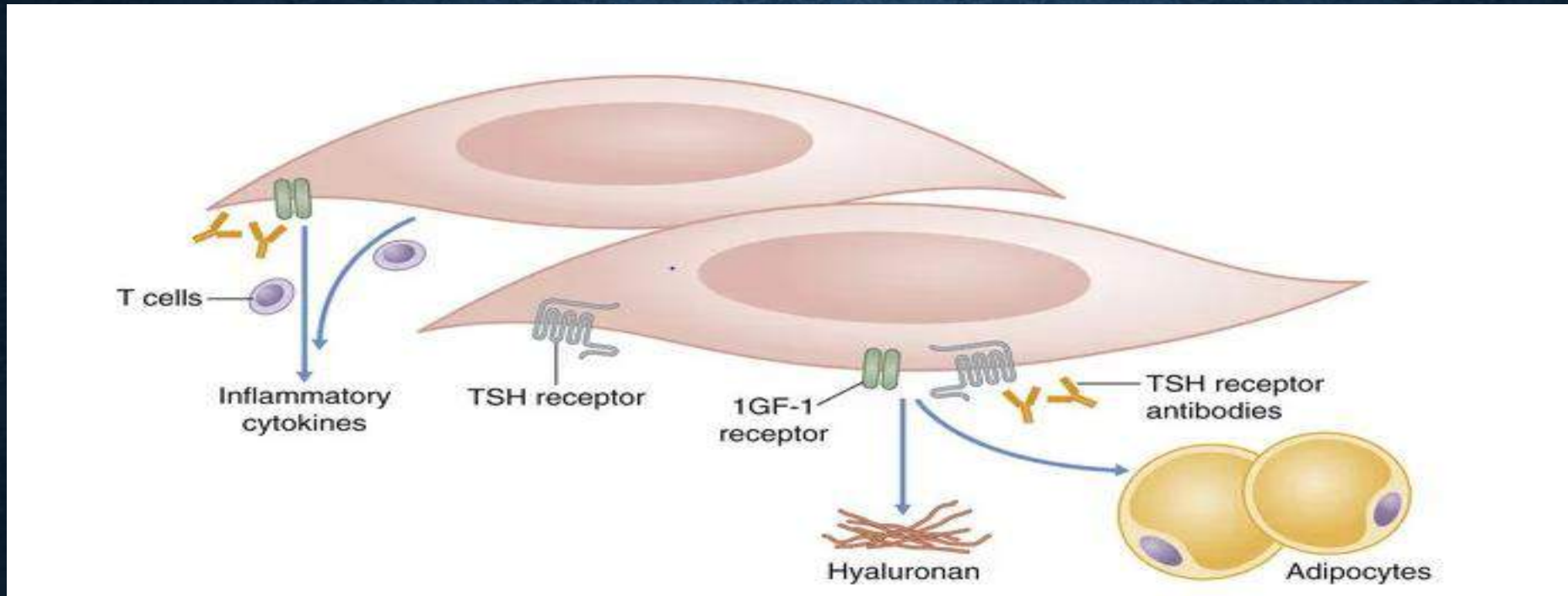
Most commonly Granulomatous uveitis, dry eye, and conjunctival nodules.



THYROID EYE DISEASE

- Thyrotoxicosis (hyperthyroidism) is a condition involving excessive secretion of thyroid hormones
- Graves Disease the most common subtype of hyperthyroidism
- Women are five times more likely to be affected





THYROID ASSOCIATED OPHTHALMOPATHY GRAVE'S DISEASE

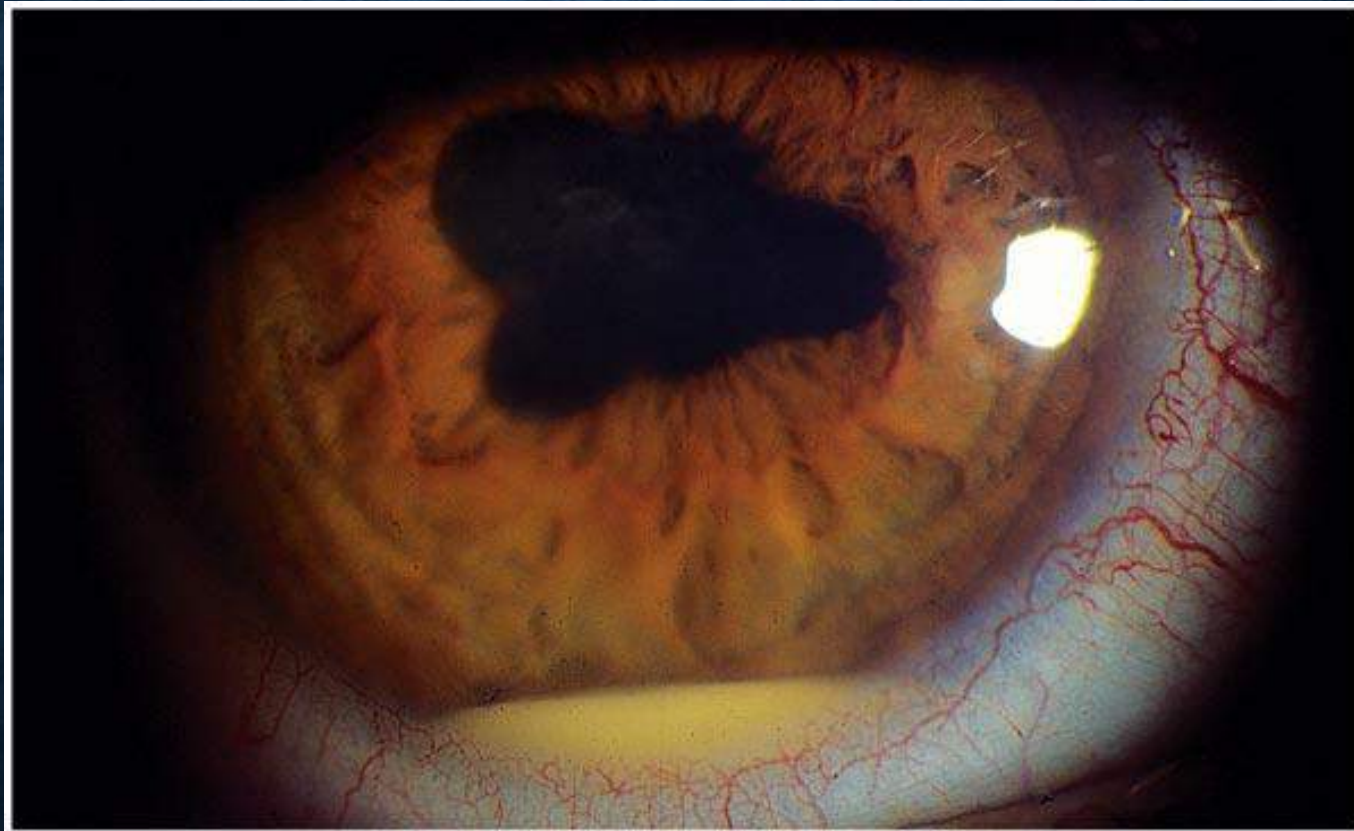
Conjunctival swelling and periorbital edema



OCULAR INVOLVEMENT IN SPONDYLOARTHROPATHY

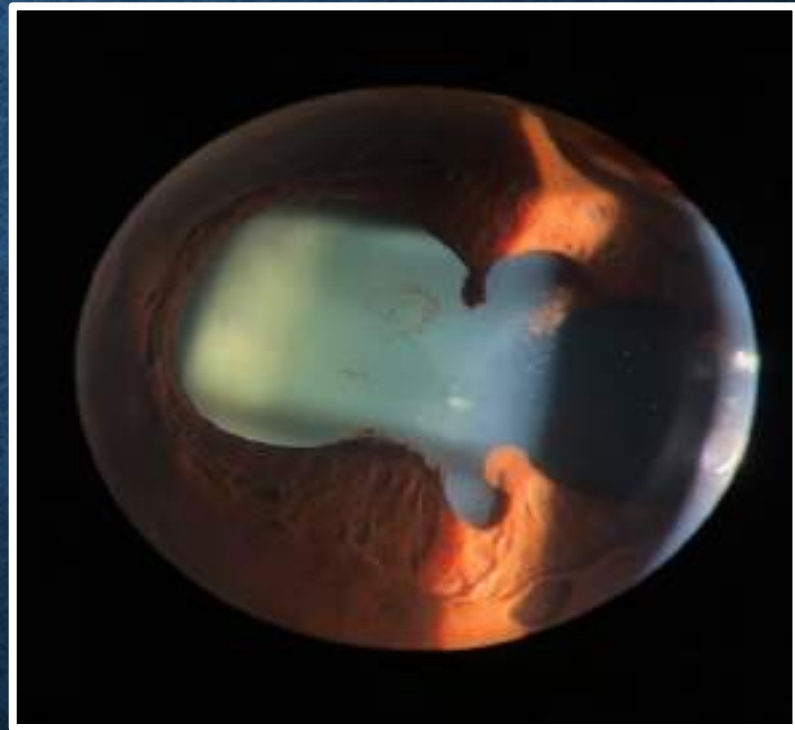
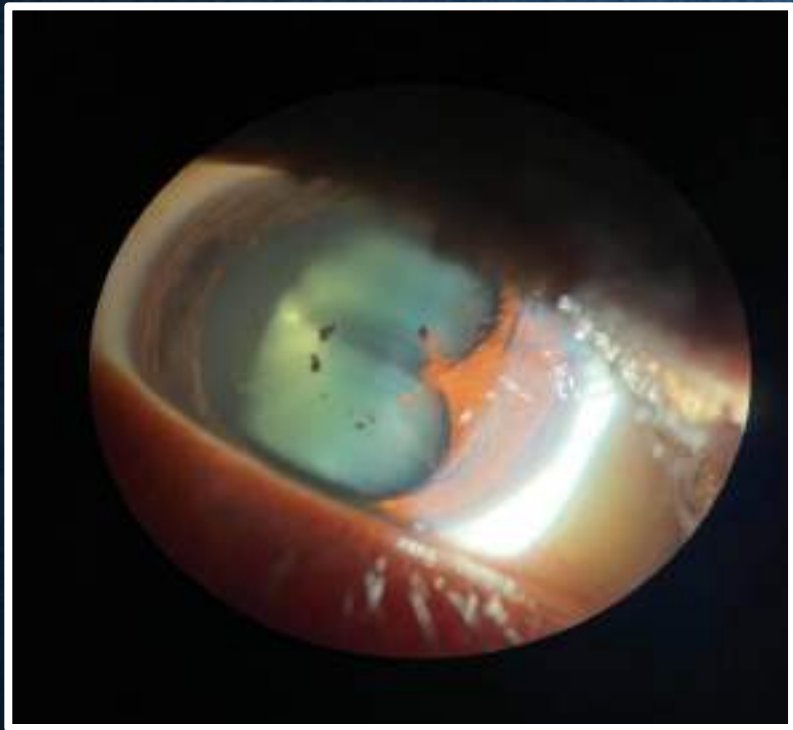
- Uveitis is the most frequent extra-articular manifestation of axial spondyloarthritis (SpA).
- Management of uveitis is crucial to prevent morbidity caused by vision loss and secondary complications.

HYPOPYON ANTERIOR UVEITIS IN SPONDYLOARTHROPATHY



A hypopyon in HLA-B27 uveitis. Half of all cases of acute anterior uveitis are HLA-B27-positive.

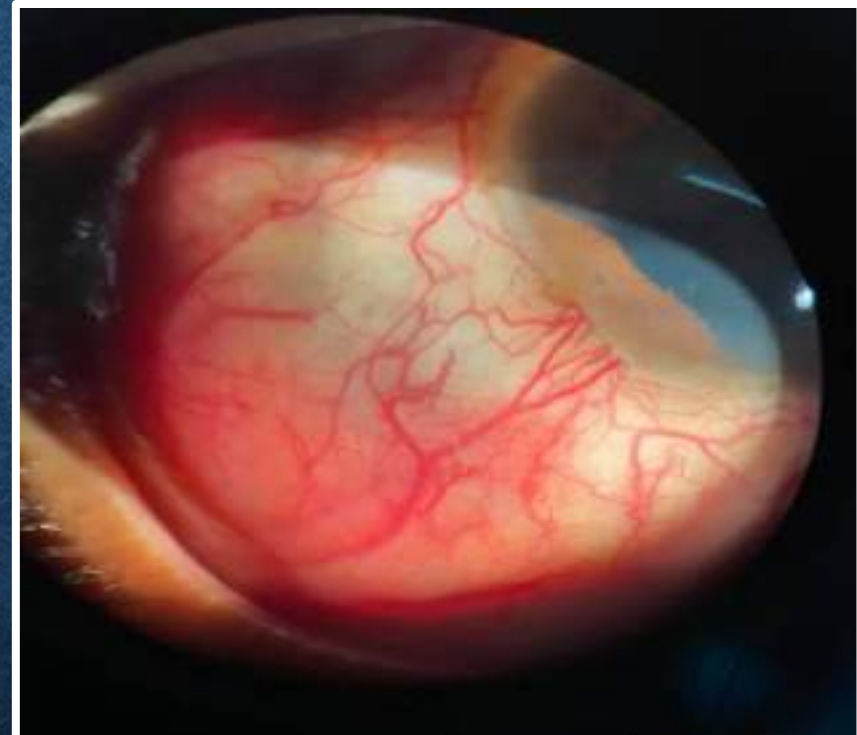
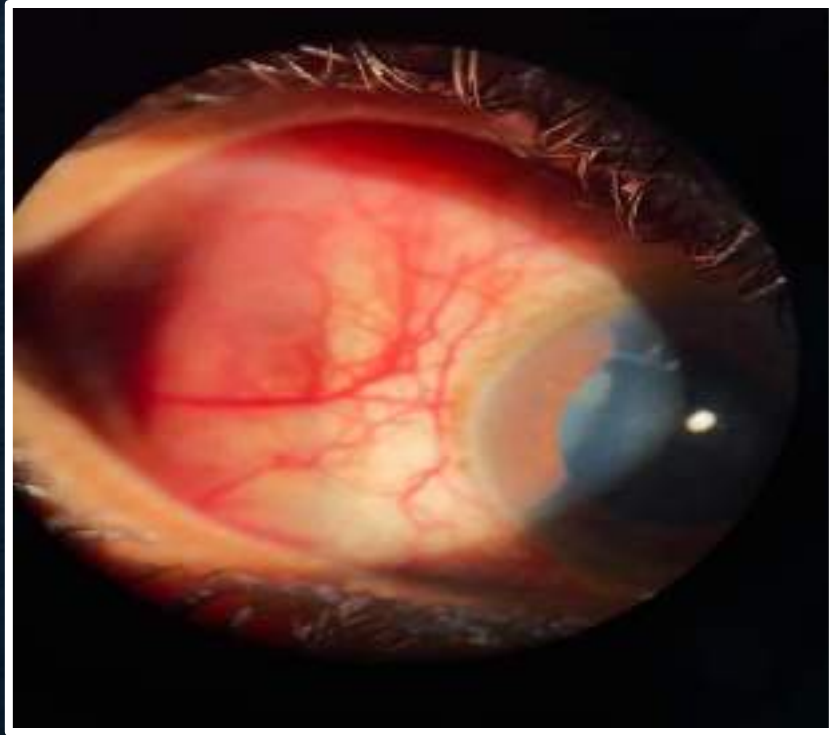
ANTERIOR UVEITIS IN SPONDYLOARTHROPATHY



OCULAR MANIFESTATION IN RHEUMATOID ARTHRITIS

- Ocular manifestations are present in 27.2% of patients
- Women were more affected
- The most common manifestation of ocular involvement is keratoconjunctivitis sicca, scleritis , keratitis

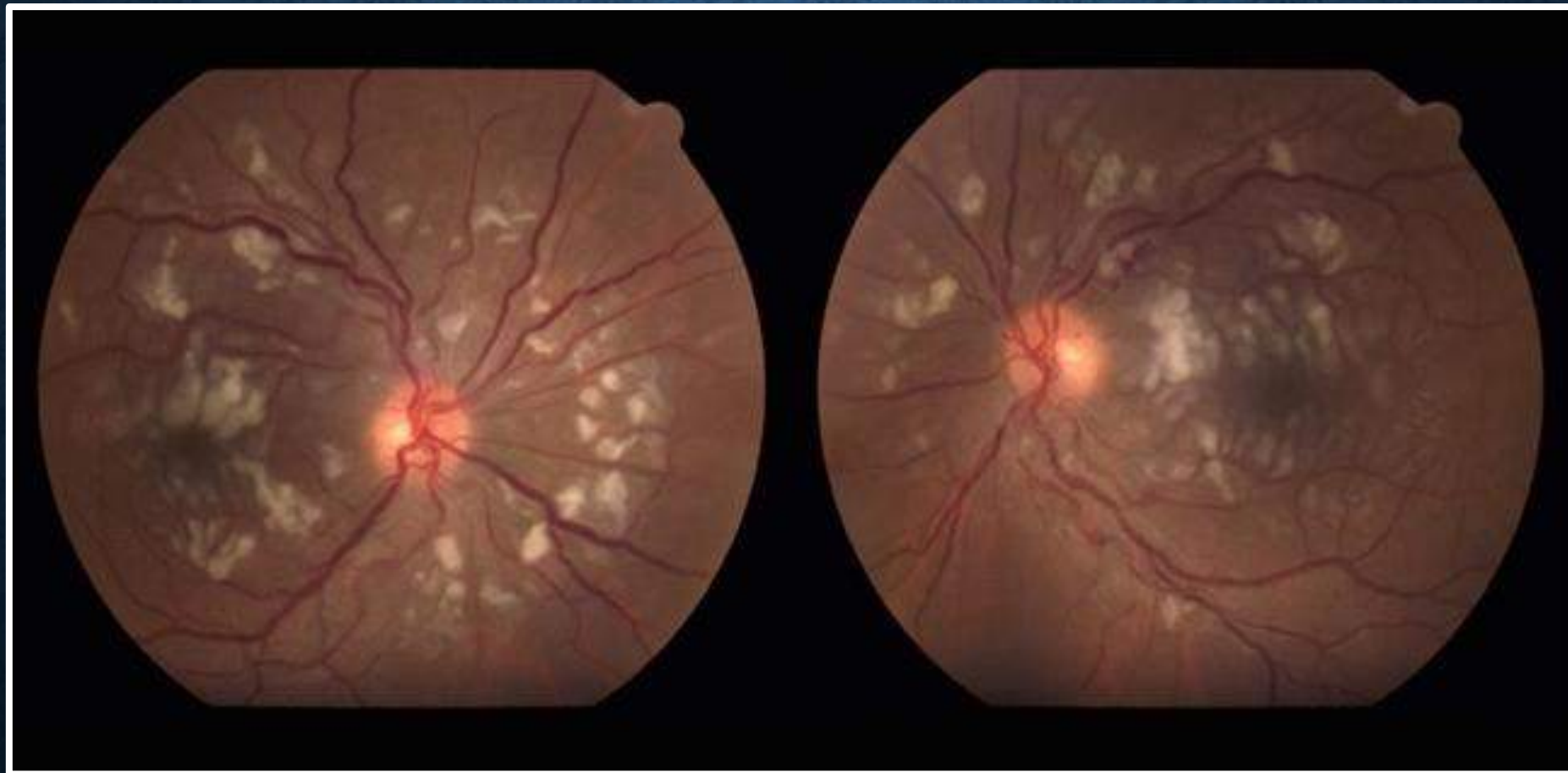
SCLERITIS IN RHEUMATOID ARTHRITIS



SLE RETINOPATHY

- The most common ophthalmologic manifestation of SLE is keratoconjunctivitis sicca (dry eye syndrome).
- The most common vision threatening ocular manifestation is Lupus retinopathy, ranging from 3-29% of patients affected, depending on disease control.

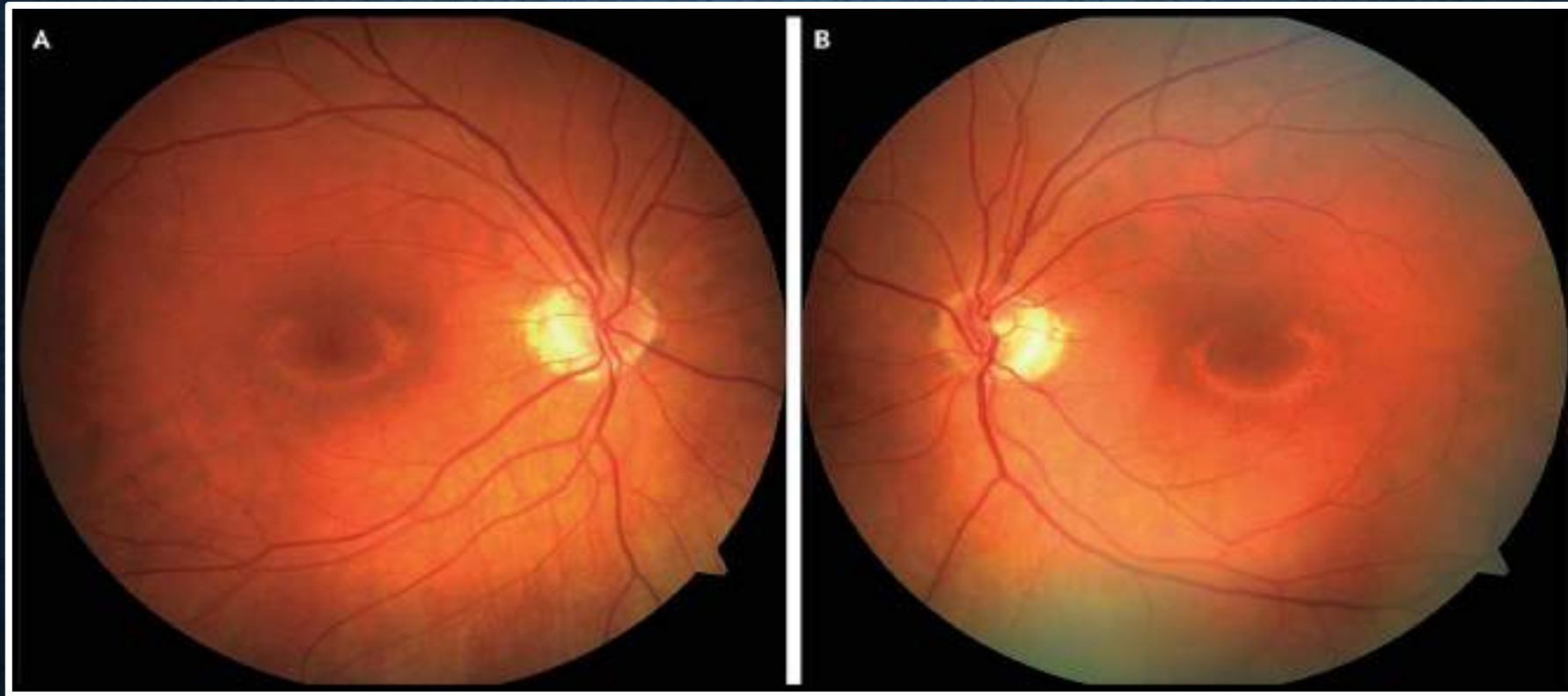
SLE RETINOPATHY



SLE RETINOPATHY

- Drugs used in treatment of SLE can also affect the eye adversely
- Anti malarial: Chloroquine, hydroxychloroquine. This drugs also used in the treatment of certain rheumatological disorders

HYDROXYCHLOROQUINE (**BULL'S EYE**) MACULOPATHY)



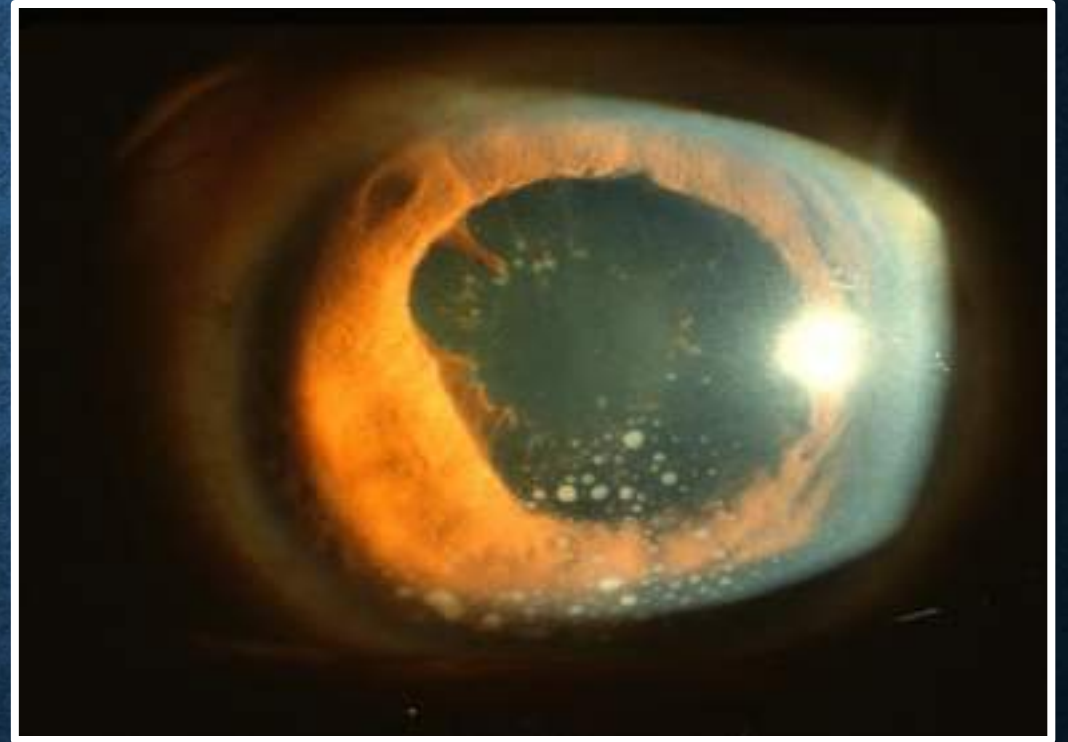
TUBERCULOSIS & EYE

- Sometimes ocular presentation is the only clue for systemic tuberculosis
- It can affect any part of the eye, most commonly the uveal tract
- Ocular Tb incidence ranges from 1.4%-5.74%.
- Clinical presentations are caused either direct infection by mycobacterium bacilli or hypersensitivity reactions to tubercular protein.

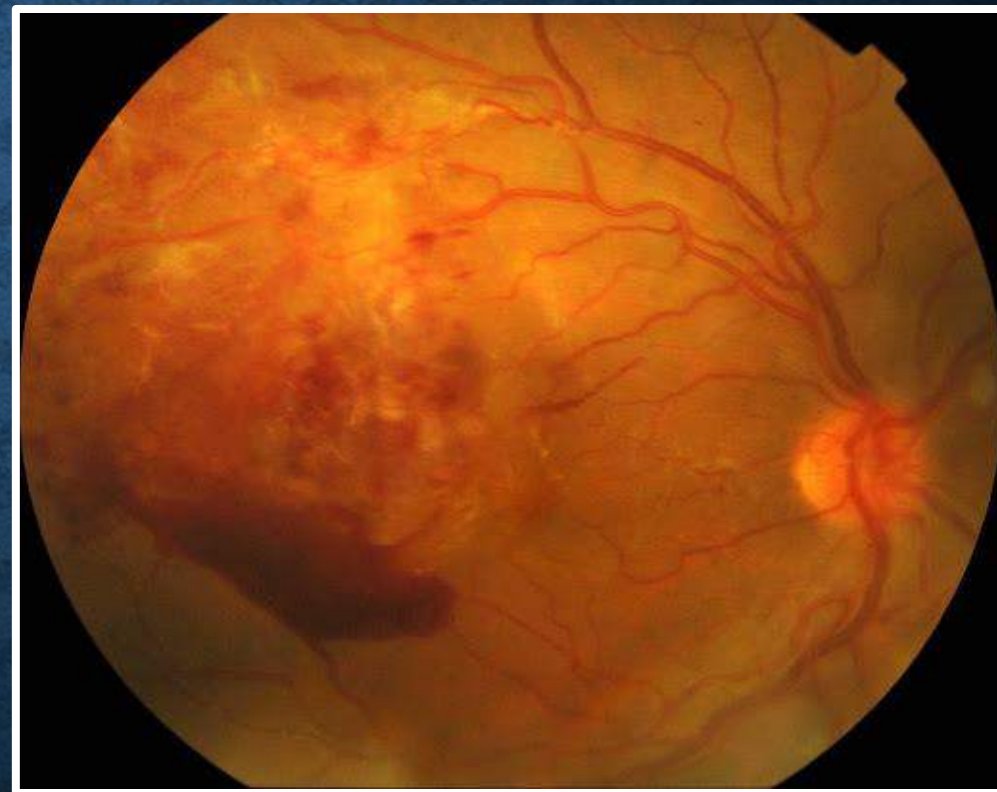
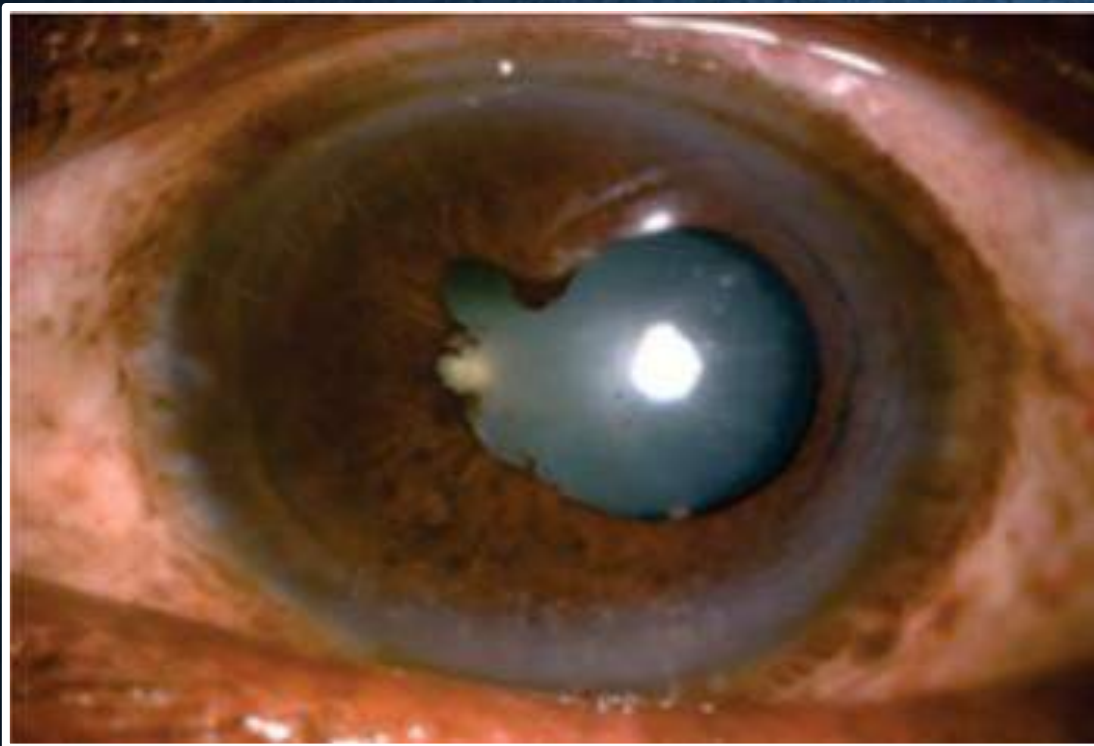
CHRONIC UVEITIS IN TUBERCULOSIS

The most common ocular manifestation of pulmonary TB is uveitis

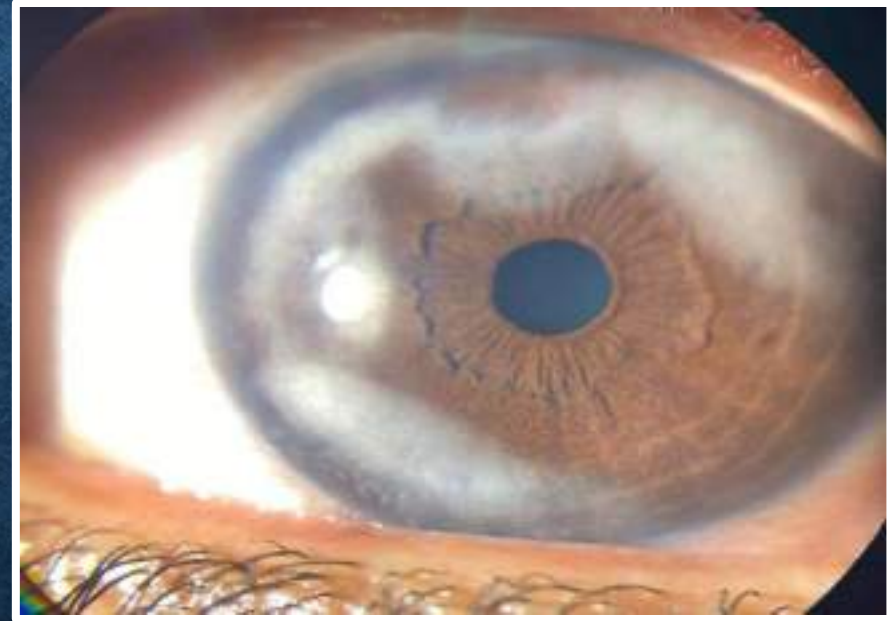
Anterior uveitis, choroid tubercles, retinal vasculitis, vascular occlusion, dense vitritis, and papillitis may also occur.



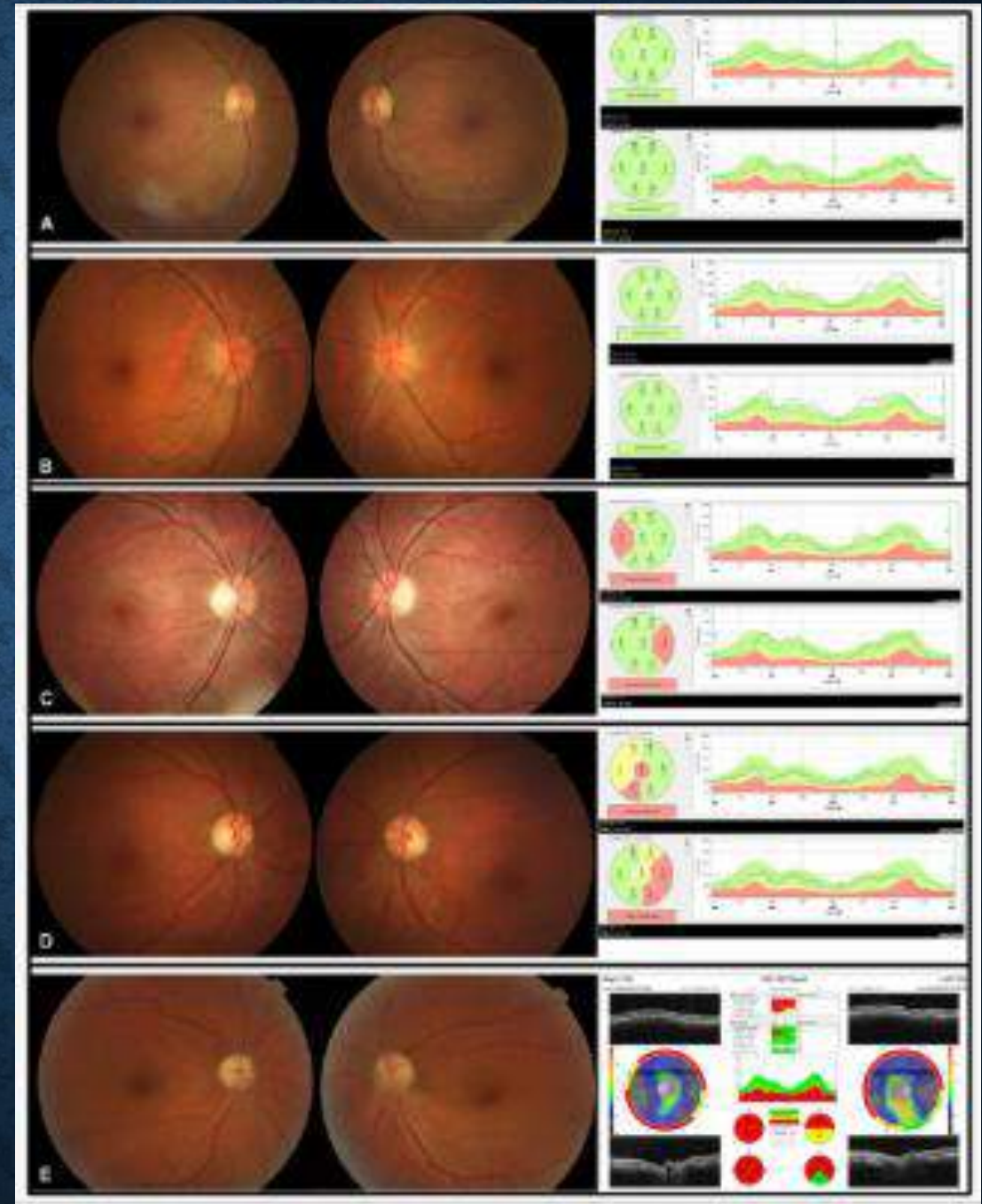
TUBERCULOSIS

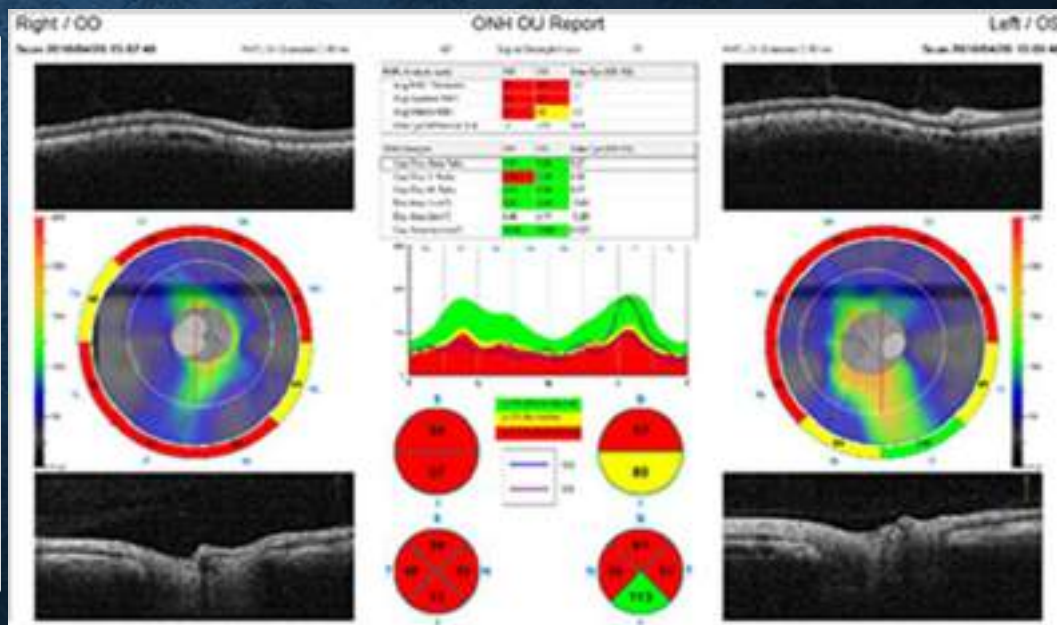
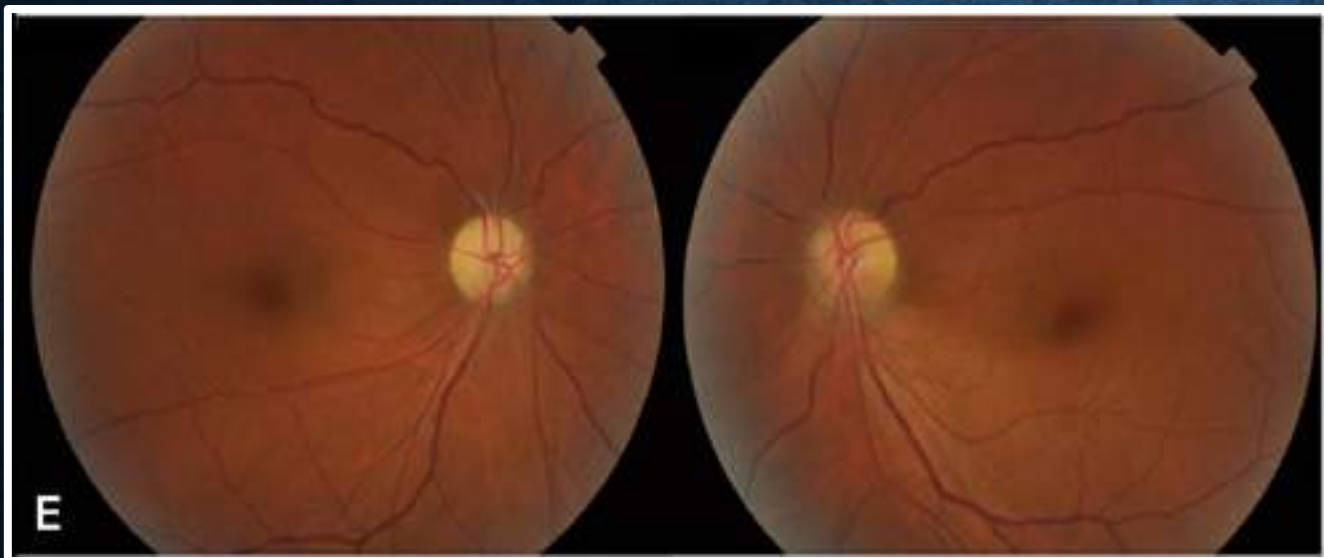
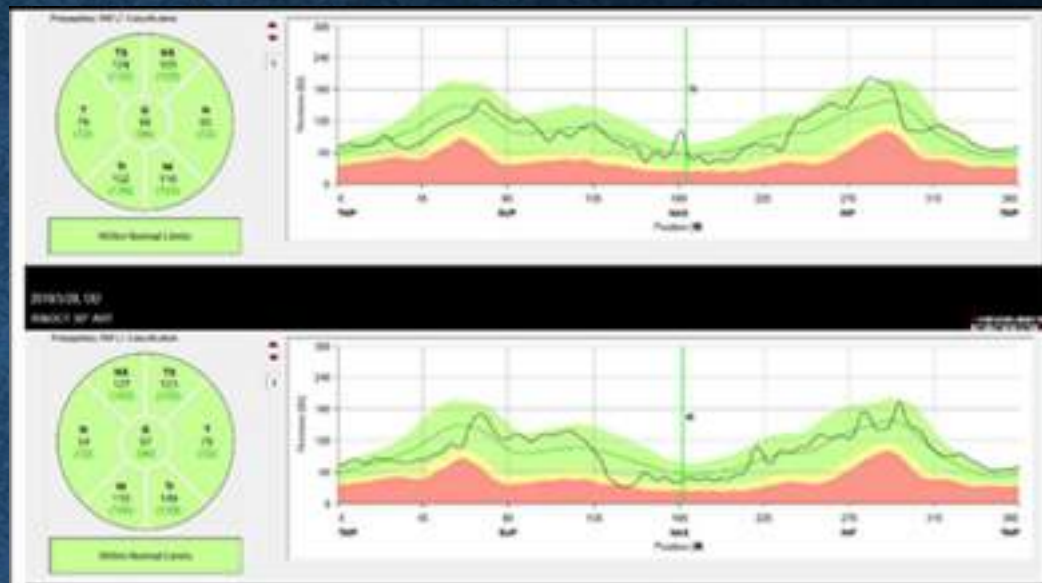


TUBERCULAR ANTERIOR SCLERITIS AND INTERSTITIAL KERATITIS



ETHAMBUTOL INDUCED OPTIC NEUROPATHY

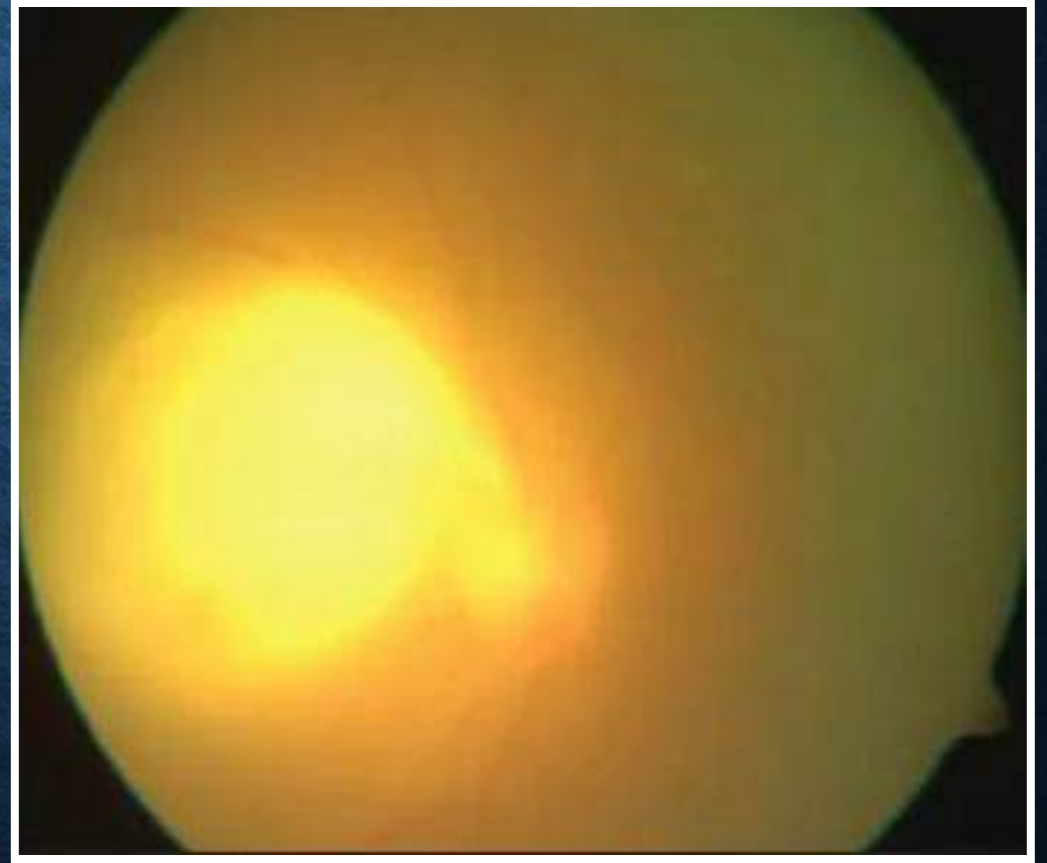




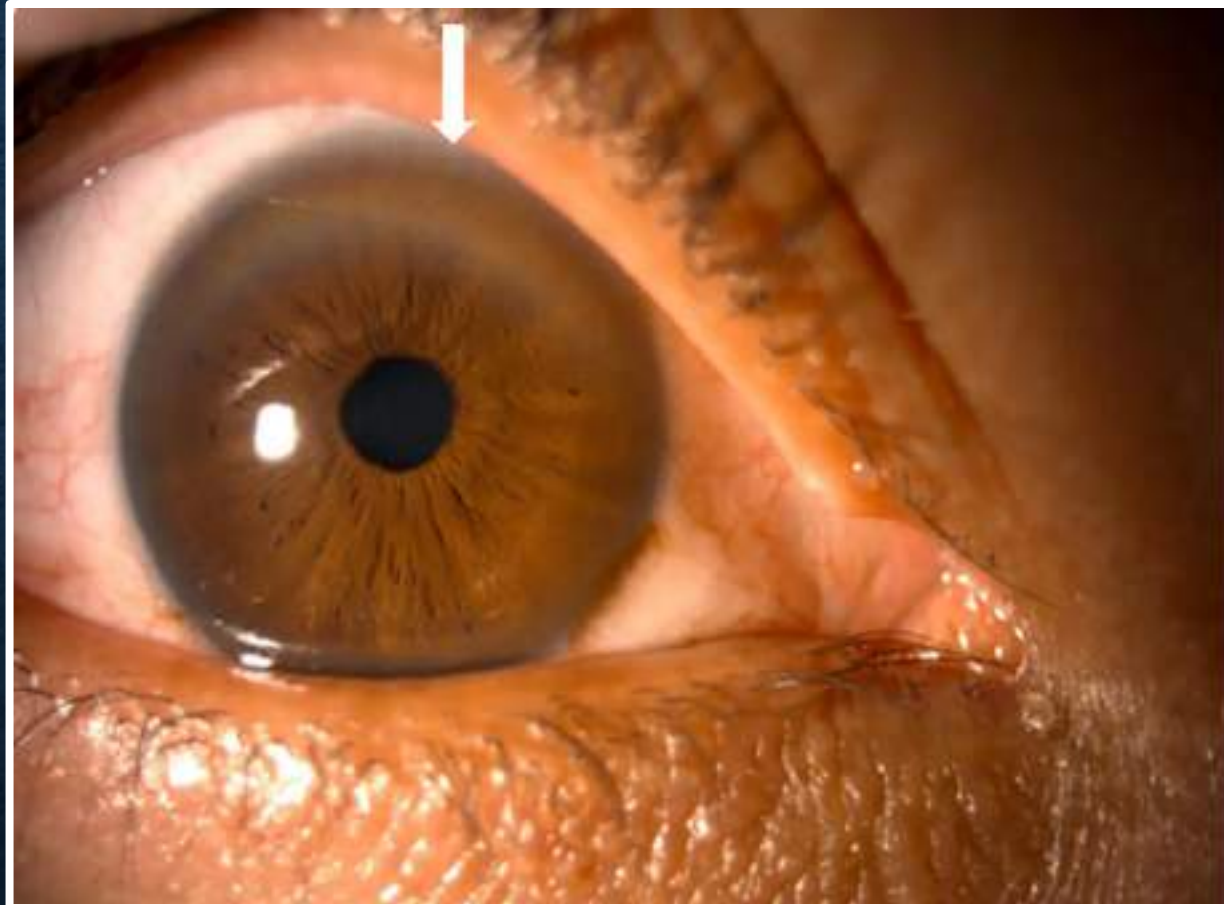
TOXOPLASMOSIS

- Toxoplasmosis is a common parasitic infection in the world.
- Ocular toxoplasmosis is a progressive and recurring necrotizing retinitis, with vision-threatening complications caused by *Toxoplasma gondii*.

TOXOPLASMOSIS



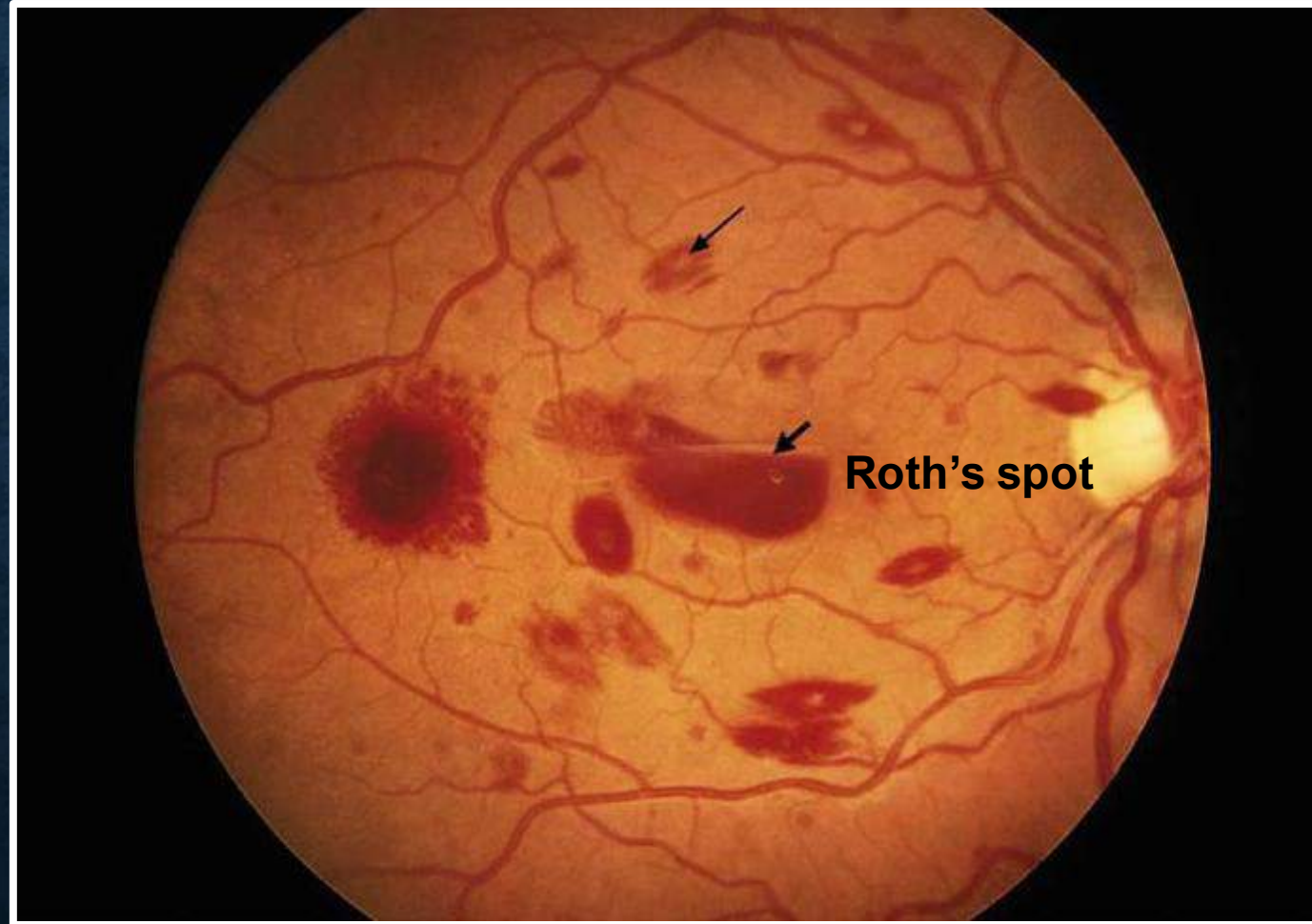
WILSON'S DISEASE



LEUKEMIC RETINOPATHY

- Intraocular involvement in leukemia can be upto 90%.
- Both acute and chronic leukemia can cause ocular manifestations.
- Retina is the most common ocular tissue to be involved in leukemia.

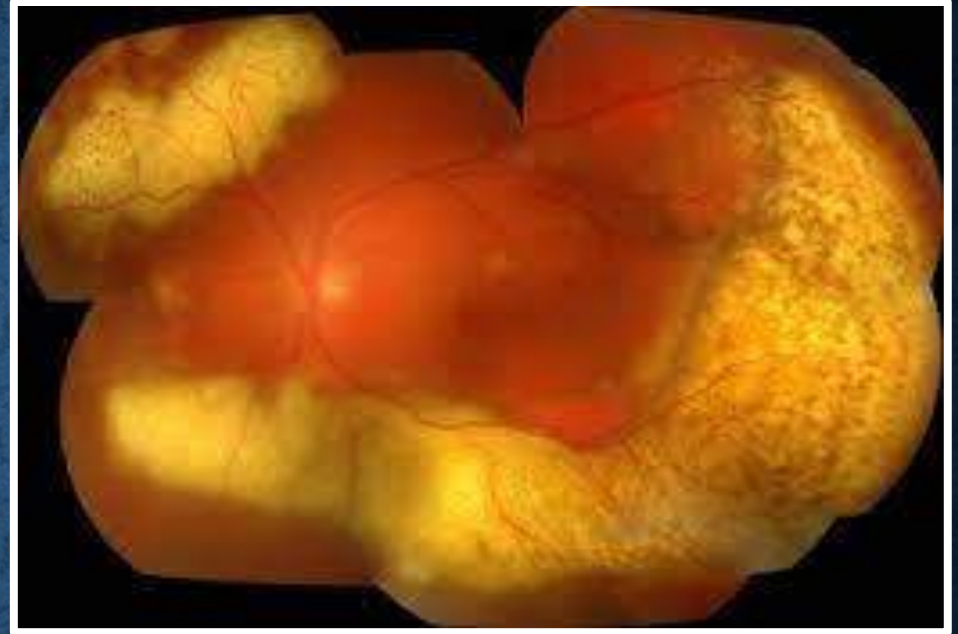
LEUKEMIC RETINOPATHY



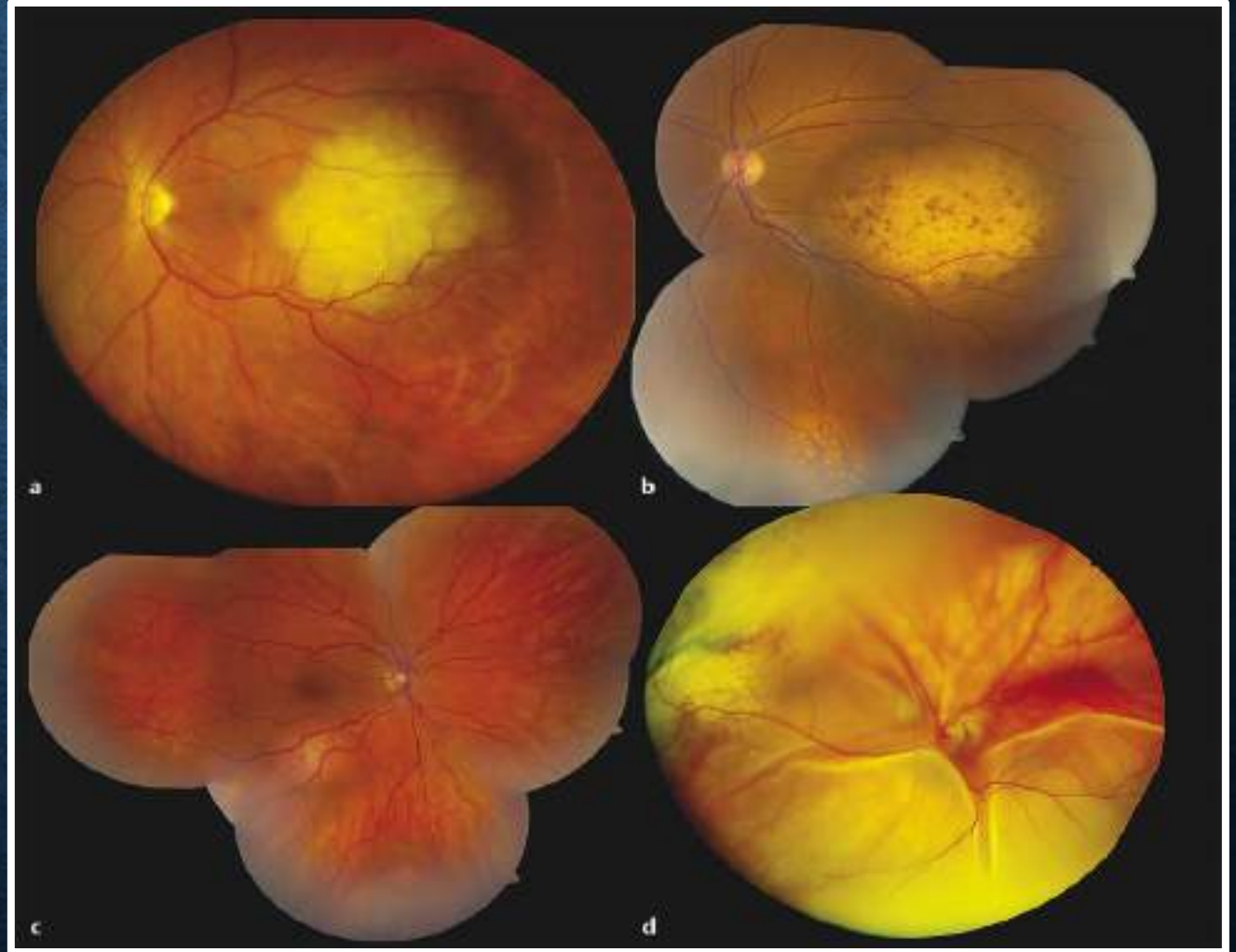
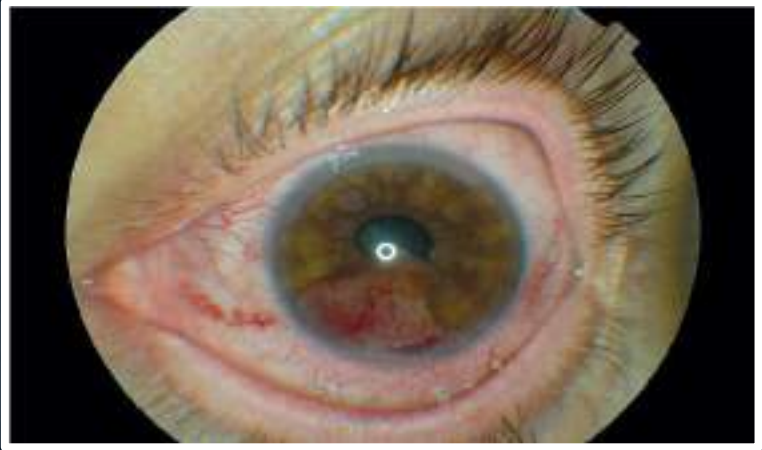
LYMPHOMA

- Primary intraocular lymphoma
- Intraocular manifestation of systemic lymphoma
- Almost all the structures in the orbit, adnexia and eye can be involved in lymphoma.

LYMPHOMA



METASTASIS



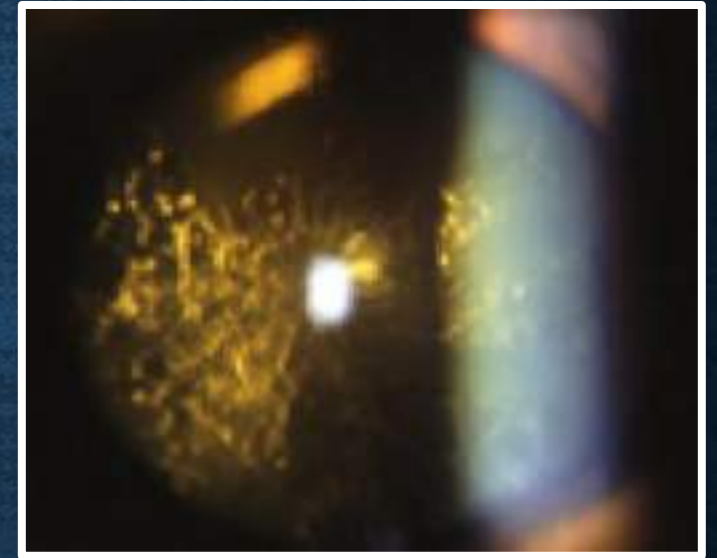
STEROID

- Are group of Anti-inflammatory drugs
- Commonly used to treat ocular & systemic conditions
- Unmonitored use resulting in undesirable side effects.
- Easily available over the counter

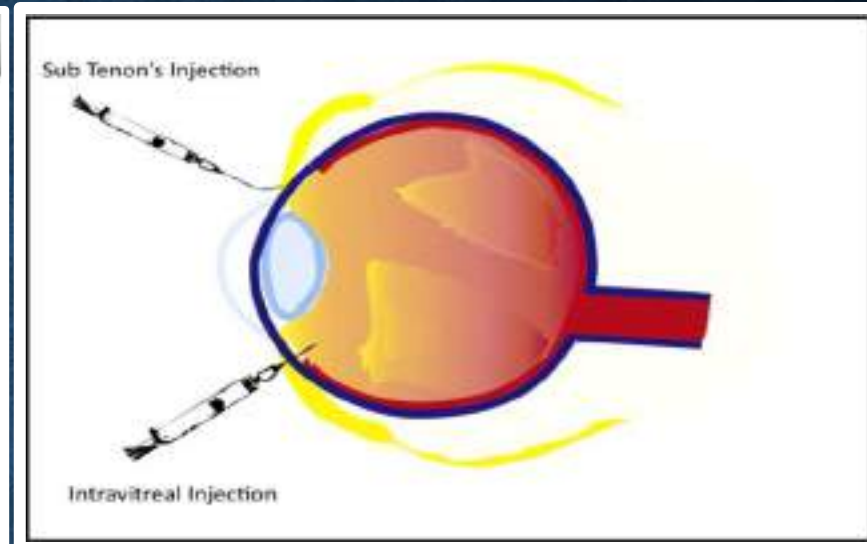
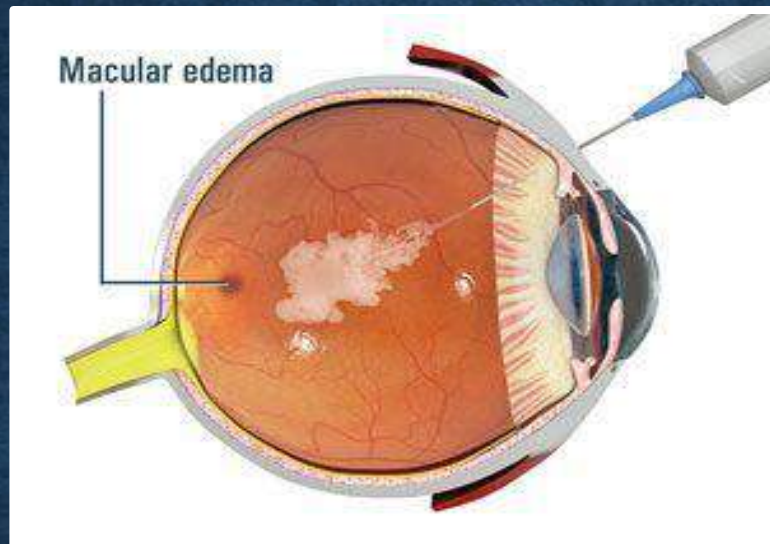


**Steroid induced
Glaucoma**

- Chronic administration in any form with raised IOP can cause optic neuropathy resulting in Steroid induced Glaucoma & Cataract
- Long term use of systemic steroid mostly cause cataract & topical use cause glaucoma



**Steroid induced PSC
cataract**



TOPIRAMATE

- Topiramate (Topamax) is an antiepileptic drug approved by FDA for prevention of migraine headache in adults.
- Its exact mechanism of action is uncertain, but it is known to affect neuronal hyperexcitability- one probable factor in the development of migraine.
- It also helps to prevent epilepsy
- It is strictly a daily preventative for migraine- not intended to relieve the pain of a migraine attack once it has begun.



American Journal of Ophthalmology

Volume 137, Issue 1, January 2004, Pages 193-195



Brief report

Mechanism of topiramate-induced acute-onset myopia and angle closure glaucoma

Jamie E Craig PhD, MBBS, FRANZCO ^{a, b} ✉, Terrence J. Ong MBBS, FRANZCO ^a, Damien L. Louis BMBS, FRANZCO ^a, Jane M. Wells BMBS, BSc (Optom) ^b

Topiramate may be associated with ciliochoroidal effusion with forward displacement of the lens-iris diaphragm and anterior chamber shallowing, resulting in acute myopia and angle-closure glaucoma.

05.05.19

07.05.19

11.05.19

Patient may come with blurred vision, pain, redness of eyes

Bokal: 357

06/05/2019 AM 11:12
No. 53093

[REF RESULT]

UD: 12.0 mm CYL: -

<R>	SPH	CYL	AX
AVE	-5.25	-0.50	108
1	-5.25	-0.50	102
2	-5.25	-0.50	111
3	-5.25	-0.50	111

<L>	SPH	CYL	AX
AVE	-6.00	-0.50	87
1	-6.00	-0.50	88
2	-6.00	-0.50	89
3	-6.00	-0.50	85

PD: 67

BANGLADESH_EYE_HOSPITAL

IOP: 33 mmHg-B/E

07/05/2019 PM 03:46
No. 53272

[REF RESULT]

UD: 12.0 mm CYL: -

<R>	SPH	CYL	AX
AVE	-3.00	+0.00	
1	-3.00	+0.00	
2	-3.00	+0.00	
3	-3.25	+0.00	

<L>	SPH	CYL	AX
AVE	-3.25	+0.00	
1	-3.25	+0.00	
2	-3.25	+0.00	
3	-3.25	+0.00	

PD: 66

BANGLADESH_EYE_HOSPITAL

IOP: 11 mmHg-B/E

11/05/2019 PM 02:49
No. 117237

[REF RESULT]

UD: 0.0 mm CYL: +-

<R>	SPH	CYL	AX
AVE	+0.50	+0.00	
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2	+0.50	+0.00	
3	+0.50	+0.00	

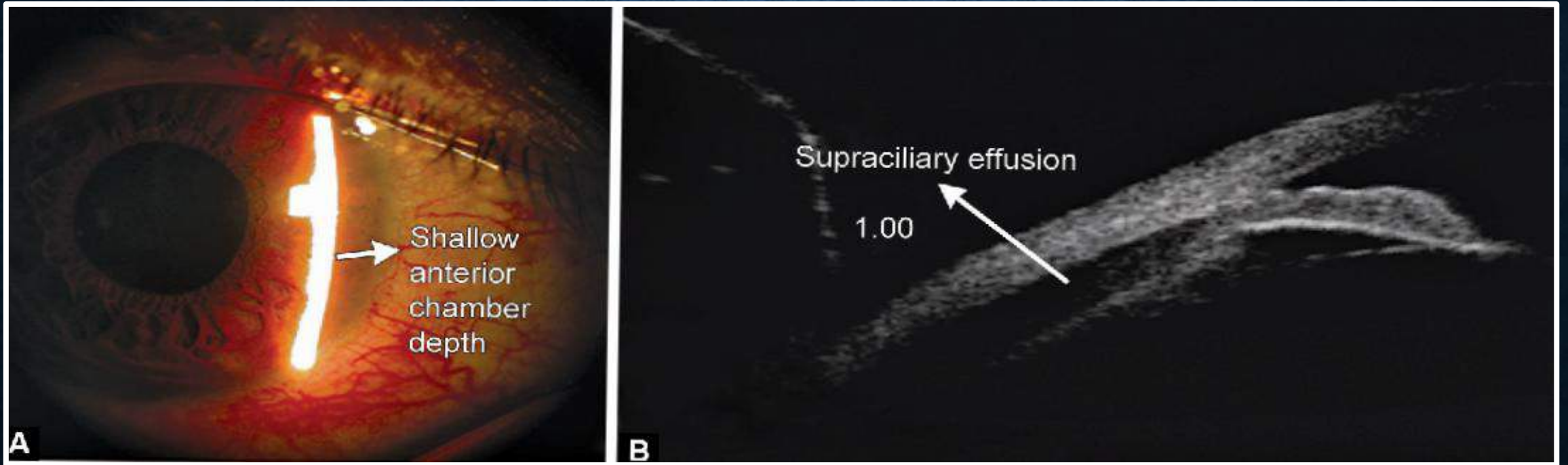
<L>	SPH	CYL	AX
AVE	+0.25	+0.25	44
1	+0.25	+0.25	47
2	+0.25	+0.25	43
3	+0.25	+0.25	43

PD: 66

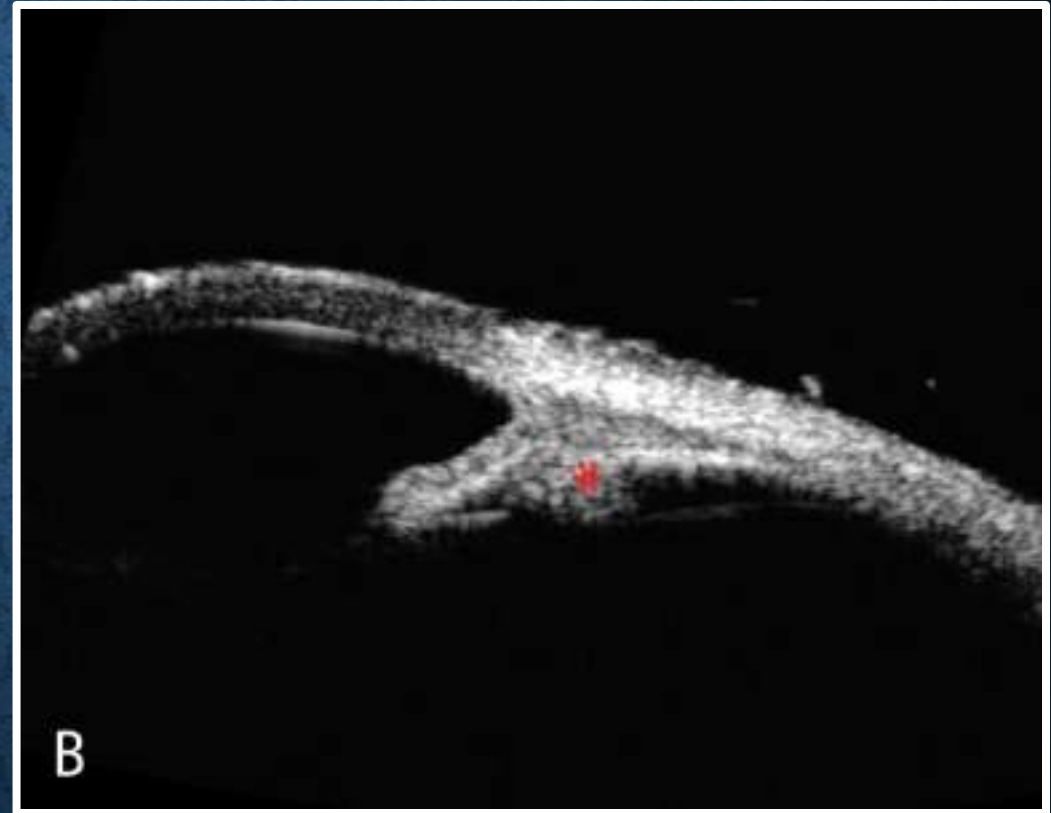
BANGLADESH_EYE_HOSPITAL

IOP: 10 mmHg-B/E

TOPIRAMATE INDUCED ACUTE ANGLE CLOSURE GLAUCOMA

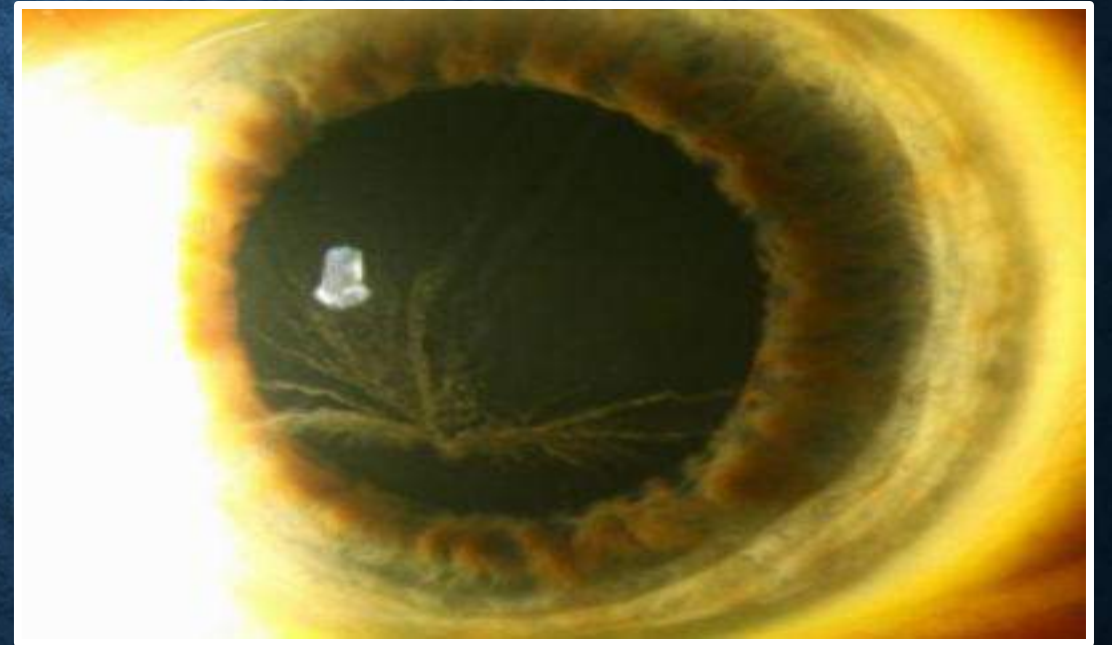


Before & after Treatment:



CHLORPROMAZINE INDUCED KERATOPATHY

- Chlorpromazine: Long term therapy may develop innocuous subtle diffuse yellowish brown granular deposits in the endothelium



TAMOXIFEN INDUCED CRYSTALLINE MACULOPATHY

Tamoxifen used in the treatment of selected patients with breast carcinoma.



TAKE HOME MESSAGE

- The eye is a unique organ which is often involved in systemic disease
- Patients with systemic disease may first present with eye pathology
- Patients with known systemic illnesses may need to screen their eyes for ocular complications
- It is important for the primary care physician to be familiar with the spectrum of ocular involvement in systemic diseases since appropriate intervention and referral can be sight saving for the patient



**Thank
You**



Any Questions