



# **CASE CONFERENCE**

**April 26<sup>th</sup> 2013**  
**Kyungmin Lee**

# Chief Complain

- 47/F
- Decreased Vision (OD)
  - Sudden onst
  - Duration : 2weeks
  - Assocaited symtoms>
    - Pain(-), Redness(-), discharge(-), flashes ( $\pm$ ), Floaters(+)

# Clinical History

- No specific medical /surgical history
- No Family history of ocular disease
- Personal history
  - Travel history (-)
  - Pet affinity(-)
  - Drug History(-)
  - Denial of exposure to raw meat

# Review of System

- HEENT : N-S
- Skin rash(-)
- Oral/genital ulcer (-)
- Arthralgy : Back pain(+), knee pain(+)
- GI system : N-S
- Other system : WNL

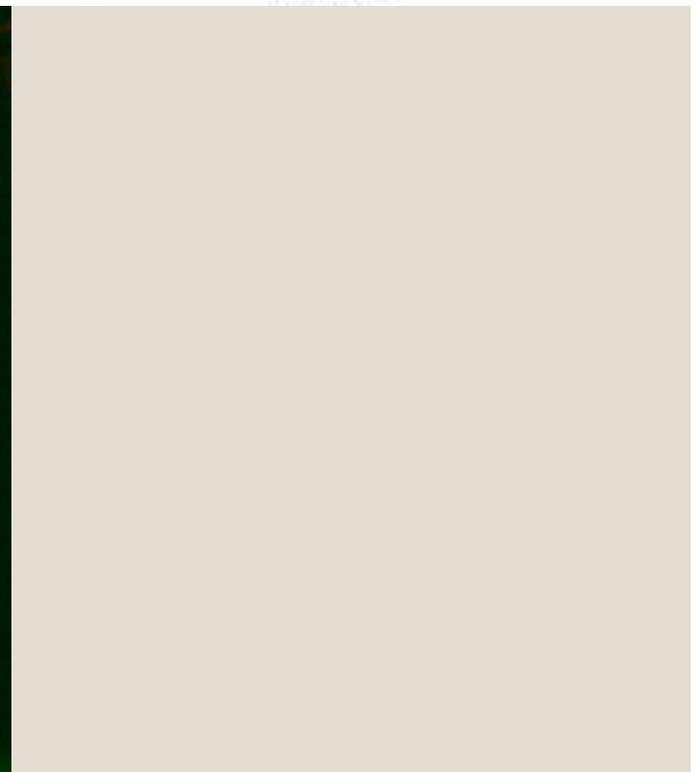
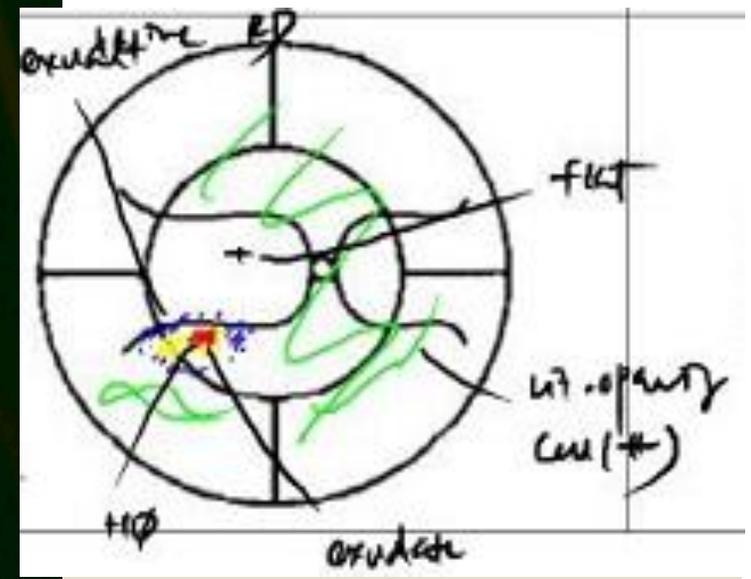
# Clinical Examination

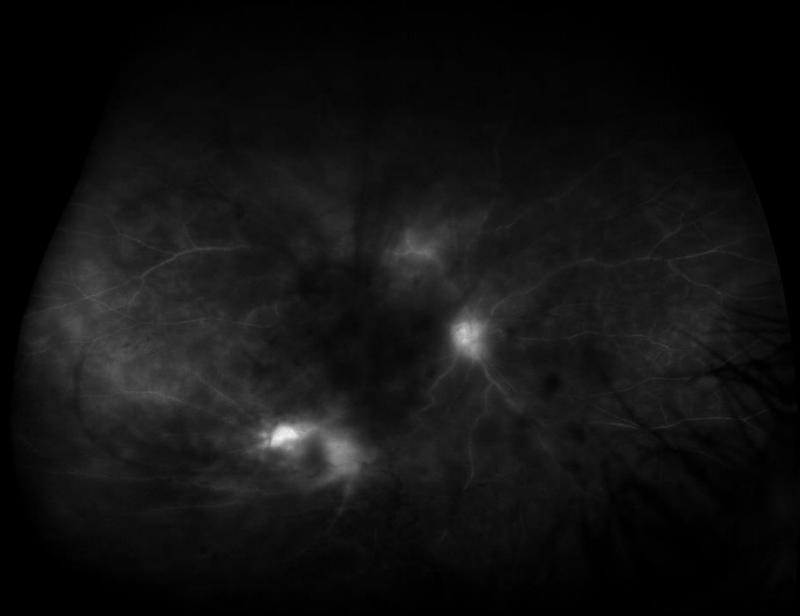
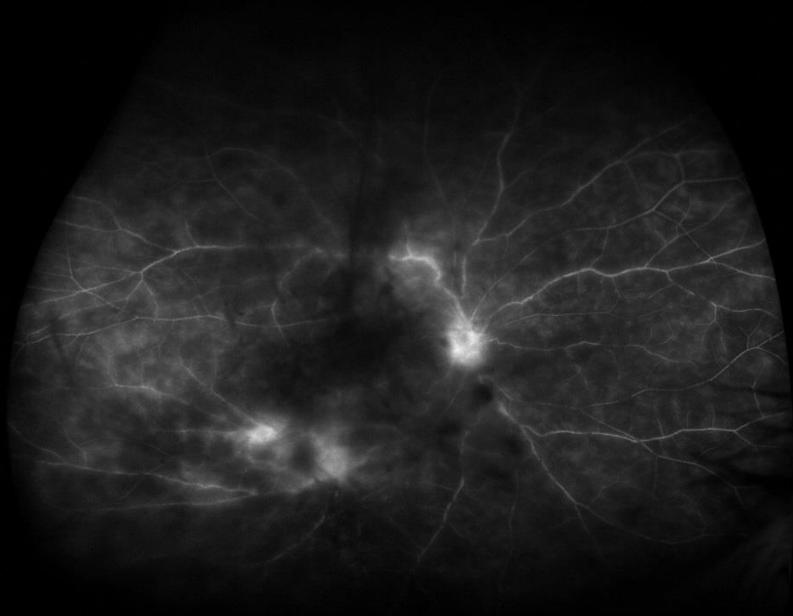
- Visual acuity
  - ❖ OD > 20/100 (N-C)
  - ❖ OS > 20/30 (20/25x1.50Dsph : -2.0Dcyl: Ax 90)
- IOP : 17/20mmHg by Pneumo
- Anterior chamber
  - ❖ Conj > WNL
  - ❖ Cornea > WNL
  - ❖ AC>
    - OD > Deep & Cell(+)
    - OS > Deep & Cell(-)
  - ❖ Lens> WNL

# Clinical Examination

Vit. Haze(+++)  
Vit. Cell(+++)

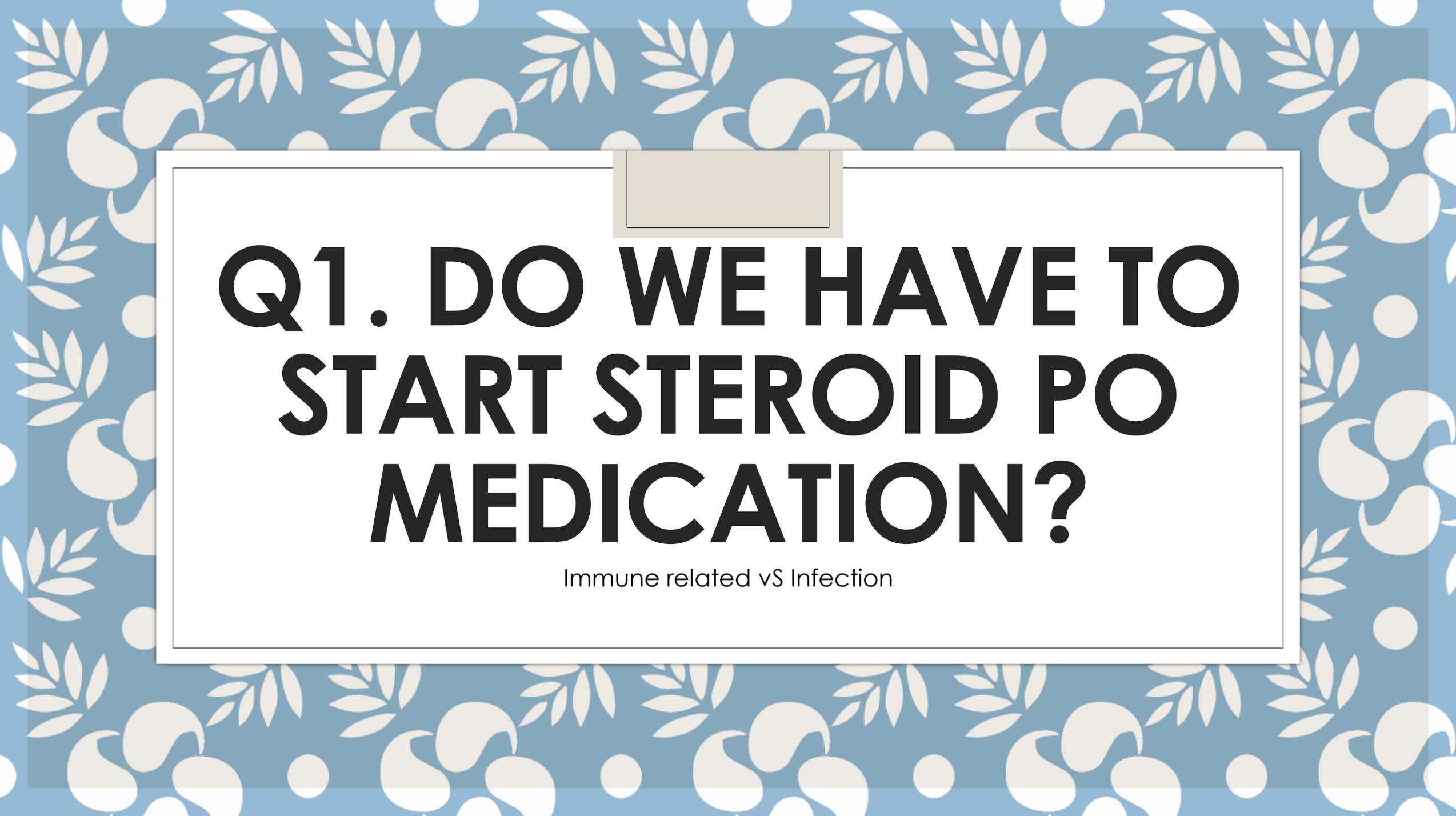






# Clue of Diagnosis

- Middle age
- Female
- Sudden onset decreased of vision (unilateral)
- Back pain & knee pain
- Ant. chamber > deep & cell(+)
- Post. cavity > Vit. Cell(+++), Vit. Haze(+++), Exudative focal change at post. Pole
- FAG> early hyperfluorescence with leakage  
disc leakage, perivascular leakage at superotemporal arcade



# **Q1. DO WE HAVE TO START STEROID PO MEDICATION?**

Immune related vS Infection

# Differential Diagnosis

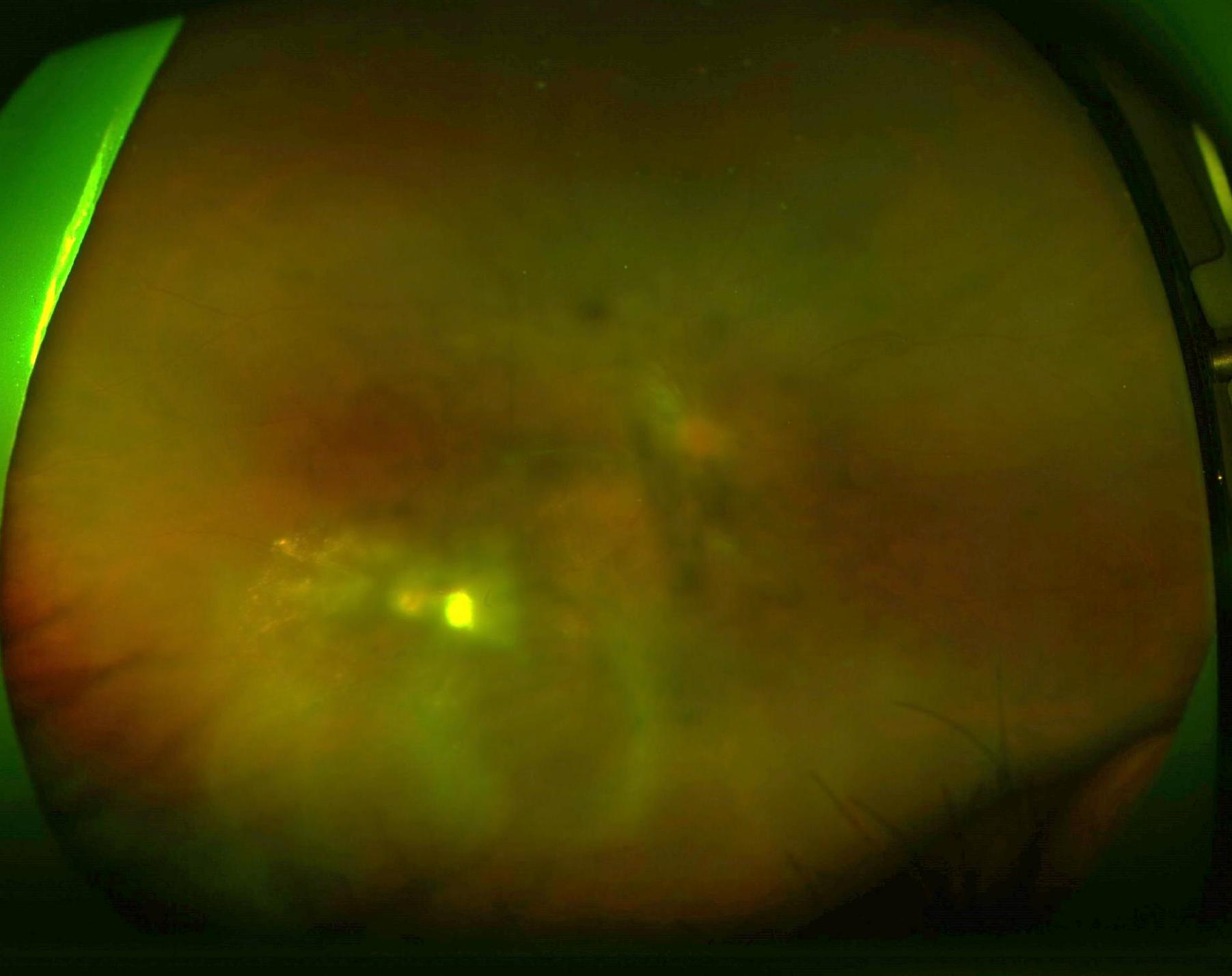
- Behcet's disease
- Sarcoidosis
- Tuberculosis
- Toxoplasmosis
- <Toxocariasis>

# Treatment Plan

- Check serology
- Check Chest CT & Xray
- Predforte QID OD
- Cycloplegics BID OD
- Follow up in 2 weeks

# Follow up 2weeks

- C.C) Increased of floaters (OD), No change of visual acuity
- VA (OD) : 20/100(N-C)
- IOP (OD) :22mmHg at AM 9:20 by Pneumotonometry
- ConJ (OD) Not injected
- Cornea (OD) clear
- AC (OD) deep chamber with trace cells
- Lens (OD) mild posterior subcapsular opacity



**Vit. Haze(++)**  
**Vit. Cell(+++)**  
**Exudative change (+)**  
**R/O Granuloma**

# Serology

그룹	검사명칭	2013-02-15 ( 1 )
◆ 기타검사 ◆		
	ACE 검사	68.6/▲
◆ 면역혈청/간염(일반) ◆		
	VDRL 매독반응검사(VDRL, RPR, ART)	Non-Reactive
	HIV항체 - 일반	Negative
◆ 수탁검사 ◆		
	C-반응성단백(정량)	0.4/▲
	RA인자 정성 Qualitative	Nonreactive
	ANA 항핵항체정밀 [면역형광법]	Negative
	ANCA-항호중구 세포질 항체	Negative
	CMV Ab IgG(정밀)	Reactive(143.2)
	CMV Ab IgM(정밀)	Nonreactive(0.18)
	HSV Ab IgG(정밀)	Positive(2.39)
	HSV Ab IgM(정밀)	Negative(0.25)
	VZV-Ab IgG(정밀)	Equivocal(0.95)
	VZV-Ab IgM(정밀)	Negative(0.18)
	Toxoplasma IgG	Negative(0.13)
	Toxoplasma IgM	Negative(0.20)
	항인지질항체-IgG(확진)	Negative(1.37)
	항인지질항체-IgM(확진)	Negative(1.65)
	HLA-B51-PCR-비급여	Negative
	HLA-B27-PCR	Negative강직성 척추염은 16

◆ 일반화학/전해질 ◆		
	ALT(SGPT)	31
	AST(SGOT)	38
	요소질소 BUN [NPN포함]	16
	크레아티닌 Creatinine	0.7
◆ CBC/PT&PTT/Bank/Gas ◆		
	혈색소(광전비색법) Hb[Spectrop]	12.2
	헤마토크리트 Hematocrit	37.4
	적혈구수 RBC Count	4.2
	백혈구수 WBC Count	8.0
	혈소판수 Platelet Count	258
	백혈구백분율 가. 혈액	Empty
	Neutrophil Seg	61
	Lymphocyte	33
	Monocyte	6
	Eosinophil	
	Basophil	
	적혈구침강속도	23/▲

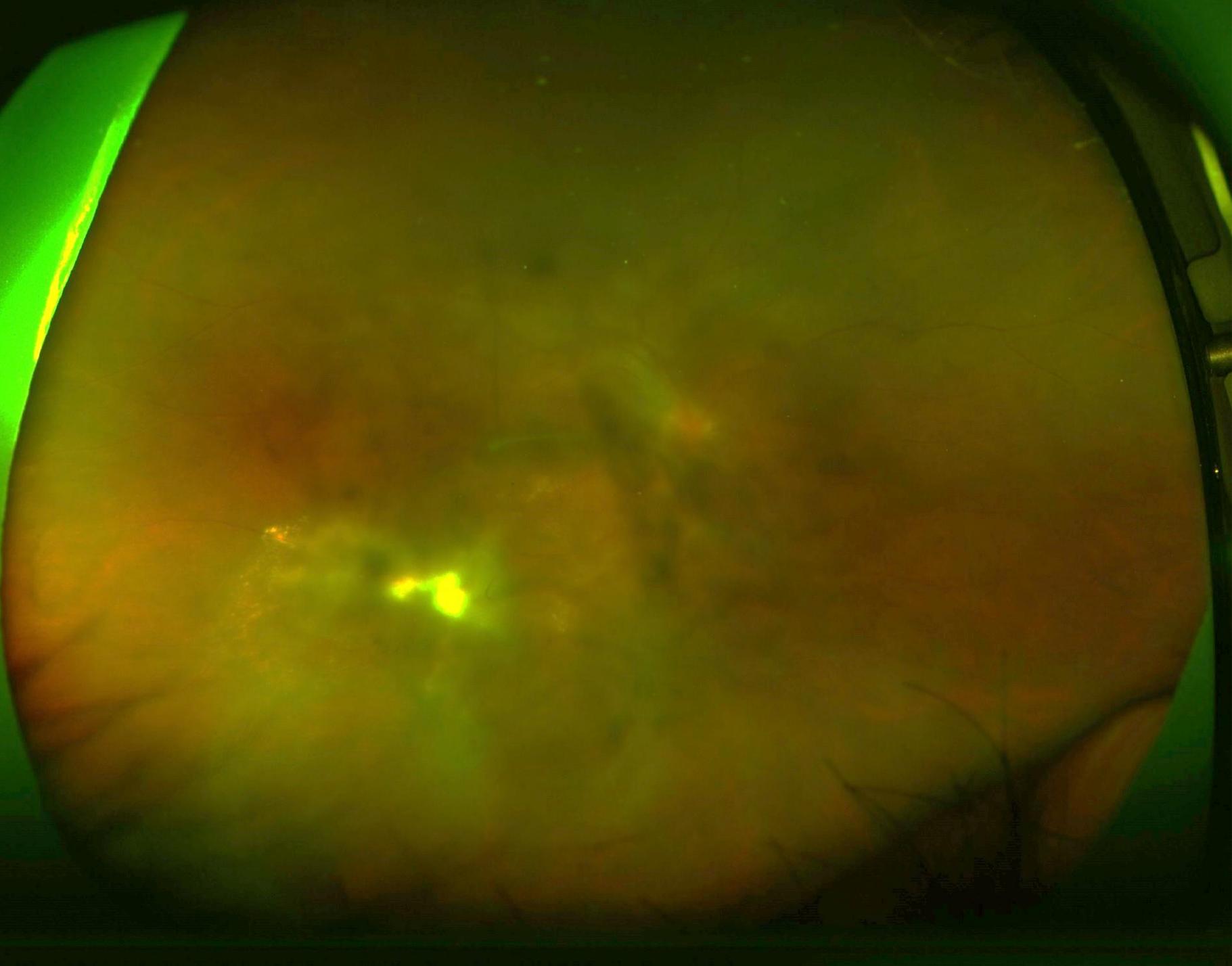
**Chest Xray & CT : No evidence of Sarcoidosis & Tuberculosis**

# Treatment Plan

- Prednisone 60mg orally
- Predforte QID OD
- Cycloplegics BID OD
- Follow up 1week later

# Follow up 1week

- C.C) No change in ocular symptoms
- VA (OD) : 20/400(N-C)
- IOP (OD) : 22mmHg at AM 10:25 by Pneumotonometry
- ConJ (OD) Not injected
- Cornea (OD) clear
- AC (OD) deep chamber with rare cells
- Lens (OD) mild posterior subcapsular opacity



**Vit. Haze(++)**  
**Vit. Cell(++)**  
**Exudative change (↑)**  
**R/O Granuloma**

# Treatment plan

- Check history again → "History of eating raw liver of cow"
- Check serology → Toxocara ELISA with TES-Ag
- Tapering Prednisone PO to 50mg orally : 10mg taper every week
- Predforte BID OD
- Stop cycloplegics
- Follow up in 1 weeks later

# Follow up 1week

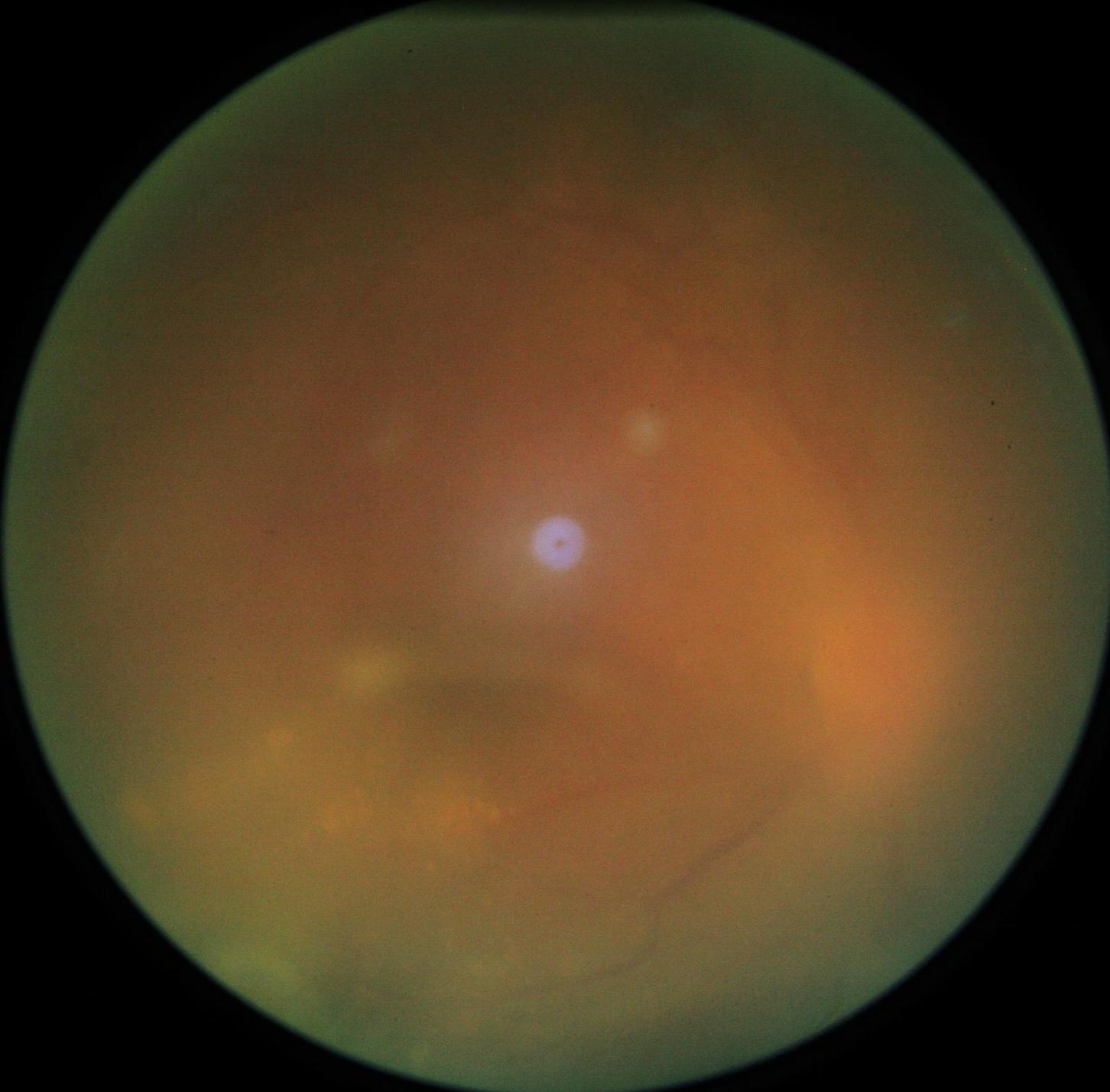
- C.C) No change in ocular symptoms
- VA (OD) : 20/400(N-C)
- IOP (OD) : 33mmHg at AM 11:20 by Goldmann Applanation
- ConJ (OD) Not injected
- Cornea (OD) clear
- AC (OD) deep chamber with rare cells
- Lens (OD) mild posterior subcapsular opacity
- Vitreous & Retina(OD): Vit Haze (++), cell(++), exudative RD (+), granuloma(stationary)
- Serology
  - Ig G (+) for ELISA with Toxocariasis Ag

# Treatment Plan

- Start Albendazole 400mg BID for 1week
- Taper Prednisone 10mg every week : currently 40mg PO
- Start Cosopt BID OD
- Predforte QD OD
- Follow up in 1week

# Follow up 1week

- C.C) Improvement in visual acuity but still blurry, floaters (+)
- VA (OD) : 20/200(N-C)
- IOP (OD) : 18mmHg at AM 9:00 with Cosopt BID OD by Goldmann Applanation
- ConJ (OD) Not injected
- Cornea (OD) clear
- AC (OD) deep chamber with rare cells
- Lens (OD) moderate posterior subcapsular opacity



**Vit. Haze(++)**

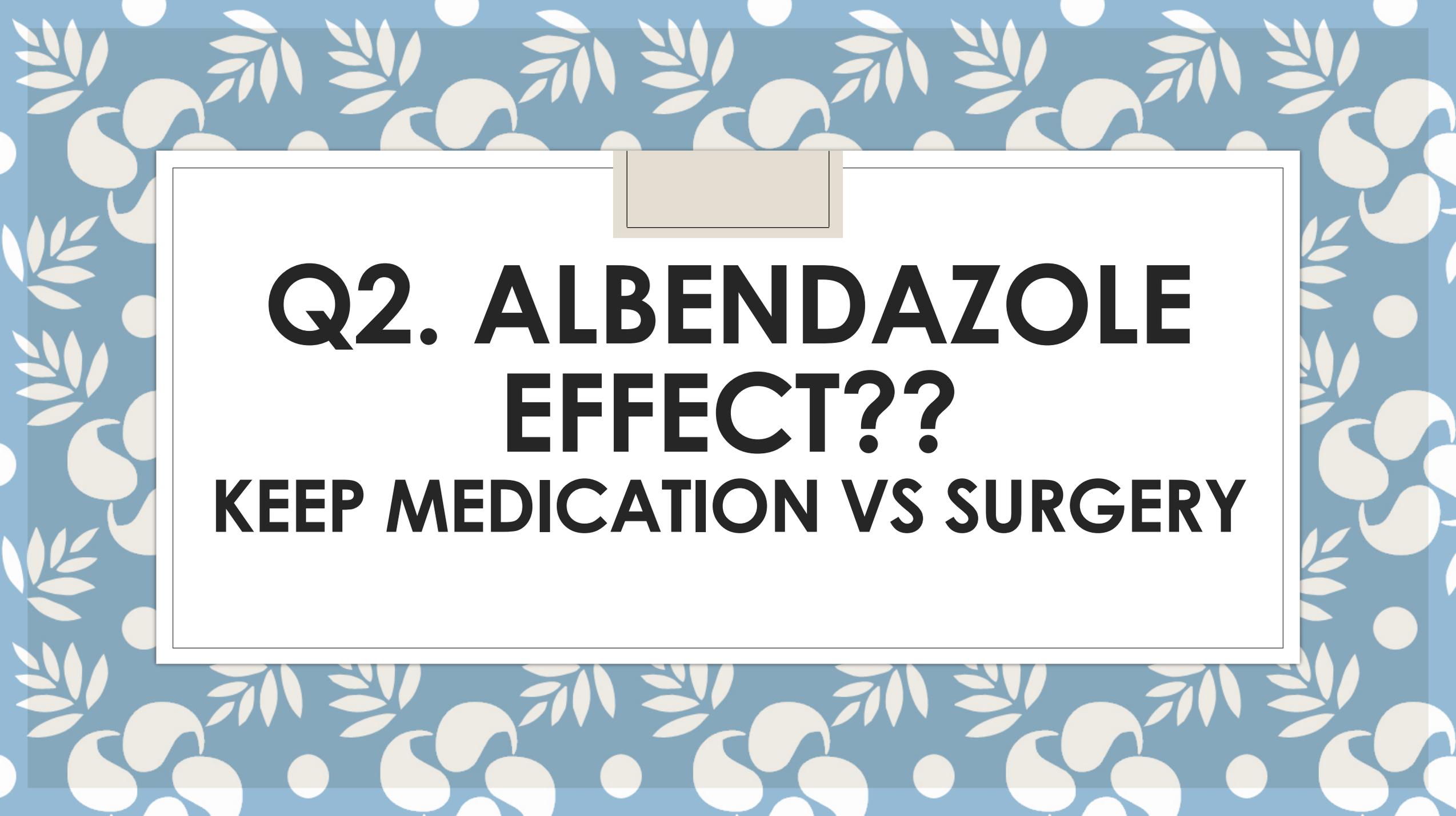
**Vit. Cell(+)**

**Exudative retinal detachment**

**Granuloma(sl. Increased)**

**Tractional membrane(+)**

**- From optic disc ~ over fovea**



**Q2. ALBENDAZOLE  
EFFECT??**

**KEEP MEDICATION VS SURGERY**

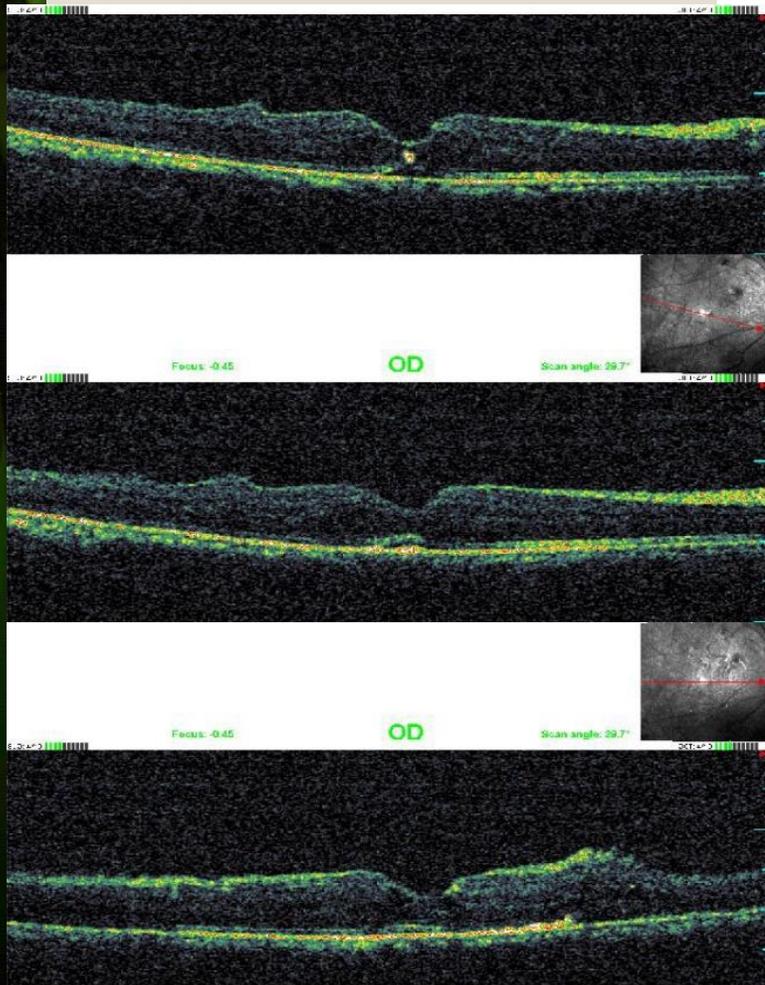
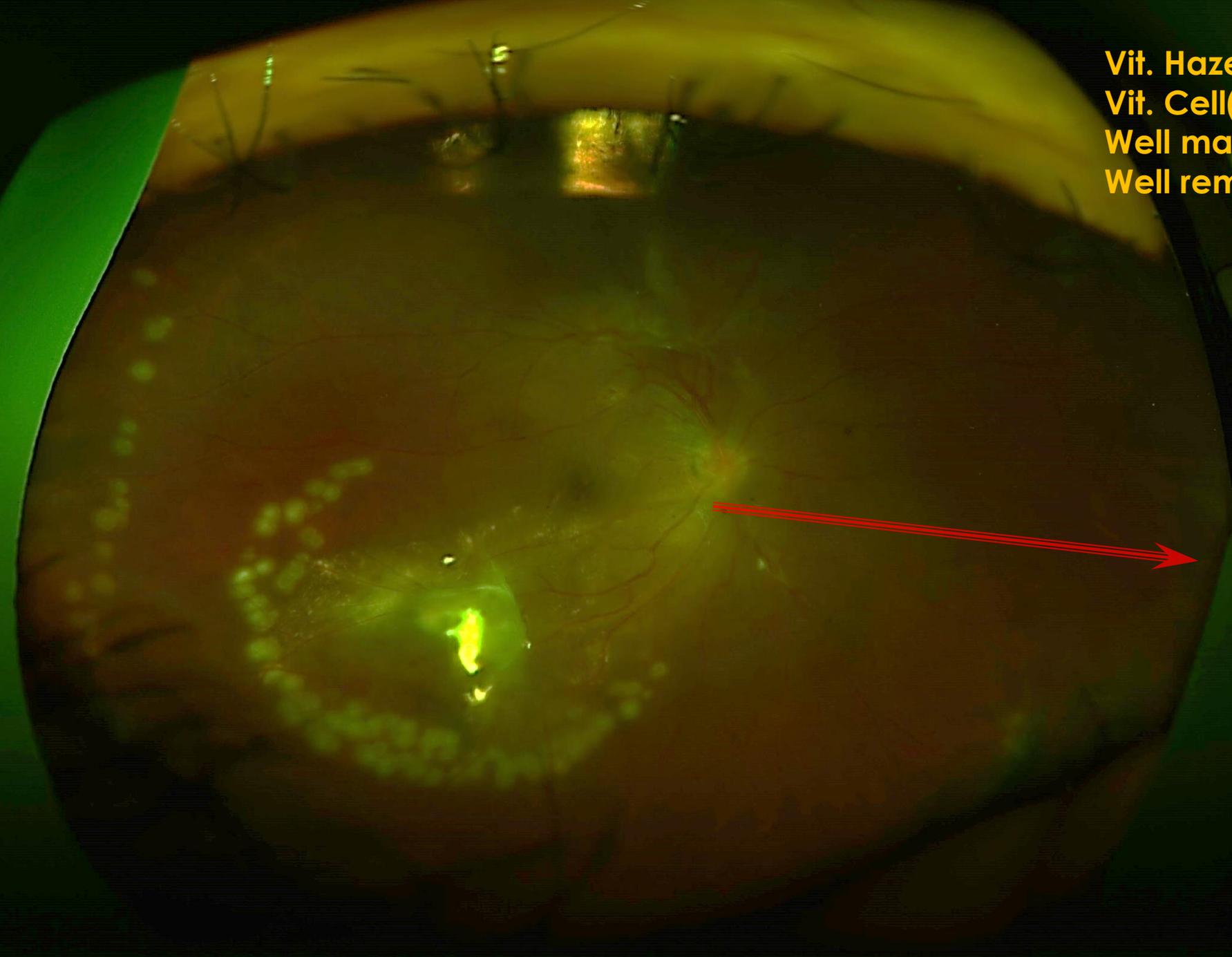
# Treatment Plan

- Keep Albendazole 400mg BID for 1 week
- Taper Prednisone 10mg every week : currently 30mg PO
- Keep Cosopt BID OD
- Stop Predforte QD OD
- Plan for Phaco+PCL+pars plana vitrectomy+membrane peeling+endolaser OD
  - OCT : no reliable findings due to vitreous haze
  - FAG : patients' refusal
  - Purpose : remove inflammatory tissues, relieve vitreomacular traction
  - Plan for vitreous sampling
    - Cytology for differentiate Sarcoidosis and Lymphoma
    - ELISA for Toxocariasis

# POD 1day

- C.C) Ocular pain(+), redness(+), decrease of floaters
- VA (OD) : 20/400(N-C)
- IOP (OD) : 13mmHg at AM 7:30 with Cosopt BID OD by Goldmann Applanation
- ConJ (OD) subconjunctival hemorrhage with mild injection
- Cornea (OD) clear
- AC (OD) deep chamber with cells(+)
- Lens (OD) PCL in good position

Vit. Haze(-)  
Vit. Cell(rare)  
Well margined mass with laser scar  
Well removed tractional membrane



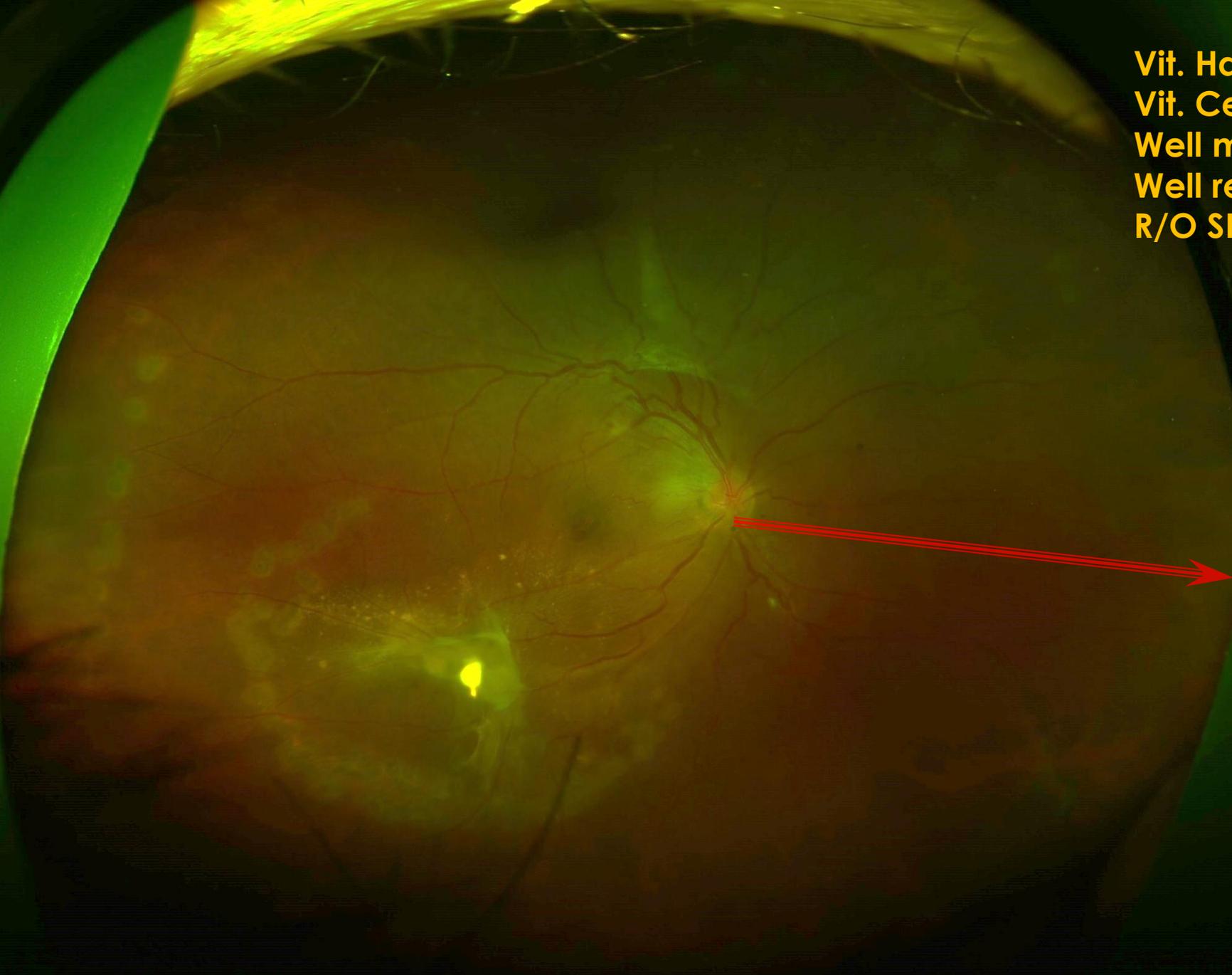
CRT : 285µm  
Focus: -0.45 OD Scan angle: 29.7°

# Treatment Plan

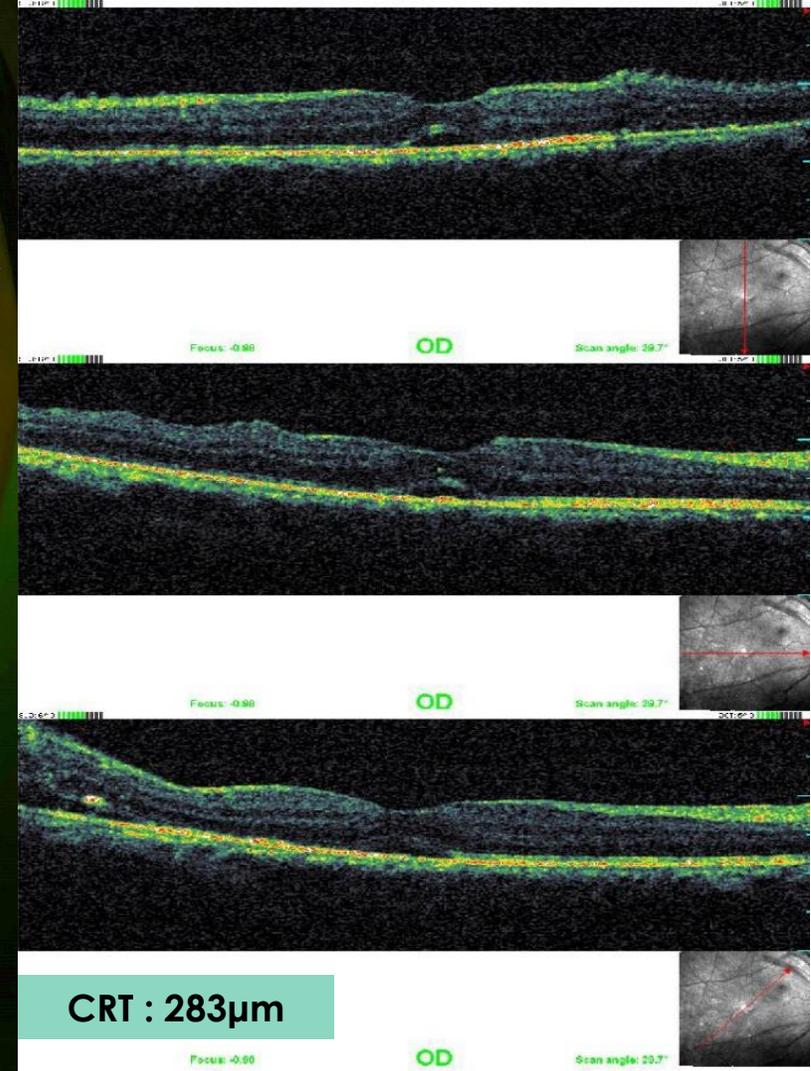
- Keep Albendazole 400mg BID
- Keep Prednisone 30mg PO
- Vigamox QID OD
- Predforte QID OD
- Homatropin BID OD
- Stop Cosopt BID OD
- Plan to follow up 1week

# POD 1week

- C.C) Improve in visual acuity and ocular pain, No floaters
- VA (OD) : 20/60(N-C)
- IOP (OD) : 19mmHg at AM 10:40 by Pneumotonometry
- ConJ (OD) Relieve of subconjunctival hemorrhage
- Cornea (OD) clear
- AC (OD) deep chamber with cells(rare)
- Lens (OD) PCL in good position
- Vitreous sample
  - Toxocara ELISA with TES Ag : IgG (+)



Vit. Haze(-)  
Vit. Cell(rare)  
Well margined mass with laser scar  
Well removed tractional membrane  
R/O SRF or PED at fovea



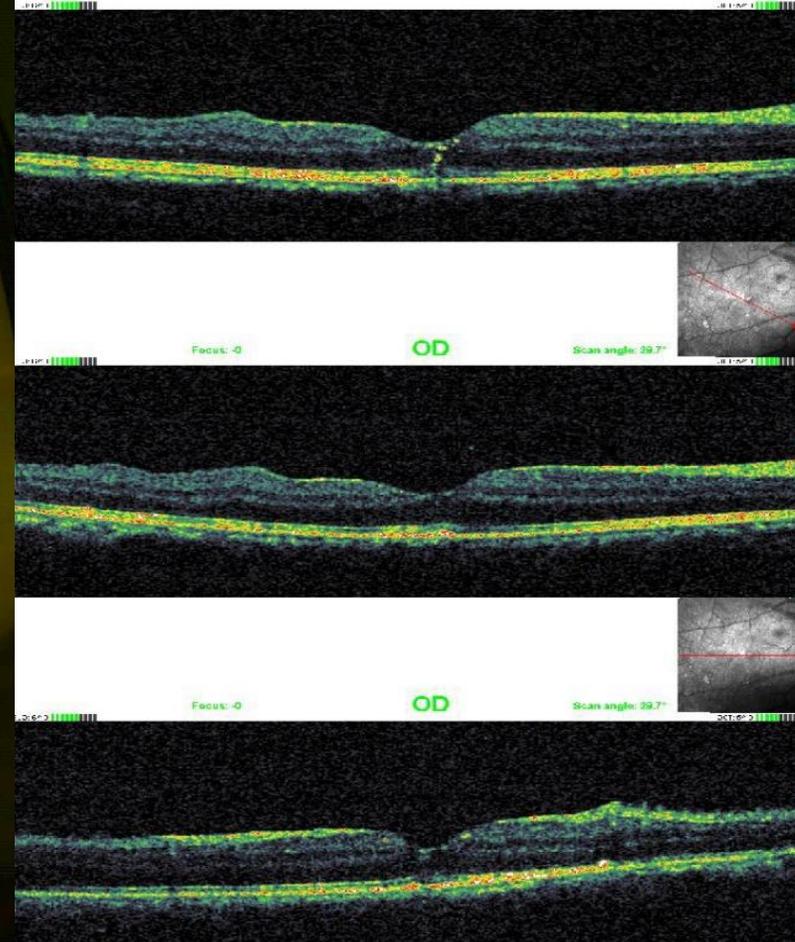
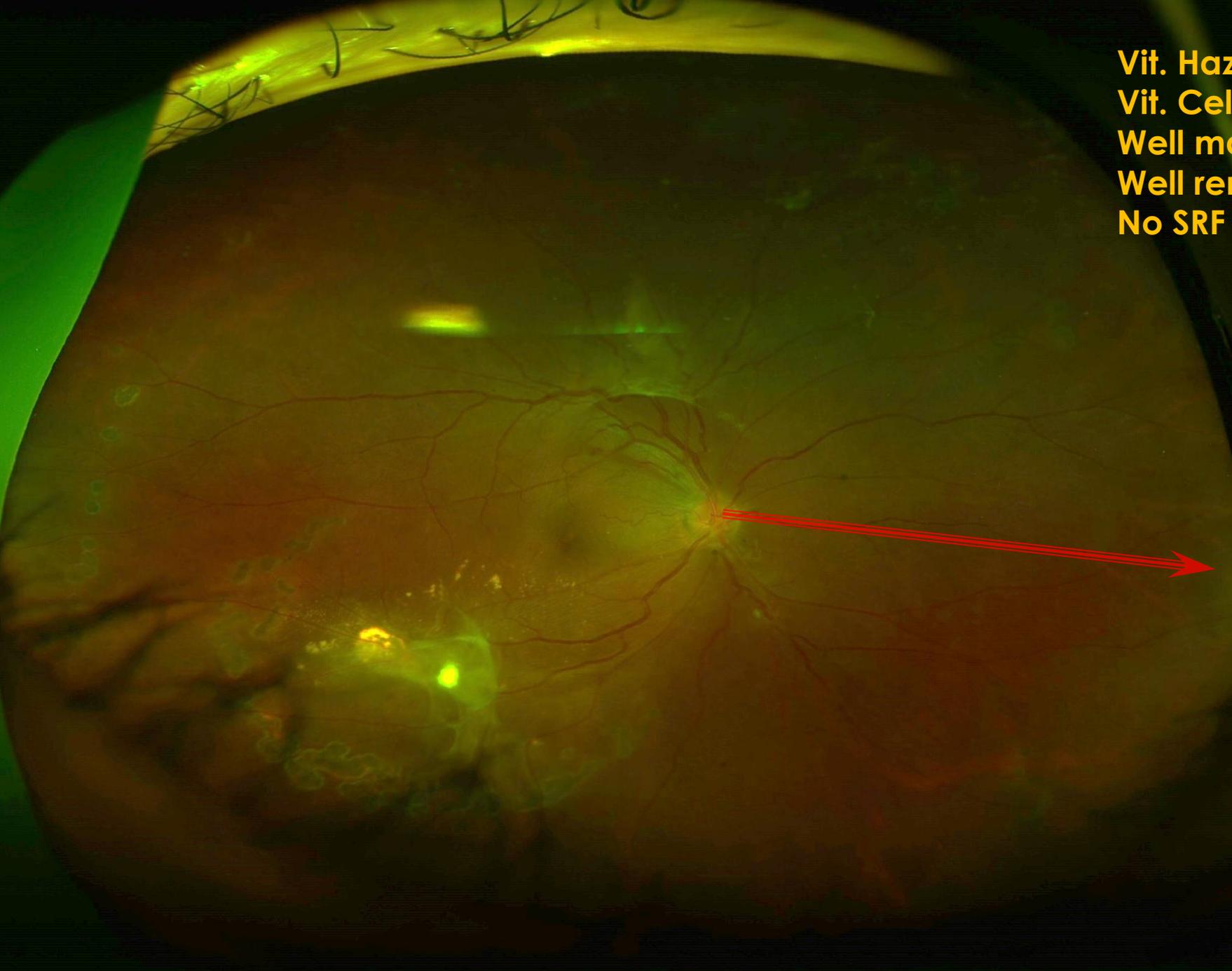
# Treatment Plan

- Keep Albendazole 400mg BID
- Taper Prednisone to 20mg PO with 10mg every week
- Vigamox TID OD
- Taper Predforte TID OD with 1 drop every week
- Stop Homatropin BID OD
- Plan to follow up 3weeks later

# POD 1 Month

- C.C) No ocular pain nor redness, blurry vision OD
- VA (OD) : 20/50(N-C)
- IOP (OD) : 20mmHg at AM 11:30 by Pneumotonometry
- ConJ (OD)normal
- Cornea (OD) clear
- AC (OD) deep chamber with no cells
- Lens (OD) PCL in good position

Vit. Haze(-)  
Vit. Cell(rare)  
Well marginated mass with laser scar  
Well removed tractional membrane  
No SRF



CRT : 240μm  
Focus: 0 OD Scan angle: 39.7°

Single Field Analysis

Eye: Right

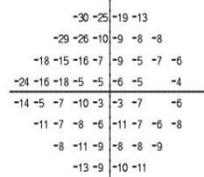
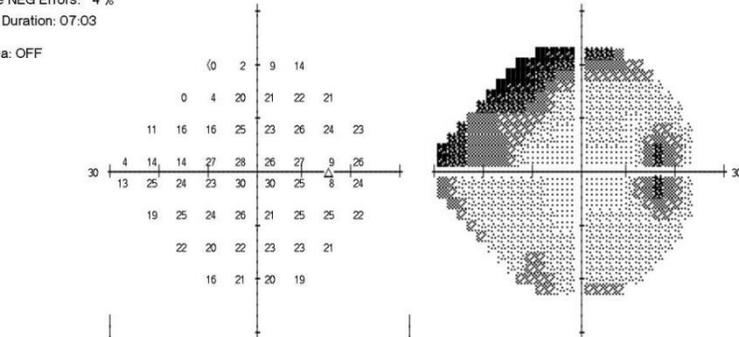
Name: S.M.S  
ID: 359149

DOB: 12-31-1964

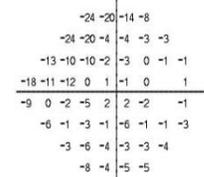
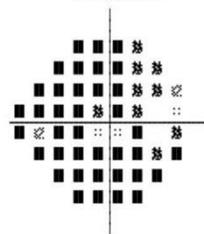
Central 24-2 Threshold Test

Fixation Monitor: Gaze/Blind Spot  
Stimulus: III, White  
Pupil Diameter:  
Date: 04-16-2013  
Fixation Target: Central  
Background: 31.5 ASB  
Visual Acuity:  
Time: 1:17 PM  
Fixation Losses: 0/17  
Strategy: SITA-Standard  
RX: DS DC X  
Age: 48  
False POS Errors: 1 %  
False NEG Errors: 4 %  
Test Duration: 07:03

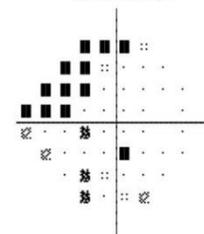
Fovea: OFF



Total Deviation



Pattern Deviation



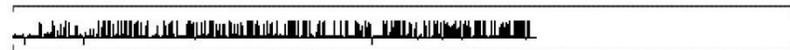
:: < 5%  
◻ < 2%  
◻ < 1%  
■ < 0.5%

GHT  
Outside normal limits

VFI 84%

MD -9.81 dB P < 0.5%

PSD 6.10 dB P < 0.5%



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HFA II 740-10829-4.2.2/4.2.2



Single Field Analysis

Eye: Left

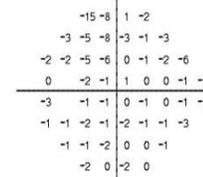
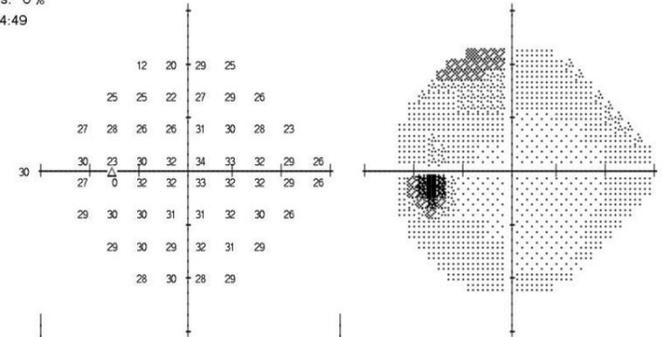
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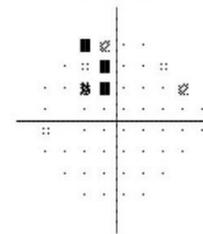
Central 24-2 Threshold Test

Fixation Monitor: Gaze/Blind Spot  
Stimulus: III, White  
Pupil Diameter:  
Date: 04-16-2013  
Fixation Target: Central  
Background: 31.5 ASB  
Visual Acuity:  
Time: 1:26 PM  
Fixation Losses: 0/15  
Strategy: SITA-Standard  
RX: DS DC X  
Age: 48  
False POS Errors: 1 %  
False NEG Errors: 0 %  
Test Duration: 04:49

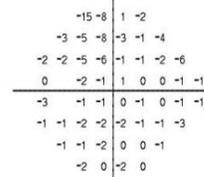
Fovea: OFF



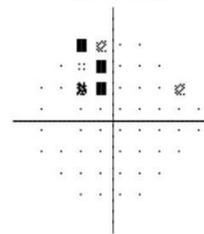
Total Deviation



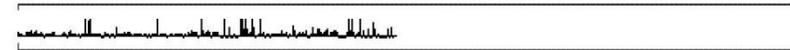
:: < 5%  
◻ < 2%  
◻ < 1%  
■ < 0.5%



Pattern Deviation

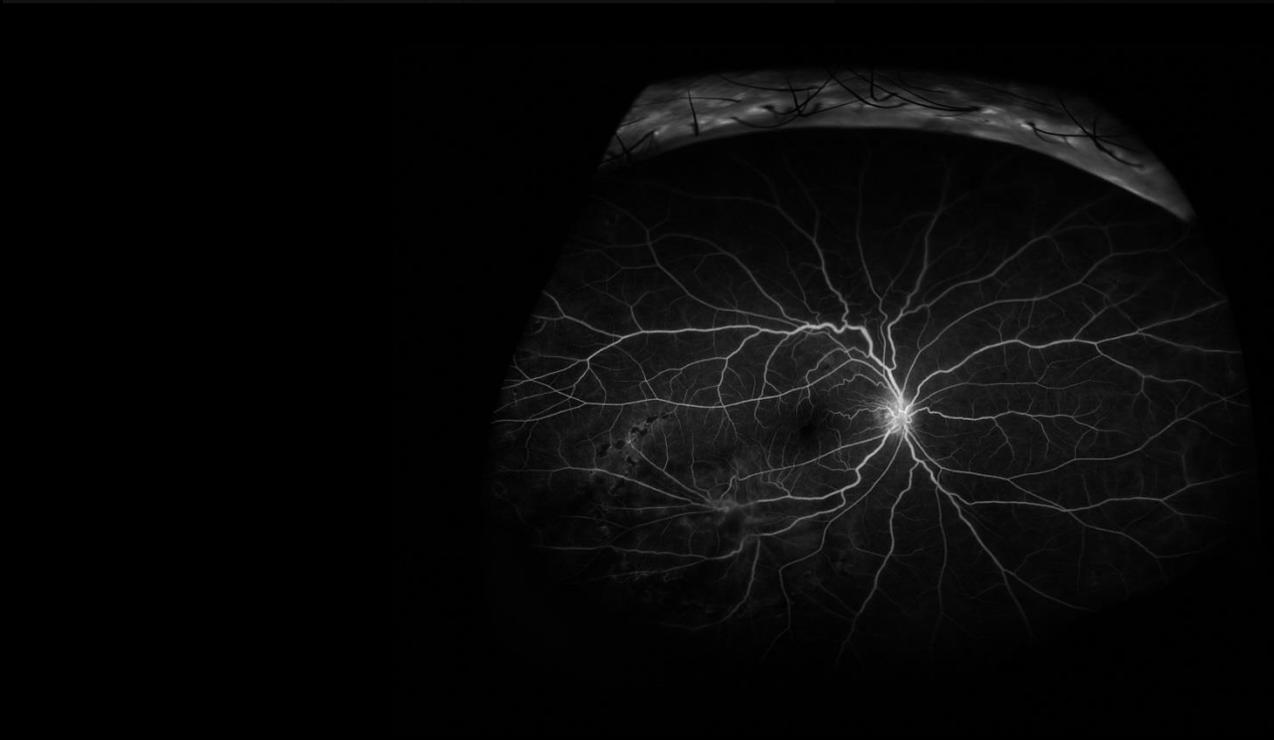


GHT  
Borderline  
VFI 97%  
MD -1.63 dB  
PSD 2.33 dB P < 5%



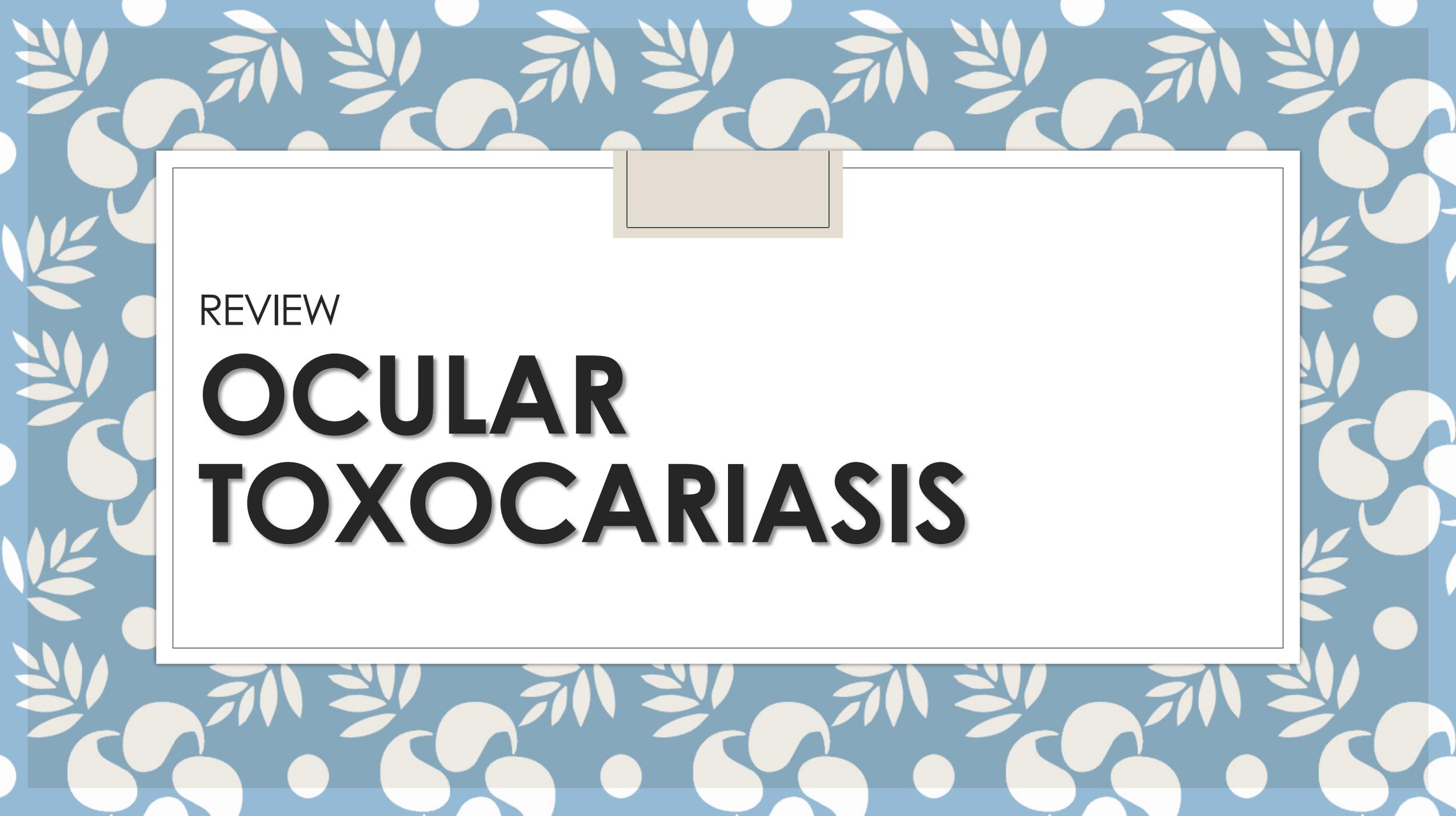
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HFA II 740-10829-4.2.2/4.2.2





# Treatment Plan

- Stop PO medication
- Stop Vigamox TID OD
- Continue Predforte QD OD
- Encourage lubricating eye drops OD
- Plan to follow up 1 month later



REVIEW

# OCULAR TOXOCARIASIS

# Introduction

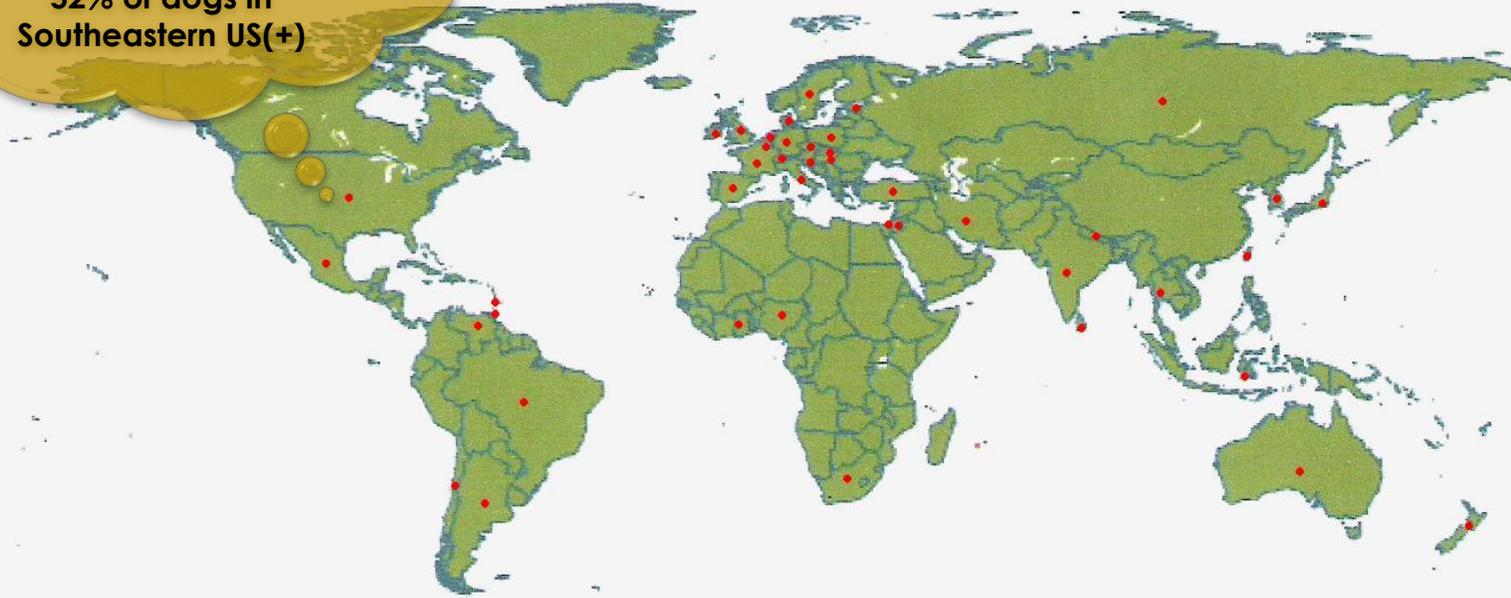


- **Zoonotic disease** caused by *Toxocara canis* or *Toxocara cati* larvae
  - *T. canis* : dog roundworm, *T. cati* : cat roundworm
  - More frequent in *T. canis*
- Transmission to human by ingestion of embryonated eggs
  - Contaminated raw vegetables
  - Infected raw meat (chicken, lamb, rabbit)
  - Contaminated water
  - Geophagia, pica

# Epidemiology

Disease is found worldwide or in virtually every country +

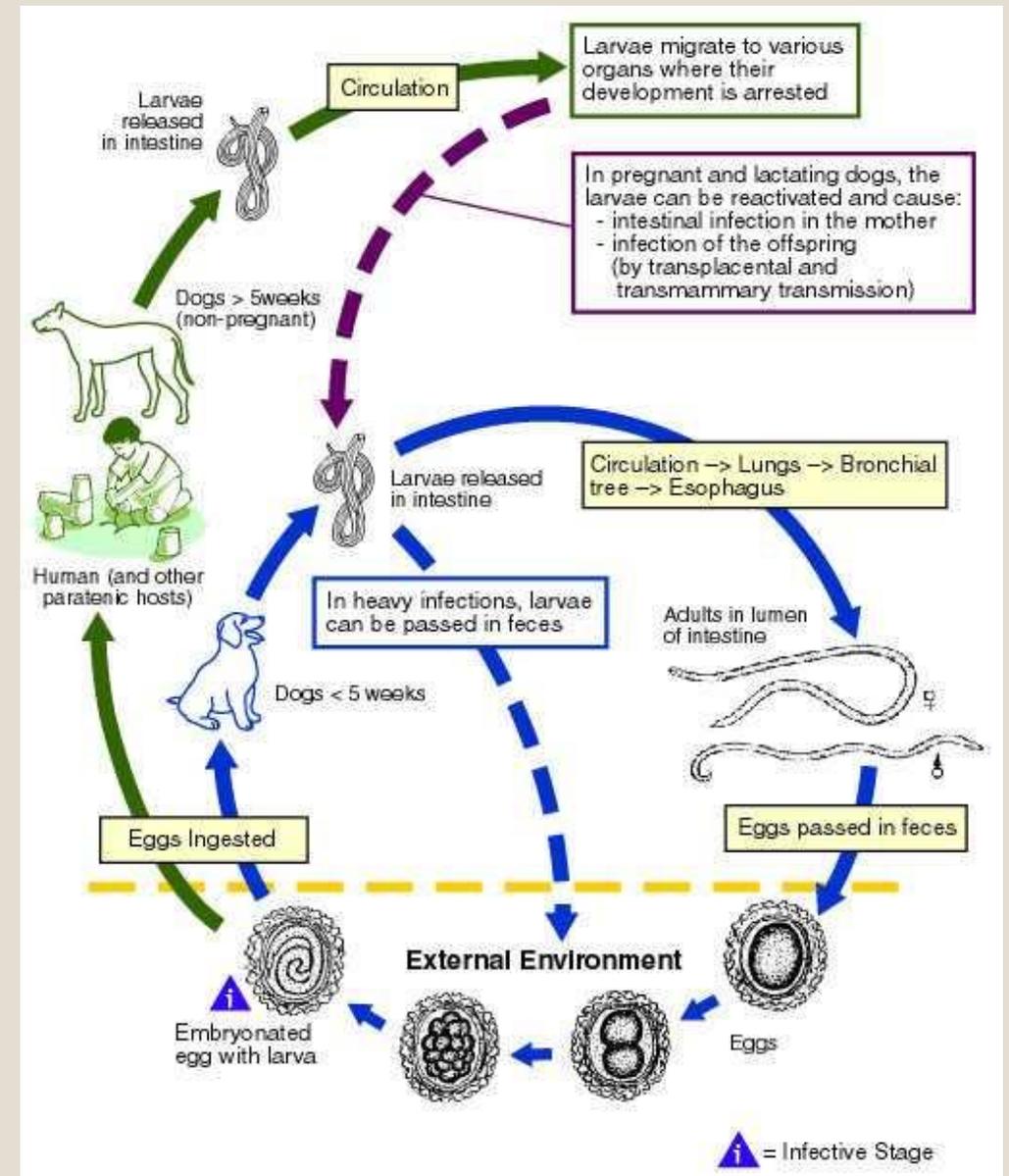
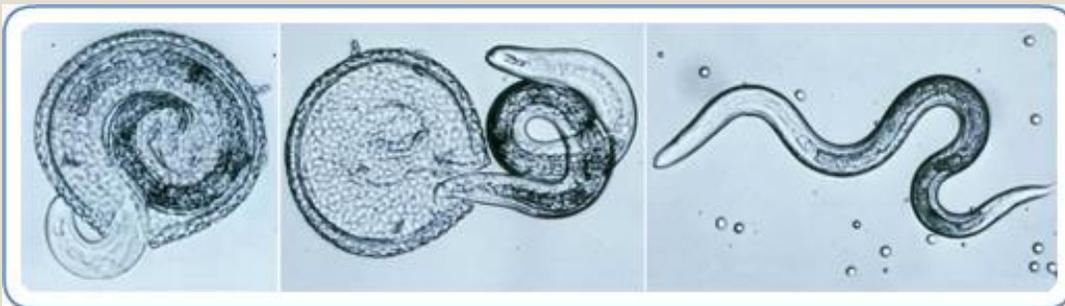
36% of dogs in nationwide(+)  
52% of dogs in Southeastern US(+)



- Susceptible group
  - Pet owners
  - Childrens
- Low prevalence of Toxocara in human
  - 10,000 new infection/yr
- Seroprevalence test
  - 5% of children
  - 50% of children with regular contact with pets and soils, having chronic respiratory problems

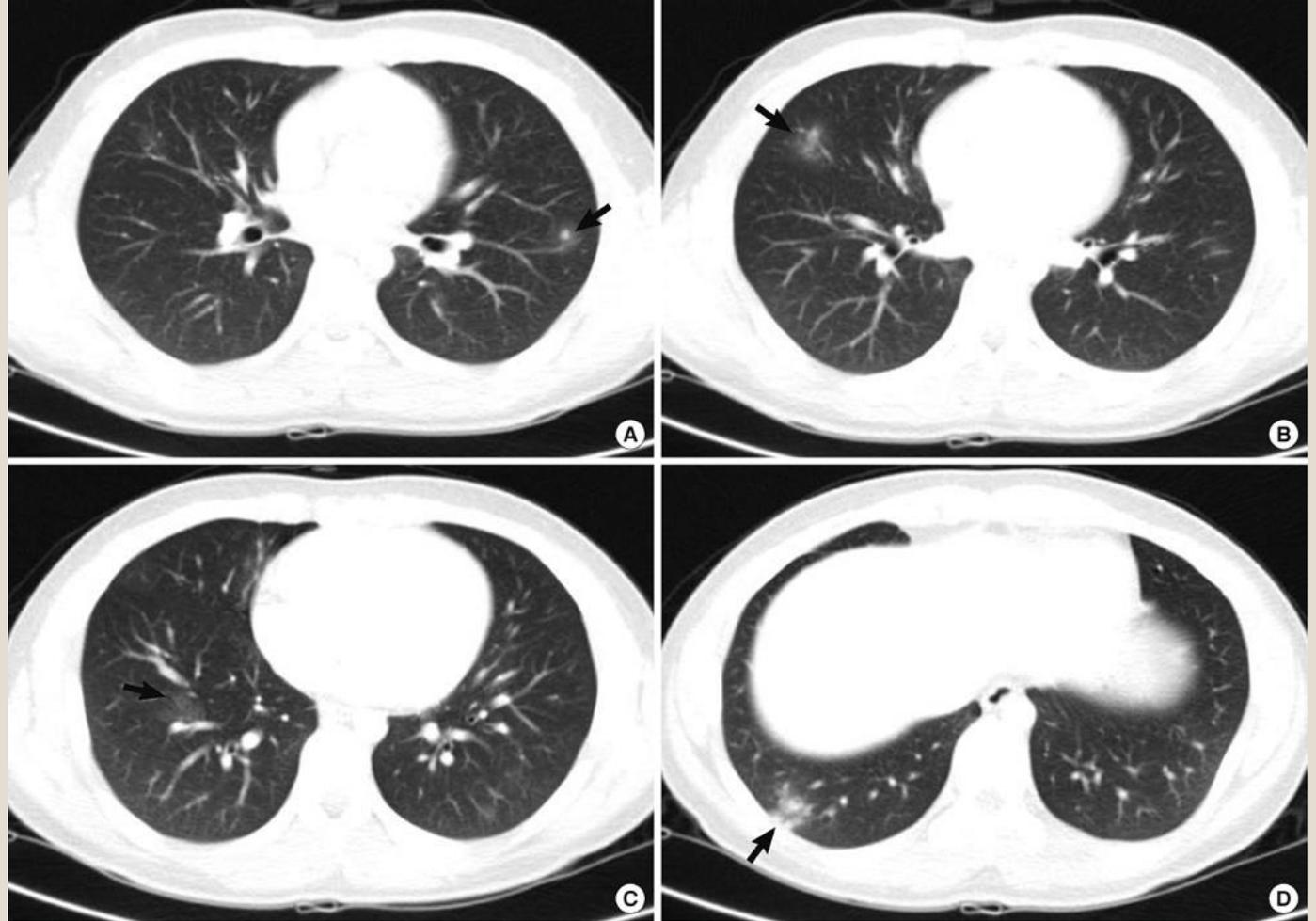
# Toxocara canis

- Ascarid : Member of Ascariditae family
- Only complete its lifecycle in the dogs
  - Stage I encapsulated larvae
  - **Stage II larvae**
  - Stage III larvae
  - Stage IV larvae
  - Adult worm
- Lifecycle ends at the stage II larval state in human (brain, lung, eye, liver)



# Systemic manifestations (VML)

- Fever
- Pulmonary symptoms
  - Dry, hacking cough
  - Asthma-like attacks
- Splenomegaly
- Hepatomegaly
- Skin lesions
- Neurologic symptoms
  - Convulsion
  - Meningitic pictures



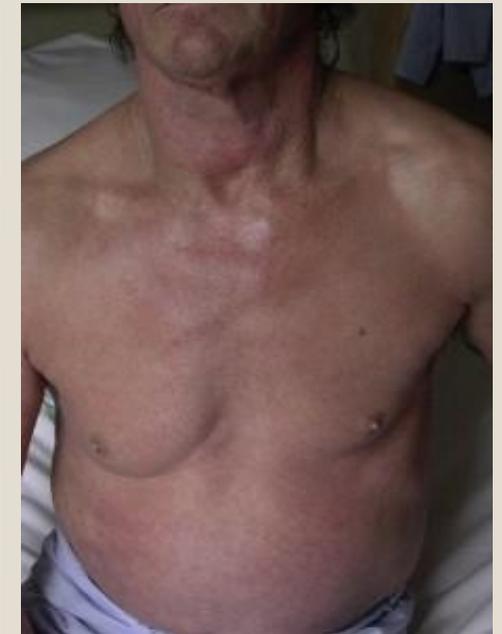
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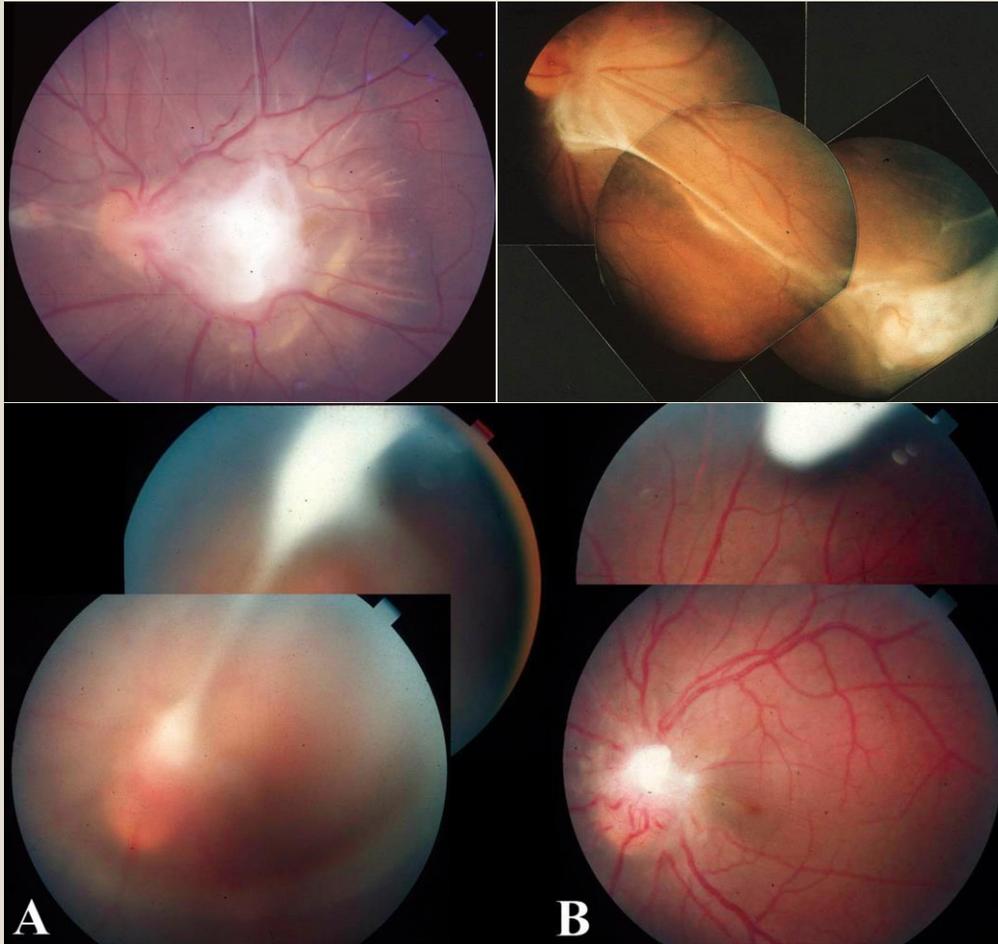


# Systemic manifestations (VML)

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- Skin lesions
- Neurologic symptoms
  - Convulsion
  - Meningitic pictures



# Ocular manifestations(1)



- Average age : 7.5 years (2~31years)
  - 80% patients : under age 16
- Typically unilateral
  - 3% : bilateral
- 'Typical' ocular presentation
  - **Granuloma** either in post. pole or in periphery
    - Raised, whitish in color, width 0.75~3DDS
    - Stage II larva lodged in the choroid and becomes encysted
    - 50% : periphery/ 25% : macula
  - Associated with **massive vitritis**

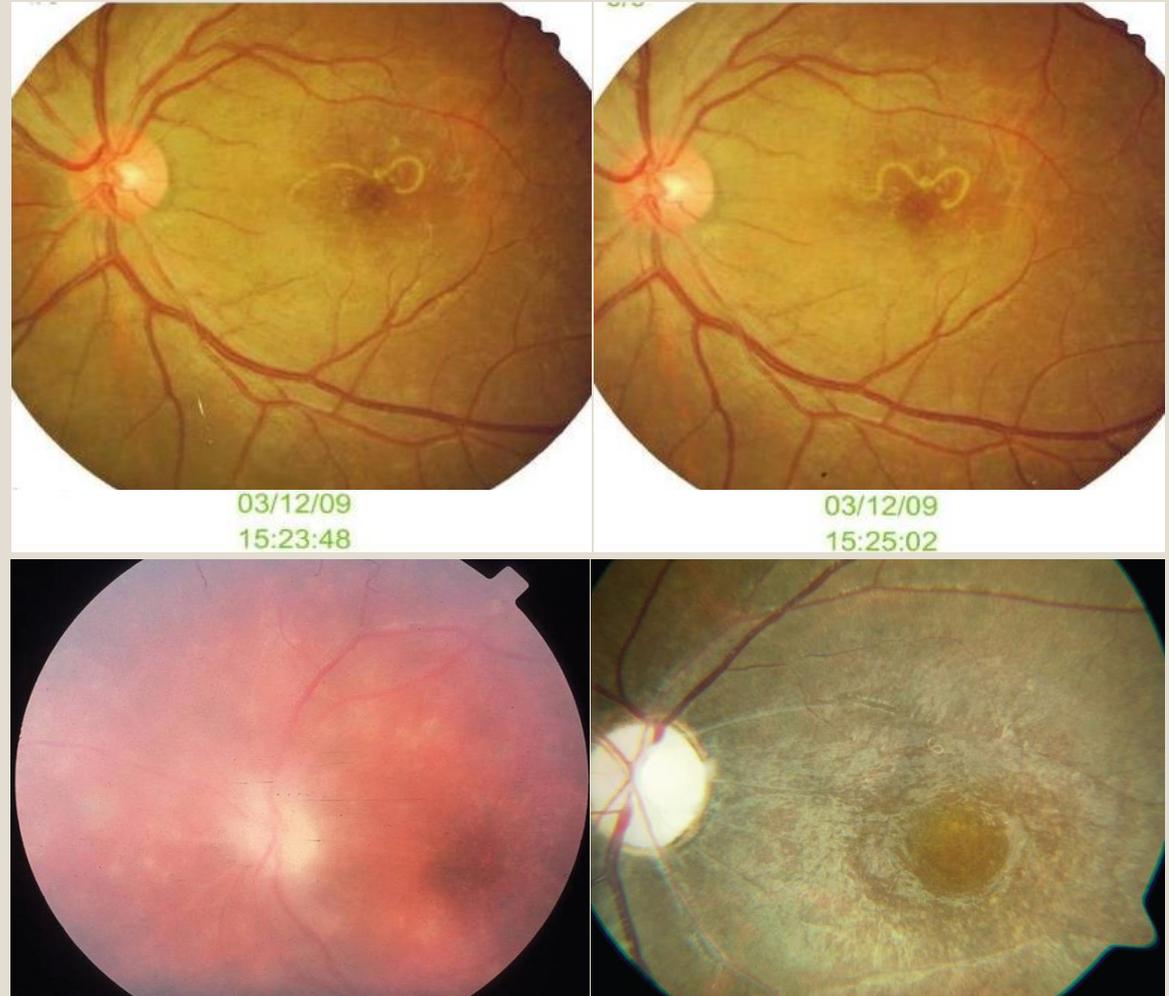
# Ocular manifestations(2)

- Live larvae in the retinal vessels
  - Peripheral retinitis
- Hypopyon uveitis
- Fuchs' heterochromia
- Leukocoria
- Motile subretinal nematode
- Diffuse chorioretinitis
- Optic nerve involvement



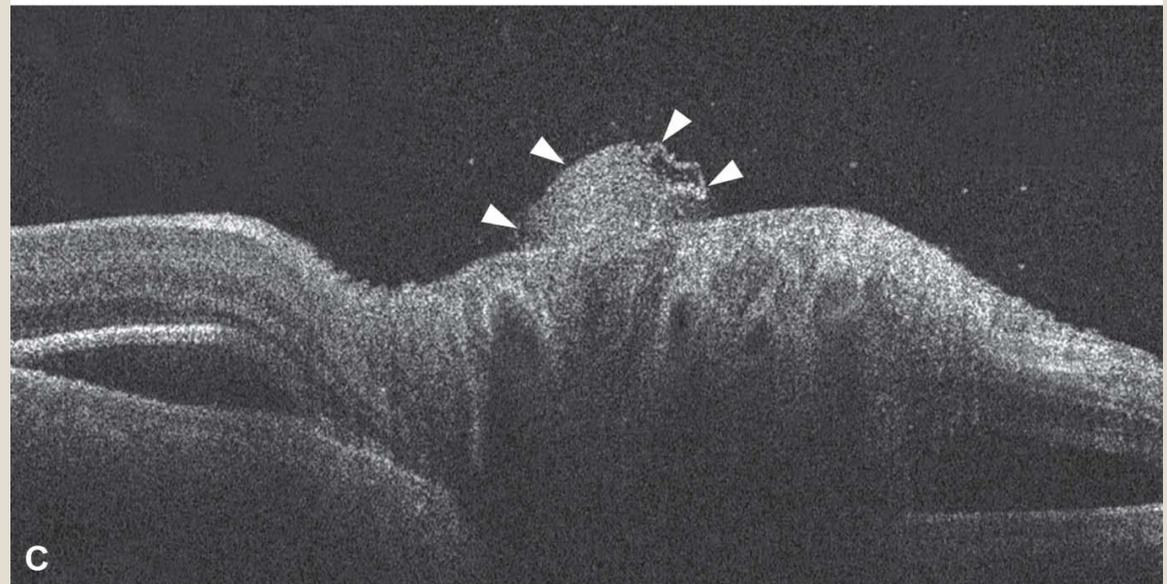
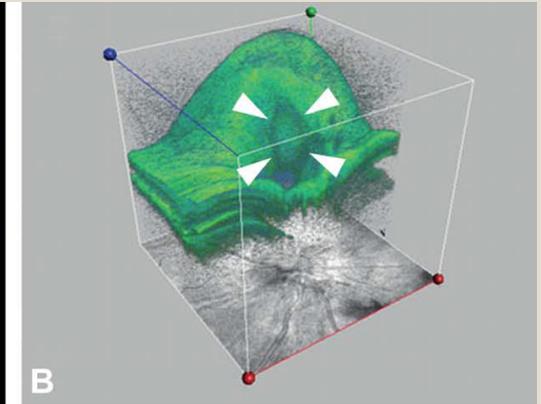
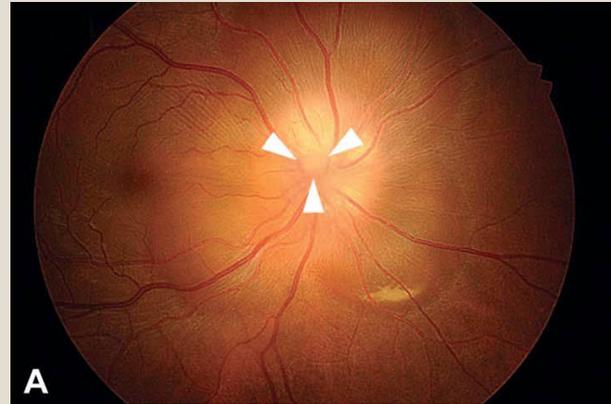
# Ocular manifestations(2)

- Live larvae in the retinal vessels
  - Peripheral retinitis
- Hypopyon uveitis
- Fuchs' heterochromia
- Leukocoria
- Motile subretinal nematode
- Diffuse chorioretinitis
- Optic nerve involvement

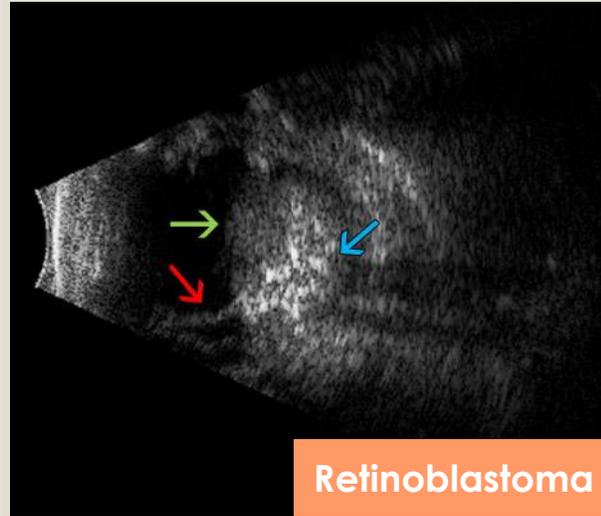
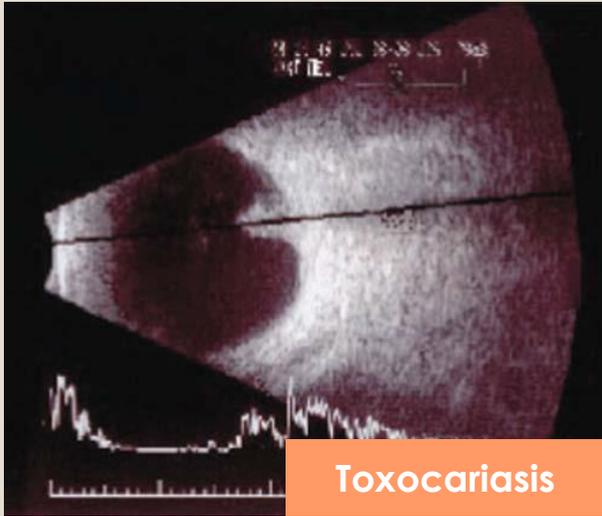


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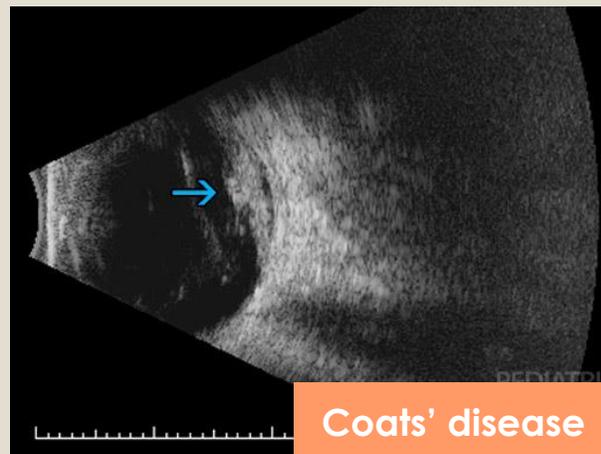
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# Differential diagnosis



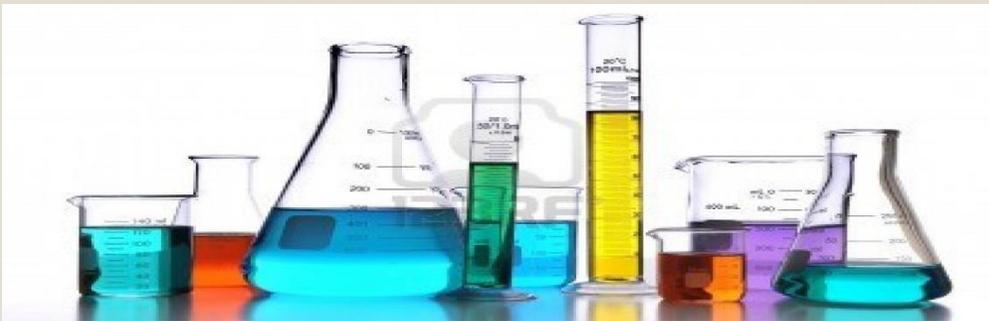
B-scan  
1) Solid highly reflective mass  
2) Vitreous band or TRD extended from the mass to post. pole



- Due to Leukocoria
  - Retinoblastoma
  - Coats' disease
  - ROP
- Due to focal choroiditis
  - Sarcoidosis
  - Retrolental fibrosis

# Diagnosis

- **Laboratory workup**
  - Eosinophilia
  - Hyperglobulinemia
  - Immune complex level
    - Good for monitoring treatment efficacy
  - No eggs in stool



- **ELIZA**
  - Most reliable & readily available test
  - Used by 2 Toxocara-derived Ag
    - Embryonated egg
    - Excretory-secretory antigen : more consistent
  - Reasonable efficient in acute Toxocariasis but not in inactive and ocular disease
    - evidence of ocular toxocariasis : Serum titer 1:8
  - High false (+) : due to cross reaction
    - Western blotting technique
    - PCR from aqueous humor

# Diagnosis

**Sensitivity and specificity of ELISA for diagnosis of ocular toxocariasis** (From Hagler WS, Pollard ZF, Jarrett WH et al. Results of surgery for ocular *Toxocara canis*. Ophthalmology 1981;88:1081-6)

Cutoff titer of positive test	Sensitivity (%)	Specificity (%)
1:2	95	72
1:4	93	86
1:8	90	91
1:16	85	94
1:32	73	95
1:64	51	97
1:128	24	99
1:256	15	100
1:512	5	100



## ○ ELISA

- Most reliable & readily available test
- Used by 2 *Toxocara*-derived Ag
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  - Excretory-secretory antigen : more consistent
- Reasonable efficient in acute *Toxocariasis* but not in inactive and ocular disease
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# Treatment

## Medical therapy

- Anthelmintic drugs
  - Thiabendazole /Albendazole
    - 800mg BID for adult
    - 400mg BID for children
- Prednisone
  - Reduce secondary inflammation
  - Use anthelmintic drug simultaneously
- Disappearance of the active larva 24hours after the initial Tx.
- No change in pre & post Tx. VA

## Surgical therapy

- Effective method to manage the secondary effects of Toxocariasis
- Favorable outcomes were reported
  - Hagler et al : 15/17 stabilized or improved post OP VA
- Photocoagulation : kill the larvae
- Cryopexy : treat vasoproliferative tumors secondary to organism

# Ocular Toxocariasis in Korea

**Table 1.** Demographic characteristics of the patients with ocular toxocariasis

Variable	Finding
No. of patients (eyes)	33 (33)
Sex (male/female)	24/9
Age at presentation (years)	
All patients	41.6 ± 11.0 (8–65)
Male	42.0 ± 12.1 (8–65)
Female	40.6 ± 7.8 (24–49)
Time from onset to presentation (months)	
All patients	2.9 ± 5.1 (<1–24)
Male	2.1 ± 3.3 (<1–12)
Female	5.0 ± 8.1 (<1–24)
Puppy/kitten exposure	10 (36%)
Raw food consumption (raw meat, liver, freshwater fish)	23 (82%)

Values are means ± SD (range) unless otherwise indicated.

**Table 3.** Clinical characteristics of the patients with ocular toxocariasis

Variable	Number (%) of patients
Chronicity	
Acute	22 (67)
Chronic	7 (21)
Recurrent	4 (12)
Laterality	
Unilateral	33 (100)
Bilateral	0
Severity	
Mild	19 (58)
Moderate	12 (36)
Severe	2 (6)
Location	
Anterior	0
Intermediate	3 (9)
Posterior	26 (79)
Diffuse	4 (12)
Type	
Posterior pole granuloma	12 (36)
Peripheral inflammatory mass	17 (52)
Chronic endophthalmitis	1 (3)
Atypical	3 (9)

SI Kwon, JP Lee, SP Park et al. *Ocular Toxocariasis in Korea*, Jpn J Ophthalmol 2011;55:143-7

# Reference

- C. Stephan Foster & Albert T. Vitale, *Diagnosis and Treatment of Uveitis* 2<sup>nd</sup> edition, Jaypee Brothers Medical Pub. 2013
- Robert B. Nussenblatt & Scott M. Whitcup, *Uveitis; fundamentals and clinical practice* 4<sup>th</sup> edition, Mosby Elsevier 2010
- SI Kwon, JP Lee, SP Park et al. *Ocular Toxocariasis in Korea*, Jpn J Ophthalmol 2011;55:143-7
- M. Paul, J. Stefaniak, H. Twardosz-Pawlik, K. Pecold, *The co-occurrence of Toxocara ocular and visceral larva migrans syndrome: a case series*, Cases Journal 2009;2:6881
- B. Gavignet, R. Piarroux, F. Aubin, L. Millon, P. Humbert, *Cutaneous manifestations of human Toxocariasis*, J Am Acad Dermatol. 2008;59:1031-42
- Rafael T. Cortez, Gema Ramirez, Lucienne Collet, Gian Paolo Giuliani, *Ocular Parasitic Disease: A Review on Toxocariasis and Diffuse Unilateral Subacute Neuroretinitis*, J Pediatr Ophthalmol Strabismus 2011;48:204-212
- YJ Kim, CH Moon, JH Chang, *Toxocariasis of the Optic Disc*, Journal of Neuro-Ophthalmology 2013;0:1-2
- John P. Campbell, Charles P. Wilkinson, *Imaging in the Diagnosis and Management of Ocular Toxocariasis*, Int Ophthalmol Clin. 2012;52:145-53
- J. Fillaux, J. F. Magnaval, *Laboratory Diagnosis of human Toxocariasis*, Veterinary Parasitology 2013;193: 327-336



**THANK YOU FOR  
YOUR ATTENTIONS**