ophthal Focus

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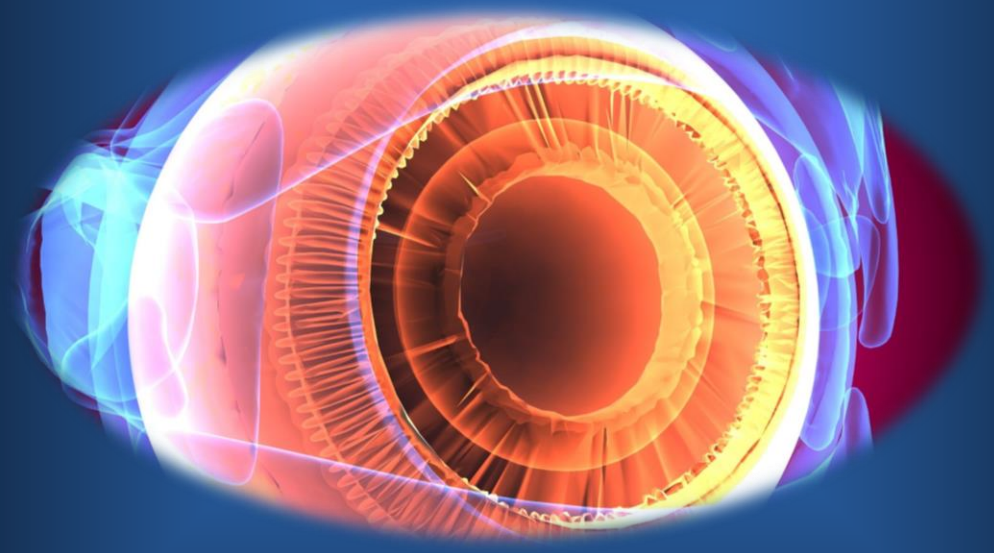


Dear Doctor,

Greetings from Micro Labs Limited. We are happy to bring you 'Ophthal Focus' which contains latest and interesting news in the field of Ophthalmology.

This issue contains

- Wide-Field (15 x 9mm) Swept-Source Optical Coherence Tomography Angiography Following Plaque Radiotherapy of Choroidal Melanoma
- Associations of Variation in Retinal Thickness With Visual Acuity and Anatomic Outcomes in Eyes With nAMD Lesions Treated With Anti–VEGF Agents
- Bilateral hazy vitreous in a patient with convulsions

Should you require any specific article or medical information, please feel free to contact us at medicalservices@microlabs.in

Looking forward to your valuable feedback

Best Regards,

Medical Team, Micro Labs Limited

Wide-Field (15 x 9mm) Swept-Source Optical Coherence Tomography Angiography Following Plaque Radiotherapy of Choroidal Melanoma: An Analysis of 105 eyes

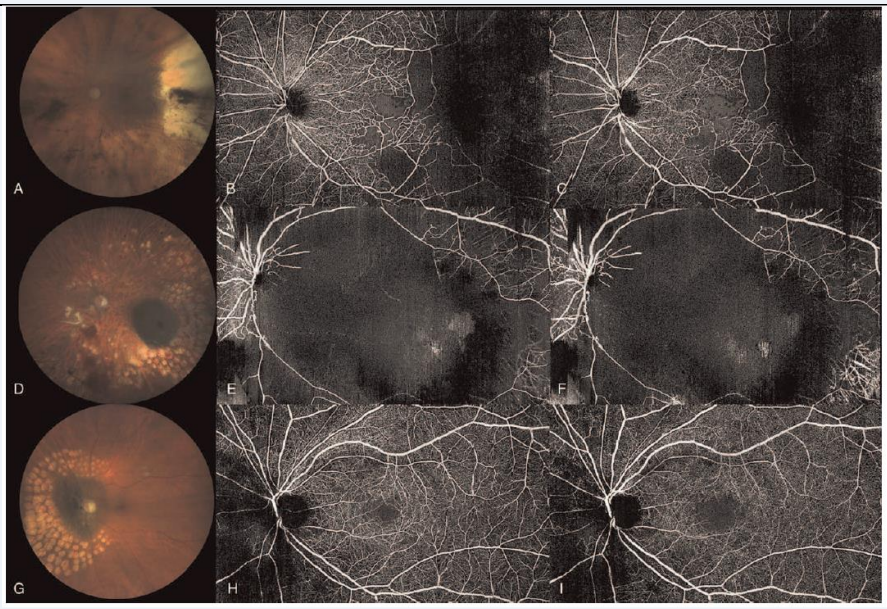
Radiation damage to the retina (radiation retinopathy) or optic nerve (radiation optic neuropathy) is usually a delayed onset, slowly progressive occlusive vasculopathy that can cause significant visual morbidity following plaque radiotherapy for choroidal melanoma (CM). The aim of this study was to evaluate retinal microvascular abnormalities following plaque radiotherapy of choroidal melanoma (CM) using wide-field swept-source optical coherence tomography angiography (OCTA). Retrospective case series of 105 CM patients treated with I-125 plaque radiotherapy and imaged with wide-field (15 × 9 mm) SS-OCTA from March 2018 to August 2018 at the Ocular Oncology Service, Wills Eye Hospital (Philadelphia, PA).

Wide-field swept-source optical coherence tomography angiography demonstrates retinal microvascular abnormalities in the CVD in eyes with and without CERR.

At mean follow-up of 49 months (range 4–297) after plaque radiotherapy, there were 52 eyes (50%) with clinically evident radiation retinopathy (CERR) and 53 eyes (50%) without CERR. Comparison (CERR vs controls) revealed foveal avascular zone enlargement (1.7 vs 0.23 mm2, P = 0.03) and reduction of capillary vascular density (CVD) in the superficial and deep plexus in the total wide-field (43% vs 47%, P < 0.001, and 46% vs 48%, P = 0.001, respectively), peripapillary region (66% vs 77%, P < 0.001, and 66% vs 72%, P = 0.001, respectively), and papillomacular bundle (60% vs 68%, P < 0.001, and 61% vs 64%, P = 0.03, respectively). Comparison (no CERR vs controls) revealed nonsignificant foveal avascular zone enlargement (1.20 vs 0.23 mm2, P = 0.16) and reduction of CVD in the superficial plexus (46% vs 47%, P = 0.008), and not the deep plexus (48% vs 48%, P = 0.42) of the total

wide-field. Comparison of irradiated eyes (CERR vs no CERR) showed reduction of CVD in the superficial and deep plexus of the total wide-field (43% vs 46%, P < 0.006, and 46% vs 48% P < 0.02, respectively), peripapillary region (66% vs 74%, P < 0.001, and 66% vs 72% P < 0.01, respectively), and superficial plexus in the papillomacular bundle (60% vs 65%, P = 0.03).

Following plaque radiotherapy for choroidal melanoma, wide-field swept-source optical coherence tomography angiography demonstrates retinal microvascular abnormalities in the CVD in eyes with and without CERR. These findings are important in early detection and monitoring of radiation retinopathy.



Wide-field SS-OCTA in choroidal melanoma with clinically evident radiation retinopathy (CERR).

A 70-year-old female, 10 years after plaque radiotherapy of a choroidal melanoma temporal to the macula, with telangiectasia inferior to the macular (A). Compared with the contralateral non-irradiated eye, there was ischemia in the region of the tumor, and discontinuity of the foveal avascular zone (FAZ) margin at the level of the superficial (B) and deep (C) capillary plexus. A 28-year-old male, 5 years after plaque radiotherapy of a choroidal melanoma in the temporal macular, with clinically evident proliferative radiation retinopathy (D). By SS-OCTA, there was severe ischemia with total loss of the parafoveal vasculature at the level of the superficial (E) and deep (F) plexuses. Wide-field swept-source optical coherence tomography angiography (SS-OCTA) in choroidal melanoma with no CERR. A 54-year-old male, 10 months after plaque radiotherapy of a peripapillary choroidal melanoma (G). Compared with the contralateral non-irradiated eye, at the level of the superficial capillary plexus, the FAZ margin was continuous but enlarged (H). Capillary dropout was present superior to the optic disc at the level of the deep capillary plexus (I).

Clinical Outcomes at Last Follow-up	Clinically Evident Radiation Retinopathy (CERR) n = 52 (%)	No Clinically Evident Radiation Retinopathy (no CERR) n = 53 (%)	*P*	Total N = 105 (%)
Post treatment follow-up, (months), mean (median, range)	60 (54, 4–157)	40 (17, 4–297)	0.04	50 (35, 4–297)
Visual acuity Mean (median, range)			0.02	
LogMAR	0.98 (0.62, 0.00–3.00)	0.59 (0.30, 0.00–3.00)		0.78 (0.48, 0.00–3.00)
Snellen equivalent	20/190 (20/83, 20/20-HM)	20/78 (20/40, 20/20-HM)		20/120 (20/60, 20/20-HM)
Radiation maculopathy	31 (60)	12 (23)	<0.001	43 (41)
Radiation papillopathy	4 (8)	1 (2)	0.35	19 (18)
Optic atrophy	10 (20)	4 (8)	0.14	14 (13)
Retinal or optic disc neovascularization	4 (8)	0 (0)	0.12	4 (4)
Tumor recurrence	4 (8)	1 (2)	0.35	5 (5)
Enucleation	0 (0)	0 (0)	na	0 (0)
Metastasis	2 (4)	3 (6)	0.30	5 (5)
Death	1 (2)	2 (4)	0.99	3 (3)

CERR indicates clinically evident radiation retinopathy; HM, hand movement.

Wide-Field Swept-Source Optical Coherence Tomography Angiography (SS-OCTA) Following Plaque Radiotherapy of Choroidal Melanoma: Clinical Outcomes at Last Follow-up

Clinical outcomes at last follow-up are listed in Table. At mean post treatment follow-up of 50 months (35, 4–297 months), mean visual acuity was 20/120 (20/60, 20/20–HM). A comparison (CERR vs no CERR) revealed the CERR group with longer follow up (60 vs 40 months, P=0.04), worse visual acuity (0.98 vs 0.59, Snellen equivalent 20/190 vs 20/78, P=0.02), and higher incidence of radiation maculopathy (60% vs 23%, P<0.001).

Wide-field SS-OCTA following plaque radiotherapy for CM demonstrates retinal microvascular abnormalities that are not limited to the fovea, but can also occur in the peripapillary region and papillomacular bundle on wide-field images. Furthermore, microvascular abnormalities are not limited to eyes with CERR but can also be seen in eyes without CERR, with distinct SSOCTA differences between the 2 groups. SS-OCTA is a useful imaging modality for early detection and monitoring of radiation retinopathy in the post-equatorial wide-field portion of the eye.

Source: Lim L S et al. Asia Pac J Ophthalmol (Phila) 2020;9:326–334. doi: 10.1097/APO.0000000000000282.

Associations of Variation in Retinal Thickness With Visual Acuity and Anatomic Outcomes in Eyes With nAMD Lesions Treated With Anti–VEGF Agents

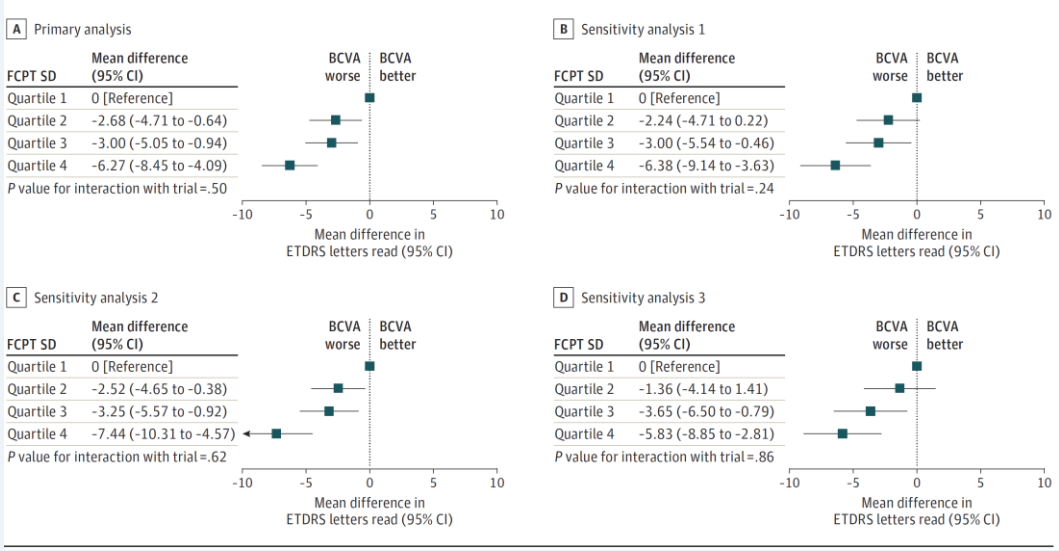
Treatment of neovascular age-related macular degeneration (nAMD) has been transformed by intraocular injection of therapies that inhibit vascular endothelial growth factor (VEGF).1 The goal of therapy is to achieve a macula free of exudation. Clinicians use optical coherence tomography (OCT) criteria (indicating disease activity) to tailor retreatment.

Greater variation in retinal thickness in eyes with nAMD during treatment with anti-VEGF was associated with worse BCVA and development of fibrosis and macular atrophy.

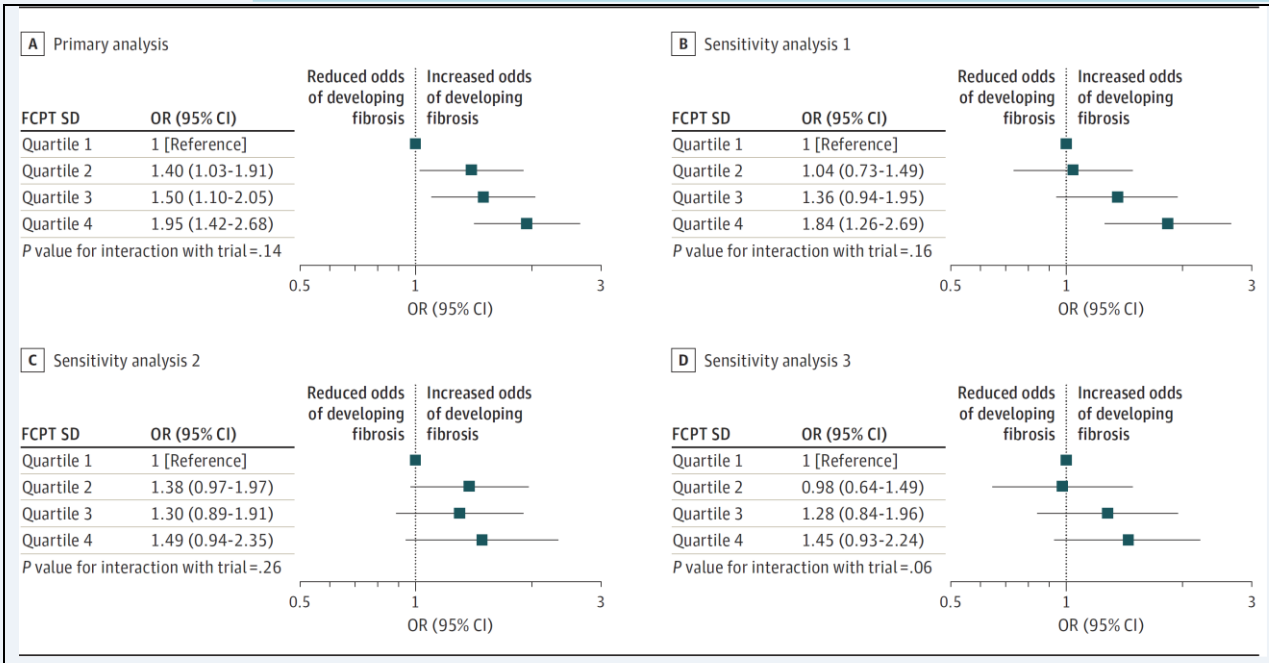
The study was conducted to investigate whether visual and anatomic outcomes in eyes with nAMD initiating anti-VEGF treatment are associated with fluctuations in retinal thickness. In this study using data from the Comparison of Age-Related Macular Degeneration Treatments Trials (CATT) and the Inhibition of VEGF in Age-Related Choroidal Neovascularization (IVAN) randomized clinical trial, people with previously untreated nAMD were included. Data were collected from February 2008 to November 2012, and data were analyzed from April 2017 to April 2020. Foveal center point thicknesses (FCPTs)were extracted from 1165 study eyes from CATT and 566 study eyes from the IVAN trial, excluding those with 3 measurements or less. For each eye, the SD of FCPT was calculated. Eyes were grouped by FCPT SD quartile. Associations of FCPT SD quartile with outcomes were quantified at month 24 or the last available visit by linear or logistic regression, adjusting for baseline best-corrected visual acuity (BCVA) and randomized allocations to drug and treatment regimen, for BCVA, development of fibrosis, and development of macular atrophy.

Of the 1731 included patients, 1058 (61.1%) were female, and the mean (SD) age was 78.6 (7.4) years. The median (interquartile range) FCPT SD was 40.2 (27.1-61.2) in the IVAN cohort and 59.0 (38.3-89.4) in the CATT cohort. After adjustment for baseline BCVA and trial allocations, BCVA worsened significantly across the quartiles of FCPT SD; the difference between the first and fourth quartiles was −6.27 Early Treatment Diabetic Retinopathy Study letters (95%CI, −8.45 to −4.09). The risk of developing fibrosis and macular atrophy also increased across FCPT SD quartiles. Odds ratios ranged from 1.40 (95%CI, 1.03 to 1.91) for quartile 2 to 1.95 (95%CI, 1.42 to 2.68) for quartile 4 for fibrosis and from 1.32 (95%CI, 0.90 to 1.92) for quartile 2 to 2.10 (95%CI, 1.45 to 3.05) for quartile 4 for macular atrophy.

Greater variation in retinal thickness in eyes with nAMD during treatment with anti-VEGF was associated with worse BCVA and development of fibrosis and macular atrophy in these post hoc analyses, despite protocol-directed treatment frequency. Practitioners may want to consider variation in retinal thickness when advising patients about their prognosis.



Estimates of Associations of Foveal Center Point Thickness (FCPT) SD Quartile With Final Best-Corrected Visual Acuity (BCVA)



Estimates of Associations of Foveal Center Point Thickness (FCPT) SD Quartile With Development of Fibrosis

The finding that increasing variation in retinal thickness was adversely associated with BCVA and the risk of developing fibrosis and GA provides an impetus to seek agents with greater treatment durability or sustained release devices, such as those currently undergoing evaluation. In summary, the findings of the present analyses are clinically important with respect to prognosis in nAMD and offer insights into key functional and morphological outcomes in patients with nAMD undergoing treatment anti-VEGF agents.

Source: Evans RM et al. JAMA Ophthalmol. 2020 Aug. doi:10.1001/jamaophthalmol.2020.3001

Bilateral hazy vitreous in a patient with convulsions

A 41-year-old gentleman presented with complaints of decreased vision and floaters in both eyes (OU) since six months with a history of convulsions for six years. Best-corrected visual acuity (BCVA) was 20/200 OU, with normal intraocular pressures. The slit-lamp examination showed quiet anterior segment OU [Fig. 1a and b]. Fundus examination after pupillary dilatation revealed dense vitreous opacities that prevented a clear fundus view [Fig. 1c]. The anterior vitreous showed strands of opacities with numerous focal attachments to the posterior lens capsule. Ultrasound B-scan revealed plenty of low reflective dot echoes with an attached retina and a normal choroid [Fig. 1d].

The slit-lamp examination showed the presence of vitreous opacities that attach to the posterior lens capsule by “foot plates” or “pseudopodia-lentis” suggestive of vitreous amyloidosis [Fig. 1a and b]. The history of convulsions further supports the diagnosis of familial amyloidotic polyneuropathy (FAP). The patient underwent pars plana vitrectomy in the right eye. The histopathology of the vitreous sample demonstrated acellular eosinophilic material on hematoxylin and eosin stain [Fig. 1e] with strongly positive Congo-red staining [Fig. 1f]. Vision improved to 20/20 in OD at 6 weeks of follow up after vitrectomy. MRI of the brain and orbit was advised at the discretion of his neurologist. The patient was advised for vitrectomy in the left eye. The diagnosis was made as Vitreous amyloidosis.

Vitreous amyloidosis occurs in familial amyloidotic polyneuropathy (FAP), caused by mutations in the transthyretin (TTR) gene.[1] TTR is a tetrameric plasma protein (prealbumin) which polymerizes into a beta-pleated structure of amyloid fibril and deposits in the peripheral nerves (80-90%),

cardiac muscle (80%), kidneys (6%), and eye (10%).[2] Leptomeningeal involvement in FAP often manifested as convulsions and was reported in 5% of cases.

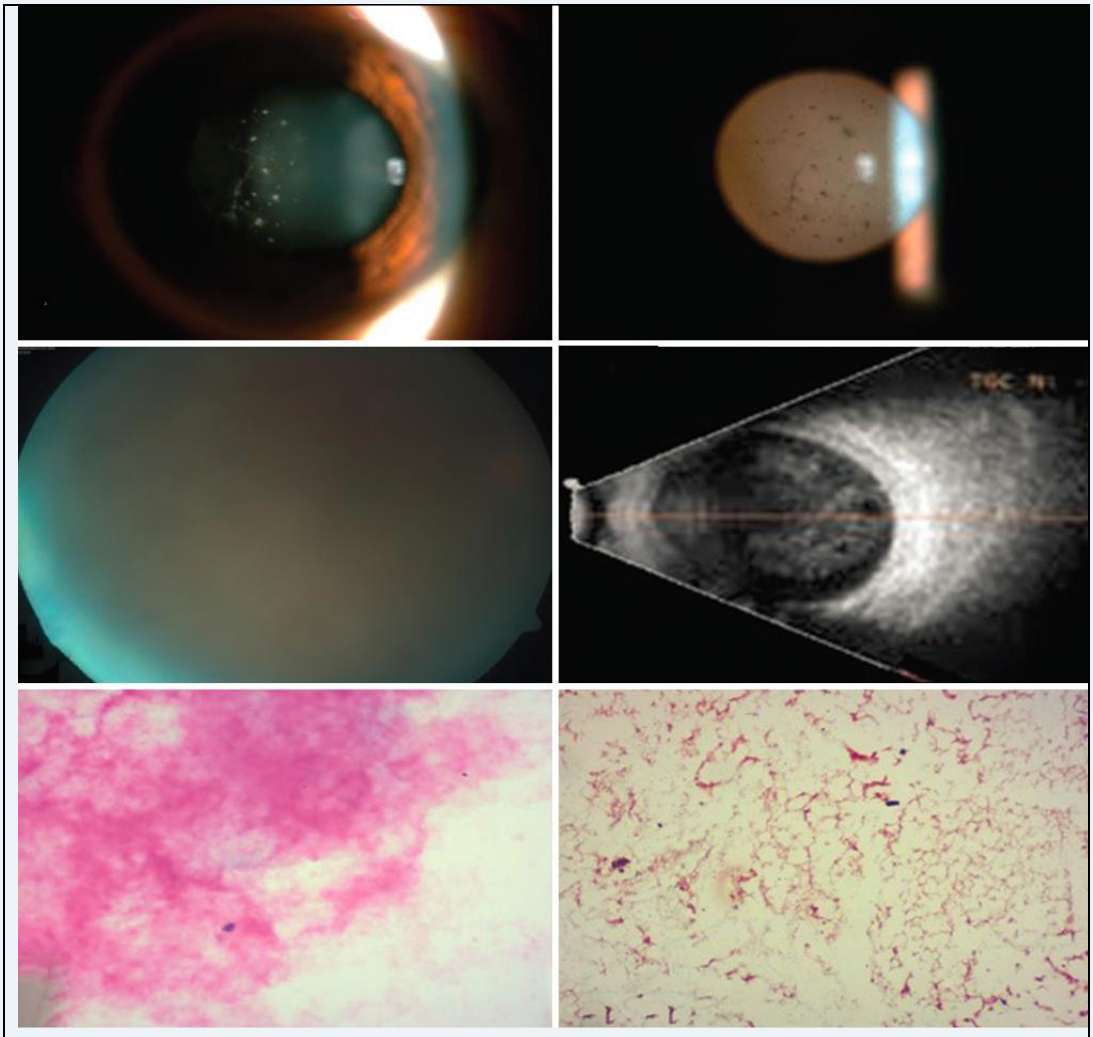


Figure: (a) Slit-lamp photo of the right eye showing vitreous opacities attached to the posterior surface of the lens capsule. (b) Retroillumination photograph showing the vitreous fibrils attached to the posterior lens surface. (c) Dense vitreous haze obscuring the fundus view. (d) USG B scan showing plenty of low reflective dot echoes in the vitreous with an attached retina and a normal choroid. (e) H and E staining of the vitreous sample post vitrectomy demonstrating eosinophilic material. (f) Positive Congo red staining

Ocular findings include abnormal conjunctival vessels, keratoconjunctivitis sicca, pupillary abnormalities, vitreous opacities, and secondary glaucoma.

The incidence of vitreous opacities varies from 5.4% to 35% and the density of the opacities determines the visual acuity and symptoms. Clinical features of vitreous amyloidosis include pseudopodia lentis, glass wool vitreous, and retinal perivascular deposits. Pseudopodia lentis are whitish opacities or the foot plates, present on the posterior surface of the lens capsule which extend into the opacified vitreous. Treatment includes partial vitrectomy, with residual vitreous acting as a filter that prevents the amyloid material from reaching the angles and causing or exacerbating an existing component of glaucoma.

Source: Trivedi M et al. Indian J Ophthalmol 2020;68:1736.