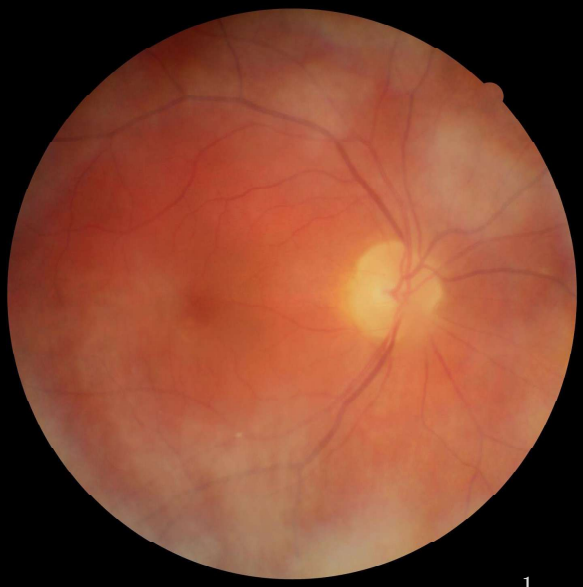
BAMM!

When a small scotoma means PAMM

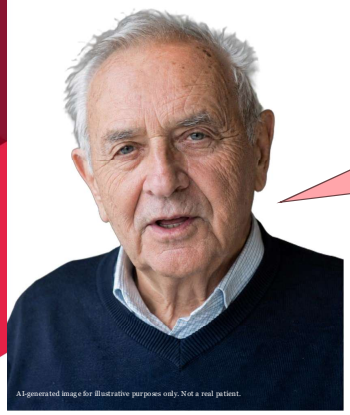
Jennifer Li MS, OD, FAAO, Diplo ABO

Saturday, June 6th, 2026



CASE PRESENTATION – 82 YO WM

- 7 day history of sudden onset, persistent blurred vision OD



AI-generated image for illustrative purposes only. Not a real patient.

"It is a constant smudge in the middle of my vision since a week ago"

CASE PRESENTATION – 82 YO WM

Ocular History

NAION OS (2015), cataract surgery (2016) & YAG capsulotomy (2019 & 2022) OU, ERM peel with vitrectomy OS (2021)

Medical History

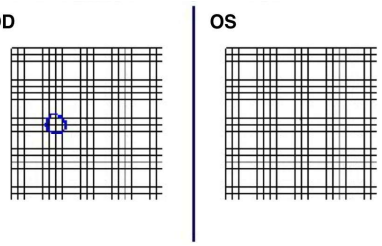
Myocardial infarction (2017), atrial fibrillation, pacemaker, cardiac stent.

Medications: rivaroxaban, atorvastatin, vitamins

CASE PRESENTATION – 82 YO WM

Functional assessment – key findings

	OD	OS
BCVA	~~20/20~~ → 20/40 (PHNI)	20/20
Amsler grid	Nasal scotoma	Normal
Pupils	ERRL – 2+ RAPD OS (longstanding with prior NAION)	
IOP	15 mmHg	16 mmHg
BP	149/87 mmHg HR: 75 BPM	



Unless otherwise noted, findings were unremarkable and within expected age-related norms.

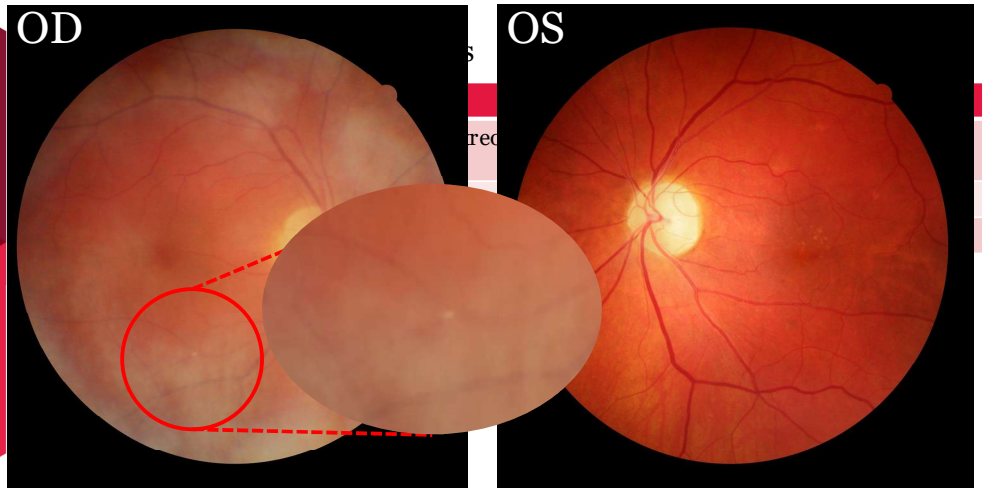
CASE PRESENTATION – 82 YO WM

Posterior segment – key findings

	OD	OS
ONH	Pink and distinct with vitreous condensation IT	Optic nerve pallor (longstanding with prior NAION)
Macula	Soft drusen	Soft drusen
Vitreous	Asteroid hyalosis + floaters	Floaters

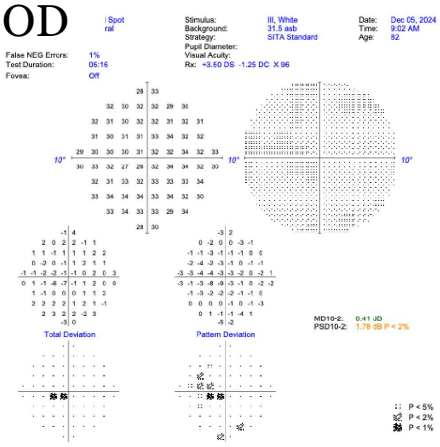
Unless otherwise noted, findings were unremarkable and within expected age-related norms.

CASE PRESENTATION – 82 YO WM

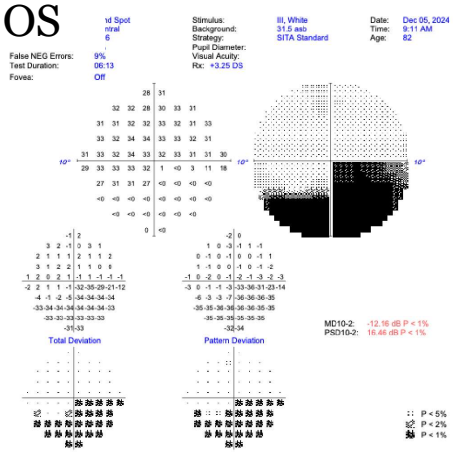


CASE PRESENTATION – 82 YO WM

OD



OS



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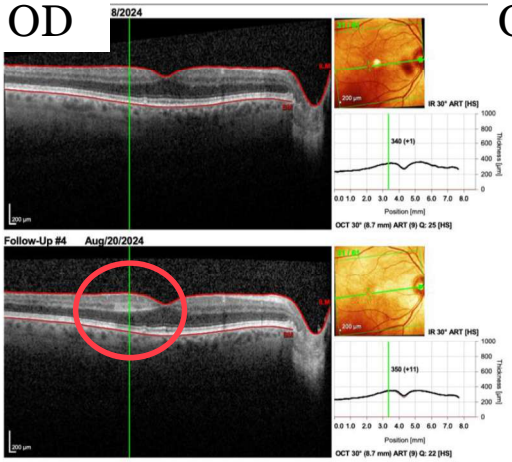
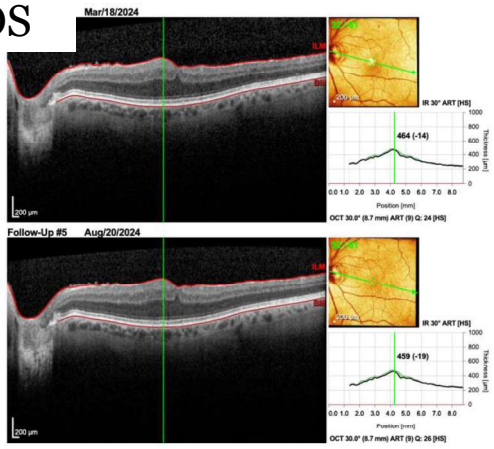
CASE PRESENTATION – 82 YO WM

OD



OS



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DIAGNOSIS?

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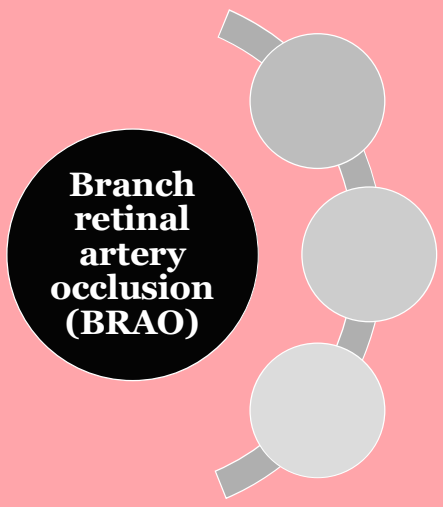

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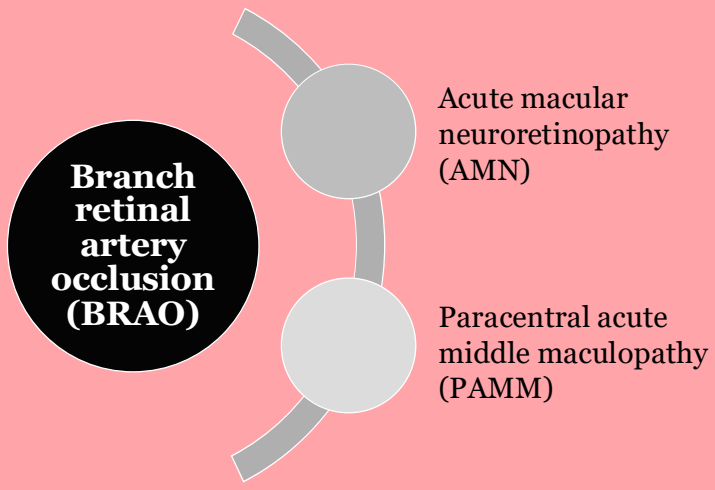
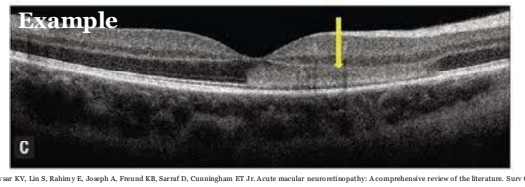
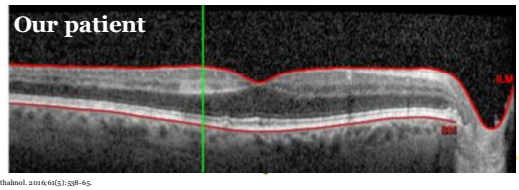


AMN vs PAMM

Acute macular neuroretinopathy (AMN)	Paracentral acute middle maculopathy (PAMM)
Monocular paracentral scotomas (no other visual / ocular symptoms) Mild decreased VA	
Outer retinal involvement	Inner retinal involvement
Hyperreflective plaques in OPL and ONL	Hyperreflective plaques on INL and IPL
Thinning of ONL with time	Thinning of INL with time





1. Bhavsar KV, Lin S, Rahimy E, Joseph A, Freund KB, Sarraf D, Cunningham ET Jr. Acute macular neuroretinopathy: A comprehensive review of the literature. Surv Ophthalmol. 2016;61(5):538-65.

CASE PRESENTATION – 82 YO WM

BRAO-spectrum event with associated PAMM.
- OCT: INL hyper-reflectivity
- Nasal scotoma on visual field

Assess embolic risk
- Hollenhorst plaque
- Cardiac history (MI, AF, Stent, and pacemaker)

Urgent systemic referral
- Echocardiography
- Neuroimaging
- Bloodwork

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What is PAMM?

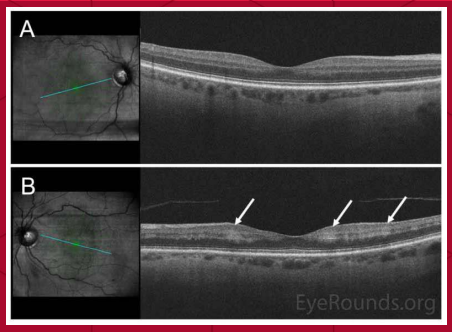

Image adapted from EyeRounds.org, PAMM case, Figure 3.

- OCT defined retinal finding
- Hyper-reflective band like lesions within the INL
- Can lead to INL thinning or atrophy
- Ischemia of the intermediate and deep retinal capillary plexus
- Not a primary retinal disease → but a ischemic biomarker

1. Fiori D, Ruggeri F, Fasciolo D, Antonello E, Bartini G, Abdolrahimzadeh S. Paracentral Acute Middle Maculopathy (PAMM) in Ocular Vascular Diseases-What We Know and Future Perspectives. *Vision (Basel)*. Mar 3 2021;5(1)doi:10.3390/vision5010019
2. Moura-Coelho N, Gaspar T, Ferreira JT, Dutra-Medeiros M, Cunha JP. Paracentral acute middle maculopathy-review of the literature. *Graefes Arch Clin Exp Ophthalmol*. Dec 2020;258(12):2583-2596. doi:10.1007/s00417-020-04826-1
3. Rahimy E, Kuehlewein L, Sadda SR, Sarraf D. Paracentral Acute Middle Maculopathy: What We Knew Then and What We Know Now. *Retina*. Oct 2015;35(10):1921-30. doi:10.1097/IAE.0000000000000785
4. Sarraf D, Rahimy E, Fawzi AA, et al. Paracentral acute middle maculopathy: a new variant of acute macular neuroretinopathy associated with retinal capillary ischemia. *JAMA Ophthalmol*. Oct 2013;131(10):1275-87. doi:10.1001/jamaophthalmol.2013.4056

Clinical hallmarks

Symptoms

- Complaint at initial presentation consists of decreased field of vision
  - Paracentral scotoma
  - Loss in field of vision (altitudinal defect)
  - Monocular sudden vision loss
  - Decreased vision with metamorphopsia

Signs

- Relatively preserved or mildly reduced VA
- Minimal or absent fundus abnormalities

Amsler grid, Humphrey 10-2 visual fields, and OCT are the core diagnostic tools

1. Gümüş G, Özçakıcıoğlu Ş, Alagöz N, Aygün BT, Alagöz C, Artunay Ö. Paracentral Acute Middle Maculopathy Associated with Different Clinical Entities: A Case Series. *European Archives of Medical Research*. 2021;37(4)

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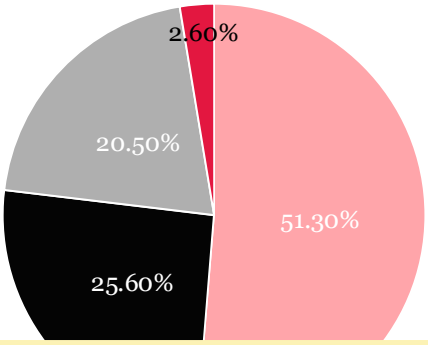
Systemic risk factors

Patients with concurrent RAO was **older** than RVO (68 vs 47.5)

- **More likely** to have history of major adverse cardiovascular event (p = 0.01)
- And **worse** presenting **BCVA** (20/50 ; p < 0.02)



Patients with isolated PAMM

- **Higher** short term risk of developing systemic cardiovascular event (compared to RVO)
- **Associated** underlying systemic disorder or triggering factor associated with the development of PAMM

⚠ In older patients with isolated PAMM, cardiovascular events occurred at a **median of one month** after PAMM diagnosis

Limoli, C., Raja, L. D., Wagner, S. K., Ferraz, D., Bolz, M., Vujosevic, S., ... & Huemer, J. (2024). Exploring patient demographics and presence of retinal vascular disease in paracentral acute middle maculopathy. *American Journal of Ophthalmology*, *260*, 182-189.

Diagnostic testing

Urgent testing to consider

- BP/vascular risk assessment
- carotid imaging/CTA or MRA head-neck
- ECG/cardiac rhythm review
- Echocardiography
- CBC/platelets
- ESR/CRP
- lipid/A1c/metabolic risk review, and
- PCP/cardiology/neurology coordination.

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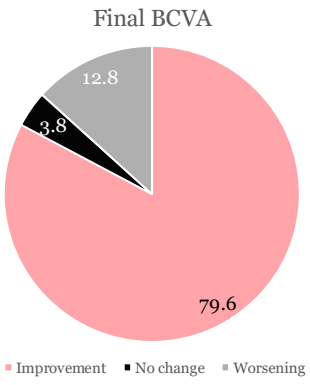
Prognosis

Visual acuity

- Central VA *may* recover while scotoma persists

Retinal layers

- Hyperreflective bands resolves → leaves middle retinal thinning and subtle structural changes



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TREATMENT?

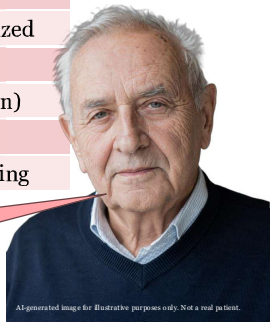
Treat the underlying systemic cause

Zhao, P. Y., Johnson, M. W., McDonald, H. R., & Sarraf, D. (2022). Paracentral acute middle maculopathy and the ischemic cascade: toward interventional management. *American Journal of Ophthalmology, 234*, 15-19.

Follow up – 82 YO WM

Key observations

	s/p 1 month	s/p 3 months
BCVA	~~20/40~~ → 20/25 (PHNI)	~~20/25~~ → 20/20
Amsler grid	Nasal scotoma	Subjectively normalized
Pupils	ERRL – 2+ RAPD OS (longstanding with prior NAION)	
OCT	focal retinal thickness at lesion: 350 µm → 296 µm (54 µm reduction)	
Vasculature	Hollenhorst plaque remained present and unresolved at all visits	
VF 10-2	Nasal visual field defect **persisted** without progression on 10-2 testing	



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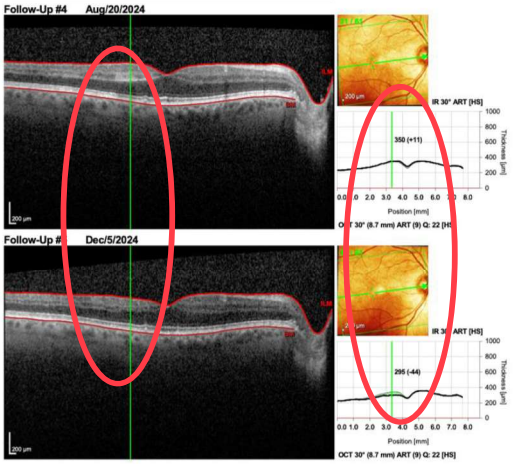

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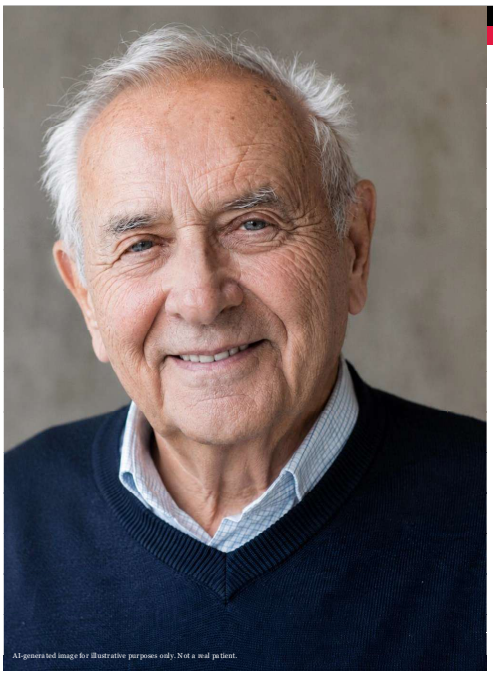
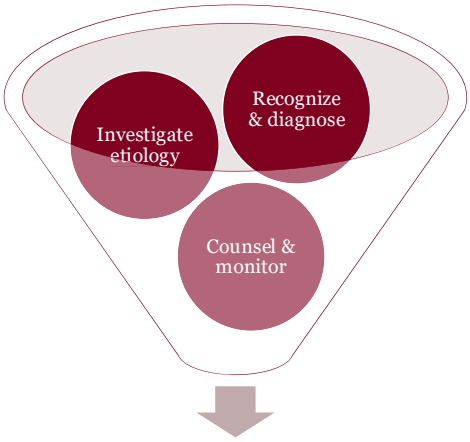


Management Principles & Conclusions



Coordinate care

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