

What's That I Smell?

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Summary

- Poppers use is relatively common, very common amongst MSM
- Can lead to significant reduction in vision
- OCT findings are the most reliable finding, sometimes the only finding
- AOSLO shows definite photoreceptor loss in the macula, especially in the fovea
- Enhancing public awareness and recognition is critical

Case History

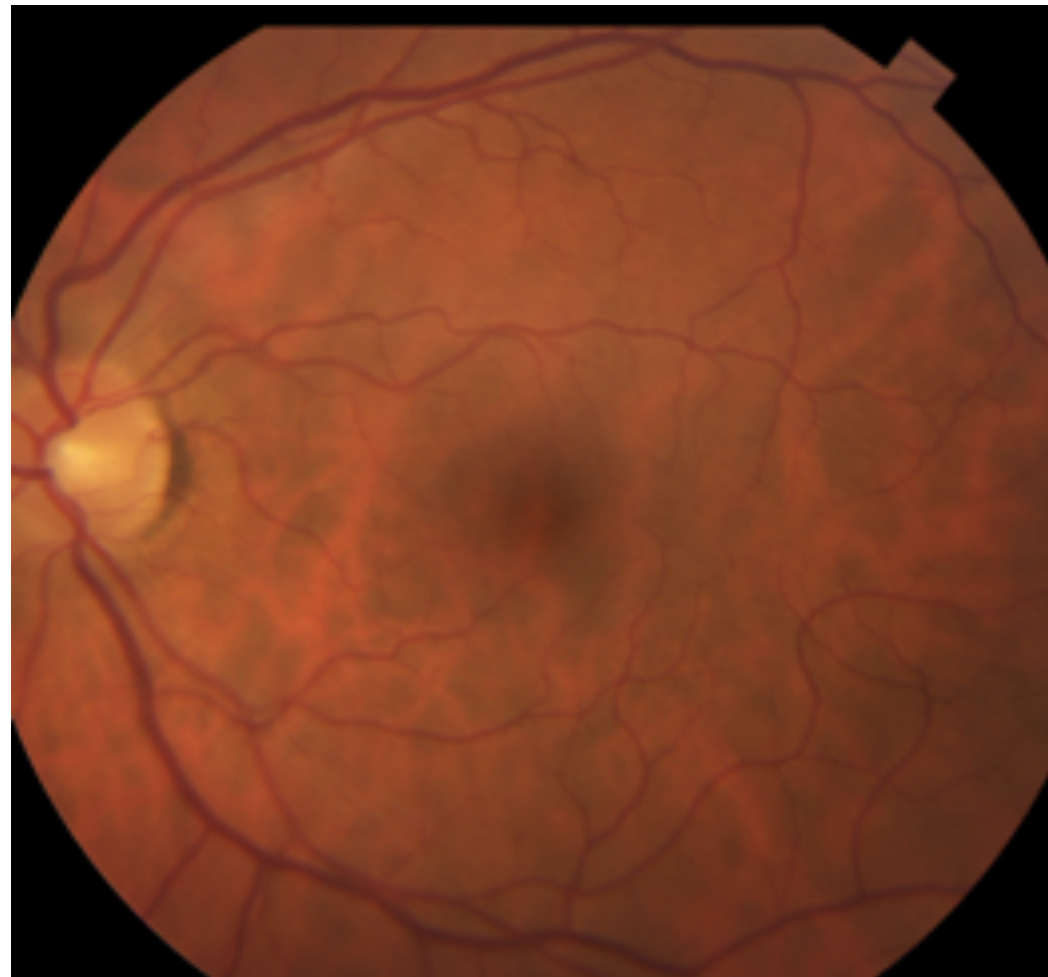
- **40 yo HIV+ male presents with 6 month history blurry vision**
- **PMHx:** HIV+, anxiety
- **Medications:** Genvoya, Lexipro, Abilify
- **POHx:** Non-contributory
- **ROS:** Non-contributory
- **SHx:** Choreographer, long term relationship with male partner, uses marijuana and ETOH moderately

Physical Exam

- BCVA: 20/40, 20/50
- Pupils: reactive, no APD
- IOP: WNL
- SLE: WNL
- Fundus Exam:

	Right	Left
Disc	Normal	Normal
C/D Ratio	0.3	0.3
Macula	Normal, No edema	Normal, No edema
Vessels	Normal	Normal
Periphery	area of chorioretinal atrophy at 9 o clock with operculum	pigmentary changes inferiorly, chorioretinal scar ST

Fundus Photos

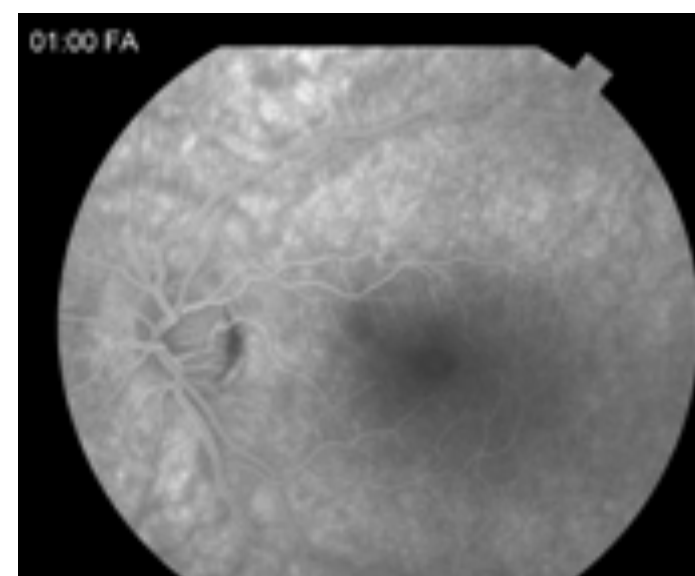
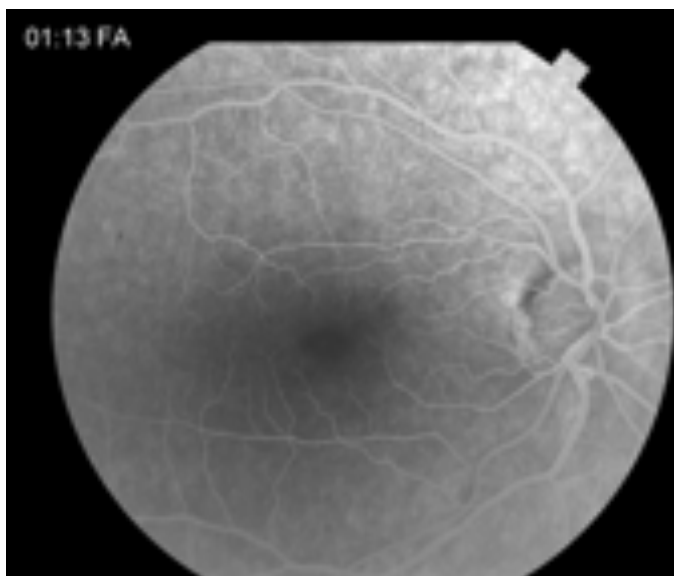


FA

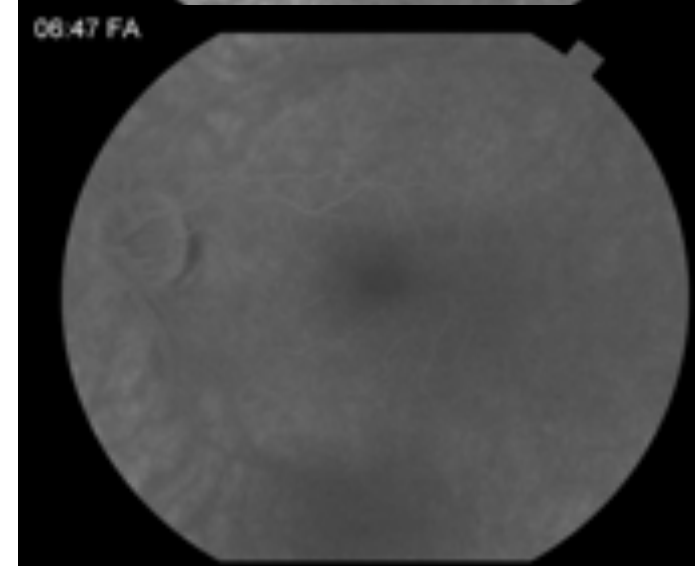
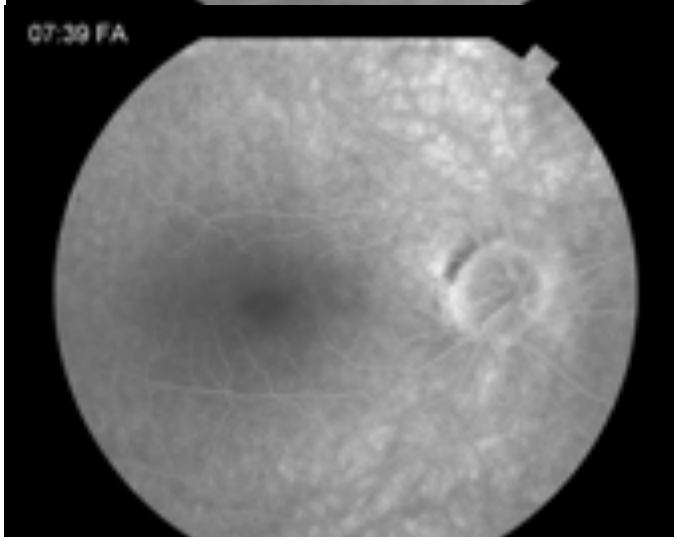
OD

OS

Early Phase

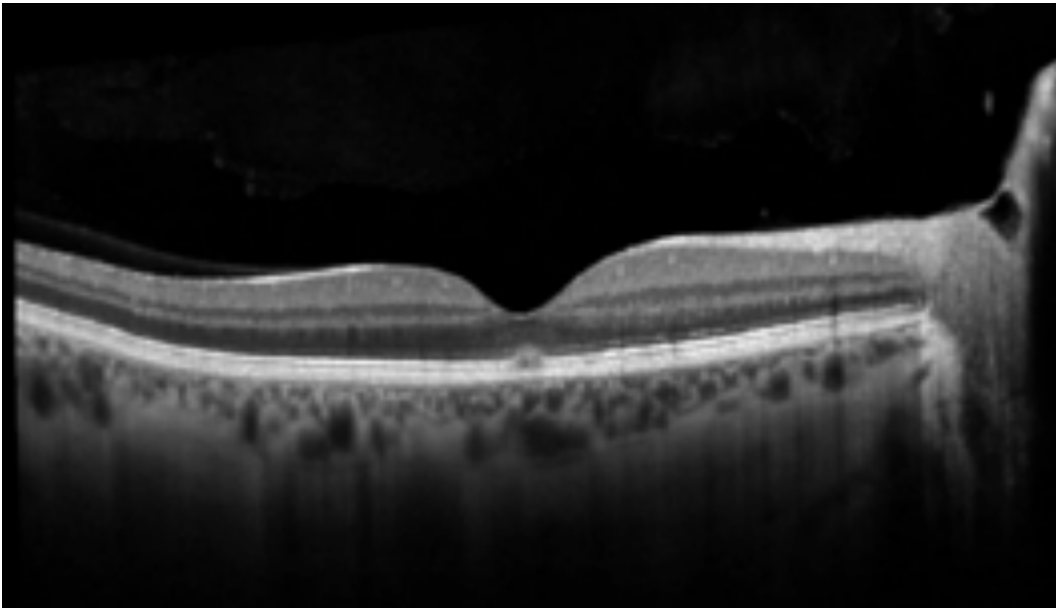


Late Phase

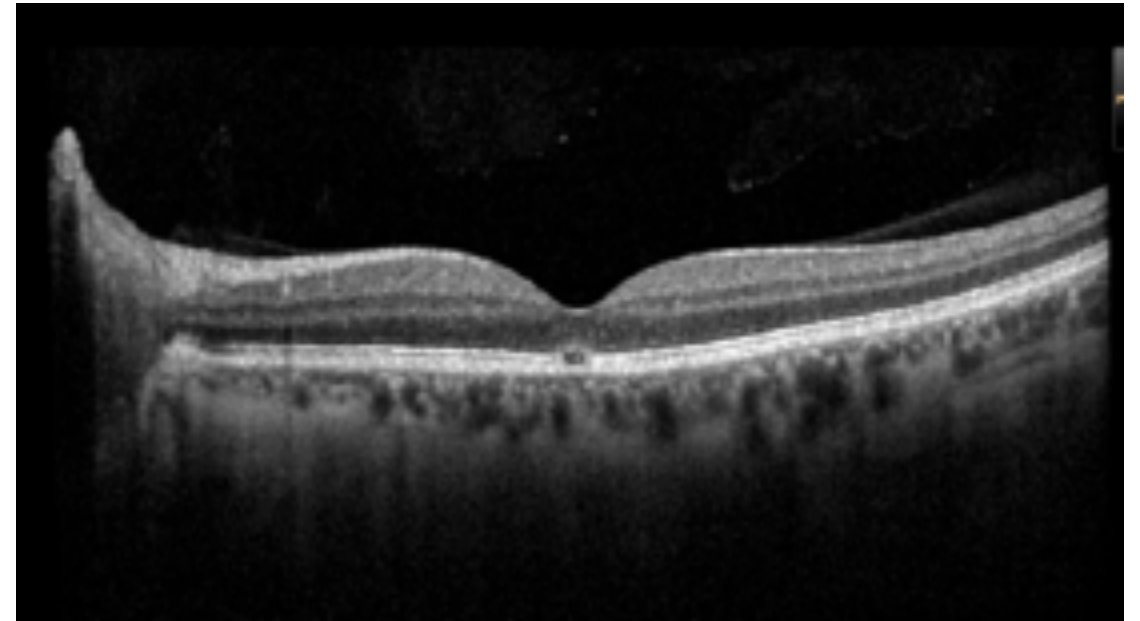


OCT

OD



OS



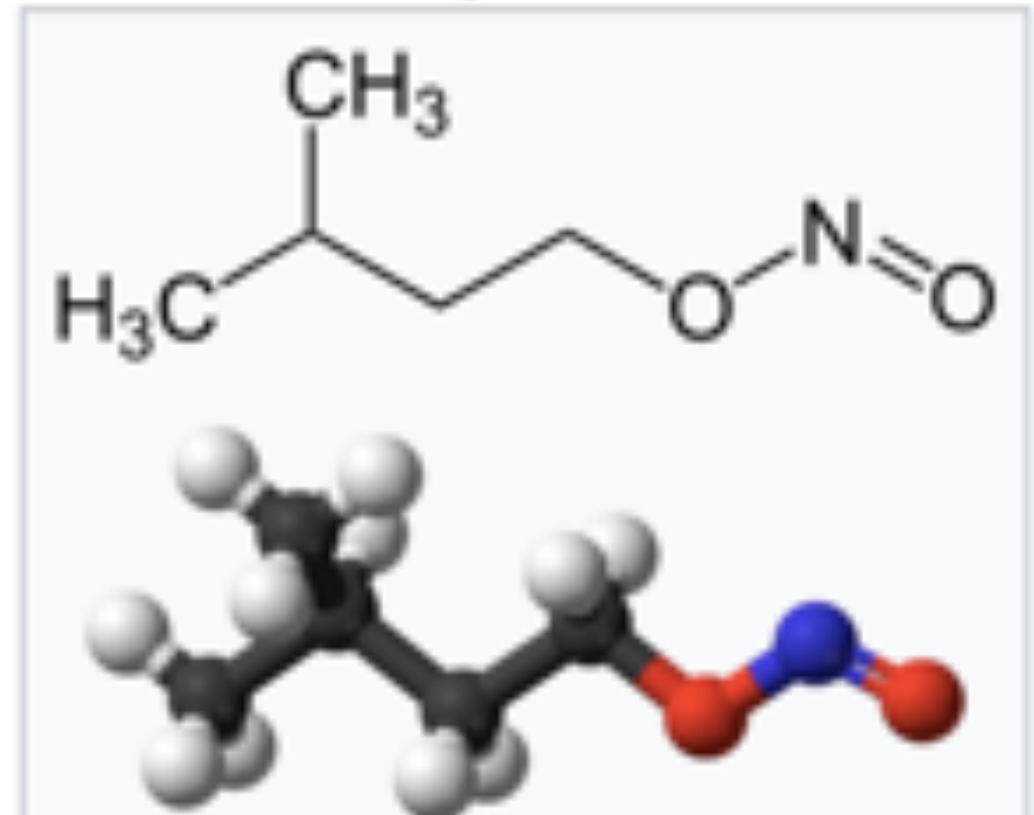
What is going on?

- DDX is limited, not many things look this
 - Mac tel? Adult onset foveo-macular dystrophy? Solar retinopathy? Occult macular dystrophy? Toxicity?
- One extra question from the history confirms the diagnosis
 - *Do you use poppers?* **“Every day for many years”**

What are poppers?

- Colloquialism used to describe a class of drugs known as alkyl nitrates or volatile nitric oxide
- Recreational drugs used for their psychoactive effects and are particularly common among men having sex with men (MSM) because of their ability to induce euphoria and myorelaxation

Amyl nitrite



How popular are poppers?

Results: The GDS received a total of 21 575 valid responses, with a total of 17 479 from the UK, Australia, USA and Eurozone. Within these areas, 5152 (29.5%) had used poppers within their lifetime and 1322 (7.6%) within the previous year. Of the 'last year' users, when asked the question: 'Do you think poppers use has affected your eyesight?', 29 (2.2%) people responded 'yes', 130 (10.0%) responded 'maybe' and 1146 (87.8%) responded 'no (17 people did not answer). Both multiple choice and free-text responses regarding the nature of visual symptoms correlated with the central visual disturbance that would be expected from maculopathy. There was significant increased symptom prevalence with age (likelihood ratio (χ^2)=19.0; $p<0.001$).

BMJ Open
Ophthalmology

The prevalence of visual symptoms in poppers users: a global survey

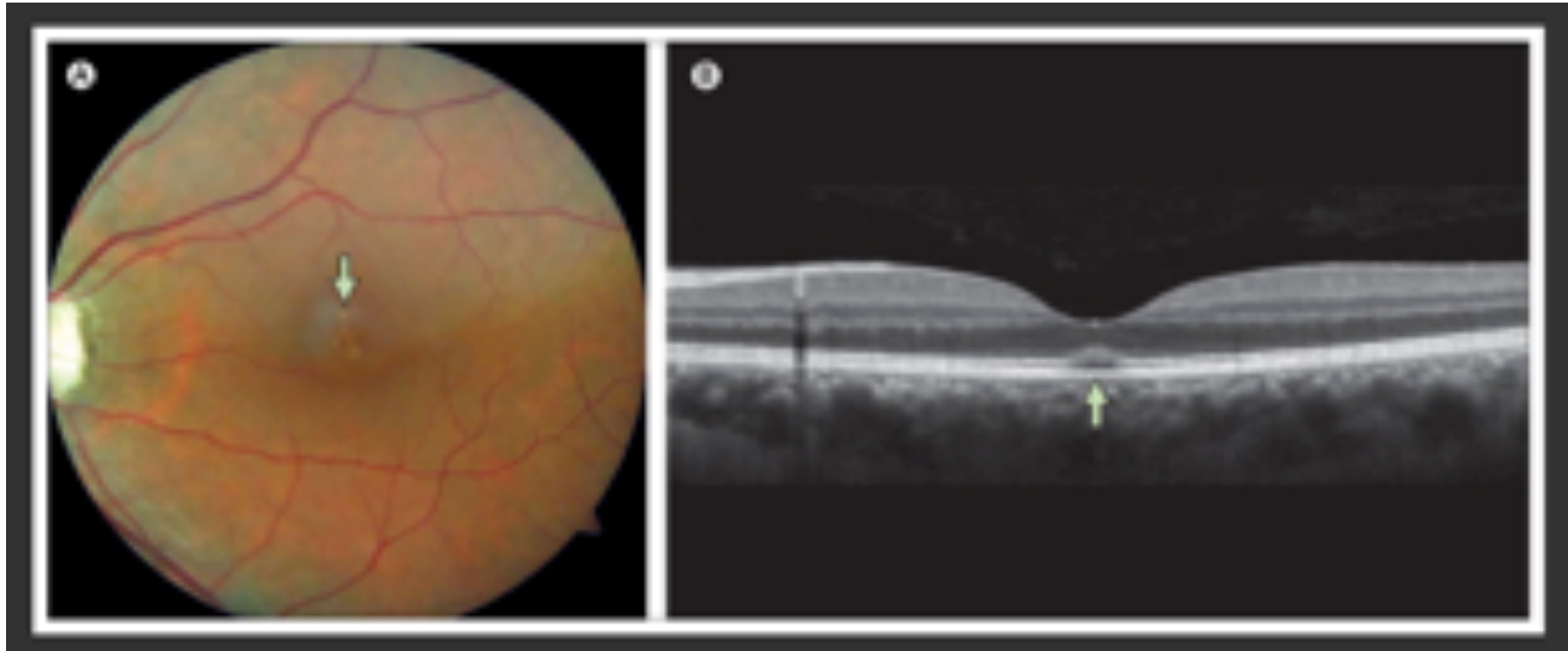
Andrew J Davies,¹ Rohan Borschmann,^{2,3} Simon P Kelly,⁴ John Ramsey,⁵ Jason Ferris,⁶ Adam R Winstock⁷

One study revealed popper use among the general population in the UK, Australia, USA and Eurozone was around 7.6% within the past year, whereas a study in Ireland showed that 35% of MSM have used poppers in the same period

Poppers Maculopathy

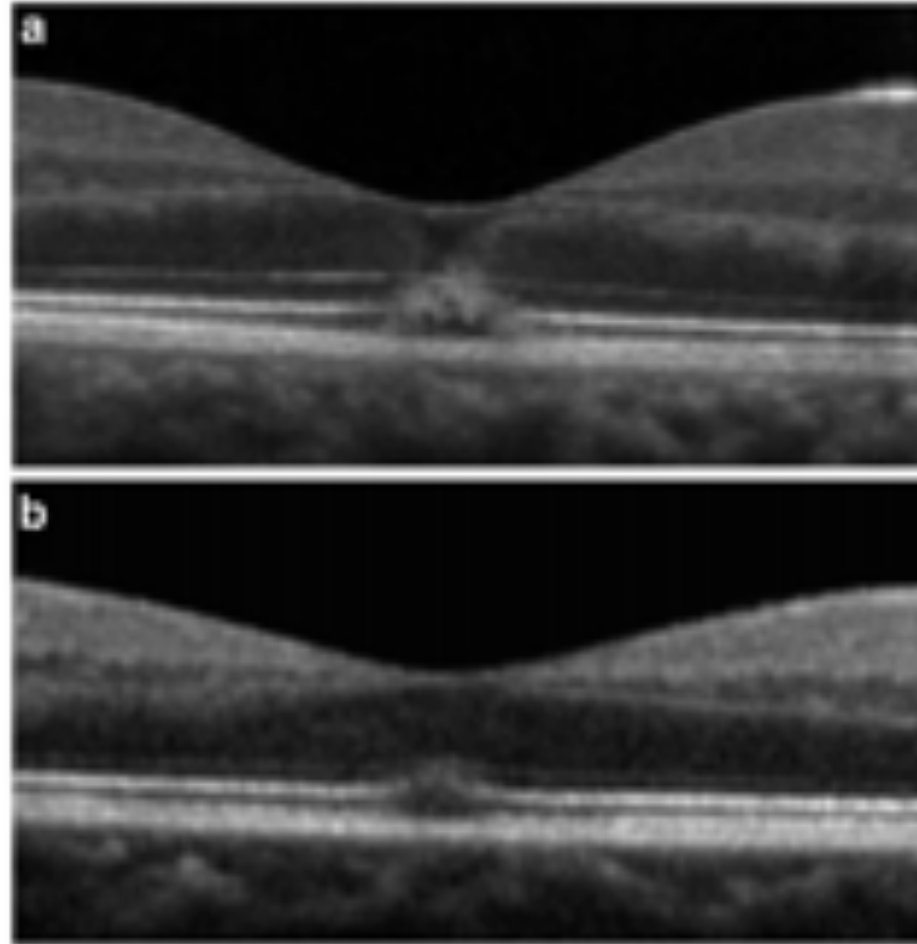
- Rare maculopathy that is poorly understood with yellow foveal discoloration and disruption of the outer segments of foveal photoreceptors
- Presents with bilateral central vision blurring that can present over the course of days to months
- Damage appears to be confined to the photoreceptors
- Abnormalities of the ellipsoid layer most common feature on OCT

Poppers Maculopathy



[https://www.thelancet.com/article/S0140-6736\(14\)60887-4/fulltext](https://www.thelancet.com/article/S0140-6736(14)60887-4/fulltext)

Poppers Maculopathy



<https://www.nature.com/articles/eye2013218.pdf>

Poppers Maculopathy

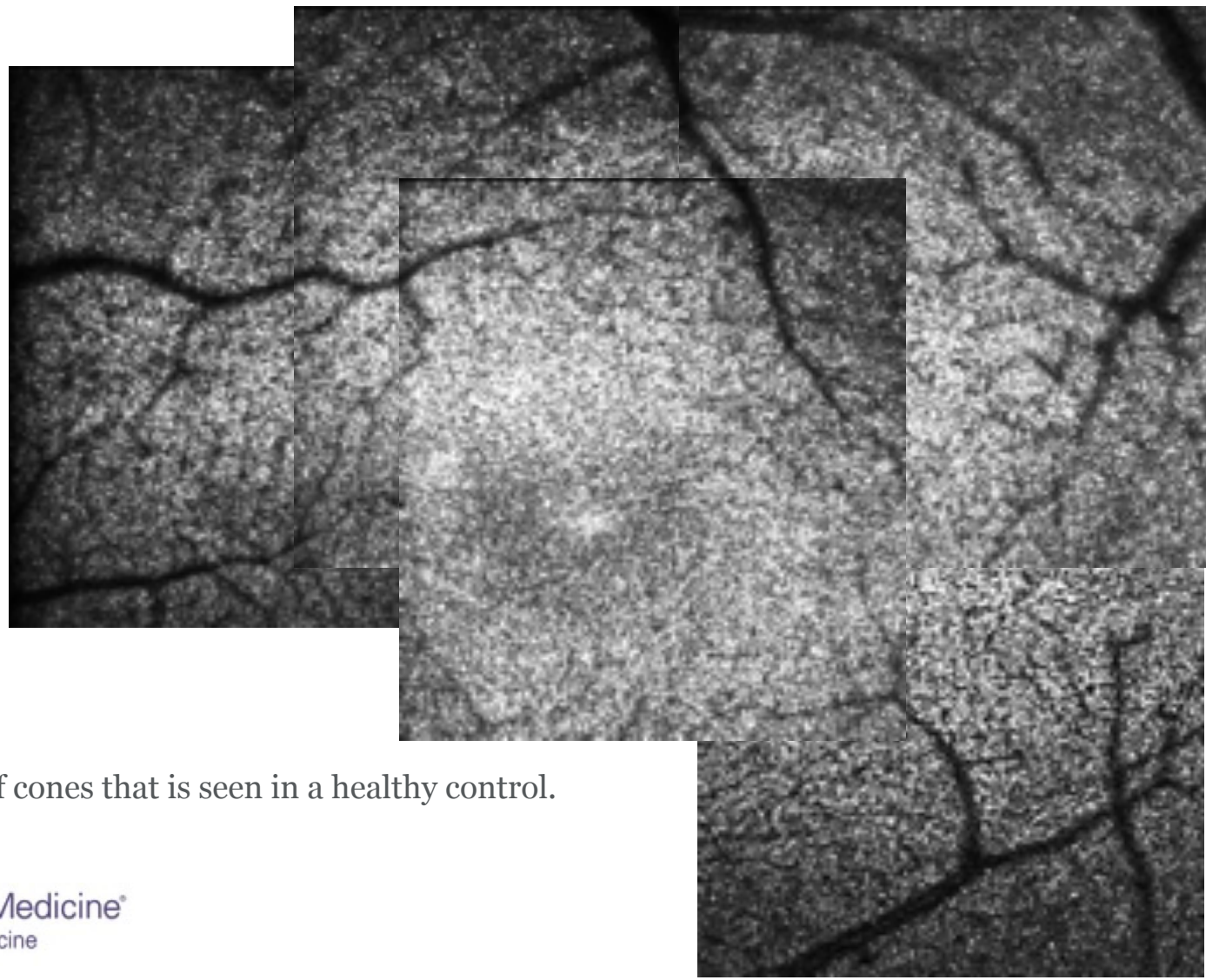
Mechanism of action:

- alkyl nitrates may be directly toxic to photoreceptors
- alkyl nitrates make photoreceptors more susceptible to photopic damage explaining the similarity in appearance to solar retinopathy
- poppers may disrupt blood flow to the photoreceptors via vasodilation

Some have suggested decreased signal on ERG may indicate a more widespread retinopathy

Back to our case: We used AOSLO to look at our patient

Healthy Control Patient

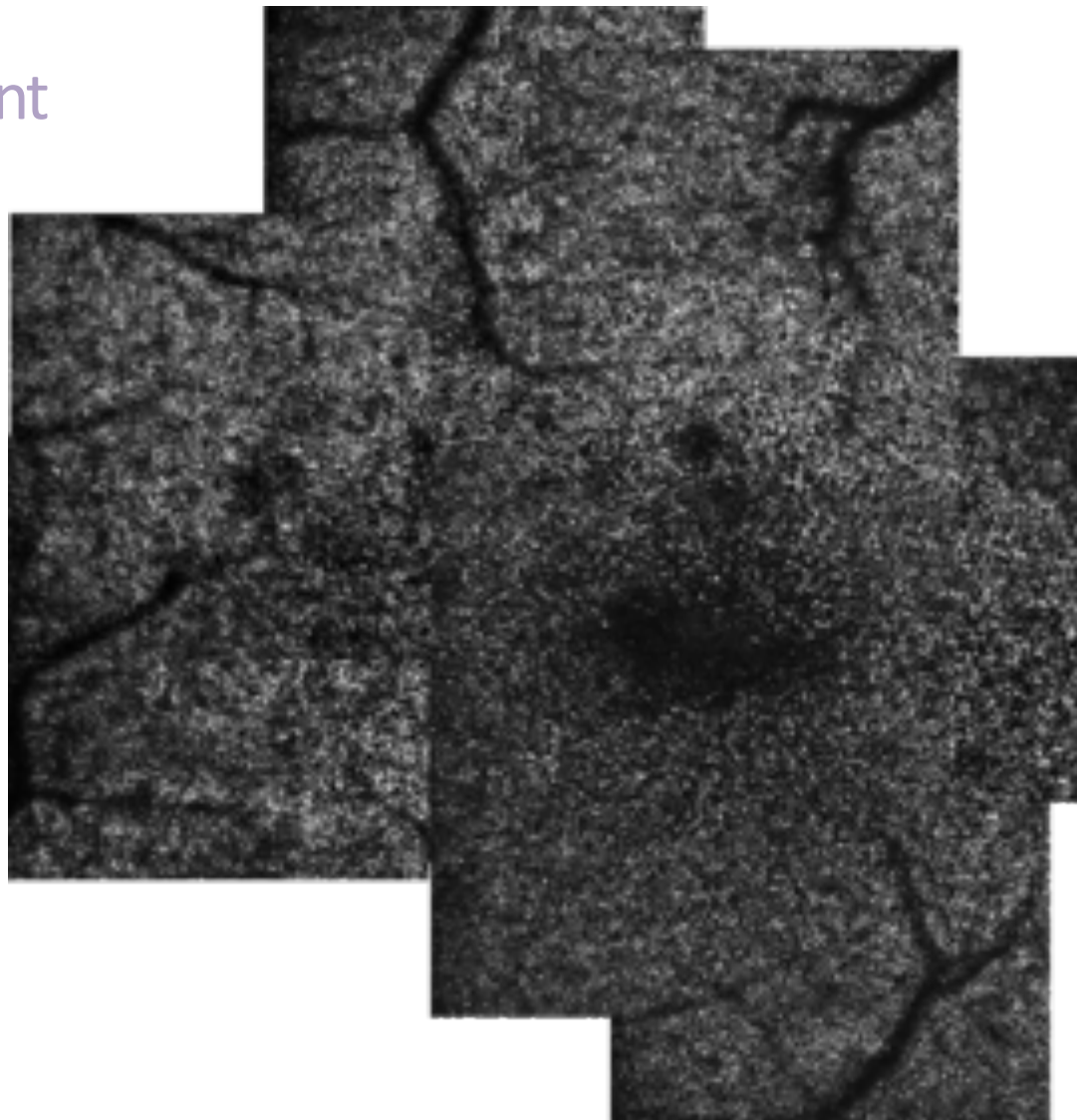


Note central high density of cones that is seen in a healthy control.

Back to our case: We used AOSLO to look at our patient

Our patient

AOSLO reveals extensive damage to the central cones of both eyes. The central dark elliptical zone denotes an area with absent cone outer segment signal. This is surrounded by normal reflecting outer segments in the perifovea.



Poppers Maculopathy

Prognosis poorly understood given the paucity of cases with long term f/u

- case series in 2014, Pahlitzsch et al showed only 1/3 patients recovering VA following initial presentation
- case series by Hui et al (Retina, 2020) showed complete recovery of VA/OCT findings in one patient at 3 yr f/u after ceasing popper use

Poppers Maculopathy

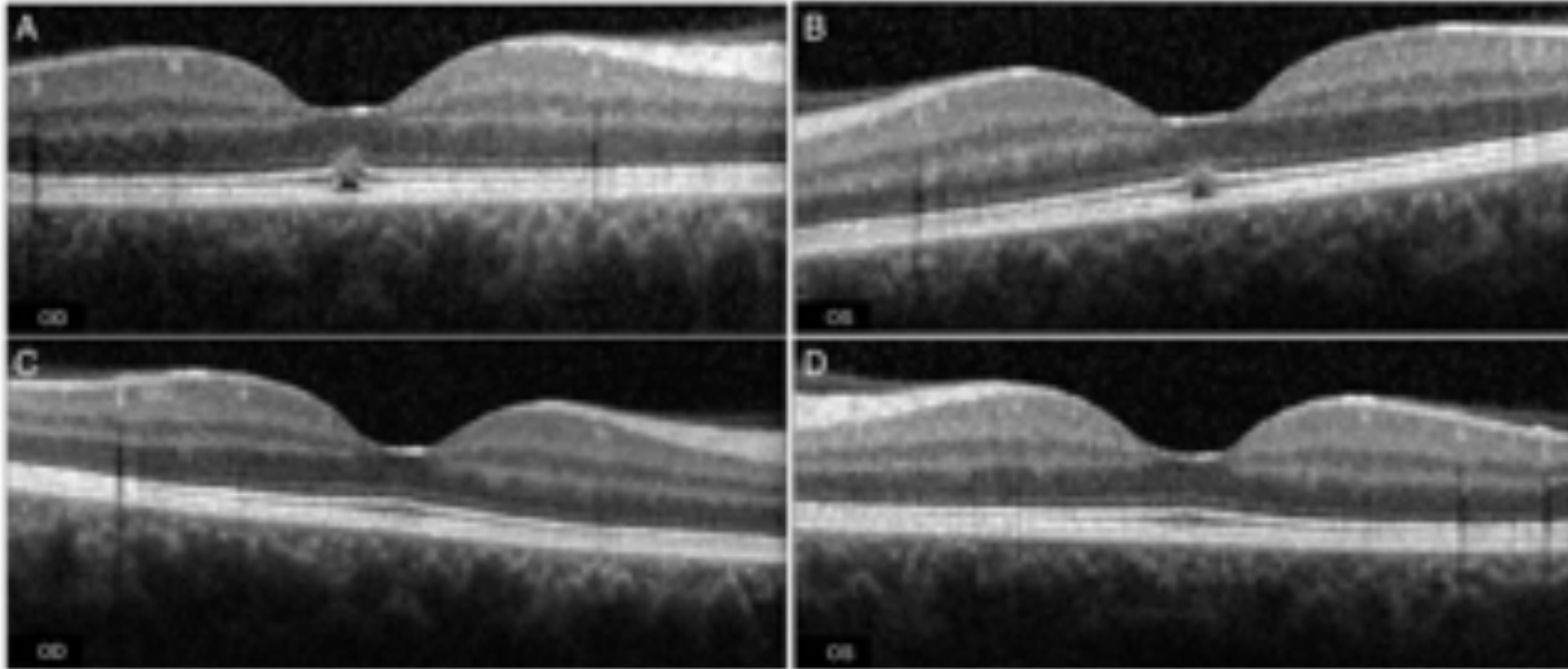


Figure 2 Optical coherence tomography (OCT) images at presentation (A and B) and 1-year follow-up (C and D), showing complete resolution (case 4). OD, oculus dexter (right eye); OS, oculus sinister (left eye).

Poppers: legal highs with questionable contents? A case series of poppers maculopathy

Rewbury, Rebecca ; Hughes, Edward ; Purbrick, Robert ; Prior, Stephen ; Baron, Mark
British Journal of Ophthalmology, 10 November 2017, Vol.101(11), p.1530

Conclusion

- Consider poppers maculopathy in differential diagnosis of subfoveal loss of EL on OCT
- Our case is the first to image the retina in Poppers maculopathy using newer AOSLO technology demonstrating significant central loss of cones supporting a more focal maculopathy.
- Poppers maculopathy may show complete resolution of signs on long-term follow-up, even after chronic popper ingestion.
- Enhancing public awareness and recognition is critical

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