

**Dr Simon Chen**

MBBS BSc(Hons) FRANZCO

Ophthalmologist, Vision Eye Institute, Sydney

# Cataract surgery in patients with age-related macular degeneration: Let's get real

As professionals dedicated to preserving and enhancing the gift of sight, optometrists play a crucial role in guiding patients through complex decisions regarding eye health. The coexistence of macular diseases, such as age-related macular degeneration (AMD), with the need for cataract surgery, is a common scenario in which patient education becomes paramount to achieving optimal outcomes.

## Case history

A 78-year-old retired female actor was referred to me for cataract surgery. She complained of deteriorating vision over the past 2 years, causing her to feel unsafe driving.

The patient expressed a strong desire and expectation to be able to see without glasses after cataract surgery, particularly when reading and playing golf. Her husband recently had cataract surgery with multifocal intraocular lens implants (MFIOLs) under my care. As he was thrilled with the surgery results and seeing well without glasses for all activities, she requested the same MFIOLs for her eyes.

## Examination findings

The patient's best corrected visual acuities (BCVA) were 6/12 (+1.00 / +1.50 x 180) R and 6/12 (+0.50 / +1.00 x 170) L. She had moderately advanced nuclear cataracts, and fundus examination showed bilateral intermediate AMD with intermediate-sized macular drusen.

Baseline investigations included Retinal Acuity Meter (RAM) testing (which indicated a potential post-operative visual acuity of 6/9 for each eye), ultra-widefield retinal imaging, (**Figure 1 & 2**) fundus

autofluorescence, optical coherence tomography (OCT; **Figure 3**) and OCT-angiography. These tests showed no evidence of geographic atrophy or choroidal neovascularisation.

## Management

I advised the patient that cataract surgery should improve her vision, with improved clarity and brightness, but that her vision would not be perfect due to her AMD. We discussed that she was not a good candidate for MFIOLs because the combination of MFIOL optics and macular disease would lead to suboptimal visual quality. I recommended monofocal IOLs and explained that she would still need to wear glasses for near and intermediate tasks after surgery. She was surprised and upset to hear this, so much so that she said she did not want to have surgery unless I used multifocal IOLs. I declined to do so as I felt that a monofocal lens would provide her with the best quality of vision in the long term. Instead, I offered to refer her to another ophthalmologist for a second opinion. She was not happy.

One month later, after she had adjusted to the idea of wearing glasses after surgery, the patient returned for cataract surgery with monofocal IOLs. I performed bilateral femtosecond laser-assisted phacoemulsification and implantation of toric monofocal blue light-blocking intraocular lenses (Clareon, Alcon), targeting emmetropia for both eyes. The operations went routinely without complications.

At her 3-month post-operative review, the patient's BCVAs were 6/9 (plano) OD and 6/9 (-0.25 D) OS. She was happy with the outcome and was comfortable wearing reading glasses for near tasks. →

## Discussion

### Managing patient expectations

In my experience, patients have increasingly high expectations of cataract surgery and are naturally inclined to hope it will restore their vision to normal. Some expect to see everything without glasses after surgery.

For patients with healthy eyes, the use of presbyopia-correcting IOLs such as extended depth of focus (EDOF) IOLs, MFIOLs or a pseudophakic monovision strategy may provide a wide range of clear vision at multiple distances without glasses. For many of these fortunate patients, the resulting vision can seem better than ever, particularly if the patient had a high refractive error prior to surgery. However, for patients with significant macular disease, particularly AMD, these results are usually not realistic, and an empathetic but frank discussion about the limitations of cataract surgery should be undertaken before surgery is considered.

It is much better for patients to be disappointed before rather than after surgery.

### Why MFIOLs are unsuitable: the contrast sensitivity conundrum

Clinicians need to appreciate that AMD and other macular disorders reduce contrast sensitivity.<sup>1</sup> In addition, EDOF and MFIOL technologies also reduce contrast sensitivity<sup>2</sup> – EDOF IOLs stretch the focal point to increase depth of focus, while MFIOLs split light to produce multiple focal points.

In patients with macular disease, the combination of reduced contrast sensitivity caused by the macular condition and reduced contrast sensitivity associated with the EDOF or MFIOL technology will often lead to a very noticeable loss of visual

quality. This is particularly noticeable in low-light conditions, compounding the difficulties that patients with AMD already have in dim light. Many unhappy patients have been referred to me with macular disease and complaints of poor visual quality after EDOF or MFIOLs have been implanted.

Patients with early AMD are often asymptomatic with good vision and may see well with EDOF or MFIOLs in the short term. These IOLs can seem attractive to both patients who desire spectacle independence and surgeons who naturally want happy patients. However, AMD is a progressive condition that reduces contrast sensitivity with time. Visual function is likely to decline, and the quality of vision with EDOF and MFIOLs tends to be significantly worse than with monofocal IOLs. As macular disease progresses, the negative impact of EDOF or MFIOLs increases. It is a gift that keeps on giving.

### IOL selection

For patients with early AMD that have a strong desire to reduce spectacle dependence, pseudophakic monovision can be an effective option (dominant eye targeted for emmetropia and non-dominant eye targeted for myopia). Pseudophakic monovision is much less effective with advanced stages of AMD when macular function is impaired. This is because successful monovision relies on seeing well with both eyes – one eye for distance and one eye for near – providing a good range of unaided vision at multiple distances. If one or both eyes cannot see clearly then the patient loses the benefits of monovision. In that situation, it is better for both eyes to be focused at the same distance so that the patient benefits from binocular summation. As macular function decreases with age and the natural progression of AMD, patients will become more dependent on glasses. Fortunately, pseudophakic monovision can be effectively 'reversed' with glasses. →

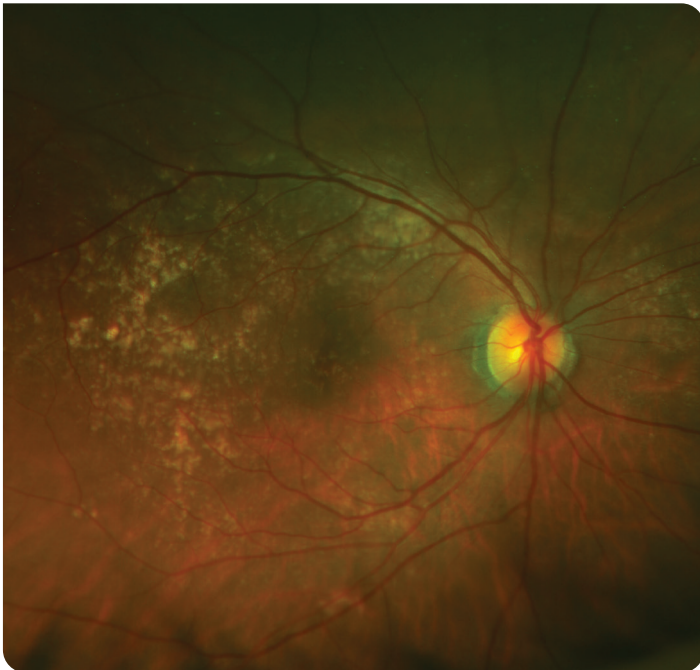


Figure 1. Right retinal photo showing macular drusen.

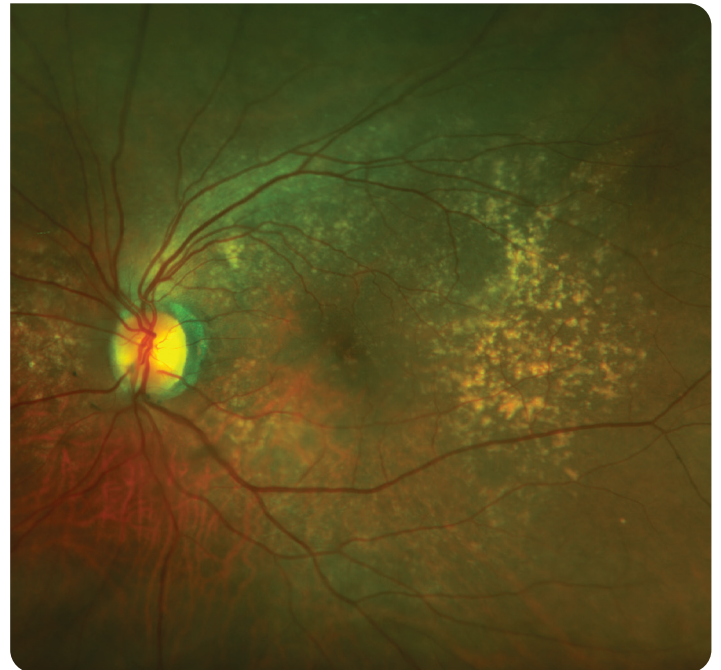
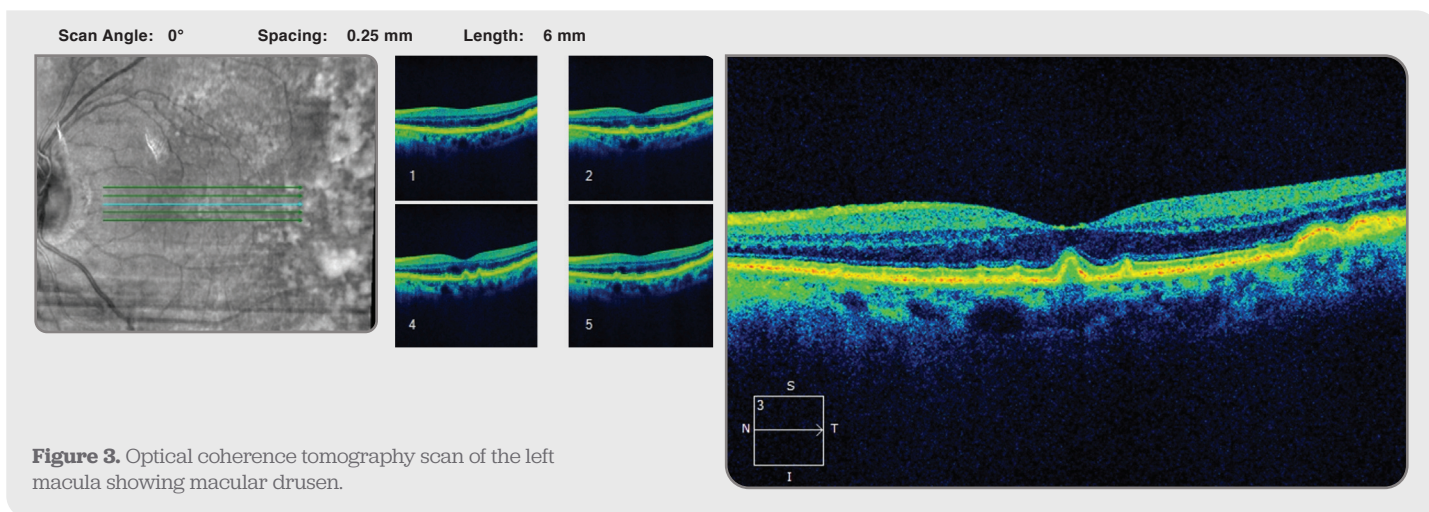


Figure 2. Left retinal photo showing macular drusen.



In contrast, the negative visual impact of EDOF or MFIOLs cannot be corrected with glasses and requires complex IOL exchange surgery to treat.

I believe EDOF or MFIOLs are usually not an appropriate option for patients with macular disease, as monofocal IOLs will provide the best quality of vision in the long term. In most cataract patients with macular disease, I recommend targeting both eyes for distance (plano to -0.50 D) or both eyes for myopia (-1 D to -3 D), depending on patient preference. Targeting similar refractive errors for both eyes facilitates binocular summation so that each eye compensates for reduced vision in the fellow eye. Remember that toric IOLs to correct astigmatism do not reduce contrast sensitivity and work well in patients with macula disease.

### Blue light filtration and macular protection

An additional consideration when selecting IOLs is the use of blue light-filtering IOLs. While all IOLs filter ultraviolet light, only some filter blue light. Blue light-filtering IOLs have extra yellow chromophores to block high-energy blue light. They are commonly used in patients with AMD to potentially protect the macula from phototoxicity, as blue light induces oxidative stress and retinal damage in *in vitro* studies. However, the proposed macular protective effect of blue light-blocking lenses has yet to be proven in human studies.<sup>3</sup>

### Key takeaways

- Patients have increasingly high expectations for their post-cataract-surgery vision. In patients with macular disease, these expectations might be unrealistic.
- The evolving landscape of cataract surgery demands a nuanced approach – one that balances technological advancements with the realities of ocular health.
- Optometrists are ideally placed to identify macular disease in cataract patients and manage their expectations while guiding them to make informed choices aligned with their long-term visual health. In doing so, they can ultimately safeguard the invaluable gift of sight.

### About the author



**Dr Simon Chen** is a highly experienced cataract and retinal surgeon at Vision Eye Institute and Adjunct Senior Lecturer at UNSW.

He regularly receives referrals for complex cataract surgery in patients with retinal disease, ocular trauma or dislocated lenses. Dr Chen was the first surgeon in the world to perform femtosecond laser cataract surgery combined with vitrectomy surgery and has had the

privilege of performing cataract or retinal surgery on over 100 Sydney optometrists and their closest relatives. Dr Chen consults at Vision Eye Institute's Bondi Junction, Chatswood and Drummoyne clinics in Sydney.

Dr Chen reports no financial disclosures.

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