

CATARACT SURGERY IMPLICATIONS FOR AMD

Research has not provided a definitive answer as to the connection between these conditions.

By Ali Erginay, MD



The potential link between cataract surgery and worsening AMD has been debated for years. Identifying a proven association would be significant, as these conditions are the two most common ocular diseases affecting the elderly, and many individuals are diagnosed with both; however, no established relationship has been identified thus far.¹ Here, I provide a review of studies that have sought to elucidate the link between AMD, cataracts, and cataract surgery.

RESEARCH SUPPORTING A LINK

Light toxicity from exposure to bright illumination during cataract surgery, indirect surgical trauma, surgery-induced proliferation of inflammatory mediators, and even increased exposure to different wavelengths of light after removing a cataractous lens have each been proposed as theories to explain the connection between cataracts and AMD.²⁻⁴

The Beaver Dam Eye Study is one of the earliest and most well-known studies to indicate a link between cataract surgery and AMD.⁵ Klein et al noticed a larger incidence of late-stage AMD in pseudophakic eyes compared with phakic eyes, as well as a greater rate of progression of early AMD if present at baseline. Geographic atrophy (GA) and wet AMD were also more likely to develop in pseudophakic eyes.⁵

A pooled study of the Beaver Dam Eye Study and Blue Mountain Eye Study arrived at similar conclusions, showing a two- to five-times increased risk of advancing to late AMD in pseudophakic eyes compared with phakic eyes of the same age group.⁶ Despite the cohort size, this study was set up as an epidemiological survey and, thus, could not prove a

direct correlation between cataract surgery and AMD.

Chaine et al designed a case control study to explore the risk factors for AMD and found that the presence of cataracts was a risk factor for AMD, including changes in the retinal pigment epithelium, GA, and wet AMD.⁷

Freeman et al conducted a cross-sectional study combining three separate datasets from three clinical sites. Each dataset supported the idea that having a history of cataract surgery, combined with a history of severe cataract itself, had an association with increased prevalence of late AMD, even after adjusting for several variables.⁸ Unfortunately, the question of whether the AMD correlation was with the surgery or the cataract itself

AT A GLANCE

- ▶ Light toxicity, indirect surgical trauma, and proliferation of inflammatory mediators have been proposed as theories to explain the connection between cataracts and AMD.
- ▶ Other studies have confirmed no association between cataract surgery and wet AMD progression.
- ▶ Although data on any putative association between AMD and cataract surgery are conflicting, popular consensus favors performing cataract surgery in patients with AMD.

remained unresolved. Although using three datasets gave this study strong credibility, its cross-sectional design still prevented any conclusions that one directly influenced the other temporally.⁸

CONFLICTING FINDINGS

In contrast to the findings supporting a possible correlation, one of the most well-known retina studies to date, the Age-Related Eye Disease Study, found no difference in rates of progression to wet AMD between pseudophakic and phakic eyes.⁹ Similarly, Sutter et al performed a retrospective review of lens status of patients over a 6-year span who had wet AMD in one eye and no AMD in the other and did not find that pseudophakia was a risk factor for the development of wet AMD.¹ This study included a well-matched control group by using each patient's other, non-AMD eye, but it was still limited by its retrospective nature and small size. Patel et al explored the hypothesis concerning exposure of the retina to new wavelengths of light but found inconclusive evidence.¹⁰

UTILITY OF FLUORESCEIN ANGIOGRAPHY

A prospective study by Dong et al was one of the best designed to address the question of whether a link existed between AMD and cataract surgery, or AMD and the cataract itself. They enrolled patients without wet AMD who were awaiting cataract surgery and monitored them at scheduled intervals for up to 12 months. Clinical examination, stereoscopic fundus photography, and fluorescein angiography (FA) were performed at each visit. After the 12-month period, the researchers concluded that there was no significant association between cataract surgery and the development of wet AMD.¹¹ They also noticed the presence of wet AMD in the FA in the first week after cataract surgery, leading them to conclude that progression may have already started prior to the operation.¹¹ It is worth noting that without FA, it is possible that the presence of wet AMD may have been missed in other studies, or at least wrongly presumed to have started much later.

WHY DON'T WE HAVE A CLEAR ANSWER?

There are many considerations that make it difficult to find direct correlations between cataracts, cataract surgery, and AMD. Besides similar age groups of patients with these diseases, it is possible that cataracts could be driven by the same risk factors as AMD. Patients with these same risk factors could theoretically have more severe cataracts, prompting surgical removal. Researchers have also brought up concerns with AMD detectability, given that detection could be impeded by dense cataracts.¹²

Popular consensus favors performing cataract surgery in patients with AMD. One study found that patients generally had significant improvements to their vision and quality

IN THE LITERATURE

In 2022, Chen et al conducted a meta-analysis of eight studies to explore the influence of cataract surgery on AMD progression.¹ Although they found that the relative risk (RR) of AMD progression after cataract surgery was not significantly different (RR = 1.194) overall, the team did find an increased risk over time. For patients with a follow-up of ≤ 5 years, the RR was 1.011; the RR rose to 1.372 for the group with > 5 years of follow-up.¹

1. Chen Z, Zeng Y, Tian F. Effect of cataract surgery on the progression of age-related macular degeneration. *Medicine (Baltimore)*. 2022;101(44):e31566.

of life after cataract surgery, regardless of AMD severity,¹³ and another found that patients with AMD reported feeling that the benefits of cataract surgery outweighed the risk of potential AMD progression.¹⁴ The Beaver Dam Eye Study suggested that cataract surgery should be considered if the cataracts are affecting visual function, although close monitoring of these patients after surgery was recommended.⁵

Recent studies have confirmed no association between cataract surgery and wet AMD progression. Kessel et al reviewed data of 89 patients with wet AMD who underwent cataract surgery and observed a mean VA improvement of 7.1 ETDRS letters 6 months after surgery without an increased need for anti-VEGF injections compared with the 6-month preoperative period.¹⁵ Nishiguchi et al followed 52 patients with wet AMD for 6 months post-cataract surgery and found that vision significantly improved post-operatively with no change in AMD status; 75% of patients reported satisfaction with their cataract surgery.¹⁶ These favorable outcomes compared with those of past studies could be due to improved phacoemulsification techniques leading to less surgical trauma and postoperative inflammation, and faster surgery times with reduced light exposure.

CONSIDERATIONS FOR SURGERY

Removal of visually significant cataracts can improve visual acuity, contrast and color sensitivity, and peripheral vision. Excluding the confounding cataract, physicians are also able to detect AMD progression more easily.

Although most experts agree on the benefits of performing cataract surgery in patients with AMD, there are no established clinical recommendations regarding timing of surgery. Previous studies have administered anti-VEGF injections within 1 to 3 months before cataract surgery.^{15,17} Karesvuo et al found reduced central subfield macular thickness and increased intervals between anti-VEGF injections despite cataract surgery, concluding that surgery may be done regardless of wet AMD activity if

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THE AMD TREATMENT LANDSCAPE

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visual acuity improvement could be expected.¹⁸ However, it is recommended that active AMD be controlled before elective cataract surgery.

Proper patient education is required to avoid unrealistic expectations. Previous studies reported 2 to 3 lines of VA improvement after cataract surgery in patients with less severe grades of AMD^{16,19}; patients with advanced AMD may experience lesser improvements. It must be clarified to the patient that distorted vision, central scotoma, and poor near vision due to AMD will not be cured with cataract surgery, unless the IOL optics were specifically designed to offer enhanced macular vision to improve visual acuity; studies have reported good visual outcomes with such IOLs.^{20,21}

TREATMENT OPTIONS ARE IMPROVING

The prevalence of cataracts and AMD is likely to increase as the global population continues to age. Novel innovations, such as extended macular vision IOLs and implantable miniature telescopes, are being developed to improve visual outcomes in AMD. Future prospective trials with larger cohort sizes and longer follow-up may better define the relationship between cataract surgery and AMD. ■

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