

SEEKING TO FULFILL AN UNMET NEED: ioIAMD

Unlike previous lenses for patients with dry AMD, it is implanted through a small incision.

BY BOBBY QURESHI, BSc, MBBS, FRCS(OPHTH)



ioIAMD (Figure 1) is a novel intraocular microincision injectable lens system designed to restore vision in patients with early, intermediate, and advanced dry age-related macular degeneration (AMD) and other macular diseases including stable wet AMD and diabetic maculopathy.

With the capability to be implanted through a small incision during routine cataract surgery, ioIAMD is the first patient- and surgeon-friendly device to address the symptoms of dry AMD. Until now, there has been no widely accepted treatment that can restore vision in AMD, the leading cause of blindness in patients over age 55. Previous attempts to solve this problem have involved riskier surgical procedures that required a much larger incision.

ioIAMD is currently being used commercially in the United Kingdom, Germany, Italy, and France. The system was originally developed for implantation in phakic patients, but the technology has continued to evolve, and now pseudophakic versions and single-lens designs are in early commercial use in the United Kingdom.

This coming year will be pivotal for ioIAMD, as all of the versions of the lens are introduced more widely to surgeons in additional markets. This article describes the process I went through to develop the lens and bring it to market.

INNOVATION

I am a nerd and proud of it. It has been natural for me to combine my two passions of technology and ophthalmology. But I have learned that it takes a lot more than medical training to take an idea to market.

I want to push boundaries, to try anything innovative that could benefit my patients. I work at my own hospital, the London Eye Hospital on Harley Street in London. I am fortunate enough to be able to work with any and all technologies that I believe will help my patients, regardless of their cost. Even with access to the best technologies the world has to offer, I still feel frustration regarding what is possible in my desire to maximize the vision and quality of life of every patient that I see.

Developing the hospital was an education for me, as I



Figure 1. The ioIAMD lens.

Courtesy of London Eye Hospital Pharma

learned skills I did not have and learned about the business of ophthalmology and how it works globally. In that process, I found that I had a level of insight that made me believe I could take my ideas through every step of development to commercialization. At every conference I attended, while I diligently sat and absorbed the lectures, I was blissfully unaware of the business taking place in the meeting rooms all around me. That is, until I found myself there, discussing billion-dollar deals.

I formed London Eye Hospital Pharma in 2011. This company is the vehicle that develops my ideas and turns them into commercial technologies that will improve my ability to offer solutions to patients. I am able to fund the projects myself, which enables me to remain in control and channel the company's activities into the areas that I feel will benefit the most people.

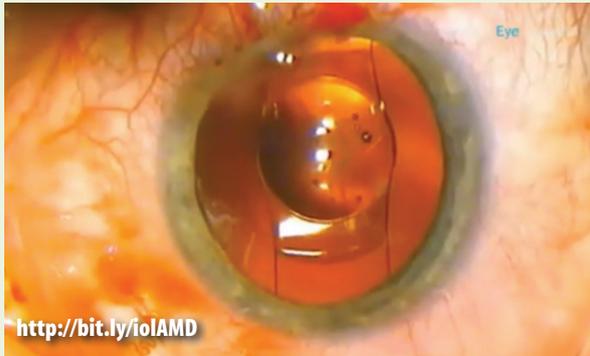
We have a number of active projects, some ready to launch and others that will take years to develop. We have projects in London Eye Hospital Pharma's developmental pipeline that might sound like science fiction, but I believe that they are the future and that the whole world will someday find them clinically valuable.

I see possibilities, maybe where others do not, and I am fortunate to have access to the funds to turn my ideas into reality. Having an idea is one thing, but turning it into a commercial product is a separate challenge.



WATCH IT NOW

iolAMD Implantation



BIRTH OF A COMPANY

I grew up with an interest in optics. I made my own telescopes, including the component lenses and mirrors. Therefore, when it came time to design the iolAMD, I was able to model the initial lens system myself. However, I needed the right team to bring the vision through the developmental process from initial concept to commercialization. I had learned from my experiences with the London Eye Hospital that, however much one wants to control or be intimately involved with every aspect, one cannot do it alone. Therefore, I wanted to find the best people I could.

It is important to have a strong team of talented, hard-working people, including world-leading specialists and experts who know their area of expertise as well as generalists who can help to coordinate the effort. Geography is not a barrier to us; we want to involve the best people, no matter where they are in the world.

I have sought out and hired fantastic people to manage and coordinate the practical aspects of running a business and scientists to help make these ideas reality. These talented people have all contributed, but the initial ideas did not come from them, nor did the initial motivation; that has come from me. I enjoy the sheer adventure of inventing something new, something that had never been done before—to accomplish something that had previously seemed impossible.

From time to time, my own managers and research and development (R&D) team have told me, “It can’t be done.” I feel as though I am working against the laws of physics or business or what people are capable of. I will listen to everybody, but, in the end, I trust my gut to make the final call.

Our R&D team is adept at taking advanced optical ideas and turning them into practical products that can be manufactured and then implanted by the general

ophthalmologist. This is not an easy task, as great ideas do not always translate into practical products.

We continue to build a great team, including scientists, R&D experts, manufacturers, marketers, managers, and lawyers, but I still do not accept any investors. I do not want to lose control of what I am doing. The last thing I want is for someone to tell me what to do because they gave me the money to do it.

DEVELOPING AN IDEA

In the past 15 years, there have been several attempts to design an IOL to help patients with dry AMD improve their vision after cataract surgery. The basic idea has been to introduce an optical system into the eye that would magnify the image size and move it to a healthier portion of retina adjacent to the damaged macula. Projection of the image on this less damaged area would enable the patient to see better.

Previous technologies had several limitations: a long surgical time, complex surgery, and a large, archaic 6- to 12-mm incision. Large incisions mean long recovery times and the potential for intraoperative complications, and, therefore, this type of surgery has been limited to use in end-stage AMD patients.

These limitations led me to conceive the idea for iolAMD in 2007, after years of implanting the earlier lenses at the London Eye Hospital. I believed passionately in improving the vision of patients with AMD, and I felt restricted by the options available to me. I was one of the first to implant the early telescopic implants. I have implanted hundreds of each model, but they all had challenges. They were huge lenses, requiring a 7- or 8-mm capsulorrhexis (which is not easy to accomplish, even with a femtosecond laser), and the surgery took a long time. For the IOL Revolution (LenSpecial), the surgeon had to put several components into the eye, then fix them together like Lego pieces—it was a real challenge, even for a nerd.

I believed that there was a genuine need to help the large population of patients with early, intermediate, and end-stage AMD, but I felt that these designs were fundamentally flawed. I thought there must be a better way to do this.



AT A GLANCE

- iolAMD is the first patient- and surgeon-friendly device to address the symptoms of dry AMD.
- Unlike other lenses, iolAMD is introduced into the eye via standard surgical techniques through a sutureless microincision, leading to a short recovery time.
- This coming year will be pivotal for iolAMD, as all of the versions of the lens are introduced more widely to surgeons in additional markets.

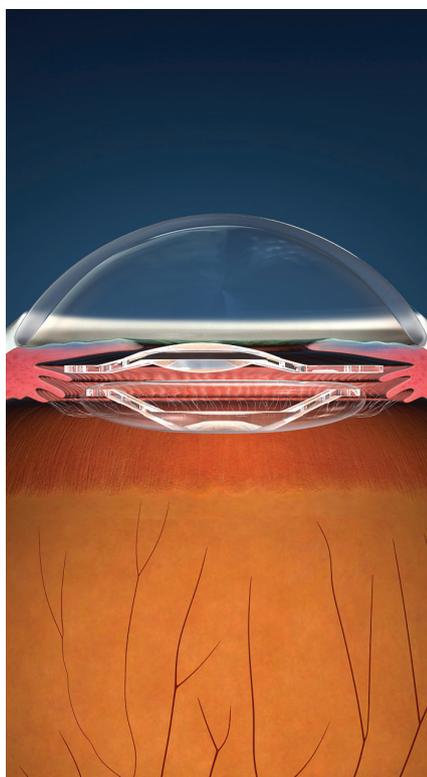


Figure 2. iolAMD is based on the concept of a Galilean telescope, with two foldable acrylic lenses, one in the capsular bag and one in the sulcus.

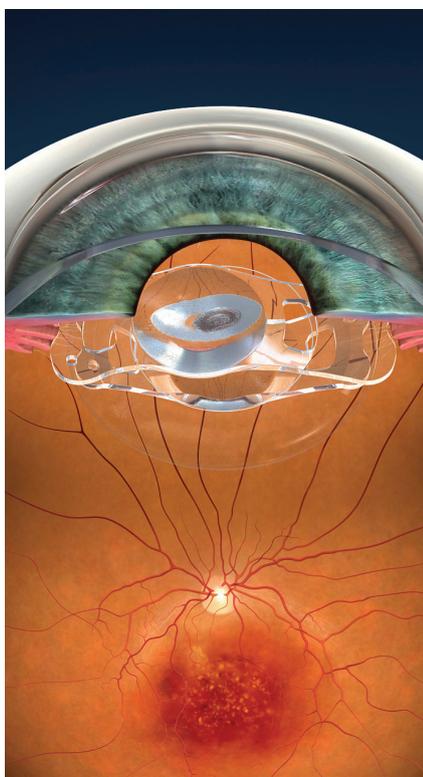


Figure 3. The asymmetric haptics of the sulcus lens result in an offset of the two lens optics.

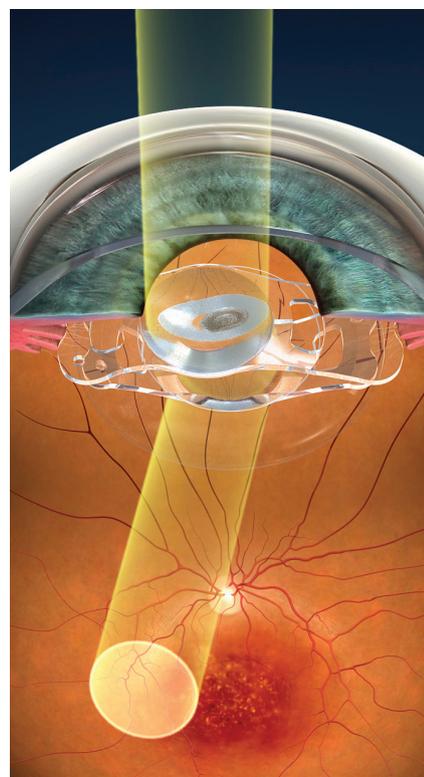


Figure 4. The offset of the optics results in projection of the image onto healthy tissue, away from the damaged macula.

Courtesy of London Eye Hospital Pharma

iolAMD was the clearest solution I could envision: a lens based on a simple Galilean principle, updated for the 21st century (Figures 2 and 3). This lens would be injectable and capable of being inserted through a small incision. The procedure had to be simple, just like implanting a standard IOL, and not add any time to the cataract operation.

Like other AMD lenses, iolAMD increases the image size and moves it to healthier areas of adjacent retina (Figure 4). Unlike other lenses, it is introduced into the eye via standard surgical techniques through a sutureless microincision, leading to a short recovery time. We have also built in additional robustness to take further disease progression into account.

CONCLUSION

Implanting iolAMD, including cataract extraction, takes less than 10 minutes, and the lens can provide higher-quality vision for patients with dry AMD. This is something that can be done at the same time as a routine phaco procedure, without additional risk, and that conveys extra benefits to patients with AMD.

The intent of iolAMD is to provide relief to as many patients as possible. iolAMD was designed as a solution for a large unmet

need in ophthalmology. We believe that the iolAMD system can potentially help millions of patients worldwide.

iolAMD has received the CE Mark, and we are planning to start the process for FDA approval this year with the view to entering the market in the United States in the coming years. We are thrilled for the patients we are helping and the opportunities this successful lens will give us to continue the momentum of our innovation.

To anyone looking to bring their own innovation to market, I would say this: If you have a clinically relevant idea and you really believe in it, go for it, no matter what anyone says. You have to believe you will succeed. The worst-case scenario is that it will not work out, but you will learn much in the process. And next time, you will do even better. ■

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- Financial disclosure: Developer (iolAMD)