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Macular OCT role in preop anterior surgery
Routine use may guide procedure planning

Surgical pearls for hypotonous eyes
Technique modifications lead to better visual outcome

Device renews hope for artificial vision
Visual cortical prosthesis intended to create artificial form of useful vision for blind individuals

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**CORNEA**  When dry eye symptoms worsen overnight
Nocturnal evaporative stress may be component

**GENE THERAPY**  Deciphering LHON data
Secondary outcome measures provide signals of efficacy

**PAEDIATRICS**  Conjunctival tumours in children
Most are epithelial and melanocytic in origin
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**Date of Prescribing Information:** September 2018.

**Job Code:** NP-CSPPF-UK-0005

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Results of a retrospective study support the routine use of macular optical coherence tomography (OCT) for preoperative screening of patients scheduled for cataract surgery, according to Yishay Weill, MD.

The research evaluated data from 226 consecutive eyes of 226 patients referred to Shaare Zedek Medical Center, Jerusalem, Israel, for cataract surgery during the last 2 months of 2017. It found that the macular OCT was normal in 51% of eyes and uninterpretable due to low quality in 9%.

However, macular pathology was identified in 40% of the eyes. Importantly, the pathology was overlooked in the referral examination in 51% of the eyes with pathology, and its presence led to a change in management in 14% of patients.

‘Cataract surgery is now a combined rehabilitative and refractive procedure, and our patients’ expectations are higher than ever.’

– Dr Yishay Weill

“Cataract surgery is now a combined rehabilitative and refractive procedure, and our patients’ expectations are higher than ever,” said Dr Weill, resident, Department of Ophthalmology, Shaare Zedek Medical Center, Israel.

Dr Weill noted that the dilated clinical fundus examination is currently considered the standard of care for preoperative evaluation of the macula.

“Its limited ability to detect pathology in patients with opaque media is a specific concern in the setting of patients presenting for cataract surgery,” he pointed out.

Dr Weill also explained that overlooked macular pathologies might lead to suboptimal postoperative results, such as unexpected low BCVA and worsening

IN SHORT

In a retrospective study, preoperative macular optical coherence tomography (OCT) identified macular pathology that was overlooked on fundus examination, and the findings led to management changes in a large percentage of patients.
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of baseline macular pathology, and that will in turn could lead to dissatisfied patients.

‘At our institution, a policy for routinely performing macular OCT for screening of cataract patients was implemented during the second half of 2017.’

– Dr Yishay Weill

“Preoperative OCT allows better patient management in terms of guiding appropriate surgery planning, timing, modification of consent, patient counseling, and matching patient expectations,” Dr Weill said. “At our institution, a policy for routinely performing macular OCT for screening of cataract patients was implemented during the second half of 2017.”

The 226 patients included in the research study had a mean age of 73 years, were predominantly female (57%), and were seen by their referring eye care practitioner at an average of 59 days before their preoperative OCT, according to Dr Weill.

The macular OCT was performed with a spectral-domain system (Spectralis, Heidelberg Engineering). All of the OCT scans were then reviewed by a retina specialist. Some of the patients found to have macular pathologies had more than one finding.

The most common macular pathologies were age-related macular degeneration (43 eyes), epiretinal membranes (27 eyes), and cystoid macular edema (18 eyes).

“All patients found to have macular pathologies were disqualified as candidates for a multifocal IOL,” said Dr Weill.

In some patients, discovering overlooked macular pathology using OCT led to a delay in surgery, and an offering of combined surgery to address the macular pathology and cataract, or use of adjunctive therapy, such as an intravitreal injection of a corticosteroid or anti-VEGF agent.

Dr Weill also pointed out that preoperative macular OCT is easy to implement because it is widely available, non-invasive, and quick.

However, he concluded that the need for research to evaluate the cost-effectiveness of its routine use for preoperative evaluation of cataract surgery patients.

DR YISHAY WEILL, MD
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This article is adapted from a presentation by Dr Weill at the American Academy of Ophthalmology’s annual meeting. He has no relevant financial interests to disclose.
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Monofocal IOLs have changed very little in recent years, in part because modern monofocal IOLs have already been providing excellent outcomes. The materials and edge designs were optimised in the 1990s, leading to lower rates of posterior capsular opacity (PCO). Aspheric optics were introduced, which improved optical performance, particularly with regard to contrast sensitivity. And with modern lenses we have long been able to achieve good centration with minimal tilt and stable axial IOL position after surgery.

However, a unique new monofocal IOL recently received the CE Mark and is now commercially available throughout Europe. The Tecnis Eyhance (Johnson & Johnson Vision) is a monofocal lens—but one that offers a slightly broader defocus curve, for high-quality distance and intermediate vision.

Intermediate vision

In a prospective, multicentre, randomised, subject- and evaluator-masked clinical trial in Europe, 67 subjects were implanted bilaterally with Tecnis Eyhance (study group) and 72 subjects with Tecnis 1-piece (ZCB00) IOLs (control group). The study group achieved 20/20 best-corrected distance visual acuity (BCDVA) and significantly improved intermediate vision compared with the control group. The study group also had the same well-established low incidence of halo, glare, and starburst as Tecnis 1-piece IOLs.

Patient-reported outcomes suggest that the Eyhance IOL allows patients to perform some activities, such as walking on uneven surfaces or engaging in hobbies, with greater ease compared to a standard aspheric monofocal.

Positioning this lens

In my practice, this lens is now my monofocal lens of choice. I position it as a better monofocal (which is how it is labeled and priced in Austria), not as a premium IOL.

In my opinion, the biggest advantage of this lens is that it has a wider landing zone or “sweet spot” than a typical monofocal, making it more forgiving of small amounts of residual refractive error. This directly addresses the biggest remaining challenge we have in implanting monofocal IOLs: the relative imprecision of biometry and power calculation. Even the best surgeons frequently don’t achieve the intended refractive target of emmetropia and therefore many patients need to wear glasses for good distance vision.

‘In my opinion, the biggest advantage of this lens is that it has a wider landing zone or “sweet spot” than a typical monofocal...’

Dr Oliver Findl

My experience has been that patients implanted with the Tecnis Eyhance have very good unaided distance vision, even with some refractive error after surgery. With an emmetropic result, the patient is likely to also get improved intermediate (and sometimes even near) vision, which is a nice surprise for the patient.

The intermediate/near acuity is not what we would expect to achieve with a trifocal or extended depth of focus IOL, but it can be significantly better than with typical monofocals.

Familiar features

The lens itself looks exactly like a Tecnis 1-Piece IOL. It has the same base geometry, material...
characteristics, edge design, haptics, and A-constant. This is an advantage because we don’t need to make any changes to our power formula calculations. The Tecnis Eyhance IOL does not rely on diffractive optics and has no rings or zones. Rather, the improved intermediate vision and broader sweet spot is achieved by incorporating a higher-order aspheric surface with a continuous increase in power from the periphery to the centre of the lens, while still reducing spherical aberration to nearly zero.

In the 50-60 patients I have implanted with the lens so far, I have had no reports of nighttime dysphotopsias, in line with the multicentre study data and my expectations, given the lens design. I have also seen no measurable changes in optical performance compared to the Tecnis 1-Piece.

For our risk-averse patients who are unwilling to consider either a presbyopia-correcting IOL or even monovision, micro-monovision with this lens could provide a more robust range of vision than would otherwise be possible. Additionally, as a monofocal IOL, it is appropriate for patients with pathology, including those with the most common sight-threatening conditions: macular degeneration, diabetic macular edema, and glaucoma. I consider even early versions of these diseases (e.g., mild drusen, poorly controlled diabetes) to be relative contraindications for multifocal lens technologies, so I am glad to have a better monofocal lens to offer these patients.

DR OLIVER FINDL, MD, MBA

For our risk-averse patients [...], micro-monovision with this lens could provide a more robust range of vision than would otherwise be possible

– Dr Oliver Findl

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EMPOWERING YOU.
In my private practice I perform cataract, refractive and glaucoma procedures that demand good visual outcomes. I have been performing bimanual microincision cataract surgery (BiMICS) for many years. With BiMICS, cataracts may be extracted through incisions of 1.1 mm, requiring precise, accurate and dependable microinstruments. While much emphasis is often placed on the decrease in incision size, the main advantages of BiMICS, in my opinion, are enhanced anterior chamber stability, improved safety through the separation of irrigation and aspiration, best wound architecture and preservation of wound integrity.

The anterior segment microsurgical instruments from MicroSurgical Technology (MST; WA, USA) are for me the instruments of choice. MST relies on the advice from many experienced surgeons to develop instruments that provide flexibility and help ease difficult surgeries. I regularly use the 23g Seibel Capsulorhexis Forceps, 23g Hoffman/Ahmed Horizontal Scissors, and the Packer/Chang IOL Cutting Kit (19g Packer/Chang IOL Cutters and the 23g Micro Holding Forceps) along with the MST Capsule Retractors as part of my surgical routine.

Conquering capsulorhexis in BiMICS

Creating a precise capsulorhexis is one of the most challenging steps in BiMICS. Surgeons require a great degree of precision, control, visibility and manoeuvrability, which needs to be attainable through a microincision. The development of capsulorhexis forceps meeting such requirements helped to transform BiMICS into my surgical routine. The Seibel Capsulorhexis Forceps (Figure 1) have become indispensable in my practice. The forceps have a coaxial design and include a unique capsulorhexis ruler, which helps the surgeon visualise, directly on the capsule, the desired capsulorhexis size. The ruler enables surgeons to centre the capsulorhexis precisely and to ensure capsular opening of an adequate size to achieve a stable implantation of the lens. The coaxial design allows greater control at the distal end of the instruments. The design as well as the ability to minimise the paracentesis to 1.0 mm, if needed, help minimise the loss of OVD, and therefore maintain a stable anterior chamber. This is very important in white cataract cases avoiding Argentinian flag complication with the help of Trypan Blue (Monoblue, Arcad Ophtha, Launac, France).

The Seibel Capsulorhexis has a ruler with exact measurements (allowing high accuracy and precision), and sharp-tipped forceps (allowing visibility when grasping the capsule).

While having the right skills and right instruments to perform capsulorhexis through a micro-incision

**IN SHORT**

- Dr Lesieur discusses the importance of using instruments that provide flexibility to adapt when performing BiMICS.
is of essence, patients can sometimes unexpectedly move during the procedure, resulting in an oval capsulorhexis. In this case, after the implantation of the lens into the anterior capsule, the capsular bag can overlap the lens more than desired. By using the micro-scissors, it is possible to correct the size of the capsulorhexis to achieve a well-centred capsulorhexis, preventing any IOL tilt or decentration. In these cases, I use the 23g Hoffman/Ahmed curved scissors, which provide great control during the cutting thanks to their small size, curved shape and hingeless design.

Having more space to work, good control and good precision are what I need to simplify micro-incision cataract surgery as well as treat complex cases.

**Unstable capsular bag and patients with weak zonules**

Dealing with an unstable capsular bag is another challenge in BiMICS. This occurs in cases with weak zonules, and can affect every step of the capsat act procedure and increase the risk of complications. When faced with weak zonules, several devices can be used to stabilise the capsular bag, such as the tension ring, iris hooks or capsule retractors.

Whether during or at the end of the surgery, my choice is the MST Capsule Retractors, Chang modification for capsular bag stability. The retractors let you support the bag throughout the operation without aggravating the zonular distension.

In comparison with the iris hooks, which only pull on the capsulorhexis margin, the MST Capsule Retractors have extended posterior tabs that support the bag. Whereas iris hooks can be somewhat aggressive and increase the risk of tearing the anterior capsule, the MST Chang-modified capsule retractors support the entire capsule equator as well as the anterior capsule rim without cinching down on the continuous curvilinear capsulorhexis edge.¹ This allows the retractors to act as artificial zonules that help the surgeon achieve enough stabilisation throughout the entire bag during phacoemulsification and cortical clean up. The retractors also allow a delayed placement of CTR until after the cortex is removed, which helps avoid the cortex being trapped by the CTR.¹ The outcomes are good with this retractor mainly due to the shape and elongation of the hooks, which provide a broader area of contact to achieve gentle support (Figure 2).

So, in patients with serious pseudo-exfoliation syndrome who suffered major complications during the operation, it is a tool that enables me to support the bag, implant the lens without increasing the zonular lesions and achieve post-operative stability.

**Conclusion**

With adaptable instruments in BiMICS, I am able to control the microenvironment that I am working in, have great visibility and precision, and minimise chances of complications, as well as manage them better if they do occur. Having instruments that provide flexibility to adapt to the situation is of essence to every doctor performing BiMICS.

**REFERENCE**


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Dr Lesieur is an anterior segment and refractive surgeon at the Centre Ophtalmologique, 91500, Antony, France. He has no financial interest with MicroSurgical Technology.
Clinical Commissioning Groups limit access to cataract surgery in England

Surgeons and patient-led groups campaign to stop cuts to patient eye care

By Erica Crompton; Reviewed by Dr Marianne Coleman

The Royal National Institute for the Blind (RNIB) estimates that there are around 677,000 people in the UK living with a cataract, 568,000 of which are in England. Cataracts are heavily linked to age, and more than half of the 568,000 affected will be people aged 80 years and over.

People with the condition can experience severely impaired vision as the eye’s lens becomes opaque. Cataracts can affect one or both eyes and are treated by surgery, during which the cloudy lens is removed and replaced by an artificial lens.

Strict access on second-eye surgery

The Royal College of Ophthalmologists states that it is important that patients regain as much vision as possible and are able to use both eyes together.

However, a survey it conducted among ophthalmic leads in 2017 found that some Clinical Commissioning Groups (CCGs) apply even stricter access to patients needing surgery on a second eye, meaning patients can have a cataract removed from one eye, but are then left with impaired vision in the other. When one eye has poorer vision, it is harder to use both eyes together to judge distances, known as stereopsis. This impairment of binocular vision increases risk of trips and falls.

Against NICE guidelines

Now, patients across England are being denied vital cataract surgery by their local CCGs, with over half including the procedure in lists of treatments they deem to be of limited clinical value, despite being proven to be effective. National clinical guidelines published by the National Institute for Health and Care Excellence (NICE) in 2017 cite the cost-effectiveness of cataract surgery, stating that it has ‘a high success rate in improving visual function, with low morbidity and mortality’.

And according to Miss Anna Maino, consultant ophthalmologist at Manchester Royal Eye Hospital, the British press and social media coverage of this subject isn’t helping patients: “The headlines made people believe that cataract surgery is ineffective, when NICE guidelines say the opposite. CCGs are deliberately not following NICE guidelines and some CCGs use specific levels of visual acuity to select which patients are eligible. Visual acuity, however, does not tell the whole story. I have operated on a number of patients who might still retain relatively good visual acuity for distance but are greatly troubled by poor visual acuity for near, glare, loss of contrast and loss of stereopsis. These problems will adversely affect their quality of life, their ability to participate in pastimes and to avoid isolation (as many patients will stop driving).”

‘Clinical Commissioning Groups are deliberately not following NICE guidelines...’ – Anna Maino

Also commenting exclusively to Ophthalmology Times Europe, Marianne Coleman and Jignasa Mehta from the British and Irish Orthoptic Society’s Public Health Clinical Advisory Group say that orthoptists are closely involved in the cataract surgery pathway in a number of capacities, such as IOL biometry and binocular vision assessment. They agree that cataract surgery is vital to patients and shouldn’t be denied: “Dense cataract can disrupt contrast sensitivity and binocular vision, both major risk factors in falls amongst older people”. Timely cataract surgery also improves vision and quality of life among patients.

IN SHORT

- Despite its cost-effectiveness and high success rate in improving visual function, patients in England are being denied vital cataract surgery by their local Clinical Commissioning Group (CCG).
Use of any visual acuity threshold for surgical referral goes against NICE guidelines for cataract surgery, which were constructed based on the evaluation of a number of tools/approaches to determine referral threshold, all of which were found wanting. Yet, under current rationing, use of binocular visual acuity thresholds by some CCGs for first-eye surgery referral allows for one eye to deteriorate to the point of meeting the requirements for monocular visual impairment (6/18), a major barrier to good quality binocular vision, they add.

“Time and again in practice, orthoptists are treating older people with binocular vision problems that have emerged as a consequence of cataract-related disruption to heterophoria control, be it due to visual acuity decline in both eyes, or a prolonged period of impaired vision in the unoperated eye while awaiting second eye surgery, which is even more heavily rationed by many CCGs,” says Marianne Coleman, whose research at the University of Surrey focuses on binocular vision problems experienced by older people with dementia, funded by Fight for Sight and the Royal Society of Medicine.

**MTG research findings**

Research by the Medical Technology Group (MTG), a coalition of patient groups, research charities and medical device manufacturers working to make medical technologies available to everyone who needs them, adds that 104 of the 195 CCGs in England restrict access to cataract surgery. These CCGs include it on lists of ‘Procedures of Limited Clinical Value’, normally reserved for complementary therapies or cosmetic procedures where there is little evidence to prove their cost effectiveness or clinical benefit.

The result of CCGs’ restrictions on cataract surgery is that patients across the country are being denied access to cataract surgery while nearby London districts Barking and Dagenham CCG offers the procedure to all patients. Concerned that the treatment patients receive is being determined by where they live, not what they need, the MTG is launching Ration Watch, a campaign to highlight variation in local commissioning and call for changes to eradicate the postcode lottery.

Barbara Harpham, chair of the MTG, said: “It’s simply not fair that patients up and down the country are being denied access to vital treatments because of where they live. This indiscriminate rationing by local NHS organisations must stop now and information about what treatments are or are not provided should be made freely available to patients. It should depend on your needs, not your postcode.”

**Impact of visual impairment on falls**

Jignasa Mehta is the lead for the British and Irish Orthoptic Society’s Public Health Clinical Advisory Group, and her research at the University of Liverpool focuses on the impact of visual impairment in falls and fear of falling, funded by the Dunhill Medical Trust. She says: “The existence of such inequalities in access to cataract surgery is a major public health issue affecting older people. Visual function and binocular vision assessment is absolutely vital within the cataract pathway as part of a multifactorial falls risk assessment, yet consideration of this factor within cataract referral guidance for both first and second eye surgery varies hugely between CCGs.”

‘It’s simply not fair that patients up and down the country are being denied access to vital treatments because of where they live.’

— Barbara Harpham
A commonly cited paper by CCGs identified an equivocal relationship between falls and delays to second eye surgery, but stereopsis has been linked by the same research group to quality of life in older people with cataract. As established decades ago, the patient’s quality of life is a far more informative metric than visual acuity when deciding on referral for cataract surgery. Yet these considerations are inconsistently applied by CCGs, with further arbitrary inequalities in access existing within some referral guidelines, such as prioritisation of drivers over non-drivers.

With all this in mind, Helen Lee, Eye Health Policy Manager for the RNIB, agrees that cataract removal is a crucial procedure that has a huge impact on the lives of patients and their families. According to Lee: “We know that restrictions or delays to cataract surgery can severely impact people’s ability to lead independent lives, making them twice as likely to experience falls and significantly reducing quality of life. It’s shocking that access to this life-changing surgery is being unnecessarily restricted by so many CCGs. We firmly believe that all patients who will benefit from cataract removal should be entitled to it and we urge CCGs to ensure the NICE guidance is fully implemented. Eye health services should be prioritised, so patients get timely access to treatment, rather than waiting months—or even years—for sight-saving surgery.”

Other treatments that are rationed

In an investigation by the MTG, conducted in October 2018, it was revealed that CCGs across the country are also rationing access to other proven treatments by including them on lists of restricted treatments or by applying high thresholds. Often these treatments can make a significant difference to patients’ quality of life and deliver savings to the NHS in the long run.

The MTG’s campaign is also calling for a national body to scrutinise decisions by individual CCGs.

The MTG’s campaign is also calling for a national body to scrutinise decisions by individual CCGs and ensure patient access to treatments is consistent across the country.

Both Marianne Coleman and Jignasa Mehta state that orthoptics is a profession devoted to maximising binocular vision for all patients, to maintain their quality of life and confidence in mobility, and mitigate vision-related risk factors in falls, and eye care professionals continue to be dismayed by and condemn the rationing practices employed by many CCGs. Further, the designation of cataract surgery (particularly for the second eye) by many CCGs as a procedure of low clinical value fails to take into account the important role of good quality binocular vision and unimpeded stereopsis in the independent lives of older people.

Conclusions

With well over half a million people in England living with a cataract and advice from The Royal College of Ophthalmologists stating the importance of treatment in both eyes, it is crucial CCGs support and help patients across England by adopting consistent and more holistic access criteria for vital cataract surgery that is proven to be effective.

The campaigns mentioned here, led by clinicians and patient-led groups, leading charities and optical organisations, continue to ensure this happens for better outcomes for all their England-based patients.

REFERENCES

The iStent inject® is intended to reduce intraocular pressure safely and effectively in patients diagnosed with primary open-angle glaucoma, pseudo-exfoliative glaucoma or pigmentary glaucoma. The iStent inject® can deliver two (2) stents on a single pass, through a single incision. The implant is designed to stent open a passage through the trabecular meshwork to allow for an increase in the facility of outflow and a subsequent reduction in intraocular pressure. The device is safe and effective when implanted in combination with cataract surgery in those subjects who require intraocular pressure reduction and/or would benefit from glaucoma medication reduction. The device may also be implanted in patients who continue to have elevated intraocular pressure despite prior treatment with glaucoma medications and conventional glaucoma surgery.

LASIK surgery continues to thrive, offering positive outcomes

Surgeons use procedure to offer patients improved vision quickly with few side effects

By Dr Robert K. Maloney

LASIK is better than ever, despite reports that have highlighted poor outcomes, most from years ago. Data actually shows that LASIK results are better than ever and patients can expect outstanding results, with few side effects. In our practice, LASIK is thriving.

While I never promise patients a particular outcome, I am up-front that our goal is to get to better than 20/20 vision. I can say this with confidence because my colleagues and I recently reported on a multicentre clinical trial in which more than three-quarters of eyes, and more than 90% of patients when measured binocularly, had uncorrected visual acuity of 20/16 or better.1

Patients are interested to hear this. The idea of “better than 20/20” is the part of a consultation that gets them excited.

Refractive surgery results have reached this point because we have seen consistent, incremental improvements in laser vision correction technology. Wavefront-guided procedures, tighter control of laser energy and laser beam angle, and other technical improvements have greatly increased the proportion of 20/20 or better outcomes and reduced the variability in results.

Newer platforms have also nearly eliminated the quality-of-vision complaints related to optical aberrations (e.g., double vision, hazy vision, disabling glare) that we sometimes saw after LASIK.

Patients have an unerring radar for a surgeon’s level of confidence. Based on my own data and what is in the published literature, I don’t have to give patients a lot of qualifiers about the results they can expect. Of course, I always warn them about possible side effects, but the numbers—and the confidence I feel—communicate that my level of concern is low.

Prospective study

The study I mentioned was an investigator-initiated, post-market study conducted by Colman Kraff, MD, Stephen Coleman, MD, and myself. In all, 97 patients were enrolled in this prospective study to evaluate the results of wavefront-guided LASIK using an aberrometer (iDesign, Johnson & Johnson Vision) to guide the treatment. All subjects underwent bilateral LASIK, with a target of emmetropia. Nomogram adjustments were made as needed to bring the wavefront sphere into agreement with the manifest refraction sphere.

Of the 97 patients enrolled, 84 completed the study. Preoperative spherical error ranged from –0.25 D to –11.0 D (mean –3.83 D), with or without astigmatism of up to –5.0 D. Subjects were examined at baseline, and 1, 3 and 6 months postoperatively.

‘Data actually shows that LASIK results are better than ever and patients can expect outstanding results, with few side effects.’

– Dr Robert K. Maloney

BY THE NUMBERS

| 97 | patients enrolled |
| 84 | patients completed |
| 6  | month follow-up |

IN SHORT

» In a multicentre clinical trial, more than 90% of patient, when measured binocularly, had uncorrected visual acuity of 20/16 or better.
A total of 97% of eyes achieved postop monocular uncorrected visual acuity of 20/20 or better; 77% were 20/16 or better. When vision was measured binocularly, all subjects could see at least 20/20, with 93% seeing 20/16 or better. The mean manifest refraction at 6 months was –0.01 D, with a standard deviation of 0.25 D, the mean manifest cylinder was –0.21 D.

At 6 months, about half the patients reported that their eyes never felt dry or gritty, while half said they “sometimes” felt dry or gritty. Only 4% reported more frequent symptoms.

At 6 months, most patients also reported rarely experiencing glare, halo, starbursts, or double vision. The rate of these symptoms decreased compared to baseline. Patient reports of starbursts declined from 15% of subjects before surgery to 1.5% after. Reports of halos decreased from 9.7% preop to 3% postop.

In total, 96% of subjects said they could function with “no difficulty” without corrective lenses, and 97% said their quality of life had improved. Nearly all subjects (99%) said they would recommend LASIK to a friend or relative.

‘To build a LASIK practice that thrives on high satisfaction and patient referrals, 20/20 is not enough.’

- Dr Robert K. Maloney

BY THE NUMBERS

- 97% had postop monocular uncorrected VA 20/20 or better
- 97% reported improved quality of life
- 99% would recommend LASIK

Standard deviation

Although our mean postoperative manifest refraction was nearly zero, the most impressive aspect of the results is the standard deviation of 0.25 D. Standard deviation of the manifest refraction spherical equivalent (MRSE) is the way we should judge a laser system.

Let us compare two hypothetical lasers. Laser One has a mean MRSE of 0.00 D with a relatively high standard deviation of 0.36 D; 84% of eyes are within 0.5 D of emmetropia. You would be the owner of a system that got 99% of eyes within 0.5 D of emmetropia. The large standard deviation of Laser One is not correctable. This is why standard deviation of MRSE should be a key measure of a laser’s performance.

We know that each extra line of uncorrected vision translates into a jump in patient satisfaction. To build a LASIK practice that thrives on high satisfaction and patient referrals, 20/20 is not enough. You really need to get patient after patient to 20/15—and that is possible with today’s wavefront technology.

REFERENCE

Pearls to manage cataract surgery for patients with hypotonous eyes

Better visual outcomes goal for patients who have also had glaucoma procedure

Careful planning, as well as pre-, intra- and postoperative modifications, can lead to better visual outcomes in hypotonous glaucoma patients when cataract surgery is performed, said Anup Khatana, MD.

Factors that can affect cataract surgery outcome include a 0.1- to 1.0-mm reduction in axial length after trabeculectomy, an IOP rise after phacoemulsification in eyes with functional blebs, and possible changes in keratometry.

“There is not a lot of data on the effects of cataract surgery on eyes with tubes, but there does not seem to be a significant effect on the IOP,” said Dr Khatana, director, Glaucoma Service, Cincinnati Eye Institute, and volunteer clinical assistant professor, University of Cincinnati College of Medicine, OH, USA.

Diagnosing hypotony

When diagnosing hypotony, the earliest signs are Bowman’s folds or epithelial microfurrows. These can be seen with a cobalt blue light after instilling a drop of 2% fluorescein.

Surgeons also should consider how long the hypotony has been present and whether there are any choroidal folds.

“If axial length reduction, choroidal folds or hypotony maculopathy are present for greater than 6 to 9 months, they will likely be permanent,” Dr Khatana said.

Surgeons have several choices to manage cataract surgery and hypotony, one of which is performing phaco alone. This could be an option if the bleb has some vascularity and looks like it could scar enough to raise the IOP. It is also an option if the hypotony is mild.

A second option, if clinically significant signs of hypotony are present, is to perform a staged procedure to raise the IOP first and perform cataract surgery later.

This could involve transconjunctival scleral flap or compression sutures or an open trab revision. If choosing this option in a patient with hypotony and cylinder of 3 to 4 D or greater, consider adding...

In Short

Better management of hypotonous glaucoma patients having cataract surgery can help ensure great visual outcomes.
a scleral relaxing incision posterior to the scleral flap. A third option is a combined phaco and glaucoma revision procedure.

**Tube revision**

If a patient with a tube has significant hypotony, you should consider some form of tube revision before phaco, Dr Khatana said.

**DR KHATANA’S PEARLS FOR PRE- AND INTRAOP PLANNING:**

1. Consider using a pupil expansion device if the pupil dilates poorly.
2. Consider endothelial cell counts in eyes with multiple previous surgeries.
3. Look at the internal sclerostomy with gonioscopy to see if there are peripheral anterior synechiae, etc.
4. Preop patient counselling is crucial in patients with hypotonous eyes as there is greater unpredictability in outcomes. There could be IOL power errors, and these patients are not good multifocal IOL candidates. Also discuss the risk of an acute IOP spike in the first 24 hours, a late IOP rise from bleb fibrosis that could require reinstituting medications, and fixation involving visual field loss that could leave patients frustrated even after a 20/20 result.

**IOL**

Dr Khatana strongly recommends noncontact A-scan axial length measurements over contact or immersion methods because of the error created by contact on a soft eye. If the axial length is similar between eyes at the time of phaco even if only one eye is hypotonous, then your calculation will be easier, and any rise in IOP will most likely not have a significant impact on refractive outcome, he said. You can use your usual IOL formulas in hypotonous eyes.

“With standard combined phaco-trab surgery, we usually aim for slight myopia, since the axial length may decrease with the IOP drop,” Dr Khatana said. “With hypotony, we usually need to aim for some hyperopia, expecting the IOP and axial length to increase.”

Postoperatively, consider using the same or a lighter and shorter steroid regimen if you want to induce bleb fibrosis to raise the IOP, Dr Khatana advised.

If you want to maintain the current IOP and bleb function, use a combination of intraocular or depot steroid, a longer and more frequent steroid regimen, and possible use of adjunct subconjunctival off-label injections of 5-fluorouracil or mitomycin C.

Dr Khatana concluded: “I tell patients that fibrosis takes time to develop, so the improvements attributable to a higher IOP will take time”.

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A novel visual cortical prosthesis system (Orion, Second Sight Medical Products) is expanding the pool of patients who can benefit from artificial vision.

Patients include not only those with retinal disease—such as retinitis pigmentosa, diabetic retinopathy, and glaucoma—but also those who have lost vision to eye injury or optic nerve injury/disease and are ineligible for any other visual prosthetic.

The FDA recently approved the system for an Early Feasibility Study through its Breakthrough Device pathway—and the latest results at 12 months have been positive, said Nader Pouratian, MD, PhD, one of the study’s principal investigators.

“We need to realise that the goal of a system, such as [this], is not to restore vision as we know it in sighted individuals, but to restore visual perception to blind people to allow better function in and interaction with the world,” said Dr Pouratian, associate professor of neurosurgery, Ronald Reagan UCLA Medical Center, Santa Monica, CA, USA. “In achieving that goal, we are making huge progress.”

The visual cortical prosthesis system is designed to bypass the eyes and optic nerve, i.e., the diseased or injured tissue.

Patients wear a miniature camera mounted on a pair of eyeglasses, an antenna, and a video processing unit (VPU). The camera captures real-time images as processed by the VPU and then converted into stimulation patterns that are transmitted wirelessly to an electrode array implanted on the surface of the primary visual cortex. The system has 60 electrical contacts that deliver the stimulation to the brain, he noted.

The feasibility study is being conducted by Dr Pouratian, Jessy D. Dorn, PhD (senior director of scientific research, Second Sight Medical Products) and Robert Greenberg, MD, PhD, at UCLA, and at Baylor College of Medicine, Houston, where Daniel Yoshor, MD, is site director and also one of the principal investigators.

Six subjects (five men, one woman; age range, 29–57 years), who became blind from disease or injury and had a normal visual cortex, participated and will be followed for 5 years. Specifically, three patients suffered a trauma, two had glaucoma, and one had endophthalmitis. To now, the average time after implantation is about 12 months. During the first testing of the
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device after implantation, 2 weeks postoperatively, each electrical contact is turned on individually to
determine at what level of stimulation results in a visual perception, i.e.,
phosphenes.
Following that initial testing session, patients continued to adapt
to the device and were ready to take
the device home for use after about 3
months.
Six months after implantation, the
impact of the implant on patients’
well-being and functional vision
was evaluated. Of the five patients
with formal evaluation at 6 months,
two (40%) of the patients had a
significant and three (60%) had a
mild improvement in visual function.
“Every patient saw some visual
perception in response to stimulation
at almost every electrode when
activated,” Dr Pouratian said.
“Patients described phosphenes of
different shapes that appeared as a
spot of light, a circle, an oval, or a
line.”

**Visual rehabilitation**

Patients work with visual rehabilitation specialists once they
begin to use the device at home.
“A major step is their learning how
to use the device in a meaningful
way,” Dr Pouratian said. “The visual
perceptions of these patients who
have bare or no light perception
are not the same as those of sighted
individuals, but we have found
that the visual perceptions can be
meaningful changes to them.”

Some of the subjects can use
the device to perform square
localisation, i.e., the ability to identify
a square presented on a screen.
When direction-of-motion testing
was performed, many were able to
identify accurately the direction of
movement, he noted.

More significant than objective
testing, however, is real-world use of
the device.

For instance, one patient was able
to locate a cue ball on a pool table. Another patient described cars that
were parked on the side of the street
and the direction in which other
people on the sidewalk were moving
and how the device allowed him to
navigate better.

Investigators reported the
occurrence of five adverse events in
two patients, only one of which was
serious (seizure).

**Accelerated development**

With encouraging results from the
first six subjects, the company is on
a path to accelerated development of
the visual cortical prosthesis system,
explained Will McGuire, president
and chief executive officer of Second
Sight.

“With five subjects out to the
1-year mark, the company has
increasing confidence in the clinical
data,” he said.

Because the visual cortical
prosthesis system can treat more
blind patients with different
pathologies, the market has the
potential to be up to 50 times larger
than that with the company’s retinal
prosthesis system (Argus II), which
treats only retinitis pigmentosa,
according to McGuire.

Finally, the visual cortical
prosthesis system is a more attractive
platform, in that its technology and
the visual quality and usefulness
can be improved more compared
with Argus, i.e., the potential use
of more electrodes and, thus, many
more pixels and the treatability of
both brain hemispheres to increase
the field of view and visual quality,
he noted.

To facilitate the accelerated
programme, Second Sight has a
3- to 5-year plan that is focusing
on the organisational structure;
adding positions in research and
development, quality control,
repertory affairs, and clinical
research; and making changes in
the supply chain and manufacturing
capabilities.

Technological improvements
envisioned by McGuire for the visual
cortical prosthesis system include
electronics enhancements so that
many more electrodes can be used,
i.e., a 169-channel chip compared
with the current 60.

Other complementary technologies
to artificial vision being pursued by
Second Sight are object and facial
recognition software, which will
inform the user of what or who is
the viewed object, and infrared
imaging, in which the stimulated
vision is produced by heat to facilitate
locations of objects.

McGuire is hopeful about
reimbursements by the Centers for
Medicare and Medicaid Services
(CMS) as a result of the Breakthrough
Device designation and the potential
for an add-on automatic payment by
CMS for 2 years with the designation.

**What about Argus II?**

Second Sight Medical Products
remains committed to supporting
existing Argus II users including
pursuing regulatory approvals for the
Argus IIs next-generation externals,
according to McGuire.

“We have next-generation
externals, Argus IIs, under
development that include new
eyewear, camera, and more powerful
VPU to upgrade the current patients,”
he said. “We will supply eyewear and
VPU replacements as needed.

“Personnel will be available to
evaluate the technology and provide
changes to the settings to optimise
the vision as it changes over time,” he
said, and forecasts the new externals
to be available before the end of 2019.

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A new class of IOLs (EyeMax Mono) is tailored for patients with dry AMD. By optimising image quality available across the macula, the device maximises the use of a preferred retinal locus (PRL) to improve vision function without the need for visual rehabilitation.

As the world’s ageing population continues to grow, global AMD prevalence is also expected to increase. Andreas F. Borkenstein, MD is an ophthalmologist working in Austria. He notes that while several effective therapies are available for his patients with wet AMD, no cure exists for dry AMD and that a ‘wait-and-see’ approach can be very frustrating for the patient and ophthalmic surgeon.

Dry AMD accounts for approximately 85–90% of all AMD cases.1 For these patients, the current recommended standard of care is limited to lifestyle changes (e.g., smoking cessation), the use of low-vision magnification aids and undertaking intensive training to use their peripheral vision.

“For many older individuals,” says Dr Borkenstein, “a diagnosis of dry AMD is associated with fear that they will spend their sunset years in complete blindness and being entirely dependent on others.”

Dry AMD involves the degeneration of the pigmented epithelial layer of the retina. Patients may also have drusen in the macula that can grow in size, shape and change in distribution over time. This ultimately results in patients having gaps in their central vision, which impacts reading and daily activities. It is estimated that at least a quarter of patients requiring cataract surgery will also have intermediate or advanced AMD, presenting the opportunity for targeted IOL implantation in appropriate patients.

However, IOL treatment options currently offered to patients with dry AMD come with caveats. While cataract surgery and standard monofocal IOL implantation has been demonstrated to deliver clinical benefit to patients with AMD,2 Dr Borkenstein highlights that a standard monofocal lens is designed to enhance vision at the foveal centre, so provides minimal improvement to vision function in patients with centre-involving dry AMD.

Moreover, Dr Borkenstein explains that surgical implantation of telescopic IOLs is often associated with surgical complications. We have previously observed rises in intraocular pressure, surgical-induced astigmatism, delayed wound healing, endothelial cell loss and challenges in post-operative capsule opacification treatment.

A unique device in the fight against dry AMD is this novel IOL with an optical design tailored for dry AMD. The device is a foldable, injectable, single-piece, soft, hydrophobic, ultraviolet-absorbing, square-edge, acrylic IOL.

“The device looks essentially very similar to a standard monofocal IOL,” explains Dr Borkenstein. “The difference, however, is that the lens is uniquely shaped to improve image quality in all areas of the macula, up to 10 degrees from the foveal centre (Figure 1).4 “This is a new concept and pretty amazing.”

The IOL allows patients with centre-involving dry AMD to maximise the use of an existing PRL (a natural coping strategy also known as eccentric fixation), or to adapt vision to use a more appropriate PRL that does not include the area of damage. Image blur is reduced and image quality is improved, allowing patients to read words and numbers more easily.

Microperimetric data suggest that, if required, neuro-visual adaptation generally occurs within approximately 4 months of implanting the lens without the need for any training. In principle, the lens should continue to support visual function as dry AMD progresses.4

“One of the key benefits to using [the lens] is that it is implanted using simple, well-established techniques that follow the same surgical principles...
as insertion of a standard monofocal IOL during cataract surgery,” Dr Borkenstein says.

Lens implantation requires a small 2.4–2.6 mm corneal incision, with the lens folded into an IOL injector system for implantation into the capsular bag. As a result of this, the device can be implanted safely with minimal intra- or post-operative complications. Dr Borkenstein notes that if postoperative capsule opacification were to occur, yttrium aluminium garnet (YAG) capsulotomy could be performed easily as in a standard case.

The postoperative target refraction following lens implantation should be between emmetropia and mild hypermetropia (+3 D), depending on patient preference.

“For severe AMD cases, the greatest visual benefit is reported if a hypermetropic refractive target is selected and paired with the aid of post-operative spectacle correction,” Dr Borkenstein adds.

Patients often adapt well to the device following surgery without the need for visual rehabilitation, although Dr Borkenstein advises that particularly older patients can be offered support and assistance to understand the process of neuroadaptation, as this may take them some time.

Dr Borkenstein’s group has recently published a patient case report in Medicine, which was also presented at ASCRS 2019, held in San Diego, USA. The patient had stable, dry AMD and progressive cataract in her left eye, and received EyeMax Mono implantation as part of a standard cataract surgery procedure. This was the first implantation undertaken in Austria with the IOL. Results showed that post-operative visual acuity improved over time and was stable from 3 to 12 months after surgery.

These data are supported by results seen in other published work. Lens implantation has been demonstrated to significantly improve visual outcomes in patients with dry AMD. A prospective case series in 96 eyes reported a mean CDVA and mean CNVA improvement of 14 and 18 ETDRS letters, respectively. In a consecutive case series of 244 eyes, there was a mean improvement in visual acuity of 18 ETDRS letters. Additionally, a pilot study in 8 eyes from 7 patients reported a 57% increase in mean reading speed (improving from 28±19 to 44±31 words per minute after surgery) and a gain in both mean CDVA and mean CNVA of 18 ETDRS letters at 2 months following surgery. Dr Borkenstein believes that as well as educating the surgeon on the features of the IOL and the post-operative neuroadaptation process, other key factors for a successful procedure include judicious patient selection and carefully managing patients’ expectations.

“Patients’ expectations are for an improvement to their current quality of life,” he explains. “The most important thing is to be completely honest, and to focus on mutual trust between the patient and doctor rather than setting unrealistic expectations. When selected for the right cases, the IOL is extremely effective. We observed high patient and surgeon satisfaction in these cases.”

As such, Dr Borkenstein advises that patient-reported outcomes are important to keep in mind. “The ultimate goal of IOL implantation is to enhance patient quality of life and self-autonomy. For example, patients’ ability to perform daily activities like eating, cooking, pouring tea in a cup, grooming of fingernails and dialling a phone.”

“Overall, I believe [this device] helps to address the unmet needs in dry AMD,” confirms Dr Borkenstein. “Implanted at the right time, and using the right procedures, it is a powerful tool in focusing our battle against dry AMD.”

![Diagram](image_url) **FIGURE 1** Laboratory simulations indicate that EyeMax Mono delivers superior image quality compared with standard monofocal IOLs at up to 10° of eccentricity. IOL, intraocular lens; PRL, preferred retinal locus. (Image courtesy of Dr Borkenstein)
As physicians, we are obligated to provide our patients with the highest quality care possible and to deliver this care at a fair cost. Laser treatment (MicroPulse) as an adjunct therapy to anti-VEGF injections allows me to ensure that my patients receive the gold standard of treatment with the added benefits of extending the efficacy period, controlling costs (for all parties), minimising pain and anxiety, and improving life quality.

**Benefits of laser therapy**

MicroPulse laser therapy is the next generation of laser therapy—it delivers the benefits of laser photocoagulation by inducing a biological response without the negative effects associated with continuous-wave laser therapy by inducing a biological response. Thermal elevation is controlled by chopping a continuous-wave beam into an envelope with repetitive short pulses. The tissue cools between the pulses, which prevents thermal build up.

We have known the retina is capable of healing itself, and with this laser technology, we can finally stimulate the retinal cells to heal themselves without causing thermal destruction.1,2

This modality permits us to treat the entire diseased area, including the fovea.3

The laser pulse stimulates a heat-shock protein response, which we know to be part of the healing, anti-inflammatory cascade. The treatment induces the response at a much higher rate than using a traditional laser, and without causing any thermal damage within the laser spot itself. Since no tissue is destroyed, the procedure is repeatable.

**Who can benefit from this laser therapy?**

Patients who present with virtually every form of cystoid macular oedema (CMO) from macular degeneration, diabetes, retinal vein occlusion, central serous retinopathy, or anything that I treat with anti-VEGF injections, can benefit from the laser treatment.

**Treatment plan**

My standard treatment protocol is to administer the initial anti-VEGF injection and measure response in one month. Since this laser treatment tends to work best when the macular thickness is under 400 μm, if the CMT is still too thick after the first injection, I administer a second anti-VEGF injection and bring the patient back two to four weeks post injection. Once CMT is 400 μm or less, I perform this laser treatment. The majority of my patients with any form of cystoid-type swelling are ready to receive the therapy after the first anti-VEGF injection.

The approach does not illicit an immediate response, and we typically do not see results for two to three months. During these first two months of treatment, the anti-VEGF therapy carries the weight of the treatment.

I follow the normal three-injection protocol, bringing my patients in monthly to see how they look. If there is no thickening, we forego the injection, but if any fluid remains (it usually does), I inject.

My goal, as always, is to get the macula completely flat, with no fluid. Then we enter a treat-and-extend type of protocol.

All things being equal, and across all disease variety and states, my patients require significantly fewer injections when they also receive this laser treatment than if I were to treat only with anti-VEGF injections.

**Reducing patient burden**

Reducing the number of anti-VEGF injections offers emotional and financial benefits to patients. When...
facing the prospect of a needle in the eye, anxiety is inevitable. Patients fear the needle, and often the appearance of the eye post injection only compounds their anxiety. In contrast, the laser treatment is fast and painless; patients would much rather undergo laser treatment than an injection.

As the stimulated retinal cells regenerate and heal, we can usually extend the period between injections and treatments, consequently reducing the frequency of office visits, deductible payments, and out-of-pocket copays.

In my experience, I am able to reduce the injection burden for nearly every patient once I add in laser therapy.

Given the natural history of the disease and the historical treatment protocol, it seems that regardless of treatment, patients would require increasingly more injections over time, but with the laser treatment, they do not.

I have patients who previously required monthly injections able to extend to an injection every three or four months after they have received the treatment; others have not required injections for over a year.

There is no argument that decreasing the injection burden is a good thing for the patient. We know that over time, the retina thins and function decreases; the more and longer we inject, the greater the chance of retinal atrophy.

Adding the treatment allows us to prevent atrophy or at least extend vision. Additionally, albeit a very low risk, we virtually eliminate any risk of infection caused by injection.

**Practice benefits**

My practice benefits fiscally by performing the laser treatment. Since introducing it to my practice, the out-of-pocket expense associated with purchasing VEGF has decreased by at least 35%. Insurance and Medicare/Medicaid reimbursement for the laser CPT code is greater than for injections. Further, since many of my patients no longer require an injection, I am able to open spots for new patients.

‘Taking less money out of the societal bucket is my duty as a physician.’

— Dr Jason Friedrichs

**Patient satisfaction**

Patients faced with the lifetime burden of diseases with CMO now have new hope for less frequent, less painful, and less costly treatments without compromising outcomes. The treatment can extend and enhance and the results achieved through anti-VEGF therapy as well as postpone retinal atrophy and vision loss. The procedure is repeatable and can be used to treat multiple diseases, making it a highly versatile laser. These factors, plus the reduced injection burden, leave my patients satisfied with the procedure.

**Social responsibility**

Taking less money out of the societal bucket is my duty as a physician. Just because we have an FDA-approved drug does not mean that I have to use it exclusively, especially if a complimentary therapy reducing the financial burden to society is available. All parties (including insurance companies) benefit when we can take an existing treatment and extend its efficacy period and reduce the amount of treatments.

**REFERENCES**


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Dr Friedrichs specialises in diagnosing and treating eye disease at his private practice in Illinois, USA. Dr Friedrichs has no financial interest in this content.

**next issue...**

- Developments in medical retina conditions
- Plus, more cutting-edge advancements across ophthalmology
INTRODUCTION

I have been a refractive surgeon since 1985 when I started to perform radial keratotomy procedures, and I began to perform laser vision correction surgery in 1993. Since 1997, I have used several different techniques and technologies to treat patients with presbyopia, including conductive keratoplasty, laser-assisted presbyopia reversal, corneal inlays, and intraocular lenses (IOLs).

In 2017, after learning more about corneal based options for presbyopic patients in a training course at the London Vision Clinic, London, England, I incorporated the PRESBYOND® Laser Blended Vision software (Carl Zeiss Meditec AG) into my practice. This software enables me to offer corneal treatments for this patient group. Eight months later and having treated almost 60 patients, I was impressed by the excellent results achieved with this customized LASIK procedure. I had even performed it in my wife and in my 91-year-old father who had previously undergone cataract surgery in both eyes with implantation of monofocal IOLs. Therefore, I felt I was thoroughly familiar with the experiences and outcomes of individuals who had the procedure.

Personally, I never needed any refractive correction throughout my life until I developed presbyopia. At the age of 52, I began needing to use glasses for reading, which was a new and unpleasant experience for me. Encouraged by the knowledge and experiences I had with PRESBYOND and considering that I had no signs of cataract, I decided 1 year ago at the age of 63 to undergo treatment for presbyopia using the PRESBYOND software. My aim was to free myself from the need to wear glasses for reading.

Encouraged by the knowledge and experiences I had with PRESBYOND and considering that I had no signs of cataract, I decided 1 year ago at the age of 63 to undergo treatment for presbyopia using the PRESBYOND software. My aim was to free myself from the need to wear glasses for reading.

Dan Z. Reinstein, MD, performed my surgery at his London Vision Clinic. I believed that I met all of the inclusion criteria for the treatment using PRESBYOND, and my eligibility as a suitable candidate was confirmed through comprehensive preoperative diagnostic evaluations. My examination included assessments for ectasia risk with measurements of corneal biomechanics (Ocular Response Analyzer, Reichert); tomography/topography (Pentacam®, OCULUS Optikgeräte GmbH; ATLAS® 9000, Carl Zeiss Meditec AG; MS-39, CSO); aberrometry (WASCA, Carl Zeiss Meditec AG; Osiris, CSO); OCT macula imaging (RTVue, Optovue, Inc.) and assessment of visual quality (HD Analyzer™, Visiometrics, S.L.).

For surgical planning, the preoperative examination also includes measurement of manifest and cycloplegic refraction and evaluation for eye dominance and tolerance to anisometropia of up to -1.50 D. My right eye is my dominant eye and my surgery was planned with a refractive target of plano for my right eye and -1.50 DS for my left eye.

The surgery takes just 10 minutes, and the time passed quickly. The procedure involves use of the VisuMax® femtosecond laser (Carl Zeiss Meditec AG) for flap creation. After lifting the flap, the MEL® 90 (or MEL 80) excimer laser (Carl Zeiss Meditec AG) is used to perform the non-linear aspheric ablation. The ablation profile is custom-designed for each patient using the proprietary PRESBYOND software for the CRS-Master® workstation (Carl Zeiss Meditec AG) that takes into account preoperative ametropia, pupil size, and spherical aberration along with the functional age of the eye.

I felt no discomfort or uneasiness during the procedure. Right after surgery, it was remarkable to me that I was able to read small print without any problem.

Already on the first day after surgery, I had excellent near and intermediate vision. I experienced some blurring at far distance, but after 1 week, my far vision was clear, and I obtained my maximum outcome that has remained durable. I did not experience any period of neuroadaptation, and I am very happy with my far, intermediate, and near vision. I am also impressed by the quality of my contrast sensitivity. For example, I am able to read the smallest size font text on my cell phone with minimum light.

The table summarizes my preoperative and postoperative refractive and visual acuity outcomes.
The only problem I encountered postoperatively was that I noticed halos while driving at night. This symptom, however, disappeared within 45 days after the surgery.

DISCUSSION

The corneal procedure using the PRESBYOND software is a customized laser vision correction approach for treating patients with presbyopia. It combines a small amount of anisometropia (≤1.5 D) with a controlled amount of spherical aberration to increase depth of field and provide a continuous range of vision from near to far. It can be used for myopic, hyperopic, astigmatic and emmetropic presbyopia correction in both phakic and pseudophakic patients.*

Although I continue to perform other procedures to treat patients with presbyopia and cataract, I am only offering the option of PRESBYOND to patients without cataract. For the latter group, I believe this corneal approach is a better choice than lens exchange with implantation of a multifocal IOL since in my experience there are hardly any problems like halos or reduced contrast sensitivity after using PRESBYOND.

For me, quality of vision assessed with the HD Analyzer is one of the most important evaluations for deciding whether a patient with presbyopia should undergo corneal based treatment using PRESBYOND or needs cataract surgery. A low Ocular Scatter Index (OSI) reading (<1.0 to 1.2) indicates that the optics of the eye are clear, and in that situation, I consider patients a good candidate for the corneal-based procedure. An OSI value above that cut-off suggests that cataract is affecting quality of vision, and I believe it is better for those patients to undergo lens replacement surgery. The OSI measurements in my preoperative evaluation were 0.8 OD and 0.5 OS.

CONCLUSION

I am now able to discuss PRESBYOND with patients from the perspective of both surgeon and patient. Having undergone the treatment myself, I have an even greater confidence recommending it to patients. Furthermore, I think that upon hearing that I had the procedure and am very happy with the results, patients become even more comfortable choosing it for themselves aiming for the freedom of spectacle independence.

I am the first surgeon in Argentina to perform PRESBYOND, and currently, only a few other surgeons in my country are doing the procedure. My satisfied patients are recommending PRESBYOND to family, friends, and other acquaintances, and my practice volume is growing because of their word-of-mouth referrals.

I am also greatly benefiting personally from having undergone the customized procedure using PRESBYOND. Now that I am again enjoying the freedom from glasses that I had earlier in life before the onset of presbyopia, I am feeling much more youthful.

*In the latter case, the procedure and the use of the MEL 80/90 excimer laser, VisuMax femtosecond laser and PRESBYOND software (Carl Zeiss Meditec AG) as described is off-label and not covered by the CE-Certificate of the device.

Dr. Mallo is a lecturer in the department of ophthalmology, University of Buenos Aires, Buenos Aires, Argentina, and medical director of the “Centro Privado de Ojos”, a private ophthalmological center in Buenos Aires. He has been performing laser vision correction surgery since 1993 and has written about his experience with presbyopia correction procedures in published journal articles and a full chapter about Monovision with Excimer Laser in the book “Refractive Surgery, Basic and Advanced Concepts” by María José Cosentino, MD. Dr. Mallo also designed the “Mallo’s marker” that is mentioned in the book Presbyopia: A Surgical Textbook, by Amar Agarwal, MD.
Psychiatrists use ophthalmology’s retinal biomarker for schizophrenia

Determining how schizophrenia relates to the retina can aid diagnosis

By Erica Crompton; Reviewed by Dr Vijayakumar Motappashastry

Schizophrenia isn’t an easy illness to live with. Firstly losing touch with reality can be hard to manage for the person with the illness. And then there are also lower employment rates for the person diagnosed with schizophrenia. It is said, for example, that only 7% of people with schizophrenia are able to maintain employment and this percentage includes voluntary positions.

With the latest advances in psychopharmacology, the outlook is not as bad as what people thought years ago. Articles on improved outcomes to challenge stigma to the condition are rife and bandied around like fashion statements these days. But this isn’t a piece on stigma. It’s actually a piece on schizophrenia and its relationship to the retina.

There are positive benefits to wellbeing with treatment such as a reduction in delusions and/or hearing voices, and a better sleep. Once stable on medication service users with severe mental illnesses might notice lesser symptoms such as jaw grinding or gaining weight or irritability, all side effects of antipsychotic medications. But what’s been interesting scientists in Spain is the combination of schizophrenia and a patient’s eyes.

It’s quite common for people on the schizophrenia-spectrum to report irritations such as rapid blinking in first episodes of psychosis (another more accepted name for schizophrenia, but also the name used at the seedling stages of schizophrenia developing). But if extreme stress can cause a patient to smoke more cigarettes, as it has been reported in The Lancet Psychiatry, this may also explain why a service user would report an overnight deterioration of their quality of vision.

Now, scientists from Spain are looking closer at these symptoms and even go as far as to say that a person’s retina could act as a biomarker for this illness, foretelling schizophrenia in patients long before any psychiatrist could.

In a recent paper written by María Paz García-Portilla from Área de Psiquiatría, Universidad de Oviedo, Oviedo, Asturias, España et al it has recently been suggested that alterations of the layers of the retina could be a biomarker of specific mental disorders since they originate in the same embryonic layer as the brain and both are interconnected through the optic nerve.1

Along with a team of psychiatrists and ophthalmologists, García-Portilla says the purpose of their article found that patients with schizophrenia and bipolar disorder have more abnormal findings in the retina, where the nerve fiber layer and the retinal layer act.

The team also found that of the clinical parameters, the duration of the illnesses correlates significantly and inversely with the thickness of the different layers in all disorders.

“In summary,” concur the authors: “optical coherence tomography findings are promising, since they could provide biomarkers of neurodegeneration and/or neuroprogression of both schizophrenia and bipolar disorder.”

Potentially this could help with early intervention and therefore better outcomes, for patients with schizophrenia and bipolar disorder.

However, Dr Vijayakumar Motappashastry, a locum consultant psychiatrist at the Midlands Partnership NHS Foundation Trust—part of the UK National Health Service—tells us that a biomarker in diagnosing schizophrenia would be quite a finding but that there are so many other factors to consider.

“I have treated patients with schizophrenia for 25 years as a psychiatrist,” Dr Motappashastry says. “It’s a very complex condition and not at all straightforward to diagnose. We cannot diagnose schizophrenia by looking at someone’s retina or retina thickness.”

IN SHORT

While leading ophthalmologists and psychiatrists in Spain take leaps towards finding biomarkers for diagnosing schizophrenia, not all psychiatrists are sure of the reliability of instant diagnosis in severe mental illnesses.
immediately—rather, it takes several assessments, plenty of time, we need to take into account the patient’s family history, and collateral using a structured assessment. Only after all of these steps can schizophrenia be diagnosed. I must stress the time it will take clinicians like me to make a diagnosis.”

‘When the schizophrenia illness is starting, it often does so at a very young age but it’s very difficult to pick up on with science and sometimes PET scans could miss the illness.’

– Dr Vijayakumar Motappashastry

“Our assessments are clinical, and we will assess the mental state that the patient is presenting. Sometimes patients are so scared which can hold back a schizophrenia diagnosis. For examples: a lady with bipolar having psychosis was in my clinic recently. She never told me about her psychotic symptoms as she said she would be locked away. In fact it was her Occupational Therapist who she eventually confided in. She told her Occupational Therapist that she believed in aliens. She was then referred to me and I commenced her antipsychotic medication.”

“When the schizophrenia illness is starting, it often does so at a very young age but it’s very difficult to pick up on with science and sometimes PET scans could miss the illness. So you see there are difficulties in diagnosing schizophrenia and you can see when we explain the process how a biomarker would be ideal, but when we clinically diagnosis, we can’t make a diagnosis on biomarkers. Schizophrenia isn’t a bodily diagnosis like cancer. Mental health is so complex and so are the treatments we offer patients. I believe there are too many variables in this illness to diagnose with a biomarker. And with schizophrenia we still don’t know the cause or effects.”

“Initially people will develop psychosis aged 16-17 sometimes from a family history and sometimes through taking illicit substances. But even at this stage of acute psychosis, sometimes only a portion of this group will develop schizophrenia. This can take 2-3 years, and then we’ll conclude that OK this person has schizophrenia.”

“We’re talking about a syndrome with several aspects. People like those with acute psychosis or early signs of schizophrenia can sometimes remit and recover without medication. However if the stress or cannabis use returns they once again become at risk of developing schizophrenia, bipolar disorder or schizo affective disorder. It all starts with acute psychosis. And we cannot predict which patients will get schizophrenia and which ones won’t or how the course of the illness will change.”

‘A microbiologist can diagnose infection by seeing bacteria, but mental illness diagnosis is not that simple.’

– Dr Vijayakumar Motappashastry

“Psychiatry is the only branch of medicine where anything can happen. I tell my patients that sometimes they can have depression, and then they’ll develop bipolar disorder, or the other way round. So the course of the illness can change and so too can the diagnosis and suddenly they might make a recovery. There’s so much variation in mental health—too much for a biomarker. Some patients see visual hallucinations, yes, but other don’t. Some patients with schizophrenia are hearing voices. So what we do as psychiatrists includes many multi factors that can contribute to the etiology of schizophrenia when we are treating severe mental illnesses. It is also worth noting that neuro-abnormalities can be caused by various factors, not just schizophrenia. Atypical symptoms can occur in schizophrenia, too. We have to be careful in coming to a conclusion. We need evidence to know what exactly what it is.”

Professor Stephen Lawrie, Head of Psychiatry at the University of Edinburgh, UK, echoes these thoughts, saying that: “What I would say in general is that these studies are probably preliminary and not yet generally accepted. The effects of medication and the various other factors that impact on people with schizophrenia could account for the changes—even if one assumes they are not, for example, a methodological artefact.”

Concludes Dr Motappashastry: “Mental health and psychiatry are not like physical health. A microbiologist can diagnose infection by seeing bacteria, but mental illness diagnosis is not that simple.”

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We educate our patients on the role of sleep as a facilitator of overall good health. But what happens when our diligent sleepers wake up with dry eye symptoms that are decidedly worse, not better? According to research published by Korb et al., poor eyelid performance while sleeping— and the nocturnal evaporative stress (NES) that follows—is prevalent in patients suffering from refractory dry eye. They identified that poor lid performance correlates relatively neatly with moderate-to-severe symptoms. This research is significant because NES is a frequently overlooked and undermanaged component of dry eye care.

To help soften our patients’ symptoms, we should first recognize that the severity of NES is influenced by both external and internal factors as well as meibomian gland dysfunction (MGD). External factors, such as those studied by Korb et al., are essentially biomechanical failures— e.g., poor lid performance, sleeping position preference or the presence of floppy eyelid syndrome.

Internal factors include medications, allergic responses to dust mites, or direct contact with turbulent vent and fan air. We can improve our considerations and assessments for a wider range of internal factors with improved knowledge of common ocular surface drying medications.

Careful examination for evidence of poor nocturnal lid performance is a good place to start to investigate external factors, as diagnostic testing and remedial options are both straightforward and effective.

To test my patients’ lid performance, I adopted the Korb-Blackie lid leak test. In a darkened room, I place a muscle light or transilluminator gently at the upper tarsus of the closed eye, and direct the light toward the interpalpebral fissure. If light escapes between the eyelids, it is a positive test. More light leakage indicates a more significant nocturnal lid seal insufficiency, which is associated with more exposure/desiccating stress and greater symptom severity.

This test takes 15 seconds to perform. We record this in the EMR as “Lid Seal Insufficiency”—negative, mild, moderate, or severe—based on the amount of light leaking in between the closed eyelids.

I then perform a “snap test”: pulling gently on the patient’s upper and lower lids to assess elasticity, with slow return to normal position indicating a lack of elasticity and lid performance.

Lift the upper lids to look for excess laxity, papillary reaction of the superior palpebral conjunctiva. These two findings, in addition to temporal upper eyelash ptosis, suggest floppy eyelid syndrome and a sleep study for obstructive sleep apnea is ordered. If light escapes, the lids are not adequately protecting the ocular surface.

I’ve observed in cases of asymmetric lid seal insufficiency that the meibomian gland (MG) drop is often more pronounced on the more severe lid seal insufficiency side.

Once poor nocturnal lid protection is identified, I first instruct them to direct fans and vents away from the head, avoid dust-mite allergens, and use a high-quality sleep mask.

This approach to identifying and managing poor nocturnal lid protection is particularly helpful for patients with micro-exposures, since reduction of ongoing desiccating stress may help manage MGD. Research has shown that inducing desiccating stress in mice created an altered protein: lipid ratio in the MG, inducing MGD. However, as with any animal study, there are limitations.

Identifying NES is worth the time spent. If we are going to recommend patients focus on good sleep hygiene and habits, we should also ensure that their eyes are also getting full rest from drying exposures.
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Clinicians know the conjunctiva to be a thin, translucent, vascularised mucous membrane comprised of numerous elements, said Jacob J. Pe’er, MD. Because the tissue is external, it is exposed to chemical, physical and biological agents that can predispose the tissue to tumours of epithelial, melanocytic and stromal origins. The vast majority of tumours in children arise from the first two. “Most conjunctival tumours in children are rare and usually benign and include epithelial tumours, such as squamous papillomas and nevi,” said Dr Pe’er, the Jonas Friedenwald Professor of Ophthalmic Research, Department of Ophthalmology, Hadassah-Hebrew University Medical Center, Jerusalem. “The rare malignant tumours, such as melanoma and lymphoma, are usually larger and develop in older children,” he added. “Xeroderma pigmentosa may cause malignant conjunctival tumours in children.”

Evaluation of patients who present with a conjunctival abnormality includes an external ocular examination, slit lamp examination, fluorescein or rose bengal staining, documentation by drawing or photography, and histopathologic diagnosis.

Benign epithelial tumours
Most of the benign tumours are squamous papillomas and epithelial cysts. The former occur frequently in children in association with the papilloma virus, are solitary but can be bilateral and multifocal, and often are asymptomatic except when they enlarge, when they can cause a foreign-body sensation, mucus secretion, haemorrhagic tears and incomplete eyelid closure.

Treatment is observation or cryotherapy. When multiple lesions are present, recurrence of the papillomas is common; recurrences are treated with topical or systemic interferon alpha-2b, topical mitomycin C, or cimetidine, according to Dr Pe’er.

Conjunctival epithelial cysts—which can be congenital or acquired, the latter of which are more common—are mostly epithelial inclusion cysts that develop spontaneously or after trauma or nonsurgical trauma.

The cysts are observed if they are asymptomatic and are removed if they enlarge or become symptomatic. Most cysts resolve spontaneously over time.

Benign melanocytic tumours
Among these, the junctional nevus develops almost exclusively in children and adolescents. According to Dr Pe’er, other growths, such as the compound nevus, the inflamed juvenile conjunctival nevus and congenital melanosis, and racial melanosis, which fall under this classification, are not actual tumours.

CONJUNCTIONAL JUNCTIONAL NEVI
Conjunctival junctional nevi are noteworthy in that they are the only stage that appear in children and young adolescents, and they appear primarily in the bulbar juxtalimbal conjunctiva.

Inflamed juvenile conjunctival nevi are important considerations in young patients.

They can be misdiagnosed as primary acquired melanosis, which develops only in adults. These appear as focal, flat, well-circumscribed lesions that move freely over the ocular surface. Treatment is periodic observation and excision upon enlargement.

IN SHORT

Among the tumours that may develop in the conjunctiva of paediatric patients, most are epithelial and melanocytic in origin.
INFLAMED JUVENILE CONJUNCTIVAL NEVI

Inflamed juvenile conjunctival nevi are important considerations in young patients. These are compound nevi that appear only in children and young adolescents. The nevi look inflamed; most are amelanotic and related to symptomatic or asymptomatic conjunctival allergy. The nevi may be worrisome with rapid growth and congestion.

Juvenile conjunctival xanthogranuloma appears as a single orange-pink stromal mass that often develops near the limbus.

CONGENITAL MELANOSIS OCULI, OCULODERMAL MELANOCYTOSIS

These are not actual tumours, but they must be considered because of the potential for development of uveal melanoma.

Stromal tumours

These tumours can be both benign and malignant. Among them, the two main types are pyogenic granulomas and various types of vascular anomalies, such as haemangiomas. Pyogenic granulomas can appear after surgery.

Of the fibrous tumours, which include fibromas, fibrous histiocytomas, which are benign in children, and nodular fasciitis, benign fibrous histiocytomas, can present in the paediatric population.

Histiocytic tumours include juvenile xanthogranuloma, which can be difficult to treat, Dr Pe’er said. Rhabdomyosarcoma is a form of myogenic tumour that can be associated with the orbital manifestation of the disease. Juvenile conjunctival xanthogranuloma appears as a single orange-pink stromal mass that often develops near the limbus.

Histopathological evaluation shows histiocytes and Touton giant cells; this tumour may resolve spontaneously. Treatment can include excision, administration of local or systemic corticosteroids, and brachytherapy.

Other tumour types are lipomatous tumours and lymphoproliferative tumours. The former include herniation orbital fat that are not uncommon. In children, the latter include usually benign reactive lymphoid hyperplasia, rare usually low-grade lymphoma that can be diagnosed by immunohistochemistry and molecular pathology.

Hamartomas and choristomas usually are diagnosed first in children and include dermoids, dermolipomas, osseous choristomas, lacrimal gland choristomas and complex choristomas. These are congenital lesions that are treated based on their size and any resulting functional disturbance.

Caruncular tumours arise from both the conjunctival tissue and from the epidermis and skin appendages.

Xeroderma pigmentosa, which is characterised by extreme sensitivity to sunlight, is inherited as an autosomal recessive trait with full penetrance. The disease occurs alone as the result of a mutation in one of eight genes involved in nucleotide excision repair.

The eyes are involved in about 20% of cases and the involvement is limited to eyelids, conjunctiva and cornea exposed to the sun. Dr Pe’er noted that the most relevant factor is that the patient is predisposed to develop multiple neoplasms of the eyelid and ocular surface, such as basal cell and squamous cell carcinoma and melanoma.

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This article was adapted from Dr Pe’er’s presentation during Cornea Subspecialty Day at the American Academy of Ophthalmology annual meeting. Dr Pe’er has no financial interests to disclose related to this report.
RSCUE, the phase III study investigating GS010 (GenSight Biologics) for Leber hereditary optic neuropathy (LHON) due to the G11778A ND4 mitochondrial mutation in patients with up to 6 months of vision loss, did not meet its primary endpoint.

Data from secondary outcome measures and from a longer follow-up in RSCUE and in a completed phase III trial that enrolled patients with a longer history of vision loss (REVERSE), however, provide strong signals of efficacy, including a potential benefit in untreated fellow eyes.

The collective clinical trial experience also shows that the gene therapy is well-tolerated and has an acceptable safety profile.

“The GS010 phase III trials are rigorously designed and conducted studies, and any well-done clinical trial often generates unexpected findings,” said Robert C. Sergott, MD, director, Wills Eye Hospital, Neuro-Ophthalmology and founding director, William H. Annesley, Jr, EyeBrain Center, Thomas Jefferson University, Philadelphia, USA, which is the central reading centre for the GS010 phase III studies.

Dr Sergott said the researchers could not fully explain the results from the GS010 trials.

“There is reason to be encouraged, however, and to be hopeful that as we go forward and more data become available, we will begin to better understand the outcomes,” he explained.

GS010 is a recombinant adeno-associated viral vector serotype 2 containing the wild-type ND4 gene. In both RSCUE and REVERSE, enrolled patients received a single intravitreal injection of GS010 in one randomly selected eye and a sham injection in the fellow eye.

The primary outcome measure in RSCUE looked at ETDRS best-corrected visual acuity (BCVA) at week 48 post-injection.

To meet the primary endpoint, the results had to show a +15-letter difference in BCVA favouring the GS010-treated eyes compared to sham.

The primary endpoint analysis showed, however, that there was essentially no difference between groups. Eyes treated with GS010 had a mean BCVA loss of 19 ETDRS letters compared with baseline while on average, sham-treated eyes had a loss of 20 ETDRS letters.

As expected and consistent with the natural history of LHON, mean BCVA in both groups declined after study entry and reached a nadir. The GS010-treated eyes achieved a mean BCVA improvement of 13 ETDRS letters relative to the nadir while sham-treated eyes improved by a mean of 11 letters.

Data from RSCUE that supports the efficacy of GS010 included the finding that GS010-treated eyes were threefold more likely than sham-treated eyes to have 20/200 or better BCVA at week 48 ($p=0.0247$).

In addition, an analysis comparing outcomes between fellow eyes in individual patients showed that the change from baseline of high-contrast visual acuity was at least 0.3 LogMar (15 ETDRS letters) better in the treated eye than in the sham-treated eye in 24% of subjects.

‘The GS010 phase III trials are rigorously designed and conducted studies, and any well-done clinical trial often generates unexpected findings.’

– Dr Robert C. Sergott

IN SHORT

Phase III studies of a gene therapy for Leber hereditary optic neuropathy (LHON) have generated some unexpected positive findings. There is biologic plausibility to explain the data.
A similar result was obtained in an analysis comparing improvements in low-contrast visual acuity, which is a more sensitive measure of visual function than high-contrast visual acuity, said Dr Sergott.

**Interpreting the data**

Various factors may explain why the RESCUE trial did not meet its primary efficacy endpoint. Premature timing of the evaluation is one possibility.

RESCUE entered patients who were early in the course of their disease when there is typically rapid neuronal degeneration and loss of vision.

Because it takes time after GS010 injection for the gene to be incorporated into cells and for the cells to begin to express functioning proteins, week 48 may have been too early to find a statistically significant difference in BCVA change from baseline between study groups.

A plot of the trajectories of visual acuity in RESCUE participants shows that BCVA declined in both GS010- and sham-treated eyes for four to five months after injection, which is consistent with what is known about the natural history of the disease. After reaching a nadir, BCVA remained more stable in the sham-treated eyes but was on an improving trend in the GS010-treated group at the week 48 visit.

“Remarkably indeed, additional analyses of outcomes in RESCUE after 72 weeks show that the eyes are tracking together in terms of showing continuing recovery of BCVA,” Dr Sergott said.

At week 72, which is the second scheduled readout of the RESCUE data, GS010-treated eyes improved by 21 ETDRS letters from nadir. Sham-treated eyes closely tracked GS010-treated eyes, improving 21.7 ETDRS letters equivalent from nadir. In both study groups, 40% of eyes improved by a clinically meaningful difference (+15 ETDRS letters), from nadir.

Further evidence to support the idea that a treatment benefit may be identified over time comes from the REVERSE trial that investigated GS010 in patients who had vision loss for 6 to 12 months before receiving treatment. In this cohort of patients who were more likely to have entered a chronic phase of disease characterised by less rapid vision loss, BCVA improved by a mean of 11 ETDRS letters from baseline to week 48, both in GS010-treated eyes and the sham-treated contralateral control eyes.

By week 96, BCVA in the GS010-treated eyes had improved by a mean of 15.4 ETDRS letters compared with baseline, representing a gain of 28.1 ETDRS letters relative to the worst vision.

While BCVA improvement in sham-treated eyes in the GS010 trials was somewhat of a surprise, access of GS010 into the control eye is a more plausible explanation than spontaneous recovery, he said.

“Cases of spontaneous vision improvement in patients with LHON are infrequent, and OCT imaging has shown us that from the time of onset of vision loss, there is not spontaneous structural recovery in the retina or optic nerve,” he explained.

Data from 96 weeks of follow-up in REVERSE show the thickness of the retinal ganglion cell layer and retinal nerve fibre layer increased by 30% to 100% in some eyes treated with GS010, and the improvements are occurring bilaterally in some cases.
W
hat would you miss if you lost your sight and hearing? Waves gently caressing a beach? The golden glow of a sunrise? Or the sound of leaves crunching underfoot as you walk through a forest on a dry autumn’s morning?

A mural entitled ‘What would you miss?’ explores all these and has, very powerfully, been informed by people who are deafblind, by what they’ve have said they miss the most since developing their disability. This is the first tactile mural that Global Street Art, an organisation specialising in their namesake, has created.

Each scene has been expertly represented using tactile materials to ensure it is accessible to a deafblind audience. The graphically enhanced street art depicts waves of string across the panel in a specific pattern that’s punctuated with starfish shells. The sunrise uses strings to showcase how lights go in every direction and the eerily-empty woodland walk includes strings to simulate trees and branches of a forest.

Of the startlingly colourful mural, Lee Bofkin, Co-founder of Global Street Art tells Ophthalmology Times Europe: “The whole mural was mocked up digitally first and we went through different options with Deafblind UK to make sure we were reflecting the things that had the most meaning to people with deafblindness. We made the images simple for those with visual impairments and the colours bold where possible (i.e., for the sunrise). We used spray paint and emulsion and we even mixed sand in some of the paint to increase its texture. There were a number of large wooden pieces also fixed to the wall at the same time. This was to give the mural more depth and allowed us to stick on even more textures to those boards. We experimented a lot with things like textured wallpaper for the tree bark, and then we added on fake ivy. There were even starfish on the beach! The artist, Perspicere, added all of the yarn elements - he’s incredible and added a completely different textural dimension to the wall too. The text on the mural was also printed in braille.”

The artist says Shoreditch—the UK’s equivalent to New York’s Williamsburg—was the desired location because as artists Global Street Art have such a great relationship with the landlords of the wall, and The Stage, whereby occasional commercial murals fully fund murals for charities. “It happens to be an amazing site too seen by 30,000 cars per day. Essentially this wall is special and allows us to do something unique on it!” said Lee, adding: “We’ve had great feedback—Deafblind UK’s Chairman, Bob Nolan, visited the mural last week. He is deafblind and seeing how he interacted with the wall meant a lot to us. Working with Deafblind UK has been a highlight of the project with staff and volunteers being hugely supportive and great to work with.”

Steve Conway is the CEO of Deafblind and says the spectrum of deafblindness is really wide and so it affects everyone differently: “Some people might just need to change the way they do things or make small adjustments, but for others it can make life very very difficult. The most basic of things, like going to the shops, catching up with friends or watching TV can be hard and a lot of the people we support tell us they often feel lonely and isolated. The world just isn’t made for people with sight and hearing loss, but we’re trying to change that.”

Deafblindness affects so many people but is often overlooked or under recognised, said the CEO, adding that this mural is rare in that those with sensory impairments can enjoy it as much as those with sight and hearing—something there is not enough of in today’s world.

Conway told Ophthalmology Times Europe that all too often, people with deafblindness rely on their mind’s...
own interpretations of the world around them, based on their memories or what people tell them. Our mural gives everyone the chance to experience art for themselves whether this is through sight or through touch. It also gives a powerful message to those who don’t know about or haven’t considered the effects of sight and hearing loss.

Deafblind UK supports people with combined sight and hearing loss, enabling them to have the life they want. It is estimated that nearly 400,000 people in the UK are deafblind, and that figure is increasing as our population ages. Global Street Art CEO and Co-founder Lee Bofkin says: “Working with Deafblind UK has been a brilliant experience for us and has really pushed our concept of what a mural is and who it is for. We’re really happy to have been able to include a much broader audience in who can appreciate this mural. We’re proud to support the great work Deafblind does.”

The mural was live for four weeks this summer at Great Eastern Street. Curated by innovative Shoreditch-based organisation Global Street Art Agency in partnership with the developers The Stage, a £750m mixed-use development on the site of Shakespeare’s Curtain Theatre, the mural is part of a programme on the Great Eastern Art Wall retained by The Stage as a space for local and international artists to collaborate with worthwhile charities.

The mural marks the start of Deafblind UK’s campaign “What would you miss?” where they will be encouraging others to think about the implications of sight and hearing loss and how it would affect them. Post what you would miss on Facebook or Twitter using the hashtag #WhatWouldYouMiss and encourage others to do the same.

With the help of our friends at Global Street Art, we have brought this to life with a mural in London’s street art capital, Shoreditch. This mural is rare in that those with sensory impairments can enjoy it as much as those with sight and hearing—something there is not enough of in today’s world. It also gives a powerful message to those who don’t know about or haven’t considered the affects of sight and hearing loss.

There was a lot of innovation in this mural - some things worked well and other things not so well. We tried a lot of techniques for texture before we felt we had the right toolkit!

Lee Bofkin concludes: “Working with Deafblind UK was our main route to involve the deafblind community. We’re hoping they can help get the message to people who are deafblind so people can come and visit the mural. The whole project was an inspiration and it made us think about who murals are for, and how they should be made, in a completely different way.”

**STEVE CONWAY**

Conway is CEO of Deafblind UK.
Nidek launches Mirante scanning laser ophthalmoscope

Nidek Co. Ltd. announces the launch of the Mirante scanning laser ophthalmoscope (SLO).

The multimodal fundus imaging platform combines high-definition SLO and OCT with ultra-widefield imaging, capturing high-quality colour images, fluorescein angiography (FA), indocyanine green angiography (ICG), fundus autofluorescence (FAF), unique retro mode images, OCT scan and OCT-angiography.

The optional wide-field adapter enables 163° ultra-widefield imaging with a single image capture. The ultra-widefield modalities of colour, FA, ICG and retro mode allow detailed evaluation of pathologies from the fovea to the extreme periphery.

Combined with ultra 4K HD imaging quality, the Mirante gives a wider, enhanced view of the retinal structure and vasculature with unparalleled clarity. The Flex Track algorithm corrects image distortion due to unstable fixation and enhances image averaging quality.

For colour imaging, three separate RGB detectors simultaneously scan different depths of the retina with red, green and blue wavelengths, producing unsurpassed colour and allowing fine adjustment of the histogram.

Dynamic blood flow using FA and ICG can be recorded, with simple, simultaneous acquisition of FA and ICG images.

The unique retro mode is a non-invasive technique to visualise pathologies deeper than the RPE and detecting pathologic changes in the choroid. The pseudo-3D images from retro mode allow better clinical appreciation of the extent of pathology.

High-definition OCT images can be acquired for a max. 16.5 x 12 mm area, allowing a wide, detailed assessment from the vitreous to choroid in a single shot.

“Multimodal retinal imaging is increasingly playing a key role for comprehensive evaluation of retinochoroidal diseases,” says Motoki Ozawa, president and CEO of Nidek Co. Ltd. “Addressing this demand, NIDEK developed the Mirante with new and existing technologies in our portfolio, and we have confidence that this platform offers a versatile solution for clinicians.”

For more information, go to www.nidek.com

Iluvien regulatory approval in Australia for DMO

Alimera Sciences Inc. announces that the Australian Therapeutic Goods Administration (TGA), the division of the Australian Department of Health that oversees the availability of medical products, has approved Iluvien (190 micrograms intravitreal implant in applicator) for the treatment of diabetic macular oedema (DMO) in patients who have been previously treated with a course of corticosteroids and did not have a clinically significant rise in intraocular pressure.

Iluvien will be commercialised throughout Australia by Specialised Therapeutics under exclusive license from Alimera Sciences.

“We are delighted to make this important new therapy available to Australian patients affected by DMO following the successful navigation of a complex regulatory process,” says Carlo Montagner, CEO of Specialised Therapeutics.

“With this approval, we continue to execute on our strategy to grow Iluvien sales in existing markets and introduce the product in new territories to maximise the value of this differentiated therapy,” says Rick Eiswirth, president and CEO of Alimera.

For more information, go to www.alimerasciences.com

Next-generation Pentacam: 5 measurements, 1 device

The new Pentacam AXL Wave combines Scheimpflug tomography with axial length, total eye wavefront, objective refraction and retroillumination.

New in the Pentacam AXL Wave is the wavefront aberrometry of the entire eye: low- and high-order aberrations of the total eye are measured based on Hartman-Shack technology for detailed crystalline lens or IOL assessment. Another novel feature is its retroillumination technology for preop assessment of crystalline lens opacities and postop control of the IOL position. Accurate objective refraction, the most essential parameter pre- and postop, is performed based on wavefront aberrometry.

Using the well-known, true and tried Pentacam Scheimpflug tomography, the new device measures, displays and analyses the anterior eye segment non-contact and independently of the tear film condition. Axial length measurements are performed using contact-free optical biometry, as in the well-established Pentacam AXL.

The new Pentacam AXL Wave will be there for visitors to try out at a hands-on premiere at the OCULUS booth F120 at the ESCRS 2019 in Paris. In addition, experts will report on first trials within the OCULUS Lunch Symposium at ESCRS on Saturday, 14 September 2019 in room South 3.

For more information, go to www.pentacam.com/axl-wave
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The ARGOS® Biometer with Image Guidance by Alcon® is the smart planning solution that keeps efficiency¹⁻³ and accuracy⁷⁻⁸ flowing through your clinic.

¹ Compared to IOL Master 700¹, IOL Master 500³, Lenstar LS900². ² Compared to VERION™ Reference Unit and VERION™ Vision Planner. ³ Argos biometer has shown better acquisition rates in dense cataract compared to IOL Master 700⁸, IOL Master 500 and Lenstar LS900. ⁴ Argos biometer has shown better prediction accuracy in medium-long eyes than IOL Master 500⁴.