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ELEVATING PATIENT CARE WITH ERG

PATIENT CASE EXAMPLES

RETeval™

ERG/VEP device

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Table of contents

PEDIATRIC GLAUCOMA RETINA CATARACT

Introduction

The RET*eval*™ device is a non-invasive tool that assesses retinal and visual pathway function through electroretinography (ERG) and visual evoked potentials (VEP). These case studies showcase the clinical application and benefits of the RET*eval* device as aid in diagnosing various eye conditions, such as central retinal vein occlusion, diabetic retinopathy, high myopia, rod-cone dystrophy, and birdshot chorioretinopathy. The real-world examples highlight the device's utility in detecting early signs of retinal disorders, monitoring disease progression, and guiding treatment decisions for both pediatric and adult patients.

Dr. Xiaoyan Ding
Sun Yat Sen University, China

Dr. Patrícia de Freitas Dotto
Dr. Jeser Amarante Faria Children's Hospital, Brazil

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Children's Hospital Roberto del Río, Chile

CASE STUDY 1

Detecting retina disease (CSNB) beyond high myopia

by Dr. Xiaoyan Ding, Sun Yat Sen University, China

INTRODUCTION

In pediatric ophthalmology, diagnosing eye disease is often complex due to patients' inability to communicate or comply with exam procedures, which are most often designed for use in adult populations. This case study involving a 3-year-old boy with bilateral high myopia (-6.25D and -7.00D), normal structural results, and no extraocular features demonstrates how the RET*eval* ERG device addresses these challenges.

CHALLENGE
What is the real cause of high myopia?

DIAGNOSIS
From high myopia to CSNB

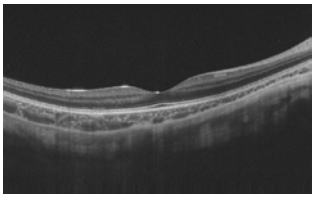
TYPE OF ASSESSMENT
Full ISCEV standard testing

WHY WAS THE ERG TEST PERFORMED?

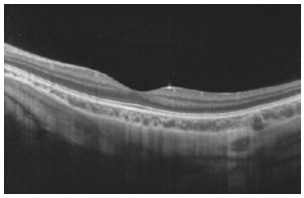
We needed to determine whether the patient had "normal" versus pathologic myopia and whether there were additional underlying problems.

Fundus left eye

Fundus right eye



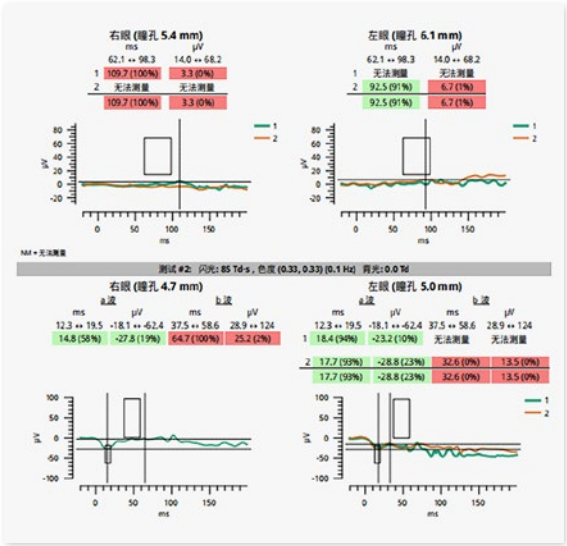
OCT left eye



OCT right eye

WHAT WERE THE ERG FINDINGS?

The dark-adapted ERG showed significant abnormalities. This guided us to the conclusion that the patient most likely has inherited retinal disease. Upon further review of the test results, we noticed an electronegative waveform in the second dark-adapted test step. Electronegative waveform means the a-wave is preserved, but the b-wave is missing. This is a typical representation of congenital stationary night blindness.



ERG Report

HOW DID ERG INFLUENCE THE PATIENT'S CARE?

The ERG findings allowed us to counsel the family about genetic testing and advise them to attend low vision care and regular ophthalmologic assessments. In the absence of a correct diagnosis, this child would likely not receive the necessary care, which could lead to further clinical challenges as well as difficulties in school. ERG with RET*eval* helped explore the cause of the high myopia in a child without the use of sedation.

CONCLUSION

This case highlights the importance of adding ERG testing in the diagnostic process. A correct diagnosis helped prevent misguided treatments, while prompting the initiation of necessary services, such as low vision programs. With appropriate counseling the patient will be better equipped to navigate the road to adulthood.

AUTHOR

DR. XIAOYAN DING

Dr. Ding is an esteemed retinal specialist with a particular focus on pediatric retina. She earned her MD and PhD from Sun Yat-sen University in 2006 and conducted post-doctoral research at the National Eye Institute (NEI) in 2007. She served as the director of the Children's Center at ZOC during 2018-2023 and currently is the director of retinal service at the same location. Her extensive experience encompasses clinical studies in pediatric diseases. With a decade of clinical practice in pediatric retina, Dr. Ding established the pediatric early-onset high myopia registry, successfully enrolling over 800 highly myopic children. Her research delved into the etiology, genetic and developmental abnormalities, and clinical characteristics of high myopia in children, along with phenotype and genotype correlation analyses.

Dr. Xiaoyan Ding has a prolific publication record, with over 200 peer-reviewed manuscripts. Her innovative contributions have resulted in 8 granted patents and 2 provisional patents. She has played an active role in shaping the field of ophthalmology by contributing to the development of several critical guidelines and expert consensus documents, including Guidelines for the Diagnosis and Treatment of Retinoblastoma in China (2019), Clinical Multifocal Electroretinogram Standards (2020), Expert Consensus on Intravitreal anti-VEGF for Retinopathy of Prematurity (2021) and Expert Consensus on the Diagnosis and Treatment of Retinopathy of Prematurity (2023).

CASE STUDY 2

ERG and VEP as a tool beyond images for children

by Dr. Mohamed Ahmed Mostafa Eid, Al-Dawly Eye Center, Egypt

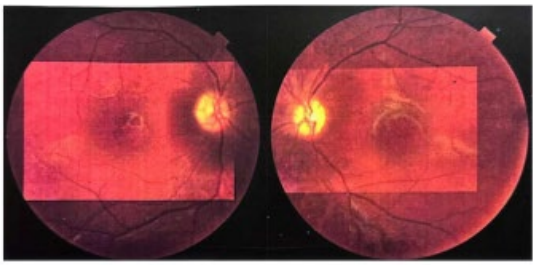
INTRODUCTION

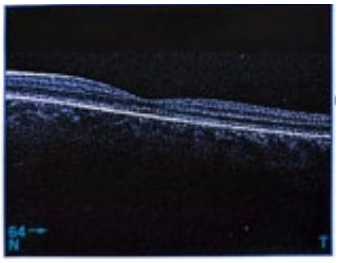
A 7-year-old child was referred to confirm a multiple sclerosis (MS) diagnosis following a brain scan. The patient complained of visual changes but identifying the cause was complex due to limited patient cooperation.
We obtained color fundus and OCT images, both of which appeared to be normal. A flash VEP test was conducted at another clinical site, but the outcome was unreadable. To either confirm or reject the suspicion of MS as the underlying cause for the visual complaints, a flash VEP and ERG ISCEV 5-Step protocol, using the RET*eval* was requested.

CHALLENGE
Obtaining a correct diagnosis

DIAGNOSIS
Cone-rod dystrophy

TYPE OF ASSESSMENT
Full ISCEV standard testing



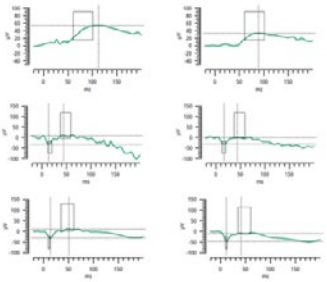


WHY WAS THE ERG TEST PERFORMED?

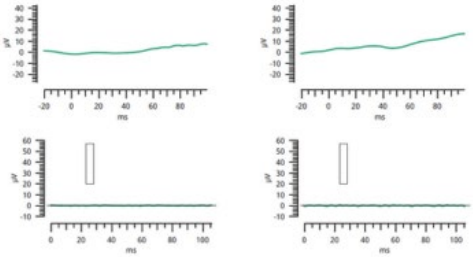
To ascertain whether the visual complaints were linked to the suspected multiple sclerosis or if there was another cause. Due to inconclusive results from an earlier VEP made on conventional device, a comprehensive assessment using the RET*eval* device was recommended.

WHAT WERE THE ERG FINDINGS?

The ISCEV 5-step protocol was conducted to evaluate the cones and rods independently. Light-adapted test results showed values outside of normal limits, with some preserved dark-adapted results. This suggested cone-rod dystrophy.

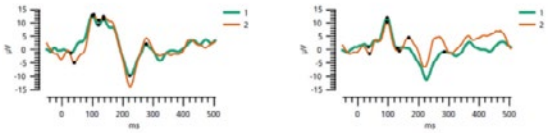


Dark-adapted tests



Light-adapted tests

Since the patient tolerated the ISCEV 5-step test well, a flash VEP test was also conducted, resulting in a clear and readable output. The test-retest outcomes for each eye were notably consistent. Similar results were observed when comparing the right and left eye, with slightly better throughput for the left eye. Both eyes exhibited a positive peak around 120ms and amplitudes below 40µV, indicating reasonable amplitudes. Overall, the VEP results do not suggest severe dysfunction of the optic nerve or brain activities.



HOW DID ERG INFLUENCE THE PATIENT'S CARE?

The comprehensive flash ERG/VEP tests indicated a cone-rod dystrophy with some preserved central vision. To affirm or dismiss the suspicion of multiple sclerosis, a pattern VEP is needed and has been ordered for future assessment. Additional testing regarding the cone-rod dystrophy may also be useful in guiding patient education and low vision management, as this can further refine the prognosis.

CONCLUSION

This case underscores the significance of incorporating user-friendly ERG testing into the diagnostic workup. By providing easy-to-interpret results, an accurate diagnosis was made. This likely prevents unnecessary treatments, while allowing for earlier implementation of low-vision support for the patient. With thoughtful counseling, the patient is poised to navigate the path to adulthood more effectively.

AUTHOR

DR. MOHAMED AHMED MOSTAFA EID

Dr. Eid is an ophthalmology resident at Al-Dawly Eye Center and a fellow at the International Eye Center (IEC). In addition to his clinical work, he's deeply involved in research. Dr. Eid believes that continuous learning and exploration is key in the field of ophthalmology. This has led him to contribute to various research projects, particularly those focused on retinal diseases.

His passion about education led him to co-found the International Educational Center for Ophthalmic Innovation (IECOI). Through this initiative, the organization aims to deliver high-quality education and training in ophthalmology to students and professionals worldwide.

Dr. Eid finds great satisfaction in tackling challenging cases, as they provide unique learning opportunities and allow him to continuously improve his skills. He is always eager to take on these cases and find the best possible solutions for his patients.

CASE STUDY 3

Nystagmus assessment for non-compliant patient

by Dr. Mario Zanolli de Solminihac, Children's Hospital Roberto del Río, Chile

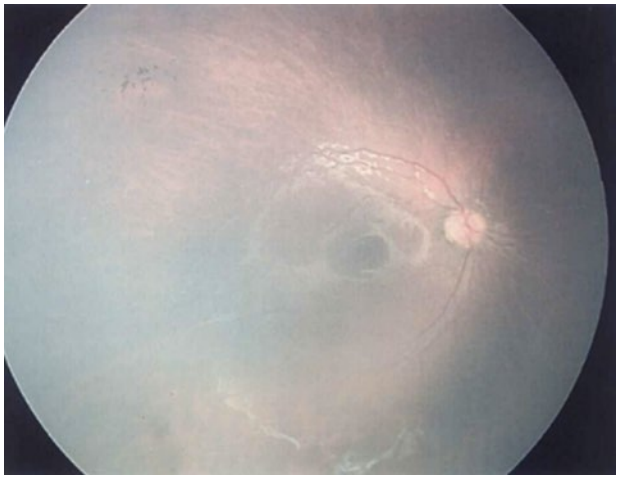
INTRODUCTION

A 4-year-old boy presented to our office with nystagmus for further assessment of required tests or treatments. The visual acuity was tested and found to be 0.3 in Snellen measurement. Taking OCT and fundus pictures showed to be very difficult due to age and nystagmus. The obtained images though, did not show any signs of abnormality.

CHALLENGE
Obtaining a correct diagnosis

DIAGNOSIS
Cone-rod dystrophy

TYPE OF ASSESSMENT
Full ISCEV standard testing



Fundus image

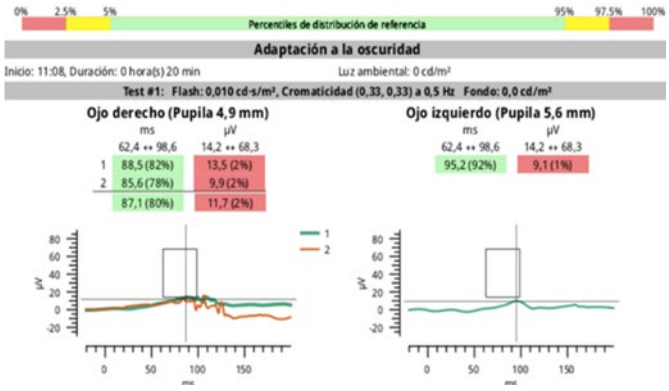
WHY WAS THE ERG TEST PERFORMED?

The cause of the nystagmus needed to be verified to determine if further tests or treatment are warranted, especially since all imaging tests appeared to be normal, but due to their low quality caused by lack of compliance were challenging to interpret.

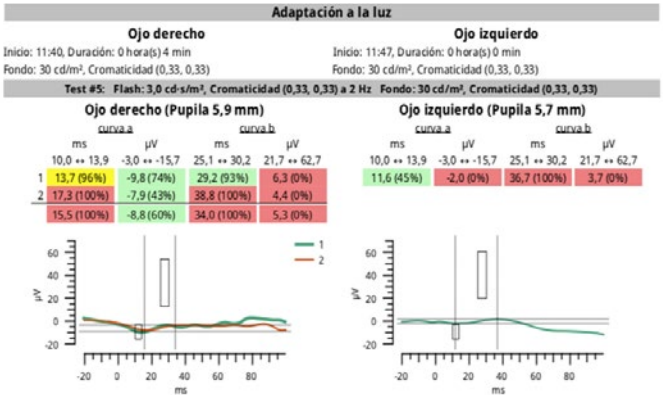
WHAT WERE THE ERG FINDINGS?

The test was conducted in the office, and since the child's caregiver (parent) was present, she/he was able to reassure the child during the test. Successful results were obtained without the need for sedation.

Both the light and the dark-adapted ERG showed significant abnormalities. This guided us to the conclusion that the patient has inherited retinal disease and we sent him for further genetic testing.



Report 1



Report 2

HOW DID ERG INFLUENCE THE PATIENT'S CARE?

The ERG findings allowed us to counsel the family about genetic testing. We advised them to attend regular ophthalmologic assessments. Furthermore, the boy obtained low-vision support and proper care for his future development.

CONCLUSION

The ERG assessment using RET*eval* enabled a comprehensive evaluation of a young boy with nystagmus, facilitating a diagnosis in a familiar setting. This efficient process eliminated lengthy wait times or referral to more distant clinics, ultimately guiding the patient to appropriate resources.

AUTHOR

DR. MARIO ZANOLLI DE SOLMINIHAC

Dr Mario Zanolli is a pediatric ophthalmologist at the Clinica Alemana, Roberto del Río Hospital and an Assistant Professor at the Universidad del Desarrollo in Santiago, Chile. He completed his training at the Los Andes Ophthalmological Foundation and then a fellowship in Ocular Genetics at Wills Hospital in Philadelphia, where he co-authored the Wills Manual of Oculogenetics.

CASE STUDY 4

When ERG uncovers Oguchi disease in siblings

by Prof. Azza Shehab, Minya University & Watany Eye Hospital, Egypt

INTRODUCTION

Two siblings born to related parents, both with lifelong difficulty seeing in dim light, presented for ophthalmic evaluation. The elder sibling had a visual acuity of 20/30 bilaterally with no nystagmus; the younger sibling had a visual acuity of 20/20 bilaterally.

The anterior segment examination was normal for both children. In contrast, the posterior segment showed a striking golden fundus with a greyish-yellow metallic sheen involving the posterior pole and extending beyond the arcades, with dark retinal vessels providing sharp contrast in both children. SD-OCT revealed densely packed parafoveal architecture in both siblings.

UWF imaging differed between the two: the elder sibling showed fading of the metallic reflex, whereas the younger sibling exhibited peripheral pigment clumps resembling bone spicules. This difference was more striking in the fundus autofluorescence images as seen in the *Figures 1* and *2*:

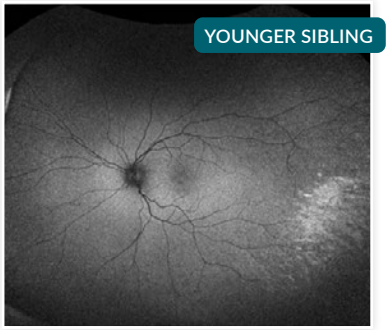


Figure 1

Figure 2

CHALLENGE
Disease confirmation

DIAGNOSIS
Oguchi disease

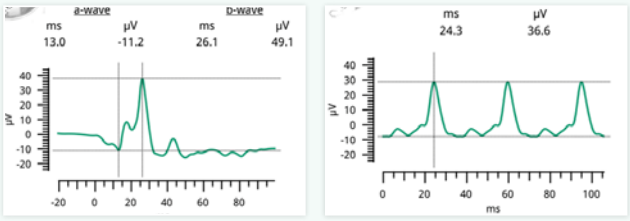
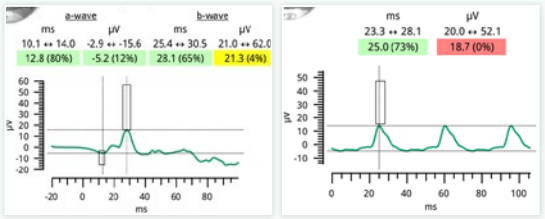
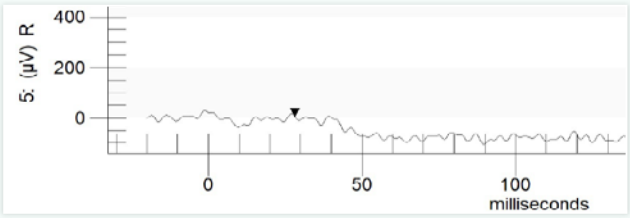
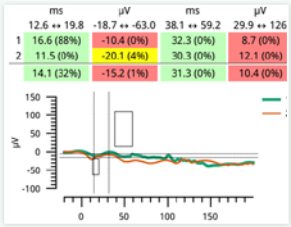
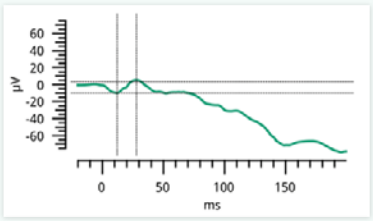
TYPE OF ASSESSMENT
ISCEV 6-step

WHY WAS THE ERG TEST PERFORMED?

The older sibling displayed classic features of Oguchi disease, while the younger sibling had less typical findings with signs suggesting retinitis pigmentosa. Because Oguchi disease shows a characteristic ERG pattern, electrophysiology was performed to confirm the diagnosis, especially in the younger sibling.

WHAT WERE THE ERG FINDINGS?

The ISCEV 6-step photopic-first protocol was recorded with the UTAS System and then repeated with the RET*eval* and Sensor Strip electrodes to obtain better cooperation by the patient, especially the younger patient. After initial testing, patients were dark-adapted for 10 minutes to take scotopic recordings. Scotopic steps were repeated after 3 hours of dark adaptation.

	YOUNGER SIBLING	OLDER SIBLING
PHOTOPIC RESPONSES	Photopic responses were normal (49 and 38 µV; flicker 39 and 30.5 µV).	Photopic responses were slightly reduced (21.3 and 26 µV; normal 21–62 µV) as were flicker responses (19 and 20.5 µV; normal 20–52 µV).
		
SCOTOPIC 3CD AFTER 10 MINUTES DA	Scotopic responses were markedly reduced after 10 minutes dark adaptation. 	Scotopic responses were markedly reduced after 10 minutes dark adaptation. 
SCOTOPIC 3CD AFTER 3 HOURS DA	And, after extended dark-adaption of 3 hours, the ERG improved, but remained negative, and thus represented a typical sign of Oguchi. 	The ERG findings in conjunction with the typical image findings were sufficient to confirm the diagnosis of Oguchi disease. Therefore the extended dark-adaptation was not neccessary for the older sibling.

HOW DID ERG INFLUENCE THE PATIENT'S CARE?

Despite differing retinal appearances, ERG results supported a diagnosis of Oguchi disease in the younger sibling. Genetic testing confirmed this. The definitive diagnosis guided counseling on prognosis, genetic implications, and early support with low-vision aids.

CONCLUSION

This case highlights how essential ERG is in evaluating inherited retinal disorders, especially when clinical findings vary between patients. Although the two siblings showed different fundus appearances, their ERG patterns provided decisive diagnostic evidence. Electrophysiology not only confirmed Oguchi disease in both children but also prevented misdiagnosis and ensured appropriate genetic counseling and management. This underscores the value of ERG as a critical tool in distinguishing clinically overlapping retinal conditions and guiding precise, patient-centered care.

AUTHOR

PROF. AZZA SHEHAB

Professor Azza Shehab is a distinguished ophthalmologist at Minya University & Watany Eye Hospital, Egypt, specializing in retinal imaging, visual electrophysiology, and photoreceptor disorders. Her work emphasizes the importance of ERG and multimodal imaging in diagnosing complex or subtle retinal diseases, and she has contributed to studies on nystagmus assessment, therapy-resistant macular degeneration, and vaccine-related optic neuropathy.

In addition to her academic career, she previously served as a consultant within the Ministry of Health's Specialised Medical Centres. She is committed to integrating advanced diagnostic techniques with comprehensive patient-centered care. She has been an ISCEV Member since 2000 and contributing to the community by teaching new generations of visual electrophysiologists.

CASE STUDY 5

PHNR as a reliable method for glaucoma follow up in children

by Dr. Bartłomiej Kocurek & Prof. Adrian Smędowski,
Medical University of Silesia, Poland

INTRODUCTION

A 7-year-old girl reported for an ophthalmological appointment with a glaucoma specialist. She has a history of congenital glaucoma and this appointment was post-trabeculectomy status. Her best corrected visual acuity (BCVA) was OD: 20/400, OS: 20/60 and her intraocular pressure measurement using the iCare device was OD: 20 mmHg and OS: 16 mmHg.

CHALLENGE
Confirmation of Glaucoma

DIAGNOSIS
Glaucoma

TYPE OF ASSESSMENT
PhNR

WHY WAS THE ERG TEST PERFORMED?

During examination of the fundus photos, the doctor's attention was drawn to a pale-pink optic disc with a tilted disc structure and pigment deficiency in the retina. Due to a lack of cooperation from the young patient, OCT and perimetry results were impossible to collect. Therefore, the Photopic Negative Response (PhNR) test was performed using the RET*eval* device from LKC Technologies.

WHAT WERE THE ERG FINDINGS?

Abnormal values of the PhNR wave amplitude at minimum value were recorded to be -1.8 µV (OD), -1.5 µV (OS), the W-ratio was 84% in the right eye, but only 8% in the left eye (*Figure 1*). The b-wave amplitude was outside the reference range in both eyes.

Additionally, due to the impaired retinal conduction in the PhNR, a full-field flash electroretinogram (ERG) according to ISCEV test steps was recommended together with supplementation of Vitamin A.

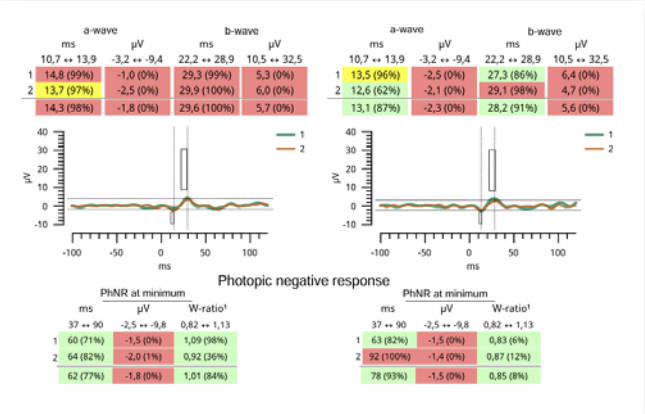


Figure 1

HOW DID ERG INFLUENCE THE PATIENT'S CARE?

After a year, all tests were repeated. BCVA improved to OD: 20/200, OS: 20/40. As a result of the treatment changes, her IOP decreased to OD: 11 mmHg, OS: 12 mmHg (iCare). Results of the PhNR test, demonstrate significantly improved amplitude with the following values OD: -5.0 uV, OS: -4.7 uV. (*Figure 2*). The a- and b-wave also normalized.

Studies have shown that a reduction in intraocular pressure (IOP) can improve retinal ganglion cell function, which may lead to better overall visual performance, including improved visual acuity.

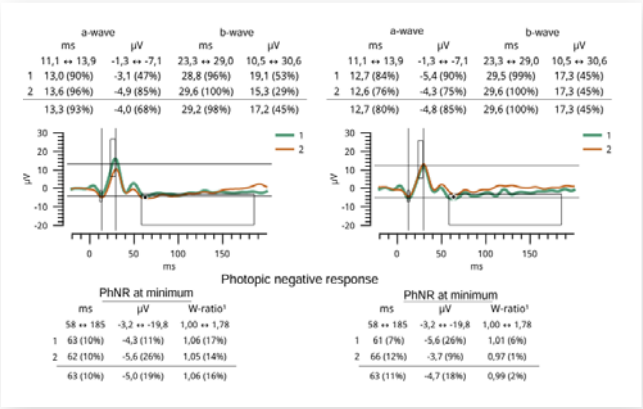


Figure 2

CONCLUSION

The PhNR test could serve as an alternative to standard assessments such as perimetry or OCT when it's impossible to perform these tests. In cases where young patients are unable to complete complex evaluations, access to simpler tests that require minimal participation will ensure they receive the appropriate treatment.

AUTHORS

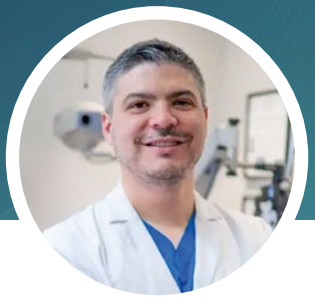
DR. BARTŁOMIEJ KOCUREK & PROF. ADRIAN SMĘDOWSKI

Bartłomiej Kocurek was educated at the Medical University of Silesia. After completing his studies, he began work to understand ERG and its utility in managing glaucoma in collaboration with Professor Adrian Smędowski, MD, PhD, FEBO. Dr. Smędowski is a Professor of Ophthalmology at the Medical University of Silesia in Katowice, Poland, where he serves as Acting Head of the Department of Pediatric Ophthalmology and Deputy Head of the Department of Ophthalmology. He is a Fellow of the European Board of Ophthalmology and a specialist in clinical ophthalmology. Prof. Smędowski earned his medical and doctoral degrees from the Medical University of Silesia and completed postdoctoral research at the University of Eastern Finland. His research focuses on neuroprotective gene therapies for glaucoma and protein interactions in retinal ciliopathies. He leads translational ophthalmology research and is CEO of GlaucoTech and founder of GlaucoMed.

CASE STUDY 6

Using ERG in complex glaucoma with macular pathology

by Dr. Josué Roberto Lozano, Centro Médico Hidalgo, Mexico



INTRODUCTION

This case involves a 69-year-old female patient diagnosed with primary open-angle glaucoma three years ago. She is pseudophakic and her left eye is corrected for near vision. Her best-corrected visual acuity is 20/25 in the right eye and 20/50 in the left eye. She is currently treated with timolol and brinzolamide. Her case presents multiple complexities that limit traditional structural and functional glaucoma assessments.

CHALLENGE
Unreliable OCT and Visual Field

DIAGNOSIS
Glaucoma

TYPE OF ASSESSMENT
PhNR

WHY WAS THE ERG TEST PERFORMED?

Conventional structural imaging with OCT, as seen in *Figure 1* was insufficient in this patient due to coexisting retinal degeneration (*Figure 2*). The ganglion cell and optic nerve analysis could not be completed effectively. The device could not properly resolve the retinal layers, because the patient has significant structural cell loss in the affected eye.

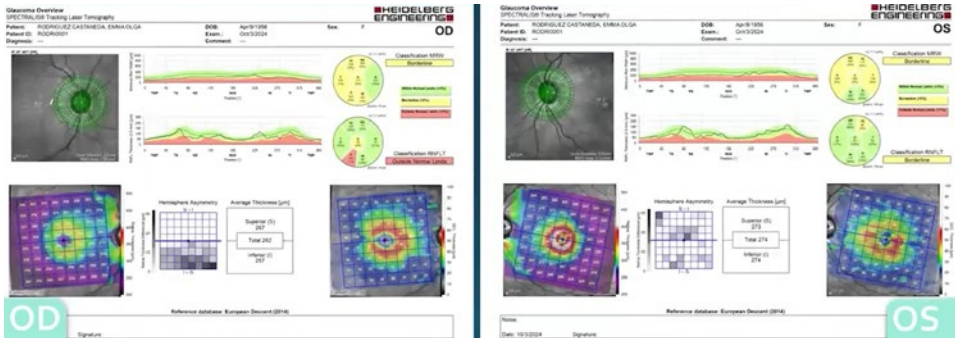


Figure 1: OCT of both eyes

In addition, visual field testing was not feasible due to the central scotoma in the left eye caused by a pre-existing macular hole.

Given these limitations, an ERG test with RET*eval* device, specifically the Photopic Negative Response (PHNR) protocol, was used to assess retinal ganglion cell function objectively.

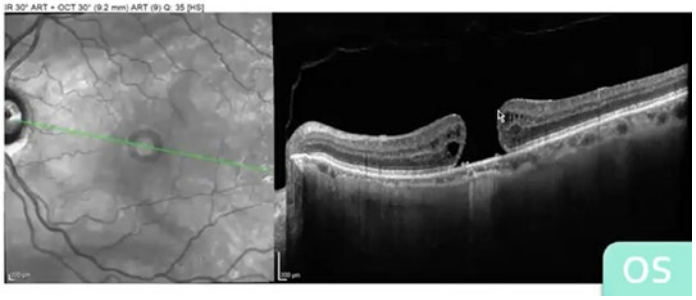


Figure 2: Macula structure at baseline

WHAT WERE THE ERG FINDINGS?

Initial ERG results showed a W-ratio of 1.0 (33%) in the right eye and 1.05 (48%) in the left eye and b-wave implicit times of 31.0 (68%) in the right eye and 31.1 (70%) in the left eye (as seen in *Figure 3*). This is within the limits of the reference range and comparable between both eyes. Structurally, the patient showed very localized glaucomatous damage in both eyes.

In a follow-up visit 9 months later, the macular hole in the left eye had closed after surgery (See *Figure 4*), although a few microcysts remained. However, a marked functional decline was observed in both eyes, more prominent in the left eye (see *Figure 5*). The b-wave implicit time of the left eye worsened to 32.6 ms (94%) on the reference percentile. This value is now above the threshold to consider glaucomatous changes. The W-ratio worsened in the left eye from 1.05 to 0.94 as well. These changes correlated with subtle, but definite structural deterioration and elevated intraocular pressure despite treatment.

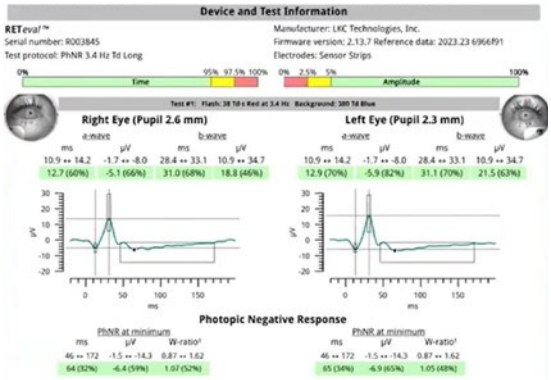


Figure 3: Baseline ERG

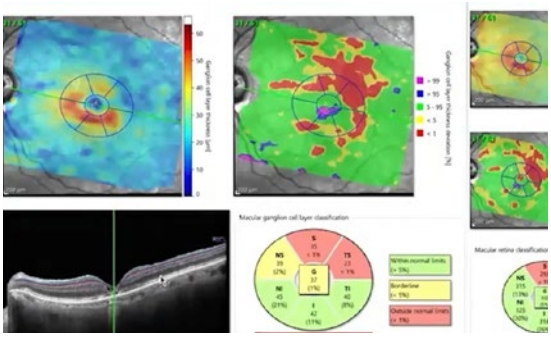


Figure 4: OCT at 9-month follow up visit

HOW DID ERG INFLUENCE THE PATIENT'S CARE?

ERG results were instrumental in identifying a decline in retinal ganglion cell function. The worsening of the ERG W-ratio and b-wave time in serial ERG testing prompted a change in treatment. The patient's prior regimen of timolol and brinzolamide was deemed insufficient based on both functional decline and persistently elevated intraocular pressure. A decision was made to initiate triple therapy: bimatoprost, timolol, and brimonidine. The structural OCT showed that the macular hole remained closed, with only minor cystic changes, that did not warrant further treatment given the visual acuity of 20/50. This patient will be followed very closely and checked for potential improvement of the PhNR values after the change in treatment.

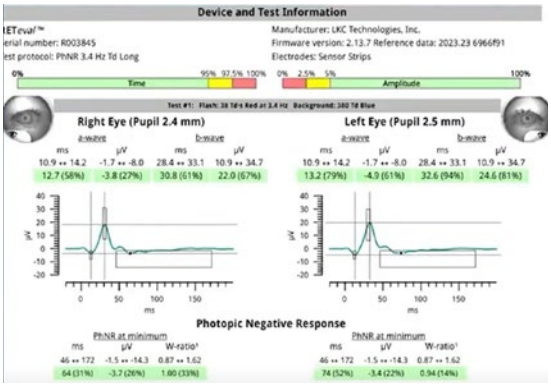


Figure 5: Follow up ERG

CONCLUSION

In complex glaucoma cases where structural imaging and visual fields are compromised, such as the presence of retinal degenerative changes or macular pathology, ERG offers a reliable and objective method for assessing functional retinal health.

In this case, serial ERG monitoring with RET*eval* revealed significant changes in retinal ganglion cell function that correlated with subtle signs of disease progression in structural imaging and guided an effective adjustment in therapy.

AUTHOR

DR. JOSUÉ ROBERTO LOZANO

Dr. Josué Roberto Lozano is a specialist in ophthalmology and subspecialist in retina and vitreous, based at Centro Médico Hidalgo in Monterrey, Nuevo León, Mexico. A graduate of Universidad Autónoma de Nuevo León, he completed his specialization at Unidad Médica de Alta Especialidad #25 (tertiary level eye hospital with advanced medical services) and subspecialty training at private and public institutions. Dr. Lozano also has advanced training in glaucoma and refractive cataract surgery. He has more than 10 years of experience, is a member of the Mexican Retina Association, the Mexican Society of Ophthalmology, and the Ophthalmology College of Nuevo León.

CASE STUDY 7

Using ERG to support RP diagnosis in case with high myopia

by Dr. Hussein Almuhtaseb, The View Hospital, Qatar

INTRODUCTION

A 50-year-old female with a history of myopia presented with complaints of progressive vision loss. She previously underwent refractive laser treatment to address visual complaints and manage her myopia. Currently, she reported new-onset vision loss, with visual acuity reduced to 0.9 in the right eye and 0.5 in the left eye. Funduscopic examination revealed bone spicule pigmentation affecting the superior posterior pole in both eyes.

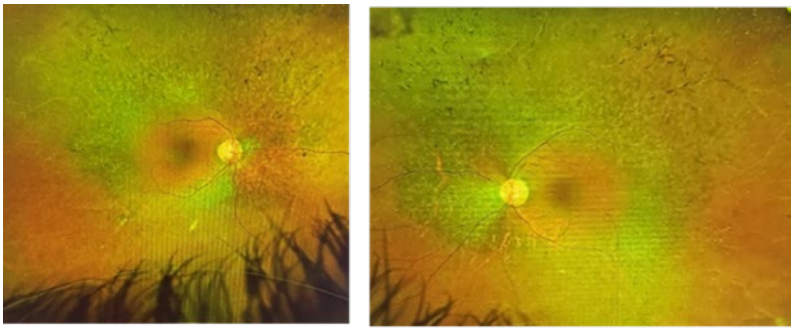


Figure 1

Visual field testing demonstrated corresponding areas of visual field loss bilaterally. Optical coherence tomography (OCT) confirmed the presence of cystoid macular edema in both eyes, more pronounced in the left. Additional findings include arterial attenuation and optic disc pallor in both eyes.

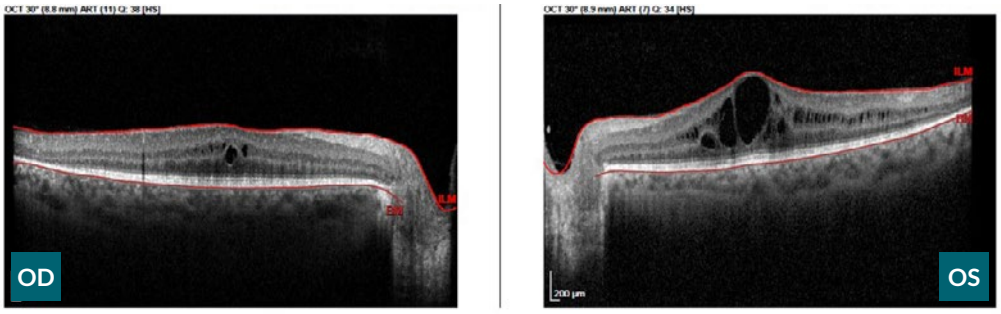


Figure 2

CHALLENGE
Get findings aligned to each other

DIAGNOSIS
Retinitis pigmentosa

TYPE OF ASSESSMENT
Full ISCEV standard testing

WHY WAS THE ERG TEST PERFORMED?

Due to her progressively worsening vision, which had not responded to previous management strategies, this patient came to us/me for a second opinion. Based on imaging findings, we suspected an inherited retinal degeneration rather than a treatable refractive or structural cause. To further evaluate retinal function and clarify the underlying diagnosis, we recommended a RET*eval* electroretinogram (ERG).

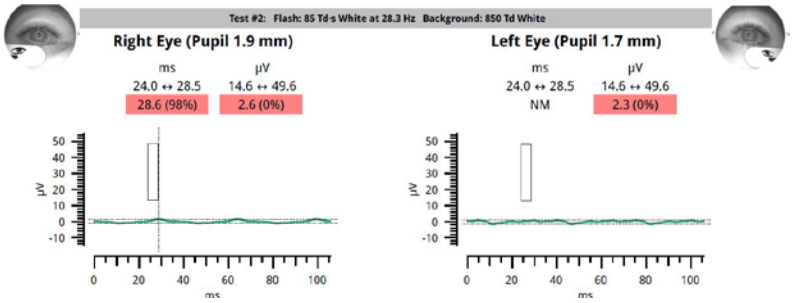


Figure 3

WHAT WERE THE ERG FINDINGS?

A photopic electroretinogram (ERG) was performed, which demonstrated abnormal cone function (as seen in *Figure 3* and *Figure 4*). Although not shown here, the scotopic ERG also revealed abnormal findings. These results are suggestive of an underlying retinal degeneration.

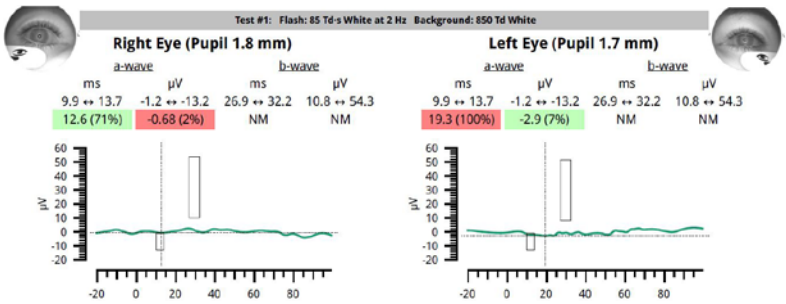


Figure 4

HOW DID ERG INFLUENCE THE PATIENT'S CARE?

The patient was scheduled for genetic testing, but was already informed of our preliminary diagnosis of atypical retinitis pigmentosa. She was also counseled regarding low vision support and available rehabilitation options.

CONCLUSION

ERG testing performed earlier could have prevented the cost and potential risks associated with refractive laser treatment and it would have allowed for earlier education and management for her progressive vision loss.

AUTHOR

DR. HUSSEIN ALMUHTASEB

Dr. Hussein Almuhtaseb is a Consultant Ophthalmologist specializing in cataract and vitreoretinal surgery at The View Hospital in Doha, Qatar (affiliated with Cedars-Sinai International). He completed advanced training at Stanford University and holds MD, MSc, and FEBO qualifications, with previous clinical and academic experience in both the UK and Spain. Passionate about innovation and committed to patient education. As a dedicated clinical researcher and international speaker, Dr. Almuhtaseb collaborates with leading global industry partners. He played a central role in launching the ophthalmology service at The View Hospital, which recently celebrated its two-year anniversary. He aims to establish the hospital as a leading regional provider of eye care. Known for his focus on clinical governance and data-driven service improvement, Dr. Almuhtaseb has earned recognition for initiatives that enhance patient-centered care. His work is shaped by international experience, a strong academic foundation, and a deep belief in medical innovation.

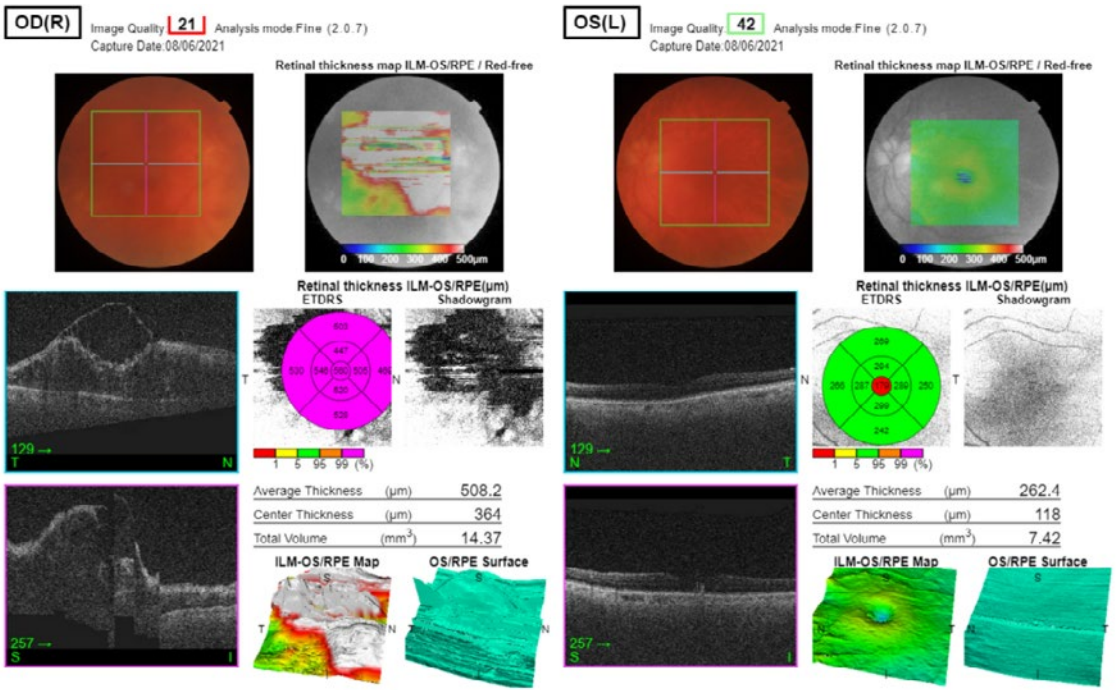
CASE STUDY 8

Risk assessment for CRVO complications (Rubeosis)

by Dr. Patrícia de Freitas Dotto, Dr. Jeser Amarante Faria
Children's Hospital, Brazil

INTRODUCTION

Dr. Patrícia de Freitas Dotto shares a case involving an 87-year-old female patient with a two-month history of blurred vision in the right eye, accompanied by a dense cataract and a Snellen visual acuity of 20/200. Seeking medical attention due to the gradual vision loss, the patient has been diagnosed with central retinal vein occlusion (CRVO) with diffuse edema based on several imaging systems/technologies.



CHALLENGE
Dense cataract

DIAGNOSIS
CRVO

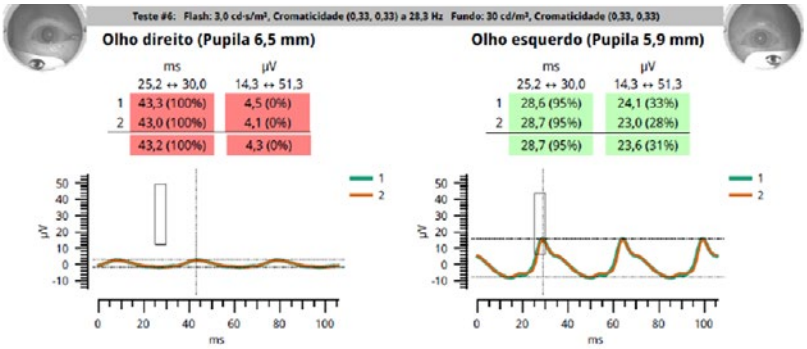
TYPE OF ASSESSMENT
Flicker test

WHY WAS THE ERG TEST PERFORMED?

Image quality was borderline low, therefore we wanted to evaluate the disease severity, especially considering the differentiation between ischemic and non-ischemic type. The ERG was used to assess the risk of developing rubeosis. A simple to conduct flicker ERG test indicates if CRVO is ischemic or non-ischemic and helps risk assessment for several CRVO complications as described by Kjeka et al[1].

WHAT WERE THE ERG FINDINGS?

The ERG results revealed significantly delayed implicit time and low amplitude in the affected eye, displaying a large inter-eye difference. The results indicated that this patient has an ischemic type and is at high risk to progress to rubeosis.



ERG Report

HOW DID ERG INFLUENCE THE PATIENT'S CARE?

Vitrectomy surgery and lens removal were done to help with cataracts. At the same time the patient received a panretinal photocoagulation (PRP) treatment to avoid progression to rubeosis. At longer follow-up the patient presented with a stable retinal appearance and no change in best corrected visual acuity of the affected eye.

CONCLUSION

The dense cataract negatively influenced quality of the images, preventing us from providing an accurate assessment. The ERG test can be successfully completed even if there are media opacities present. In this case, ERG played a crucial role in identifying the ischemic nature of CRVO and predicting the patient's high risk of developing rubeosis.

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1. Kjeka O, Bredrup C, Krohn J. Photopic 30 Hz flicker electroretinography predicts ocular neovascularization in central retinal vein occlusion. Acta Ophthalmologica Scandinavica. 2007;85(6):640-643.

AUTHOR
DR. PATRÍCIA DE FREITAS DOTTO

Dr. Dotto is a PhD-trained ophthalmologist and clinical visual electrophysiology specialist with two decades of experience in children's visual development, retinal disorders, and neuro-ophthalmology. Earned her Medical Degree and completed her Ophthalmology Residency at Universidade Estadual Paulista (UNESP), followed by a fellowship in Clinical Retina and Pediatric Ophthalmology at the Hospital das Clínicas, University of São Paulo (USP). Specialized in visual development and neuro-ophthalmological disorders at the Federal University of São Paulo (UNIFESP), where she obtained her PhD in Visual Sciences in partnership with GRAACC – a leading pediatric oncology institution in Latin America. Serves as a peer reviewer for international scientific journals, contributing to the advancement of ophthalmology research worldwide. Combines clinical excellence, academic rigor, and health communication expertise to make visual health accessible, engaging, and valued by society through the integration of assistive technology, interactive strategies, and evidence-based content.

CASE STUDY 9

ERG to replace FA for CRVO treatment decision

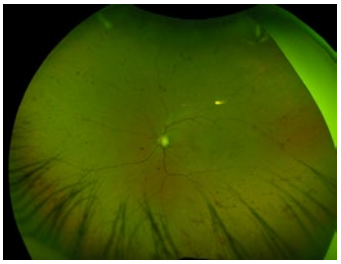
by Miho Nozaki, MD, PhD, Nagoya City University East Medical Center, Japan

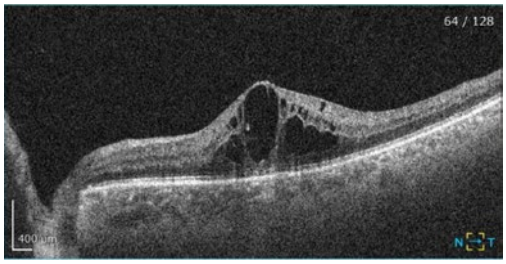
INTRODUCTION

An 87-year-old male patient presented for a routine check-up without any visual issues. His medical history included pulmonary hypertension cardiac amyloidosis and a brain stroke six months prior. Upon examination, significant central edema and central retinal vein occlusion (CRVO) was observed in his left eye via fundus imaging and OCT. Despite these findings, visual acuity in the left eye was maintained at 20/20.

In the absence of symptoms, the patient was monitored closely. Since he was less than six months post-stroke, anti-VEGF injections were put on hold. Three months later, the patient returned with unchanged retinal edema volume, but a deteriorated retinal appearance and slightly reduced visual acuity of 20/25. There was the concern that the CRVO had progressed to an ischemic state.

Because of the patient's cardiac amyloidosis, conducting fluorescein angiography posed a risk. Consequently, an ERG using the RET*eval* Flicker 16 Td protocol was performed to gather essential information while minimizing potential complications associated with contrast agents.





CHALLENGE
Diagnosing CRVO and deciding on treatment

DIAGNOSIS
CRVO

TYPE OF ASSESSMENT
Flicker 16 Td

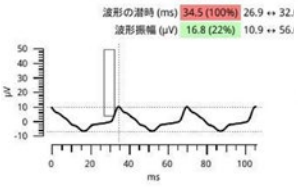
WHY WAS THE ERG TEST PERFORMED?

To understand the nature of the patient's CRVO and determine ischemic risks in a safe manner. The results of the ERG were critical for developing his treatment plan.

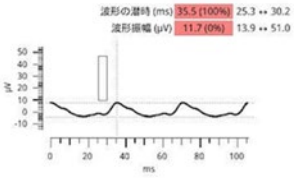
WHAT WERE THE ERG FINDINGS?

The ERG results showed an implicit time of 35.5 ms in the waveform. Miyata et al. found a difference of 4 ms between the healthy and the affected eye to be indicative for the ischemic type of CRVO[1]. Kijeka et al. found a high risk of progression to neovascularization for patients with an implicit time of >35 ms. This patient had an implicit time difference of 1 ms between his eyes, but a relatively big difference in amplitude and implicit time of >35 ms, suggesting a higher risk of progression[2].

Considering the heightened risk of progression and a potential ischemic type of CRVO, treatment options were discussed with the patient. After a thorough explanation of potential risks and side effects, the patient opted for anti-VEGF injections. Additionally, a panretinal photocoagulation (PRP) procedure was performed following an initial loading phase of injections. This comprehensive approach aimed to address the underlying ischemic changes and mitigate the risk of further deterioration.



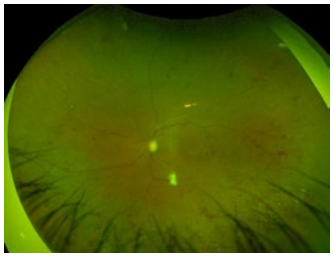
Healthy eye

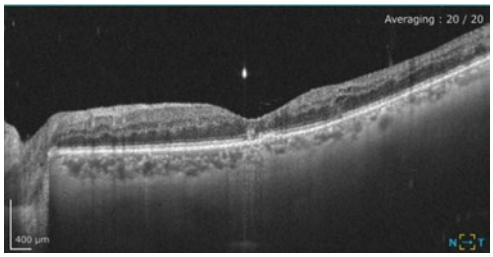


Affected eye

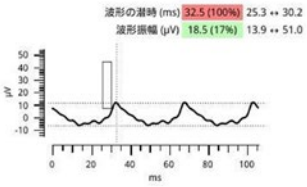
HOW DID ERG INFLUENCE THE PATIENT'S CARE?

Following administration of a third anti-VEGF injection, the patient's BCVA improved to 20/20. Additionally, retinal appearance showed signs of improvement, and the previously observed edema had resolved.

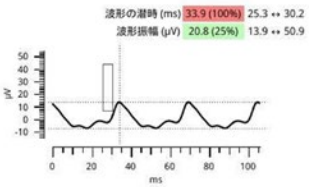




To further assess retinal function, a repeat ERG was conducted after one month and on the day of the first PRP session, revealing promising results. The implicit time decreased from 35.5 to 33.9 ms, indicating a positive response to treatment, albeit with residual ischemia. Moreover, there was a significant recovery in amplitude (from 11.7 µV to 20.8 µV), suggesting enhanced retinal functioning after three injections and directly before laser treatment.



One month after first injection



After third injection on the day of first PRP laser treatment

CONCLUSION

In cases where standard of care diagnostic options, such as FA or ICGA, are not available or pose additional risks, the RET*eval* may serve as a valuable alternative for assessing retinal conditions. This non-invasive test aids in differentiating the nature of CRVO, particularly when assessing ischemic changes that dictate treatment plans. Incorporating ERG into clinical practice enables thorough evaluation and tailored management strategies, especially in complex cases where conventional approaches may be limited.

REFERENCES

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AUTHOR

DR. MIHO NOZAKI

Dr. Miho Nozaki graduated from Nagoya City University School of Medicine and furthered her studies at the University of Kentucky, USA, where she worked on basic research in the Laboratory of Ocular Angiogenesis. After returning to Japan, Dr. Nozaki became an associate professor at Nagoya City University School of Medicine, later becoming a professor in September 2022. Her main research interests revolve around diabetic retinopathy, diabetic macular edema, fundus imaging, and development of new retinal laser techniques.

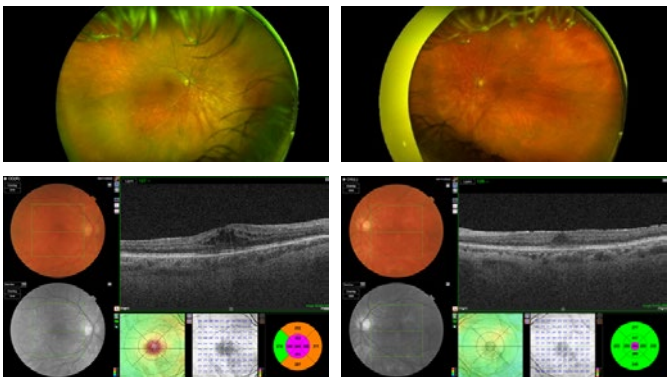
CASE STUDY 10

Management of Birdshot Chorioretinopathy

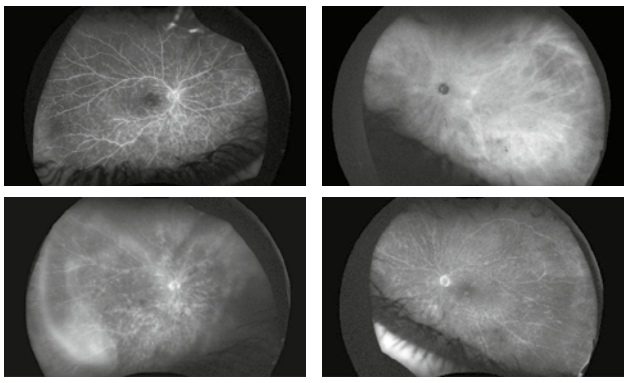
by Prof. Paulo Eduardo Stanga, Andrea Saladino, William Ayliffe and Sebastian Eduardo Francisco Stanga, The Retina Clinic London, UK

INTRODUCTION

A 62-year-old patient sought a second opinion following a diagnosis of intraocular inflammation in both eyes, which was more severe in the right (BCVA: 0.4 LogMAR) than the left (BCVA: 0.3 LogMAR). An optician diagnosed vitritis. A month later, a local hospital diagnosed the patient with birdshot chorioretinopathy and initiated treatment that included Ozurdex intravitreal therapy in both eyes, oral prednisolone, and methotrexate.



OCT (OD) *OCT (OS)*



Fluorescein Angiography (OD) *Fluorescein Angiography (OS)*

CHALLENGE
Determining appropriate treatment plan

DIAGNOSIS
Birdshot chorioretinopathy

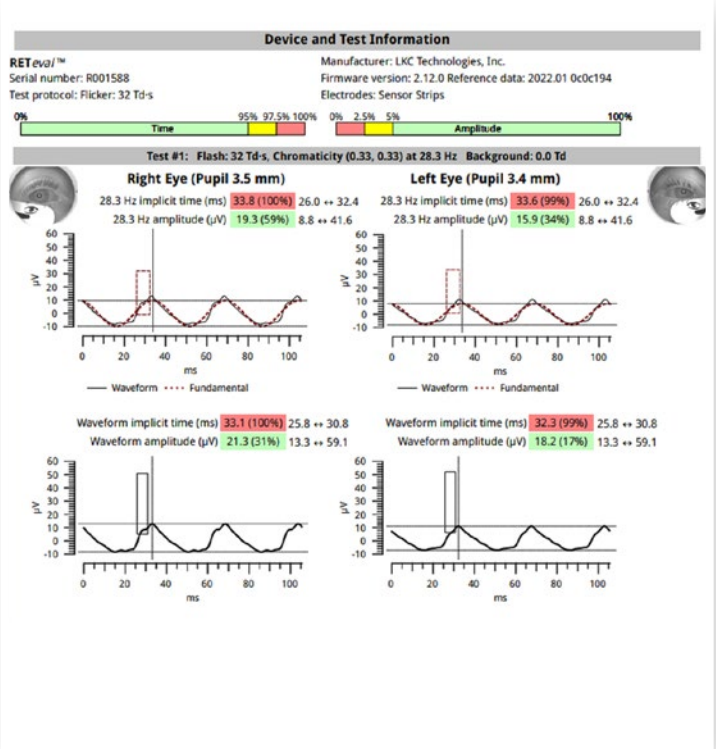
TYPE OF ASSESSMENT
Flicker 32 Td

WHY WAS THE ERG TEST PERFORMED?

Despite several multimodal and ultra widefield images, there was a need to obtain objective functional data to assess if active inflammation was still present from the birdshot chorioretinopathy. If so, what was the extent of the inflammation? Since treatment had already started, the RETeval ERG was needed as an objective biomarker to further define the type and amount of treatment.

WHAT WERE ERG THE FINDINGS?

ERG results from the Flicker 32 Td protocol showed increased implicit times outside of the normal range which confirmed the presence of widespread retinal inflammation. Despite ongoing treatment, the implicit time was still delayed, indicating the need to adjust the treatment plan.



Flicker 32 Td Report

HOW DID ERG INFLUENCE THE PATIENT'S CARE?

Further immunosuppressants were prescribed as the inflammation appeared to be active and severe in the affected area. Additionally, the prednisolone was tapered in 1 mg steps per week from 10 mg until it reached 5 mg a day.

CONCLUSION

The use of ERG in this case helped to determine the optimal treatment plan and schedule for the patient. The delayed implicit time, indicating active inflammation, prompted an adjustment of the patient's medication to reduce the inflammation quickly and effectively.

AUTHORS

PROF. PAULO EDUARDO STANGA, ANDREA SALADINO, WILLIAM AYLIFFE AND SEBASTIAN EDUARDO FRANCISCO STANGA

Professor Stanga is the Founder and Chief Medical Officer at The Retina Clinic London, and Professor at the UCL Institute of Ophthalmology. With over 30 years' experience in ophthalmology and a focus on medical and surgical retina, including macular degeneration, diabetic retinopathy, vitreous floaters, cataracts, retinal laser, R&D new therapies, surgical technology, advanced imaging & clinical studies, Prof. Stanga is committed to advancing the realm of eye care and is dedicated to transforming lives through pioneering work in ophthalmology. Dr. Andrea Saladino, Prof. William Ayliffe and Mr. Sebastian Stanga have all been instrumental in the care of this patient. The Retina Clinic London is focused on delivering bespoke eyecare.

CASE STUDY 11

ERG supports treatment decision in Diabetic Retinopathy

by Dr. Hussein Almuhtaseb, The View Hospital, Qatar

INTRODUCTION

A 46-year-old patient with diabetic retinopathy and bilateral blurry vision presented to our clinic. Visual assessment revealed best corrected visual acuity of 0.8 in the left eye and 1.0 in the right eye. The left eye had a history of prior panretinal photocoagulation (PRP), and OCT findings (*Figure 1*) indicated mild diabetic macular edema (DMO). Given the history of PRP in the left eye, additional PRP was considered in response to signs of mild ischemia. However, the patient questioned the recommendation after experiencing loss of peripheral vision after PRP in the left eye.

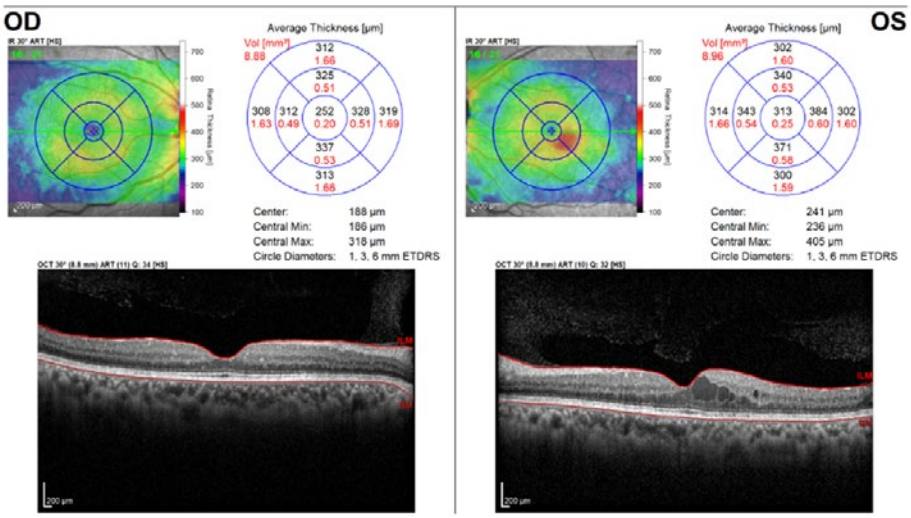


Figure 1

CHALLENGE
Validating delay of treatment

DIAGNOSIS
DR

TYPE OF ASSESSMENT
DR Assessment

WHY WAS THE ERG TEST PERFORMED?

Fundus imaging findings (*Figure 2*) suggested the need for peripheral laser treatment; however, the signs were mild, and the patient expressed concerns about potential peripheral vision loss associated with PRP. As a result, a RET*eval* ERG was requested to evaluate retinal function and help determine the risk of disease progression.

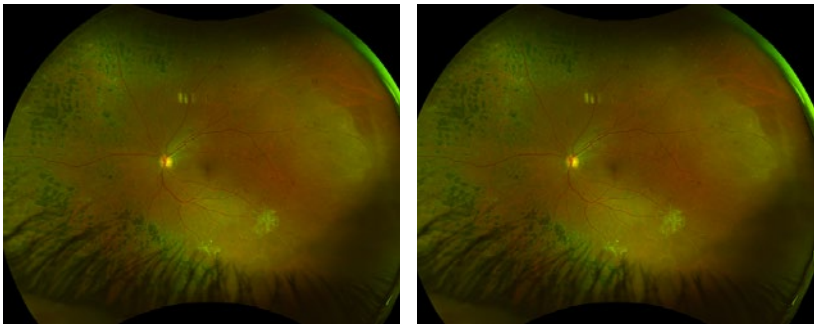


Figure 2

WHAT WERE THE ERG FINDINGS?

Although some changes were seen in the peripheral retina, the RET*eval* DR Score was 19.6. Based on the recent study by Davis et al., a score of 19.6 is linked to a 0% risk of progression at both 6 and 12 months, indicating very mild changes and low concern for disease progression. The ERG flicker results demonstrated amplitudes within normal limits, and the implicit times for the brighter flicker stimulus were also within the normal range. The reduced ERG amplitude in the left eye may be attributable to prior PRP treatment and a solid DR Score may indicate stable disease.

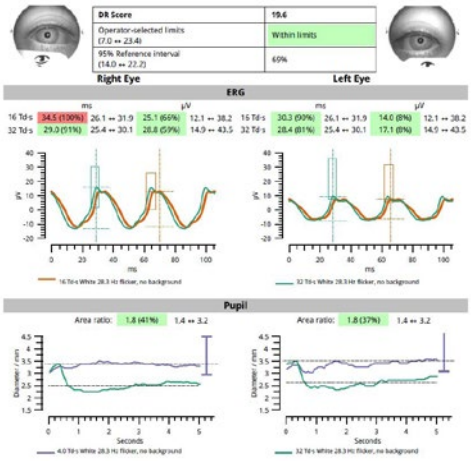


Figure 3

HOW DID ERG INFLUENCE THE PATIENT'S CARE?

The ERG results were reassuring, indicating that photocoagulation treatment was not necessary at that time. We opted for close monitoring to detect any signs of deterioration or unexpected developments. More than a year later, the eye remains stable without the need for PRP.

CONCLUSION

Using objective, functional testing to complement structural imaging ensures that we have the whole story and can make accurate disease management decisions. In this case, adding ERG with the RET*eval* gave us data to support not rushing into PRP for the right eye.

AUTHOR

DR. HUSSEIN ALMUHTASEB

Dr. Hussein Almuhtaseb is a Consultant Ophthalmologist specializing in cataract and vitreoretinal surgery at The View Hospital in Doha, Qatar (affiliated with Cedars-Sinai International). He completed advanced training at Stanford University and holds MD, MSc, and FEBO qualifications, with previous clinical and academic experience in both the UK and Spain. Passionate about innovation and committed to patient education. As a dedicated clinical researcher and international speaker, Dr. Almuhtaseb collaborates with leading global industry partners. He played a central role in launching the ophthalmology service at The View Hospital, which recently celebrated its two-year anniversary. He aims to establish the hospital as a leading regional provider of eye care. Known for his focus on clinical governance and data-driven service improvement, Dr. Almuhtaseb has earned recognition for initiatives that enhance patient-centered care. His work is shaped by international experience, a strong academic foundation, and a deep belief in medical innovation.

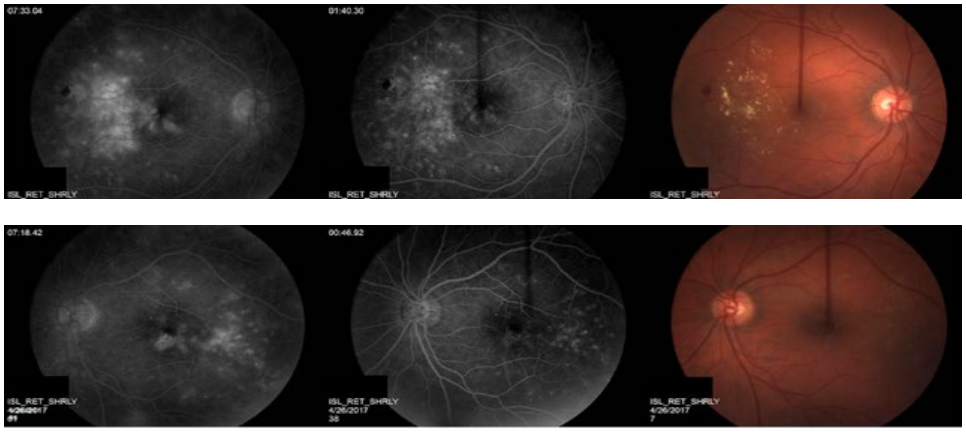
CASE STUDY 12

ERG role in DR progression assessment

by Dr. Pamela Weber, Island Retina, USA

INTRODUCTION

A 39-year-old patient presented with a 20-year history of type 1 diabetes mellitus. The initial examination revealed nonproliferative diabetic retinopathy (NPDR) with diabetic macular edema (DME). In response to these findings, anti-VEGF injections were administered to address the diabetic macular edema. The RET*eval* ERG was used at follow-up exams from 2017 through 2019 to aid in monitoring disease progression, ultimately alerting us to advancement to PDR and a need for more aggressive treatment.



Fluorescein Angiography

CHALLENGE
Early recognition of disease progression

DIAGNOSIS
NPDR with DME

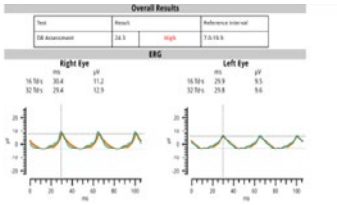
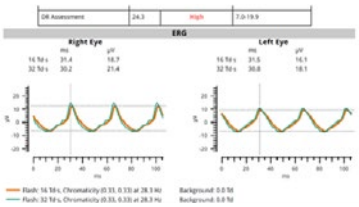
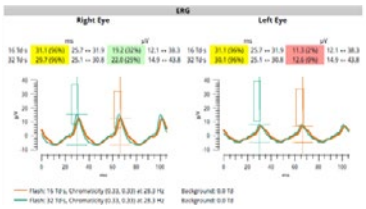
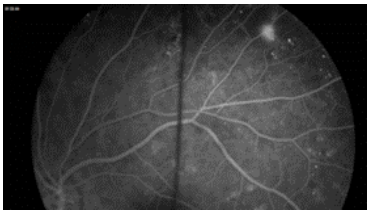
TYPE OF ASSESSMENT
DR Assessment

WHY WAS THE ERG TEST PERFORMED?

To monitor changes and possible disease progression in order to make informed decisions regarding the need for more aggressive treatment.

WHAT WERE THE ERG FINDINGS?

Despite no significant changes on OCT or fundus photography over the years, ERG revealed a deterioration, prompting fluorescein angiography examination, which in turn revealed neovascularization elsewhere (NVE) as well as progression from NPDR to PDR.

2017	Several injections and focal laser in both eyes. The DR Score is relatively high (24.3 for 23.4 limit), with low amplitudes.	
2018	The DR Score remains unchanged, but amplitudes improve significantly.	
2019	A remarkable decrease in amplitude in the left eye, even though the fundus and OCT image didn't show significant change.	
	ERG results indicate the need for close monitoring to watch for ischemia, invisible on fundus, but appearing on FA. Neovascularization elsewhere (NVE) was detected in the periphery and the eye was treated more aggressively.	

HOW DID ERG INFLUENCE THE PATIENT'S CARE?

The ERG offered an efficient method for monitoring a high-risk patient over several years. Concerning ERG findings demonstrated a need to schedule more frequent follow-up appointments and also prompted more extensive testing, including FA. This revealed NVE, and a progression from NPDR to PDR with ischemia. Accordingly, the patient received more aggressive treatment.

CONCLUSION

This case highlights the crucial role of ERG in monitoring progression in patients with diabetic retinopathy, particularly in cases resistant to treatments. The use of ERG with other diagnostic tools can facilitate a more complete understanding of the clinical picture, reducing delays in necessary follow-up exams and treatment.

AUTHOR

DR. PAMELA WEBER

Dr. Pamela Ann Weber is a retinal specialist with Vitreoretinal Consultants of New York, USA, and practices at the Island Retina office in Shirley, NY. She specializes in retinal disease assessment, including diabetic retinopathy. Dr. Weber has a rich academic background and extensive experience. She received her B.Sc. from McGill University, Montreal, and her MD from Columbia College of Physicians and Surgeons, NYC. She completed her residency in ophthalmology at the New York Eye and Ear Infirmary, and a fellowship in retina at Harvard University, Boston. Dr. Weber utilizes the RET*eval* ERG/VEP device for monitoring retinal conditions in her practice.

CASE STUDY 13

Cataract treatment decision in non-compliant dementia patient

by Dr. Hussein Almuhtaseb, The View Hospital, Qatar

INTRODUCTION

A 72-year-old male patient with dementia and a history of diabetes presented with significant visual impairment. The family reported challenges in daily care, including increased episodes of aggression and withdrawal — symptoms that had noticeably intensified in parallel with his declining vision.

The patient had no light perception in the right eye and markedly reduced vision in the left one. Best corrected visual acuity in the left eye was 0.2, improving slightly to 0.3 with pinhole testing. Examination revealed a dense, brunescent cataract in the left eye, with severely limited fundus visibility, as illustrated in the accompanying images (*Figure 1*). The family and patient were primarily concerned about whether cataract extraction could meaningfully improve his residual vision.

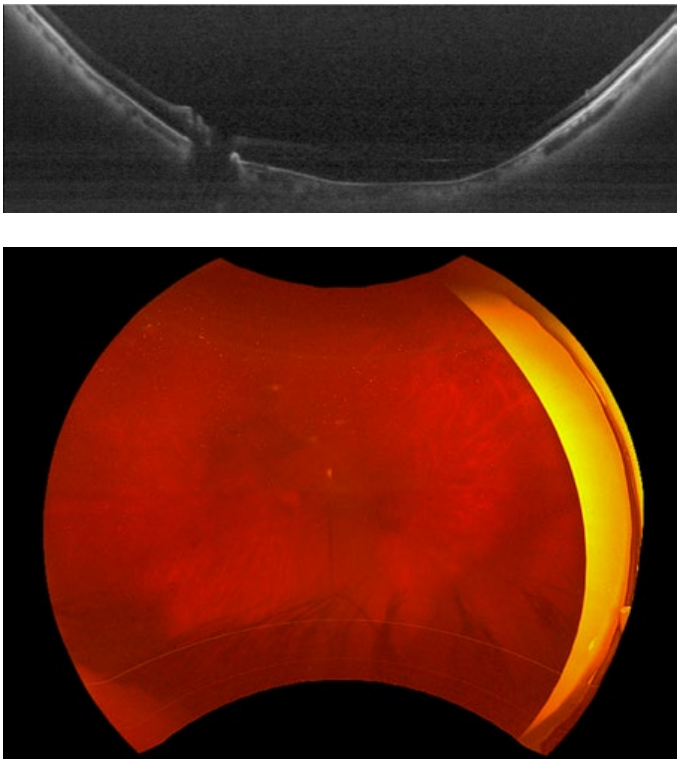


Figure 1

CHALLENGE
Support disease management decisions

DIAGNOSIS
Cataract

TYPE OF ASSESSMENT
ISCEV Flash/Flicker

WHY WAS THE ERG TEST PERFORMED?

Fundus imaging was inconclusive due to poor media clarity. Previous consultants had discouraged cataract surgery, citing a high-risk profile and uncertain benefit in a cognitively impaired and behaviorally challenging patient. However, the profound burden placed on both the patient and his caregivers due to the vision loss warranted a deeper investigation. To better understand the functional capacity of the retina and to support an informed decision, an electroretinogram (ERG) was performed on RET*eval*.

WHAT WERE THE ERG FINDINGS?

The ERG revealed amplitudes and implicit times within borderline to normal ranges (*Figure 2*), which represents an encouraging result. This suggested that despite the media opacity, the retinal function remained largely intact. Based on these findings, we communicated to the patient and family that there is a reasonable likelihood of visual improvement following cataract surgery.

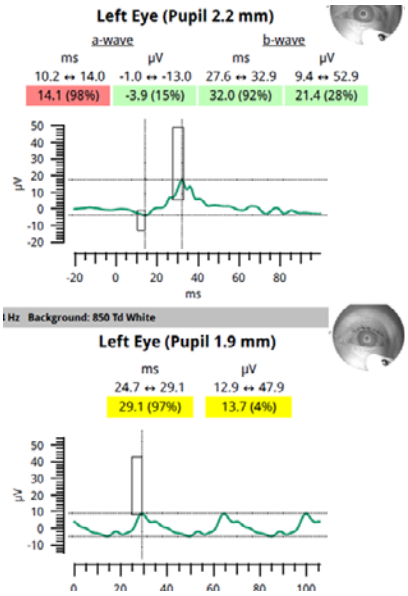


Figure 2

HOW DID ERG INFLUENCE THE PATIENT'S CARE?

Based on the ERG findings we decided to continue with cataract surgery on the left eye, resulting in an improved visual acuity of 0.7 postoperatively. At one of the postoperative visits, the family reported a striking and unexpected transformation: the patient's mood had brightened, and his level of engagement had noticeably increased. With better vision, he appeared more responsive, more curious, and more connected to his surroundings, which is a huge relief for the family. The impact of improved vision extended beyond measurable acuity.

CONCLUSION

Had the ERG not been performed, a definitive recommendation for surgery may not have been possible. This uncertainty could have led to deferral of treatment, leaving the patient in a state of visual and emotional stagnation. In this case, the ERG not only informed a successful surgical decision, but ultimately contributed to remarkable improvements in both visual function and emotional well-being—reminding us of the profound interconnection between vision, cognition, and quality of life.

AUTHOR

DR. HUSSEIN ALMUHTASEB

Dr. Hussein Almuhtaseb is a Consultant Ophthalmologist specializing in cataract and vitreoretinal surgery at The View Hospital in Doha, Qatar (affiliated with Cedars-Sinai International). He completed advanced training at Stanford University and holds MD, MSc, and FEBO qualifications, with previous clinical and academic experience in both the UK and Spain. Passionate about innovation and committed to patient education. As a dedicated clinical researcher and international speaker, Dr. Almuhtaseb collaborates with leading global industry partners. He played a central role in launching the ophthalmology service at The View Hospital, which recently celebrated its two-year anniversary. He aims to establish the hospital as a leading regional provider of eye care. Known for his focus on clinical governance and data-driven service improvement, Dr. Almuhtaseb has earned recognition for initiatives that enhance patient-centered care. His work is shaped by international experience, a strong academic foundation, and a deep belief in medical innovation.

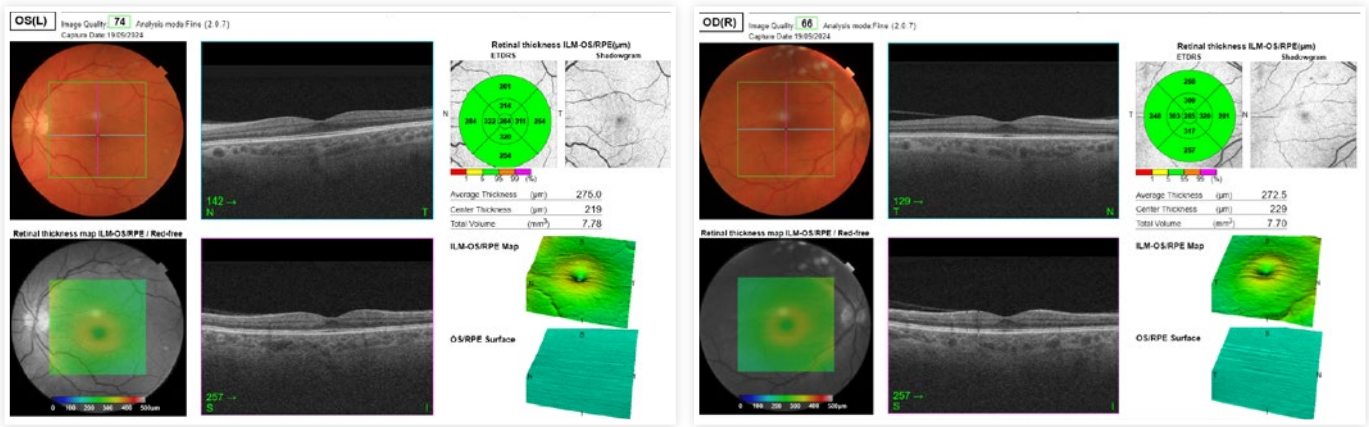
CASE STUDY 14

Lens decision in cataract surgery supported by electrophysiology

by Dr. Márton Trencsényi, MVZ Augenarztzentrum Stadthagen, Germany

INTRODUCTION

The patient presented with a gradual deterioration of vision in the right eye (BCVA 0.63 vs. 1.0 in the left eye). A symmetric mild cataract, a corticonuclearis was observed in both eyes. To understand the reduced vision in the right eye, an intensive retinal evaluation with ophthalmoscopy and OCT was performed, showing no abnormalities that could account for the difference compared to the left eye. To improve visual acuity, a toric intraocular lens was recommended.



OCT OS *OCT OD*

Figure 1

CHALLENGE
Unknown reason of vision loss

DIAGNOSIS
Cataract

TYPE OF ASSESSMENT
ISCEV Flash/Flicker + PhNR

WHY WAS THE ERG TEST PERFORMED?

The implantation of the recommended lens involved a considerable financial cost for the patient. Therefore, the patient requested further assessment of retinal function to ensure a successful surgical outcome. We conducted an ERG test with the RET*eval* device and a pattern VEP with the UTAS device to investigate any potential retinal or optic nerve impairment that might limit surgical success.

WHAT WERE THE ERG FINDINGS?

We used the ISCEV Flash/Flicker & PhNR tests to evaluate cone system and ganglion cell function. All RET*eval* ERG measurements showed symmetrical, nearly identical values between the right and left eyes. Additional assessment of the visual pathway using the UTAS pattern VEP also demonstrated normal and comparable values for both eyes.

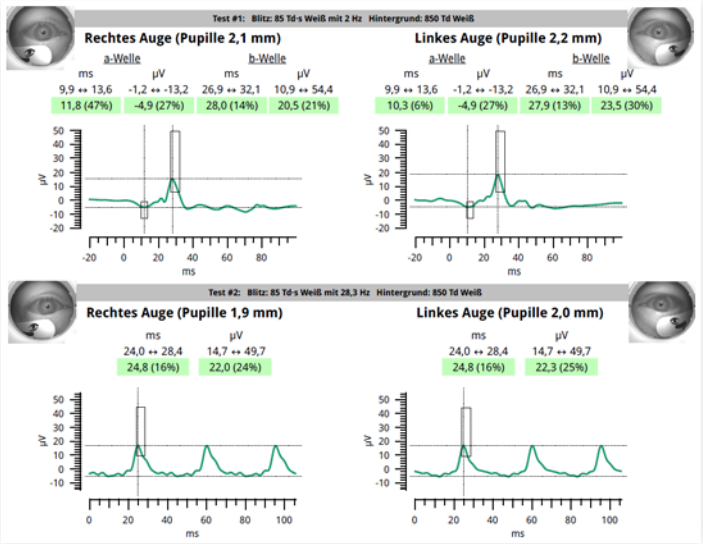


Figure 2

HOW DID ERG INFLUENCE THE PATIENT'S CARE?

The ERG results were normal, with no indication of broader retinal dysfunction. The pattern VEP, reflecting central visual pathway function, also showed normal findings. This confirmed that the visual reduction was solely attributable to the cataract. The patient subsequently agreed to proceed with toric lens implantation. At the three-month follow-up, BCVA in the right eye had improved to 1.0, and the patient was highly satisfied with the treatment outcome.

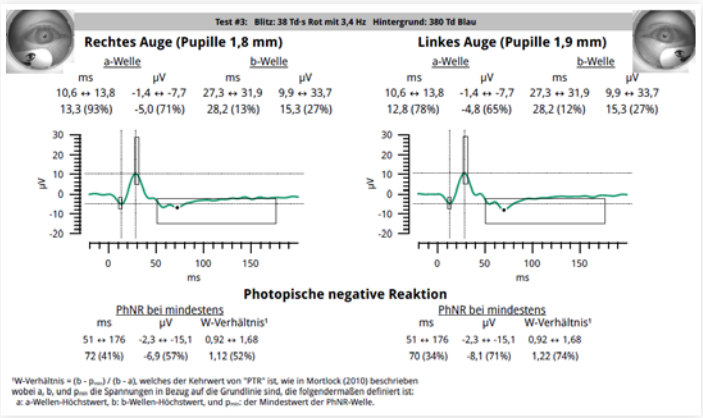


Figure 3

CONCLUSION

In this case, adding ERG and pattern VEP testing provided more complete information, objectively confirming the initial impression that no retinal or optic nerve pathology was contributing to the reduced vision. The normal electrophysiological findings offered reassurance to both the clinician and the patient, supporting confidence in the proposed treatment plan, and facilitating an informed decision.

AUTHOR

DR. MÁRTON TRENCSÉNYI

Dr. Trencsényi completed his medical studies in 2012 in Budapest before pursuing his specialization in neurology in Herford, Germany, which he finished in 2019. He subsequently worked for several years as a senior physician (Oberarzt) in neurology at Klinikum Herford, gaining extensive experience in neurophysiological diagnostics.

Following this, he transitioned into ophthalmology, where he now develops and leads the electrophysiology program at the MVZ Stadthagen. His unique background allows him to integrate neurological and ophthalmological expertise, providing comprehensive diagnostic insights that bridge both fields.

RETeval™

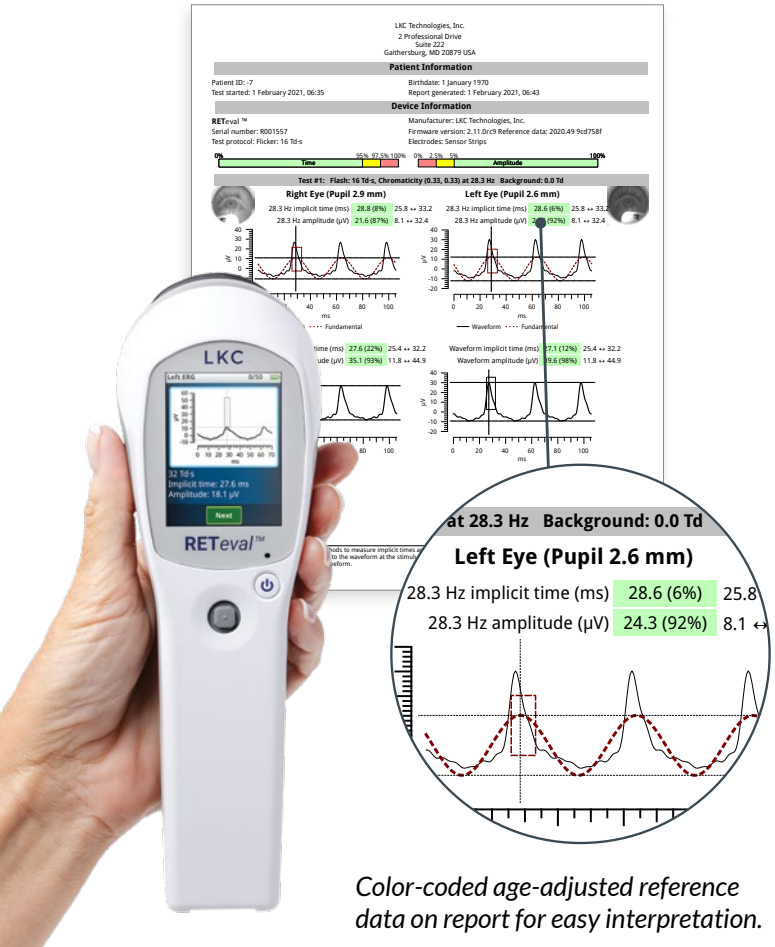
Improve Patient Outcome **with ERG**

INTUITIVE | OBJECTIVE | REPEATABLE

VISUAL ELECTROPHYSIOLOGY TESTING

ERG and VEP tests provide objective information on how the visual system is functioning. It provides reliable guidance for medical professionals to manage functional changes that may impact a patient's vision.

Report



Color-coded age-adjusted reference data on report for easy interpretation.

Indications

DIABETIC RETINOPATHY
GLAUCOMA
INHERITED DISEASES
PEDIATRIC NYSTAGMUS
OPTIC NEUROPATHIES
CRVO
UNEXPLAINED VISION LOSS
ACQUIRED RETINA DISEASES
ACHROMATOPSIA
BIRDSHOT CHORIORETINOPATHY
RETINITIS PIGMENTOSA
CONE-ROD DYSTROPHIE
LCA
CSNB
DRUG TOXICITY MONITORING
CHOROIDEREMIA
RETINAL DETACHMENT
X-LINKED RETINOCHISIS
TOXOPLASMOSIS
VITAMIN A DEFICIENCY

IMPROVE YOUR DIAGNOSIS WITH THE RIGHT INFORMATION IN HAND

ADVANCED TESTING IN 17 LANGUAGES FOR ALL YOUR NEEDS

- DR Assessment
- ISCEV compliant 5 and 6 steps
- Photopic Negative Response
- Flash / Flicker tests
- Flash VEP
- Scotopic Flash tests
- S-cone test
- On / Off
- Custom protocols for specific needs

1. Soft eye cup for patient comfort
2. IR camera to view eye during testing
3. Immediate test results right on the device
4. Simple joystick control
5. Ergonomic to fit comfortably in hand
6. Small charging base
7. Lithium ion battery for up to 8 hours* of use
8. Docking station offers USB connectivity

**Approximately 70 patients before recharging, depending on protocol used.*

TESTIMONIALS

As a specialist in both medical and surgical retina, I understood long time ago the important role of ERG in helping to diagnose several diseases. However, the technologies available so far on the market were not user friendly. They were complicated and time-consuming. This is perhaps one of the reasons we have all so heavily relied mainly on imaging. This changed for me after being introduced to the RETeval device from LKC Technologies."

Prof. Paulo. E. Stanga
The Retina Clinic London,
Director & Vitreoretinal Surgeon

I use RETeval every day. It's easy to use and I don't need a technician to use it. I like it so much that I use it myself, so if I need ERG I'll do it right away. (...) I've used all of those (tests) but my favorite really is the dark-adapted rod flash followed by light-adapted flicker. I can do that within four minutes."

Rob Koenekoop, MD, PhD
McGill University, Montreal,
Chief of paediatric ophthalmology

There are over several hundred publications about the RET*eval* device or where the RET*eval* device was used. For the full list, please contact LKC Technologies Inc. at **sales@lkc.com**

The RET*eval* device is in use in thousands of locations all over the world. The manufacturing site is located in Maryland, US.

RET*EVAL* HANDHELD ERG/VEP IN CLINICAL OPHTHALMOLOGY

Pediatric diseases

Ischemic diseases

Optic Nerve dystrophies

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4. Sensor Strip electrodes eliminate the need for corneal contact.
5. No special room required for photopic testing.
6. Handheld device can be brought to the patient for testing; no special position required.

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LKC TECHNOLOGIES

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MM-093 Rev 3

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