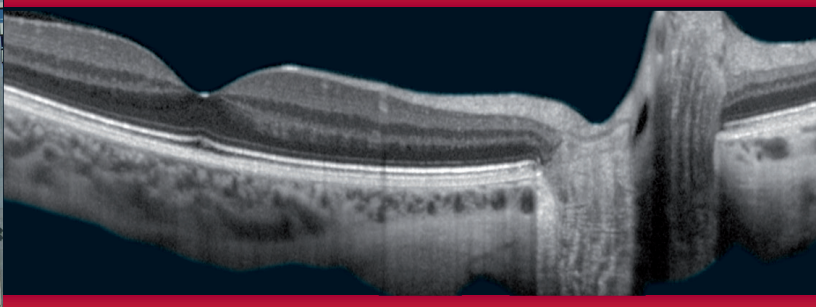
13th International SPECTRALIS® Symposium (ISS)

Abstract Book



October 16-17, 2015
Ateneo Mercantil de Valencia · Spain

Course Director

Roberto Gallego-Pinazo, Juan Donate (Spain)

Faculty

Balwantray Chauhan (Canada)
Julián García Feijoo (Spain)
Antonio Ferreras (Spain)
K. Bailey Freund (USA)
Frank G. Holz (Germany)
Christian Mardin (Germany)
Jordi Monés (Spain)
Norbert Pfeiffer (Germany)
José M. Ruiz-Moreno (Spain)
Giovanni Staurenghi (Italy)

Guest Lecture

Eric Souied (France)

HEIDELBERG ENGINEERING ACADEMY

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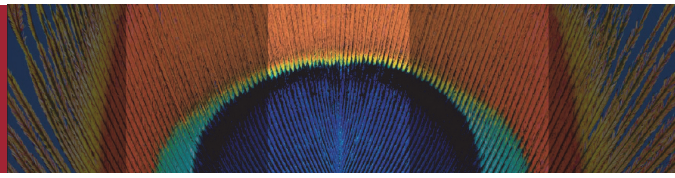

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K. Bailey Freund (USA), Frank G. Holz (Germany), Christian Mardin (Germany), Jordi Monés (Spain),
Norbert Pfeiffer (Germany), José M. Ruiz-Moreno (Spain), Giovanni Staurenghi (Italy)

Guest Lecture: Eric Souied (France)

Scientific Program

Friday, October 16, 2015

09.00 Registration and Welcome Coffee

Innovation - Moderators: **Roberto Gallego-Pinazo, Juan Donate**

09.50 Welcome Note (Roberto Gallego-Pinazo, Juan Donate)

10.00 MultiColor Imaging Revisited (Roberto Gallego-Pinazo) **– page 9**

10.20 Update on Autofluorescence Imaging (Frank G. Holz) **– page 11**

10.40 New Widefield OCT in Peripheral Diseases (Mariano Cozzi) **– page 13**

10.50 SPECTRALIS Glaucoma Module Premium Edition (Julián García Feijoo) **– page 15**

11.10 Transverse Section Analysis (Giovanni Staurenghi) **– not available (software presentation)**

11.30 Coffee Break

AMD and More - Moderators: Giovanni Staurenghi, Jordi Monés

12.00 Geographic Atrophy in Patients Receiving Anti-VEGF Therapy for Neovascular AMD (K. Bailey Freund) **– page 17**

12.20 "Nascent" Geographic Atrophy (Jordi Monés) **– not available**

12.40 Are you afraid of "Ghost Drusen"? (Eric Souied) – Guest Lecture **– page 19**

13.00 Probing Dry AMD - What is the best approach? (Frank G. Holz) **– page 21**

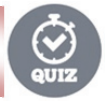
13.20 Beyond Exudative Manifestations in Neovascular AMD (Rosa Dolz-Marco) **– page 23**

13.30 Idiopathic Macular Telangiectasia Type 2 Associated with Acquired Vitelliform Lesion (Sara Vaz-Pereira) **– page 25**

13.40 Lunch

14.30 All Poster Session Starts – Presentation Posters 01-09 / Moderators: Roberto Gallego-Pinazo, Giovanni Staurenghi

15.15 "The Frank Holz Retina Battle"
Interactive Cases and Quiz-Show - Win an iPad mini!



16.30 Coffee Break

Multimodal Imaging - Moderators: José M. Ruiz-Moreno, Antonio Ferreras

17.00 Autofluorescence Patterns in Central Serous Chorioretinopathy (Vicente Chaqués) **– page 27**

17.10 Ocular Tumors (Marco Pellegrini) **– page 29**

17.20 Ocular Inflammation (Alessandro Invernizzi) **– page 31**

17.30 The Pachychoroid Spectrum (K. Bailey Freund) **– page 33**

17.50 Chorioidal Neovascularization: OCT Angiography versus Multimodal Imaging (Eric Souied) **– page 35**

18.10 Change Break

Special Guest Lecture – Moderator: Gerhard Zinser

18.20 SPECTRALIS SD-OCT at the International Space Station (Robert Gibson, Stephen Hart) **– not available**

19.00 END

19.30 Busses leave for Birthday Dinner

25 Years
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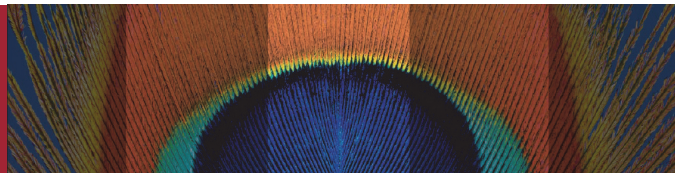

Saturday, October 17, 2015

08.30 ***Welcome Coffee***

Glaucoma 1 - Moderators: Norbert Pfeiffer, Balwantray Chauhan

09.00 Optic Disc Haemorrhage and Laminar Defects: Fact or Fiction? (Balwantray Chauhan) **– page 37**

09.20 Appearance of Optic Nerve Head in OCT: In Vivo Meets Ex Vivo Histology (Christian Mardin) **– page 39**

09.40 BMO-MRW in Patients with Glaucomatous and Simple Optic Atrophy (Laura Schrems) **– page 41**

09.50 Performance of MRW/RNFL vs East London Glaucoma Prediction Score in a Multi-Ethnic South African Population (Stephen Cook) **– page 43**

10.00 Optic Nerve Head Interactive Quiz (Balwantray Chauhan) **– not available**

10.30 ***Coffee Break***

Glaucoma 2 - Moderators: Christian Mardin, Julián García Feijoo

11.00 The Mainz Gutenberg Health Study: What do we learn about ophthalmic health? (Norbert Pfeiffer) **– page 45**

11.20 Optic Nerve Head Hemorrhages and Vitreous Traction (Karel Van Keer) **– page 47**

11.30 RNFL Assessment in Myopic Patients (Julián García Feijoo) **– page 49**

11.50 Evaluation of GCL Thickness and Volume Using Macular Fast and Posterior Pole SPECTRALIS SD-OCT Scan Protocols (Rodrigo Abreu-González) **– page 51**

12.00 ***Change Break***

Clinical Applications of OCT Angiography (Case Studies) - Moderators: K. Bailey Freund, Frank G. Holz

12.10 OCT Angiography in Macular Diseases (Frank G. Holz) **– page 53**

12.30 OCT Angiography of a CNV in Adult Onset Foveomacular Vitelliform Dystrophy: Pearls and Pitfalls (Marco Lupidi) **– page 55**

12.40 OCT Angiography of PCV and Polypoidal CNV (K. Bailey Freund) **– page 57**

12.50 OCT Angiography versus Traditional Multimodal Imaging in Assessing the Activity of Exudative AMD (Gabriel Coscas) **– page 59**

13.00 Macular Atrophy Differential Diagnosis. The Role of ICGA and Angio OCT (Giovanni Staurenghi) **– page 61**

13.10 OCT Angiography Pearls – A First Experience (Roberto Gallego-Pinazo) **– page 63**

13.30 ***Lunch***

14.15 ***All Poster Session Starts – Presentation Posters 10-18 / Moderators: Roberto Gallego-Pinazo, Giovanni Staurenghi***

15.00 **Awarding of the 3 Best Posters**

15.15 "The Christian Mardin Glaucoma Battle"
Interactive Cases and Quiz-Show – Win an iPad mini!

16.00 ***Coffee Break***

Clinical Retina - Moderators Roberto Gallego-Pinazo, Juan Donate

16.30 Assessment of Diseases of the Vitreomacular Interface with SD-OCT (Antonio Ferreras) **– page 65**

16.50 Anatomic and Functional Outcomes of Symptomatic Vitreo-Macular Traction Syndrome (Lihteh Wu) **– page 67**

17.00 Early Changes in the OCT in Diabetic Patients without Diabetic Retinopathy (José M. Ruiz-Moreno) **– page 69**

17.20 Diabetic Choroidopathy (Jorge Ruiz Medrano) **– page 71**

17.30 Staphyloma Induced Serous Maculopathy (Suzanne Yzer) **– page 73**

17.40 Lacquer Cracks and Perforating Scleral Vessels in Pathologic Myopia (Giuseppe Querques) **– page 75**

17.50 Retinal Imaging for Detection of Risk Factors for Developing Myopic Choroidal Neovascularization (Moritz Schröder) **– page 77**

18.00 ***END***

19.00 ***Farewell Reception at University La Nau***

25 Years
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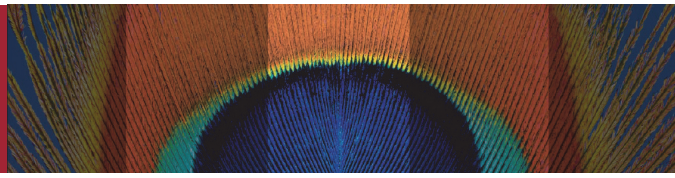

Poster Presentations

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25 Years HEIDELBERG ENGINEERING ACADEMY

Course Directors:

Roberto Gallego-Pinazo, MD, PhD, DiSSO

University and Polytechnic Hospital La Fe, Grupo Mácula Visión, Valencia, Spain

Dr. Roberto Gallego-Pinazo is the medical director of Vitreous Retina Macula Valencia, and retina specialist at the Unit of Macula of the University and Polytechnic Hospital La Fe of Valencia. He graduated from the University of Valencia Medical School in 2003. His general ophthalmology training was at the University Hospital La Fe of Valencia, Spain. He was awarded as the best in class resident doctors in 2008. He completed the Diploma Superior Specialist in Ophthalmology by the European School in the Advanced Studies in Ophthalmology, equivalent to the Certificate of Advanced Studies in Ophthalmology in the Swiss University ContInuing Education. He has also undertaken a retinal fellowship during 2012 at the Royal Manhattan Eye, Ear and Throat Hospital, the New York University Bellevue Hospital, and the Vitreous Retina Macula Consultants of New York, with Dr Lawrence A. Yannuzzi and K. Bailey Freund.

Dr Gallego-Pinazo is actively involved in clinical research and has been awarded numerous research grants in Spain. In 2012, he was recipient of the Arruga Award of the Spanish Society of Ophthalmology. He completedr the 2013-2014 Leadership Development Program of the Panamerican Association of Ophthalmology and the American Academy of Ophthalmology.

He has authored of over 125 scientific papers in international journals, as well as over 150 book chapters. He is principal investigator of the Panamerican Collaborative Retina Study Group (PACORES) and principal investigator of the Retics-Oftared research group of the Health Institute Carlos III.

Juan Donate Lopez, MD

Hospital Clínico San Carlos, Unidad de Patología Macular, Quirónsalud, Clínica La Luz, Madrid, Spain

Juan Donate Lopez is nowadays responsible of the unit of retina of the Clinical Hospital San Carlos in Madrid and Chairman of the Unit of Ophthalmology of the “Clínica La Luz”, Madrid. Formed in the University of Salamanca and University Compllutense of Madrid, where he realized studies of doctorate in both universities.

Co-founder of the Spanish Club of Mácula and Founder and co-director of the Spanish Journal of Macular Pathology. His major clinical interest is degenerative macular patology and other medical disease and specially, surgical retina.

Principal Investigator for Clinical Trails. Honorific professor of the department of Ophthalmology of "Universidad Complutense; Madrid".

Scientific reviewer of international journals and consulting for "Institute of Health Carlos III".

Has published more than 10 chapters of books and monographs in the last 5 years and more than 20 articles in scientific magazines of impact.

Faculty Members:

Prof. Balwantray C. Chauhan, PhD

Dalhousie University, Halifax NS, Canada

Balwantray Chauhan is Mathers Professor and Research Director of Ophthalmology and Visual Sciences, and Professor of Physiology and Biophysics at Dalhousie University. He obtained his Ph.D. at the University of Wales, Cardiff, UK, and his postdoctoral training at the University of British Columbia, Vancouver, Canada, under Dr. Stephen Drance.

Dr. Chauhan's clinical research interests centre on changes in the visual field and optic nerve head in glaucoma. He has devised new strategies for detecting glaucomatous progression and conducted research leading to their translation to clinical practice. A key contribution in this area is the Topographical Change Analysis (TCA), used for identifying changes in optic nerve head topography with imaging techniques. Dr. Chauhan is Principal Investigator of the Canadian Glaucoma Study, a multicentre study on the risk factors for the progression of open-angle glaucoma. His recent contributions have been on the acquisition and analysis of anatomically and geometrically accurate neuroretinal rim measurements. He also conducts research with experimental models of optic nerve damage. Areas of activity include studies of neuron-glia interaction in the retina and optic nerve, in vivo imaging of retinal ganglion cells and neuroprotection. This research is conducted in the Retina and Optic Nerve Research Laboratory, a multidisciplinary facility he was instrumental in establishing.

Dr. Chauhan has received numerous awards and recognitions including the Achievement Award of the American Academy of Ophthalmology, Fellow of the Association for Research in Vision and Ophthalmology and the Alcon Research Institute Award. His research is funded by the Canadian Institutes of Health Research (CIHR), the Atlantic Innovation Fund and other public and private sector agencies.

Prof. Julián García Feijoo, MD, PhD

Hospital Clínico San Carlos, Departamento de Oftalmologia, Madrid, Spain / Universidad Complutense, Madrid, Spain, OFTARED (ISCIII)

Julian Garcia Feijoo is Professor of Ophthalmology and Chairman of the Ophthalmology Department at Universidad Complutense-Hospital Clinico San Carlos (Madrid). He studied medicine at Universidad Complutense (UCM) and received his PhD in 1998. In 2002 became Tenure Professor at UCM and Head of the Glaucoma Department at Hospital Clinico San Carlos, Professor of Ophthalmology in 2007 and was appointed Chairman of the Opthalmology Department in 2009.

His research interest are glaucoma treatment, imaging technology and visual field, and has received 16 Research Grants (Public Founding), including and participated as investigator in more than 100 clinical trials and research projects.

He is the President of the Spanish Society of Glaucoma and serves on the Executive Committee of the European Glaucoma Society and Spanish Society of Ophthalmology. He is also the Coordinator of the Strategic Planning Board for Ophthalmology, Madrid Health Service.

Editor of Journal Archivos de la Sociedad Española de Oftalmología is Co-editor or Member or the Editorial Board of 7 Journals. He was published 175 papers in indexed Journals (H-index: 18) and authored or co-authored over 100 books and book chapters. He was awarded international and national prices, including the Spanish Society of Ophthalmology "Arruga Research Award" for the best Ophthalmologist under 40.

Antonio Ferreras, MD

Miguel Servet University Hospital, Aragon Health Research Institute,
IIS Aragón, University of Zaragoza, Spain

Antonio Ferreras has been an associate professor of Health Sciences at Zaragoza University School of Medicine (Spain) since 2007. His research interests include glaucoma, diagnosis based on functional and structural imaging technologies and vitreo-retinal diseases.

He received his MD from the University of Zaragoza in 1996 and his PhD from the same university in 2003. The University of Zaragoza awarded him his doctorate. He became a consultant ophthalmologist and eye surgeon in the Miguel Servet university hospital, Zaragoza in 2003. Until 2010, he worked as a glaucoma and cataract surgeon, and he is currently a vitreoretinal surgeon and the deputy medical director of the surgical services in his hospital. Dr. Ferreras has been involved in numerous clinical trials and has been continuously funded by Spanish granting agencies since 2008. He has published numerous articles in the main scientific journals of his speciality and has served on several editorial boards. He obtained the Arruga award by the Spanish Society of Ophthalmology in 2010, which recognise the best research and professional trajectory of a Spanish ophthalmologist younger than 40 years old. He is the recipient of an International Ophthalmologist Education Award (2009) and an Achievement Award (2013) from the American Academy of Ophthalmology.

K. Bailey Freund, MD

Vitreous Retina Macula Consultants of New York
Clinical Professor of Ophthalmology, NYU School of Medicine, USA

K. Bailey Freund, MD specializes in all retinal disorders including macular degeneration, diabetic retinopathy, and retinal vascular diseases and is an expert in difficult-to-diagnose and rare conditions. He has initiated and conducted many clinical trials for treatments for retinal diseases. Dr. Freund is a Clinical Professor of Ophthalmology at New York University School of Medicine. He is a senior partner at Vitreous Retina Macula Consultants of New York. He is an attending surgeon at Manhattan Eye, Ear and Throat Hospital and New York Presbyterian Hospital.

Dr. Freund is a member of the Retina Society, Macula Society, and the American Society of Retina Specialists. He is on the Editorial Board of the journal Retina and is an Associate Editor for Retinal Cases & Brief Reports. He has authored over 250 peer-reviewed scientific manuscripts and has written numerous book chapters. He has received numerous awards including the prestigious Young Investigator Award from the Macula Society. He is a graduate of Williams College and the New York University School of Medicine and completed his residency training in general ophthalmology and fellowship in medical and surgical retina at the Manhattan Eye, Ear, and Throat Hospital. Dr. Freund is also a prominent collector of vintage magic apparatus.

Prof. Frank G. Holz, MD, FEBO

University Eyeclinic of Bonn, Germany

Frank G. Holz is Professor and Chairman of the Department of Ophthalmology at the University of Bonn, Germany. His major clinical interest is medical and surgical retina. His main research interests include the pathogenesis, biomarkers and new therapies for macular and retinal diseases including age-related macular degeneration. He has a keen interest in innovative retinal imaging technologies and image analysis strategies. He was a scholar of the German National Academic Foundation (Studienstiftung des deutschen Volkes), trained at the University of Heidelberg, Germany, and the University of Chicago/Pritzker School of Medicine, and passed a fellowhip at Moorfields Eye Hospital, London, with Prof. Alan C. Bird. Professor Holz has been a cofounder of the Priority Program AMD of the German Research Council (DFG) and founded the GRADE Reading Center Bonn to perform digital image analysis in clinical natural history and interventional trials with a focus on dry AMD. He is a Board Member of the German Ophthalmological Society (DOG), EURETINA, German Retina Society, Member of the Club Jules Gonin, the European Academy of Ophthalmology (EAO), the Macula Society, the Gass Club, Editor-in-Chief of Der Ophthalmologe, and serves a reviewer for many peer reviewed journals.

He has received numerous awards including the Pro Retina Macular Degeneration Research Award, the Leonhard-Klein Award for Ocular Surgery, the Alcon Research Institute (ARI) Award, and the Senior Achievement Award of the AAO. He published more than 400 articles in peer-reviewed journals and is editor of several books on retinal diseases.

Prof. Christian Mardin, MD, FEBO

Department of Ophthalmology, University Erlangen-Nürnberg, Germany

Christian Mardin is senior consultant at the department of ophthalmology of the University Erlangen-Nuernberg in Erlangen, Germany.

He graduated at the University of Erlangen (Germany) in 1991 and spent his residency with GOH Naumann at the University of Erlangen until 1996. He wrote his doctorate thesis with J Jonas on the morphometry of the human lamina cribrosa and is since than interested in posterior segment and disc imaging with emphasis on glaucomas. He led several projects funded by DFG (German Research Foundation) on the topic of optic disc imaging. He became associate professor in 2000 and full professor in 2006.

His research, publications and lectures emphasize on glaucoma diagnosis and genetics. He is a member of ARVO since 1990, DOG since 1991 and SIDUO since 1996.

Jordi Monés, MD, PhD

Hospital Quirón Teknon, Institut De La Mácula I De La Retina, Barcelona, Spain

Since 2007, Dr. Monés is Director of the Institut de la Màcula and the Director, principal investigator and one of the founder governors of the Barcelona Macula Foundation: Research for Vision since 2011. He is the Coordinator of Ophthalmology at the Centro Medico Teknon since 2010. He earned his Medicine and Surgery degree and his PhD cum laude in Medicine and Surgery at the Universitat de Barcelona. He specialized in Ophthalmology at Centro de Oftalmología Barraquer (Universitat Autònoma de Barcelona). He got his Retina Specialist degree at The Massachussets Eye and Ear Infirmary at Harvard University, and at Hospital San José at the Monterrey Institute of Technology and Higher Education (ITSM). His research particular fields of interest are macular diseases, choroidal neovascularization, macular degeneration, antiangiogenic therapy, anti PDGF therapy, geographic atrophy, retinal degeneration, retinal transplant, stems cells, gene therapy, macular edema, and vitreoretinal and macular surgery.

As founder and Medical Director of the Barcelona Macula Foundation: Research for Vision (BMF) is dedicated to fight blindness supporting and conducting research in retinal diseases that currently have no treatment. Dr. Monés is participating in three major European Union (EU) projects performed by several agencies from different countries. For the last twenty years, he's been a researcher in most of the international multicentre clinical trials for the treatment of AMD. Reference researcher as Principal Investigator in macular degeneration for the last 15 years. Currently, he is conducting Clinical and pre-Clinical trials in phases I, II, III and IV and Investigator driven trials (13 trials during 2014). He has published widely in scientific journals and specialist books and has given more than 300 talks at international congresses and meetings.

Prof. Norbert Pfeiffer, MD

The University Hospital Mainz, Chairman and Director of the Department of Ophthalmology Johannes Gutenberg University Eye Clinic, Mainz, Germany

Norbert Pfeiffer studied medicine at the Universities of Gießen, Newcastle upon Tyne (England), Würzburg, Freiburg and Cambridge (England) and received his M.D. degree from Freiburg University (summa cum laude). He majored in ophthalmology at the Universities of Freiburg and Mainz. After a fellowship in pharmacology at Freiburg University in the group of Prof. Starke he focused his research interest on the diagnosis and treatment of glaucoma. In 1995 he became chairman and director of the department of ophthalmology at Mainz University and served as the CEO of Mainz University Hospital from 1999 – 2002, 2008 – 2010 and 2012-2014.

He is a member of several national and international societies including the American Academy of Ophthalmology, the Association for Research in Vision and Ophthalmology and the prestigious Leopoldina and serves on the Executive Committee of the European Glaucoma Society. His research has focused on elucidating important aspects of the diagnosis and treatment of glaucomatous disease combining both morphological and functional aspects and introducing basic science methods into the clinical diagnosis and treatment of glaucoma. He has authored or co-authored well over 400 scientific publications and was awarded several scientific prices including the prestigious Galenus von Pergamon Prize for the introduction of innovative medical therapies.

Prof. José M. Ruiz-Moreno, MD, PhD

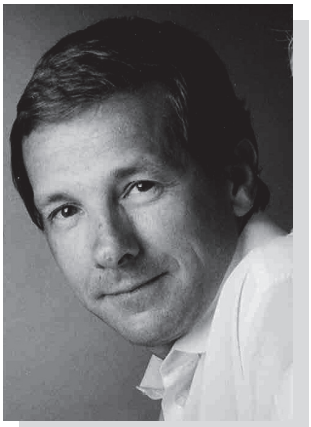
Universidad Castilla La Mancha, Catedrático de Oftalmología,
Albacete, Spain

Jose Maria Ruiz-Moreno, MD, PhD is a Professor of Ophthalmology University of Castilla La Mancha, Medical Director of the European Institute for Retina Baviera, and Chairman of the Clinical Unit Retina Albacete (UCRA), Spain. MD and PhD for the University of Zaragoza. He is currently President of the Spanish Society of Retina and Vitreous (SERV). His clinical work includes medical and surgical retina with a specific focus on Age-related Macular Degeneration, Macular edema and macular surgery.

His research interests include treatment of AMD by antiangiogenic drugs, treatment of macular edema and diagnostic imaging of macular pathology as angio-OCT and SS-OCT. He is a principal investigator of several clinical trials using antiangiogenic agents for AMD, diabetic macular edema and macular edema from other ethiologies. Professor Ruiz-Moreno has published many papers (169) in peer-reviewed journals with impact factor, Co-editor of 10 international books, author of 61 chapters in international books and is a member of Numerous international ophthalmological societies, Including the American Academy of Ophthalmology, Euretina, European Association for Vision and Eye Research, SERV and SEO.

Prof. Giovanni Staurenghi, MD

Sacco Hospital, University of Milano, Italy



Giovanni Staurenghi, presently Professor of Ophthalmology is Chairman of the University Eye Clinic at Department of Biomedical and Clinical Science “Luigi Sacco” University of Milan Italy.

He got his degree at the University of Pavia (Italy) in 1986 and his residency at the University of Milan(Italy) in 1990. He was research fellow at the Schepens Eye Research Institute from 1991 to 1992 and Visiting Scientist at the same Institute from 1992 to 1993. He became associate professor in 1999 and full professor in 2007.

His research, publications and lectures have an important bearing on retinal degeneration; in particular his work is oriented on different types of imaging and treatment. He has been a member of ARVO since 1988 and Silver medal FARVO, Macula Society since 2004, Ophthalmic Photographer Society since 2006 and American Accademy of Ophthalmology since 2007 and Gass Club.

He serves as Editorial Board Member for IOVS and as Reviewers. He has received numerous awards including the Junius Kunt Award.

Guest Speaker:

Prof. Eric Souied, MD, PhD

Hopital Intercommunal de Créteil, University of Paris XII, France

Professor Eric Souied earned his MD and PhD degrees in 1990-2006, at the University Paris Est (UPE). He completed his ophthalmology residency with Prof. Gabriel Coscas (1991-2006) and subsequently his fellowship with Prof. Gisele Soubrane (2006-2010). He also accomplished a post-doctoral fellowship on gene therapy at the Jules Stein Eye Institute, UCLA.

Prof. Eric Souied has contributed to more than 260 peer-reviewed publications in the areas of age-related macular degeneration (AMD), hereditary retinal diseases, ophthalmic genetics and multimodal imaging. He began in the field on genetics ophthalmology in 1993, working on genetics of retinitis pigmentosa and Stargardt disease. In 1995, he investigated a novel hypothesis: the role of genetics in AMD, and he published in 1998 the first paper about a genetic polymorphism linked with AMD, on the ApoE gene. In parallel, Prof. Eric Souied investigated the role of fatty acids in the occurrence of AMD and published the first interventional study about oral DHA in the prevention of exudative AMD, the NAT2 study, in 2013.

Besides these studies on genetic and environmental factors on AMD, Prof. Souied also leads a dynamic group focused on multimodal imaging of the macula. This team published many papers describing angiographic, SD-OCT, enface-OCT, OCT angiography, adaptive optic features in many macular conditions such as juvenile drusen, reticular pseudodrusen, chrorioretinal anastomosis, adult-onset foveomacular vitelliform dystrophy, geographic atrophy.

In addition, Prof. Souied explored emerging therapies and protocols for AMD, DME, RVO, including anti VEGF treatments. He has led or participated to several studies engaged in exploring new therapeutics.

In 2006, the Paris Est University attributed him a full time professor position and, in 1999, his hospital designed him as head of department of ophthalmology at both “Hopital Intercommunal de Creteil” and “Henri Mondor” hospital, in France. He is the founder president of the French “Association DMLA” and the founder president of the French society “Federation France Macula”.

MultiColor Imaging Revisited

Roberto Gallego-Pinazo, MD,PhD,DiSSO

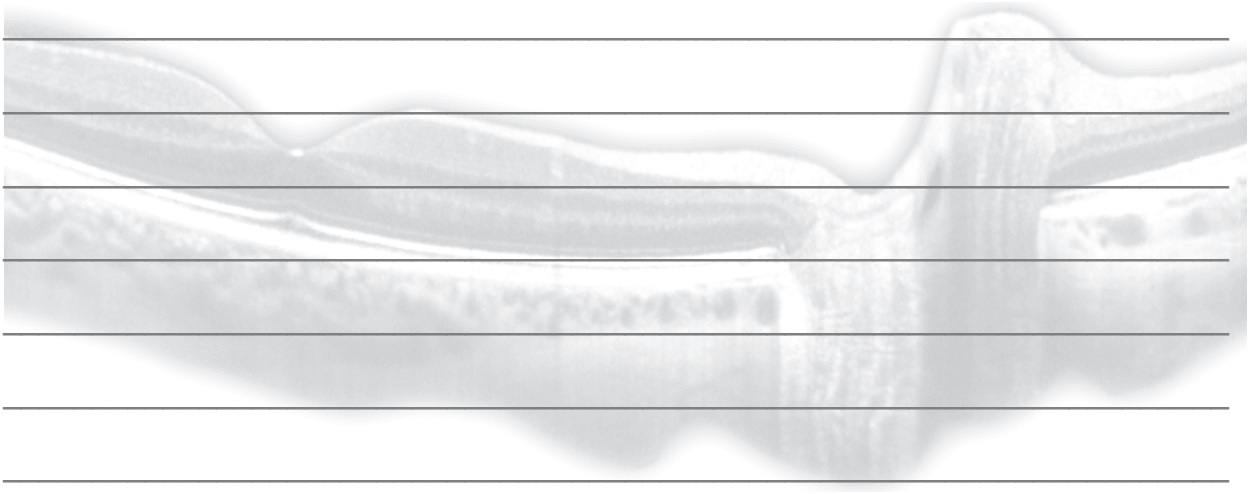
Unit of Macula, Department of Ophthalmology, University and Polytechnic Hospital La Fe, Valencia, Spain

The retina subspecialty has evolved within the last two decades more than any other specialty in medicine. Not only due to novel treatments that have been able to swift the visual prognosis of patients that were used to become blind in the past, but also and mainly due to the multimodal imaging diagnostic approach to retinal diseases. The more we can see as physicians, the more we will be able to prevent and treat.

MultiColor Imaging represents one of the newly developed diagnostic techniques adding further details and information to the rest of imaging modalities existing previously. The multispectral integration of blue, green and infrared wavelengths achieves a unique fundus image providing not only morphological information, but also enhancing different changes depending on their depth within the retinal tissue. Actually, in addition to the 30º acquisition, MultiColor images can be obtained with the 55º lens, providing a complete view of the posterior pole altogether with the midperipheral retina.

Multicolor images may reveal valuable information in a variety of macular and retinal diseases, improving the visualization of particular diagnostic findings: subretinal drusenoid deposits, deep retinal capillary plexus ischemia, subretinal melanotic lesions, outer retinal atrophy, vitreomacular interface abnormalities, geographic atrophy of the retinal pigment epithelium, and many others.

Notes



Update on Fundus Autofluorescence Imaging

Frank G. Holz, M. Fleckenstein, J. Steinberg, M. Gliem, P. Charbel-Issa,
S. Schmitz-Valckenberg

Department of Ophthalmology, University of Bonn, Germany

Purpose: Fundus autofluorescence (FAF) imaging is a non-invasive imaging method that allows for topographic mapping of naturally or pathological occurring fluorophores at the posterior pole. It is particularly helpful for the assessment of the retinal pigment epithelium/photoreceptor complex and macular pigment distribution. Herein, recent developments and applications using this imaging modality are reviewed.

Methods: The Spectralis instrument allows for both blue und green fundus autofluorescence imaging. Signals derived from fundus autofluorescence can now be quantified - quantitative autofluorescence imaging - qAF. To accomplish standardized measurements, a reference fluorophore is inserted into the optical pathway of the Spectralis instrument. Besides the generation of reference values in normal probands, patients with a wide variety of retinal diseases were examined.

Results: Fundus autofluorescence imaging provides information over and above conventional imaging modalities including fundus photography and fluorescein- or indocyanine green angiography. Thereby, refined phenotyping can be performed, e.g. in various retinal diseases with the common downstream pathogenetic pathways. Specific disease entities may be associated with discrete patterns of abnormality. The use of qAF has been shown to be useful for various assessments, e.g. to distinguish ABCA4-related macular dystrophies from other forms of macular dystrophies.

Conclusions: Fundus autofluorescence imaging is a non-invasive examination technique that is a helpful tool both for research application and for clinical routine. Due to the absorption properties of luteal pigment, FAF-imaging is also suitable to determine macular pigment optical density which may show variation with certain diseases. qFAF will be useful for monitoring therapeutic effects of pharmacological interventions as well as for natural history studies in monogenic and complex macular retinal diseases and is already implemented in clinical trials.

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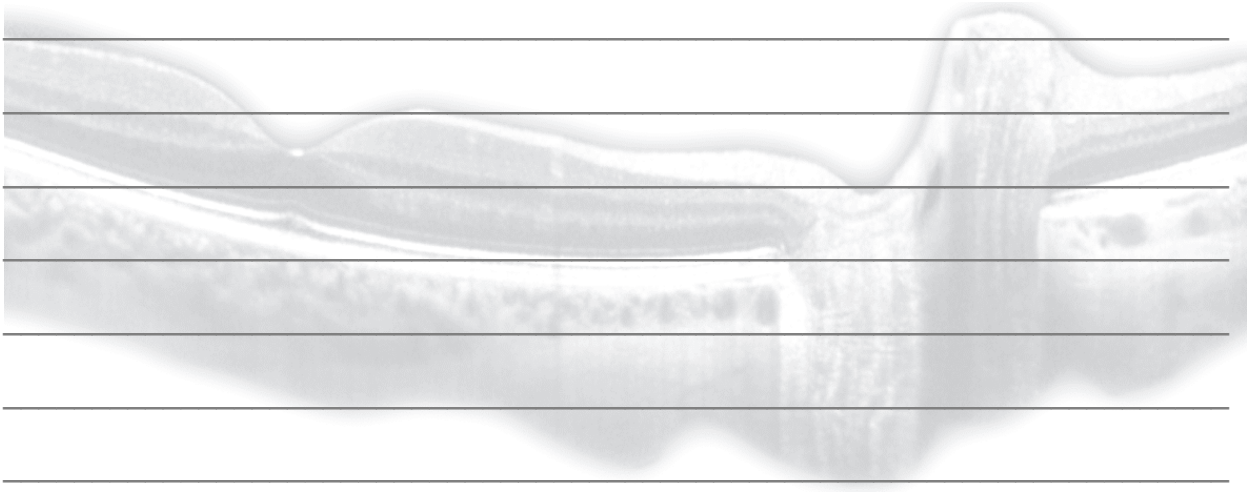

New Widefield OCT in Peripheral Diseases

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Eye Clinic, Department of Biomedical and Clinical Science “Luigi Sacco”,
Sacco Hospital, University of Milan, Italy

Purpose: To investigate the ability of the new wide-field 55 degrees Spectral Domain Optical Coherence Tomography (SD-OCT) imaging in mid-extreme peripheral retinal diseases.

Methods: Observational case series of 22 eyes of 22 subjects. Only patients encompassed in instrument database (Eye Explorer, Heidelberg Engineering, Germany) with retinal lesions in mid or extreme periphery were included in the study. All patients underwent a prototype 70MHz Spectral Domain OCT2 (Heidelberg SPECTRALIS, Heidelberg Engineering, Germany); several single averaged B-scans with different scan angle were collected using a 55 degrees lens (approx. 16.5mm). Multiple single cross lines per eye were reviewed and morphologic characteristics of choroid, retina and vitreous investigated. Neither enhanced depth imaging nor enhanced vitreous imaging modality was used for improve scans quality.

Results: Lesions reported in our study were distributed in all quadrants. Peripheral wide-field SD-OCT were obtained in 6 patients with vitreoretinal interface lesions, in 5 eyes with retinal detachment, in 3 patients with retinoschisis, in 3 eyes with choroidal lesions, in 2 subjects with peripheral exudative hemorrhagic chorioretinopathy (PEHCR), in 2 patients with vascular disease and in 1 patient affected by retinal detachment associated with retinoschisis.

Overall imaging quality was satisfactory with vitreous, retina, and choroid assessable simultaneously in most of the scans.

Conclusions: Wide-field 55 degrees SD-OCT is a useful adjunctive tool for diagnosis and follow up of peripheral retinal diseases. Moreover simultaneous 55 degrees infrared reflectivity and flexible head camera allow easier lesion localization in extreme periphery and maximize the angle of view.

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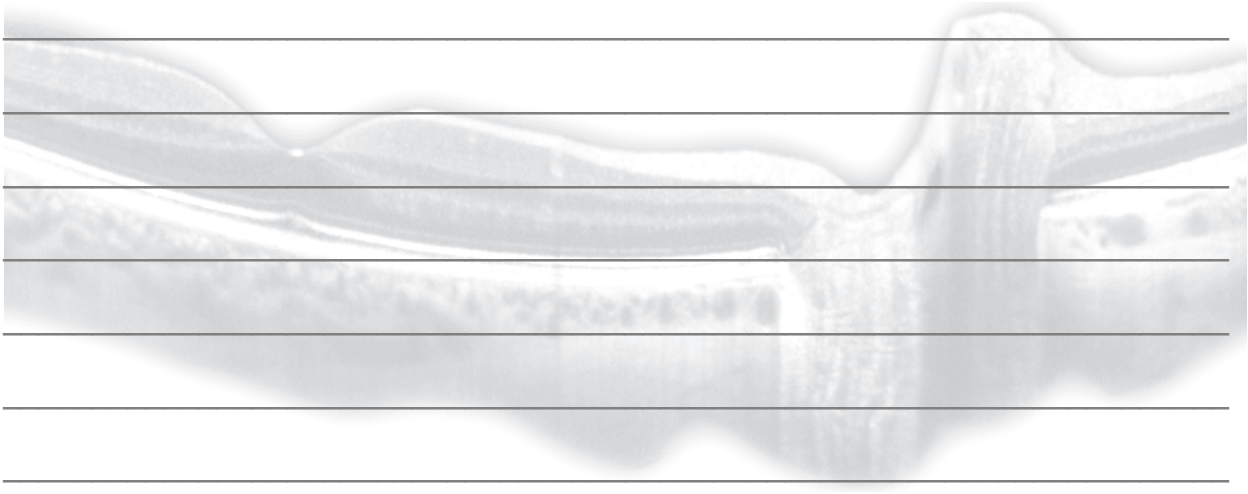

SPECTRALIS Glaucoma Module Premium Edition

Julian Garcia Feijoo, MD, PhD

Hospital Clinico San Carlos, Departamento de Oftalmologia, Facultad de Medicina, Universidad Complutense de Madrid and Instituto de Investigacion Sanitaria del Hospital Clinico San Carlos (IdISSC), Madrid, Spain

Glaucoma is one of the leading causes of blindness and visual impartment in Europe. Current OCT technology allows for a better diagnose and follow up of the glaucoma patients and glaucoma suspects. However, OCT is not as reliable in eyes with some anatomic characteristics, such as myopic changes. Moreover monitoring for progression of the disease is a key aspect of the glaucoma management. For these reason it is crucial to obtain not only more information but reliable data.

The new glaucoma software implements a more detailed analysis of the RFNL and the optic nerve head (Rim) and is of help when studying eyes with a "non-standard" anatomy. As the total measurement time using with this software increases, an adequate tracking system is needed and has been implemented. This combination of new software with a more accurate eye tracking improves the reproducibility of the measurements. It makes possible a detailed analysis increasing the capacity of the OCT to detect minimal changes.

Also the analysis of the structural data obtained with the retina segmentation (GCL map), rim analysis, and RNFL can help to diagnose glaucoma and rule out other conditions that may mimic glaucomatous damage.

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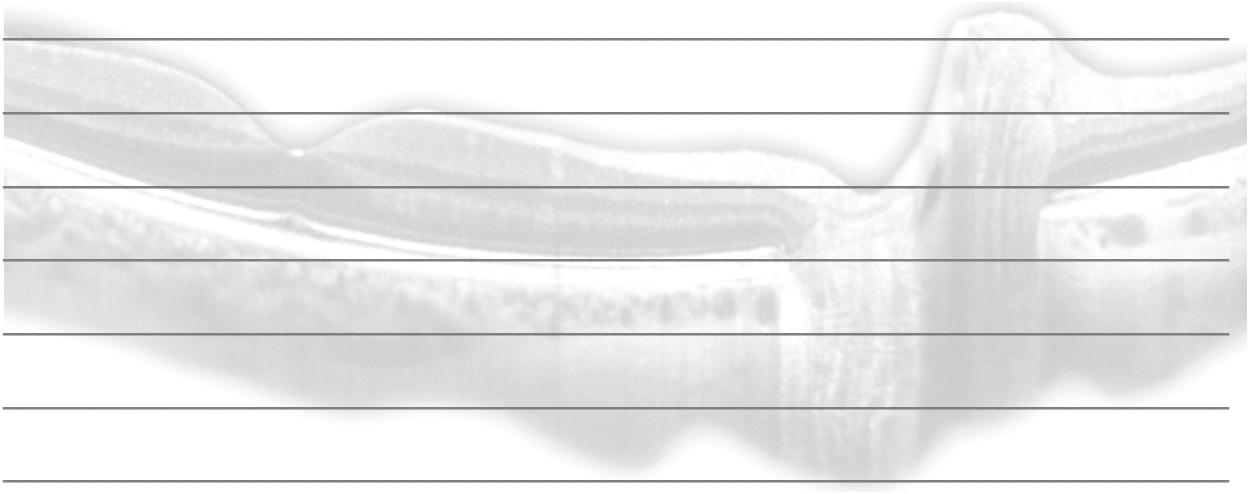

Geographic Atrophy in Patients Receiving Anti-VEGF Therapy for Neovascular AMD

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Purpose: To report a series of age-related macular degeneration (AMD) patients in whom progression to geographic atrophy (GA) in an eye receiving frequent intravitreal injections of anti-vascular endothelial growth factor (anti-VEGF) for type 1 neovascularization (NV) was slower than that in the fellow eye with non-neovascular AMD.

Methods: This retrospective, observational case series studied the clinical course and GA progression rate in 4 patients in which one eye had converted to type 1 neovascular AMD and was receiving anti-VEGF therapy, while the fellow eye manifested signs of non-neovascular AMD only. Eligibility criteria included anti-VEGF therapy duration of over 4 years and over 50 injections. Lesion evolution was documented via multimodal imaging. GA at baseline and final visits was quantified and GA progression rate for each eye was determined.

Results: Four nonconsecutive patients (1 male; 3 females); mean age of 85.5 years (range 76 - 95) were followed for a mean interval of 94 months (range 62 -120). One eye harbored type 1 NV while the fellow eye remained non-neovascular. The former received a mean of 65.5 ± 15.2 anti-VEGF injections. The mean rate of GA progression in non-neovascular eyes was 0.076 ± 0.024 mm2/month and in type 1 NV eyes was 0.004 ± 0.005 mm2/month. The difference in GA progression rate between type 1 and non-neovascular eyes was found to be statistically significant (P = 0.001).

Conclusion: These findings support previous hypotheses that, unlike type 2 and 3 lesions, type 1 NV may represent a neovascular AMD subtype more resilient to GA formation. This may have implications for anti-VEGF regimens in the management of type 1 NV.

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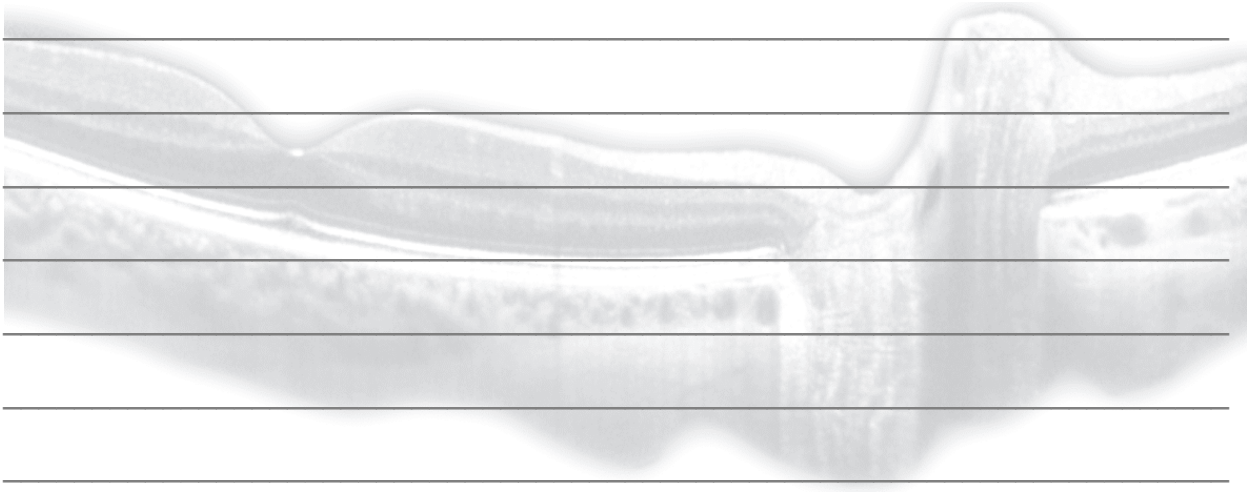

Ghost Drusen

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University Paris Est Creteil, Creteil, France

Purpose: We observed hypereflective dome-shaped or pyramidal structures (HPS) on spectral-domain optical coherent tomography (SD-OCT) in patients affected with geographic atrophy (GA). Our purpose was to describe the multimodal imaging features of HPS identified in areas of GA in age-related macular degeneration (AMD) patients.

Methods: This is a retrospective case series of GA patients harboring HPS in atrophic areas. Multimodal imaging examination including infrared (IR) reflectance, fundus autofluorescence (FAF) and SD-OCT, was performed for each patient. IR and FAF appearance and mean SD-OCT height of the structures in GA were analyzed.

Results: A total of 36 eyes of 25 patients (20 women; mean age 82.3±5.9 years, range 73-92 years) with GA were included. A total of 96 HPS in GA were analyzed by SD-OCT. In all HPS (96/96; 100%), the peripheral part was hypereflective. In 66/96 HPS (69%) the center was heterogeneously hyperreflective, whereas in 30/96 HPS (31%), the center was hyporeflective. On IR reflectance images, HPS in GA appeared as hyporeflective lesions surrounded by hypereflective halos, within an area of background hypereflectivity due to GA in all eyes On FAF, 39/96 HPS (41%) were heterogeneously hyper-autofluorescent, whereas 57/96 HPS (59%) were hypo-autofluorescent. Mean height of HPS was 91±50.9 µm in the foveal scan (range 42 to 291 µm).

Conclusion: We describe a multimodal imaging of distinctive lesions that presented as hypereflective pyramidal structure on SD-OCT. Because these HPS appear in GA areas, and because of their pyramidal or dome-shaped aspect on SD-OCT, we suggest the name of “ghost drusen”.

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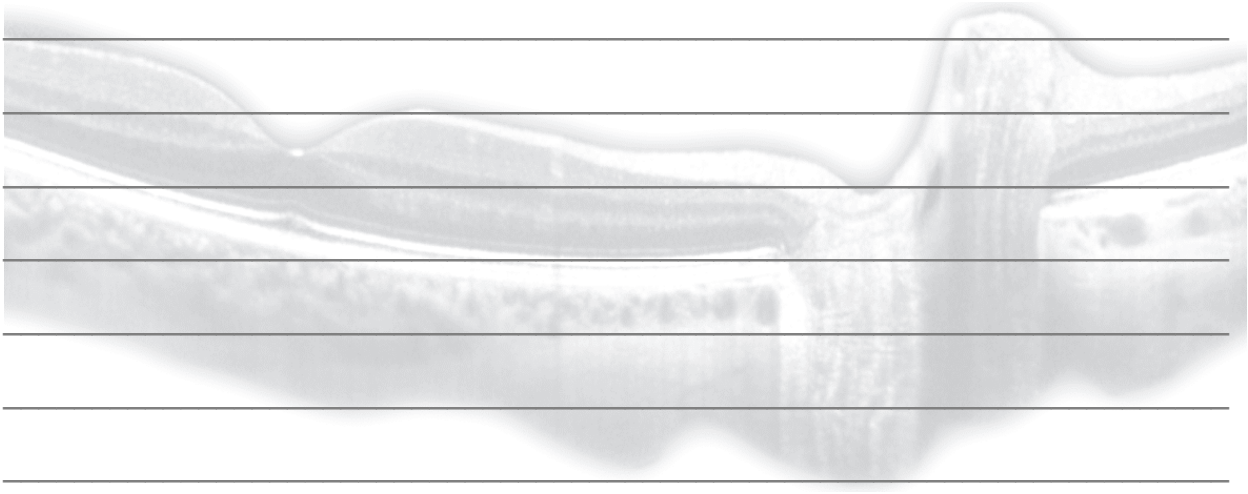

Probing Dry AMD – What is the best approach?

Frank G. Holz

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Purpose: Dry AMD age-related macular degeneration encompasses a wide spectrum of phenotypic variations. The pros and cons of different imaging modalities for clinical assessment will be reviewed. Furthermore, directional kinetics of the spread of geographic atrophy (GA) is explored in eyes with foveal sparing.

Methods: Eyes with dry AMD pathologies including reticular pseudodrusen, sub-RPE drusen, hyperpigmentations, and geographic atrophy were examined. Longitudinal examinations were conducted with fundus autofluorescence (FAF; excitation wavelength, 488 nm; emission wavelength, >500 nm) and near infrared (NIR) reflectance imaging (Spectralis HRA+OCT or HRA2; Heidelberg Engineering, Heidelberg, Germany). Areas of foveal sparing and GA were measured by 2 independent readers using a semiautomated software tool that allows for combined NIR reflectance and FAF image grading (RegionFinder; Heidelberg Engineering). A linear mixed effect model was used to model GA kinetics over time.

Results: For detection of reticular pseudodrusen FAF, NIR reflection and multicolor imaging along with SD-oCT imaging are most suitable. While cSLO-based imaging modalities allow for highly accurate and reproducible area determinations in presence of GA, SD-OCT imaging enables differentiation of different border phenotypes which may have an impact on local progression. Hyperpigmentary lesions can now be detected automatically with a novel image analysis software. Mean area progression of GA toward the periphery was 2.27±0.22 mm^2/year and 0.25±0.03 mm^2/year towards the center. Analysis of square root-transformed data revealed a 2.8-fold faster atrophy progression toward the periphery than toward the fovea. Faster atrophy progression toward the fovea correlated with faster progression toward the periphery in presence of marked interindividual differences.

Conclusions: FAF imaging still represents the gold standard for GA identification and quantitative assessments over time and serves as anatomic outcome parameter in interventional clinical trials approved by regulatory authorities. Imaging modalities including cSLO-fundus autofluorescence imaging and SD-OCT images have added substantially to the understanding of the advanced form of dry AMD. The results demonstrate a significantly faster centrifugal than centripetal GA spread in eyes with GA and foveal sparing. Quantification of directional spread characteristics and modeling may be useful in the design of interventional clinical trials aiming to prolong foveal survival in eyes with GA.

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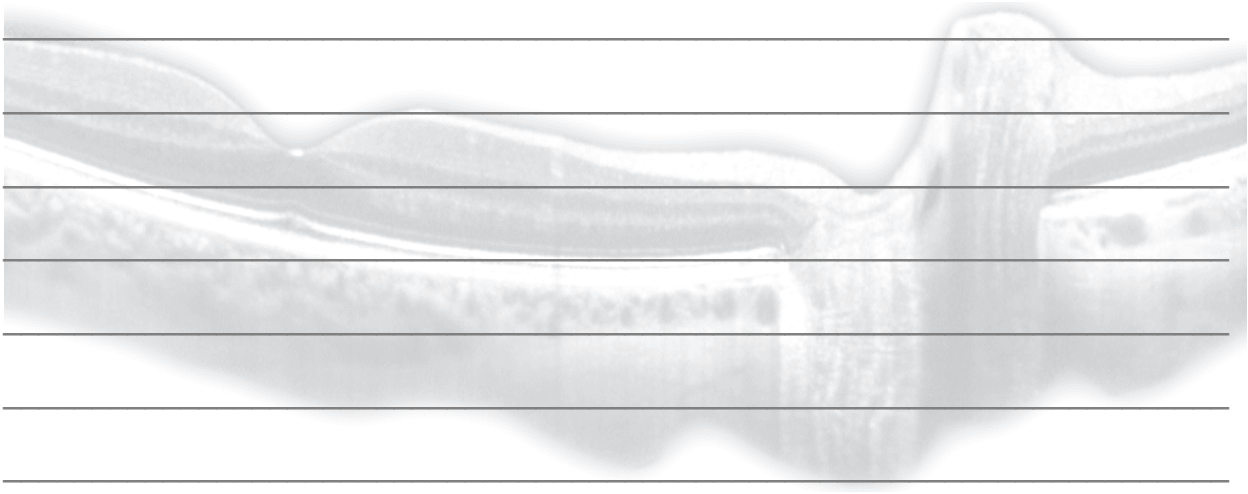

Beyond Exudative Manifestations in Neovascular AMD

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The monitoring and treatment strategies in patients with neovascular Age-Related Macular Degeneration (AMD) basically depend on the presence of any exudative sign in the optical coherence tomography (OCT) scans at each one of the follow-up visits. However, the histoarchitectural information provided by the OCT goes much more beyond these simple findings. However, patients with neovascular AMD may eventually show and develop atrophic changes that might be strongly associated with their visual prognosis.

The presence of outer retinal tubulations, outer retinal pseudoswelling, onion sign, inner intraretinal pseudocysts and subretinal clefts will be retrospectively assessed in a cohort of patients with neovascular AMD, and their correlation with the visual prognosis and treatment response will be analyzed.

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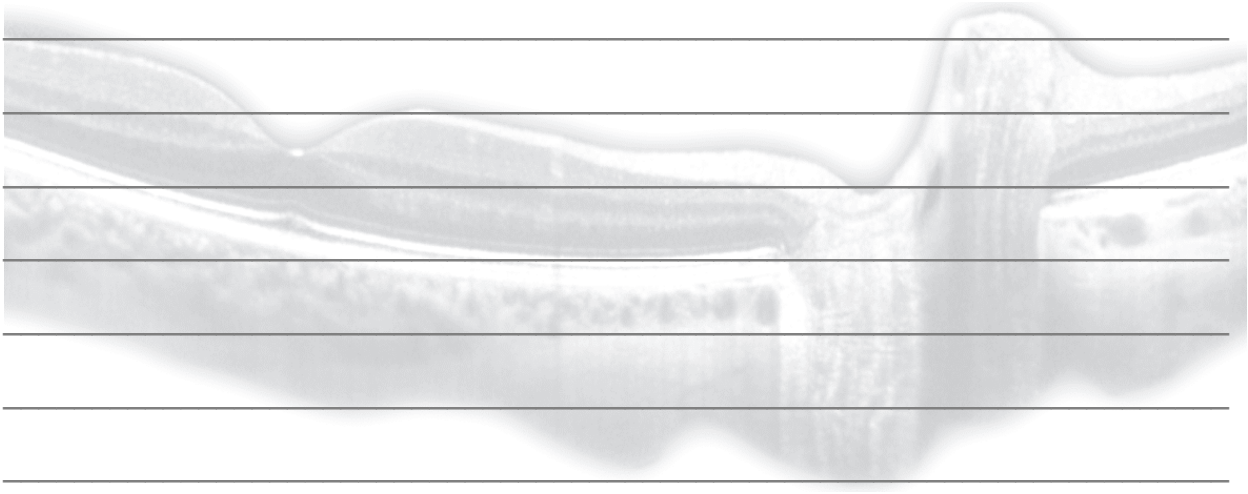

Idiopathic Macular Telangiectasia Type 2 Associated with Acquired Vitelliform Lesion

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Purpose: To describe cases of idiopathic macular telangiectasia type 2 (MacTel-2) associated with an acquired vitelliform lesion (AVL).

Methods: Case series of 3 patients with MacTel-2 and coexisting AVL. Complete ophthalmic examination and multimodal imaging was performed.

Results: Four eyes of 3 patients (2 females and 1 male) with a mean age of 44.3 years were included. Dilated funduscopic examination revealed a bilateral greyish appearance and loss of transparency of the temporal juxtafoveal retina in all eyes consistent with MacTel-2 along with a yellowish material deposit, compatible with an AVL. Fluorescein angiography revealed parafoveal telangiectatic capillaries most prominent temporally with late leakage, in accordance with MacTel-2, and blocked fluorescence at the level of the AVL. Spectral-domain optical coherence tomography showed accumulation of hyperreflective material in the subretinal space and a focal disruption in the ellipsoid layer temporally to the fovea as well as some retinal cavitation-like changes, respectively in agreement with both AVL and MacTel-2. No drusen were found in either case and the AVLs were hyperautofluorescent. No treatment was warranted.

Conclusions: Adult AVLs can be present in a variety of different clinical entities. AVLs associated with MacTel type 2 are an uncommon finding and a multimodal imaging strategy is useful for its diagnosis.

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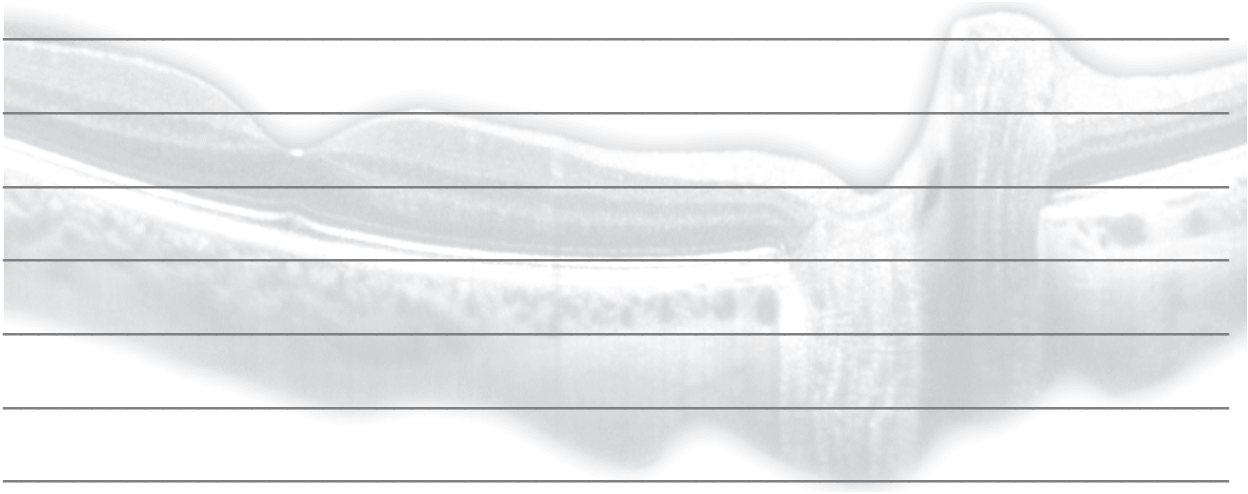

Near-Infrared Autofluorescence Imaging in Central Serous Choroidopathy

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Ester Francés-Muñoz, Consuelo Arroyo-Bermúdez

Hospital Arnau de Vilanova, Valencia

Fundus AutoFluorescence (FAF) (excitation wavelength of 488 nm) provides functional images of the eye fundus by employing the stimulated emission of light from endogenous fluorophores. Among them, lipofuscin is the most significant.

In the case of RPE cells, the buildup of lipofuscin is mainly related to phagocytosis of damaged photoreceptor outer segments and altered molecules retained within lysosomes, which eventually become lipofuscin.

Moreover, Near-Infrared fundus Autofluorescence (NIA) (excitation wavelength of 787 nm) is able to study RPE, choriocapillaris, and choroid, by determining melanin fluorescence.

Our purpose is to describe the standard Fundus AutoFluorescence (FAF), Near-Infrared Autofluorescence (NIA) and Optical Coherence Tomography (OCT) patterns in 20 Central Serous Choroidopathy patients with at least three months of follow up.

We present the results of these useful imaging techniques as well as the correlation among them in the diagnosis and follow up of Central Serous Choroidopathy.

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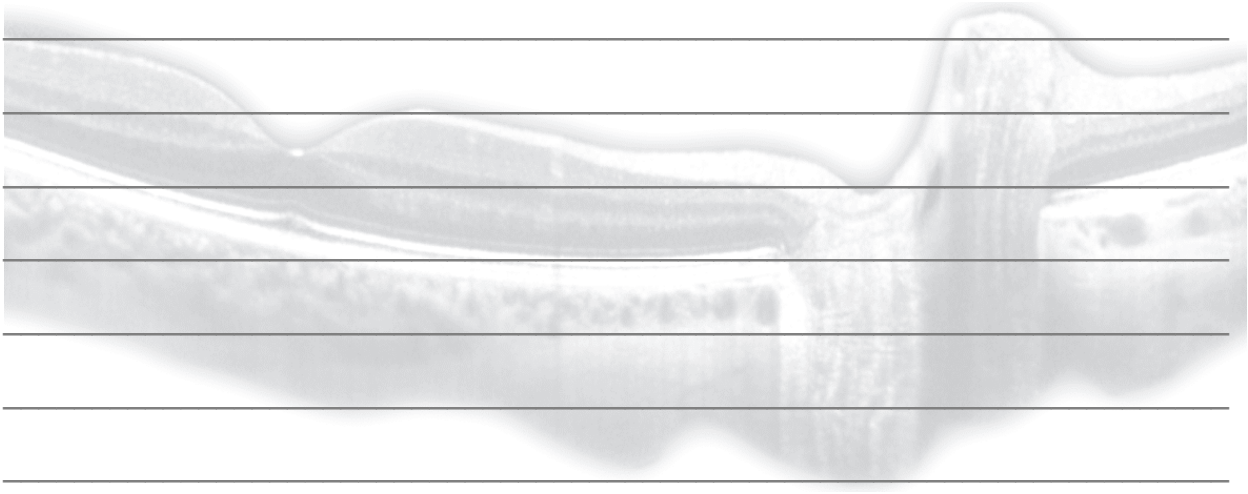

Ocular Tumors

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Eye Clinic, Department of Biomedical and Clinical Science “Luigi Sacco”, Sacco Hospital, University of Milan, Italy

Purpose: To investigate the advantages offered by a novel Wide Field Spectral Domain-Optical Coherence Tomography (WF SD-OCT) device characterized by Long Term Averaged B- scans in the detection and follow up of chorioretinal affections examined at the ocular oncology service of Luigi Sacco Hospital, University of Milan, Italy.

Methods: Case series study performed using a prototype (OCT2 module) derived from the Heidelberg Spectralis HRA+OCT (Heidelberg Engineering, Heidelberg, Germany). Patients presenting with peripheral and posterior lesions difficult to be examined secondary to their anterior position or thickness were included in the study.

Results: 54 eyes affected by miscellaneous chorioretinal affections were included in the study. 6 patients suffered of peripheral exudative hemorragic chorioretinopathy (PEHCR), 13 displayed choroidal nevi, 8 uveal melanomas and 3 had choroidal metastasis. Additionally there were 4 choroidal osteomas, 7 choroidal hemangiomas, 8 vasoproliferative tumors of the retina and 5 sclero-choroidal calcifications. In all cases continuous averaging allowed good visibility of both the deep structures and the vitreous. High quality images could be obtained also anteriorly to the equator requiring poor or no pupil dilation.

Conclusions: We evaluated a new prototype of SD-OCT capable to obtain wide field imaging of the retina and choroid characterized by faster images acquisition. WF SD-OCT offered a comprehensive view of both retinal and choroidal affections with the possibility of imaging thicker lesions compared to standard devices. In the future this may represent a useful tool in the daily practice adding useful informations to ocular ultrasonography.

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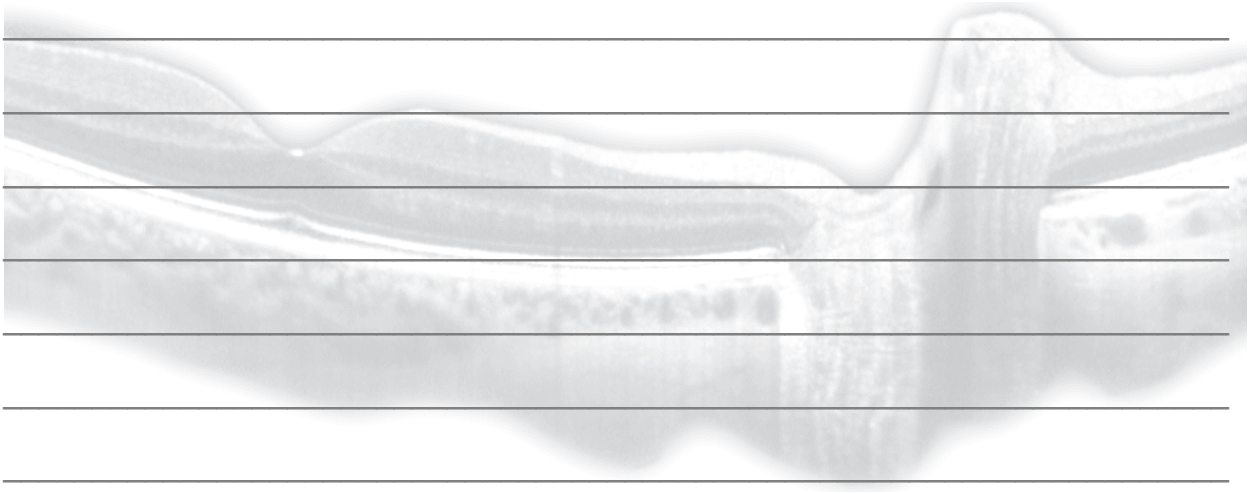

Ocular Inflammation

Alessandro Invernizzi MD

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Purpose: The aim of the presentation is to analyze the possible use of multi imaging with particular focus on the EDI-OCT and the wide field OCT (OCT2) in the field of uveitis.

Material and Methods: Review of the literature on multi imaging in uveitis and case series of patients affected by inflammatory conditions investigated by multi imaging including standard OCT, EDI-OCT and OCT2

Results: Recent innovations in the imaging technology have drastically changed the management of ocular inflammatory conditions in the last decade. The combination of different imaging techniques, in particular ICGA and EDI-OCT allow the clinicians to better understand, diagnose and manage several kind of uveitis. In our series the OCT2 resulted superior to the standard OCT in the study of different inflammatory conditions allowing a better management of the disease.

Conclusions: A multi imaging approach can help the clinicians in the management of inflammatory conditions of the eye. Non invasive techniques, in particular EDI-OCT, represent the best tool for the follow-up of patients affected by uveitis. Wide field OCT expands the potentials of non invasive imaging allowing to visualize and image the majority of inflammatory lesions.

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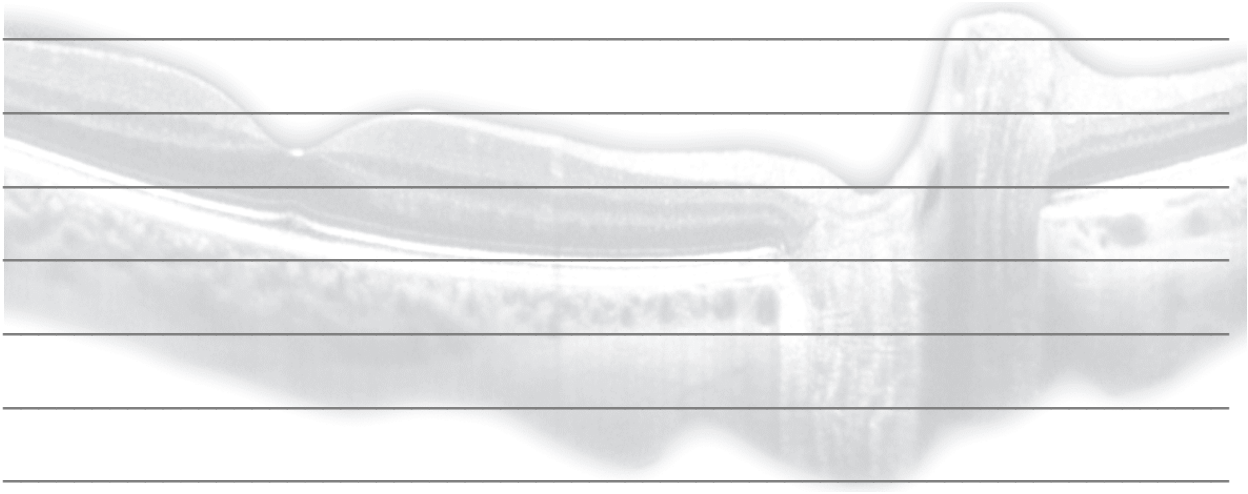

The Pachychoroid Spectrum

K. Bailey Freund, MD

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Purpose: To correlate clinical manifestations with multimodal imaging in pachychoroid disorders including central serous chorioretinopathy (CSC), pachychoroid pigment epitheliopathy (PPE), pachychoroid neovasculopathy (PNV) and polypoidal choroidal vasculopathy (PCV).

Methods: Patients with pachychoroid spectrum diagnoses were identified non-consecutively through a review of charts and multimodal imaging including *en face* OCT and OCT angiography. Each eye was categorized as uncomplicated pachychoroid, PPE, CSC, PNV or PCV.

Results: Choroidal thickness maps confirmed increased thickness under areas of PPE, CSC, type 1 NV (PNV), or polyps (PCV). *En face* OCT showed dilated outer choroidal vessels in all eyes. In several eyes with chronic disease, focal choriocapillaris atrophy with inward displacement of deep choroidal vessels was noted.

Conclusion: Although clinical manifestations of pachychoroid spectrum disorders vary considerably, these entities share morphologic findings in the choroid, including increased thickness and dilated outer choroidal vessels. *En face* OCT localizes these changes to disease foci and shows additional findings that may unify our understanding of disease pathogenesis.

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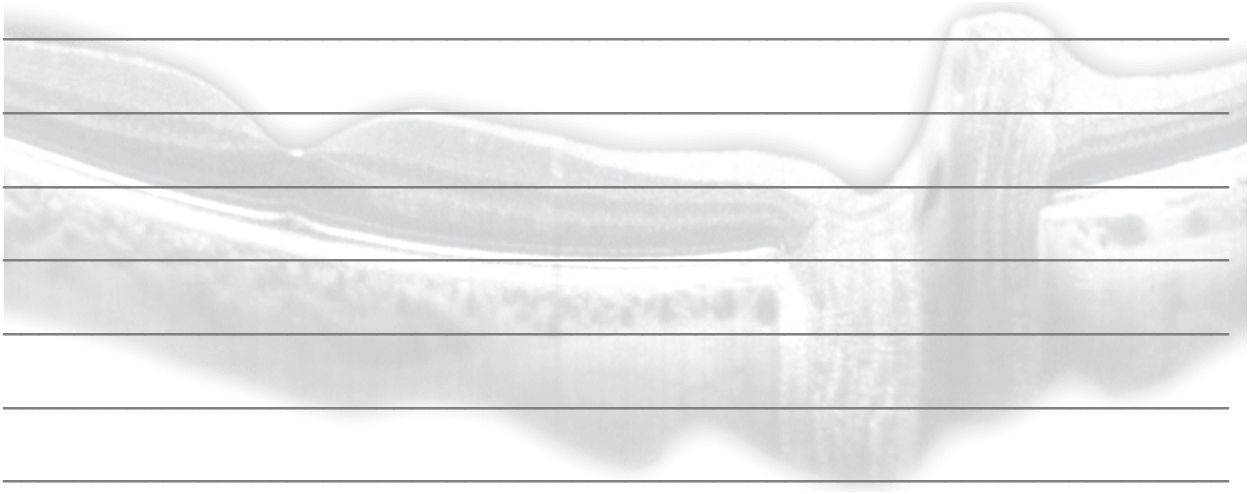

Chorioidal Neovascularization: OCT Angiography versus Multimodal Imaging

Eric H Souied

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Purpose: Optical coherence tomography angiography (OCT-A) is a novel and non-invasive technique for imaging retinal microvasculature by detecting changes in reflectivity related to blood flow. Our purpose of was to describe type 1, type 2, type 3 NV characteristics in AMD using OCT-A.

Methods: Consecutive patients with CNV related with AMD were prospectively included. All patients underwent a complete ophthalmological examination including color and infrared fundus photography, fluorescein and indocyanine green angiography, spectral-domain OCT and OCT-A.

Results: Type 1 CNV presented as a tangled pattern or blossoming tree. The type 2 lesion could be detected by OCT-A, presenting as a hyper-flow lesion in the outer retina and the choriocapillaris layer, and harboring a glomerulus shape or a medusa shape surrounded by a dark halo. OCTA of treatment naïve type 3 neovascularization showed almost constantly a high flow, tuft-shaped abnormal outer retinal proliferation, frequently associated to a small glomerular lesion in the chaoriocapillaris layer. In fibrotic eyes, a remaining blood flow inside the fibrotic scar could be detected in 94% of cases.

Conclusion: OCT-A may be a new imaging method for diagnosis of CNV in clinical routine. OCT-A of subretinal fibrosis showed almost constantly a perfused, abnormal vascular network and collateral architectural changes in the outer retina and the choriocapillaris layer.

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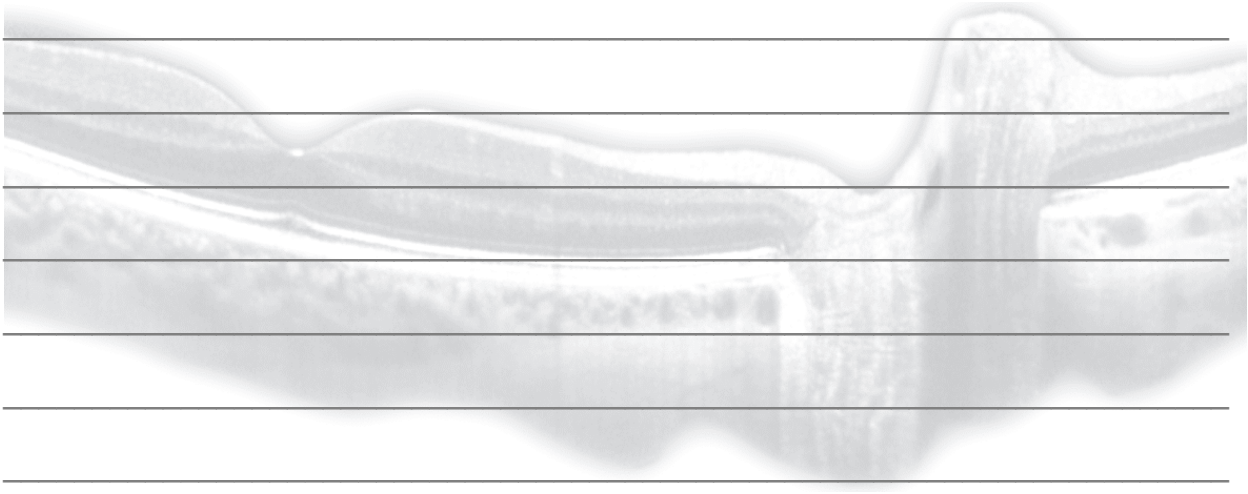

Optic disc Haemorrhage and Laminar Defects: Fact or Fiction?

Balwantray C. Chauhan

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Purpose: Recent studies suggest a causal relationship between optic disc hemorrhages (ODH) and peripheral lamina cribrosa defects. We objectively determined the frequency of laminar disinsertions (LD) in glaucoma patients with and without a history of ODH, as well as the spatial correspondence between LD and ODH. The strength of the current study design was that patients were selected on the basis of a history of ODH without prior review of OCT images, minimizing bias introduced by retrospectively determining ODH history in eyes with LD.

Methods: With stereo optic disc photographs supplemented with clinical notes from 2 prospective studies, we identified 52 eyes of 46 patients with a history of ODH (ODH group). We then identified 52 control eyes of 46 patients with no documented history of ODH (non-ODH group). The date and position of the ODH was noted. Spectral domain OCT (high resolution, 24 radial B-scans centred on the optic nerve head in enhanced depth imaging mode; Spectralis, Heidelberg Engineering) images were de-identified. A trained observer, masked to patient group and position of ODH determined the presence of LD in each of the 48 positions (2 per B-scan) in each image with a confidence score of 1 (most confident) to 5 (least confident). For this analysis only LDs with a score of ≤ 3 were included. The frequency and spatial location of LD in the two groups as well as the spatial correspondence of LD to ODH was examined.

Results: The ODH and non-ODH groups matched for age [70.6 (sd, 9.6) and 74.0 (sd, 11.4) years, respectively (P = 0.11)] and visual field damage [Mean Deviation = -6.11 (sd, 5.56) and -6.52 (sd, 5.01) dB, respectively (P = 0.70)]. Eyes in the ODH group were almost twice as likely to have LD compared to eyes in the non-ODH group (P < 0.01). Fifty (96%) eyes in the ODH group had LD, with 32 (62%) eyes having multiple LD, while 27 (52%) eyes in the non-ODH had LD, with 7 (13%) eyes having multiple LD. The width of LD in the ODH and non-ODH was similar [28.8° (sd, 16.3°) and 28.2° (sd, 18.9°) respectively (P = 0.92)]. Of the total of 84 ODH, only 33 (39%) corresponded spatially with LD, while the remaining ODH occurred in areas with no LD (Figure).

Conclusions: Our results confirm the strong association between LD and ODH. However, a significant number of LD also occur in patients with no documented history of ODH. Finally, there was a relatively poor spatial correspondence between LD and ODH.

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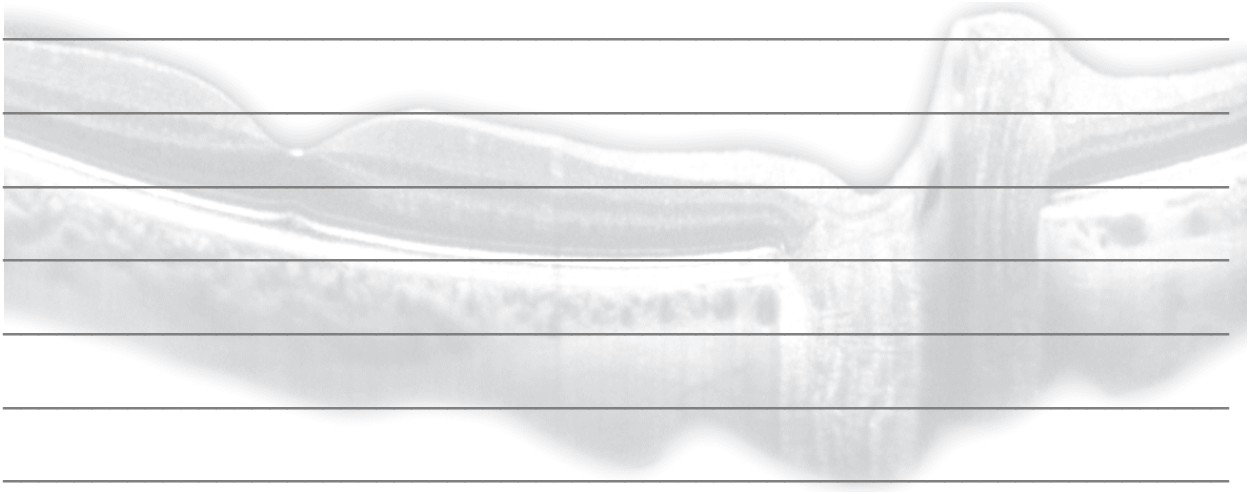

Appearance of Optic Nerve Head in OCT: In Vivo Meets Ex Vivo Histology

Christian Mardin MD, F.E.B.O., C. Rummelt

Department of Ophthalmology, University Erlangen-Nürnberg, Erlangen, Germany

Purpose: To correlate optic disc findings in histology slides to spectral domain optical coherence tomography (SD-OCT).

Methods: Three eyes of three patients were examined with Spectralis OCT's (Heidelberg Engineering) star scan (48 disc centered scans with 96 measuring points) prior to surgical enucleation due to ciliary body melanoma, iris melanoma and orbital malignancy after informed consent. Standard histology preparation was performed using horizontal, serial sections through the optic disc's center. Staining was done in HE and PAS. Slides through the center of the optic disc were correlated with OCT's star scan sections.

Results: Although there were clearly visible artifacts due to histological preparation Elschnig's tissue and scleral spur, Bruch's membrane, Choroid and RPE ending could clearly be correlated with OCT cross-section images. Elschnig's scleral spur and Bruch's membrane were identified as border of the optic disc. OCT was not able to visualize lamina cribrosa's posterior part. Shadowing artifacts by retinal vessels are still a challenge for OCT imaging of optic disc structures.

Conclusions: SD-OCT can by all means be called in vivo histology with the limitation of scan depth and optic artifacts.

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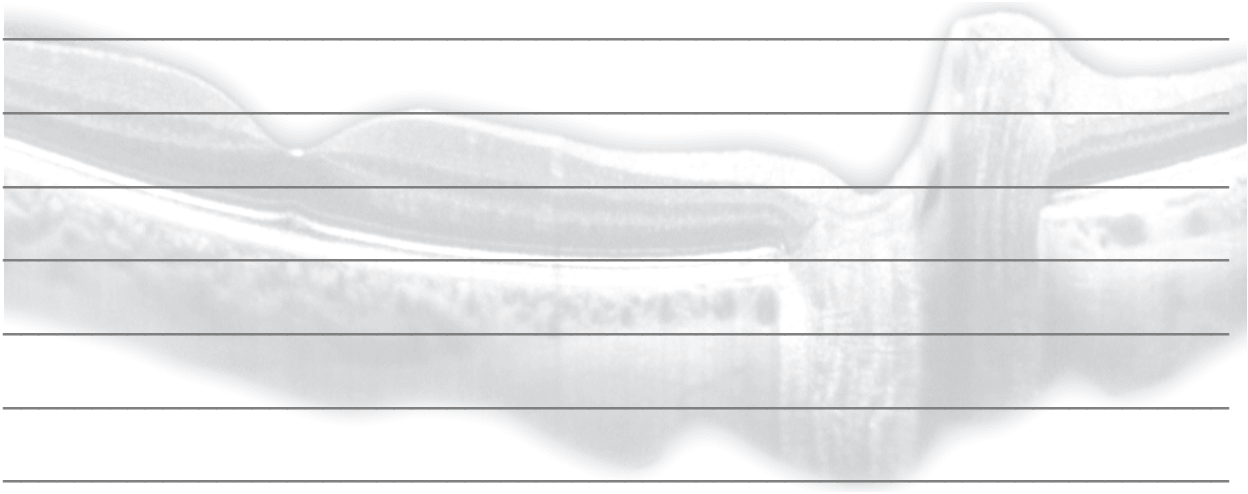

BMO-MRW in Patients with Glaucomatous and Simple Optic Atrophy

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Purpose: To compare the new geometrically and anatomically accurate parameter Bruch's membrane opening-minimum rim width (BMO-MRW) with retinal nerve fiber layer (RNFL) measurements in patients with glaucomatous and simple optic atrophy and healthy controls.

Methods: Nineteen patients clinically diagnosed with simple optic atrophy, 41 patients with ocular hypertension, 50 glaucoma suspects, 50 perimetric glaucoma patients and 40 healthy controls were recruited for this prospective cross-sectional study. Each patient and control had slit-lamp biomicroscopy, funduscopy and Spectral-Domain Optical Coherence Tomography (Spectralis, Heidelberg Engineering GmbH) performed on the same day. We analyzed BMO-MRW, RNFL average and in six sectors.

Results: In patients with simple optic atrophy average RNFL (69 ± 21.5 µm) was significantly reduced compared to healthy controls (92 ± 10.8 µm, $p<0.001$).

Average BMO-MRW showed no significant difference between patients with simple optic atrophy (276 ± 69.5 µm) and healthy controls (296 ± 93.1 µm; $p=0.427$). RNFL temporal superior sector showed highest diagnostic accuracy to distinguish between simple optic atrophy and healthy controls (AUROC=0.817, 76.9% sensitivity at 90% specificity).

Average BMO-MRW was 284.5±76.4 µm for patients with ocular hypertension, 215.0±66.2 µm for glaucoma suspects and 162.6±48.8 µm for perimetric glaucoma patients.

Average RNFL was 90.5±11.5 µm for patients with ocular hypertension, 77.1±12.1 µm for glaucoma suspects and 62.9±12.7 µm for perimetric glaucoma patients. RNFL nasal superior sector (AUROC=0.811±0.052) and BMO-MRW temporal inferior sector (AUROC=0.768±0.062) showed highest diagnostic accuracy to distinguish between glaucomatous optic atrophy and healthy controls.

Conclusions: Simple optic atrophy patients showed a significant loss of peripapillary RNFL, but not BMO-MRW compared to healthy controls. Glaucomatous patients showed significant loss of both BMO-MRW and RNFL. Both BMO-MRW and RNFL might be helpful for the clinician to differentiate between simple optic atrophy, glaucomatous optic disc damage and healthy controls.

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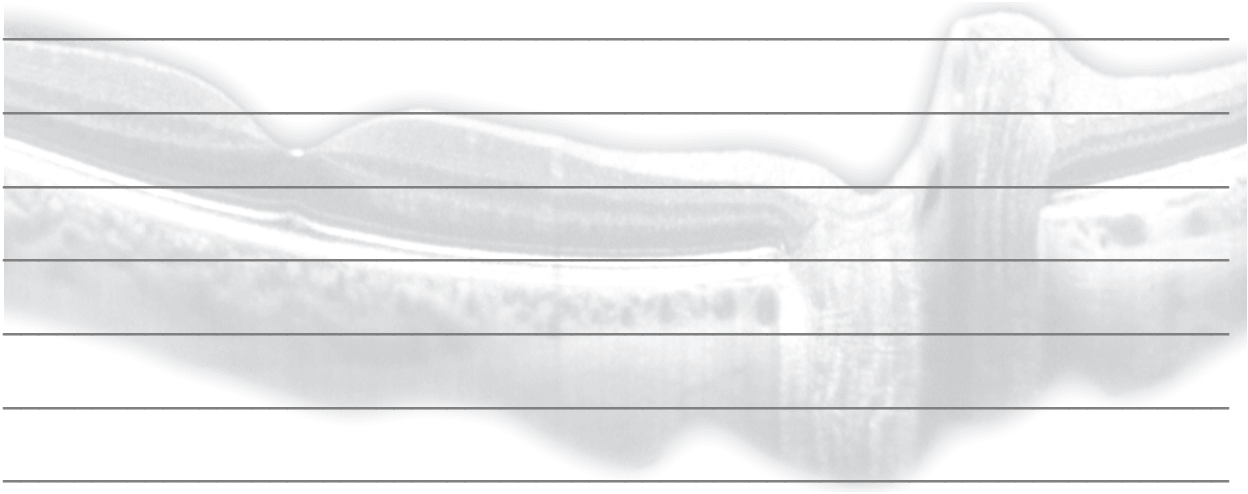

The Diagnostic Performances of the Outputs BMO-MRW and RNFL Compared with the East London Glaucoma Prediction Score among Multiethnic South African Populations

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Purpose: The East London Glaucoma Prediction Score (ELGPS) is well validated as a cheap ethnicity screening tool for glaucoma risk among multi-ethnic South African population. We hypothesize that this ELGPS, Gold Standard, is superior to the Heidelberg Glaucoma outputs (BMO-MRW and RNFL) which utilises spectral domain OCT to measure the structures in the retina and optic disc.

The purpose of the study is to determine the agreement between BMO-MRW, RNFL, OCT and ELGPS for unlikely Glaucoma, Glaucoma suspect, and likely Glaucoma.

Methods: The Kappa static measures the agreement between BMO-MRW, RNFL, OCT, and ELGPS using SAS Version 9.4 among South African patients at the Eye Centre in East London, South Africa.

Results: Out of 165 patients with medium age of 64years, 43% (n=71), 57% (n=94), 55.2& (n=91), 40% (n=66), 2.4% (n=4), and 2.4% (n=4) were males, females, White, Black, Indian and Mixed respectively. Compared with ELGPS, BM, RNFL, and OCT has Kappa values of 0.581 ($P<0.01$), 0.163 ($P<0.01$), and 0.099 ($P<0.01$), respectively.

Conclusions: There was a significant discordance at discriminating unlikely Glaucoma, Glaucoma suspect, and likely Glaucoma between BMO-MRW, RNFL, OCT, and ELGPS in these South African patients. There was better association between ELGPS, BMO, RNFL and OCT when data are grouped into Glaucomatous (Glaucoma suspect and Glaucomatous) and normal.

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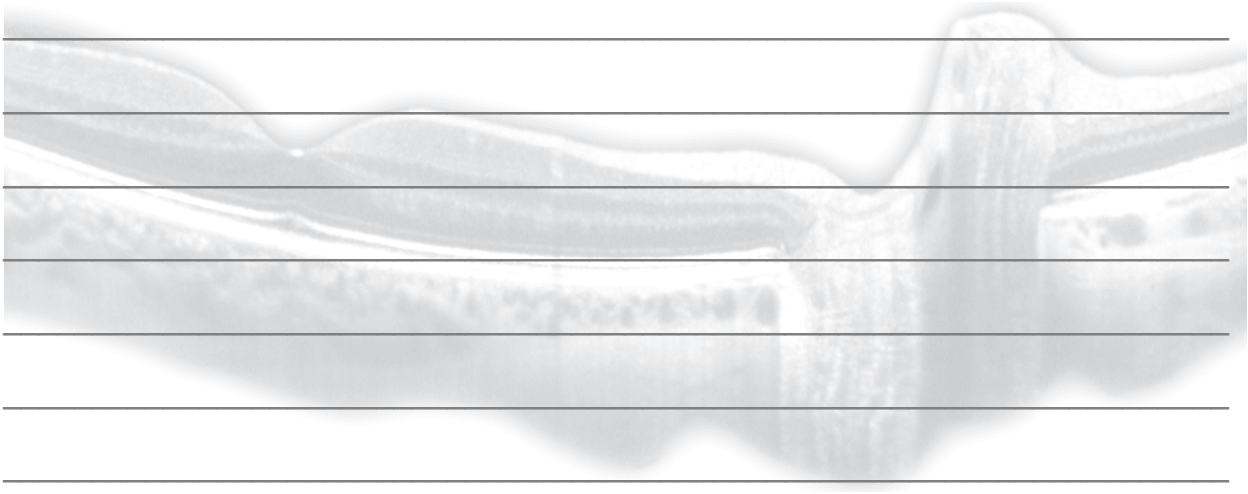

The Mainz Gutenberg Health Study: What do we learn about ophthalmic health?

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Purpose: The Gutenberg Health Study (GHS) is an ongoing, prospective, interdisciplinary, single-center, population-based cohort study in Germany. The main goals of the ophthalmological section are to assess the prevalence and incidence of ocular diseases and to explore risk factors, genetic determinants and associations with systemic diseases and conditions.

Methods: The study sample is recruited from subjects aged between 35 and 74 years at the time of the exam. The eye examination at baseline included a medical history, self-reported eye diseases, visual acuity, refractive errors, intraocular pressure, visual field, pachymetry, keratometry, fundus photography and tear sampling. The 5-year follow-up visit additionally encompassed anterior segment imaging, optical biometry, and optical coherence tomography. One macular volume scan (a modified posterior pole scan) with enhanced depth imaging and two optic disc scans were conducted: an optic nerve head volume scan with enhanced depth imaging, and a peripapillary retinal nerve fiber layer (RNFL) scan.

Results: We found new and important prevalence data and identified risk factors for age related macular degeneration, diabetic retinopathy, intraocular pressure and the development of myopia. Age and RNFL thickness as measured by OCT were significantly and negatively associated, as well as axial length. Spherical equivalent was positively associated with RNFL.

Conclusions: The GHS is the most extensive dataset of ophthalmic diseases and conditions and their risk factors in Germany and one of the largest cohorts worldwide. This dataset will provide new insight into the epidemiology of ophthalmic diseases.

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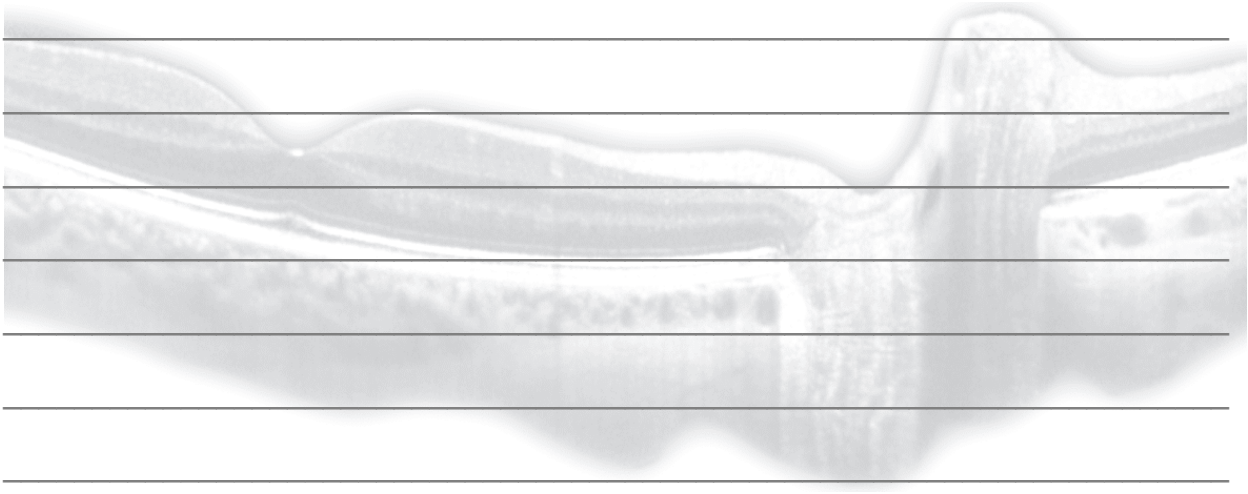

Optic Nerve Head Hemorrhages and Vitreous Traction

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Purpose: During the process of posterior vitreous detachment (PVD), the posterior hyaloid remains attached to the optic disc for a certain period. It can exert traction with development of optic nerve head hemorrhages (ONHH). ONHH are known to be associated with glaucomatous progression and retinal nerve fiber layer (RNFL) defects. Therefore, this study aims at investigating the relationship between PVD formation and ONHH in open angle glaucoma patients.

Methods: Patients presenting with an ONHH were included from November 2014 on. They underwent a comprehensive ophthalmological investigation, automated visual field test (Humphrey or Octopus), confocal scanner (HRT III), OCT scan (Spectralis) and stereographic photos of the optic nerve head. This study is part of a larger study (clinicaltrial.gov NCT02290795) investigating vitreopapillary traction (VPT).

Results: Thirty eyes of 30 patients were included (20 normal tension and 10 primary open angle glaucoma). Fourteen out of 30 eyes (46,7%) had concomitant VPT and 9 had a complete PVD. Thirteen ONHHs were located inferotemporal, 7 superotemporal, 7 temporal and 3 nasal. In the non-VPT group 6 out of 16 (37,5%) eyes showed matching retinal nerve fiber layer defects, with 8 out of 14 (57,1%) in the VPT subgroup ($p>0,05$).

Conclusions: VPT is a frequent finding in glaucomatous patients with ONHH, and could be a confounding factor in glaucoma assessment. Future work is needed to determine the frequency of VPT in glaucoma patients without ONHH and in non-glaucomatous individuals, and to gain insight in the role of VPT in the pathogenesis of glaucomatous optic neuropathy.

Keywords: Glaucoma, Vitreopapillary traction

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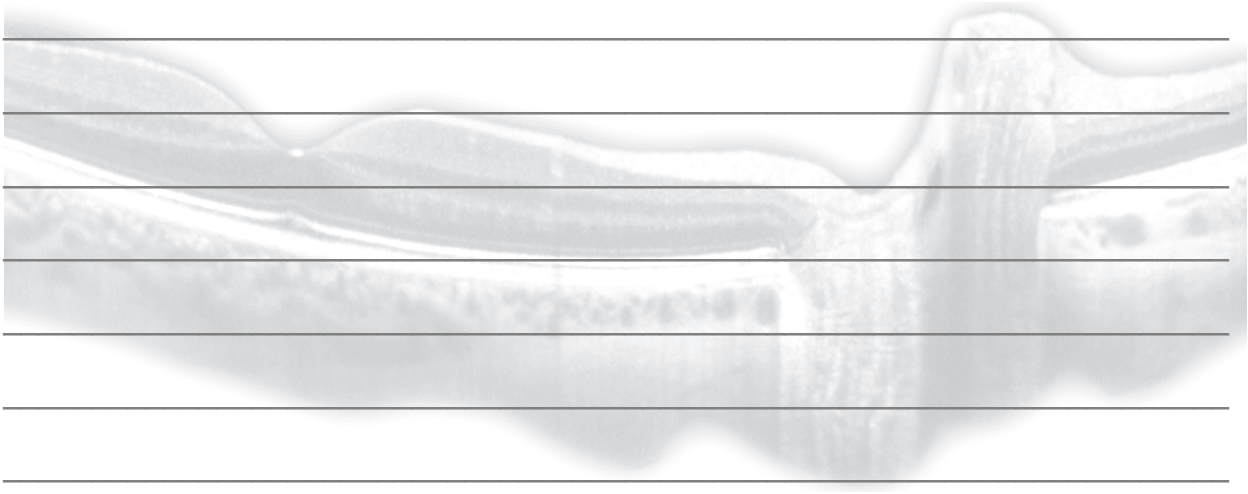

RNFL Assessment in Myopic Patients

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Purpose: To assess whether the new retinal nerve fiber layer analysis and rim analysis software with anatomical positioning system of Heidelberg Spectralis spectral domain optical coherence tomography (SD-OCT) yields a better diagnostic performance than the conventional in myopic eyes.

Methods: A Prospective cross-sectional study including 65 healthy subjects, 37 of them with spherical refractive errors in the range of -3 to -6 diopters (D) (moderate-high, G1) and 28 with less than -3 D (low-non-myopic, G0).

All patients were examined with Heidelberg Spectralis SDOCT, including Glaucoma Premium Module Edition (GPME) software and also with the former retinal nerve fiber layer protocol (RNFL-S). With GPME we analyzed optic nerve head (ONH) Rim Analysis (Bruchs Membrane opening-minimum rim width, BMO-MRW) and RNFL (RNFL-GMP).

Results: The mean age of patients was 30.2±9.3 years for G0 and 29.9± 7.1 years for G1 (p=0,903). Mean sphere was -0.5 ±0.3D (-1.25 to 0D) G0 and -3.9± 0.3D (-6.00 to -3D) G1 (p<0,0001). Global RNFL thickness between G0 and G1 showed significant differences in the RNFL-GMP (3.5mm p=0,018; 4.1mm p=0,049) and RNFL-S (p<0.0001) analysis. False positive rate was similar with both software's. Bruchs membrane opening-minimum rim width (BMO-MRW) measurement was similar in both groups (G0: 366,5±48,9µm, G1: 379,0±53,8µm, p=0,331). BMO-MRW measurement in G1 was more specific compared with RNFL-S thickness examination (89,18% and 64,9% respectively p=0,031).

Conclusions: Ring analysis based on BMO-MRW measurements has greater specificity to study myopic eyes and it would be advisable to take this into consideration when analyzing these patients.

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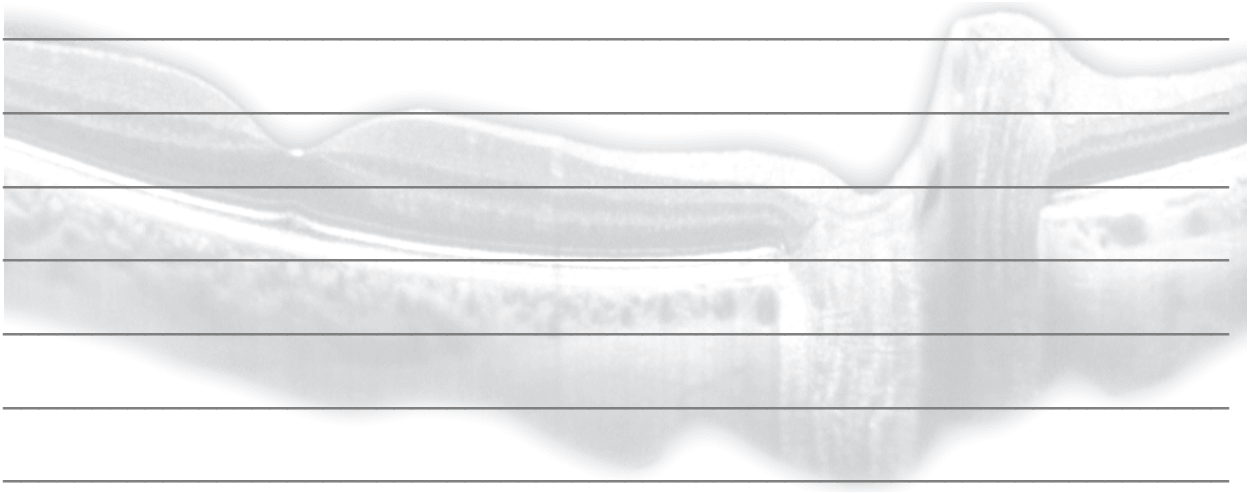

Evaluation of Ganglion Cell Layer Thickness and Volume Using Macular Fast and Posterior Pole SPECTRALIS SD-OCT Scan Protocols: A Pilot Comparative Study in Healthy Population

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Purpose: To evaluate differences between macular fast (MF) and posterior pole (PP) SPECTRALIS SD-OCT scan protocols in ganglion cell layer (GCL) thickness and volume analysis.

Methods: Thirty eyes, from 16 consecutive healthy subjects, were analyzed using Spectralis SD-OCT MF (20ºx20º, 25 sections, 240 microns between sections) and PP (30ºx25º, 61 sections, 120 microns between sections) scan protocols. GCL thickness and volume were obtained using SPECTRALIS SD-OCT software. All patients underwent a comprehensive opthalmological examination. Spherical equivalent inclusion criteria was from -5.0D to +5.0D. Inner ring ETDRS (IRE) diagram sectors analysis was performed. All exams were performed by the same experienced operator.

Results: GCL IRE mean thickness analysis showed: 50.21 +/- 5.56 microns (MF) and 50.2 +/- 5.17 microns (PP) with no statistical signiticance (p=0.94). GCL IRE mean volume analysis showed: 0.079 +/- 0.008 microns (MF) and 0.079 +/- 0.008 microns (PP) with no statistical signiticance (p=0.49).

Conclusions: These results indicate that MF and PP SPECTRALIS SD-OCT scan protocols show both the same GCL thickness and volume with no statistical significance.

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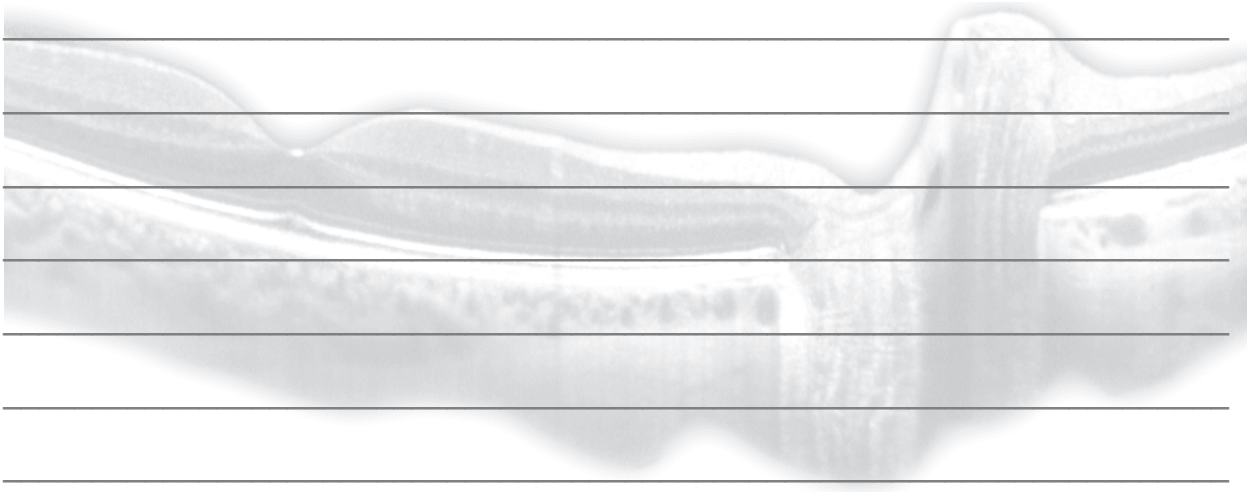

OCT Angiography in Macular Diseases

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Purpose: OCT angiography (OCT-A) is a new diagnostic method that allows for 3-dimensional visualization of the vascular structures of the retina and the choroid. We performed OCT-A in a variety of macular diseases and compared the findings to those obtained with conventional fluorescence angiography.

Methods: OCT-A images were obtained in a variety of macular diseases with the novel Spectralis OCT-2 (Heidelberg Engineering, Heidelberg, Germany). The instrument provides a A scan rate of 70 kHz, which allows the generation of high qualitiy OCT volume scans within a short period of time.

Results: Advantages of OCT-A include image acquisiton without pupil dilation or intravenous dye injection. There is no masking by leakage, pooling or staining phenomena. OCT-A allows for exact 3-dimensional localisation of vascular alterations with disease. Typical findings are discussed in various macular diseases including neovascular and atrophic age-related macular degeneration, polypoidal vasculopathy (PCV), diabetic retinopathy, retinal vein occlusion, macular telangiectasia type 2, pseudoxanthoma elasticum, hereditary retinal degenerations, and central serous chorioretinopathy.

Conclusions: OCT angiography allows for unprecedented insights into physiology and pathology of the retinal and choroidal vasculature by high-resolution imaging of perfused vessels without interference by dye leakage. The resulting images show distinct differences to conventional fluorescein or indocyanine green angiography. Knowledge of those differences are of importance for interpretation and its routine clinical application.

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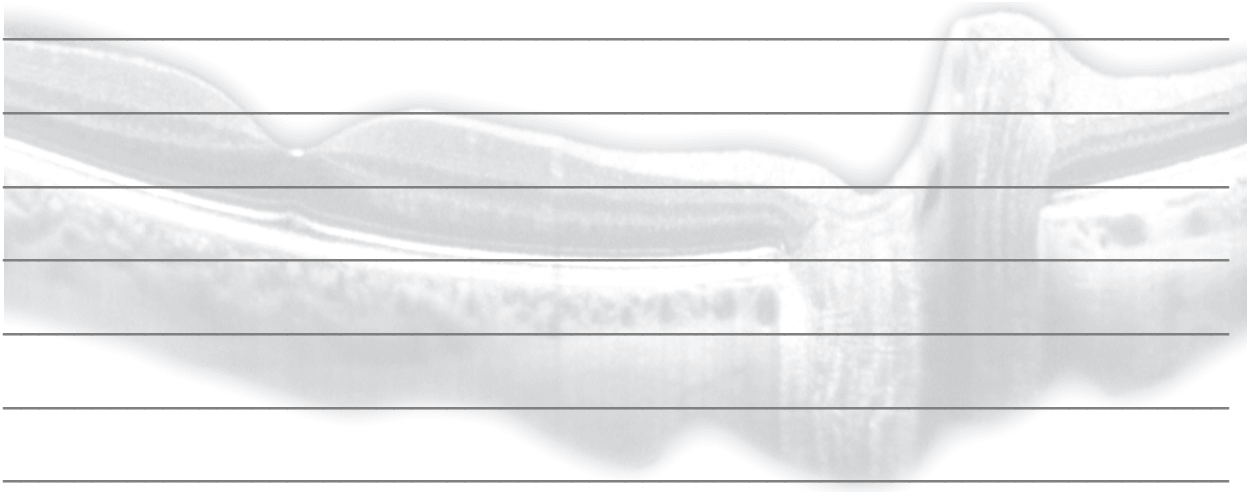

Optical Coherence Tomography Angiography of a Choroidal Neovascularization in Adult Onset Foveomacular Vitelliform Dystrophy: Pearls and Pitfalls

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Purpose: To determine the sensibility and specificity of optical coherence tomography angiography (OCT-A) in detecting choroidal neovascularization (CNV) complicating Adult Onset Foveomacular Vitelliform Dystrophy (AOFVD) and to highlight the possible pitfalls related to the heterogeneous spectrum of acquired vitelliform maculopathies.

Methods: Twenty-five eyes of 22 consecutive AOFVD patients with suspected CNV were enrolled. The traditional multimodal imaging findings, based on Fluorescein Angiography (FA), Indocyanine green angiography (ICGA) and B-Scan OCT, were used as a basis and were compared with those obtained from OCT-A to define its sensibility and specificity for detecting CNV in the case of AOFVD. A qualitative and quantitative analysis of the CNV appearance and of the associated OCT-A findings was also performed with the aim to define the features and elucidate possible diagnostic pitfalls.

Results: A traditional multimodal imaging approach diagnosed a CNV in 5 of 25 eyes (20%), whereas a CNV lesion was clearly observed on OCT-A in 4 (16%) of 25 cases. The sensitivity and specificity of CNV detection by OCT-A in cases of AOFVD were 80% (4/5) and 100 % (20/20), respectively.

OCT-A in 10 cases (40%) showed a focal hyper-intense signal, without vascular aspects, at the level of the outer nuclear layer or immediately above the subretinal material accumulation.

Conclusions: Our study demonstrates the capability of OCT-A to diagnose the presence of a CNV in AOFVD patients. Although FA remains the gold standard for determining the presence of a neovascular network, OCT-A offers non-invasive monitoring of the retinal and choroidal microvasculature, aiding diagnosis and treatment decisions during follow-up.

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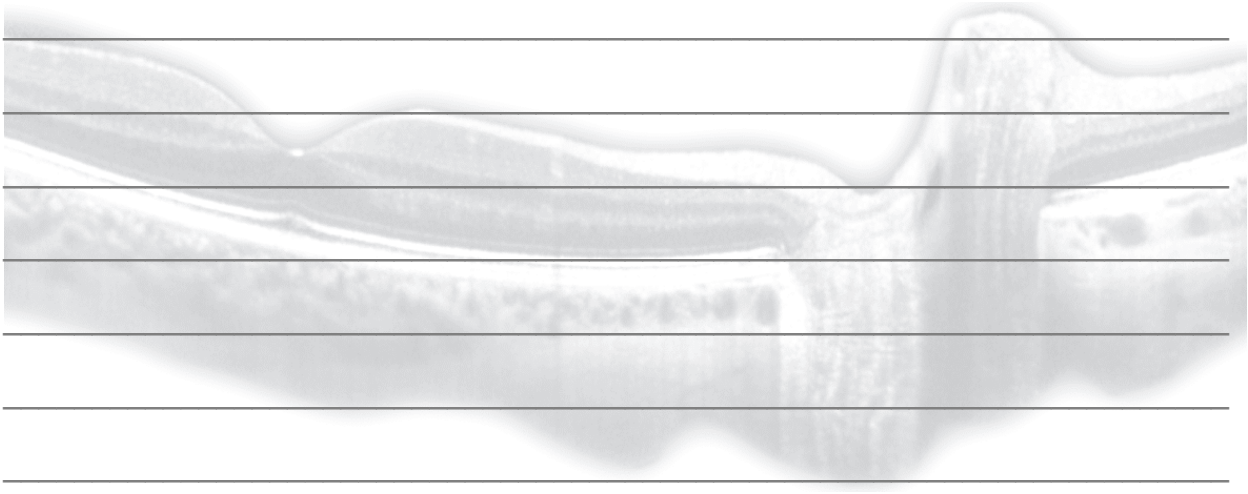

OCT Angiography of PCV and Polypoidal CNV

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Purpose: To describe the utility of optical coherence tomography angiography (OCT-A) for evaluating the spectrum of polypoidal vascular diseases.

Methods: Retrospective observational case series of seven patients with polypoidal choroidal vasculopathy (3 cases) or polypoidal choroidal neovascularization (4 cases). OCT-A information was acquired using two different OCT-A devices (The Optovue RTVue XR Avanti SD-OCT and the Spectralis OCT angiography). Flow signals within branching vascular networks (BVNs), type 1 neovascularization and polyps were evaluated. Comparisons were made between *en face* and cross-sectional OCT-A images. Vascular information from OCT-A was also compared to indocyanine green angiography (ICGA).

Results: *En face* images from OCT-A provided anatomical information about BVNs that were comparable to ICGA. Polyps were poorly resolved on *en face* OCT-A images but were clearly defined on cross-sectional OCT-A images. Cross-sectional OCT-A revealed flow signals within focal regions of the polyps with a significant portion of the polyp lumen being devoid of flow signal. Flow signals from cross-sectional OCT-A images also showed that BVNs, type 1 neovascularization and polyps were confined to the anatomic compartment between the retinal pigment epithelium and Bruch`s membrane. It was not possible to detect leakage on *en face* or cross sectional OCT-A.

Conclusions: The combination of *en face* and cross-sectional OCT-A images provides anatomical information about polypoidal structures that is comparable to ICGA. Although several limitations of OCT-A were identified in this study, it may be a useful modality for the management of polypoidal diseases.

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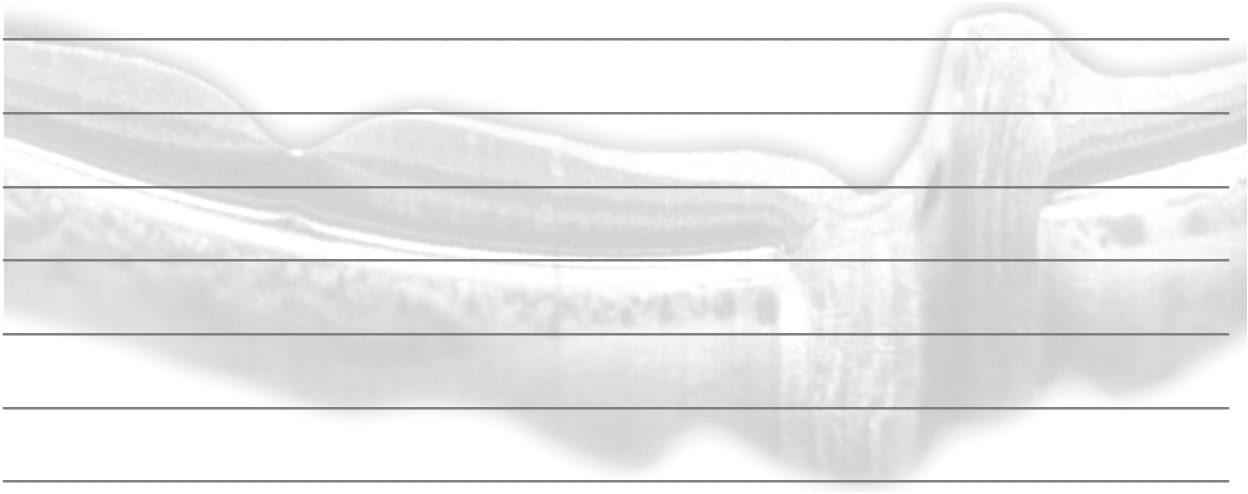

Optical Coherence Tomography Angiography Versus Traditional Multimodal Imaging in Assessing the Activity of Exudative Age-Related Macular Degeneration

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Purpose: To compare OCT-Angiography (OCT-A) with traditional multimodal imaging in patients with exudative AMD (eAMD) in terms of assessing the activity and guiding the treatment decision.

Methods: Prospective case series of 80 eyes of 73 consecutive eAMD patients (39 females, mean age 79.4 ± 5.3 years) diagnosed with different types of CNV (58 type I, 2 type II, 6mixed type I-II, 3 retinal angiomatous proliferation, 11 AMD-related polyps). The data obtained from traditional multimodal imaging, based on Fluorescein Angiography (FA), Indocyanine green angiography (ICGA) and B-Scan OCT, were compared with those obtained from OCT-A.

Results: An active CNV lesion was identified in 59 eyes (73.7%) on OCT-A and in 58 eyes in traditional multimodal imaging with agreement between the two imaging protocols in 75 eyes (93.8%). There was high ($p < 0.05$) inter-observer agreement in grading the activity of a CNV in both traditional multimodal and OCT-A imaging analysis.

Conclusions: Our study demonstrates the capability of OCT-A to grade the activity of a CNV in eAMD patients. Although FA remains the gold standard for determining the presence of leakage and OCT shows fluid accumulation and its variations, OCT-A offers non-invasive monitoring of the status of the choroidal neovascularization, aiding the treatment decisions and the follow-up.

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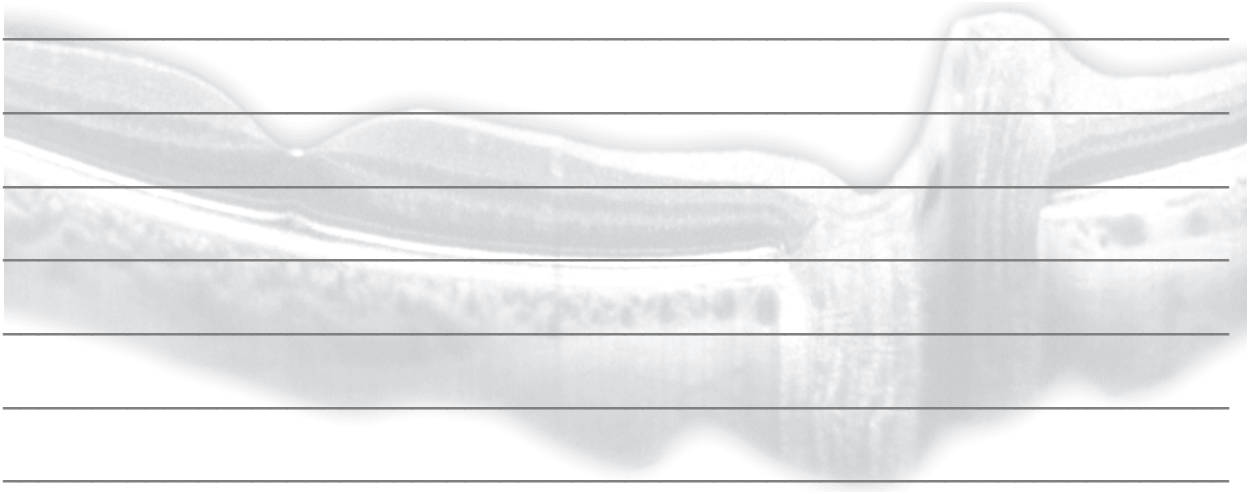

Macular Atrophy Differential Diagnosis. The Role of ICGA and Angio OCT

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Objective: To assess the status of choriocapillaris in eyes with macular atrophy secondary to age related macular degeneration (GA) and Stargardt disease (STGD) using optical coherence tomography angiography (OCTA).

Design: Prospective, observational case series.

Participants: 14 patients (20 eyes) affected by GA and 10 patients (20 eyes) affected by STGD.

Methods: Each patient underwent a complete ophthalmological examination including fundus autofluorescence (FAF), dynamic simultaneous fluorescein (FA) and indocyanine green (ICGA) angiography, enhanced depth imaging-optical coherence tomography (EDI-OCT) (HRA+OCT Spectralis, Heidelberg Engineering, Heidelberg, Germany) and OCTA using Angioflow (Optovue inc, Freemont, CA, USA) and Heidelberg Engineering Spectarlis OCT2 (prototype). An evaluation of the status of choriocapillaris in the two groups was performed.

Results: Patients mean age was 75 years for GA subjects (median 76 years; range 63-88 years) and 61 years for STGD or late onset STGD (median 62 years; range 40-74 years). Atrophy was bilateral respectively in 42% (n=6) of GA and 100% (n=10) of STGD subjects. In the early frames, FA displayed hyperfluorescence in the atrophic area in 100% (n=20) of eyes affected by GA and 20% (n=4) of STGD; dark choroid was present in 0% of eyes and 65% (n=13) respectively. Atrophy in ICGA late frames was hypocianescent in 20% (n=4) of GA eyes and 100% (n=20) of STGD. A ring at atrophy margins was detected in both FA (90%, n=18) and ICGA (100%, n=20) in STGD eyes. Mean subfoveal choroidal thickness was 156 µm (147, 42-362) for GA and 168 µm (167, 55-320) for all STGD. At OCTA evaluation, GA eyes showed persisting, rarefied choriocapillaris in correspondence of retinal pigment epithelium (RPE) atrophy in 80% (n=16) of cases whereas eyes affected by STGD had disappearance of this tissue in 100% (n=20).

Conclusions: Analysis of macular atrophy by OCTA in STGD patients revealed an extensive loss of choriocapillaris in the central area with persisting tissue at the margin of RPE atrophy In GA population the central part of atrophy of the RPE is characterized by persistency of Sattler layer and rarefied choriocapillary.

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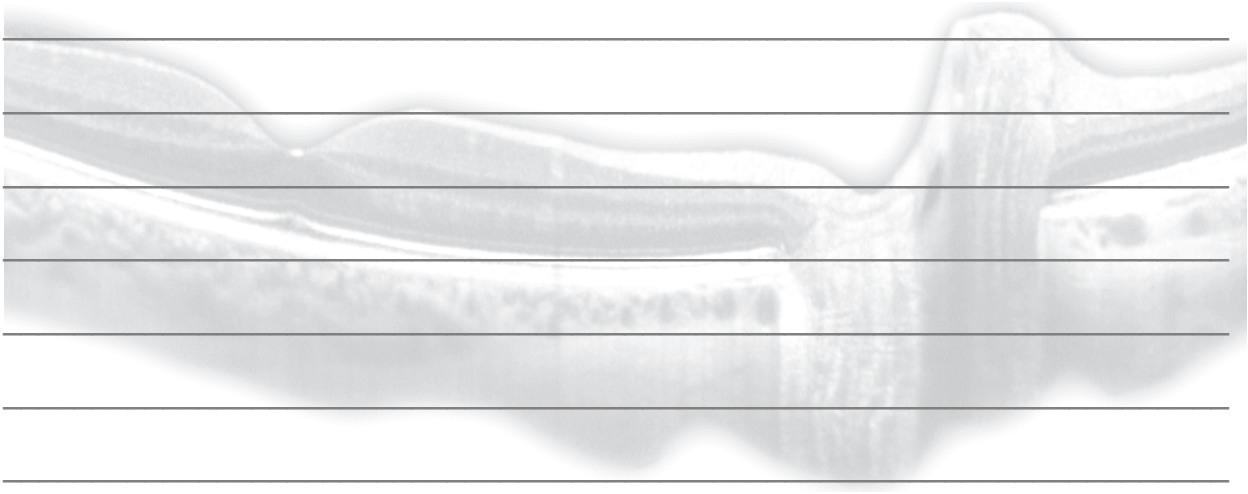

OCT Angiography Pearls - A First Experience

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The development of new diagnostic techniques in the field of retina diseases constitutes one of the more active research areas in medicine. However, there are only few discoveries that really change the way to diagnose and treat patients. OCT Angiography is one of these, and for sure it will represent a before and after in our routine practice.

A recurrent question is if OCT Angiography may replace fluorescein angiography. At this point, given the inherent limitations this is unlikely to happen in the near future due to the following facts:

- OCT Angiography does not show leakage
- OCT Angiography does not show peripheral vascular changes

Eye motion is critical in order to achieve high resolution images of the vascular plexus. Spectralis® OCT Angiography enables the possibility to monitor vascular changes both in the superficial and the deep vascular plexus based on the exclusive TruTrack® eye tracking system. This point also avoids the motion artifacts present in the rest of devices. Furthermore, as an additional unique feature of Spectralis® OCT Angiography, the high definition of the OCT scans and the segmentation software makes possible to clearly visualize vascular structures present at each retinal layer.

We should take into account that images provided by this new born technology is yet to be fully understood, and the combination of both the current state of knowledge based on those obtained with conventional techniques, and the images that we are able to image with OCT Angiography is mandatory.

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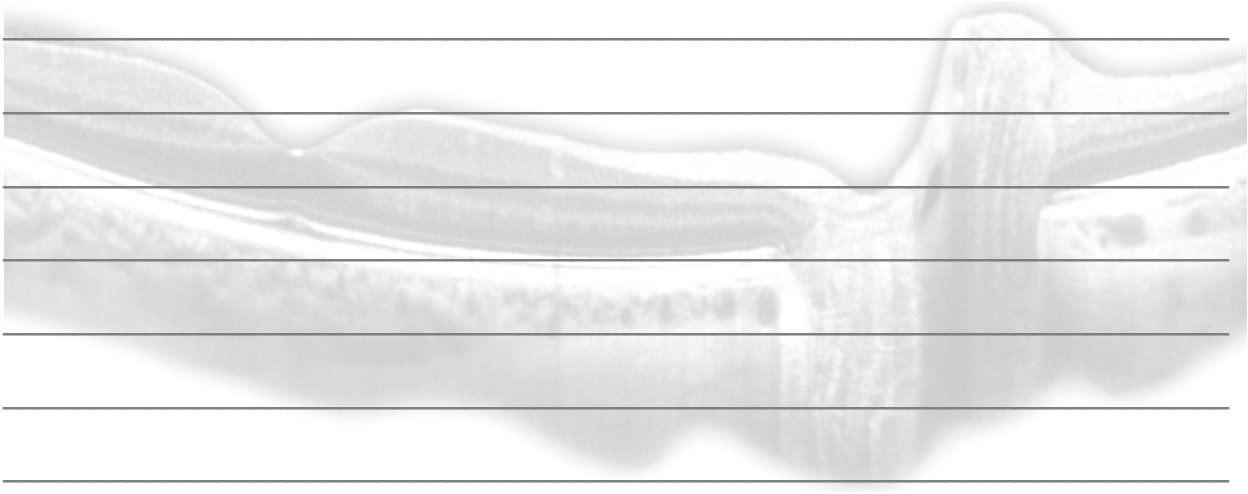

Assessment of Diseases of the Vitreomacular Interface with SD-OCT

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Background: The study of the vitreoretinal interface has become easier since the introduction of optical coherence tomography (OCT) in clinical practice. Spectral-domain OCT provides good visualization of the posterior vitreous and its relationship to the most internal layers of the retina. Thus, diagnostic and therapeutic decisions based on this imaging technology have become a common procedure.

Purpose: To evaluate and compare the OCT characteristics related to vitreomacular adhesion (VMA), vitreomacular traction (VMT) and macular holes (MHs).

Methods: The Institutional Review Board approved the study protocol. Eleven thousand sixty-five macular OCTs performed with the Spectralis (Heidelberg Engineering, Heidelberg, Germany) were revised. Six hundred and twenty-six cases had VMA, 52 had VMT and a MH was found in 45 subjects (prevalence=0.4%). Macular thickness and OCT outcomes were compared between groups.

Results: Mean MH size was 534.8±328.5 μm, VMA width was larger (3135.6±1058.5 μm) than VMT width (880.4±784.2 μm; $p<0.001$). Macular thickness was thicker near the fovea in MHs compared to the normal group. Epiretinal membrane (ERM) was observed in 11.5% of VMT and 35% of MHs ($p<0.001$). Age was inversely correlated with the VMA and VMT width (-0.548; $p<0.001$). The 26.9% of VMT and the 82.2% of MHs presented macular cysts, while retinal pigment epithelial detachment was more frequent in VMT individuals (5.8%).

Conclusions: Macular thickness in the paracentral ETDRS regions was increased in MHs. A third of MHs were associated with ERMs.

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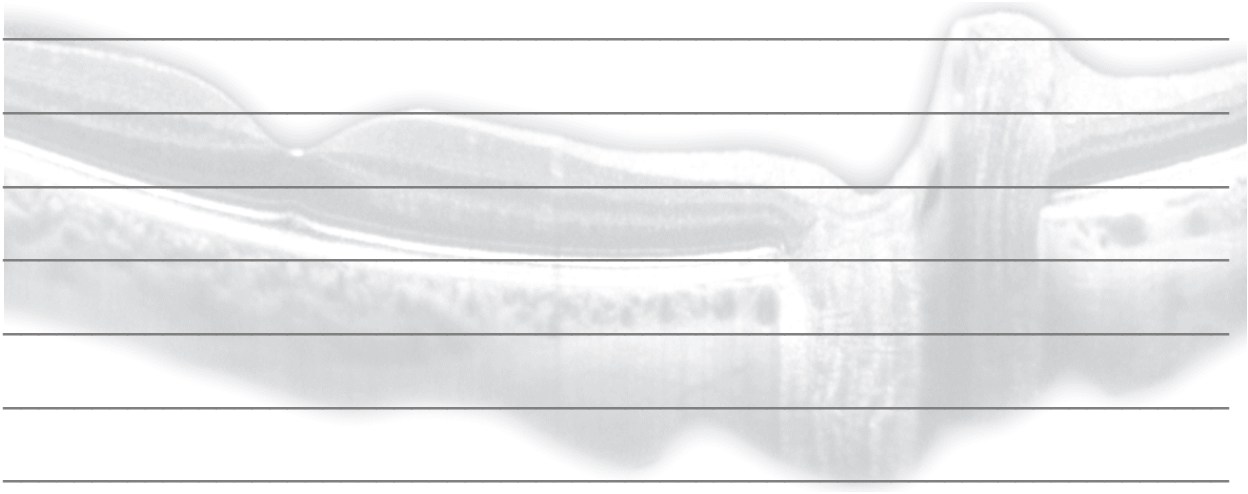

Anatomic and Functional Outcomes of Symptomatic Vitreo-Macular Traction Syndrome. A Natural History Study from the Pan American Collaborative Retina Study (PACORES) Group

Lihteh Wu MD, Marcelo Zas MD, Maria H. Berrocal MD, J Fernando Arevalo MD, Marta Figueroa MD, Francisco Rodriguez MD, Martin Serrano MD, Federico Graue MD, Arturo Alezzandrini MD, Roberto Gallego-Pinazo MD, José A. Roca MD, Matias Iglicki MD, José Dalma-Weishauz MD, Igor Kozak MD, Alberto Collado MD, Josep Badal MD, Mauricio Maia MD, Guillermo Salcedo-Villanueva MD, Hugo Quiroz-Mercado MD, Jans Fromow-Guerra MD, David Lozano-Rechy MD, Marcos Avila MD, Jay Chhablani MD

Instituto de Cirugía Ocular, San José, Costa Rica

Purpose: To describe the functional and anatomic outcomes of eyes with symptomatic vitreomacular traction syndrome (VMTS) that were initially managed with observation.

Methods: Retrospective multicenter study of 168 eyes with symptomatic VMTS and spectral domain optical coherence tomography (SD-OCT) findings consistent with VMTS. All eyes were graded according to SD-OCT findings. Grade 1 was defined as incomplete cortical vitreous separation with foveal attachment. Grade 2 was defined as Grade 1 plus intraretinal cysts or clefts. Grade 3 was defined as Grade 2 plus a foveal detachment. All patients were followed for at least 6 months.

Results: There were 168 patients (51 male) with a mean age of 68.8 ± 10.7 years old. Patients were followed for a mean of 22.7 ± 20.1 months. The mean duration of symptoms prior to initial presentation was 3.65 ± 5.42 months. At baseline, 72 eyes had Grade 1, 74 eyes had Grade 2 and 22 eyes had Grade 3 SD-OCT findings. After a mean of 12.3 ± 12.6 months (range, 1-42 months), 36 (21.4%) eyes had spontaneous resolution of the VMTS with normalization of the foveal anatomy. After a mean of 10.3 ± 10.7 months, 6 eyes developed a lamellar macular hole and 7 eyes developed a full thickness macular hole. In the remaining 119 eyes, at the last follow-up 65 eyes had Grade 1, 42 eyes had Grade 2 and 12 eyes had Grade 3. On average the best corrected visual acuity improved from 0.40 ± 0.35 logMAR (Snellen 20/50) at baseline to 0.35 ± 0.36 logMAR (Snellen 20/45, p=0.0372); and the mean central macular thickness (CMT) improved from 350 ± 132 µm to 323 ± 121 µm.

Conclusion: VMTS spontaneously resolved in 21.4% (36/168) of eyes after a mean of 11.4 ± 12.6 months. An unfavorable anatomic outcome occurred in 7.7% (13/168) of eyes.

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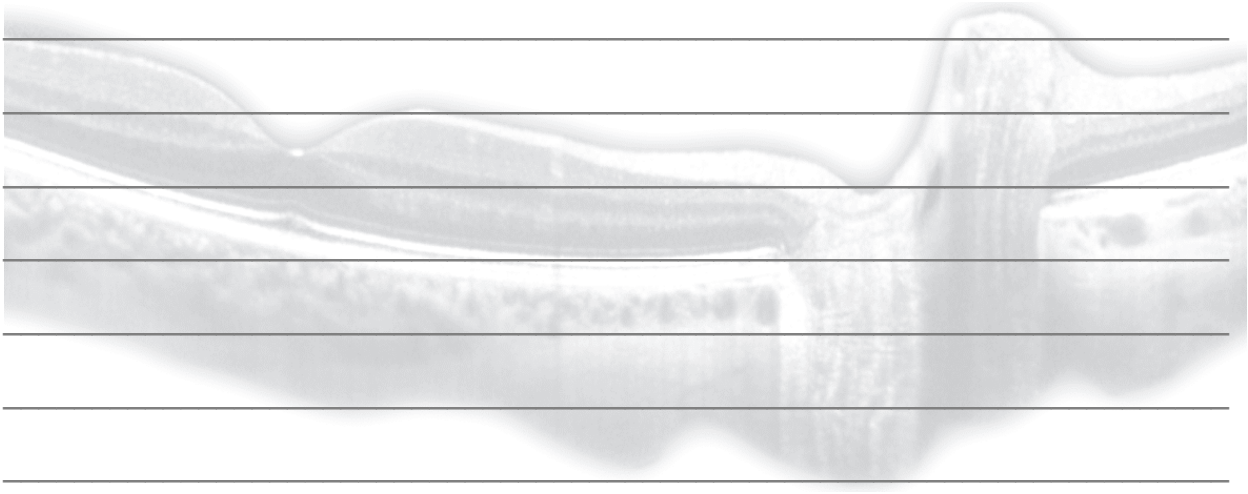

Early Changes in the OCT in Diabetic Patients without Diabetic Retinopathy

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Universidad Castilla La Mancha, Catedrático de Oftalmología, Albacete, Spain

Purpose: To study retinal thickness layers changes in patients with diabetic mellitus (DM) without diabetic retinopathy (DR).

Setting/Venue: Multicenter, prospective, non interventional study.

Methods: Sixty consecutive diabetic patients without DR (Group 1) and 60 consecutive healthy controls matched for age and axial length were evaluated. Both eyes were examined. Exclusion criteria were previous treatment by intraocular drugs, ocular diseases and refractive error ≥ 6 dioptres. Full ophthalmic examination and Heidelberg Spectralis spectral domain optical coherence tomography (SD-OCT) were performed. Specifically, automatic retinal layer segmentation of a 6×6mm, 64 horizontal B-scan lines macular scan centred on the fovea, and manual choroidal layer segmentation of vertical and horizontal 9 mm cross-hair scan (1536 A-scans) centred on the fovea, were performed.

We have measured with automatic segmentation the thickness of following retinal layers: RNFL, GCL, IPL, INL, OPL, ONL and photorreceptors+RPE (from ELM to Bruch membrane). Retinal layers thickness was automatically calculated in the 8 or 9 ETDRS areas (consisting in a central circular zone with a 1-mm diameter, representing the foveal area and inner and outer rings of 3 and 6mm diameter, respectively). The inner and the outer rings are divided into four quadrants: superior, nasal, inferior, and temporal. Mean retinal layer thickness and mean thickness of each of the five retinal layers in each of the eight-nine ETDRS subfields were recorded. We also recorded duration of DM and HbA1c, %.

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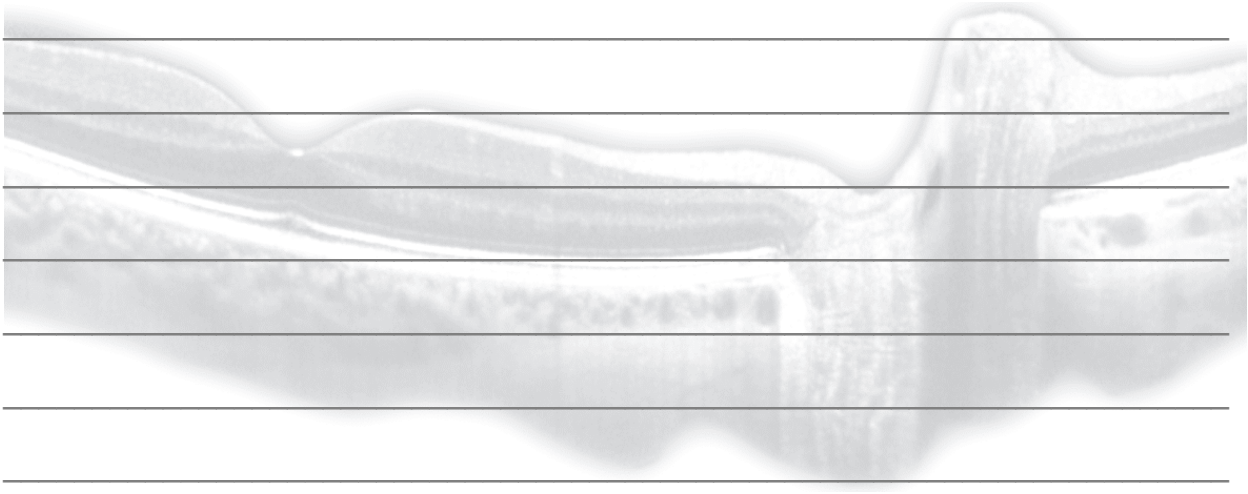

Diabetic Choroidopathy

Jorge Ruiz-Medrano, Alicia Valverde-Megías, José M Ruiz-Moreno

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Objective: To compare the choroidal thickness (CT) profile of diabetic patients with and without diabetic retinopathy (DR) and CT profiles in type I and type II diabetic patients using enhanced depth imaging optical coherence tomography (EDI-OCT).

Methods: Cross-sectional, non-interventional study. 57 eyes from 57 diabetic patients with spherical equivalent (SE) between ±3D, were scanned using a EDI-OCT (Heidelberg Engineering. Heidelberg, Germany). A horizontal CT profile of the macula was created by manually measuring the subfoveal CT (SFCT) from the posterior edge of retinal pigment epithelium (RPE) to the choroid/sclera junction. Three further determinations were performed at successive points 1000 μm nasal, temporal, inferior and superior to the fovea. The subjects were divided depending on the presence of DR and the type of diabetes.

Results: EDI OCT allowed the measurement of the CT in all eyes (100%). The mean age was 65.01 years (from 26 to 88). The mean SFCT was 318.20 μm (95% confidence interval: 168 to 603) in the no DR group and 284.92 μm (131 to 544) in the DR group, differences were statistically significant (p=0.001). CT in all four sectors was statistically different when comparing both groups. The mean SFCT was 399.33 μm (95% confidence interval: 244 to 534) in the type I group and 275.86 μm (131 to 603) in the type II group, differences were statistically significant (p=0.01). CT in all four sectors was statistically different when comparing both groups.

Conclusions: Patients with diabetic retinopathy show thinner choroids when compared to diabetic patients that do not show it. Type I dibetics show thicker choroids than type II diabetics, even after the corrections by age are applied.

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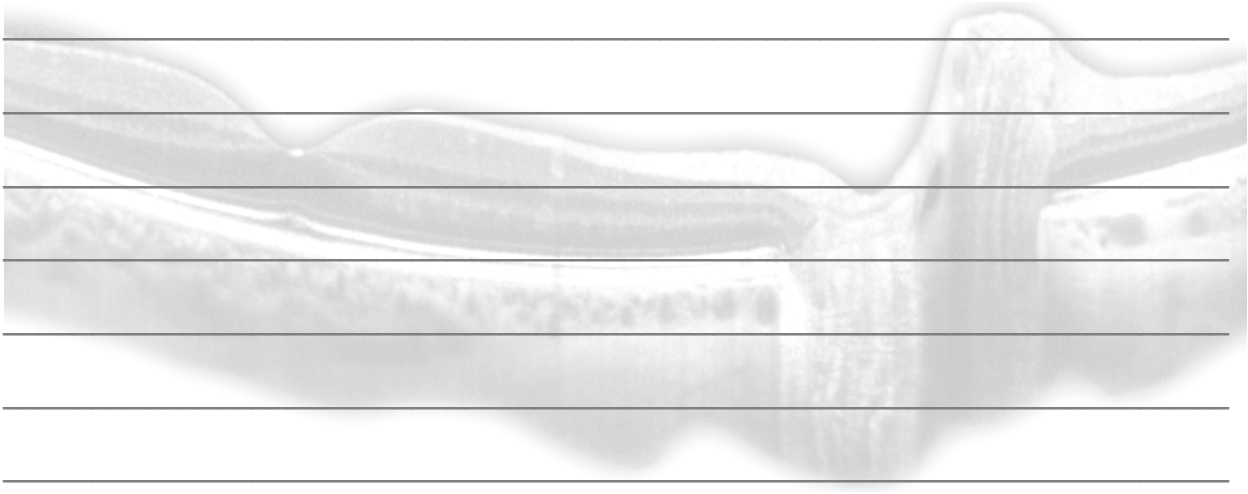

Staphyloma Induced Serous Maculopathy

Suzanne Yzer[1], K. Bailey Freund[2], Jose P. Martinez[1]

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[2] Vitreous, Retina, Macula Consultants of New York, New York, USA

Purpose: To evaluate the clinical characteristics of posterior staphyloma associated with subfoveal fluid (SFF).

Methods: In an observational study we examined 6 patients (7 eyes) with posterior staphyloma and presence of SFF as detected by Spectralis® optical coherence tomography (OCT). All patients underwent a complete eye-exam including OCT and fluorescein- and indocyanine green angiography.

Results: All patients had sub-optimal visual acuity and refraction varied from emmetropia to pathologic myopia. On funduscopy RPE changes, mainly hypopigmentation in the macula was clearly visible. On OCT SFF was visible, however both FA and ICG failed to show the cause of it. Spectralis® OCT's showed an abrupt change in thickness of the choroid precisely on the edge of non-staphylomatous to staphylomatous curvature. This change in chroroidal thickness was not visible with other OCT devices (like Canon OCT-HS100 or Optovue).

Conclusions: This observational study of patients with posterior staphyloma and SFF showed that subretinal fluid was present on the edge of staphylomas. We hypothesize that the funduscopically visible hypopigmentation on the border of staphylomas may be caused by stretching of the RPE, potentially affecting the function of the RPE. All patients had a relatively thick choroid in the non-staphylomatous area possibly causing a neurosensory detachment in a similar fashion as observed in patients with pachychoroid pigment epitheliopathy. Also, the abrupt change in choroidal thickness on the transition side of non-staphylomatous to staphylomatous curvature may cause hydrostatic pressure of the choroid, potentially leading to the development of subretinal fluid.

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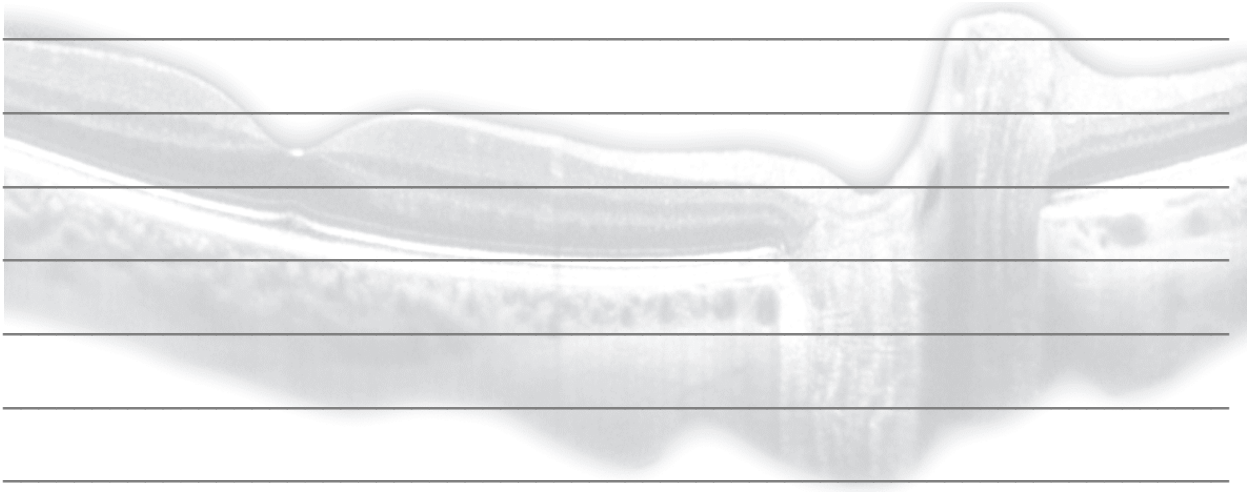

Lacquer Cracks And Perforating Scleral Vessels in Pathologic Myopia

Giuseppe Querques, MD, PhD[1,2], Federico Corvi, MD[1],
Chandrakumar Balaratnasingam, MD [3,4,5], Giuseppe Casalino, MD[1],
Maurizio Battagli Parodi, MD[1], Ugo Introini, MD[1], K Bailey Freund, MD[3,4],
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Purpose: To describe a possible causal association between perforating scleral vessels and the occurrence of overlying lacquer cracks (LC) in eyes with pathologic myopia.

Methods: We reviewed the multimodal imaging, including confocal scanning laser ophthalmoscopy and spectral domain optical coherence tomography (SD-OCT), of patients from two institutions who presented between 2010 and 2014 with LC secondary to pathologic myopia in at least one eye.

Results: A total of 35 eyes with LC secondary to pathologic myopia were included in the study. In 37 out of 45 LC (82%) we found on SD-OCT retrobulbar vessels perforating the sclera beneath the LC. In 8 LC, transverse En Face images through the area of LC were available and clearly depicted the vessels course within the sclera to where they joined the choroid, directly beneath the LC.

Conclusions: Perforating scleral vessels are often present at the site of LC in pathologic myopia. We hypothesize that scleral expansion at the location of perforating vessels may play a role in the formation of LC.

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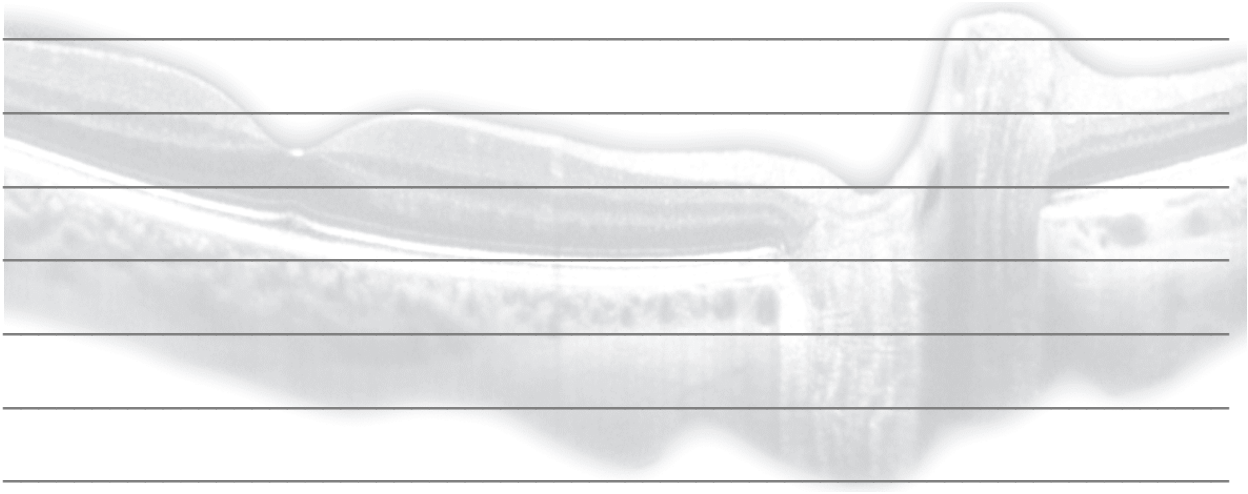

Retinal Imaging for Detection of Risk Factors for Developing Myopic Choroidal Neovascularization

Moritz Schröder[1], Focke Ziemssen[2], Nicole Eter[3], Christian Brinkmann[1], Gisela Häusser-Fruh[4] , Marc Schargus[5], Frank G. Holz[1], Steffen Schmitz-Valckenberg[1]

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Purpose: The purpose of this multicenter, prospective study in high myopic Caucasians with pre-defined disease patterns is to record the natural history over a period of three years in order to identify predictive markersfor the development of myopic choroidal neovascularization (mCNV).

Methods: This is a non-interventional study with yearly visits, targeting enrollment of 250 subjects in 30 centers throughout Germany. At each visit, the assessments include the completion of a standardized extensive history, an ophthalmic exam and acquisition of multimodal retinal imaging consisting of fundus-photography, funduss autofluorescence and EDI-OCT imaging (Spectralis, Heidelberg Engineering, Germany). In addition to an axial length ≥ 26 mm, at least one of the following five disease patterns has to be present in the study eye for inclusion: (1) subfoveal choroidal thinning <50 µm, (2) choroidal curvature length >6300 µm, (3) lacquer cracks, (4) patchy atrophy >5 mm2 or (5) preexisting mCNV in the fellow eye. Eligibility is independently confirmed by a central reading center (CRC).

Results: At the time of the first interim analysis of baseline data, a total of 46 subjects (mean age: 52.4 years, range 18-77; mean axial length 29.0 mm, range 23.0 – 37.7) were screened for eligibility by the CRC. The presence of at least one of the five pre-defined disease patterns was confirmed in 25 (54%) subjects (mean age: 55.3 years, range 29 – 77). The most common disease pattern was subfoveal choroidal thinning (n = 15), followed by lacquer cracks (n = 10), patchy atrophy (n = 8) and then followed by preexisting mCNV in the fellow eye (n = 4). A choroidal curvature length >6300µm was found in one subject with an axial length of 34.3 mm. In 15 subjects, more than one of the five disease patterns was present in at least one eye. The mean axial length of the enrolled subjects was 29.5 mm (range, 26.0 – 35.5).

Conclusions: Within the prospective study cohort, a high variability between the extent of bulbus elongation and the presence of disease patterns was noted in myopic subjects. The correct interpretation of various and complex imaging findings in high myopic eyes is important and can often be ambiguous and more challenging when compared toemmetropic eyes. Manual correction of e.g. incorrect segmentation in OCT images is prudent. Identification of high risk features for the development of mCNV appears to be important for patient management and visual prognosis in the long-term.

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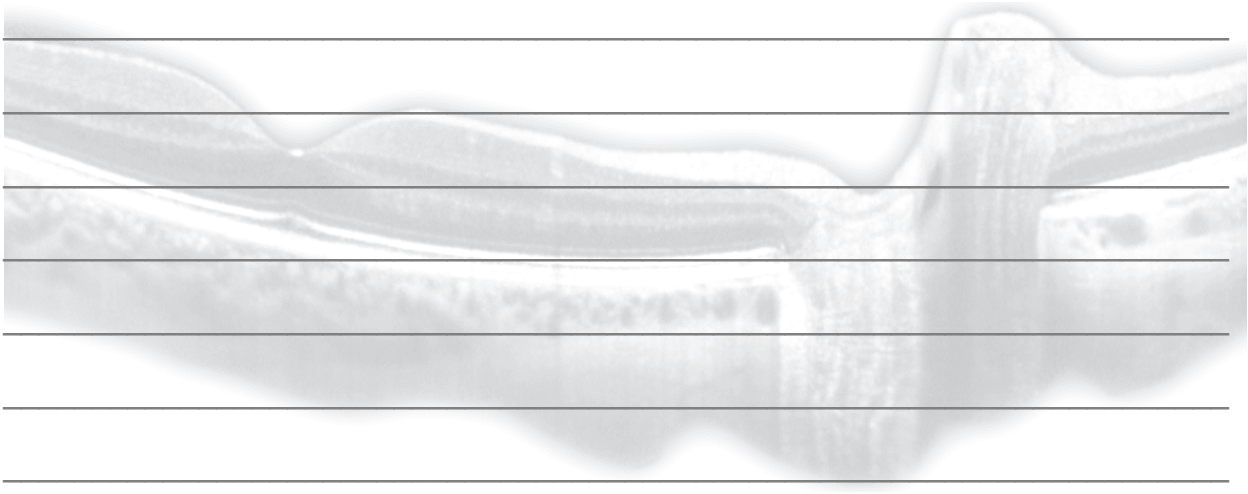

3D Presentation

SPECTRALIS 3D MultiColor Imaging

Shozo Sonoda[1], Yasushi Sonoda[2], Taiji Sakamoto[1]

[1] Department of Ophthalmology, Kagoshima University, Kagoshima, Japan
[2] Sonoda Eye Hospital, Kagoshima, Japan

Purpose: MultiColor (MC) module on SPECTRALIS is a scanning laser ophthalmoscopy, and the images are illuminated with lasers of three different wavelengths: infrared, green, and blue. The resulting color images are clear, fine and detailed. Furthermore, they include structural information from different retinal layers using confocal technique. For accurate diagnosis, 3-dimension (3D) observation with a stereo photography was performed such as in the optic nerve head analysis and fluorescence angiography examination. In this study, we investigated whether MC images could be utilized as a three-dimensional picture.

Methods: MC images of macular diseases such as age-related macular degeneration (AMD) and macular hole (MH) were studied. Unlike a normal image acquisition, the shooting camera head moved bilaterally 5 degrees each direction from the front face, and two pairs of MC images were obtained, respectively. Each image was projected on the 3D monitor using the software StereoPhoto Maker™, and confirmed by the two independent observers with the 3D glass.

Results: ERM, exudative AMD, macular edema, MH, pigment epithelial detachment and nerve fiber layer could be observed more sterically by using the 3D image.

Conclusions: 3D images of MC can facilitate detection of the lesion more easily for patients and doctors. This would be one of the potentially strong features of MC, which has established with **SPECTRALIS MultiColor system.**

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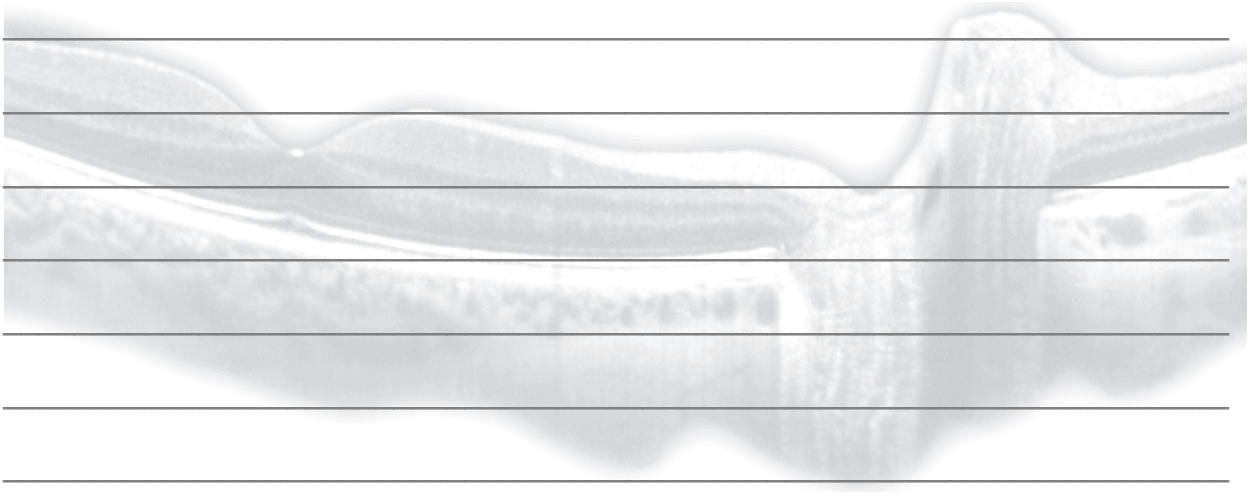

Poster Presentation

Choroidal thickness and visual prognosis in type 1 lesion due to neovascular age-related macular degeneration treated with *pro re nata* regimen with intravitreal ranibizumab after 24 months

Hernández-Martínez, Pablo (MD); Dolz-Marco, Rosa (MD, PhD); Pascual-Camps Isabel (MD); Andreu-Fenoll, Maria; Gallego-Pinazo, Roberto (MD, PhD)

University and Polytechnic Hospital La Fe, Valencia, Spain

Purpose: To evaluate the association between subfoveal choroidal thickness and the visual outcome in eyes with type 1 choroidal neovascularization (CNV) due to neovascular age-related macular degeneration (n-AMD).

Methods: Retrospective, longitudinal cross-sectional study including patients diagnosed with n-AMD and type 1 lesions managed with intravitreal injections of ranibizumab into a pro re nata strategy during 24 months. The ophthalmic charts of patients with type 1 CNV were reviewed recording the visual acuity, number of intravitreal injections and follow-up period. Subfoveal choroidal thickness was measured using enhanced depth imaging (EDI) scans obtained with Spectralis HRA + OCT device (Heidelberg Spectralis HRA-OCT, Heidelberg Engineering, GmbH, Dossenheim, Germany)

Results: Twenty-five eyes of twenty-one patients were included. The mean baseline logMAR BCVA was 0.52 (0,35) [median, 0,5; range (R), 0,1 – 1; Interquartile range (IRQ), 0,3 – 0,8] and improved to 0,39 (0,39) [median, 0,4; R, 0,1 – 1; IQR, 0,2 – 0,5] by the end of the follow-up ($p = 0.038$]. The Subfoveal Choroidal Thickness measured in all the included patients was 202,8 (60,3) [median, 218; range, 81 – 285; IQR, 146 – 258] µm. Mixed effects models associated a rate of evolution of visual acuity with subfoveal choroidal thickness ($p < 0.001$), with higher thickness values showing lower degradation rates.

Conclusions: The presence of higher choroidal thickness values may influence positively in the visual outcomes in patients with type 1 CNV secondary to n-AMD treated with PRN regimen with intravitreal ranibizumab after 24 month.

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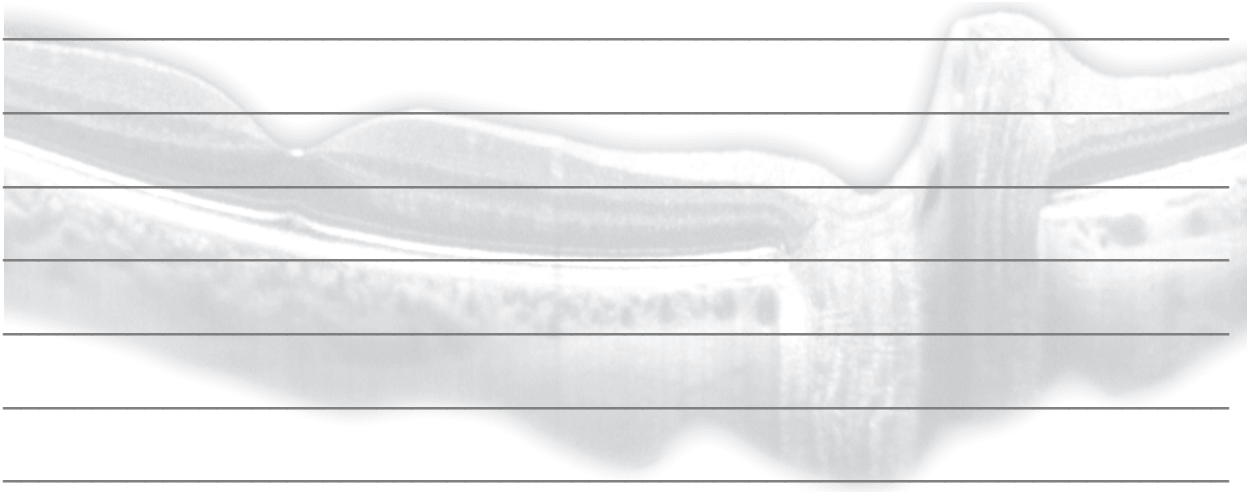

Poster Presentation

Retinal Findings on Mitochondrial Disorders: Two Case Reports

Raquel Almeida[1], Nelli Roosipuu[2], Roza Dolz Marco[3], Roberto Gallego-Pinazo[3]

[1] Department of Ophthalmology, Centro Hospitalar de Entre o Douro e Vouga, Santa Maria da Feira, Portugal.
[2] Department of Ophthalmology, Tartu Ülikooli Silmakliinik, Tartu, Estonia.
[3] Department of Ophthalmology, University and Polytechnic Hospital La Fe, Valencia, Spain.

Purpose: Mitochondrial diseases are a clinically heterogeneous group of disorders. Ragged-red fibers (RRFs) in muscle biopsy provide an important clue for their final diagnosis.

Methods: We present two cases of mitochondrial disease with retinal manifestations.

Results: First case is a 50-year-old woman with progressive bilateral vision loss. She was under evaluation due to sensorineural deafness. Best-corrected visual acuity (BCVA) was 20/70 in her right eye (OD) and 20/25 in her left eye (OS). Dilated fundus examination showed increased tessellation in a concentric fashion around the fovea, reaching the mid peripheral retina, and vascular attenuation. Spectral Domain Optical Coherence Tomography images (SD-OCT; Spectralis® Heidelberg Engineering, Heidelberg, Germany) confirmed the diffuse thinning of the retina and severe disruption of the outer retinal layers with partial preservation of the foveal area. Second case is a 57 years-old woman with bilateral central vision loss. Personal history included a glomerulopathy, high blood pressure, type 2 diabetes mellitus, anemia, hyperuricemia, Gilbert disease and a frontoparietal linfoma. BCVA was 20/20 OD and 20/30 OS. Fundoscopy revealed increased pigmentation and focal whitish dots in the posterior pole of OU and a patch of RPE atrophy, temporal to the fovea, in the OD. SD-OCT showed thickening of the ellipsoid layer with disruption of the interdigitation zone in OU and an area of geographic atrophy, temporal to the fovea, in OD. Muscle biopsy showed RRFs in both cases.

Conclusions: Mitochondrial diseases present with bewildering array of clinical presentations that at some point can´t fulfill a syndromic diagnosis.

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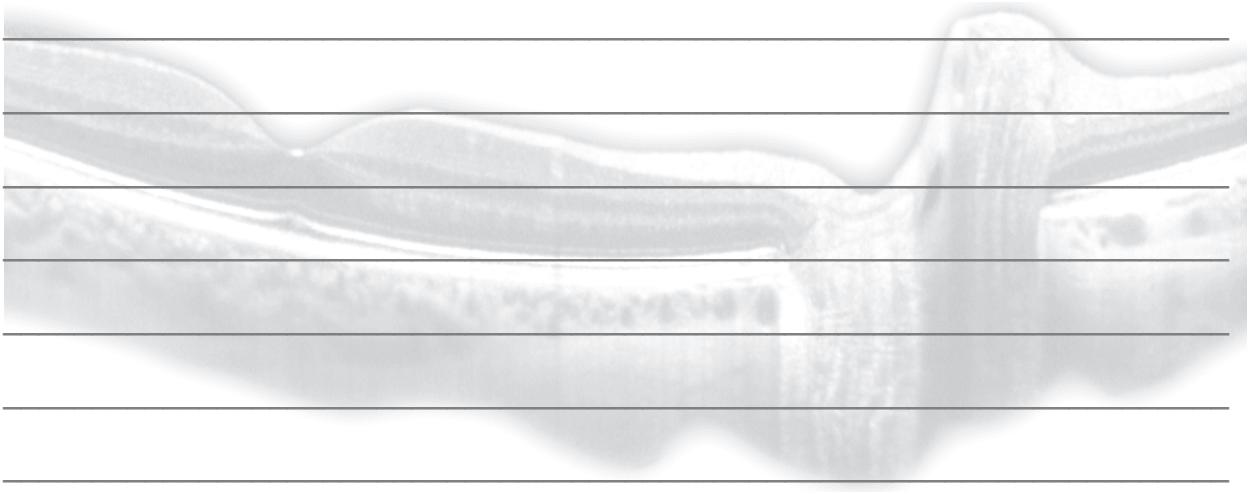

Poster Presentation

Prognostic Value of the Tomographic Phenotypic Characterization of Myopic Choroidal Neovascularization

Isabel Pascual-Camps, Pablo Hernández-Martínez, María Andreu-Fenoll, Rosa Dolz-Marco, Roberto Gallego-Pinazo

University and Polytechnic Hospital La Fe, Valencia, Spain

Purpose: To evaluate the presence of hyperreflective ring around myopic choroidal neovascularization (CNV) in optical coherence tomography (OCT) as a prognostic factor.

Methods: Retrospective study of 48 eyes with myopic CNV and antiangiogenic therapy (pro re nata regime). Demographics and visual acuity(VA) data were collected. OCT images were analyzed, classified on the complete or partial presence or absence of a hyperreflective ring around the CNV; central retinal thickness (CST) was measured before and after treatment.

Results: The median age was 60,31 years (83.33% women). The median initial VA was 0.28 and final VA 0.48; median follow-up time was 15,45 months. After OCT analysis, 30 eyes were classified as Type 1 (presence of the ring), 6 as Type 2 (absence) and 12 as a mixed type. There were no statistically significant differences in age (p=0.226), sex (p=0.423), or follow-up (p=0.102) between the 3 types. Differences were observed in initial and final VA (p=0.001; p<0.001); and also in initial, after first treatment and final CST(p=0.035; p=0.005 and p=0.039). In the intragroup analysis, differences between initial and final VA were observed in type 1 CNV (p<0.001), not in type 2 and mixed type (p=0.08 and p=0.059). Between initial and final CST only type 1 met differences (p=0.005), not type 2 and mixed type (p=0.068 and p=0.136).

Conclusions: The presence of hyperreflective ring around the CNV (type 1) is statistically associated with VA improvement after treatment. On the contrary, its absence does not get these differences.This could be a positive prognostic factor for myopic CNV.The sample is small, larger studies would be needed to draw conclusions.

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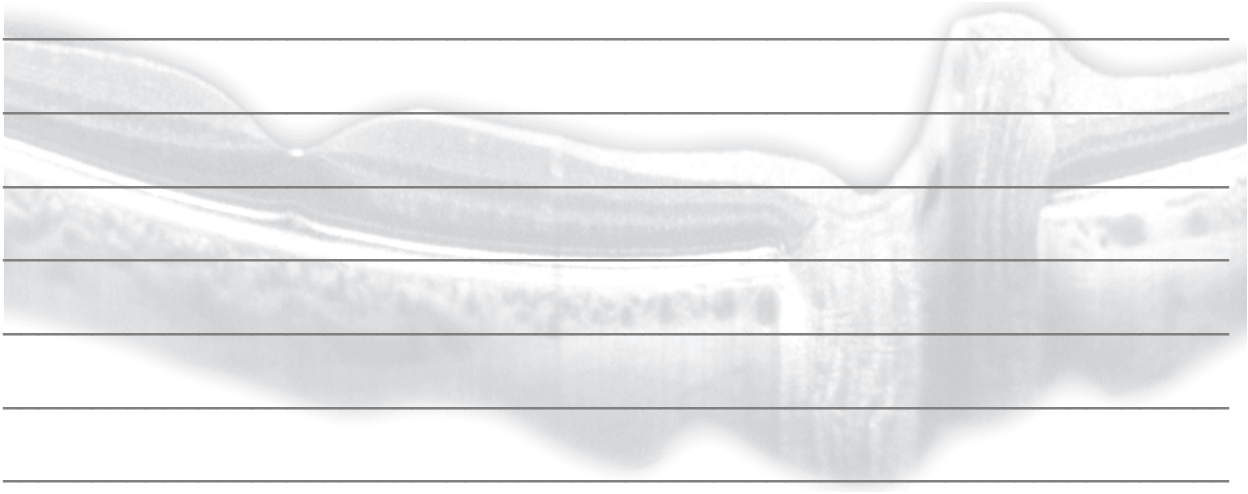

Poster Presentation

"Onion Sign" in Multimodal Imaging of Age Related Macular Degeneration

Laura Monje Fernández[1], Rosa Dolz Marco[2], Roberto Gallego Pinazo[2]

[1] University Complex Hospital León, Spain

[2] University and Polytechnic Hospital La Fe, Valencia, Spain

Purpose: To analyze the characteristics of the onion sign present in age-related macular degeneration.

Methods: Retrospective observational study about onion sign in patients suffering age-related macular degeneration. Examination included: color fundus photographs, fundus autofluorescence, spectral-domain optical coherence tomography (SD-OCT) and MultiColor imaging.

Results: Nineteen eyes were included. Color fundus photographs showed a yellowish crystalline appearance. The onion sign appeared variable in the autofluorescence images, however the MultiColor imaging showed a bright yellowish appearance. The SD-OCT evidenced a variable amount of hyperreflective bands underneath the retinal pigment epithelium. These lesions remained stable through the follow up, or increased over time.

Conclusions: We synthesize the main characteristics of the onion sign. The origin of the onion sign is unknown. We hypothesized that the aging changes in Bruch's membrane may constitute the ideal environment to trigger pathologic dystrophic calcification.

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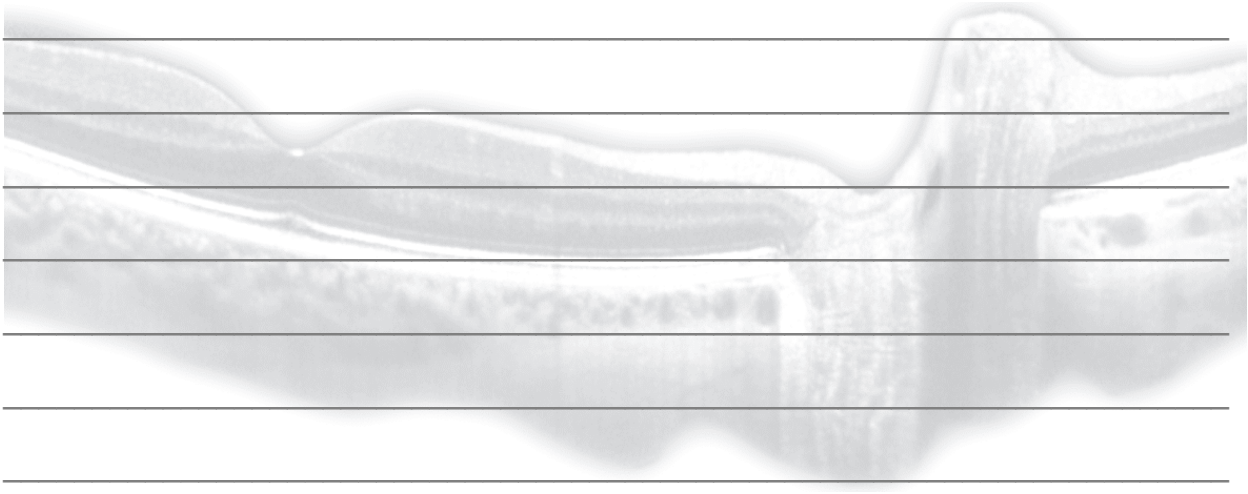

Poster Presentation

Evaluation of Macular Thickness and Volume Using SPECTRALIS SD-OCT 20º and 30º Scan Protocols

Marta Alonso-Plasencia, Ruymán Rodríguez-Gil, Lorena Solé-González,
Rodrigo Abreu-González

University Hospital of La Candelaria, Tenerife (Canary Islands), Spain

Purpose: To evaluate differences between macular fast (MF) and macular width (MW) SPECTRALIS SD-OCT scan protocols macular thickness and volume analysis.

Methods: Thirty four eyes, from 18 consecutive healthy subjects, were analyzed using Spectralis SD-OCT MF (20ºx20º, 25 sections, 240 microns between sections) and MW (30ºx25º, 31 sections, 240 microns between sections) scan protocols. Macular thickness and volume were obtained using SPECTRALIS SD-OCT software. All patients underwent a comprehensive opthalmological examination. Spherical equivalent inclusion criteria was from -5.0D to +5.0D.

Results: MF (20º) scan protocol showed: Mean central thickness of 265.94 +/- 20.62 microns and a mean total volume of 8.55 +/- 0.42 microns. MW (30º) scan protocol showed: Mean central thickness of 267.03 +/- 21.87 microns and a mean total volume of 8.53 +/- 5.84 microns. There were no statistical significance between MF and MW central thickness (p=0.332) and MF and MW total volume (p=0.269). ETDRS sectors measurements were no statistically significant related to thickness and volume but temporal internal sector volume (p=0.0001).

Conclusions: These results indicate that MW (30º) could be a standard macular fast protocol due to be equivalent to MF (20º) and because we capture 9mm image sections instead of 6mm images.

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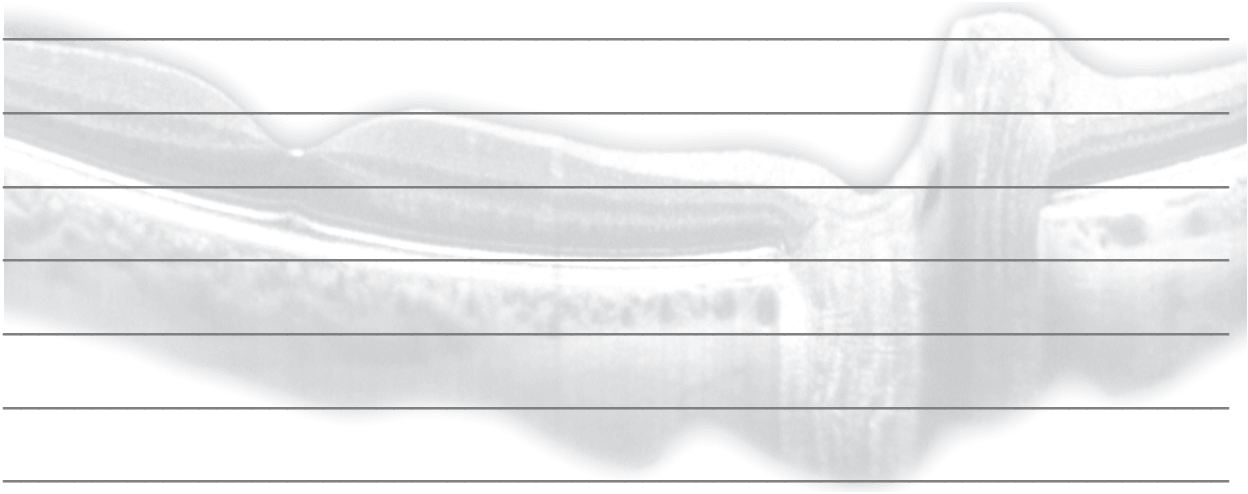


Poster Presentation

SPECTRALIS SD-OCT Fovea to Disc Alignment Technology (FoDI) versus Anatomic Positioning System (APS) in Healthy Population

Lorena Solé-González[1], Rodrigo Abreu-González[1], José Abreu-Reyes[2]

[1] University Hospital of La Candelaria, Tenerife (Canary Islands), Spain

[2] University Hospital of the Canary Islands, Tenerife, Spain

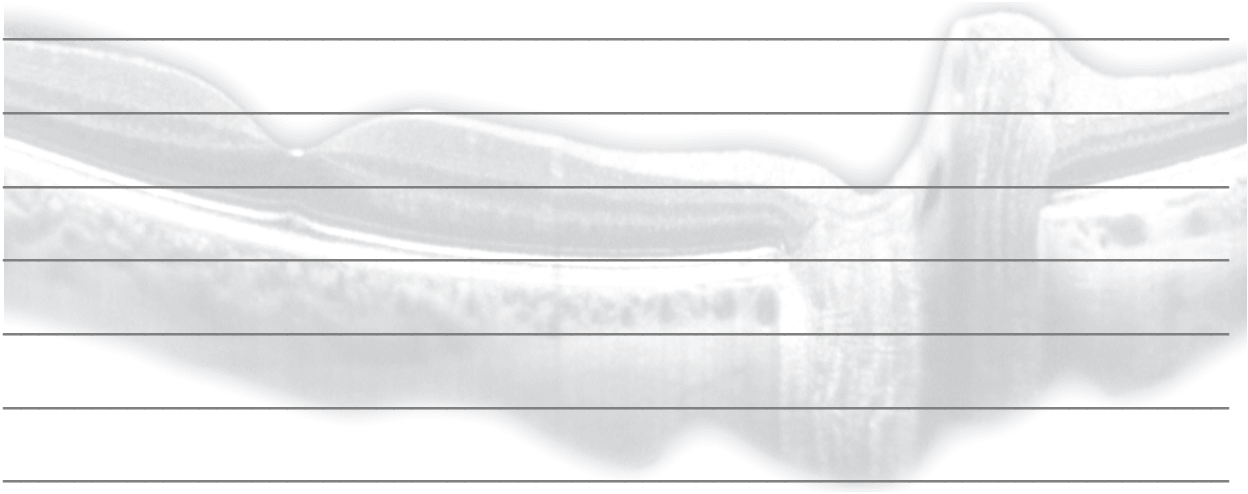
Purpose: To evaluate differences between SPECTRALIS SD-OCT fovea to disc aligment technology (FoDi) versus anatomic positioning system (APS) in healthy population.

Methods: Twenty eight eyes, from 18 consecutive healthy subjects, were analyzed using SPECTRALIS SD-OCT fovea to disc aligment technology (FoDi) versus anatomic positioning system (APS) in retinal nerve fiber layer (RNFL) scan protocols. RNFL diagram sectors thickness were obtained using SPECTRALIS SD-OCT analysis software. All patients underwent a comprehensive opthalmological examination. Spherical equivalent inclusion criteria was from -5.0D to +5.0D. All exams were performed by the same experienced operator.

Results: RNFL average thickness was: 102.56 +/- 7.91 microns (FoDi) and 105.44 +/- 8.02 (APS) showing estatistical significance ($p=0.004$). Only temporal superior and nasal inferior RNFL diagram sectors RNFL thickness showed no statistical significance ($p>0.05$).

Conclusions: These results indicate that SPECTRALIS SD-OCT RNFL thickness measurements uisng FoDi and APS showed different values, so they are not interchangeable.

Notes



Poster Presentation

Tattoo Associated Retinochoroiditis

Jorge Orellana R. MD[1], Gabriela Strauch B. MD[1], Juan I. Verdaguer D. MD[2],
Grisel Bravo L. OT[3], Dominique Oyarzún M. OT[3]

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Purpose: Regarding an increasing awareness of the medical community to hazards of tattooing, we report a case of retinochoroiditis occurring after the placement of permanent tattoo.

Methods: A 25-year-old female was referred to our offices with impairment of visual acuity after a third tattoo put on her left arm. The patient was examined with ophthalmoscopy, fluorescein angiography and optical coherence tomography (TOPCON 3D OCT-1000 and Heidelberg SPECTRALIS OCT). Systemic medical and laboratory work-up were performed in order to exclude an infectious agent or inflammatory disease.

Results: A subretinal yellowish yuxtafoveal lesion in left eye associated with outer retinal disruption and nummular pigmentary defects in mid-periphery was assessed using multi-modality diagnostic imaging showing different patterns to be discussed.

Conclusions: Ophthalmologists treating uveitis should question patients regarding tattoos and tattoo inflammation given the numbers of subjects undergoing artistic tattooing to identify this uncommon but increasingly recognized condition.

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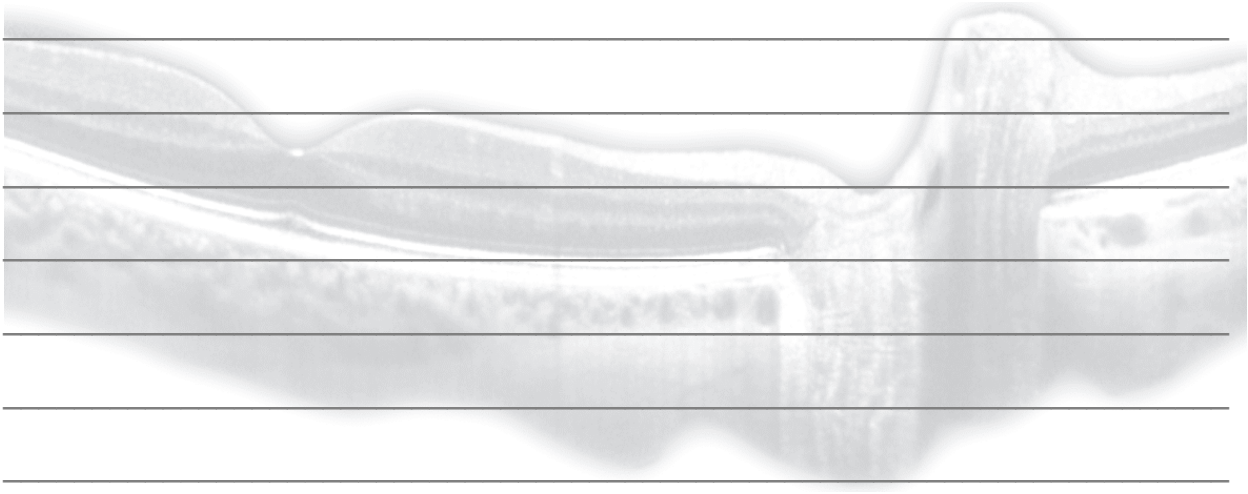

Poster Presentation

Is Indocyanine Green Angiography still Useful in Non-Responders in Neovascular AMD? Looking for Polypoidal Choroidal Vasculopathy

Maribel Fernandez Rodriguez[1,2]*, Maria Gil Martinez[1,2], Maria Jose Rodriguez Cid[1], Francisco Gomez-Ulla de Irazazabal[1,2]*

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*Miembros de la Red Tematica de Investigacion Cooperativa en Salud (Retics). Oftared. Patologia Ocular. Subprograma de Enfermedades de la Retina. RD/0034/11

Purpose: Photodynamic therapy with Visudyne (PDT), alone or in combination with antiangiogenic drugs (anti-VEGF),seems to be necessary for a complete resolution of polypoidal lesions in polypoidal choroidal vasculopathy (PCV). The purpose of this study is to evaluate the utility of indocyanine green angiography (ICGA) for guided reduced spot PDT and analysis of atrophic areas using fundus autofluorescence (FAF). We discuss the usefulness of these two methods not only at the diagnosis but also during the follow up.

Methods: Retrospective case-series study of patients with PCV at the Ophthalmology Department at Santiago de Compostela University Hospital and Instituto Oftalmológico Gómez-Ulla between January 2011 and July 2015. We analyze the results of FAF and ICGA using the HRA-2 (Heidelberg Engineering Inc, Heidelberg, Germany). The spot size was reduced to cover only active polyps. We combined anti-VEGF with PDT or laser when PCV remained active without visible polyps in ICGA or without a complete response.

Results: A total of 28 eyes from 25 patients were included. The mean age was 75,95±8,6 years with a mean of follow-up of 37,17±19,26 months. We divided the treatment in 5 groups according to the ICGA findings: 1) PDT alone: 3 eyes 2) PDT+antiVEGF:18 eyes 3) anti-VEGF alone: 2 eyes, 4) anti-VEGF+ laser: 2 eyes, 5) PDT+antiVEGF+laser: 3 eyes

Conclusions: The sensitivity of ICGA in making a correct diagnosis at presentation was 100% in our serie it also was very helpful during the follow up. FAF was suitable for show atrophic areas and to asses the functional outocome. ICGA was essential to reach a diagnosis and to customize the treatment what reduce the need of antiVEGF.

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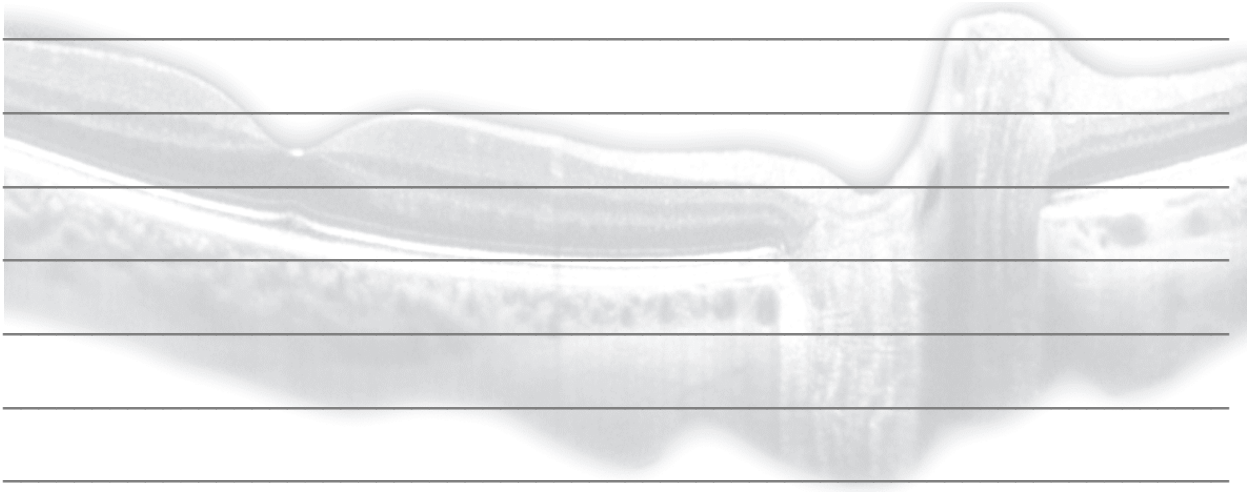

Poster Presentation

Macular Outer Retinal Layers and Retinal Pigment Epithelium Segmentation: Comparison of Thicknesses Among Healthy, Hypertensive and Glaucomatous Patients

Jose Javier García-Medina, Miguel Tudela-Molino, Daniel Sanchez-Martinez, Celia Gomez-Molina, Alicia Guardiola-Fernandez, Miriam Pastor-Montoro, Marta Beatriz Rodriguez-Cavas

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Purpose: To compare measurements made at macula of the outer macular layers and retinal pigment epithelium (RPE) using new spectral-domain optical coherence tomography (OCT) software.

Methods: Healthy, hypertensive and primary open-angle glaucoma eyes were recruited according to previous clinical records. All of them underwent posterior pole SPECTRALIS OCT (8x8 grid pattern centered on foveal pit). Then macular outer layers (outer nuclear, outer plexiform, and photoreceptor layers) and RPE were segmented and their thicknesses automatically calculated in 64 macular locations. Only reliable exams were considered. Comparisons among groups were calculated using T-Student tests for independent samples.

Results: The study included 206 healthy eyes (control group), 164 hypertensive eyes and 256 glaucomatous eyes. Outer plexiform and nuclear layers showed low variability among groups on the grid. However photoreceptor layer and EPR layer thicknesses were significantly thicker in many locations in glaucomatous eyes.

Conclusions: Photoreceptor and EPR layers may be useful in differentiating glaucomatous eyes from healthy or hypertensive eyes.

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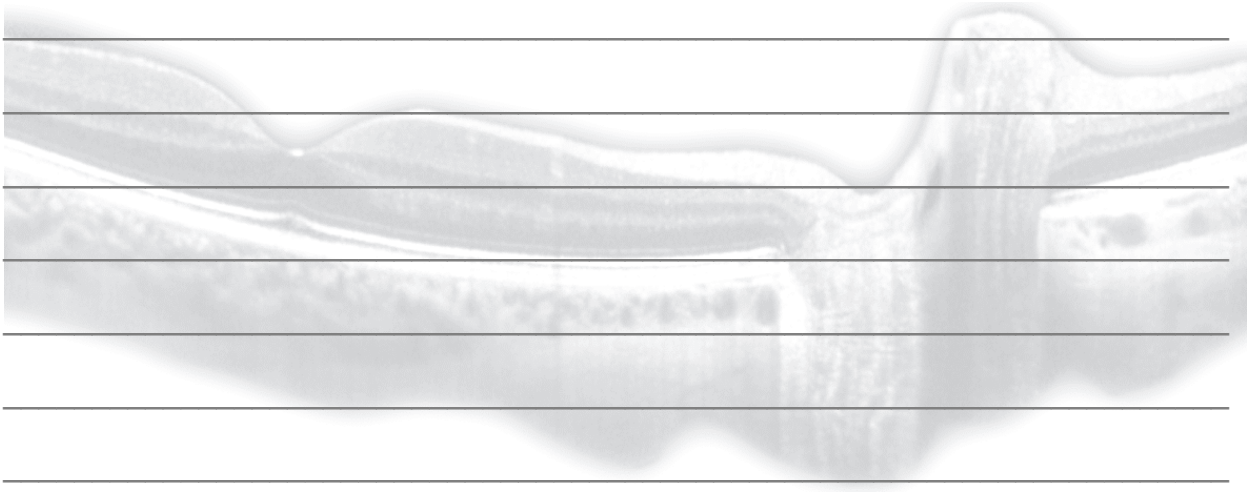

Poster Presentation

Icarus' Fovea? Case Report about one Pilot

Paola Salvetti, MD; Avinash Gurbaxani, MD

Moorfields Eye Hospital Dubai, United Arab Emirates

Purpose: Case presentation; 62 yo pilot failed at VA acuity for routine license renewal. Nuclear cataract present bilaterally, VA 6/7.5-2 in each eye, binocular 6/7.5, impossible to increase.

Methods: IR, RF and AF imaging; OCT; All images acquired with SPECTRALIS HRA.

Results: OCT en face documents presence of focal foveal interruption of layers from myoid, throught to interdigitation, possibly compatible with solar maculopathy. The lesion is not visible on AF images. Nucler cataract may have contributed to binocular visual impairement.

Conclusions: OCT en face is a valuable tool to appreciate extent of damage to different layers of retina.

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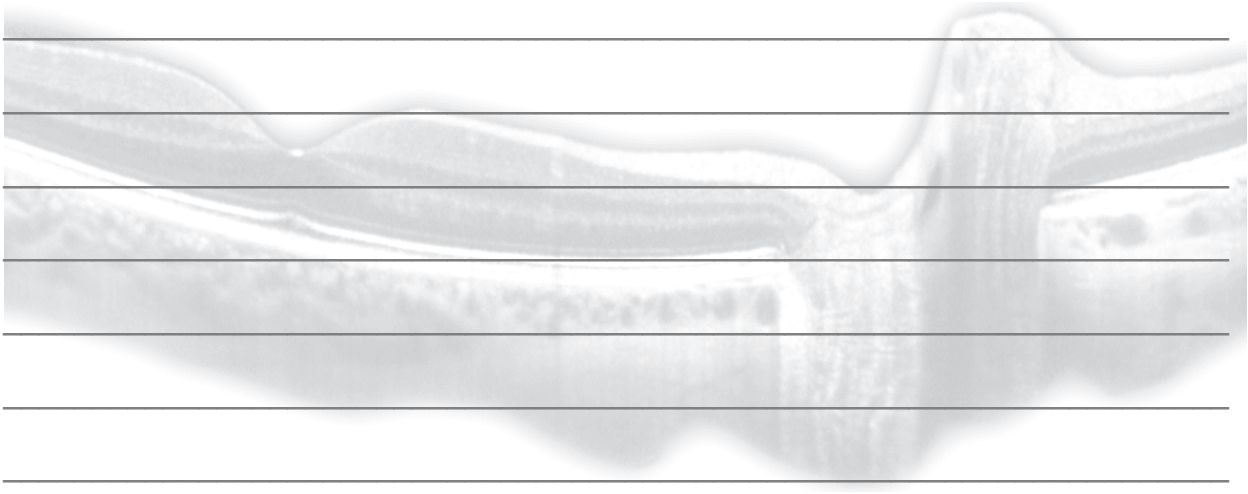

Poster Presentation

Comparison of Anatomical Features of Choroidal Naevi and Choroidal Hemangiomas with Swept-Source Optical Coherence Tomography and Enhanced Depth Imaging Tomography: a Pilot Study

S Degli Esposti[1,3], VP Papastefanou[1], C Vázquez-Alfageme[1,3], S-T Xirou[2], PJ Patel[1,3], MS Sagoo[1,2,3]

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Purpose: To assess and compare the retinal and choroidal features of choroidal naevi (CN) and circumscribed choroidal hemangiomas (CCH) using swept-source optical coherence tomography (SS-OCT) and enhanced-depth optical coherence tomography (EDI-OCT).

Methods: Observational case series. Patients with CN and CCH underwent clinical examination, B-scan ultrasonography, SS-OCT and EDI-OCT. For both SS-OCT and EDI-OCT, horizontal and volume scans were obtained. Clinical features, location and dimensions of the lesions were documented. Both SS-OCT and EDI-OCT retinal and choroidal features were recorded.

Results: Images were acquired for 22 eyes of 22 patients (mean age 60.5±7.5 years), of which 20 had CN and 2 CCH. Of the 20 CN, 17 (85%) were melanotic and 3 (15%) amelanotic. The mean thickness of the naevi was 0.705±0.302 mm and mean diameter was 2.935±0.716 mm. With regards to retinal features, there was no difference in assessment between modalities. Overlying retinal pigment epithelial (RPE) changes were absent in 9 cases (45%). RPE disruption and photoreceptor layer changes were found in 11 cases (55%), drusen in 1 case (5%), subretinal fibrosis in 1 case (5%), subretinal fluid in 6 cases (30%). Bruch`s membrane was visualized intact in 16 cases (80%) on SS-OCT versus 14 cases (70%) on EDI-OCT. Intrinsic hyperreflectivity with optical shadowing was noted in 19 cases (95%) on SS-OCT and 18 cases (90%) on EDI-OCT though the degree of optical shadowing was less with SS-OCT. The posterior margin of the naevus was visualized in 16 cases (80%) with SS-OCT and in 9 cases (45%) with EDI-OCT. Intratumour vessels were visualized in 18 cases (90%) with SS-OCT and 13 cases (65%) with EDI-OCT. Distended bordering vessels were visible in 11 cases (55%) with SS-OCT and in 13 cases (65%) with EDI-OCT. No difference was noted between modalities for the two cases of CCH. On both OCT modalities, lesions were hyporeflective, the posterior interface with the sclera was visualized, distended choroidal vessels were visible mostly at the margins of the lesion and choriocapillaris appeared normal.

Conclusions: Our preliminary results indicate that imaging with SS-OCT enables better visualization of certain anatomical aspects of choroidal naevi namely intratumour vessels and posterior margin. No difference was noted between OCT modalities in two cases with circumscribed choroidal hemangioma.

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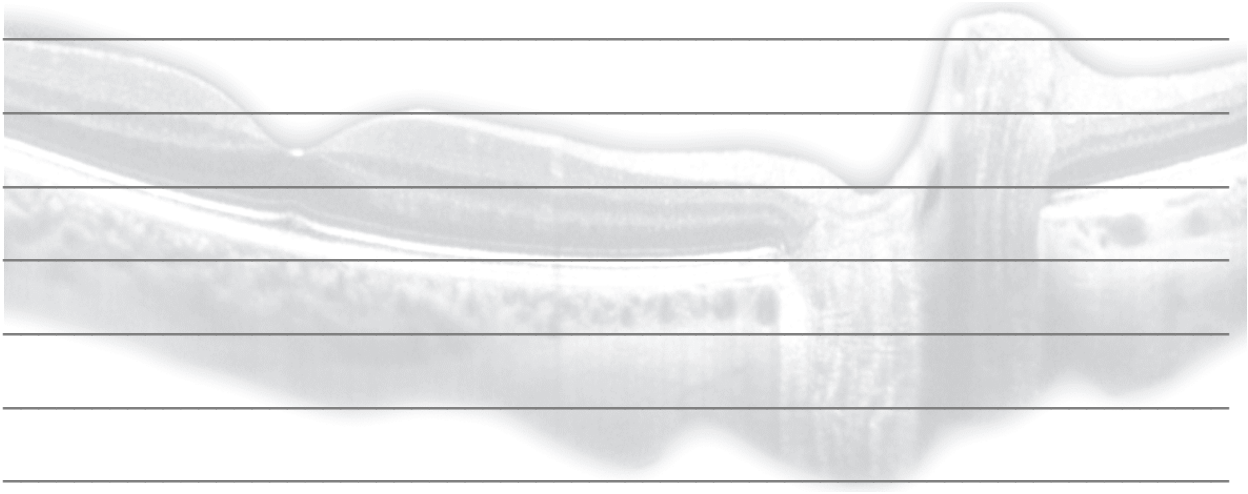

Poster Presentation

Chloroquine-Induced Maculopathy: OCT Changes Using ENFACE Protocol

Gonzalo Suarez, B.; Oleñik Memmel, A.

Hospital Ramon y Cajal, Madrid, Spain

Purpose: To describe the findings using optical coherence tomography (OCT) SPECTRALIS (Heidelberg Engeneering) with ENFACE transversal section a case of chloroquine- induced maculopathy.

Case: A 77-year-old lady on chloroquine for treatment of eritematous systemic lupus referred from to screen for chloroquine-induced maculopathy referring none ocular symptoms. The daily dosage was 50 mg for 8 years (approximated accumulate doss: 146g). Clinical examination was normal with a best corrected visual acuity (BCVA) of 0,9 in both eyes. Humphrey field analyzer 10.2 perimetry was made showing a paracentral persistent scotoma with an acceptable performance of the examination on right eye being normal on left eye. A multifocal electrorretinogram confirmed the diagnosis of premaculopathy showing a decrease retinal response in both eyes and the Fanswoth-Munsell test revealed a moderate decrease of sensitivity for colors in right eye with a possible protanopia and a normal test on left eye. The Spectral Domain OCT (Heidelberg Engineering) showed aberration of ellipsoid layer and pigmentary epithelium defects using Retina Fast protocol but those findings where nonspecific and difficult to correlate with the HFA results en right eye and left eye appears to be unaffected. In the ENFACE protocol on right eye hiperreflectance lesions where described as well as in left eye with had been previously informed as normal OCT using sectional protocols.

Conclusions: Chloroquine maculopathy OCT findings are sutile and difficult to asses using the common OCT retina tests (Fast, 7-line raster). Using ENFACE protocol OCT alterations can be correlated to visual field scotoma and even present lesions prior to visual field changes which can be missed using other protocols.

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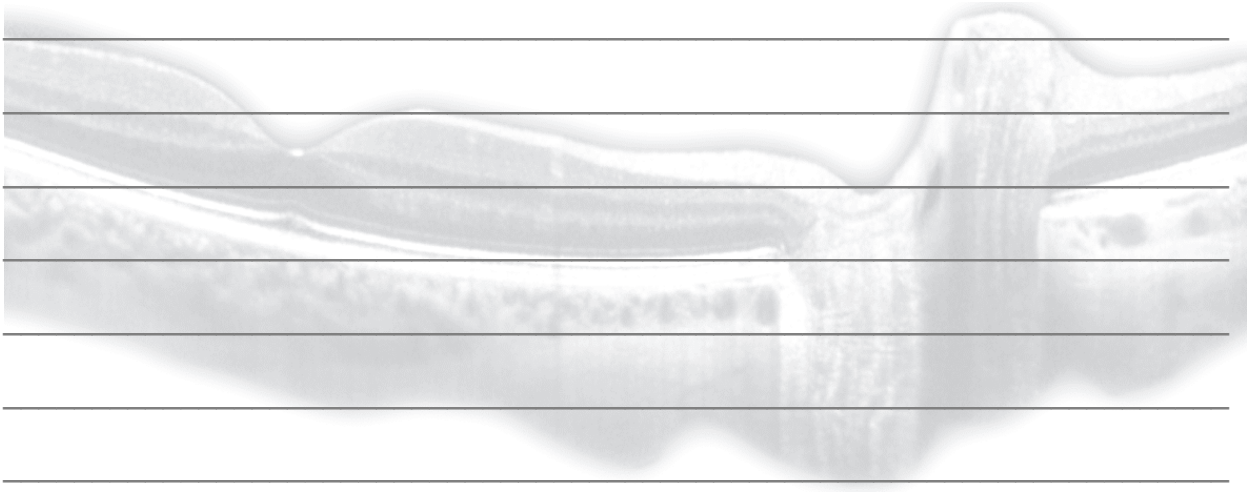

Poster Presentation

Case of Peripheral Retinal Degenerations using Ultra-Wide Field Lens Imaging

Chidamber Boughram Srinivas, MD

City Centre Clinic, Dubai, United Arab Emirates

Purpose: To highlight a series of Peripheral retinal Degenerations in non-mydriatic eyes using Ultra-wide field lens Imaging.

Methods: A poster depicting a series of cases showing the versatility of the Ultra-wide field imaging function of the Spectralis. The efficient means of capturing far peripheral degenerations and highlighting the ease of incorporating structures like ora serrata and Ciliary body in such images proves the superiority of this platform in documenting and diagnosing various degenerations and disorders in non-mydriatic eyes.

Results: The image clarity with high resolution peripheral images and ease of acquisition are highlighted in this poster showing various peripheral retinal degenerations.

Conclusion: The Ultra-wide field imaging function of Spectralis helps in documenting and diagnosing the far peripheral retinal degenerations and may serve as a reliable replacement of dilated fundus examinations in difficult cases.

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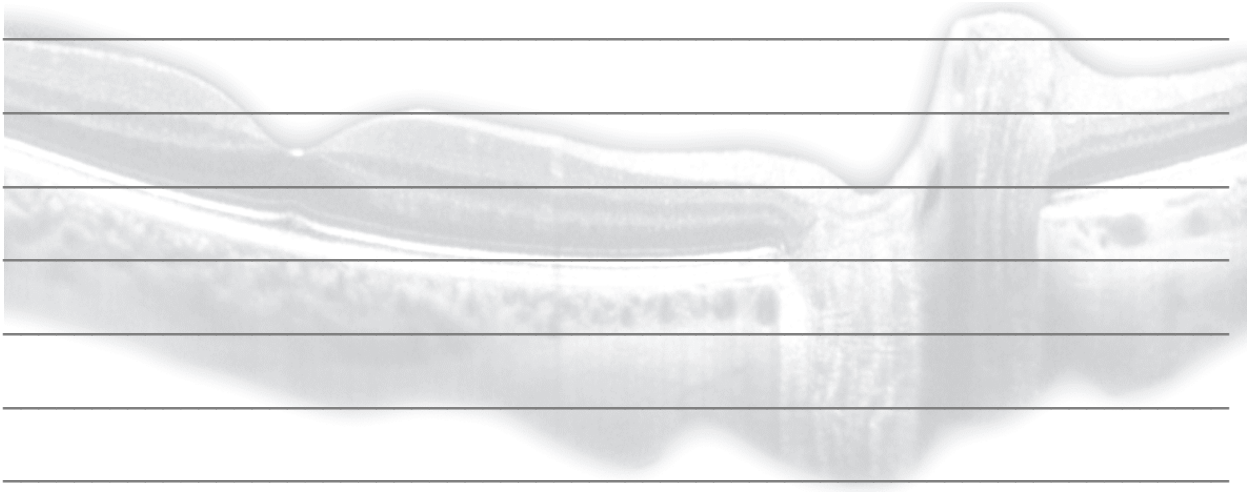

Poster Presentation

BMO-MRW function in a Case of Disc Edema in Benign Intracranial Hypertension

Chidamber Boughram Srinivas, MD

City Centre Clinic, Dubai, United Arab Emirates

Purpose: A series of cases showing the efficacy of the BMO-MRW function in monitoring the progression of the treatment efficacy and dosage titration in cases of disc edema in benign intracranial hypertension.

Methods: A poster depicting the clinical utility of the Bruch's membrane opening – Minimum rim width function of Spectralis in monitoring the progression of the treatment efficacy as well as dosage titration in treating disc edema in benign intracranial hypertension.

Results: A reliable and standardized means of serially documenting disc changes during the management of disc edemas.

Conclusion: BMO-MRW function of Spectralis serves as an excellent tool in monitoring and documenting changes in disc related disorders in addition to glaucomatous hanges.

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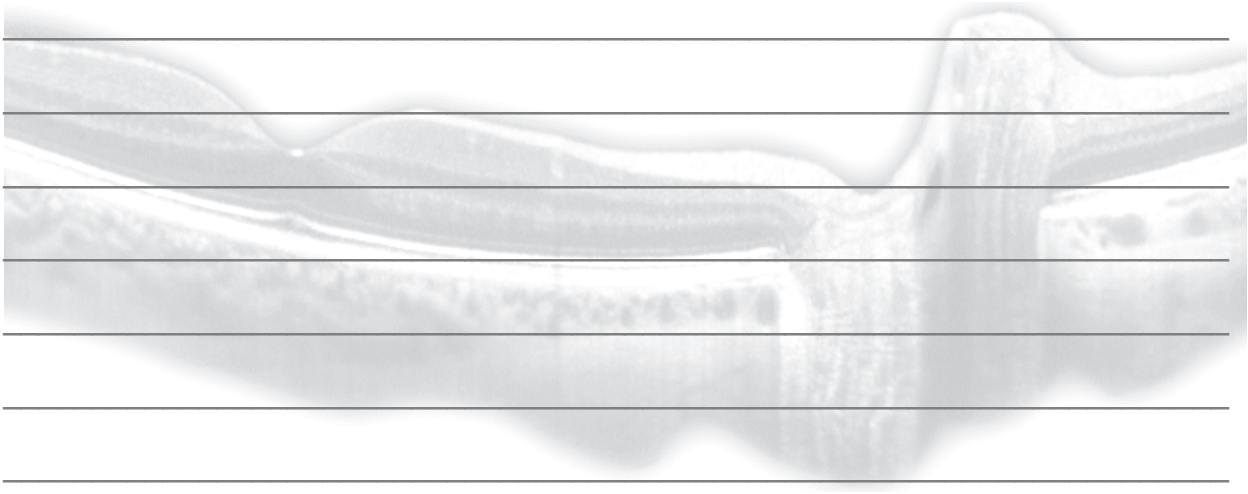

Poster Presentation

Optical Coherence Tomographic Hyperreflective Retinal FOCI in Tuberculous Choroiditis

Francisco Pérez Bartolomé, Jaime Almendral Gómez, Alejandra Acebal Montero, David Díaz Valle

Hospital Universitario San Carlos, Madrid, Spain

Purpose: To describe and analyze the hyperreflective retinal foci in a case of monofocal tuberculous choroiditis with spectral-domain optic coherence tomography (SD- OCT). We also compared it with choroidal lesions of other etiologies using enhanced depth imaging (EDI) technology.

Methods: Descriptive case report. A 23 years-old transsexual male diagnosed with adquired immunedeficiency syndrome C3 Stage and military tuberculosis (TB) presented a three day-lasting vision loss in his left eye (LE). Fundus exam, SD- OCT, EDI- OCT, both fluorescein and green indocianine angiography revealed a macular choroidal lesion in the LE.

Results: EDI-OCT showed a single elevated choroidal mass with great swelling of coriocapilar vessels. Both EDI and SD- OCT showed a neurosensory retinal detachment compromising the fovea. We observed in SD- OCT multiples hyperreflective foci in photoreceptor (PR) layer and PR outer segments. Partial resolution of neurosensory detachment and hyperreflective foci were registered after tuberculous therapy and highly active antiretroviral therapy instauration. Nevertheless, three weeks later, both tomographic signs worsened again. We attributed this phenomena to an immune reconstitution inflammatory syndrome.

Conclusion: Intrarretinal hyperreflective foci seen in SD- OCT may supose an inflammatory biomarker in a choroiditis`s scenario. EDI- OCT may help to detect some diferential tomographic signs from other choroidal lesions.

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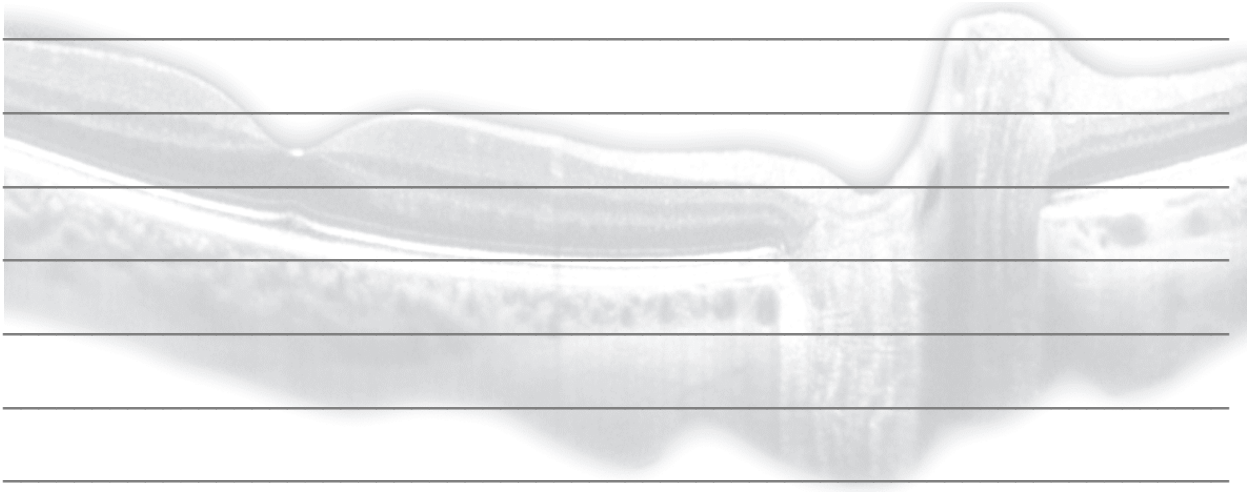

Poster Presentation

Prognostic Value of the Tomographic Characterization of Vitreomacular Traction Syndrome

Acebal Montero A., Perucho González L., Berrozpe Villabona C.

Hospital Universitario San Carlos, Madrid, Spain

Purpose: Description of the findings on spectral domain optical coherence tomography (SD-OCT) after injection of intravitreal ocriplasmina (IVO) in patients with vitreomacular traction (VMT).

Methods: A retrospective study in which the tomographic findings of patients treated with OIV by TVM were reviewed. OCT, detailed history, complete eye examination, metamorphopsia questionnaires and visual function were performed before the OIV and during monitoring visits (a week, 28 days, 3 months and 6 months after the injection).

Results: The age range of the patients was between 60 and 85 years old. In most of the patients VMT complete resolution occurred. Cystoid macular edema (CME) , lamellar macular hole (LMH), detachment of the retinal pigment epithelium (DPE), changes in the ellipsoid region and nonspecific changes in the outer layers of the retina reflectivity were found.

Conclusions: Baseline factors that predict successful treatment outcome with OIV are the phakic status, female gender, age under 65, VMT reduced size (< 1500 microns), weak vitreous adhesion and the absence of epiretinal membrane (ERM) . In this preliminary study we describe other tomographic findings after IVO, not just the VMT resolution. The ocriplasmina seems effective in the VMT treatment, but larger and long-term studies about possible effects on other retinal structures and their anatomical and functional consequences are required.

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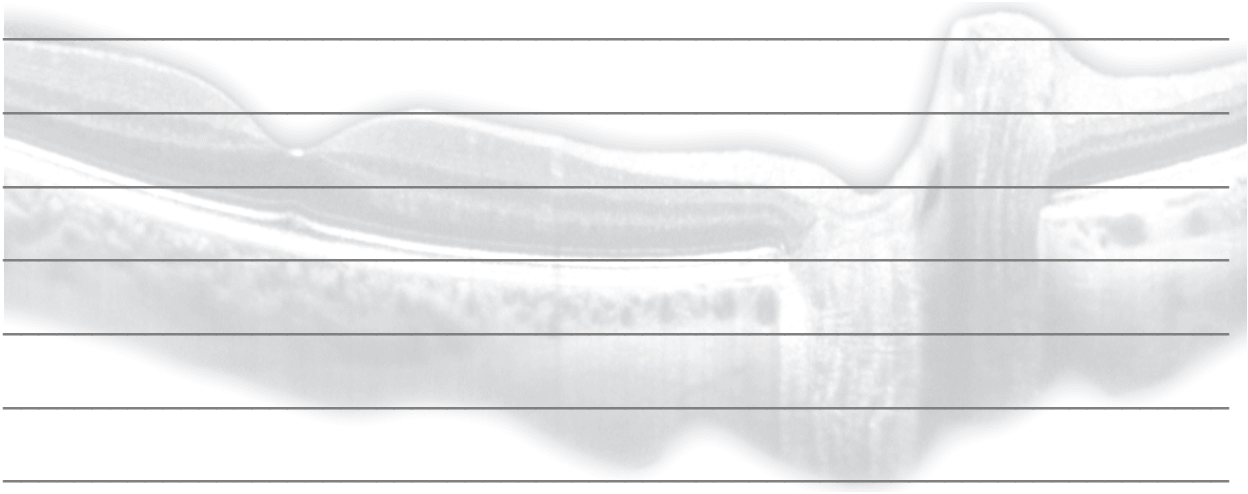

Poster Presentation

Macular Retinal Automated Segmentation with SD-OCT in Glaucomatous Patients

Marta Pazos[1,2], Agnieszka Dyrda[3], Alicia Gómez[3], Alfonso Antón[1,3]

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[2] Institut de la Màcula. Centre Mèdic Teknon. Barcelona, Spain

[3] Institut Català de la Retina (ICR) Barcelona, Spain

Purpose: To evaluate thickness of the different retinal layers in the macular area in normal and glaucomatous eyes using the automated layer by layer retinal segmentation software of SPECTRALIS Spectral-Domain Optical Coherence Tomograph (SD-OCT). Methods: Sixty-four eyes (24 normal, 20 mild glaucoma and 20 moderate glaucoma) were prospectively studied. Complete ophthalmological examination was done, including reliable 24-2 Humphrey Visual Field (HFV), Intraocular Pressure (IOP), optic disc evaluation by glaucoma specialists and a good quality (Q≥20) SPECTRALIS posterior pole imaging with the automated retinal layers segmentation software (figure 1). Inclusion criteria for the normal group: IOP≤ 21 mmHg, normal optic disc appearance and normal HVF. For glaucoma: IOP>21 mmHg with glaucomatous optic disc. HVF Mean Deviation (MD) was used for glaucoma classification (mild: MD<-6Db; moderate: MD≥-6dB). A thickness map of 9 regions using the ETDRS circle (1-3-4 mm rings centered on the fovea) was obtained for each layer/group of layers including Retinal Nerve Fiber Layer (RNFL), Ganglion cell complex (GCCx) and Ganglion Cell layer (GCL). Differences among groups were assessed with ANOVA at $p<0.01$.

Results: RNFL volume was 0.99±0.1 mm3 for the normal group, 0.84±0.1 mm3 for the mild, and 0.76±0.1 mm3 for the moderate glaucoma, and inferior quadrants showed the highest thickness difference (42±5, 32.4±8 and 24.9±4.6 µm, respectively)($p<0.01$). Both for GCCx and GCL, 8 regions in the mild glaucoma group (except the central area) and all 9 regions studied in the moderate glaucoma group, showed a significant thickness reduction when compared to normal eyes; when comparing mild vs moderate glaucoma, significant thinning was found in the inferior and temporal quadrants (see figure 2 for GCL quantitative results).

Conclusions: 1. The Automated segmentation of the SD-OCT Spectralis allows visualization and quantification of the different retinal layers in the macula including isolated GCL (without Inner Plexiform Layer). 2. This segmentation showed significant thinning of RNFL, GCCx and GCL in glaucomatous eyes when compared to normal eyes. 3. GCCx and GCL thickness were found to be significantly thinner in the temporal and inferior areas of moderate glaucoma when compared to mild glaucoma.

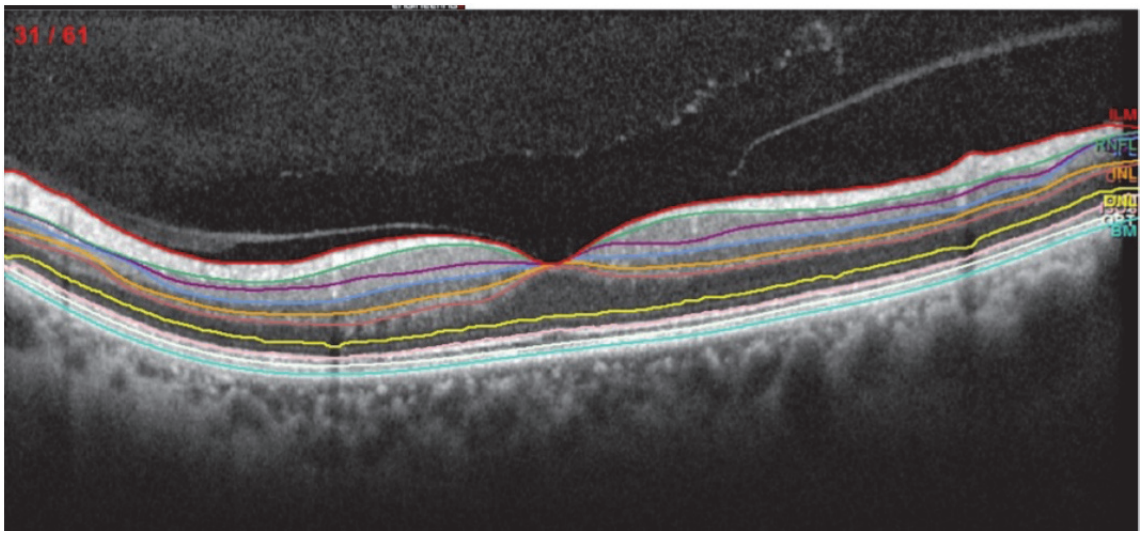

Figure 1.

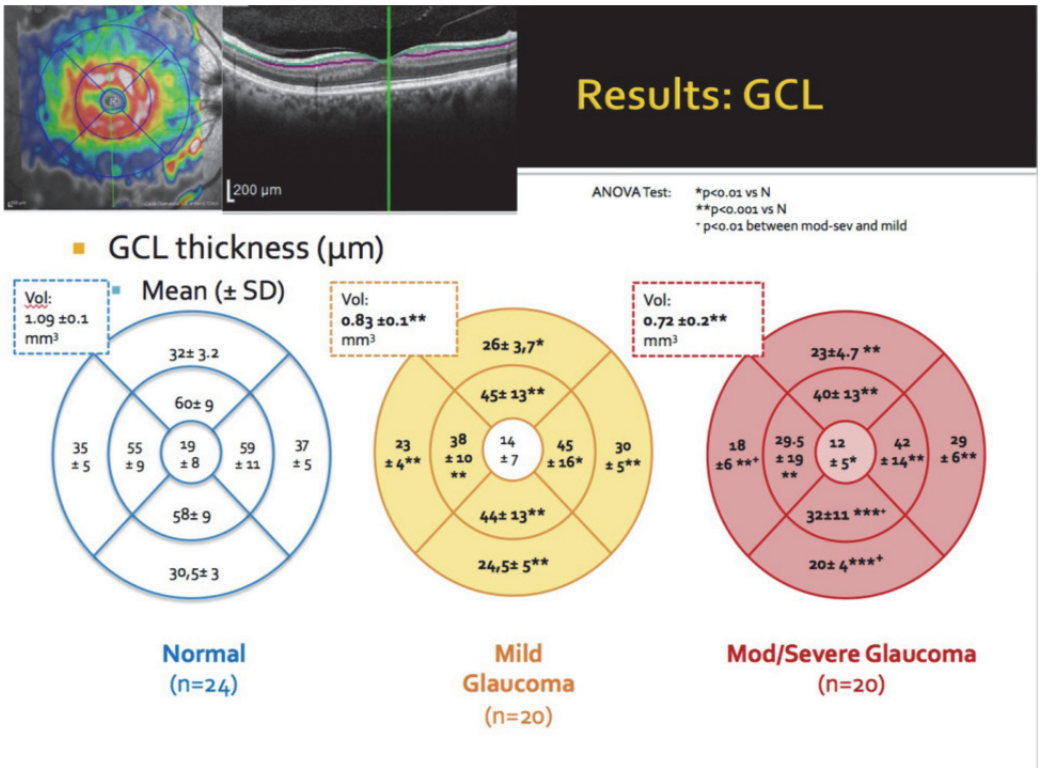

Figure 2.

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