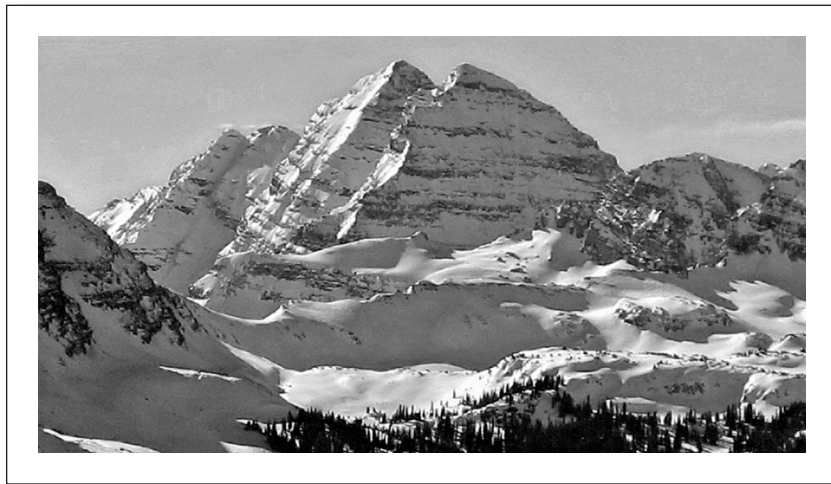


THE ASPEN RETINAL DETACHMENT SOCIETY

*"Oh vitreous where is thy humor"*

38th  
Annual  
**Aspen Retinal  
Detachment Society  
Meeting**



March 6–10, 2010 • Snowmass, Colorado

Donald J. D'Amico, MD    Timothy G. Murray, MD, MBA    William O. Edward, MD

Ottiwell W. Jones, MD    Jerry E. LeClaire, MD

Organizing Committee



**FMA ACCREDITATION  
PROGRAM**  
How Physicians Earn Quality CME

This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the Florida Medical Association and the Aspen Retinal Detachment Society. The Florida Medical Association is accredited by the ACCME to provide continuing medical education for physicians.

The Florida Medical Association designates this educational activity for a maximum of twelve (12.0) AMA PRA Category 1 Credits.<sup>™</sup> Physicians should only claim credit commensurate with the extent of their participation in the activity.

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Will not be discussing the off-label or  
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## ARDS 2010 Program

# Saturday

MARCH 6

### **4:00-9:00PM**

Registration  
*Snowmass Conference Center*

### **6:00-9:00PM**

Welcome Dinner

# Sunday

MARCH 7

### **3:30-4:00PM**

Exhibits/Après ski refreshments

### **4:00-4:25PM**

Vitreoretinal Surgery in Patients  
with Permanent Keratoprosthesis  
*Szilárd Kiss, MD*

### **4:25-4:35PM**

Discussion

### **4:35-5:00PM**

Does Small Gauge Technology  
Change our Techniques in  
Retinal Detachments?  
*Stanislao Rizzo, MD*

### **5:00-5:10PM**

Discussion

### **5:10-5:35PM**

Sustained Released  
Pharmacotherapy for  
Retinal Disease  
*Anthony P. Adamis, MD*

### **5:35-5:45PM**

Discussion

### **5:45-6:15PM**

Break/Exhibits

### **6:15-6:40PM**

Ultra-wide Imaging of the Retina:  
Do We Really Need It?  
*Thomas R. Friberg, MD*

### **6:40-6:50PM**

Discussion

### **6:50-7:15PM**

Small Incision Vitrectomy:  
Pros and Cons  
*Carl D. Regillo, MD*

### **7:15-7:30PM**

Discussion

# Monday

MARCH 8

### **3:30-4:00PM**

Exhibits/Après ski refreshments

### **4:00-4:25PM**

Drug Development for AMD and  
Diabetic Retinopathy: Biological  
Insights and Open Questions  
*Anthony P. Adamis, MD*

### **4:25-4:35PM**

Discussion

### **4:35-5:00PM**

Part A: OCT Evaluation in  
Neurological Disease.  
Part B: OCT Data Viewing  
in the "CAVE"  
*Szilárd Kiss, MD*

### **5:00-5:10PM**

Discussion

### **5:10-5:35PM**

Severity Scales and AMD:  
Are They Relevant?  
*Thomas R. Friberg, MD*

### **5:35-5:45PM**

Discussion

# Monday

MARCH 8

(continued)

**5:45-6:15PM**

Break/Exhibits

**6:15-6:40PM**

Genetics and Age-related  
Macular Degeneration:  
What the Clinician Should Know  
*Michael L. Klein, MD*

**6:40-6:50PM**

Discussion

**6:50-7:15PM**

Macula Risk and Genetic  
Testing for AMD: Early Canadian  
Experience and Perceptions  
*David R. Chow, MD, FRCS(C)*

**7:15-7:30PM**

Discussion

# Tuesday

MARCH 9

**12:00-2:00PM**

NASTAR ski race & lunch

**3:30-4:00PM**

Exhibits/Après ski refreshments

**4:00-4:25PM**

Surgical Treatment of Retinal  
Detachment with Severe  
Vitreoretinal Proliferation  
*Jeroni Nadal, MD*

**4:25-4:35PM**

Discussion

**4:35-5:00PM**

Imaging: Cones in Human  
Macular Diseases  
*Steven D. Schwartz, MD*

**5:00-5:10PM**

Discussion

**5:10-5:35PM**

Surgical Treatment of Retinal  
Detachment in High Myopia  
*Jeroni Nadal, MD*

**5:35-5:45PM**

Discussion

**5:45-6:15PM**

Break/Exhibits

**6:15-6:40PM**

Geographic Atrophy:  
Development, Progression and  
Treatment Considerations  
*Michael L. Klein, MD*

**6:40-6:50PM**

Discussion

**6:50-7:20PM**

**THE TAYLOR SMITH LECTURE**  
**Optical Coherence Tomography**  
**at the Brink: Intraoperative**  
**Imaging and Navigation and**  
**Multimodal Applications**  
*Carmen A. Puliafito, MD, MBA*

**7:20-7:30PM**

Discussion

**8:00PM**

Closing Dinner

# Wednesday

MARCH 10

**3:30-4:00PM**

Exhibits/Après ski refreshments

**4:00-4:25PM**

Late Complications of ROP  
*Kimberly A. Drenser, MD, PhD*

**4:25-4:30PM**

Discussion

**4:30-4:55PM**

Optimizing Treatment of  
Neovascular AMD  
*Carl D. Regillo, MD*

**4:55-5:00PM**

Discussion

**5:00-5:25PM**

PVR: Update from the  
Old World  
*Stanislao Rizzo, MD*

**5:25-5:30PM**

Discussion

**5:30-6:00PM**

Break/Exhibits

**6:00-6:25PM**

Simplifying Vitrectomy with a  
20g Sutureless Technique and  
the Use of Chandeliers  
*David R. Chow, MD, FRCS(C)*

**6:25-6:30PM**

Discussion

**6:30-6:55PM**

Management of Congenital  
X-Linked Retinoschisis: Tractional  
and Rhegmatogenous Detachments  
*Kimberly A. Drenser, MD, PhD*

**6:55-7:00PM**

Discussion

**7:00-7:25PM**

Ischemic Index in Retina  
Vascular Disease  
*Steven D. Schwartz, MD*

**7:25-7:30PM**

Discussion

# Sunday

MARCH 7

4:00-4:25PM

## Vitreoretinal Surgery in Patients with Permanent Keratoprosthesis

*Szilárd Kiss, MD*

Although keratoprosthesis (KPro) surgery has existed for more than two hundred years, it has been only during the past decade that significant improvements in techniques have led to promising results for the treatment of complicated corneal disorders and repeated failed grafts. Currently available KPro designs include the Boston (Dohlman) KPro, the osteo-odonto KPro (OOKP), and the AlphaCor KPro. The Boston KPro utilizes a collar-button design consisting of a polymethylmethacrylate (PMMA) optic that clamps within it a donor ring of corneal tissue, which is then sutured in place like a traditional corneal graft. Worldwide, over 2,500 Type I and Type II Boston keratoprostheses have been successfully implanted for a variety of corneal conditions including aniridia, herpetic eye disease, Stevens-Johnson syndrome, ocular cicatricial pemphigoid, trauma, chemical and thermal burns, and repeated corneal graft failures.

Posterior segment abnormalities in association with a KPro may be present prior to KPro placement (as a consequence of injury, previous ocular disease, or a complication of prior surgical intervention), may develop intraoperatively during KPro placement, or may occur postoperatively. The most common of these complications include: 1) the development of retroprosthetic membranes in up to 35% of patients; 2) retinal detachment, noted in up to 12% of patients, and; 3) posterior segment inflammation, either the more commonly observed sterile vitritis or the much less frequent, but visually devastating endophthalmitis.

In 2002, D'Amico and colleagues were the first to comprehensively review vitreoretinal surgical techniques for posterior segment complications in patients with the Boston KPro. Two important observations about KPro patients made by these authors were: 1) the extreme difficulty in visualization of the posterior segment, especially the peripheral retina; and 2) the often abnormal anterior segment anatomy, secondary to profound fibrosis and contracture from the underlying condition requiring KPro placement. The fundamentals of KPro posterior segment surgery outlined by D'Amico and colleagues continue to hold true even today, with one important exception. Since 2002, vitreoretinal surgery has evolved away from 20-gauge sclerotomies and instrumentation to microcannula-based smaller 23- and 25-gauge vitrectomy

techniques. The primary advantage of microcannula-based small gauge vitrectomy in KPro patients is not its 'sutureless' nature, but rather, the ability for easier access in patients with scarred, foreshortened and fibrosed anterior segments. Additionally, the potential for straightforward switching of the infusion cannula to any one of three locations provides for improved visualization and access of peripheral vitreoretinal pathology. As more patients receive keratoprosthesis worldwide, vitreoretinal surgeons will undoubtedly care for more of these patients in their surgical practice.

4:35-5:00PM

## Does Small Gauge Technology Change Our Techniques in Retinal Detachments?

*Stanislao Rizzo, MD*

MIVS initially was recommended for macular pathologic features or simple vitreous hemorrhage because of the limited designs and fragility of small-gauge instrumentation in the initial stage, recent development of rigid instrumentation and a bright light source expanded the indications for MIVS to include complex vitreoretinal disorders such as rhegmatogenous retinal detachment (RRD) and proliferative vitreoretinal disorders.

Today the progress of technology in vitreoretinal surgery has completely changed our approach to the posterior segment. The systems of vitreons, the colorants of the vitreoretinal structures and the new machines make possible an easier and safer surgery.

The small gauge vitrectomy cutter with a high flow and a high duty cycle is promising to be a surgical device for proliferative membrane removal as well as vitreous removal that will contribute to improving the visual outcomes of treating of complicated vitreoretinal diseases.

An ideal vitrectomy probe is the one that can produce a less traumatic and effective vitreous removal, leading to decreased force on the retina. As the cutting rate of the vitrectomy probe increases, the amount of tissue pulled into the cutter port decreases, leading to smoother cutting.

As the duty cycle of the vitrectomy probe increases, the amount of tissue aspirated into the cutter probe increases, leading to time-saving in the cutting procedure. Thus, the performance inside the vitrectomy probe depends on the cutting rate, aspiration vacuum, the duty cycle, and the stiffness of the probe.

Today 25-gauge sutureless vitrectomy has progressed significantly since its introduction in 2002. Improvements in instruments, illumination, and techniques give surgeons an opportunity to perform vitreoretinal surgeries even in complicated cases.

5:10-5:35PM

## Sustained Released Pharmacotherapy for Retinal Disease

*Anthony P. Adamis, MD*

How does one best deliver a drug to the retina? Is the ideal a once a day pill? A daily eye drop? A six-month intravitreal implant? Is one approach more effective than others? Which route is safest and most likely to lead to regulatory approval? Given the relatively recent discovery of drug targets for retinal disease, these questions have taken on a new urgency. The different routes for drug delivery will be considered, taking into consideration the special circumstances of preventing and/or treating a chronic retinal disease.

6:15-6:40PM

## Ultra-wide Imaging of the Retina: Do We Really Need It?

*Thomas R. Friberg, MD*

Our understanding of many retinal diseases has been limited because evaluation of the retinal periphery is difficult to perform, and documentation of retinal findings outside of the posterior pole requires additional effort. With the Optos P200A, images can be acquired as quickly as when using conventional approaches. This is in contrast to systems that require a contact lens for ultra-wide imaging.

In either instance, when one has wide-angle imaging readily available, disease states become simpler to comprehend and differences between patients become more relevant. Diseases thought generally to be confined to the posterior pole turn out to have many peripheral manifestations, some of which require treatment. Our understanding of retinal vascular disease, particularly venous occlusions and diabetic retinopathy is greatly amplified when the entire vasculature can be observed in a single fluorescein angiographic frame. Treatment of macular edema by focal laser alone is bound to fail if there is marked peripheral ischemia, which promotes the release of factors that create or exacerbate macular leakage. In such cases panretinal photocoagulation or vegf inhibition may be a better choice.

Ultra-wide angiographic imaging is also an efficient way to detect neovascularization elsewhere (NVE), so prompt treatment can be offered. Even retinitis pigmentosa can manifest unexpected peripheral pathology on wide field FA, the treatment of which can improve vision in some instances. Finally, when working-up unknown pathology, particularly involving uveitis and inflammatory disease,

ultra-wide angle imaging can be very helpful in narrowing down the diagnosis and in disease management. For many experienced retinal specialists, this technology has proved to be invaluable. Multiple examples will be presented.

6:50-7:15PM

## Small Incision Vitrectomy: Pros and Cons

*Carl D. Regillo, MD*

The adoption of small incision vitrectomy has been remarkably rapid. In just over 6 years, there has been a major shift away from 20 gauge (G) surgery to either 25 G or 23 G surgery. Early published series showed advantages such as shorter operating times, faster postoperative healing, greater postoperative patient comfort, less conjunctival scarring, less initial postoperative induced astigmatism, and faster visual improvement.

Despite these advantages, many surgeons were reluctant to routinely small incision PPV for the majority of cases because of certain drawbacks such as slower vitrectomy, more difficult peripheral retinal manipulation due to greater instrument flexibility, and reduced intraoperative capability because of poor lighting and limited instrumentation, especially when the technique was first introduced. Furthermore, potential safety issues started to come to light that were related to some degree of wound leakage that may occur in the early postoperative period. These problems included hypotony, choroidal detachment and a possible increased rate of endophthalmitis.

However, within the past few years, there have been significant developments in the field that have allowed for the small incision surgical approach to continue growing in utilization. First, there have been refinements in the instrumentation to make them stiffer and behave more akin to 20 G instruments. Second, the lighting has dramatically improved with the introduction of brighter light sources (eg. Xenon.) Together, a greater array of more reliable instruments emerged allowing for expanded vitreoretinal capability.

While all the refinements were occurring, several groups began exploring the issues surrounding wound construction. It became clear that angled entry allows for more consistent, water-tight closure and reduced rates of leaks and hypotony with 25 G surgery. Because several published studies early on reported increased rates of postoperative endophthalmitis with 25 G surgery, a microincisional pars plana vitrectomy task force formed to address potential safety concerns, most notable being the possible increased risk of endophthalmitis.

The task force has put forth several recommendations for small incision surgery. These include (but are not limited to) angling 25 G trochar insertion through displaced conjunctiva, air exchange at the end of cases, suturing any leaking wounds and administration of subconjunctival antibiotics at the end of all cases.

Today, surgeons are much more comfortable with small incision vitrectomy because of the all of these recent refinements and a significant body of published literature which now is indicating a better safety profile. In essence, the “pros” of small incision vitrectomy surgery continue to grow as the “cons” continue to diminish.

# Monday

MARCH 8

4:00-4:25PM

## Drug Development for AMD and Diabetic Retinopathy: Biological Insights and Open Questions

*Anthony P. Adamis, MD*

At least eight companies are developing AMD therapeutics aimed at modulating the complement cascade. The case for complement playing a role in the pathogenesis of AMD will be reviewed and knowledge gaps will be identified. In the case of diabetic retinopathy, new information indicates that inflammation plays an important mechanistic role at the earliest stages of diabetic retinopathy. Work in pre-clinical models has demonstrated, and recent clinical trial data have confirmed, that subclinical inflammation is causal for some of the vision threatening complications of diabetic retinopathy.

4:35-5:00PM

## Part A: OCT Evaluation in Neurological Disease.

## Part B: OCT Data Viewing in the “CAVE”

*Szilárd Kiss, MD*

## Part A: Optical Coherence Tomography Evaluation in Neurological Disease

Parkinson’s disease (PD), Alzheimer’s disease (AD), and multiple sclerosis (MS) are progressive neurodegenerative disorders affecting distinctive collections of central nervous system (CNS) neurons. Despite their progressive

nature, there are no objective, reliable, noninvasive, quantifiable diagnostic measures of disease activity, progression, or response to treatment. In addition to the motor and cognitive abnormalities, symptoms in PD, AD and MS patients often include blurred vision, color vision abnormalities and decreased contrast sensitivity. These visual disturbances may be accompanied by distinctive structural changes within the retina. The retina, being a direct extension of the CNS, may offer a unique, quantifiable location to noninvasively investigate the pathophysiology and to monitor disease activity in these disorders.

Due to its quantitative nature, sensitivity, ease of use, low cost (relative to MRI), and noninvasiveness, optical coherence tomography (OCT) is emerging as a valuable diagnostic tool in patients with MS, PD, and AD. Most of the utility of OCT in neurodegenerative disorders comes from larger studies of MS patients in which retinal nerve fiber layer (RNFL) thickness and macular volume abnormalities have been noted to correlate with disease activity and progression.

Much smaller studies indicate inner retinal thickness abnormalities in PD patients. Still smaller studies point toward RNFL thinning and decreased macular volume in some AD patients. As more and more neurologist, especially MS specialists, adopt the routine use of OCT, findings in neurodegenerative disorders need to be placed in the context of a comprehensive ophthalmic evaluation.

## Part B: Optical Coherence Tomography Viewing in the “CAVE”

Interactive Visualization and Analysis of the Human Retina in a Virtual Reality Environment

Optical coherence tomography (OCT) has revolutionized our ability to non-invasively and rapidly image the retinal with ultra-high resolution. However, the interaction of retinal sub-structures seen on flat OCT slices may not always be evident from the two-dimensional images. We developed a novel method to visualize the human retina within a three-dimensional, stereoscopic, immersive virtual reality environment (“CAVE”). This tool allows users to collaboratively interact with, walk around, view, manipulate and analyze a combined volumetric and slice based spectral-domain optical coherence tomography image (SD-OCT) of a patient’s retina in three-dimensional space, appreciating normal and pathological morphology with full depth perception.

5:10-5:35PM

## Severity Scales and AMD: Are They Relevant?

Thomas R. Friberg, MD

Several risk scales have been offered to define the risk of an eye with dry AMD progressing to late AMD (central GA or CNV). We performed a retrospective, cross-sectional analysis at a single time point on subjects from a single center (UPMC Eye Center) participating in one of two large prospective dry AMD clinical trials: Age-Related Eye Disease Study (AREDS) and Prophylactic Treatment of Age-Related Macular Degeneration (PTAMD) to assess risk.

Data were from 946 eyes of 522 subjects with dry AMD. Fundus photographs of all eyes were digitized and read by trained readers using a drusen analysis algorithm. Median follow up period was 3.75 years (mean: 3.4 years).

Risk was assessed based on the following characteristics:

- ETDRS visual acuity
- Presence or absence of hyperpigmentation within central 1000 or 3000 microns (D=1000 or 3000)
- Total drusen area as a continuous variable in square microns
- Drusen area exceeding a specified threshold level
- Presence of wet AMD in the fellow eye

Risk analysis was performed using generalized estimating equations (GEE) and logistic regression and survival analysis with frailty.

Contrary to risk scales predicated on patients, we calculated them according to eyes. That is, typical risk scales treat bilateral dry AMD subjects one way (and estimate risk of event per patient) and those with a previous event in one eye another (estimate risk of event occurring in the remaining eye).

Results: The risk of developing a choroidal neovascular membrane in an eye with dry AMD is significantly increased by:

- Previous event in the fellow eye . . . . Odds Ratio 5-6
- Presence of hyperpigmentation outside central 1000D . . . . . Odds Ratio 2.8
- Drusen area >0.012 mm<sup>2</sup> (1 large druse) . . . . . Not significant
- Drusen area >0.061 mm<sup>2</sup> (5 large drusen) . . . . . Odds Ratio 5.58
- Drusen area has commonly been thought to be a risk factor. However, our analysis shows that drusen area as a continuous variable generally was not a statistically significant factor, though area above a certain threshold it is.
- ETDRS visual acuity and age were not significant factors.

Even though we can identify higher risk eyes with severity scales, such scales are not too helpful in following patients, as their morphological features are essentially fixed. So we looked at longitudinal data to determine whether change of features over time were predictive, and we found something very interesting: A drop in ETDRS visual acuity seems to occur well before a CNV event. A 10 letter drop in acuity from baseline over our follow-up time increased the risk of conversion to wet AMD by about 20 times. Similar results were obtained using a much larger database as well and will be discussed.

Conclusion: A drop in visual acuity over time in an eye with dry AMD is an important harbinger for the development of CNV, well before the event occurs.

6:15-6:40PM

## Genetics and Age-related Macular Degeneration: What the Clinician Should Know

Michael L. Klein, MD

We will discuss the current state of our knowledge relating to genetics and age-related macular degeneration (AMD). This includes the known role of genetic factors and their relationship to various stages of AMD, the role of genetic variants in predicting progression from early to late stages of AMD, and the potential to help predict an individual's response to preventive and treatment measures. We will discuss how this information relates to the clinician's current management of the AMD patient, and its potential role in the future.

6:50-7:15PM

## Macula Risk and Genetic Testing for AMD: Early Canadian Experience and Perceptions

David R. Chow, MD, FRCS(C)

Over the last few years, genetic studies have shown with increasing strength that AMD is a genetic disease. Numerous SNP's have been identified with variable associated risk profiles. The strongest disease association loci identified to date are the CFH and ARMS2 loci. Macula Risk, is a genetic test that evaluates a patients risk of developing AMD through the evaluation of 11SNP's (including those on CFH and AMRS2). It was released in Canada in the fall of 2008. Early Canadian experience has identified patients who would seem to benefit most from testing and surveillance/management plans have been evolving for "high risk" patients that are identified. Secondary indications for testing have also been identified and are being explored.

# Tuesday

MARCH 9

4:00-4:25PM

## Surgical Treatment of Retinal Detachment with Severe Vitreo-retinal Proliferation

*Jeroni Nadal, MD*

Revision of prognostic factors and surgical techniques specified for each type of RD with VRP. Evaluation of different techniques of peeling of pre-retinal as well as retro-retinal membranes using unimanual maneuvers with liquid perfluorocarbon, bimanual surgery and viscosurgery. Use of biologic dyes. Indications of retinotomy or retinotomies and type of intra-ocular tamponade to achieve the best index of retinal adaptation.

4:35-5:00PM

## Imaging: Cones in Human Macular Diseases

*Steven D. Schwartz, MD*

Imaging cones in the living macula may advance scientific discovery and provide meaningful clinical information for the evaluation, management and study of a number of relevant maculopathies. Using adaptive optics and a scanning laser ophthalmoscope (AOSLO) we have been able to study the physiology and pathophysiology of cones in patients with macular disease.

We hypothesize that this technology may allow for a number of important advances including: 1) early detection; 2) improved phenotyping; 3) new, sensitive clinical endpoints. In other words, AOSLO imaging may allow for very early diagnosis and thus early intervention; AOSLO may help focus the search for candidate genes or candidate therapeutics; and perhaps most importantly, AOSLO imaging may provide a measure by which disease progression or response to new interventions can be studied within realistic time frames.

5:10-5:35PM

## Surgical Treatment of Retinal Detachment in High Myopia

*Jeroni Nadal, MD*

Analysis of results of a prospective study to assess the efficacy of vitrectomy with peeling of the vitreal cortex and internal limiting membrane in the posterior pole

with silicone oil tamponade as a treatment for posterior pole retinal detachment secondary to myopic macular hole. The sample was consisted of 18 eyes affected with retinal detachment with myopias between 9 and 27 diopters, the results prove that there was 90% retinal adaptation with 60% macular hole healing but the efficacy of this technique might be limited in cases with antero-posterior axis greater than 31 mm. Cases where retinal reapplication could not be achieved, were treated by means of macular indentation procedure.

6:15-6:40PM

## Geographic Atrophy: Development, Progression, and Treatment Considerations

*Michael L. Klein, MD*

In this presentation, a clinical overview of the current state of our knowledge of geographic atrophy (GA) will be provided. We will discuss (1) the natural history and risk factors related to development of GA in eyes with age-related maculopathy; (2) the characteristics of established GA with regard to progression, including ocular and genetic risk factors; and (3) potential treatment approaches currently under investigation.

6:50-7:20PM

## THE TAYLOR SMITH LECTURE Optical Coherence Tomography at the Brink: Intraoperative Imaging and Navigation and Multimodal Applications

*Carmen A. Puliafito, MD, MBA*

Since its initial description in 1991, optical coherence tomography (OCT) has revolutionized the day-to-day practice of the retinal practitioner. It is almost exclusively employed in the outpatient setting. Recent advances in optical coherence tomography technology have made the use of OCT in the vitreoretinal surgical suite a real possibility.

The development of spectral domain OCT (SD-OCT) systems has made the high-speed acquisition of a 3D data set feasible. This data set can be acquired through trans-pupillary imaging or, since OCT is a fiberoptically based technology, delivery via an intraocular probe is also feasible. This paper will review the technical basis of this application and describe early clinical results.

# Wednesday

MARCH 10

4:00-4:25PM

## Late Complications of ROP

Kimberly A. Drenser, MD, PhD

Retinopathy of Prematurity (ROP) has changed significantly over the past few decades. With improved management and intervention the late complications of ROP have changed as well. Today's retina surgeon is faced with three possible situations.

1. Baby Boomers: This is the pre-Cryo-ROP population. These patients will present with a variety of tractional and rhegmatogenous retinal detachments with posterior breaks, atrophic retina and an abnormal vitreoretinal interface.
2. Ablation Generation: This is the Cryo-ROP and ETROP population. These patients will present with rhegmatogenous retinal detachments with more peripheral breaks or tractional detachments with hyaloid contraction.
3. Limbo ROP: This may be seen in the pre- or post-ablation era population. These patients have incomplete vascularization but do not meet ablation criteria. They often present with increasing amblyopia and posterior pole traction at a later age. They may also develop rhegmatogenous retinal detachments that are atypical.

All three groups will require surgical management but the approach differs based on the anatomy. A thorough understanding of the history as well as the presentation will help direct the surgical repair.

4:30-4:55PM

## Optimizing Treatment of Neovascular AMD

Carl D. Regillo, MD

Ranibizumab was proven in FDA phase III prospective randomized clinical trials to be very safe and effective in treating exudative age-related macular degeneration (AMD). A very high rate of visual stabilization and a one to two line mean visual acuity improvement was achieved with monthly dosing on ranibizumab over two years in the MARINA and ANCHOR trials with all types of subfoveal choroidal neovascularization (CNV). Small, retrospective case series appear to indicate a similarly favorable efficacy profile with intravitreal

bevacizumab. Ocular and systemic adverse events were very rare with both drugs when administered by intravitreal injection.

Different patients appear to require different amounts of therapy with ranibizumab or bevacizumab for adequate control of the exudative AMD and a variety of dosing schemes have been tested. Fixed, less frequent quarterly dosing of ranibizumab in the phase IIIb PIER and EXCITE studies did not show visual benefits as good as fixed monthly dosing. Subsequent studies using traditional "PRN" approaches to treat exudative AMD showed variable results.

When comparing data from PRONTO, SAILOR, HORIZON, SUSTAIN, and other studies using various PRN regimens, visual results appear better when there is a higher average number of treatments and closer follow-up. Furthermore, new data from Wills Eye show good efficacy with an individualized regimen commonly referred to as "treat and extend." In common to all the monotherapy studies treating neovascular AMD with either ranibizumab or bevacizumab in which visual results are good is the meticulous control of macular exudation.

Whether combining anti-VEGF therapy with PDT, steroids, or radiation therapy allows for adequate control of exudation and good visual outcomes, but with less total treatments have yet to be demonstrated in large, prospective, control studies. Several large trials are underway. Until more data are available, relatively close follow-up and prompt treatment for any exudative activity is the best way known to maximize individual patient vision outcomes.

5:00-5:25PM

## PVR: Update from the Old World

Stanislao Rizzo, MD

PVR is the most common cause of failure of surgery for rhegmatogenous retinal detachment (RD). It is reported to represent between 5% and 10% of all RD. The success rate of surgical management has increased because of new vitreoretinal techniques, the use of different intravitreal substances to reposition the retina and tamponade retinal breaks, and the technologic improvement of equipment.

There are no clear indications for treating PVR with standard RD techniques, but based on our experience, it appears that PVR grades up to C1 of the Retina Society classification can be successfully treated with buckling procedures.

In the most complex cases of PVR, it is necessary to perform pars plana vitrectomy (PPV) with membrane peeling and a gas tamponade or silicone oil injection. When the retina cannot be flattened intraoperatively by pneumatic or hydraulic techniques, despite maximal removal of PVR tissue, relaxing retinotomy should be performed in order to counteract intractable retinal shortening.

For the most severe PVR stages (C1/D3) success rates vary from 33 to 80%. The Silicone Study confirmed the superiority of silicone oil on perfluoropropane gas in terms of retinal reattachment or achieving a visual acuity of 5/200 or greater.

However the anterior PVR may worsen the prognosis in patients with previous PPV. A number of drugs have been tested experimentally to inhibit cell proliferation and membrane contraction. However, many have potentially severe side effects, and only a few have been used in clinical trials. Dexamethasone and 5-fluorouracil administered after surgical treatment inhibit the development of PVR in a high-risk RD, significantly reducing its incidence (36%) as compared with the control group (80%).

Other substances used in humans are Colchicine<sup>10</sup> and Daunomycin<sup>94,134</sup> that has been used in association with PPV and silicone oil tamponade, showing no toxicity but also no clinical improvement.

**6:00-6:25PM**

## **Simplifying Vitrectomy with a 20g Sutureless Technique and the Use of Chandeliers**

*David R. Chow, MD, FRCS(C)*

Although many surgeons have converted to the newer 23 and 25g sutureless trocar cannula systems, 20g vitrectomy still offers some significant advantages to surgeons in terms of instrument availability, stiffness and cost. For difficult cases, the use of a sutureless 20g vitrectomy technique offers the best of both worlds. The addition of a chandelier to difficult cases such as complicated retinal detachments and diabetic dissections allows for true bimanual surgery.

**6:30-6:55PM**

## **Management of Congenital X-Linked Retinoschisis: Tractional and Rhegmatogenous Detachments**

*Kimberly A. Drenser, MD, PhD*

Surgical management of Congenital X-linked retinoschisis (CXLRS) has continued to evolve with the advent of enzymatic manipulation of the vitreoretinal junction, improved surgical instrumentation, and enhanced surgeon control. The surgical techniques include removal of hyaloid from retina aided by plasmin enzyme and a high speed vitrector; inner wall retinectomy if the hyaloid can't be dissected from the inner retina wall; drainage of the schisis cavity; drainage from a full-thickness retinal break; 10% perfluoropropane for intraocular tamponade; silicone oil.

Classification based on ophthalmoscopy and OCT has changed the understanding of this disease. The identification of lamellar (flat) schisis has made high-risk eyes easier to identify and aid in the surgical planning. Additionally, OCT analysis may reveal abnormal vitreoretinal adhesions causing progressive splitting of the retina. These diagnostic and surgical advances allow for earlier surgical intervention and improved outcomes.

**7:00-7:25PM**

## **Ischemic Index in Retina Vascular Disease**

*Steven D. Schwartz, MD*

Traditional management of retinal vascular disease centers on detection and treatment of macular edema and neovascularization. We hypothesize that imaging the retinal vascular circulation with ultrawide field angiography allows for the calculation of an ischemic index. This index essentially calculates the perfused/non-perfused retinal vascular ratio and seems to predict macular edema and neovascular complications across diabetic retinopathy and all forms of retinal venous occlusive disease. Interestingly, the ischemic index associated with these complications appears to be very different for BRVO, CRVO and Diabetic Retinopathy. Furthermore, macular edema is associated with peripheral retinal vascular non-perfusion. These observations may substantiate treatment strategies that involve a combination of targeted photocoagulation and pharmacotherapy.

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