Meeting Notes From the 43rd Annual Meeting of the ARDS

The Aspen Retinal Detachment Society (ARDS) prides itself on leading conversations about vitreoretinal surgical techniques and technologies. Inviting innovators in the field to discuss tactics and strategies promotes healthy conversation during breaks; at past meetings, I have heard more than a few retina surgeons discussing the merits of, say, scleral buckles over martinis and hors d'oeuvres.

This installment of ARDS Meeting Notes reviews talks delivered by Dean Eliott, MD, associate director of the Retina Service at Massachusetts Eye and Ear Infirmary, Harvard Medical School, Boston, Mass.; and Kimberly Drenser, MD, PhD, the director of ophthalmic research at the Beaumont Eye Institute in Royal Oak, Mich. Both speakers offered a plethora of exciting comments on the evolving nature of vitreoretinal surgery, and reminded us that exciting and quotidian procedures merit equal patience and concentration to maximize patient safety.

—Timothy G. Murray, MD, MBA

Common Issues in Proliferative Vitreoretinopathy

Dean Eliott, MD

In his presentation on proliferative vitreoretinopathy (PVR), Dean Eliott, MD, covered several topics, including retinectomy, scleral buckles, lensectomy, perfluorocarbon liquid (PFCL), and silicone oil. He noted that these procedures often spark debate, and that he was merely presenting his own approaches.

RETINECTOMY

Years ago, retinectomy was rarely performed in PVR cases, but its use has become more popular. "A retinectomy that is too small is a problem, and I sometimes have to make a retinectomy that is larger than I initially intended.

"The inferior 180° retinectomy is probably the most common type," Dr. Eliott said. He noted that he sometimes performs 360° retinectomies and that these often do well. "Gary Abrams, MD, taught me that if you do a retinectomy greater than 270°, you should extend it to 360°," he remarked.

Why at 3 o'clock and 9 o'clock? "The edges are most vulnerable to reproliferation and traction," he explained. "If the edges are at 3 o'clock and 9 o'clock, as they typically are for a 180° retinectomy, there is a higher success rate than if the edges are closer to 6 o'clock because PVR is most pronounced inferiorly." Nowadays, a vitrectomy probe is used to cut the retina because the port is much closer to the tip compared with the older probes. "However, in the case of a very low-lying detachment, I use vertical scissors to cut along the edge," Dr. Eliott said. "I do scleral depression and meticulously remove all of the anterior retina to prevent postoperative proliferation, which also reduces hypotony."

Because reproliferation is more likely if blood is present at the edge of a retinectomy, Dr. Eliott said he was meticulous about cleaning off all blood and making sure that the edge of the retinectomy is clean.

SCLERAL BUCKLES

"In my opinion, failure to place a scleral buckle is a common mistake in PVR surgery," Dr. Eliott said. "I think a

At a Glance

- Retinectomy is used more now than previously, with the 180˚ retinectomy being the most common.
- Subretinal PFCL that migrates toward the fovea should be removed quickly.
- Emulsification and overfill are two important issues associated with silicone oil use.

Video: Changing Surgical Paradigms

buckle is a good idea even when you have a 180° retinectomy because it is used to support the edges at 3 and 9 o'clock."

He advised his colleagues to weigh the benefits of placing a buckle against the risks. As an example, he said, "Obviously you would not use a buckle if you are going to do a 360° retinectomy or when there is so much laser for 360° that the laser has essentially created a new ora serrata several millimeters posteriorly."

LENSECTOMY

Lensectomy enables more complete vitrectomy. In Dr. Eliott's opinion, it is important, especially in patients with anterior PVR. "I think it should be performed more frequently in severe cases (eg, macula-off retinal detachments associated with extensive PVR)," he commented. "Postoperative hypotony is much less common in aphakic eyes."

Dr. Eliott posed the question of leaving the anterior capsule in severe PVR cases if IOL implantation is a possibility. He remarked that most of the time, an IOL does not get implanted later, and advised that "for really severe cases, win the game by getting the retina reattached permanently rather than trying to hit a grand slam by leaving the capsule, hoping to place an IOL later, and dreaming of a 20/20 result. There is no way that is going to happen if the macula has been detached for a while, which is almost always how these cases present."

POSTOPERATIVE COMPLICATIONS

Subretinal Perfluorocarbon

"Avoid retained subretinal PFCL," advised Dr. Eliott. He noted that it can migrate and, when it does, it moves toward the fovea. "If the PFCL is at or is migrating toward the fovea, then it needs to be removed relatively soon," he said. His preferred method of avoiding retained PFCL is a saline rinse, especially in cases with large breaks and retinectomies, which he learned from Dr. Abrams. He explained, "After I remove the PFCL via a fluid-air exchange, I always drip about 10 drops of balanced salt solution from a 25-gauge needle attached to a tuberculin (TB) syringe onto the reattached retina in the air-filled eye. I then aspirate this fluid. Sometimes I perform the rinse twice." Dr. Eliott noted that the alternative is to not use PFCL by draining the subretinal fluid through a peripheral break (preferred technique) or by creating a posterior drainage retinotomy.

Silicone Oil

According to Dr. Eliott, one of the least forgiving things a retinal surgeon can do with oil is create an overfill because it means a trip back to the OR. He explained what he does to avoid an overfill in an aphakic or pseudophakic eye: "I infuse the oil through the superotemporal cannula while, in the other hand, I have an empty TB syringe (with the plunger removed) attached to a 25-gauge needle. This needle is placed through the inferotemporal sclerotomy (after the infusion line is removed) and the tip is placed at the iris plane. As oil enters the eye, air exits via the needle. As soon as the oil comes up to the needle tip, I pull both instruments out of the eye at the same time."

Another issue to consider when using silicone oil is emulsification. "Nystagmus is one of the biggest risk factors for oil emulsification due to the constant shearing force," Dr. Eliott told attendees. "Another risk factor is duration," he added, noting that the average time to the beginning of emulsification is 13 months. "Viscosity also plays a role," he continued. "The definition of viscosity is the ability to prevent deformation in the presence of shearing forces, and 1000 centistoke oil emulsifies much sooner than 5000 centistoke oil." Dr. Eliott also prevents postoperative subconjunctival silicone droplets by suturing the sclerotomies with small-gauge surgery.

Management of Complex Retinal Diseases

Kimberly Drenser, MD, PhD

Kimberly Drenser, MD, PhD, said familial exudative vitreoretinopathy (FEVR) presents diversely and overlaps quite a bit with other spectrums of disease.

What is the purpose of studying rare diseases such as FEVR? "For one thing, they are not that rare," she explained. "We just tend to miss a lot of it in the general population." Dr. Drenser noted that ophthalmologic examination alone is not sufficient to determine the level of disease, adding that angiography can unmask a significant amount of avascular retina and anomalous vasculature. The rest of her talk centered on how retina specialists can better predict disease progression to better manage patients with FEVR.

"The Wnt signaling pathway is the primary driver of

early vascular and retinal neurogenic development in the eye of the fetus within the first 3 months of life," Dr. Drenser said. She explained that, by understanding these two characteristics, retina specialists can be better able to determine how often to examine patients with FEVR and how often to intervene.

"A lot of the data we have comes from a biobank," said Dr. Drenser, explaining that this biobank contains prospectively obtained samples from more than 1000 children with various vitreoretinal diseases. In a retrospective review of data, she looked at mutation databases, changes in alterations, progression, and angiographic changes over time. According to Dr. Drenser, 64 patients who met the study enrollment criteria had a positive mutation in the Wnt pathway.

"Age at presentation was highly variable," she said, noting that gestational age was an important consideration. "We generally think of FEVR as a disease that affects full-term babies and looks like retinopathy of prematurity (ROP)."

She credited Audina Berrocal, MD, with first describing overlapping characteristics such as anomalous vasculature, a condition in which the physician cannot determine whether a premature infant has ROP or FEVR.

Wide-ranging birth weights may also cause confusion, Dr. Drenser noted. "Just because you have a premature baby, do not assume they have ROP," she said.

When she looked at the angiograms in her study, Dr. Drenser found family history and direct examination to be unreliable. "There are so many ways that FEVR is inherited," she said. "It can be dominant, recessive, or x-linked." And because the extent of eye disease is so variable among family members and between eyes, she said all first-degree family members should have an angiographic diagnosis with staging.

Dr. Drenser's research showed that retinal folding is quite predominant in patients' presenting factors and is what often leads them to a retina specialist. In fact, she noted that folds are seen in roughly one-third of the eyes in her practice and in her database. She also said that approximately 40% of patients presented with the same stage in both eyes. "That is telling us that FEVR is an asymmetric disease," said Dr. Drenser. "Without angiography, you will miss disease in the fellow eye."

As far as gene mutations, almost half (44%) of patients from the biobank had a norrin protein ligand mutation, and nearly all others had a Frizzled-4 (FZD4) receptor mutation, Dr. Drenser said.

"If you have a norrin protein ligand mutation with a conserved knot, there will be severe dysgenesis of the eye, which always requires surgical intervention," she said.

The earlier the intervention, the better the patient's chances at improvement, she said. "The nonconserved knots tend to have milder phenotypes and have a very good course if they are identified early and lasered aggressively," she said. Dr. Drenser reported seeing patients of this type every 3 months or so, at which time she also performs angiography "until we know what their course is going to be."

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> —Kimberly Drenser, MD, PhD

Patients with FZD4 mutations "need quarterly monitoring, at a minimum," Dr. Drenser said. "If you are administering treatment, you may be looking at these patients every 4 to 6 weeks doing angiograms until you feel that you have this under control."

She explained that retina specialists see much more neovascularization in such patients and that retina doctors must be more aggressive with management. Exudation is treated with a combination of anti-VEGF therapy and laser.

"Ablate anything that is avascular or has capillary dropout," she advised. "And if you see leakage or exudation on the exam or angiogram, treat them with an anti-VEGF agent." Tractional attachment, she added, is a surgical indication.

Dr. Drenser said that the first goal of treatment is to ablate avascular retina and then to control exudation, for which an anti-VEGF agent is used. "We intervene with a vitrectomy when we see tractional changes," she said, explaining that the goal of vitrectomy is to address the tractional elements and avoid making breaks.

"If you intervene early, it is a much easier surgery," she added. ■

At a Glance

- FEVR is a disease that often presents similar to ROP.
- Understanding how to predict disease progression may help retina doctors manage FEVR in pediatric patients.
- Patients presenting with FEVR should undergo fluorescein angiography so retina doctors can see if the disease is present in the fellow eye.