THE RETINA TIMES

EDUCATION. EXPERIENCE. COMPASSION.

Fall 2021 • Issue #22

CASE STUDY: Full Thickness Macular Hole

Submitted by **Aaron M. Ricca, MD**

Case Presentation

A pleasant 63 year old lady was referred for reduced visual acuity in her left eye. She reported that over a several year time frame she noticed a steady decline in vision in the left eye. She now has a relative blind spot directly in the center of the vision in the left eye. Her vision in the right eye remained unchanged during this time. She denied any prior eye trauma or pain.

On presentation to our clinic, her visual acuity was 20/500 in her left eye and 20/20 in her right eye. She had 1+ nuclear sclerotic cataracts in each eye and a positive Watzke-Allen sign in the left eye. Funduscopic exam revealed a large, full thickness macular hole in the fovea in the left eye and a normal fundus in the right eye. On optical coherence tomography (OCT) imaging, the macular hole was approximately 550 microns in diameter with outer retinal atrophy and parafoveal interstitial fluid present (Figure 1).

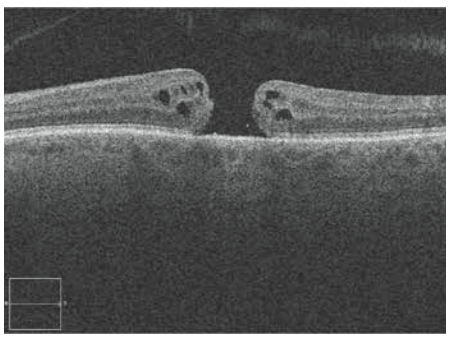

Figure 1. *Optical coherence tomography of a left eye demonstrating a large, chronic appearing full thickness macular hole at the fovea. There is outer retinal atrophy with loss of the ellipsoid zone. The reflectance of the posterior hyaloid face is visible in the top left corner of the image indicating a partial posterior vitreous detachment.*

We reviewed the management options including observation or surgical repair and she elected to proceed with the surgery. A 25-gauge pars plana vitrectomy with peeling of the internal limiting membrane was performed. She was left with sulfur hexafluoride gas and instructed to position face down for approximately 5-7 days given the large, chronic nature of the hole. At the one month post-operative visit, the gas had completely dissipated and the macular hole was closed with the vision improving to 20/100. There was early reconstitution of the outer retinal atrophy on OCT imaging that will likely still improve with time.

Natural history and pathophysiology

There are thought to be two main causes of macular hole formation: vitreomacular traction syndrome and epiretinal membrane formation. The cause of most macular holes is vitreomacular traction, where the posterior hyaloid face adheres tightly to the fovea while degenerating and occasionally releasing from the parafoveal macula. This results in traction on the fovea as the vitreous condenses into the center of the eye. The vitreomacular traction can be great enough to cause a partial or full thickness macular hole which can progress with completion of the posterior vitreous detachment. Occasionally the traction releases without hole formation.

The second common pathway by which full thickness macular holes form begins with an epiretinal membrane formation on the surface of the macula. Cells frequently grow in sheets, especially when provided with the right environment and a scaffold on which to grow. When certain cells such as hyalocytes, macrophages, and glial cells land on the surface of the retina, they can multiply and grow to form a fibrous sheet known as an epiretinal membrane. This membrane matures and contracts and as it does so, it can pull apart the retina at the fovea, one of the structurally weakest points in the macula. This can occur without any separation of the posterior vitreous.

There are other less common causes of macular hole formation, such as trauma or genetic syndromes such as Alport syndrome, but these are the vast minority in comparison.

Clincial Finding and Staging

Patients most commonly report a loss of central acuity after developing a macular hole. Other commonly reported complaints include metamorphopsia, micropsia, macropsia, and scotomata.

The Watzke-Allen sign, as mentioned above, is a funduscopic physical exam finding that is performed at the slit lamp. The fundus is viewed through a 90 diopter lens and the slit beam is made very thin then shined directly onto the fovea. A positive finding is when the patient does not report an intact line of light, but instead reports a broken or distorted line as the beam of light passes through the macular hole.

There are 4 main stages to macular hole formation, as initially described by Gass and Johnson in 1988. A Stage 1 hole is an impending or occult hole on exam and OCT imaging demonstrates traction and splitting of the outer retinal layers without a full thickness defect. A Stage 2 hole is a full thickness macular hole with a pseudo-operculum (Figure 2) while a Stage 3 hole is a full thickness hole >400 microns in diameter but without a complete PVD. When a full PVD has occurred, the hole then becomes a Stage 4 macular hole.

Funduscopic findings demonstrate a round hole in place of a normal foveal light reflex. Occasionally there can be a small surrounding cuff of fluid or drusen deposition as well. Size and chronicity are very important predictors of surgical success and post-operative visual outcomes. A macular hole is labeled as chronic when it has been present for greater than 3 months.

The near infrared image obtained with the OCT can provide a detailed en face

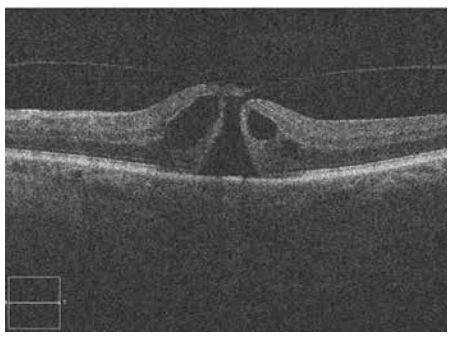

Figure 2. *This OCT demonstrates a full thickness macular hole with a pseudo-operculum present with persistent vitreomacular traction and parafoveal interstitial fluid.*

image of the macular hole (Figure 3). OCT findings demonstrate splitting of the neurosensory retinal layers at the fovea as previously discussed. The retinal pigment epithelium and choroid remain intact.

There is occasionally a partial or complete overlying operculum visible as well as parafoveal interstitial fluid.

Management

Patients with any stage of macular hole formation should be evaluated by a retina specialist. It is important these patients are seen as many require a surgical intervention. The timeline for referral is non-urgent. It is not necessary to evaluate and schedule these patients for surgery on the same timeline as one would address a retinal detachment. In general, these patients should be seen by a retina specialist within several weeks after initial presentation. After initial evaluation, if surgery is indicated, then it is non-urgently scheduled.

The management options for a full-thickness macular hole are limited in that other than observation, the most reliable way to treat the hole is with surgery. The surgery is a pars plana vitrectomy with peeling of the macular membrane and frequently the internal limiting membrane.

It involves placement of a short-acting gas, or air, in the eye and there is often a short period of face-down positioning required. Once the gas resorbs the vision returns to normal and the acuity and metamorphopsia will continue to slowly improve over the following 6-12 months.

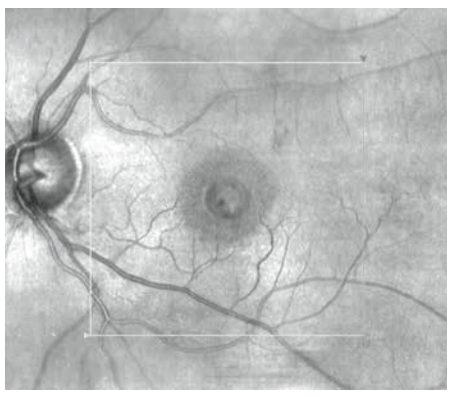

Figure 3. *En face near infrared imaging of a large full thickness macular hole with surrounding macular edema.*

PHYSICIAN SPOTLIGHT

Aaron M. Ricca, MD

Training:

Undergraduate BS:
University of Arkansas, College of Engineering

Medical School MD:
University of Arkansas For Medical Sciences, College of Medicine

Integrated Internship in Medicine/ Ophthalmology:
University of Iowa Hospital and Clinics

Residency:
University of Iowa Hospital and Clinics

Fellowship:
University of Iowa Hospital and Clinics, Vitreoretinal Disease

Bio:
Aaron M. Ricca, MD received his undergraduate degree in mechanical engineering from the University of Arkansas College of Engineering where he finished with high distinction. He then graduated from the University of Arkansas for Medical Sciences College of Medicine in 2015, where he was ranked first in his class. Dr. Ricca completed his internship and ophthalmology residency at the University of Iowa Hospitals and Clinics where he was the recipient of the Stacy L. Thompson Resident Leadership Award, served on the Residency Selection Committee, and participated in the Macula Society sponsored Advocacy Ambassador forum. Dr. Ricca performed his Vitreoretinal Surgical Fellowship at the University of Iowa Hospitals and Clinics where he gave local and national educational presentations, received the P.J. Leinfelter Research Award, and was on staff at the U.S. Department of Veterans Affairs Healthcare System where he taught trainees in the clinic and the operating room.

Freeman WR, Azen SP, Kim JW, el-Haig W, Mishell DR 3rd, Bailey I. Vitrectomy for the treatment of full-thickness stage 3 or 4 macular holes. Results of a multicentered randomized clinical trial. The Vitrectomy for Treatment of Macular Hole Study Group. Arch Ophthalmol. 1997 Jan;115(1):11-21. doi: 10.1001/archopht.1997.01100150013002. Erratum in: Arch Ophthalmol 1997 May;115(5):636. PMID: 9006420. Gentile RC, Landa G, Pons ME, Eliott D, Rosen RB. Macular hole formation, progression, and surgical repair: case series of serial optical coherence tomography and time lapse morphing video study. BMC Ophthalmol. 2010 Sep 17;10:24. doi: 10.1186/1471-2415-10-24. PMID: 20849638; PMCID:PMC2954958.

RESEARCH CORNER

A BIG shout out to our Research Manager, Diana for being spotlighted in a recent Kodiak Sciences Inc. clinical research studies update!

How did you get into ophthalmology and clinical research?

I have been a licensed Optician in the state of Kentucky since 1990 and always had an interest in the medical field but was unsure of changing careers. I was working as a Licensed Optician at Lenscrafters and was the Gift of Sight Captain for our store and I had worked with the Low Vision Director for Retina Associates of Kentucky to help their patients that couldn't afford eyeglasses get eyeglasses through the Gift of Sight program. The Low Vision Director for Retina Associates of Kentucky called and asked if I would be interested in working for them and I said yes! I interviewed for a Low Vision Specialist position and started working in July 2004. I then had my first experience of working on a clinical research trial when the Research Coordinator needed a back-up coordinator for when she was on maternity leave in 2005. I loved working on clinical research studies from that point on! I had my first study as the main Research Coordinator in 2006. I also became a certified BCVA examiner for multiple masked clinical studies that the clinic was involved in. I still worked in the clinic and Low Vision Department as well. I became more involved with research in 2007 as the main masked coordinator.

I haven't looked back since! I became Research Manager in June 2016. I have a great research team that I am very grateful for and couldn't do without!

What is your favorite part of the job?

I love helping the patients in every way that I can. I love to help educate the patient about their eye disease and their treatment options and then explain to them the study medication, study design, potential benefit of the study medication and why the study is being done. I like to explain to the patients that without clinical trials we would not be able to find treatments for diseases such as theirs. Since COVID-19 and the recent vaccines sometimes I feel patients know a little more about clinical trials which could be good or bad and sometimes I try to use this as an example of clinical trials and treatments. I get excited when I think about some of the major research studies that I have been involved in and to think I was part of those trials that helped get the drug or device approved is very exciting. For the studies that maybe the drug or device didn't get approved I still am glad I was a part of those studies and know that we tried some treatments especially those for patients with Geographic Atrophy. The research patients become part of our extended family since we see them so often and sometimes more than we do our family members. I love to see the unmasking report when the study results are completed and letting the patients know which group they were in and what treatment they received and also to see if what I thought they were getting was correct or not! I have met a lot of great people and friends throughout the years and traveled more than what I ever would have and have some great patients thanks to working as a coordinator in clinical research studies with Retina Associates of Kentucky. I am very grateful for this journey!

What is your favorite thing/ hobby to do outside of work?

I like to go on walks after work and just re-charge. We adopted a dog, Lucy, from the Humane Society on Mother's Day and we love her. We are getting to see more and more of her personality come out. She is about a year and a half old and about 37 pounds. I like to visit with our daughter who is now 25 and lives about 2 hours away. My Mom who is 90 and my sister also live in the same town along with one of my brothers and sister in law. Since COVID I have not been able to visit them as much but I am very thankful to still have my daughter, Mom, my sister, my brother and sister n law close by, my other siblings live out west. I like to work outside in the yard as much as I can. I used to love hosting our neighborhood Christmas party and attending our multiple neighborhood gatherings but I haven't been able to do that since COVID. I also love helping people with whatever I can. I love helping my family, neighbors or friends with any tasks that they need help with especially if it involves anything outside. I also want to experience ziplining!

What is the your favorite place you have traveled to? Why?

I really liked going to Vancouver, Canada for a study coordinator meeting. That was my first time out of the US and I wish I would have been able to stay longer or site see more. I was able to experience the Capilano Suspension Bridge Park which was amazing!

What is your favorite movie and/or book?

This is a tough one for me. I don't read much unless it's a study protocol or study related items. I know pretty boring. I don't watch a lot of movies. I have always liked watching certain Christmas movies. Home Alone is a must in our family. I do watch Netflix and some of my favorites are Grace and Frankie, Atypical, Heartland, Virgin River, Outer Banks and The Queens Gambit. I am trying to listen to more podcasts and I am open for suggestions. The most recent one I listened to was on Business Wars, Vaccine Wars, which discusses the beginning of the COVID-19 vaccine development, very interesting to me since it discusses clinical trials as well.

A note from the Author:

In each edition of our newsletters we are going to spotlight one of our amazing Study Coordinators contributing to the Dazzle study. For this edition, we shine the spotlight on Diana Holcomb from Dr. Kitchens' site in Lexington, Kentucky. We thank Diana for all of her help on the DAZZLE study!

Kodiak Daylight study -Treatment naive Ex AMD eyes Enrolling at Selected Sites only- Enrolled 4s patients and have 2 patients in screening.

Kodiak Gleam study (https://clinicaltrials.gov/ct2/show/NCT04611152?recrs=a&type=Intr&titles=Gleam&spons=kodiak&draw=2&rank=1) -Treatment naive DME eyes-Still Enrolling-Enrolled 4.

Kodiak Beacon study (https://clinicaltrials.gov/ct2/show/NCT04592419?recrs=a&type=Intr&titles=Beacon&spons=kodiak&draw=2&rank=1)-Treatment naive BRVO eyes-Still Enrolling-Enrolled 6.

Kodiak Dazzle study- https://clinicaltrials.gov/ct2/show/NCT04049266?recrs=d&titles=DAZZLE&spons=Kodiak&draw=2&rank=1- Treatment naive eyes- Not Enrolling-Following patients-Enrolled 12.

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NEW LOUISVILLE OFFICE

Opening 9.27.21

6450 Dutchmans Parkway
Louisville, KY 40205

Retina Associates is excited to announce that we will begin seeing patients in our new Louisville office, located 6450 Dutchman's Parkway, on Monday September 27th. This building is next door to our current office at The Springs Medical Center.

Thank you for trusting us with your patients' retinal care and supporting our presence in Louisville. Your continued support has enabled us to move to this new location, which offers patients easier first floor access, with parking only steps from the front door. It will also provide more space to accommodate patients, grow our clinic, and serve the community.

CHECK OUT OUR NEW SOMERSET OFFICE

LEXINGTON WEST CLOSING

Effective 9.30.21

We are consolidating offices in anticipation of our brand new Lexington office which will open in the second half of 2022. This move will not impact our capacity to see patients in Lexington, as we are increasing occupancy of our 4th floor space where we will see patients daily.

For any questions regarding this change, you may reach our Scheduling Department at (800) 627-2020, option 5.

COMING SOON! NEW OFFICE LOCATION

DANVILLE

418 Whirl A Way Drive
Danville 40422

November 2021

WHAT'S HAPPENING

SEP 17 2021	**Fall KOA Conference** *Louisville*	SEP 27 2021	**New Louisville Office Opening**	SEP 30 2021	**Fall IOA Seminar** *Bloomington*	NOV 9 2021	**RAK Fall CE Course** *Castle + Key*

THE **RETINA** TIMES

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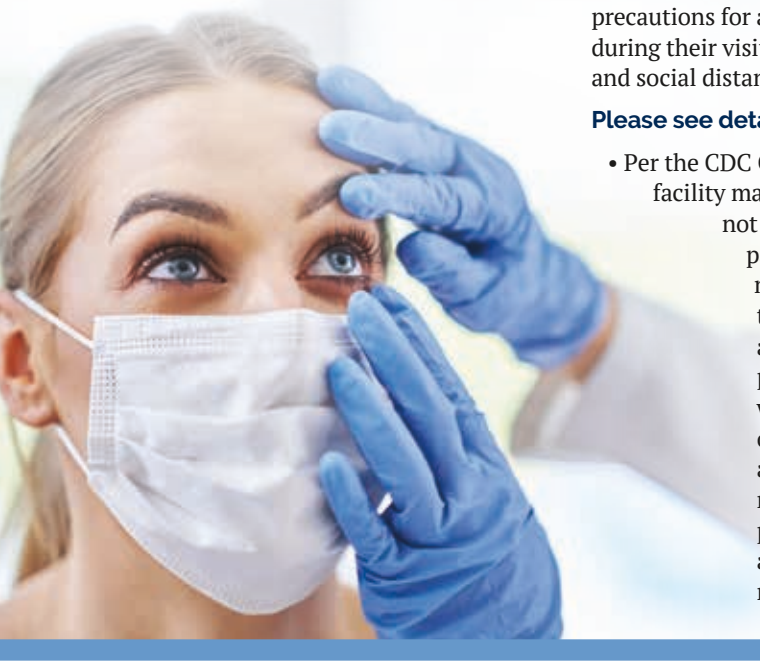
CORONAVIRUS (COVID-19)

Precautions for Safeguarding Our Patients



We have had a lot of questions about whether there is any interaction between COVID vaccines and injections for retinal disease. We are unaware of any interaction or interference between these two treatments. Patients may safely continue to undergo retinal treatment before, during or after your COVID vaccine. As part of your patient's health history, we ask that patients update us on their vaccination status; whether or not they are fully vaccinated/ number of shots (1 or 2 depending on the manufacturer), and the date of their vaccination/s.

Even if patients have been vaccinated, if they are symptomatic, we ask that that they reschedule their appointment until they are symptom-free and have a negative COVID test.

We continue to practice our COVID precautions for all patients and staff during their visit, including mask wearing and social distancing.

Please see details below:

- Per the CDC Guidelines Healthcare facility mask mandates have not changed. We ask that patients wear a protective mask (surgical or cloth) to their appointment and likewise all RAK physicians and staff will have masks on and other protective gear, as necessary. Protective masks should be worn properly covering nose and mouth to help minimize exposure.
- We ask patients to arrive 15 minutes before their appointment time to help us follow social distancing guidelines. If patients arrive earlier than 15 minutes, they will be asked to wait in their car until closer to the appointment.
- A Retina Associates representative will greet patients with a risk survey regarding COVID-19. Patients will be asked to reschedule an appointment if they or a household member have been diagnosed with COVID-19, have a fever, or have had any other COVID-19 symptoms. If they have traveled internationally or on a cruise we may require a recent COVID- 19 negative test, and/or quarantine based on vaccination status.
- During this time, we have restricted entry to patients only. If patients require assistance, they should call our office **(800) 627-2020** prior to their appointment to discuss their needs.
- As we resume care for our established patients, there will be increased demand for appointments. As we follow the social distancing guidelines we have fewer patient appointment openings. During this time, we are unable to guarantee patient appointments with a specific doctor in our office. We may change the time, date, location or doctor to accommodate appointments during this time.
- Patients will receive an email or text message with a link to pre-register in the comfort of their own home, using their own device through our self check-in process (Phreesia).
- If patients are on a treatment plan, we ask that they keep their appointment, as many of our patients need this treatment to preserve vision. We have and will continue following state and CDC Guidelines for their safety.

We appreciate your patience during the Coronavirus (COVID-19) situation, our hold times may be longer than normal and appointment modifications are inevitable.

To save a call to our office during heavy call volume, visit our website to access the online Consultation Request feature **https://www.retinaky.com/referring-providers/online-consultation-request-form/** for any non-urgent referrals or you may fax the Consultation Request form to our Scheduling department **(859) 264-2911** with your chart notes and the patients medical insurance card. Upon successfully scheduling the patient's appointment we will send an Appointment Confirmation fax to you for your documentation.

You are always welcome to email our Scheduling team for any non-urgent appointments at **Scheduling@RetinaKY.com** and an RAK Representative will respond.

We will continue our communication on our Facebook page and Website as new information becomes available. We are always here if you need us, (800) 627-2020. Thank you for trusting us with your patient's retinal care! We look forward to warmer brighter days with you and hope you and your families stay well!

MYSTERY CASE

Submitted by **Aaron M. Ricca, MD**

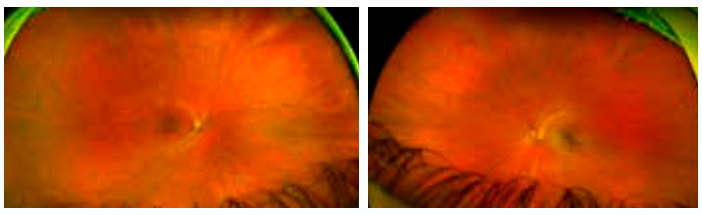


Figure 1. Optos color fundus photographs of the right and left eye demonstrate numerous faint, hypopigmented lesions throughout the posterior pole in the right eye and a normal appearing fundus in the left eye.

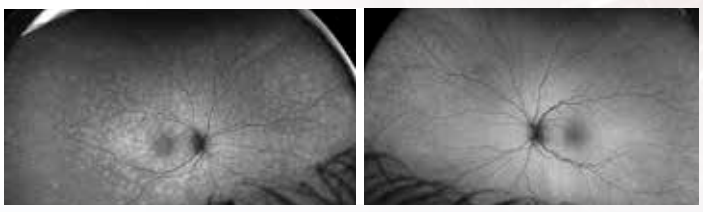


Figure 2. Optos fundus autofluorescence imaging of the right and left eye clearly show hyperfluorescent lesions throughout the posterior pole corresponding to the lesions seen on fundoscopic exam in the right eye and a normal fluorescent pattern in the left eye.

Figure 3. Optical coherence tomogram through the fovea in the right eye showing a faint disruption of the ellipsoid zone at the fovea and in the temporal macula.

This mystery case was referred to our practice for vision loss of unknown etiology. The patient is a 26 year old female who presented with a 1 week history of sudden, painless vision loss in the right eye. She states that the vision loss has remained constant and stable since the onset. She reports blurry central vision along with occasional flashing lights in the right eye. The vision has remained stable and good in the left eye. She has no significant past ocular history. She denies any recent illnesses or hospitalizations and a thorough review of systems was negative. She has no significant past medical history and has no diabetes or hypertension. The images of the fundus photographs and ancillary testing from the day of presentation are presented above. The diagnosis will be revealed and discussed in the following newsletter!

MAIN OFFICES

Lexington
120 N. Eagle Creek Drive, Suite 500
Lexington, KY 40509

Louisville
6450 Dutchmans Parkway
Louisville, KY 40205

Ashland
1700 Winchester Avenue
Ashland, KY 41101

OUR OTHER LOCATIONS

Kentucky
Bardstown
Danville
Frankfort
London
Paintsville
Richmond
Somerset

Indiana
Jeffersonville

OUR PHYSICIANS

William J. Wood, MD, Founder (Retired)
Rick D. Isernhagen, MD
Thomas W. Stone, MD
John W. Kitchens, MD
Todd J. Purkiss, MD, PhD
Belinda L. Shirkey, MD
Blake A. Isernhagen, MD
Jack L. Hollins, MD
Miguel A. Busquets, MD, FACS
Aaron M. Ricca, MD