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## Office-Based Surgery: Our First 700 Cases

It's 4:30 PM on a Friday when you are informed of a macula-on retinal detachment (RD) initiating a complex ballet of logistics. Will the hospital allow the add-on today? What is the *nil per os* (NPO) status?

Will the hospital staff know how to use the retina equipment? Can the case even be done today—or will they make us wait until after the weekend? What if the patient is not a pneumatic candidate?

### Could there be a better way?

Our team decided to introduce office-based surgery (OBS) to our retina practice to help solve the problem of reliable operating room (OR) availability for emergency retina surgery. Since performing our first OBS case in May 2022, we have completed 345 procedures in our OBS.

In addition to improving patient access to urgent retinal care, we discovered that retina OBS is safe and comfortable, provides a better experience and saves time for the patient and surgeon, and lowers costs to the health care system.

Here, we have combined our outcomes with those of another retina OBS, Coastal Eye in Greenwich, Connecticut, in collaboration with Omar Shakir, MD, MBA, and present the combined experience of what we have learned in our first 700 cases. We've also asked Omar Shakir, as well as Drs. David Almeida, Constance Mei, and Thomas Aaberg Jr, to share their perspectives on OBS.

### Background

Vitreoretinal techniques have continually evolved since their introduction in the 1970s by Robert Machemer, MD.<sup>1</sup> With smaller-gauge systems, higher cut rates, and improved visualization during surgery, as well as sophisticated new instrumentation, retina surgery has become highly successful and efficient.<sup>2</sup>

Ophthalmic microsurgery, initially performed in a hospital setting and requiring subsequent hospitalization, has shifted largely to hospital outpatient departments and ambulatory surgical centers (ASCs).<sup>3</sup>

In a continued natural evolution, cataract surgery is now being performed in office-based ORs,<sup>4</sup> with 2 recent studies demonstrating the safety and efficacy of office-based cataract surgery.<sup>4,5</sup>

The definition of an office-based procedure varies state to state.<sup>6</sup> New York State Public Health Law defines office-based surgery as a surgical or invasive procedure requiring anesthesia or sedation in a location other than an Article 28-certified facility but excluding minor procedures.<sup>7</sup>

Office-based surgery has been growing not only in ophthalmology but also in general surgery, gastroenterology, gynecology, radiology, dermatology, dentistry, and other specialties.<sup>6</sup>

In 2014, successful results were reported in a small cohort of patients for retina surgery performed in the minor procedure room.<sup>8</sup>

### Accreditation

Office-based surgery practices in New York State, where the NYC Retina OBS is located, must be accredited by one of 3 agencies—the Accreditation Association for Ambulatory Health Care (AAAHC), the American Association for Accreditation of Ambulatory Surgery Facilities (AAAASF, *Quad A*), or The Joint Commission.<sup>7</sup>

Our center is Quad A certified and Coastal Eye is both Quad A and Joint Commission certified. This ensures that the OR meets the highest safety standards and involves an initial inspection as well as ongoing accreditation requirements and inspections.

Practically speaking, the OBS OR looks and feels just like the OR in a hospital or ASC

(Figure 1). Because the surgeon is in control of equipment and instrument selection, the OR is optimized to perform vitreoretinal procedures.

### Staffing

The staff members from our medical retina practice are cross-trained to assist in surgery in the OBS. Using a consulting company for help with regulatory compliance and staff training, we have staff trained in 4 positions in the OR—scrub, circulator, preoperative, and sterilizer.

Our staff, especially the technicians and scribes, thoroughly enjoyed the training process, which included learning sterile technique and the names of instruments. This has also been a useful factor in recruiting new staff, all of whom are excited to add OR experience to their skill set.

Although training and cross-training take time, we now have fully trained staff who can handle any retina case at any time in our OBS. They are trained not only for retina surgery, but for us specifically as surgeons.

There's no more worrying about staff not knowing how to work the retina equipment or dealing with OR staff who do not know our personal preferences as surgeons. Plus, having familiar staff follow the patient from the office to the OR has been very calming and reassuring for patients.

### Preoperative assessment

Prior to scheduling surgery, medical and surgical history, as well as medications, are reviewed with patients and caregivers. Medical clearance by a primary care physician is obtained at the discretion of the surgeon.

If the case can be scheduled in the future and the patient has medical comorbidities, we obtain medical clearance with the primary care physician.

In cases where a healthy patient has an emergency, the retina surgeon obtains medical clearance to obviate any delays in getting the patient on the OBS table.

Importantly, OBS patient selection is critical in being able to care for patients safely and appropriately.

Patients with high anxiety or multiple medical comorbidities who may require deep sedation or high-level monitoring by an anesthesiologist are not appropriate for office-based procedures.

## Safety

In our OBS, the most common systemic comorbidities in descending order are diabetes, hypertension, and hyperlipidemia.

Of the first 700 consecutive OBS cases, there were no incidences of emergency perioperative medical intervention and no patients required emergency medical care within 24 hours of surgery.

There were no instances of postoperative endophthalmitis. Surgical times were comparable to those in the ASC/hospital setting.

Overall, retina surgery has been safe and effective in the OBS setting.

## Types of cases

Although we have performed a wide range of retina surgeries, the emphasis has been on urgent procedures. Of the 345 total cases, we have done 164 vitrectomies for RD, of which 83 were same day. Additionally, we have done procedures for dropped lenses, intraocular lens (IOL) cases with scleral fixation, epiretinal membrane, and macular hole repair.

Coastal Eye also performs the same range of retina surgeries with an emphasis on same-day retina emergencies. Dr. Shakir was able to get a patient referred with endophthalmitis on the table within an hour. Coastal Eye also performs cataract extractions combined with pars plana vitrectomies.

Additional procedures include silicone oil removal and Susvimo implant (Port Delivery System with ranibizumab, Genentech, Inc) at Coastal Eye. Four scleral buckles (3 at NYC Retina, one at Coastal Eye) and one scleral buckle explant were performed. The scleral buckles were done on young patients with fovea-threatening RDs on a weekend. Non-fovea-threatening RDs or macula-off RDs that required a scleral buckle were scheduled for monitored anesthesia care (MAC) or general anesthesia at an ASC/hospital.

## Anesthesia

The first question we are asked about OBS is, “How do you do anesthesia?” The concept of our current anesthesia technique was born 5

years ago at the 2019 ASRS Annual Meeting during a lecture on complications from retrobulbar injections. Jonathan Feistmann was sitting next to Dr. Calvin Mein, who turned and said, “I haven’t done a retrobulbar injection in 29 years.”

Calvin Mein showed Jonathan a video of his surgical technique: It starts with 360 degrees of subconjunctival lidocaine/marcaine prior to the patient getting prepped and draped. After the surgeon scrubs, the 3 cannulas are placed, after which a posterior sub-Tenon’s block is placed.

Since the 3 main sources of pain with retina surgery are trocar/cannula placement, endolaser, and scleral depression, we wondered whether the posterior sub-Tenon’s block was even necessary as the patient had already tolerated the 3 cannulas with subconjunctival anesthesia alone.

Three years away from opening our OBS and inspired by Calvin Mein’s technique, we changed our approach to local anesthesia administration in the ASC/hospital. We wanted to test our minimal anesthesia technique with an anesthesiologist present prior to performing it in our OBS—so we asked that the anesthesiologist administer only a low dose of midazolam or no IV sedation and we performed 360-degree subconjunctival lidocaine/marcaine anesthesia alone.

The anesthesiologists were happy to cooperate and give minimal systemic anesthesia, and we were all surprised to see how well patients tolerated minimal local and systemic anesthesia for retina surgery. Of the 420 cases done in this manner between 2019 and 2022, we saw high patient satisfaction and adequate anesthesia and analgesia (manuscript in preparation).

There were patients who needed supplemental subconjunctival lidocaine at the equator for endolaser or scleral depression and some needed a posterior sub-Tenon’s block during the case. All did well after supplemental lidocaine and waiting a few minutes for the local anesthesia to work.

The cases done this way were RDs with and without membrane peels, secondary IOL cases, and macular holes/ERMs. Jonathan even did a ruptured globe, intraocular foreign body removal, lensectomy and corneal repair with subconjunctival anesthesia alone.

Of course, select cases of the 420 were planned general anesthesia cases, so not every single case is amenable to this approach, but it gave us confidence that this could be a safe and effective way to operate and one that we could mimic in an office setting.

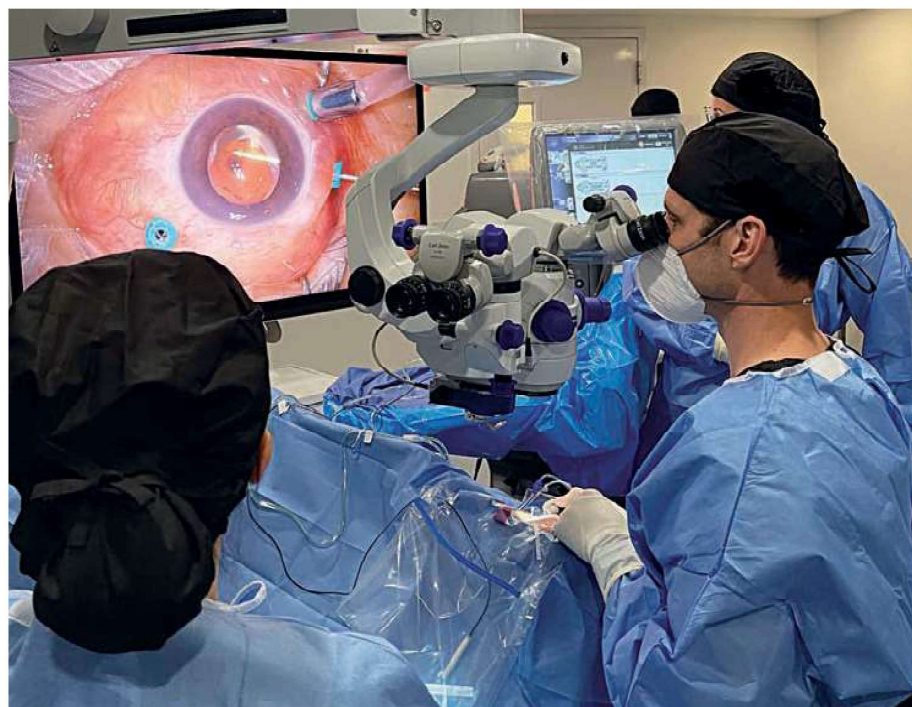


Figure 1. Jonathan Feistmann, MD, operates in the OBS suite at NYC Retina. Image courtesy Jonathan Feistmann, MD.



For the 345 retina surgeries we have performed in our OBS over the past 2 years, the results are similar. Here is our 3-step technique:

**Step 1.** In the preoperative area, topical conjunctival anesthesia is achieved with proparacaine drops, followed by 4% lidocaine on a cotton pledget and then 4% lidocaine in 3 subconjunctival blebs over the areas of trocar insertion.

**Step 2.** Once the patient is in the OR and has been prepped and draped, additional posterior sub-Tenon's anesthesia is administered using a 22-gauge angiocatheter.<sup>9</sup> Because there is already subconjunctival lidocaine in the area, patients tolerate the posterior sub-Tenon's block very well without any IV anesthesia.

**Step 3.** Subconjunctival or posterior sub-Tenon's lidocaine 4% can be added as needed throughout the procedure.

We performed the first 50 cases with subconjunctival anesthesia alone, but we added a posterior sub-Tenon's block to minimize chemosis and decrease the need for occasional supplemental lidocaine during the case.

We still do add subconjunctival lidocaine at the equator for laser or scleral depression and/or more posterior sub-Tenon's block, but this is the exception. For macular cases, although subconjunctival anesthesia is sufficient for pain control in most cases, the surgeon must be comfortable operating on a patient who is able to move their eye, and the patient must be able to follow instructions to look at the light and not move their eye.

Note that we do not use IV sedation in our OBS. We use oral diazepam and/or oral midazolam, ketamine, ondansetron (MKO) melt for systemic anesthesia if necessary. Oral anesthesia has been proven safe and effective in eye surgery, does not require NPO status, and minimizes the risk of cardiovascular events introduced by IV anesthesia.<sup>10, 11</sup>

Surprisingly, at NYC Retina OBS, 285 out of 345 patients declined midazolam when offered prior to surgery, and only 4 total have needed an MKO melt during surgery for breakthrough anxiety. Some patients are even surprised we are asking.

This might be due to the less intimidating office setting, familiar staff, and/or reassurance that the procedure will be painless, but more research is needed to draw definitive conclusions.

Just as the medical clearance process is more straightforward for MAC than for general anesthesia, it is even more so with oral

anesthesia or local anesthesia only. This is especially helpful in urgent/emergent retina cases in a healthy patient.

We have been monitoring patients' experience before, during, and after surgery and documenting their responses. In one such study, we compared immediate postoperative pain in the OBS and hospital/ASC. Utilizing Wong-Baker Faces pain rating scale, we demonstrated comparable pain scale results in 120 patients undergoing procedures at our OBS compared to those having procedures in the hospital/ASC setting with IV sedation (manuscript in preparation).

## Finances

Although the OBS finances are a work in progress, we have had success with a self-pay model for services not currently covered by payers.

The goal after we prove safety, clinical utility, and savings to the health care system is to get reimbursement from payers to cover the overhead of performing retina surgery in an OBS.

For emergency patients who are unable to pay out of pocket for non-covered services, both NYC Retina and Coastal Eye perform surgery for the professional fee only, prioritizing the timeliness of treatment for the patient.

When evaluating the finances of retina OBS cases, it is important to look not only at the net revenue, but at the net time spent on the case—the ratio of revenue to time.

The numerator is admittedly lower than if we had done the case in the hospital (professional fee minus cost of the case in the OBS), but the denominator is lower still (30 to 60 minutes at the end of our clinic in the OBS vs hours at the hospital); so even in the cases when there is only the professional fee, we still come out ahead.

More importantly, we have found that saving time from diagnosis to the OR table for a patient with an RD is a gift to the patient and the surgeon.

Some have voiced a concern regarding the unintended consequence of office-based surgery lowering the reimbursement for the retina surgery professional fee. Tens of thousands of cataract surgeries have been performed in OBS in the past decade. In addition to a better patient and surgeon experience, cataract surgeons have discovered new revenue streams not available to them in an ASC.

Although we must focus on the numerator of the revenue-to-time ratio and fight for

every bit of reimbursement we can get for our surgery, we must not neglect the denominator of that ratio: time we spend on after-hours emergency retina surgery and on routine retina surgery.

With the revenue from retina surgery becoming a smaller percentage of our overall practice revenue, we must consider the excessive amount of time we spend on this small percentage. Our OBS has helped us shrink the denominator, not to mention bring joy back to operating.

## Obstacles and future directions

New ideas and approaches in retina are often met with skepticism and reluctance. Some new ideas turn out not to be beneficial and are rejected. Retina surgical care often depends on the whim of institutions and availability of time but retinal OBS puts the power back in the hands of the surgeon.

While there are many obstacles to overcome, such as appropriate reimbursement, retina OBS is an idea whose time has come and we hope that you will experience, as we did, the incredible opportunity to provide expedient, efficient, and safe surgical care in the office.

## OBS: Revolutionizing retina surgery



**Omar R. Shakir, MD, MBA**  
Chief Executive Officer  
Coastal Eye  
Greenwich, Connecticut

OBS has almost entirely replaced hospital and ambulatory surgery settings in my practice. To date, I have performed nearly 500 consecutive retinal procedures in my office-based surgical center.

These cases encompass a comprehensive range of retinal pathologies, from intraocular foreign body removal to scleral-fixation of IOLs, diabetic detachments to endophthalmitis, and anything my skill set will allow.

Operating in an environment that I have fully tailored to my needs has been incredibly rewarding. Reflecting on the past 3 years, I cannot envision performing surgery without the support of my expertly trained staff, access to cutting-edge technologies and instruments, flexible scheduling, work-life balance, and direct oversight of sterilization protocols.

My surgical patients also cannot imagine undergoing surgery in any other setting once they experience the OBS approach. This level of autonomy enhances access to care and

significantly improves the quality of care and patient recovery.

From a health care system perspective, OBS is both cost-effective and resource-efficient. It reduces the need for extensive staffing and infrastructure, thereby alleviating the burden on health care resources. Furthermore, this approach supports environmental sustainability by minimizing waste and energy consumption.

Our practice's use of oral sedation and local anesthesia lowers operational costs and expands access to high-quality retina care, making it a promising model for global health care. The office-based model also adheres to high safety standards, as evidenced by our Joint Commission accreditation, establishing it as an innovative and forward-thinking solution in retina surgery.

## Research in the OBS setting



**David R.P. Almeida, MD, MBA, PhD, DABO, FRCSC, FASRS**  
President and CEO  
Erie Retina Research  
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The same efficiencies that drive utility for OBS in standard-of-care medicine also provide an increasingly recognized viable and advantageous setting for conducting vitreoretinal clinical research trials. One key benefit of OBS research is the streamlined surgical scheduling that can align with study visit calendars; this reduces surgical out-of-window protocol deviations and enhances organizational forecasting.

The consistency and reliability of scheduling inherent in OBS settings are paramount in maintaining the integrity of clinical trials by ensuring protocol fidelity. This intrinsic flexibility of OBS is a key factor in its success, allowing for better patient management and enhancing the adaptability of clinical practices. This adaptability means that patients can often undergo surgery more swiftly than in traditional settings, reducing wait times and improving trial efficiency.

## A recent fellow's perspective



**Constance K. Mei, MD**  
Attending Physician  
NYC Retina  
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I had the unique opportunity during fellowship training with Drs. Jonathan Feistmann and Julia Shulman to experience

retina surgery in the hospital, ASC, and now office setting. We have managed retinal emergencies, especially urgent RD surgeries, in all these situations.

The effort needed to add an emergency case at the hospital or ASC was an enormous burden on my attendings and staff, while adding cases in the OBS was a breeze. OBS cases could be seamlessly added at the end of the day and I would still be home at a reasonable time, while emergency add-ons at the ASC/hospital usually involved hours of waiting and operating in the middle of the night.

During fellowship, I found that the technical aspects of performing surgery and the operative time to be the same in all 3 settings. Office-based surgery allows the surgeon even more control over the instruments and machines than in hospital-based and ASC settings.

Office-based surgery is in many ways much more efficient because everyone already understands the urgency of the situation and are all working toward the same goal of getting the patient through surgery. Even patients with a history of ocular surgery have preferred the office-based retina surgery experience.

## Exploring office-based vitrectomy



**Thomas M. Aaberg Jr, MD**  
Founder  
Retina Specialists of Michigan  
Grand Rapids, Michigan

My journey toward office-based vitrectomy began in early 2011 and was driven by the belief that overcoming certain challenges could make it a viable option and would put control of the entire surgical process in the hands of surgeons.

The challenges included maintaining patient safety, high capital costs (associated with the vitrectomy machine, the microscope and viewing system, reusable vitrectomy packs, and instrumentation), the need for appropriate surgical space in the office setting, staffing, anesthesia considerations, and payment structures.

The feasibility, safety and efficacy of office based 3-port vitrectomy was presented at several prestigious venues, including the ASRS Annual Meeting, the Vail Vitrectomy meeting, and the American Academy of Ophthalmology Retina Subspecialty Day. Initial clinical outcomes were memorialized

in a *Retinal Physician* 2014 publication that reported good outcomes and no safety issues.<sup>8</sup>

Office-based vitrectomy represents a significant shift in the practice of retina surgery. While it poses challenges, its potential benefits in accessibility, cost, and patient comfort are compelling. It allows the vitreoretinal surgeon full control of surgical scheduling, staff, instrumentation decisions, and financing.

As medicine continues to evolve, innovations require both champions and cautious scrutiny to ensure they serve the best interests of patient care. The ongoing efforts by visionaries in the field are crucial in navigating these waters, as they work to refine the procedures and advocate for broader acceptance and support. 🌐

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## Financial Disclosures

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