Sound surgical judgment includes not only the knowledge of how to operate, but also the wisdom of when to operate. For many surgical retinal conditions, such as rhegmatogenous retinal detachment and macular hole, the decision of whether to proceed to surgery is typically straightforward. Yet for epiretinal membranes, retina surgeons must perform a careful calculus of the relative risks and benefits for each patient.

In this edition of Practical Retina, Nicholas D. Chinskey, MD, and Gaurav K. Shah, MD, provide their insights on when to operate for epiretinal membranes, highlighting current publications on the topic as well as their own research. The authors also tackle related topics such as whether to routinely peel the internal limiting membrane and the use of recently introduced 27-gauge instrumentation.

There is a surgical aphorism that good judgment comes from experience, and experience comes from bad judgment. This article serves to promote sound surgical judgment for the management of epiretinal membranes.

Epiretinal membranes (ERMs) are among the most common problems treated by retina specialists today. Based on some reports, they are present in 9% to 28% of eyes in patients older than 50 years of age.1-2 Patients typically present with metamorphopsia or blurring of central vision. However, others are referred to retina specialists with no symptoms at all, with membranes found incidentally on routine exam or on optical coherence tomography (OCT). The decision on when to operate and what particular surgery to do are still topics of debate within the retina community.

**WHEN TO OPERATE?**

One of the most difficult problems faced by retina specialists today is which patients to offer surgery to and which ones should be observed. Sometimes the decision is very straightforward. For example, very few would argue that an asymptomatic patient with 20/25 vision, referred because an ERM was detected on OCT, should be offered surgery. On the other hand, most surgeons would offer intervention to a patient with 20/200 vision, metamorphopsia, and an otherwise healthy eye with a significant membrane. However, the situation can be difficult when the patient presents with a significant pucker and symptoms, but very good starting vision. Sometimes these individuals are insistent on having surgery, and knowing what to do is challenging. When the question of how to treat a 20/25 symptomatic patient with an ERM was asked by the American Society of Retina Specialists (ASRS), 81.3% of American surgeons recommended observation, whereas only 15.7% said they would offer surgical intervention.3
Surgeons have conventionally advised observation for patients with very good vision. Probably the biggest concern for early intervention is the risk of surgical complications, including retinal detachment, creation of a full-thickness hole, infection, and micro-trauma to the posterior pole leading to decreased vision, such as creating a choroidal neovascular membrane. There is also an argument that since the patients are starting with such good vision, there is really no room for improvement. Lastly, the membranes of many individuals do not appear to progress with time. There are many patients who are followed for years without any sign of progression either on OCT or symptoms.

On the other hand, the majority of patients who undergo vitrectomy for removal of an ERM report improvement in symptoms, visual acuity, and quality of life. In addition, data from several publications show that the people with the best visual acuity and minimal metamorphopsia following pars plana vitrectomy for ERMs are those with the best vision preoperatively. This is backed up by anatomical data that demonstrate that patients with the most favorable preoperative OCTs have the best outcomes following surgery. Specifically, it appears that the outer nuclear layer thickness and ellipsoid band integrity best predicts visual acuity pre- and postoperatively. The inner nuclear layer thickness best predicts the degree of metamorphopsia both before and after surgery. Therefore, there is some reasoning to offer surgery to patients with bothersome symptoms, even if they have good starting visual acuity.

Recently there have been several publications looking at outcomes of patients with good starting vision undergoing vitrectomy for symptomatic pucker. Thompson first looked at this question in 2005, using all 20-gauge (G) surgery. In this study, there was a mean improvement of all patients by about 1 line and about 1.4 lines for those who started pseudophakic. Only 5% of patients were reported as having a 2-line or greater loss that could not be attributed to cataract formation.

When this question was again examined in 2013, in the era of 23-G surgery, Rahman and Stephenson found that 5% of patients had some degree of visual decline with 67.2% noting improvement. As this study was done in the United Kingdom, all patients were either pseudophakic prior to surgery or underwent cataract removal at the time of 23-G vitrectomy.

In the two most recent studies published in the last year, the first showed a statistically significant improvement in vision among all subjects, with about 34% gaining 2 or more lines of vision and 12% with a 2 line or more loss. This is similar to our data, where we saw that 47.9% of patients had some improvement in visual acuity, with 10% of patients with vision loss of 3 lines or greater. The other recent study by Lehpamer and Carvounis showed an improvement of about 1 line at 1 year, with 73% of patients experiencing improvement in visual symptoms. This is, perhaps, the most significant finding as subjective visual improvement, or reduction of metamorphopsia, is the ultimate indicator if surgery was successful, even if best-corrected visual acuity does not change.

**TECHNIQUE**

When patients are taken to the operating room for removal of an ERM, several decisions still need to be made. One major question that always comes up is whether to peel the inner limiting membrane (ILM) along with the ERM. From histological data, the ILM is the scaffold for recurrent cellular proliferation. As a result, several studies, well-reviewed recently by Walia, have demonstrated significantly reduced rates of recurrent ERM when the ILM is peeled at the time of surgery. Thus, by removing the ILM, there is a significantly reduced rate of reoperation with no confirmed risk to visual acuity, other than the possible risk of mechanical trauma from additional surgical maneuvers or adjunctive dyes. The recent ASRS Preferences and Trends (PAT) Survey showed that a majority of American surgeons are in agreement with removal of the ILM, with 53.5% of surgeons peeling both tissues 70% to 100% of the time.

Another decision that needs to be made is what gauge surgery to perform. Benefits of smaller-gauge surgery have been well-documented and include faster visual recovery, decreased postoperative pain, and decreased astigmatism. There have been a number of reports on the safety of 27-G surgery published within the last few years. The papers have demonstrated very low rates of wounds requiring suture closure and minimal postoperative complications, with no reports of postoperative endophthalmitis or sclerotomy related retinal tears. One major downside to the use of 27-G vitrectomy by more surgeons are the limited options for forceps and other instrumentation. Smaller, 27-G instruments tend to be much more flexible and difficult to work with. In fact, the recent PAT survey suggested that only 23.3% of American surgeons plan to use 27-G instruments in the future, with another 23% indicating no plan to use this gauge of surgery.

We have recently adapted a hybrid 23/27-G platform that combines the benefits of both 23- and 27-G surgery. Although the cannula for the infusion and the nondominant hand are 27 G, the dominant hand...
is made 23 G, the preferred gauge for forceps in our practice. Using the 27-G cutter, we are able to do a 27-G vitrectomy. Then, the surgeon can peel with the preferred, more rigid, 23-G forceps. Although the cost of the extra 23-G trocar is the limiting factor to this technique, at least one company, Dutch Ophthalmic, plans to manufacture packs for use with this hybrid system. We hope to publish the safety profile and clinical outcomes of this technique within the next year.

**CONCLUSION**

The decision on when to offer surgery to people with ERMs is still debated among retinal specialists. Although most surgeons still suggest observation to individuals with good preoperative vision, more research is emerging to justify early interventional as a viable option. At the same time, advances in surgical techniques are developing that are leading to reduced rates of disease recurrence, faster recovery times, and decreased postoperative pain, while not significantly affecting the surgeon’s ability to perform the operation.

**REFERENCES**


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