Meibomian gland dysfunction awareness grows

Although 2015 ASCRS Clinical Survey respondents thought 37% of their dry eye patients had MGD, this number increased to 55% by 2018.

All 2019 Meibography Summit participants think the prevalence of MGD is increasing, which is attributed in part to aging, the average American diet, and increased use of electronic devices. A high percentage of cataract patients have MGD. “Most patients having cataract surgery are older, and they have never had therapy for their meibomian glands throughout their lifetime,” said William Trattler, MD.

Gupta et al. found that 80% of cataract patients had abnormal results for tear osmolarity, MMP-9, or both.5 Cochener et al. reported that half of cataract surgery candidates with MGD had no symptoms and 56% had meibomian gland atrophy.6 “After surgery, these patients usually become symptomatic. That is why it is very important to detect and pretreat patients to guarantee better results after surgery, especially patients receiving premium intraocular lenses (IOLs),” said Béatrice Cochener-Lamard, MD, PhD.

Users of digital devices blink less often, increasing the risk of MGD symptoms. “If you look at ocular surface interferometry, so many people have partial blinks,” said W. Barry Lee, MD.

While treating MGD, clinicians should educate patients about the importance continued on page 2
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of blinking, Dr. Cochener-Lamard said.

Some assert that the increasing prevalence is related to greater awareness of MGD. “There are many risk factors, many unidentified, and we are learning more and more about what is causing MGD and certainly the prevalence,” said Sumit “Sam” Garg, MD.

MGD in optometry

“MGD is one of the leading causes of contact lens intolerance,” said Alice Epitropoulos, MD.

“The contact lens industry reports that 16–18% of contact lens patients drop out per year,” said Douglas Devries, OD. Therefore, he said, it is important to recognize that a high percentage of patients dropping out of contact lenses have MGD, and earlier detection and treatment may reduce dropout.

Younger patients

Cynthia Matossian, MD, encouraged clinicians to look for MGD in younger patients. “The average age for our cataract surgery patient is decreasing, so MGD is being observed in younger and younger patients,” she said.

Gupta et al. found that 42% of children age 4–17 had meibomian gland atrophy.8

Summit participants said potential causes include digital devices and poor diet. In ongoing research, Gupta et al. found that body mass index in children is correlated with meibomian gland tortuosity but not with meibomian gland atrophy. “It is not surprising that we did not see something relating to atrophy because children were in the study and perhaps atrophy has not had time to develop,” said Preeya Gupta, MD. “But I think nutrition plays a significant role in this disease.”

Participants emphasized that clinicians cannot afford to overlook MGD, which may or may not have symptoms or staining. “This is such a prevalent condition that eventually, if cataract/refractive surgeons are not proactively assessing and treating their patients for this condition prior to surgery, they will run the risk of an unexpected and suboptimal refractive outcome, especially with toric and/or presbyopia-correcting IOL technology,” said Terry Kim, MD.

References

Diagnosing meibomian gland dysfunction

As awareness of meibomian gland dysfunction (MGD) increases, the range of diagnostic technologies has expanded, offering clinicians numerous ways to detect MGD.

To guide clinicians in integrating diagnosis and treatment of OSD into their preop evaluation, ASCRS introduced the Preoperative Ocular Surface Disease (OSD) Algorithm.1 It provides a sequence of steps to help clinicians diagnose ocular surface disease in a standardized manner.

The algorithm begins with three essential screening tests—the ASCRS SPEED II questionnaire to assess symptoms and tear osmolarity and MMP-9 to identify signs. If results are positive on any of these tests, additional assessments are performed. Subsequently, the clinician performs the LLPP (look, lift, pull, push) portion of the clinical exam, followed by diagnostic staining.

One benefit of LLPP is that all clinicians can perform it because it does not require additional diagnostic technologies, which will offer the impetus for clinicians to use it, said Paul Karpecki, OD.

Role of symptoms
Screening questionnaires help detect symptoms. “Patients with MGD, when it is active and inflamed, are the ones who complain of a burning sensation, particularly in the morning and redness upon awakening,” said Elizabeth Yeu, MD. Fluctuating vision is another major symptom of MGD.

However, there may be no symptoms. “There is a variant of MGD that is known as non-obvious MGD, and by acknowledging that it exists, it prompts you to look for it,” said Frank Bowden, MD.

Strategic testing
Based on dry eye questionnaire and point-of-care tests, eye care professionals may perform additional assessments if they are available.

Meibography is useful in assessing meibomian gland structure, and clinicians can correlate findings with other tests. “While tear osmolarity and MMP-9 will help us diagnose dry eye, I do not think they are that useful in differentiating the causes,” said Eric Donnenfeld, MD.

“Meibography has become the linchpin for our practice in differentiating the form of dry eye, which then dictates treatment later.”

In addition, meibography helps clinicians monitor treatment response. At the 2019 ASCRS ASOA Annual Meeting, Alice Epitropoulos, MD, and Arjan Hura, MD, presented a report indicating that visible gland structure may increase after thermal...
“We looked at the gland structure in pixelated detail using Adobe Photoshop, and it demonstrated that 69% of eyes that had thermal pulsation had an increase in visible gland structure compared with untreated controls,” she said.

However, meibography is not essential, Dr. You said. “Even looking at the lid margin beyond saponification and suds, if you see pitting, inspissated capping, or the lid margin notching, it is inevitable that if you correlate it with the meibography, in the area of the notch, you will see a missing meibomian gland,” Dr. You said.

“I have found that corneal topography is such a useful tool when I’m looking at the mires or finding an irregular pattern on a topography image preoperatively,” said Marjan Farid, MD. Areas of irregularity and dropout, appearing as black or white areas, are correlated with patient reports of visual fluctuation.

Signs of irregular astigmatism should also be noted. “There are red hot spots (of steepening) juxtaposed and mixed with flat islands,” Dr. You said. “Correlating the irregular area(s) on the axial map image with the Placido disc ring image is very telling.”

If clinicians only look for topographic axial map dropout, they will miss many MGD cases, Dr. You continued. “A lot of MGD patients have great Placido imaging because they do not necessarily have corneal staining, and with each blink, there is enough tear film coverage to capture the reflective image.” However, a difference of more than 0.2 or 0.3 D on the average corneal power between two devices suggests evaporative disease with a very rapid tear breakup time, she said.

When surgeons see discrepancies between devices, they need to explain this to patients, treat them, and ask them to return for repeat testing, said Sumit “Sam” Garg, MD.

Béatrice Cochener-La mard, MD, PhD, underscored the importance of being able to obtain quantitative values to grade MGD. “It is good to show patients their disease, but for me, the additional parameters that devices provide, like the thickness of the tear film and the quality of blinking, may be even more valuable than the gradient of the atrophy at that point,” she said. “The combination of these parameters makes it possible to quantify the quality of the dynamics of the ocular surface. Characterizing the tear film by its thickness, its distribution, or the height of the tear meniscus is of great interest, especially since an excess of evaporation and a decrease in secretion are often combined and will require treatment addressing these two aspects of the deficit.”

An additional test, such as double-pass technology, demonstrates tear film instability and meibomian gland function. “By looking at point-spread function—images over a 20-second period at 5-second intervals—instability of the tear film is graphically illustrated,” Dr. Bowden said.

In addition, Marguerite McDonald, MD, explained that keratography is useful in objectively measuring tear breakup time; there are systems available that accurately measure breakup time using real-time keratographic monitoring.

**Critical eyelid examination**

With this information in hand, the clinician proceeds with the clinical examination. “We need to educate all of our colleagues in optometry and ophthalmology of the importance of looking at the eyelids and how you can diagnose MGD very simply by doing that,” Dr. Donnenfeld said.

All of the Summit participants strongly agreed that clinicians should perform eyelid examinations on all cataract patients.

“Clinicians often focus on the cornea and the intraocular exam and may ignore the external examination,” said Edward Holland, MD. “It is important to examine the eyelid position, eyelid function, and the blink rate. Then we evaluate the anterior and posterior lid margins and expressed meibum to see if there’s anterior blepharitis or MGD.”

When expressing the meibomian glands, clinicians observe whether the meibum is clear, viscous, free-flowing, or thick and whether the glands are obstructed. They also examine the tear film and tear film meniscus height.

Terry Kim, MD, instructs technicians in his practice to perform meibography on patients in whom he witnesses any abnormality upon manual expression of the lower eyelid margin with a cotton-tip applicator. On meibography, dilatation or truncation of the glands signifies MGD and obstruction that must be relieved, whereas atrophy indicates significant MGD. “Even if only a few glands display atrophy, my belief is that all of the glands are affected and you have MGD,” he said.

If patients do not have gland secretions, the gland orifices may be epithelialized,
Overlooked signs

“One of the signs that is often missed in diagnosing MGD is the presence of a foamy tear film,” said Henry Perry, MD (Figure 1). “Many times, when we see it, it is exaggerated and easy to note, but to me, even one little bubble in the tear film is diagnostic of a patient who has problems with their meibomian glands.”

“Eyelash loss is another overlooked sign of MGD. A lot of cosmetic agents on the market designed to help your lashes grow contribute to MGD,” said W. Barry Lee, MD.

In addition, cosmetic eyelash procedures—such as lash extensions, lash perma nents, and lash tinting—are associated with MGD, said Cynthia Matossian, MD. “When you see patients with extraordinarily long and unrealistic eyelashes, look for MGD,” she said.

The everted superior tarsus also provides outstanding information, encompassing alterations in vascular integrity, epithelial inclusions, pigment aggregation, deep substantia propria scarring depicting severe chronic inflammation, follicles indicative of chronic hypersensitivity reactions, and acute papillary changes seen with allergy, viral infection, and toxicity, said John Sheppard, MD.

Staining steps

After gland expression, staining is performed with lissamine green or fluorescein. “In MGD we are going to find more staining inferiorly vs. aqueous tear deficiency, where we see more staining interpalpebrally,” Dr. Holland said. Then he uses fluorescein to look for epithelial defects of the cornea.

“Patients often think their vision loss is entirely due to cataracts,” said William Trattler, MD. “When you place fluorescein in the tear film, you will often determine that your patients have a rapid tear film breakup time. Upon questioning your patients, they often confirm that they are experiencing fluctuation of their vision. In many cases, this fluctuation is contributing to difficulties with their vision.”

Recognizing MGD

Asymptomatic MGD can lead to challenges with treatment compliance. “Thus, these patients are less willing to take our advice, despite the fact that it will benefit their outcomes,” Dr. Sheppard said. Clinicians need to incorporate meibography into their basic ocular surface diagnostic algorithm. MGD influences corneal epithelial integrity and therefore biometric accuracy and should be central to routine cataract evaluations, he said.

Clinicians can begin by simply expressing the meibomian glands during routine slit lamp examination, Dr. Kim said. “Once they realize that the prevalence is there, there may be more incentive to invest in imaging devices like meibography, as well as treatment devices like thermal pulsation and intense pulsed light therapy,” he said.

Staff engagement

Dr. Kim recommended that practices educate the staff as a team about MGD because technicians will be heavily involved. “When we decided to implement premium cataract/intraocular lens technology in our office, we had educational meetings with our staff where we planned how it would be implemented in the practice,” Dr. Kim said. “It is not like you are saying, ‘I’m going to be a dry eye practice.’ It’s saying, ‘I’m going to pay more attention to this condition within the practice population that I currently see,’ as it can have a significant impact on your patient outcomes with cataract and refractive surgery.”

References

MEIBOGRAPHY SUMMIT: Better understanding of meibomian gland dysfunction and how to integrate meibography in diagnosis and treatment planning

Incorporating meibography into your practice

Device helps clinicians view the meibomian gland structure

Meibography is a valuable tool in assessing the structure of the meibomian glands and the severity of meibomian gland dysfunction (MGD), and experts have developed protocols to integrate it into their examinations (Figure 1).

Valuable tool

“I find meibography to be one of those tests that routinely changes how I manage patients,” said Preeya Gupta, MD. “As much as we think that we are excellent clinicians, we do not have x-ray vision. We can see the function of the gland by exerting pressure on it, looking at the flow, but we cannot assess the architecture without meibography.”

“Meibography helps as an educational tool to show patients the extent of their MGD. It serves as an important tool for preoperative evaluation when you need to delay cataract surgery and treat this problem,” said W. Barry Lee, MD.

“Enabling the patient to visualize the extent of their disease is powerful,” said Frank Bowden, MD. “It allows you to set a measure of urgency in the patient that this is a problem that needs to be dealt with and not ignored or dismissed.”

Meibography is also advantageous for evaluating contact lens wearers, said Paul Karpecki, OD. “That is a major part of optometric practices where it can assist in selecting the type of lens or modality that is likely to be most successful,” he said.

Incorporating meibography

Although 44% of Meibography Summit participants think meibography should be performed at the point of care for cataract patients before surgery if they are suspected of having ocular surface disease (Figure 2), approximately 80% of respondents to the 2018 ASCRS Clinical Survey do not use meibography.

In his practice, meibography is used for every patient evaluated for dry eye or having a cataract surgery evaluation, said Douglas Devries, OD. “On routine patients, we are looking for a SPEED score greater than 6; then they would receive point-of-care tests including meibography,” he said. They also perform meibography if technicians suspect tear film instability based on imaging or refraction.

Technicians often perform testing before the patient sees the clinician. In her practice, Marguerite McDonald, MD, said all preoperative patients and those with only one positive symptom on the dry eye questionnaire have tear osmolarity and MMP-9 testing before her
Incorporating meibography into your practice examination. “If you performed meibography on absolutely everyone who walks in, that would slow down the office significantly, so you have to develop a scheme,” Dr. McDonald said. “For the average patient, if they have virtually no symptoms, but they have abnormal tear osmolarity and MMP-9 scores, I know I am going to need the meibography image to convince them to follow my treatment plan. The technicians know that they should proceed with meibography—before I even see the patient—if the first two tests are positive.”

“For anyone who is coming in for a refractive surgical evaluation or a cataract surgery evaluation, meibography is an essential tool,” said Elizabeth Yeu, MD. Her technicians also are empowered to ask a few questions on any routine examination, about issues including vision fluctuation and classic dry eye symptoms (redness, irritation, foreign body sensation), which trigger a dry eye evaluation including meibography.

Key resource
Meibography helps clinicians stage MGD and educate patients about it, but it is essential to provide an accurate picture of the patient’s condition, Dr. Gupta said.

“The role of diagnostic testing is to allow us to treat diseases more effectively, to diagnose a disease, and to educate patients,” said Eric Donnenfeld, MD. “Meibography gives us all of these parameters and has become a key resource. When we are looking at meibomian glands, for the most part, we are looking at the tip of the iceberg. When we have meibography, we have much more information on structure that translates to function.”

Reference

Should meibography be performed at the point of care for cataract patients preoperatively?

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<tr>
<td>Yes, any patient suspected of having OSD</td>
<td>44%</td>
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<tr>
<td>Yes, any patient suspected of having MGD</td>
<td>19%</td>
</tr>
<tr>
<td>No, only on a case-by-case situation at this time</td>
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Figure 2. Meibography Summit responses to the question: Should meibography be performed at the point of care for cataract patients preoperatively?
MEIBOGRAPHY SUMMIT: Better understanding of meibomian gland dysfunction and how to integrate meibography in diagnosis and treatment planning

Targeting MGD with advanced treatment options

Increased understanding of MGD helps clinicians make the most of today’s therapies

In addition to guiding diagnosis of ocular surface disease (OSD), the ASCRS Preoperative OSD Algorithm plays an important role in identifying meibomian gland dysfunction (MGD) and directing treatment in the preoperative setting.

“It is a much more aggressive, multifaceted approach to improve tear quality quickly in these patients because we want to get them into the operating room,” said Marjan Farid, MD. “A significant part of that is treating MGD aggressively, oftentimes with a procedural therapy, such as thermal pulsation, to get the oil glands flowing better and improve tear breakup time before surgery.”

Shifting focus

Previously clinicians focused on treating inflammation and increasing the tear film, said Paul Karpecki, OD. However, for evaporative dry eye, which accounts for 86% of all dry eye, “you also have to treat the obstructed meibomian glands as well as the biofilm.” So evaporative dry eye requires management of obstructed glands, biofilm, inflammation, and the tear film,” Dr. Karpecki said. “You have to have all of these tools to address all four elements, and that is when you really start seeing great success.”

“I think the cornerstone of MGD treatment is lid hygiene, and I think thermal pulsation and blepharoexfoliation are the best way to treat these patients,” said Henry Perry, MD. “I have also looked in terms of Demodex blepharitis, and we have used blepharoexfoliation to remove the cylindrical dandruff. That surprisingly removed 80–90% of the Demodex with one treatment in 1 month.”

Interest in Demodex is also increasing in Europe, with the appearance of tree-impregnated compresses combined with a tear film regenerator as an effective and well-tolerated therapeutic option, said Béatrice Cochen-Lamard, MD, PhD.

“In addition to a procedural treatment like evacuation of meibomian glands,” said Cynthia Matossian, MD, “at-home treatments like lid scrubs with tea tree oil, tea tree and coconut oil combinations, or hypochlorous acid all help potentiate the effect of the actual treatment.”

Minimum treatments

When asked about the minimum MGD treatments they would recommend, Summit participants agreed that clinicians need to remove the biofilm and express the meibomian glands and suggested other treatments. They also shared their responses on the role of in-office devices for MGD treatment (Figure 1).

“I am hoping clinicians still use the treatment algorithm from DEWS II as a guideline for treating MGD,” said Terry Kim, MD. He thinks practices should be able to offer level I and II therapy, at the very least.

Dr. Kim explained that lipid-based tears and lid margin hygiene therapy are important for patients with MGD and recommended using a microwavable heat mask and cleaning debris from the eyelid margins with microblepharoexfoliation therapy. In addition, he prescribes topical corticosteroids for acutely inflamed eyes and pulsed corticosteroid therapy for patients with dry eye flares.

Standard treatments for MGD include omega-3 nutritional supplements and combination therapy that may include azithromycin, lipid-based tears, or oral doxycycline, said Edward Holland, MD. “I have not been impressed with home lid hygiene or lid heat therapies,” he said. “I do think the devices we now have, such as microblepharoexfoliation of the lid margin to remove the biofilm as well as thermal pulsation or anterior thermal treatment to the lids, are useful.”

High-quality omega-3 has been shown to be effective in dry eye disease and MGD, and the majority of dry eye algorithms have included omega-3 as a primary therapy for dry eye disease and MGD, said Alice Epitropoulos, MD. She explained that it also helps restore the quality of the meibum after mechanical treatment, such as thermal pulsation.
“I am now a huge believer in microblepharoexfoliation,” said Elizabeth Yeu, MD. “I think that it is a treatment for MGD, especially for those who have good, healthy architecture but you can tell that there is a bit more turbid meibum, so the patient is in the earlier stages of MGD.”

Dr. Epitropoulos added that blepharoexfoliation not only helps with OSD, it also helps reduce the risk of endophthalmitis by reducing or eliminating the overgrowth of bacteria on the lid margins.

Dr. Yeu also recommended mechanical thermal pulsation or thermal therapy to the lid. “My preferred choice is thermal pulsation,” she said. “I think it does the most accurate melting of the meibum to the posterior lamella, followed by graded or gradual evacuation.”

In patients with a fair complexion with rosacea who have agreed to thermal pulsation, Frank Bowden, MD, offers intense pulsed light therapy (IPL), finding it to be a very helpful adjunctive measure.

For a subset of patients with more advanced MGD, Dr. Matossian performs thermal pulsation once a year, with IPL at the 6-month mark. “It is potentiating the effect and keeping those glands evacuated with an anti-inflammatory approach through the IPL,” she said.

Dr. Farid has found that oral doxycycline can be helpful in patients with rosacea. “In the preoperative setting, it works well to help decrease inflammation quickly,” she said.

Using an electrothermal device that heats the eyelid for 15 minutes followed by meibomian gland expression during a clinical study, William Trattler, MD, was impressed with how it facilitated expression. “I was shocked when I was manually expressing these glands how much I was getting out,” he said. Therefore, he also began manually expressing the glands after thermal pulsation.

Dr. Karpecki thinks blepharoexfoliation is critical and most effective, but manual debridement of the lower eyelid during a follow-up examination is helpful. “You start nasally and move away, and you go across the lower eyelid in one direction,” he said.

**Advancing understanding**

Dr. Holland thinks the ASCRS algorithm brings MGD to the forefront. “I hope we can get clinicians to think about MGD, diagnose MGD, and start treating MGD,” he said.

**Figure 1.** Meibography Summit participants responded to the question: What is the role of in-office devices for the treatment of MGD?

<table>
<thead>
<tr>
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<td>I provide them as primary therapy for all of my MGD patients</td>
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<tr>
<td>I provide them as primary therapy for most of my MGD patients</td>
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<tr>
<td>I use them for patients with significant and/or late stage disease</td>
<td>0%</td>
</tr>
<tr>
<td>I use them rarely</td>
<td>0%</td>
</tr>
<tr>
<td>I do not use in-office treatments</td>
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**References**

Timing meibomian gland dysfunction treatments

Effective treatment before cataract and refractive surgery increases optimal outcomes

Optimal timing can make all the difference in effectively treating meibomian gland dysfunction (MGD).

Early treatment

It is particularly important to promptly diagnose and treat MGD in patients who are receiving premium intraocular lenses (IOLs), which are more sensitive to visual fluctuations. “I like to treat patients preoperatively,” said Edward Holland, MD. “If patients have moderate to severe MGD, I may delay surgery, especially depending on the basis of visual needs and the patient’s expectations.” Corneal findings such as punctate epithelial keratitis will reduce the accuracy of IOL calculations and postoperative outcomes. “We will maximize MGD therapy and get the ocular surface as healthy as possible, repeat the IOL calculations, then perform surgery,” he said. His approach is even more aggressive in corneal refractive surgery candidates. Based on meibomian gland expression, quality of meibum, clinical examination, and meibography, Dr. Holland differentiates whether the patient has mild, moderate, or severe MGD and develops a treatment plan.

Terry Kim, MD, begins treating MGD when he sees truncation or dilation of the meibomian glands on meibography. “You don’t want to wait until you get late-stage signs of gland atrophy,” he said.

Figure 1 shows how Meibography Summit participants’ practices correlate with guidelines from the Tear Film and Ocular Surface Society Dry Eye Workshop II, which advises that clinicians diagnose and treat ocular surface disease (OSD) before making decisions for refractive or cataract surgery.

The current global scientific and medical consensus guidelines (TFOS DEWS II) indicate that MGD should be identified and treated prior to surgical decision making in the cataract patient. Does your current medical practice reflect these guidelines?

<table>
<thead>
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<td>Yes, in most cases</td>
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<td>Yes, sometimes</td>
<td>6%</td>
</tr>
<tr>
<td>No</td>
<td>0%</td>
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</table>

“Figure 1. Most Meibography Summit participants follow the current guidelines for diagnosis and treatment of MGD before cataract surgery.”

If you wait too long, it is very difficult to get a patient back into contact lenses, but if you catch them early, you can change that.”

—Paul Karpecki, OD

As in surgical patients, early diagnosis and treatment of MGD are critical in the optometric setting, particularly if it causes patients to stop wearing contact lenses. “If you wait too long, it is very difficult to get a patient back into contact lenses, but if you catch them early, you can change that,” said Paul Karpecki, OD. “If you allow patients to stay in lenses for another 3 or 5 years, the impact on the profession would
be extremely significant, as it is in surgical and other areas as well.”

**Regular gland expression**

Elizabeth Yeu, MD, recommended that patients have a lid evaluation and meibomian gland expression at least twice a year. “It is one thing if we perform a formal thermal pulsation therapy once a year, especially when you see architectural damage. But the biofilm that plugs the orifices, getting those open a minimum of twice a year I think helps with allowing for better egress with less pressure, which is only going to help the management of the MGD process.”

Marguerite McDonald, MD, recommended taking steps to remove the biofilm before thermal pulsation therapy. “We do blepharolysis and thermal pulsation almost exclusively together, back to back,” she said. She is collecting data on the impact of this protocol, but trends are showing that patients get 6 months of additional relief before it needs to be repeated.

**Comanagement recommendations**

Figure 2 shows how Summit participants instruct comanaging clinicians regarding diagnosis and treatment before referral.

“Although we encourage it, not all referring optometrists are identifying MGD and pretreating it before sending us their cataract patients,” said Cynthia Matossian, MD. “We try very hard to educate our OD community by providing lectures, inviting them to come and spend time with us, to see our different diagnostic and treatment tools in action. It is a continuum of training. Our goal is to get our comanaging ODs to identify, treat, and send us a tuned-up ocular surface.”

Douglas Devries, OD, agreed. “We discuss this with our referring doctors through education. We talk about it consistently, but unfortunately, it still is a fairly low percentage in which ocular surface disease is identified and treated … before the referral.”

Technicians play an important role in alerting surgeons to patients with signs of MGD who have not been diagnosed or treated before referral. “You have to train technicians to get you when they see abnormal values stacking up,” Dr. McDonald said. “That way, you can go into the exam lane, examine the patient, and start treatment. You must explain that the rest of the cataract evaluation (dilated exam, biometry, topography, optical coherence tomography of the macula, etc.) will take place at the next visit,” she said.

**Figure 2.** More than half of Meibography Summit participants who comanage cataract surgery instruct comanaging clinicians regarding diagnosis and treatment of MGD before referring patients.

| Yes, always | 56% |
| No, I prefer to manage MGD in my clinic | 6% |
| Yes, sometimes | 38% |

**For surgeons who comanage cataract surgery, do you routinely instruct your comanaging ODs/MDs to identify and treat MGD prior to referring the patient?**

References
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CME questions (circle the correct answer)

1. Which of the following is/are referred to as potentially contributing to the increase in meibomian gland dysfunction?
   a. Dysfunctional lens syndrome
   b. Decreased blinking with electronic devices
   c. Aqueous deficiency
   d. A and B

2. According to the ASCRS Preoperative Ocular Surface Disease Algorithm, which of the steps follows the LLPP portion of the clinical examination?
   a. MMP-9 testing
   b. Tear osmolarity testing
   c. Diagnostic staining
   d. Aberrometry

3. MGD may be evidenced by _________ during a clinical examination.
   a. Foamy tear film
   b. Clear meibum
   c. Tear breakup time greater than 12 seconds
   d. None of the above

4. Which was NOT reported to be a benefit of meibography?
   a. Demonstrates the architecture of the meibomian glands
   b. Allows clinicians to evaluate meibomian gland function
   c. Valuable in educating patients about meibomian gland disease
   d. Can assist in selecting the type of contact lens that would be most successful

5. Which is one of the key treatments to remove biofilm from the lid margin?
   a. Blepharoexfoliation
   b. Lipid-based tears
   c. Omega-3 nutritional supplements
   d. Meibomian gland probing

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