

CRST

Cataract & Refractive Surgery Today

Introducing Intense Pulsed Light for Medical and Aesthetic Applications in the Ophthalmic Practice

This monograph summarizes a panel discussion about implementing the Lumenis Intense Pulsed Light with OPT into an ophthalmic practice and treating skin disorders associated with ocular conditions. The discussion was held in November 2015 during the American Academy of Ophthalmology Annual Meeting in Las Vegas.

Consider Intense Pulsed Light for Your Ophthalmic Practice

Use of this device improves surgical and treatment outcomes

BY STEVEN J. DELL, MD



The demand for our services is increasing; an active senior population is exploding in size; and the actual supply of ophthalmologists is going down. In the United States, about 450 ophthalmologists graduate every year, but about 500 retire. In the near future, we are going to face a substantial physician shortage, particularly in specialties that serve a senior population, including ophthalmology. And yet ophthalmology's historically high career-satisfaction rating is declining. What is wrong with this picture?

With the growth of health insurance exchanges, many ophthalmologists expect a substantial reduction in their income. Despite this, results of a survey that asked, "have you thought about adding new ancillary services to your practice in the last few years?" revealed that most ophthalmologists have not.¹ It is probably time to break free of the insurance game, and to seriously think about ways to expand our practice offerings.

In our practice, two big opportunities—the aesthetics and the dry eye component—are expanding faster than any other.

Dry eye syndrome (DES) is ubiquitous. The number of patients who have DES dwarfs the number of cataract patients. In the United States, there were 40 million DES patients in 2010, and this number is estimated to increase to 90 million by 2050. In comparison, 24 million patients had cataract surgery in 2010, and this number is estimated to increase to 50 million by 2050.² Many of these DES patients are undiagnosed or underdiagnosed, and the vast majority of them are therefore untreated or undertreated.³

PERSISTENT SYMPTOMS

Will DES just go away? It absolutely will not, and one can either ignore it, which is the strategy many ophthalmologists use, or one can choose to properly treat it. The bottom line is that, next to ametropia, DES is the most common condition that we see in our patients, and its incidence is poised to explode.

There are many different causes of DES. This is a multifactorial disease, but the final common pathway for every case of DES is increased tear film osmolarity and tear film instability.⁴ The overwhelming majority of DES is evaporative, rather than aqueous deficient. There is now a growing awareness that meibomian gland dysfunction (MGD), the major cause of evaporative dry eye, is the pivotal element in DES.^{5,6} In MGD, the meibomian glands are plugged or do not function properly. This triggers an increase in tear film osmolarity,

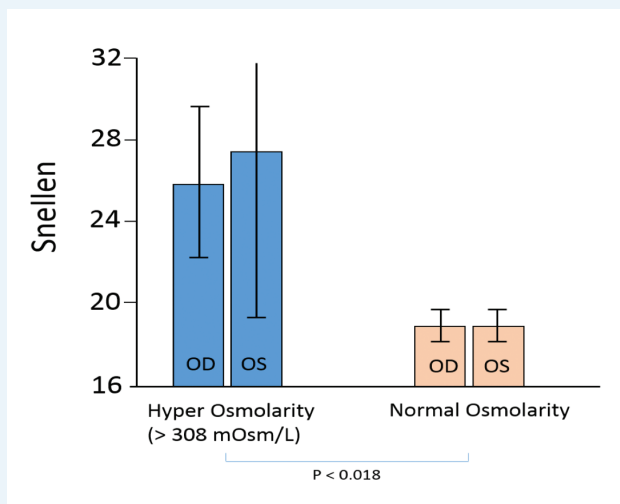


Figure. Refractive outcomes at 3 months postoperative is affected by tear osmolarity. Data from 128 subjects who underwent vision correction with LASIK.⁷ Adapted from Donnenfeld, ESRCR Presentation, 2011.

leading to tissue damage, inflammation, more increase in tear film osmolarity, and so on. This cascade, which feeds upon itself, destabilizes the ocular surface and brings about a great reduction in the quality of life. Most artificial tears in the market certainly can replenish the tear film. However, artificial tears or other preparations for DES do not address the underlying problem.

OCULAR HEALTH AND SURGICAL OUTCOMES

Why do I care about DES and MGD? By specialty, I am a cataract and refractive surgeon. As such, I am very interested in optimizing the outcomes of my cataract and LASIK patients. Failure to do so erodes patient confidence, and ultimately costs us time and money. In our clinic, we spend a lot of our time treating patients for DES before we deal with things like cataracts or LASIK. If you are a refractive or cataract surgeon trying to obtain good topography to determine a patient's astigmatism, choose an IOL power, or give your patient the best vision postoperatively, you should think hard before performing surgery without proper management of pre-existing dry eye conditions. A study from Eric D. Donnenfeld, MD, from Ophthalmic Consultants of Long Island, looked at outcomes of LASIK in controlled and uncontrolled DES patients.⁷ Indeed, results are simply better when DES is under control, as measured by tear film osmolarity (Figure). In our cataract patients, I would venture to say that some degree of DES is nearly universal. This is supported by study findings from Trattler et al who showed that close to

80% of cataract patients had asymptomatic DES.⁸

In summary, DES and aesthetics are two big opportunities for expanding an ophthalmology practice. A single technology, intense pulsed light, could offer solutions to both. In the following articles, Ronald N. Gaster, MD, discusses the association between inflammatory skin conditions, such as rosacea, and DES secondary to MGD; and Sheila Barbarino, MD, discusses how to use intense pulsed light to prevent and treat skin rosacea and other skin disorders. ■

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The Association Between Rosacea and Ocular Surface Disease

Exploring the mechanisms by which rosacea could trigger dry eye syndrome

BY RONALD N. GASTER, MD



Cutaneous rosacea is an inflammatory condition, mostly affecting facial skin in the central area of the face. Although rosacea is predominantly a skin condition, it often leads to eyelid and ocular surface inflammation, which can then trigger meibomian gland dysfunction (MGD), the major cause of dry eye syndrome (DES).¹ Frequently, dermatology patients do not mention their ocular symptoms. Conversely, ophthalmology patients do not discuss their skin manifestations with their doctors. Consequently, rosacea and DES are both either underdiagnosed or diagnosed late, resulting in poor management of DES.

Cutaneous rosacea can be triggered by both exogenous factors (nei.nih.gov/health) and/or endogenous factors (immune response, hormonal changes, age). These factors lead to dilation of the superficial vasculature and erythema, inflammation, edema, and eventually telangiectasia. Ocular signs are frequently associated with cutaneous rosacea, often preceding or lagging it.²⁻⁴ The most common ocular sign

associated with cutaneous rosacea is MGD, with more than 80% of rosacea patients having the condition.⁵ Other ocular signs associated with skin rosacea include blepharitis (eyelid inflammation) and rosacea keratitis (corneal involvement).

Several mechanisms could explain the association between rosacea and MGD. First, skin rosacea is characterized by increased epithelial turnover.⁶ The dead epithelial cells could accumulate causing debris, which would propagate to the eyelids and obstruct the meibomian glands. This would lead to low delivery of the meibum and the development of DES. A second possibility is that the abnormal blood vessels formed in rosacea, in particular telangiectasia, release cytokines and chemokines and orchestrate an inflammatory cascade. These inflammatory agents could reach the eyelids via the vasculature surrounding the eyes, leading to inflammation of the meibomian glands.⁷ A third possibility is that the edema associated with rosacea favors the colonization of *Demodex* mites, which are often infested with *Bacillus olerinus* bacteria. This, by itself, could increase the sensitivity of the Toll-like receptor 2, thereby enhancing the production of antimicrobial peptides that results in further inflammation and vascular changes such as neovascularization, erythema and telangiectasia.⁸ A fourth option involves the toxic lipases excreted from the proliferating bacteria, which could modify the composition of the meibum, increase its viscosity, and clog the meibomian glands.

All these factors may combine to prevent proper delivery of the meibum, increasing pressure within the meibomian glands and, eventually, leading to atrophy and irreversible dropout of these glands. When properly functioning glands fall below a critical number, the integrity of the tear film is irreversibly compromised, leading to DES and to a significant deterioration in the quality of life.

In summary, there is a clear association between skin rosacea and DES. A number of mechanisms could explain this relationship. It is unclear whether this association is merely correlation, or actual causation. Whatever it is, I believe that the treatment of rosacea is beneficial for the management of DES. ■

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Expanding Your Ophthalmology Practice With the Lumenis M22 IPL with OPT

Using intense pulsed light to treat rosacea and skin-related ocular disorders

BY SHEILA BARBARINO, MD



It has never been more challenging to run a lucrative medical practice and, in particular, a profitable ophthalmology practice. Ophthalmologists' revenues are declining year after year. We are working harder, but making less money. What is the solution? Diversify, as any good financial advisor would recommend. In our field, diversifying means expanding the ophthalmology practice with additional treatments.

There is much crossover and synergy between ophthalmology and aesthetics. Many common cosmetic procedures, such as Botox (onabotulinumtoxinA; Allergan) and Latisse (bimatoprost ophthalmic solution; Allergan), were pioneered by ophthalmologists. In addition, our ophthalmology patients are often extremely interested in aesthetic treatments. We see them every day in our office: these are our LASIK, cataract, blepharoplasty, and reconstructive surgery patients. We have strong relationships with these patients; why not offer them cash-based treatments for aesthetic purposes?

We can also offer energy-based treatments with lasers and intense pulsed light (IPL). IPL, the most versatile device for treating skin conditions in the aesthetic field, could be a natural addition to our existing armamentarium. It is the first energy-based treatment in the entire aesthetic field, with the first FDA clearance granted to Lumenis in 1995. In the United States alone, more than 600,000 IPL procedures are performed annually, and this number is continuously growing, especially among men for whom the annual increase exceeds 40%.²

IPL technology uses a wide range of wavelengths to target different chromophores, depths, and skin types. In that sense, IPL is a multifactorial solution to a multifactorial problem. Treatment parameters such as fluence and pulse duration can be customized to address different depths, individual skin properties, and indications. More than 30 indications are now FDA approved for treatment with the Lumenis M22 IPL with OPT system, including telangiectasia and erythema of rosacea.

Facial rosacea is particularly important to ophthalmologists, even those not looking to expand their practice to aesthetics. In 20% of patients, ocular rosacea precedes facial (cutaneous) rosacea.³ However, in most cases skin findings occur first, or the presentation of rosacea is concurrent. Both conditions are inflammatory and

need to be treated. In facial rosacea, inflammation could spread from the facial skin to the eyelids, triggering dry eye syndrome (DES). As we well know, healthy meibomian glands are essential for the integrity of the tear film and corneal health. IPL is very effective for treating rosacea by destroying abnormal blood vessels and removing a major source of inflammation that often also reaches the eyelids and ocular surface. Several studies have shown that IPL treatment indeed attenuates signs and symptoms of DES.^{4,5}

I would like to describe my personal experience with IPL. Eight years ago, I acquired a Lumenis M22 IPL with OPT system (Figure 1) with the intent to treat patients with skin issues such as fine lines, wrinkles, hyperpigmentation, and rosacea.

Figure 2 illustrates the perfect candidate for IPL, with moderate to severe facial rosacea before treatment. Note the results after several monthly treatments. This is a lunchtime, in-and-out procedure, with no downtime. Many of the patients who received IPL treatment reported that symptoms such as dry, itchy eyes improved and they decreased their need for artificial tears. In my experience, even patients without rosacea found relief of their DES symptoms.

These patients' testimonies convinced me that the association could not be random. Therefore, I began to speak with different opinion leaders in the field about these results. Recently, I met Steven J. Dell, MD, who was excited to hear about this. Soon after, I joined Dell Laser Consultants to bring my IPL expertise into his practice. As a preliminary step toward gaining FDA approval for DES, we are currently conducting a study to further support the hypothesis that IPL treatment is beneficial for DES.

With a charge of between \$350 to \$900 per IPL session, the Lumenis M22 IPL with OPT system can be financially rewarding. The Lumenis M22 IPL with OPT system offers several key features, first of which is the Optimal Pulse Technology. This proprietary Lumenis technology ensures the delivery of consistent and homogeneous levels of energy during brief IPL pulses, thus eliminating unsafe energy spikes, increasing reproducibility, and improving results with fewer treatment sessions and a significantly reduced risk for skin damage. The second key feature is a chiller tip that allows one to use higher levels of energy, producing deeper penetration without compromising on safety or causing discomfort for the patient. Third is ease of use. The system comes with a huge repertoire of preloaded presets that allows users to rapidly choose the set of parameters that are optimal for the indication, depth, and skin type in question. Fourth is that it also allows users to customize the treatment according to the desired indication, depth, and skin type by selecting the most adequate filter from a variety of seven cut-off and two band-pass filters. Fifth is the option of three spot sizes for treatment of both wide and narrow areas. Sixth is a training course with a certificate upon completion, which many malpractice insurances require. The last is modularity: In addition to IPL, three other modules can be added—a Q-switched Nd:YAG module, a long-pulsed Nd:YAG module, and a Resurfacing module. These additional modules further extend the treatment capabilities.

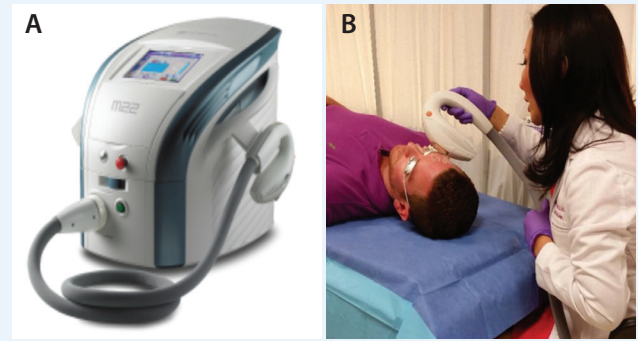


Figure 1. The Lumenis M22 IPL with OPT system (A) and a patient being treated for rosacea with the system (B).



Figure 2. Before and after photographs of a patient with moderate rosacea who was treated with the Lumenis M22 IPL with OPT system (four sessions, 1 month apart).

In summary, one has to ask: where do I see my practice in 3 to 5 years? In the long run, early technology adapters are more likely to do better. As medicine changes, we need to adapt and diversify. Be an early adapter and adopt the Lumenis M22 IPL with OPT. ■

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