Putting pressure on MGD

At the annual conference of the American Academy of Optometry back in 2015, I came across a novel

Meibomian Gland Dysfunction treatment that uses heat. It also treats associated Dry Eye problems. As a typical sufferer myself (figure 1), I was impressed by the system and found it both easy to use (figure 2) and, as clearly demonstrated by use of a thermal imaging device immediately after treatment (figure 3), effective in delivering a controlled heat source with pressure to the affected area for a set period of time. At the time, I was not aware of the unit being available in the UK. Since then, the Heated Eye Pad (from Digital Heat) has received a CE marking and is currently in use at a number of dry eye specialist clinics, such the Manchester Dry Eyes Clinic, who kindly loaned me one for trial (figure 4).

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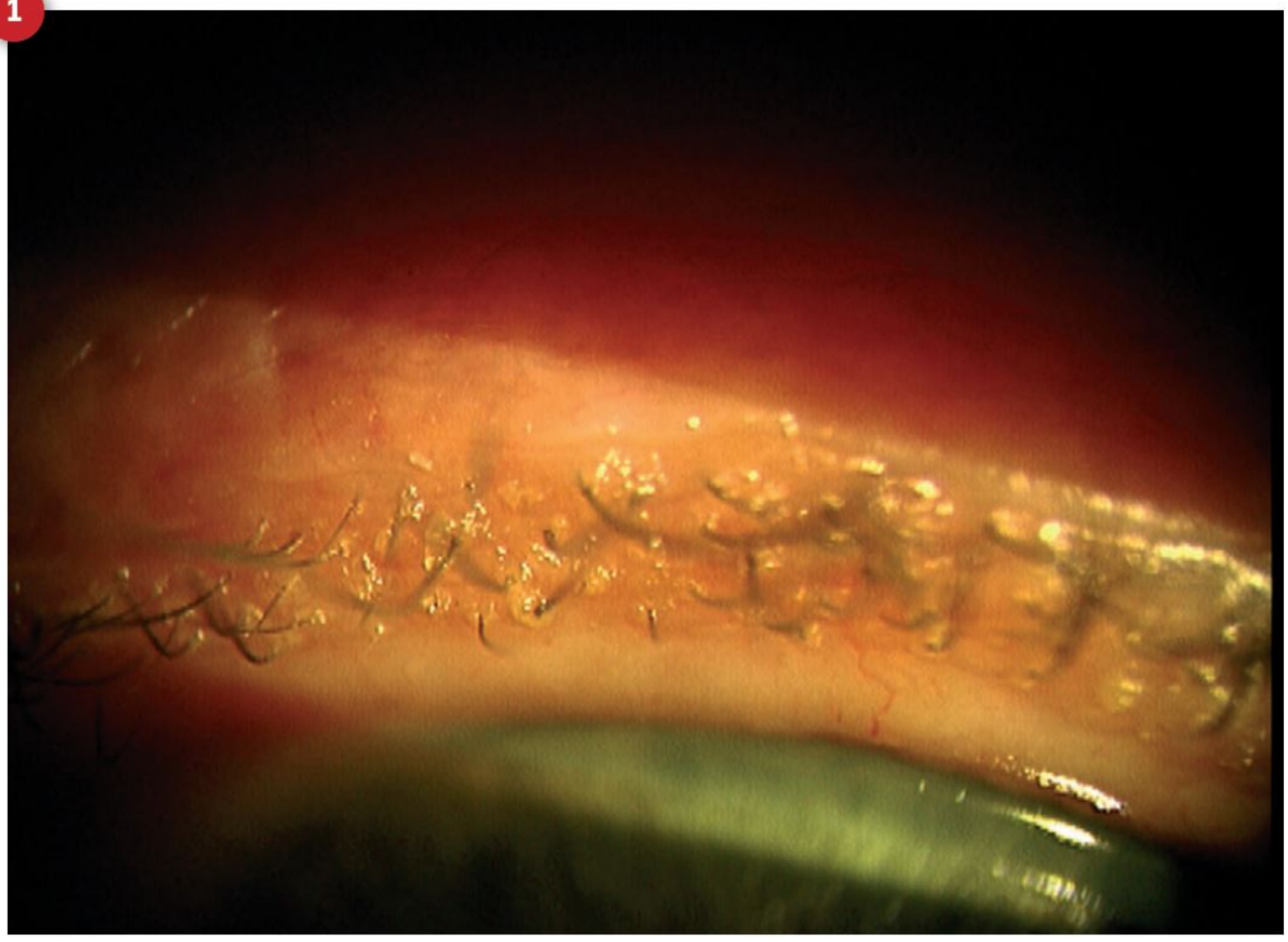

BACKGROUND TO COMPRESSES

The 2011 definition of meibomian gland dysfunction (MGD) by the TFOS MGD Workshop highlighted the importance of termi-nal duct obstruction in MGD,[1] which has 'encouraged the use of treatments to remove obstruction from the terminal duct and ductal system of the meibomian glands'. The group suggested there is a significant role for conventional treatments in the management of MGD, including ocular lubricants, lid hygiene and warm compresses.

There has been much excitement in the profession about the recent release of the 2017 TFOS DEWS II Management and Therapy Report which includes an excellent up to date review of the literature regarding management options for dry eye and MGD, including the use of warm compresses, led by Professor Lyndon Jones, a name familiar to *Optician* readers.[2]

Previous to this, studies have shown that warm, moist com-press therapy applied to the skin of the closed eyelids increases tear film lipid layer thickness for subjects with MGD by more than 80%, five minutes after initiating treatment and an additional 20% after 15 minutes of treatment.[3]

Regardless of methodology, the therapeutic goals of heat therapy are as follows:4

- To heat the meibomian gland contents to facilitate their secretion into the tear film.
- To alleviate meibomian gland obstruction.
- To increase vascular flow to the tissue surrounding the meibomian glands

Although there is no single melting point for solidified meibomian secretion,[5] because the chemistry and viscosity of

the solidified secretion itself are variable,[6] it has been stated that solidified secretions from severely obstructed glands have a considerably higher melting point than those from apparently normal unobstructed glands.[7] Thus, it can be assumed that higher temperatures, provided safety is maintained, are superior for the treatment of more severely obstructed glands.

TFOS DEWS II confirms that 'The ability for heat from a warm compress to soften or liquefy the secretions in obstructed glands in the case of MGD is supported by Level 2 and 3 evidence'.

However, despite having heard the contrary at recent lectures on the circuit, the report goes on 'The temperature and time required for melting obstructive material within the meibomian gland excretory duct has not been definitively established. Preliminary evidence from multiple studies has reported a range of melting points (32 to 45° C) for the contents of the

meibomian glands, reflecting in part that meibum is a highly complex lipid mixture.[8] Jones et al conclude: ‘Level 2 and 3 evidence suggests that heating the individual meibomian gland to a temperature of ≥40°C is likely to be required for optimal warm compress treatment.’ This 40°C recommendation refers to the temperature of the palpebral conjunctiva and the gland, not the temperature on the contact surface of the treatment device or the temperature of the external skin of the eyelids.

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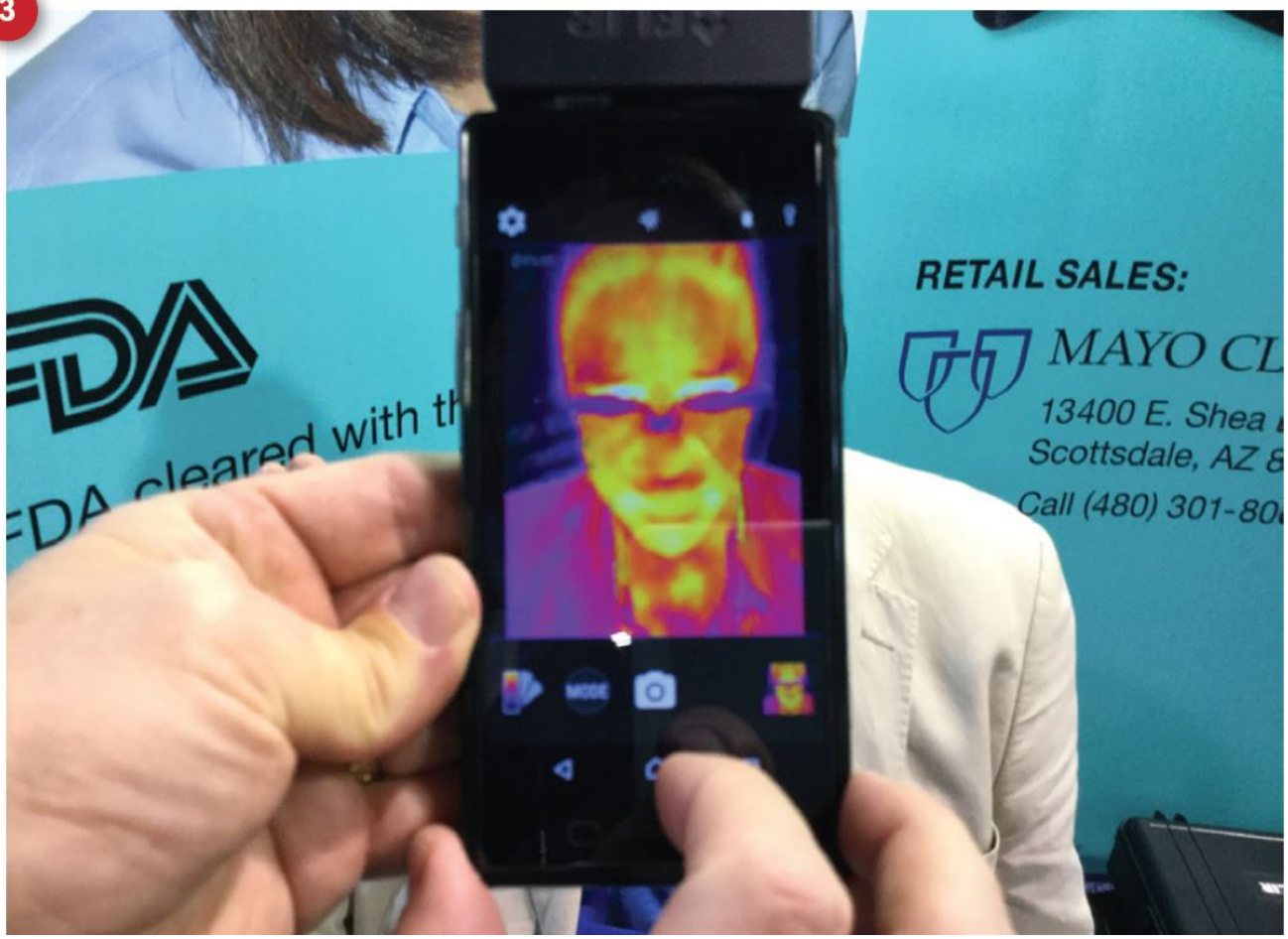

MAINTAINING THE HEAT

There are a range of products available for the management of MGD by heat and pressure application. These tend to fall into one of three categories;

- Microwave – the product is heated first in a microwave and then applied over the closed eyes
- Chemical – these tend to be disposable, pressure-activated warming units where the heat is derived from a mixing of con-tained chemicals when used
- Electrical – the unit is powered by an external electrical sup-ply during use

The Heated Eye Pad belongs to the final category, with a USB and adaptor input (figure 5). Unlike most microwave and chemical devices, the heat filaments apply the required ≥40°C

temperature to the lid area only rather than the whole orbital opening. Also, because of the adjustable nature of the frames (adjusted for pupillary distance and length of side as with a trial frame), the pressure to the lids may be tempered as to not cause undue pressure. Such pressure has been found with other devices and can cause post-treatment visual blur that some patients dis-like enough to discontinue with their treatment.

Indeed, patient compliance with all of these compress products is the bane of our lives. Jones *et al* point out that compliance is a major factor in determining MGD treatment success. The Heated Eye Pads are easy to use and, importantly in my view, show some immediate benefit in terms of ocular comfort improvement (where discomfort has been previously noted). Furthermore, most US practices adopt a fee structure where patients invest intheir treatments – people are more likely to continue with some-thing they have paid for.

Before each use, the frame needs careful adjustment to suit the patient. The heating elements are cleaned with an alcohol swab. After each treatment, the patient should be encouraged to under-take their usual lid hygiene procedure I recommended a proprietary lid wipe.

SUCCESS

In terms of easy of use and providing controllable pressure and maintenance of adequate temperature for the desired five to 10 minutes treatment, this new product ticks all the boxes. It could easily be incorporated into practice schedules and, indeed as is often the case in the US, be sold to carefully coached patients for home use as directed. Definitely worth a look.

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