

Current trends in the management of dry eye

The patient with dry eye is a regular visitor to most ophthalmologists' offices, a patient that can be difficult to treat and hard to satisfy. Four European ophthalmologists met at the 9th ESCRS Winter Refractive Surgery Meeting to discuss current strategies in the diagnosis and treatment of this challenging condition. Paul Rosen FRCS chaired the discussion.

Rosen: I would like to welcome everyone to this roundtable discussion on dry eye. What we want to do is have a general discussion on dry eye, its aetiology, investigation and management, particularly in relation to laser refractive surgery. The first issue to discuss is the scope of the problem and what percentage of your practices have patients with dry eyes.

"I would estimate about 10% of patients who present to a refractive clinic have symptomatic dry eye which may exclude them from corneal laser refractive surgery."

Tayo Akingbehin

Akingbehin: Within a general clinic population dry eyes is a fairly common occurrence in the older age groups but the demography of the refractive clinic is much younger. I would estimate about 10% of patients who present to a refractive clinic have symptomatic dry eye which may exclude them from corneal

laser refractive surgery. That is not to say there are not other patients who show signs of lower tear production but are not necessarily symptomatic.

Peckar: I think in the younger population there is a very high prevalence of dry eye symptoms in contact lens wearers. Longterm contact lens wearers all have a degree of dry eye or disturbance of tear production and a large proportion of these patients occur among the refractive surgery population by definition.

Epstein: I find the issue very confusing, because we have one sector which can be defined medically as dry eyes and a larger group that describe themselves as having dry eyes but there are no findings to substantiate the diagnosis. The best estimates I know suggest that these two groups comprise about 25% of patients who present at a general ophthalmological practice. If you look at the two groups you will find that a lot of patients, such as contact lens wearers and women on the pill, have dry eye symptoms but they don't really have dry eyes by any clinical definition.

Rosen: I think that brings us neatly to how we investigate someone with symptoms of so-called dry eyes. Do you have a plan that you use in your practice?

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Dan Epstein

Epstein: I very much like the Rose Bengal staining technique because I trust that technique very much. Some people use the height of tear meniscus but that can be tricky because in patients who have blepharitis, the tear meniscus may look different at different times. There is also the tear break-up time. But I don't trust the break-up time that much either, because the definition of break-up time also varies and the only relevant physiological break-up time is what happens between two blinks.

Rosen: What about Schirmer's do you think that's of any value?

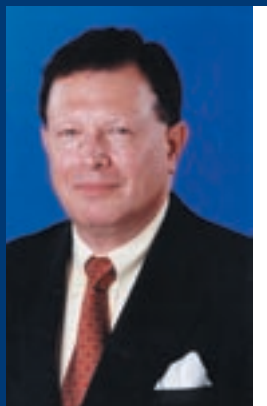
Epstein: I have stopped using it.

Peckar: I have also stopped using it. As regards the Rose Bengal test, although it's the best way to understand what's happening to the corneal epithelium, if you carry it out routinely on your patients, large numbers of them will desert you because of the extreme pain induced by the test. I have therefore tended to replace that in day-to-day clinical practice by studying the fluorescein staining of the tear film and the epithelium and relating that to what I know happens in a Rose Bengal test.

Akingbehin: Yes I agree with Clive and in a way I feel that Schirmer's test is useless. Nevertheless, I think it is important in a refractive surgery clinic to document some element of tear production and this is the only objective way of doing it. So we are still doing it routinely on arrival on all our patients in the clinic. The difficulty with using the Rose Bengal in the clinic is that by the time they get to the ophthalmologist and they have been through the optometrist and the nurse technician the corneal epithelial surface has already been compromised in various other ways so that it is no longer a useful test at this stage in the clinic.



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“As we are talking here mainly of the milder dry eyes in the younger population I think it is often related to contact lens wear. In the elderly it is almost physiological.”

Clive Peckar

Epstein: In most cases we treat problems of the quality of the tear film with quantity, and that doesn't work. You've got the extreme dry eye where you have an autoimmune disease and you know that the tear gland is affected. Then you have the age-related decrease of tear production. We know that in women you have the testosterone/oestrogen cycle change at the age of 45 to 55 years, which also affects the tear quality. The pill has an effect on the composition of tears so you have another pathogenesis path. You cannot generalise because dry eye symptoms have different causes in different people.

Akingbehin: We have discussed the quantity and the quality of tears, but what is also important is the way the tears are distributed over the corneal and conjunctival surfaces. It is sometimes possible to see very minor pathologies that interfere with the function of the eyelid and the way that the tear film is spread across the eye.

Rosen: Staying with pathogenesis but moving on to its relation to refractive surgery, I am interested to know your views as to the aetiology of dry eye following laser surgery.

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Tayo Akingbehin

Akingbehin: There has always been the debate in corneal laser surgery-- I am talking in particular about LASIK to start with--whether patients who have a superiorly placed hinge are more prone to having dry eye compared to patients who have a nasally placed hinge. For quite a while one of the alleged values of the nasal-hinge microkeratomers was that the patients had less dry eye with it. It would be interesting to see whether in fact this will be proven statistically with the IntraLase, which lets the surgeon choose where he places the hinge. But it always interests me that dry eye is mostly regarded as a complication of corneal laser surgery and yet it will occur as frequently following cataract surgery, where we do not disturb the corneal innervation as significantly as when we have the microkeratome cut a corneal flap.

Rosen: Do you think there is a difference in dry symptoms between LASIK and LASEK?

Akingbehin: That is a difficult one to answer because I think you've got to look at the stability of the corneal epithelium. Even after the contact lens has been removed following LASEK the epithelial cells are still not as stable as in LASIK. Now that we have a choice between using an alcohol-induced flap or a mechanical epithelial flap with Epi-LASIK, we may get an opportunity to see if there is a difference in the chemical damage to the epithelial cells in LASEK.

Epstein: I have been in the PRK and Excimer field from the very start. We began by doing thousands of PRKs and I don't recall any major problem with dry eye. The dry eye issue emerged with LASIK and then came the speculation that it resulted from cutting the nerves in the cornea. We have evidence for that, Bill Bourne had a beautiful poster at the ESCRS last year in which he used confocal microscopy to show that even three years after LASIK the nerve regeneration has not been completed, but with PRK, regeneration was complete after one to two years. Therefore, you would think that LASIK patients are the ones that would have the most dry eye, if you believe in the corneal sensation aspect of it.

Rosen: Tayo, you mentioned that when screening patients for LASIK they all undergo a Schirmer's test; do you ever reject anyone on the basis that they have dry eyes? Remember a lot of these patients are contact lens wearers they are drying out and can't tolerate their contact lenses.

Akingbehin: Of course we do reject some patients but not on the result of Schirmer's test alone. A useful sign that the corneal epithelium is not functioning properly in contact-lens-intolerant patients is an objective improvement in their vision with their eyedrops.

Rosen: What are you telling patients in terms of informed consent about the possibility of dry eye after refractive surgery?

Akingbehin: We now tell them that they will all get dry eyes and we also inform them that the majority of them may need some form of canalicular implant in addition to the eyedrops for their dry eyes.

Epstein: We tell them they are going to need intensive lubrication immediately post-op and we tell them that on average, based on the literature, usually most people recover after six months, but not everybody.

Rosen: This very neatly leads us on to treatment. I think there is some confusion. Dan, what's your treatment strategy with these patients?

Epstein: First I tell them that they have a probable problem with the quality of the tears and I am going to treat them with a quantity increase. That is a difficult therapeutic situation so I want to

decrease their level of expectation. I also try to avoid all drops with preservatives since, unfortunately, while benzalconium chloride is a superb preservative, it is not the kind of thing you want to put in the eye of a patient with dry eye symptoms. My great hope now is that new products will act longer in the eye. The duration in the eye of a normal drop is miniscule. The other way to get long time effect is to prescribe gels. I do that especially in people who mainly have morning problems. I have patients who only have gel at night and they do just fine.

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Dan Epstein

Peckar: I agree with Dan's observation. There is no ideal teardrop to replace the complex traditional three component natural tear film. Therefore, if you can't produce more of the natural tears the alternative is to try and make the natural tears hang around longer. In extremely dry eyes this, obviously, isn't going to solve the problem but in the patients we are talking about, on the whole post-LASIK and post-penetrating keratoplasty patients, my strategy now is to go straight to a inferior canalicular occlusion with the thermodynamic hydrophobic implant.

Rosen: You wouldn't use drops at all?

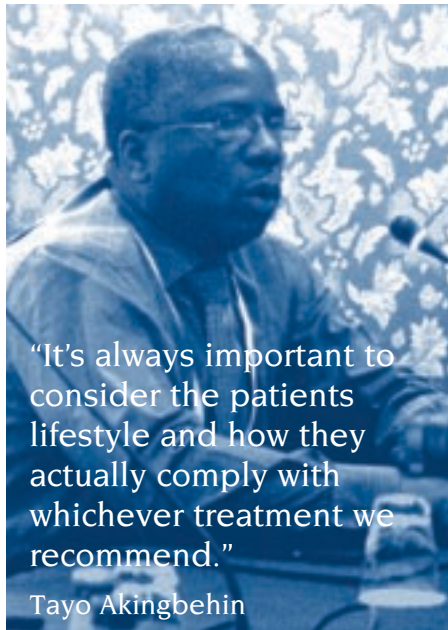
Peckar: A couple of years ago I actually started going straight into treatment with these SmartPlug implants that are 99% reversible. When you inject these implants, they sit in the ampulla in the lower canaliculus and, unlike the traditional punctal plugs, there is no risk of corneal abrasion from the plug and they increase the amount of available tears. We get 70% of patients off all drops using this strategy.

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Clive Peckar

Rosen: What about products like sodium hyaluronate? Have you ever used that?

Peckar: Absolutely, where I do use drops I use one of the two strengths of sodium hyaluronate as produced by Vismed either the 0.18% or recently the 0.3% and the patients think it's wonderful. The big problem with this drop is that it has been



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registered as a device because of its use in intraocular surgery. As a result it cannot be prescribed by general practitioners or made available for local pharmacies. The only way we can provide it is through the hospital pharmacy, which is a big burden. For five years we’ve been waiting to get through the bureaucratic tangle of getting this registered as a pharmaceutical treatment because it is preservative-free and well tolerated.

Akingbehin: I would add that it’s always important to consider the patients lifestyle and how they actually comply with whichever treatment we recommend. For example, if we are going to use drops, hourly use is almost impracticable for quite a lot of patients. Moreover, some of the drops do actually blur your vision and you have got to balance the discomfort against the effect it has on your acuity as it can also affect patient compliance.

Rosen: Do any of you use autologous serum?

Epstein: I think the autologous serum techniques developed such a bad name in the past because they were not assessed in controlled studies, which makes it very difficult to think of them as the magic solution.

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Rosen: I think the practicalities are that it is difficult to use, difficult to produce and therefore it tends to be used for the very special patient. Can we move on to cyclosporine and Restasis, which is very popular in the US where it is prescribed to many post-LASIK patients.

Epstein: The patients I have on cyclosporine are American patients who have come to me for second opinion. We have not had it available on the European market yet. These are cases of extreme dry eye after LASIK, people who already had dry eye before LASIK. They have tried everything else and it is the only thing that works for them. Some of these patients now live in Europe and have to go back to the States to purchase it.

Rosen: It is not available in the UK and almost impossible to get so our experience is very limited, do you think it works?

Epstein: If a patient subjectively feels better and has tried everything else and only this helps, then I think that is not an insubstantial argument for using it. However, until they introduce it in Europe there will not be much experience with it on this side of the Atlantic.

Rosen: What about other new products like Systane produced by Alcon. Clive, have you had any experience with that?

“I think that in the majority of cases controlling loss of tears down the lachrymal drainage systems certainly helps, but for some patients you are still going to have to use some sort of lubricant eyedrop.”

Clive Peckar

Peckar: No, I have been waiting for samples to arrive. They promised to send them last May and I said I would do an evaluation and I am still waiting.

Rosen: And Dan, you have just recently started using it in your patients?

Epstein: I’ve just started. Alcon has decided not to register it as a medical treatment in Switzerland so it is going to be an over-the-counter product. It is perceived by patients as rather expensive at €12 a 10 mg bottle. But the Swiss government is considering removing all medications under €13 from the official list so that everybody may eventually have to pay for similar drugs out of their pocket anyway.

Rosen: Last question – what do you think would be the ideal treatment for dry eyes and do you think we are ever likely to achieve it?

Peckar: I think that in the majority of cases controlling loss of tears down the lachrymal drainage systems certainly helps, but for some patients you are still going

to have to use some sort of lubricant eyedrop. There is a huge amount of research going on trying to find the ideal tear substitute and this work is going to continue. One company had a very innovative idea. Rather than giving a small single dose they produced a multiple dose container with a one way pump system and silver electrodes and silver antibacterial components so they could use a preservative free drop arrangement.

Epstein: Hyaluronic acid is being sold in that form. In Germany and in Switzerland it is called Hylo-COMOD.

Peckar: We had it as HyloPrompt, but the product was withdrawn. Patients loved it because they could carry this pump container around and it was preservative free. The sodium hyaluronate we currently use comes in single-dose containers. And although the new version has a sort of semi-resealable cap, they can still get only two or three drops out of it. This is a major problem.

Akingbehin: I think for such a very common disease that needs treating most of the time and with very good success rate in its management it would be nice to get the industry to look at affordable canalicular implants and preservative-free drops used in combination.

Peckar: We worked out what the use of thermodynamic canalicular implants could save the health service in the United Kingdom. Working on the percentage of patients not requiring regular drops for a year after implantation, we calculated that there would be a saving nationally to the country of about £6 million a year. However, that would require a transfer of funds in the health service from the drug budget and there has just been no will to do this because it is not a priority.

Rosen: Dan, I am going to give the last word to you.

Epstein: As long as we are not sure what the common dry eye condition as defined by the patient is caused by, we really don’t know what to do therapy-wise. If Systane, for example, does prove to stay longer on the eye because it has a lipid layer on top which prevents evaporation, maybe that’s it. But I feel uncomfortable about the uncertainties with respect to the pathogenesis of the largest group, the contact lens wearers with dry eye, the young women with dry eye and the pre LASIK with dry eye. All of these dry eyes that are not genuine dry eyes but still have symptoms of dry eyes.

Akingbehin: Before you round up this discussion I just wonder whether it is appropriate to get an opinion from the panellists here, if we say dry eye is very common and it invariably follows lasik procedure, at what stage is it legitimate to start recording this as an adverse event following lasik?



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Dan Epstein

Rosen: I am not sure that you can achieve a definition. Maybe it should be symptoms of dry eyes lasting more than six months but the symptoms are very subjective and may be determined by other factors not just the physical state of the eye.

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Epstein: Yes, I agree. Very often you have a patient who has had dry eye complaints for longer than six months but simultaneously presents with other problems such as suboptimal refractive result, uncorrected cylinder or night driving symptoms. Are the dry eyes a surrogate for the other unresolved issues? It may be that this is a way of expressing dissatisfaction and that makes it even more difficult to define what it is all about.

Rosen: I would like to finish by thanking you all for your participation.