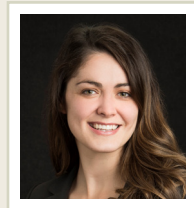


Contact Lens Update

CLINICAL INSIGHTS BASED IN CURRENT RESEARCH

Case Study: Utilizing Meibography to Address Contact Lens Intolerance

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Andrea Lasby, OD, FAAO, FSLs graduated with a Doctor of Optometry at the University of Waterloo in 2013. She completed a Cornea and Contact Lens Residency at Northeastern State University, Oklahoma College of Optometry, in 2014. Dr. Lasby currently practices in Calgary as a partner at Mission Eye Care, is a Fellow of the American Academy of Optometry and the Scleral Lens Society and currently serves as president-elect of the Alberta Association of Optometrists.

Dr. Gina Sorbara was a staple of the contact lens program at the University of Waterloo and was internationally recognized for her vast contributions to the field of contact lens research. For countless students that passed through the doors of UW, she was a fearless mentor – her enthusiasm and passion for contact lenses was infectious. Surely, the majority of Canadian Optometrists owe their contact lens knowledge, in part, to Dr. Sorbara.

I am honoured to dedicate this case study to Dr. Sorbara. Thank you for your encouragement, and for showing your students the impact Canadian Optometrists can have on the world of Optometry.

Background

Contact lens (CL) discomfort is a relatively common complaint in primary practice. Parallels exist between meibomian gland dysfunction (MGD) and CL wear in that they both result in disruption of the lipid layer of the tear film.¹⁻⁵ The association between MGD and CL intolerance has been hypothesised for 40 years, with that early publication reporting more frequent obstruction of the meibomian gland (MG) orifices in CL intolerant patients compared to asymptomatic lens wearers.⁶ Although evidence regarding the association of CL wear with MG structural changes is mixed,⁷⁻¹³ there is certainly emerging evidence that improving lid margin health can positively impact CL comfort in symptomatic wearers.¹⁴⁻¹⁷

Clinically, when complaints of CL intolerance occur, practitioners often find success in refitting with an alternate material or a change of modality, for example, from a monthly to daily disposable. Although this often improves symptoms, it does not address what may be the cause of the CL intolerance in the first place. This case highlights the importance of monitoring the health of the MG from the onset of CL wear, even in young patients.

History

A 28-year-old female presented to our clinic for the first time for her annual eye examination with complaints of significant dryness with CL wear. She reported irritated, red, sore eyes that were worse in the morning and evening. Her symptoms were more significant while working in a medical setting which required wearing a mask and goggles. She was a full-time wearer of the daily disposable delefilcon A (DALIES TOTAL1®, Alcon), and reported adherence with disposing lenses daily and never sleeping in her CL. She mentioned she had worn the current lens type for roughly 3 years, but had a prior history of 'overwearing' monthly lenses (unknown brand), and was prescribed her current CL after trialling several daily disposable options. She described how she had to switch out the CL multiple times per day due to dryness just to get through the day. She reported using Refresh® (Allergan) artificial tears PRN OU while wearing her CL. She was otherwise healthy and took a birth control pill daily.

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Baseline acuities with spectacles were 20/20 OD, OS and 0.40M at near OD, OS. Extraocular muscles were unrestricted in all gazes and binocular vision testing was WNL OU. Intraocular pressures were 17mmHg OD and 18mmHg OS at 11:18am. Manifest Refraction was OD: -3.75-0.50×160 20/20 and OS: -4.00-0.50×017 20/20, which was very similar to the patient's habitual spectacles.

The slit lamp examination showed bilateral trace lid margin telangiectasia, trace lid wiper epitheliopathy, and MG expression revealed the glands were inspissated OU. There was grade 1 nasal and temporal bulbar conjunctiva injection OU (Efron grading scale), and the cornea appeared clear OU. The anterior chamber was deep and quiet OU. Both crystalline lenses were clear. The posterior segment was unremarkable OU.

Given the patient was new to the practice, the following CLs were trialed to confirm the fit and prescription:

DALIES TOTAL1® 8.50/14.10 OD: -3.75 VA 20/20 over-refraction = plano

DALIES TOTAL1® 8.50/14.10 OS -4.00 VA 20/20 over-refraction = plano

Fit: Good centration OU, Movement on blink = 0.50mm OU, Centration: centered OU

The patient was diagnosed with compound myopic astigmatism, and evaporative dry eye disease (secondary to ocular rosacea and MGD) was suspected. The spectacle prescription and CL prescription was updated. The CL initially offered excellent comfort/fit and vision in-office. However, due to her chief complaint of dryness, she was instructed to decrease her wearing time as much as possible before returning to our clinic in 2 weeks for a full dry eye work-up. She was instructed not to use CL or any artificial tears on the day of her appointment.

The Dry Eye Workup

Symptoms	OSDI	58
Homeostasis markers	Osmolarity	OD 321 mOsm/L; OS 325 mOsm/L
	Non-invasive tear break up time	OD 4.9 sec; OS 6.9 sec
	Fluorescein tearbreak up time	OD 2.0 sec; OS 3.0 sec
	Ocular surface staining (Efron)	OU Grade 2 bulbar staining OU Grade 1.5 inferior superficial punctate keratitis (SPK) OU trace lid wiper epitheliopathy
Subtype classification	Phenol red thread test	OD 4mm; OS 5mm
	Meibomian gland diagnostic expression	OU opaque and inspissated MG expression, trace telangiectasia
Additional Observations	Bulbar conjunctiva	OU grade 1 diffuse nasal + temporal injection
	Meibography (Pult Scale¹⁸)	OU Grade 2 recession & distortion lower lid and upper lid (Figure 1)

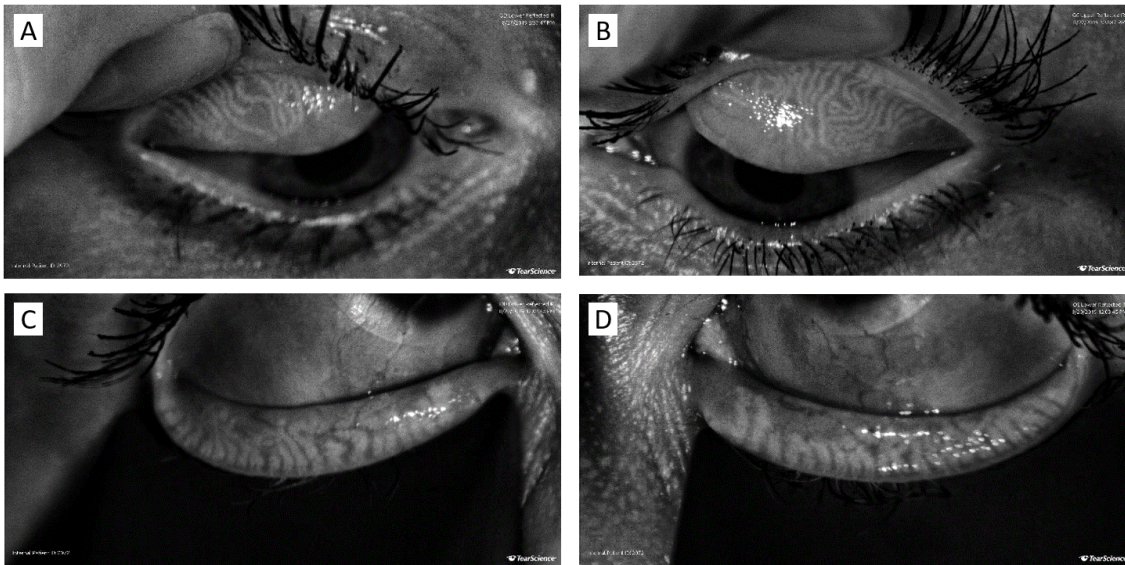


Figure 1: Meibography (A: OD upper; B: OS upper; C: OD lower; D: OS lower) illustrating grade 2 recession and distortion of the meibomian glands (Pult scale)

Assessment

The diagnosis of evaporative dry eye disease and mild ocular rosacea was confirmed.

Plan

The patient was instructed to start 250mg Azithromycin QID PO x 10d with loading dose of 500mg on day one as well as 1gt loteprednol 0.5% QID OU x 2 weeks, tapering to BID OU x 2 weeks then discontinue. She was also advised to start 1gt Biodrop MD QID OU, a lid hygiene routine comprising of a Bruder mask (Bruder Healthcare, US), lid massage, and lid scrub all BID OU, along with 2000mg Omega-3 QD PO. Intense pulsed light (IPL) and radiofrequency (RF) therapies were discussed with the patient, and after that discussion the patient decided to go forward with scheduling four sessions of radiofrequency, spaced 3 weeks apart each.

Follow-Up

The patient returned two weeks later for her first RF treatment (Geneo by Pollogen, Lumenis, Israel) and returned for three more treatments during the following 9 weeks. At each visit, MG were expressed manually following RF, and expressions improved from being non-expressible or paste-like consistency to clear/slightly milky OU. Reported symptoms started to improve after each treatment. The previous management recommendations were reviewed at each visit to ensure she was still adherent.

The last follow-up was scheduled one month after the fourth RF treatment. The patient reported she was now comfortable all day long until midnight, and asymptomatic on non-working days. Patient felt asymptomatic OS, and OD was only mildly symptomatic. Her OSDI improved to normal levels, with an OSDI of 8. She also reported discontinuing her birth control pill two weeks prior at her naturopath's recommendation for a previously unreported stomach issue. MG expression improved to all clear OD except for 4 MG which were still slightly turbid and clear OS. Fluorescein break-up time improved to 5sec OU. There was no bulbar conjunctival or corneal staining OU.

She was advised to return to our clinic in six months for her next follow-up, or sooner should she feel her

symptoms return. The following indefinite management was recommended: continue using 1gt Biodrop MD QID OU, lid hygiene BID OU and 2000mg Omega-3 QD PO. Throughout treatment, and now in long-term management, the patient has been able to continue full-time use of her daily disposable CL. The patient was advised of the chronic, long-term nature of dry eye, and was educated about future treatment options (topical cyclosporine, IPL, scleral lenses, etc.) should her symptoms progress.

Discussion

Meibography is becoming more prevalent in primary eye care. However, some practitioners may struggle to determine a protocol of which patients should be screened, and how often they should be monitored for changes to MG morphology, especially when the patient is asymptomatic.

Studies associating MG atrophy and CL use are mixed, and there is certainly a need for more longitudinal studies like Llorens-Quintana et al to determine the extent of any association between CL use and MG atrophy.¹³ Until this data is available, the clinician must use their own professional judgement to determine how often to monitor for changes in MG structure and function in their patients that wear CL.

This case study offers an example of how useful dry eye diagnostics – especially those that monitor MG structure and function – are in determining the etiology of CL intolerance. Meibography is important not only at baseline when initiating CL wear, but throughout the duration of CL wear. At the first sign of early MGD, the astute clinician should consider treating *prior* to the onset of symptoms, thus avoiding CL dropout and preventing a chronic, severe disease state. The patient highlighted in our case had been suffering from dry eye symptoms for quite some time before presenting to our clinic. Previous practitioners had already changed her to daily disposable contact lenses, yet her symptoms remained. By treating the MGD causing her dry eye symptoms, we were able to improve her OSDI score to a normal level without having to discontinue contact lens wear.

Clinical Pearl

The structure and function of MG in prospective CL wearers should be evaluated prior to prescribing CL, even for young patients with no symptoms of DED. The MG should be routinely evaluated throughout CL use so patients can be better informed about the potential implications should MG changes become apparent (with either age or CL wear). When investigating complaints of CL intolerance, a complete dry eye workup is recommended to ensure the healthy functioning of the MG, before attributing symptoms to issues with the contact lens material, wettability, edge design or solution.

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