LEARNING METHOD AND MEDIUM
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CONTENT SOURCE
This continuing medical education (CME) activity captures content from a roundtable discussion held August 2013.

ACTIVITY DESCRIPTION
Eye care providers face multiple challenges in diagnosing allergic conjunctivitis (AC) and achieving patient satisfaction with treatment. Studies show that AC is often undiagnosed and often not optimally managed. Recently, a group of experts convened to discuss their insights and approaches for managing patients with AC. This CME activity brings you highlights from these case discussions in a 4-part series.

TARGET AUDIENCE
This educational activity is intended for ophthalmologists.

LEARNING OBJECTIVES
Upon completion of this activity, ophthalmologists will be better able to:
• Choose appropriate medications based on disease severity to effectively control the early-phase and late-phase responses of ocular allergy
• Choose appropriate medications to provide effective maintenance control of ocular allergy
• Counsel patients on preemptive strategies and the role of pharmacologic and nonpharmacologic interventions for allergy control
• Collaborate with colleagues in other specialty areas to optimize the management of the patient with ocular allergy

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**CASE 4**

**Introduction**

Allergic conjunctivitis is a common cause of contact lens intolerance and may coexist with other ocular surface conditions affecting comfortable contact lens wear.

This roundtable discussion focuses on a patient who fits this clinical scenario. She is a woman with keratoconus wearing rigid gas permeable (RGP) contact lenses who has allergic conjunctivitis, dry eye disease, and giant papillary conjunctivitis (GPC) with secondary ptosis. Her case brings forth the importance of careful evaluation to arrive at an accurate and complete diagnosis and comprehensive management of her multiple comorbidities, including the role of referral to an allergist and to an oculoplastic surgeon.

**Case presentation**

A 35-year-old African American woman presents on referral after developing intolerance to her RGP contact lenses. She was fitted with RGP lenses because of keratoconus and has reported recent development of late-afternoon discomfort, including itching, epiphora, and ocular redness. She works in a hospital as a nurse supervisor and states she cannot function with eyeglasses. Her ocular history includes an episode of extended-wear toric soft contact lens-related *Pseudomonas aeruginosa* keratitis, so she is concerned about developing another corneal infection with the use of a piggyback soft or hybrid contact lens system. Current medications include oral loratadine, topical ketotifen, and topical olopatadine, 0.1%, all prescribed for treatment of allergy, along with oral hydrochlorothiazide for hypertension.

Ocular examination reveals hard, flat elevations in a cobblestone pattern on the undersurface of her upper eyelid (Figure 1). Topography shows inferior steepening with steep keratometry readings of 55.00 x 60.00 D OD and 48.00 x 55.00 D OS. She has mild central corneal scarring OU, a 2-mm peripheral corneal scar OD from the *P aeruginosa* keratitis, osmolarity readings of 320 mOsm/L OD and 309 mOsm/L OS, Schirmer scores of 6/10 OU, and central pachymetry measurements of 400 microns OD, 450 microns OS.

**Figure 1.** Evverted superior tarsus revealing cobblestones, hyperemia, and absence of normal conjunctival vascular architecture classic for giant papillary conjunctivitis.

Photo Courtesy of John Sheppard, MD, MMSc

**Dr Sheppard:** Dr Parekh, what is your diagnosis?

**Dr Parekh:** Patients presenting with contact lens intolerance and irritated eyes are common in the eye care provider’s office, and there is a broad differential diagnosis to consider for individuals with these findings. A thorough history and examination, including eversion of the eyelids and assessment of the inferior fornices, is needed to accurately determine the underlying cause or causes. This patient is known to have allergic conjunctivitis. She also has evidence of dry eye disease, and both of these ocular surface issues can be contributing to her contact lens intolerance. However, the appearance of the upper tarsal conjunctiva is the key to diagnosing GPC.

**Dr Sheppard:** What would be your plan for managing this patient?

**Dr Parekh:** My immediate goal would be to control the GPC-related inflammation and make the patient more comfortable. Knowing that GPC is an immune-mediated condition in which chronic mechanical irritation from a foreign body in the eye induces inflammation, I would be firm in warning this patient that she must abstain from wearing her contact lenses while she is being treated to control the inflammation and rehabilitate the ocular surface. In fact, I would insist on getting her verbal agreement that she will follow my instructions and tell her that I cannot continue to see her if she does not comply.

The significant inflammation accompanying her GPC necessitates treatment with a topical corticosteroid, and this patient will likely require more than just a short burst of steroid treatment to control her inflammation. Thus, the safety profile of the selected drug will be very important. Both loteprednol etabonate, 0.5%, and fluorometholone have been reported effective for treating GPC, and both agents have less potential for causing steroid-induced side effects than other potent steroids.1-6

The studies of loteprednol for GPC used the suspension, which was the only 0.5% formulation available at the time the studies were conducted. For this patient, however, I would choose the newer gel formulation of loteprednol because, in my opinion, it is particularly well-suited for eyes with ocular surface problems. Compared with the suspension, the gel has a lower preservative content, a more physiological pH, and added demulcents (glycerine and propylene glycol).

**Dr Sheppard:** In light of her elevated tear osmolarity and dry eye, would you change any of her other medications?

**Dr Parekh:** Her dry eye is likely being exacerbated by her oral medications, loratadine and hydrochlorothiazide,7,8 and I would consult with the physicians prescribing those medications about finding appropriate substitutions. Topical ketotifen and olopatadine are good treatments for allergic conjunctivitis. However, in this patient who has problems with dry eye, alcaftadine or bepotastine might be better options for a dual-acting antihistamine/mast cell stabilizer because they are reported to have higher H1 antihistamine potency and less antimuscarinic activity, which should reduce their propensity to cause ocular surface drying.9
Dr Sheppard: Epinastine is another ophthalmic antihistamine/mast cell stabilizer with low activity at the muscarinic receptors. Unfortunately, epinastine is now available only as a generic medication, and I find that while generic products contain the same active ingredient as the original branded formulation, they tend to cause more discomfort because of differences in the vehicle.

Dr Parekh: Because of her central corneal thickness measurements, this patient is a borderline candidate for cornea collagen crosslinking (CXL), but the possibility of performing that procedure to stabilize her keratoconus is something that would be considered only in the future.

Dr Sheppard: The concept of delaying CXL is an important one because ocular surface disease increases the risk for complications with CXL, particularly when performed with an epithelium-off technique.

Dr Blaiss, recognizing that GPC is a localized phenomenon that tends to develop in an environmentally challenged individual, is there any justification for doing allergy testing to determine if this patient could benefit from immunotherapy?

Dr Blaiss: GPC is not an IgE-mediated condition and so is not an indication for immunotherapy. That said, I think this patient deserves testing to determine if she might be treated with immunotherapy for her allergic rhinoconjunctivitis.

As Dr Parekh noted, I think it is also important that she discontinue loratadine because it definitely can cause ocular dryness. In addition, the ophthalmologist should consult with the physician who prescribed hydrochlorothiazide to see if this patient can be switched to a nondiuretic antihypertensive medication.

I agree with Dr Parekh that it is preferable to use a dual-acting antihistamine/mast cell stabilizer that has low antimuscarinic activity to treat her ocular allergy. Also, there may be some added benefit to using an intranasal corticosteroid as these agents have been shown to also improve ocular symptoms associated with allergic rhinitis.

Dr Sheppard: Oral montelukast is another option for treating allergic rhinitis that does not exacerbate dry eye. In my experience, most patients with dry eye who are taking oral antihistamines can reduce or eliminate the oral antihistamine when started on montelukast.

Dr Parekh, if our patient is compliant with her medications and abstains from contact lens wear, how long do you estimate it would take to resolve her GPC?

Dr Parekh: On the basis of my experience treating patients such as this, it generally takes a few months. Patients may start feeling better within a couple of weeks, but it takes longer for the giant papillae and ptosis to resolve. Just as it took time for those changes to develop, it will take some time for them to improve.

I believe there is not an immediate role for using loteprednol etabonate, 0.2%, to treat the acute inflammation in this patient, given its severity. However, I might consider switching to that product after several weeks or a couple of months of using loteprednol, 0.5%, in a tapering fashion. The patient also should be using a good artificial tear substitute and perhaps have punctal plug placement to help rehabilitate the ocular surface, especially considering the likelihood that the air is very dry in the hospital where she is working.

I know some clinicians consider switching to a different contact lens material or care system in patients who develop GPC. I am convinced, however, that the presence of the lens as a foreign body on the surface of the eye is the cause of the problem, perpetuating it, and must therefore be eliminated.

Dr Sheppard: Reducing accumulation of deposits on the lens surface may help to minimize the risk for GPC, and switching to daily disposable lenses may be considered if there is a product meeting the patient's optical needs. There are also newer contact lenses designed specifically to provide comfort and good visual function in this challenging population of patients with keratoconus. These are hybrid contact lenses (ClearKone), and flexible soft contact lenses (Kerasoft IC and NovaKone).

Yet in this situation, in which the physical presence of any foreign object on the eye is best avoided, any relative differences between lens materials and solutions are a moot point. Nevertheless, in a desperate situation such as this case in which the patient can not function at all with eyeglasses, perhaps she might be allowed to continue wearing her contact lens in 1 eye while the fellow eye is being treated.

Is there any role for injecting corticosteroid into the eyelid to control the inflammation?

Dr Joly: My answer is no. GPC is really a conjunctivitis, not a tarsitis, and it is not possible to deliver a depot of corticosteroid at the desired location. Because the conjunctiva is firmly adherent to the tarsus, the tissue is not distensible and so cannot accept the volume of an injection (Figure 2). The depot can easily be placed anterior or superior to the tarsus, but that will not target the GPC.

![Figure 2. Upper eyelid cross-section showing potential injection sites. Depot preparations can be deposited in the pretarsal space or in the post-septal, supratarsal space, but not in the post-tarsal, subconjunctival space.](image-url)
Dr Sheppard: What other concerns do you have when examining her lids?

Dr Joly: This patient has ptosis that is probably secondary to the development of a thickened, heavy lid. It is likely that she may also have dehiscence of the levator muscle caused by long-term stretching of the lid. I do not believe that it is absolutely necessary to wait for resolution of her GPC before undertaking surgical repair of the ptosis, but it is important to proceed carefully and conservatively, so as not to exacerbate the inflammation. Therefore, I would choose a surgical procedure that uses an anterior approach, such as external levator advancement, as opposed to a posterior approach, such as Müller muscle-conjunctival resection.

Her keratoconus is another reason to be conservative with the ptosis surgery, considering the possibility that she may progress to requiring a CXL or corneal transplant procedure in the future. Exposure keratopathy increases the risk for delayed reepithelialization as well as corneal transplant failure, and any ptosis correction will, by definition, increase the exposure of the cornea. Therefore, the goal of ptosis surgery should be to allow the upper lid margin clear to the limbus.

Dr Sheppard: Are there any other significant cicatricial sequelae that can arise in patients with chronic inflammation of the palpebral conjunctiva?

Dr Joly: Patients with chronic subtarsal inflammation can form calcium concretions within the palpebral conjunctiva that are often overlooked on casual examination because ophthalmologists do not think to flip the eyelid or to check the fornix for the calculi. These calculi develop as a result of inflammation, and once they are present, they can exacerbate ocular surface inflammation via a mechanical effect by rubbing on the cornea or bulbar conjunctiva. I like to remove the calcium crystals in order to eliminate their role as an irritant stimulus.

Removal of the calcium crystals can be done at the slit-lamp with a needle pick technique or using a jeweler’s forceps to grasp the crystals. I take off only the calculi that are on the surface and do not dig deeper into the tissue nor use cautery, trichloroacetic acid, or laser techniques because any of those manipulations will induce more inflammation that could lead to scarring.

Dr Sheppard: In summary, this is a challenging patient with advanced keratoconus who is dependent on RGP contact lenses for visual correction, but has developed GPC and has other ocular surface issues. Immediate management should focus on resolving the GPC by eliminating the inciting factor and treating with a potent anti-inflammatory medication. Looking ahead, this patient should be followed for progression of her ectasia and may need to undergo surgical intervention for keratoconus. Whether she is deemed a candidate for CXL, placement of intracorneal ring segments, or keratoplasty, control of inflammation and rehabilitation of her ocular surface must be achieved before she would be an acceptable candidate for any of those surgical procedures.

References


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