Giant papillary conjunctivitis (GPC) is characterized by the presence of giant papillae on the superior tarsal conjunctiva that can be visualized upon eyelid eversion. Although the pathophysiology is not well understood, it is believed to be a result of an immunologic process that results from foreign bodies such as contact lenses, exposed sutures, ocular prosthetics, and filtering blebs. The etiology is likely multifactorial and involves immediate and delayed hypersensitivity reactions caused by chronic mechanical trauma to the superior tarsal conjunctiva. The most common cause of GPC is contact lens wear, also referred to as contact lens–induced papillary conjunctivitis. Multiple factors are involved in the development of GPC in contact lens wearers. These include the frequency of contact lens replacement, type of contact lens, wearing time, contact lens hygiene, lens size, and lens fit. Studies have shown that the risk of developing GPC is greater in patients wearing monthly replacement lenses as compared to those wearing more frequently replaced lenses. GPC is also more common in soft contact lens wearers than in rigid gas permeable (RGP) lens wearers, and the incidence is similar between silicone hydrogel and hydroxyethylmethacrylate (HEMA)-based hydrogel lenses. GPC can develop after months or years of successful and asymptomatic contact lens wear; soft contact lens wearers develop the condition sooner.
than RGP wearers. In addition to higher prevalence and shorter time of onset, soft contact lens wearers also experience more severe symptoms.

**SIGNS AND SYMPTOMS**

Patients with GPC will typically report ocular irritation, redness, itching, and mucus accumulation on the inner canthus upon awakening. Contact lens wearers may also complain of fluctuating vision and excessive lens movement, resulting in contact lens intolerance. On clinical examination, the superior tarsal conjunctiva may show inflammation and papules (Figure), usually larger than 0.3 mm. Signs and symptoms are typically bilateral, although unilateral cases have been reported.

It is important to note that, in the very early stages of GPC, symptoms may precede signs, and some patients may consider these symptoms to be normal contact lens discomfort. Therefore, practitioners should question patients at each visit to elicit details of symptoms that are consistent with GPC.

As GPC progresses, the superior tarsal conjunctiva undergoes gradual inflammatory changes, beginning with nonspecific signs that progress into the development of the large papules that give the condition its name. To evaluate patients with suspected GPC, it is best to have them remove their contact lenses and to examine the conjunctiva and cornea at the slit lamp biomicroscope.

Evaluate the anterior segment and note any bulbar conjunctival injection, corneal pannus, or corneal opacities before everting the lids. After everting the superior eyelids, evaluate the tarsal conjunctiva for hyperemia, abnormal vascular patterns, subconjunctival scarring, and papules. The use of fluorescein and a blue cobalt filter can significantly aid in visualization of the papillary reaction. Fluorescein in the tear film helps outline the papules, which allows the practitioner to better identify the pattern and size of the papules.

**DIFFERENTIAL DIAGNOSES**

Other types of papillary conjunctivitis can present similarly to GPC. When evaluating patients with suspected GPC, we should have vernal keratoconjunctivitis (VKC) and atopic keratoconjunctivitis (AKC) on the list of differential diagnoses.

VKC is a chronic allergic conjunctivitis that affects children and young adults between the ages of 6 and 18 years; it is more common in boys than girls. Patients with VKC may also experience other allergic disorders such as seasonal allergies and asthma. Signs and symptoms of VKC can vary with the season, spring and summer being the worst.

VKC has two forms, palpebral and limbal. In the palpebral form, findings include giant papillary hypertrophy of the superior tarsal conjunctiva. In the limbal form, limbal papillae with epithelial infiltrates consisting of eosinophils called Horner-Trantas dots are present. Superior punctate corneal lesions can be seen in both forms, and these can coalesce into sterile shield ulcers in the upper part of the cornea.

The presentation of AKC is similar to that of VKC, but it affects a different demographic. AKC typically appears in the late teens or early 20s, with peak incidence between the ages of 30 and 50 years. It occurs in up to 40% of patients with atopic dermatitis and is closely associated with a personal or family history of atopic disease such as asthma and eczema.

Patients may present with eczema of the eyelids along with other signs that are characteristic of atopic dermatitis, such as eyelid skin hyperpigmentation and infraorbital eyelid folds known as Dennie-Morgan lines. Findings on the superior tarsal conjunctiva for AKC are similar to those seen in VKC and GPC. However, the inferior palpebral conjunctiva is generally more affected in AKC, and this difference helps make it clinically distinguishable from VKC and GPC.

**AT A GLANCE**

- The most common cause of giant papillary conjunctivitis (GPC) is contact lens wear, with causative variables including frequency of lens replacement, lens type, wearing time, and lens hygiene.
- GPC is more common in soft contact lens wearers than rigid gas permeable lens wearers, and incidence is similar between silicone hydrogel and HEMA-based lenses.
- The first step in treatment should be discontinuation of lens wear for 2 to 4 weeks.
“GPC CAN DEVELOP AFTER MONTHS OR YEARS OF SUCCESSFUL AND ASYMPTOMATIC CONTACT LENS WEAR; SOFT CONTACT LENS WEARERS DEVELOP THE CONDITION SOONER THAN RGP WEARERS.”

**TREATMENT**

Removing the inciting agent is the best management approach to GPC. Because the vast majority of GPC is caused by contact lenses, the first step should be discontinuation of lens wear for 2 to 4 weeks. In treatment of GPC related to contact lens wear, the frequency of contact lens replacement is an important factor. Patients wearing 1-day or 2-week disposable lenses have significantly less risk of developing GPC than those wearing lenses that are replaced at monthly or longer intervals.

For patients who are at high risk for GPC, fitting with frequently replaced lenses may be a better strategy than incorporating enzymatic cleaning into their care systems. If refitting a patient to frequently replaced lenses is not an option due to cost, availability of parameters, or RGP wear, use of a rub-and-rinse cleaning technique is advisable. This technique is effective in reducing bacterial load and removing deposits on lenses, especially those with silicone hydrogel materials.

In addition to discontinuing contact lens wear, topical therapeutics may be prescribed for GPC. Topical mast-cell stabilizers such as cromolyn sodium 4.0% and lodoxamide tromethamine ophthalmic solution 1.0% (Alomide, Novartis) are effective against GPC and can be used during the period of lens discontinuation. Antihistamine/mast-cell stabilizer drops, such as olopatadine hydrochloride ophthalmic solution 0.7% (Pataday Once Daily Relief Extra Strength, Alcon), are also safe and effective and can bring symptomatic relief, especially for itching.

In severe GPC, topical steroids such as prednisolone acetate 1% (Pred Forte, Allergan), presnilone phosphate 1%, and dexamethasone 0.1% may be helpful. However, the risk of side effects with long-term steroid use must be discussed with the patient. Loteprednol etabonate ophthalmic suspension 0.5% (Lotemax, Bausch + Lomb) has been shown to be safe and effective in improving signs and symptoms when used four times per day for 6 weeks. Nonsteroidal antiinflammatory drugs are another treatment option that can be used as an adjunct to topical steroids or as an alternative therapy when steroids are contraindicated.

**GIANT STEPS**

The prognosis for GPC is excellent, once the offending agent is removed or changes in contact lens wear schedule and hygiene have been implemented. Note, however, that persistent noncompliance can lead to recurrences.

Eyelid eversion should be part of a routine eye exam for contact lens wearers, and practitioners should be proactive in identifying early signs and symptoms of GPC. Educating patients about the benefits of frequently replaced contact lenses and proper contact lens hygiene can prevent the condition from becoming more problematic and difficult to treat.

**REFERENCES**


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