

A Medical Approach to Forming a Complete Eyelid Crease

Topical prostaglandins may be a viable nonsurgical option for Asian patients who desire a double eyelid crease.

BY JULIA SONG, MD

About half of the Asian population has a natural eyelid crease, but in some instances, the crease is incomplete. Electron microscopy has shown that, in Asian individuals with a gradual double eyelid crease, bunched fibers of levator aponeurosis penetrate through orbicularis muscle to fuse with the skin in the palpebral sulcus.¹

Asian blepharoplasty, commonly termed “double eyelid surgery,” is a cosmetic surgical procedure that creates an upper eyelid with a crease in an eyelid that does not have one. Topical prostaglandins, however, may be a medical option for individuals who do not want to undergo surgery. Topical prostaglandin eye drops, which are used to treat glaucoma, have been found to cause periorbital fat atrophy and a deeper sulcus in both Asian²⁻⁴ and non-Asian eyelids.⁵⁻⁸ Based on the results of the following case report, topical

prostaglandins can assist in formation of a double eyelid crease in patients who have an incomplete eyelid crease.

CASE REPORT

A 39-year-old Asian woman presented complaining of an incomplete eyelid crease. She stated that she was born with both eyelid creases. As a child, however, her left upper eyelid would sometimes form a larger crease than her right eyelid, especially when she was fatigued. According to the patient, her eyelid crease had enlarged in both the right and left upper eyelids 3 years earlier. The left upper eyelid was always complete, she reported, but the right was not (Figure 1). She would frequently place tape on it to help it form, but that approach was not always successful.

The patient contemplated double eyelid surgery on



Figure 1. The patient with an unformed right upper eyelid crease.



Figure 2. The same patient, 1 week after beginning bimatoprost therapy. The right upper eyelid crease is larger and more formed.

her right upper eyelid to achieve a complete eyelid that would be symmetrical with her left upper eyelid. She was hesitant to undergo surgery, however, and after discussing the options, she opted to instill one drop of bimatoprost ophthalmic solution 0.01% (Lumigan; Allergan, Inc.) in her right eye for 1 month.

Results

One week after beginning medical therapy, there was a noticeable change in the patient's



Figure 3. In the same patient, the right upper eyelid crease is fully formed after 1 month of medical therapy.

right upper eyelid crease (Figure 2). The crease was larger and formed. Additionally, the lashes had darkened and thickened. By the end of the second week, her crease was more defined. The crease was symmetrical to that of the left upper eyelid by the end of the third week and fully formed by 1 month (Figure 3). The patient reported mild conjunctival injection in the right eye but did not have any other complaints.

DISCUSSION

The definitive treatment for forming a permanent eyelid crease in Asian eyes is a double eyelid surgery via a variety of methods, including incisional and suture methods. This case shows that, before surgical treatment, a topical prostaglandin may be used temporarily to test if the eyelid crease can form. Topical prostaglandins were discovered in 1997 to lower IOP in glaucomatous eyes through increased uveoscleral outflow.⁹⁻¹² Rare side effects such as burning, itching, iritis, cystoid macular edema, serous retinal detachment,¹³ and decreased corneal thickness have been documented.¹⁴ Cosmetic side effects include thickened eyelashes and periorbital hair growth,¹³⁻¹⁶ darkening of the iris¹⁷⁻²¹ and periorbital skin, and pigmented conjunctivae.²² Other side effects noted include periorbital fat atrophy and a deeper sulcus.²⁻⁸ Periorbital fat atrophy has been documented histologically (decreased density of adipocytes)² but was found to be reversible. Despite the belief of some surgeons that the prostaglandin analogues are toxic to fat cells, the effects of these drugs are not from toxicity but rather atrophy that is reversible.²³

As the patient aged, she developed mild periorbital fat atrophy and a deeper sulcus, which is not unexpected. This development resulted in a larger eyelid crease. One of her eyelids did not form a complete crease despite various over-the-counter treatments such as taping her eyelids. Perhaps the patient's right upper eyelid would have formed naturally without the aid of the prostaglandin, but she had waited 3 years for the eyelid to form permanently without success. The patient uses the medication intermittently, and thus

far, the effect has been maintained. She did not report any periorbital hyperpigmentation.

CONCLUSION

Topical prostaglandins can assist in the formation of a double eyelid crease in patients who have an incomplete eyelid, negating the need for surgical intervention in certain individuals. More studies are needed to determine if these medications can assist those who do not have a double eyelid. ■

Julia Song, MD, is in private practice with DrSongVision in Pasadena and Long Beach, California. She acknowledged no financial interest in the products or companies mentioned herein, but has a provisional patent on Lumigan (Allergan, Inc.) as an eyelid crease aid. Dr. Song may be reached at (626) 844-9393; jsongmd@drsongvision.com.



- Cheng J, Xu FZ. Anatomic microstructure of the upper eyelid in the Oriental double eyelid. *Plast Reconstr Surg.* 2001;107:1665-1668.
- Park J, Cho HK, Moon JI. Changes to upper eyelid orbital fat from use of topical bimatoprost, travoprost, and latanoprost. *Jpn J Ophthalmol.* 2011;55:22-27.
- Yang HK, Park KH, Kim TW, et al. Deepening of eyelid superior sulcus during topical travoprost treatment. *Jpn J Ophthalmol.* 2009;53:176-179.
- Jayaprakasam A, Ghazi-Nouri S. Periorbital fat atrophy—an unfamiliar side effect of prostaglandin analogues. *J Orbit.* 2010;29:357-359.
- Aydin S, Isikiliqil I, Teksen YA, et al. Recovery of orbital fat pad prolapse and deepening of the lid sulcus from topical bimatoprost therapy: 2 case reports and review of the literature. *Cutan Ocul Toxicol.* 2010;29:212-216.
- Tappeiner C, Perren B, Iliev ME, et al. Orbital fat atrophy in glaucoma patients treated with topical bimatoprost—can bimatoprost cause enophthalmos? *Klin Monbl Augenheilkd.* 2008;225:443-445.
- Peplinski LS, Albani SK. Deepening of lid sulcus from topical bimatoprost therapy. *Optom Vis Sci.* 2004;81:574-577.
- Filiopoulos T, Paula JS, Torun N, et al. Periorbital changes associated with topical bimatoprost. *Ophthalmol Plast Reconstr Surg.* 2008;24:302-307.
- Arranz-Marquez E, Teus MS. Prostanoids for the management of glaucoma. *Expert Opin Drug Saf.* 2008;7:801-808.
- Cracknell KP, Grierson I. Prostaglandin analogues in the anterior eye: their pressure lowering action and side effects. *Exp Eye Res.* 2009;88:786-791.
- Alm A, Grierson I, Shields MB. Side effects associated with prostaglandin analog therapy. *Surv Ophthalmol.* 2008;53:593-105.
- Goldberg I, Li XY, Selaru P, et al. A 5-year, randomized, open-label safety study of latanoprost and usual care in patients with open-angle glaucoma or ocular hypertension. *Eur J Ophthalmol.* 2008;18:408-416.
- Addison PK, Papadopoulos M, Nischal KK, et al. Serous retinal detachment induced by topical bimatoprost in a patient with Sturge-Weber syndrome. *Eye.* 2011;25:124-125.
- Zhong Y, Shen X, Yu J, et al. The comparison of the effects of latanoprost, travoprost, and bimatoprost on central corneal thickness. *J Cornea.* 2011;30:861-864.
- Ortiz-Perez S, Olver JM. Hypertrichosis of the upper cheek area associated with travoprost treatment of glaucoma. *Ophthalmol Plast Reconstr Surg.* 2010;26:376-377.
- Wester ST, Lee WW, Shi W. Eyelash growth from application of bimatoprost in gel suspension to the base of the eyelashes. *Ophthalmology.* 2010;117:1024-1031.
- Coronel-Pérez IM, Rodríguez-Rey EM, Camacho-Martínez. Latanoprost in the treatment of eyelash alopecia in alopecia areata universalis. *J Eur Acad Dermatol Venerol.* 2010;24:481-485.
- Lamminen H, Voipio V, Manninen T, et al. Effects of latanoprost in iris bioidentification. *Acta Ophthalmol.* 2009;87:529-531.
- Huang P, Zhong Z, Wu L, et al. Increased iridial pigmentation in Chinese eyes after use of travoprost 0.004%. *J Glaucoma.* 2009;18:153-156.
- Yildirim N, Sahin A, Kara S, et al. Latanoprost-induced changes in the iris and trabeculum: an electron-microscopic morphological study. *Int Ophthalmol.* 2010;30:93-97.
- Albert DM, Gangnon RE, Grossniklaus HE, et al. A study of histopathological features of latanoprost-treated irides with or without darkening compared with non-latanoprost-treated irides. *Arch Ophthalmol.* 2008;122:626-631.
- Cagigioriu A, Boero E, Carenini AB, et al. Do antiglaucomatous prostaglandins induce melanogenesis in human conjunctiva? An impression cytology pilot study. *J Glaucoma.* 2010;19:44-50.
- Seibold LK, Ammar DA, Kahook MY. Acute effects of glaucoma medications and benzalkonium chloride on pre-adipocyte proliferation and adipocyte cytotoxicity in vitro. *Curr Eye Res.* 2013;38(1):70-74.