



Floppy eyelid syndrome and ectropion improvement after 1 month of 0.03% Bimatoprost topical therapy

Alessandra De Gregorio^{a,*}, Emilio Pedrotti^b, Giulia Stevan^a, Andrea Scala^a,
Alessandro Lambiase^c, Simonetta Morselli^a

^a Ophthalmic Unit, San Bassiano Hospital, Bassano Del Grappa, Italy

^b Eye Clinic, Department of Neuroscience, Biomedicine and Movement, University of Verona, Italy

^c Department of Sense Organs, Faculty of Medicine and Odontology, Umberto I Policlinic, Sapienza University of Rome, Italy

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ABSTRACT

Purpose: To report the clinical improvement observed in a glaucomatous patient affected by floppy eyelid syndrome and ectropion after treatment with Bimatoprost 0.03%.

Methods: Retrospective observational case report of a single glaucomatous patient (caucasian, 82 years old) affected by floppy eyelid syndrome with marked eyelid laxity and ectropion after 1 month of once a day 0.03% Bimatoprost ocular drop administration.

Results: We observed a reduction of intraocular pressure (36% in the right eye and 37.5% in the left eye) and an unexpected improvement of eyelid laxity and inferior ectropion after 1 month of therapy with topical 0.03% Bimatoprost. Secondary outcomes were the improvement of the related ocular surface diseases and the decrease of the upper eyelid dermatochalasis. No side effect in terms of conjunctival inflammation and eyelashes growth was observed.

Conclusions and Importance: The first observational clinical case of a possible prostaglandin therapeutic effect on periocular tissue improving the laxity and malposition of the eyelids in a patient with floppy eyelid syndrome associated with inferior eyelid ectropion.

1. Introduction

Floppy Eyelid Syndrome (FES) is an eyelid disorder first described in 1981 by Culbertson and Ostler¹ characterized by floppy upper eyelid and papillary change of the upper tarsal palpebral conjunctiva, frequently with spontaneous eversion of the upper lid during sleep. Other FES classical features include eyelid/lash ptosis and lower lid ectropion or entropion due to laxity of the tarsal ligamentous sling.²

FES is frequently associated with Obstructive Sleep Apnea Syndrome (OSAS). About 50% of patients with OSAS had a diagnosis of eyelid hyperlaxity or FES.³

Currently FES is treated with topical medication for related ocular surface diseases or with a surgical approach to correct lid laxity.

Prostaglandin F_{2α} (PGF_{2α}) analogues, such as Bimatoprost, are used in patients with glaucoma to reduce intraocular pressure (IOP).⁴ Recent studies have shown that PGF_{2α} analogues (Bimatoprost most frequently than other PGF_{2α} analogues) can cause prostaglandin-associated periorbitopathy (PAP) such as enophthalmos, periorbital fat atrophy, eyelid

retraction and deepening of the upper-eyelid sulcus.^{5,6}

To the best of our knowledge, clinical improvement of FES after 0.03% Bimatoprost topical ocular therapy has not yet been reported.

2. Methods

This is a retrospective observational case report of a caucasian 82 year old man referred to our center for a first diagnosis of glaucoma and clinical signs of FES. Six months before the patient underwent polysomnography performed with a portable device (Embletta-PSD Somnologica, Sapio Life, Reykjavik, Iceland) and the diagnosis of a mild OSAS was confirmed (Apnoea/Hypopnoea Index: 13).

We performed a complete ocular examination including: best-corrected distance visual acuity (BCDVA); slit lamp biomicroscopy of the anterior and posterior segment; Goldmann applanation tonometry, optical coherence tomography (OCT) analysis (anterior segment, macular and optic nerve), gonioscopy, corneal pachymetry, visual field.

An eyelid examination was performed by evaluating horizontal and

* Corresponding author. San Bassiano Hospital, Via dei Lotti 40, Bassano del Grappa, 36061, Vicenza, Italy.

E-mail address: adegre3@gmail.com (A. De Gregorio).

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Table 1
Patient clinical data before and after 1 month of 0.03% Bimatoprost topical therapy.

Clinical Values	Eye	Baseline	After 1 month of 0,03% Bimatoprost topical therapy
Best corrected visual acuity, Snellen equivalent	Right	20/25	20/25
	Left	20/25	20/25
Intraocular Pressure, mmHg	Right	25	16
	Left	24	15
Pachymetry, micron	Right	504	504
	Left	515	515
Upper eyelid vertical distraction, millimeters	Right	12	3
	Left	10	5
Inferior eyelid vertical distraction, millimeters	Right	15	6
	Left	14	5
Ectropion severity	Right	+++	-
	Left	++	+/-
Tarsal papillary conjunctivitis grading	Right	+++	+/-
	Left	++	+/-
Upper eyelid eversion grading	Right	Easy	Difficult
	Left	Easy	Difficult
Dermatochalasis grading	Right	+++	++
	Left	+++	++

vertical distraction from the ocular globe of the upper and lower eyelids, and the easy eversion sign of upper eyelid (easy distortion and eversion with minimal superolateral traction). A photo documentation with the patient written informed consent was taken before and after the treatment.⁷

Topical 0.03% Bimatoprost was prescribed once a day and a follow up was planned a month later. No concomitant topical treatments were recommended for the eyelid pathology in order to reduce the risk of poor compliance and mistakes with glaucoma therapy. Our primary goal was to reduce the IOP and subsequently to treat, either medically or surgically, the eyelid malposition.

3. Results

Table 1 and Figs. 1 and 2 show patient data and photo reports at baseline and after 1 month of topical therapy. After 1 month of 0.03% Bimatoprost topical therapy we observed a IOP reduction and an improvement of FES signs in term of eyelid laxity, ectropion and tarsal papillary conjunctivitis. A secondary outcome was the decrease of the upper eyelid dermatochalasis. No side effects such as ocular surface diseases or eyelashes growth were observed.

4. Discussion

Despite the pathogenesis of FES has not been fully understood, many theories have been postulated. Immunohistochemistry studies analyzing the histopathology of eyelids diagnosed with FES have demonstrated a decrease in the quantity of elastic fibers within the tarsal stroma, orbicularis muscle and eyelid skin probably induced by the activation of elastin-degrading enzymes such as matrix metalloproteinases (MMPs), particularly MMP-7 and MMP-9.⁸

Change in this enzymatic activity has been reported after topical



Fig. 1. Baseline photos of patient affected by floppy eyelid syndrome and inferior ectropion. Legend: Natural eyelid position and after upper eyelid vertical distraction.



Fig. 2. Title: Patient photos after 1 month of 0.03% Bimatoprost topical therapy.
Legend: Natural eyelid position and after upper eyelid vertical distraction.

PGF2 α administration in some periocular and orbital tissue. PGF2 α seems to modulate the equilibrium between MMP and tissue inhibitor of metalloproteinases (TIMP) levels. MMPs and TIMPs remodel the extracellular matrix by modifying the structure and activity of substrates that are key players in maintaining ocular and periorbital physiology.⁹ Many findings suggest that PAP induced by PGF2 α topical administration may be related to MMP/TIMP alterations in adipose and collagen tissue. This could be the leading cause for the fat atrophy responsible for the eyelid sulcus deepening, the dermatochalasis involution and the mild enophthalmos.

Moreover, a recent animal study demonstrated that prolonged daily usage of 0,03% Bimatoprost induces a decrease in the distractibility and thickness of the eyelid tissue, probably due to an inappropriate activation of myofibroblast with subsequent elastin deposition.¹⁰

5. Conclusion

Medical treatment of FES by lubrication and modulation of ocular surface inflammation is palliative. If medical management of FES fails, a surgical approach is indicated for both symptomatic relief and preservation of ocular surface integrity.

The potential side effects of Bimatoprost, in particular eyelid retraction/tightening, dermatochalasis involution and deepening of upper eyelid sulcus could be an advantage in patients affected by FES reducing distractibility and laxity of the eyelid.

The standard surgical procedure is aimed at eyelid tightening, in

order to reduce the easy eversion and laxity.

Recently, for its associated periorbitopathy, Bimatoprost has been proposed as a possible alternative to surgery in case of dermatochalasis, potentially achieving a “chemical blepharoplasty”.¹¹

Patients affected by FES may benefit from the side effects of 0.03% Bimatoprost on periocular tissue by resolving the laxity and the related eyelids malpositioning. Consequently a better eyelid position could improve the frequently associated ocular surface inflammation.

Although this is a preliminary report of further studies (currently in progress) with a longer follow-up and a larger sample size, this is the first evidence of the potentially beneficial role of Bimatoprost in case of FES as a “chemical eyelid tightening”.

Patient Consent

A written informed consent was taken for the photo documentation as a clinical routine. Consent to publish the case report was not obtained. This report does not contain any personal information that could lead to the identification of the patient.

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Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

Declaration of competing interest

No author has financial disclosures: (ADG, EP, GS, AS, AL, SM).

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