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Case Report

# Prostaglandin-Associated Periorbital Lipodystrophy in Cosmetic Eyelid Surgery: A Novel Cause of Facial Asymmetry

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## Abstract

A 70-year-old woman presented to our practice with profound ptosis of the left upper eyelid and notable asymmetry of the periocular area. On examination, she was noted to have significant atrophy of the periocular tissues on the left side, with lower eyelid retraction. These features were present but less severe on the right side. Upon further questioning, she stated that she had cataract surgery on the left side that was complicated by a high intraocular pressure and required subsequent secondary surgery. She had taken a prostaglandin eyedrop for many months after her cataract surgery to keep the eye pressure low. Recently, a newly recognized adverse effect of prostaglandin eyedrops has been described in the ophthalmic literature in which patients develop periorbital lipodystrophy. This case emphasizes that this may occur unilaterally in patients taking the eyedrop in only one eye, and should be recognized prior to considering functional and aesthetic surgery of the periocular area.

**Level of Evidence: 5**


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Evaluation of the cosmetic surgery patient requires careful attention to subtle differences in facial aging and, especially, taking note of facial asymmetry. This is especially true in eyelid surgery as patients often present with dermatochalasis or ptosis and desire a correction to establish a more symmetric shape to the palpebral fissure. Identifying facial asymmetry before surgery is of paramount importance in preoperative planning to address symmetry and to set realistic expectations with the patient.

Recently, there have been reports in the ophthalmology literature of periorbital hollowing, or lipodystrophy, with the increasing use of eyedrops to treat ocular hypertension or glaucoma that contain a prostaglandin analogue as the active ingredient.[1] These medications are known to cause hypertrichosis, hyperpigmentation, meibomian gland dysfunction, horizontal eyelid shortening, lid retraction, and lipodystrophy.[1-3] They have recently been used commercially to increase eyelash length (bimatoprost, Latisse, Allergan Inc., Irvine, CA). Recent reports have demonstrated severe atrophy of the periorbital fat has been noted to occur with the long-term use of these agents, although in some cases it may be reversible.[4,5] It is not known exactly why this occurs, but it may involve blockade of the PPARg pathway which is involved in adipogenesis.[6-8] While this fat atrophy is problematic in most patients, we have postulated that it may have potential use in conditions such as thyroid eye disease in the future.

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## CASE REPORT

A 70-year-old woman presented to our clinic in October 2014 with a droopy left upper eyelid and dry eyes. On examination, she was noted to have mild dermatochalasis but severe involutional ptosis of the left upper eyelid and also a dermatochalasis and ptosis of the right upper eyelid. She was also noted to have bilateral lower eyelid retraction and confluent staining of the cornea indicating dry eyes. Her past ocular history included cataract surgery on both sides, but on the left eye she had a complicated initial surgery in which the posterior capsule of the lens was violated, which required a second surgery in which she underwent anterior vitrectomy and anterior chamber intraocular lens placement. She reported that her intraocular pressure had been as high as 50 mm Hg after cataract surgery (normal range, 10 to 21 mm Hg) and that she required travoprost prostanglandin eyedrops postoperatively for over six months to lower the pressure. Prior to surgery, we noted significant periorbital lipodystrophy on the left side with a deep supratarsal sulcus and asymmetric effacement of the junction between the nasal sidewall and a deep tear trough causing a hollow appearance (Figure 1A).

The patient underwent upper eyelid levator advancement surgery to correct her ptosis and also lateral canthal tightening and midface elevation to address the lower eyelid retraction on both sides. At the time of surgery, the orbital septum was opened to address the upper eyelid fat pads and the left upper eyelid fat pad was noted intraoperatively to be significantly atrophied when compared to the right (Figure 1B). In order to improve symmetry, she underwent conservative fat removal and sculpting on the right side but no fat removal on the left side. She also underwent upper punctal occlusion to close her tear ducts, and elected to have transpalpebral removal of the corrugator and depressor superciliaris muscle to reduce the furrowing of her eyebrows. At two months postoperatively, she had improvement in the upper eyelid ptosis, an improved contour to the lower eyelid with an upward tilt at the lateral canthi, relief of her symptoms from dry eye, and improved symmetry (Figure 1C).

## DISCUSSION

Periorbital lipodystrophpy secondary to prostaglandin use has received increasing attention in the ophthalmology and ophthalmic plastic literature since it was first described in 2008.[1-3] The existing literature has focused on the changes that occur in the eyelids and periorbital tissues, and other authors have shown striking examples of unilateral disease that can give the appearance of severe facial asymmetry. To this point, the existing literature has focused on the clinical manifestations of this disease. We present a unique case in which we noted changes preoperatively but also intraoperatively demonstrated a difference in the amount of pre-aponeurotic fat. It is not possible to prove that this difference was directly caused by the prostaglandin analogue, but as is often the case in the field of facial plastic surgery, we relied on our observation of the asymmetry as well as the clinical history to infer that the changes may have been secondary to the medication-induced lipodystrophy. This finding has potential interest for all eyelid surgeons and is a notable finding in the context of the growing literature on this topic.

## CONCLUSION

Noting facial asymmetry is critical during the evaluation of the cosmetic eyelid surgery patient. As use of eyedrops containing prostaglandin analogues has increased in the general population, it is important for the facial plastic surgeon to be aware of the side effect of periorbital lipodystrophy in these patients. This is especially important if the patient is using the medication unilaterally, which can


**Figure 1.** (A) Preoperative photograph of a 70-year-old woman showing bilateral dermatochalasis but more prominent on the right side, severe left upper eyelid ptosis with a deep supratarsal sulcus, and asymmetric effacement of the junction between the nasal sidewall and a deep tear trough causing a hollow appearance; (B) intraoperatively, showing larger pre-aponeurotic fat on the right side as compared to the left; (C) at two months postoperatively, the patient had improvement in the upper eyelid ptosis, an improved contour to the lower eyelid with less scleral show, and improved symmetry.

affect the surgical planning and, if ignored, will lead to unsatisfactory outcomes after surgery.

## Disclosures

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