

# Topical Bimatoprost for the Treatment of Eyebrow Hypotrichosis

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## ABSTRACT

Topical bimatoprost was FDA approved in December of 2008 for the treatment of eyelash hypotrichosis. Since its approval, some physicians have advocated the use of bimatoprost "off label" for hair growth in other areas, such as the scalp or eyebrows, but there has yet to be published scientific evidence to support this use. We report one of the first cases of significant eyebrow hair growth in a patient after use of topical bimatoprost for eyebrow hypotrichosis.

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## CASE REPORT

A 47-year-old Caucasian female presented to our hair transplant clinic for evaluation of sparse eyebrows. She reported very thin eyebrow hair on her left eyebrow for many years. The process had been gradual but was cosmetically significant, and she was interested in initiating treatment.

Upon examination, the patient was found to have sparse hair on her left lateral eyebrow (Figure 1a). Her right eyebrow and left medial eyebrow were clinically normal. Both surgical options (follicular unit transplantation)<sup>1,2</sup> and medical treatment (topical bimatoprost) were discussed at length with the patient. The decision to initiate topical bimatoprost therapy was made, and the patient was instructed to apply the solution once daily for four months to her left eyebrow only.

At a follow-up visit four months later, the patient reported significant thickening of her left lateral eyebrow. She also reported that she had been using the solution approximately every other day. Physical examination revealed increase left eyebrow density, hair length, darker color, slight skin pigmentation, and eyelash treatment (Figure 1b). The patient was instructed to maintain use of topical bimatoprost every other day.

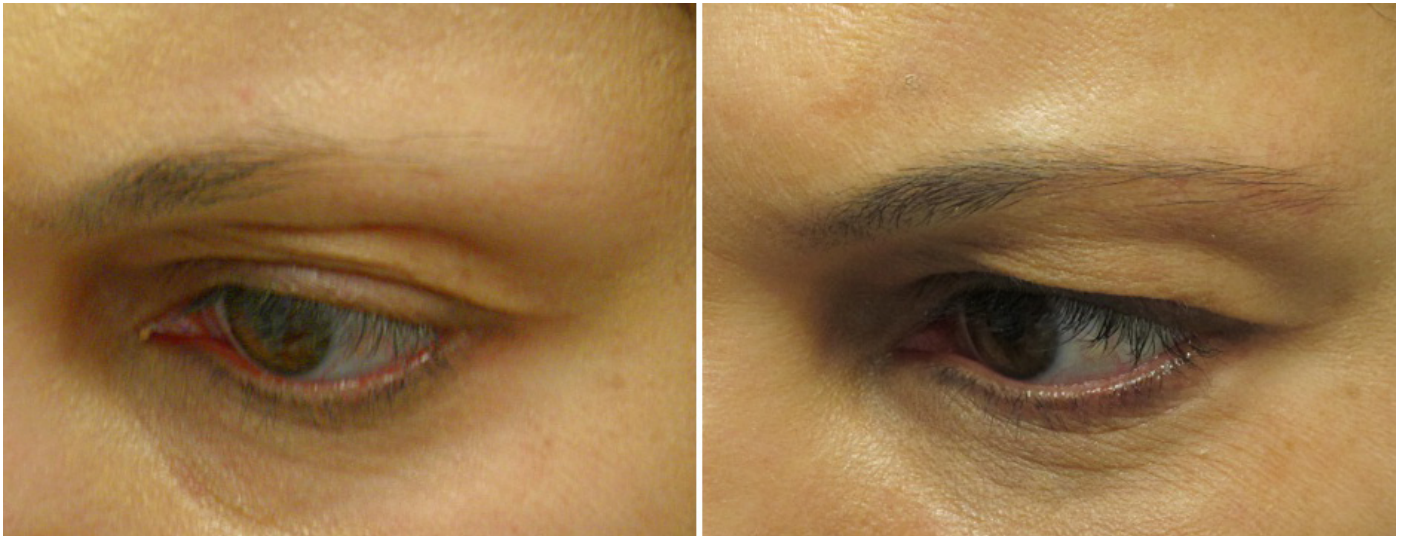
## DISCUSSION

Hypotrichosis is characterized by less than normal amounts of hair. The issues that hypotrichosis of the eyelashes and eyebrows create are multifaceted. Eyebrows and eyelashes

provide a defense against foreign bodies for the eye, and furthermore, full eyebrows and eyelashes can make the face look more cosmetically attractive.<sup>3</sup> Causes of hypotrichosis can vary from aging, chemotherapy, genetic, or other medical treatment and unknown causes.<sup>4</sup> Previous studies have established that Latisse (bimatoprost 0.03% solution) increases eyelash length, thickness, and darkness in patients with hypotrichosis of the eyelashes.<sup>3</sup>

Topical bimatoprost was FDA-approved for eyelash hypotrichosis in December 2008. In previous studies bimatoprost, a synthetic prostamide analog used topically, has been shown to reduce intraocular pressure and helps control the progression of glaucoma.<sup>5</sup> The mechanism of bimatoprost is complex. Bimatoprost works by increasing the overall percentage of eyelash follicles in the anagen cycle at any one time. Bimatoprost also stimulates melanogenesis, which results in darker pigmentation of eyelashes. In addition, bimatoprost likely increases the size of both the dermal papilla and hair bulb.<sup>6</sup>

The method by which bimatoprost works is through interactions between prostaglandins and prostamides with prostanoid receptors. These receptors are known to be present in the dermal papilla and in the outer root sheath of the hair follicle. It has been shown that the receptors are involved in the development and regrowth of hair follicles.<sup>7</sup> This interaction stimulates hypertrichosis by promoting resting follicles in the telogen phase

**FIGURE 1:** Before and after bimatoprost solution.

to enter the anagen phase.<sup>6</sup> The increase in anagen phase is determined at the initiation of the anagen phase and is controlled by the dermal papilla.<sup>3</sup> When prostaglandins are inhibited by agents such as indomethacin or aspirin, hair growth is shown to be decreased. In addition minoxidil was reported to activate COX-1, a prostaglandin pathway, suggesting that prostaglandin plays a vital role in hair growth.<sup>3</sup>

There have been numerous studies documenting the effectiveness of bimatoprost solution for upper eyelid hypotrichosis. In clinical studies with bimatoprost, the majority of patients report an increase in eyelash length and darkening of color after daily use for 12 weeks.<sup>5</sup> In clinical practice, many patients notice results in as early as four weeks, and many patients report using the solution every other day instead of daily with continued efficacy.

Potential known local side effects of bimatoprost include eye pruritus, conjunctival hyperemia, eye irritation, dry eye symptoms, erythema, and temporary hyperpigmentation of the eyelid skin.<sup>3</sup> Reported rare side effects of ophthalmic bimatoprost for treatment of glaucoma include darkening of the iris pigmentation and recently periorbital fat atrophy.<sup>8</sup> The efficacy and adverse effects of bimatoprost gel has been examined in patients with no prior history of glaucoma or other ocular disease. The adverse effects of conjunctival hyperemia, ocular puritis, hyperpigmentation and medical cathral hair growth resolved after discontinuation of bimatoprost gel.<sup>4,9</sup>

While topical bimatoprost is only FDA-approved for upper eyelash growth, it has been used off-label to promote growth for both the lower eyelashes and the eyebrows. While anecdotally using topical bimatoprost on the eyebrows has been advocated there had yet to be published scientific evidence to support this.

While topical bimatoprost is only FDA-approved for upper eyelash growth, it has been used off-label to promote growth for both the lower eyelashes and the eyebrows.

## CONCLUSIONS

We report one of the first cases of topical bimatoprost for successful treatment of eyebrow hypotrichosis. Studies are needed to confirm the efficacy and safety of topical bimatoprost to treat eyebrow hypotrichosis. If confirmed, topical bimatoprost should be a useful non-surgical option for patients with eyebrow hypotrichosis.

## DISCLOSURES

The authors have no relevant conflicts of interest to disclose.

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