



The falsies effect: How this beauty trend falsely induces severe glaucoma

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ARTICLE INFO

Keywords:

Glaucoma

HVF

False eyelashes

Pseudoptosis

ABSTRACT

Purpose: To bring awareness on how the false eyelash beauty trend can impact routine glaucoma evaluations.

Observation: False eyelashes have the ability to induce pseudoptosis and visual disturbance complaints from patients. This translates to the patient care setting by inhibiting proper administration of Humphrey Visual Field analysis and portraying gross overestimations on patients' glaucoma progression.

Conclusions: Patients should be asked to remove false eyelashes prior to administering Humphrey Visual Field analysis or have their eyelids taped up to prevent obstruction of view during examination.

Importance: Making medical management decisions based on a Humphrey Visual Field analysis completed on a patient wearing false eyelashes could lead to overly aggressive treatment on an otherwise healthy patient.

1. Introduction

Glaucoma is a group of conditions that cause irreversible vision loss via direct damage to the optic nerve head. It is the leading cause of blindness worldwide and disproportionately affects the African American population.¹ While there is a strong genetic component to the development of glaucoma, a large part of the population will develop it spontaneously. Currently, it is estimated that over 80 million individuals worldwide suffer from glaucoma and that number is predicted to increase to 111 million by 2024.² With the severity of disease, and poor prognosis if left untreated, great lengths are taken when screening patients for glaucoma and monitoring them once diagnosed.

Alongside slit lamp and dilated fundus examinations, the mainstay diagnostic imaging for evaluation of glaucoma is optical coherence tomography (OCT) of the retinal nerve fiber layer (RNFL) and Humphrey Visual Field (HVF) analysis. OCT RNFL is a technique by which the optic nerve head and adjacent retinal tissues can be imaged at microns high resolution to evaluate their thickness. HVF analysis identifies areas of blindness in a patient's visual field while maintaining steady fixation. By tracking progression of thinning on OCT RNFL and visual field defects on HVF, physicians can begin to make informed decisions on next steps in glaucoma management. However, when these diagnostic techniques cannot be administered properly, physicians may erroneously interpret progression or regression of one's glaucoma.

It is no secret that individuals have spent centuries trying to achieve

the dramatic large eyes look with long, dark eyelashes. The ancient Egyptians have been credited as the original creators of lash extensions, but it was not until the 18th century that lashes were patented. This beauty standard has only continued to grow in popularity with the global eyelash market becoming a record breaking 1.62-billion-dollar industry in 2021.³ The most recently adopted eyelash trend includes eyelash extensions; defined as adhering synthetic lashes to one's natural lash base to produce a fuller appearance of one's eyelashes. Unlike the traditional strip false lashes, where false lashes are attached to a single band is then adhered over the lash line, eyelash extensions require a certified lash professional to individually glue false lashes to the client's natural lashes.⁴ The ocular aesthetics market has caused a spike in false eyelash donning patients seeking specialists' attention due to the deleterious effects these enhancements have on the ocular surface and beyond.⁵ In this report we document how one patient's eyelash falsies resulted in artificial bilateral superior arcuate defects on HVF 24-2.

2. Patient case

A 67-year-old female with a past medical history of mixed mechanism glaucoma including mild primary open angle glaucoma (POAG) and narrow angle glaucoma in both eyes presented to the local eye institute for complaints of decreased vision. The patient previously underwent bilateral laser peripheral iridotomies, selective laser trabeculoplasty of the left eye, and phacoemulsification with intraocular lens

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<https://doi.org/10.1016/j.ajoc.2024.102123>

Received 6 March 2024; Received in revised form 10 June 2024; Accepted 12 July 2024

Available online 23 July 2024

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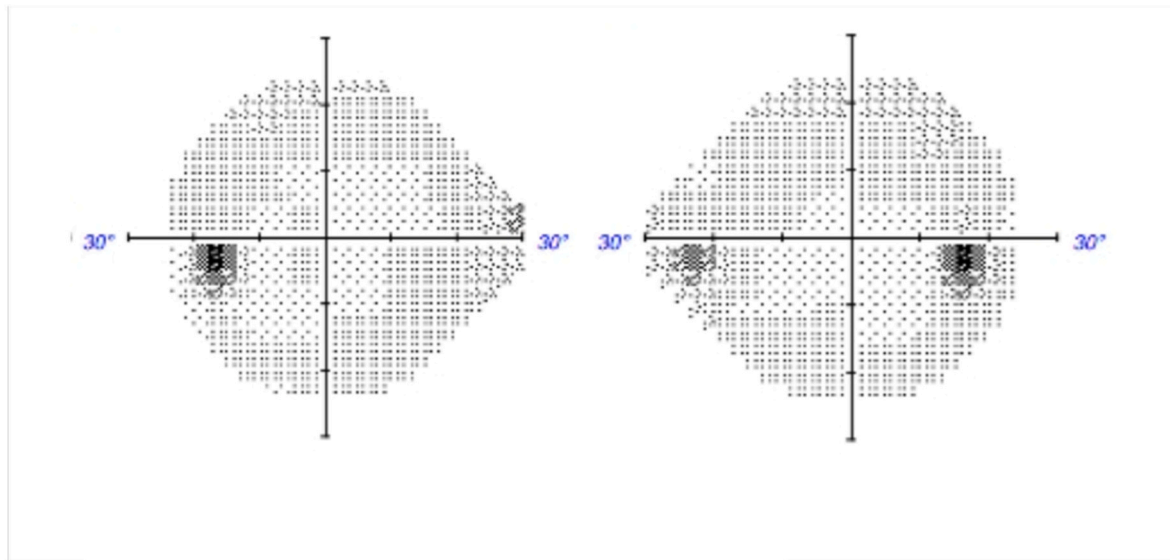


Fig. 1. This is the patient's original HVF from her initial presentation to the glaucoma clinic back in 2019. The HVF shows no specific pattern to indicate a glaucoma diagnosis. Fixation loss (FL) in the right and left eye was 1/13 and 1/14 respectively. False positive rate (FPR) in the right and left eye was 6 % and 3 %, respectively. False negative rate (FNR) in the right and left eye was 3 % and 0 %, respectively.

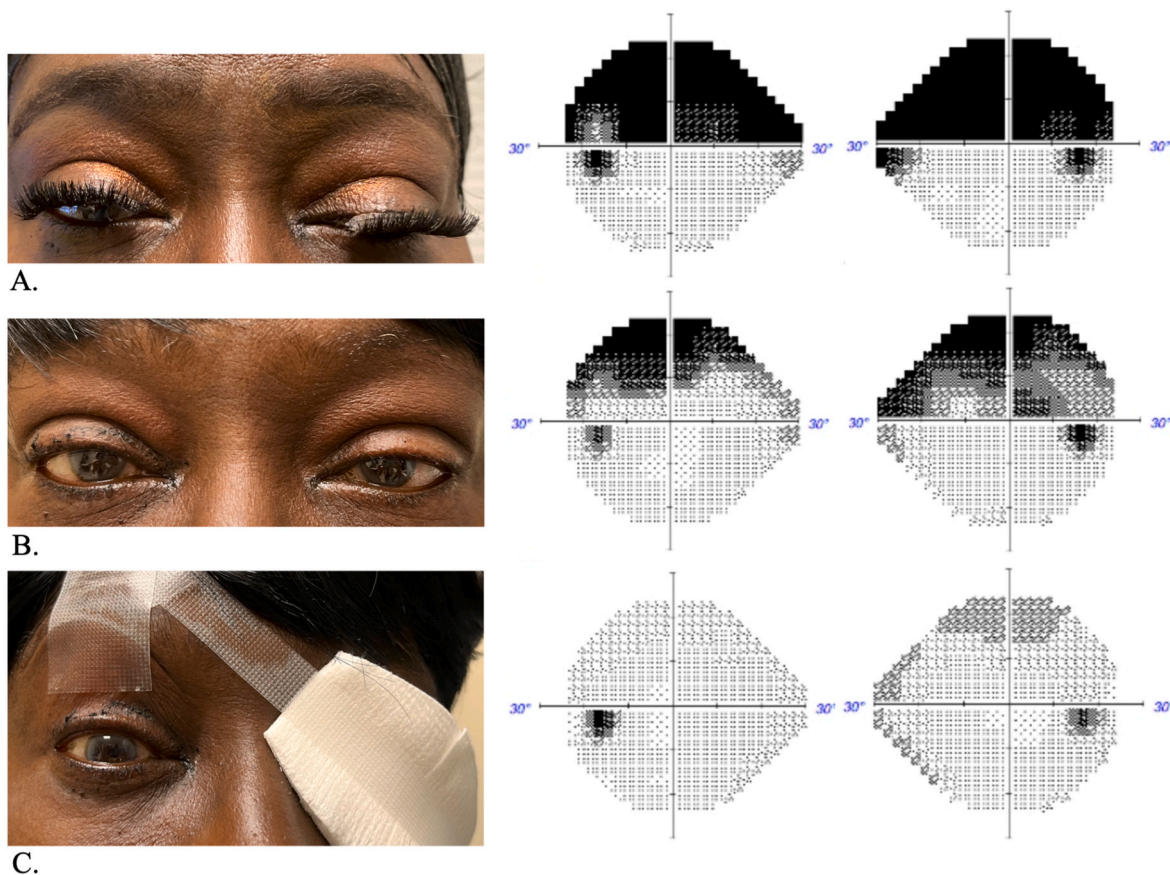


Fig. 2. A. This is the patient's HVF while wearing false lashes. The HVF shows a superior hemifield defect indicative of severe stage glaucoma. FL in the right and left eye was 10/15 and 4/17 respectively. FPR in the right and left eye was 4 % and 4 %, respectively. FNR in the right and left eye was 6 % and 13 %, respectively. B. This is the patient's HVF after removing the false lashes. The HVF shows improvement of the original defect but continues to show a superior arcuate defect indicative of severe stage glaucoma. FL in the right and left eye was 6/15 and 4/16 respectively. FPR in the right and left eye was 1 % and 0 %, respectively. FNR in the right and left eye was 6 % and 6 %, respectively. C. This is the patient's HVF after taping her eyelids up. The HVF shows resolution of the previous superior field defect. FL in the right and left eye was 13/18 and 9/16 respectively. FPR in the right and left eye was 0 % and 1 %, respectively. FNR in the right and left eye was 4 % and 1 %, respectively.

implantation and Hydrus microstent insertion in both eyes. At the time of the visit, the patient was being medically treated with latanoprost once a day in the left eye and timolol-brimonidine twice a day in the left eye. Visual acuity in the right eye was 20/30 and in the left eye was 20/40. Extraocular movements were full. The margin to reflex distance (MRD)1 was 1mm and 0mm in the right and left eye, respectively. Applanation tonometry in the right eye was 13 mmHg and the left eye was 9 mmHg. Humphrey Visual Field 24-2 (Fig. 1) revealed dense superior defects bilaterally with low test reliability due to high fixation loss in both eyes. Slit lamp examination revealed blepharitis and false lashes bilaterally with patent peripheral iridotomy at 9 o'clock in the right and 3 o'clock in the left. Fundus examination revealed cup-to-disc ratios of 0.75 in the right and 0.7 in the left.

The patient returned to the clinic the following week for repeat HVF imaging and was instructed not to wear false eyelashes. Slit lamp examination was unchanged from the previous week aside from the lack of false lashes and mild ptosis in each eye with fluctuating MRD1 between 2 and 3mm. IOP in each eye was 13 mmHg and 14 mmHg in the right and left eye, respectively. Repeat HVF imaging without false lashes showed improvement with some residual superior arcuate defects, however test reliability remained low due to high fixation loss in both eyes. HVF with taping of the eyelids eliminated the defect completely (Fig. 2) even with a reported high fixation loss in both eyes.

3. Discussion

There are three main reliability indices used when determining the quality of a HVF 24-2: fixation losses, false positive response rates, and false negative response rates. Of the three indices, it has been noted that low quality HVFs are most commonly due to fixation losses.⁶ Common causes of fixation loss during routine HVF 24-2 include ptosis obscuring the pupil, blinking, or faulty tracking secondary to an irregular pupil.⁷ Upon reviewing the patient's previous examinations, the only difference found between exams was the drastic change to her HVF 24-2. Therefore, we hypothesize that the patient's large false eyelashes caused pseudoptosis which obstructed her view during the exam, inducing the bilateral superior arcuate defects.

A deeper review of the literature through PubMed on 08/16/2023 using the search terms false eyelashes, eyelash extension, eyelash induced glaucoma did not yield any study that indicated wearing false eyelashes, eyelash extensions, or having a lash lift/tint resulted in development and/or progression of a patient's glaucoma. More concern has been placed on the lash adhesive itself, as chemical analyses conclude threshold levels of formaldehyde within the products.⁸ There have been several reported effects following the use of false eyelashes and eyelash extension procedures ranging from allergic blepharitis to keratoconjunctivitis.^{5,8}

4. Conclusion

While there is no formal contraindication to false eyelashes in glaucoma, patients should ultimately be educated on proper hygiene techniques to prevent possible infection. Physicians, optometrists and visual field technicians alike should recognize false eyelashes as a potential cause of changes seen on HVF 24-2. If possible, patients should be advised to remove lashes prior to arriving for their exam. If a patient presents to their exam with visually compromising false eyelashes, their lids should be taped up, as done with ptotic patients requiring HVF analysis, for improved visual field quality and reliability.⁹ Any patient thought to have an erroneous HVF 24-2 due to false eyelashes should undergo repeat examination prior to making medical management

changes.

Patient consent

The patient consented to publication of the case in writing.

CRediT authorship contribution statement

Sophia C. Bertot: Writing – review & editing, Writing – original draft. **Pooja Pendri:** Writing – review & editing. **Elena Bitrian:** Writing – review & editing, Supervision, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements and Disclosures

I would like to thank Dr. Elena Bitrian and Dr. Pooja Pendri for their mentorship and guidance throughout the completion of this article. I would also like to thank Bascom Palmer Eye Institute and The Samuel & Ethel Balkan International Pediatric Glaucoma Center for allowing me the opportunity to observe and learn from their diverse patient population. I would like to also thank the staff, who aided me in the collection of various patient documents to complete this article.

The authors of this article do not have any financial disclosures to share.

Funding

This work was supported by Dr. Elena Bitrian of the Bascom Palmer Eye Institute.

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