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Case Report

Higher Order Aberrations and Night Vision Disturbance in a 30-Year-Old Female Patient. A Case Report

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Background

Higher-order aberrations (HOAs) can significantly affect visual quality, especially in low-light conditions, leading to symptoms like glare, halos, and decreased contrast sensitivity. This case report examines a 30-year-old woman experiencing night vision issues due to a considerable level of HOAs identified through aberrometry, with a particularly affected point of minimal dispersion.

Case Presentation

A 30-year-old female presented to our clinic with complaints of poor night vision, difficulty seeing in dim lighting, and halos around lights, particularly while driving at night. She had no history of previous ocular surgery, trauma, or systemic diseases affecting her vision. The clinical examination revealed an uncorrected visual acuity of 6/24 in the right eye and a best-corrected visual acuity of 6/6 (-2.00 -4 x160) with a normal slit lamp examination and an intraocular pressure (IOP) of 14 mmHg. In the left eye, the uncorrected visual acuity was 6/36, and the best-corrected visual acuity was 6/6 (-1 -2.75 x 20), also with a normal slit lamp examination and an IOP of 15 mmHg.

Wavefront aberrometry (Fig. 1 and 2) was performed for both eyes, revealing significant higher-order aberrations particularly affecting night vision. Specifically, the aberrations included spherical aberrations (leading to halos and glare), coma aberrations (reducing contrast sensitivity and increasing image distortion), trefoil aberrations (further diminishing her visual quality in dim conditions), and an affected point of minimal dispersion, impairing retinal imaging focus and worsening night vision symptoms.

Based on the clinical presentation and aberrometry findings, the patient was diagnosed with higher-order aberrations contributing to night vision disturbances as well as an affected point of minimal dispersion.

The management and treatment plan involved prescribing wavefront-guided glasses with advanced anti-reflective glare properties and enhanced contrast sensitivity, along with rigid gas permeable contact lenses to neutralize corneal irregularities. Environmental and lifestyle adjustments, such as increasing lighting when possible at night to reduce strain in low-light settings, avoiding bright headlights, and adjusting ambient lighting in the car while driving, were also recommended.

The patient is currently being followed up in the eye clinic, showing good adaptation to the proposed optical treatment and considerable improvement in her night vision symptoms.

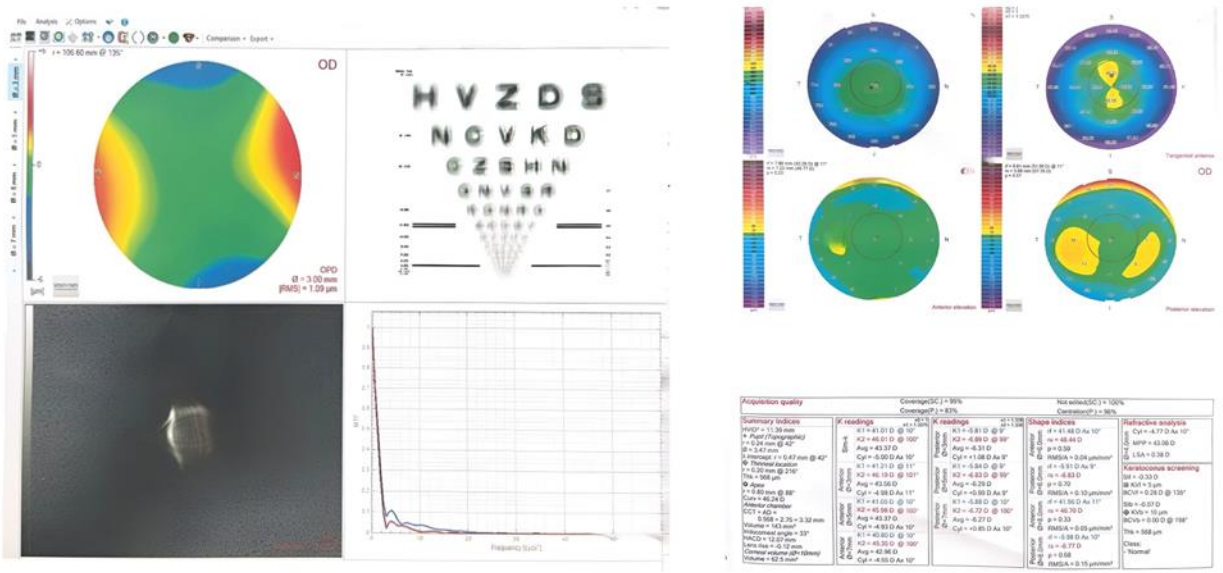

Fig.1 Wavefront Aberrometry of the right eye

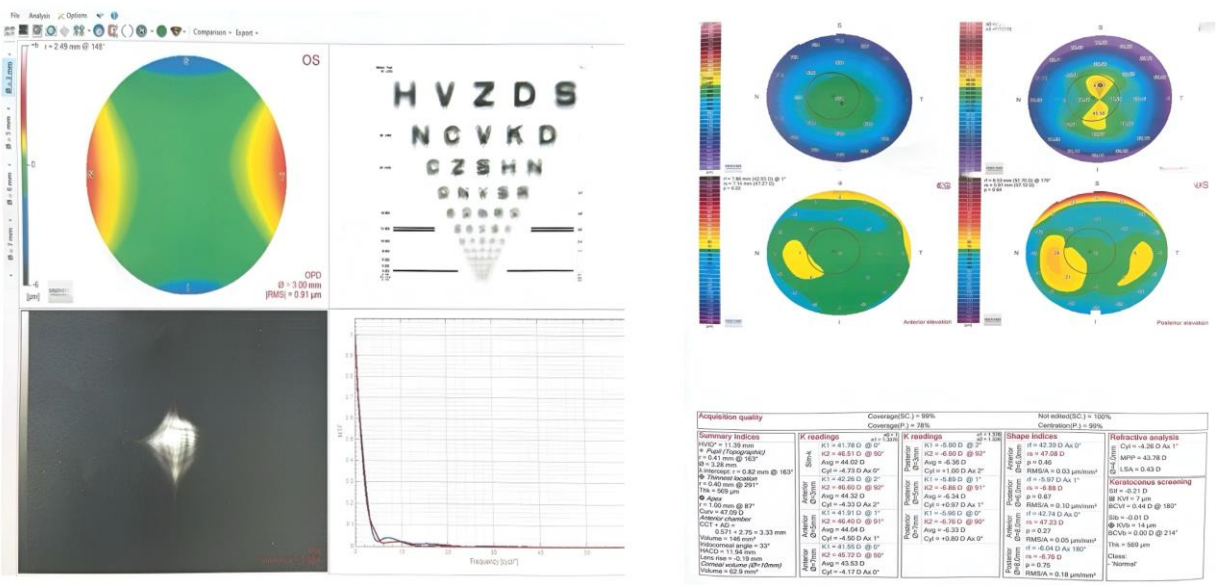

Fig.2 Wavefront Aberrometry of the left eye

Discussion

Higher-order aberrations, particularly coma and spherical aberrations, are known to diminish visual quality, especially at night. The significant effect on the point of minimal dispersion in this patient further clarifies her night vision issues. Early detection through aberrometry facilitates personalized management strategies, ranging from customized optics to potential surgical interventions.

Conclusion

This case emphasizes the importance of aberrometry in assessing unexplained night vision disturbances. A patient-centered approach that incorporates customized optical corrections and, if necessary, surgical interventions is essential for effective management. Continuous monitoring and adjustments are vital to ensure optimal visual outcomes.

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