

Case Report

Misdiagnosis of Amblyopia in a Refractive Surgery Candidate

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Abstract

Purpose: To highlight the importance of comprehensive dilated examination in refractive surgery and how early detection of lenticonus can prevent misdiagnosis and suboptimal management.

Case Report: A 29-year-old female presented to our refractive surgery center with compound myopic astigmatism and a high astigmatic component. Her best corrected visual acuity was 5/10 in the right eye and 4/10 in the left eye, and she was initially diagnosed with amblyopia due to high astigmatism. Retinal and corneal imaging showed no pathological findings. However, dilated examination revealed a conical protrusion of the crystalline lens consistent with posterior lenticonus. The patient underwent clear lens extraction with intraocular lens implantation. Postoperatively, her visual acuity improved to 9/10 in both eyes, with minimal residual hyperopic astigmatism.

Conclusion: Comprehensive dilated examination of the fundus and lens is suggested among refractive surgery candidates to prevent misdiagnosis and facilitate early detection of conditions such as lenticonus, allowing appropriate management.

Keywords: Lenticonus; Astigmatism; Amblyopia; Lens Extraction; Intraocular Lens Implantation; Refractive Errors.

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Introduction

Lenticonus is a rare morphological anomaly of the crystalline lens caused by thinning of the lens capsule and cortex, resulting in a cone-shaped protrusion of one or both lens surfaces¹. Anterior lenticonus typically occurs bilaterally and is associated with Alport syndrome, an X-linked hereditary disorder characterized by progressive nephritis, ocular abnormalities, and sensorineural hearing loss².

Posterior lenticonus, in contrast, is a congenital condition that may present in isolation, although associations with systemic diseases such as Lowe syndrome have also been reported³. Lens extraction with intraocular lens (IOL) implantation can improve visual acuity and overall quality of vision in affected patients, irrespective of concomitant cataract.

Case Report

This study adhered to the principles of the Declaration of Helsinki. Institutional ethics committee approval was obtained, and written informed consent for publication of clinical details and images was provided by the patient. A 29-year-old female presented to our tertiary eye care center requesting refractive surgery to eliminate her dependence on glasses. She had worn glasses since childhood and reported progressive reduction in vision quality associated with increasing refractive error.

Her current spectacle prescription was OD: - 2.25 - 7.00 × 170 and OS: - 2.00 - 6.75 × 170. Manifest refraction showed OD: - 3.00 - 8.75 × 180 and OS: - 2.50 - 8.00 × 160. Visual acuity with glasses was 5/10 in the right eye and 4/10 in the left eye, with no further improvement on subjective refraction or BCVA. Retinoscopy demonstrated a scissoring reflex. Slit-lamp examination showed normal corneal layers without visible thinning or bulging. The

anterior chamber was quiet, the lenses were clear on slit-lamp evaluation, and the posterior pole showed no abnormalities. Based on these findings, a provisional diagnosis of bilateral refractive amblyopia due to the high astigmatic component was made.

The patient underwent macular and retinal nerve fiber layer (RNFL) OCT scans, both of which were normal. Pentacam imaging confirmed regular corneal topography and indices. Comparison of corneal versus total astigmatism (OD: 1.54 D vs. 8.75 D; OS: 1.07 D vs. 8.00 D) indicated that most of the astigmatism originated from internal ocular structures.

After pharmacological dilation with cyclopentolate hydrochloride 1% (also used for cycloplegic refraction), a distinct posterior bulging of both crystalline lenses was observed, consistent with posterior lenticonus. The treatment plan was therefore revised from refractive surgery to clear lens extraction (CLE) with sulcus-fixated intraocular lens (IOL) implantation, starting with the right eye followed by the left eye 10 days later.

At the one-month postoperative visit, stable refraction measured OD: + 0.50 – 0.50 × 170 and OS: + 0.25 – 0.50 × 160, with visual acuities of 9/10 and 9+/10, respectively.

Discussion

Posterior lenticonus is a rare ocular abnormality with an estimated prevalence of approximately 1 in 100,000^{4,5}. It is typically sporadic and unilateral in about 95% of cases^{6,7}, although bilateral involvement may occur via autosomal dominant or X-linked inheritance patterns. Diagnosis is aided by identification of a localized conical or hemispherical protrusion of the lens, often described as an “oil droplet” on slit-lamp or ophthalmoscopic

examination ^{8,9}.

Importantly, the lenticular protrusion may not be easily detected without adequate pupil dilation. Although uncommon, lenticonus can cause significant refractive error and reduced visual acuity that is often not adequately correctable with spectacles or contact lenses. In such cases, lens extraction with IOL implantation can restore functional vision ¹⁰. Surgical intervention is generally indicated when the lesion involves or threatens the visual axis or when visual performance is significantly impaired.

A similar report described the use of wavefront aberrometry to detect subtle lenticular irregularities responsible for decreased best-corrected visual acuity ¹¹. Likewise, systematic comparison of corneal and total astigmatism, corneal curvature profiles, axial length, and refractive status can support accurate diagnosis. Failure to consider such discrepancies may result in misdiagnosis as refractive amblyopia and lead to inappropriate or delayed management.

Conclusion

Comprehensive dilated examination of the fundus and lens should be routinely performed in all refractive surgery candidates to prevent misdiagnosis and facilitate early detection of conditions such as lenticonus, allowing appropriate management.

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Footnotes and Financial Disclosures

Conflict of interest:

The authors have no conflict of interest with the subject matter of this manuscript.

