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Progressive myopia due to forward displacement of the spherophakic lens

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CASE REPORT

An 8-year-old boy was referred to our department for progressive myopia since three years prior to presentation. His medical and familial histories were not significant. There was no consanguinity in the family. On examination, his bilateral best corrected visual acuity was 1.2. The spherical equivalent refractive error was −13.125 diopters (D) and −13.50 D in the right eye (RE) and left eye (LE), respectively. His intraocular pressure was 20 mmHg, and the anterior chamber was slightly shallow and clear bilaterally. Phacodonesis was present with eye movements. Bilateral fundus examination yielded unremarkable findings. The radius of corneal curvature was 7.96/7.60 and 8.00/7.72 mm in the RE and LE, respectively. The corneal diameter was 12.30 and 13.36 mm in the RE and LE, and keratometric values were 42.40 D/44.41 D (175°/85°) and 42.19 D/43.72 D (22°/111°) in the RE and LE, respectively. Axial lengths measured by the IOL Master were 22.95 and 23.00 mm in the RE and LE, respectively. The anterior chamber depth was 2.46 and 2.51 mm in the RE and LE, respectively. The lens thickness (anteroposterior diameter) was 4.70 and 4.71 mm in the RE and LE, respectively. Anterior segment optical coherence tomography revealed the anterior lens surface located anteriorly to the iris plane level (Figure 1). His height (120 cm) and weight (24 kg) were appropriate for his age. No other systemic dysmorphic features were observed, nor were other abnormal findings on general physical examination. As supported by the biometric and refractive data, he was diagnosed with isolated spherophakia. He was prescribed appropriate new glasses.

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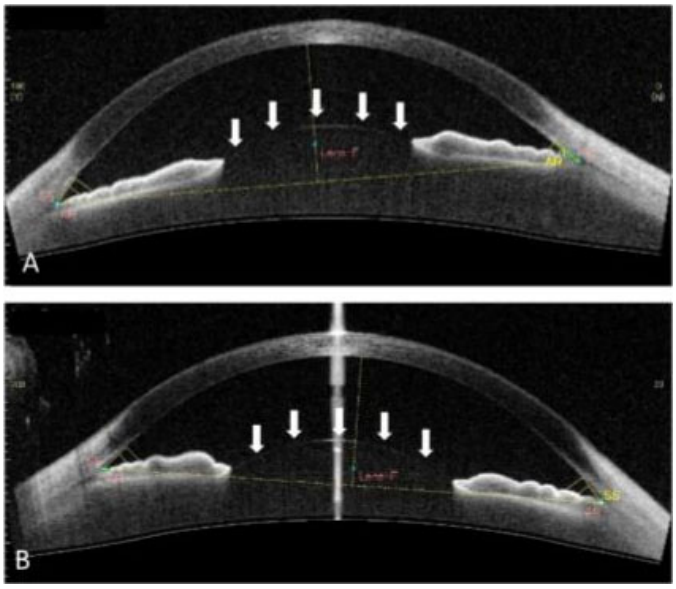

Figure 1: Anterior segment optical coherence tomography showed anterior lens surface (arrows) was located anteriorly to the iris plane level.

DISCUSSION

Increased lens focusing power induces a variable degree of myopia (lenticular myopia). This case illustrated that forward displacement of spherophakic lens may result in the development of progressive myopia.

Spherophakia is a rare eye disease that may present as an isolated condition or, more frequently, may be associated with a systemic syndrome such as Weill–Marchesani, Marfan, Alport, Klinefelter, Sturge–Weber, and Axenfield–Rieger syndromes [1–3]. Spherophakia is constantly characterized by abnormally weak developmentally hypoplastic lens zonules. For this reason, crystalline lens changes the normal shape to spherical, with increased anteroposterior thickness and reduced equatorial diameter. Moreover, the highly convex lens allows a greater range of anterior movement of the iris-lens diaphragm. Consequently, lens subluxation or dislocation can occur, leading to pupillary-block glaucoma [1–3], which is rare in children [4].

CONCLUSION

When spherophakia is suspected, a careful ophthalmological evaluation is strongly recommended for the prevention of pupillary-block glaucoma. Our patient exhibited no systemic features of Weill–Marchesani syndrome; however, as the body develops, short stature and other systemic abnormalities may become more pronounced. Further follow-up will be necessary to identify these abnormalities.

Keywords: Anterior segment optical coherence tomography, Axial length, Progressive myopia, Spherophakic lens

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Author Contributions

Yuka Kasuya – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Shinji Makino – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.