Letter to the Editor Re: "Preferred Retinal Locus in Juvenile Macular Dystrophy"

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Dear Editor,

We read with great interest the study by Erbezci et al.[1] evaluating preferred retinal locus (PRL) characteristics in juvenile macular dystrophy (JMD). The authors are to be commended for addressing an important clinical question and for employing scanning laser ophthalmoscope/optical coherence tomography to characterize fixation behavior. While the findings are valuable, several methodological limitations not discussed in the article warrant consideration.

First, the study did not report genetic or phenotypic stratification of JMD patients. JMDs encompass heterogeneous entities, including ABCA4-related Stargardt disease and cone-rod dystrophies, with differing lesion morphology and progression, which may confound PRL patterns.[2] Second, prior exposure to low-vision rehabilitation or eccentric viewing training was not documented. Such interventions can influence PRL location and stability, making it difficult to distinguish spontaneous adaptation from training effects.[3]

Third, fixation stability was quantified using maximum dispersion of fixation points rather than standardized metrics such as the bivariate contour ellipse area. This methodological choice may limit comparability with other studies and underestimate subtle instability.[4] Fourth, the absence of a control group (e.g., age-matched individuals with other macular diseases) restricts the ability to contextualize whether observed PRL behaviors are unique to JMD or reflect broader adaptation mechanisms.[5] Finally, the modest sample size precluded subgroup analyses by disease severity or lesion morphology, which could have provided more nuanced insights into PRL adaptation.[2]

Despite these limitations, the study contributes meaningfully to our understanding of PRL behavior in JMD. Future prospective, longitudinal studies with larger, genetically characterized cohorts and standardized fixation metrics will be essential to fully elucidate PRL adaptation and optimize rehabilitation strategies for young patients with central vision loss.

Keywords: Juvenile macular dystrophy, preferred retinal locus, fixation stability, low vision rehabilitation, methodological critique

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Declarations

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Reply

We thank the author for their interest in our study[1] and their constructive comments.[2] We appreciate the opportunity to clarify several methodological aspects of our retrospective analysis evaluating preferred retinal locus (PRL) characteristics in patients with juvenile macular dystrophy (JMD).[1]

First, we acknowledge that JMD comprises a heterogeneous group of inherited retinal disorders with diverse genetic and phenotypic backgrounds. Genetic testing was not systematically available for the majority of patients during the study period. All patients were diagnosed and referred by experienced retina specialists based on clinical examination and multimodal retinal imaging, reflecting routine real-world clinical practice. The primary objective was to characterize functional fixation behavior in a clinically defined cohort of young patients with central macular involvement. Retrospective genetic stratification would have substantially reduced the sample size and introduced selection bias.

Second, regarding prior low-vision rehabilitation or eccentric viewing training, we would like to explicitly clarify that all patients were evaluated at their first referral to the low-vision rehabilitation unit. As stated in the Methods section, "JMD-related lesions and PRLs were assessed at the beginning of their low-vision clinical evaluation." Accordingly, none of the patients had previously undergone structured low-vision rehabilitation or formal eccentric viewing training. Therefore, the PRL characteristics described in this study reflect spontaneous neurovisual adaptation to central vision loss rather than rehabilitation-induced effects. While informal compensatory strategies cannot be entirely excluded, no patient had received supervised rehabilitation prior to assessment.

Third, fixation stability was quantified using maximum dispersion of fixation points rather than the bivariate contour ellipse area (BCEA). While BCEA is a widely accepted metric, fixation data were acquired using an Optos SLO/OCT-based microperimetry system, whose software versions available during the study period did not consistently compute BCEA or export raw fixation coordinates. Post-hoc BCEA calculation from the summary reports was not feasible, and raw coordinate export was not supported by the legacy software configuration. However, maximum dispersion provides a clinically interpretable measure of fixation instability and has been applied in previous clinical studies.[3] Moreover, dispersion and BCEA are strongly correlated measures of the same underlying fixation instability, and the observed clinical associations would be expected to remain consistent regardless of the metric used.[4]

Fourth, with respect to control groups, age-matched controls with other macular diseases are epidemiologically difficult to identify, as most macular disorders occur later in life. Comparisons with healthy controls yield limited insight into eccentric fixation mechanisms, as healthy subjects invariably use the fovea. Accordingly, the most relevant comparisons are internal correlations with disease-related parameters, supported by comparisons with established PRL patterns in age-related macular degeneration reported in the literature.[5]

Finally, the modest sample size and absence of a control group are acknowledged limitations and should be interpreted in the context of the epidemiology of JMD. As JMD is a rare disorder, assembling a cohort of young patients (mean age 19.8 years) with complete fixation and microperimetric data at a single center is inherently challenging. Many foundational PRL studies have relied on similarly sized cohorts, whereas larger datasets (e.g., ProgSTAR) required multicenter collaboration.[6] Despite the limited number of cases, the sample size allowed detection of strong main associations, including a significant correlation between age and PRL location ($r=0.541$, $p=0.002$).

Despite these limitations, we believe that our study provides clinically relevant real-world data on PRL behavior in young patients with central macular disease—an underrepresented population in the literature. We agree that future prospective, longitudinal studies incorporating genetic characterization and standardized fixation metrics will be essential to further elucidate PRL adaptation mechanisms.

Declarations

Authorship Contributions

Surgical and Medical Practices: M.E., Concept: M.E., Z.Ö.T., T.Ö., Design: M.E., Z.Ö.T., T.Ö., Data Collection or Processing: M.E., Z.Ö.T., T.Ö., Analysis or Interpretation: M.E., Z.Ö.T., T.Ö., Literature Search: M.E., Z.Ö.T., T.Ö., Writing: M.E., Z.Ö.T.

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