

Co-localization of hyperautofluorescent ring and ellipsoid zone area in patients with retinitis pigmentosa using en face optical coherence tomography

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Purpose

To assess the spatial correlation between the hyperautofluorescent parafoveal ring and the preserved ellipsoid zone (EZ) in patients with retinitis pigmentosa (RP) by isolating EZ areas on en face optical coherence tomography (OCT) scans and superimposing them over the respective fundus autofluorescence (FAF) images.

Materials and Methods

Data from 16 patients (31 eyes) with RP and hyperautofluorescent parafoveal ring were collected for this retrospective study. All patients underwent a prior comprehensive eye examination with FAF (Optos, Dunfermline, UK, or Spectralis; Heidelberg Engineering, Heidelberg, Germany) and spectral-domain OCT (Optovue, Fremont, CA, USA) imaging. En face OCT images were generated using the iVue software (Optovue) with segmentation at the level of the EZ along the Bruch membrane as the reference layer. Eyes with low scan quality (Q score < 5/10) or EZ extending beyond the 6 mm x 6 mm scanning field were excluded. In all included cases, EZ areas were manually isolated from the en face scans and superimposed over FAF images. Correlation between the preserved EZ and the hyperautofluorescent ring at its internal and external boundaries was analyzed.

Results

Eighteen eyes of 10 patients (age range 18 to 74 years, mean 45.2) met the en face image criteria and were included in the analysis. Nine eyes of 5 patients had cystoid macular edema, and 1 patient had epiretinal membrane in both eyes. The mean Q score of the en face scans was 7.2 ± 1.2 . The area of the isolated EZ compared to the hyperautofluorescent ring at its internal and external boundaries was $86.7 \pm 13.8\%$ and $32.2 \pm 18.2\%$, respectively. The EZ was larger than the internal border of the ring in 3 eyes, and the overlap between the two regions was $80.9 \pm 14.0\%$ of the inner ring area. In all eyes, the EZ fell completely within the outer border of the ring.

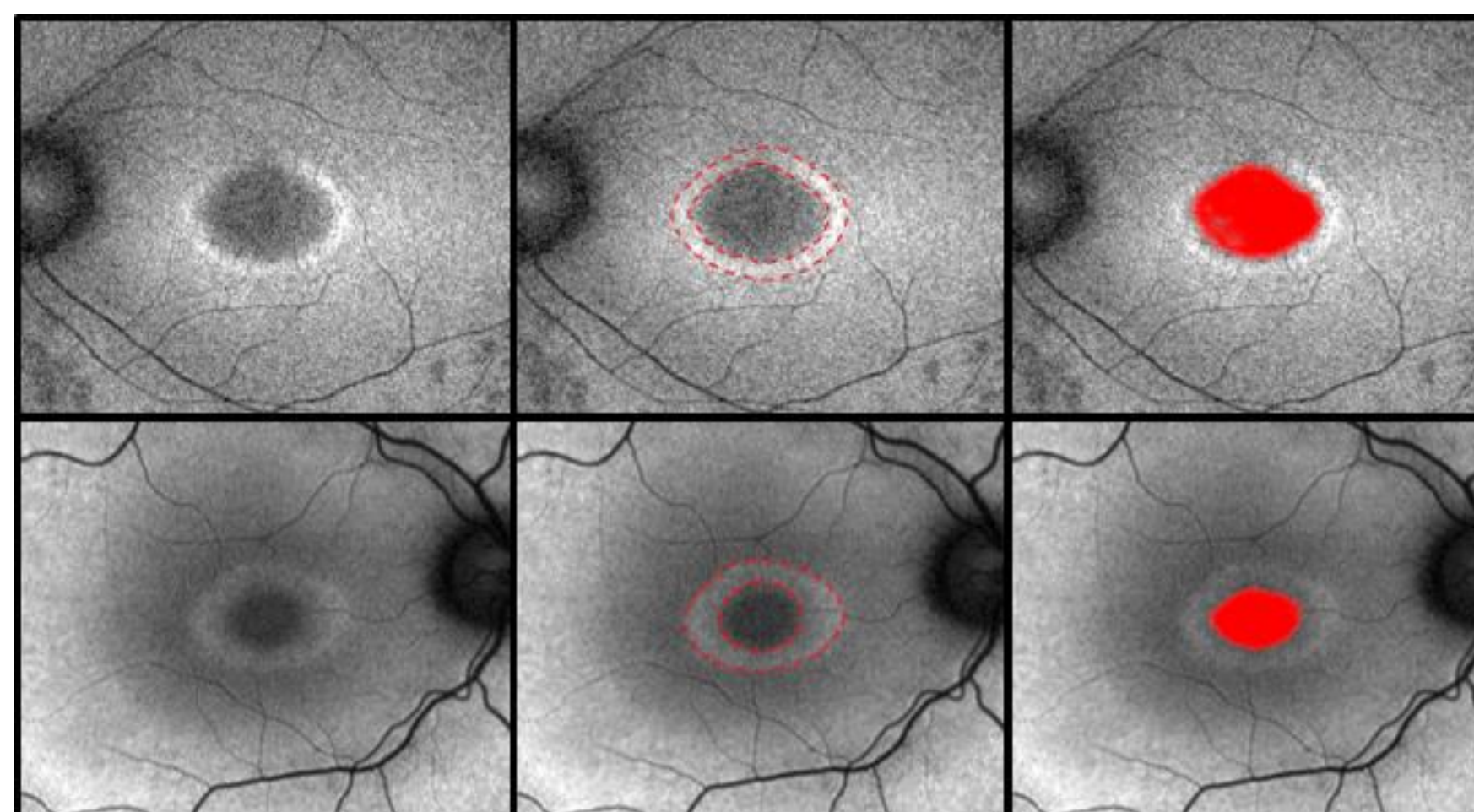


Figure 1. Overlay images demonstrating FAF photos (left column), central hyperautofluorescent ring (middle column), and preserved ellipsoid zone identified from the en face OCT (right column)

Results

Patient	Sex	Age (y)	Eye	Inheritance Pattern	BCVA		Comorbidity	
					OD	OS	OD	OS
1	F	48	OU	AR	20/50	20/60	CME	CME
2	M	63	OU	XL	20/50	20/70	CME, ERM	CME, ERM
3	F	40	OU	Sporadic	20/20	20/20	CME	CME
4	M	37	OU	Sporadic	20/25	20/25	None	None
5	M	24	OU	Usher II	20/25	20/30	None	None
6	M	60	OU	AR	20/30	20/40	None	None
7	F	74	OD	Unknown	20/80		None	
8	F	18	OU	Usher II	20/60	20/60	CME	CME
9	F	26	OU	Unknown	20/25	20/25	None	None
10	F	62	OS	Unknown		20/50		CME

Table 1. Clinical characteristics of study subjects

Conclusion

The isolated EZ highly co-localized with the internal boundary of the parafoveal hyperautofluorescent ring in patients with RP. Evaluation of changes in the preserved EZ areas using en face OCT may be an effective modality for monitoring disease progression and outcomes of therapeutic interventions

References

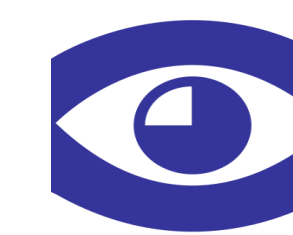
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