Audit to evaluate the performance of Foveal-to-Disc alignment technology (FoDi) in uveitis patients examined with Spectralis SD-OCT

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Introduction

Foveal-to-disc alignment technology (FoDi) is a novel feature of the Spectralis SD-OCT that automatically aligns the OCT scans to the fovea and optic disc. This technology has the potential to improve the accuracy and consistency of measurements obtained from OCT scans, which can aid in the diagnosis and management of uveitis.

Objectives

To evaluate the performance of Foveal-to-Disc alignment technology (FoDi) in uveitis patients examined with Spectralis SD-OCT

Methods

Audit included review of 352 RNFL scans done between 1st January 2014 to 1st January 2019 in Queen Elizabeth Hospital Birmingham, UK.

We included at least 3 consecutive RNFL scan for each uveitis patient. RNFL scans were divided into three groups based on FoDi line position at the foveal side into properly aligned, misaligned, and non-gradable.

Effect of manual realignment on sectoral RNFL thickness was studied for OCT scans with misaligned FoDi line noting how variable FoDi angle is among our cohort.

Results

1- Of 352 scans analysed, good FoDi alignment was seen in 64.5%, FoDI misalignment in 21% and non-gradable in14.5%.

2- The angle of the FoDi line varied in our cohort between -17 degree and 14 degrees with mean (SD) of -3.4 degree (7.6 degrees). Subjective manual realignment for misaligned FoDi lines based on the FAZ resulted in significant change in the absolute and relative sectoral RNFL thickness in both supero-temporal (ST) section (p = 0.016 for absolute and p = 0.031 for relative thickness) and inferonasal (IN) section (p = 0.09 for absolute and p = 0.01 for relative thickness).

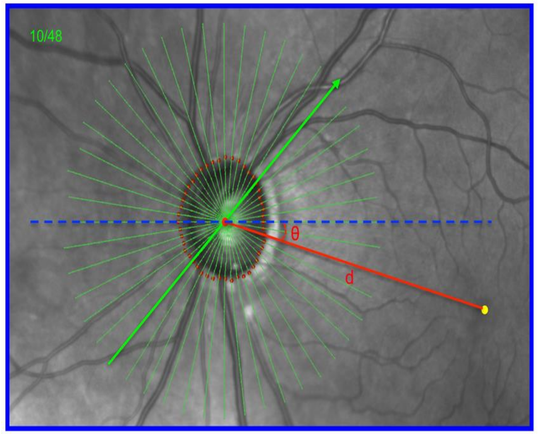
3- Manual realignment of FoDi line had significant impact on sectorial RNFL thickness in the superotemporal and inferonasal sections. Consecutive scans for the same eye were noted to be consistent in the degree of misalignment of the FoDi line suggesting a likely structural cause.

Comparing sectorial RNFL thickness pre and post manual FODI alignment.

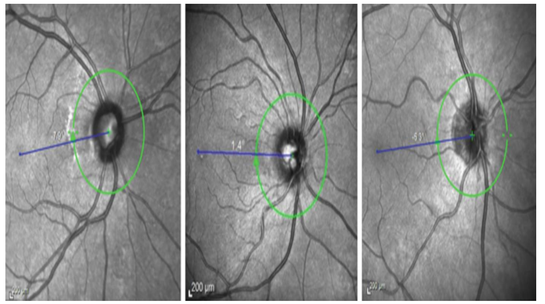
	Pre-FODI alignment		Post-FODI alignment		Parried t test at 95%CI	
	Mean	SD	Mean	SD	t	P- value
T. relative	1.15	0.30	1.16	0.32	-0.49	0.63
TS. relative	0.77	0.31	0.80	0.30	-2.21	0.03
TI. relative	0.85	0.35	0.87	1.26	0.21	0.97
N. relative	1.01	0.72	0.93	0.35	-1.60	0.12
NS. relative	0.85	0.34	0.81	0.37	1.88	0.07
NI. relative	1.00	0.64	0.94	0.60	2.67	0.01
G. relative	0.91	0.31	0.93	0.33	-1.55	0.13

Relative: percentage of RNFL thickness in our cohort in relation to age matched RNFL.
T: Temporal sector TS: supertemporal TI: inferotemporal
N: nasal sector NI: inferonasal NS: superonasal G: average RNFL thickness

FoDi angle in Spectralis OCT disc



Positive FoDi angle for foveal location above horizontal line versus negative FoDi angles for foveal location below the horizontal line



Conclusion

In this audit of the performance of FoDi technology in uveitis patients, we noted that misalignment occurred in at least 1 in 5 patients and was sufficiently common to cause statistically significant alterations in RNFL measurements for some sections. This may affect the early detection of glaucomatous optic neuropathy. The misalignment appears to be consistent within the same patient and therefore even in these misaligned scans RNFL measurements may usefully detect change over time, however as a general principle clinical staff should consider FoDi alignment as part of the RNFL assessment.

References

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