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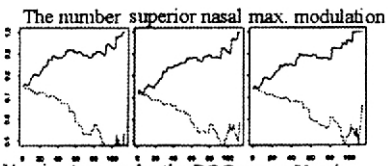
INCREASED NASAL AND TEMPORAL RETINAL NERVE FIBER LAYER THICKNESS MEASUREMENTS IN THE GDx, A SCANNING LASER POLARIMETER, ARE RELIABILITY "RED-FLAGS". E.Z. Blumenthal, C. Bowd, C.C. Berry, L. Zangwill, R.N. Weinreb. Glaucoma Center and Diagnostic Imaging Laboratory, University of California, San Diego.
Purpose: To evaluate whether GDx RNFL thickness measurements of the temporal and nasal parapapillary retina can serve as a reliability criteria to flag a subset of scans as unreliable (having reduced diagnostic value). **Methods:** 54 normal subjects and 68 glaucoma patients were scanned. 16 GDx parameters were each used separately to predict the diagnosis (normal vs. glaucoma) by calculating sensitivity and specificity. A preliminary analysis established that RNFL thickness in the two nasal and two temporal 22.5 degree sectors does not differentiate between normal and glaucoma eyes (p-values between 0.21 - 0.99). We then removed the subjects with the thickest temporal & nasal values, one by one, recalculating the area under the ROC curve, for each standard parameter, each time. We also re-ran this analysis removing (one by one) the subjects with the thinnest values. **Results:** For 12 out of 16 parameters, a statistically significant correlation was found between thin nasal-temporal RNFL thickness and accurate diagnosis. 5 parameters (the Number, a linear discriminant function, superior-nasal, maximal modulation, ellipse modulation) were highly statistically significant at the $p<0.001$ level (via permutation test). **Conclusions:** For most GDx parameters, scans with thick temporal and nasal RNFL thickness have reduced diagnostic value. Using temporal and nasal thickness as a reliability criterion could assist clinicians in interpreting GDx test results and may provide additional insight on how this technology might be improved. We speculate that these findings may stem, at least in part, from a corneal polarization-axis artifact.



Y-axis: Area under the ROC curve. X-axis: Number of subjects removed. Thick line: Subjects with thick temporal-nasal RNFL thickness removed. Thin line: Subjects with thin temporal-nasal RNFL thickness removed.

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