

Correlating OCT with Lens Density and Energy Required during Cataract Extraction

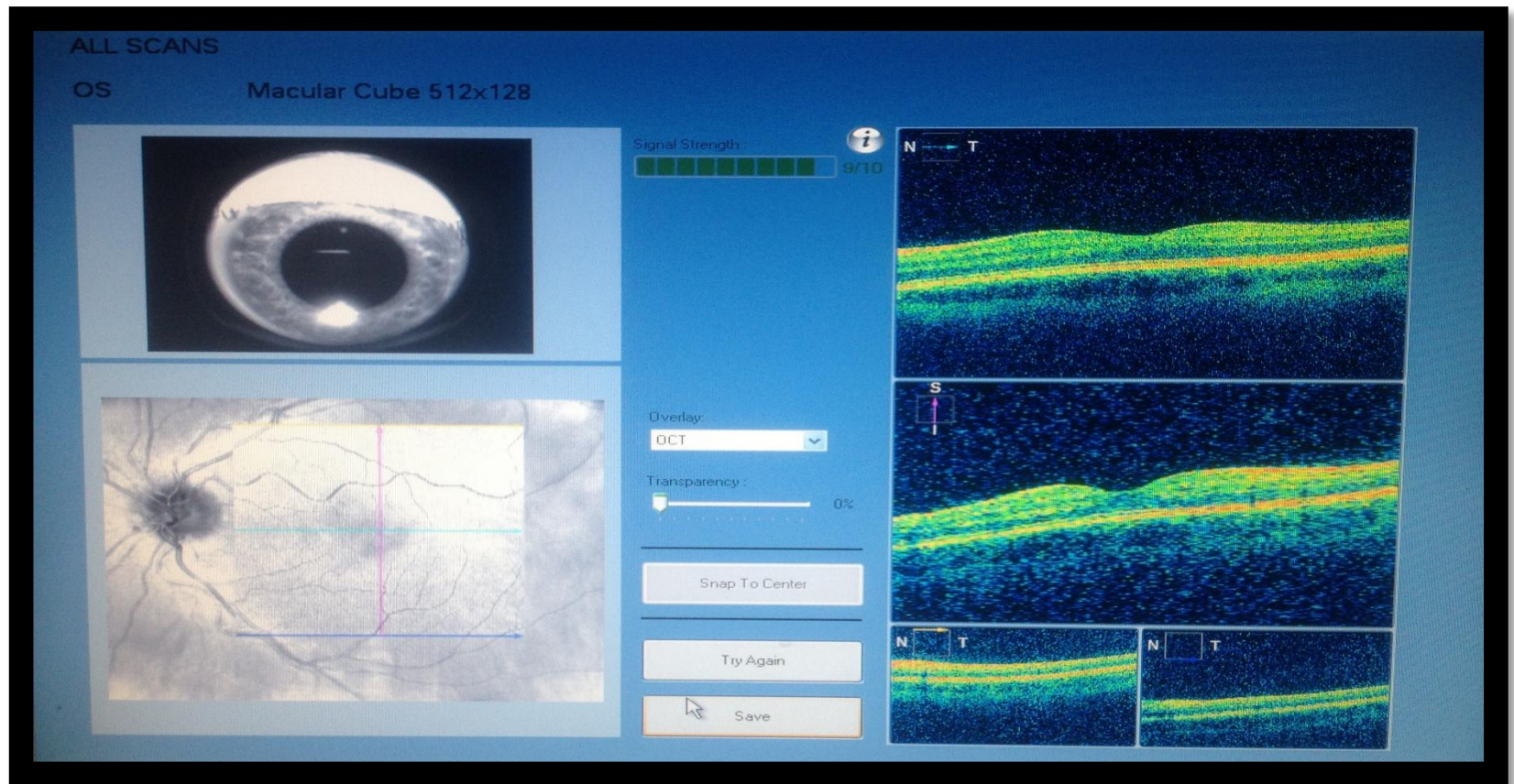
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- ▶ The authors do not report any financial interests in this presentation.

OCT and Cataract Density

- ▶ OCT has become a ubiquitous instrument in ophthalmic practices.
- ▶ It requires light transmittance and reflection.
- ▶ The amount of light scattered and lost may reflect the density of the lens in patients with otherwise clear media.
- ▶ This lost light is reflected in the “signal strength”



Example OCT Display »»

Methods

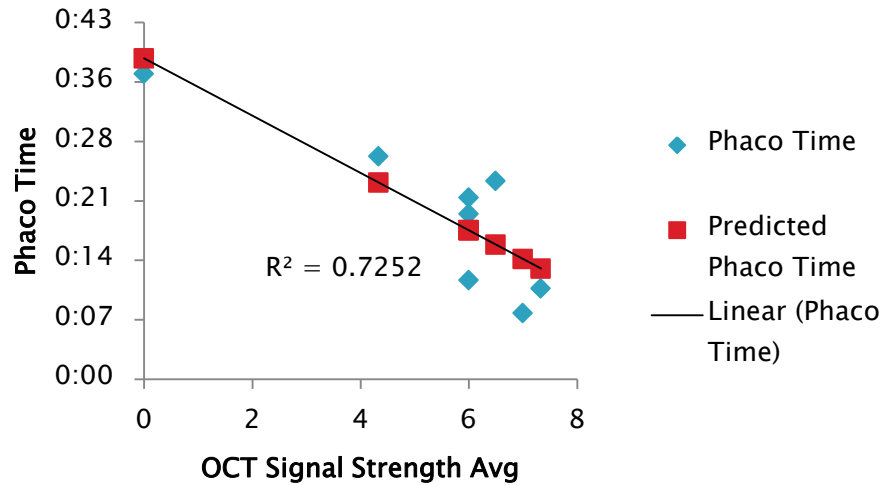
- ▶ Patients were identified who had required OCT prior to cataract extraction.
- ▶ The cataract was graded by a single observer.
- ▶ 512x128 macular cube OCT was obtained by a single technician on a Zeiss Cirrus SD OCT. Signal strength was recorded.
- ▶ Cataract extraction was completed in standard fashion by a single surgeon on a single phacoemulsification machine.

Results

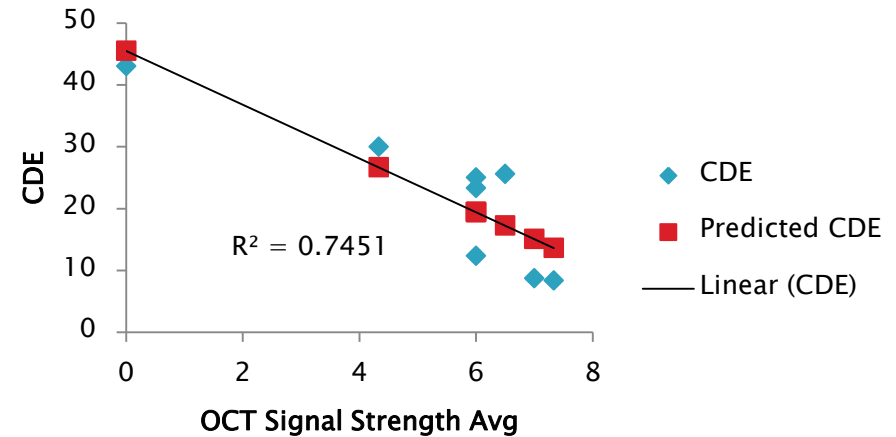
- ▶ 42 eyes were identified and 30 eyes had surgery completed.
- ▶ 21 eyes (16 operated) were nuclear sclerotic only
- ▶ 9 eyes (8 operated) had a posterior subcapsular component
- ▶ 14 eyes (8 operated) were predominately combined nuclear and cortical cataracts
- ▶ 2 combined cataracts were included in the posterior subcapsular group due to the prominence of the PSC component

OCT Signal Strength vs. Combined Cataracts

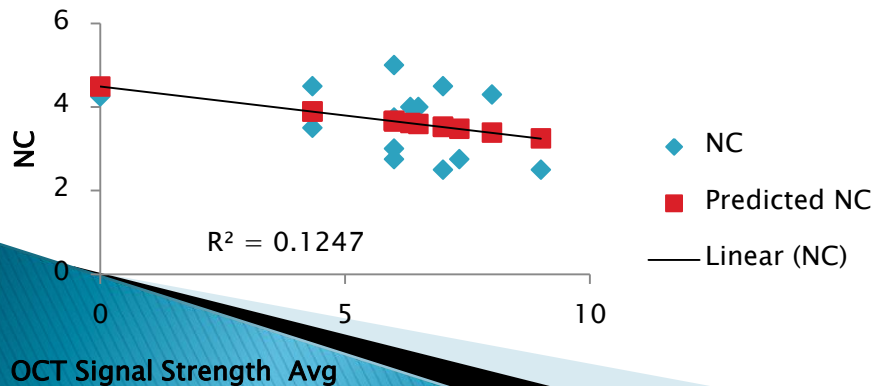
OCT Signal Strength vs Effective Phaco Time Avg Line Fit Plot



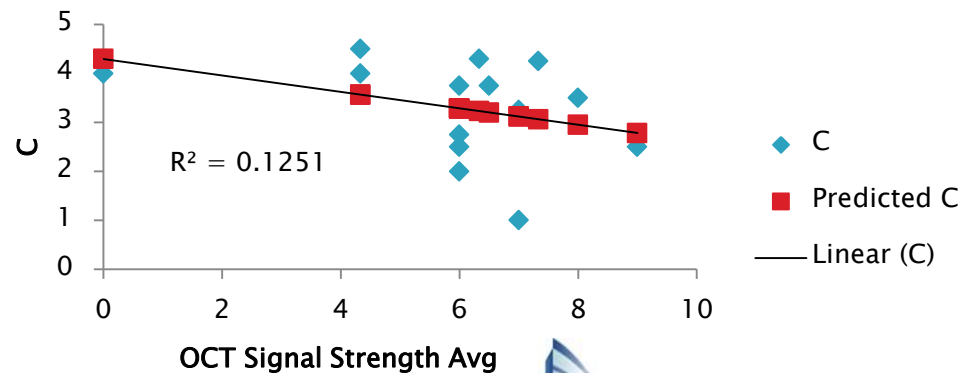
OCT Signal Strength vs. Cumulative Dissipated Energy Avg Line Fit Plot



OCT Signal Strength vs. Nuclear Color Avg Line Fit Plot

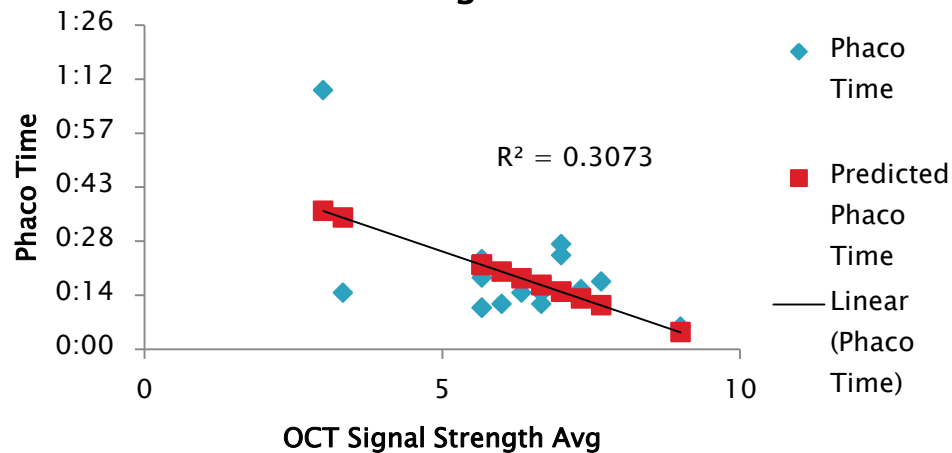


OCT Signal Strength vs. Cortical Grade Avg Line Fit Plot

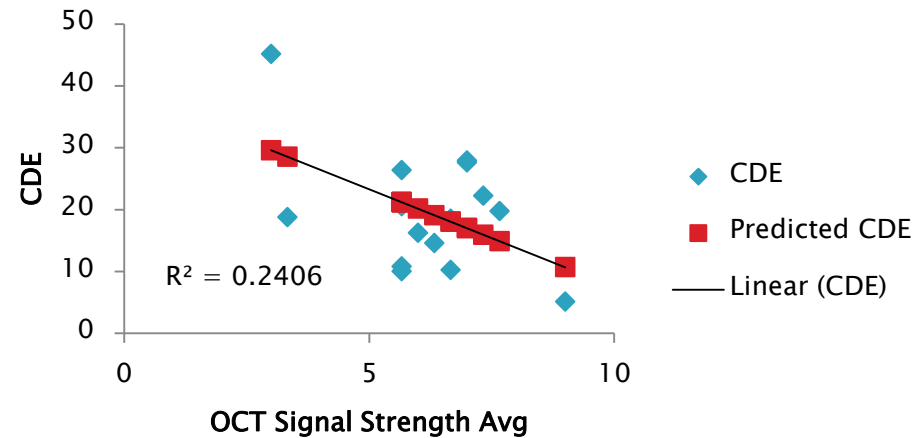


OCT Signal Strength vs. Nuclear Cataracts

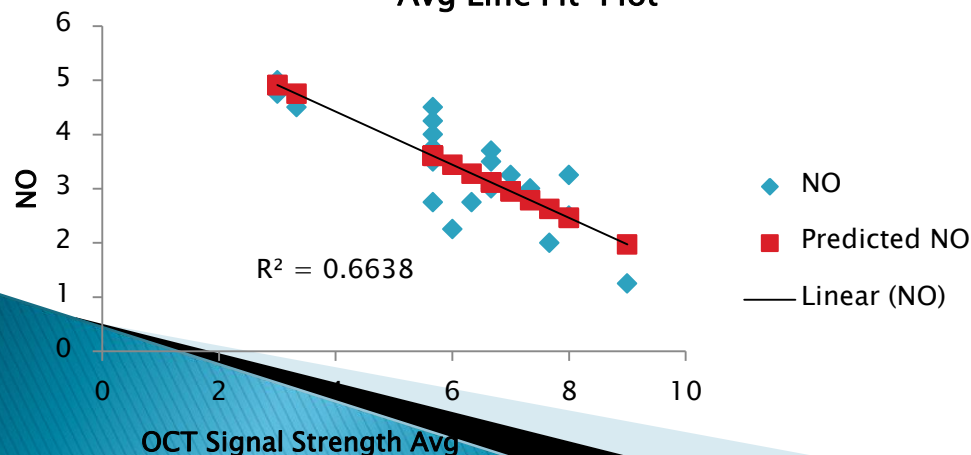
OCT Signal Strength vs. Effective Phaco Time Avg Line Fit Plot



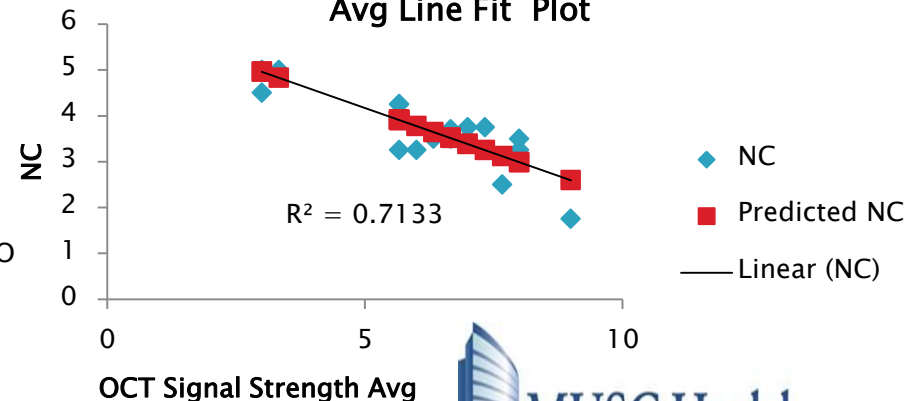
OCT Signal Strength vs. Cumulative Dissipated Energy Avg Line Fit Plot



OCT Signal Strength vs. Nuclear Opalescence Avg Line Fit Plot

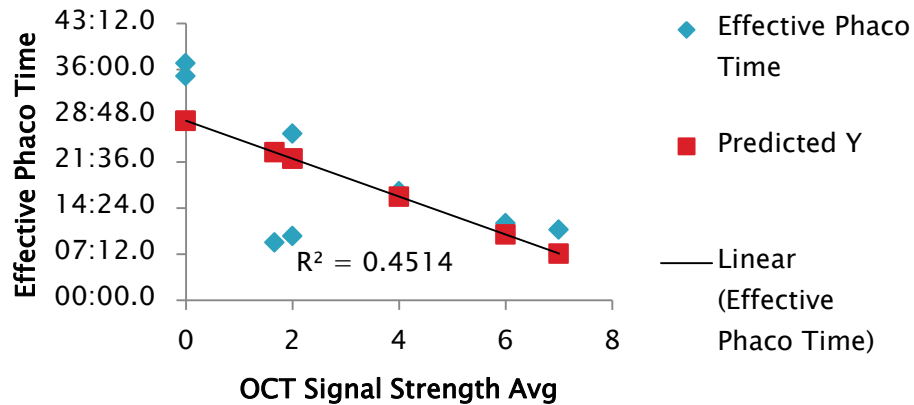


OCT Signal Strength vs. Nuclear Color Avg Line Fit Plot

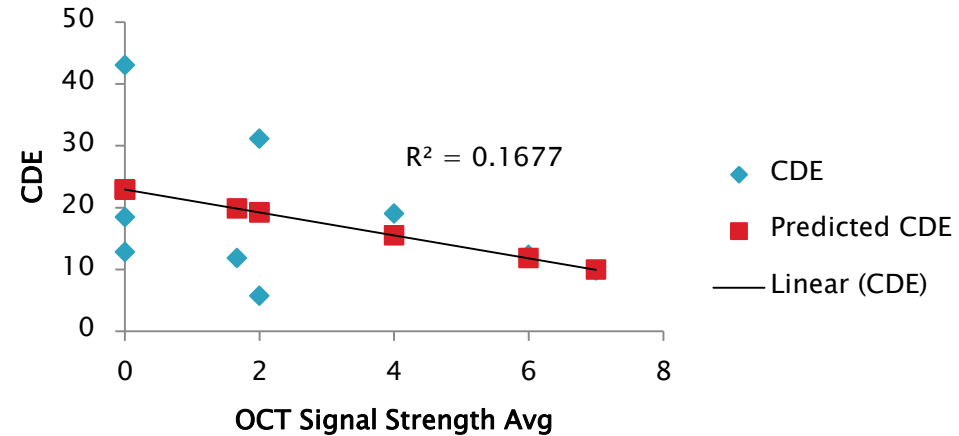


OCT Signal Strength vs. Predominately Posterior Subcapsular Cataracts

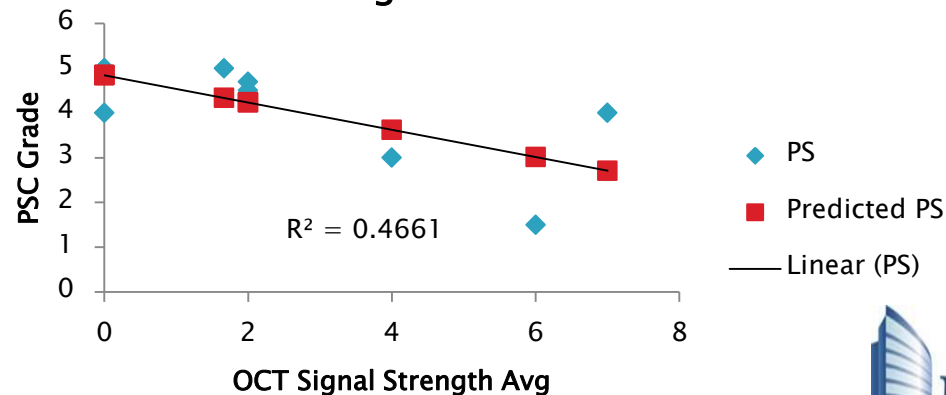
OCT Signal Strength vs. Effective Phaco Time Avg Line Fit Plot



OCT Signal Strength vs. Cumulative Dissipated Energy Avg Line Fit Plot



OCT Signal Strength vs. PSC Grade Avg Line Fit Plot



Conclusions

- ▶ The effective phaco time and cumulative dissipated energy correlated well with the OCT signal strength in combined cataracts, but not nuclear or posterior subcapsular cataracts
- ▶ The nuclear color and opalescence grades correlated well with OCT signal strength in nuclear cataracts
- ▶ A pre operative OCT may provide predictive information for surgery in patients with combined cataracts

Limitations

- ▶ All surgeries were performed by a single resident surgeon with limited experience. The technique was standard divide and conquer but the surgeon skill level likely improved during the study.
- ▶ Please contact us with any questions at magrath@musc.edu