



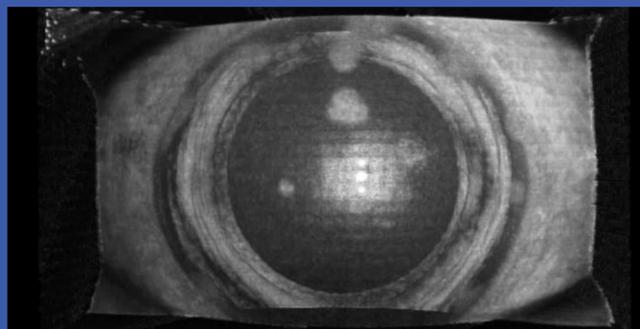
Hyper-Parallel Optical Coherence Tomography Imaging of Herpes Zoster Keratitis



Mauranda Men, AB; Nina Cherian, BS; Edmund Tsui, MD

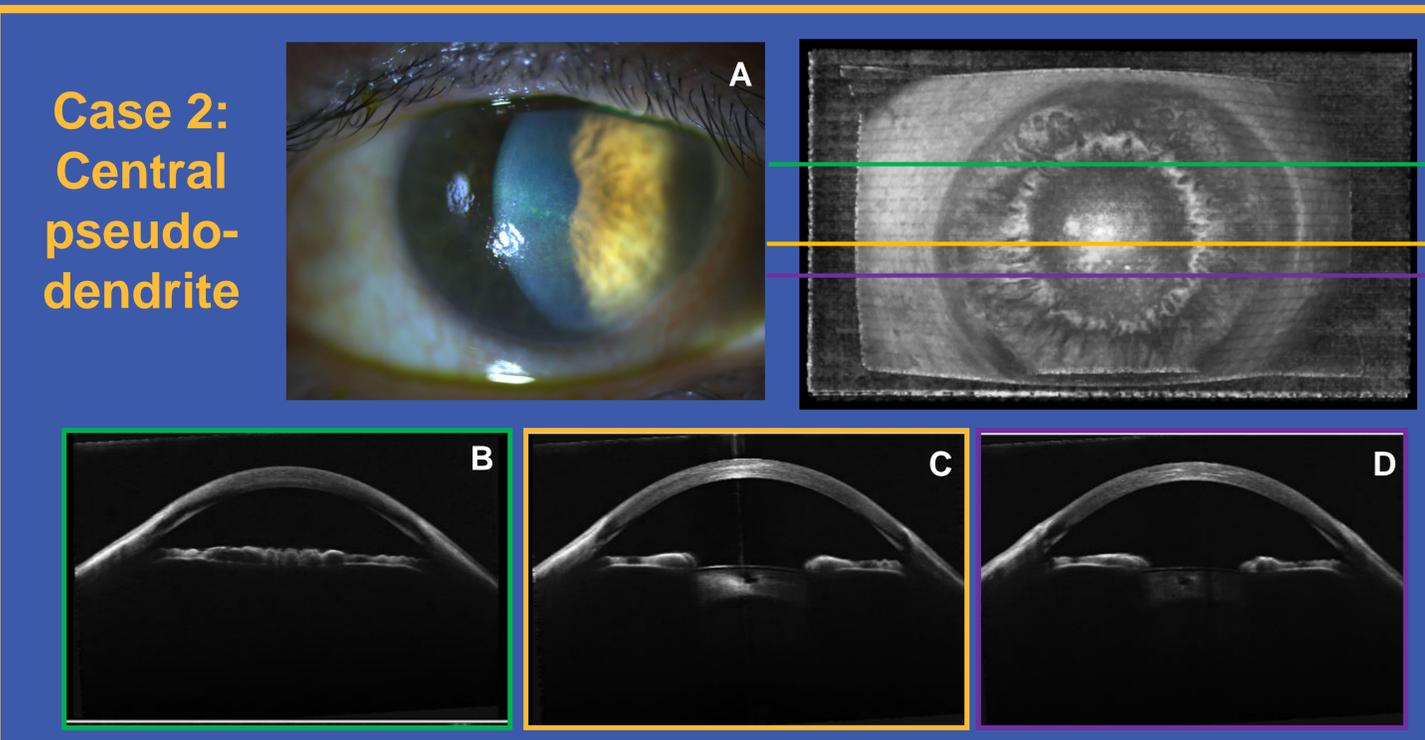
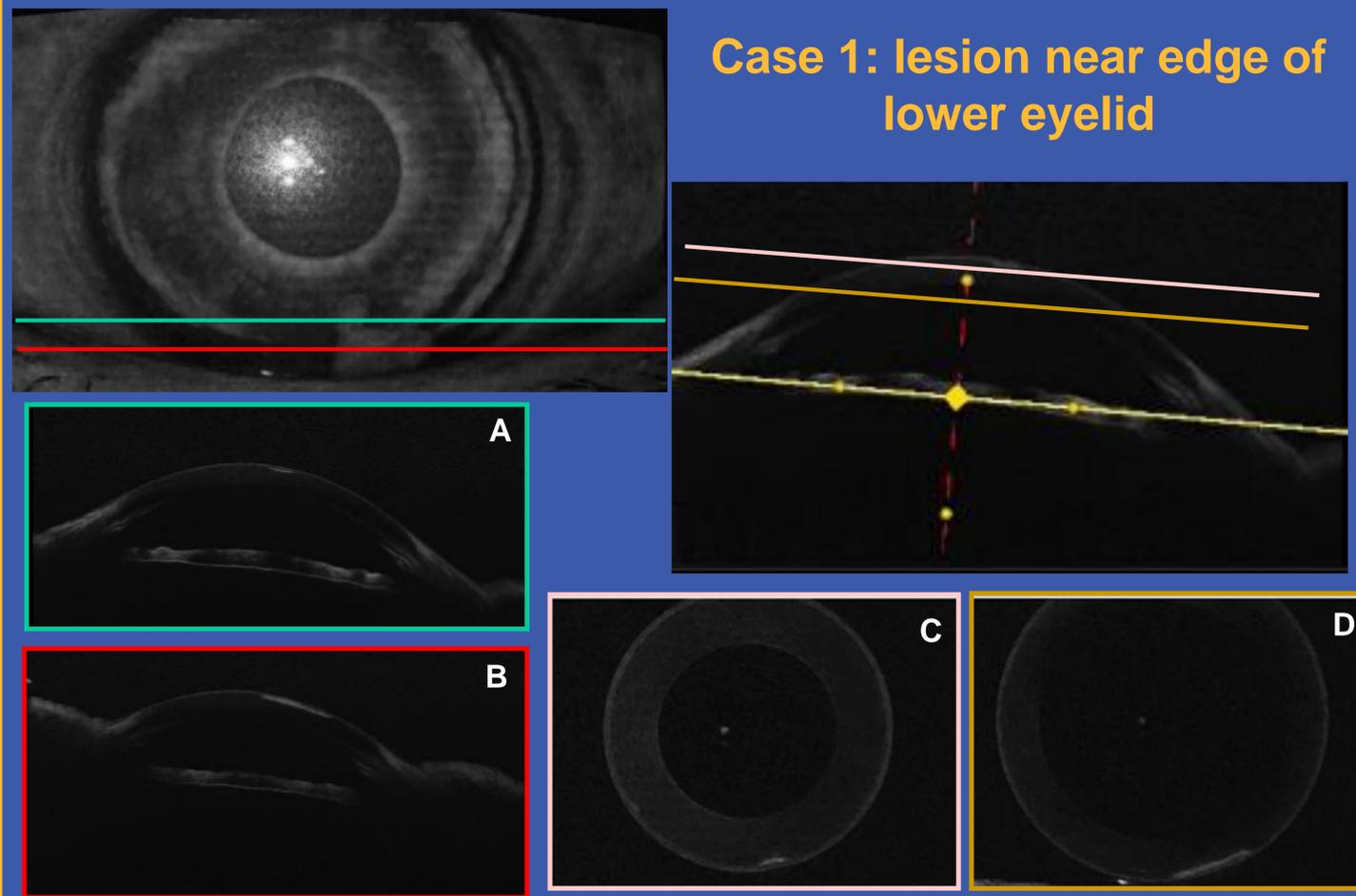
Background

- Optical coherence tomography (OCT) is a widely used ocular imaging modality, often clinically focused on the retinal layers in the back of the eye.
- Hyper-Parallel OCT, or HP-OCT, splits the 840nm light into 1008 individual beamlets, projected as a grid over a 16.8x9.6mm area of the eye.
- This fine subdivision allows for images of the entire anterior of the eye to be captured noninvasively within one second.
- Additionally, the individual images can be stitched together to create a volumetric scan of the eye (video below).



Significance

- Compared to existing imaging modalities, HP-OCT provides a much wider field of view in a shorter capture time.
- Importantly, this large amount of diagnostic knowledge can be acquired with relatively little technical expertise.
- This accessibility opens the doors to conveniently monitoring the status of patients with all sorts of corneal ulcers or other anterior segment disease over time.



Methods

- HP-OCT images were obtained in patients with herpes zoster keratitis.
- Any slice of interest can be selected after acquisition to identify diagnostic findings or analyze biometric data such as chamber volume or corneal thickness.

Discussion

Case 1:

Figure shows B-scans (A,B) at their corresponding location by color, where the lesion can be seen lighter than the rest of the corneal stroma. Additionally, the volumetric synthesis allows coronal sectioning of the eye (C,D), where the lesion can be similarly identified.

This patient's corneal scar from stromal keratitis is stable but still monitored for any signs of change. This HP-OCT scan could identify any corneal thinning or associated pathology.

Case 2:

Figure includes a slit-lamp photograph of the feature on the surface of the cornea (A), identifiable by the fluorescent pigment near the center. There are also B-scans of the eye at different sections, with B showing a healthy area and C and D showing the changes within the corneal stroma.

This patient has epithelial keratitis, so the pseudodendrite is more superficial. These depth differences are important in diagnosing corneal disease. The progress of similar cases (lesion size, depth) could be tracked via HP-OCT.