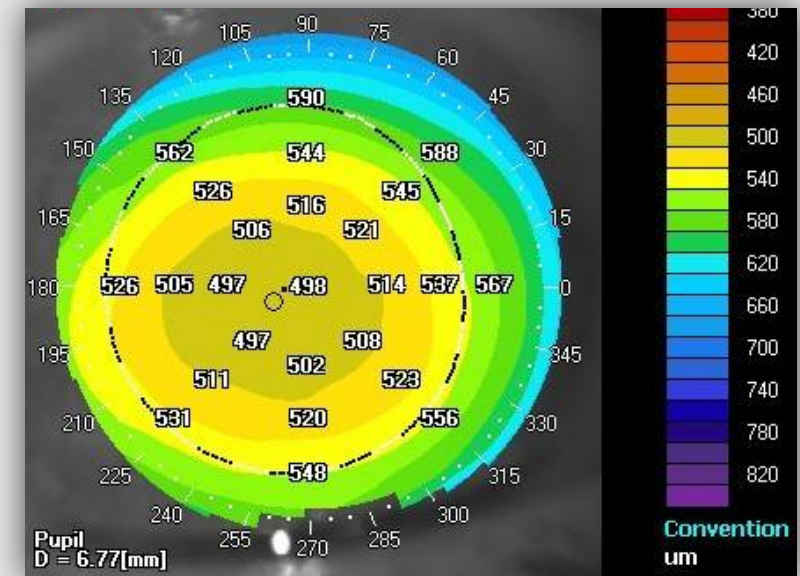
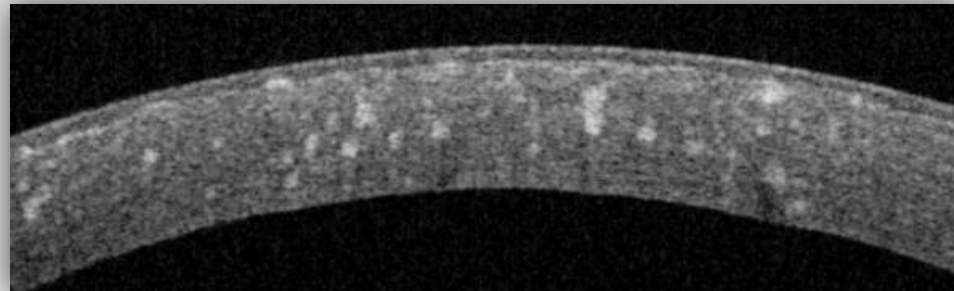
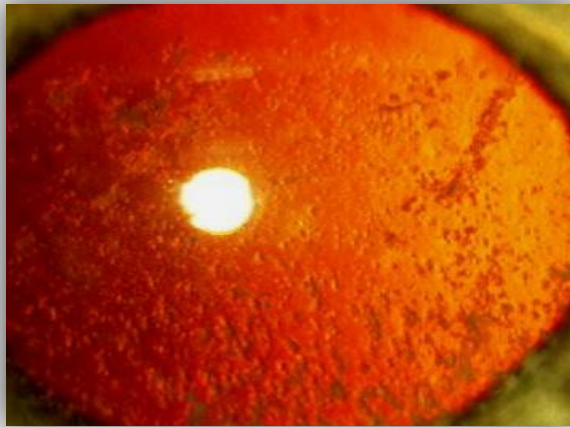




Edward Wylęgała

# Anterior OCT in corneal dystrophies



Author has no financial interest in this presentation



# Aim of Presentation:

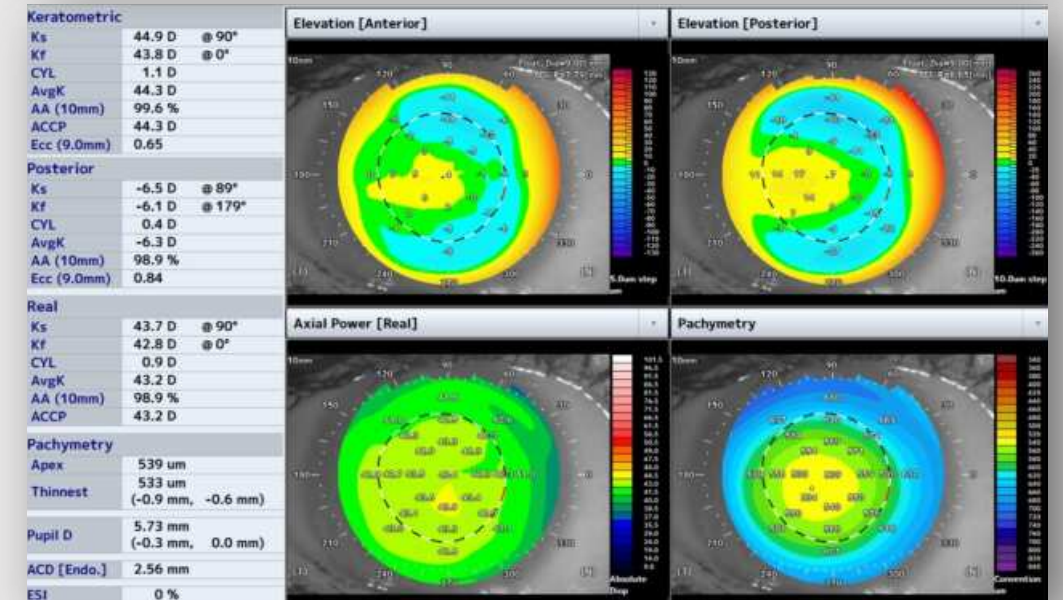
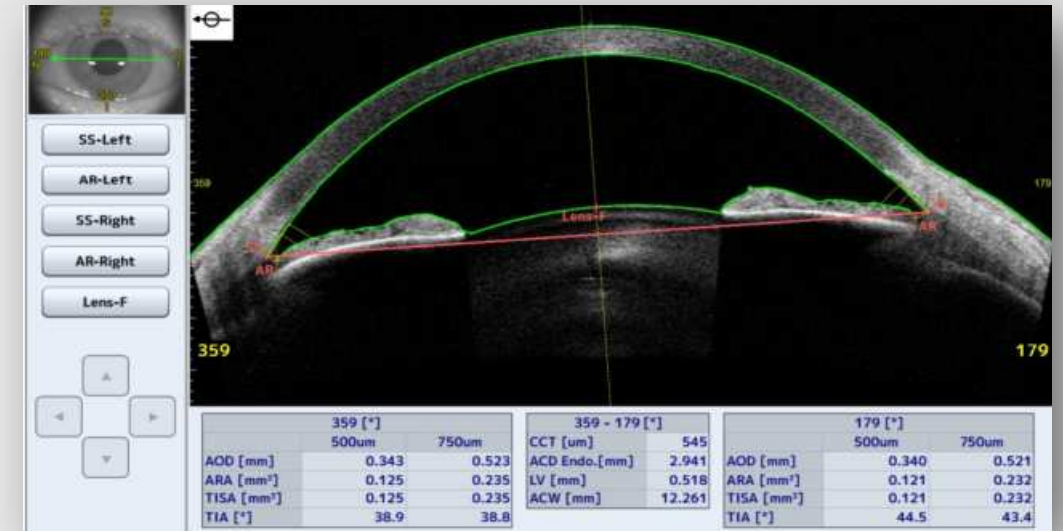
To explore the diagnostic potential and clinical relevance of Anterior Optical Coherence Tomography (OCT) in the assessment and management of corneal dystrophies.





# Clinical application of optical coherence tomography of the anterior segment of the eye

- ✓ Corneal morphology
- ✓ iridocornealangle morphology
- ✓ Morphometric measurements
- ✓ Keratometric measurements





+++Rozdzielczość

## AS-OCT in our clinic



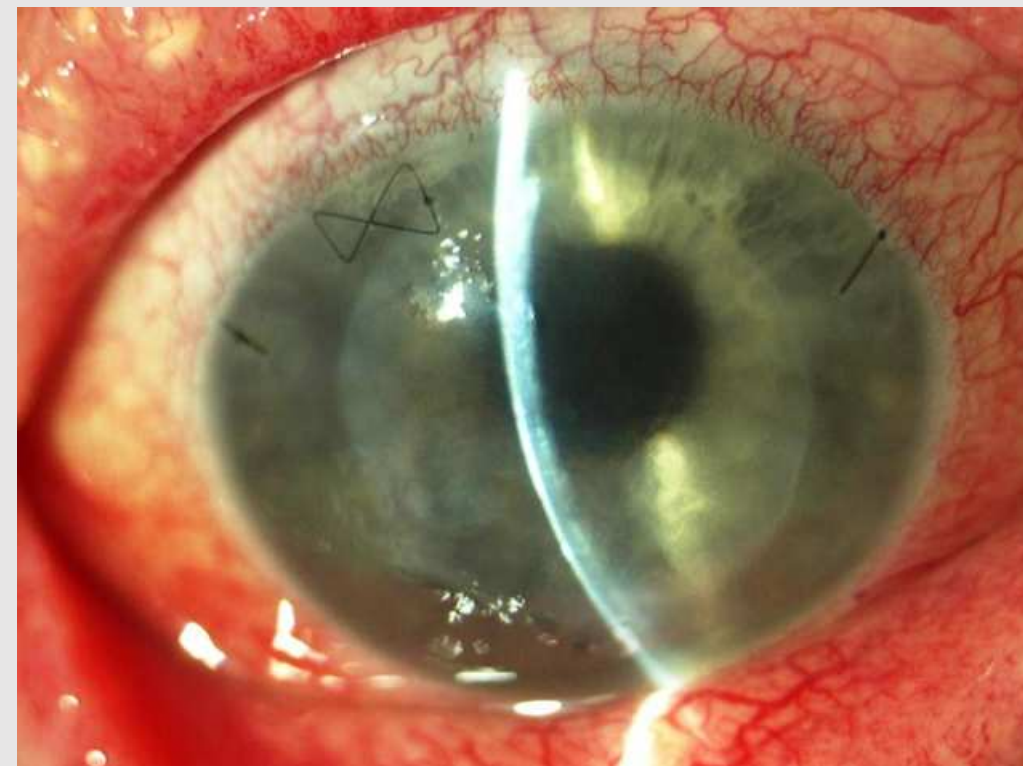
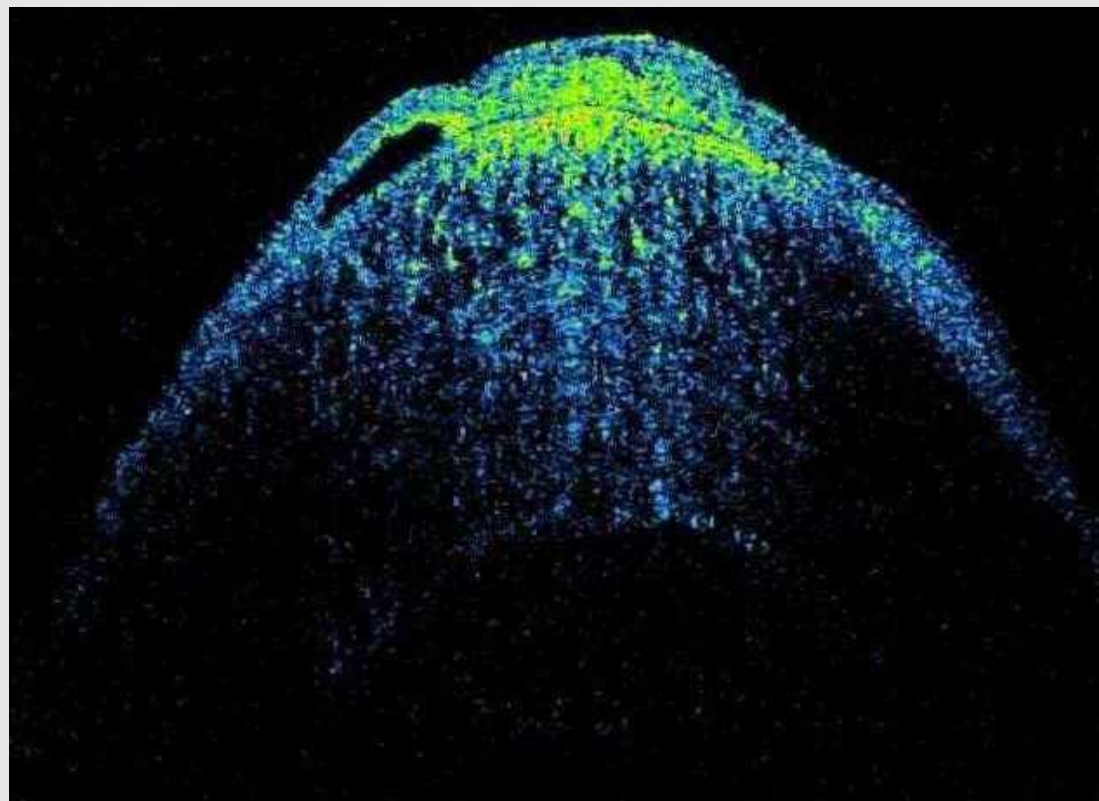
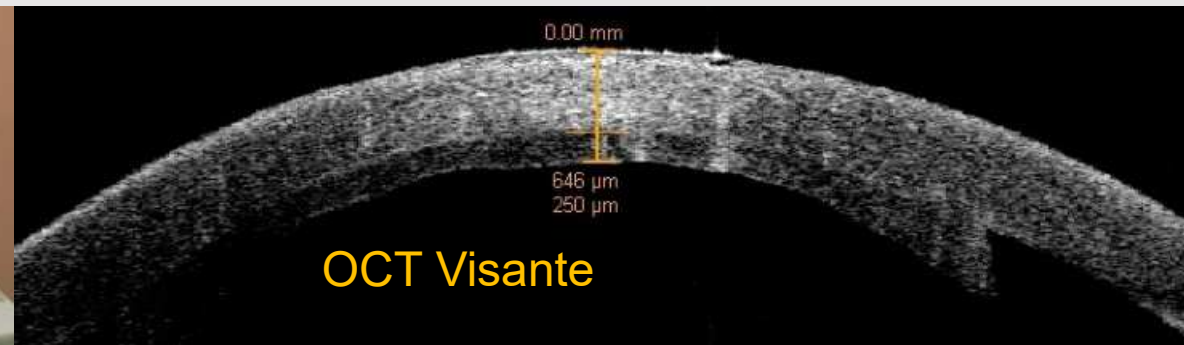


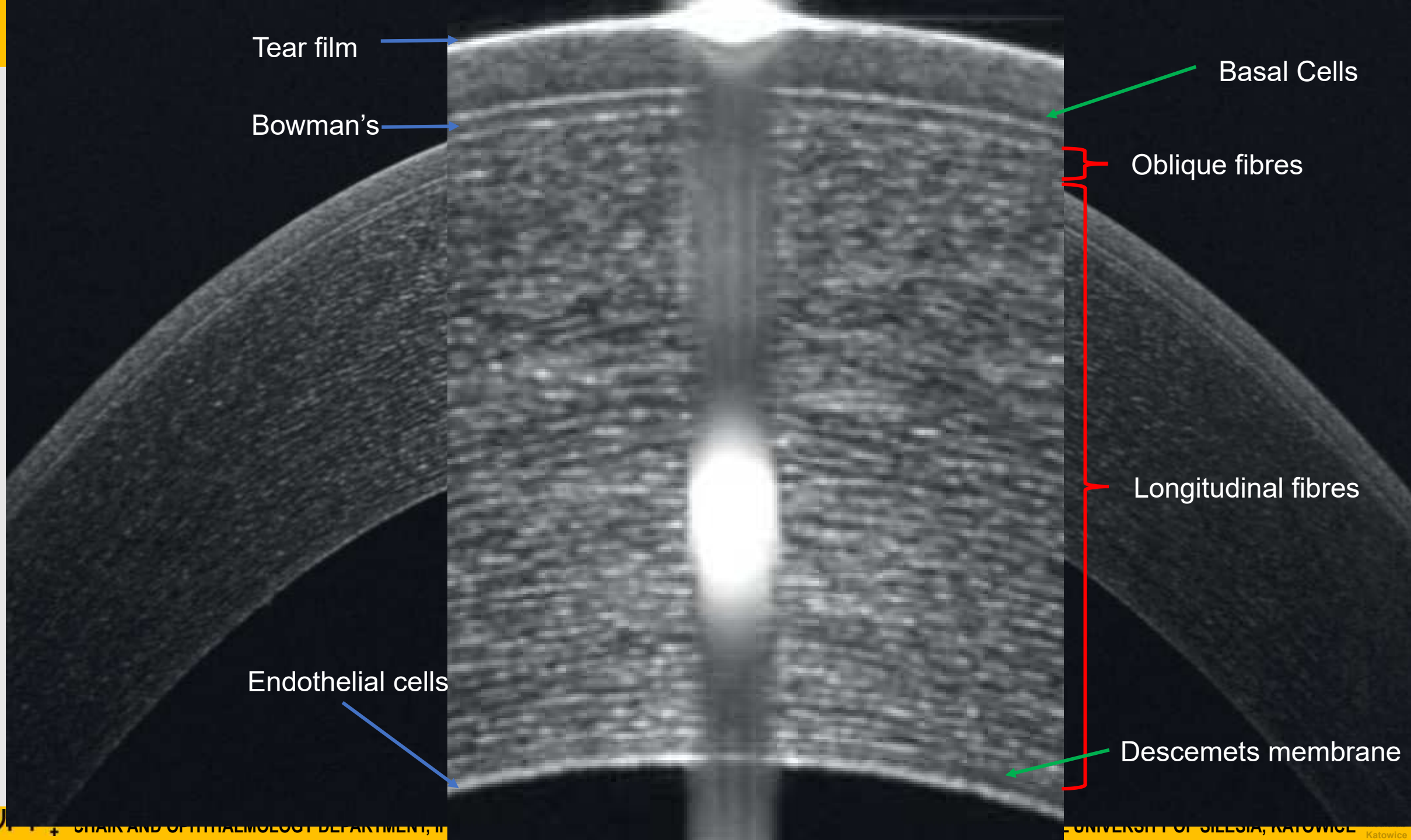


# DSEK 2006

7 days after surgery

SOCT protot





Tear film

Bowman's

Basal Cells

Oblique fibres

Longitudinal fibres

Endothelial cells

Descemet's membrane



# The IC3D Classification of the Corneal Dystrophies

[www.corneasociety.org/ic3d](http://www.corneasociety.org/ic3d)  
Cornea Volume 27,

Suppl. 2, December 2008

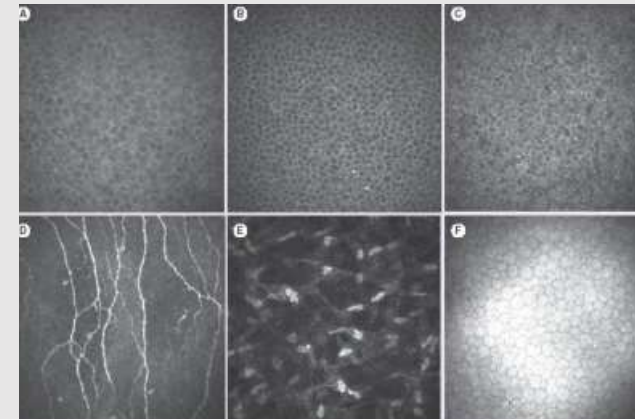
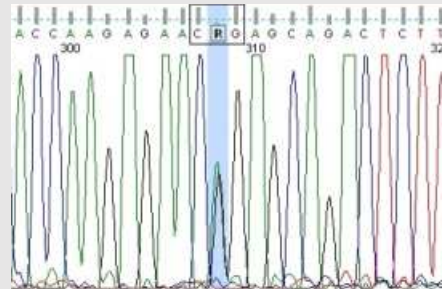


**I** = International

**C** = Committee

**3** = Third-generation classification

**D** = of Corneal Dystrophies



Our proposed corneal dystrophy classification system is anatomically based, with dystrophies classified according to the layer chiefly affected ([www.corneasociety.org/ic3d](http://www.corneasociety.org/ic3d)). Thus, they are epithelial and subepithelial, Bowman layer, stromal and those affecting Descemet membrane and the endothelium





# Epithelial and Subepithelial Dystrophies

EBMD - Epithelial basement membrane dystrophy

ERED - Epithelial recurrent erosion dystrophy

SMCD - subepithelial mucinous corneal dystrophy

MECD - Meesmann corneal dystrophy

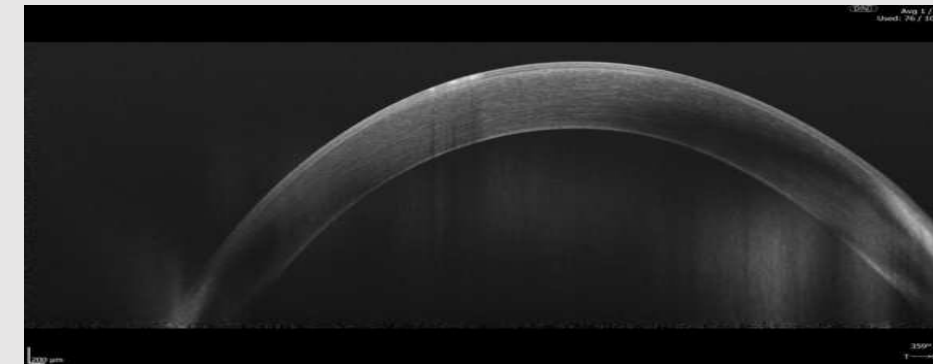
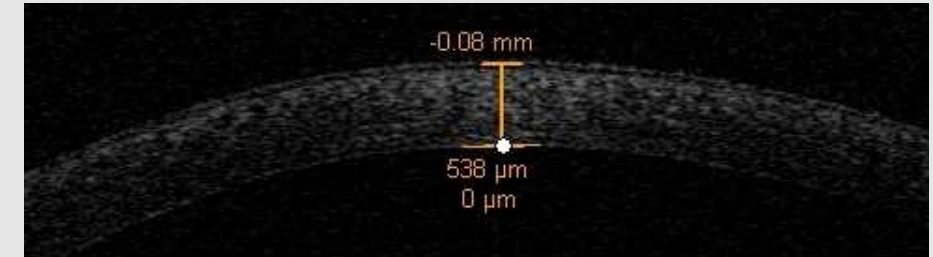
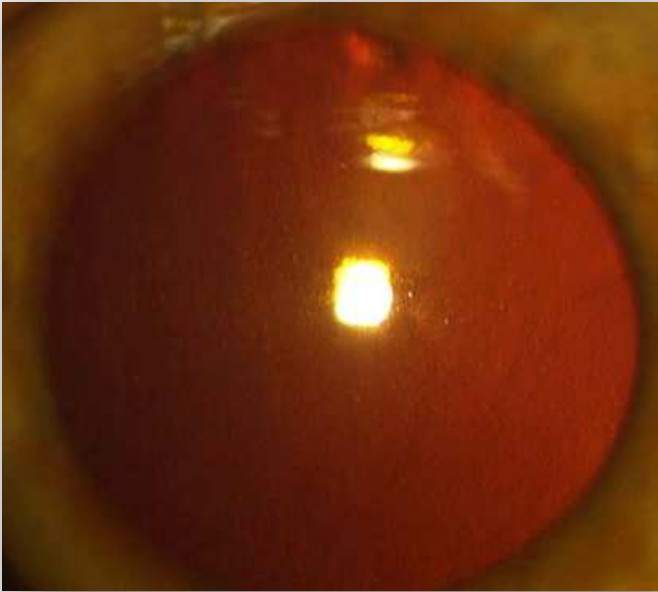
LECD - Lisch epithelial corneal dystrophy

GDLD - Gelatinous drop-like corneal dystrophy

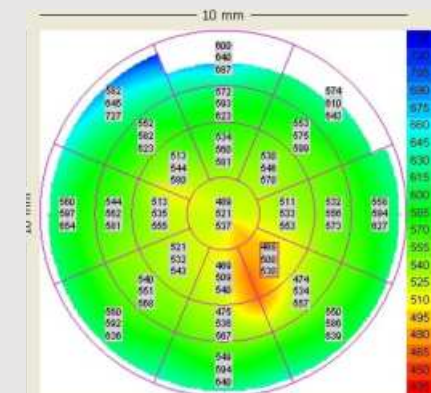




# MECD - Meesmann corneal dystrophy

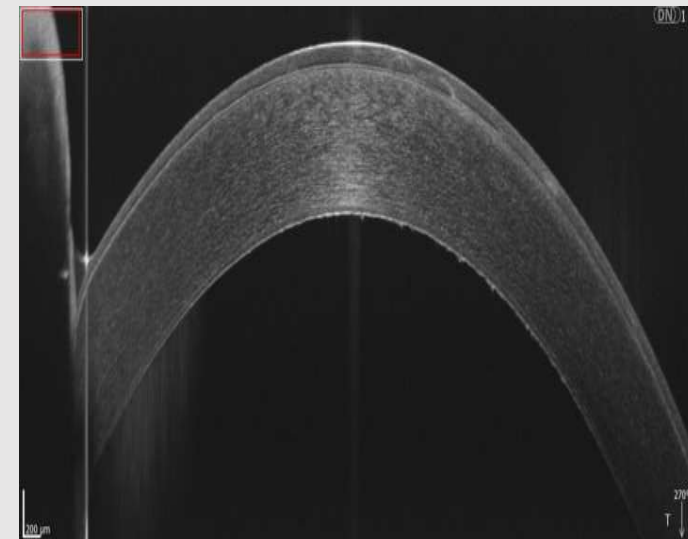
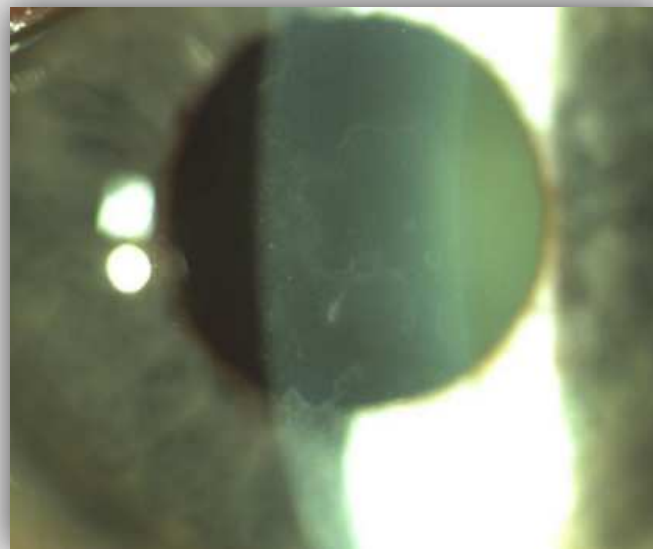


- Diffuse hyperreflectivity in the epithelial layer with hyperreflective spots in superficial layers
- Irregular epithelial thickness observed in affected regions
- Characteristic microcysts are visible with a clear demarcation from unaffected areas

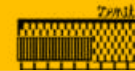




## Map-dot-fingerprint Dystrophy (Epithelial Basement Membrane Dystrophy)



- Irregular and thickened epithelial basement membrane seen as duplications in OCT scans
- Hyperreflective dots correspond to intraepithelial pseudocysts
- Fingerprint patterns show as hyperreflective, wave-like structures within the epithelium



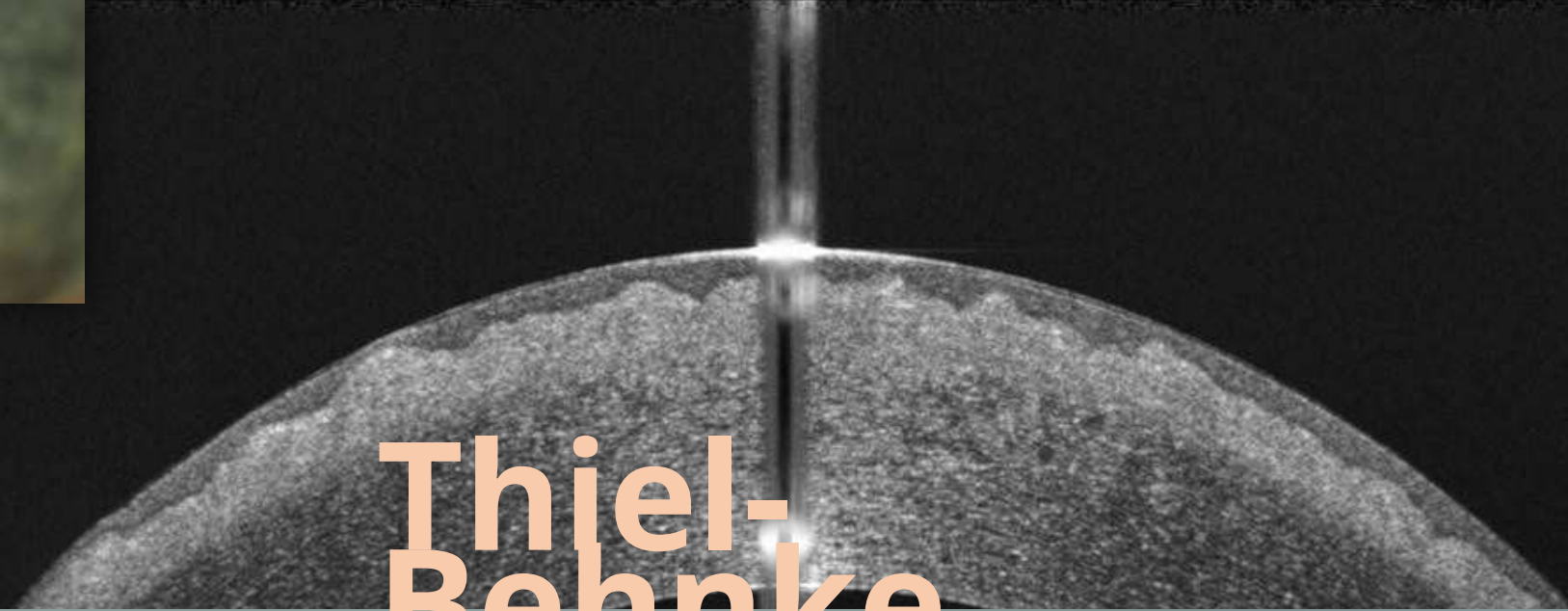
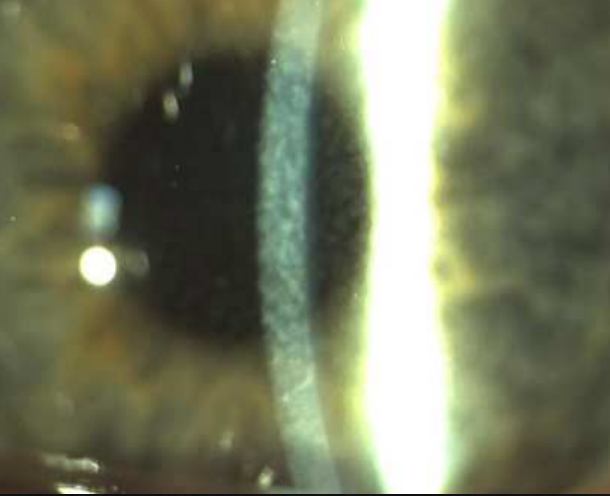
# Bowman Layer Dystrophies

TBCD - Thiel–Behnke corneal dystrophy

RBCD - Reis–Bücklers corneal dystrophy

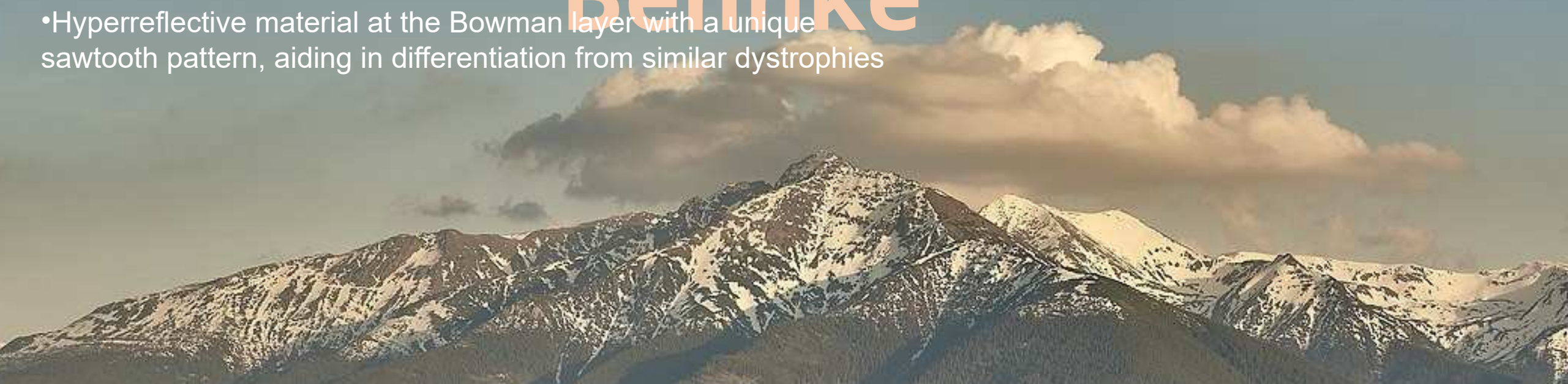
GWCD - Grayson –Wilbrandt corneal dystrophy





# Thiel-Behnke

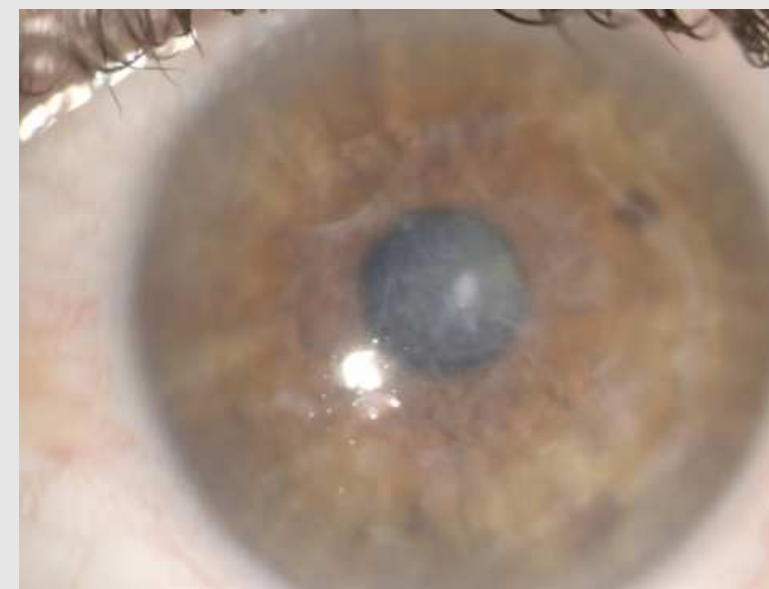
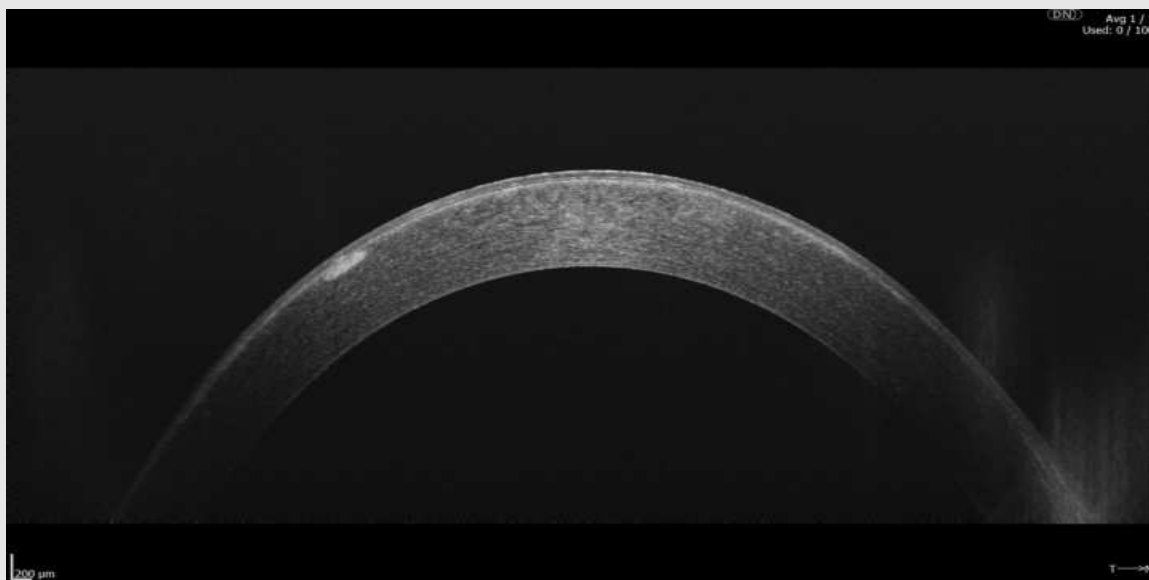
- Hyperreflective material at the Bowman layer with a unique sawtooth pattern, aiding in differentiation from similar dystrophies





# Reis-Bücklers Corneal Dystrophy (RBCD)

- Homogeneous hyperreflective deposits with serrated anterior border in Bowman layer
- Thickest centrally, thinning toward the limbus

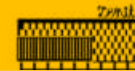




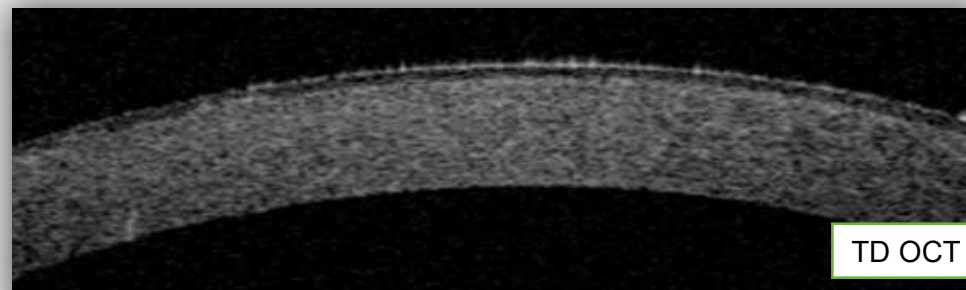
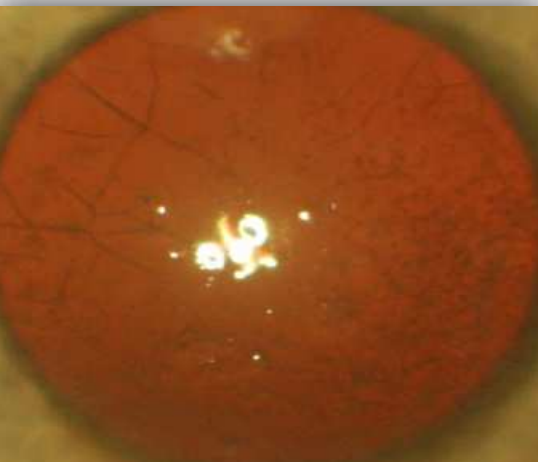
# Stromal Dystrophies

- **1. TGFBI corneal dystrophies;**
- **A. Lattice corneal dystrophy:** a. Lattice corneal dystrophy, TGFBI type (LCD): Classic lattice corneal dystrophy (LCD1) C1, variants (III, IIIA, I/IIIA, and IV) C1
- b. Lattice corneal dystrophy, gelsolin type (LCD2) C1 (This is not a true corneal dystrophy but is included here for ease of differential diagnosis)
- **B. Granular corneal dystrophy C1**
- a. Granular corneal dystrophy, type 1 (classic) (GCD1) C1
- b. Granular corneal dystrophy, type 2 (granular-lattice) (GCD2) C1
- c. Granular corneal dystrophy, type 3 (RBCD) = Reis–Bücklers C1
- **2. Macular corneal dystrophy (MCD) C1**
- **3. Schnyder corneal dystrophy (SCD) C1**
- **4. Congenital stromal corneal dystrophy (CSCD) C1**
- **5. Fleck corneal dystrophy (FCD) C1**
- **6. Posterior amorphous corneal dystrophy (PACD) C3**
- **7. Central cloudy dystrophy of François (CCDF) C4**
- **8. Pre-Descemet corneal dystrophy (PDCD) C4**

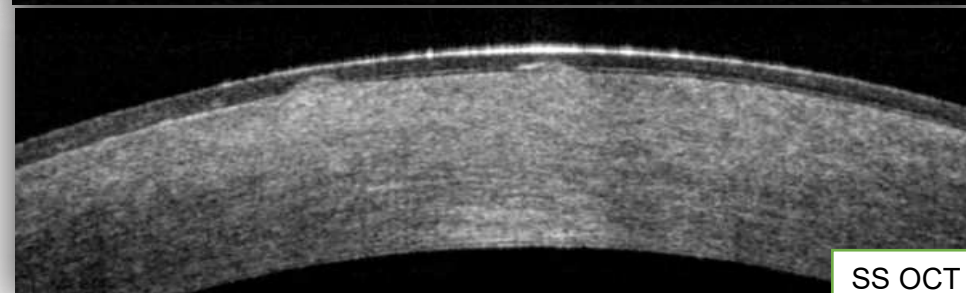




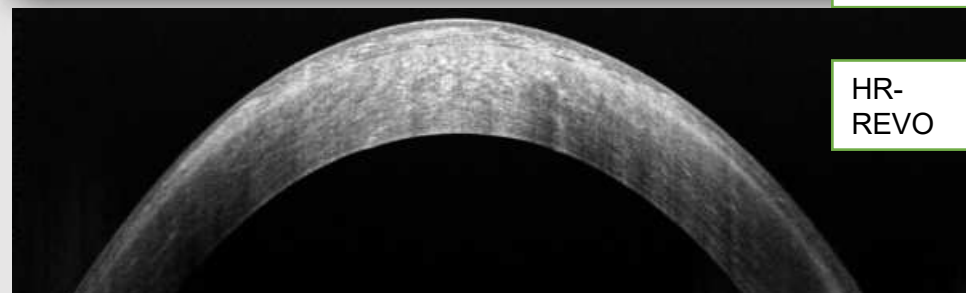
## LCD Lattice corneal dystrophy



TD OCT



SS OCT

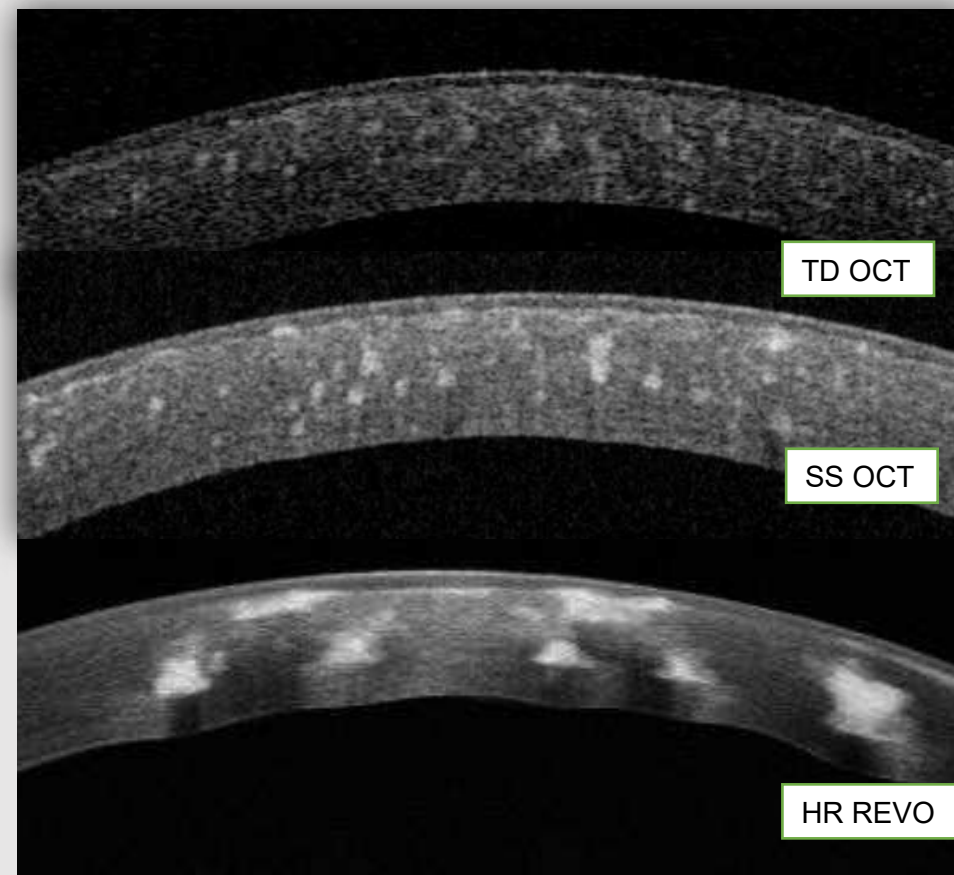
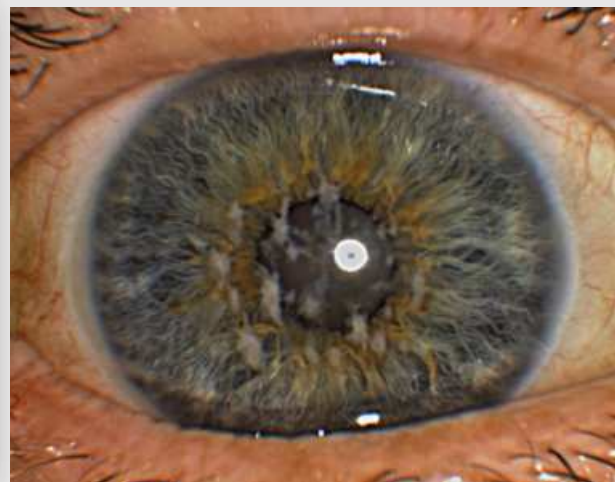
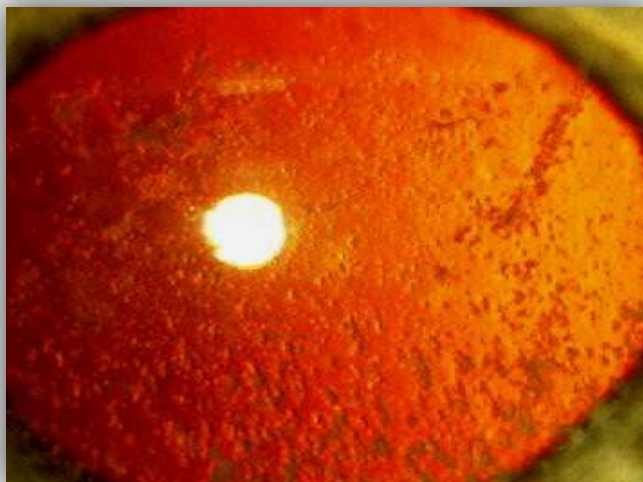


HR-REVO

- Ropy, linear hyperreflective structures, often affecting the Bowman layer and anterior stroma
- Variants may show lattice lines with diverse shapes and patterns, including thicker, ropier structures in intermediate and late-onset forms



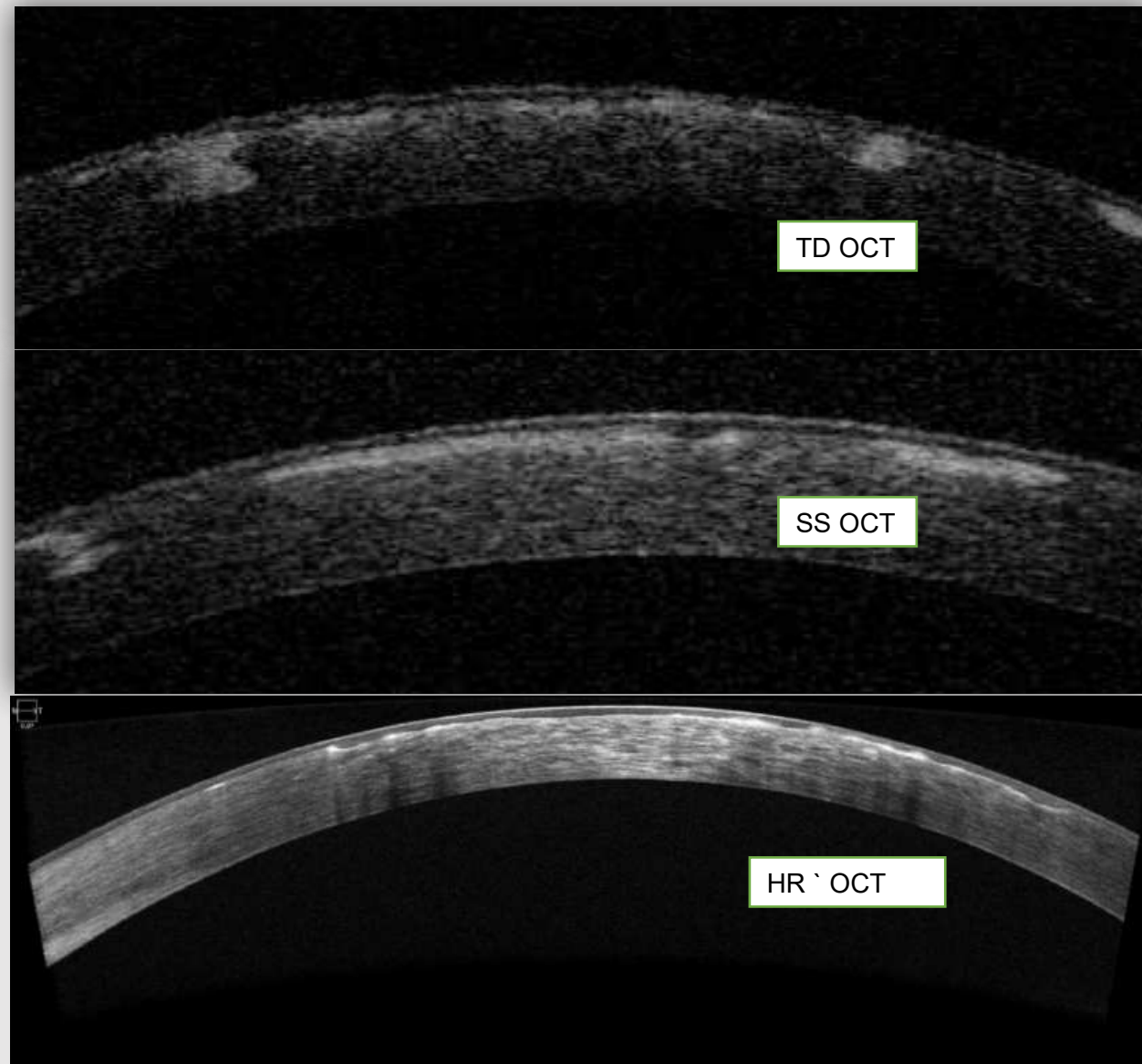
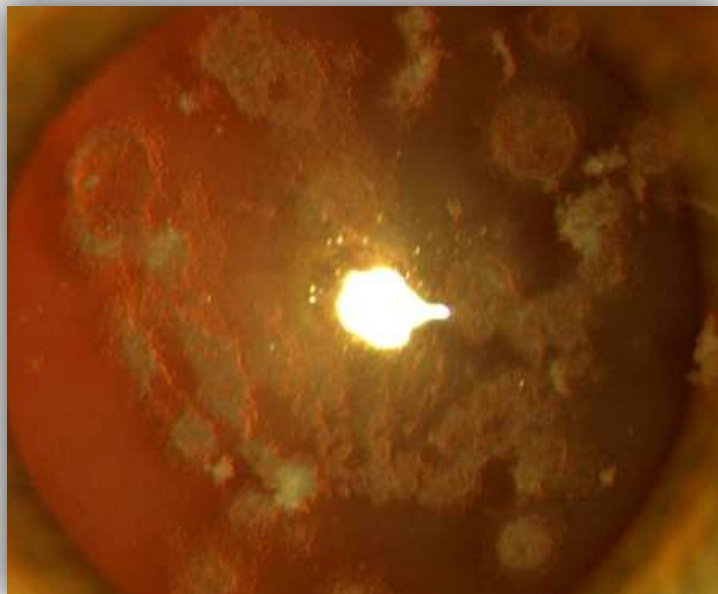
# GCD1 Granular corneal dystrophy, type 1



- Multiple hyperreflective stromal deposits with distinct borders from deep epithelium to Descemet membrane
- OCT shows well-defined deposits as "snowflake" patterns in stroma



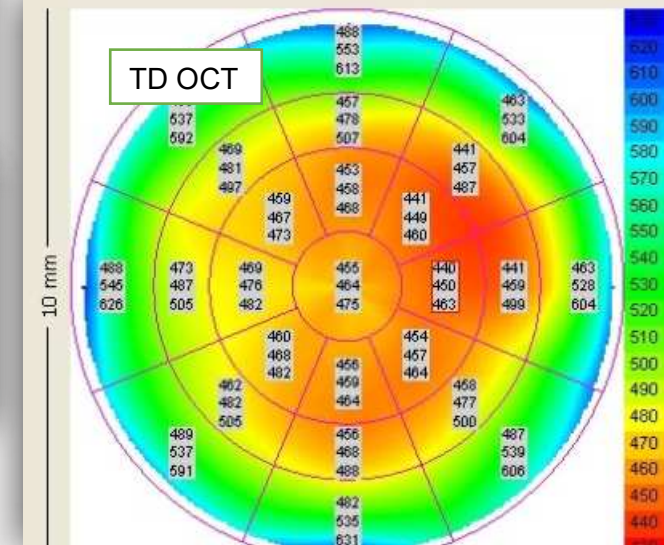
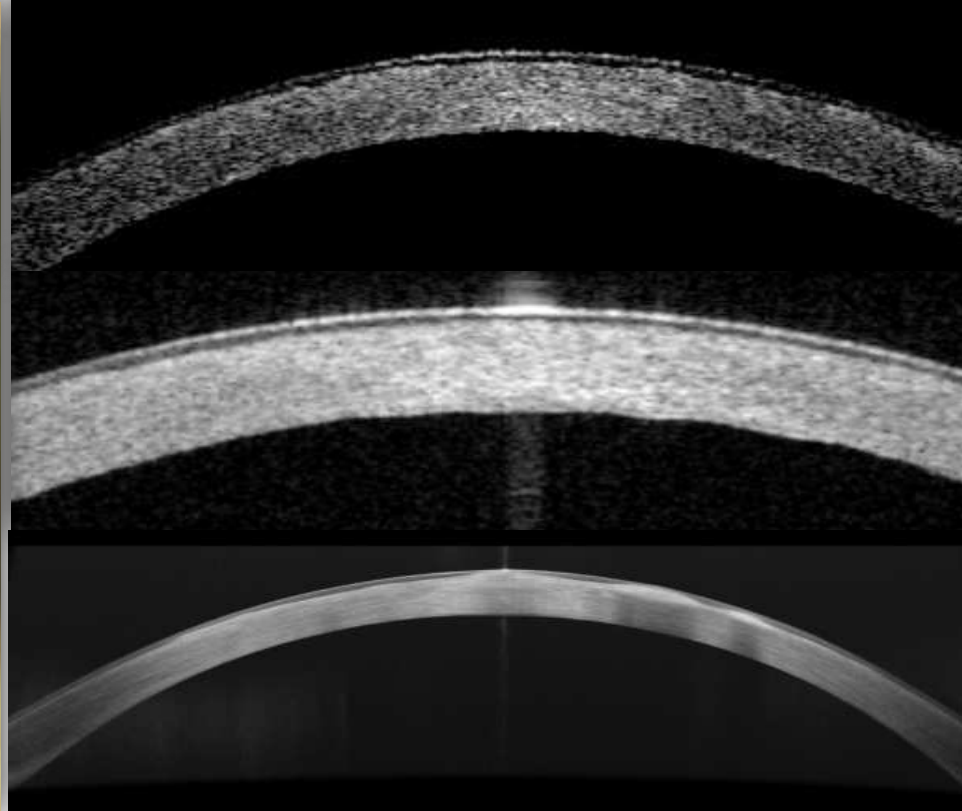
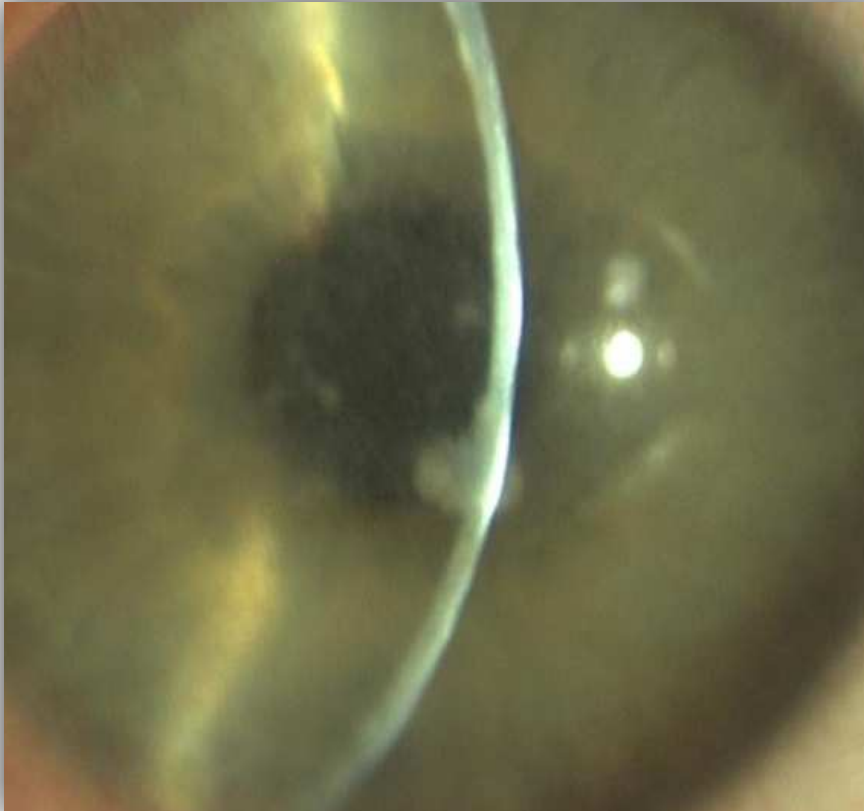
# GCD2 Granular corneal dystrophy, type 2 Avelino







# MCD Macular corneal dystrophy



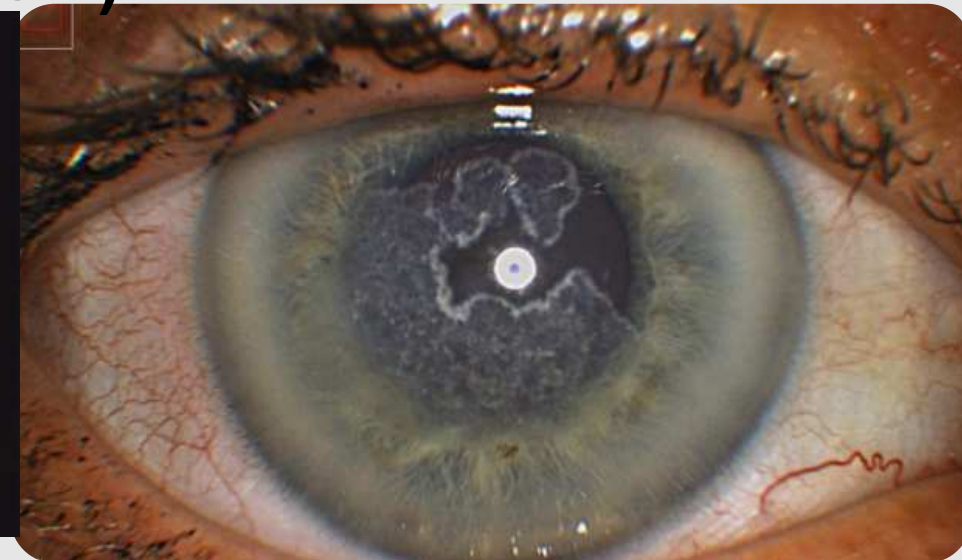
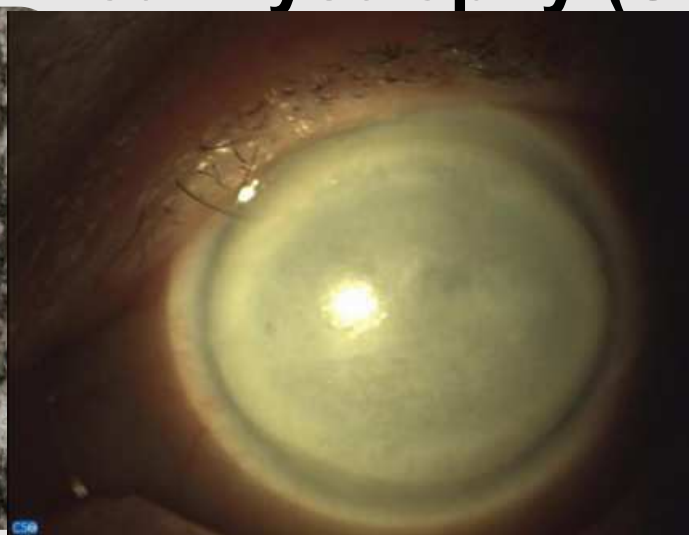
- Diffuse corneal clouding with hyperreflective stroma
- Bowman layer displays hyperreflective opacities



## Schnyder Corneal Dystrophy (SCD)



MONTARRONE, PIEDMONT



- Hyperreflective subepithelial lucency represents cholesterol crystalline deposits
- Panstromal hyperreflectivity in the absence of crystals indicates lipid deposition





# Descemet Membrane and Endothelial Dystrophies

Fuchs endothelial corneal dystrophy (FECD)

Posterior polymorphous corneal dystrophy (PPCD)

Congenital hereditary endothelial dystrophy 1 (CHED1)

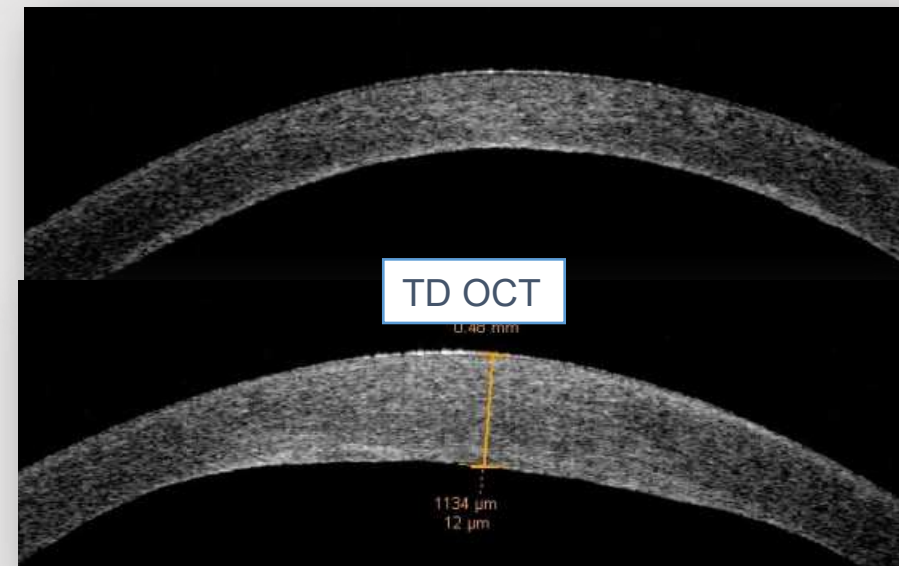
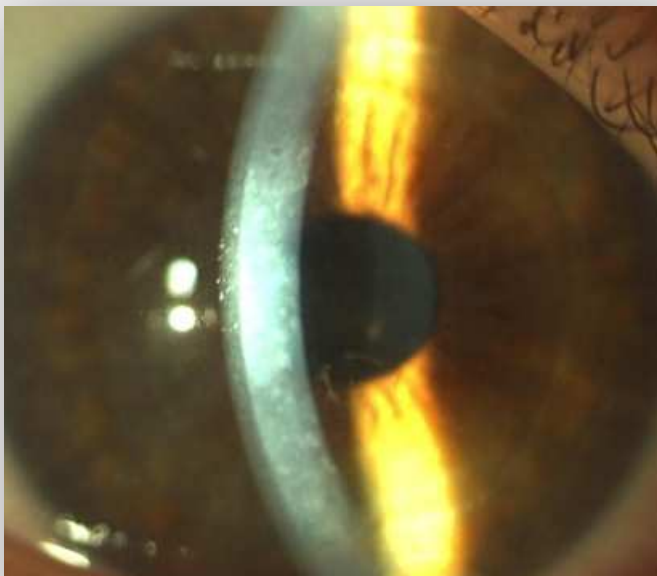
Congenital hereditary endothelial dystrophy 2 (CHED2)

X-linked endothelial corneal dystrophy (XECD)

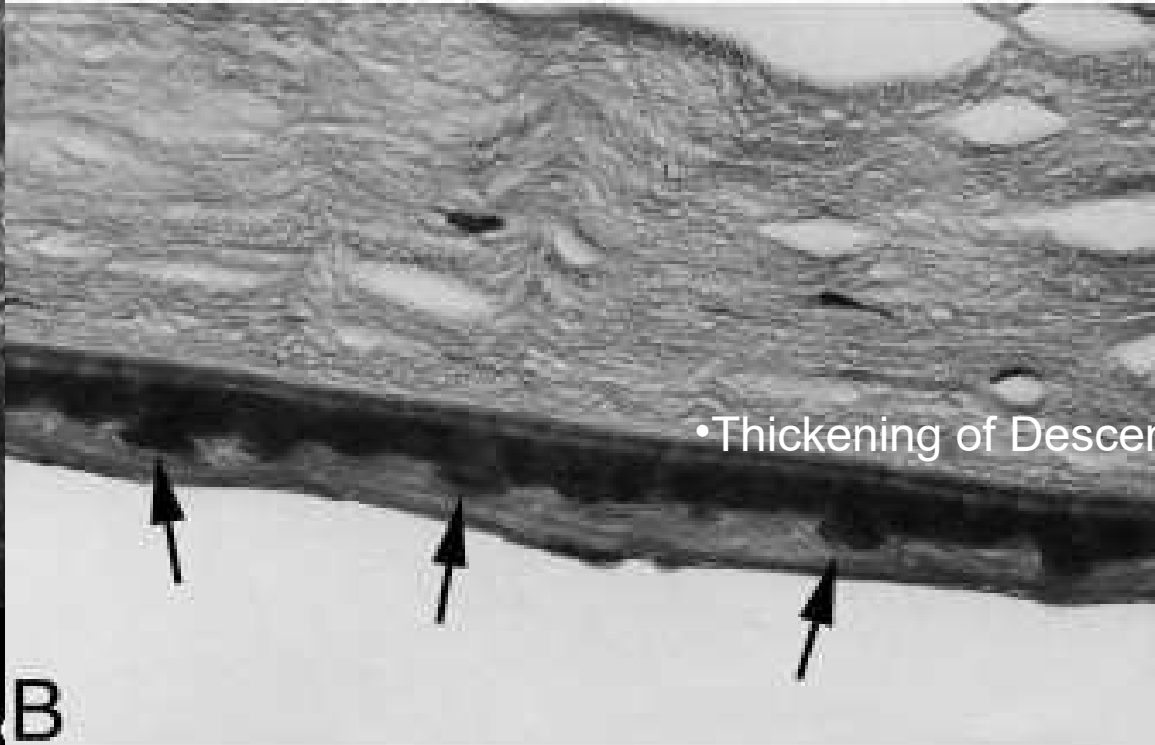
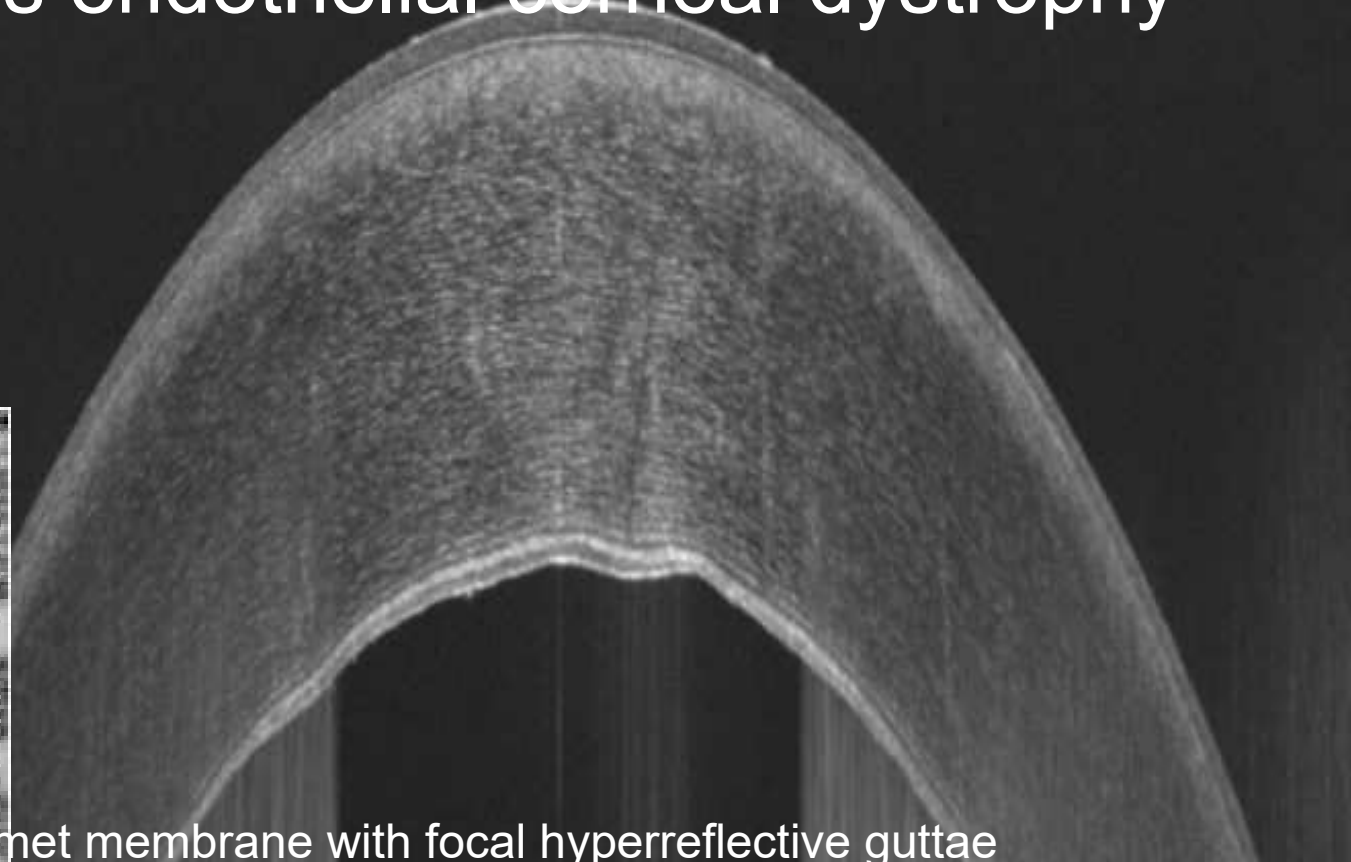
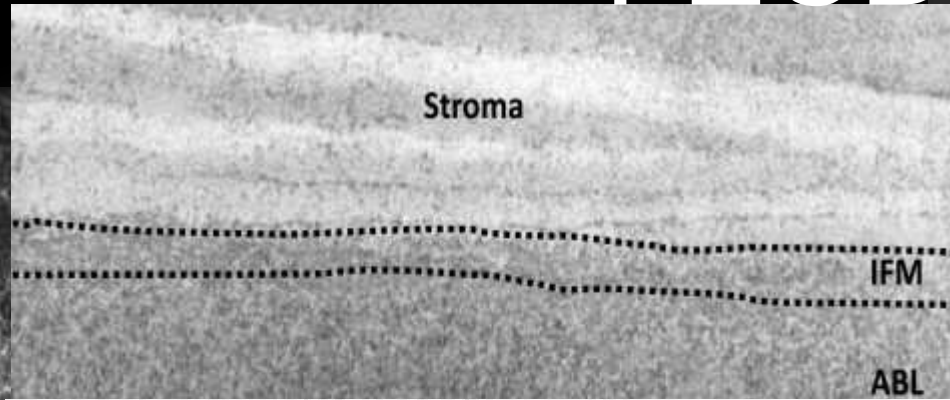




# PPCD - Posterior polymorphous corneal dystrophy



# FECD Fuchs endothelial corneal dystrophy



Fuchs  
Dystrophy

# 1 / 1: 1423  $\mu\text{m}$

HEIDELBERG  
ENGINEERING





Working meeting in Messina

The long-standing scientific collaboration has resulted in 15 joint scientific publications, including in *Ophthalmology*, *Cornea*, *Investigative Ophthalmology & Visual Science (IOVS)*, and *British Journal of Ophthalmology (BJO)*.





## Conclusion.

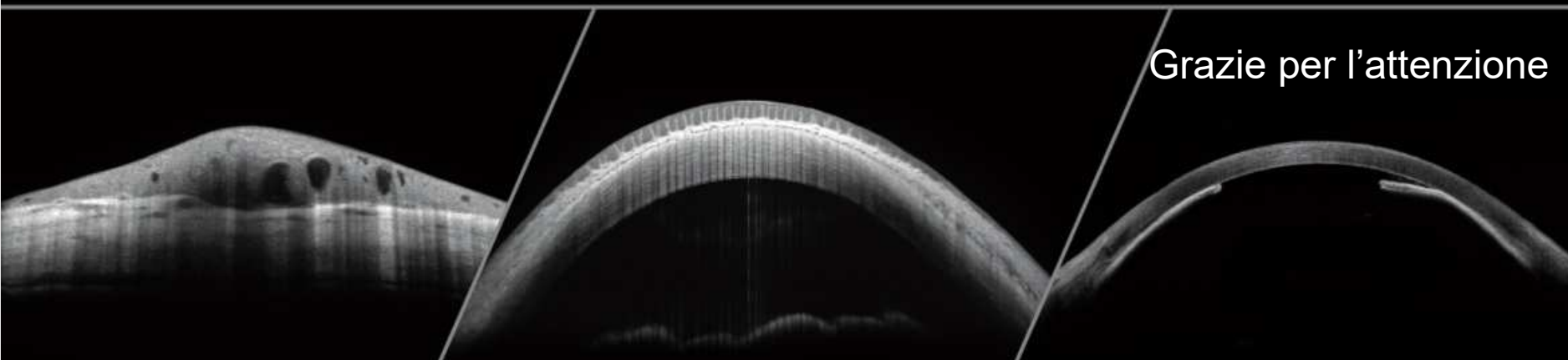
- 1.Enhanced Diagnosis:** Anterior OCT enables precise, early detection of corneal dystrophies by visualizing detailed corneal layers.
- 2.Personalized Treatment:** It guides tailored treatment strategies, improving both medical management and surgical interventions.
- 3.Improved Outcomes:** OCT plays a key role in optimizing corneal transplant results and monitoring disease progression over time.



REVO ITALIA 2024



Grazie per l'attenzione



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