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Cornea and Oculoplasty: Contemporary Practice. 22-24 January 2020

Symposium 6: Keratoplasty Techniques
Descemet's Membrane Deachment: What have we missed so far?

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Descemet's Membrane Detachment: What we do know

First Recorded case(s) approximately a hundred years ago (Fuchs E in AOS Thesis by Samuels B 1928).

Usually seen after complicated or multiple intraocular surgery.
Separate issue with Endothelial keratoplasty.

Symptoms and Signs:

Persistent edema of overlying stroma and epithelium

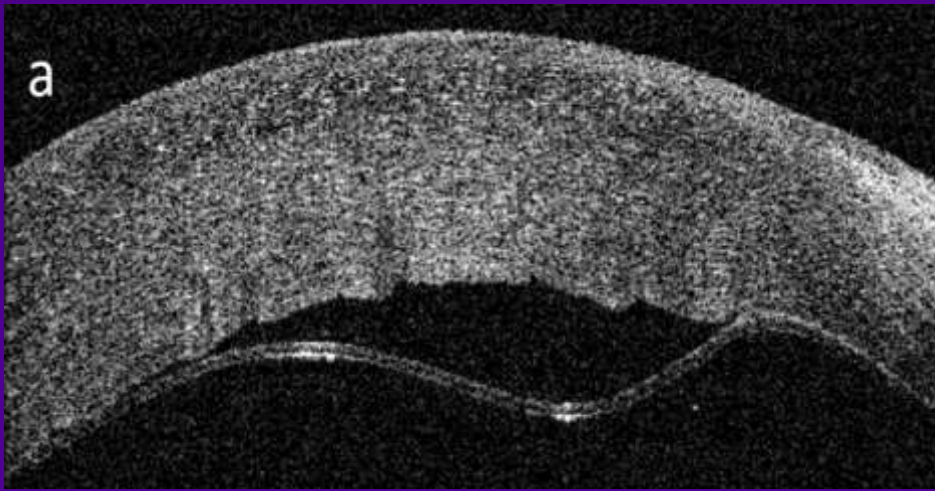
Vision is affected when pupil area involved

Slit lamp and OCT shows the detached 'line' in anterior chamber

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Descemet's Membrane Detachment: What we do know

OCT shows DM as a 'double contour line'. Parallel thin hyper-reflective lines with a narrow dark space in between.



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Descemet's Membrane Detachment: What we do know

CLASSIFICATION:

Based on pathology (Samuels B, 1928):

Active: Pushed back

Passive: Pulled back

Clinical (McKool and Holtz 1977):

Planar: Separation of 1mm or less.

Non-planar: Separation greater than 1mm

Based on OCT (Agarwal et al 2015):

Rhegmatogenous

Tractional

Bullous

Complex

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Descemet's membrane Detachment: Back to basics

Ex-vivo simulation of DALK

Type-1 Big Bubble

Type 1BB: PDL + DM



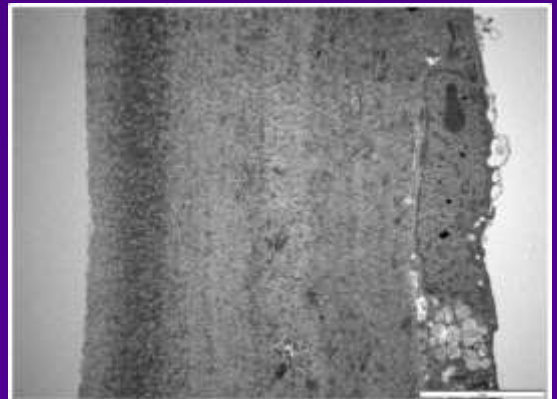
Type-2 Big Bubble

Type 2BB: DM.



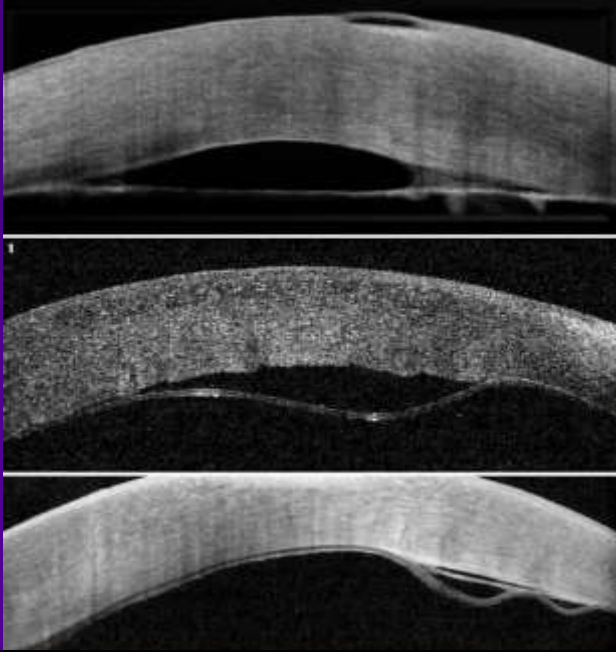
Descemet's membrane Detachment: Back to basics

Mixed: Part Type 1 and Part Type 2



No split of Descemet's Membrane

Descemet's Membrane Detachment (DMD): What we did not know



DMD is of three types

Type 1

Straight, taut, 'chord of a circle'
hyper-reflective: DM and PDL

Type 2

Sinuous, wavy, 'double contour'
line: DM only

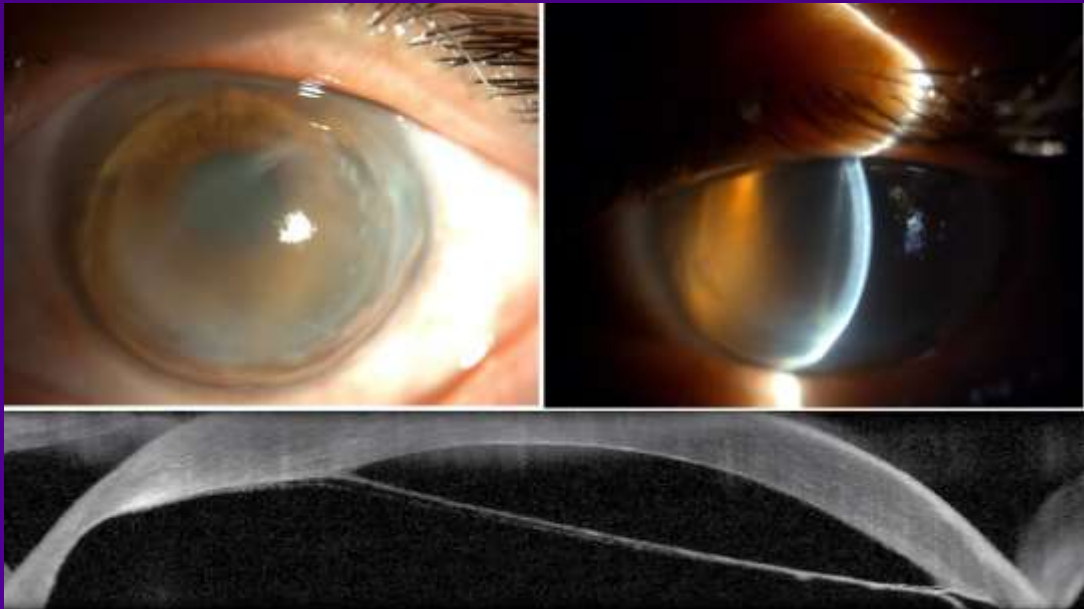
Mixed

Both PDL and DM detached
and also from each other

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Descemet's Membrane Detachment (DMD): What we did not know

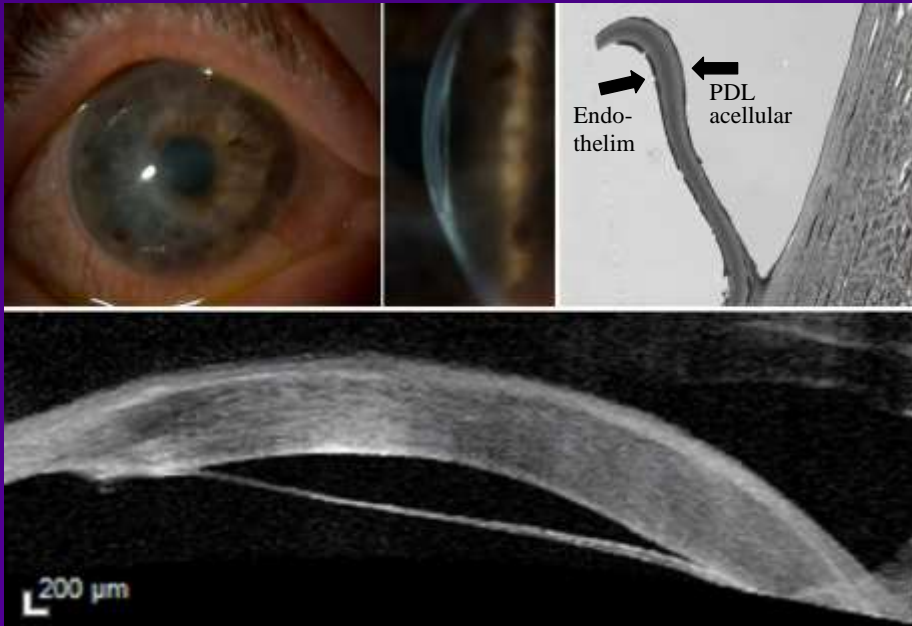
Type 1 DMD



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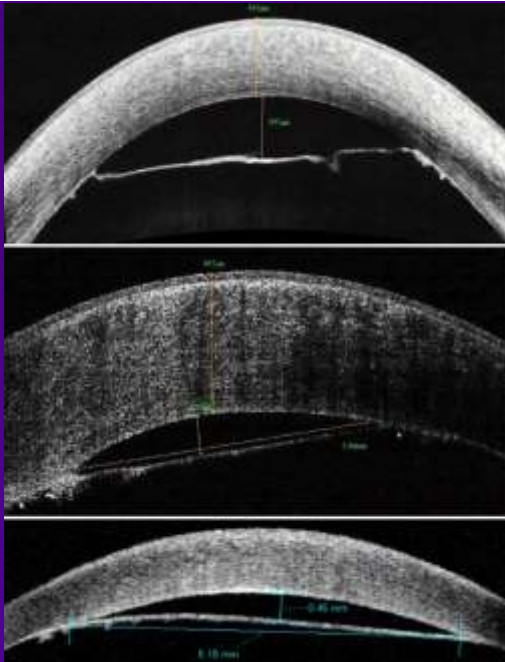
Descemet's Membrane Detachment (DMD): What we did not know

Type 1 DMD



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Descemet's Membrane Detachment (DMD): What we did not know



Type 1 DMD
(Detachment of PDL + DM)
3 different patients

Planar (< 1mm)

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Descemet's Membrane Detachment: What we do know

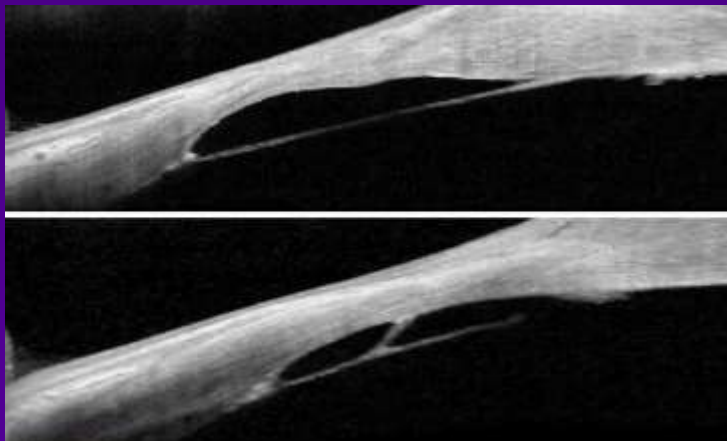
Collagen strands extend from deep stroma to PDL in DALK



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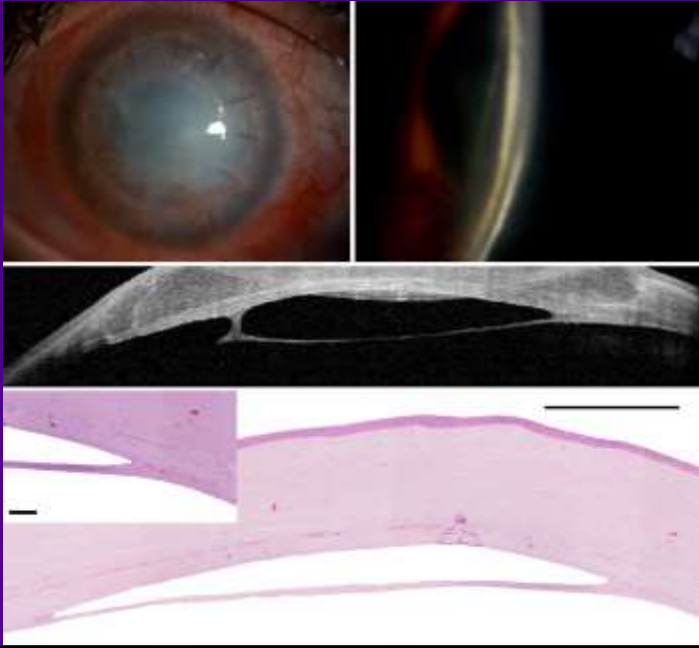
Descemet's Membrane Detachment (DMD): What we did not know

Collagen strand extending from deep stroma to PDL in Type 1 DMD



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Descemet's Membrane Detachment (DMD): What we did not know

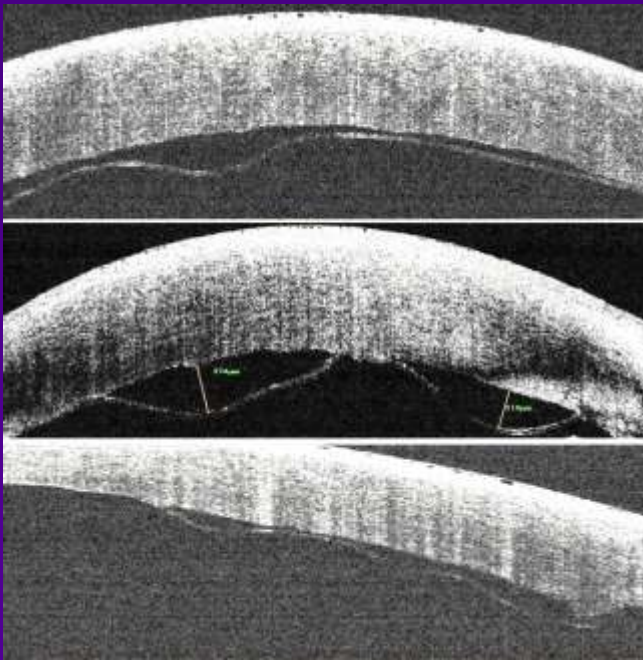


Collagen strand
extending from deep
stroma to PDL in Type
1 DMD

Cellular infiltration:
Keratocyte derived cells

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Descemet's Membrane Detachment: What we do know



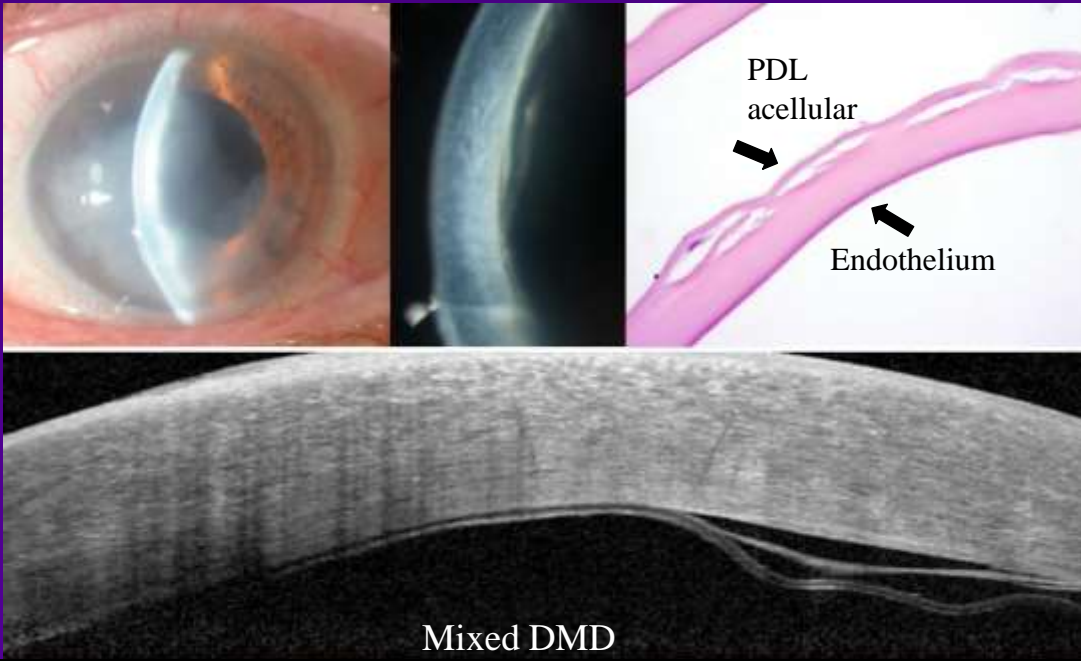
Type 2 DMD
(Detachment of DM only)

Planar (< 1mm)

Optovue OCT does not
give 'double contour line'
of DM

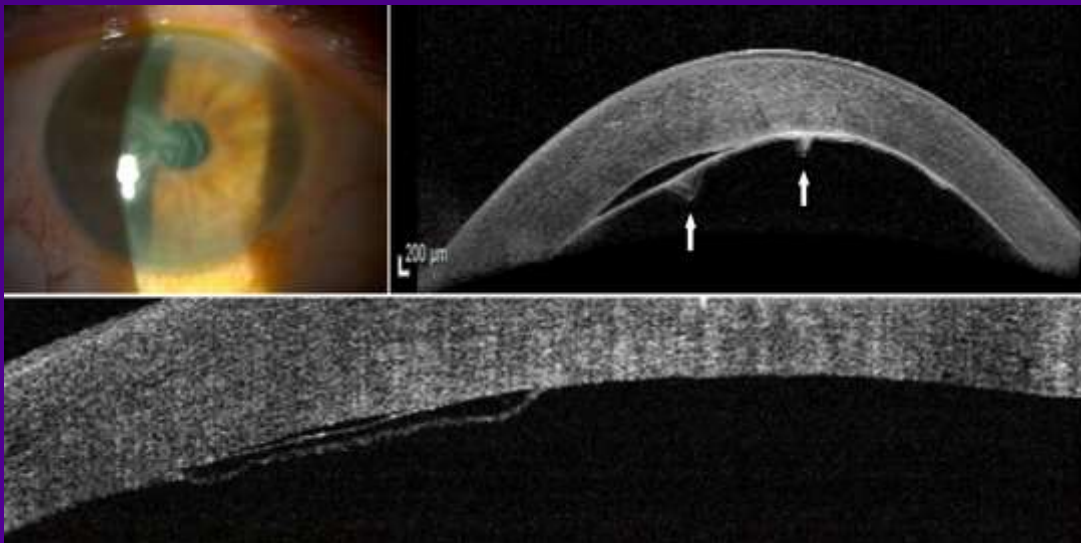
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Descemet's Membrane Detachment (DMD): What we did not know



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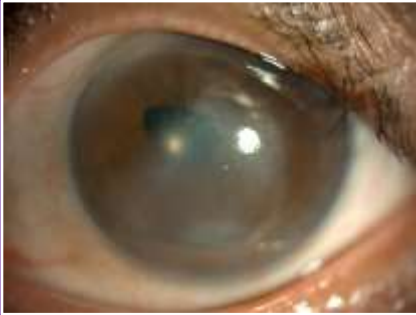
Descemet's Membrane Detachment (DMD): What we did not know



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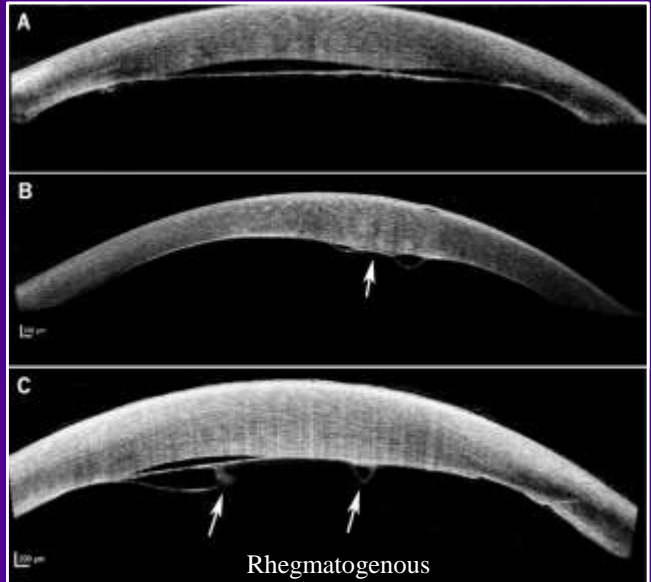
Descemet's Membrane Detachment: Tear or no Tear

Post cataract surgery chronic corneal edema



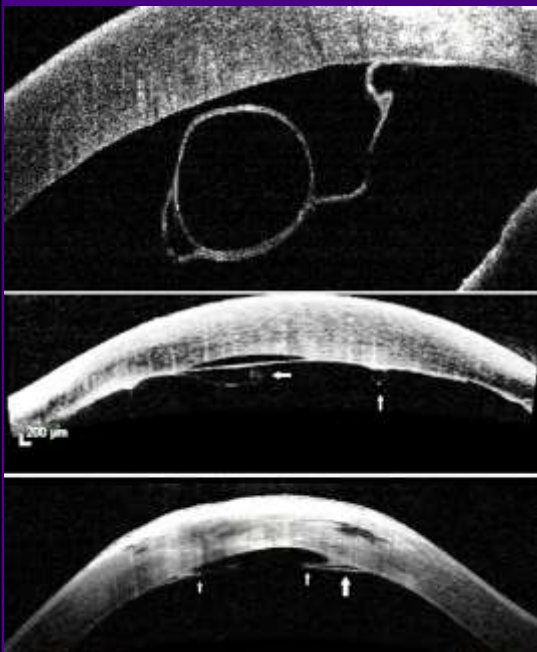
First and clear evidence of participation of PDL in clinical pathology of the posterior cornea

Dua HS, Said DG. Eye (Lond). 2016; 30:1144-5



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Descemet's Membrane Detachment (DMD): What we did not know



Type 2 rhegmatogenous, non-planar

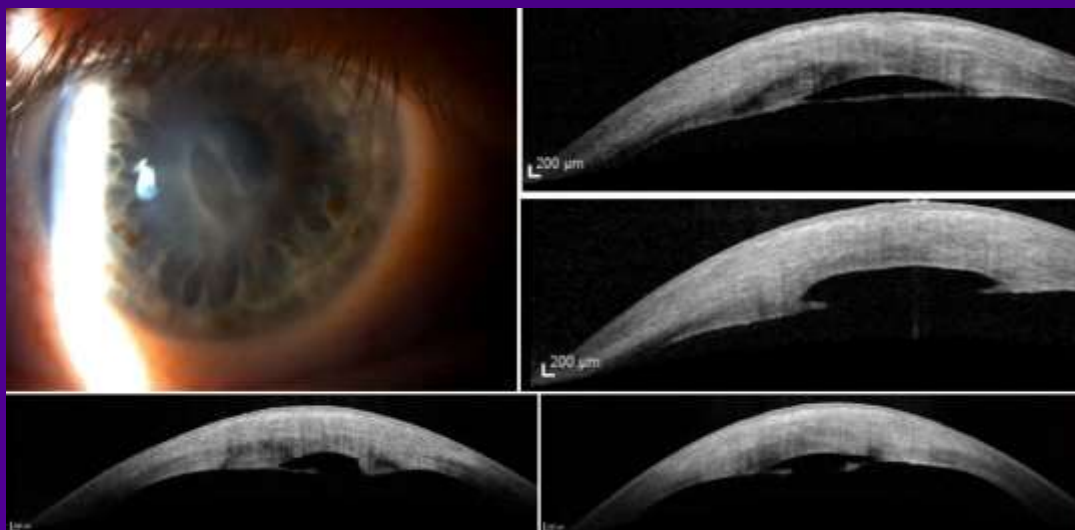
Mixed, rhegmatogenous with DM tear only

Mixed rhegmatogenous with both layers torn

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Descemet's Membrane Detachment (DMD): What we did not know

Acute hydrops is due to tear in both DM and PDL
Never seen one where PDL is torn and DM is intact



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SUMMARY

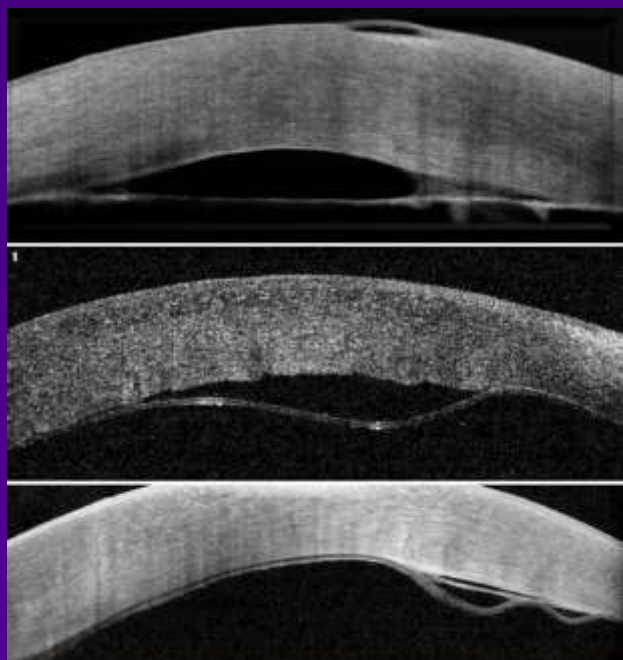
Paradigm shift in understanding of DM detachment. Involvement of the PDL

Complementary classification:

Type 1, Type 2, Mixed.

Rhegmatogenous or non-rhegmatogenous

Implications for diagnosis and management



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THANK YOU