



SAMER HAMADA

Paediatric Keratoplasty

RIO 2020 Memorial Lecture

14th International Conference of the Research Institute of Ophthalmology







GIFT

OF
SIGHT

HUMANITY FIRST



Table 3 Regional variation in causes of blindness

	<i>EME (%)</i>	<i>FSE (%)</i>	<i>Latin America and Caribbean (%)</i>	<i>Middle Eastern Crescent (%)</i>	<i>China (%)</i>	<i>India (%)</i>	<i>OAI (%)</i>	<i>SSA (%)</i>
Cataract	3.50	8.30	57.60	45.20	32.40	51.20	39.80	43.60
Corneal scar (trachoma)	—	—	6.80	25.70	17.60	9.70	23.60	19.40
Glaucoma	7.50	6.80	8.00	5.70	22.70	12.80	16.70	12.00
Others	89.00	84.90	27.50	23.40	27.30	26.30	19.90	25.00

EME = Established Market Economies; OAI = Other Asia & Islands; FSE = Former Socialist Economies of Europe; SSA = sub-Saharan Africa.
Source—Data on Global Blindness WHO 1995.



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Table 4 Estimates of the prevalence of childhood blindness by world bank regions

<i>World bank regions</i>	<i>Estimated regional prevalence</i>	<i>Estimated no. of blind children</i>	<i>% Of global childhood blindness</i>
Established market Economies	0.3	50 000	3.57
Former Socialist Economies	0.51	40 000	2.85
Latin America & the Caribbean	0.62	100 000	7.14
Middle-Eastern Crescent	0.8	190 000	13.5
China	0.5	210 000	15
India	0.8	270 000	19.3
Other Asia & Islands	0.83	220 000	15.7
Sub-Saharan Africa	1.24	320 000	22.9

Information based on prevalence data published in Tropical Doctor 2003 (October).

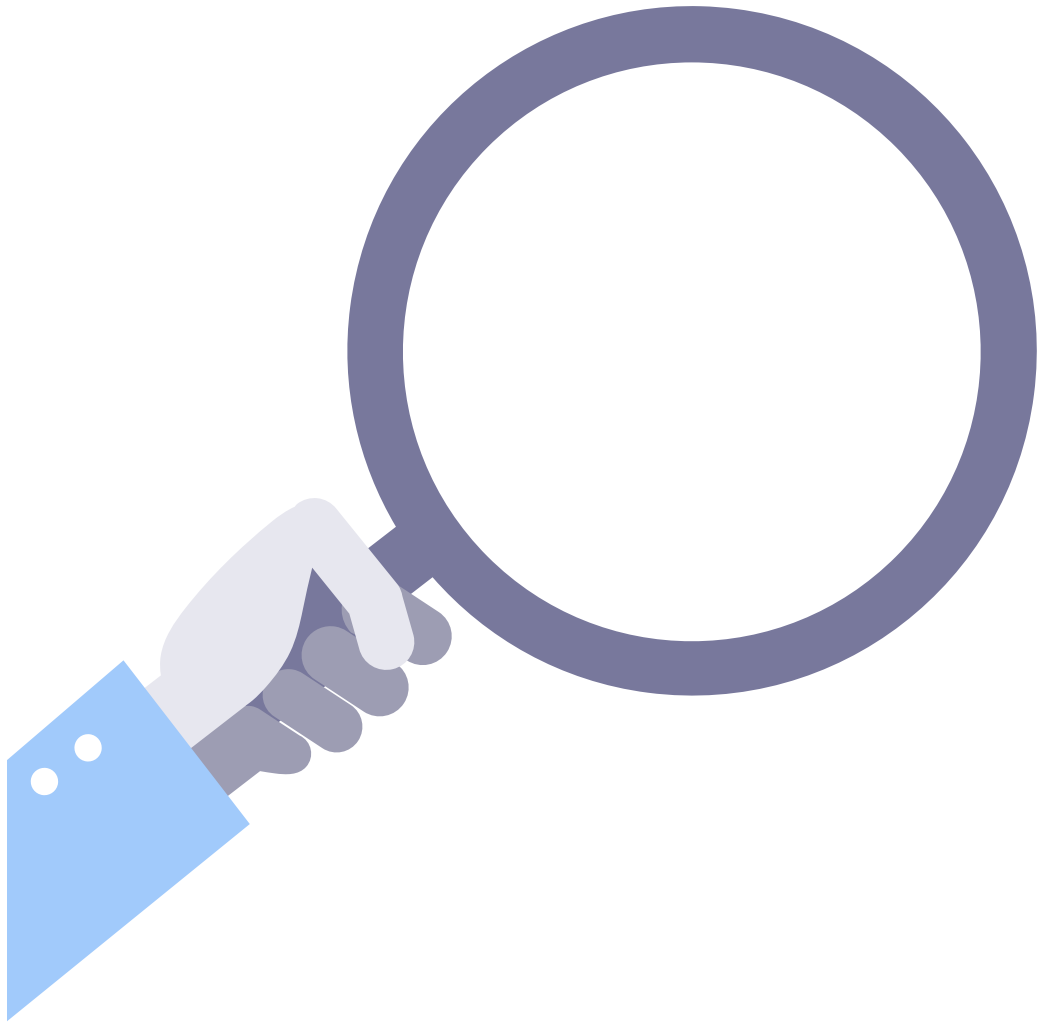
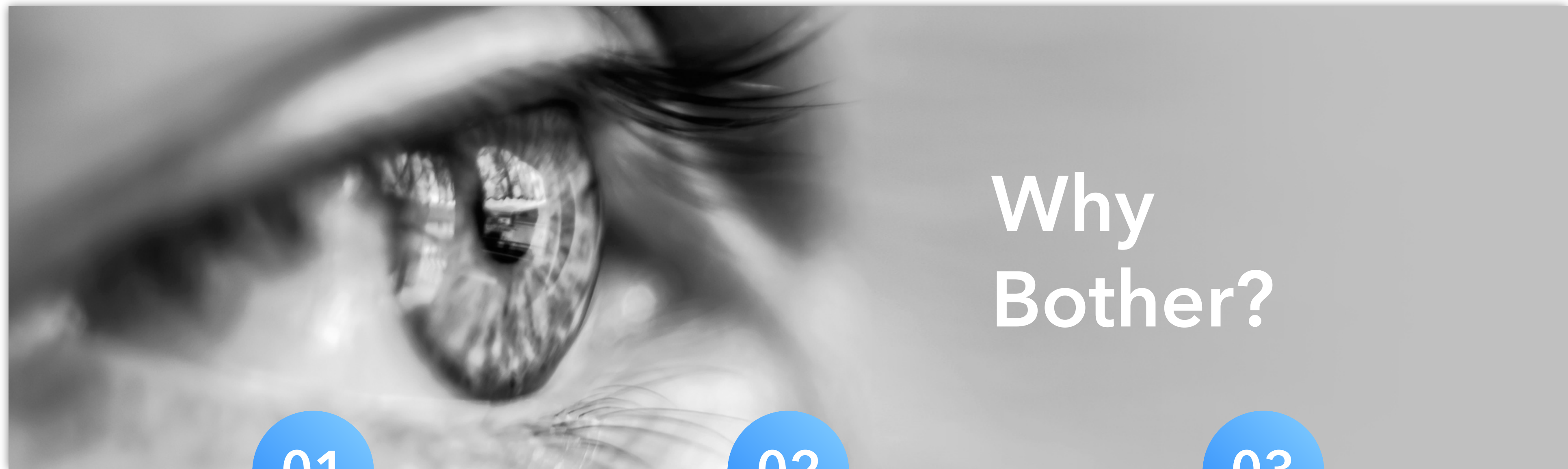




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Why Bother?

01

Monocular opacity

13% would never perform keratoplasty in a patient with a monocular opacity

02

Poor Visual Outcomes

Graft failure as high as 78%

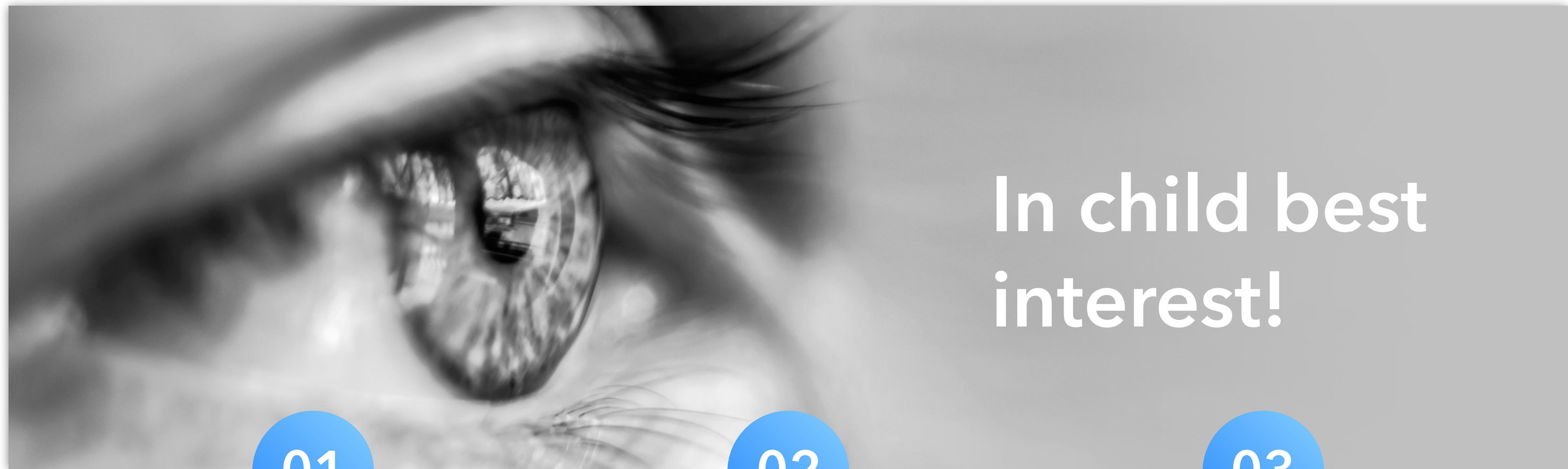
Amblyopia is severe

Most children don't see more than 20/200

03

MDT / Parents compliance

MDT is a must:
Paediatrician, Paediatric ophthalmologist, Cornea specialist, Optometrists, social worker



In child best
interest!

01

Restoring gift of sight

Minimal vision is better than
blindness
Small window of vision for
short time

02

Improved outcomes

Customised lamellar surgery
Use of Femto and Excimer
Lasers
Better post-op management

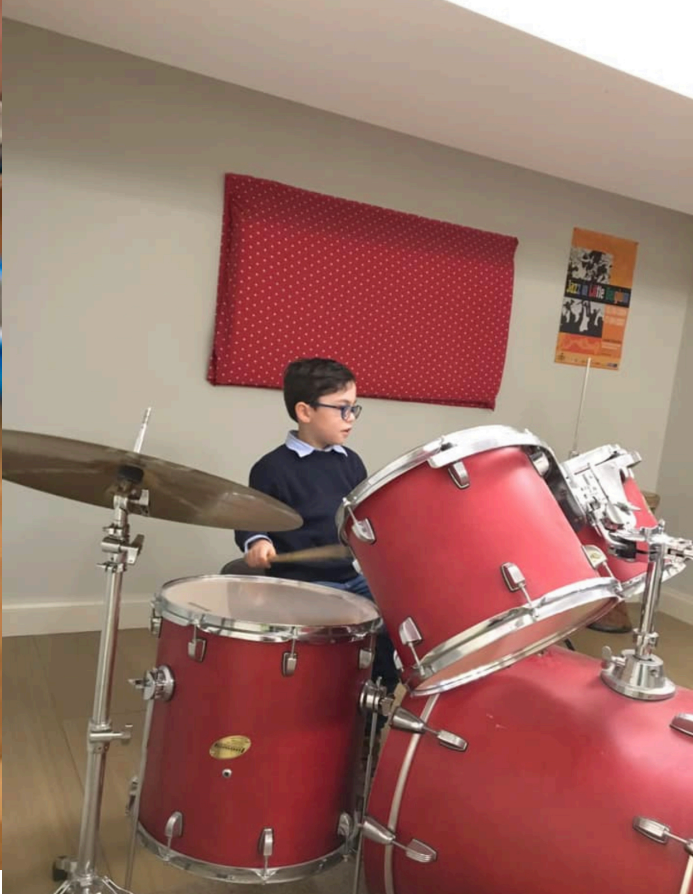
03

Better Graft survival

Aetiology
Age
Co-morbidity
Parents' Education

Listen to the Parents







Paediatric Keratoplasty



Survey of
Ophthalmology
International Review Journal

Surv Ophthalmol. 1983 Sep-Oct;28(2):128-34.

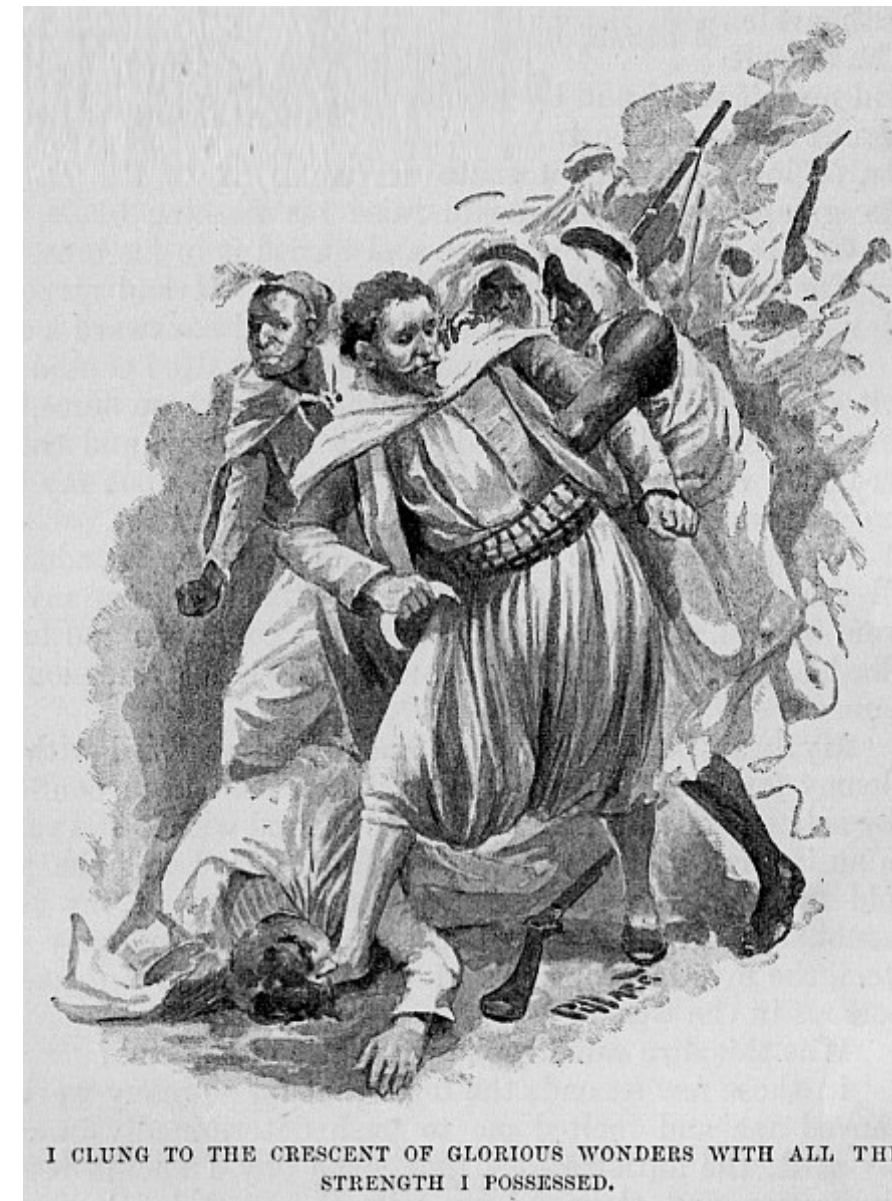
John Vetch and the Egyptian ophthalmia.

Feibel RM.

Abstract

During the Napoleonic Wars from 1798-1815, severe epidemics of keratoconjunctivitis affected the military and civilian populations of Western Europe. This disease was known as the Egyptian ophthalmia because it was first described in troops stationed in Egypt. Most physicians believed this condition was not infectious, but caused by various climatological factors. John Vetch, a British physician, emphasized that this disease was spread by direct conveyance of pus from the diseased to the healthy eye. His insistence that the ophthalmia was contagious, and his suggestions for prevention and treatment were milestones in the history of ophthalmology.

PMID: 6359513 DOI: [10.1016/0039-6257\(83\)90082-6](https://doi.org/10.1016/0039-6257(83)90082-6)



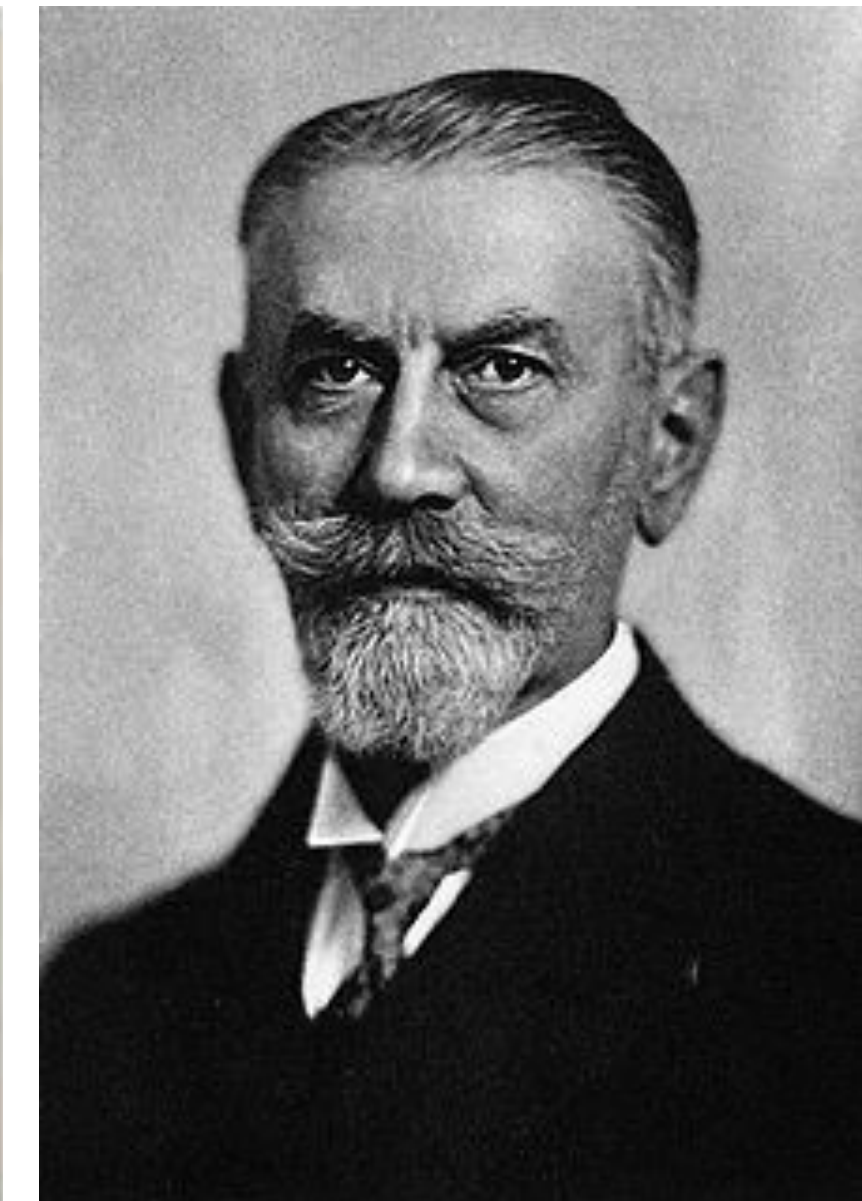
Bigger in 1837

**PKP
Gazelle Homograft**



Kissam in 1838

**PKP
Human Xenograft**



Von Hippel 1888

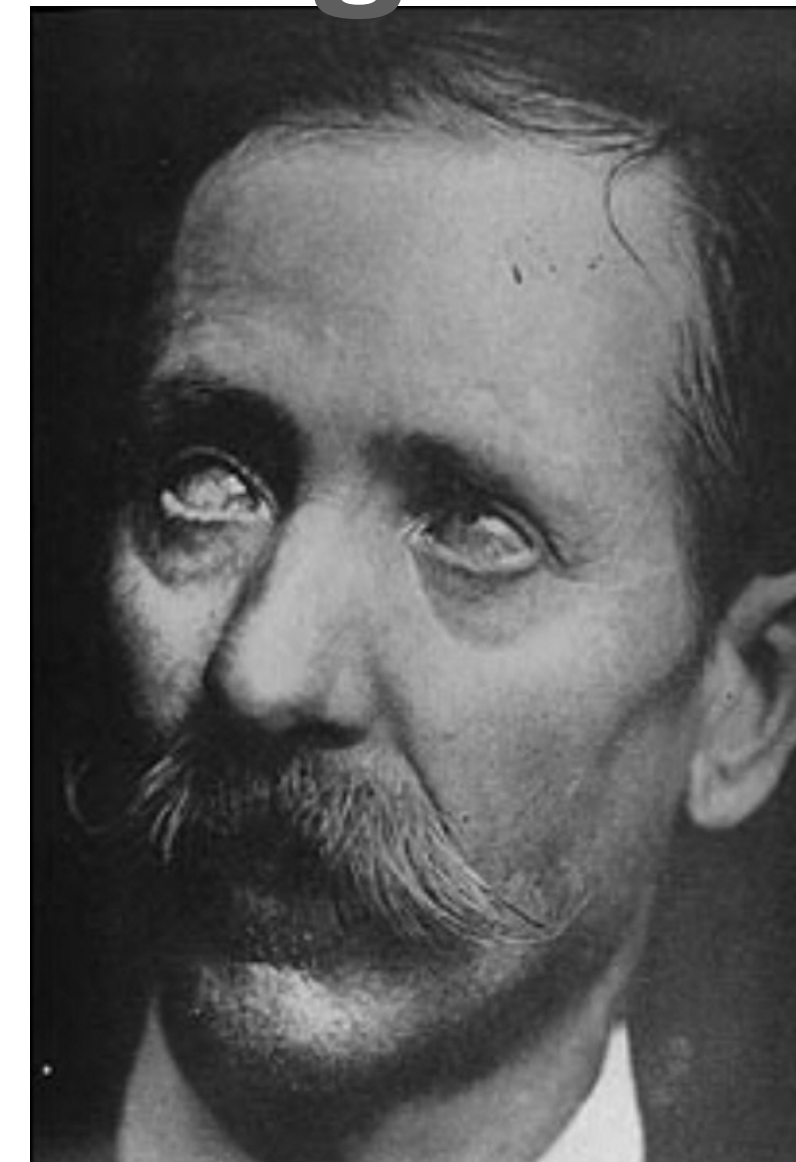
**Lamellar
Human Xenograft**

1905

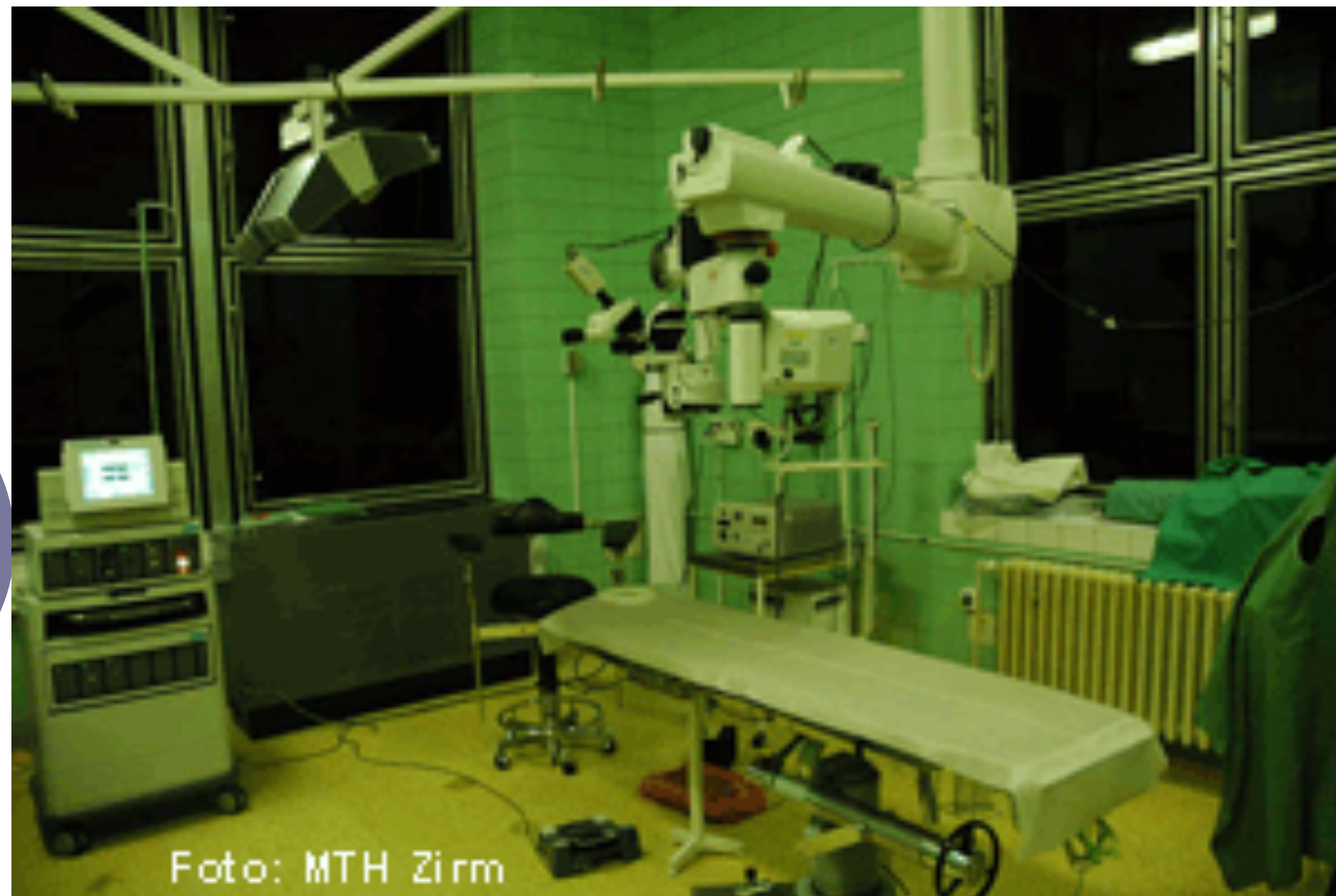
Human Allograft



Eduard Zirm



Alois Golgar





So What about Children?



- 1958, Leigh advised against performing PK in children
- Castroviejo was concerned that “unruly behaviour of children in postoperative period may jeopardise corneal graft outcomes”
- 1965, Picetti and Fine published a study involving 40 PKP in children
- First paediatric DSAEK in 2008
- First Paediatric FALK in 2008

The cornea in a child is not adult



- Developmental milestones
- Visual development
- Growing
- Elasticity
- Isolated or syndromic
- Symptoms and signs
- Challenges
 - Diagnosis
 - Management
 - Priorities



Keratoplasty in Children



Surgically Challenging

- Small eye
- Low scleral rigidity with increase positive pressure
- Risk of expulsive haemorrhage / spontaneous lens expulsion



Post-op Challenges

- Faster premature healing
- loose sutures
- Risk of infection
- Corneal neovascularization



Young donor

Need for young donors



Poor Prognosis

Amblyopia

Ametropia

Rejection

Glaucoma

Failure

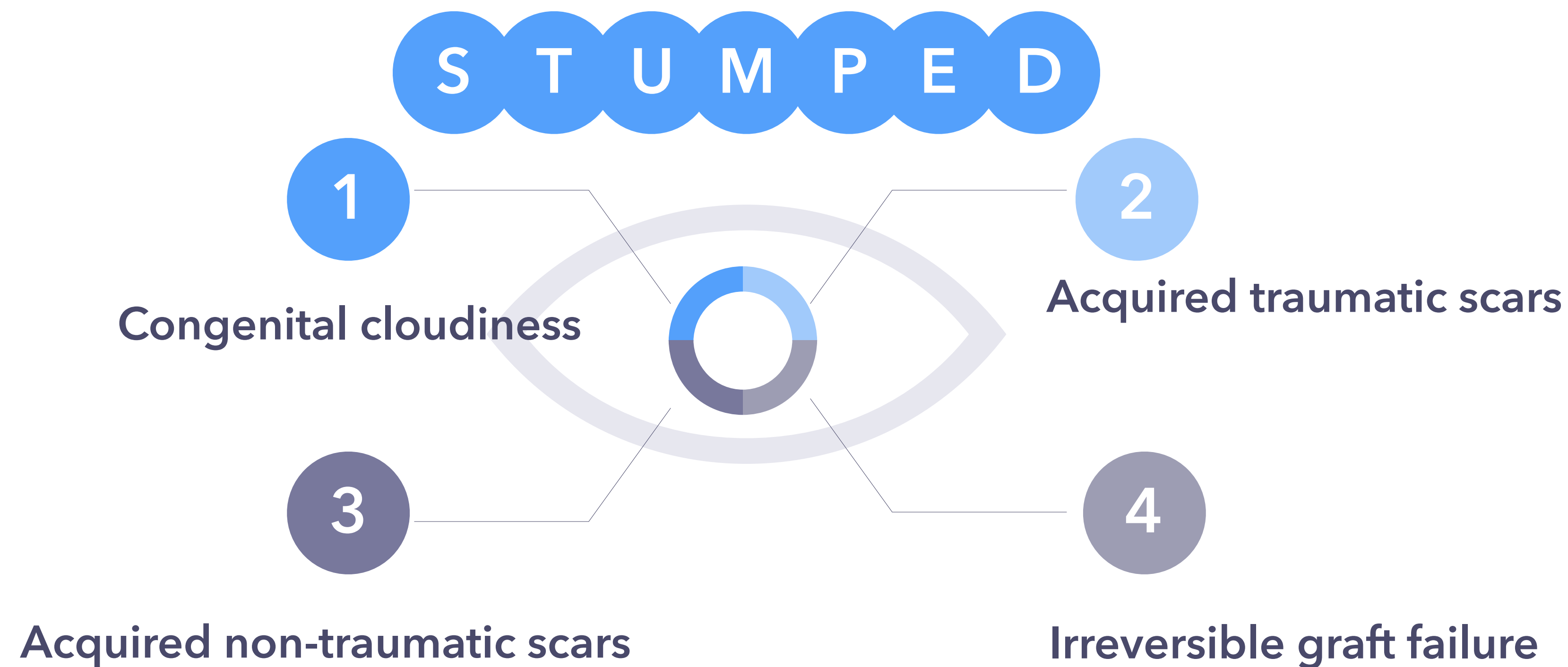
Paediatric Keratoplasty: Challenges



Are we doing well?

- PK for congenital corneal opacities 1.6% of all PK in the U.S.
- 5% of all corneal transplants in Australia
- Graft survival rate (PK) 22% to 82% at one year of follow-up
- Graft survival rate increases with age at the time of surgery

Why We Do it?

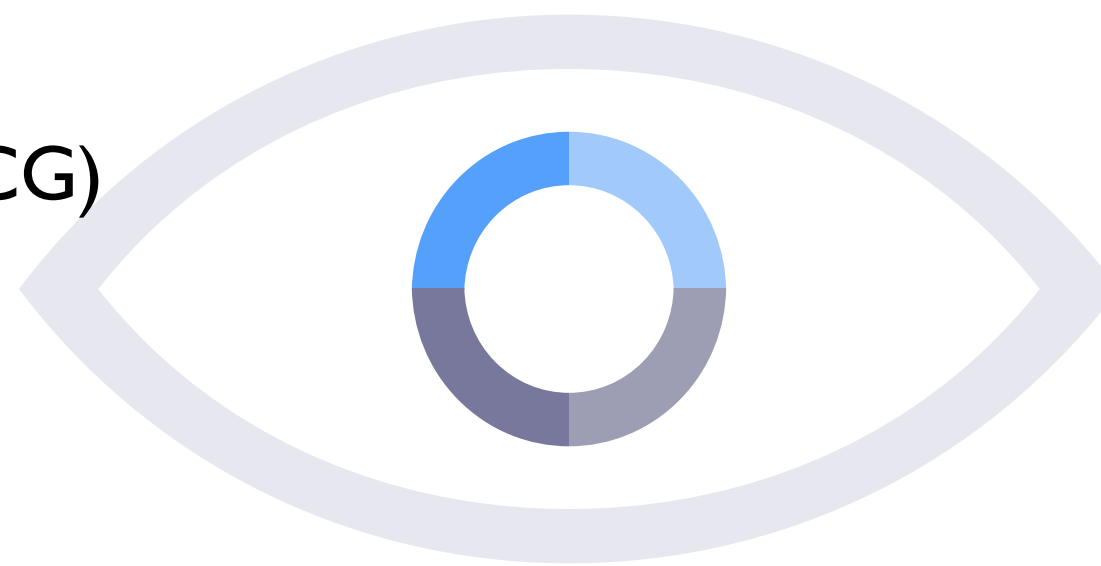


<i>Causes of corneal opacity</i>	<i>Dana et al (1995)</i>	<i>Dada et al (1999)</i>	<i>Aasuri et al (2000)</i>
Congenital	109 (66.46)	51 (12.28)	47 (30.54)
Acquired nontraumatic	28 (17.07)	296 (71.32)	85 (55.19)
Acquired traumatic	27 (16.46)	23 (5.54)	22 (14.28)
Regraft	27 (16.46)	45 (10.85)	8
Total	164	415	154

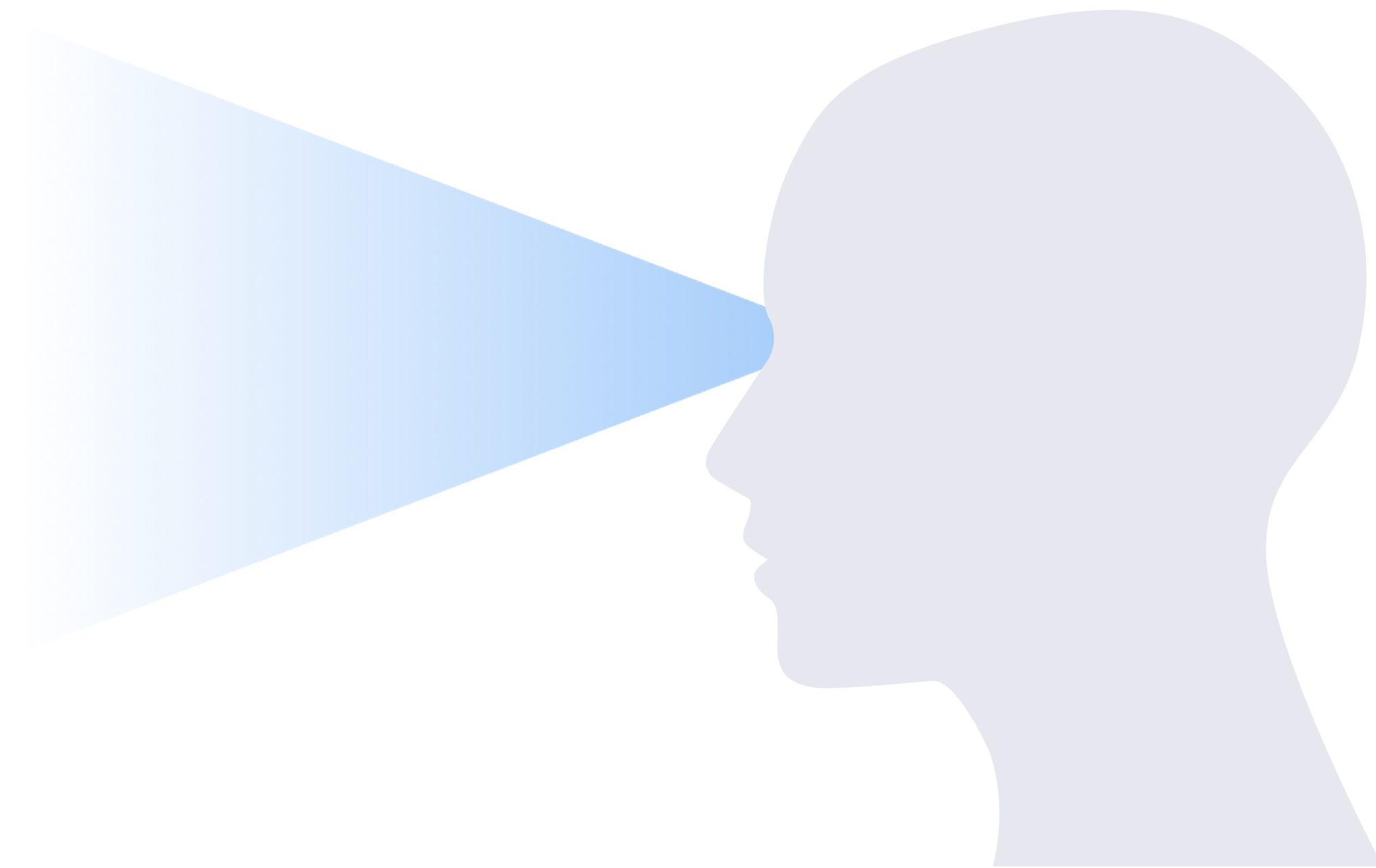
Abnormal Corneal Structure

- **STUMPED**

- **S**clerocornea
- **T**ears in DM (trauma, CG)
- **U**lcers (HSK)
- **M**etabolic (MPS)
- **P**eters anomaly
- **E**dema (CHED, PPMD, Glaucoma)
- **D**ermoid



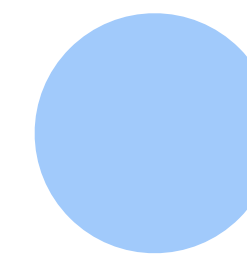
What Surgery?



Penetrating Keratoplasty

Most Invasive

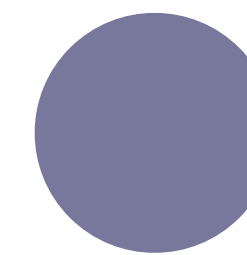
78% of all paediatric Keratoplasty



Lamellar Keratoplasty

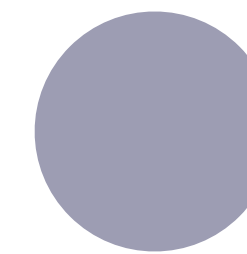
PTK - SALK - DALK

DSEK - DMEK



Optical Iridectomy

Peter's Anomaly



Ipsilateral autologous rotational keratoplasty

Traumatic, small limited scar



Prognosis?

01

Aetiology

Certain diagnosis carry
bad prognosis

02

Age

Congenital opacity 1-3
months
Older = better outcomes
 ≤ 1
 $> 1 - 7$
 $\geq 7 - 12$

03

Co-morbidities

Inflammation
Infection
Adnexa abnormalities
Exposure Keratopathy
Corneal neovascularisation

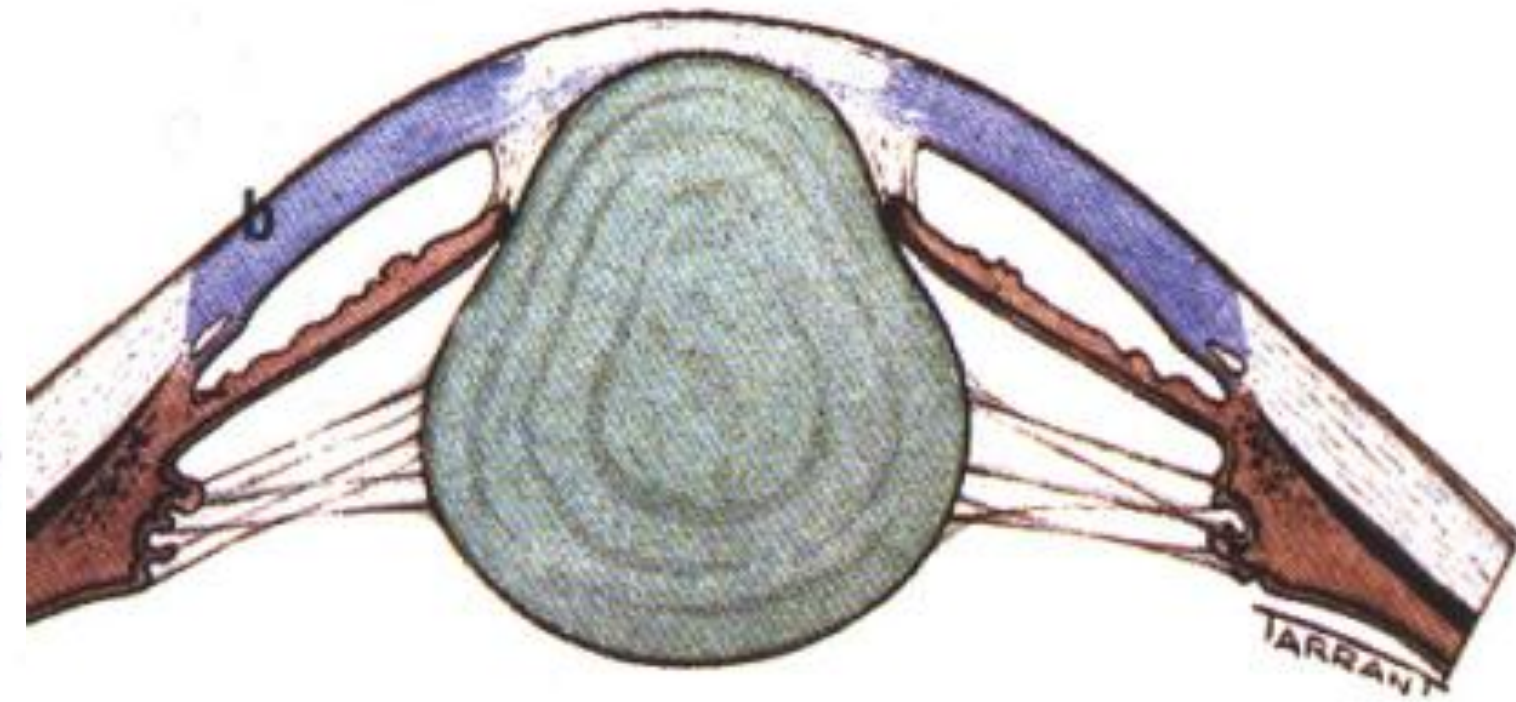
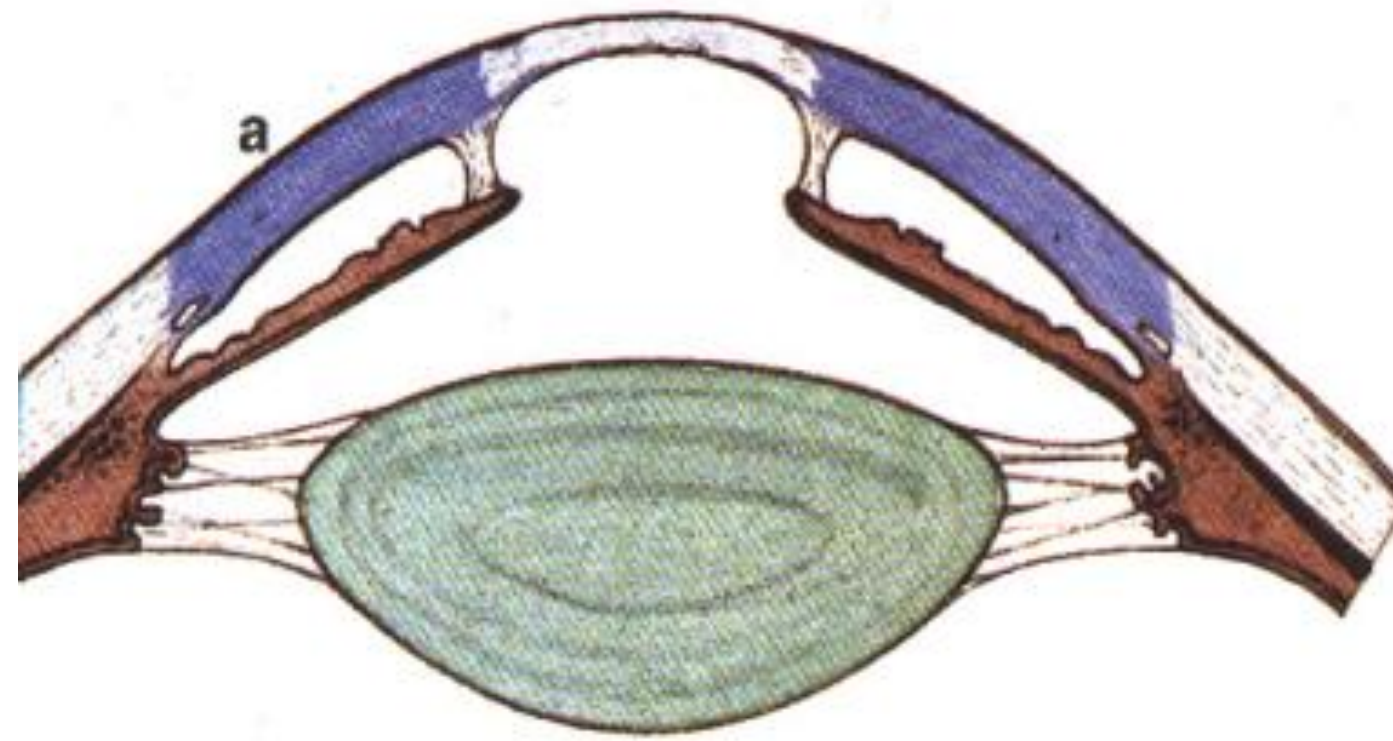
How can we make outcomes better?



Diagnosis:
Peter's Anomaly



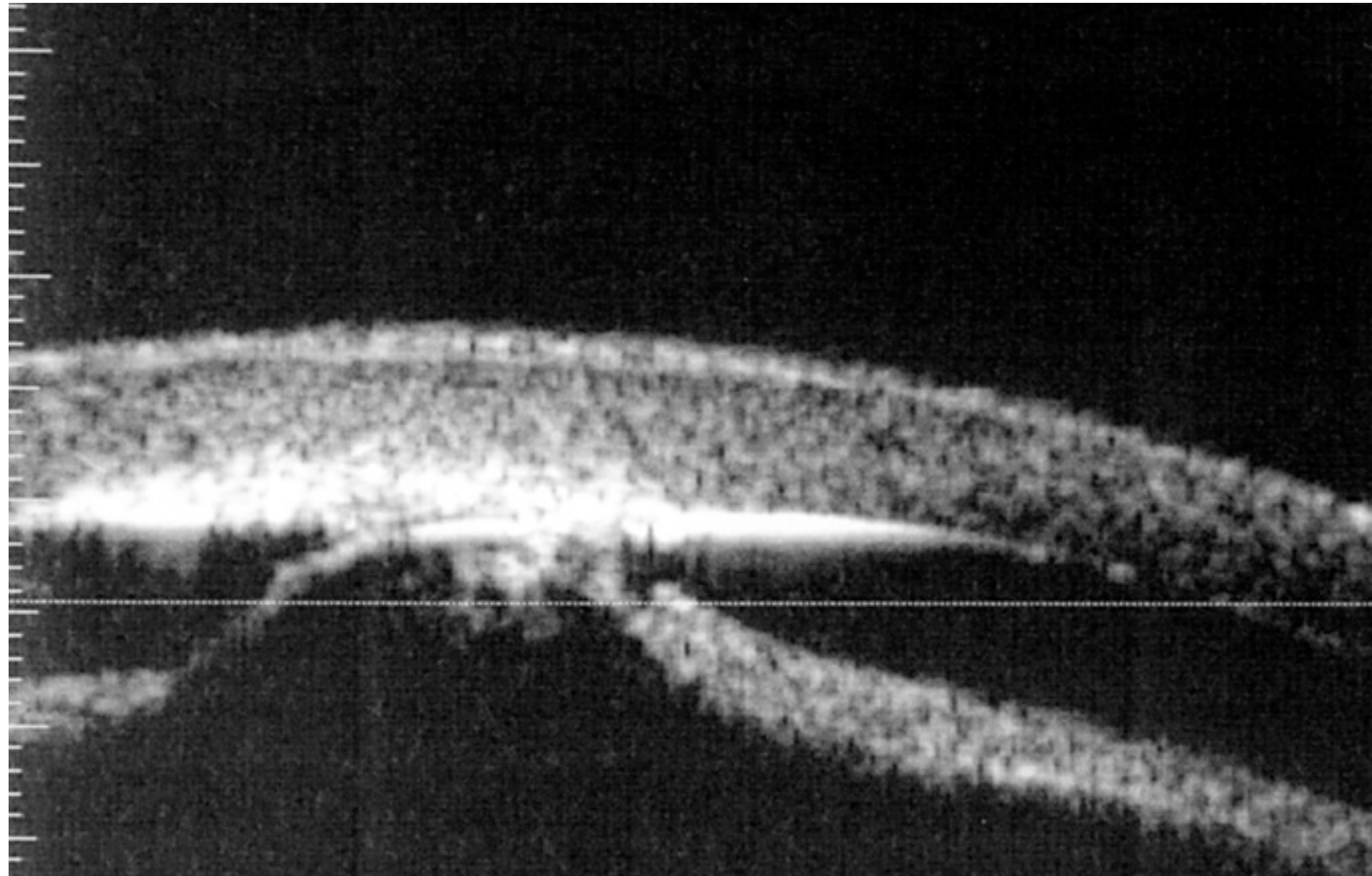
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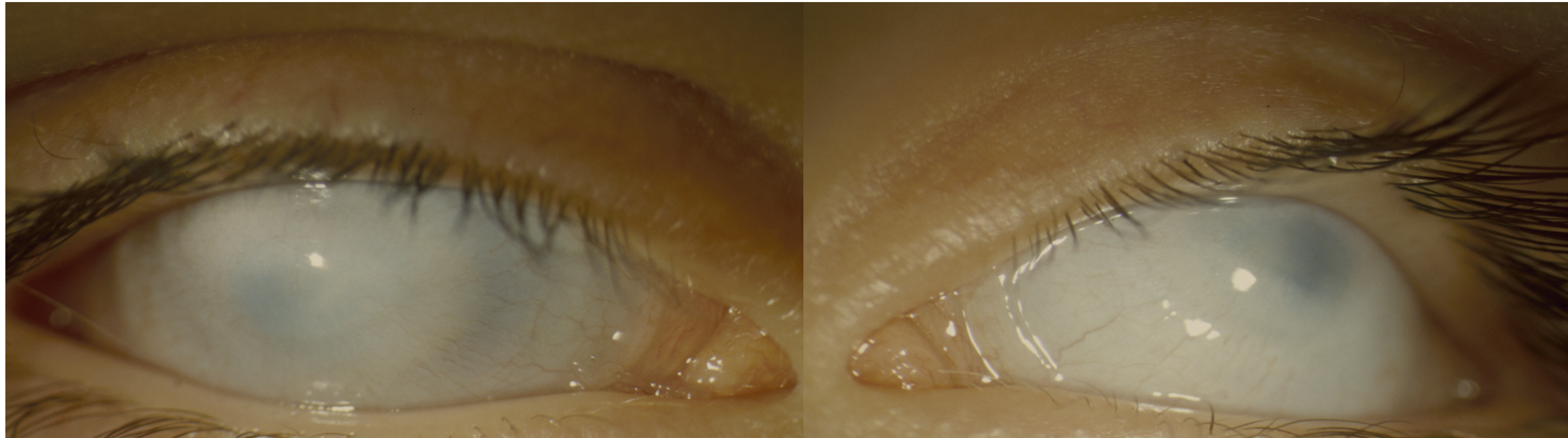
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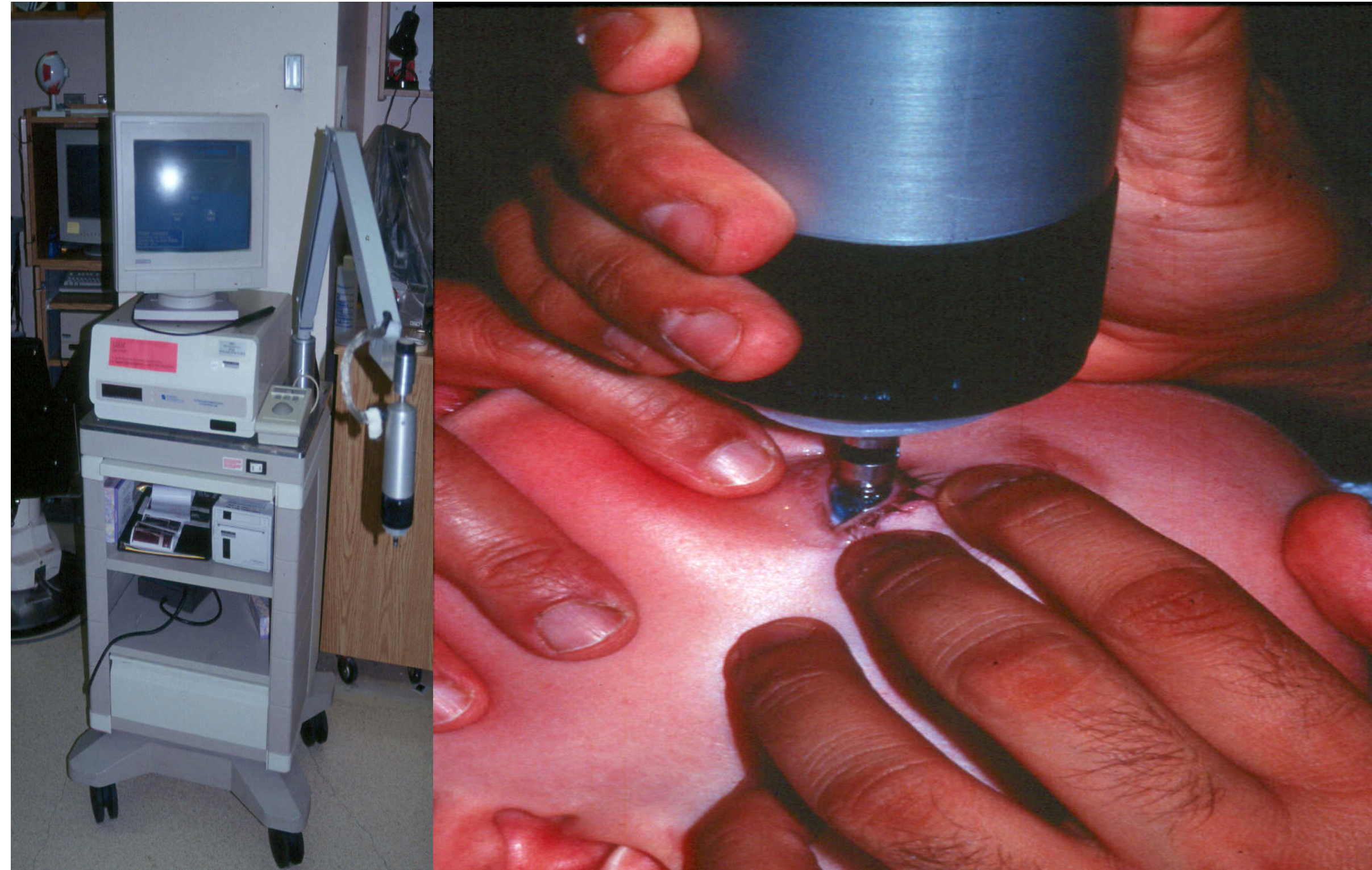
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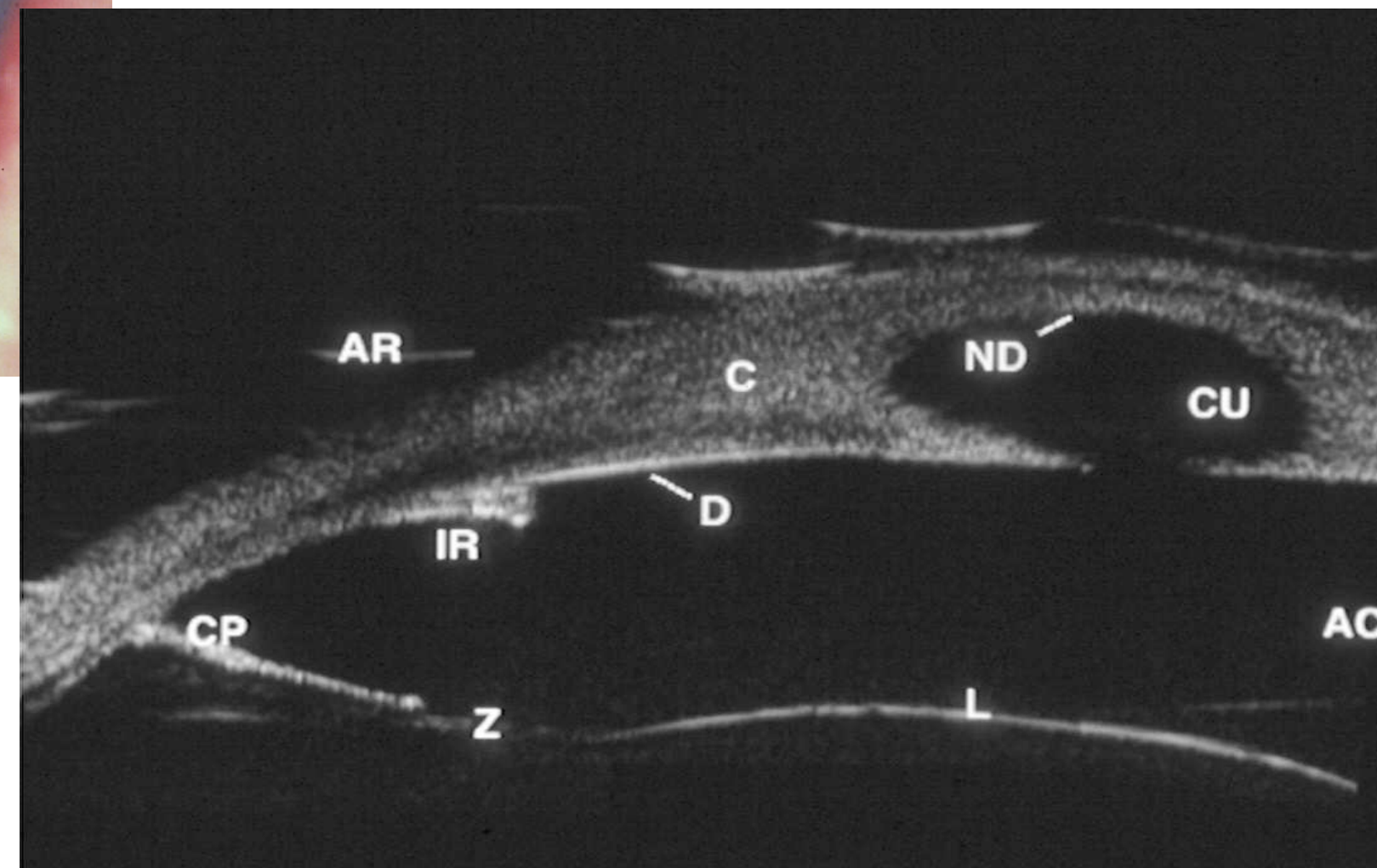
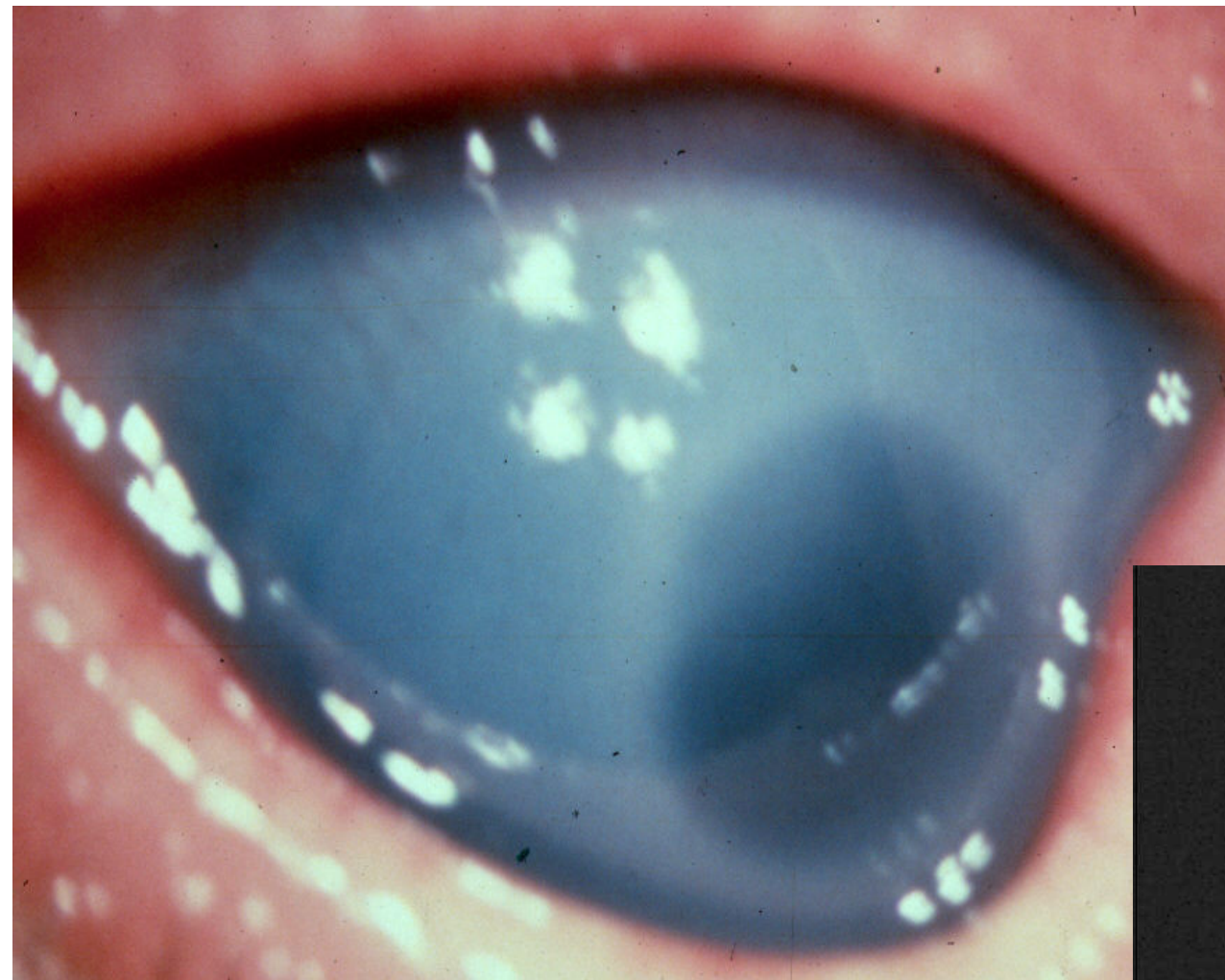
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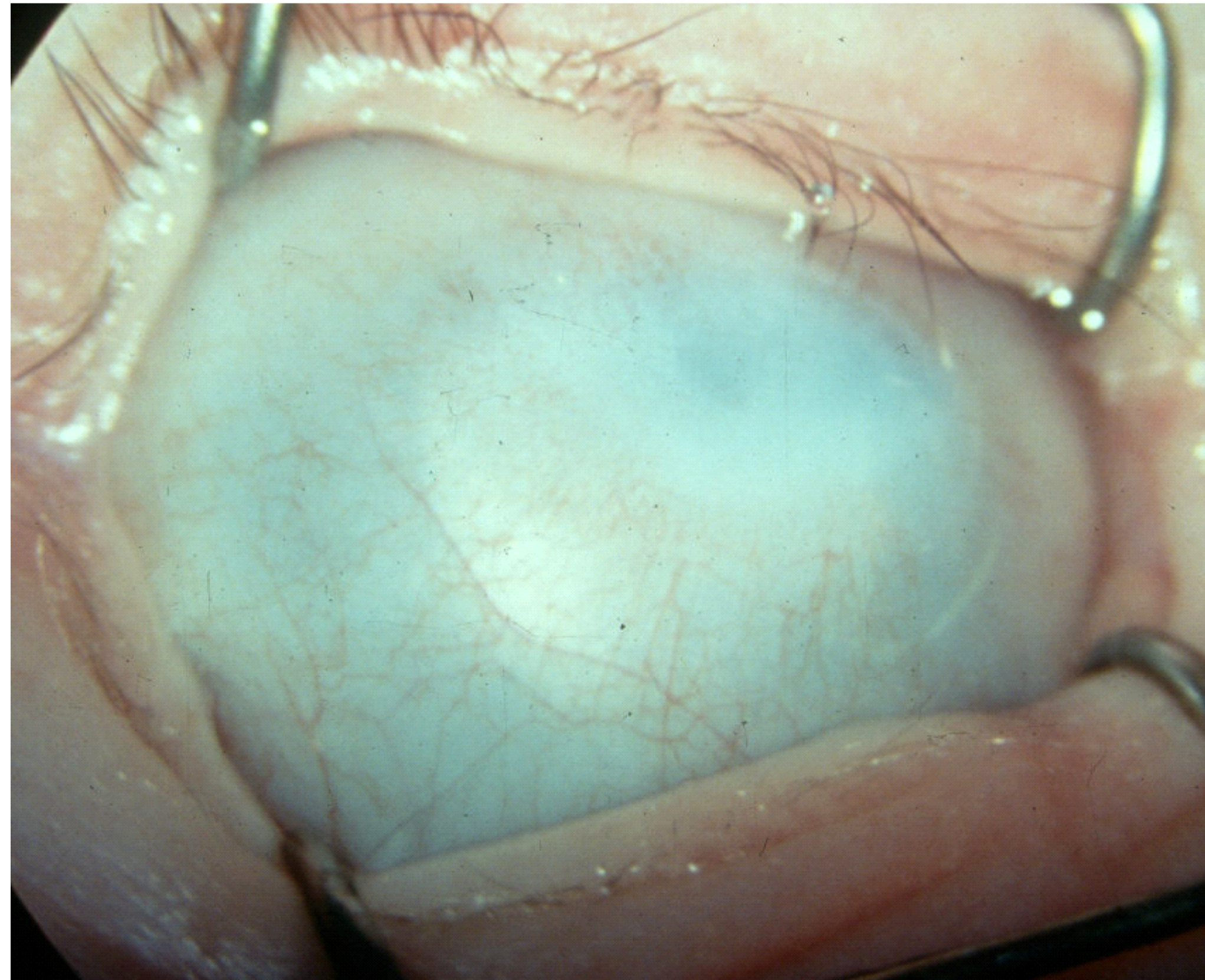
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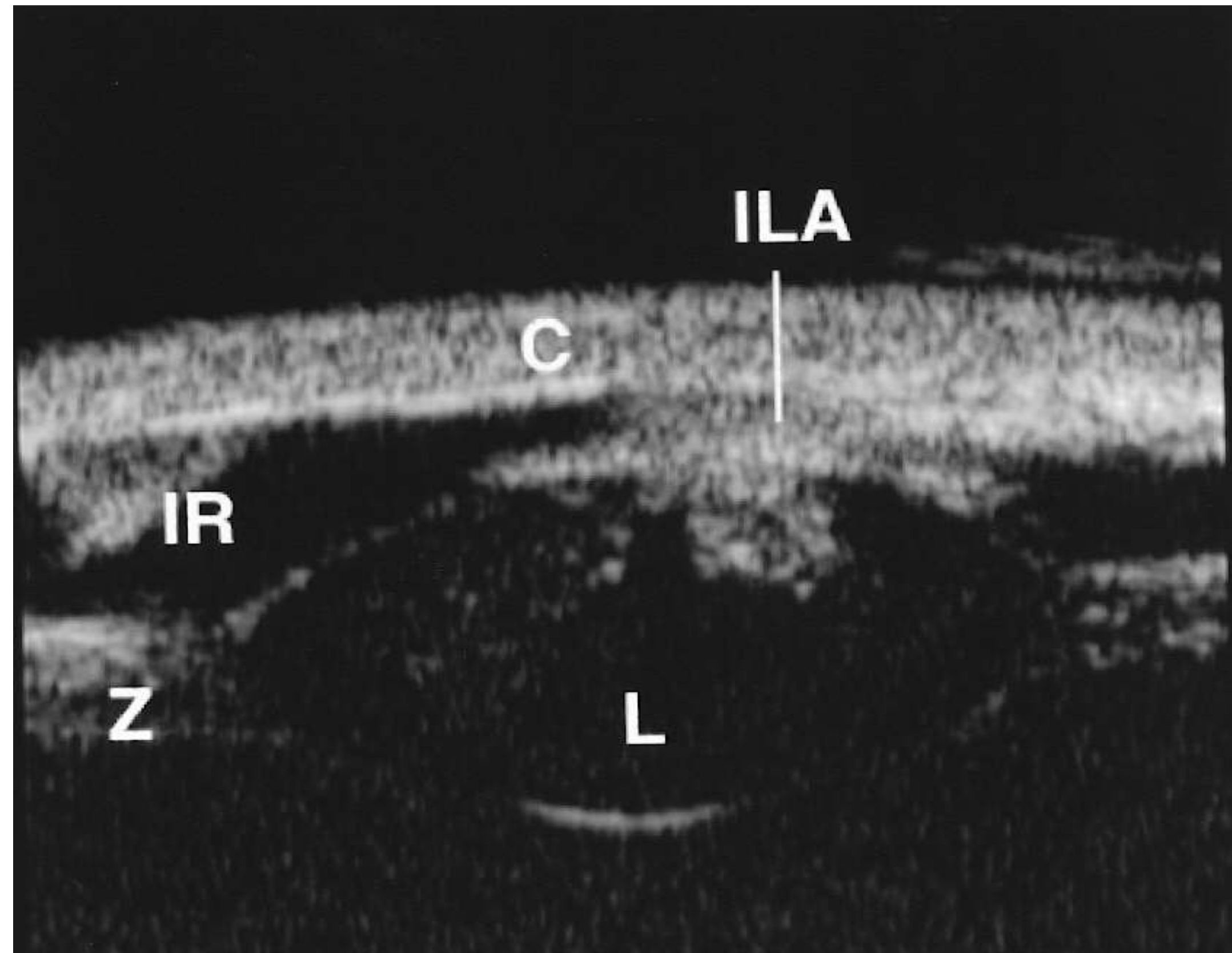
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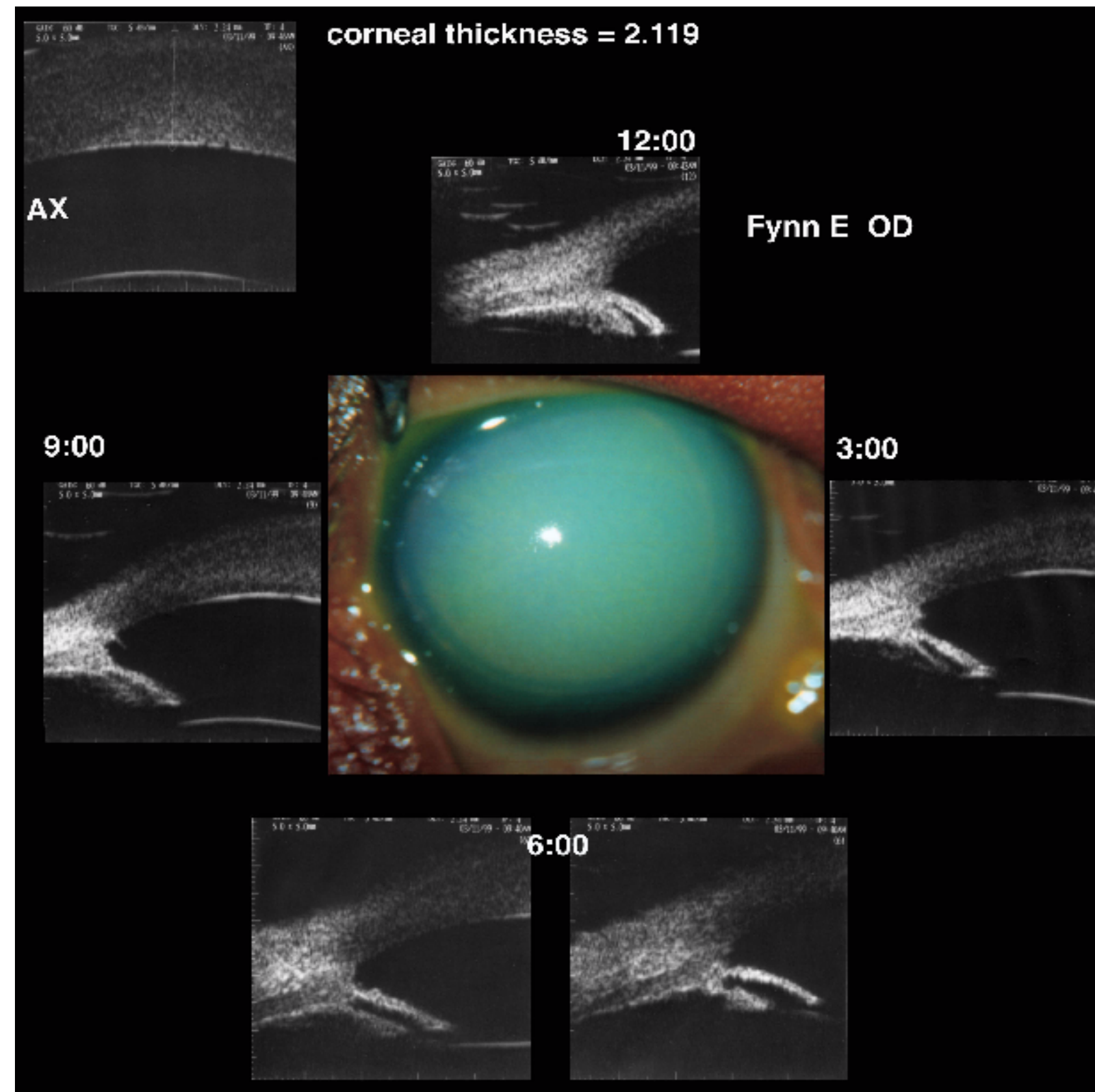
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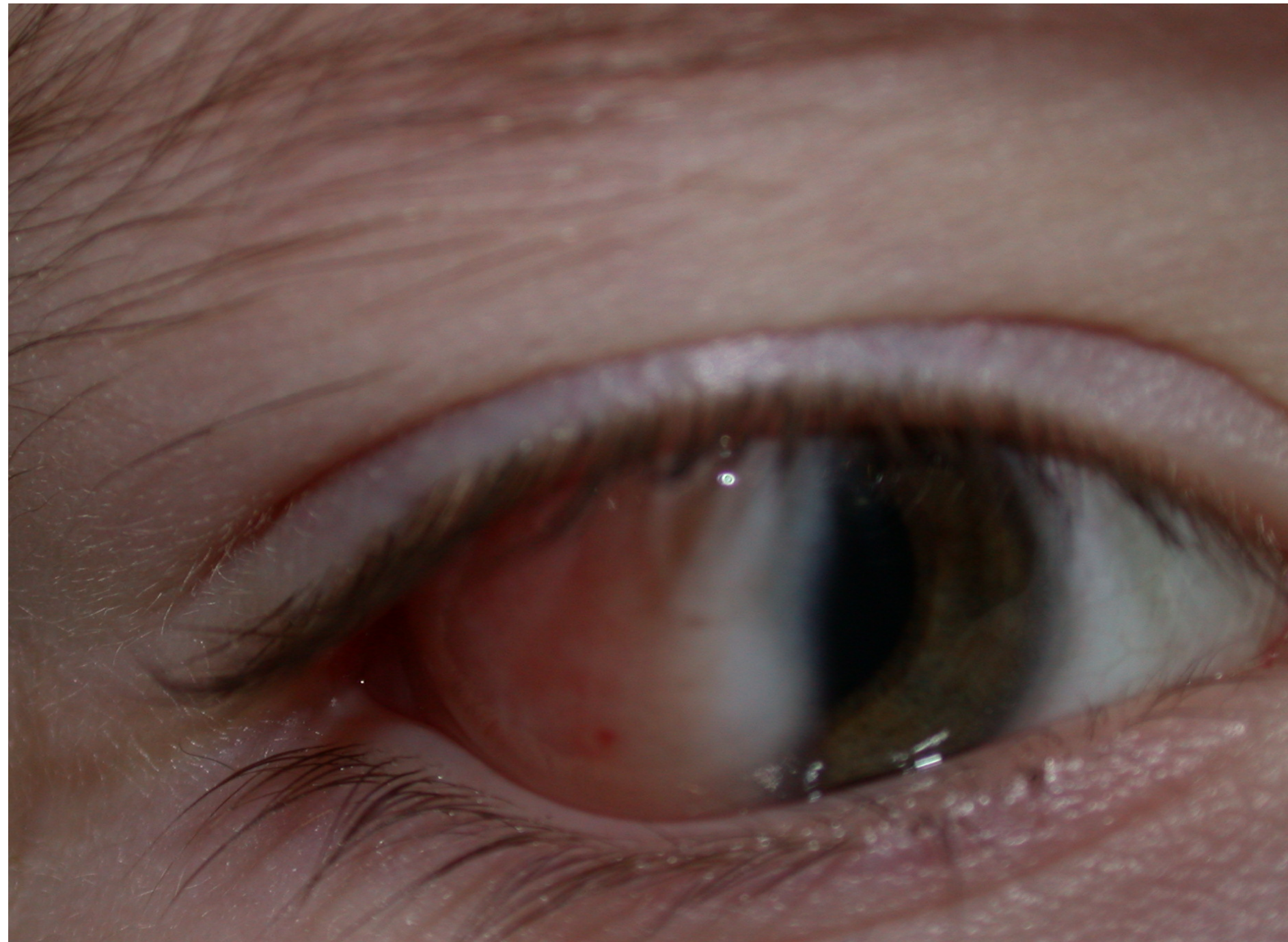
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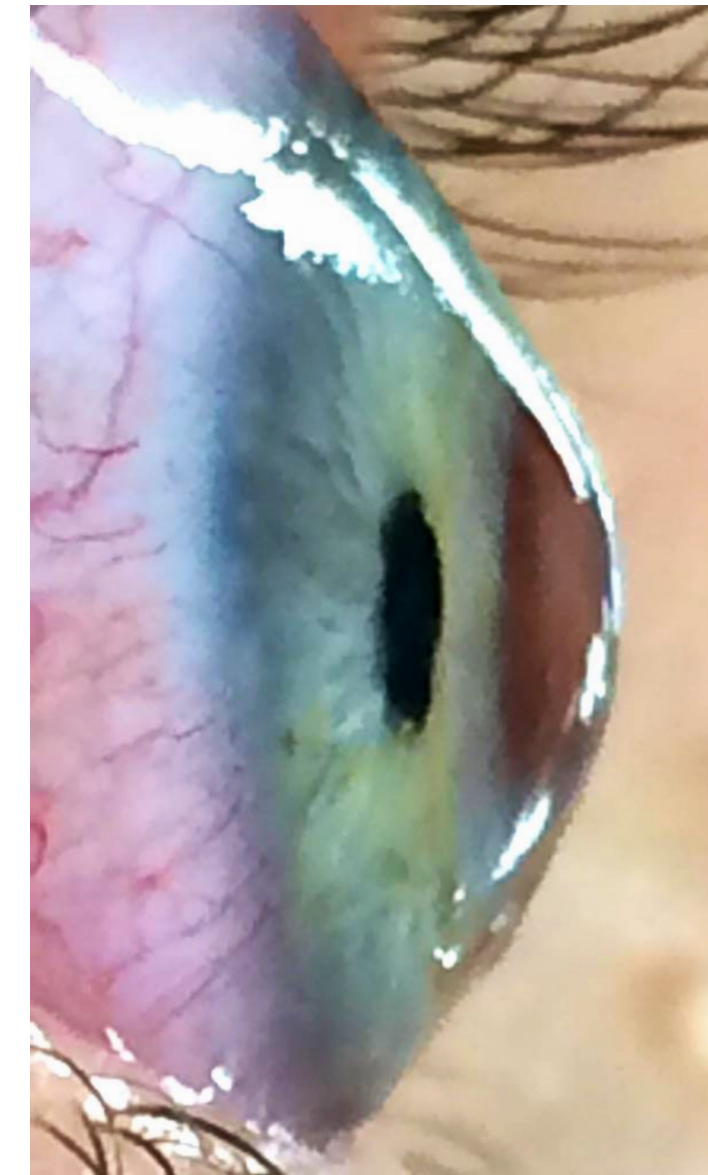


How can we make outcomes better?



Diagnosis: Keratoconus

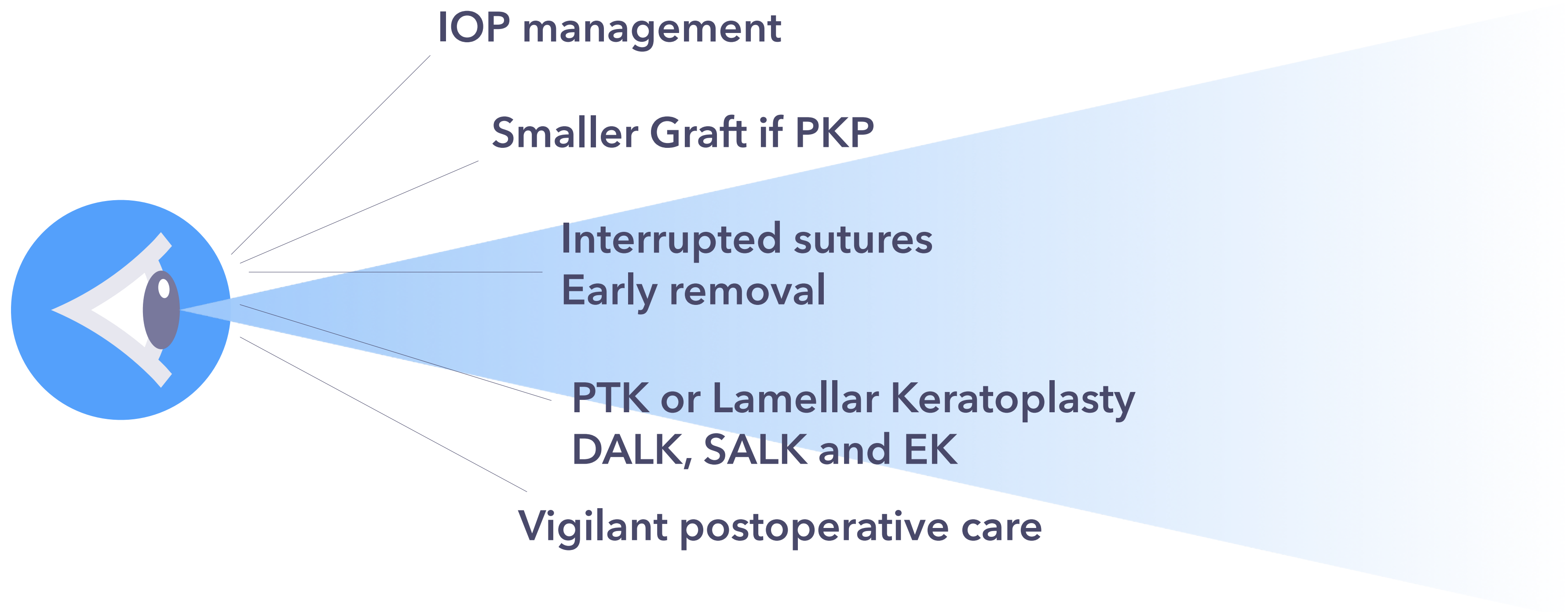
- Older age
- Lamellar keratoplasty
- Controlable co-morbidities
- Lower risk of amblyopia



	Busin	Ritu arrora	Samantha harding	Jatin ashar
Mean Age	11.7+-2.5 years	14.4 years	13 weeks to 14 years 11 month	7.82/+/-4.64 years
Number of eyes	14	20 eyes/16 patients	13 eyes/9 patients Successful in 11 eyes	26 eyes/26 patients
indication	Keratoconus 9 Post infectious scar 4 Prost traumatic scar 1	Keratoconus (< 18 years)	MPS 5 patients 3 – post infectious scarring 1 keratoconus	Keratoconus 8 Keratitis 6 Scar 6 Keloid 3 Chemical injury 2 Dermoid 1
Big bubble	13/14 eyes (92.8)			5 eyes Manual dissection 21
Endo cell density	2211+/- 414 cells/cumm	2179+/-119		
Mean follow up	16 months (6- 36 months)	44.5 months (24-105 months)	10 – 80 months	1 week to 7.3 years
complications		Rejection 1 Shiled ulcer(2) Infection(2) Interface vascularistaion (4)	Rejection graft failure re dalk	
Anatomical outcome	All graft clear	18/20 clear	10/11 clear	18/26 clear

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How can we make outcomes better?



Optimising Outcomes of Paediatric Keratoplasty?

Management of Comorbidities



- Ocular Surface Inflammation
- Exposure Keratopathy
- Corneal Neovascularisation

Optimising Outcomes of Paediatric Keratoplasty?

Management of Comorbidities



- **Ocular Surface Inflammation**
 - Restoring Homeostasis (OS Microenvironment)
 - Serum eye drops
 - Anti-inflammatories
 - Topical and Systemic Immunosuppression
 - Amniotic membranes
 - other modalities

Optimising Outcomes of Paediatric Keratoplasty?

Management of Comorbidities



- Ocular Surface Inflammation
- **Exposure Keratopathy**
- Corneal Neovascularisation







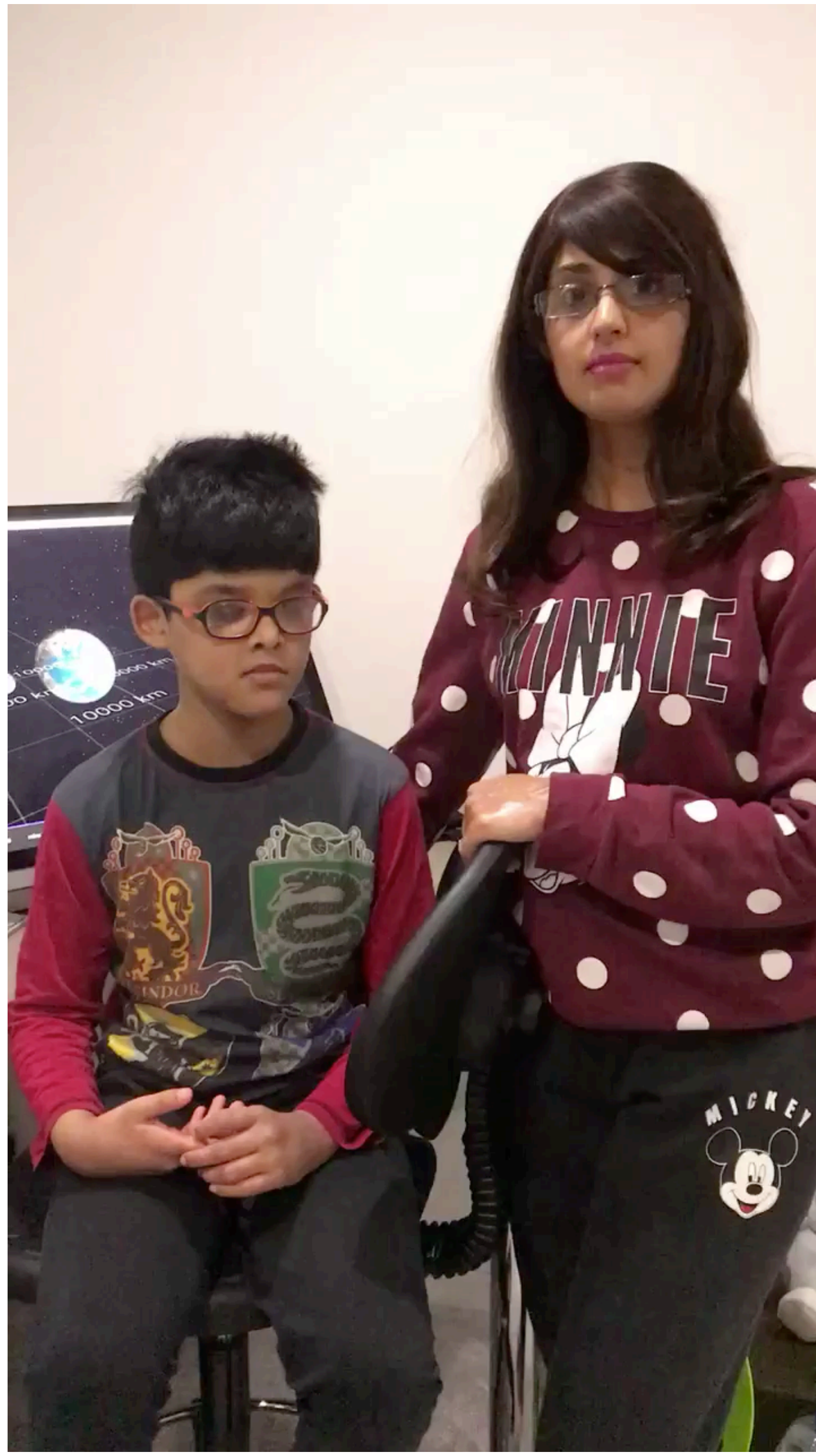


(c) 2013 QVH NHS Trust









Optimising Outcomes of Paediatric Keratoplasty?

Management of Comorbidities

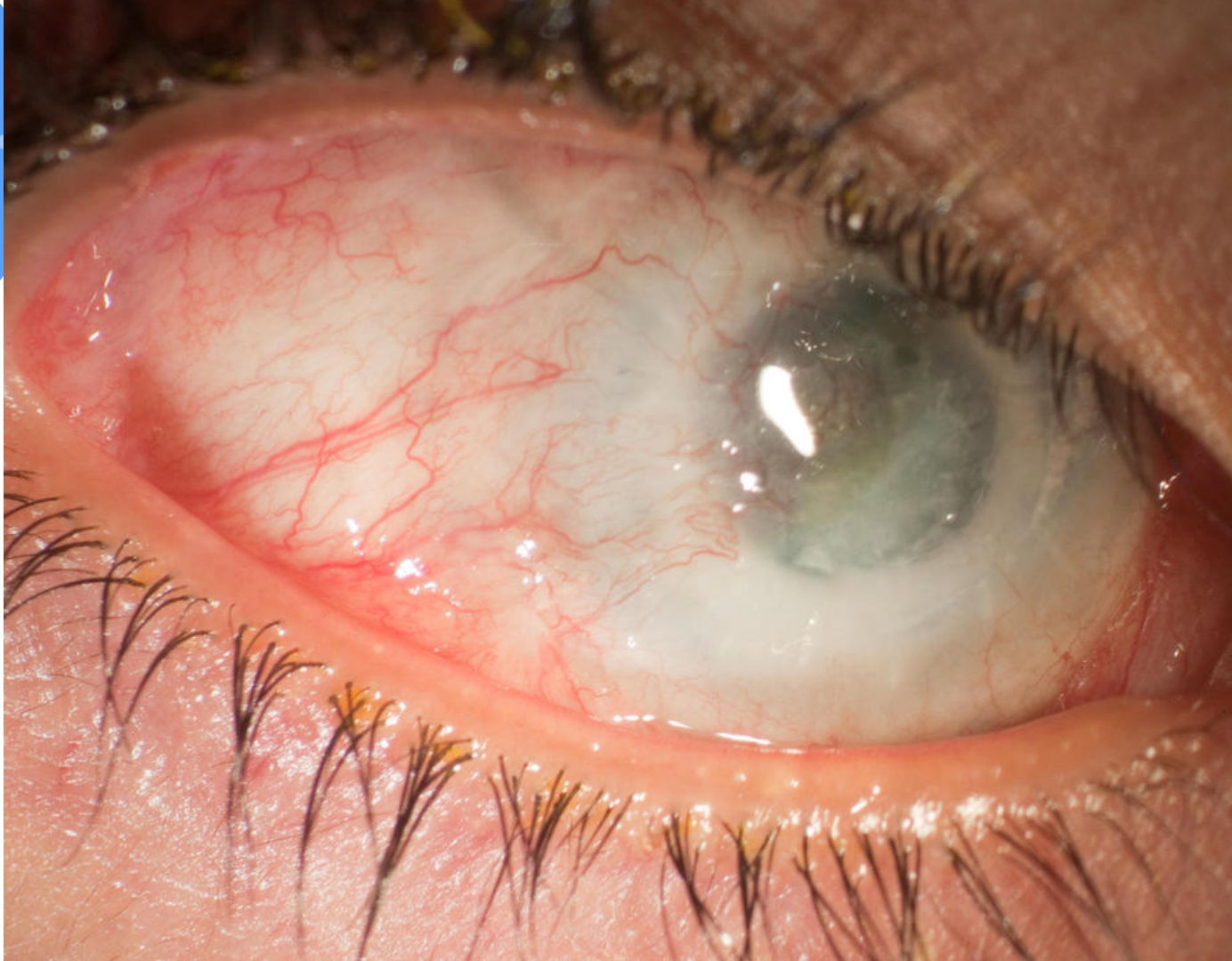
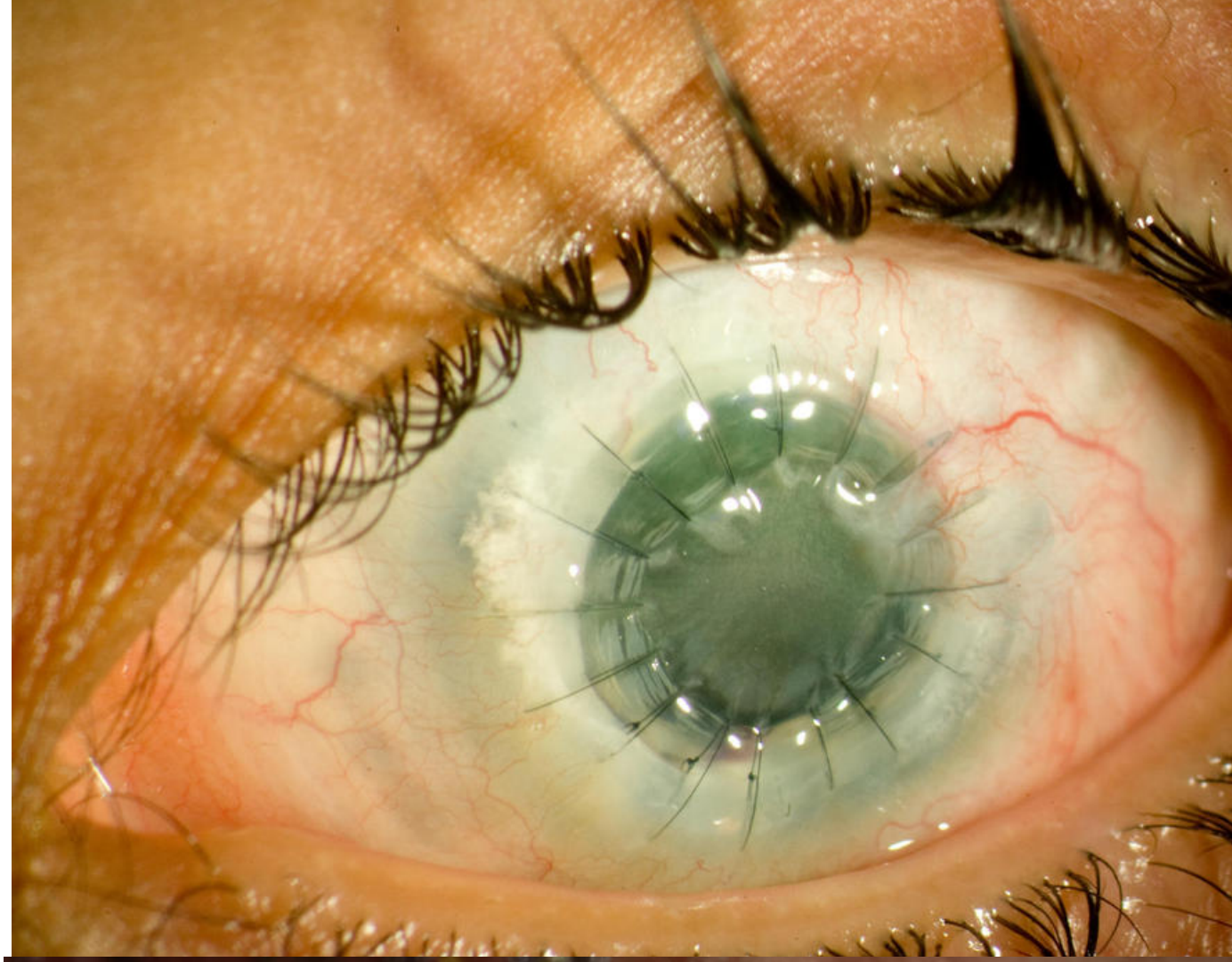
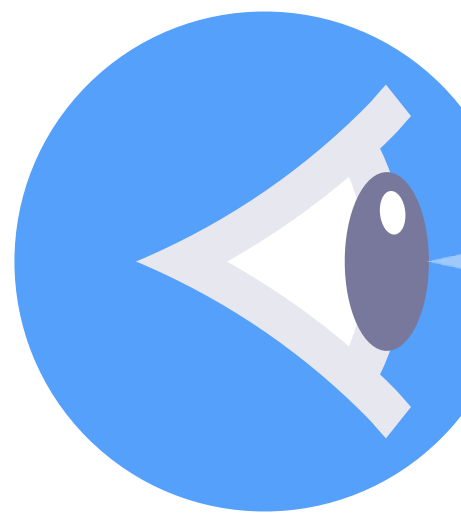


- Ocular Surface Inflammation
- Exposure Keratopathy
- **Corneal Neovascularisation**

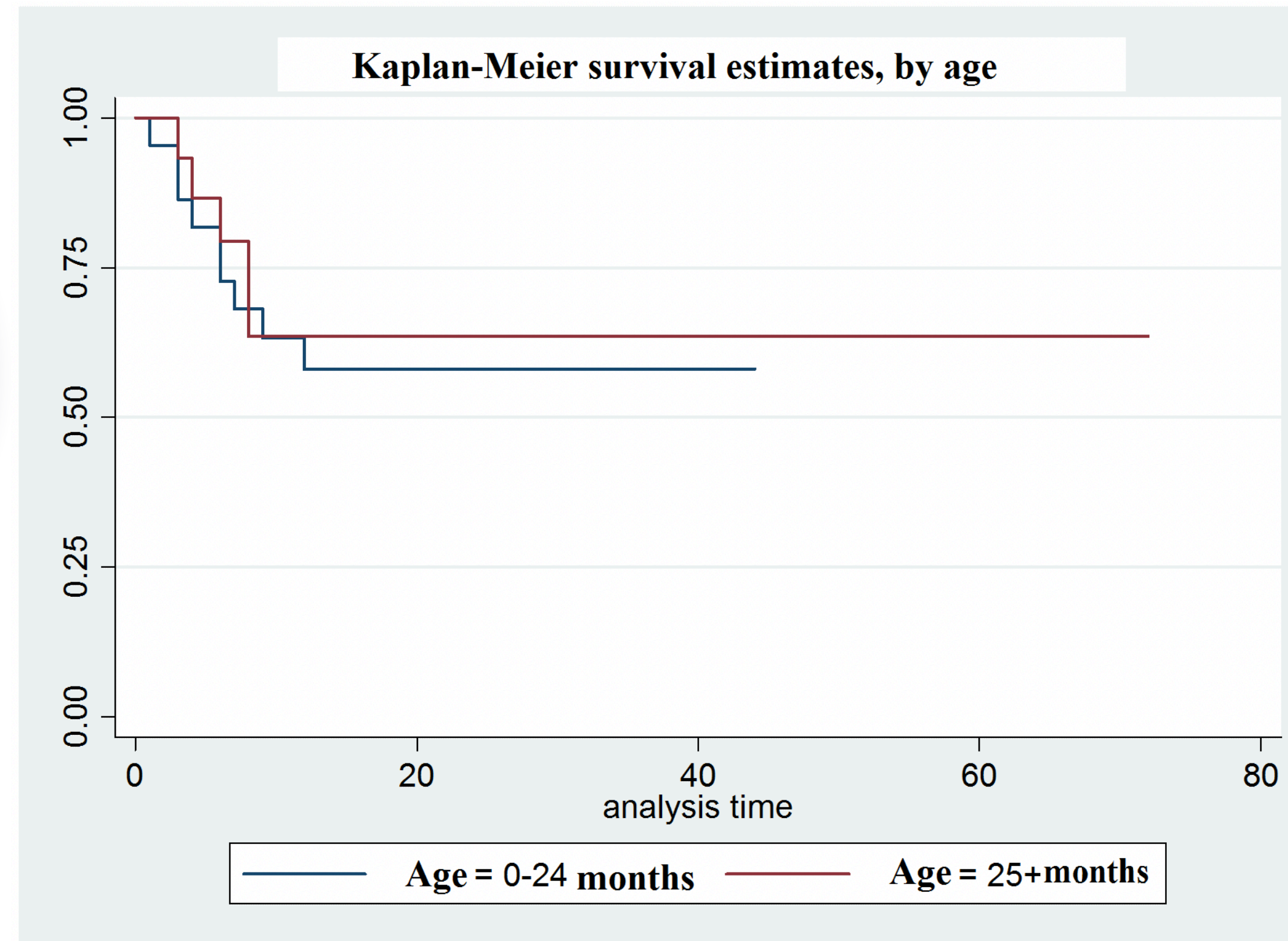


Pre-Injections

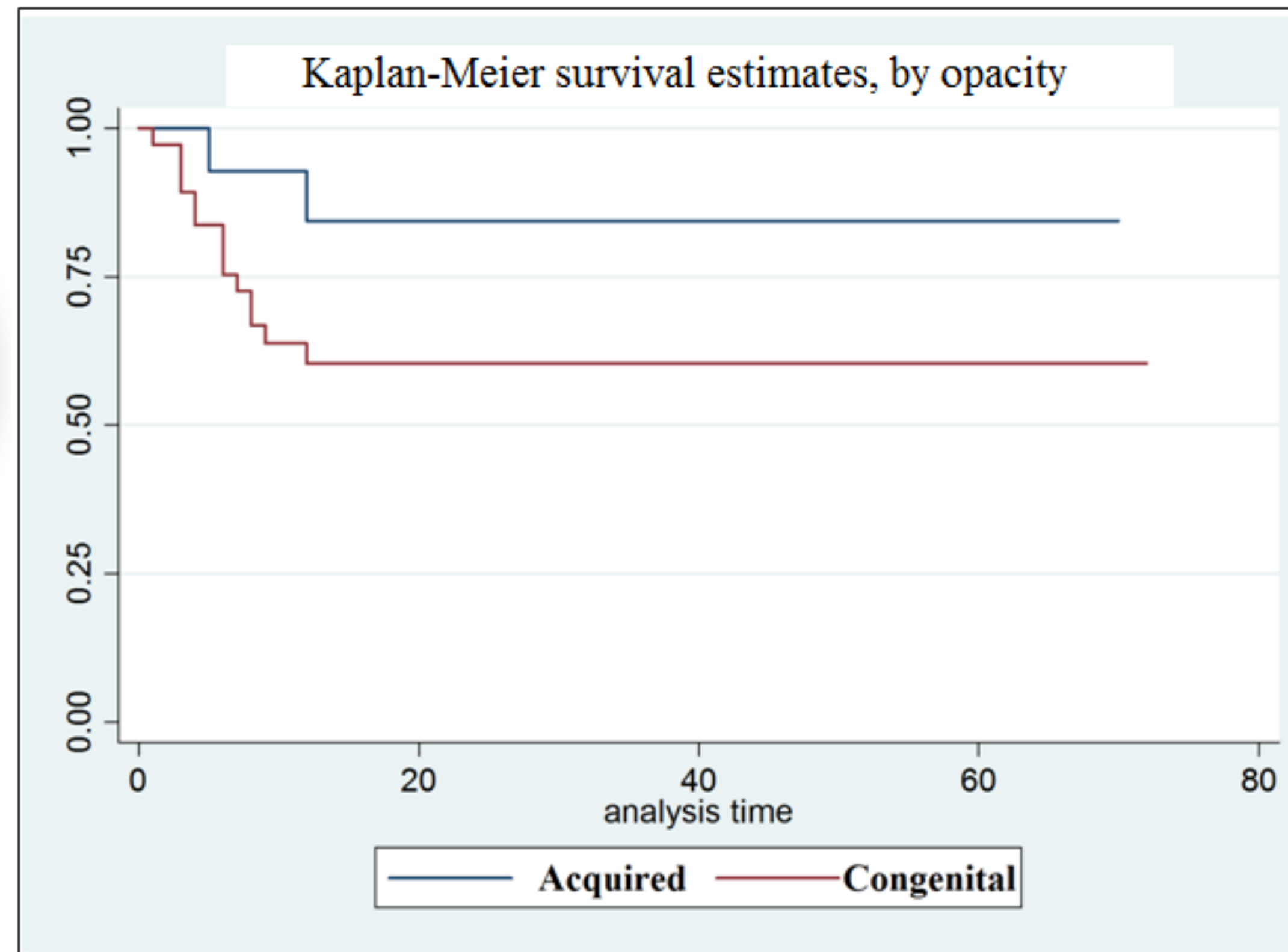
After 2-Injections



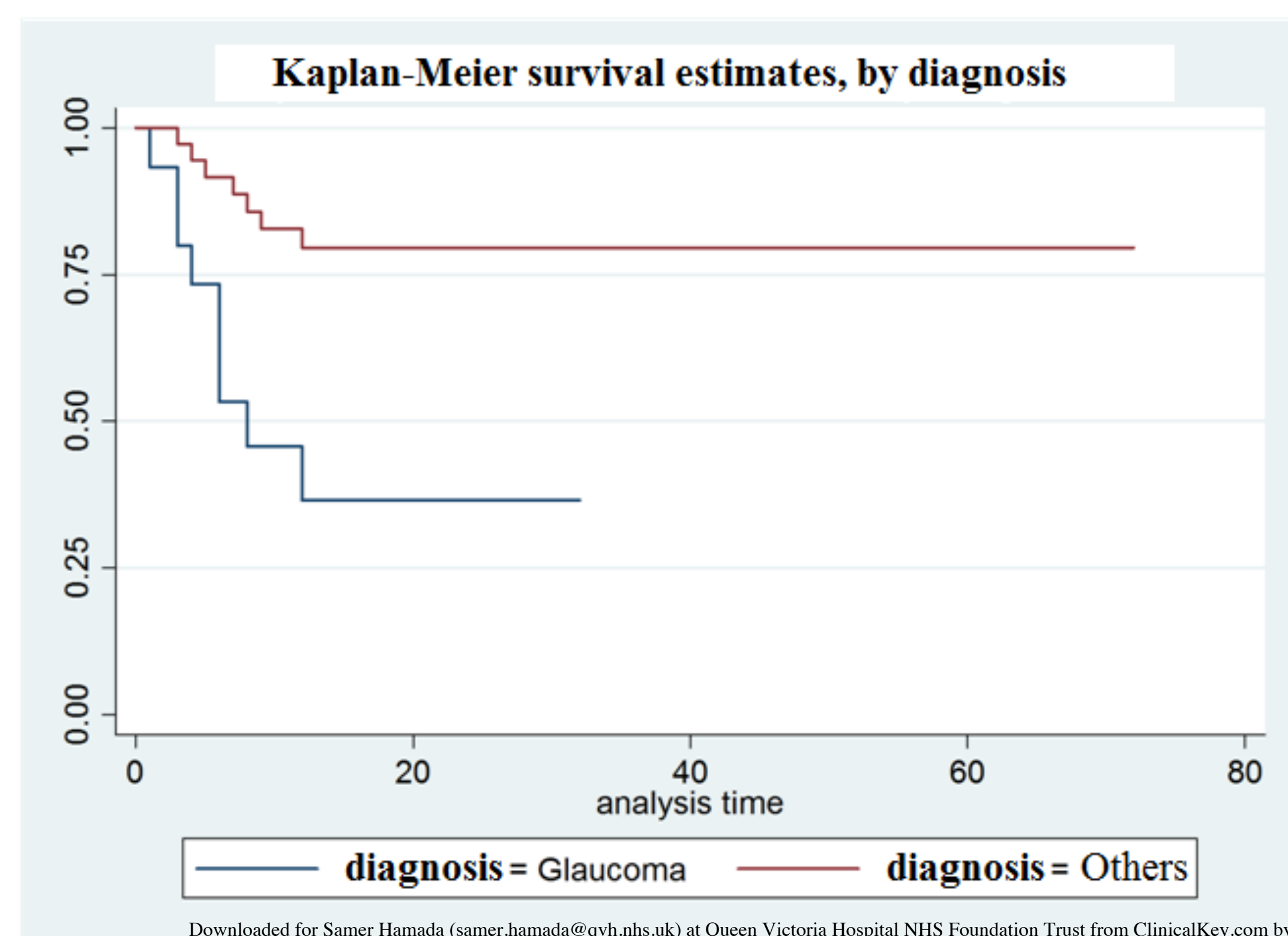
Success Rate



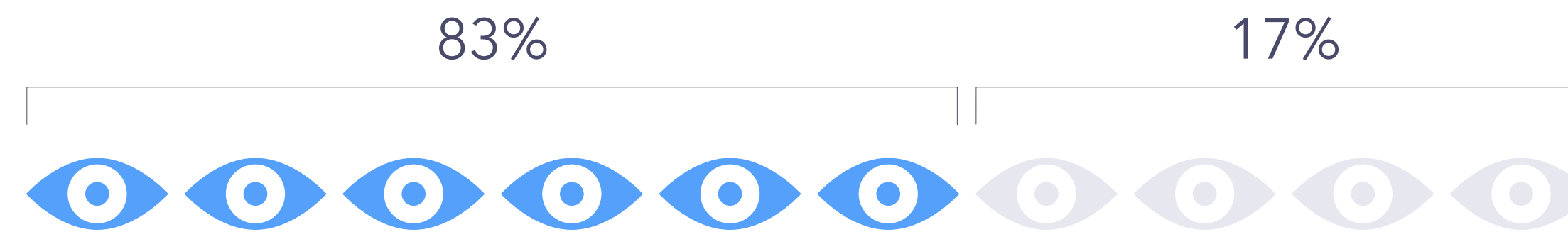
Success Rate



Success Rate



Success Rate



- Treating pre-existing co-morbidities
 - older ages ≥ 7
 - Acquired opacities
 - Lamellar Keratoplasty
-
- Congenital opacities
 - Peter's type 2
 - Poor compliance

Visual Outcomes

Clear Graft \neq Good Vision



- 74.5% better BCVA
- In a multicenter, 80% clear grafts
 - 33% VA = 20/200
 - 18% worse vision
- **Clear visual axis in early childhood is very important to minimise amblyopia**

Visual Rehabilitation

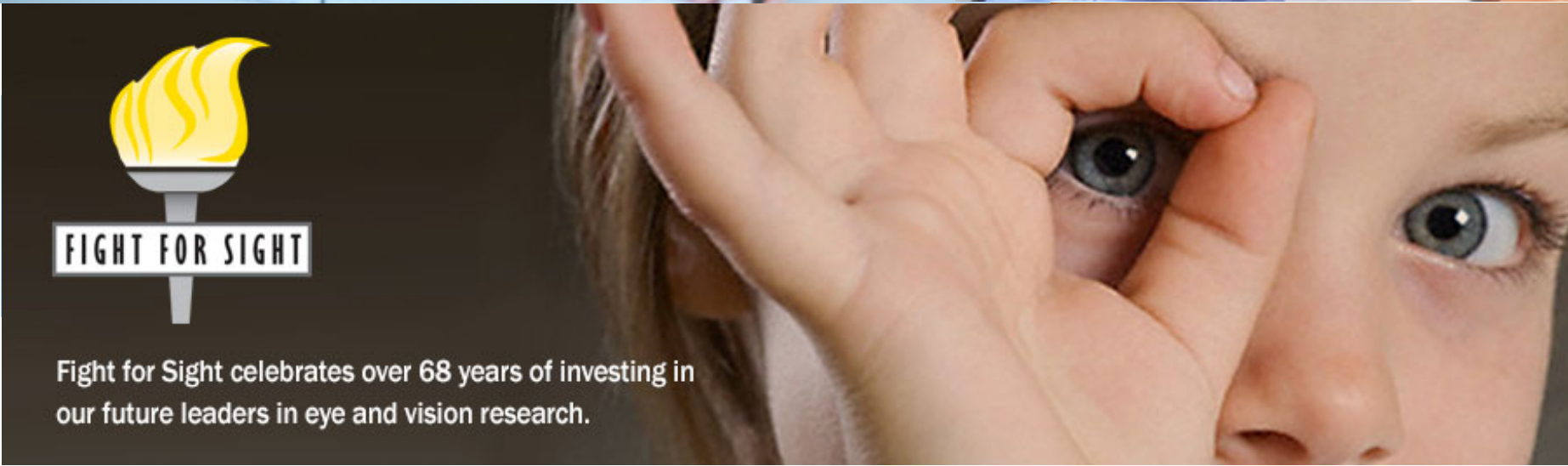


- Aggressive Amblyopia Management
- Parents Education
- Contact lenses better
- Refractive surgery
- Intraocular surgery




The Inclusive Learning Service
Sensory Team
Are excited to announce the launch of our new
Sensory Newsletter

Connecting with families of children and young people with a hearing or vision impairment
For parents/ carers of children supported by the Stoke-on-Trent Visual and Hearing Impairment Teams
Our first Sensory Newsletter will be emailed out in July 2019.
If you would like to receive these emails, please register at the link below:
www.stoke.gov.uk/sensorynews

Fight for Sight celebrates over 68 years of investing in our future leaders in eye and vision research.







JustGiving™

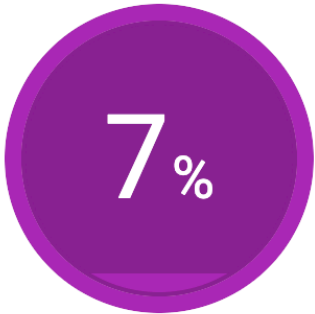
Menu ▾

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Sign up



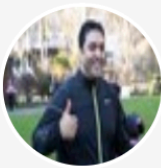
£150.49

raised of £2,000 target
by 4 supporters

Donate



Share on Facebook



Mohamed Elalfy

Mohamed's page

I am running for my patients for Royal National Institute of Blind People because I admire what RNIB do for people with sight loss

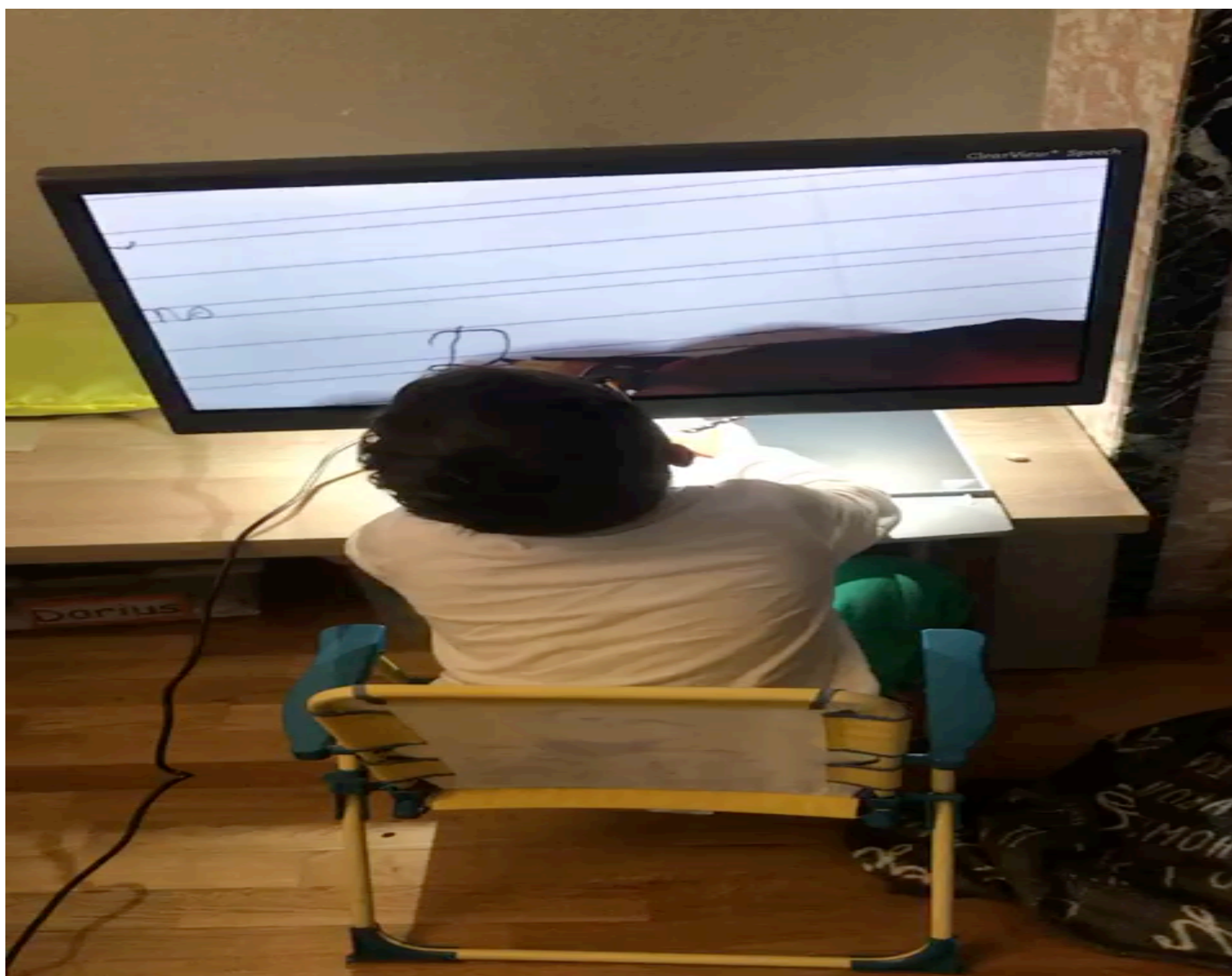
📅 Event: London Marathon 2020, 26 Apr 2020 [Start fundraising for this event](#)

RNIB
See differently

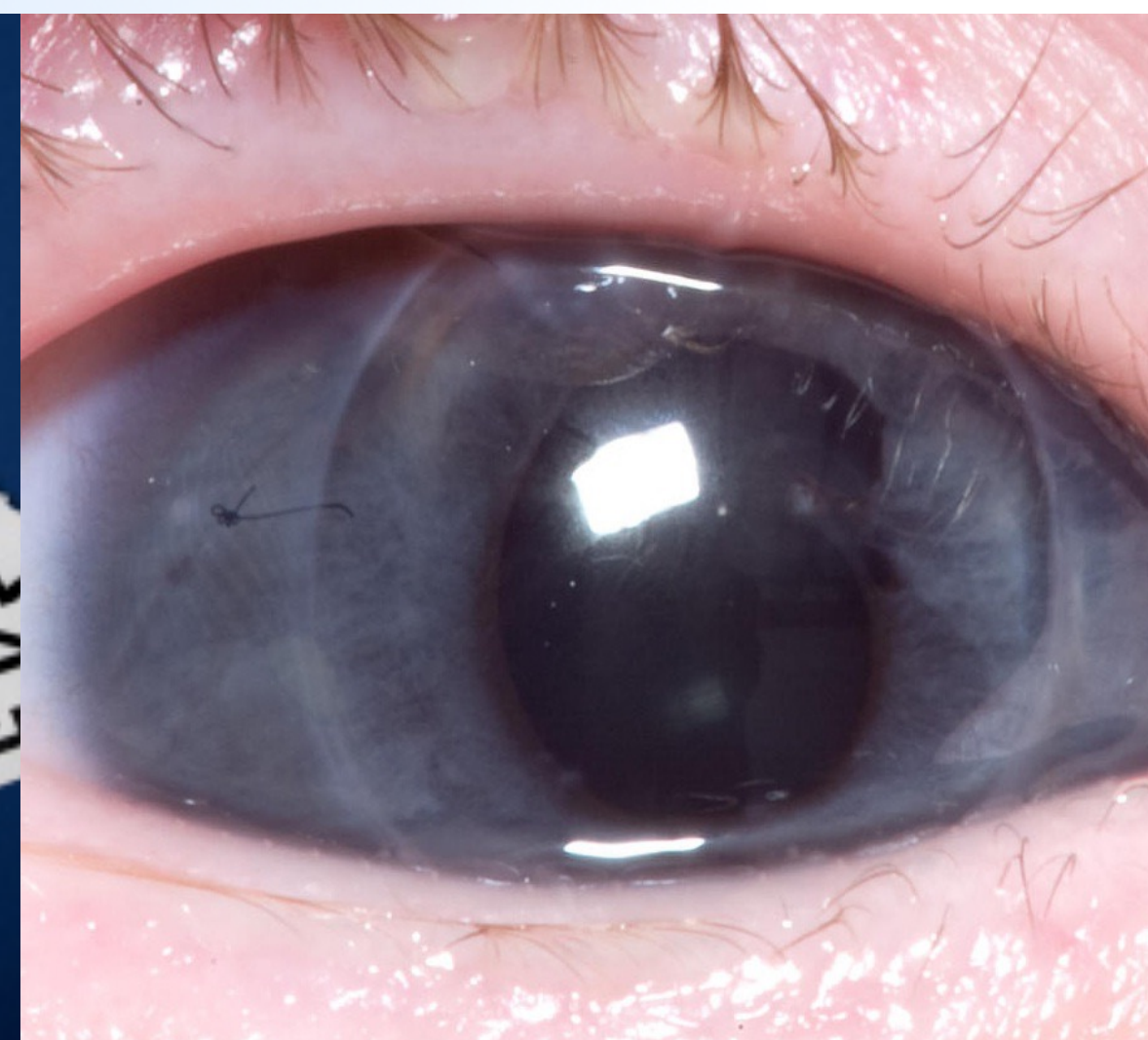
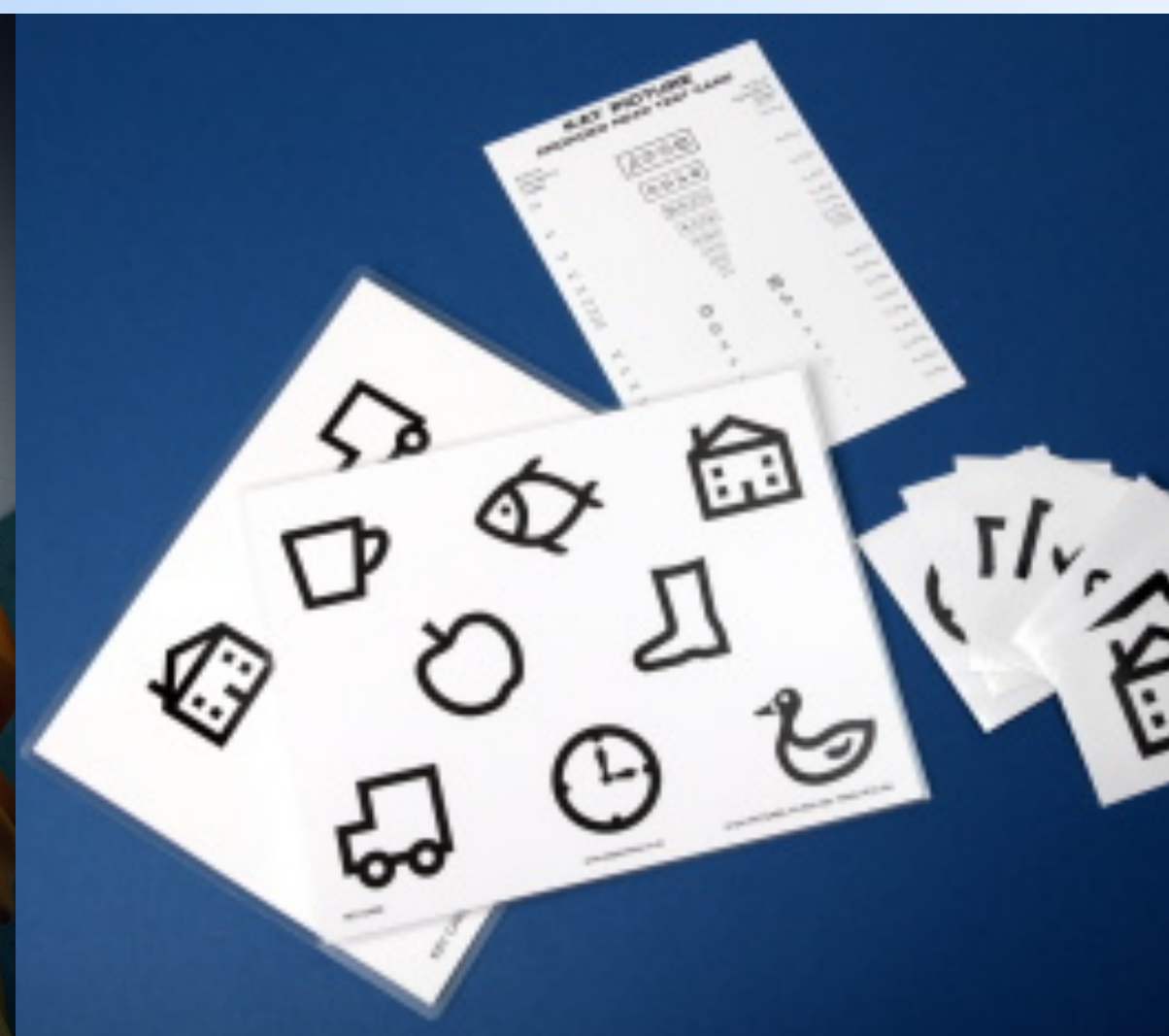
RNIB London Marathon team 2020

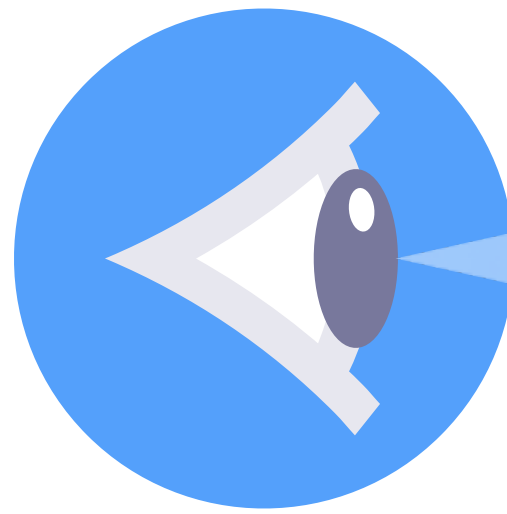
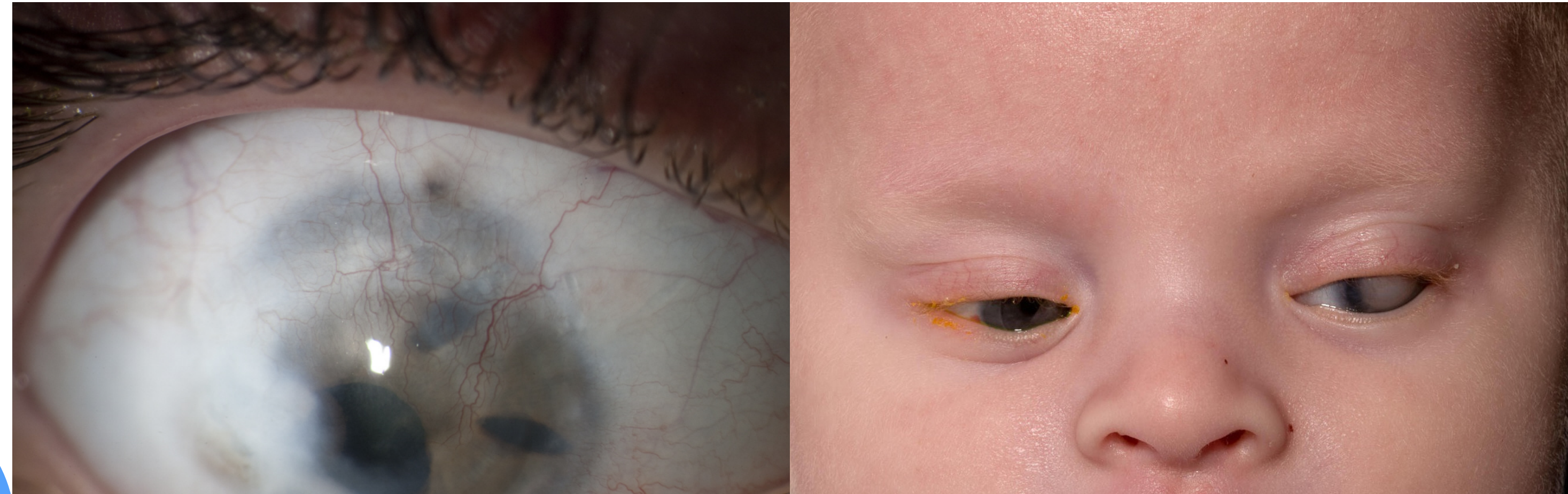
run by Royal National Institute of Blind People

Welcome to our 2020 London marathon page!



Measuring Outcomes!



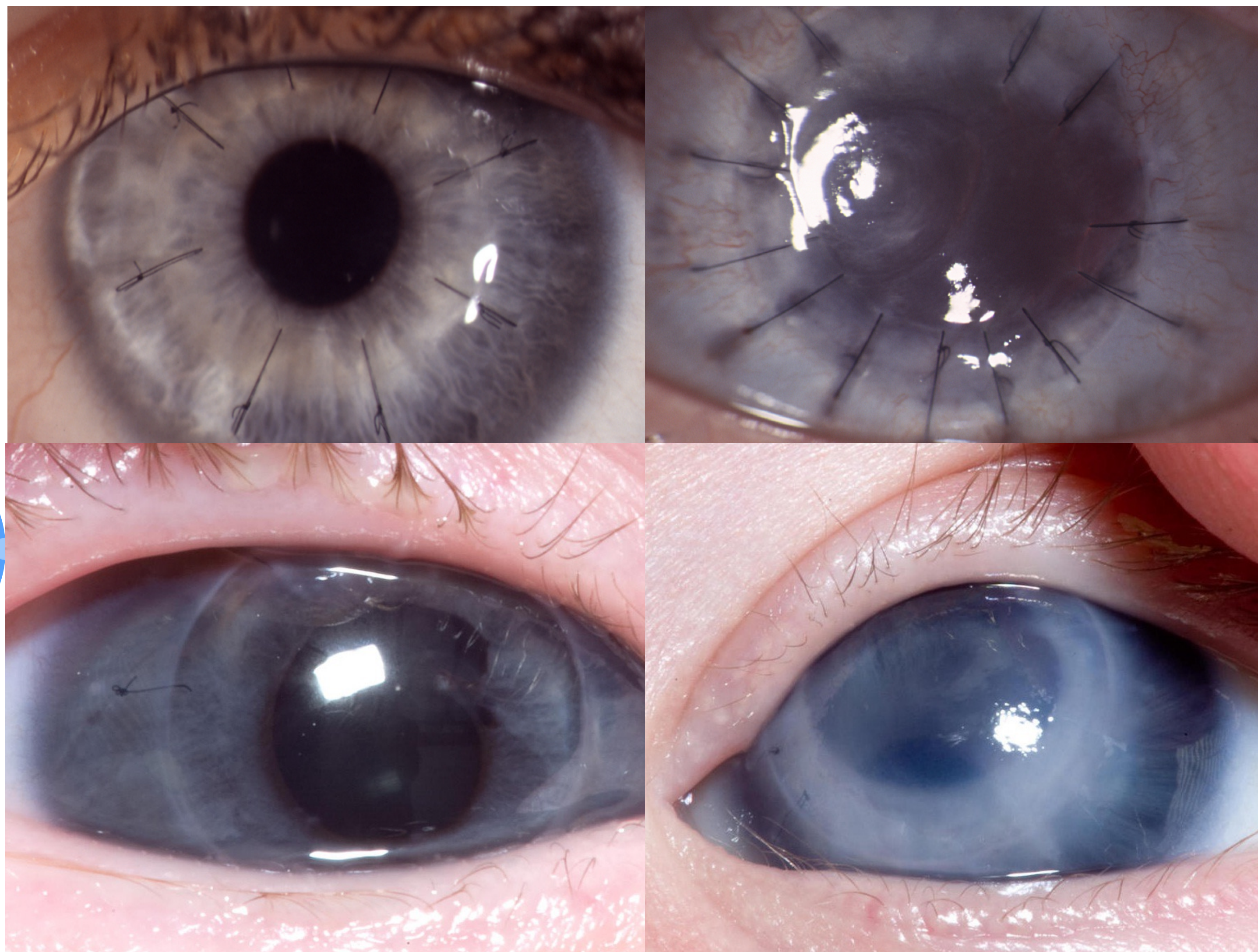


Surgeon

- Visual acuity
- Graft clarity
- Keratometry

Parents/child

- Daily functioning/
subjective visual
function
- Patients/parents
expectations
- Adaptation abilities





Listen to the Parents

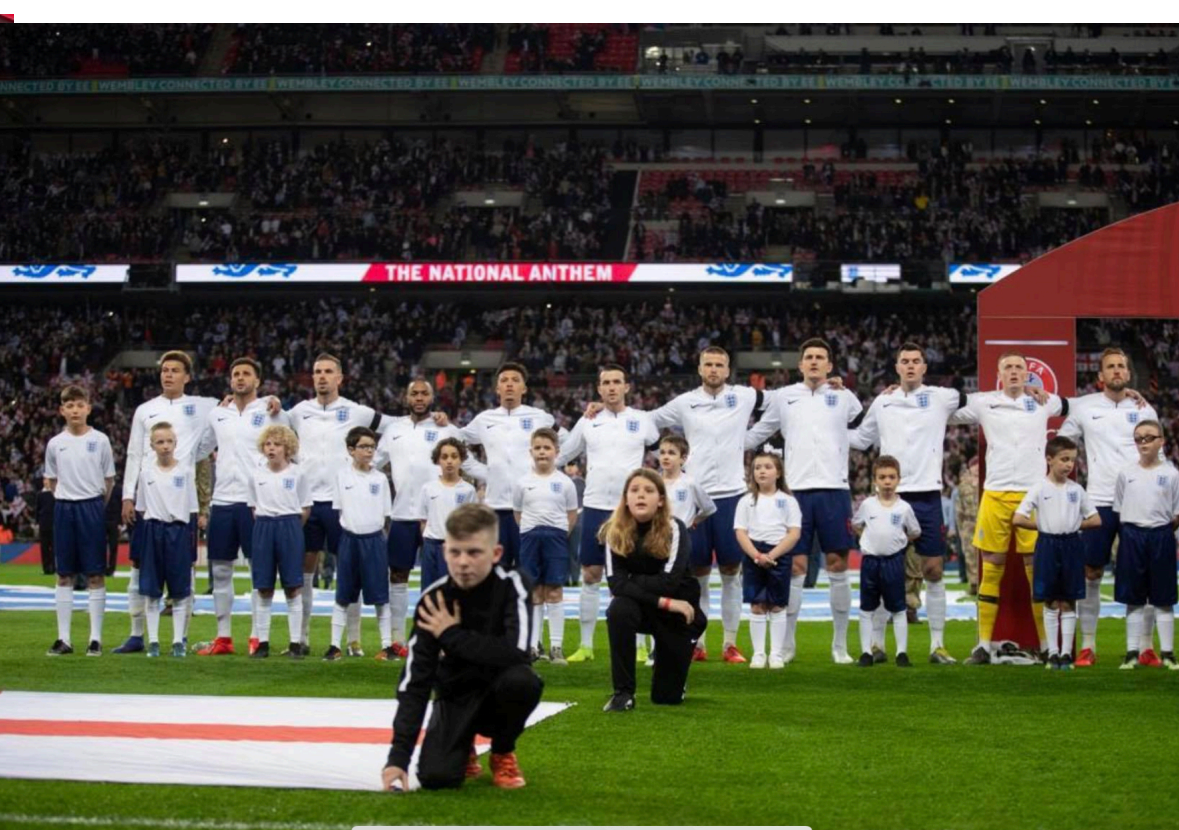


Listen to the Parents





It's been a VERY long time for him to play the sport he loves, but Declan is joining in... See more





“The ultimate measure by which to judge the quality of a medical effort is whether it helps patients as they see it”
Donald Berwick



See, Feel, Act



Corneal Transplantation in Children!



- Decision making
- Judicious selection of procedures
- Meticulous attention to details
- Encouraging outcomes
- Promising future


Paediatric Keratoplasty

Give them the hope!



Listen to the parents





Paediatric Keratoplasty

Give them the hope!

