UMEÅ UNIVERSITY

Cornea guttata som riskfaktor vid gråstarrskirurgi

Användarmöte Svenska kataraktregistret

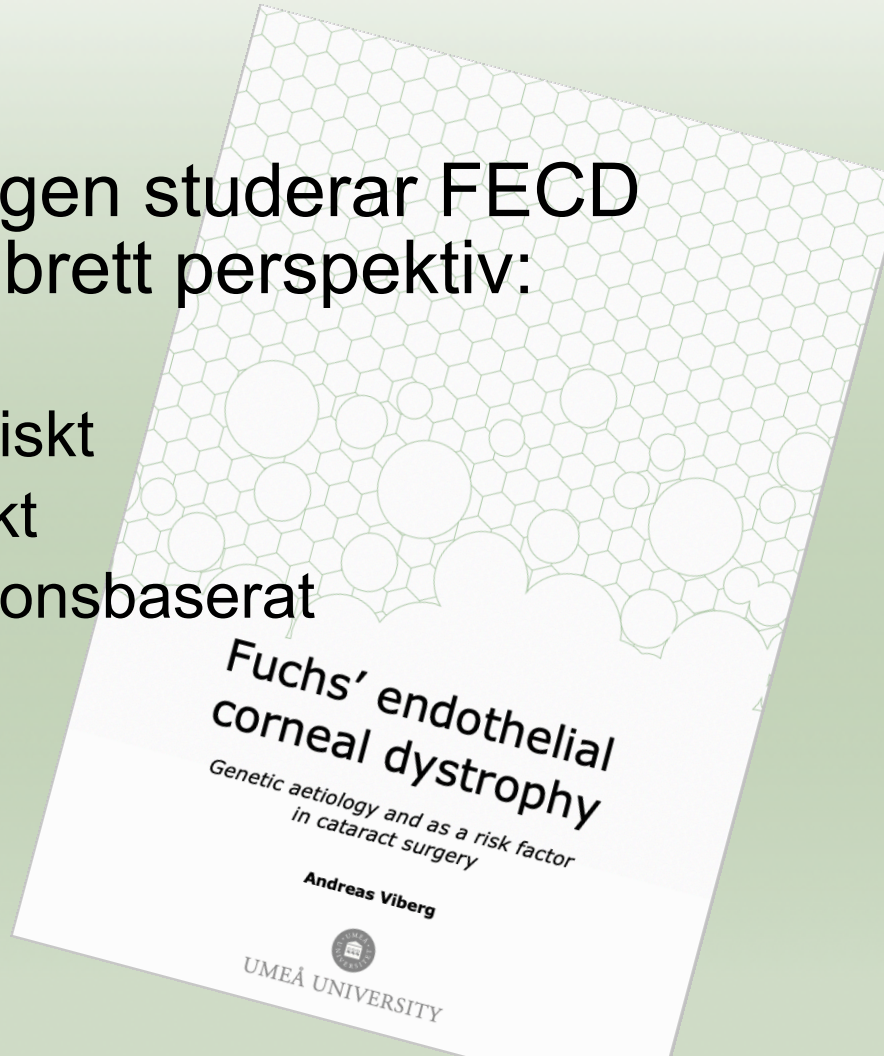
Andreas Viberg

Specialistläkare, Medicine doktor
Ögonkliniken Umeå

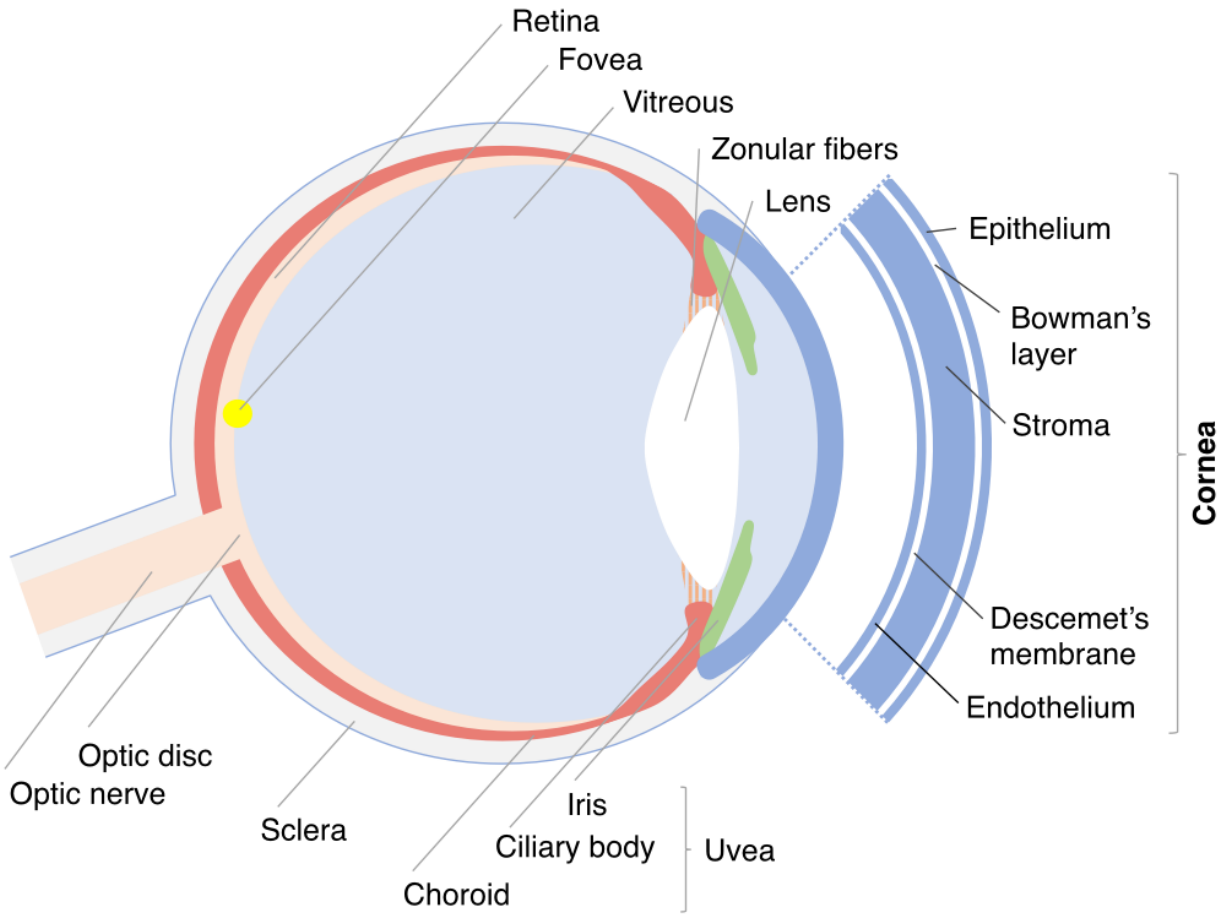
SYFTE MED AVHANDLINGEN

- Att undersöka den ärftliga orsaken till Fuchs' endotelial corneala dystrofi (FECD)
- Via nationella kvalitetsregister studera hur FECD påverkar utgången av gråstarrskirurgi
- Utfall vid gråstarrskirurgi med tät lins och bakre kapselruptur

- Avhandlingen studerar FECD utifrån ett brett perspektiv:
  - Kliniskt
  - Fenotypiskt
  - Genetiskt
  - Populationsbaserat



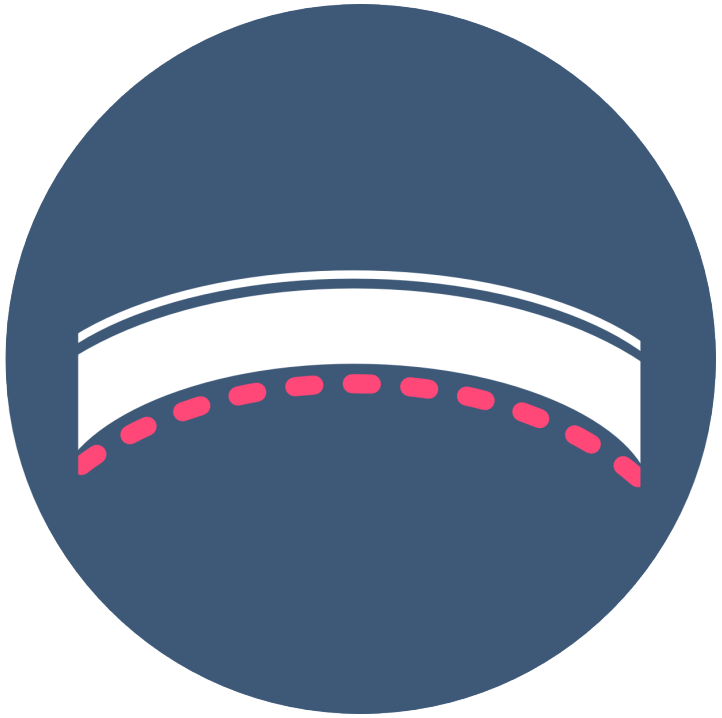
INTRODUKTION



Cornea, hornhinnan

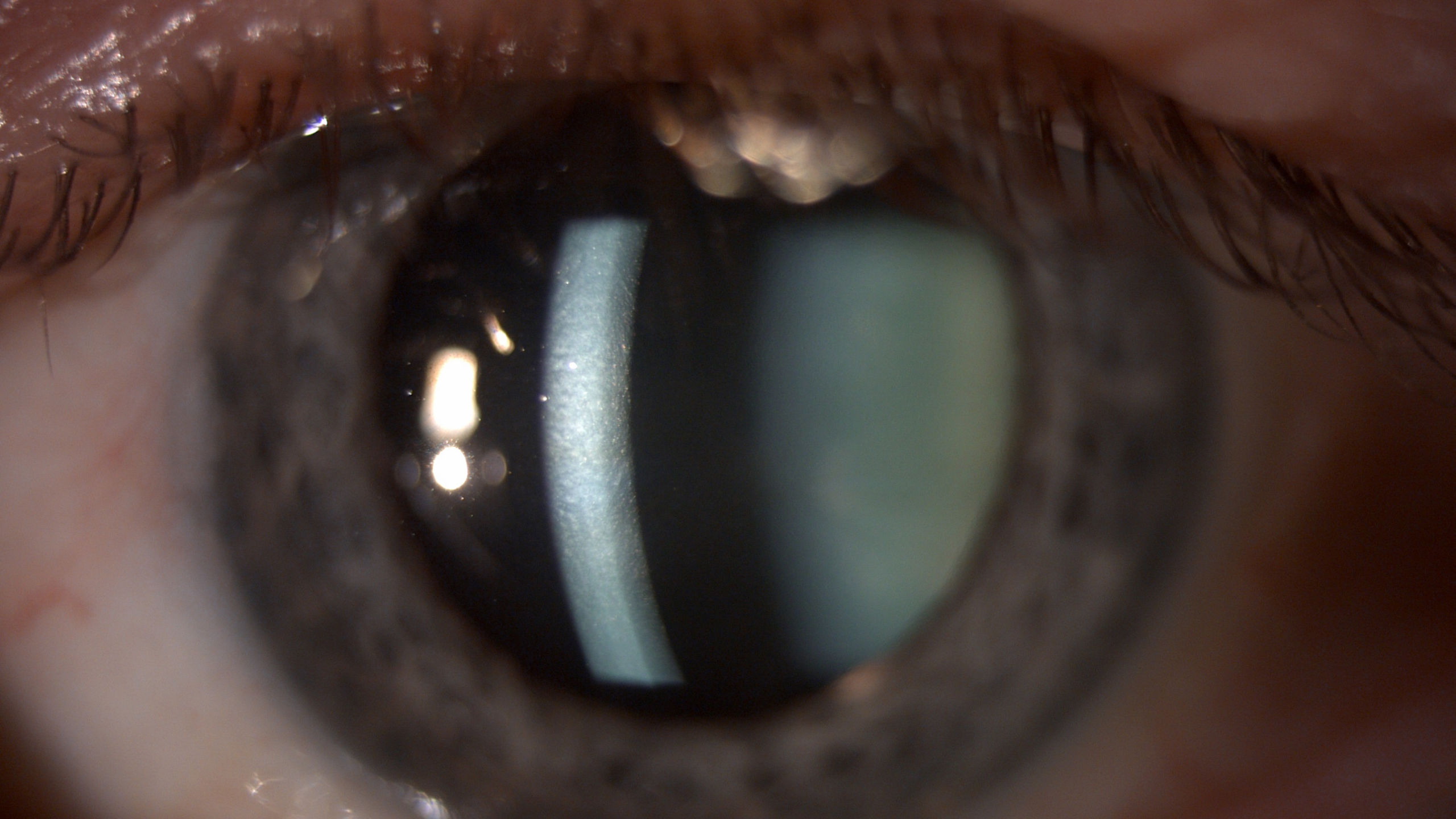
- ~0,5mm tjock i centrum hos friska
- Ögats ”fönster”, flera lager
- Genomskinlig, vätska pumpas ut ur hornhinnan, Na/K-pump
- Endotelcellslagret, ett cellager tjockt, hexagonala celler

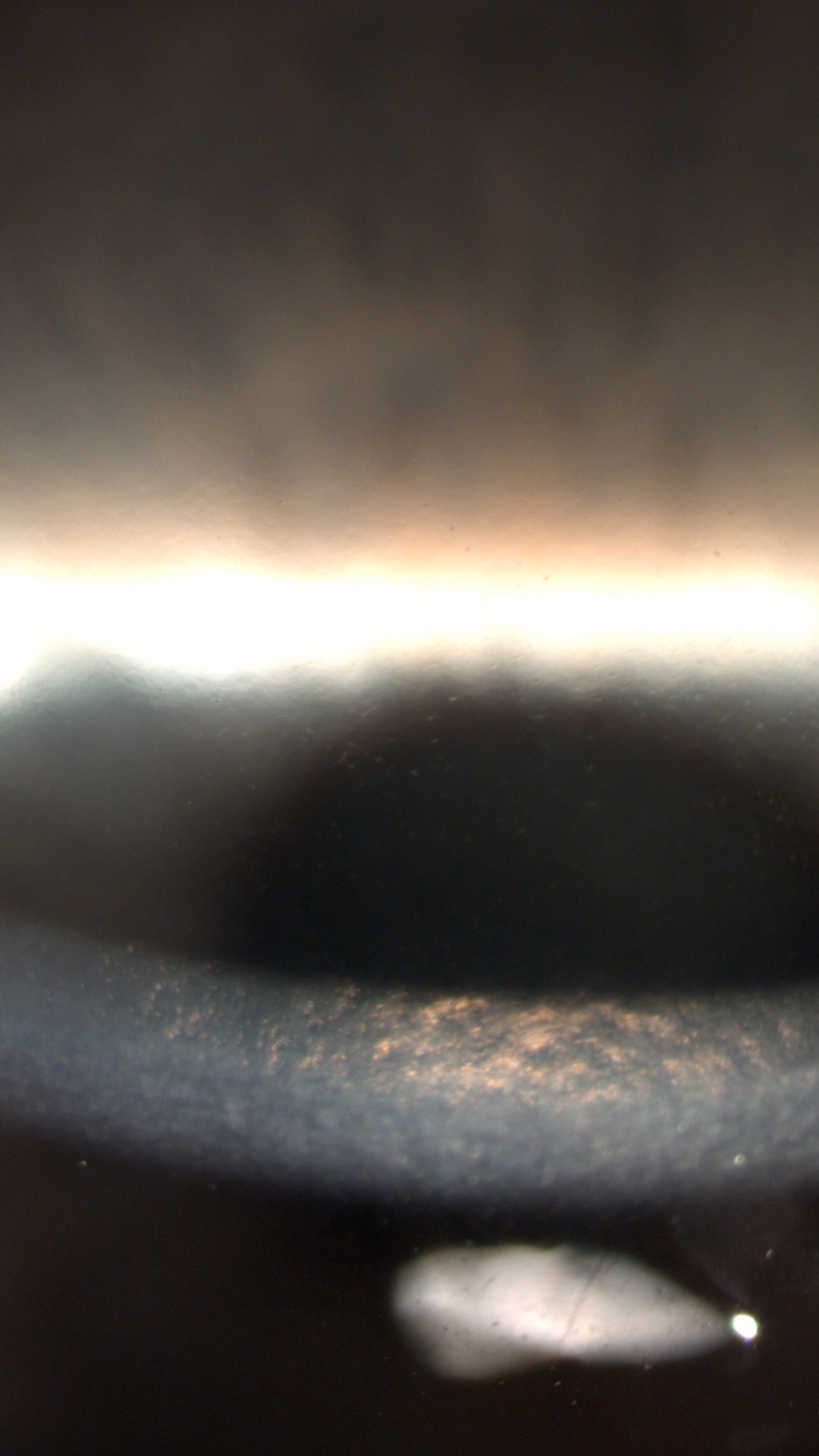
INTRODUKTION

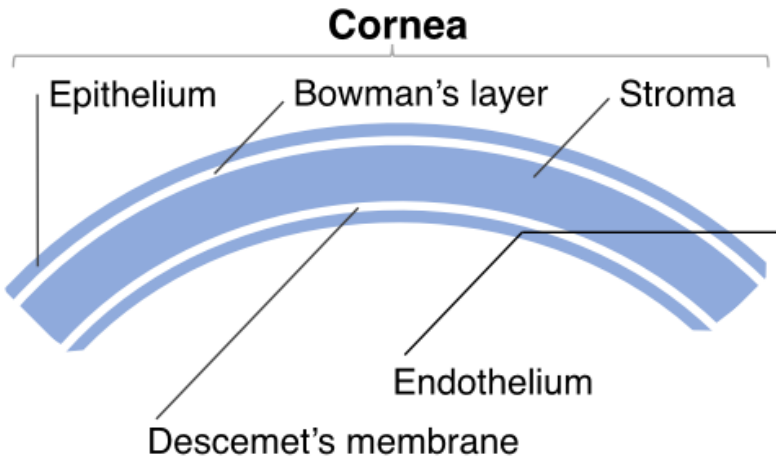


Fuchs’ endotelial corneala dystrofi

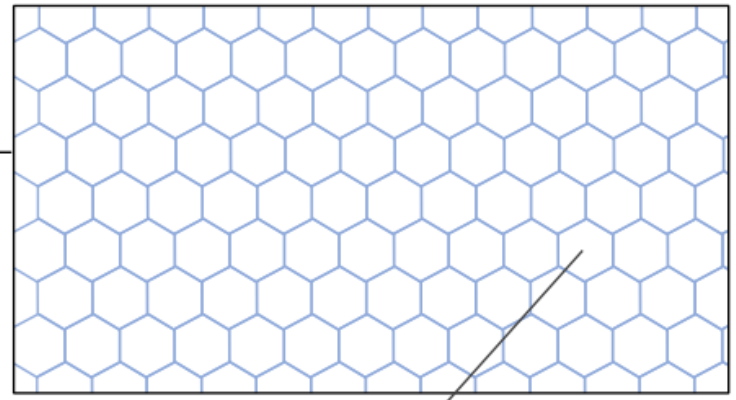
- Ernst Fuchs 1910
- ”Vanlig”, ofta ärftlig, icke inflammatorisk, drabbar båda ögonen
- Cornea guttata, droppformade förtjockning av Descemets membran
- Endotelets pumpförmåga försämras - hornhinnan sväller – synnedsättning. Vid avancerad sjukdom: blåsor, sår, ärr
- Vanligaste orsaken till hornhinnetransplantation

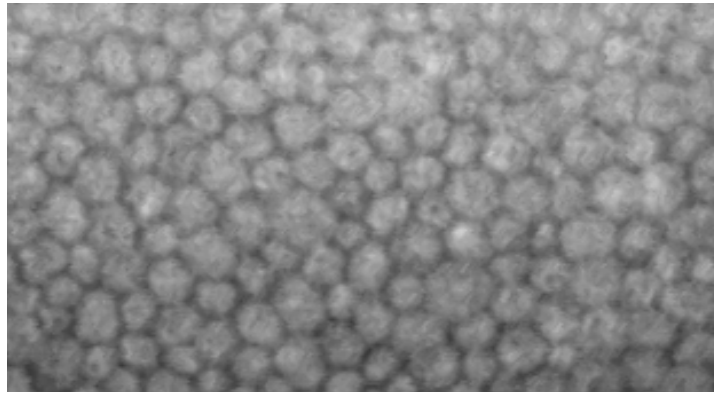




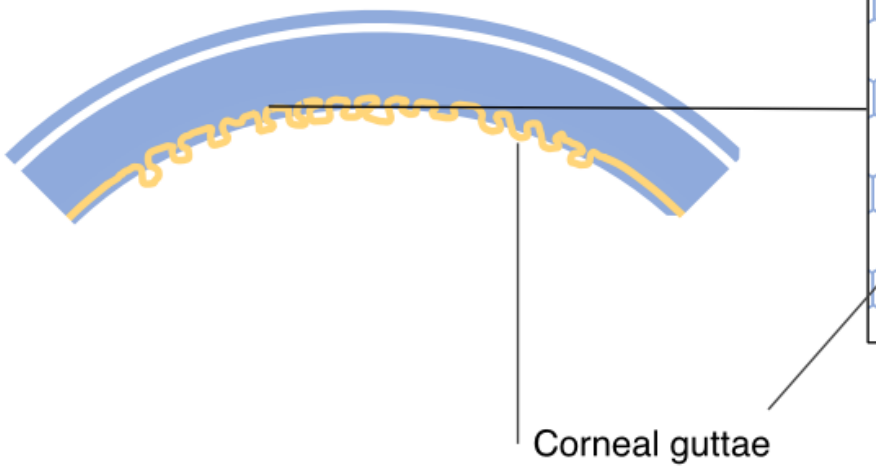


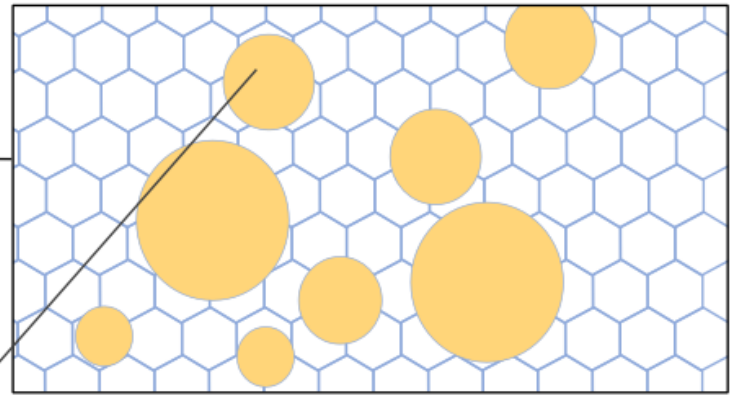
Endothelial layer without corneal guttata

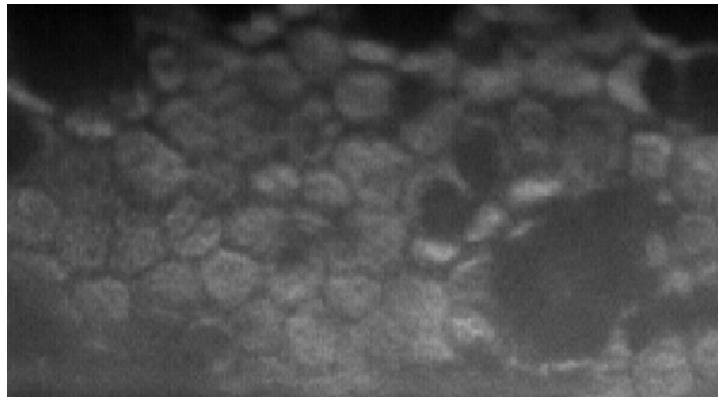




Endothelial layer with corneal guttata





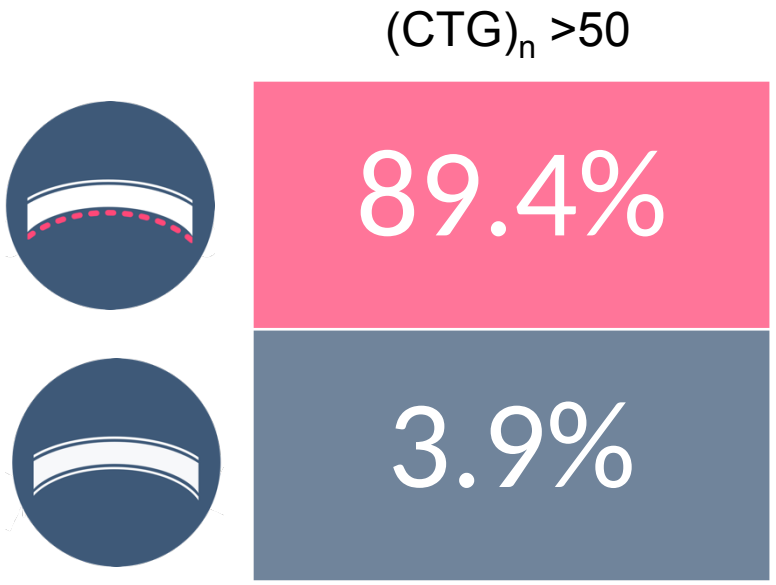


GENETIK

TCF4 - transkriptionsfaktor

- Kromosom 18, q21.2
- Instabil region med trinukleotidrepetitioner (CTG) i tredje intronområdet

DELSTUDIE I

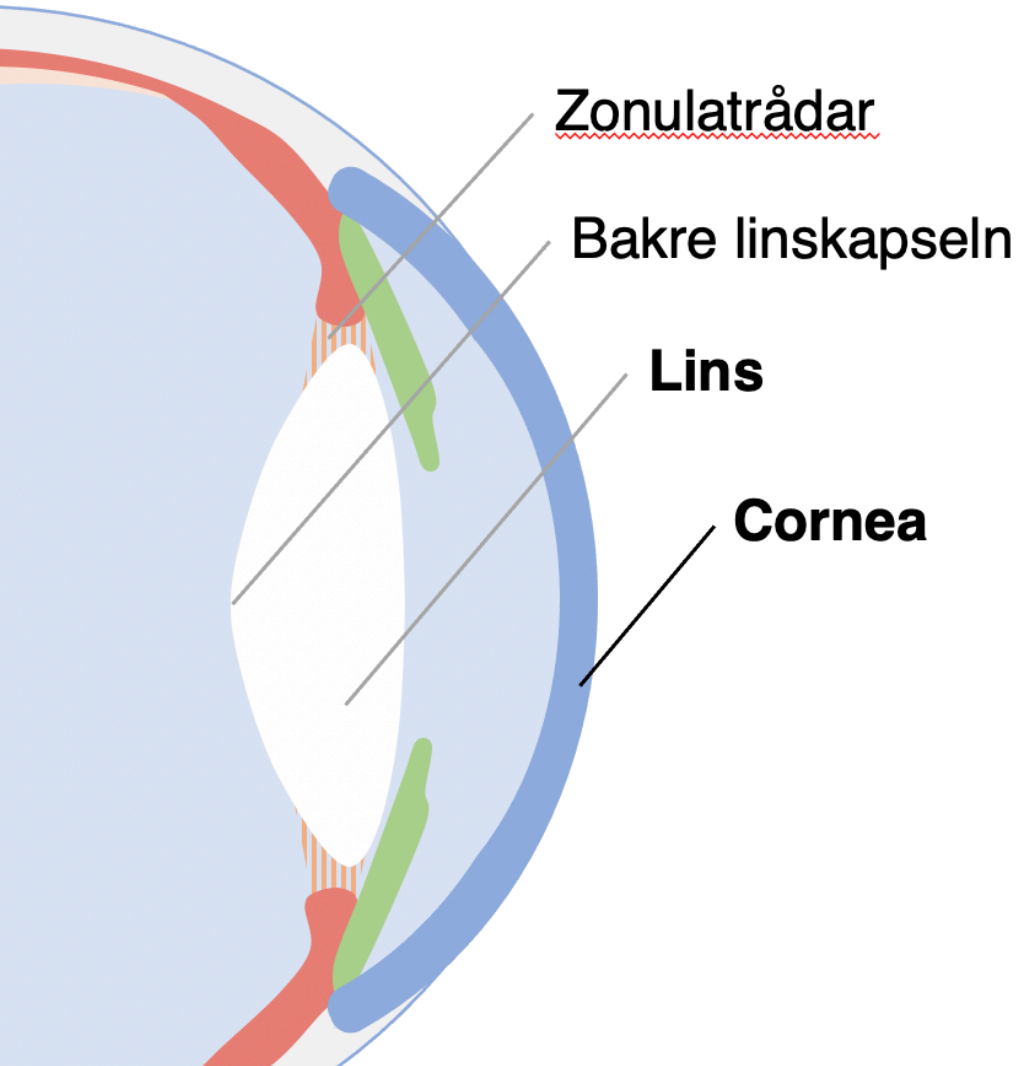


Resultat

- Stark koppling mellan FECD och $(CTG)_n$-expansion i *TCF4*
- Koppling mellan antalet ”repeats” och sjukdomens svårighetsgrad

Viberg A, Westin IM, Golovleva I, Bystrom B. TCF4 trinucleotide repeat expansion in Swedish cases with Fuchs' endothelial corneal dystrophy. *Acta Ophthalmol.* 2021.

KATARAKT OCH CORNEA



Endotelet vid gråstarrskirurgi

- Ofta samtidig katarakt och cornea guttata
- Kirurgi nära endotelcellerna
- 4-16% endotelcellsförlust vid gråstarrskirurgi hos friska
- Sveriges vanligaste operation, >120 000/år
- Hur går det vid samtidig endotelcellssjukdom?

DELSTUDIE

THE IMPACT OF CORNEAL GUTTATA ON THE RESULTS OF CATARACT SURGERY

JCRS
Journal of Cataract & Refractive Surgery

ARTICLE

The impact of corneal guttata on the results of cataract surgery

Andreas Viberg, MD, Per Liv, PhD, Anders Behndig, MD, PhD, Mats Lundström, MD, PhD, Berit Byström, MD, PhD

Purpose: To study the impact of corneal guttata on postoperative visual acuity and patients' self-assessed visual function after cataract surgery.

Setting: Patient data from 49 Swedish cataract surgery units.

Design: Retrospective cross-sectional register-based study.

Methods: Data from patients who had cataract surgery from 2010 to 2017 and completed the Catquest-9SF questionnaire were obtained from the Swedish National Cataract Register. Logistic proportional odds regression was used to model the impact of corneal guttata on the visual acuity and self-assessed visual function. Adjustments were made for age, sex, ocular comorbidities, days to follow-up, preoperative corrected distance visual acuity (CDVA) and preoperative Rasch person

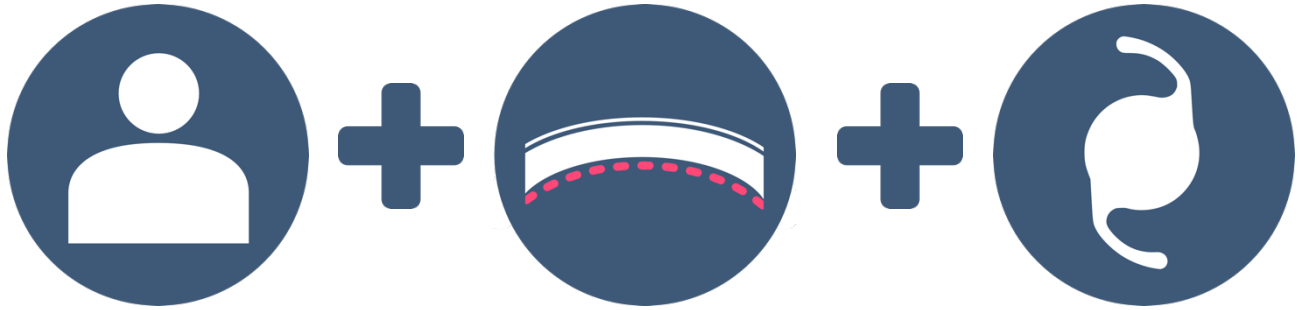
Results: The study comprised data from 33 741 patients. Cataract surgery greatly improved CDVA and self-assessed visual function in patients both with and without corneal guttata. Still, corneal guttata was significantly associated with a poorer visual acuity and a worse self-assessed visual function after cataract surgery. The negative effect of corneal guttata on visual acuity was most prominent during the first 3 weeks postoperatively, but it persisted at least 3 months postoperatively.

Conclusions: Patients with corneal guttata benefit substantially from cataract surgery but have an additional risk for inferior results compared with patients without corneal guttata. These findings could serve as valuable tools in clinical practice, in particular, when deciding to perform cataract surgery and how to inform the patient about surgical benefits and risks.

J Cataract Refract Surg 2019; ■:■–■

DELSTUDIE

THE IMPACT OF CORNEAL GUTTATA ON THE RESULTS OF CATARACT SURGERY



- Syfte: Att studera om det går sämre för patienter med cornea guttata vid kataraktkirurgi jämfört med patienter utan cornea guttata

- Registerbaserad studie, Nationella kataraktregistret
- Uppföljningsdata från 2010 – 2017
- Etiskt godkännande

DELSTUDIE

THE IMPACT OF CORNEAL GUTTATA ON THE RESULTS OF CATARACT SURGERY

Utfallsmått

- **Synskärpa** på avstånd med korrektion
- LogMAR, omvänd skala jämfört med Decimal, Snellen

- **Självskattad synfunktion** efter 3 månader, formuläret Catquest-9SF

DELSTUDIE

THE IMPACT OF CORNEAL GUTTATA ON THE RESULTS OF CATARACT SURGERY

	n (%)	DFN ATCOY HKPRIUL			
	893 (2.6%)	0.4	0.8	-0.14	-3.16
	32 848 (97.4%)	0.5	1.0	-0.18	-3.35
			Decimal	Logit	

DELSTUDIE

THE IMPACT OF CORNEAL GUTTATA ON THE RESULTS OF CATARACT SURGERY

1.74

1.22

Resultat

- Cornea guttata var associerat med:
  - Sämre synskärpa efter kataraktoperation, justerad oddskvot 1.74 (95% CI, 1.33-2.26)
  - Sämre postoperativ självskattad synskärpa, justerad oddskvot 1.22 (95% CI, 1.08-1.37)

DELSTUDIE

INCIDENCE OF CORNEAL TRANSPLANTATION AFTER PHACOEMULSIFICATION IN PATIENTS WITH CORNEAL GUTTATA: A REGISTRY-BASED COHORT STUDY

Vad är risken för hornhinnetransplantation efter kataraktoperation hos patienter med cornea guttata?

DELSTUDIE

INCIDENCE OF CORNEAL TRANSPLANTATION AFTER PHACOEMULSIFICATION IN PATIENTS WITH CORNEAL GUTTATA: A REGISTRY-BASED COHORT STUDY

JCRS
Journal of Cataract & Refractive Surgery

ARTICLE

Incidence of corneal transplantation after phacoemulsification in patients with corneal guttata: a registry-based cohort study

Andreas Viberg, MD, Branka Samolov, MD, PhD, Margareta Claesson Armitage, MD, PhD, Anders Behndig, MD, PhD, Berit Byström, MD, PhD

Purpose: To investigate the risk for corneal transplantation after phacoemulsification related to corneal guttata.

Setting: Forty-nine Swedish cataract surgical units and 7 Swedish cornea transplantation units.

Design: Registry-based cohort study.

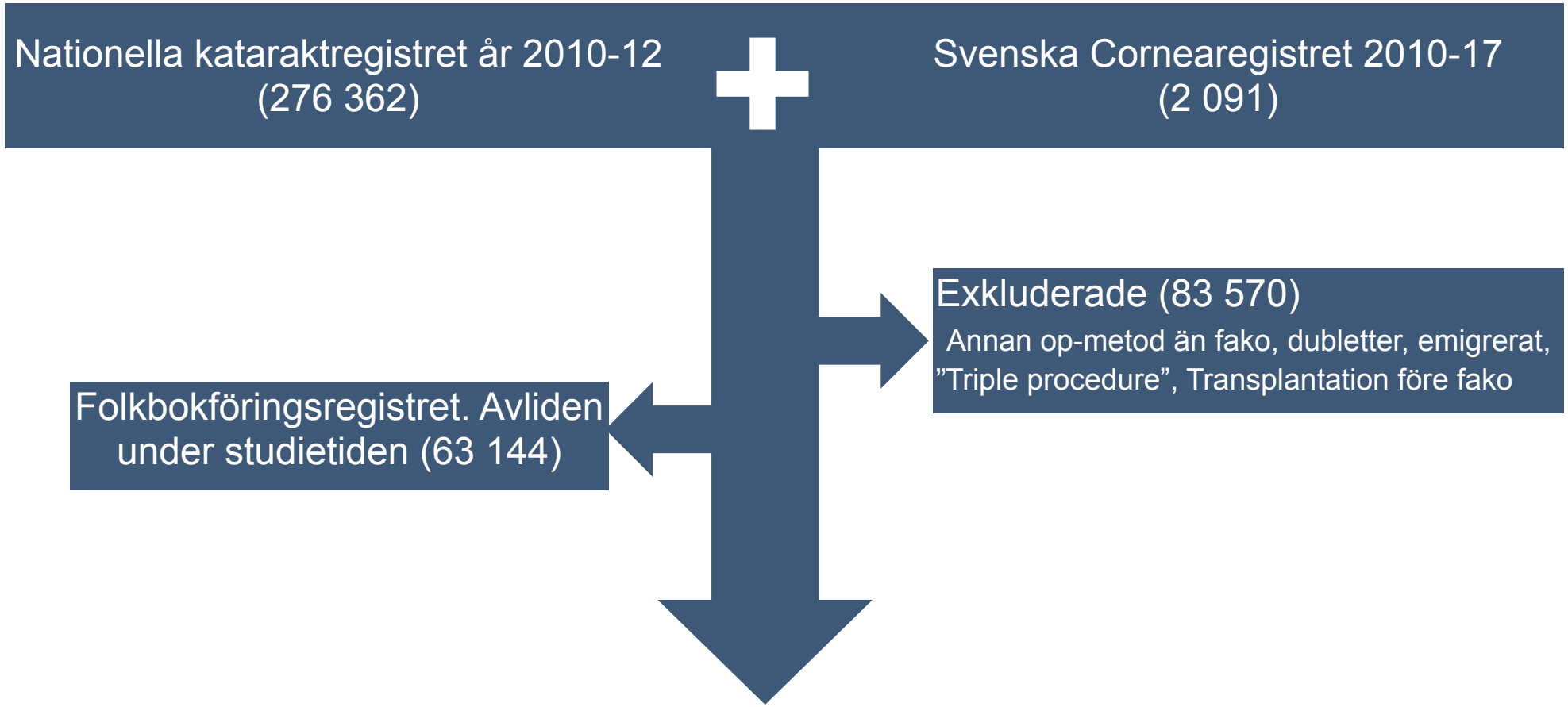
Methods: Patient data from the Swedish National Cataract Registry between 2010 and 2012 were linked with data from the Swedish Cornea Transplant Registry between 2010 and September 2017. Data from cataract patients were linked with data from patients who underwent corneal transplantation because of endothelial failure.

Results: Altogether, data from 276 362 cataract patients were linked with data from 2091 patients who underwent corneal transplantation. The incidence rate of corneal transplantation after phacoemulsification among patients with corneal guttata was 88 per 10 000 person years (95% CI, 74.5-103.1). The annual incidence rate was highest within the first year and diminished thereafter. The incidence rate of corneal transplantation among patients without corneal guttata was 1.4 per 10 000 person years (95% CI, 1.2-1.6). Phacoemulsification in patients with corneal guttata was associated with corneal transplantation with an adjusted relative risk of 68.2 (95% CI, 54.0-86.2).

Conclusions: The relative risk for corneal transplantation after

DELSTUDIE

INCIDENCE OF CORNEAL TRANSPLANTATION AFTER PHACOEMULSIFICATION IN PATIENTS WITH CORNEAL GUTTATA: A REGISTRY-BASED COHORT STUDY

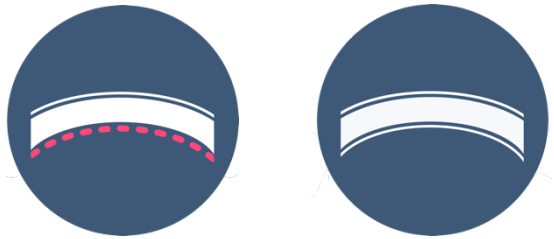


Incidens och relativ risk för hornhinnetransplantation efter gråstarrskirurgi

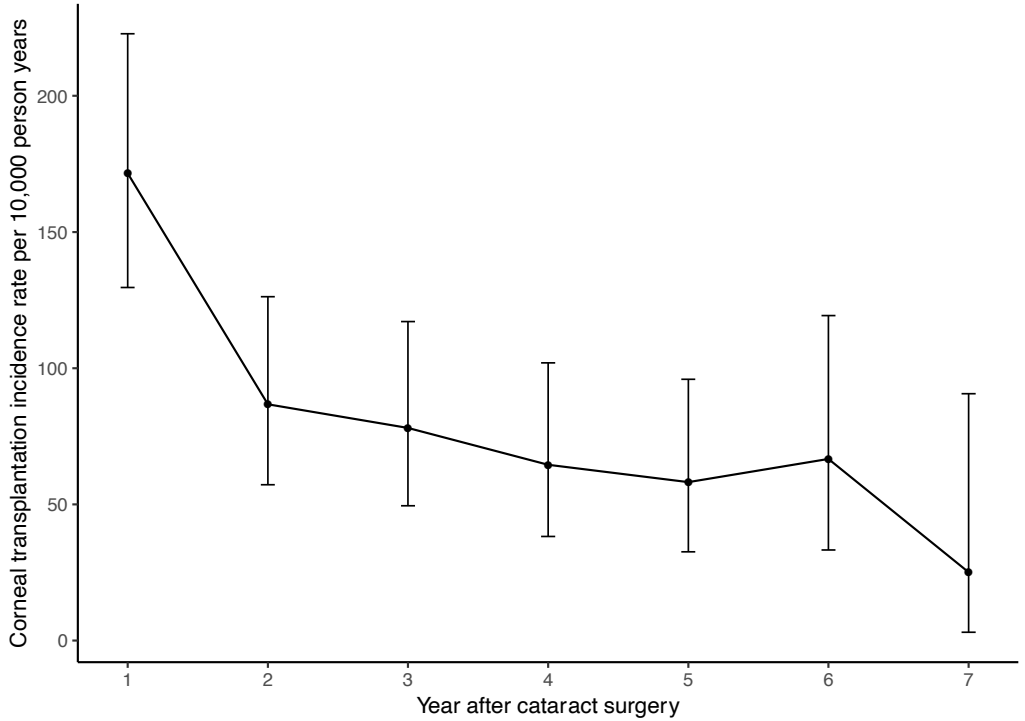
DELSTUDIE

INCIDENCE OF CORNEAL TRANSPLANTATION AFTER PHACOEMULSIFICATION IN PATIENTS WITH CORNEAL GUTTATA: A REGISTRY-BASED COHORT STUDY

Resultat

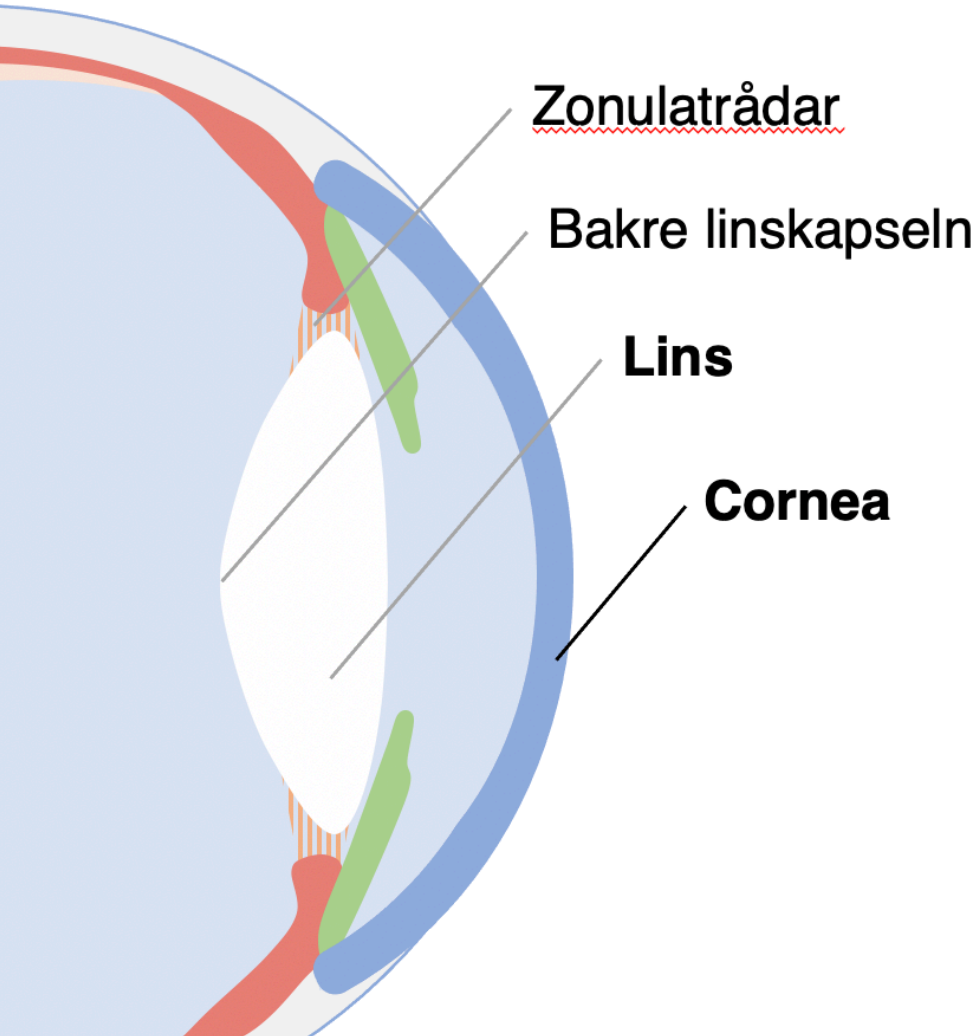


n (%)	**3 338 (1.7%)**	**188 915**
Transplantation (%)	152 (4.6%)	141 (0.1%)
Incidens (per 10 000 personår)	88	1.4
Relativ risk (adjusted)	68.2	1



DELSTUDIE

INCIDENCE OF CORNEAL TRANSPLANTATION AFTER CHALLENGING CATARACT SURGERY IN PATIENTS WITH AND WITHOUT CORNEAL GUTTATA



Utmanande operation

- Leder en gråstarrsoperation med hård lins och/ eller bakre kapselruptur till ökar risk för hornhinnetransplantation?
- Hur påverkas risken vid en redan vulnerabel hornhinna (FECD)?

- Trypanblått som pseudomarkör för hård lins
- Liknande metod som Studie III

DELSTUDIE | INCIDENCE OF CORNEAL TRANSPLANTATION AFTER CHALLENGING CATARACT SURGERY IN PATIENTS WITH AND WITHOUT CORNEAL GUTTATA

JCRS
Journal of Cataract & Refractive Surgery

ARTICLE

Incidence of corneal transplantation after challenging cataract surgery in patients with and without corneal guttata

Check for updates

Andreas Viberg, MD, Berit Byström, MD, PhD

Purpose: To study the risk for corneal transplantation after phacoemulsification with dense cataract or posterior capsule rupture (PCR) and the impact of corneal guttata.

Setting: Forty-nine Swedish cataract surgical units and 8 Swedish cornea transplantation units.

Design: Registry-based cohort study.

Methods: Patient data from the Swedish National Cataract Registry (2010 to 2012) were linked with data from the Swedish Cornea Transplant Registry (2010 to 2017). The outcome measures were risk for future corneal transplantation, visual acuity, and self-assessed visual function after phacoemulsification.

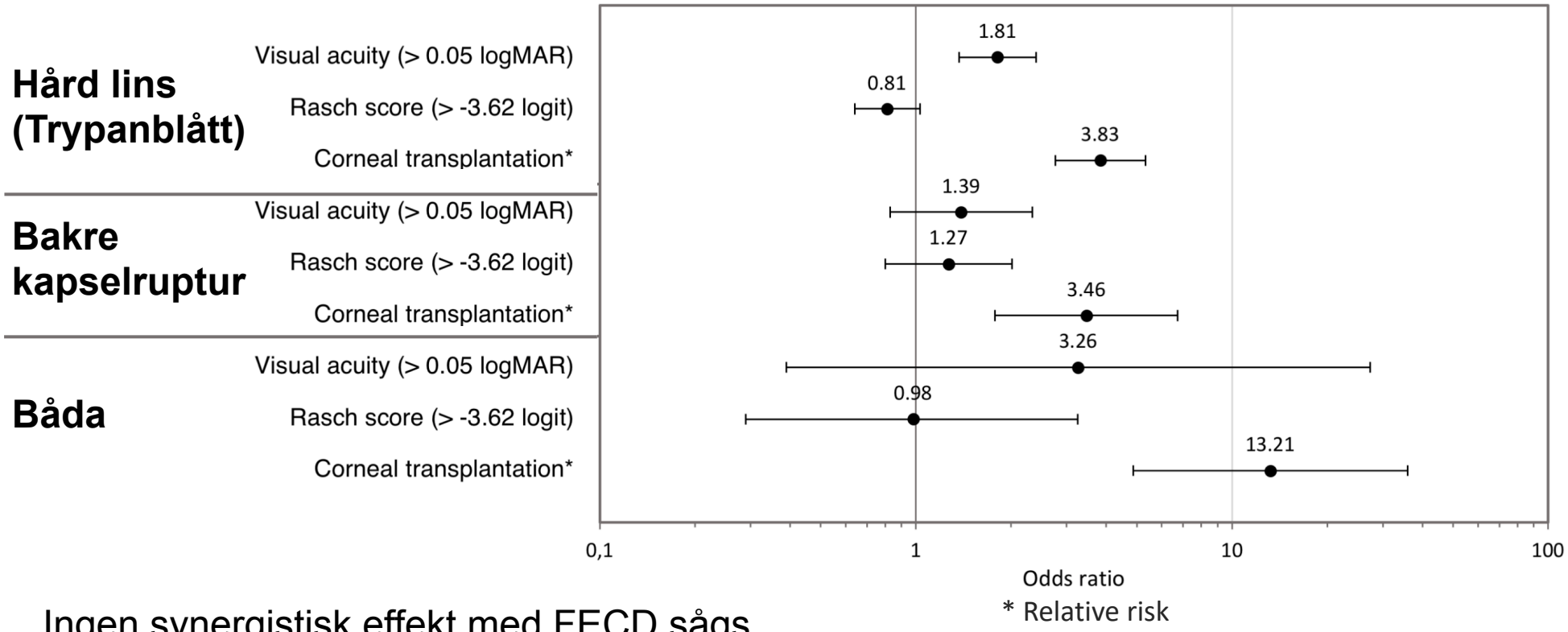
underwent corneal transplantation.The risk for future corneal transplantation increased more than 3-fold with the presence of dense cataract or PCR, and a trend toward an ever-higher risk with the combination of TB and PCR together, but without any significant synergy of corneal guttata. Dense cataract, but not PCR, was significantly associated with an increased probability of inferior visual acuity after phacoemulsification. The impact on satisfaction was not statistically significant for any of the factors.

Conclusions: Challenging cataract surgery increases the risk for future corneal transplantation equally in patients both with and without corneal guttata, despite a more vulnerable

DELSTUDIE

INCIDENCE OF CORNEAL TRANSPLANTATION AFTER CHALLENGING CATARACT SURGERY IN PATIENTS WITH AND WITHOUT CORNEAL GUTTATA

Resultat



Ingen synergistisk effekt med FECD sågs

SLUTSATS

- Det flesta patienter med cornea guttata har stor nytta av gråstarrsoperation
- Men de har en större risk för sämre resultat och att behöva genomgå en hornhinnetransplantation efteråt
- En gråstarrsoperation med tät lins eller bakre kapselruptur ökar risken för hornhinnetransplantation
- Trots den riskökning som cornea guttata medför vid gråstarrsoperation, rekommenderas att börja med gråstarroperation innan man planerar för hornhinnetransplantation