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Role and Timing of Glaucoma Surgery in Boston Keratoprosthesis Type 1 Patients

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Introduction

- The **Boston keratoprosthesis type 1** (KPro) is the most widely used **artificial cornea**
- Indicated for eyes with corneal blindness and high risk of failure with standard corneal transplantation
- Leads to substantial vision improvement
- **Glaucoma** is the most important vision-threatening complication after KPro

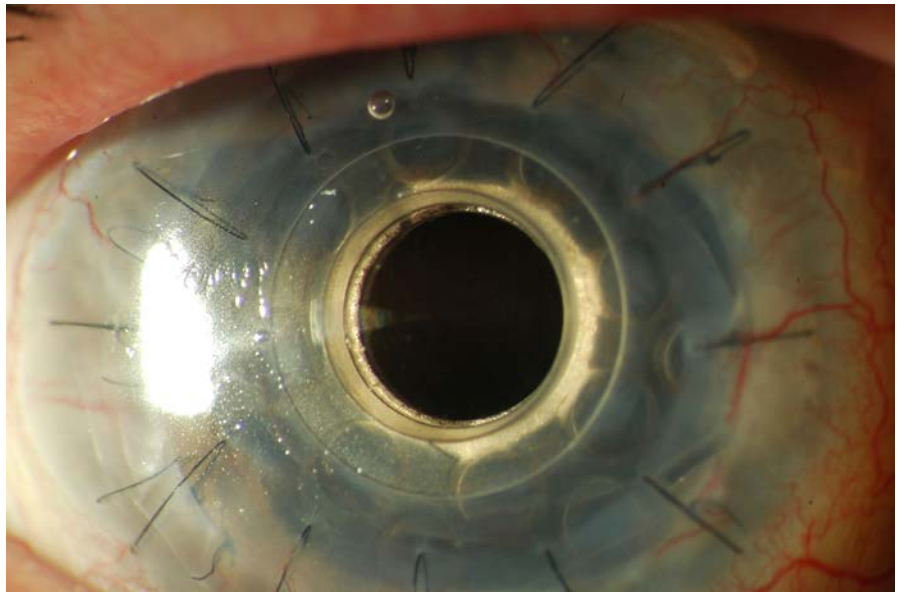


Photo courtesy Dr. Mona Harissi-Dagher

Introduction

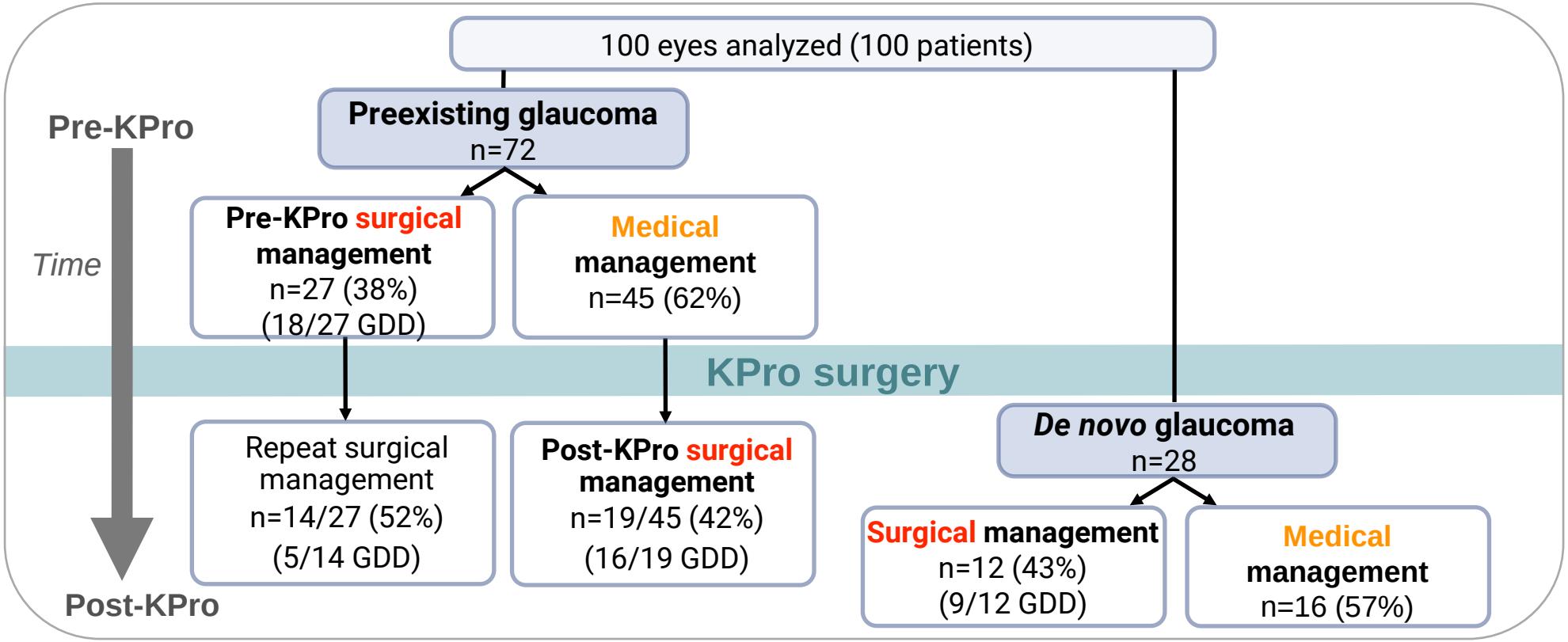
- Experts do not yet agree on the best order of KPro implantation and glaucoma surgery (trabeculectomy, cyclophotocoagulation [CPC], glaucoma drainage devices [GDD])
- Literature lacks in objective measures because only subjective measurements of cup-to-disk ratio were used to compare progression for different timings

- **Purpose**: To assess the role and timing of glaucoma surgery in relation to KPro, based on definite glaucoma progression (= characteristic visual field defects, OCT, and need for additional surgery/ medications)

Methods

- **Design**: Retrospective, interventional case series
- **Participants**: 100 eyes (100 patients) implanted with a KPro (2008-2017) and diagnosed with glaucoma
  - **2 groups: (1)** Eyes with preexisting glaucoma, **(2)** Eyes with *de novo* glaucoma after KPro, then divided based on if managed medically or surgically (trabeculectomy, CPC or GDD)
- **Primary outcomes**: Best-corrected visual acuity (BCVA), glaucoma progression, and complications
- **Statistical analyses:** Differences in outcomes were compared using parametric and non-parametric tests, and log-rank test to compare time-to-outcome events

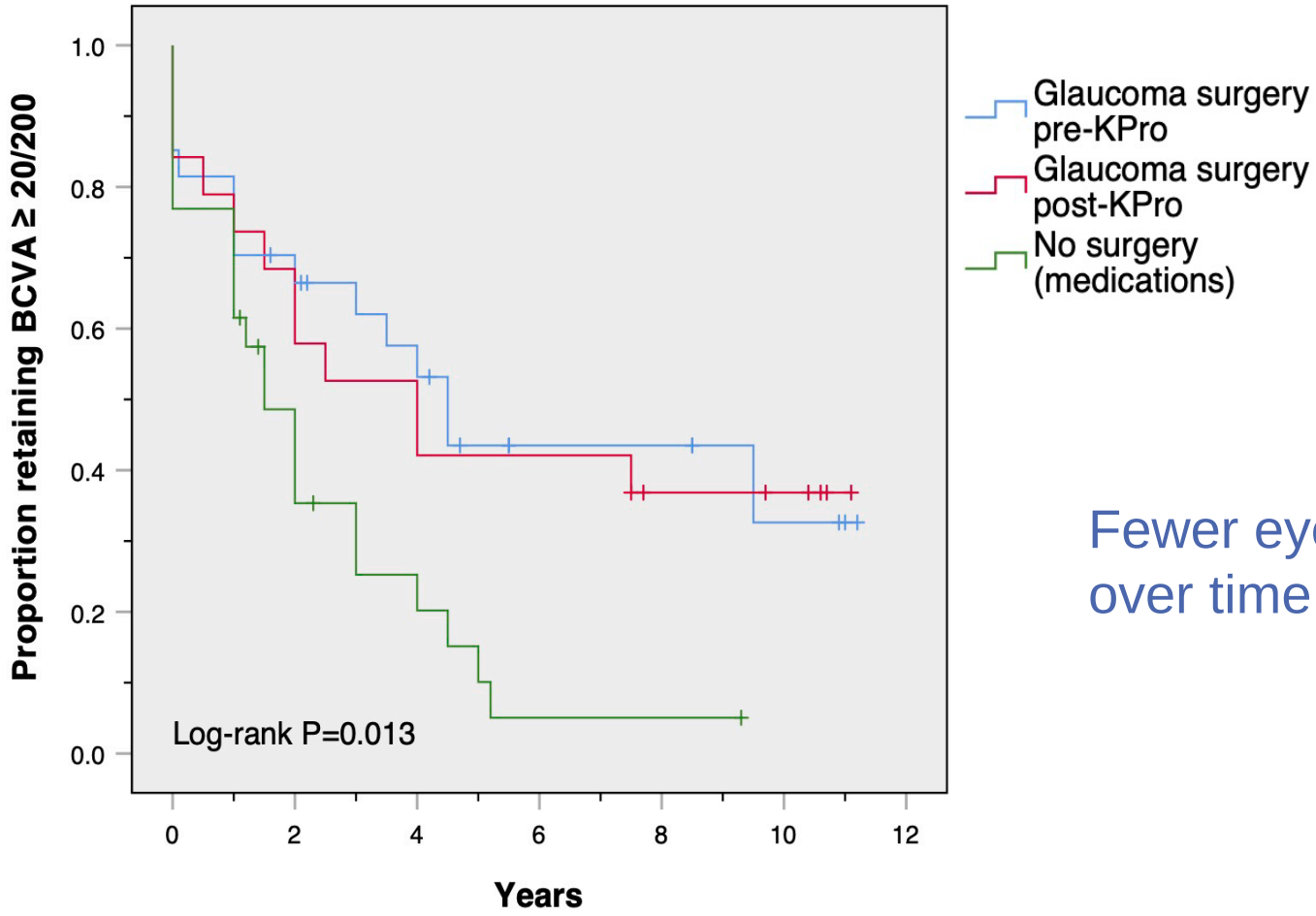
Glaucoma outcomes in KPro based on onset and management



Results

- In eyes with preexisting glaucoma: Definite glaucoma progression is worse with post-KPro glaucoma surgery (100%) compared to pre-KPro surgery (74%, P=0.016)
- In eyes with de novo glaucoma: Similar glaucoma progression and BCVA between medical and surgical management (P>0.05)
- In eyes with preexisting or de novo glaucoma: No increase in complications with glaucoma surgery compared to medications only (P >0.05)

Retention of BCVA ≥ 20/200 in eyes with preexisting glaucoma based on glaucoma management



Fewer eyes maintained BCVA ≥ 20/200 over time with medical management.

Conclusions

- Glaucoma surgery should be performed **as early as possible** in KPro eyes when visual potential is good, to limit glaucoma progression
- Glaucoma surgery should be performed prior or concurrently to KPro in eyes with preexisting glaucoma
- Complication rates not increased when glaucoma surgery is performed in KPro eyes, compared to medications alone
- Future studies: Longitudinal prospective design

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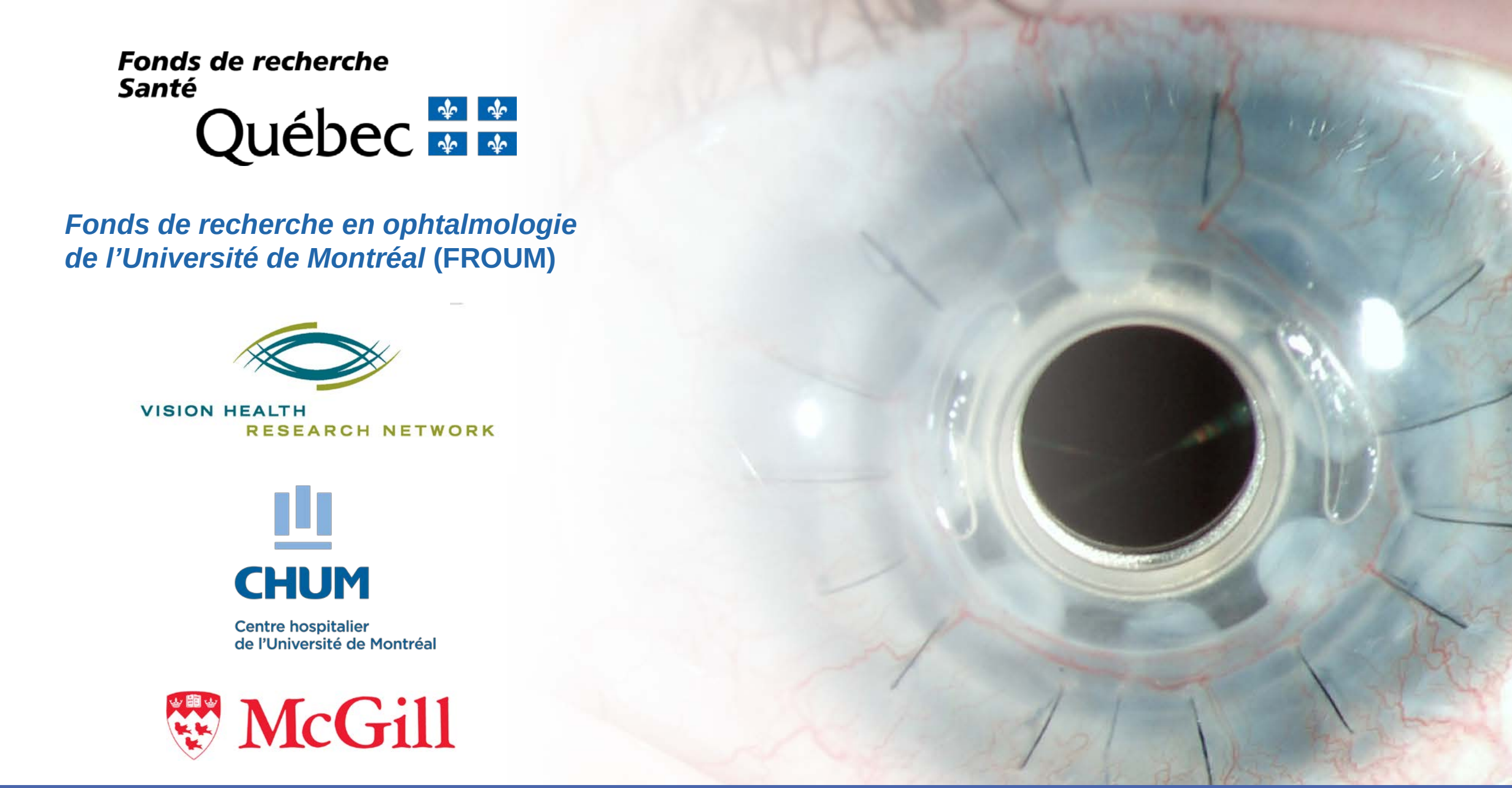

Thank you