

Textural Interface Opacities in DSAEK Transplants: A Dual Challenge for Eye Banks and Surgeons

Chatzea M., MD¹, Vakalopoulos D., MD¹, Katsimpras M., MD¹, Togka K., MD¹, Lalou L., MD¹, Tsagkogiannis V., MD¹, Kymionis G.D., MD¹

¹National and Kapodistrian University of Athens, 1st University Department of Ophthalmology, Athens, Greece

Collaborating Institutes

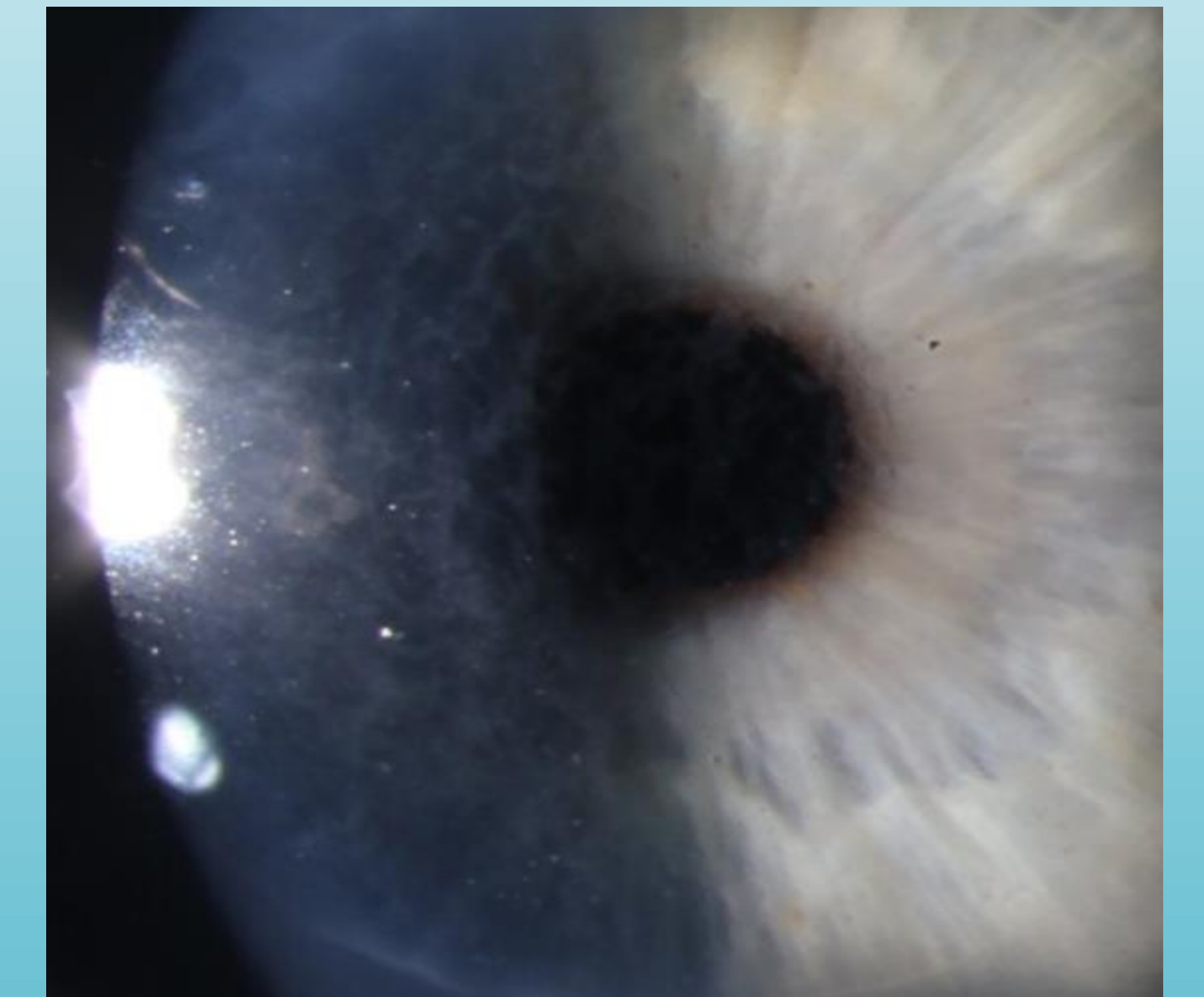
D. Mora², E. Fout², K. Llanes, CEBT², S.R. Dubovy, MD^{2,3}, R.S. Tonk, MD², S. Yoo, MD²

² Beauty of Sight, University of Miami Miller School of Medicine, Miami, Florida, USA

³Corneal and External Diseases, Bascom Palmer Eye Institute, University of Miami Miller School of Medicine, Miami, Florida, USA

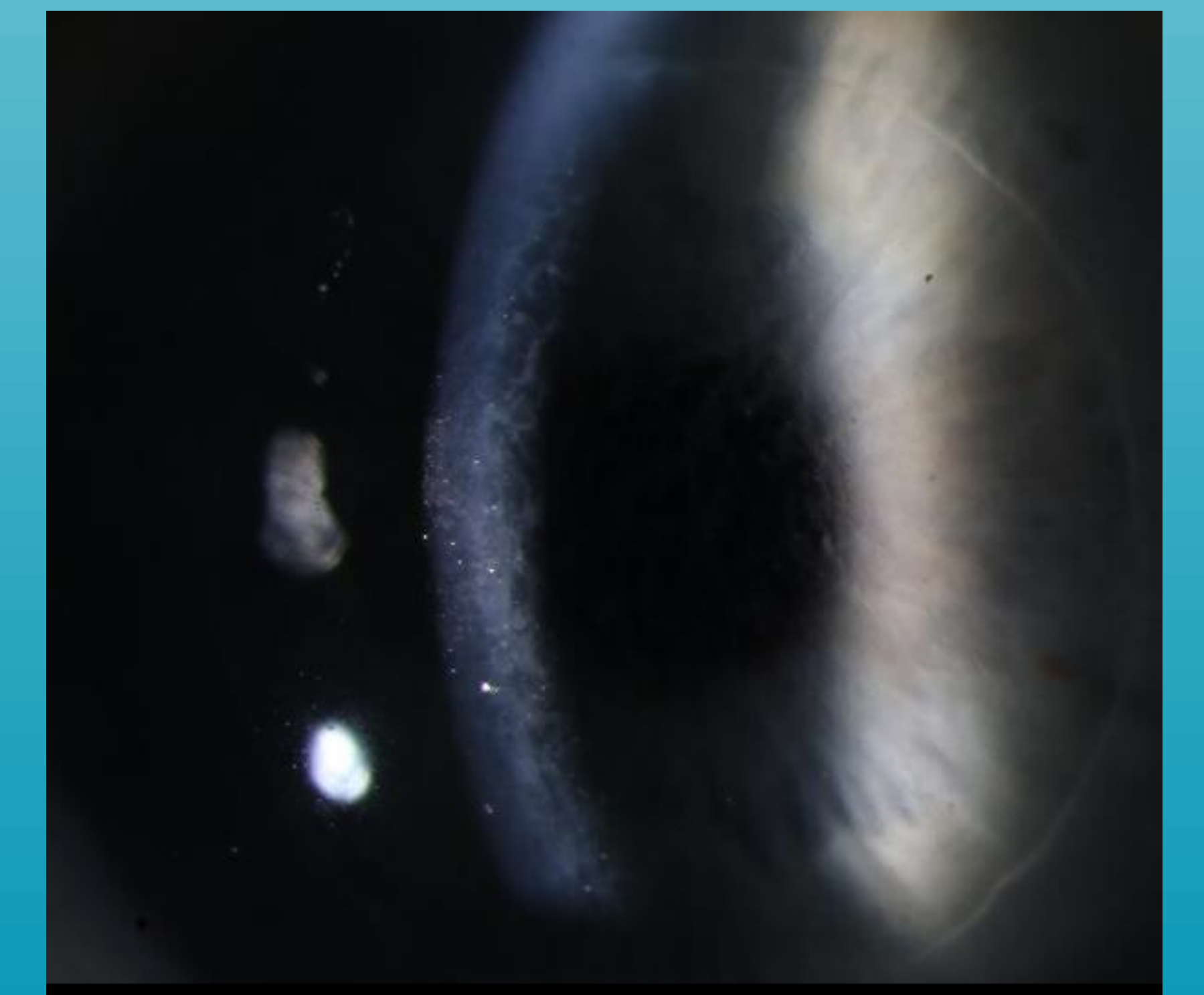
Background

Textural Interface Opacities (TIO) were initially associated with DSAEK in 2009 and have become a notable postoperative concern. Several studies have attempted to identify correlations between TIO development and intraoperative factors; including fluid dynamics, viscoelastic usage, and recipient immunological responses. Despite these efforts, the precise etiology of TIO remains uncertain. Considering that TIO was initially observed primarily following laser in situ keratomileusis (LASIK) and their occurrence has notably diminished with the adoption of femtosecond laser for flap creation, we propose that a common factor between these surgical techniques could be the usage of a microkeratome to create stromal cuts.



Purpose

The aim of the study is to examine the potential correlation between TIO and microkeratome cuts during the processing of DSAEK grafts, **the incidence rate of TIO, and its effect on the visual outcome of the transplantation and to develop effective preoperative screening and grading methods for TIO in eye banks to minimize its effect on transplant recipients.**



Materials and Methods

Retrospective 5-year, single-institution study analyzed OCT images (n=220) of DSAEK grafts

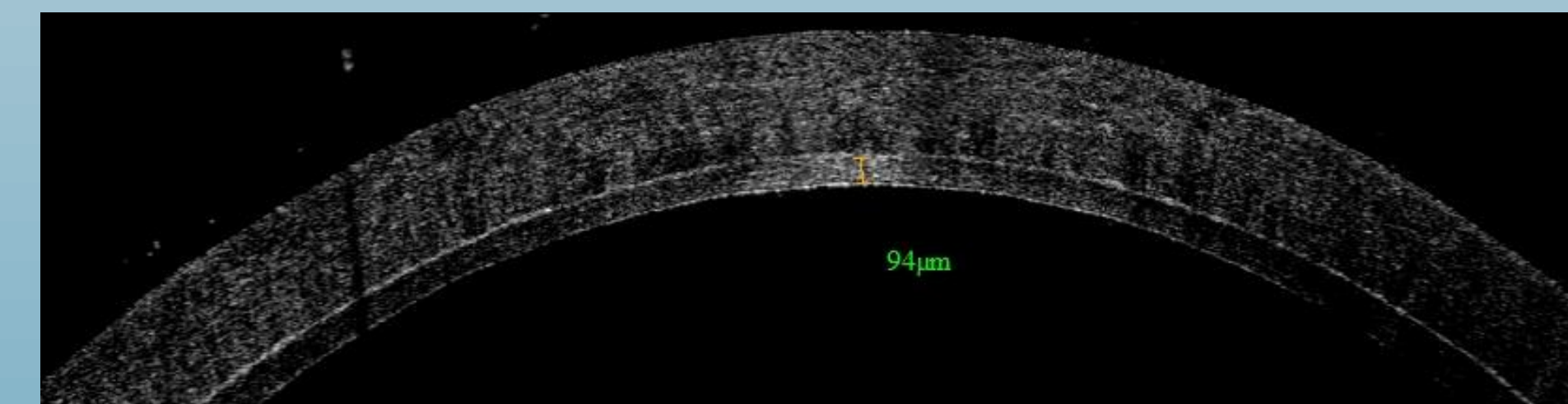
- Processed in 2019-2023 using Moria microkeratome
- Transplanted at the Bascom Palmer Eye Institute
- Blinded analysis was used to evaluate and categorize the occurrence of TIO from 3 different OCT images of DSAEK grafts were correlated with the final visual acuity of patients who underwent corneal transplantation.

Inclusion criteria Fuch's corneal dystrophy and Pseudophakic Bullous Keratopathy

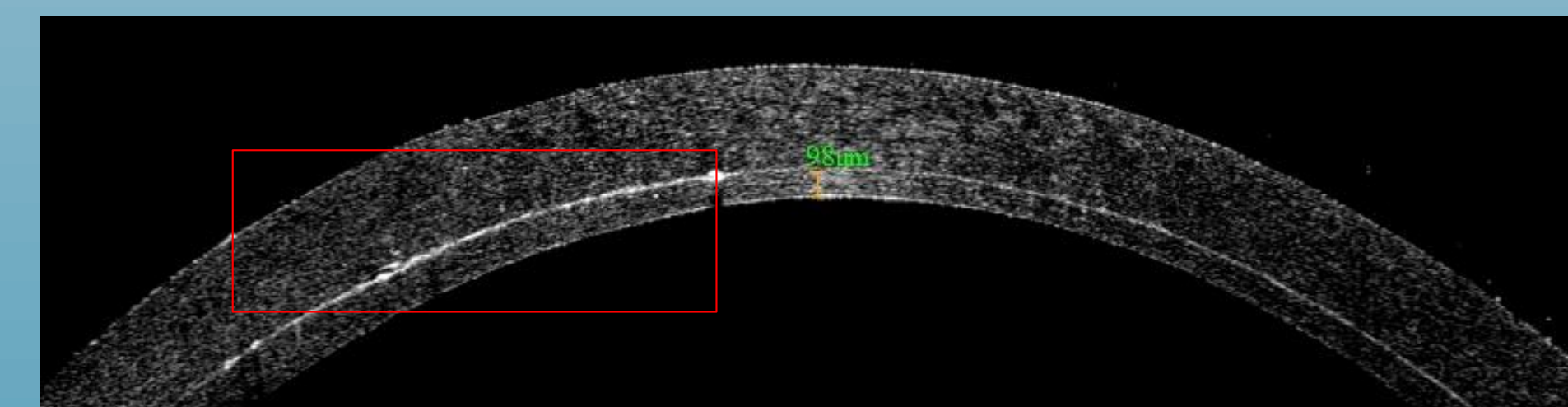
Exclusion criteria Glaucoma or Retinal comorbidities

Grading Scale

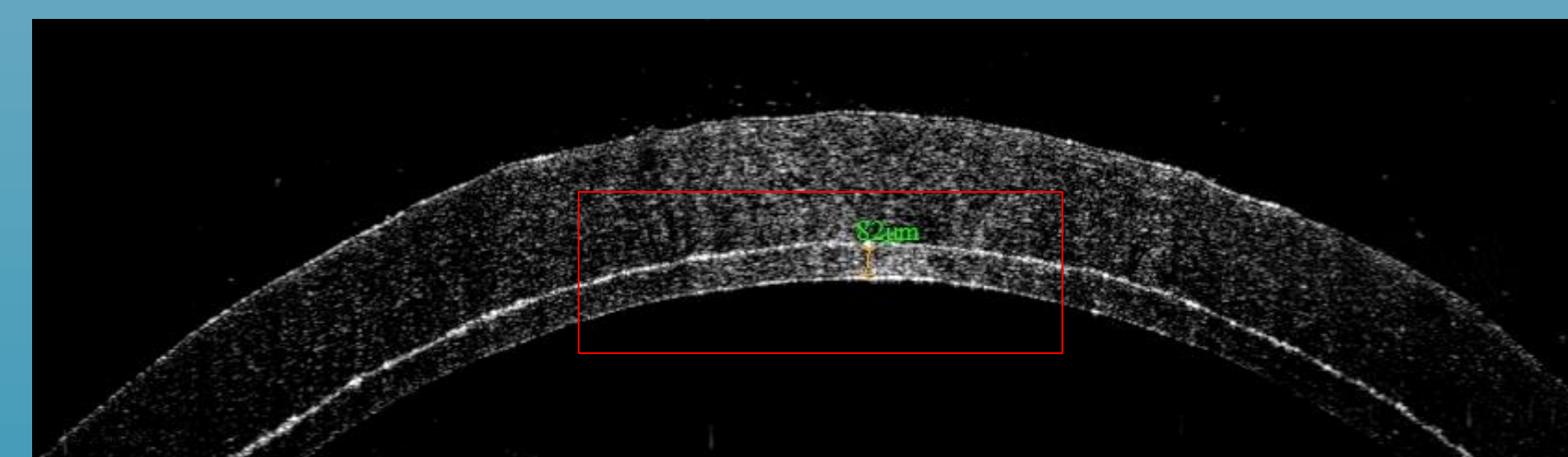
Textural Interface Opacities present in OCT images of DSAEK grafts as a thick, hyperreflective area and severe cases may exhibit a rough surface appearance. A grading scale was developed to assess the areas of the cornea based on the frequency and severity of TIO.



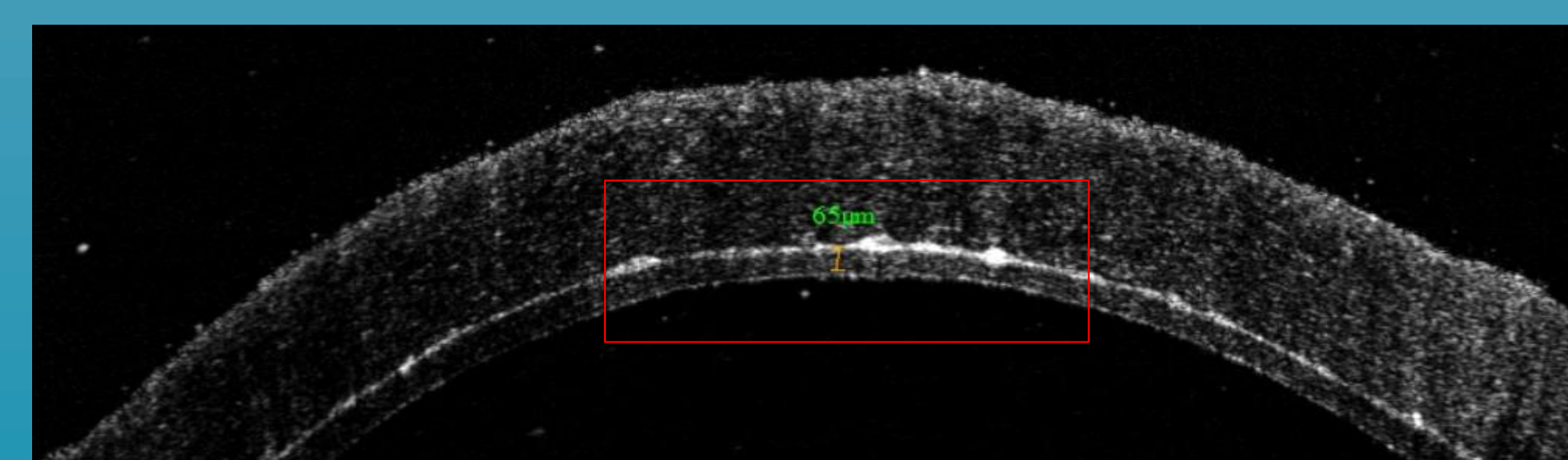
GRADE 0: No visible TIO on OCT



GRADE 1: Mild TIO affecting only the periphery but not the central zone

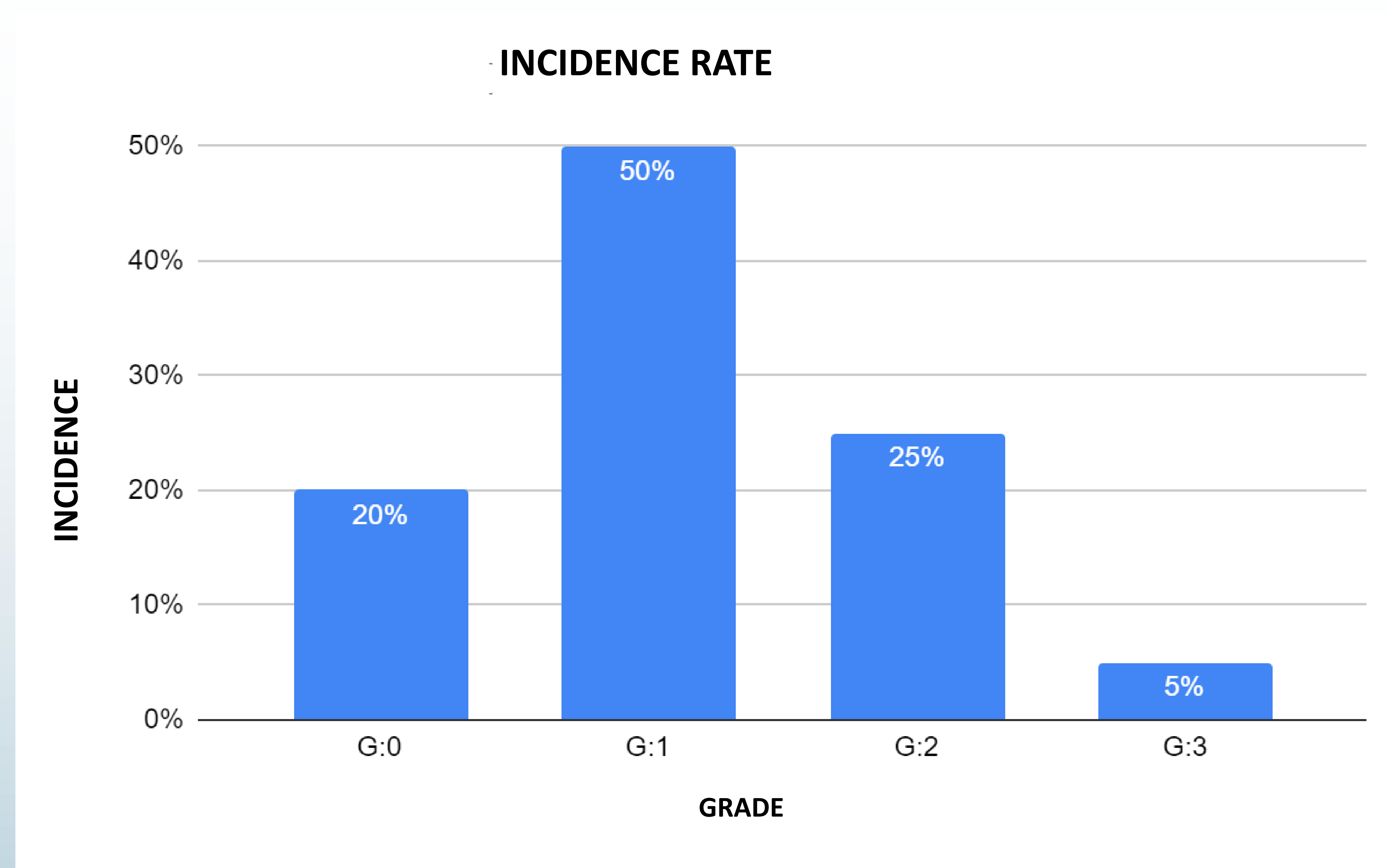


GRADE 2: Mild TIO affecting central zone



GRADE 3: Severe TIO affecting central zone

Results



Conclusion

The preliminary outcomes suggest that:

- I. Preoperative presence of TIO** can be observed in certain DSAEK grafts and **OCT images can be utilized for grading and screening.**
- II. Lower grades (Grade 1 and 2)** seem to have **minimal impact on postoperative visual acuity.**
- III. Grade 3** despite its **significantly lower incidence rate**, as most of these grafts are excluded by slit lamp evaluation, may **result in decreased visual acuity and induce visual disturbances such as glare and halos.**

This study is ongoing and further data is being collected to determine the causes of TIO.

References

1. Kymionis GD. Interface Wavelike Deposits After Descemet Stripping Automated Endothelial Keratoplasty. Archives of Ophthalmology. 2009;127(10):1389.
2. Juthani V V., Goshe JM, Srivastava SK, Ehlers JP. Association Between Transient Interface Fluid on Intraoperative OCT and Textural Interface Opacity After DSAEK Surgery in the PIONEER Study. Cornea. 2014;33(9)
3. Kim K, Alder B, Vora GK, Carlson AN, Afshari NA, Kuo AN, Kim T. Textural interface opacity after Descemet-stripping automated endothelial keratoplasty. J Cataract Refract Surg. 2014;40(9):1514-1520.
4. Kontadakis GA, Palioura S, Yoo SH. Wavelike Interface Opacities After Descemet-Stripping Automated Endothelial Keratoplasty: 7-Year Follow-up. Eye & Contact Lens: Science & Clinical Practice. 2017;43(4):e13-e15.
5. Ivarsen A, Thøgersen J, Keiding SR, Hjortdal JØ, Møller-Pedersen T. Plastic particles at the LASIK interface. Ophthalmology. 2004;111(1):18-23.