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Identify factors associated with excessive corneal haze noted to have increased in frequency over the last 6 months post corneal cross-linking procedure

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Identify factors associated with excessive corneal haze noted to have increased in frequency over the last 6 months post corneal cross-linking procedure

Submitting/Presenting Author (must be a trainee): Sonal Dangda, MD

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Other authors/contributors involved in project: Christina Twardowski, OD

IRB Number (if applicable): -

Describe role of Submitting/Presenting Trainee in this project (limit 150 words): I was involved in the data collection and analysis. Additionally, as a part of my training, I am involved in the pre, intra and postoperative care aspects of the patients undergoing corneal cross-linking.

Problem Statement/Question, Background/Project Intent (Aim Statement), Methods (include PDSA cycles), Results, Conclusions limited to 500 words

Problem Statement/Question: Over the past 6 months, increased post-operative corneal haze and decreased vision was noted in patients following corneal crosslinking for keratoconus.

Background/Project Intent (Aim Statement): Identify factors that may contribute to increased post-procedure haze and analyze these factors for the total cohort of crosslinking patients since 2017. The goal of this study is to ensure that the increased haze is due to unique patient factors and not an external cause.

Methods (include PDSA cycles): Patients who underwent corneal cross-linking between January 2017 – December 2021 were identified. Retrospective data was collected at baseline visit, at one-month post-crosslinking and last follow up visits. Data points included: 1) presence or absence of pre-operative and post-operative corneal scarring and haze 2) best corrected pre- and post-operative visual acuity (BCVA) 3) maximal keratometry (Kmax) value 4) thinnest corneal thickness (TCT) and 5) central corneal thickness (CCT) prior to starting the crosslinking procedure. A correlation between the presence of scarring/haze (1) and all other parameters (namely, 2-5) was done with the help of Microsoft Excel. The purpose of this analysis was to identify if pre-operative patient factors could be associated with increased scarring/haze or if additional causes should be considered.

Results: Eighty eyes were analyzed (5 eyes were excluded due to inadequate follow up), of which 12 eyes showed a decline in BCVA ranging from 1-0.1 (log MAR BCVA). Post operative scarring/haze was noted in 3 of the 12 eyes with decreased BCVA while in the remaining 9 eyes, decline was due to patient reluctance to attempt or wear specialized contact lenses. Overall, post operative haze/scarring was noted

in 22 eyes, of which 19 were in the last 2 years. Kmax and TCT were $63.7 + 13.5$ D and $440 + 57$ mm respectively in eyes with postoperative haze/scarring, while in eyes without postoperative haze/scarring, they were $54.9 + 10.9$ D and $448 + 46$ mm, respectively. There was a statistically significant difference between the Kmax ($p=0.009$, independent t-test, unequal variance) values between the eyes with and without postoperative haze/scarring. Whereas the same was not noted for TCT ($p=0.43$) and pre-surgery CCT ($p=0.051$).

Conclusions: Postoperative haze was noted to be of concern in eyes with steeper pre-operative corneal testing. This is a helpful guide towards patient counselling. Best corrected visual acuity was not noted to be worsened, at the last follow up, in eyes with more-than-expected haze.