Impact of corneal guttata on cataract surgery results

Data from the Swedish Cataract Registry showed that patients with corneal guttata benefited from cataract surgery but had poorer visual acuity and self-reported visual function than patients without guttata. As corneal surgeons, we are concerned about the recommendation to wait at least 3 weeks after cataract surgery to decide on corneal transplantation.

First, it is important to differentiate visual impairment caused by edema versus guttata alone. The slower visual recovery noted in patients with guttata1 was caused by secondary edema from the acute trauma of cataract surgery on corneal endothelial cells functionally compromised by guttata.2

The effect of guttata alone on vision traditionally has been underestimated. When the only treatment for Fuchs dystrophy was penetrating keratoplasty (PKP), which had unpredictable refractive results and variable visual recovery that could take years, patients were advised to postpone surgery until advanced corneal edema severely impaired vision.

Today, we can selectively replace dysfunctional endothelium and guttata with Descemet membrane endothelial keratoplasty (DMEK). Patients often realize visual improvement within a few days and can have the fellow eye treated within 1 to 2 weeks.2 We have performed DMEK in patients with no clinically discernible edema, only guttata, who have a preoperative corrected distance visual acuity (CDVA) of 20/20 or better in a dark room using high-contrast letters. Afterward, when they compare the vision in the treated eye with that in the untreated eye, they frequently ask to have the “better” fellow eye treated as soon as possible to eliminate the glare, halos, and poor contrast caused by the guttata. This is similar to cataract patients who have good vision measured with an eye chart in a dark room but experience disabling phenomena such as glare and halos caused by posterior subcapsular cataracts. We do not wait for the cataracts to get “ripe” now that we have intraocular lenses (IOLs). Likewise, we should not wait for corneas to get “ripe” with edema; instead, we should go ahead and treat the visual disability caused by the guttata alone.

A simple analogy to patients with cataracts and guttata is a window with 1 side covered with brown dust and the other covered with raindrops. We can clean off the dust and the view through the window will improve, but the view will still not be great because of the raindrops on the other side. If we use cold water to wipe off the dust, we might get fog on the other side as well as the raindrops; the fog is comparable to early postoperative edema. If we wipe off the raindrops, which distort the view similar to guttata, the view through the window finally clears.

We should think of eyes with guttata as we do windshields. We probably have all driven with a few raindrops on the windshield. The threshold to turn on the windshield wipers varies with the individual, the density of raindrops, the driving conditions, and the occasional fogging of the window. We have to assess how well patients can see through the window (cornea), the effect when driving at night with oncoming headlights, and how well can they see detail well enough to, for example, read road signs or see someone step in front of the car. We often find that patients do not fully appreciate the disability of guttata because it progresses so gradually. Asking the spouse whether they are comfortable riding with the patient driving at night often provides a better indication of the visual disability.

The benefit-to-risk ratio is so much better with DMEK or with Descemet stripping only than it was with PKP3; thus, whether to treat the guttata should be considered before cataract surgery—not after. First, patients frequently prefer to combine cataract surgery with DMEK or Descemet stripping only rather than have separate surgeries. Second, guttata reduce the accuracy of biometry.4 Therefore, for patients who desire a premium IOL or a very accurate refractive result, one should consider treating dense guttata before performing cataract surgery.5

Guttata, like rain drops, increase intraocular light scatter, decrease contrast sensitivity, and decrease visual acuity. Let us not underestimate the importance of keeping the window clear for our patients with these drops on their corneas.

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REFERENCES

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Reply: Drs. Price and Feng’s analogy of the cornea resembling a windshield is useful. We agree on the importance of a holistic approach to the patient’s visual problems and the involvement of

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corneal transplantation as a possible treatment early in the planning process before cataract surgery.

Our study, involving nearly 900 corneal patients with guttata, found that these patients benefit considerably from cataract surgery as a group. However, corneal guttata was associated with worse visual acuity results and worse patient self-assessed visual function than in cataract patients without corneal guttata. The negative effect of corneal guttata on visual acuity was most prominent during the first 3 weeks.

Data on grading of the corneal guttata was not available for our study. Undoubtedly some patients in our cohort had substantial discomfort resulting from their corneal guttata; however, the need for future corneal surgery was beyond the scope of our article and would be an intriguing subject for future studies. Still, the median postoperative Snellen decimal CDVA in the guttata group was 0.8 compared with 0.4 preoperatively. The probability of achieving even better visual acuity (≥ 0.9 Snellen) after 3 weeks was well over 40% (Figure 4 in article). The median value of patients’ self-assessed visual function improved by more than 3 logit units, just slightly less than for patients without corneal guttata. These substantial improvements after cataract surgery in the guttata group makes it questionable whether further surgery is relevant for most of the patients.

With that said, it is crucial to identify patients with posterior corneal dystrophy who do not have improved visual function after cataract surgery and who thus require further surgery. As Drs. Price and Feng point out, improvement of corneal surgical techniques shifts the risk-benefit evaluation toward earlier corneal transplantation. We believe that there is room for more use of DMEK and other corneal surgeries for patients with corneal guttata and Fuchs endothelial dystrophy. Nevertheless, cataract surgery is a less complex surgery than lamellar corneal transplantation, especially from a postoperative perspective in terms of the risk for graft detachment and rejection. Corneal transplantation also requires human donor tissue, which today is scarce worldwide. Although Descemet stripping only is an exciting method, it seems hasty to recommend it more widely in corneal guttata patients, especially when in combination with cataract and when keeping the results in our study in mind.

Lamellar corneal transplantation, as DMEK, is a fantastic surgical technique that helps patients with troublesome corneal guttata and should be offered to these patients. Our clinical experience is that patients with corneal guttata and seemingly minimal cataracts can have improved visual function after cataract surgery. Based on that and the results in our study, we endorse performing cataract surgery before corneal transplantation as a standard strategy, even in cases in which transplantation is likely. However, we advocate an individual risk-benefit assessment with the patient’s interest in focus and as part of treatment planning, which can lead to other treatment approaches in each individual case.

We based our recommendations on patient-reported outcomes, which means the patients’ perspective. It is well known that patient-reported outcomes and clinical outcomes can diverge, like reality and a map might.—Andreas Viberg, MD, Per Liv, PhD, Anders Behndig, MD, PhD, Mats Lundström, MD, PhD, Berit Byström, MD, PhD

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Prerequisites for pain assessment

Shetty et al. evaluated the effect of a bandage contact lens soaked in ketorolac ophthalmic 0.45% solution on pain modulation in patients having transepithelial photorefractive keratectomy (PRK). The authors did not mention whether the patients in the treatment group and no treatment group were masked. It is known that when patients are aware of the allocation to an experimental intervention or to a comparator including a placebo, they experience, report, or record greater benefits than when they are unaware of the assignment.

The authors compared different individuals in 2 groups. We believe that the method used in a recent study by Vingopoulos and Kanellopoulos might have been a better choice; their study compared fellow eyes of the same patient, with the 2 eyes receiving a different treatment modality. We believe this would have provided a more reliable assessment because pain is perceived differently by different individuals.

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REFERENCES

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Reply: Drs. Agrawal and Khurana raise valid points. We would like to clarify that the patients were masked to which group they were assigned and were not aware of whether they were receiving a ketorolac-soaked bandage contact lens or a plain lens.