

only 2–3% of the corneal stroma volume consists of cells, conversely dextran possesses a high affinity for water because of its abundant hydrophilic hydroxyl groups leading to deswelling beyond the physiological level. For this reason we suggest to evaluate not only the osmolality of the solution but also the concentration of dextran.

In conclusion, our report confirmed the literature finding that a preoperative high keratometry is a positive predictive factor. Furthermore, our findings add that keratoconic corneas with very low pachymetry are more likely to improve. For this reason we suggest to treat advanced KC also and in case of ThCT <400 μm to use swelling solutions.

Conflict of interest

The authors declare no conflict of interest.

References

- 1 Toprak I, Yaylalı V, Yildirim C. Factors affecting outcomes of corneal collagen crosslinking treatment. *Eye (Lond)* 2014; **28**(1): 41–46.
- 2 Vinciguerra R, Romano MR, Camesasca FI, Azzolini C, Trazza S, Morengi E *et al*. Corneal cross-linking as a treatment for keratoconus: four-year morphologic and clinical outcomes with respect to patient age. *Ophthalmology* 2013; **120**(5): 908–916.
- 3 Greenstein SA, Hersh PS. Characteristics influencing outcomes of corneal collagen crosslinking for keratoconus and ectasia: implications for patient selection. *J Cataract Refract Surg* 2013; **39**(8): 1133–1140.
- 4 Vinciguerra P, Albe E, Romano MR, Sabato L, Trazza S. Stromal opacity after cross-linking. *J Refract Surg* 2012; **28**(3): 165.
- 5 Vetter JM, Brueckner S, Tubic-Grozdanis M, Vossmerbaumer U, Pfeiffer N, Kurz S. Modulation of central corneal thickness by various riboflavin eyedrop compositions in porcine corneas. *J Cataract Refract Surg* 2012; **38**(3): 525–532.

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Sir, Response to Vinciguerra *et al*

We thank Vinciguerra *et al*¹ for their interest and valuable comments on our article.² The rationale of our study was to determine the preoperative patient characteristics affecting visual and topographic outcomes of corneal collagen crosslinking (CXL) for progressive keratoconus. We found that patients with a worse preoperative corrected distance visual acuity (CDVA, $\leq 20/40$ Snellen equivalent) tend to experience more visual improvement after CXL treatment ($P < 0.001$).² However, an older age (≥ 30 years) and a thinner cornea (thinnest pachymetry <450 μm) appear to be positive preoperative predictors for more flattening in maximum keratometry ($P = 0.024$ and $P = 0.005$, respectively).² Similarly, Vinciguerra *et al*³ reported that age between 18 and 39 years has positive effect on the outcomes of CXL, and they found a significant association between the thinnest pachymetry and sphere change after CXL treatment.

Unlike the studies of Vinciguerra *et al*³ and Greenstein *et al*,⁴ our analysis showed no significant relation between initial maximum keratometry and postoperative improvement in visual acuity and maximum keratometry.² In our study, cut points were determined as 54 diopters (D) for the maximum keratometry and 450 μm for the thinnest pachymetry in accordance with the current literature and median values. A significant result could be found by shifting cut point to 58.5 D for maximum K, whereas inappropriate and unbalanced number of subjects between subgroups did not allow using this cut point in our study.

We agree with the comments of Vinciguerra *et al*¹ that intraoperative corneal thickness measurement is crucial and swelling riboflavin solutions should be used when the intraoperative minimum corneal thickness is <400 μm to prevent complications. However, in our study we excluded the eyes, which received swelling riboflavin solution during the CXL procedure.²

In conclusion, our results suggest that age, preoperative CDVA, and thinnest pachymetry seem to affect the outcomes of CXL treatment. Moreover, Vinciguerra *et al* and several studies concluded that preoperative maximum keratometry has an effect on the clinical improvement after CXL treatment.^{3–6} However, the predictive threshold values for each preoperative factor remain to be investigated.

Conflict of interest

The authors declare no conflict of interest.

References

- 1 Vinciguerra P, Romano V, Romano MR, Azzolini C, Vinciguerra R. Comment on, 'Factors affecting outcomes of corneal collagen crosslinking treatment'. *Eye (Lond)* 2014; **28**(8): 1032–1033.
- 2 Toprak I, Yaylalı V, Yildirim C. Factors affecting outcomes of corneal collagen crosslinking treatment. *Eye (Lond)* 2014; **28**(1): 41–46.

- 3 Vinciguerra R, Romano MR, Camesasca FI, Azzolini C, Trazza S, Morengi E *et al*. Corneal cross-linking as a treatment for keratoconus: four-year morphologic and clinical outcomes with respect to patient age. *Ophthalmology* 2013; **120**(5): 908–916.
- 4 Greenstein SA, Hersh PS. Characteristics influencing outcomes of corneal collagen crosslinking for keratoconus and ectasia: implications for patient selection. *J Cataract Refract Surg* 2013; **39**(8): 1133–1140.
- 5 Koller T, Pajic B, Vinciguerra P, Seiler T. Flattening of the cornea after collagen cross-linking for keratoconus. *J Cataract Refract Surg* 2011; **37**: 1488–1492.
- 6 Yam JC, Cheng AC. Prognostic factors for visual outcomes after crosslinking for keratoconus and post-LASIK ectasia. *Eur J Ophthalmol* 2013; **23**(6): 799–806.

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Sir,

RE: Long-term outcomes and risk factors for failure with the EX-press glaucoma drainage device

We congratulate Mariotti *et al*¹ for their very interesting article ‘Long-term outcomes and risk factors for failure with the EX-press glaucoma drainage device’ in which they report the long-term outcomes and risk factors for failure with the EX-PRESS shunt implanted under a scleral flap.

We would like to point out some issues that we believe need further clarification.

First, in their article the authors report that ‘Two hundred and forty-eight eyes of 211 patients with uncontrolled glaucoma underwent EX-PRESS implantation (with or without cataract extraction) between September 2000 and September 2009’; however, it is not clear whether the authors excluded patients who had previously undergone cataract surgery and intraocular lens (IOL) implantation? More importantly, did they exclude patients with complicated cataract surgery?

Second, in the 112 eyes that underwent combined surgery, what was the exact technique?

Did they perform the cataract surgery and then the modified trabeculectomy with the EX-PRESS valve or vice versa? Was the cataract surgery in all the eyes uncomplicated? And if not, did they continue the procedure of the EX-PRESS implantation? Did the authors have any cases where an anterior chamber IOL (ACIOL) or an Artisan type had to be inserted? It would be very interesting to know whether the EX-PRESS valve works efficiently in the eyes with complicated cataract

surgery and whether the EX-PRESS success rates are different in these eyes.

Conflict of interest

The authors declare no conflict of interest.

Reference

- 1 Mariotti C, Dahan E, Nicolai M, Levitz L, Bouee S. Long-term outcomes and risk factors for failure with the EX-press glaucoma drainage device. *Eye (Lond)* 2014; **28**(1): 1–8.

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Sir,

Response to: RE: Long-term outcomes and risk factors for failure with the EX-press glaucoma drainage device

We thank Georgalas *et al*¹ for the interest shown towards our article.²

We did not exclude pseudophakic eyes before surgery. In our series, 79 patients were pseudophakic at the time of the Ex-press implantation (32%). Patients with previous complicated cataract surgery were not excluded.

The combined technique consisted of starting the procedure with the modified trabeculectomy first and then, once the scleral flap was ready, performing the cataract surgery with a temporal approach. After the phaco and IOL implantation were completed the surgeons placed the AC maintainer and performed the sclerotomy and Ex-press insertion. Cataract surgery was uneventful in all patients of this group. None of the surgeries required ACIOL.

Conflict of interest

The authors declare no conflict of interest.

References

- 1 Georgalas I, Papaconstantinou D, Koutsandrea C. RE: Long-term outcomes and risk factors for failure with the EX-press glaucoma draining device. *Eye* 2014; **28**(8): 1034.
- 2 Mariotti C, Dahan E, Nicolai M, Levitz L, Bouee S. Long-term outcomes and risk factors for failure with the EX-press glaucoma drainage device. *Eye (Lond)* 2014; **28**(1): 1–8.