

during deep anterior lamellar keratoplasty in keratoconus. *Am J Ophthalmol* 2020;212:127–133.

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## Reply To Comment on Predictors of Bubble Formation and Type Obtained With Pneumatic Dissection During Deep Anterior Lamellar Keratoplasty in Keratoconus



EDITOR:

WE THANK GOWEIDA AND ASSOCIATES FOR THEIR INTEREST in our recent article<sup>1</sup> in which we analyzed the predictors of bubble formation and bubble type in 155 eyes with keratoconus (KC) that underwent big-bubble deep anterior lamellar keratoplasty. Our main finding was the strong correlation between type 2 bubble formation and either older age or advance stage of KC, as detected by anterior segment optical coherence tomography (AS-OCT). Goweida and associates<sup>2</sup> also reported the higher rate of type 2 bubble formation in older patients and in eyes with thin corneas and deep scars. However, the 2 studies differ in several substantial aspects, thus hampering a reliable comparison.

First, the success rate of bubble formation is very different, with 41% in Goweida and associates<sup>2</sup> vs 73% in our study. Several factors can explain the lower percentage reported in the former, such as the heterogeneity of corneal diseases included in the study, the different surgical technique used, and the presumably earlier phase of the surgeon's learning curve. We believe that all these factors may affect also other outcomes, including the occurrence of bubble type 2.

Second, in our series we graded the progression of KC not only by measuring the corneal thinnest point, as done by Goweida and associates,<sup>2</sup> but instead also evaluating the changes in corneal architecture by means of AS-OCT. In particular, we found that staging of KC based on AS-OCT analysis had a higher diagnostic power for the predictability of the type of bubble (type 1 vs type 2) obtained with pneumatic dissection. This correlation was not possible for Goweida and associates,<sup>2</sup> who included in their study eyes with postinfectious scars in addition to keratoconic eyes.

Finally, we acknowledge that Goweida and associates<sup>2</sup> described for the first time a higher risk of double chamber occurrence after type 2 bubble formation, even in the absence of microperforation.<sup>3</sup> However, in our study we could not confirm this finding.

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