Editorial

Deep layers of the cornea and basic research in Spain

Las capas profundas de la córnea y la investigación básica en España

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An interesting debate (not only in scientific meetings but also in personal conversations) has been taking place amongst ophthalmologists specialized on ocular surface and cornea. A few months ago, 2 articles in the Ophthalmology journal examined the characteristics that could determine the response of corneal tissue to 2 highly “fashionable” surgical techniques: Deep Anterior Lamellar Keratoplasty (DALK) and Descemet Membrane Endothelial Keratoplasty (DMEK). Both articles analyzed at the ultrastructural level (electronic microscope) the characteristics that can determine the success or failure of these procedures which operate on the posterior limits of the corneal stroma as well as on the adjacent Descemet Membrane (DM).

It is well known that collagen fibers account for the physical union between Bowman’s membrane and DM, and that these adhesions are important to maintain them joined to the epithelium as well as the endothelium. However, these 2 papers go beyond that and help us understand the implications for DALK and DMEK of the relationship between the corneal structure and the mechanical properties of the cornea.

The research by the Kruse group demonstrates that even in the presence of direct insertions of collagen fibers to DM in cases in which extreme difficulties were encountered to separate DM (a situation which produced tears and tissue loss for use in DMEK), revealed abnormalities at the ultrastructural level (“tweezer-type” connections) as well as at the biomechanical level (increased stain intensities for adhesive glycoproteins).

The observations described by Dua et al. in his paper indicate that the large double technique described by Anwar and Teichmann (big-bubble) for DALK frequently produces DM separation, although not always in isolation but together with an acellular layer of posterior stroma between 6 and 13 μm. Depending on whether DM can be desiccated with said acellular layer joined to it or in isolation, a different type of bubble will be formed.

Both findings help us understand the variations all cornea surgeons have found when desiccating DM for DMEK, or at the time of trying to produce a bubble for DALK.

Spanish ophthalmologists who have been working “since the dawn of time” with corneal lamellar surgery have discussed the various behavior of the cornea in these 2 procedures, and we have done so in dozens of meetings throughout many years because our clinical experience is quite significant. In Spain, it is very frequent to start building the house by the roof in the disciplines that combine clinic and disease. In fact, our surgeons are frequently skilled as well as courageous, performing novel techniques and collecting a large number of cases in a short time. However, it nearly always is the case that someone must come from abroad to explain the reason for the clinical observations that we have been witnessing for years and discussed in numerous meetings.

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The objective of this editorial is to make a summary of the above findings that explain many of the problems we have all encountered. But we would also like to emphasize the absence of basic research in our country. We are so dedicated to our patients that we forget to look for the causes of what we witness every day. If clinics and pathologists walked parallel paths, we would probably find great to benefit and above all at a more timely moment for our patients.

REFERENCES