

SUMMARY

The morphological and functional integrity of the cornea is disrupted in cornea degenerations and dystrophys, which can be characterized by abnormal parameters. Measuring the thickness of the cornea provides indirect data about the structure and functional state of the cornea. In order to properly interpret the abnormal pachymetric data, we have to know the normal range identifiable by this instrument and this examination method, as well as the correlation of the data defined by the various instruments. Therefore, we have carried out prospective examinations on healthy eyes using two newly developed instruments in order to define their applicability, - including their limitations - for biometric measures. We have concluded that the data provided by both instruments were significantly correlated, furthermore both devices are suitable for defining the biometric parameters of the eye. We have also proved that the instruments cannot be used interchangeably in the patient follow-up. We have carried out ultrasound biometric and tear film examinations in rare corneal disorders. In the case of keratoglobus we could select the optimal therapy (perforating keratoplasty) with the help of ultrasound pachymetric examinations involving the periphery of the cornea as well. We have proved by biopsy that the thinning of the cornea, which can be measured with a pachymeter, is caused by the reduction of the collagen fibres in the cornea stroma.

In the case of microcornea associated with axial myopia the pachymetric examination of the cornea revealed data similar to the values of the intact cornea. We have also found that the anterior chamber was shallow, which may be caused by glaucoma. In the background of the myopic refraction, experienced in spite of the flatter corneal surface and a smaller refractive power, an elongated axial length was detected by ultrasound examination.

In the case of primary lipid keratopathy (xanthoma corneae) we have proved the thickening of the cornea by using pachymetry tests. Biochemical examination of the precorneal tear film

(non-invasive methods) were used to demonstrate that the corneal lipid deposits consist of phospholipids and fatty acids.