

Corneal Thickness

Eye doctors these days often measure the corneal thickness when assessing patients for glaucoma. This is because large trials have shown that the corneal thickness is related to the susceptibility all risk of developing glaucoma. It is been found that people with thin corneas are more likely to develop glaucoma than people with thick corneas.

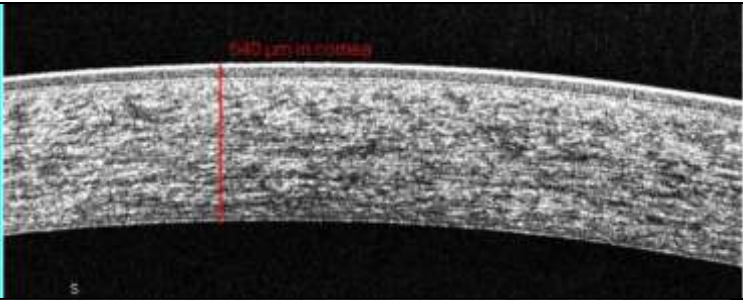
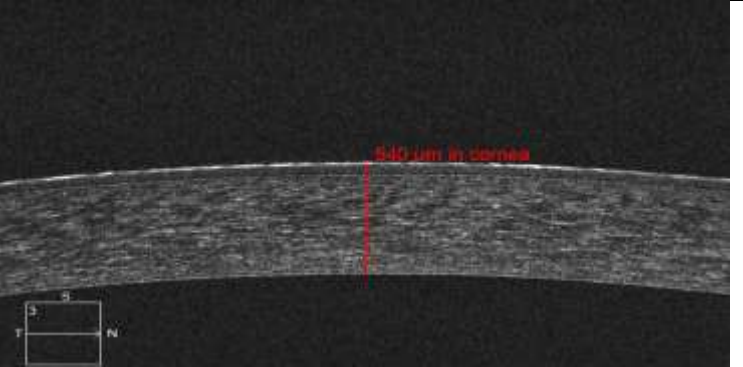
The average corneal thickness is 560 μ and one would consider the cornea to be thick images above 600 μ or thin below 500 μ .

The corneal thickness may be measured with handheld Pachymetry devices or may be undertaken with an anterior segment OCT scan as demonstrated below.

In addition the standard way in which intraocular pressure is measured is affected by the corneal thickness. The standard Goldmann tonometer is standardised on an average corneal thickness of 560 μ . If the cornea is thicker than usual then the pressure is under read and needs to be decreased for instance by two mmHg if the cornea is 600 μ and vice versa if the cornea is below 500 μ intraocular pressure needs to be adjusted by increasing the intra-ocular pressure by 2 mmHg.

One formula that can be used for this adjustment is below.

$$IOP = IOP - 0.045 * (CT - 554)$$

<p>Optical Coherence Tomography Cross section of a patient cornea with a thickness of 644 μm</p>	
<p>Thinner cornea 540nm</p>	

In Bullous Keratopathy you can thin the cornea by using Hypertonic saline 5 % applied four times a day. This does though sting when applied but I have seen this

work well in some patients. The paper below says it works best in corneas thinner than 650um.

Reference

Therapeutic efficacy of 5% NaCl hypertonic solution in patients with bullous keratopathy.

Knezović I, Dekaris I, Gabrić N, Cerovski J, Barisić A, Bosnar D, Rastegorac P, Parać A.

Author information

Abstract

A clinical trial was undertaken to evaluate the efficacy of hypertonic solution (5% NaCl) in patients who have bullous keratopathy (BK). The aim of the study was to define the stage of the disease and the thickness of cornea in micrometers, which would be the threshold for therapeutic approach. This was a prospective study on 70 eyes of 55 patients. Patients were divided in two groups at the beginning of the study. The first group (n=33 eyes) included patients with initial stage of BK: only stromal component of corneal oedema was present. The second group (n=37 eyes) included patients with advanced stage of BK: the epithelial component of the disease with bullae on the corneal surface had already developed. Visual acuity, central and peripheral thickness of cornea and morphology of the disease was recorded before therapy, 7 days and 4 weeks after administration of hypertonic solution. Our results shown that the efficacy of hypertonic solution correlates with the severity of clinical picture in patients with BK. When 5% NaCl hypertonic solution was applied in the early stage of the disease, when only stromal component of corneal oedema was presented, visual acuity and pachymetry readings were significantly improved. The threshold pachymetry measurement of corneal thickness justifying the application of hypertonic solution was 613-694 microm (in the central corneal area), and 633-728 microm (at corneal periphery). It seems reasonable to apply hypertonic solution to the patients who have BK and whose pachymetric values are below mentioned range. In terminal stages of BK, when superficial bullae (epithelial component) had already developed, treatment with NaCl was not effective and patients had to be submitted to penetrating keratoplasty.