Corneal pachymetry

**Corneal pachymetry** is the process of measuring the thickness of the cornea using contact methods, such as ultrasound[1] and confocal microscopy (CONFOSCAN), or noncontact methods such as optical biometry with a Scheimpflug camera (such as SIRIUS or PENTACAM), Optical Coherence Tomography (OCT, such as Visante) and online Optical Coherence Pachometry (OCP, such as ORBSCAN). Corneal Pachymetry is particularly essential prior to a LASIK procedure for ensuring sufficient corneal thickness to prevent abnormal bulging out of the cornea, a side effect known as ectasia. The instrument used for this purpose is known as a pachymeter. Conventional pachymeters are devices that display the thickness of the cornea, usually in micrometres, when the ultrasonic transducer touches the cornea. Newer generations of ultrasonic pachymeters[2] work by way of Corneal Waveform (CWF)[3]. Using this technology the user can capture an ultra-high definition echogram of the cornea[4], somewhat like a corneal A-scan. Pachymetry using the corneal waveform process allows the user to more accurately measure the corneal thickness, verify the reliability of the measurements that were obtained, superimpose corneal waveforms to monitor changes in a patient's cornea over time, and measure structures within the cornea such as micro bubbles created during femto-second laser flap cuts.[5] [6]

Corneal Pachymetry is essential for other corneal surgeries such as Limbal Relaxing Incisions. LRI [7] is used to reduce corneal astigmatism by placing a pair of incisions of a particular depth and arc length at a steep axis of corneal astigmatism. By using the corneal pachymetry the surgeon will reduce the chances of perforation of the eye and improves his surgical outcome. Newer generations of pachymeters will help surgeons by providing graphical surgical plans to eliminate astigmatism.

Corneal pachymetry is also considered an important test in the early detection of glaucoma. In 2002, the five-year report of the Ocular Hypertension Study (OHTS) was released. The study reported that corneal thickness as measured by corneal pachymetry was an accurate predictor of glaucoma development when combined with standard measurements of intraocular pressure. As a result of this study and others that followed, corneal pachymetry is now widely used by both glaucoma researchers and glaucoma specialists to better diagnose and detect early cases. Newer generation pachymeters have the ability to adjust the intraocular pressure that is measured according to the corneal thickness.
References

[5] Corneal waveform measurements have advantages in pachymetry, Ocular surgery news Nov 1, 2006 Vol 24 No 21
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