INTRODUCTION

For years, conventional slit-lamp, keratometry, ultrasound, pachymetry, and topography systems have served clinicians and researchers as helpful tools for evaluation and diagnosis. However, each of those modalities has its limitations and new informational requirements have arisen as a result of recent advances in the field of ocular surgery (Dick,2005).

Pentacam is considered the most recent and comprehensive method for evaluating the anterior segment of the eye (Novak,2005).

Pentacam is a rotating Scheimpflug camera which captures Scheimpflug images of the anterior segment. The Scheimpflug technique provides sharp and crisp images that include information from the anterior corneal surface to the posterior crystalline capsule.The rotating camera supplies a movable three-dimensional presentation of the anterior chamber. The centre of the cornea is measured very precisely as the rotating imaging process takes less than two seconds and corrects the slightest eye movements. By measuring more than 25,000 true elevation points,the Scheimpflug system offers precise representation and repeatability (Neuhann, 2007).

Pentacam system is a powerful, multifunctional tool for cornea and anterior chamber imaging that can be used in a broad range of clinical applications while offering the potential to overcome the shortcomings of existing technologies. For example, it is now being used in LASIK screening for diagnosing corneal anomalies that would exclude patients from surgery. It is also a useful tool in the evaluation of patients seeking retreatment for determining residual stromal tissue to allow a safe enhancement procedure.

The optical and topographical analyses features of the Pentacam have been applied for the evaluation of corneal striae in post-LASIK eyes (Lackner, 2006).

Pentacam, as an elevation-based diagnostic imaging system, is highly accurate in detecting keratoconus, because it provides the level of precision in measuring the corneal surface necessary to diagnose this condition (Belin, 2006).

Pentacam allows users to take direct measurements of the power of the cornea, thus avoiding the problems of keratometers and topographers which cause errors, especially with IOL calculations in patients who have undergone refractive surgery (Holladay, 2006).

Researchers also reported a number of applications for surgical planning and follow-up in cases of phakic IOL implantation. Anterior chamber depth, which is one of the criteria for selecting candidates for implantation of the iris-fixated Artisan phakic IOL, can be accurately measured with Pentacam. Pentacam can also be used for characterizing defects in the cornea after foreign body removal and keratopathy quality. In addition the Pentacam can be used in serial studies to evaluate the results of arcuate keratotomy performed to correct astigmatism during cataract surgery (Lackner, 2006).

Pachymetric colored map from limbus to limbus, the actual thickness can be evaluated at any location by clicking on the area or by using the numerical value. Important parameters like thickness in the pupil center, apical corneal thickness and the thinnest location are provided . For calculating corneal thickness, the camera measures from the top of the epithelium to the anterior surface of the endothelium. Importantly, it does not measure the tear film (Grewal, 2008).