Rotating Scheimpflug imaging system assists in diagnosis of posterior polymorphous corneal dystrophy in a 6 years old patient. A case report

Background
Posterior polymorphous corneal dystrophy (PPCD) is a bilateral, uncommon, hereditary and usually non-progressive corneal dystrophy affecting the Descemet’s membrane and endothelium. A new rotating Scheimpflug camera (Pentacam: Oculus, Inc., Wetzler, Germany) was used in this case report to determine different corneal parameters including anterior and posterior corneal curvatures, topographic corneal thickness and corneal aberration. It was previously reported to have good limits of agreement between ultrasound pachymetry and good intra- and inter-sessions repeatability in anterior and posterior corneal assessments.1,2

Case history
A 6 years old Chinese girl visited the Optometry Clinic in 2006 and an atypical band-like PPCD was found unilaterally at the mid-superior corneal region (approximately 2 mm from pupil centre) of her right eye (Figure 1). Her best corrected visual acuity was normal (20/20) in both eyes.

The profile of corneal thickness and posterior corneal curvature along the vertical meridian in the affected eye were shown in Figure 3. A noticeable difference in corneal thickness and obvious flattening of posterior corneal curvature are possibly explained with the abnormal biomicroscopic findings.

Discussion
It was the first case report to discuss the uses of the rotating Scheimpflug imaging system on the PPCD in our best knowledge. PPCD have been classified into vesicular, band and diffuse form. Most patients suffered from PPCD are asymptomatic with normal vision and tends to be non-progressive. Bilateral involvements were a typical presentation while single eye was affected only in this case. Both non-contact specular and confocal microscopies are clinically capable to image corneal endothelium in vivo. Confocal microscopy has advantage over specular microscopy as it could offer a continuous scanning over the cornea and could determine the location of lesion. However, local anesthesia and steady fixation without blinking are required during the assessment which is difficult for children.

The new rotating Scheimpflug imaging system measures the cornea non-invasively with short acquisition time which is especially welcome by children. Posterior corneal surface flattening was shown at the mid-superior corneal region in the affected eye which was obviously different from the other eye. Flattening of posterior corneal curvature along the vertical meridian which possibly induces higher order aberration, e.g. vertical coma Z(3,1). Deteriorated best corrected vision may be explained with the high corneal aberration, however, it was not shown in this case.

In the comparison of topographic corneal thickness, this system revealed abnormal corneal thickening at mid-superior region in the affected eye while comparable thickness profiles were shown in the inferior cornea of both eyes. This system possesses good inter-sessions repeatability in peripheral corneal thickness measurement and could monitor the longitudinal change of PPCD.

Conclusion
Rotating Scheimpflug imaging system was beneficial to assess and monitor the posterior corneal curvature, corneal thickness and posterior corneal aberration changes in the PPCD which could not be omitted in the PPCD diagnosis.

Reference