CURRENT UNDERSTANDING OF POSTERIOR CORNEAL ASTIGMATISM

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TRAIN OF ASTIGMATISM

DOUGLAS KOCH → PCA → BAYLOR NOMOGRAM → ABULAFIA KOCH → 6 PEARLS → BARRETT → WHAT IF PCA>0.5D

Evaluating patient's astigmatic error isn't just about the shape of the front of the eye anymore. Failure to include posterior corneal curvature in the presurgical cataract calculations can bring unwanted refractive surprises for both patient and surgeon. There's a fair amount of astigmatism on the posterior surface of the cornea.

Douglas Koch-

87%of patients had posterior corneal astigmatism at 180 degree

90% of these eyes </= 0.5 D of astigmatism

Relations between post and ant corneal astigmatism

1)Mean magnitude of post corneal astigmatism=0.37+/-0.19D

2) 91%of eyes had ATR posterior corneal astigmatism

3)Significant correlation between ant and post astigmatism

a)In WTR ant astigmatism group=96.6% had post ATR

b)In ATR ant astigmatism group =74% had post ATR

4)With aging WTR → ATR

A)0.36 D for 10 yrs from 50 onwards

5)Posterior corneal astigmatism remains unchanged with age

6)No correlations between magnitude of anterior and posterior corneal astigmatism

7)In eyes with- WTR anterior and ATR posterior=reduces net corneal astigmatism =overcorrection

8)In eyes with-ATR ant and ATR post=increases net corneal astigmatism= under correction

Baylor Nomogram

1) Nomogram aims to leave patients with slight WTR astigmatism to account for the ATR shift that occurs over time with aging.

2)In eyes with WTR astigmatism**.** The nomogram shifts the threshold for selecting a toric IOL up 0.7 D,

3)In eyes with ATR astigmatism**.** It shifts the threshold for selecting a toric IOL down 0.7 D,

Abulafia Koch

1) Net corneal astigmatism = IOL cylinder at corneal plane – Residual cylinder

2) Regression formula for measured v/s actual ant corneal astigmatism for x and y components separately

3)Reading to apply to patient

measure astigmatism
↓
separate into x and y components
↓
apply regression formula
↓
use for toric calculation

6 Pearls of Elizaneth Yeu

1) Measure anterior corneal astigmatism accurately

2) Factor in posterior corneal astigmatism – total refractive astigmatism(Baylor , Abulafia Koch , ASSORT , cross cylinder)

3) Determine effect of SIA

4) Plan for corneal astigmatism changes over time

5) Don't be confused by Oblique,WTR ,ATR

6) Keep an eye on Effective Lens Position (ELP) and IOL power

Barrett Nomogram

Incorporated -

Post corneal astigmatism

ELP

IOL power

Introduced the term of centroid SIA

If posterior corneal astigmatism is >0.5 D

Keratometers (manual, automated, and Placido-disc) measure only anterior astigmatism and use a fixed posterior:anterior curvature ratio to calculate the total corneal astigmatism.

Measuring posterior corneal astigmatism is a challenge.
Two devices on the market, the Galilei Dual Scheimpflug Analyzer (Ziemer, Port, Switzerland) and the Pentacam (Oculus, Lynnwood, Wash.), measure it "moderately accurately,