Clinical outcomes of toric ICL for the correction of myopic astigmatism in eyes with keratoconus

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Corneal astigmatism: Keratoconic eyes

Posterior corneal astigmatism ⇒ ATR astigmatism

Anterior 3.9 ± 2.8D

Posterior 0.9 ± 0.6D

Correlation between Ant. and Post.

Keratoconic eyes
N=132

Pearson correlation coefficient
r=0.77

Benefits of ICL in keratoconus

1, Surgery is easy
2, ICL calculation is easy

Deep ACD

Wide working space !!

Methods

• Design
  – Retrospective study
• Post operative 1 week, 1, 3, 6 months
• Subjects
  – Visual acuity (UDVA・CDVA)
  – Safety (Safety index = Post. CDVA / Pre. CDVA)
  – Efficacy (Efficacy index = Post. UDVA / Pre CDVA)
  – Predictability (within ±0.5, 1.0 D)
  – Stability
  – Complication

3, Total astigmatism of keratoconic eye

Total Astigmatism

3.9 - 0.9 = 3.0 D

25% of Ant. astigmatism

HCL is over correction ?
• Visian toric ICL™ (STAAR surgical)
• 27 eyes of 17 patients
  Age: 37.4 ± 7.0 y.o. (30~51 y.o.)
• Sex: Male 10 eyes, Female 17 eyes
• Pre SE : -10.11 ± 2.46 D
• Pre astigmatism : -3.03 ± 1.58 D

Inclusion Criteria
  – Amsler-Krumeich : Stage 1 or 2

Astigmatism: Vector Analysis

Correction Index = 87%

Contrast Sensitivity (Photopic)

Contrast Sensitivity (Mesopic)

Complication
- Endothelial cell density
  - Pre: 2734 ± 482 cells/mm²
  - Post: 2587 ± 407 cells/mm²
- Cataract: 0%
- Axis misalignment: 0%

Summary
- In view of the corneal posterior astigmatism, astigmatic correction of toric ICL might be more effectively.
- Toric ICL was beneficial in all measures. (UDVA, CDVA stability & predictability)
- Toric ICL is suitable for keratoconus, because keratoconic eye has deep ACD.

Good combination