Cataract Surgery after Myopic Refractive Procedures

Ray Guard Eye Center
Huang Wei-Jen, MD
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Cataract Surgery after Myopic Refractive Procedures

Challenges

* How to explain the occurrence of cataract
* How to determine the power of IOL
* How to choose the type of IOL
* How to explain the possibility of touch-up for postoperative refractive error
* Something related to characteristic of myopic eyes
Cataract after Myopic Refractive Procedures

* Nucleus sclerosis
  not relevant to previous procedures
  myopic shift
deteriorate rapidly

* ASC
  maybe relevant to previous procedures
  surgical trauma or iatrogenic acute glaucoma
  stable refraction status
  mostly limited
Types of Myopic Refractive Procedures

* RK
* ALK
* PRK/LASIK
* Phakic IOL

Different procedure has different consideration
Power of IOL

Corneal procedures (RK, ALK, PRK/LASIK)

* Changed anterior - posterior corneal curvature ratio, ELP

→ difficult to get accurate IOL power

* Various published methods or formulae

* Personal nomogram

\[ \text{IOL optimal} = \text{IOL current} + \text{D} \times \text{R} \]
IOL current + D x R

IOL current:
IOL power based on current K(Auto-K) personalized formula (SRK-T, adjusted SRK II or.....)

D: diopter corrected by previous myopic procedure

R: refractive factor
PRK/LASIK 0.4
RK 0.5
ALK 0.6
Power of IOL

Phakic IOL

AXL measurement

aphakic mode for A-scan

Optical measurement

(IOL master, LenStar)
Type of IOL

Spheric or Aspheric

* Increased SA after myopic corneal procedures

* Aspheric IOL is esp. beneficial for this group of patients
Type of IOL
Type of IOL

Monofocal or Accomodative or Multifocal

* Residual astigmatism
* Irregular astigmatism (Topo, centration)
* Severe diurnal refractive change in RK patients
* RK > 8 cuts, OZ < 3mm
* Available power of IOLs
  - ReSTOR +6, TMF +5, Crystal +4
* Ocular pathology
Refractive Accuracy

No matter what we have done to get accurate measurement and IOL power calculation, the possibility of postoperative refractive error is still there, esp. for patient with previous corneal refractive procedure.
Refractive Accuracy

* Preoperative education and consultation
* Intraoperative aberrometry
* Immediately check-up for post-op refraction
* Management of postoperative refractive error
Touch up for Refractive Errors

* LASIK / PRK
* Piggyback IOL
* IOL exchange
* IOL capture
* Mini-RK
* PCRI
LASIK / PRK

* The most accurate method of correction
* Wound concern during flap creation
* Epithelium healing issue after PRK in elder patients
* Dry eye after LASIK / PRK in elder patients
* Not practically achievable for every cataract surgeon
* Consider YAG capsulotomy before LASIK or PRK
IOL Exchange

* Timing issue
* IOL material
  - hydrophobic acrylic: capsule adhesion
  - silicone: slippery during manipulation
* Ant. and post. capsule status
* Zonule integrity
* Smooth previous operation?
* Piggyback IOL as the back-up procedure
**Piggyback IOL**

* One in bag, one in sulcus
* Avoid hydrophobic acrylic to hydrophobic acrylic IOL (interlenticular opacity)
* Three-piece IOL or special design for sulcus implantation is better
* Watch out unexpected insertion of leading haptic into bag during implantation
* x1.5 for hyperopic correction
* x1.2 for myopic correction
IOL Capture

* Reverse CCC optic capture (haptic in the bag, optic above the CCC)

* Myopic shift 0.5D ~ 1.0D depends on IOL power

* Capsule zonule status

* Optimal CCC size is required

* Piggyback IOL as the back-up procedure
Radial Keratotomy

Bad reputation
Poor predictability
Visual disturbance
Diurnal vision instability
Hyperopic shift
due to
too small optic zone
too many incisions
scleral involvement
Mini-RK

* 4-cut or 2-cut
* Stronger effect for elder patients
* Less incisional scarring for elder patients
* Optic zone 5mm (preferable) or 4mm large enough for elder patient
Personal Mini-RK

* 100% depth incision, downhill track
* 4-cut OZ 5 mm

-1.25D ~ -1.5D

* OZ 4 mm add 25% effect
Personal Mini-RK

* 2-cut OZ 5 mm

-1.0D

-0.5 D with
-1.0 D 180°

* OZ4 mm add 25% effect
Different considerations for different myopic refractive procedures.
RK

* Diurnal change (OZ, cut number, corneal rigidity)
* Halo, glare, star burst
* Irregular astigmatism
* In-between corneal wound or scleral wound to avoid RK wound splitting
* Early postoperative hyperopic shift (K flattening)
* Reduce intraoperative and postoperative IOP to avoid pseudo refractive surprise
* IOL power selection for 2nd eye
LASIK

* Flap stability
* Intraoperative interface edema in prolonged surgical time and high bottle
* Postoperative IOP issue and interface fluid accumulation syndrome
Phakic IOL

* Wound size needed for phakic IOL explantation
  - Artisan 5.2/6.2mm
  - Artiflex 3.5mm
  - ICL 3.0mm

* Explantation is always easy for experienced hand

* Suture the wound if needed to secure chamber stability then proceed to phaco procedure
Cataract Surgery in High Myopic

Intraoperative
* Pain sensation during inflow insertion
  stepwise bottle height
  intracameral xylocaine
  instrument indentation between iris and
  ant. eapsule to release block
* Zonule weakness
  gentle procedure to avoid further
  damage
* Large bag
  Toric IOL rotational stability concern
  C-T-R(?)
Cataract Surgery in High Myopic
Cataract Surgery in High Myopic

Postoperative
* Retina status: break, macular lesion
* IOL-bag complex status: spontaneous dislocation
* IOP issue
Conclusion

* High incidence and early onset of cataract in high myopic eyes
* Different considerations for different myopic refractive procedures pre-, intra-, post-operatively
* Special concerns for high myopic eyes
Thanks for your attention!