



المؤتمر السنوي الدعوي للجمعية الرمديّة المصريّة
INTERNATIONAL CONGRESS OF THE
**EGYPTIAN
OPHTHALMOLOGICAL
SOCIETY**


Corneal or lenticular refractive surgery ? When and Why

Symposium of the Hellenic Society of
Intraocular Implant and Refractive Surgery
Cairo, 14/3/2018



Patient selection & examination

THOMAS ORFANIDIS



Preoperative examination of the refractive candidate



History taking

- Ophthalmic
- Systemic



Ophthalmic examination (Complete & meticulous)

- Many patients are poor candidates or ineligible because of a local or systemic disease (may be excluded by history)
- Some of the local or systemic conditions and diseases are considered **relative or absolute** contraindications for laser keratorefractive surgery



Ocular contraindications

- **Active,**
- **Residual, or**
- **Recurrent ocular disease:**
 - Sjögren disease (absolute)
 - Herpes simplex keratitis (reactivation), &
 - Corneal scars



Systemic contraindications

- **Pregnancy**
 - Women who are pregnant, lactating or potentially child-bearing
 - Laser-induced teratogenesis???
 - Possible contraindication of drugs that may be required postop
- **Contraceptive pills** may temporarily induce myopia
- **Collagen vascular disease**
 - Rheumatoid arthritis
 - SLE
 - Sjögren disease
- **Diabetes**



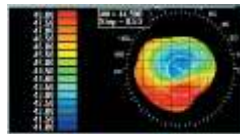
Diabetes: The problem:

- Epithelial healing ...
- Refraction is usually not stable
(Regression or undercorrection?)
- Diabetics develop cataracts earlier than non-diabetics
- Higher danger for infection (+ steroids?)



Contact lens wearers

- SOFT CLs: Stop using them for at least 1 week
prior to evaluation and surgery.
- Corneal warpage syndrome
(may need to abstain from wearing CLs for 3-5 months)
- HARD CLs: Abstain from wearing CLs for 2 weeks



Examination

Order:

- A. Non-invasive tests
- B. Invasive tests, i.e. touching the eye,
e.g. pachymetry or IOP
 - Unaided Visual Acuity (UVA): Efficacy and predictability
 - Near UVA (macular function – presbyopes)
 - Best corrected visual acuity (BCVA) - Manifest refraction



Examination

Exclude:

- Subclinical keratoconus
- Corneal warpage syndrome
- Irregular astigmatism

Optimize-standardize conditions for the patient's examinations used in evaluation of VA (comparative measurements)



Best corrected visual acuity (BCVA) - Manifest refraction

Postoperative value: Safety of a procedure

- «Gain of BCVA» ???
- Use soft or, preferably, hard contact lens in:
 - myopia over 6.5 diopters
 - hyperopia over 4 diopters
 - BCVA less than 20/20



Stability of refraction

Check:

- 18 years old or older
- Earlier refractive status
- Frequency of changing spectacles or CLs
- Discrepancy between manifest & cycloplegic?
- Checking of clarity or condition of the optical media
- Suspicion of: keratoconus or cataract in progression, or corneal warpage syndrome



Contrast sensitivity testing Measures safety

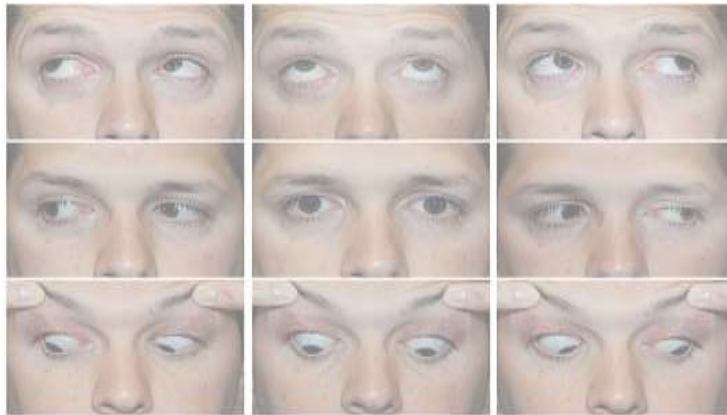
LASIK and PRK treat the stroma of the cornea

- Healing in the interface, and
- Potential reduction of clarity and, in turn, contrast sensitivity
 - In very high myopes, it is sometimes very difficult with the available tests to measure contrast sensitivity
 - Every attempt should be made to record a measurement and this is always done with the patient having his best-contact-lens-correction on



Ocular motility

Ductions, versions, tropias and phorias



Slit-lamp examination

Lids & adnexae: Any disease or blepharitis

Cornea: Clarity, scars, presence of dystrophies or degenerations, neovascularization (suction)

Anterior chamber: Active iritis, crystalline lens



Keratoconus & Ectasias

- Subclinical keratoconus (diagnosed by corneal topography)
By some, not an absolute contraindication for LASIK
- Preoperative stability of refraction & a preop central corneal thickness of 500 microns or less

Inform the patient that:

- Refraction may end up **suboptimal**
- Condition may **deteriorate**
- Corneal **transplantation** may become necessary



Keratoconus & Ectasias

Recent studies suggest that in some mild cases treatment **may** be possible, using

- **PRK**, *following or combined with CCL*
- **LASIK Xtra**



Dry eye syndrome (unresponsive to treatment)

- Artificial tears are increased postop for a period of 3 to 6 months
- Permanent plugs may be required
- **Schirmer test:** performed in order to avoid treating cases with xerophthalmia, something that may delay healing
- More important in PRK

Remember: Drug preservatives may accentuate symptoms



The pupil

Why important? **To avoid glare problems** postop

- Fact: thickness of cornea removed is proportional to ablation zone diameter
- Usual tactics: small zones are utilized in order to avoid getting too deep in the cornea
- Prismatic effects of the reshaped corneal optics are liable to induce glare and halo phenomena (more commonly with PRK)



Cycloplegic refraction

- Cyclopentolate 1%
- Determine refraction about 30-40 minutes later
- Use contact lenses
- Hyperopes (spasm of accommodation)
- Myopes? What if cycloplegic refraction \neq manifest



Pachymetry

- **Obligatory**
- **Corneal thickness ≤ 500 microns:**

LASIK NOT recommended,

unless you plan for a very low correction and you have a very small scotopic pupil

- **Topographic pachymetry (ORBSCAN) – not very accurate**
- Some lasers have real time pachymeters



“Glaucoma is NOT an absolute contraindication for photorefractive surgery”

However...

- Concern: Period for which steroids are prescribed may totally destabilize the patient's IOP
- Corneal epithelium may be found to be suffering from anti-glaucomatous drug-related epitheliopathy
- **Following PRK or LASIK, common tonometers are **TOTALLY UNRELIABLE** they tend to over- or under-estimate IOP !!!**



Fundus examination

- **Peripheral retinal** degeneration holes, tears, breaks
(Argon laser prior to surgery)
- **Macular pathology** (photodocumentation & fluorescein angiography)

Most important

The patient should understand that correction of his refractive error is only **optical and not anatomical**, and that, as a myopic eye, he will always be more liable to retinal detachment than the natural emmetrope.



Decision Making

- Which eye to operate first?
Usually the dominant eye,
unless otherwise asked for by the patient
- What is the intended correction? Plano refraction?
Many older myopes have never recognized their reading
problem! **Discuss monovision**
- One or two eyes?



Informed consent form

Explain:

- Other options for overcoming the refractive error
- Nature of procedure
- Expected benefits
- Possible complications



Informed consent form

Explain:

- Overcorrection or undercorrection,
- Decrease of BCVA,
- Glare and haloes,
- Potential driving problems, as well as rare complications such as
- Scarring, epithelial islands, and **the possibility of requiring corneal transplantation** in such cases, are recorded in **simple language**.

Women should also sign that they are not pregnant or lactating.



Choosing refractive procedure

- There are no hard and fast rules defining the boundary where lenticular refractive surgery is implemented in preference to corneal refractive surgery.
- The decision process is multifactorial.



Major Factors for decision making

- Age
- Amount of refractive error
- Contraindications for photorefractive



AGE

Would you ever perform, as a routine, RLE to a 20 years old patient for -4 D myopia ?

NO

Why ?

Reason No 1 **“Loss of accommodation”**

No RLE before 45 when refractive error can be corrected with accommodation preserving procedures (ICL, Photorefractive)



AGE

Would you ever perform, lens replacement surgery to a 20 years old patient for -4 D myopia ?

YES

Presence of evolving cataract has an oneway solution at any age: **“Cataract Surgery”**



Age + Amount of refractive error

What if your <45 patient has no contraindications for photorefractive surgery and a refractive error of

Myopia	< -10,00
Hyperopia	< +4,00
Astigmatism	< 3,00

Corneal Photorefractive is the primary option

- accommodation is preserved,
- high accuracy, efficacy and predictability,
- very good quality of vision (under conditions at correction limits)

ICLs is a secondary option at some combinations of the above refractive errors.



Age + Amount of refractive error

What if your <45 patient has contraindications for photorefractive OR a refractive error of

Myopia	> -10,00
Hyperopia	> +4,00
Astigmatism	> 3,00

Start thinking of ICLs

- Wide range of correction (ICLs, toric ICLs)
- accommodation is preserved,
- very good accuracy, efficacy and predictability,
- very high quality of vision.



Age + Amount of refractive error

What if your >45 patient has no contraindications for photorefractive and a refractive error of

Myopia < -10,00
Hyperopia < +4,00
Astigmatism < 3,00

Presbyopia is engaged, things are getting harder !

- Start thinking of photorefractive with monovision or some kind of multifocality.

BUT on the other side cataract is in front of the gates and the evolution of multifocal IOLs is posing a great Dilemma !

- You may also start thinking of RLE with monofocal (monovision or not) or multifocal IOLs.



Age + Amount of refractive error

What if your >45 patient has a refractive error of

Myopia > -10,00
Hyperopia > +4,00
Astigmatism > 3,00

Start thinking of

- RLE with monofocal IOLs and monovision (or not)

OR

- RLE with multifocal IOLs



Age + NO refractive error

What if your >45 patient has NO refractive error and is asking for a more permanent (than spectacles and CLs) presbyopia solution ?

Start thinking of

- Corneal inserts (many variants) OR
- Presbylasik (many variants) ? OR
- Photorefractive monovision OR
- LTK Laser Thermal Keratoplasty OR
- CK Conductive Keratoplasty OR
- RLE with monofocal IOLs and monovision OR
- RLE with Bifocal IOLs OR
- RLE with multifocal accomodating IOLs OR
- RLE with multifocal diffractive IOLs
- RLE with multifocal refractive IOLs OR...

I could continue but I 'd rather stop here, because you may already have a headache...



Age + NO refractive error

Oh God,
why presbyopia has so many solutions ?

Because actually none of them really works like nature.
We try to substitute an advanced **dynamic** procedure with a **static** one.

Best are yet to come...



Thank you !

