SUB BOWMN KERATOMILIUSIS
SBK

A procedure for Present and Future

MOSTAFA M. SALAH
MD
PROFESSOR
Head of Refractive Unit
RESEARCH INSTITUTE OF
OPHTHALMOGY
CAIRO - EGYPT
THIN FLAP LASIK

DEF.  
- Creation of Intended regular thin flap less than 120 mic.

- Historically A complication

Un intended  
- Irregular thin flap
- Damage to Bm.
- Difficult manipulation

Irregular astigmatism

CAUSES  
- Poor suction
- Damaged MK blade

THIN FLAP LASIK

Advantages:

- Thicker RSB
- SAFE correction of higher levels of ametropia
- Preserve corneal BIOMECHANICS
- Less risk of c. ectasia
- Allow large ablation zones
THIN FLAP LASIK

**Advantages:**
- Rapid visual recovery
- Better Contrast sensitivity
- Better adhesion to bed
- Lesser induction of HOA.
- Less decr. Of corneal sensations.
- Dec. Rate of refractive enhancement

**Disadvantages**
- Wrinkles
- Manipulation.

**SUB BOWMAN KERATOMELIUSIS SBK**

- A LASIK procedure with a very thin flap.
- By making a cut just under the Bowman’s membrane
SBK

SBK Lasik the thinner flaps are obtained of 90 to 110 microns thickness.

The conventional LASIK create a flap of 120 to 180 microns thickness.

The Rational for SBK

Lasik
- with traditional flap provides rapid visual recovery with minimal if any postoperative pain.

Surface ablation
- causes least effect on biomechanics stability of the cornea, but with postoperative pain and slow visual recovery.

SBK
- may combine the advantages of both (90 microns flap), Better biomechanical stability and more tissue to ablate safely.
Anterior third of the stroma being the strongest region of cornea (red area), the deeper the cut is made in the «strong cornea», the more the cornea is weakened.

**Loss of mechanical strength in function of flap thickness**

- 80-µm flap: 14%
- 140-µm flap: 25%
- 160-µm flap: 29%
- 180-µm flap: 33%

**SBK flaps induce 14% loss** of corneal mechanical strength, twice less than conventional LASIK.

**Less corneal weakening translates into less risk of ectasia**
SBK - THE NAME

Wavefront-guided excimer laser ablation using photorefractive keratectomy and sub-Bowman's keratomileusis: a contralateral eye study.
Daniel S. Durrie, Stephen G. Slade, John Marshall
Published 2008 in Journal of refractive surgery

Indication

- Any LASIK candidate that has:
  - A preop pachymetry equal or over 500 microns
  - An average K between 39 and 48 D
How Can we make SBK flap?

- Mechanical Microkeratome
- Femto LASER

**Moria One Use-Plus SBK**

is a single use head, linear, Nasal-hinged and Automated microkeratome.
Moria-SBK

Two motors

One use-Plus

Nasal hinge

Metal ring

Eye image
FSL OR MM ONE USE PLUS

- SPEED OF FLAP MAKING
- FLAP PROFILE
- SMOOTH STROMAL BED
- FLAP THICNESS REPRODUCIBILTY
- RAPID VISUAL RECOVERY
- EFFECT ON CORNEAL NERVES
- FLAT CORNEAS
- HYPEROPIA
- COMPILICATIONS
- REDO

Benefits of FS Laser

- Program all surgical parameters for **personalized flaps**
- Preserve biomechanical properties of the cornea
- **Preserve the stroma** to confidently complete refractive procedure, regardless of refraction or corneal curvature
- **Predict the precision of uniformly planar flaps**, optimized intra-corneal surfaces
- Create the LASIK flap in just under 30 seconds
Planar Flaps

Flaps as planar as femto flaps

One Use-Plus
SBK
Metal

IntraLase 60 kHz
**Excellent flap thickness reproducibility**

| Surgeons                  | # eyes | Measurement method of central flap thickness | Flap thickness  
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<tbody>
<tr>
<td>Dr. Casado Feb 2008</td>
<td>82</td>
<td>Ultrasound</td>
<td>100.6 ± 13.6</td>
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<tr>
<td>Dr. Casado May 2008</td>
<td>50</td>
<td>OCT Visante</td>
<td>104.8 ± 4.4</td>
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**Smooth stromal bed**
Smother stromal bed than LDV

One Use-Plus  Femto LDV Da Vinci

One Use-Plus SBK creates a much smoother surface compared to “velcro-like” rough surface when using a FS laser.
Comparison Of The Flaps Made By Femtosecond Laser And Automated Keratome For Thin-flap Lasik

Conclusions:
The flaps created by the IntraLase femtosecond laser and Moria One Use-Plus SBK are more uniform; regular; accurate and better reproducibility than by the traditional M2 single use 90µm-head microkeratome.

VISUAL RECOVERY
Zhao W, Wu T, Dong ZH, Feng J, Ren YF, Wang YS.

Comparison of visual acuity of the patients on the first day after sub-Bowman keratomeileusis or laser in situ keratomeileusis

CONCLUSION:
• Compared with LASIK, SBK is safer and more effective, with faster recovery.
Lesser induction of HOAs & SA THAN 150 KHz ifs after 3 m f/u

Durrei et al. 2008 JCRS
SBK VERSUS PRK

Clinical results
- SBK provides quicker visual recovery,
- Reichert Ocular Response Analyzer
  SBK impact on the cornea is similar to PRK
Comparison of microkeratome assisted sub-Bowman keratomileusis with photorefractive keratectomy

Talal A. Althomali

Conclusion

The visual and refractive outcomes after both PRK and microkeratome assisted SBK are comparable,

Safety of the automated microkeratome for Sub-Bowman’s Keratomileusis on the flat cornea.

Falcon C¹, Norero Martinez M²

CONCLUSION:

The Moria One Use-Plus SBK microkeratome is an excellent device that allows easy creation of thin corneal flaps regular and smooth corneal beds, safely and predictably even in extremely flat corneas (40D) without complications.
HYPEROPIA CORRECTION:
LASIK VS. SBK VS. PHAKIC IOL
A.I. Kovalov  O.S. Averyanova
AILAS Medical Center, Kiev, Ukraine

Conclusions:
• All three methods are safe end effective for correction of hyperopia.

SBK with thinner flap and bigger optical zone is more predictable and safe than conventional LASIK.

• The most predictable and stable results are achieved by implantation of pIOL

Confocal comparison of corneal nerve regeneration and keratocyte reaction
between FS-LASIK, OUP-SBK, and conventional LASIK

Article in Investigative ophthalmology & visual science 53(9):5536-44 · July 2012

3 months after surgery, CSNFs were found around 3 mm near the center of the flap. In 62.5% of eyes (conventional LASIK),

72% of eyes (OUP-SBK), and

64.3% of eyes (FS-LASIK)
Complications of sub-Bowman’s keratomileusis with a femtosecond laser in 3009 eyes.

CONCLUSIONS:
• The complication rate of SBK is low.
• Intra-operative complications included flap tear, free cap, bubble escape, and flap folds.
• Postoperative complications included DLK and epithelial ingrowth.
• Vision loss is rare.

Femto related complications
• Longer suction time
• failure of iris registration
• Vertical Gas breakthrough
• Transient light sensitivity
• energy related DLK (less common now)
• Difficulty in lifting the flap for retreatments
• Expense of the machine and cones
The Impact of Flap Creation Methods for Sub-Bowman’s Keratomileusis (SBK) on the Central Thickness of Bowman’s Layer

Meixiao Shen, Liang Hu, Xiran Zhuang, Mei Peng, Di Hu, Jing Liu, Jianhua Wang, Jia Qu, Fan Lu
Published: May 4, 2015

Conclusions
• Central Bowman’s layer thickness increased 1 day post-SBK. Flap creation by Moria microkeratome and femtosecond laser

• NO significantly different impacts on Bowman’s layer thickness following SBK.

How thin is safe!!
Not thinner than 85micron

- FSL SBK
- Post operative haze
- FLAP THICKNESS 65 mic
TAKE HOME MESSAGE

- **SBK** is an excellent LASIK procedure for now and future.

- **SBK** one use plus mechanical microkeratome is as good and sometimes better than **FSL** but much more cheaper.
Thank you