

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

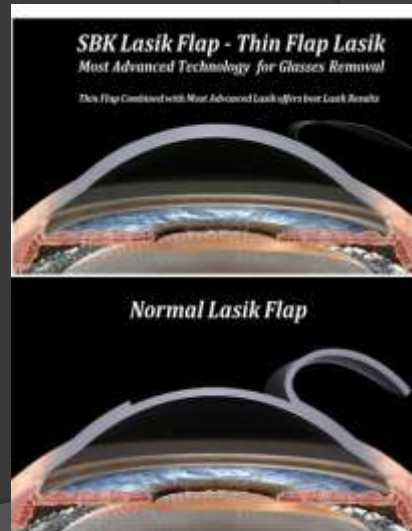


- A LASIK procedure with a very thin flap.
- By making a cut just under the Bowman's membrane

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

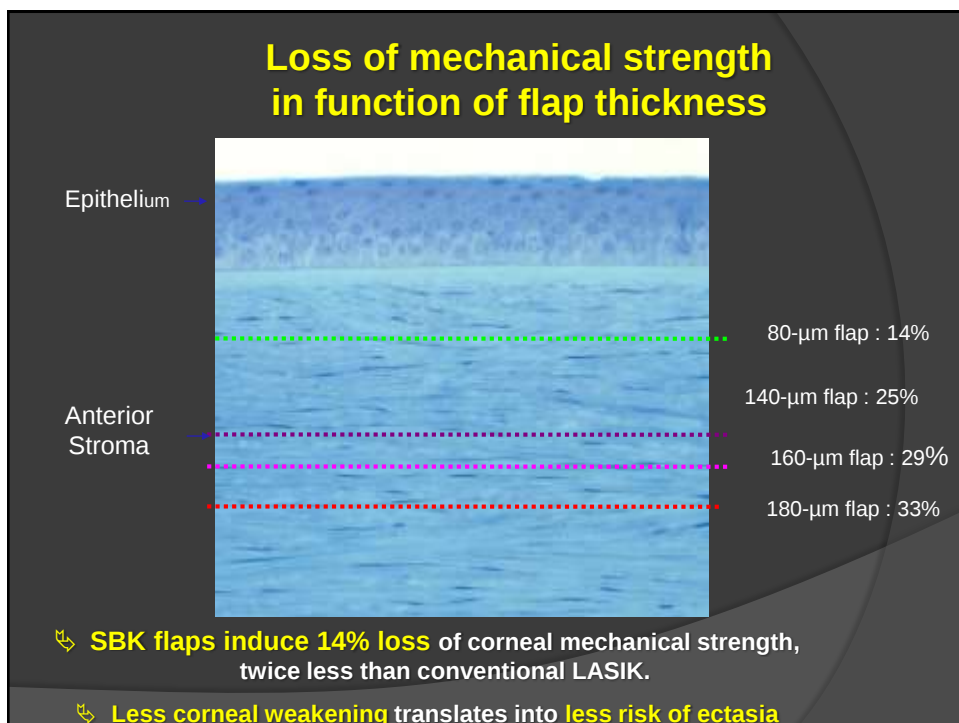
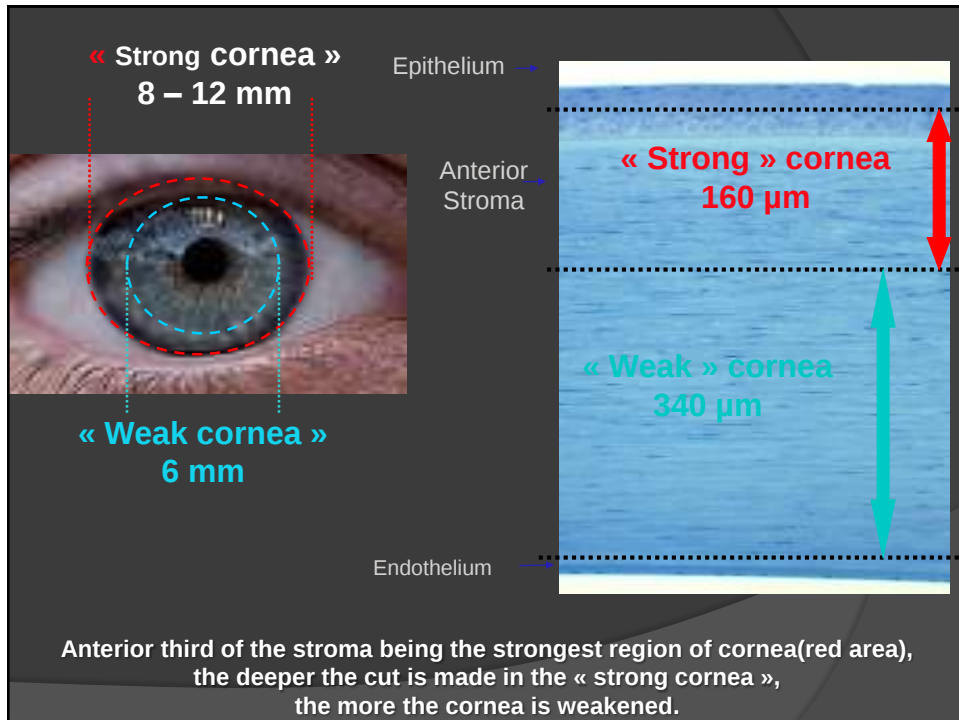
- with traditional flap provides rapid visual recovery with minimal if any postoperative pain.

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.



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



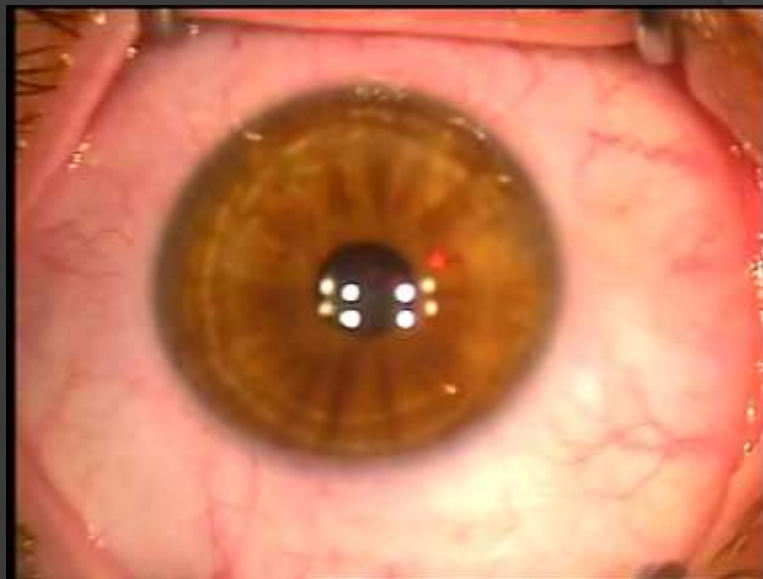
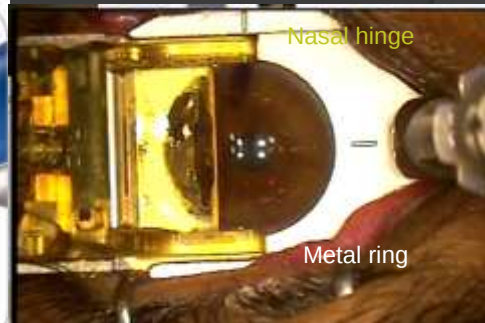
One Use-Plus **SBK**



Moria One Use-Plus SBK

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

Moria-SBK



FSL OR MM ONE USE PLUS

- SPEED OF FLAP MAKING
- FLAP PROFILE
- SMOOTH STROMAL BED
- FLAP THICKNESS REPRODUCIBILITY
- RAPID VISUAL RECOVERY
- EFFECT ON CORNEAL NERVES
- FLAT CORNEAS
- HYPEROPIA
- COMPLICATIONS
- REDO

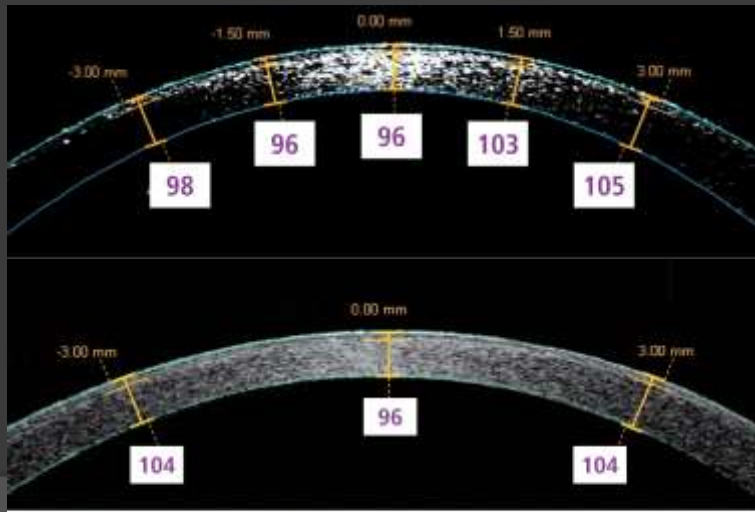
Benefits of FS Laser



- 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**

One Use-Plus SBK

Planar Flaps

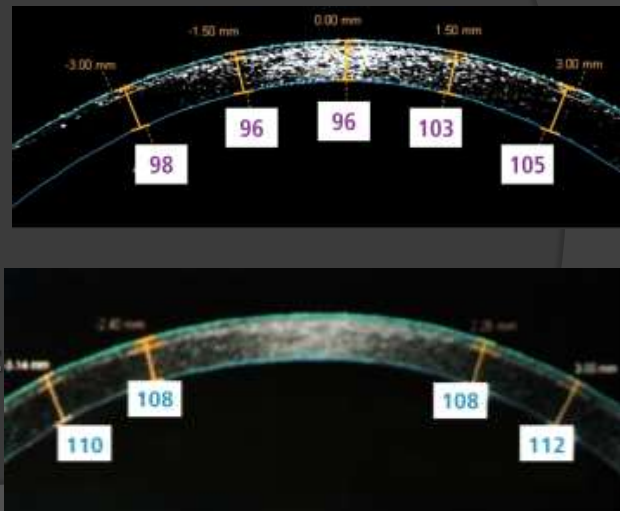


One Use-Plus SBK

Flaps as planar as femto flaps

One Use-Plus
SBK
Metal

IntraLase 60 kHz



Excellent flap thickness reproducibility

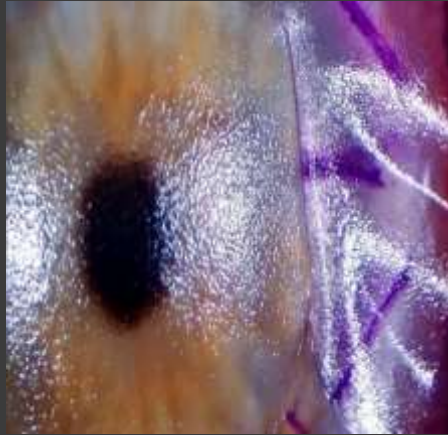
Surgeons	# eyes	Measurement method of central flap thickness	Flap thickness Speed 2 Mean $\pm$ SD (range)
Dr. Casado Feb 2008	82	Ultrasound	100.6 $\pm$ 13.6
Dr. Casado May 2008	50	OCT Visante	104.8 $\pm$ 4.4

Smooth stromal bed

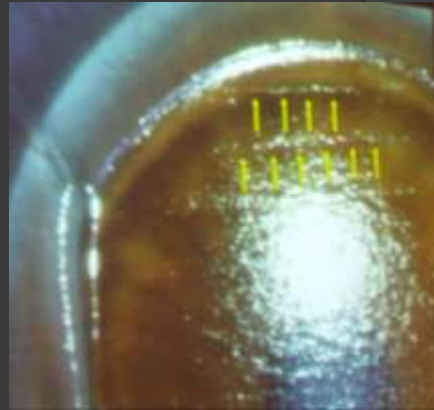


One Use-Plus **SBK**

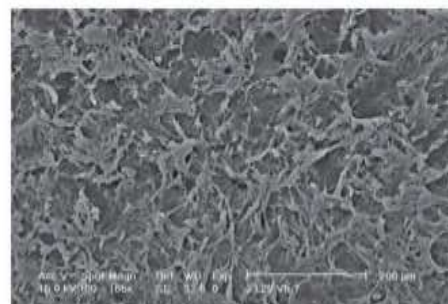
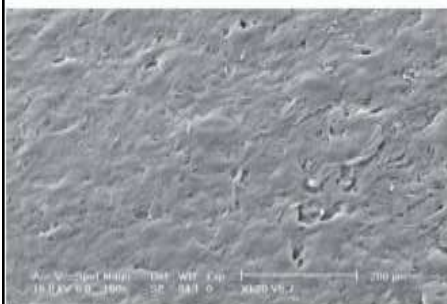
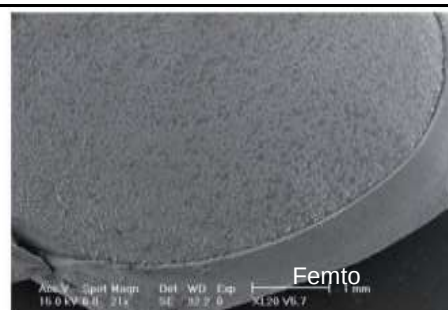
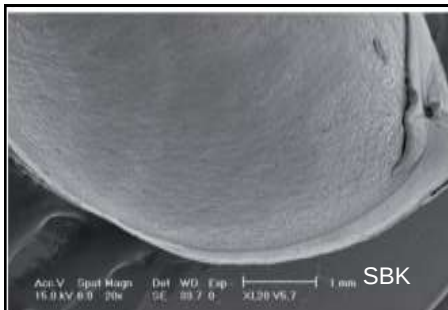
Smoother stromal bed than LDV



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 keratomileusis or laser in situ keratomileusis.

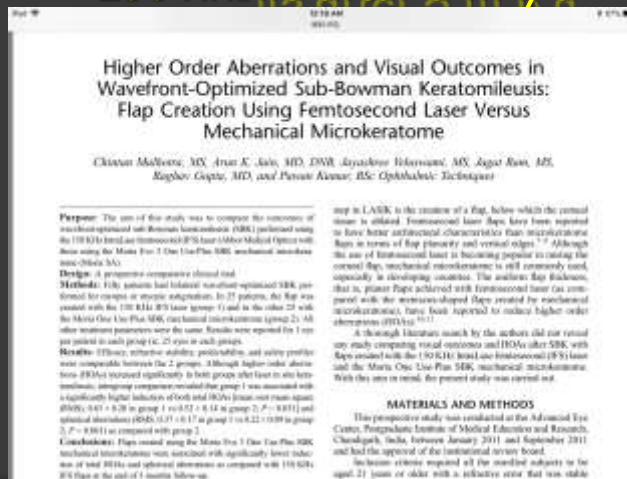
Int J Ophthalmol 2016;9(3):448-452,doi:10.18240/ijo.2016.03.22

CONCLUSION:

- Compared with LASIK, **SBK** is safer and
- more effective, with faster recovery.

One Use-Plus SBK

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

Saudi J Ophthalmol. 2017 Jan-Mar; 31(1): 19–24.

Published online 2017 Jan 29. doi: 10.1016/j.sjopt.2017.01.004

PMCID: PMC5352945

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,

J Fr Ophtalmol. 2016 Feb;39(2):202-9.

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 save 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)

J Refract Surg. 2008 Jan;24(1):S97-101

Chang JS

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 !!

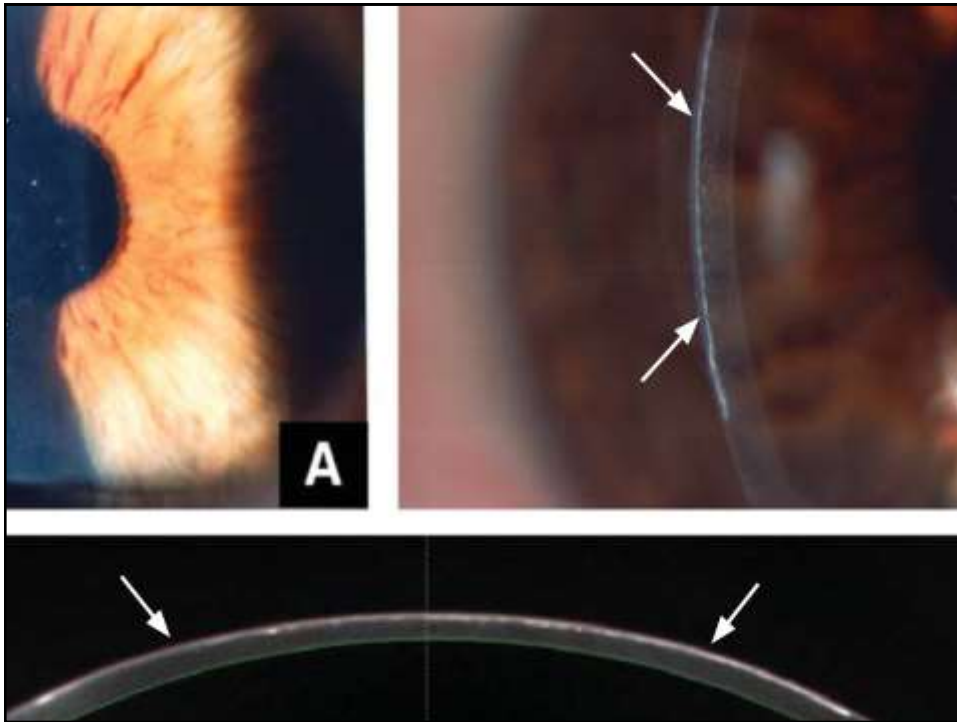
Not thinner than 85micron



◉ **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

