Advantages and Disadvantages of Femto-SMILE Procedure Compared To Other Refractive Surgeries

Essay
Submitted for Partial Fulfillment of M.S. Degree in Ophthalmology
By

Nehal Zaghloul Darwish Ibrahim
M.B., B.CH.
Faculty of Medicine, Zagazig University.

Under supervision of

Prof. Dr. Sherif Zaky Mansour
Professor of Ophthalmology
Faculty of Medicine, Ain Shams University

Prof. Dr. Thanaa Helmy Mohamed
Professor of Ophthalmology
Faculty of Medicine, Ain Shams University

Dr. Rania Gamal El-Din Zaki
Assistant Professor of Ophthalmology
Faculty of Medicine, Ain Shams University

Faculty of Medicine
Ain Shams University
Cairo - Egypt
2018

مميزات وعيوب تقنية الفيمتو سمايل مقارنة بجراحات تصحيح عيوب الابصار

دراسه تمهيديه للحصول على درجة الماجستير في طب وجراحة العيون

مقدمه من

طبيبه/ نهال زغلول درويش ابراهيم

بكالريوس الطب والجراحه

كلية الطب - جامعة الزقازيق

تحت اشراف

الأستاذ الدكتور

شريف زكي منصور

أستاذ طب وجراحة العيون

كلية الطب - جامعة عين شمس

الأستاذ الدكتور

ثناء حلمي محمد

أستاذ طب وجراحة العيون

كلية الطب - جامعة عين شمس

الدكتوره

رانيا جمال الدين زكي

أستاذ مساعد طب وجراحة العيون

كلية الطب - جامعة عين شمس

كلية الطب- جامعة عين شمس

القاهره - جمهورية مصر العربيه

٢٠١٨

Acknowledgments

I wish to express my deep appreciation and sincere gratitude to Prof. Dr. Sherif Zaky Mansour**,** *Professor of Ophthalmology, Ain Shams University, for his supervision, help, valuable instructions, patience, advices and guidance. He has generously devoted of his time and effort. It was a great honor to work under his supervision.*

I wish to express my great thanks and gratitude to Prof. Dr. Thanaa Helmy Mohamad*, Professor of Ophthalmology, Ain Shams University, for her kind supervision, indispensable advice and great help in this work.*

I wish also to express my great thanks and gratitude to Dr. Rania Gamal El-Din Zaki*, Assistant Professor of Ophthalmology, Ain Shams University, for her support, help, kind supervision, patience, and valuable observations in this work.*

Table of Contents

List of Abbreviations

AK	**Astigmatic Keratotomy**
AS-OCT	**Anterior segment optical coherence tomography**
BCVA	**Best corrected visual acuity**
BSS	**balanced salt solution**
CH	**corneal hysteresis**
CRF	**corneal resistance factor**
CDVA	**Corrected distance visual acuity**
DLK	**Diffuse lamellar keratitis**
EBK	**Epithelial Bowman keratectomy**
FEMTOLASIK	**femtosecond laser-assisted laser in situ keratomileusis**
FSL	**femtosecond laser**
FLEx	**Femtosecond lenticule extraction**
HOAs	**Higher order aberrations**

ICRS	**Intra Corneal Ring Segments**
INTRACOR	**Intrastromal Presbyopia Correction**
IR	**Infra-red**
IVCM	**In vivo confocal microscopy**
kHz	**Kilo hertz**
LASEK	**Laser-assisted sub-epithelial keratectomy**
LASIK	**Laser-assisted in situ keratomileusis**
LogMAR	**Logarithm of the minimum angle of resolution**
MRSE	**Manifest refraction spherical equivalent**
Nd: YAG	**neodymium-doped yttrium aluminium garnet**
Nd: YLF	**neodymium-doped yttrium lithium**
Ns	**nanoseconds**
OBL	**Opaque bubble layer**
ORA	**Ocular Response Analyzer**
Ps	**picosecond**
PRK	**Photo refractive keratectomy**

ReLEx	**Refractive Lenticule Extraction**
RK	**radial keratotomy**
RMS	**Root mean square**
RSBT	**residual stromal bed thickness**
SE	**Spherical equivalent**
SMILE	**Small Incision Lenticule Extraction**
TBUT	**Tear film break-up time**
TLSS	**Transient light sensitivity syndrome**
tPRK	**transepithelial Photo refractive keratectomy**
TZ	**Transition Zone**
UAVA	**Unaided visual acuity**
UDVA	**Uncorrected distance visual acuity**
UV-A	**Ultra Violet A**
VA	**Visual acuity**
µJ	**Micro joule**
µm	**Micrometer**

WF-LASIK	**Wave front laser-assisted in situ keratomileusis**

List of Figures

	Laser pulses stacked on each other obliquely to create an angled cleavage plane.	**4**
	VISUMAX femtosecond laser	
0		**8**
	Difference between generations of laser refractive surgeries	
1		**5**
	Incision geometry and ranges for surgical parameters	
2		**1**
	Curved contact glass	
3		**4**
	Docking procedure	
4		**4**
	Centration onto optical axis	
5		**6**
	Preparation of the refractive part of the lenticule	
6		**6**
	Preparation of the frontside of the lenticule	
7		**6**

List of Tables

Introduction