SMILE® Clinical Compendium
Peer-reviewed journal articles
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SMILE technology

“Using the straight-out-of-the-box algorithm for SMILE, without nomogram adjustments, investigators in the clinical trial achieved outcomes comparable to those achieved with excimer laser technology with the benefit of 23 years of optimization.”
Doane JF, Cataract Refractive Surgery Today 2018 Nov

“After a detailed review of the technique itself, we then focus on the scientific evidence for the safety and efficacy of SMILE and its current indications. Advantages of SMILE will be discussed in comparison to the conventional techniques, particularly concerning dry eye and the risk of corneal ectasia related to LASIK. Lastly, the current limitations of SMILE (indications, retreatment) are discussed, and future applications are considered regarding new improvements in the technique.”
Chiche A et al, Journal Francais d’Ophthalmologie 2018 Jun

“Overall, this procedure has proved to be promising, delivering equivalent, or better visual and refractive results to LASIK and providing clear advantage in terms of being a flapless, minimally invasive procedure with minimal pain and postoperative discomfort thus offering high patient satisfaction.”

Overview

Practice pearls for ReLex SMILE in 2018. Full text
European Ophthalmic Review 2018 Aug, Reinstein DZ

SMILE (Small Incision Lenticule Extraction) among the corneal refractive surgeries in 2018.
Abstract
Journal Francais d’Ophthalmologie 2018 Jun, Chiche A, Trinh L, Baudouin C, Denoyer A

Refractive lenticule extraction SMILE: a new refractive surgery paradigm. Full text
Indian Journal of Ophthalmology 2018 Jan, Ganesh S, Brar S, Arro RR

Historical overview of the clinical development of the small incision lenticule extraction surgery (SMILE). [Article in German] Abstract
Klinische Monatsblatter fur Augenheilkunde 2017 Feb, Blum M, Kunert KS, Sekundo W

Refractive lenticule extraction (ReLex) through a small incision (SMILE) for correction of myopia and myopic astigmatism: current perspectives.
Full text
Femtosecond laser refractive surgery: small incision lenticule extraction vs. femtosecond laser-assisted LASIK. **Abstract**
Current Opinion in Ophthalmology 2015 Jul, Lee JK, Chuck RS, Park CY

Small incision lenticule extraction (SMILE) in 2015. **Full text**
Cornea 2015 Apr, Reinstein DZ

Advances in refractive surgery. **Full text**

Small incision lenticule extraction. **Abstract**

Small incision lenticule extraction (SMILE) history, fundamentals of a new refractive surgery technique and clinical outcomes. **Full text**
Eye and Vision 2014 Oct, Reinstein DZ, Archer TJ, Gobbe M

**Incorporating SMILE into practice**

Adopting new refractive technology. **Full text**
CRS Today 2018 Apr, Bofna S, Parkhurst GD, Piracha AR, Rebenitsch L, Visco DM

**SMILE in the USA**

Initial single-site surgical experience with SMILE: a comparison of results to FDA SMILE, and the earliest and latest generation of LASIK. **Full text**

That SMILE keeps growing. **Full text**
Cataract & Refractive Surgery Today 2018 Nov, Doane JF

What’s behind that SMILE. **Full text**
Review of Ophthalmology 2018 Feb, Manche E (USA)

A refractive surgery to SMILE about. **Full text**
Ophthalmology Management 2017 Jun, Jon D, René L

Refractive surgeons look to SMILE into the new year. **Full text**

An update on SMILE - views from Europe and the United States. **Full text**
Cataract & Refractive Surgery Today 2016 Jul, Reinstein DZ, Slade SG
Clinical advantages of SMILE

“SMILE is a safe way to correct for myopia higher than -10 D, with PCEs remaining stable 2 years after surgery.”


“Small-incision lenticule extraction demonstrated that the induction of total HOAs was comparable to corneal wavefront-guided transepithelial PRK, accompanied by smaller spherical aberration induction and larger coma aberration induction. During small-incision lenticule extraction, surgeons should aim to obtain optimum centration for smaller induction of corneal HOAs.”

Lee H et al, Journal of Cataract & Refractive Surgery 2018 Jun

“According to this meta-analysis, the SMILE procedure has fewer negative impacts on the ocular surface and corneal innervation than does FS-LASIK. Furthermore, SMILE shows superiority over FS-LASIK by exhibiting a lower risk of postoperative dry eye.”

Kobashi H et al, Cornea 2017 Jan

Corneal sensitivity and dry eye

Influence of incision size on dry eye symptoms in the SMILE procedure. Abstract
Cornea 2019 Jan, Cetinkaya S, Gulmez M, Mestan E, Ucar F, Ali N

Dry eye evaluation and correlation analysis between tear film stability and corneal surface regularity after SMILE. Abstract

Tear meniscus evaluation after microkeratome LASIK, FS-LASIK and SMILE using AS-OCT. Full text
Clinical Ophthalmology 2018 Jul, Shaaban YM, Badran TAF

Evaluation of femtosecond laser in flap and cap creation in corneal refractive surgery for myopia: a 3-year follow-up.
Full text
Clinical Ophthalmology 2018 May, Elmohamady MN, Abdelghaffar W, Daifalla A, Salem T

Dry eye and corneal sensitivity after SMILE and FS-LASIK: a meta-analysis. Full text

Dry eye after SMILE and femtosecond laser–assisted LASIK: meta-analysis. Abstract
Cornea 2017 Jan, Kobashi H, Kamiya K, Shimizu K

Dry eye and corneal sensitivity after SMILE and FS-LASIK: a meta-analysis. Full text

Dry eye after SMILE and femtosecond laser–assisted LASIK: meta-analysis. Abstract
Cornea 2017 Jan, Kobashi H, Kamiya K, Shimizu K

Corneal sensitivity after small incision lenticule extraction and laser in situ keratomileusis. Abstract
Journal of Cataract & Refractive Surgery 2015 Aug, Reinstein DZ, Archer TJ, Gobbe M, Bartoli E
Dry eye disease after refractive surgery: comparative outcomes of small incision lenticule extraction versus LASIK. Abstract

Central corneal sensitivity after small incision lenticule extraction versus femtosecond laser-assisted LASIK for myopia: a meta-analysis of comparative studies. Full text

Nerve fibre regeneration

Corneal re-innervation following refractive surgery treatments. Full text
Neural Regeneration Research 2019 Apr, Bandeira F, Yusoff NZ, Yam GH, Mehta JS

Regeneration of corneal nerve after SMILE, FS-LASIK and T-PRK surgery and study its relationship with subjective visual quality. Abstract
Zhonghua Yan Ke Za Zhi 2018 Oct, Wang LX, Li Y

Fellow eye comparison of nerve fiber regeneration after SMILE and femtosecond laser-assisted LASIK: a confocal microscopy study. Abstract

Corneal regeneration after femtosecond laser small incision lenticule extraction: a prospective study. Abstract

Influence of femtosecond lenticule extraction and small incision lenticule extraction on corneal nerve density and ocular surface: a 1-year prospective, confocal, microscopic study. Abstract

Corneal biomechanical stability

Biomechanics of LASIK flap and SMILE cap: a prospective, clinical study. Abstract

Two-year observation of posterior corneal elevations after small-incision lenticule extraction (SMILE) for myopia higher than -10 dioptres. Abstract
Comparison of corneal biomechanical changes after refractive surgery by noncontact tonometry: small-incision lenticule extraction versus flap-based refractive surgery – a systematic review. Abstract
Acta Ophthalmologica 2019 Mar, Raevdal P, Grauslund J, Vestergaard AH

Review of corneal biomechanical properties following LASIK and SMILE for myopia and myopic astigmatism. Full text
The Open Ophthalmology Journal 2018 Jul, Damgaard IB, Reffat M, Hjortdal J

Biomechanical properties of human cornea tested by two-dimensional extensiometry ex vivo in fellow eyes: femtosecond laser-assisted LASIK versus SMILE. Abstract

Corneal biomechanics after laser refractive surgery: unmasking differences between techniques. Abstract

Corneal biomechanical changes and tissue remodelling after SMILE and LASIK. Full text

Contralateral eye comparison of SMILE and flap-based corneal refractive surgery: computational analysis of biomechanical impact. Full text

New parameters for evaluating corneal biomechanics and IOP after SMILE by Scheimpflug-based dynamic tonometry. Abstract

Corneal biomechanics after small-incision lenticule extraction versus Q-value-guided femtosecond laser-assisted in situ keratomileusis. Full text

Comparison of biomechanical effects of SMILE and LASEK. Abstract
Acta Ophthalmologica 2016 Nov, Chen M, Yu M, Dai J

Corneal biomechanical changes in eyes with SMILE and LASIK. Full text
BioMed Central Ophthalmology 2016 Jul, Osman IM, Helaly HA, Abdalla M, Shousha MA

Comparison of corneal biomechanical characteristics after surface ablation refractive surgery and novel lamellar refractive surgery. Abstract

Higher order aberrations

Optical and visual quality after small-incision lenticule extraction. Full text Journal of Cataract & Refractive Surgery 2019 Jan, Gyldenkerne A, Ivarsen A, Hjortdal J


Comparison of visual results and higher-order aberrations after SMILE: high myopia vs. mild to moderate myopia. Full text BioMed Central Ophthalmology 2017 Jul, Jin HY, Wan T, Wu F, Yao K


Postoperative ocular higher-order aberrations and contrast sensitivity: femtosecond lenticule extraction versus pseudo small incision lenticule extraction. Abstract Journal of Cataract & Refractive Surgery 2015 Mar, Tan DK, Tay WT, Chan C, Tan DT, Mehta JS
Patient’s experience or satisfaction

“All 3 modalities were effective for myopic astigmatism at the end of 1 year. Quality of vision and patient satisfaction with T-ICL and ReLEx SMILE were similar and better than FS-LASIK.”

Ganesh S et al, Clinical Ophthalmology 2017 Jul


Matched population comparison of visual outcomes and patient satisfaction between 3 modalities for the correction of low to moderate myopic astigmatism. Full text Clinical Ophthalmology 2017 Jul, Ganesh S, Brar S, Pawar A
Visual Outcomes

“SMILE in mild-to-moderate myopia offers predictable correction of SE refractive error. Refractive results were stable at the long-term follow-up.”
Ağca A at al, Journal of Cataract & Refractive Surgery 2019 Apr

"Almost 25% of the variation after small-incision lenticule extraction for myopic astigmatism might be explained by the size of the attempted cylinder correction and ATR/WTR astigmatism. Incorporating these parameters in preoperative planning might produce more consistent results in high cylinder corrections.”
Ivarsen A at al, Journal of Cataract & Refractive Surgery 2018 Sep

“This is a review aimed to examine the current literature that describes and compares the corneal biomechanical properties after Laser Assisted In-situ Keratomileusis (LASIK) and Small Incision Lenticule Extraction (SMILE).”
Damgaard IB at al, The Open Ophthalmology Journal 2018 Jul

Low, moderate, high myopia and myopic astigmatism

Long-term (5 years) follow-up of small-incision lenticule extraction in mild-to-moderate myopia.
Abstract
Journal of Cataract & Refractive Surgery 2019 Apr, Ağca A, Tülü B, Yaşa D, Yıldırım Y, Yıldız BK, Demirok A

Correction of myopic astigmatism by small incision lenticule extraction: does laterality matter?
Abstract
Lasers in Medical Science 2019 Mar, Yildiz BK, Urdem U, Goksel Ulas M, Yildirim Y, Agca A, Fazil K, Aygit ED, Taskapili M, Demirok A

15-month visual outcomes and corneal power changes of SMILE in treating high myopia with maximum myopic meridian exceeding 10.00 D.
Abstract

Influence of preoperative astigmatism type and magnitude on the effectiveness of SMILE correction. Abstract

Small-incision lenticule extraction in a patient with high astigmatism and nystagmus. Abstract
Journal of Cataract & Refractive Surgery 2019 Apr, Reinstein DZ, Vida RS, Archer TJ

Small-incision lenticule extraction for the correction of myopic astigmatism. Full text
Journal of Cataract & Refractive Surgery 2019 Jan, Taneri S, Kießler S, Rost A, Schultz T, Dick HB

Visual and refractive outcomes of SMILE in high myopia: 5-year results. Full text
Correction of astigmatism with small-incision lenticule extraction: impact of against-the-rule and with-the-rule astigmatism. Full text
Journal of Cataract & Refractive Surgery 2018 Sep, Iversen A, Gyldenkerne A, Hjortdal J

Vector analysis of high (≥3D) astigmatism correction using SMILE and LASIK. Abstract

Early visual outcomes and optical quality after femtosecond laser SMILE for myopia and myopic astigmatism correction of over -10 dioptres. Abstract

Visual and refractive outcomes of SMILE in mild, moderate, and high myopia: six-month results. Abstract
Journal of Cataract & Refractive Surgery 2017 Apr, Torky MA, Alzafiri YA

One-year outcomes of small incision lenticule extraction (SMILE): mild to moderate myopia vs. high myopia. Abstract

Anterior and posterior corneal astigmatism after refractive lenticule extraction for myopic astigmatism. Full text

SMILE: refractive lenticule extraction for myopic correction. Abstract

Monovision

Retrospective observational study of micro-monovision small incision lenticule extraction (SMILE) for the correction of presbyopia and myopia. Abstract
Medicine (Baltimore) 2018 Dec, Kim JS, Ra H, Rho CR

Small incision lenticule extraction (SMILE) monovision for presbyopia correction. Full text

Safety and satisfaction of myopic SMILE combined with monovision. Full text

Learning curve and visual outcomes

Early clinical outcomes after SMILE. Abstract
Effect of the learning curve on visual and refractive outcomes of SMILE. Abstract
Cornea 2017 Sep, Chan TCY, Ng ALK, Cheng GPM, Woo VCP, Zhang J, Wang Y, Jhanji V

Experience with introduction of SMILE: learning phase of our first 200 treatments. [article in German] Abstract
Klinische Monatsblatter fur Augenheilkunde 2017 Jan, Taneri S, Kießler S, Rost A, Dick B

Follow up >3 years

Five-year results of small incision lenticule extraction (SMILE) and femtosecond laser LASIK (FS-LASIK) for myopia. Abstract

Long-term (5 years) follow-up of small-incision lenticule extraction in mild-to-moderate myopia.
Abstract
Journal of Cataract & Refractive Surgery 2019 Apr, Ağca A, Tülü B, Yaşa D, Yildirim Y, Yildiz BK, Demirok A

Visual and refractive outcomes of small-incision lenticule extraction in high myopia: 5-year results. Full text
Journal of Ophthalmology 2018 Oct, Ağca A, Çakir İ, Aygün BT, Dilek Yaşa, Yildirim Y, Yildiz BK, Demirok A

Visual outcomes 5 years after small incision lenticule extraction (SMILE), surgery on spherocylindrical myopia eyes, from 616 eyes. Abstract
Journal Francais d’Ophthalmologie 2018 May, Burazovitch J, Ferguene H, Noguszewski D

Follow up <3 years

Three-year outcomes of small incision lenticule extraction (SMILE) and femtosecond laser-assisted laser in situ keratomileusis (FS-LASIK) for myopia and myopic astigmatism. Full text

A multicenter study on early outcomes of Small-Incision Lenticule Extraction for myopia. Full text
Scientific Reports 2019 Mar, Kamiya K, Takahashi M, Nakamura T, Kojima T, Toda I, Kariya M

Three-year results of small incision lenticule extraction and wavefront-guided femtosecond laser-assisted laser in situ keratomileusis for correction of high myopia and myopic astigmatism. Full text
International Journal of Ophthalmology 2018 Mar, Xia LK, Ma J, Liu HN, Shi C, Huang Q
Four-year observation of predictability and stability of SMILE. Full text

Visual recovery and quality

SMILE with low energy levels: assessment of early visual and optical quality recovery. Abstract
Journal of Refractive Surgery 2019 May, Donate R, Thaéron R

Optical and visual quality after small-incision lenticule extraction. Full text
Journal of Cataract & Refractive Surgery 2019 Jan, Gyldenkerne A, Ivarsen A, Hjortdal J

Regeneration of corneal nerve after SMILE, FS-LASIK and T-PRK surgery and study its relationship with subjective visual quality. Abstract
Zhonghua Yan Ke Za Zhi 2018 Oct, Wang LX, Li Y

Early recovery of quality of vision and optical performance after refractive surgery: small-incision lenticule extraction versus laser in situ keratomileusis. Full text

Interface healing and its correlation with visual recovery and quality of vision following SMILE. Full text

SMILE for correction of myopia and myopic astigmatism: first 24-hour outcomes. Full text
Journal of Ophthalmology 2017 Jun, Liu TX, Dan T, and Luo Y

Corneal clarity and visual outcomes after SMILE and comparison to FS-LASIK. Full text

Comparison of the optical quality between SMILE and Femto-LASIK. Full text

Comparison with surface ablation

Comparative study of wave-front aberration and corneal asphericity after SMILE and LASEK for myopia: a short and long term study. Full text
BMC Ophthalmology 2019 Mar, Yu M, Chen M, Liu W, Dai J

Comparing corneal HOAs in corneal wavefront-guided transepithelial PRK vs SMILE. Abstract

Comparison of ReLEx SMILE and PRK in terms of visual and refractive outcomes for the correction of low myopia. Abstract
Clinical outcomes of SMILE with a triple centration technique and corneal wavefront-guided trans-epithelial PRK in high astigmatism. **Abstract**


Visual outcomes after SMILE, LASEK, and LASEK combined with corneal collagen cross-linking for high myopic correction. **Abstract**

Cornea 2017 Apr, Hyun S, Lee S, Kim JH

Early outcomes after SMILE and PRK for correction of high myopia. **Full text**


**Comparison with LASIK**

Five-year results of small incision lenticule extraction (SMILE) and femtosecond laser LASIK (FS-LASIK) for myopia. **Abstract**


Visual and optical quality outcomes of SMILE and FS-LASIK for myopia in the very early phase after surgery. **Full text**


Three-year outcomes of small incision lenticule extraction (SMILE) and femtosecond laser-assisted laser in situ keratomileusis (FS-LASIK) for myopia and myopic astigmatism. **Full text**


Quality of life after refractive surgery: ReLEx SMILE vs. Femto-LASIK. **Full text**

Clinical Ophthalmology 2019 Mar, Klokova OA, Sakhnov SN, Geydenrikh MS, Damashauskas RO

Effect of corneal curvature on optical zone decentration and its impact on astigmatism and higher-order aberrations in SMILE and LASIK. **Abstract**


Comparison of changes in refractive error and corneal curvature following small-incision lenticule extraction and femtosecond laser-assisted in situ keratomileusis surgery. **Full text**

Indian Journal of Ophthalmology 2018 Nov, Zhang YL, Cao Li, Chen HW, Xu XH, Li ZN, Liu L

Comparison between Q-adjusted LASIK and small-incision lenticule extraction for correction of myopia and myopic astigmatism. **Abstract**

Eye & Contact Lens 2018 Nov, El-Mayah E, Anis M, Salem M, Pinero D, Hosny M
Comparison of effective optical zone after small-incision lenticule extraction and femtosecond laser-assisted in situ keratomileusis for myopia. Abstract

Early recovery of quality of vision and optical performance after refractive surgery: small-incision lenticule extraction versus laser in situ keratomileusis. Full text

Review of corneal biomechanical properties following LASIK and SMILE for myopia and myopic astigmatism. Full text
The Open Ophthalmology Journal 2018 Jul, Damgaard IB, Reffat M, Hjortdal J

Control-matched comparison of refractive and visual outcomes between SMILE and femtosecond laser-assisted LASIK. Full text

Three-year results of SMILE and wavefront-guided FS-LASIK for correction of high myopia and myopic astigmatism. Full text
International Journal of Ophthalmology 2018 Mar, Xia LK, Ma J, Liu HN, Shi C, Huang Q

Two-years results of SMILE and wavefront-guided LASIK for myopia. Abstract

Clinical outcomes of SMILE versus FS LASIK for myopia: a meta-analysis. Full text

Vector analysis of astigmatic changes after SMILE and wavefront-guided LASIK. Abstract
Journal of Cataract & Refractive Surgery 2017 Jun, Khalifa MA, Ghoneim AM, Shaheen MS, Piñero DP

SMILE versus FS-LASIK for myopia: a systematic review and meta-analysis. Full text

Comparison of moderate to high astigmatism corrections using wavefront-guided LASIK and SMILE. Abstract

Clinical outcomes of SMILE and FS-LASIK used to treat myopia: a meta-analysis. Abstract
Comparison with Flex

Efficacy, safety, predictability, aberrations and corneal biomechnical parameters after SMILE and FLEX: meta-analysis. Full text
International Journal of Ophthalmology 2016 Jun, Ma J, Cao NJ, Xia LK

Comparison of astigmatic correction after femtosecond lenticule extraction and small incision lenticule extraction for myopic astigmatism. Full text

Comparison with ICL

ICL versus SMILE in management of anisometropic myopic amblyopia in children. Abstract
Canadian Journal of Ophthalmology 2018 Dec, Eissa S, Badr Eldin N
Treatment parameters

“For high myopic corrections, a 160-µm cap caused less anterior curvature flattening and more posterior steepening than a 110-µm cap, and consequently less myopic correction. The inflation test revealed a reduction in the biomechanical strength after SMILE; this was similar when using a 110- or 160-µm cap thickness.”

Damgaard IB et al, Investigative Ophthalmology & Visual Science 2018 Apr

“The lower end of the energy studied was associated with a better postoperative UDVA in this population. The spot-track-distance of 4.5 µm with 125 nJ energy was the optimal combination within this range.”

Li L et al, Journal of Refractive Surgery 2018 Jan

Cap thickness

Contralateral eye comparison between 2 cap thicknesses in Small Incision Lenticule Extraction: 110 versus 130 µm. Abstract
Cornea 2019 May, Wu F, Yin H, Yang Y

Corneal cap thickness and its effect on visual acuity and corneal biomechanics in eyes undergoing SMILE. Full text

Refractive correction and biomechanical strength following SMILE with a 110- or 160-µm cap thickness, evaluated ex vivo by inflation test. Full text

Evaluation of human corneal lenticule quality after SMILE with different cap thicknesses using scanning electron microscopy. Abstract

Comparison of 120- and 140-µm SMILE cap thickness results in eyes with thick corneas. Abstract

SMILE procedures with four different cap thicknesses for the correction of myopia and myopic astigmatism. Abstract

Lenticule depth

Contralateral eye comparison between femtosecond small-incision intrastromal lenticule extraction at depths of 100 and 160µm. Abstract
Minimum thickness

Variation of lenticule thickness for SMILE in low myopia. Abstract

Optical zone

Functional optical zone and centration following SMILE and LASIK: a prospective, randomized, contralateral eye study. Abstract

Comparison of effective optical zone after small-incision lenticule extraction and femtosecond laser-assisted in situ keratomileusis for myopia. Abstract

Functional optical zone after small-incision lenticule extraction as stratified by attempted correction and optical zone. Abstract
Cornea 2018 Sep, Fu D, Wang L, Zhou X, Yu Z

Corneal power distribution and functional optical zone following small incision lenticule extraction for myopia. Abstract

Incision size

Influence of incision size on dry eye symptoms in the SMILE procedure. Abstract
Cornea 2019 Jan, Cetinkaya S, Gulmez M, Mestan E, Ucar F, Ali N

Comparison of corneal biomechanics after microincision lenticule extraction (MILE) and SMILE. Abstract

Nomogram

Adjustment of spherical equivalent correction according to cap thickness for myopic SMILE. Abstract

Influence of preoperative astigmatism type and magnitude on the effectiveness of SMILE correction. Abstract

Changes in astigmatism, densitometry, and aberrations after SMILE for low to high myopic astigmatism: a 12-month prospective study. Abstract
Vector analysis of low to moderate astigmatism with small incision lenticule extraction (SMILE): results of a 1-year follow-up. Full text

**Cap-lenticule diameter difference**

Effect of cap-lenticule diameter difference (CLDD) on the visual outcome and higher-order aberrations in SMILE: 0.4 mm versus 1.0 mm. Full text

**Energy setting**

Energy setting and visual outcomes in SMILE: a retrospective cohort study. Abstract
Journal of Refractive Surgery 2018 Jan, Li L, Schallhorn JM, Ma J, Cui T, Wang Y

Effect of lowering laser energy on the surface roughness of human corneal lenticules in SMILE. Abstract

Lower laser energy levels lead to better visual recovery after SMILE: prospective randomized clinical trial. Abstract

Three years follow-up study after SMILE using 500 kHz femtosecond laser in “fast mode”. Abstract
Klinische Monatsblatter fur Augenheilkunde 2017 Feb, Messerschmidt-Roth A, Sekundo W, Lazaridis A, Schulze S

Effect of femtosecond laser setting on visual performance after small incision lenticule extraction for myopia. Abstract
“The presence of a clear and appropriate tear film in SMILE enhanced predictability, minimized variability, and ensured stability of refractive outcomes. An uncontrolled tear film might render cutting imprecise and trigger severe OBL formation. TFC-SMILE had more predictable results than DD-SMILE.”
Koh IH et al, Graefe’s Archive for Clinical and Experimental Ophthalmology 2018 Nov

“We herein review the patient selection for SMILE and various surgical techniques of SMILE with their pros and cons. With increasing surgeon experience, a standard technique is expected to evolve that may be performed in all types of cases with optimal outcomes and minimal adverse effects.”
Titiyal JS et al, Clinical Ophthalmology 2018 Sep

**Tips & pearls in SMILE technique**

**Flushing versus not flushing the interface during SMILE.** [Abstract](#)

**Enhancement of refractive outcomes of small-incision lenticule extraction via tear-film control.** [Abstract](#)
Graefe’s Archive for Clinical and Experimental Ophthalmology 2018 Nov, Koh IH, Seo KY, Park SB, Yang H, Kim I, Nam SM

**Small incision lenticule extraction (SMILE) technique: patient selection and perspectives.** [Full text](#)
Clinical Ophthalmology 2018 Sep, Titiyal JS, Kaur M, Shaikh F, Gagrani M, Brar AS, Rathi A

**Practice pearls for ReLEx SMILE in 2018.** [Full text](#)
European Ophthalmic Review 2018 Aug, Reinstein DZ

**Five signs of unintended initial dissection of the posterior plane during SMILE.** [Full text + video](#)

**Perform SMILE like an expert.** [Full text](#)
CRS Today 2017 Dec, Doane JF

**Refractive lenticule extraction - the ReLEx/SMILE technique: video article [Article in German]** [Abstract](#)
Der Ophthalmologe 2017 Sep, Blum M, Sekundo W

**Tips for a better SMILE.** [Full text](#)
Review of Ophthalmology 2017 Feb, Hjortdal J

**Centration**

**Functional optical zone and centration following SMILE and LASIK: a prospective, randomized, contralateral eye study.** [Abstract](#)
Comparison of the distribution of lenticule decentration following SMILE by subjective patient fixation or triple marking centration.

Abstract

Pocket irrigation
Effect of intraoperative corneal stromal pocket irrigation in small-incision lenticule extraction.
Full text

Manual cyclotorsion compensation technique
Comparison of SMILE surgery with and without cyclotorsion error correction for patients with astigmatism. Abstract

Cap repositioning
Intra-operative cap repositioning in SMILE for enhanced visual recovery. Abstract

Surgical instrument
Editorial: surgical instruments for small incision lenticule extraction (SMILE). Full text

Alternative surgical techniques
Development of the modified lenticule edge dissection technique for small incision lenticule extraction. Abstract

Development of a liquid dissection technique for small-incision lenticule extraction: clinical results and ultra-structural evaluation. Full text
Short-term observation of intraocular scattering and Bowman’s layer microdistortions after SMILE-CCL. **Abstract**

Microscope-integrated intraoperative OCT-guided SMILE: new surgical technique. **Abstract**

Lenticuloschisis: a “no dissection” technique for lenticule extraction in SMILE. **Abstract**
Journal of Refractive Surgery 2017 Aug, Ganesh S, Brar S

Chung’s swing technique: a new technique for SMILE. **Full text**
BioMed Central Ophthalmology 2016 Sep, Kim BK, Mun SJ, Lee DG, Choi HT, Chung YT

Development of the continuous curvilinear lenticulerrhexis technique for small incision lenticule extraction. **Abstract**

**Alternative surgical instrument**

Intraoperative complications of refractive SMILE in the early learning curve. **Full text**
Clinical Ophthalmology 2018 Apr, Hamed AM, Abdelwahab SM, Soliman TT

Refractive small incision lenticule extraction: push-up and push-down techniques. **Full text**
Journal of Cataract & Refractive Surgery 2016 Dec, Hamed A, Fekry A
SMILE enhancement

“In this first study directly comparing surface ablation versus CIRCLE enhancement after SMILE, both methods yielded comparable results at 3 months. However, CIRCLE re-treated eyes showed a markedly increased speed of recovery concerning UDVA and CDVA compared to surface ablation.”


“This review discusses major advantages and disadvantages of these options and compares the visual outcomes based on the existing literature. An algorithmic approach created from this analysis is presented to guide retreatment decision-making.”


Surface Ablation versus CIRCLE for myopic enhancement after SMILE: a matched comparative study. Abstract

Surgical options for retreatment after small-incision lenticule extraction: advantages and disadvantages. Full text
Journal of Cataract & Refractive Surgery 2018 Nov, Moshirfar M, Shah TJ, Masud M, Linn SH, Ronquillo Y, Hoopes PC Sr

Inferior pseudo-hinge fulcrum technique and intraoperative complications of laser in situ keratomileusis retreatment after small-incision lenticule extraction. Full text
Journal of Cataract & Refractive Surgery 2018 Nov, Reinstein DZ, Carp GI, Archer TJ, Vida RS

Outcomes of re-treatment by LASIK after SMILE. Abstract
Journal of Refractive Surgery 2018 Sep, Reinstein DZ, Carp GI, Archer TJ, Vida RS

CIRCLE enhancement after myopic SMILE. Abstract

Cap-preserving SMILE enhancement surgery. Full text
BioMed Central Ophthalmology 2018 Feb, Sedky AN, Wahba SS, Roshdy MM, Ayaad NR

Enhancement after SMILE using surface ablation. Abstract

Enhancement after SMILE: incidence, risk factors, and outcomes. Abstract
Ophthalmology 2017 Jun, Liu YC, Rosman M, Mehta JS

Biomechanical weakening of different re-treatment options after SMILE. Abstract
Journal of Refractive Surgery 2017 Mar, Kling S, Spiru B, Hafezi F, Sekundo W

SMILE: re-treatment options - techniques and results. [Article in German]. Abstract
Klinische Monatsblatter fur Augenheilkunde 2017 Jan, Meyer B, Kunert KS

The sub-cap method for SMILE enhancement. Full text
Corneal Refractive Surgery Today Europe 2016 Jun, Donate D, Thaéron R
Risks & safety

“Although SMILE is a promising technique for the correction of myopia and myopic astigmatism with predictable, efficient, safe refractive and visual outcomes, complications can occur. However, most of them are related to inexperience and are included in the learning curve of the technique. More studies with a bigger number of eyes are required to efficiently evaluate the intraoperative complications and standardize their management strategies.”

“With appropriate management, it is possible for the SMILE procedure to be completed on the same day by either continuing with SMILE or converting to LASIK depending on the progress of the femtosecond laser cutting.”
Reinstein DZ et al, Journal of Refractive Surgery 2018 Dec

Overview

Postoperative corneal complications in SMILE: long-term study. Abstract

SMILE intraoperative complications: incidence and management. Full text

A review of small incision lenticule extraction complications. Abstract
Current Opinion in Ophthalmology 2018 Jul, Krueger RR, Meister CS

Incidence and management of intraoperative complications during SMILE in 3004 cases.
Abstract

Safety and complications of more than 1500 small incision lenticule extraction procedures.
Abstract
Ophthalmology 2014 Apr, Ivarsen A, Asp S, Hjortdal J

SMILE and keratectasia

Ectasia following small incision lenticule extraction (SMILE): a review of the literature. Full text
Clinical Ophthalmology 2017 Sep, Moshirfar M, Albarracin JC, Desautels JD, Birdsong OC, Linn SH, Hoopes PC Jr (USA)

Risk profiles of ectasia after keratorefractive surgery. Abstract
Current Opinion in Ophthalmology 2017 Jul, Giri P, Azar DT (USA)

Bilateral ectasia after femtosecond laser-assisted SMILE (case report). Abstract
Journal of Refractive Surgery 2016 Jul, Mattila JS, Holopainen JM
Corneal ectasia after femtosecond laser-assisted small incision lenticule extraction in eyes with subclinical keratoconus/forme fruste keratoconus. Abstract
Journal of Cataract & Refractive Surgery 2015 Jul, Remy M, Kohnen T

Corneal ectasia 6.5 months after small incision lenticule extraction. Abstract

Bilateral ectasia after femtosecond laser-assisted small incision lenticule extraction. Abstract
Journal of Cataract & Refractive Surgery 2015 Apr, El-Naggar MT

**Suction loss**

Clinical study of suction loss in small incision lenticule extraction. Abstract
Zhonghua Yan Ke Za Zhi 2018 Dec, Ma JN, Wang Y, Zhang L, Zhang JM

Suction stability management in SMILE: development of a decision tree for managing eye movements and suction loss. Abstract
Journal of Refractive Surgery 2018 Dec, Reinstein DZ, Archer TJ, Vida RS, Carp GI

Comparison of immediate small incision lenticule extraction after suction loss with uneventful small incision lenticule extraction. Abstract
Journal of Cataract & Refractive Surgery 2017 Apr, Park JH, Koo HJ

Refraction outcomes after suction loss during SMILE. Full text
Clinical Ophthalmology 2017 Mar, By Gab-Alla AA

Impact of suction loss during small incision lenticule extraction (SMILE). Abstract

Suction loss during femtosecond laser-assisted SMILE: incidence and analysis of risk factors. Abstract
Journal of Cataract & Refractive Surgery 2016 Feb, Osman IM, Awad R, Shi W, Abou Shousha M

**Intraoperative black areas**

Possible risk factors and clinical outcomes of black areas in SMILE. Abstract
Cornea 2018 Aug, Ma J, Wang Y, Chan TCY
Diffuse lamellar keratitis

Incidence and outcomes of sterile multifocal inflammatory keratitis and diffuse lamellar keratitis after SMILE. Abstract

Atypical presentation of diffuse lamellar keratitis after small-incision lenticule extraction: sterile multifocal inflammatory keratitis. Full text
Journal of Cataract & Refractive Surgery 2018 Jun, Stuart A, Reinstein DZ, Vida RS, Archer TJ, Carp G

Diffuse lamellar keratitis after small incision lenticule extraction. Abstract

Interface fluid syndrome

Corneal densitometry changes in a patient with interface fluid syndrome after SMILE. Full text

Shifting “ectasia”: interface fluid collection after SMILE. Abstract
Journal of Refractive Surgery 2016 Nov, Bansal AK, Murthy SI, Maaz SM, Sachdev MS

Delayed / residual lenticule removal

CIRCLE software for the management of retained lenticule tissue following complicated SMILE surgery. Abstract
Journal of Refractive Surgery 2019 Jan, Ganesh S, Brar S, K V M

Retained lenticule or lenticular fragments after SMILE. Full text
Journal of Refractive Surgery 2018 Jul, Singh R, Tripathy K

Secondary lenticule remnant removal after SMILE. Abstract
Journal of Refractive Surgery 2017 Nov, Ng ALK, Kwok PSK, Chan TCY

SMILE rescue: delayed lenticule removal in a patient with high myopia. Abstract
Journal of Refractive Surgery 2017 Mar, Tong JY, Cherepanoff S, Males JJ

Transient light sensitivity syndrome

Case of presumed transient light-sensitivity syndrome (TLSS) after SMILE. Abstract
Cornea 2017 Sep, Desautels JD, Mosheifar M, Quist TS, Skanchy DF, Hoopes PC
Visual or safety related investigations

“This study suggests that the predictability between the achieved and VisuMax readout is favorable. The lenticule thickness at the pupil center is closer to the VisuMax readout than corneal vertex.”

Zhou J et al, Eye & Contact Lens 2018 Nov

“After SMILE, CDVA was significantly worse in eyes with a preoperatively displaced corneal apex compared to eyes with a more central corneal apex. However, good visual results were achieved in both groups.”


VisuMax laser cut quality and accuracy

Lenticule thickness accuracy and influence in predictability and stability for different refractive errors after SMILE in Chinese myopic eyes. Abstract

Predictability of the achieved lenticule thickness in small incision lenticule extraction for myopia correction. Abstract

Stromal remodeling and lenticule thickness accuracy in SMILE: one-year results. Abstract

Centration accuracy

Effect of corneal curvature on optical zone decentration and its impact on astigmatism and higher-order aberrations in SMILE and LASIK. Abstract

Impact of a displaced corneal apex in small incision lenticule extraction. Abstract

Relationship between decentration and induced corneal HOAs following SMILE procedure. Full text
Impact of treatment decentration on higher-order aberrations after SMILE. *Full text*  

Optical zone centration accuracy using corneal fixation-based SMILE compared to eye tracker based femtosecond laser-assisted LASIK for myopia. *Abstract*  
*Journal of Refractive Surgery* 2015 Sep, Reinstein DZ, Gobbe M, Gobbe L, Archer TJ, Carp GI

Decentration of optical zone center and its impact on visual outcomes following SMILE. *Abstract*  

**Opaque bubble layer**

Corneal thickness, residual stromal thickness, and its effect on opaque bubble layer in SMILE. *Abstract*  

Risk factors for opaque bubble layer in SMILE. *Abstract*  
*Journal of Refractive Surgery* 2017 Nov, Li L, Schallhorn JM, Ma J, Zhang L, Dou R, Wang Y

Possible risk factors and clinical effects of opaque bubble layer in SMILE. *Abstract*  

**Changes to corneal curvature and power**

Effect of corneal curvature on optical zone decentration and its impact on astigmatism and higher-order aberrations in SMILE and LASIK. *Abstract*  
*Graefe's Archive for Clinical and Experimental Ophthalmology* 2019 Jan, Chan TCY, Wan KH, Kang DSY, Tso THK, Cheng GPM, Wang Y

Comparison of changes in refractive error and corneal curvature following small-incision lenticule extraction and femtosecond laser-assisted in situ keratomileusis surgery. *Full text*  

Corneal irregular astigmatism and curvature changes after SMILE: 3-year follow-up. *Abstract*  

Determining total corneal power after SMILE in myopic eyes. *Abstract*  
*Journal of Cataract & Refractive Surgery* 2017 Nov, Wei P, Wang Y, Chan TCY, Ng ALK, Cheng GPM, Jhanji V
Comparison of the change in posterior corneal elevation (PCE) and corneal biomechanical parameters after SMILE and FS-LASIK for high myopia correction. Full text

Assessing the corneal power change after refractive surgery using Scheimpflug imaging. Abstract
Ophthalmic & Physiological Optics 2015 May, Gyldenkerne A, Ivarsen A, Hjortdal JØ

Wound healing/inflammatory response

Wound healing, inflammation, and corneal ultrastructure after SMILE and femtosecond laser-assisted LASIK: a human ex vivo study. Abstract

In vivo and ex vivo evaluation of inflammation and apoptosis induced after SMILE procedures for different refractive error range. Abstract

Comparison of corneal biological healing after FS-LASIK and SMILE procedure. Abstract

Early corneal wound healing and inflammatory responses after SMILE: Comparison of the effects of different refractive corrections and surgical experiences. Abstract

Effect on endothelial cells

Short term effects of SMILE surgery on corneal endothelium. Full text

Short-term and long-term effects of small incision lenticule extraction (SMILE) on corneal endothelial cells. Abstract

SMILE & corneal opacity

The observation during SMILE for myopia with corneal opacity. Full text
Percentage tissue altered

Impact of different percent tissue altered (PTA) values on visual outcome after ReLEx SMILE. [Article in German]. Abstract

Corneal epithelium

Comparison of corneal epithelial remodeling over 2 years in LASIK versus SMILE: A contralateral eye study. Abstract
Cornea 2019 Mar, Kanellopoulos AJ

Corneal remodeling and spatial profiles following small incision lenticule extraction. Abstract

Comparison of corneal epithelial remodeling after femtosecond laser-assisted LASIK and SMILE. Abstract

Epithelial thickness profile changes following SMILE for myopia and myopic astigmatism. Abstract

Corneal epithelial remodeling induced by SMILE. Full text

Intraocular pressure

Intraocular pressure changes in eyes with small incision lenticules and laser in situ keratomileusis. Abstract

Real-time intraocular pressure measurements in the vitreous chamber of rabbit eyes during small incision lenticule extraction (SMILE). Abstract

Comparison of different IOP measurement techniques in normal eyes and post SMILE. Full text
Clinical Ophthalmology 2017 Jul, Hosny M, Aboalazayem F, Shiwy HE, Salem M
Corneal densitometry

**Corneal densitometry after FS-LASIK and SMILE.**

*Abstract*


**Corneal densitometry after PRK, FS-LASIK, and SMILE.**

*Abstract*


Intraocular scattering

**Cap morphology after SMILE and its effects on intraocular scattering.**

*Full text*


Accommodation

**Accommodative changes after SMILE for moderate to high myopia correction.**

*Full text*

*BioMed Central Ophthalmology 2016 Oct, Zheng K, Han T, Zhou XT*
Experimental applications

“A donor lenticule from SMILE surgery is a useful adjunct to seal macroperforations in deep anterior lamellar keratoplasty because the thin uniform lamellar tissue is easily applied using fibrin glue and gives uniform and good apposition on both host and donor sides. It can be used immediately without further preparation unlike hand-fashioned patch grafts.”
Jacob S et al, Cornea 2019 Jun

“Both SFII and PKP surgical procedures resulted in a stable corneal volume and improved visual acuity in this long-term study. SFII was less invasive and more efficient compared with PKP.”
Jin H et al, Cornea 2019 Apr

SMILE lenticule re-implantation / transplantation

Fibrin glue-assisted closure of macroperforation in predescemetian deep anterior lamellar keratoplasty with a donor obtained from SMILE. Abstract
Cornea 2019 Jun, Jacob S, Dhawan P, Tsatsos M, Agarwal A, Narasimhan S, Kumar A

Small-incision femtosecond laser-assisted intracorneal concave lenticule implantation (SFII) in patients with keratoconus. Abstract

Partial thickness cornea tissue from small incision lenticule extraction: a novel patch graft in glaucoma drainage implant surgery. Abstract

Corneal remodelling and topography following biological inlay implantation with combined crosslinking in a rabbit model. Full text
Scientific Reports 2019 Mar, Damgaard IB, Liu YC, Riau AK, Teo EPW, Tey ML, Nyein CL, Mehta JS

Lamellar keratoplasty using femto-second laser intrastromal lenticule for limbal dermoid: case report and literature review. Full text

Case series: use of stromal lenticule as patch craft. Full text
American Journal of Ophthalmology 2018 Sep, Song YJ, Kim S, Yoon GJ

A modified small-incision lenticule intrastromal keratoplasty (sLIKE) for the correction of high hyperopia: a description of a new surgical technique and comparison to lenticule intrastromal keratoplasty (LIKE). Full text
An experimental study of femto-laser in assisting xenograft acellular cornea matrix lens transplantation. Abstract

Reshaping and customization of SMILE-derived biological lenticules for intrastromal implantation. Full text

Treatment of corneal ectasia by implantation of an allogenic corneal lenticule. Abstract

Two-year outcome of a patient treated with PRK and autologous SMILE lenticule transplantation for flap-related complications following LASIK. Abstract

Biological lenticule implantation for correction of hyperopia: an ex vivo study in human corneas. Abstract

Keratophakia with autograft aided by a femtosecond laser: one-year follow-up. Full text
Journal of Cataract & Refractive Surgery 2018 Feb, Orlich C

Femtosecond laser-assisted stromal lenticule addition keratoplasty for the treatment of advanced keratoconus: a preliminary study. Abstract

Stromal lenticule transplantation for management of corneal perforations; one year results. Abstract
Graefes Archive for Clinical Experimental Ophthalmology 2017 Jun, Abd Elaziz MS, Zaky AG, El Saebay Sarhan AR

Preliminary evidence of successful near vision enhancement with a new technique: presbyopic allogenic refractive lenticule (PEARL) corneal inlay using a SMILE lenticule. Abstract

Corneal lenticule allotransplantation after SMILE in rabbits. Full text

Using donor lenticules obtained through SMILE for an epikeratophakia technique combined with phototherapeutic keratectomy. Abstract
Refractive lenticule transplantation for correction of iatrogenic hyperopia and high astigmatism after LASIK. Abstract

Application of the SMILE-derived glued lenticule patch graft in microperforations and partial-thickness corneal defects. Abstract
Cornea 2016 Mar, Bhandari V, Ganesh S, Brar S, Pandey R

The safety and predictability of implanting autologous lenticule obtained by SMILE for hyperopia. Abstract

Tailored stromal expansion with a refractive lenticule for cross-linking the ultrathin cornea. Abstract

**SMILE with collagen cross-linking**

Corneal remodelling and topography following biological inlay implantation with combined crosslinking in a rabbit model. Full text
Scientific Reports 2019 Mar, Damgaard IR, Liu YC, Riau AK, Teo EPW, Tey ML, Nyein CL, Mehta JS

In vivo confocal laser microscopy of morphologic changes after small incision lenticule extraction with accelerated cross-linking (SMILE Xtra) in patients with thin corneas and high myopia. Abstract

Femtosecond intrastromal lenticular implantation combined with accelerated collagen cross-linking for the treatment of keratoconus - initial clinical result in 6 eyes. Abstract
Cornea 2015 Oct, Ganesh S, Brar S

Clinical outcomes of small incision lenticule extraction with accelerated cross-linking (ReLEx SMILE Xtra) in patients with thin corneas and borderline topography. Full text

**SMILE with collagen cross-linking**

Corneal safety and stability in cases of SMILE with collagen cross-linking (SMILE Xtra). Full text
**SMILE with keratoplasty / keratotomy**

Bilateral SMILE after penetrating keratoplasty.  
*Abstract*  

Full-thickness astigmatic keratotomy combined with small incision lenticule extraction to treat high-level and mixed astigmatism.  
*Abstract*  
*Cornea* 2015 Dec, Kim BK, Mun SJ, Lee DG, Kim JR, Kim HS, Chung YT

Small-incision lenticule extraction after deep anterior lamellar keratoplasty.  
*Abstract*  
*Journal of Refractive Surgery* 2015 Sep, Mastropasqua L, Calienno R, Lanzini M, Nobile M

**SMILE on flap**

Report: SMILE as re-treatment for a thick LASIK flap.  
*Abstract*  
Future development

“Based on the current literature, SMILE represents a viable surgical alternative to LASIK in the correction of hyperopia. Lenticule intrastromal keratoplasty and small-incision lenticule intrastromal keratoplasty may be able to correct severe hyperopia in patients who would not otherwise be candidates for refractive surgery.”

Moshirfar M et al, Current Opinion in Ophthalmology 2019 Apr

“Refractive and visual outcomes 3 months after SMILE for hyperopia were promising, given the high degree of hyperopia corrected and relatively reduced CDVA in this population. Undercorrection of more than 1.00 D in 5 eyes might be partly explained by latent hyperopia in these young patients.”

Reinstein DZ et al, Journal of Refractive Surgery 2019 Jan

Hyperopia correction

Hyperopic small-incision lenticule extraction.

Abstract
Current Opinion in Ophthalmology 2019 Jul, Moshirfar M, Bruner CD, Skanchy DF, Shah T

Small Incision Lenticule Extraction for hyperopia: 3-Month refractive and visual outcomes. Abstract

Higher-order-aberrations following hyperopia treatment: small incision lenticule extraction, laser-assisted in situ keratomileusis and lenticule implantation. Full text

Hyperopic refractive correction by LASIK, SMILE or lenticule reimplantation in a non-human primate model. Full text
PLOS One 2018 Mar, Williams GP, Wu B, Liu YC, Teo E, Nyein CI, Peh G, Tan DT, Mehta JS

SMILE for hyperopia: optical zone diameter and spherical aberration induction. Abstract

SMILE for hyperopia: optical zone centration. Abstract


Improved lenticule shape for hyperopic femtosecond lenticule extraction (ReLEx® FLEX): a pilot study. Abstract
Lasers in Medical Science 2016 May, Sekundo W, Reinstein DZ, Blum M
“Epithelial thickness maps could clearly visualize different ET patterns. Parameters with the highest potential of diagnostic discrimination between eyes with KC and healthy eyes were, in descending order, R1, RTI/NS, and minET. Consequently, epithelial thickness irregularity and asymmetry seem to be the most promising diagnostic factor in terms of discriminating between keratoconic eyes and healthy eyes.”

Pircher N et al, American Journal of Ophthalmology 2018 May

“From linear regression, more myopic RRE was associated with higher preoperative myopia, intraocular pressure (IOP), flattest curvature of anterior cornea (AC), and highest concavity deformation (HCD), and was associated with lower anterior elevation, anterior asphericity, steepest curvature of AC, and second applanation velocity. Postoperative outcomes of SMILE can be predicted by individual CTBPs.”

Wang M et al, ARVO 2018 Sep

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Small incision lenticule extraction (SMILE) technique: patient selection and perspectives. Full text
Clinical Ophthalmology 2018 Sep, Titiyal JS, Kaur M, Shaikh F, Gagrani M, Brar AS, Rathi A

Keratoconus

Distinguishing keratoconic eyes and healthy eyes using ultrahigh-resolution OCT–based corneal epithelium thickness mapping. Abstract

Mean posterior corneal power and astigmatism in normal versus keratoconic eyes. Full text

Advanced anterior segment imaging in keratoconus: a review. Abstract
Clinical Experimental Ophthalmology 2018 Mar, Gokul A, Vellara HR, Patel DV (New Zealand)

Evaluation of the reliability and repeatability of Scheimpflug system measurement in keratoconus. Abstract

The importance of diagnosing ectatic corneal disease. Full text
European Ophthalmic Review, 2017 Oct, Ambrósio R

Review: new perspectives on the detection and progression of keratoconus. Abstract
Journal of Cataract & Refractive Surgery 2017 Sep, Martinez-Abad A, Piñero DP
Fourier analysis algorithm for the posterior corneal keratometric data: clinical usefulness in keratoconus. Abstract

Corneal epithelium

Dynamic roles of the corneal epithelium in refractive surgery. Abstract
Current Ophthalmology Reports 2017 Sep, Dohlman TH, Brissette AR, Lai EC, Starr CE

Role of the corneal epithelium measurements in keratorefractive surgery. Abstract

Dry eye assessment

Comparative evaluation of clinical methods of tear film stability assessment: a randomized crossover trial. Abstract
JAMA Ophthalmology 2018 Mar, Wang MTM, Craig JP

Dry eye post-LASIK: major review and latest updates. Full text

Assessment of meibomian glands and tear film in post-refractive surgery patients. Abstract
Clinical & Experimental Ophthalmology 2017 Dec, Jung JW, Jung Yong Kim JY, Chin HS, Suh YI, Kim TI, Seo KY

Refractive surgery and dry eye disease (DED) - 2nd topic. Full text
CRST Europe 2017 Sep, Ambrósio R, Faria-Correia F

Cycloplegia

Effect of cycloplegia on corneal biometrics and refractive state. Full text

Contrast sensitivity

Effects of HOAs on contrast sensitivity (CS) in normal eyes of a large myopic population. Full text

Corneal properties

Predicting refractive outcome of SMILE for myopia using corneal properties. Full text
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