

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

SMILE

*Management of
Intraoperative Difficulties
& Complications*

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SMILE The next generation method for laser vision correction

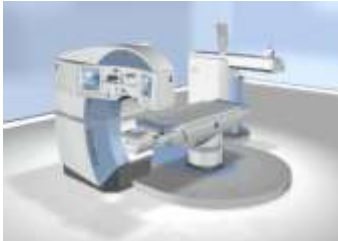
PRK

- LASEK
- Epi-LASIK



LASIK

- Standard LASIK
- Femto-LASIK



SMILE

- smile Small Incision Lenticule Extraction



Indications

- **Compound myopic astigmatism**

- Sphere up to -10.00 D
- Cylinder up to - 5.00 D

Sum up
to -12.5D

- Min. RST 250 μm
- Better 280 μm

Hyperopia is not yet
commercially released



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Why SMILE

Same (if not better) excellent results of F-LASIK but with

- **Minimally invasive**
 - **80%** less side cut - **30%** less cap cut
- **↓↓ flap complications**
- **Correction** not affected by room conditions
- **fully corrected OZ**
- **↓↓ Dry eye**
- **Biomechanical advantage**



Flapless & minimally invasive
Small incision - big advantage



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Effectiveness – Predictability and accuracy of MRSE correction

Comparison to most recent LASIK approvals



Predictability and accuracy of the MRSE correction is comparable to or better than LASIK (**6 months** after surgery).

MRSE	Sphere-only SMILE	Spherocyl SMILE	Alcon Contoura	iDesign	Nidek EC-5000
Preoperative mean \pm SD	-4.86 \pm 2.21 D	-5.46 \pm 2.35 D	-4.61 \pm 2.43 D	-6.21 \pm 2.78 D	-3.57 \pm 1.45 D
Postoperative mean \pm SD (deviation from attempted MRSE*)	-0.14 \pm 0.33 D (-0.04 \pm 0.32 D)	-0.03 \pm 0.28 D (-0.02 \pm 0.28 D)	0.01 \pm 0.35 D	-0.46 \pm 0.42 D	-0.08 \pm 0.33 D
Within \pm 0.50 D	93%	94%	93%	69%	91%
Within \pm 1.00 D	99%	99%	99%	93%	99%

*eyes with MRSE target due to 0.25 D or 0.5 D untreated cylinder



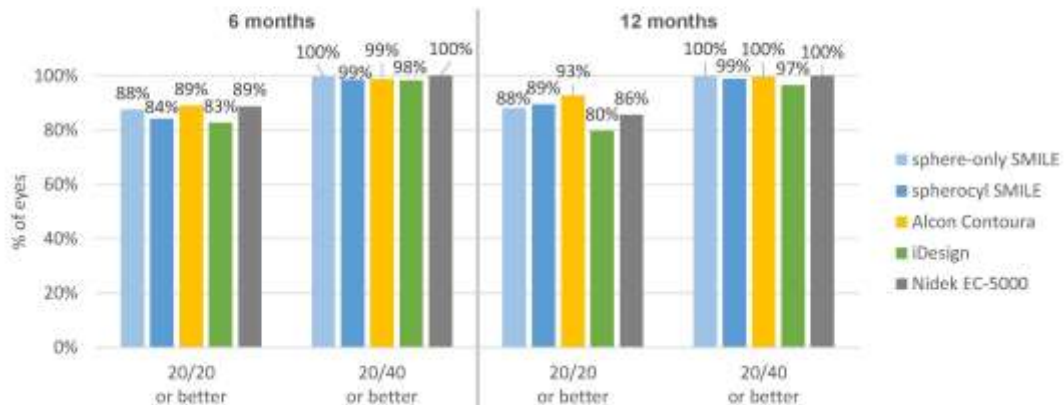
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Effectiveness – Improvement of UCVA after surgery

Comparison to most recent LASIK approvals



UCVA results after SMILE are comparable to results after LASIK.



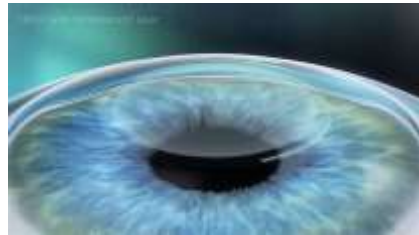
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SMILE *A minimally invasive and innovative procedure*

1 Create the complete lenticule and access cut in one step

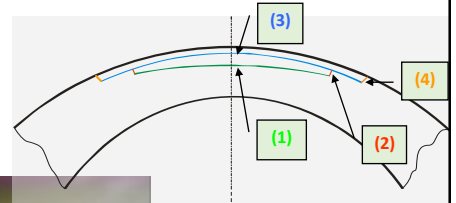
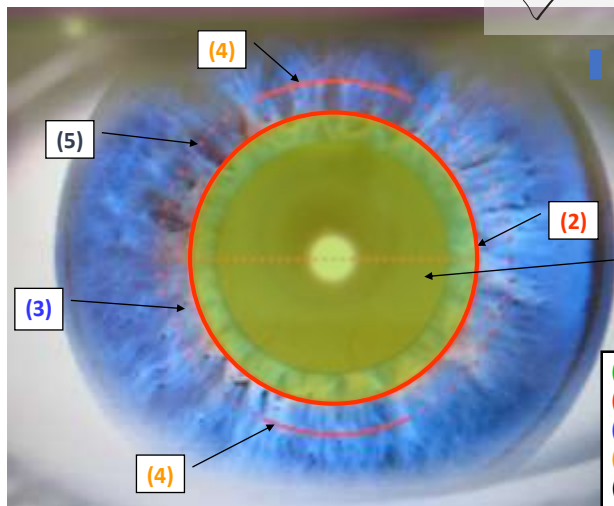
2 Manual tissue separation through the small incisions

3 Extraction of the refractive intrastromal lenticule through the small incision



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SMILE steps



- (1) Green: Lenticule cut
- (2) Red: Lenticule side cut
- (3) Blue: Cap cut
- (4) Orange: Cap side cut
- (5) : not served tissue

Intraoperative Complications In SMILE

Difficult docking

Radial tear

Suction loss

Residual part

Difficult dissection

Bleeding to the interface



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- **Head position:** Elevate
- **Hair pillow** .. Free it
- **Nose** .. Face turn
- **Chin up** .. Lower it



- Wash the conjunctiva and the cornea before docking
- Keep the cornea moist but not too wet
- **Reclean the cone and the conjunctiva before docking**



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Suction loss during SMILE

- Can happen with movement of the patient, loss of green light, ...
- Can be inconsequential or disastrous
- Calm down and reassure the patient (Verbal anesthesia)



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How to Manage

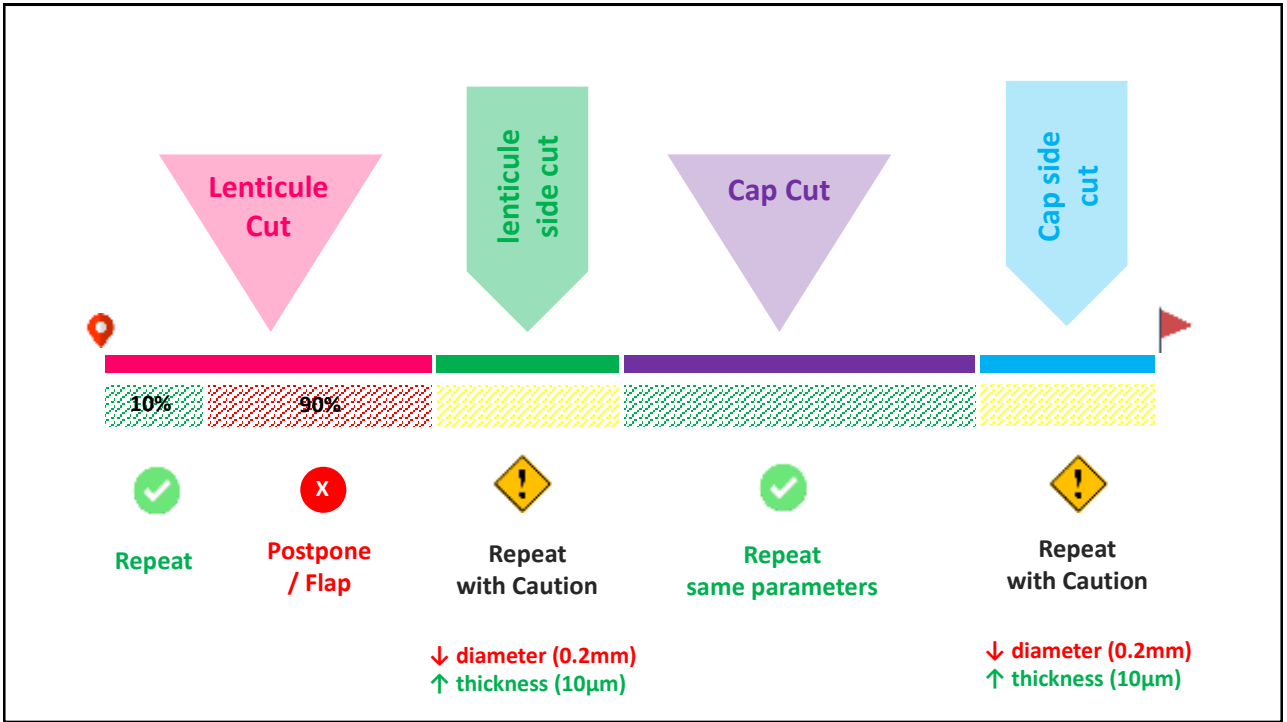
Suction loss is detected by the laser and procedure stops automatically

- confirm the immediate restart message with "YES"



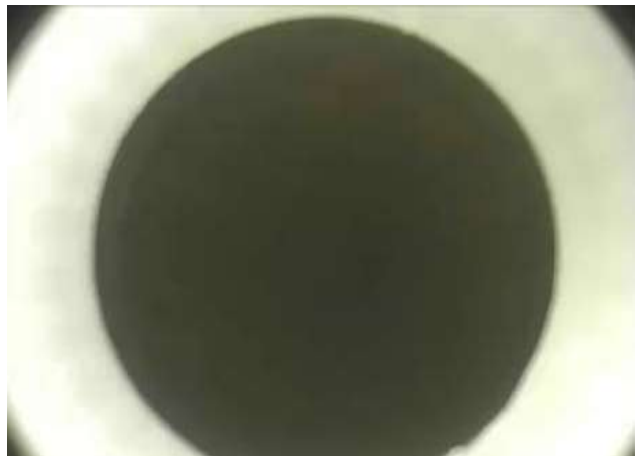
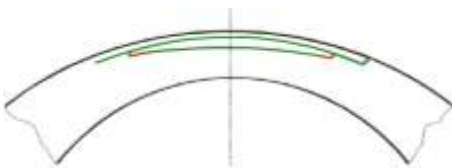
**Management depends on the stage
in which suction loss happened**

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If the laser treatment is interrupted during the **first 10 %** of lenticule cut:

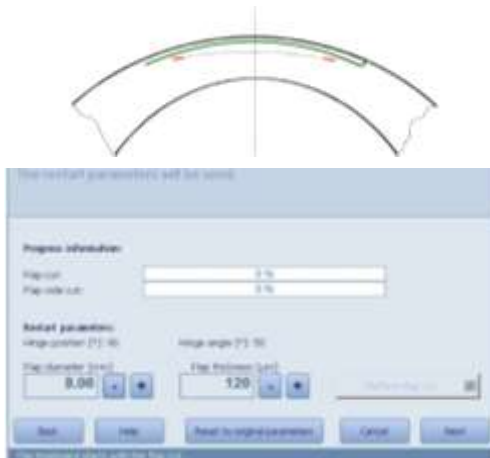
Repeat the entire procedure with the same parameters.



If the laser treatment is interrupted **between 10 % and 100 %** of lenticule cut

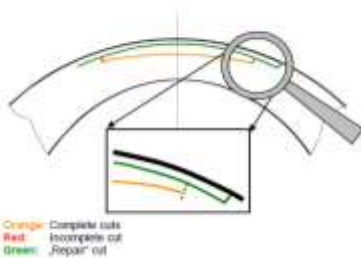


The laser switches automatically to a flap cut or postpone and repeat the whole procedure later on



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If the laser treatment is interrupted during the creation of a **lenticule side cut**

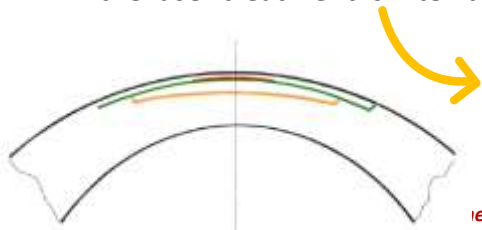


- ↓ the lenticule **diameter** by 0.2mm
- ↑ the lenticule **thickness** by 10µm.

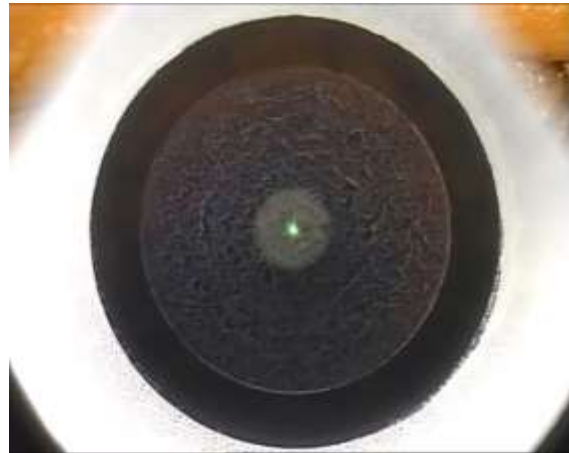


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If the laser treatment is interrupted during the creation of a **cap cut**

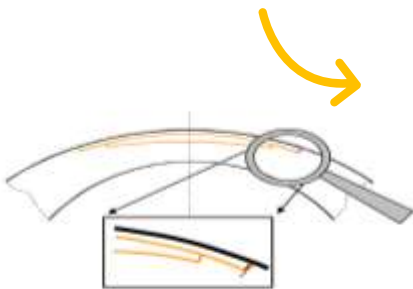


Repeat from the start of the cap cut with the same parameters.



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If the laser treatment is interrupted during the creation of a cap sidecut



- ↓ the lenticule **diameter** by 0.2mm
- ↑ the lenticule **thickness** by 10µm.



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Intraoperative Complications In SMILE

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Difficult dissection

Bleeding to the interface



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- The speed matches the resistance
- Expect more resistance if,
 - Energy higher than needed (OPL)
 - Steep cornea
 - Black spots in the laser profile



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- If you find difficulty getting under the lenticule, you may have lenticule stuck to the cap
- If you miss the superior plane don't worry
- Do not make the cornea dry
- Try gently to get above the lenticule from the corridor



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- **Avoid by**

- *Pivot at the access incision*
- *Fix limbus with forceps*

- **If it happened**

- *Minimize manipulation at the site of the incision*
- *Apply bandage contact lens*



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- Keep MLT > 15 μm in low errors
- Separate the edge before trying to pull the lenticule
- Examine the lenticule carefully
- prednisolone drops \uparrow visualization
- If significant, you have to remove it to avoid irregular astigmatism



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- Try to avoid having blood in the interface

- *Use vasoconstrictors*
- *Vary the position of the access incision*
- *Dry the bleeding*
- *And finally wash the interface if you have to*



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Conclusion

- SMILE is a simple safe effective and predictable refractive procedure
- It has eliminated most of LASIK flap related complications however it has its own subset of difficulties complications
- *Systematic approach to prevent and manage such complications together with growing experience and proper instrumentations would decrease the incidence of such events and make them harmless should they happen*



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