

Lenticule Intrastromal Keratoplasty (LIKE) for hyperopia correction - feasibility

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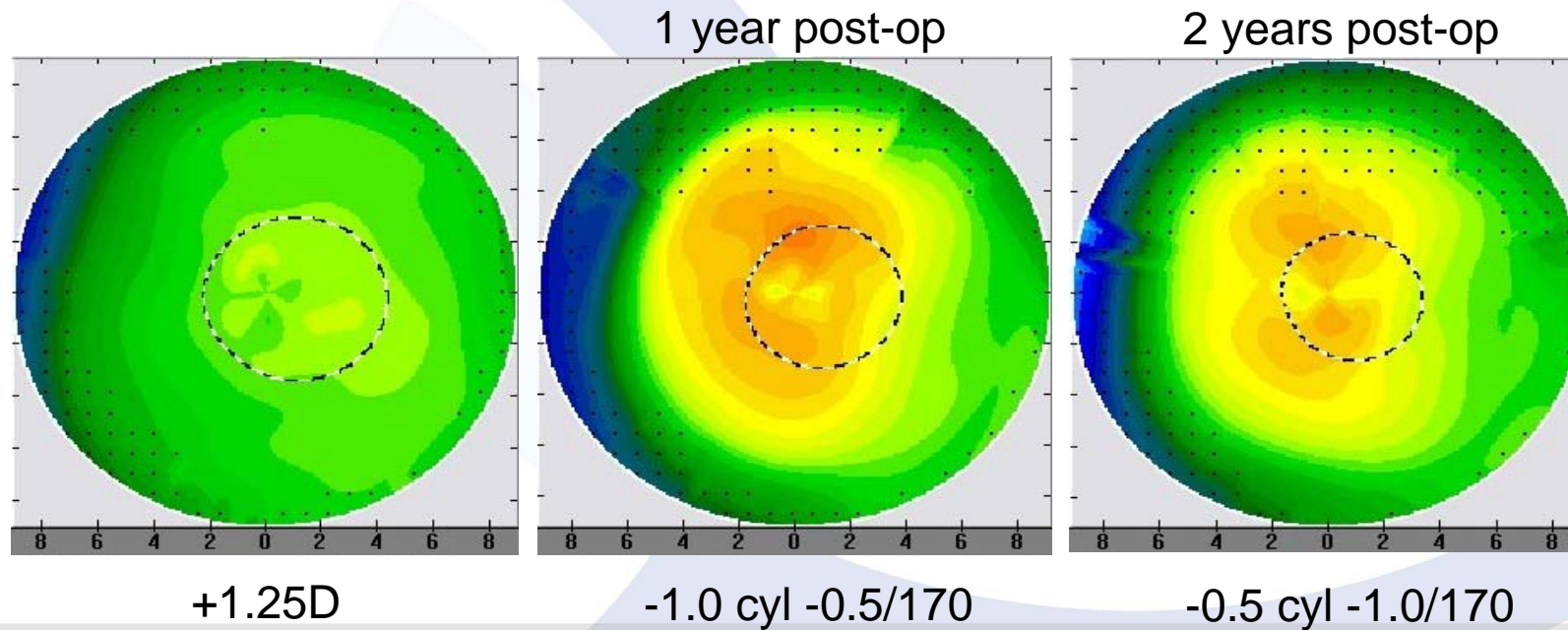
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None of the authors has financial interest in this subject

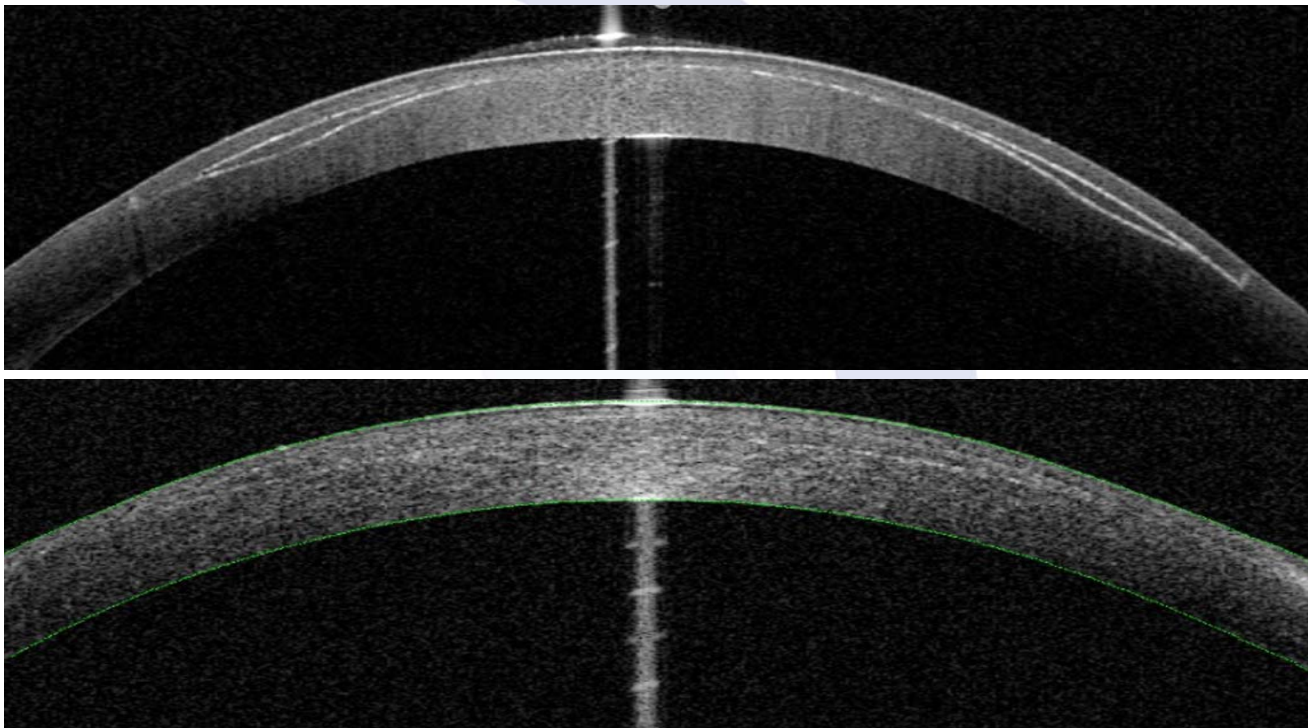
hyperopia correction

Hyperopic LASIK achieves notoriously undercorrection and only 80% and less are 1 year after surgery within $\pm 0.5D$ (for example Alio et al. JRS,2015). Also, the optical zone is plagued with significant and asymmetric regression inducing the so-called “healing astigmatism.”



hyperopia correction

Instead of removing a doughnut-shaped tissue ring from the cornea (that induces asymmetric healing) we propose an additive technique where a prepared lenticule of donor tissue is implanted under a 10mm-LASIK flap.



hyperopic LASIK

hyperopic LIKE

donor preparation

After epithelium removal the donor cornea is attached to a titanium foam-block with a defined profile (Gebauer, Germany) and the lenticule cut with a special blade. The lenticule`s diameter ranges from 7 to 9 mm with a range of correction up to 10D. It has to be emphasized that the lenticules include an intact Bowman`s.

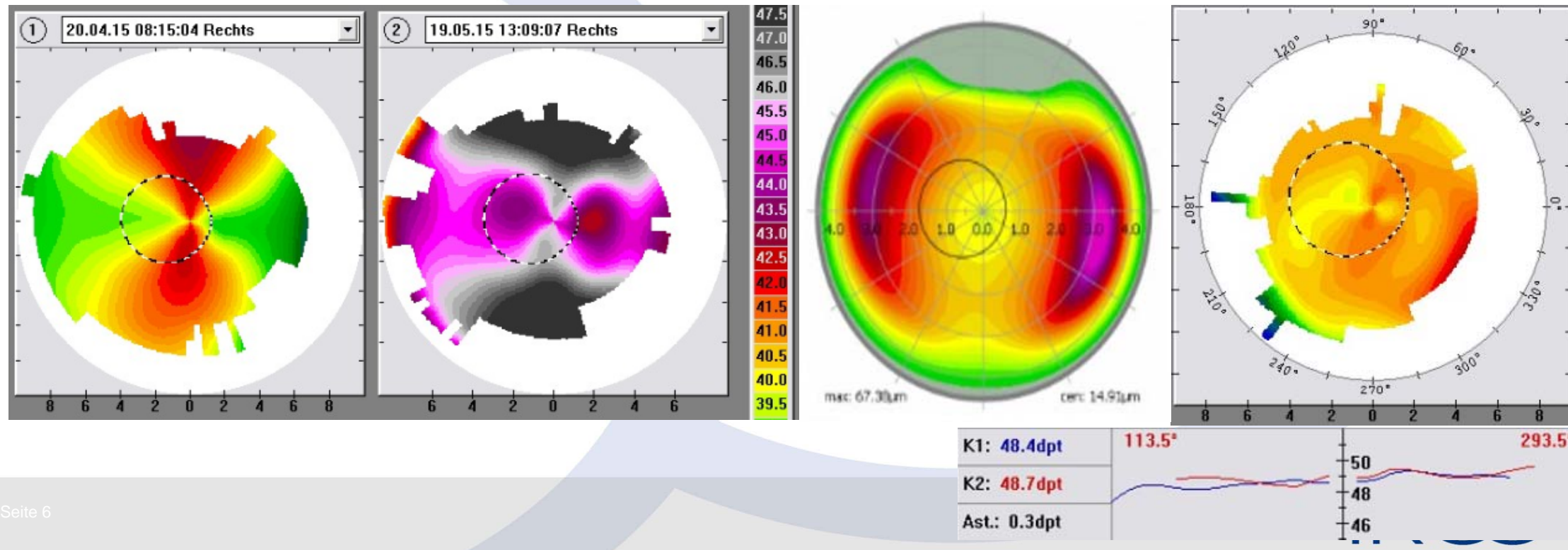


wavefront-optimized profile

The diagram shows a cross-section of a lenticule. On the left, a thin, light blue layer represents the epithelium. This layer is attached to a thicker, light blue block representing the titanium foam. The top surface of the foam block is curved, forming a concave shape. A white box with a black border is positioned above this curve, containing the text 'wavefront-optimized profile'. A thin black line follows the curve of the foam block's top surface, indicating the specific profile being referred to.

patient 2

The patient was referred because of hyperopic astigmatism (+5.5 cyl -2/175), contact lens intolerance and shallow anterior chamber. One month after a +7D-LIKE, we performed a relift and a topography-guided ablation on the lenticule. VA increased from 0.4 to 0.7 one year post-op.

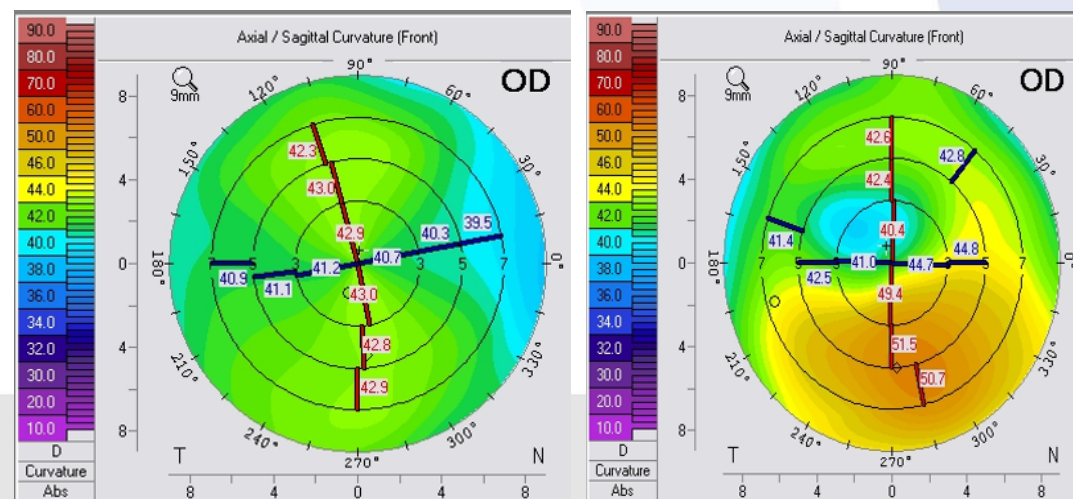


results

Seven eyes of 6 patients were treated with LIKE for hyperopia up to +6.5D and astigmatism up to -2.5D, 3 eyes received laser ablation on the lenticule at 1 month post-op. One lenticule was replaced at 1 month (undercorrection).

None of the eyes lost more than 1 line 6 months after LIKE, 3 eyes gained 2 lines and more. Four of 7 eyes showed transient haze (+1) in the lenticule.

In 2 eyes the lenticule was decentered, the lenticule was recentered in 1 eye.



conclusion

- ❖ **The refractive results after hyperopic LASIK are significantly worse compared to myopia**
- ❖ **Additive hyperopia correction (LIKE) is a new approach implanting a precut donor lenticule**
- ❖ **This technique appears to be feasible**
- ❖ **Prospective studies are necessary to show safety and efficacy**