Contact Holmium Laser Thermokeratoplasty (LTK) for Hyperopia Surgery: 30 months' follow-up

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Dr. Mathys, from Brussels, Belgium, presented on Contact Holmium Laser Thermokeratoplasty (LTK) for the treatment of hyperopia at the AAO meeting in San Francisco. His co-authors in this work were Marie Jose Tassignon, MD, of Antwerp, Belgium, and Linda J Muller, Ph.D., of Amsterdam, The Netherlands.

Dr. Mathys and his co-authors focused on identifying the surgical limits of the LTK procedure--that is, what is the highest degree of hyperopia that may be safely and effectively treated without inordinate regression.

The Technomed Ho:YAG laser, made in Germany, was the laser used in this study. The first author performed the LTK in all cases, thereby eliminating a potential source of inter-observer bias. The only anesthetic necessary during the LTK procedure was 10 mg PO Valium and local anesthesia.

Ninety hyperopic patients were included in the study population. Their refractive ranges were divided into three groups, of low (<1.75D), moderate (between 2 - 3 D), and high hyperopia (> 3D).

All patients had less than 1.25D of astigmatism. A myopic shift (regression) was noted to occur in the early postoperative phase in all three groups. Patients with “thick” corneas were found to have more regression than patients with normal-thickness corneas. Similarly, patients with lower degrees of hyperopia (<2.5D) had less regression than those patients with higher degrees of hyperopia.

No patient loss any lines of best corrected visual acuity (BCVA), and uncorrected visual acuity (UCVA) improved in a large proportion of the study patients.
Dr. Mathys stated that all patients in the study were very satisfied with their results. He concluded that these early results indicate that LTK can safely and effectively treat hyperopia up to 2.5D.

Dr. Mathys' paper was discussed by Dr. Sandra Belmont, of New York City, who began her discussion with a brief historical review of LTK. She identified several factors which were, in the past, associated with regression, including high temperatures, which induce severe collagen shrinking. Whether or not current LTK techniques can overcome this limitation remains to be seen.

Dr. Belmont then identified several potential problems with contact LTK, such as that performed by Dr. Mathys using the Technomed Ho:YAG laser . These problems include irregular pulse-to-pulse laser fluctuation, a long time of procedure, differential pressure applied by the contact probe, and the contribution of IOP to LTK effect.

In Dr. Belmont's opinion, many of these problems may be eliminated with the use of non-contact LTK, which thus may have inherent advantages over contact LTK. Nevertheless, she believes that the current study shows that even contact LTK can successfully treat low degrees of hyperopia in patients over 40 years of age.