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Title:	Refractive Surgery Using 213 nm Solid-State Laser: Clinical Outcomes and Histological Findings
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Purpose:	To report the experimental histological findings and the clinical outcomes after myopic refractive surgery using CustomVis Pulzar Z1 Solid state laser system.
Methods:	The experimental part of the study consisted of forty pigmented rabbits (80 eyes) that underwent myopic PRK for the correction of 6D (dioptres). Photoablation was randomly assigned, using a solid state laser (CustomVis Pulzar Z1) in one eye and excimer laser (Allegretto Wavelight) in the fellow eye. Rabbits were sacrificed immediately after the ablation, at 7 days and at one, 3 and 12 months after surgery. Corneal tissue was preserved for Light (LM) and Transmission electron microscopy (TEM) at all postoperative intervals. The clinical study was conducted on 60 patients (115 eyes) who underwent PRK and on 20 patients (40 eyes) who underwent LASIK using the CustomVis quintupled Nd:YAG Solid State laser at 213 nm. The PRK group had a mean SEQ of $-4.43 \pm 1.81D$ (-1.50 to -11.0) and mean cylinder of $-0.43 \pm 0.68D$ (-0.25 to -4.00). The LASIK group had a mean SEQ of $-5.55 \pm 1.52D$ (-8.13 to -2.00) and a mean cylinder of $0.64 \pm 0.72D$ (-2.5 to -0.00).
Results:	Experimental study: Immediately after the ablation, light, scan and transmission electron microscopy revealed relatively smooth ablation surfaces in both groups while activated keratocytes were observed in the stromal layers adjacent to the epithelium. At 1, 3 and 12 months postoperatively, there was tissue appearance, typical for post-PRK samples, of all corneal layers in both groups. Clinical study: After 12 months follow-up for the PRK mean RSEQ was $-0.11 \pm 0.52D$ and mean UCVA was 1.03 or 20/19. 39% gained more than 1 line, 48% had no loss or gain of lines and 12% lost more than 1 line. For the LASIK group at 12 months the mean RSEQ was $0.42 \pm 0.70D$ and the mean UCVA was 0.94 or 20/21; 61% of eyes gained more than 1 lines, 33.3% of eyes gained had no loss of lines and 5.6% of eyes lost more than 1 line. In terms of predictability 67% of eyes were in the ± 0.25 and 72% of eyes were in the ± 0.5 interval for the lasik patients. For the PRK patients 49% of eyes were in the ± 0.25 and 80% of eyes were in the ± 0.5 interval for the lasik patients. The PRK patients did not changed in terms of SEQ more than 0.03D in the last 9 months ($-0.11D$ mean value of SEQ at 12 months). The LASIK patients did not changed in terms of SEQ more than 0.01D in the last 9 months ($-0.41D$ mean value of SEQ at 12 months). The measured endothelial cell count per 1.0 mm ² did not significantly change up to 1 year postoperatively in either group (both $P < .05$).
Conclusion:	Photorefractive keratectomy in rabbits with ultraviolet solid state

and excimer laser revealed similar histopathologic findings up to one year postoperatively. PRK and LASIK in humans were both effective and safe in the correction of myopic astigmatism.