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## COMPARISON OF 5 VS 6 MM ABLATION ZONE FOR PRK.

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**Purpose:** To investigate the potential benefit of a larger ablation zone for myopic PRK

**Methods:** We reviewed the charts of patients who were included in the prospective evaluation of the Summit Technologies lasers (Waltham, MA) with a minimum of 6 months follow up. 30 eyes treated with the Omnimed excimer laser (ablation zone 6 mm) were compared to 30 matched eyes treated with the Excimed model (ablation zone 5 mm). Surgical parameters such as depth of ablation, number of pulses, and duration of procedure were correlated to postoperative outcome including uncorrected and best corrected visual acuity, spherical equivalent and cylinder under cycloplegia, reported glare and halos, and subjective reduction of vision in dim light conditions. In addition, haze, centration of ablation, amount of initial flattening of central cornea, regression of refractive effect and the rate of central island formation at 3 months were also assessed.

**Results:** Larger ablation (6 mm) was associated with a more progressive flattening of the central cornea and with less regression over time. However, no significant difference was observed in term of haze or reported halos, while a higher incidence of central island was observed in this group as compared to the 5 mm group.

**Conclusion:** These results suggest that a larger ablation zone may be beneficial in patients with large pupil area as well as in patients with an expected healing response above standard level.

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## HISTOCHEMICAL CHARACTERISTICS OF SUBEPITHELIAL HAZE FOLLOWING EXCIMER LASER KERATECTOMY

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**Purpose:** To evaluate histochemical and immunohistochemical characteristics of corneal subepithelial haze following excimer laser keratectomy.

**Methods:** Laser keratectomy was performed on 30 eyes of Japanese white rabbits. EC-5000 excimer laser system (Nidek Co., Japan) was used to produce a 6.0mm diameter photokeratectomy. The pulse energy and repetition rate were set at 130mJ / pulse and 30Hz respectively. We also performed mechanical keratectomy with a diameter of 7.0mm on 10 corneas of rabbits with a blunt spatula. All rabbits were sacrificed at 20th day after the operations. The corneas were removed and prepared for histochemical and immunohistochemical studies. Corneal sections were stained with Alcian blue before or after the treatments with keratanase, chondroitinase ABC or hyaluronidase. Immunohistochemical studies with antibodies to type III, IV and VII collagens, keratan sulfate and large proteoglycan were also carried out.

**Results:** The area immediate subjacent to the epithelium, that clinically corresponds to the subepithelial haze following excimer laser keratectomy, showed poor organization of collagen fibers. There were also many fibroblast-like keratocytes at this area. Strong staining was observed with Alcian blue at this area before the treatments with any enzymes for proteoglycan degradation. But, the treatment with chondroitinase ABC or hyaluronidase weakened the Alcian blue staining at the subepithelial area. Immunohistochemical studies showed positive reactions with antibodies to type III and IV collagens and large proteoglycan at the subepithelial area following excimer laser keratectomy. The subepithelial opacity was also observed in the cornea after mechanical keratectomy, and histochemical characteristics of this opacity were basically similar to those of subepithelial haze following excimer laser keratectomy.

**Conclusion:** These results suggest that type III and IV collagens, and large proteoglycan with chondroitin sulfate and hyaluronic acid are present at the subepithelial area following both excimer laser and mechanical keratectomies. We conclude that the subepithelial haze following excimer laser keratectomy is not specific change but a corneal scar generally formed after corneal wounds.

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## IN VITRO EVALUATION OF SURFACE REGULARITY FOLLOWING ABLATION WITH SEVEN DIFFERENT EXCIMER LASERS

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**Purpose:** To investigate the ability of various excimer lasers to produce a regular surface of ablation in standardized conditions.

**Methods:** 7 different excimer lasers, including Omnimed (Summit), MEL60 (Meditec), Keratom (Schwind), 20/20 (VisX), EC5000 (Nidek), Compak 200 (Lasersight) and Technolas (Chiron) were tested in standardized field conditions (not laboratory conditions) onto PMMA flat surface. PRK procedure was performed for a theoretical correction of 6 D using both a 5 mm and a 6 mm ablation diameter (except for the Compak 200) in 5 samples (total = 70 plates). PMMA plates were coated with a thin layer of gold palladium and analyzed using slit lamp microscopy, low power phase contrast microscopy, scanning electron microscopy or confocal microscopy.

**Results:** Various ablation profiles were observed. The Omnimed device produced a characteristic gritted pattern surrounded by a smoother transition zone while the Keratom and the Technolas were associated to a regular circular step pattern with intermediate increments. Ablation by the EC5000 resulted in a similar circular pattern, however with much smaller increments. Finally the Compak 200 created a very smooth ablation surface with no distinguishable pattern. No central island could be identified by any of these techniques in any of the samples.

**Conclusion:** These in vitro model proved useful to assess technological advances for the enhancement of surface regularity following PRK but may not be sensitive enough for the investigation of clinically relevant surface aberration such as central islands

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TITLE : VISX 20/20 EXCIMER LASER : AN EXPERIENCE OF TWO YEARS.

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**OBJECTIVES :** Nowadays the VISX 20/20 is one of the few Excimer Devices which have got the approval on the european market. However, in order to improve inadequate results in high myopic and astigmatic corrections, a new software has been designed. We suggest to compare the results achieved using "the old and the recent" software.

**MAIN OUTCOME MEASURES :** These comparisons underline the significant interest of software refinements : elliptical mode, pretreatments, ke yards...

**RESULTS :** We performed refractive treatments for myopia (-1.0 to -8.5 D) and/or astigmatism (-0.5 to 4.5 D) in series of 447 patients divided in two groups depending on the ablation mode. We evaluate the outcome in terms of visual acuity, stability of results, astigmatic correction and central islands occurrence.

**CONCLUSION :** We provide again the prove of the innocuity and efficiency of the excimer ablation in low myopia and the improvement in results achieved by the new software. Continuous progresses are expected from the future delivery systems and are necessary to the validation of this procedure in the treatment of high myopia and astigmatism.