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TOPICAL OPHTHALMIC PHARMACOLOGICAL AGENTS IN POST OPERATIVE MANAGEMENT AFTER ABLATIVE AND INCISIONAL REFRACTIVE CORNEAL PROCEDURES.

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PURPOSE: As the population of patients undergoing current refractive procedures increases, it is now important for clinicians of all backgrounds to know the various FDA and DHSS approved topical preparations which are routinely used in the management of eyes after Radial Keratotomy (RK) and Excimer laser photorefractive keratectomy (PRK).
METHODS: This paper presents details of the various effects and side-effects of all current topical ophthalmic preparations used in post-operative care of RK and PRK/PARK/PTK patients.
RESULTS:Detailed effects of these drugs on 1) Regression of ametropia; 2) Corneal thickness variation; 3) Changes in corneal sensitivity and wound healing will be discussed.
CONCLUSION: The role of steroids and Non-steroidal anti-inflammatory agents in post-operative refractive and visual results cannot be over emphasized.

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TITLE: A NEW TECHNIQUE FOR ASSESSING CORNEAL WOUND HEALING AND TRANSPARENCY AFTER PRK.

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Purpose: *To develop a method to objectively assess epithelial and stromal wound healing in patients undergoing PRK.*
Methods: *High resolution digital retroilluminated corneal images were obtained and submitted for computer image analysis in 10 consecutive patients undergoing PRK. These images could be obtained as early as 1 hour after surgery and serial images at various time points were used to monitor the pattern, rate of epithelial closure and corneal transparency after PRK.*
Results: *The results show that epithelial closure after PRK occurs 3-4 days after surgery and pattern of closure suggests a relationship between corneal curvature and epithelial closure. Corneal transparency was initially poor (upto 1 week) due to epithelial healing at around 3 months due to haze. Haze distribution was not uniform and showed inter-subject variation. The corneal transparency index developed correlated well with a forward scatter during the postoperative period.*
Conclusion: *The ultimate refractive result after PRK is a function of the initial ablation and the corneal wound healing response induced by the ablation. In order to develop strategies to modulate this response to a favorable endpoint it is important to be able to monitor this response in-vivo. The in-vivo temporal and spatial distribution of corneal wound healing as demonstrated by this technique show that this system can objectively monitor this response in a clinical setting.*

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CONTRALATERAL CORNEAL MODIFICATION AFTER 193 nm EXCIMER AND 213 nm UV SOLID STATE LASER PHOTOABLATIONS

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Purpose: No contralateral histological modifications were described after PRK and almost all studies used contralateral cornea as control. As we were investigating the wound healing process following corneal photoablation, we observed that we could not used contralateral as control. We decided to devise a specific protocol to evaluate the contralateral effects.
Methods: Photoablations were performed on left rabbit eyes with a Summit 193 nm Excimer laser (n=18) and a laserharmonic prototype (Lasersight, 213 nm UV solid state laser) (n=9). Central optical zone of the right non photoablated corneas were removed 7, 30 and 90 days after surgery. Corneal stromas were pepsin -solubilized and collagen and total protein contents were determined. We used 4 corneas from 2 non photoablated rabbits as control.
Results With the 193 nm Excimer laser we observed the contralateral effects for a deep photoablation (100μm), this phenomenon disappeared after the seventh days after the surgery. Total protein and collagen contents modifications were parallel. In contrary, with the 213 nm UV solid state laser the contralateral effects were observed for 50 μm persisting up to 90 days after the surgery.
Conclusion This findings have two important implications. First: studies that have used an intrinsic contralateral control should be interpreted in lights of these findings. Second: it is possible that this contralateral effect may also be seen in human.

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PREOPERATIVE ON-LINE SCHEIMPFLUG IMAGING OF THE CORNEAL PROFILE BEFORE ER:YAG-LASER PHOTOREFRACTIVE SURGERY

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Purpose: The photoablation of the cornea with the Er:YAG-Laser is mediated by energy absorption in water molecules. The Gaussian distributed emission profile of the Er:YAG-Lasers in the fundamental mode produces a deeper ablation in the center. This is required for myopia correction. The morphological evaluation of the ablation profile is difficult due to considerable distortion during the histological preparation. The possibility of a preoperative native evaluation of the profiles by means of on-line Scheimpflug imaging was examined.
Methods: The emission profile of the Er:YAG-Laser (λ=2.94μm) in the fundamental mode was compared to the ablation profiles of freshly emucleated pig eyes. These pig eyes were treated with average fluence rates between 2.13 and 3.98 J/cm^2 and were studied immediately after ablation with on-line Scheimpflug imaging (modified Topcon SL-45). The corneas were then examined by histology and scanning electron microscopy.
Results: Representation with the rotation slit lamp and morphologic examinations confirmed Gaussian distributed ablation profiles. Profiles with multiple peaks resulting from insufficient fine tuning of the laser resonator were identified. In comparison to the histological preparations the ablation profiles represented with the rotation slit lamp were free of distortions and instantly available.
Conclusions: The Er:YAG-Laser in the fundamental mode allows a homogeneous ablation of corneal tissue without any additional beam modulation such as iris diaphragms. Preoperative native on-line Scheimpflug imaging showed good agreement with the true ablation profile and allowed verification of the intensity profile at the cornea.