

Endothelial damage caused by uncoated and fluorocarbon-coated poly(methyl methacrylate) intraocular lenses

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Purpose: To assess endothelial damage induced by poly(methyl methacrylate) (PMMA) intraocular lenses (IOLs) coated with a fluorocarbon polymer, Teflon™ AF, to make them highly hydrophobic.

Setting: Department of Ophthalmology, Hôtel-Dieu Hospital, Paris, France.

Methods: Ten Teflon-coated and 10 uncoated PMMA IOLs were used in an in vitro static touch model. The corneal endothelium was placed in direct contact with the IOL for 15 seconds and then stained with trypan blue and alizarin red.

The endothelial damage produced by each IOL in the area of contact was assessed semiquantitatively and quantitatively.

Results: Teflon-coated IOLs produced significantly less endothelial damage than uncoated PMMA IOLs ($P < .0001$). Endothelial cells in contact with Teflon-coated IOLs did not usually adhere to the IOL surface. In contrast, the uncoated IOLs produced large areas of endothelial cell loss.

Conclusion: Teflon-coated PMMA IOLs have an antiadhesive effect that reduced endothelial damage after IOL insertion in an in vitro model.

In vivo study of a fluorocarbon polymer-coated intraocular lens in a rabbit model

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Purpose: To evaluate the biocompatibility in rabbit eyes of poly(methyl methacrylate) (PMMA) intraocular lenses (IOLs) that were surface modified using Teflon AF.

Setting: Hôtel-Dieu Hospital, Paris Cedex, France.

Methods: The IOLs were coated with Teflon AF, an amorphous, transparent, and highly hydrophobic fluorocarbon polymer, by immersing them in Teflon AF 5% and evaporating the solvent (C_8F_{18}). The surface quality of the Teflon-coated IOLs was evaluated by scanning electron microscopy (SEM). Teflon-coated ($n = 20$) and control PMMA ($n = 10$) IOLs were implanted in rabbit eyes. The presence of iris-IOL synechias and the number of deposits on the IOL surfaces were clinically evaluated in both groups to assess the antiadhesive effect of Teflon AF. The Teflon-coated IOLs were removed, their surfaces were evaluated by

SEM, and their elemental composition was checked by EDXA and Raman spectrometry.

Results: The PMMA IOLs were completely coated with Teflon AF. The Teflon group had no iris-IOL synechias and the control group, two extensive synechias. There were significantly fewer deposits on the surfaces of Teflon-coated IOLs than on the control IOLs 30 and 60 days postoperatively ($P < .0001$). Scanning electron microscopy showed lens epithelium proliferation and spindle-shaped cells on the surfaces of the PMMA IOLs and cell deposits on the irregular regions of the Teflon-coated IOLs. White-yellow spots were present on the surfaces of both IOL types. The elemental composition of Teflon-coated IOLs was stable.

Conclusion: Teflon AF had an antiadhesive effect that increased the biocompatibility of PMMA IOLs in vivo.

Hyphema after peribulbar anesthesia for cataract surgery in Fuchs' heterochromic iridocyclitis

Ocular Immunology and Inflammation 1998;6:57-8.

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Purpose: To describe an unusual ocular sign in one patient with Fuchs' heterochromic iridocyclitis at cataract surgery.

Methods: We describe a patient with Fuchs' heterochromic iridocyclitis and cataract who developed a 1 mm hyphema observed two minutes after peribulbar anesthesia for cataract surgery.

Results: The patient was found to have an equivalent of the

Amsler-Verrey sign. It appeared after peribulbar anesthesia and before any instrument touched the globe. It did not interfere with surgery and disappeared completely by day 2.

Conclusion: The appearance of a hyphema after peribulbar anesthesia in Fuchs' heterochromic iridocyclitis is an unusual sign that may have the same pathophysiology as the Amsler-Verrey sign.

Alterations in blood-aqueous barrier after corneal refractive surgery

Cornea 1998;17:158-162.

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Purpose: To assess alterations in the blood-aqueous barrier after radial keratotomy (RK), photorefractive keratectomy (PRK), laser in situ keratomileusis (LASIK), and phototherapeutic keratectomy (PTK).

Methods: Aqueous flare was evaluated using the Kowa FM 500 laser flare meter in a total of 87 eyes from 82 patients who underwent refractive surgery. Measurements were obtained preoperatively in 51 eyes of 51 patients who underwent RK or PRK and again at the end of surgery, and at 1 day and 1 week postoperatively. These patients had been randomized (double masked) to receive topical 0.1% dexamethasone, polymyxin B (6,000 U/ml), and 0.5% neomycin 4 times a day for 1 week after surgery, or polymyxin B (6,000 U/ml) and 0.5% neomycin for 1 week. Aqueous flare measurements were also obtained before surgery in 36 eyes (31 patients) that underwent LASIK and again at 1 day and 1 and 2 weeks postoperatively. All patients in this group received topical 0.1% dexamethasone, polymyxin B (6,000 U/ml), and 0.5% Neomycin 4 times a day for 15 days after surgery.

Results: Uneventful RK induced a significant increase in

flare immediately after surgery, although this did return to baseline 1 day after surgery (Friedman test). Measurements at 7 days after surgery were similar in steroid-treated and untreated groups. Limbal bleeding, which occurred in 23% (12/51) eyes, did not induce significantly increased flare as compared to uneventful RK. Microperforations, which occurred in 18% (9/51) eyes, did induce significant alterations in the blood-aqueous barrier that persisted for > 1 day, but measurements returned to preoperative levels by day 7. PRK and LASIK induced substantially increased flare in some eyes. Phototherapeutic keratectomy, in particular, induced an elevation in flare measurements that did not return to normal levels even by 15 days after surgery (Friedman test).

Conclusions: Using mean results of laser flare meter evaluation, uneventful RK appears to induce short-lasting elevations in aqueous flare in both steroid-treated and untreated patients. Microperforation induced prominent alterations in flare measurements, although limbal bleeding did not. Both PRK and LASIK did appear to increase flare measurements in some eyes, while PTK induced significant elevations in aqueous flare in the majority of eyes.

Corneal endothelial cell damage by silicone tube contact

Ann Ophthalmol 1998;30:22-5

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Drainage tube-cornea touch may result in corneal endothelial cell damage following glaucoma implant surgery. Using rabbit 6 mm corneal buttons, we investigated the extent of endothelial cell damage following contact with a silicone tube similar to that used in glaucoma implants. Corneal button endothelial cell layers in contact with a silicone tube for either

1, 5, 15, or 30 minutes had significantly greater damage than those of control buttons, and 30-minute contact time produced significantly greater endothelial cell damage than that of shorter contact times. SEM demonstrated that the damage was typified by the loss of large numbers of endothelial cells resulting in areas of denudation of Descemet's membrane.

Quantitative study of the effect of dacryocystorhinostomy on lacrimal drainage

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Using scintigraphy, we have studied the lacrimal drainage from the conjunctival sac of normal subjects and patients who have undergone dacryocystorhinostomy. A mathematical model of drainage was constructed that accurately described the complete activity curves for both groups. The initial rate of

drainage was shown to be a relevant parameter to characterize drainage, and it was found to be different from normals to patients, indicating that the lacrimal pump mechanism is affected by dacryocystorhinostomy.

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Digital image processing measurement of the upper eyelid contour in Graves disease and congenital blepharoptosis

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Objective: This study used image processing techniques to quantify the upper eyelid contour of patients with Graves upper eyelid retraction and congenital blepharoptosis.

Design: The study design was a cross-sectional study.

Participants: A total of 29 patients with Graves disease, 22 patients with congenital blepharoptosis, and 50 patients with no history of eye disease participated.

Intervention: The images of the palpebral fissure of all participants were transferred to a personal computer and processed with NIH Image 1.55 software.

Main Outcome Measures: The following parameters were analyzed: the curvature of the upper eyelid contour, the position of the contour peak relative to the midline, and the ratio between the temporal and nasal upper quadrant areas of the palpebral fissure.

Results: All upper eyelid contours could be fitted with second-degree polynomial functions. The mean temporal/nasal area ratio was 1.33 mm in patients with Graves disease,

0.92 mm in patients with blepharoptosis, and 1.04 mm in control subjects. The peak of the upper eyelid contour was found to be lateral to the midline in control subjects (1.05 mm) and in patients with Graves disease (2.09 mm). In patients with blepharoptosis, the peak was 0.69 mm medial to the midline. Overall, the distance between the midpupil and the upper eyelid margin was correlated with several factors: the degree of curvature, the position of the peak of the eyelid contour, and the temporal/nasal area ratio.

Conclusions: In Graves eyelid retraction, the curvature of the upper eyelid is enhanced, the peak of the contour is displaced laterally, and the temporal upper quadrant area is increased. Conversely, in congenital blepharoptosis, the eyelid is almost flat, the peak of the contour is displaced medially, and the upper quadrant area is diminished. The lateral segment of the upper eyelid is more involved than the nasal segment in both Graves upper eyelid retraction and congenital blepharoptosis.

Phakomatous choristoma of the orbit

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Phakomatous choristoma is a rare adnexal congenital tumor of lenticular anlage. The authors performed a standard orbital tomography of the orbits for the evaluation of a mass that was palpable in the left lower eyelid of a 3-month-old boy. Hematoxylin-eosin, special stainings and immunohistochemistry were performed on the excised mass. The histopatho-

logical and immunohistochemical findings confirmed the diagnosis of phakomatous choristoma. The CT scans showed that the mass was located in the orbit. Even though phakomatous choristoma is usually reported as a lower eyelid lesion, the orbital localization offers a better explanation for the chronological embryonic origin of this rare pediatric tumor.