

MANAGEMENT OF EPITHELIAL INGROWTH AFTER LASIK ON A TERTIARY CARE CORNEA SERVICE

By **Christopher J. Rapuano, MD**

Purpose: To review the management of epithelial ingrowth after LASIK from 1996 through 2007.

Methods: Data of all patients referred to the Wills Eye Cornea Service after having undergone LASIK were reviewed. Charts of all patients with the diagnosis of epithelial ingrowth were analyzed. Data included patient demographics, previous ocular history, visual acuity, size and location of the ingrowth, and management. Additional data on eyes that underwent removal of the ingrowth at Wills were obtained.

Results: 305 patients (153 F, 152 M, mean age 44.7 y) were referred for eye problems after LASIK during the study period. Epithelial ingrowth was confirmed in 46 patients (19 F, 27 M, mean age 47.4 y) involving 55 eyes (27 R, 28 L). Patients were seen a mean of 26 months after LASIK (range 0.5-108 months). 24 eyes had undergone previous enhancements, 2 twice. 14 eyes had undergone previous removal of epithelial ingrowth, 8 more than once (range 2-8). In 35 eyes, simple follow-up was recommended. In 7 eyes, epithelial removal was recommended to the referring physician. 13 eyes underwent flap lift and epithelial removal at Wills; 9 included flap suturing. One eye required repeat treatment with flap suturing and fibrin glue. There was no recurrence in 10, small recurrences in 2 and a large recurrence in 1 eye (mean f/u 16 m).

Conclusion: Epithelial ingrowth after LASIK is not rare. Mild ingrowth can be followed, while significant ingrowth can respond well to removal with a low chance of significant recurrence.

AUTOPHAGY, AN EARLY FORM OF CELLULAR DYSFUNCTION IN DIABETIC RETINOPATHY

By **Thomas W. Gardner, MD, MS**, Ravi S.J. Singh, MD, Patrice E. Fort, Phd, Mandy Losiewicz, BS

Purpose: To investigate the development of retinal autophagy, a process of cellular auto-digestion, in diabetes.

Methods: Retinas from control and diabetic male Sprague Dawley rats were analyzed by immunoblotting and immunohistochemistry for proteins associated with autophagy 4 and 8 weeks after streptozotocin injection.

Results: Lysosomal activity increased in the ganglion cell layer and retinal pigment epithelium. Immunoblotting revealed increased conversion of pro-cathepsin to mature cathepsin, and increased beclin-1 (Bcl2 interacting protein). Studies also revealed cleavage of the autophagy protein, Atg5 to a pro-apoptotic 24 kDa fragment. Simultaneously, the expression of pro-survival proteins, Bcl2 and Bcl-xL, were reduced by 75%. Microtubule associated light chain 3 (MAP-LC3) was significantly reduced. All changes were reversed by insulin treatment.

Conclusion: These are the first data demonstrating that diabetes rapidly induces a catabolic state in the retinas of diabetic animals, with activation of lysosomal degradative process and induction of pro-apoptotic proteins and loss of pro-survival proteins. These changes likely contribute to the earliest stages of diabetic retinopathy and may serve as important therapeutic targets for preventative strategies.

AVIATION INSTRUCTION AS A MODEL FOR TEACHING EYE SURGERY

By **James S. Kelley, MD**

Purpose: Suggest the use of "Aviation Instructor's Handbook" for both teachers and students in Ophthalmology.

Methods: Use of the Handbook during the 2007 academic year, pilot interviews, flight instructor interviews.

Results: The "Handbook" is a brief overview of teaching techniques with thirty years of testing in aviation.

Conclusion: Teaching techniques used in aviation can be applied to ophthalmology.

NEURODEVELOPMENTAL OUTCOMES IN CHILDREN WITH CONGENITAL OCULAR MOTOR APRAXIA

By A. Paula Grigorian, MD, **Michael C. Brodsky, MD**, Paul H. Phillips, MD

Purpose: Ocular motility abnormalities in patients with congenital ocular motor apraxia (COMA) are well described in the literature. However, the neurodevelopmental profile of these patients has not been systematically investigated. The purpose of this study is to characterize the neurodevelopmental outcome of patients with COMA.

Methods: Retrospective analysis of medical records of all children diagnosed with COMA at Arkansas Children's Hospital between 1993 and 2007. Each patient had a complete ophthalmologic examination and developmental history, including questions regarding motor coordination, language development, intellectual ability and school performance. Patients with associated neurological disorders were excluded from the analysis.

Results: Twenty-five patients were diagnosed with COMA based on the presence of characteristic clinical findings including horizontal head thrusting, inability to generate horizontal saccades and relative preservation of vertical eye movements. All patients had hypotonia during infancy. Thirteen patients continued to have motor developmental delay and did not start walking until after 18 months. Eleven patients had speech delay and all patients had reading difficulties. Fifteen patients had cranial magnetic resonance imaging and two had cranial computed tomography. Abnormalities included vermis hypoplasia (6 patients), cerebral atrophy (2 patients), and cortical heterotopia (2 patients). All patients with abnormal neuro-imaging had developmental delay. Among the 7 patients with normal neuro-imaging, 6 had developmental delay.

Conclusion: Patients with COMA frequently have delayed speech, reading, and motor development. Neuroimaging abnormalities are common, but developmental delay is common even in the absence of neuroimaging abnormalities. Notwithstanding the presence of neuroimaging abnormalities, COMA seems to represent the salient abnormality in a broad spectrum of neurodevelopmental dysfunction.

EFFECT OF VISUAL IMPAIRMENT ON CANCER THERAPY OUTCOME

By **Stephen S. Feman, MD**, Frank E. Johnson, MD, Katherine S. Virgo, Phd, Jeffrey L. Van Eps, BS, Colby Parks, BS, Richard A. Seagrave, BS

Purpose: The production of melatonin, an innate oncostatic agent, is changed by light perception. We measured cancer treatment results in patients without light perception.

Methods: Lung, prostate, and colorectal cancers are the most frequently treated cancers at Veterans Affairs (VA) Medical Centers. The nationwide VA Patient Treatment File (PTF) database was searched for veterans with these primary cancers receiving curative-intent therapy during a ten-year interval. Data were extracted for those reported to have had total visual impairment before cancer discovery.

Results: Of the 3.5 million unique veterans treated annually, 46 lung, 106 prostate, and 28 colorectal cancer patients matched our criteria. Chart reviews revealed that only 3 lung, 3 colorectal, and 7 prostate cancer patients were truly without light perception. The numbers were too small for a statistically significant evaluation although the prostate cancer chart review is still underway. However, survival rates for lung cancer were higher than expected and the colorectal and preliminary prostate cancer rates were lower than expected. Recurrence rates for the lung and colorectal cancer patients were comparable to the published literature.

Conclusion: Visual impairment is one factor that influences cancer discovery. Veterans have equal healthcare access with their survival mostly influenced by stage at time of treatment. If melatonin has a protective effect in humans, it should be seen in this population. Unfortunately, frequent coding errors resulted in values too small for statistical analysis. These errors must be addressed if electronic medical records are to be a viable clinical tool.