Visual Outcome Post Cataract Surgery Unaffected by Anticoagulant Use

Evaluation of the Need to Discontinue Antiplatelet and Anticoagulant Medications Before Cataract Surgery.

Kobayashi H:

J Cataract Refract Surg 2010; 36 (July): 1115-1119

Patients using anticoagulant or antiplatelet therapy can safely continue the use of these drugs at the time of phacoemulsification.

Objective: To evaluate the clinical outcome of routine cataract surgery in patients who are using antiplatelet and/or anticoagulant therapy at the time surgery.
Design: Nonrandomized, comparative clinical case series.
Participants: 355 consecutive patients who underwent phacoemulsification with intraocular lens implantation using a corneoscleral tunnel incision and sub-Tenon's infusion of anesthetic on a blunt cannula.
Methods: All patients were using Coumadin and/or aspirin at the time of surgery. During the first study year, the surgeon's routine practice was to ask patients to discontinue these medications one week prior to surgery. During the second study year, patients were asked to continue these drugs throughout the perioperative period. Clinical records were evaluated to compare short- and long-term clinical outcomes between groups.
Results: 182 patients discontinued the use of anticoagulants prior to surgery while 173 patients continued to use these drugs throughout the perioperative period. A statistically significantly greater proportion of patients in the continuation group developed subconjunctival hemorrhage (16.5% versus 10.8%, *P* =0.03). A small proportion of patients developed microhyphema, with 4.0% developing this complication in the continuation group and 2.5% in the discontinuation group, but the difference was not statistically significant. There were no differences in visual outcomes, and no patient developed any serious perioperative bleeding.
Conclusions: Subconjunctival hemorrhage occurs more frequently in patients using Coumadin and/or aspirin at the time of phacoemulsification. However, no serious bleeding episodes occurred, and no differences in visual outcomes were present in those who continued and those who discontinued the use of these drugs at the time of surgery.
Reviewer's Comments: In this study, it is notable that the surgeon used a corneoscleral tunnel incision and periocular infusion of lidocaine on a blunt cannula. These techniques are more likely to lead to hemorrhagic complications than a clear corneal phacoemulsification and topical anesthesia. In spite of this, no clinically important bleeding episodes occurred, demonstrating that the routine discontinuation of Coumadin and/or aspirin at the time of cataract surgery does not alter the clinical outcome. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Cataract Surgery, Complications, Antiplatelets, Anticoagulants

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Interferometry-Keratometry Device Offers Accurate Measurements in Most Patients

Precision of Biometry, Keratometry, and Refractive Measurements With a Partial Coherence Interferometry-Keratometry Device.

Shammas HJ, Chan S:

J Cataract Refract Surg 2010; 36 (September): 1474-1478

Partial coherence interferometry with integrated keratometry (IOLMaster) offers accurate measurement of axial length, anterior chamber depth, and average keratometry, but may not offer optimal measurement of astigmatism prior to cataract surgery.

Objective: To evaluate the precision of axial length (AL), keratometry (K), anterior chamber depth (ACD), and astigmatism using a partial coherence interferometry device with integrated keratometry.
Design: Prospective clinical study.
Participants: 121 eyes of 121 patients with bilateral visually significant cataracts.
Methods: Prior to initial cataract surgery, all patients underwent ocular biometry using the IOLMaster (Karl Zeiss Meditec, Inc). One month later, prior to the second-eye cataract surgery, measurements were repeated in the eye planned for second-eye surgery. This provided sequential measurements in 121 eyes that had not been surgically manipulated. Statistical analysis was performed to compare measurements between sessions, in order to determine the reproducibility of these measurements. Interclass correlation coefficient (ICC) and Bland-Altman analysis were performed to determine reproducibility in the 95% limits of agreement on repeated measurements.
Results: Extremely high reproducibility in AL and ACD measurements were observed. For example, the ICC for AL was 0.999. Precision of keratometry values was also high, but only in flatter corneas. Those eyes with corneas <42 diopters (D) demonstrated the greatest amount of reliability of measurements. In addition, precision of astigmatism and cylinder axis measurements was high in eyes with flat corneas, but decreased in eyes with steeper corneas >42 D. **Conclusion:** The IOLMaster provides highly reproducible measurements of AL and ACD, as well as K in eyes with corneas <42 D. For measurement of astigmatism, particularly in patients with steeper corneas, measurements are less accurate.
Reviewer's Comments: The results of this study imply that alternative methods of measurement of corneal astigmatism and power are important in patients who are planning to undergo toric IOL implantation. In addition, those with corneas steeper than 42 D may also benefit from having repeated measures using alternative keratometry devices. Experienced users of manual keratometry feel that this is a more accurate and direct measure of corneal power, and may prefer its use. Other devices that perform corneal topography or automated keratometers devoted to precision measurements of the cornea may also be considered. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Cataract Surgery, Ocular Biometry, Refractive Error

Print Tag: Refer to original journal article

Alcohol Consumption Influences Rate of Cataract Development

Alcohol Consumption and the Long-Term Incidence of Cataract and Cataract Surgery: The Blue Mountains Eye Study.

Kanthan GL, Mitchell P, et al:

Am J Ophthalmol 2010; 150 (September): 434-440

Alcohol consumption at a level >2 drinks per day is associated with an increased risk of cataract surgery during the subsequent 10 years.

Objective: To evaluate the relationship between alcohol consumption and the long-term incidence of cataract or need for cataract surgery.
Design: Population-based prospective cohort study.
Participants: 3654 patients aged ≥49 years.
Methods: Patients were examined at baseline and 2564 subjects returned for follow-up 5 and/or 10 years later. At each follow-up, lens photographs were taken, which allowed the objective grading of cataract density with regard to nuclear, cortical, and posterior subcapsular opacities. In addition to undergoing clinical examination, subjects also underwent an interviewer-administered questionnaire, which collected additional information including self-reported level of alcohol consumption. Statistical analysis allowed for evaluation of the relationship between alcohol consumption, rate of development of lens opacity, and need for cataract surgery.
Results: No statistically significant associations were seen between alcohol consumption and the long-term change of nuclear, cortical, or posterior subcapsular lens opacity. However, after adjusting for factors including age, gender, smoking, diabetes, myopia, socioeconomic status, and steroid use, total alcohol consumption >2 drinks per day was associated with a 2-fold increase of requiring cataract surgery. Similarly, individuals who reported no alcohol use demonstrated a 2-fold increase of requiring cataract surgery during follow-up.
Conclusions: Moderate alcohol consumption appears to be protective from the need for cataract surgery. Excessive alcohol consumption increases this risk.
Reviewer's Comments: Alcohol consumption has been linked to a wide range of systemic diseases and has been estimated to account for as much as 4% of the total global burden of human disease. Moderate alcohol consumption has been shown to reduce the risk of cardiovascular disease, while excessive consumption can increase its risk. This study suggests that a similar relationship between alcohol consumption and cardiovascular disease is also present between alcohol consumption and cataracts. Further investigation is required to confirm these results, but it is clear that patients should be counseled to avoid excessive drinking, not only from the potential risk of cataract progression, but from an overall health standpoint. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Cataract, Risk Factors, Alcohol Consumption

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Lens Exchange Effective in Restoring Vision After Late In-The-Bag IOL Dislocation

Management of Late Spontaneous In-The-Bag Intraocular Lens Dislocation: Retrospective Analysis of 45 Cases.

Lorente R, de Rojas V, et al:

J Cataract Refract Surg 2010; 36 (August): 1270-1282

Pseudoexfoliation is the strongest risk factor for late in-the-bag spontaneous dislocation of an intraocular lens.

Objective: To evaluate risk factors for spontaneous, late in-the-bag intraocular lens (IOL) dislocation and to evaluate clinical outcomes of its surgical management.
Design/Participants: Retrospective, consecutive clinical case series of 45 eyes of 42 patients who underwent surgical management for spontaneous late in-the-bag IOL dislocation.
Methods: Medical records were reviewed to determine clinical characteristics of patients, as well as the demographic and other clinical factors present in each case. Surgical factors from time of original surgery, including type of IOL, use of a capsule tension ring, and methods of surgical management were also recorded. Visual outcomes and complications of surgery to replace the dislocated IOL were also noted.
Results: The strongest risk factor for spontaneous in-the-bag IOL dislocation was pseudoexfoliation, present in 67% of cases. In 8 cases, a capsule tension ring was present, indicating that the use of this device does not prevent late in-the-bag dislocation of the IOL. Patients were managed using repositioning or replacement of the IOL, including scleral fixation, or iris suturing, or exchange for an anterior chamber or iris-claw lens. A significant improvement in visual acuity was noted following surgery, although surgical complications did occur in some patients. These included self-limited vitreous hemorrhage, choroidal detachment, or exacerbation of glaucoma requiring subsequent trabeculectomy.
Conclusions: Pseudoexfoliation is the strongest risk factor for in-the-bag IOL dislocation. Clinical outcomes are generally good with appropriate surgical management.
Reviewer's Comments: Since placement of a capsule tension ring cannot prevent in-the-bag dislocation of the entire bag/lens complex, it is important not to use a capsule tension ring when greater than one third of the zonules are absent. In patients with pseudoexfoliation, even smaller amounts of zonular dehiscence may be associated with a high risk of subsequent dislocation of the lens in the bag. No particular method of surgical management was found to be superior to others. Experienced surgeons may rely upon their own judgment to determine the best type of repositioning or replacement of an IOL when this complication develops. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Intraocular Lens Dislocation, Pseudoexfoliation

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Single-Vision Spectacles Allow Easier Navigation of Stairs Than Multifocal

Use of Single-Vision Distance Spectacles Improves Landing Control During Step Descent in Well-Adapted Multifocal Lens-Wearers.

Timmis MA, Johnson L, et al:

Invest Ophthalmol Vis Sci 2010; 51 (August): 3903-3908

Use of bifocals or progressive lenses reduces stability of older adults when negotiating stairs in comparison to single-vision distance glasses.

Objective: To investigate the effect of the use of multifocal lenses on stability of older adults in negotiating stairs.
Design: Prospective clinical study.
Participants: 20 adults with hyperopia or myopia who were well-adapted to the use of progressive or bifocal glasses.
Methods: Individuals with mobility problems, history of a fall, or any medical condition that could affect mobility were excluded. Glasses were provided using frames to which the subjects were already accustomed, either with their current bifocals or with single-vision distance glasses of the appropriate prescription. Mobility testing was performed by having the subjects step from a stationary standing point position on top of a block, 7.5 cm, 15.0 cm, or 22.0 cm in height. Three repetitions were performed at each height using each type of glasses. Order of testing was randomized with regard to type of glasses used. Subjects were not told whether bifocals or multifocal glasses were in use. A standardized and validated technique for measuring stability while negotiating a step was performed using analysis of video photography.
Results: Use of single-vision distance glasses led to a significant increase in landing control as indicated by multiple parameters including the single-limb support time, ankle and knee angle, and vertical center-of-mass velocity at contact with the lower level. These findings indicated that landing control occurred in a more stable manner when subjects wore single-vision distance spectacles rather than their customary multifocal lenses. This allowed them to step from the upper to lower level in a controlled fashion, rather than dropping rapidly from the upper to lower level as occurred when wearing bifocals.
Conclusions: Use of single-vision distance glasses leads to improvement in landing control in older adults when negotiating stairs, in comparison to multifocal lenses.
Reviewer's Comments: Falls are an important cause of morbidity and mortality in older adults. Vision problems can significantly contribute to the risk of falls, as has been indicated in numerous epidemiologic studies. This study further indicates that use of bifocals or multifocal lenses can further contribute to problems negotiating stairs. Instability increased further when using traditional bifocals rather than progressive lenses, possibly due to the fact that bifocals can lead to image jump and diplopia, rather than the simple blur and image displacement that can occur from progressive lenses. When any type of multifocal lens is used in older adults, particularly in those known to have mobility problems, counseling should include the potential risks associated with negotiating stairs. Ophthalmologists should consider prescription of single-vision distance glasses to improve mobility under such circumstances. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Refractive Correction, Falls

Print Tag: Refer to original journal article

Graft Failure After Penetrating Keratoplasty More Common With Glaucoma Implant

Graft Failure After Penetrating Keratoplasty in Eyes With Ahmed Valves.

Hollander DA, Giaconi JA, et al:

Am J Ophthalmol 2010; 150 (August): 169-178

Graft failure in patients with a glaucoma drainage device may be due to mechanical factors associated with the tube or with poor intraocular pressure control.

Objective: To determine the rate of graft failure after penetrating keratoplasty (PK) in eyes that have undergone previous implantation of an Ahmed glaucoma valve.
Design/Participants: Retrospective observational clinical study of a consecutive series of 77 eyes of 77 patients who underwent PK after Ahmed valve implantation at a single institution.
Methods: Clinical records were reviewed to determine patient characteristics associated with graft survival. Graft failure was defined by development of stromal thickening, with or without the retention of graft clarity. Multivariate statistical analysis was performed to determine factors associated with graft survival.
Results: Following PK, increased requirement for glaucoma medications was observed in 52% of patients. In addition, 13% of patients required implantation of a second glaucoma drainage device. Rate of graft failure at 1, 2, and 3 years was 42.4%, 57.1%, and 59.1%, respectively. Use of a larger number of glaucoma medications was found to be protective against graft failure, presumably due to improved intraocular pressure (IOP) control in patients using glaucoma medications. In addition, lower IOP itself was found to be a protective factor against graft failure.
Conclusions: Long-term survival of corneal grafts in eyes that have undergone previous implantation of a glaucoma drainage device is poor.
Reviewer's Comments: This study demonstrates poor graft survival in patients following PK who have undergone Ahmed valve implantation. Many anterior segment surgeons attribute the poor graft survival to the mechanical factors associated with the presence of a tube in the anterior chamber, and its contact with corneal endothelium. This study also suggests that in addition to these mechanical factors, poor IOP control is associated with graft failure. In my experience, properly positioned drainage tubes placed flat on the iris and far from the corneal graft can be well tolerated. It is important, however, to pay close attention to technical factors associated with the tube positioning, and if possible place the tube in the posterior segment. In addition, attention to maintaining good IOP control is important in achieving long-term graft survival. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Keratoplasty, Glaucoma, Grafts, Ahmed Glaucoma Valve

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Topical Steroids Allow Accumulation of Extracellular Matrix Causing IOP Elevation

Morphologic Changes in the Outflow Pathways of Bovine Eyes Treated With Corticosteroids.

Tektas O-Y, Hammer CM, et al:

Invest Ophthalmol Vis Sci 2010; 51 (August): 4060-4066

Intraocular pressure elevation caused by steroid use is due to accumulation of extracellular matrix beneath the endothelium of the inner wall of Schlemm's canal.

Objective: To identify morphologic changes in the trabecular meshwork of bovine eyes treated with topical steroids.
Design: Laboratory investigation.
Methods: 4 adult Braford cow eyes were treated with topical prednisolone 0.5% eyedrops 3 times daily for 7 weeks. Contralateral control eyes were treated with artificial tears; control eyes of 2 animals that did not undergo treatment with topical steroids in either eye were also evaluated. Intraocular pressure (IOP) measurements were performed at the end of the course of steroid treatment. Eyes were enucleated and evaluated by both light and electron microscopy to determine morphologic changes associated with the use of topical steroids.
Results: IOP elevation was seen in eyes treated with prednisolone, with a mean IOP of 23 mmHg compared to 15 mmHg in untreated eyes. In steroid-treated eyes, accumulation of extracellular matrix plaques was noted beneath the endothelium of the inner wall of Schlemm's canal. This material was determined on electron microscopy to contain type 6 collagen. Similar plaques were seen in lesser quantities in contralateral control eyes of treated animals, but were absent in control eyes of animals not treated with topical steroids.
Conclusions: Accumulation of extracellular matrix in the trabecular meshwork occurs in association with use of topical steroids and appears to be responsible for IOP elevation.
Reviewer's Comments: The observations of this study are important for 2 reasons. First, the methods described provide an animal model by which future investigations may shed important light upon biological mechanisms and potential interventions for steroid-induced glaucoma. In addition, the fact that IOP elevation is due to accumulation of extracellular matrix indicates why IOP elevation may take weeks to develop after initiation of treatment and weeks to months to resolve after cessation of therapy. In patients with steroid-induced IOP elevation, watchful waiting with medical therapy may be the best approach, unless the IOP poses an immediate threat to vision. After several weeks, the IOP may improve considerably, avoiding the need for surgery. Of course, in eyes where IOP is severely elevated, prompt intervention to prevent glaucomatous optic nerve damage is important. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Glaucoma, Steroid Induced, Trabecular Meshwork

Print Tag: Refer to original journal article

Intravitreal Triamcinolone, Bevacizumab Reduce Macular Edema Following PRP

Intravitreal Triamcinolone and Bevacizumab as Adjunctive Treatments to Panretinal Photocoagulation in Diabetic Retinopathy.

Cho WB, Moon JW, Kim HC:

Br J Ophthalmol 2010; 94 (July): 858-863

Intravitreal injection of triamcinolone or bevacizumab at the time of panretinal photocoagulation is useful in preventing macular edema in diabetic patients.

Objective: To assess efficacy of intravitreal injection of triamcinolone acetonide and bevacizumab as adjunctive treatment to panretinal photocoagulation (PRP) in the management of diabetic retinopathy.
Design: Randomized clinical trial.
Participants: 91 eyes of 76 patients with high-risk proliferative retinopathy requiring PRP.
Methods: Patients were randomly assigned to undergo PRP alone, or in conjunction with intravitreal injection of 4 mg of triamcinolone acetonide or 1.25 mg of bevacizumab. Follow-up evaluations through 3 months included optical coherence tomography (OCT) imaging of the retina and fluorescein angiography to allow evaluation of the development of or change in the severity of macular edema.
Results: A significant decline in best-corrected visual acuity was noted in patients who underwent PRP alone. No change in visual acuity was noted from baseline in patients who underwent laser in conjunction with either study drug. A significant increase in clinically significant macular edema was noted in patients who underwent PRP alone. A reduction in macular edema was noted in patients who had baseline macular edema and who underwent treatment in conjunction with intravitreous injection of triamcinolone. Bevacizumab-treated patients showed neither increase nor decrease in macular thickness following treatment.
Conclusions: Intravitreal triamcinolone and bevacizumab may be effective as adjunctive therapy to PRP in reducing the risk of post-laser macular edema and associated vision loss.
Reviewer's Comments: PRP has been the mainstay of treatment for proliferative diabetic retinopathy for decades. It has long been known that it can induce the development of diabetic macular edema, or increase its severity in patients who already have it at the time of treatment. This study demonstrates that adjunctive therapy, either with intravitreal injection of steroid or the vascular endothelial growth factor inhibitor bevacizumab may be useful in reducing the probability of development of diabetic macular edema following PRP. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Diabetic Retinopathy, Macular Edema, Laser Treatment

Print Tag: Refer to original journal article

Hydroxychloroquine Toxicity More Common With Increased Duration, Dosage

Rates and Predictors of Hydroxychloroquine Retinal Toxicity in Patients With Rheumatoid Arthritis and Systemic Lupus Erythematosus.

Wolfe F, Marmor MF:

Arthritis Care Res (Hoboken) 2010; 62 (June): 775-784

Risk factors for hydroxychloroquine retinal toxicity include duration of therapy >5 years and cumulative dose of >800 g.

Background: Hydroxychloroquine (HCQ) is used for the treatment of rheumatoid arthritis and lupus, and its use can result in parafoveal retinal toxicity causing a characteristic bull's-eye maculopathy. Early detection is critical but evidence-based risk factors are poorly understood.
Objective: To determine the prevalence of and risk factors for development of HCQ retinal toxicity.
Design: Observational longitudinal database study.
Participants: 3995 patients on HCQ.
Methods: The National Data Bank for Rheumatic Diseases (NDB) has recruited volunteers since 1998 to answer a semi-annual questionnaire. The authors identified 3995 patients with a history of HCQ use out of 6307 total participants. Volunteers specifically answered whether they had been told they had HCQ-related eye problems. If so, the authors wrote to the eye specialist for more details and records. Patients were categorized as definite, probable, or possible toxicity based on the records.
Results: Mean age was 61 years and percentage male was 15%. Of 298 who noted an eye problem from HCQ, no follow-up information existed for 83. Of the remaining 215 patients, 165 had seen an eye specialist. Of those, data for 84 were obtained. Authors identified 10 cases of definite/probable toxicity and 13 cases of possible toxicity. Prevalence was 6.5 per 1000 with definite/probable toxicity and 10.4 per 1000 with possible toxicity. Rate of toxicity was 0.33% in the first 5 years of treatment increasing to 2.2% with >15 years of treatment. The rate increased sharply after 6 years and a cumulative dose of 800 grams. Daily dose, dose by weight, or age did not appear to affect toxicity. Liver and renal disease was not identified in the HCQ toxicity group compared to 2% in the control group. Of patients, 40% were seen every 6 months and 50% were seen annually.
Conclusions: The risk of HCQ toxicity rises with treatment >5 years and cumulative doses of >800 mg.
Reviewer's Comments: The American Academy of Ophthalmology published guidelines on HCQ toxicity in 2002. This document states that higher risk occurs with the following factors: age >60 years, daily dose >6.5 mg/kg, treatment >5 years, and concomitant renal/liver disease. Using these criteria, >90% of participants in this study would have been designated as "high risk" but only 23 of almost 4000 developed toxicity. This really calls into question whether those factors are truly high risk factors or not. This study argues that duration and cumulative dose are much more important and that age and weight do not seem to matter. (Reviewer-Michael S. Lee, MD).

Keywords: Hydroxychloroquine, Plaquenil, Retinal, Toxicity

Print Tag: Refer to original journal article

OCT Useful in Grading Severity of Papilledema

Diagnosis and Grading of Papilledema in Patients With Raised Intracranial Pressure Using Optical Coherence Tomography vs Clinical Expert Assessment Using a Clinical Staging Scale.

Scott CJ, Kardon RH, et al:

Arch Ophthalmol 2010; 128 (June): 705-711

Optical coherence tomography measurements of retinal nerve fiber layer thickness and total retinal thickness correlate well with grading of lower stages of optic disc edema.

Background: The Modified Frisén Scale (MFS) has been validated as a useful method to stage papilledema. Optical coherence tomography (OCT) can provide quantitative measurements of the peripapillary retinal nerve fiber layer (RNFL) thickness and total retinal thickness.
Objective: To compare MFS to OCT in the evaluation of optic disc edema.
Design/Participants: Retrospective, observational case series of 36 eyes of 36 patients with optic disc edema.
Methods: Eyes were included if photographs and OCT images existed and were of sufficient quality. Fast RNFL and fast optic disc images using the Stratus OCT3 were obtained. Signal strength, a measure of the quality of the image on a 1to10 scale, had to be ≥5. A separate cohort of 101 patients with papilledema was also evaluated by OCT 3. Investigators assessed whether the best-fit lines reasonably followed the inner and outer edges of the RNFL and total retinal thickness. Four masked reviewers evaluated photographs monocularly. MFS ranges from 0 (normal) to 5 (severe edema with obscuration of all vessels on the disc).
Results: Grade 5 edema was excluded since no high-quality OCT images could be obtained. No eye was excluded for poor photographic quality. There were 8 eyes with grade 4; 4 with grade 3; 10 with grade 2; 7 with grade 1; and 7 with grade 0 edema. There was a strong correlation between MFS grade and OCT RNFL (Spearman rank correlation 0.85) and between MFS grade and OCT total retinal thickness (Spearman rank correlation 0.87). For every grade of MFS, total retinal thickness showed greater change than RNFL, likely from the effects of exudative peripapillary retinal detachment at higher grades of disc edema. Total retinal thickness showed lower failure rates for best-fit line quality compared to RNFL thickness.
Conclusions: OCT is well correlated to clinical grading of optic disc edema at lower stages. At higher grades, OCT total retinal thickness is more consistent than RNFL thickness in terms of quality.
Reviewer's Comments: The MFS has only 6 ordinal grades compared to OCT, which is a continuous variable. I think it is reasonable to obtain OCT measurements in patients with grades 1 to 3 edema using the total retinal thickness algorithm, which showed a more highly correlated and more robust measurement of edema. The question is how much change in the OCT measurements is real versus fluctuation? (Reviewer-Michael S. Lee, MD).

Keywords: Papilledema, Optical Coherence Tomography, Frisén, Grading, Diagnosis

Print Tag: Refer to original journal article

Mirrors Reflect Visual Acuity in Infants

The 'Mirror Test' for Estimating Visual Acuity in Infants.

Bowman R, McCulloch DL, et al:

Br J Ophthalmol 2010; 94 (July): 882-885

One can grossly assess visual acuity in an infant using the distance at which the child fixates on his own mirror image.

Background: It can be challenging to assess visual acuity in preverbal infants. Often acuity cards are used to assess preferential looking. These cards are not universally available and take some specialized skill in using.
Objective: To compare visual acuity cards to fixation on images in the mirror in a group of normal infants.
Design: Prospective observational study.
Participants: 78 babies from the United Kingdom.
Methods: Participants were recruited from a physiotherapy class. Infants were excluded if born >3 weeks premature, obvious refractive error using retinoscopy, misalignment on Hirschberg testing, or were poorly attentive. The infant sat on its mother's lap and faced a relatively blank wall. The Teller acuity card has a black and white grating of various spatial frequencies. A child that preferentially gazes at the stripes is able to discriminate them and an estimate of acuity can be obtained. Children <7 months were tested at 38 cm and older children were tested at 55 cm. The mirror was initially held 20 cm from the child's face. The child was gradually moved further away until they lost attentiveness. Maximum distance was measured and recorded 5 times. Low and high values were removed and the mean of the other 3 distances was recorded. A wall-mounted mirror and handheld mirror measuring 30 by 40 cm were used. The mirror distance was compared to the Teller acuity.
Results: Mean age was 56 days (range 1 to 266 days). The wall-mounted mirror was associated with good attention in 92% compared to 62% with the hand-held mirror. The mirror distance showed good correlation with Teller acuity for the hand-held mirror group but not the wall-mounted mirror group. Mirror distance was well correlated to age.
Conclusions: A mirror fixation distance test correlates well with acuity card testing in infants. This may represent a useful way to help identify poor vision in infants.
Reviewer's Comments: The authors argue that this test may seem subjective, but so are the Teller testing and fix and follow. The examiner assesses whether the infant is looking at a grating or just looking around. The examiner assesses whether the infant is still looking at the mirror or not. I think it is a reasonable idea especially in a primary care doctor's office. It would be nice if the authors could provide some more normative data on minimum mirror distances for various ages. (Reviewer-Michael S. Lee, MD).

Keywords: Acuity, Vision, Infant, Baby, Preverbal, Mirror

Print Tag: Refer to original journal article

Anisometropic Amblyopia More Common in Left Eyes

Laterality of Amblyopia.

Repka M, Simons K, et al:

Am J Ophthalmol 2010; 150 (August): 270-274

The left eye is affected more often by anisometropic amblyopia whether alone or combined with strabismus.

Background: Amblyopia occurs from anisometropia, strabismus, or unilateral media opacity or a combination of these factors.
Objective: To assess the frequency of left versus right eye in amblyopia.
Design: Retrospective, multi-centered data review.
Participants: 2635 patients age <18 years from 9 randomized clinical trials.
Methods: Data were taken from studies performed by the Pediatric Eye Disease Investigator Group (PEDIG). Patients with unilateral amblyopia were categorized into 3 groups: strabismic amblyopia, anisometropic amblyopia without strabismus, or combined mechanism amblyopia (anisometropia and strabismus). Anisometropia was defined as 0.5 diopters (D) of spherical equivalent or 1.50 D of astigmatism. Strabismus was defined as any size heterotropia at distance or near. The amblyopic eye ranged from 20/40 to 20/400 Snellen acuity or 0.3 to 1.3 logarithm of the minimum angle of resolution (logMAR). Laterality was calculated with subgroup analyses based on cause of amblyopia, race, acuity, and age of intervention.
Results: There were 57% left eyes (95% CI of 55 to 59%). This left eye predominance occurred in anisometropic amblyopia with (61%) or without strabismus (59%). Strabismic amblyopia did not show a predilection (50%) for left or right eyes. Age, race, and visual acuity did not affect laterality.
Conclusions: The left eye is affected more often by anisometropic amblyopia whether alone or combined with strabismus. Strabismic amblyopia alone does not show a right-left predilection.
Reviewer's Comments: The authors propose several reasons for this left eye predominance. They suggest that maybe these patients have a microtropia, a small heterotropia that cannot be seen clinically. They also suggest that 60% of people are right-eye dominant and this might contribute. To me, these arguments do not explain why strabismic amblyopia shows no laterality but anisometropic does. I would chalk the left eye involvement to interesting observation with no good explanation similar to Duane's syndrome, which is more likely to affect the left eye as well. (Reviewer-Michael S. Lee, MD).

Keywords: Amblyopia, Left, Right, Laterality, Side

Print Tag: Refer to original journal article

Complications More Common After Pars Plana Vitrectomy Than Scleral Buckling

One-Year Outcomes After Retinal Detachment Surgery Among Medicare Beneficiaries.

Day S, Grossman DS, et al:

Am J Ophthalmol 2010; 150 (September): 338-345

Complications occur more frequently after pars plana vitrectomy than scleral buckling in patients undergoing surgery for primary rhegmatogenous retinal detachment.

Objective: To determine rates of reoperation and adverse outcomes following pneumatic retinopexy, scleral buckling, and pars plana vitrectomy (PPV) in patients with primary rhegmatogenous retinal detachment (RRD).
Design: Retrospective, longitudinal cohort study.
Methods: Medicare claims records were used to identify a cohort of patients who underwent surgery for primary RRD. Patients were classified by type of surgery initially performed. Rate of necessity of a second procedure was determined for each group based on follow-up Medicare claims. Subsequent Medicare claims were also used to determine the occurrence of adverse events, as indicated by new diagnosis codes for other problems including endophthalmitis and blindness.
Results: At 1-year follow-up, patients who underwent pneumatic retinopexy had the highest rate of requiring a second procedure (40.6%) compared to scleral buckling (19.2%) or PPV (21.2%). Adverse outcomes were more commonly seen in patients following PPV than scleral buckling. However, the severity of retinal detachment and likelihood of having proliferative vitreoretinopathy were also greater in PPV than scleral buckling patients.
Conclusions: Adverse outcomes appear to occur more commonly following PPV than after scleral buckling in patients undergoing surgery for primary RRD.
Reviewer's Comments: It is possible that the more severe pathology in PPV patients accounted for the higher rate of adverse outcomes seen in that group. However, PPV does have potential risks that are not present in scleral buckling surgery, and is more likely to lead to lens opacity. In straightforward cases of primary RRD without complicating factors, scleral buckling may offer a less complicated postoperative course than PPV. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Retinal Detachment Surgery, Outcomes

Print Tag: Refer to original journal article

Genetic Factors Most Influential in Myopia Development

Family History, Near Work, Outdoor Activity, and Myopia in Singapore Chinese Preschool Children.

Low W, Dirani M, et al:

Br J Ophthalmol 2010; 94 (August): 1012-1016

Family history is the strongest predictor of preschool myopia, as opposed to environmental factors such as near work or outdoor activity.

Objective: To investigate genetic and environmental risk factors for myopia in preschool children.
Design: Cross-sectional epidemiologic study.
Participants: 3009 children aged 6 to 72 months.
Methods: The Strabismus, Amblyopia, and Refractive Error in Singaporean Children Study is a population-based epidemiologic study was performed that identified a cohort of children, and included ophthalmic evaluation and measurement of refractive error by cycloplegic automated refraction. Children included in the present analysis were age ≤72 months at time of examination. Parents of enrolled children completed a questionnaire that assessed family history of myopia, number of hours of near work (reading, coloring, playing video games, etc), and outdoor activity. Statistical analysis identified factors associated with the refractive error. Myopia was defined by a spherical equivalent refractive error of at least -0.50 diopters.
Results: Children of myopic parents were more likely to be myopic, with an odds ratio of 1.91 (95% CI; 1.38 to 2.63). There was no association seen between time spent in near work or outdoor activities.
Conclusions: Genetic factors, reflected by family history are more strongly predictive of myopia in preschool children than are environmental factors such as near work or outdoor activity.
Reviewer's Comments: Studies in older children and teenagers have demonstrated the effect of near work and other environmental factors on the risk of myopia. Prolonged near work has been demonstrated to be a risk factor for myopia in older children and teenagers, particularly if they do not participate in as much outdoor activity. These factors presumably influence myopia through prolonged accommodation during near work and less time spent with relaxed accommodation during outdoor activity. In younger children, genetic factors appear to exert the strongest influence, indicating that genetic predisposition toward myopia is important, and suggesting that environmental factors play a role in predisposed individuals. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Myopia, Preschool, Genetics, Environment

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Epinephrine Use During Cataract Surgery Not Linked With Macular Edema

Effect of Intracameral Epinephrine Use on Macular Thickness After Uneventful Phacoemulsification.

Bozkurt E, Yazici AT, et al:

J Cataract Refract Surg 2010; 36 (August): 1380-1384

Intracameral epinephrine is useful for intraoperative pupil dilation and does not lead to macular edema as can long-term topical epinephrine used as glaucoma therapy.

Objective: To evaluate the association between intracameral epinephrine use and the development of postoperative macular edema.
Design: Randomized, controlled clinical trial.
Participants: 149 patients scheduled to undergo routine phacoemulsification.
Methods: Patients were randomly assigned to have intraoperative injection of 0.2 ml of epinephrine 1:5000 solution or to a control group without intracameral epinephrine injection. The drug was injected immediately after performance of a clear corneal incision. The remainder of the surgery proceeded in identical fashion in both groups. Postoperative macular thickness values measured by optical coherence tomography (OCT) at periodic intervals through 6 months following surgery were compared to preoperative values in each group.
Results: 73 eyes were in the treatment group and 76 eyes were in the control group. A statistically significant increase in macular thickness was seen in both groups at 1 month, 3 months, and 6 months following surgery in comparison to baseline values. However, there was no difference in macular thickness between the epinephrine and control groups.
Conclusions: Intracameral epinephrine does not result in macular thickening when used during cataract surgery.
Reviewer's Comments: Intracameral epinephrine can be useful for intraoperative mydriasis and has a rapid onset of action. In addition, it has been suggested as a treatment to reduce intraoperative problems associated with floppy iris syndrome caused by Flomax and other systemic alpha sympathetic antagonists. Chronic topical use of epinephrine for glaucoma therapy has been associated with the development of cystoid macular edema, prompting the current study to be performed. The results demonstrate that there is no risk from its intraoperative use on postoperative macular thickness. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Cataract Surgery, Retinal Edema, Epinephrine

Print Tag: Refer to original journal article

Intracameral Triamcinolone Reduces Inflammation Following Pediatric Cataract Surgery

Outcomes of Cataract Surgery and Intraocular Lens Implantation With and Without Intracameral Triamcinolone in Pediatric Eyes.

Dixit NV, Shah SK, et al:

J Cataract Refract Surg 2010; 36 (September): 1494-1498

Intracameral triamcinolone acetonide injection can reduce postoperative inflammation and obscuration of the visual axis following pediatric cataract surgery.

Objective: To evaluate the efficacy of intracameral triamcinolone acetonide injection on reducing postoperative inflammation and preventing capsular opacification following pediatric cataract surgery.
Design/Participants: Retrospective case-control study in 124 consecutive children undergoing surgery for congenital cataract extraction.
Methods: All patients were aged ≤21 months at the time of surgery. In the study group, intraoperative injection of triamcinolone suspension 40 mg/ml was given 3 times during surgery with a volume of 0.1 to 0.2 ml in each injection. Age-matched control subjects received no triamcinolone injections. The remainder of the cataract procedure was identical in both groups and included anterior and posterior capsulorrhexis and anterior vitrectomy prior to insertion of a foldable acrylic posterior chamber intraocular lens. Postoperative comparison of ocular inflammation and obscuration of the visual axis was compared between groups.
Results: Mean patient age was 9.2 months in the study group (41 eyes) and 9.3 months in controls (83 eyes). Obscuration of the visual axis by inflammatory membranes occurred in no triamcinolone-treated eyes, while it occurred in 11% of control eyes (P =0.03), many of which required secondary vitrectomy and membrane removal. A significantly lower amount of postoperative inflammation was seen in treated eyes as reflected by fewer inflammatory deposits and less posterior synechia formation.
Conclusions: Intracameral triamcinolone acetonide administered during pediatric cataract surgery reduces postoperative inflammation and obscuration of the visual axis by inflammatory membranes.
Reviewer's Comments: Infants undergoing cataract surgery are prone to a much more robust postoperative inflammatory response than are older patients. This study demonstrates that intraoperative use of triamcinolone can significantly reduce this inflammatory reaction and decrease the risk of requiring subsequent surgery to manage related complications. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Cataract Surgery, Complications, Triamcinolone Acetonide

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Increased Tilt of Operating Microscope Reduces Photic Stress on Macula

Effect of the Angle of the Operating Microscope Light Beam on Visual Recovery After Phacoemulsification: Randomized Trial.

Harman FE, Corbett MC, Stevens JD:

J Cataract Refract Surg 2010; 36 (August): 1311-1315

Photic stress on the macula from the operating microscope can be decreased by tilting the angle of the microscope during ophthalmic surgery.

Objective: To evaluate differences in the rate of recover from photic stress following ophthalmic surgery with direct or tilted illumination from the operating microscope.
Design: Randomized, controlled clinical trial.
Participants: 30 patients undergoing routine cataract surgery by phacoemulsification targeted for emmetropia.
Methods: Preoperative evaluation included grading of the nucleus density on a scale of 0 to 4. Patients with corneal opacity or astigmatism >1.50 diopters (D) were excluded, as were those with nucleus density less than grade 1 or greater than grade 3. Random assignment was made to having the microscope directly over the visual axis, or tilted to 15° nasally. Uncorrected and pinhole visual acuity 10 minutes and 60 minutes after surgery was used to assess recovery from macular photic stress.
Results: No differences were present between groups in the mean nucleus density, axial length, or amount of astigmatism. Mean uncorrected Snellen equivalent visual acuity 10 minutes after surgery was 20/50 in eyes with tilted illumination, compared to 20/105 in those where direct illumination was used. Mean pinhole visual acuity at the same time point was 20/30 in eyes with tilted illumination, and 20/55 in those with direct illumination. These differences were statistically significant. No differences in visual acuity between groups were noted at the 60 minute time point.
Conclusions: Tilting the operating microscopy by 15° results in reduced photic stress to the macula, as demonstrated by faster recovery of postoperative visual acuity.
Reviewer's Comments: Retinal injury from the phototoxicity from the operating microscope is a well-described phenomenon and can result in permanent reduction of visual acuity in rare cases when surgery is prolonged and when the crystalline lens or an intraocular lens allows crisp focus of the bulb filament on the macula. Although the long-term effects of shorter exposure are uncertain, reducing photic stress to the macula is clearly desirable and can be achieved with slight tilt of the microscope. With modern microscopes, this has little effect on the quality of the red reflex. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Cataract Surgery, Complications, Photic Stress, Microscope Illumination

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Common Causes of Toxic Anterior Segment Syndrome Appear Preventable

Toxic Anterior Segment Syndrome: Common Causes.

Cutler Peck CM, Brubaker J, et al:

J Cataract Refract Surg 2010; 36 (July): 1073-1080

Re-use of single-use disposable surgical products and poor instrument cleansing and sterilization practices increase the risk of toxic anterior segment syndrome.

Objective: To identify factors associated with the development of toxic anterior segment syndrome (TASS) following intraocular surgery.
Design: Survey of members of the American Society of Cataract and Refractive Surgery.
Methods: A TASS questionnaire was placed on the web site of the American Society of Cataract and Refractive Surgery. The questionnaire assessed issues related to processing and sterilization of surgical instruments for cataract surgery, as well as surgical protocols followed during surgery. Questions included evaluation of the type of surgical products used, the use and re-use of disposable instruments including surgical blades and cannulas, and the use of preservative-free solutions for intraocular injection. The results of the questionnaire were analyzed and common practices associated with the occurrence of cases of TASS were identified.
Results: Data were evaluated from 77 questionnaires associated with cases of TASS. In addition, data from 54 site visits to surgical facilities where a total of 367 cases of TASS had occurred were also evaluated. Common practices associated with the occurrence of TASS included inadequate flushing of phacoemulsification and irrigation/aspiration hand pieces prior to sterilization, use of enzymatic cleansers, use of the wrong concentration of detergents, ultrasonic bath use for instrument cleansing, use of preserved epinephrine for intraocular injection, use of inappropriate agents for skin sterilization, and use of powdered gloves. Significant factors increasing the risk of TASS included re-use of single-use instruments and poor instrument maintenance.
Conclusions: A variety of causes of TASS have been identified. Proper maintenance, cleansing, and sterilization of surgical instruments and following proper protocols during surgery can prevent the occurrence of this complication of ophthalmic surgery.
Reviewer's Comments: TASS can result from a variety of causes, but all have in common the introduction of chemicals into the anterior chamber that induces inflammation and/or corneal endothelial cell dysfunction. It is imperative that proper cleansing, handling, and sterilization practices be followed for maintaining surgical instruments in order to prevent toxic residues from accumulating on their surface. In addition, the introduction of preservatives into the anterior chamber through the misuse of drugs not intended for intraocular use must be avoided by maintaining strict procedures for nursing and technical staff to follow when preparing for ophthalmic surgery. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Cataract Surgery, Complications, Toxic Anterior Segment Syndrome

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Cyclosporine Can Improve Dry-Eye Symptoms Following Cataract Surgery

Cyclosporine 0.05% to Improve Visual Outcomes After Multifocal Intraocular Lens Implantation.

Donnenfeld ED, Solomon R, et al:

J Cataract Refract Surg 2010; 36 (July): 1095-1100

Treatment of dry eye can improve quality of vision through restoration of a normal tear film, which is important to gain the advantages of uncorrected acuity offered by multifocal intraocular lenses.

Objective: To evaluate the efficacy of topical cyclosporine 0.05% (Restasis®) in improving dry eye-related symptoms in patients following cataract surgery with implantation of a multifocal intraocular lens (mIOL).
Design: Randomized, controlled clinical trial.
Participants: 28 eyes of 14 patients with bilateral visually significant cataract scheduled for bilateral sequential cataract surgery.
Methods: All patients underwent surgery by a single cataract surgeon, with implantation of a mIOL (ReZoom®) in the capsular bag. Each patient was randomly assigned to use, in addition to other routine topical medications following surgery, either cyclosporine 0.05% twice daily or Systane® Free non-preserved artificial tears twice daily for 2 months. The alternate study medication was assigned for the second eye undergoing cataract surgery. Follow-up examination at the 2-month time point was performed to compare clinical and visual outcomes between groups.
Results: Mean uncorrected distance visual acuity was better in the cyclosporine treated eyes than in the artificial tears eyes (20/25 vs. 20/30, *P* =0.04). In addition, mean corrected distance visual acuity was better in cyclosporine-treated eyes than controls (20/20 vs. 20/25, *P* =0.03). Other objective indicators of dry eye were less prominent in cyclosporine-treated eyes, including severity of superficial punctate keratitis and length of tear film breakup time. Furthermore, patients subjectively preferred the vision in cyclosporine-treated eyes than in controls (57% vs. 14%, *P* =0.01).
Conclusions: Topical cyclosporine can reduce subjective and objective findings of dry eye and improve visual acuity after cataract surgery.
Reviewer's Comments: Patient expectations for visual quality after cataract surgery are much higher in this era of small incision cataract surgery. Those patients who choose to have multifocal IOL implantation can have particularly high expectations not only for best corrected, but also uncorrected visual acuity at distance and at near. Dry eye can result in poor tear film quality that not only causes distressing symptoms of foreign body sensation, but also degrades the quality of vision. Treatment of dry eye with topical lubricants is not always effective. In such cases, the use of topical cyclosporine can offer improvement in symptoms and in the quality of vision, allowing patients with multifocal IOLs to benefit from the possibility of spectacle independence. This study found a benefit in all patients, regardless of the presence or absence of baseline dry eye symptoms, suggesting that unrecognized dry eye is common in older patients undergoing cataract surgery. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Dry Eye, Tear Film, Topical Cyclosporine

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Antioxidants May Decrease Risk of Pseudoexfoliation

Exfoliation Syndrome in the Reykjavik Eye Study: Risk Factors for Baseline Prevalence and 5-Year Incidence.

Arnarrson A, Jonasson F, et al:

Br J Ophthalmol 2010; 94 (July): 831-835

A diet high in antioxidants may be a protective factor against the development of pseudoexfoliation syndrome.

Objective: To evaluate the prevalence and incidence of pseudoexfoliation syndrome (PXS) and to identify risk factors for its development.
Design: Population-based, longitudinal cohort study.
Participants: 1045 adults aged ≥50 years identified in Reykjavik, Iceland.
Methods: Baseline clinical evaluation included a comprehensive ophthalmic examination. Findings on slit-lamp examination were used to identify the presence of pseudoexfoliation in the anterior segment. In addition, study subjects completed an extensive questionnaire that evaluated demographic, dietary, and other factors. Follow-up examination was also performed in 981 surviving members of the cohort in 2001. Repeat examination allowed the identification of new cases of pseudoexfoliation occurring in this 5-year time interval. Statistical analysis was performed to determine risk factors associated with the presence of PXS.
Results: Age, female gender, increased iris pigmentation, moderate use of alcohol, and a self-reported history of asthma were all correlated with the presence of PXS at baseline. Evaluation of dietary date demonstrated that those subjects who reported at least twice weekly consumption of fiber-rich vegetables, green or yellow vegetables, or fruits during their 20s through 40s were significantly less likely to have PXS at baseline than those who reported such consumption less than once monthly. The same results were found for those who reported this pattern of fruit and vegetable consumption during their 40s through 60s. The risk of developing PXS increased by 5% for each decade of increased age.
Conclusions: PXS incidence increases with age. In addition, its presence appears to be influenced by consumption of fruits and vegetables.
Reviewer's Comments: The fruits and vegetables evaluated in the dietary questionnaire are high in antioxidants. The authors hypothesize that antioxidant consumption may modify the risk of developing PXS, leading to their observed findings. Further research is needed to elucidate the role that oxidative stress may play in the development of PXS and how dietary and other factors may be useful in its prevention. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Pseudoexfoliation Glaucoma, Prevalence, Incidence

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Improvements in Amblyopia Therapy Needed

An Audit of the Outcome of Amblyopia Treatment: A Retrospective Analysis of 322 Children.

Awan M, Proudlock FA, et al:

Br J Ophthalmol 2010; 94 (August): 1007-1011

The outcome of amblyopia therapy is worse in children with anisometropia and strabismus than in those with only one of these conditions.

Objective: To evaluate the efficacy of treatment for amblyopia in children with anisometropic or strabismic amblyopia, or a combination of these two etiologies.
Design/Participants: Retrospective, comparative clinical case series of 322 children with amblyopia.
Methods: Clinical records were reviewed of a consecutive series of children with amblyopia who were aged ≤8 years at the time of presentation. Those with an etiology of amblyopia other than strabismus and/or anisometropia were excluded. Patients were categorized on the basis of the cause of amblyopia (strabismic, anisometropic, or mixed). The type of treatment provided including the number of hours per day and duration of recommended patching was recorded. In addition, treatment outcomes were assessed based on the change in best corrected visual acuity at the time of final follow-up examination.
Results: Children with mixed amblyopia had worse visual acuity at baseline and were prescribed a more intensive course of patching therapy than those with strabismic or anisometropic amblyopia. A higher proportion of patients with anisometropic or strabismic amblyopia achieved a final visual acuity of 20/40 or better than in the mixed amblyopia group (86%, 90%, and 64%, respectively).
Conclusions: The results of amblyopia therapy are not always optimal. Results are particularly disappointing in children with both strabismus and amblyopia as contributors toward amblyopia development.
Reviewer's Comments: This study shows that the results of amblyopia therapy are too often disappointing. Since failure to comply with the recommended regimen of patching is a common contributor to failure of amblyopia therapy, further work is needed to find ways to improve compliance. Some potential methods to address this problem include the development of effective educational and training interventions for parents. In addition, in cases where compliance with patching is a known problem, alternative treatments to patching (such as atropine penalization) that does not require parental participation is another option. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Amblyopia, Treatment

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