

## Reducing Pre-Op Bacterial Colonization of Conjunctive

*Preoperative Topical Moxifloxacin 0.5% and Povidone-Iodine 5.0% Versus Povidone-Iodine 5.0% Alone to Reduce Bacterial Colonization in the Conjunctival Sac.*

Halachimi-Eyal O, Lang Y, et al:

J Cataract Refract Surg 2009; 35 (December): 2109-2114

Betadine 5.0% applied to the conjunctival sac is as effective as combined treatment with Betadine and topical moxifloxacin for reduction of bacterial counts prior to intraocular surgery.

**Objective:** To evaluate effectiveness of topical moxifloxacin 0.5% when used in addition to topical povidone-iodine 5.0% for reduction of bacterial cell counts in the conjunctiva prior to intraocular surgery.

**Design:** Randomized, placebo-controlled clinical trial.

**Participants:** 464 consecutive patients undergoing intraocular surgery.

**Methods:** 2 hours prior to surgery, patients were randomly assigned to receive topical moxifloxacin 0.5% 4 times every 15 minutes, or saline drops as a control. All patients received the same regimen of preoperative treatment apart from study medicine or placebo, which included application of 5.0% Betadine solution into the conjunctival sac immediately prior to surgery. Bacterial cultures were obtained at baseline before any preoperative medications were given and immediately prior to the surgical procedure. Bacterial culture results were compared between groups.

**Results:** Positive conjunctival cultures were obtained at baseline in 38% of patients in the antibiotic group and 41% of patients in the control group. Immediately prior to surgery, 3 minutes after application of topical Betadine, 4% of patients in the antibiotic group and 3% of controls had positive cultures. None of these differences was statistically significant.

**Conclusions:** Treatment with Betadine 5.0% to the conjunctiva alone is as effective as combined treatment with moxifloxacin 0.5% and Betadine 5.0% in reducing conjunctival bacterial counts prior to intraocular surgery.

**Reviewer's Comments:** While I will continue to use topical antibiotics, to be certain that I am doing everything possible to prevent endophthalmitis, it must be recognized that the use of Betadine 5.0% to the conjunctiva is the most important thing that can be done to prevent this major complication from occurring. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Antiseptics, Betadine, Povidone Iodine, Bacterial Colonization, Conjunctival Sac

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## Corneal Flap Characteristics Do Not Affect Dry Eye Following LASIK

*Dry Eyes and Corneal Sensation After Laser In Situ Keratomileusis With Femtosecond Laser Flap Creation: Effect of Hinge Position, Hinge Angle, and Flap Thickness.*

Mian SI, Li A, et al:

J Cataract Refract Surg 2009; 35 (December): 2092-2098

Dry eye symptoms and signs tend to resolve within 12 months following LASIK when performed with the femtosecond laser for flap creation.

**Objective:** To determine whether characteristics of the corneal flap affect corneal sensation and dry eye signs and symptoms after myopic laser in situ keratomileusis (LASIK) in patients who have flap creation using a femtosecond laser.

**Design:** Randomized, controlled clinical trial.

**Participants:** 95 patients with myopia undergoing bilateral LASIK.

**Methods:** Patients were randomly assigned in each eye to have variation in the flap hinge location, either superior or temporal; flap hinge angle, either 45° or 90°; and flap thickness, either 100 µm or 130 µm. Baseline measurements of corneal sensation using Cochet-Bonnet esthesiometry, objective testing for dry eye including Schirmer test, tear film breakup time, as well as corneal and conjunctival staining with fluorescein and lissamine green, were performed. In addition, patients completed the Ocular Surface Disease Index questionnaire to assess subjective findings indicative of dry eyes. These tests were repeated at 1 week, 1 month, 3 months, 6 months, and 12 months following surgery.

**Results:** Corneal sensation was decreased at all postoperative visits throughout the 12-month follow-up period. However, corneal sensation improved throughout the study, and almost returned to baseline by the 1-year follow-up time point. No differences in corneal sensation were seen as a function of hinge location, hinge angle, or flap thickness at any time point. Indicators of dry eye based on clinical examination demonstrated resolution of dry eye findings after the 3-month follow-up time point. Although dry eye symptoms occurred immediately after LASIK and through 3 months of follow-up, the Ocular Surface Disease Index score returned to baseline by the 6-month time point.

**Conclusions:** Dry eye syndrome after myopic LASIK using the femtosecond laser for flap creation tends to be mild and improves after treatment. Corneal flap hinge position, hinge angle, and flap thickness have no apparent effect on the occurrence of this complication after LASIK.

**Reviewer's Comments:** The authors speculate that greater regularity in terms of flap thickness and diameter, as well as reduced trauma to the corneal epithelium during flap creation using the femtosecond laser in comparison to a mechanical microkeratome results in less trauma to the corneal nerves. It is well known that corneal denervation due to trauma to the corneal nerves during flap creation is responsible for dry eye following LASIK, and the relatively mild symptoms and resolution after 6 months in this study compares favorably to other studies that investigated dry eyes using mechanical microkeratome-performed LASIK. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Dry Eye, Refractive Surgery, LASIK, Corneal Flap, Corneal Sensation

Print Tag: Refer to original journal article

## Better Visual Outcomes Seen After PRK With Mitomycin C Than After LASIK

*One-Year Outcomes of a Bilateral Randomised Prospective Clinical Trial Comparing PRK With Mitomycin C and LASIK.*

Wallau AD, Campos M:

Br J Ophthalmol 2009; 93 (December): 1634-1638

Best-corrected visual acuity and contrast sensitivity are better following photorefractive keratectomy with mitomycin C than LASIK.

**Objective:** To compare clinical outcomes 1 year following photorefractive keratectomy (PRK) with mitomycin-C (MMC), and laser in situ keratomileusis (LASIK) for correction of myopia.

**Design:** Randomized controlled clinical trial.

**Participants:** 88 eyes of 44 patients with moderate myopic astigmatism.

**Methods:** Patients underwent bilateral surgery with 1 eye randomly assigned to receive PRK with MMC 0.002% applied for 1 minute, and LASIK in the fellow eye. Patients were monitored postoperatively, and clinical outcomes at 1-year follow-up were compared.

**Results:** No significant differences were seen between LASIK and PRK with MMC eyes at baseline. At 1-year postoperatively, there was no statistically significant difference in the spherical-equivalent refractive error. Spherical aberration, astigmatism, and higher-order aberrations were slightly less in the PRK with MMC eyes. While uncorrected visual acuity was identical in groups, slightly better best-corrected visual acuity and improved contrast sensitivity were noted in the PRK with MMC group.

**Conclusions:** Wavefront-guided PRK with MMC was more effective than LASIK for correction of moderate myopia at 1-year follow-up.

**Reviewer's Comments:** Use of MMC in conjunction with PRK has demonstrated a benefit with regard to elimination of stromal haze even in the correction of moderate and higher myopia. This study demonstrates excellent visual outcomes in both groups, but superior outcomes in PRK with MMC in comparison to LASIK. In addition, surface ablation offers a thicker residual stromal bed, a reduced risk of postoperative ectasia, and an absence of potential flap complications. For these reasons, PRK with MMC may be a better choice than LASIK in many patients in spite of the longer recovery time and greater degree of postoperative discomfort. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Refractive Surgery, Myopia, Photorefractive Keratectomy, LASIK, Mitomycin-C

Print Tag: Refer to original journal article

# Late Flap-Lift for LASIK Retreatment Increases Risk of Epithelial Ingrowth

*Incidence of Epithelial Ingrowth in Primary and Retreatment Laser In Situ Keratomileusis.*

Caster AI, Friess DW, Schwendeman FJ:

J Cataract Refract Surg 2010; 36 (January): 97-101

Flap-lift retreatment, particularly when performed  $\geq 3$  years after initial LASIK, increases the risk of clinically significant corneal epithelial ingrowth.

**Objective:** To evaluate risk of development of clinically significant epithelial ingrowth after primary laser in situ keratomileusis (LASIK) and flap-lift retreatment of LASIK.

**Design:** Retrospective interventional clinical case series.

**Methods:** A consecutive series of all patients who underwent LASIK by a single surgeon in a 3.5-year time period were retrospectively reviewed. Follow-up examination allowed identification of clinically significant epithelial ingrowth, which was defined by growth of epithelial cells between the stroma and corneal flap that approached the visual axis and resulted in a reduction of best-corrected or uncorrected visual acuity. Patients were also classified on the basis of having only 1 session of LASIK, or those who required a flap lift for retreatment of persistent, symptomatic refractive error. Comparison of probability of developing epithelial ingrowth was made between groups.

**Results:** 3866 patients underwent primary LASIK alone, while 646 patients underwent LASIK with flap-lift retreatment. The proportion of patients that developed clinically significant epithelial ingrowth was higher in those requiring flap-lift retreatment (2.3% versus 0.0%,  $P < 0.0001$ ). The authors found that epithelial ingrowth was more likely to occur in patients who underwent flap-lift retreatment  $\geq 3$  years after primary LASIK (7.7% versus 1.0%,  $P = 0.0001$ ). No other clinical or demographic factors were associated with the risk of epithelial ingrowth.

**Conclusions:** Flap-lift retreatment for LASIK performed  $\geq 3$  years after the initial procedure leads to a significantly higher risk of clinically significant epithelial ingrowth.

**Reviewer's Comments:** The authors found that treatment of clinically significant epithelial ingrowth with an additional flap lift and debridement of the epithelial cells was highly effective in resolving this problem. However, they recommend that flap-lift retreatment be performed, when possible,  $< 3$  years after initial LASIK, and that patients who require flap-lift retreatment at a later time be informed of the risk of this potential complication. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Refractive Surgery, Complications, Epithelial Ingrowth, LASIK

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## New Glasses Could Mean Higher Risk of Falls in Older Adults

*Adaptive Gait Changes Due to Spectacle Magnification and Dioptric Blur in Older People.*

Elliott DB, Chapman GJ:

Invest Ophthalmol Vis Sci 2010; 51 (February): 718-722

Magnification change resulting from dispensing new glasses may affect the ability of older adults to negotiate stairs, even though visual acuity may be improved.

**Objective:** To evaluate the effect of spectacle magnification on the ability to negotiate steps in older adults.

**Design:** Prospective clinical study.

**Participants:** 10 adults with a mean age of 77 years.

**Methods:** Visual acuity was measured after manifest refraction to determine refractive error. Visual acuity, contrast sensitivity, and stereoacuity were measured with the proper distance correction and with +1.00, +2.00, -1.00, and -2.00 diopter blur lenses. A series of measurements of the ability to navigate a 152mm step beginning two paces away from the edge of the step were performed. This was repeated with optimal distance correction and with +1.00, +2.00, -1.00, and -2.00 diopter blur lenses.

**Results:** The +1.00 and -1.00 diopter blur lenses led to equal reduction in visual acuity and stereoacuity. Similarly, a greater but equal reduction in visual acuity and stereoacuity was seen with the +2.00 and -2.00 diopter blur lenses. Although the effect on visual acuity and stereoacuity was similar with plus or minus blur lenses, step negotiation differed greatly with the plus or minus blur lenses. With plus lenses, a greater distance of the foot from the edge of the step with increased vertical toe clearance was noted in comparison to the corresponding minus blur lens.

**Conclusions:** Negotiation of steps is not affected by refractive correction on blur or stereoacuity, but by magnification changes of the lenses.

**Reviewer's Comments:** Those of us who prescribe glasses should be aware that a change in magnification resulting from the dispensing of new glasses can affect the ability of older patients to negotiate steps. Other studies have linked the receipt of new glasses to a higher incidence of falls in older adults. Even though clarity of vision may improve with proper prescription of distance glasses, it can take time for individuals to adapt to the new magnification changes, which can affect their ability to negotiate steps. Warning patients to take care while adapting to new glasses is important in order to minimize the risk of such incidents. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Refractive Correction, Gait, Elderly

Print Tag: Refer to original journal article

## Bifocals Can Slow Progression of Myopia in Some Children

*Randomized Trial of Effect of Bifocal and Prismatic Bifocal Spectacles on Myopic Progression: Two-Year Results.*

Cheng D, Schmid KL, et al:

Arch Ophthalmol 2010; 128 (January): 12-19

The use of 1.5-diopter bifocals can slow the rate of progression of myopia in children who have a high rate of myopia progression at baseline.

**Objective:** To determine whether bifocal and prismatic bifocal spectacles reduce the rate of myopia progression in children.

**Design:** Randomized controlled clinical trial.

**Participants:** 135 myopic Chinese-Canadian children.

**Methods:** Participants had myopia of  $\geq 1.00$  diopter and had experienced progression of myopia of  $\geq 0.50$  diopters in the year prior to enrollment. Children were randomly assigned into 1 of 3 treatment groups: (1) Single-vision distance glasses; (2) +1.50 diopter executive-style bifocals; (3) +1.50 diopter executive-style bifocals with +3.00 prism diopters of base-in prism in the near segment of each lens. Baseline examination included cycloplegic refraction using an autorefractor; this was repeated at every 6 months through 2 years of follow-up. In addition, axial length measurements were made using A-scan ultrasonography at each follow-up visit. Differences in rate of change of refractive error and axial length were compared between groups.

**Results:** Rate of progression of myopia was significantly lower in children in the bifocal or prismatic bifocal groups compared to those using single-vision distance glasses. Mean amount of myopia progression was -1.55 diopters in the single-vision distance glasses group, compared to -0.96 diopters and -0.70 diopters in the bifocal and prismatic bifocal groups, respectively. Axial length increased an average of 0.62 mm in the single-vision distance glasses group. In both bifocal groups, mean change in axial length was 0.41 mm. In comparison to single-vision glasses, both standard and prismatic bifocal groups showed significantly lower rates of myopia progression and change in axial length.

**Conclusions:** Bifocal lenses can slow the rate of myopic progression in children with high baseline rates of myopia progression, according to 2 years of follow-up.

**Reviewer's Comments:** The authors did not feel that the difference in myopia progression between bifocal groups was clinically significant. In addition, the absence of a difference in axial length change during the study in the bifocal groups suggests that prismatic bifocals, which reduce not only accommodative demand but also convergence demand, show no additional benefit. They believe that the reduction of accommodative demand was primarily responsible for the reduced rate of myopia progression. It must be emphasized that these results can be applied only to children who show significant baseline rates of myopia progression, and may not prevent myopia from progressing in children who have a slower rate of change. In addition, it is clear that factors other than accommodation are at work in myopia progression, as the rate of myopia progression did not decrease completely in children who wore bifocals. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Myopia, Bifocal Spectacles, Children

Print Tag: Refer to original journal article

## High Caloric, Sodium Intake Increase Risk of Diabetic Retinopathy

*High Caloric and Sodium Intakes as Risk Factors for Progression of Retinopathy in Type 1 Diabetes Mellitus.*

Roy MS, Janal MN:

Arch Ophthalmol 2010; 128 (January): 33-39

Sodium intake is significantly associated with an increased risk of developing diabetic macular edema in type 1 diabetic patients.

**Objective:** To evaluate the association between dietary intake and 6-year progression of diabetic retinopathy in African-American patients with type 1 diabetes mellitus.

**Design:** Prospective, observational cohort study.

**Participants:** 725 African-American individuals with type 1 diabetes.

**Methods:** Baseline ophthalmic examination was performed, which included fundus photography that allowed classification of patients with regard to presence and severity of diabetic retinopathy and macular edema. Study subjects also completed a food frequency questionnaire to document average daily dietary intake. Follow-up examination was performed at 6 years, which included repeat ocular examination and fundus photography that allowed the identification of new cases of proliferative diabetic retinopathy and clinically significant macular edema. Statistical analysis was performed to determine dietary factors associated with the risk of progression of diabetic retinopathy.

**Results:** 469 subjects had 6-year follow-up data available and were at risk for developing vision-threatening diabetic retinopathy. Progression to vision-threatening diabetic retinopathy, which included proliferative diabetic retinopathy or macular edema, was significantly associated with an increased total caloric intake, as well as a higher intake of carbohydrate, protein, total fat, cholesterol, and sodium intake. New onset of clinically significant macular edema was significantly associated with an increased sodium intake.

**Conclusions:** In African-American patients with type 1 diabetes, increased caloric and sodium intake are risk factors for the development of vision-threatening diabetic retinopathy, including proliferative retinopathy and macular edema.

**Reviewer's Comments:** This study demonstrates the important role of diet in proper management of patients with type 1 diabetes, and may also be relevant for type 2 diabetics as well. Our patients with diabetes should be counseled to closely adhere to the dietary recommendations given to them by their internist or endocrinologist, and should be reminded that not only their longevity, but also their quality of life from a vision and overall standpoint, will be improved if they adhere to those recommendations. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Diabetic Retinopathy, Dietary Intake, Calories, Sodium, Type 1 Diabetes Mellitus

Print Tag: Refer to original journal article

# Rituximab Can Improve Inflammation in Patients With Thyroid Eye Disease

*Rituximab Treatment of Patients With Severe, Corticosteroid-Resistant Thyroid-Associated Ophthalmopathy.*

Khanna D, Chong KKL, et al:

Ophthalmology 2009; 117 (October 7): 133-139

Rituximab treatment greatly improved orbital inflammation among patients with severe, corticosteroid-resistant thyroid eye disease.

**Background:** There is no definitive therapy for thyroid eye disease (TED). Rituximab, a monoclonal antibody, targets CD20, a protein on B cells leading to apoptosis of B cells. Current indications include non-Hodgkin lymphoma and rheumatoid arthritis.

**Objective:** To report use of rituximab in severe, refractory TED and thyroid optic neuropathy.

**Design:** Retrospective case series.

**Participants:** 6 patients with TED from a single center in Los Angeles.

**Methods:** All patients had Graves disease (GD) and severe TED based on the clinic activity score (CAS), a 7-item evaluation. Patients were considered for rituximab therapy if they had a poor response to corticosteroids (CAS decreased <2, increase in CAS of  $\geq 2$  after discontinuation of corticosteroids), thyroid optic neuropathy, or persistent optic neuropathy after medial orbital wall decompression and corticosteroid therapy. Corticosteroid treatment consisted of oral prednisone at 1mg/kg/day for 4 weeks. Of patients, 1 received pulsed IV methylprednisolone and 1 received CellCept® as well. Rituximab was given in 1g infusions twice separated by 2 weeks. Of patients, 1 had an orbital decompression 12 days after rituximab therapy and the orbital tissues were examined by immunohistochemistry.

**Results:** There were 4 women and 2 men with a mean age of 54 years. Of patients, 3 were smokers. Corticosteroids were begun at 5 months after TED symptoms began and were administered for 8 months before rituximab was given. CAS was 5.3 before corticosteroids and 5.5 during corticosteroid therapy. CAS was 5.3 before rituximab and 1.3 at 8 weeks after the second rituximab infusion. At 6-month follow-up, CAS was 0.7. Of patients, 4 had thyroid optic neuropathy and all enjoyed improvement within 4 weeks of first rituximab treatment and returned to baseline at 2 months. Hertel measurements were 24 mm before therapy and 23 mm after therapy. No patient showed improvement in motility and 4 progressively worsened. Of patients, 1 died of cardiac arrest 3 months after the last infusion. No B cells or T cells were seen on the orbital biopsy.

**Conclusions:** Rituximab led to significant, rapid, and sustained improvement in orbital inflammation among patients with severe, corticosteroid-refractory TED.

**Reviewer's Comments:** The natural history of TED is for orbital inflammation to worsen over the course of 1 to 2 years and then improve. Typically, patients suffer persistent proptosis, ophthalmoplegia, and eyelid retraction. Two treatments of rituximab abbreviated this inflammation dramatically, but proptosis and ophthalmoplegia were essentially unaffected. It appears that rituximab abbreviates the duration of inflammation. (Reviewer-Michael S. Lee, MD).

Keywords: Thyroid Eye Disease, Ophthalmopathy, Rituximab

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## Is Oral Methylprednisolone as Effective as IV in MS Patients?

*A Short-Term Randomized MRI Study of High-Dose Oral Vs Intravenous Methylprednisolone in MS.*

Martinelli V, Rocca MA, et al:

Neurology 2009; 73 (December 1): 1842-1848

Daily oral methylprednisolone is not inferior to daily intravenous methylprednisolone in identical doses with regards to gadolinium-enhancing lesions in patients with multiple sclerosis.

**Background:** Standard of care for a multiple sclerosis (MS) relapse is to treat with intravenous (IV) methylprednisolone (MP) 1g per day for 3 to 5 days. However, IV therapy is expensive, time consuming, and more difficult for the patient. Studies have suggested that oral methylprednisolone (oMP) and IVMP may have similar biologic effects in the treatment of MS relapses.

**Objective:** To compare short-term effects of oMP and IVMP on clinical and brain MRI activity in an acute relapse of MS.

**Design:** Randomized, single-masked clinical trial.

**Participants:** 40 MS patients with acute relapse from a single center in Italy.

**Methods:** Patients had to have relapsing remitting MS and a new demyelinating attack within 14 days of steroid treatment, and at least 1 gadolinium-enhancing lesion on brain MRI. Patients were excluded for use of any steroids within 30 days, age >55 years, diabetes, gastritis, spinal cord involvement, and high disability scores. The neurologist was masked to treatment and MRI results; disability was graded on a quantitative scale, the Expanded Disability Status Scale (EDSS). Patients were randomized to receive either 1g of daily oMP or IVMP for 5 days.

**Results:** There were 20 patients in each group. Each group had 6 men. Patients in the oMP were older than the IVMP with a mean age of 36 years versus 31 years, respectively. EDSS scores were 3.0 and 3.5 in the IVMP and oMP groups, respectively. Mean reduction in number of gadolinium-enhancing lesions at 1 week was 79% and 58% in the oMP and IVMP groups, respectively. The difference was not statistically significant. This similarity persisted at 4 weeks. The EDSS improved in both groups similarly at week 1 and week 4. Adverse events were reported in 65% of patients and were similar between groups except dysgeusia was more common among the oMP group (n=5) compared to the IVMP group (n=1).

**Conclusions:** Oral MP (1g daily for 5 days) is as effective and safe as IVMP (1g daily for 5 days) in reducing short-term EDSS and gadolinium-enhancing lesions for acute MS relapse.

**Reviewer's Comments:** This study shows a similar effect of 1g daily methylprednisolone for 5 days given orally or intravenously. Keep in mind that oMP is not the same as oral prednisone. This study does not indicate that oral is as effective and safe as intravenous MP in a first attack of optic neuritis or other ophthalmic diseases. (Reviewer-Michael S. Lee, MD).

Keywords: Multiple Sclerosis, Corticosteroids, Oral, Intravenous, Methylprednisolone

Print Tag: Refer to original journal article

## Fat Distribution Differs in Patients With Idiopathic Intracranial Hypertension

*Idiopathic Intracranial Hypertension Is Associated With Lower Body Adiposity.*

Kesler A, Kliper E, et al:

Ophthalmology 2009; 117 (November 12): 169-174

Patients with idiopathic intracranial hypertension tend to accumulate fat in the lower body instead of the abdomen.

**Background:** Idiopathic intracranial hypertension (IIH) overwhelmingly affects obese women of childbearing age. The reasons for this association are unclear. Most harmful disorders related to obesity (eg, diabetes, hypertension, etc) result from abdominal fat deposition as opposed to gynecoid obesity (fat accumulation in the buttocks and legs).

**Objective:** To determine the adipose distribution of patients with IIH.

**Design:** Retrospective, observational case series.

**Participants:** 44 women with IIH and 383 controls from Israel.

**Methods:** All patients met the modified Dandy criteria for the diagnosis of IIH. Controls were selected from 199 women in an Israeli nutritional health survey with a body mass index (BMI)  $\geq 30$  kg/m<sup>2</sup> and aged 25 to 57 years. Another group of controls included 184 women who visited the medical center's obesity clinic. All women had measurements of height, weight, blood pressure, fasting lipid panel, and fasting blood glucose. IIH patients and obesity clinic patients had waist circumference measured halfway between the lower rib cage and iliac crest at the mid-axillary line. National survey patients had waist circumference measured at narrowest part of the trunk where the skin folds with bending the trunk sideways. Hip circumference was measured at the widest line around the buttocks. Upper body and lower body obesity were defined as waist-to-hip ratio (WHR) of  $\geq 0.85$  and  $\leq 0.79$ , respectively.

**Results:** There were 44 patients with IIH. BMI of 4 patients fell in the normal range ( $< 25$  kg/m<sup>2</sup>) and 80% were obese (BMI  $> 30$  kg/m<sup>2</sup>). Mean age in the obesity clinic and national survey were significantly higher (45 and 40 years, respectively) than the IIH group (32 years). BMI in the obesity clinic was significantly greater than other groups. WHR was adjusted for these differences. WHR in the IIH group (0.79) was significantly lower than the national survey (0.84) and obesity clinic (0.91). Among the IIH group, 20% fell in the upper body obesity group compared to 59% in the obesity clinic, and 43% in the national survey. Lower body obesity was seen in 45% of the IIH group, 7% of the national survey, and 2% of the obesity clinic. The IIH group had lower blood pressure, glucose, and lipid panels than the obesity clinic.

**Conclusions:** Gynecoid rather than abdominal fat accumulation occurs more commonly in IIH.

**Reviewer's Comments:** Adverse sequelae of obesity such as diabetes and hypertension typically relate to abdominal fat accumulation. Meanwhile, accumulation of lower body fat relates to IIH. We still don't know the cause of IIH, but this may help us focus our efforts on women with gynecoid obesity to identify pathophysiology and prevention. (Reviewer-Michael S. Lee, MD).

Keywords: Obesity, Idiopathic Intracranial Hypertension, Pseudotumor Cerebri, Variation, Distribution

Print Tag: Refer to original journal article

## Intravitreal Erythropoietin Appears Safe for Patients

### *Feasibility of Intravitreal Erythropoietin Injections in Humans.*

Lagrèze WA, Feltgen N, et al:

Br J Ophthalmol 2009; 93 (December): 1667-1671

A single intravitreal injection of 2000 U of erythropoietin appears reasonably safe without obvious complication.

**Background:** There is no effective neuroprotective agent for optic neuropathies to date. Numerous animal studies and in vitro studies have shown that erythropoietin (EPO) is neuroprotective. Some randomized clinical trials have shown a beneficial effect of EPO in stroke and multiple sclerosis.

**Objective:** To assess the safety of intravitreal EPO injections in human subjects.

**Design:** Prospective, interventional case series.

**Participants:** 3 patients with visual loss from a single center in Germany.

**Methods:** Patients could be included in this study if they were aged 50 to 80 years and suffered an acute ischemic event of the optic nerve or retina within 3 days. Patients were excluded if they had glaucoma, diabetic retinopathy, temporal arteritis, or any form of cancer. Each patient was given a single intravitreal injection of 2000 U of EPO in 0.05 mL using a 30-gauge needle 4 mm posterior to the limbus in the superotemporal quadrant. Acuity, Goldmann perimetry, full-field photopic electroretinography, serum EPO levels, and hematocrit were measured before the injection and then 1 day, 1 week, 1 month, and 3 months after the injection.

**Results:** Of patients, 2 had central retinal artery occlusion (male aged 76 years and female aged 79 years) and 1 had non-arteritic anterior ischemic optic neuropathy (male aged 65 years). None of the patients enjoyed improvement in visual acuity. Electrophysiology and perimetry did not change substantially. Serum EPO levels rose between 2 and 3 times baseline within the first week, but remained within the normal range. Levels returned to normal at 1 month follow-up. Hematocrit did not change over the 3-month period. There were no changes in intraocular pressure.

**Conclusions:** No complications or toxicities were observed in this small pilot series of a single 2000 U injection of erythropoietin.

**Reviewer's Comments:** There has been a lot of excitement about using various agents for neuroprotection. Topical brimonidine was tried in a number of ophthalmic trials, but has yet to show benefit as it has in the laboratory. Erythropoietin is another potential therapy. One of the added bonuses is that it is already approved by the Food and Drug Administration for human use. Here, the authors advocate intravitreal injection in an off label fashion. While no benefit was observed, they have laid the groundwork for possible future human trials. No short-term adverse events were observed, but this was a small number of patients. (Reviewer-Michael S. Lee, MD).

Keywords: Neuroprotection, Intravitreal, Erythropoietin

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## Pain Can Vary With Ocular Motor Cranial Nerve Palsies

*Pain in Ischaemic Ocular Motor Cranial Nerve Palsies.*

Wilker SC, Rucker JC, et al:

Br J Ophthalmol 2009; 93 (December): 1657-1659

Severe pain lasting weeks can accompany a microvascular, ocular motor cranial nerve palsy.

**Background:** Patients with microvascular third, fourth, or sixth nerve palsies may experience pain. There is a commonly held belief that pain is more common and severe among diabetics.

**Objective:** To determine severity and temporal characteristics of pain in patients with isolated, microvascular ocular motor nerve palsy.

**Design:** Retrospective and prospective case series.

**Participants:** 87 patients with an isolated, microvascular ocular motor cranial nerve palsy (MP) from 2 tertiary care centers in Cleveland and Atlanta.

**Methods:** Patients had to have an isolated third, fourth, or sixth nerve palsy with complete improvement over 6 months follow-up. Nearly complete resolution was acceptable if brain MRI was normal. It was defined as <3 prism diopters of residual strabismus or residual symptoms without any measurable misalignment. Patients were excluded for lack of improvement or follow-up, presence of aberrant regeneration, or alternative diagnosis. Of patients, 11 were studied prospectively and asked to rate pain on a 0 to 10 score. Duration of pain was determined in this group.

**Results:** There were 92 MP in 87 patients (54 men and 33 women with a mean age of 67 years). About half had sixth nerve palsy, about 40% had third nerve palsy, and 5% had fourth nerve palsy. Pain was more common among third nerve palsies (77%) compared to sixth nerve palsies (54%). In total, 40% of MP had diabetes mellitus and 60% of all MP experienced pain. Presence of pain, stratified by diabetic status, was not significantly different: 72% of diabetics and 55% of non-diabetics. Pain began an average of 6 days prior to diplopia in one third of patients and concurrent with diplopia in two thirds. Duration of pain was 10 days for mild-to-moderate pain and 26 days for severe pain. Almost 15% of MPs were described as severe pain.

**Conclusions:** Pain accompanies the majority of microvascular, ocular motor palsies independent of diabetic status. Pain can be severe, occur before or concomitantly with the diplopia, and last several weeks.

**Reviewer's Comments:** The key here is that just because the pain is severe or lasts several weeks, this does not rule out a microvascular cause. It is not as common, but certainly happens. (Reviewer-Michael S. Lee, MD).

Keywords: Pain, Ischemic, Ocular Motor, Trochlear

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## Resolving Abnormal Head Position With Congenital Superior Oblique Palsy

*Residual Torticollis in Patients After Strabismus Surgery for Congenital Superior Oblique Palsy.*

Lau FHS, Fan DSP, et al:

Br J Ophthalmol 2009; 93 (December): 1616-1619

Approximately 70% of children experience resolution of an abnormal head position following strabismus surgery to address congenital superior oblique palsy.

**Objective:** To evaluate the efficacy of strabismus surgery in eliminating a compensatory abnormal head position (AHP) in children with congenital superior oblique palsy (SOP).

**Design:** Prospective, interventional clinical case series.

**Participants:** 32 children with congenital SOP and a compensatory AHP.

**Methods:** All patients underwent a comprehensive preoperative ophthalmic and orthoptic examination. The surgical procedure (inferior rectus recession versus combined inferior rectus and inferior oblique recession) was selected based on bilaterality, spread of comitance, and severity of the vertical deviation. Children with a history of trauma or significant horizontal strabismus were excluded. Follow-up evaluation allowed determination of the probability of resolution of AHP and the degree of residual strabismus.

**Results:** Mean patient age at the time of surgery was 82.6 months. Mean follow-up after surgery was 38 months. A final postoperative vertical deviation of <3 prism diopters was achieved in 66% of cases. Success rate for elimination of the AHP was 69%.

**Conclusions:** Resolution of an AHP is achieved in the majority of children who undergo surgery for congenital SOP.

**Reviewer's Comments:** SOP is the most common cause of ocular torticollis. A compensatory head posture can result in the achievement of single binocular vision. This study demonstrates that the majority of children who undergo surgery to address this problem experience resolution of their compensatory head position, but parents must understand that a significant minority of children continue to require some degree of head positioning to achieve single binocular vision. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Superior Oblique Palsy, Strabismus Surgery, Abnormal Head Position, Children

Print Tag: Refer to original journal article

## Vision-Related Quality of Life Improves Following Macular Hole Surgery

*Vision-Related Quality of Life and Visual Function in Patients Undergoing Vitrectomy, Gas Tamponade and Cataract Surgery for Macular Hole.*

Fukuda S, Okamoto F, et al:

Br J Ophthalmol 2009; 93 (December): 1595-1599

Reduction in metamorphopsia following macular hole surgery is associated with significant improvement in vision-related quality of life.

**Objective:** To investigate the effect of macular hole surgery on vision-related quality of life.

**Design:** Prospective, observational clinical study.

**Participants:** 32 consecutive patients undergoing pars plana vitrectomy with gas tamponade and cataract extraction.

**Methods:** Each participant underwent a preoperative evaluation which included measurement of visual acuity and administration of a 25-item questionnaire assessing vision-related quality of life: the National Eye Institute Visual Function Questionnaire (VFQ-25). Follow-up evaluation was performed 3 months following surgery to evaluate functional improvement experienced by patients after surgery.

**Results:** There was a significant improvement in vision-related quality of life following surgery, reflected by higher scores on the VFQ-25. Significant improvements were noted on the overall score, as well as subscores for general vision, near activities, distance activities, social functioning, mental health, and dependency ( $P < 0.05$ ). Statistical analysis demonstrated a significant association between the severity of metamorphopsia and overall VFQ-25 score, and was the only clinical factor associated with quality of life scores.

**Conclusions:** Reduction in metamorphopsia can be achieved by macular hole surgery, which results in improved vision-related quality of life in patients affected by this condition. Improved function is observed in numerous aspects of patients' lives, including distance and near visual activities along with social and mental health aspects of quality of life.

**Reviewer's Comments:** Studies of quality of life are important in demonstrating the benefits in day to day life that are appreciated by patients after undergoing surgery. While the visual acuity outcomes that we commonly assess in patients are important, studies such as this confirm that the improved acuity that can be achieved translates into a functional benefit for patients. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Vitrectomy, Macular Hole, Quality of Life

Print Tag: Refer to original journal article

## Anticoagulants Worsen Subretinal Hemorrhage In Macular Degeneration Patients

*Subretinal Hemorrhages Associated With Age-Related Macular Degeneration in Patients Receiving Anticoagulation or Antiplatelet Therapy.*

Kuhli-Hattenbach C, Fischer IB, et al:

Am J Ophthalmol 2010; 149 (February): 316-321

The severity of subretinal hemorrhage appears to be greater when it occurs in patients with macular degeneration who are taking anticoagulant or anti-platelet medication.

**Objective:** To evaluate the effect of anticoagulant and anti-platelet medication use in patients with exudative age-related macular degeneration (AMD).

**Design:** Retrospective, observational clinical case series review.

**Methods:** Review of medical records and fundus photographs was completed on a consecutive series of 71 patients who were treated for acute subretinal hemorrhage caused by exudative AMD. Fundus photographs were evaluated, allowing the measurement of the size of subretinal hemorrhages in each patient. Review of medical records allowed the determination of systemic medication use. Patients were classified on the basis of use of systemic anticoagulants or anti-platelet medications. Size of subretinal hemorrhage was compared between groups.

**Results:** Patients who received anticoagulant or anti-platelet therapy were found to have significantly larger subretinal hemorrhages than those who did not use these drugs. Mean size of hemorrhages in the anticoagulant user group was 9.7 disc areas, compared to 3.0 disk areas in the non-user group ( $P < 0.001$ ). Subgroup analysis confirmed that anticoagulant and anti-platelet medication use were each independently associated with an increased size of subretinal hemorrhage. Hypertension also appeared to contribute to an increased size of hemorrhage in patients who were using anticoagulant or anti-platelet medication.

**Conclusions:** Anticoagulant and anti-platelet medication use increases the size of subretinal hemorrhage in patients who develop this complication of exudative AMD.

**Reviewer's Comments:** This study has important implications regarding long-term use of anticoagulants and anti-platelet medications in patients who have or are at risk for developing exudative AMD. Use of these drugs has not yet been shown to increase risk of occurrence of hemorrhage, but once a hemorrhage occurs, this study found that the amount of bleeding is significantly greater. Communication between ophthalmologists and those who care for other conditions that may lead to the consideration of anticoagulant use is important to make rational treatment decisions in patients with chronic ophthalmic and systemic diseases. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Macular Degeneration, Anticoagulant Therapy, Anti-Platelet Medication

Print Tag: Refer to original journal article

## Early Childhood Refractive Error, Family History Predictive of Future Myopia

*Early Childhood Refractive Error and Parental History of Myopia as Predictors of Myopia.*

Jones-Jordan LA, Sinnott LT, et al:

Invest Ophthalmol Vis Sci 2010; 51 (January): 115-121

First grade children with refractive error of  $\leq +0.75$  diopters, or who have one or both parents affected by myopia, have a higher incidence of developing myopia during later childhood.

**Objective:** To identify factors associated with the development of myopia in school-aged children.

**Design:** Prospective, observational cohort study.

**Participants:** 1854 non-myopic children in the first grade.

**Methods:** Participants were enrolled in the Collaborative Longitudinal Evaluation of Ethnicity and Refractive Error Study. Myopia was defined by a refractive error of  $\leq -0.75$  diopters in both primary meridians on cycloplegic autorefraction. Subjects were divided into 2 categories, those with a cycloplegic spherical equivalent  $>$  or  $< +0.75$  diopters. Myopia in one or both parents was ascertained by a survey completed by the parents. Longitudinal measurement of the cycloplegic refractive error allowed identification of new cases of myopia through 8 years of follow-up.

**Results:** Of participants, 21.3% had refractive error of  $< +0.75$  diopters at baseline (high-risk group). By the eighth grade, 45% of high-risk children without myopic parents developed myopia, 60% with 1 myopic parent developed myopia, and 80% with 2 myopic parents developed myopia. In contrast, low-risk children were less likely to develop myopia by eighth grade. Of those with no myopic parents, 8% developed myopia, 12% with 1 myopic parent developed myopia, and 18% with 2 myopic parents developed myopia.

**Conclusions:** Refractive error in first grade,  $< +0.75$  diopters, and parental history of myopia are each associated with an increased probability of developing myopia during later childhood.

**Reviewer's Comments:** Although the factors identified in this study were predictive of the development of childhood myopia, there were still a significant number of myopic children without baseline myopia and with no parental history of myopia that these parameters alone are insufficient to serve as the sole criteria for myopia screening. Additional study is required to develop a more sensitive protocol to screen school-aged children for risk of developing myopia. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Myopia, Development, Children

Print Tag: Refer to original journal article

# Bacterial Keratitis in Nursing Homes Associated With Dry Eye, Ocular Disease

*Microbiological and Clinical Profiles of Patients With Microbial Keratitis Residing in Nursing Homes.*

Jhanji V, Constantinou M, et al:

Br J Ophthalmol 2009; 93 (December): 1639-1642

Dry eye and ocular surface disease predispose elderly patients to bacterial keratitis.

**Objective:** To evaluate microbiological and clinical characteristics of cases of microbial keratitis affecting residents of nursing homes.

**Design:** Retrospective clinical case series.

**Methods:** A review of a consecutive series of patients treated for microbial keratitis at a single institution was performed. Eligible subjects were institutionalized residents of nursing homes. Medical records were reviewed as well as the results of laboratory testing to identify causative organisms, as well as clinical factors associated with the development of infection.

**Results:** 66 patients were included (39 female, 27 male). Mean patient age was 81 years (range 46 to 97 years). Clinical factors associated with microbial keratitis included dry eye, which was present in 26% of patients, and rheumatoid arthritis, which was present in 81% of patients. Positive bacterial cultures were obtained in 81% of patients. *Staphylococcus* species were the most common pathogens identified, occurring in 48% of cases. Severity of cases tended to be high, with surgical interventions including tarsorrhaphy and keratoplasty being required in 48% of cases.

**Conclusions:** Microbial keratitis occurring in nursing homes is most often caused by *Staphylococcus* species, and is frequently associated with dry eye and ocular surface disease.

**Reviewer's Comments:** Resistance to commonly used antibiotics was identified in a significant number of cases, indicating the need to have a high index of suspicion for resistant bacterial strains in institutionalized patients. Taking cultures at the time of diagnosis is important in order to evaluate microbial sensitivity in case an initial clinical response to empirical therapy is not favorable. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Bacterial Keratitis, Elderly, Nursing Homes

Print Tag: Refer to original journal article

## Choose Hydrogen Peroxide Contact Lens Solution for Fewer Complications

*Contact Lens-Related Adverse Events and the Silicone Hydrogel Lenses and Daily Wear Care System Used.*

Carnt NA, Evans VE, et al:

Arch Ophthalmol 2009; 127 (December): 1616-1623

Hydrogen peroxide contact lens solution is associated with a lower rate of corneal infiltration than other lens solutions.

**Objective:** To investigate rate of occurrence of adverse events with silicone hydrogel contact lens wear and effect of contact lens solution type on these complications.

**Design:** Non-randomized, open-label clinical trials.

**Participants:** 558 subjects.

**Methods:** Data were compiled from several trials of contact lens use. All studies followed the same protocol, but varied in type of contact lens and lens solution. Each trial consisted of a 3-month study of contact lens and contact lens solution combination. Subjects underwent a baseline examination to evaluate the ocular surface and cornea. Subjects were aged  $\geq 18$  years, had myopic refractive error between -0.50 and -6.00 diopters, and were free from other ocular pathology. Evaluated were 5 different silicone hydrogel lenses and 4 different solutions. Approximately 40 subjects participated in each trial of a single lens material/solution combination. Follow-up examinations during 3 months of daily contact lens use allowed comparison of rate of development of corneal infiltrates between lenses and solutions.

**Results:** Rate of development of corneal infiltrates was 3.1 per 100 participant-months. Rate of development of symptomatic events of corneal infiltration was 1.7 per 100 participant -months. Hydrogen peroxide solution use was associated with a lower rate of development of these adverse events (0.6 per 100 participant-months), but varied according to type of lens material used. Other complications including corneal erosions and staining that varied according to the combination of lens material and solution used.

**Conclusions:** Hydrogen peroxide contact lens solutions are associated with a lower rate of development of corneal infiltration in patient using daily wear silicone hydrogel contact lenses.

**Reviewer's Comments:** There was evidence in this study that the performance of different contact lens solutions varied depending upon the type of hydrogel contact lens it was being used with. Additional research is needed to better understand the interaction between contact lens materials and solutions in minimizing the risk of complications of contact lens wear. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Contact Lens, Keratitis, Silicone Hydrogel

Print Tag: Refer to original journal article

## Aspheric Vs Spherical IOLs -- Reducing Complications After Cataract Surgery

*Clinical Comparison of the Optical Performance of Aspheric and Spherical Intraocular Lenses.*

van Gaalen KW, Koopmans SA, et al:

J Cataract Refract Surg 2010; 36 (January): 34-43

Spherical aberration of the eye's optics is lower following implantation of aspheric intraocular lenses compared with traditional lenses with spherical optics.

**Objective:** To compare postoperative optical performance of aspheric and spherical intraocular lenses (IOLs) in patients following phacoemulsification.

**Design:** Prospective, double-masked, randomized, comparative clinical study.

**Participants:** 30 patients with visually significant bilateral cataracts.

**Methods:** Patients eligible for inclusion had no history of uveitis, macular degeneration, diabetic retinopathy, glaucoma, optic nerve disease, or history of prior ocular surgery. One eye was randomly assigned to have placement of a traditional spherical IOL (Sensor AR40e) or an aspheric IOL (Tecnis ZA9003) in the capsular bag. IOL power was chosen to provide postoperative emmetropia. Postoperative evaluation included wavefront analysis to measure optical aberrations, measurement of contrast sensitivity, and stray light. Investigators were masked as to which IOL type was implanted in eyes being tested.

**Results:** Patients had a spherical equivalent refractive error following surgery within 2 diopters of emmetropia, and had <2.5 diopters of astigmatism. All patients had best corrected visual acuity after surgery of 20/25 or better. No significant differences were seen in visual acuity or contrast sensitivity between eyes. There was, however, significantly lower measured spherical aberration in eyes implanted with the aspheric IOL design (-0.04 vs +0.06  $\mu\text{m}$ ,  $P < 0.001$ ).

**Conclusions:** Postoperative spherical aberration is lower following implantation of IOLs with aspheric optics in comparison to traditional spherical IOLs.

**Reviewer's Comments:** Other studies have shown improved contrast sensitivity, especially with low ambient illumination in patients with aspheric IOLs compared with spherical IOLs. Although differences with regard to patient satisfaction are small, gradual improvements in IOL design will continue to result in ever better postoperative outcomes following cataract surgery. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Intraocular Lens Design, Phacoemulsification

Print Tag: Refer to original journal article

## Cosmetic Iris Implants Can Lead to Serious Complications

*Uveitis-Glaucoma-Hyphema Syndrome and Corneal Decompensation in Association With Cosmetic Iris Implants.*

Arthur SN, Wright MM, et al:

Am J Ophthalmol 2009; 148 (November): 790-793

Cosmetic iris implants can lead to significant hemorrhagic and inflammatory complications.

**Objective:** To describe complications that can occur in association with the use of cosmetic iris implants.

**Design:** Interventional case report.

**Methods:** Clinical course was reviewed of a patient who presented to the University of Minnesota Department of Ophthalmology after having bilateral cosmetic iris implantation in Panama. Implantation of the iris implants (NewIris, Kahn Medical Device Corporation, San Fernando, Panama) was performed approximately 1 year prior to presentation.

**Results:** Patient presented with symptoms of redness, pain, and blurred vision. Approximately six months earlier, patient was involved in an automobile accident and developed the above-noted symptoms, which progressively increased in spite of use of topical, non-steroidal anti-inflammatory drugs. Bilateral intraocular pressure (IOP) elevation was present (38 mmHg OD, 40 mmHg OS). Patient had bilateral corneal edema, anterior segment inflammation, and microhyphema. Implants were in stable position without movement. Bilateral optic disk cupping indicative of glaucoma was present. Patient required removal of the implants and performance of trabeculectomy to control the IOP.

**Conclusions:** Cosmetic iris implants can result in uveitis-glaucoma-hyphema syndrome.

**Reviewer's Comments:** The silicone iris implant is used only outside of the United States as it is not approved by the Food and Drug Administration. It is marketed for the management of functional and cosmetic defects related to iris coloboma and anterior segment trauma, but also as a purely cosmetic implant for individuals who wish to change their iris color. This case report illustrates the significant complications that can occur in association with this device. Awareness of these complications is important for all ophthalmologists, including those in the United States as we may encounter patients who inquire about the device, who should be appropriately cautioned about their use. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Secondary Glaucoma, Hyphema, Uveitis

Print Tag: Refer to original journal article

## Glaucoma Progression Slowed By Surgery

*Glaucoma Surgery Decreases the Rates of Localized and Global Visual Field Progression.*

Folgar FA, de Moraes CGV, et al:

Am J Ophthalmol 2010; 149 (February): 258-264

Successful reduction of intraocular pressure through glaucoma surgery reduces the rate of progression of visual field loss.

**Objective:** To evaluate the effect of glaucoma surgery on the progression of visual field loss in patients with uncontrolled intraocular pressure (IOP).

**Design:** Retrospective interventional clinical case series.

**Methods:** Medical records were reviewed of patients in a referral glaucoma practice who had at  $\geq 10$  visual field examinations performed with the Humphrey SITA standard 24-2 program. From these patients, those who underwent successful IOP reduction (IOP  $< 18$  mmHg) and who had  $\geq 5$  preoperative and 5 postoperative visual field tests were included. Rate of progression of visual field loss was estimated for each patient before and after surgery by pointwise linear regression. This allowed evaluation of both global and focal rates of change and effect of surgery on these rates.

**Results:** 28 eyes of 28 patients were included in the study. Mean age of patients enrolled was 61.2 years. Mean number of visual fields was 13.4 spanning a follow-up period between 4 and 9 years. Mean IOP decreased from 19.0 mmHg preoperatively to 11.3 mmHg postoperatively. Mean global rate of decline decreased after surgery from -1.48 dB per year to -0.43 dB per year. Proportion of eyes with statistically significant progression at  $\geq 1$  points decreased from 43% before surgery to 7% after surgery. Each mmHg of decreased IOP following surgery was associated with a slower rate of progression of global visual field loss of 0.1 dB per year.

**Conclusions:** Successful glaucoma surgery is associated with a significant reduction in rate of progression of visual field loss in patients with uncontrolled IOP.

**Reviewer's Comments:** Studies such as this can be used as the basis for counseling patients who face the need for glaucoma surgery, to confirm its benefits in the setting of uncontrolled intraocular pressure. (Reviewer-Scott D. Smith, MD, MPH).

Keywords: Glaucoma, Filtering Surgery, Visual Field Loss, Intraocular Pressure

Print Tag: Refer to original journal article