Higher-Risk Ocular Hypertensives Benefit More From Early Prophylactic Tx

Delaying Treatment of Ocular Hypertension: The Ocular Hypertension Treatment Study.
Kass MA, Gordon MO, et al:

Arch Ophthalmol 2010; 128 (March): 276-287

The greater lifetime risk of developing glaucoma among younger patients with ocular hypertension implies a greater potential benefit of earlier prophylactic therapy.

Objective: To characterize the efficacy of earlier versus later treatment in preventing primary open angle glaucoma (POAG) in individuals with ocular hypertension.

Design: Randomized controlled clinical trial.

Participants/Methods: 1636 individuals with elevated intraocular pressure between 24 and 32 mm Hg in one eye and 21 and 32 mm Hg in the fellow eye were randomly assigned to observation or treatment with intraocular pressure-lowering medication. After a median of 7.5 years without treatment, the observation group received medical therapy for a median of 5.5 years. The cumulative proportion of participants developing POAG in the initial treatment and the initial observation groups was compared through 13 years of follow-up.

Results: The cumulative proportion of participants in the initial observation group who developed POAG at 13 years was 22% compared to 16% in the initial medication group (P=0.009). Among those participants in the highest third of baseline risk of developing POAG, a significantly higher proportion developed POAG in the original observation group than in the original medication group (40% vs 28%). In the lowest category of baseline risk, little difference was seen in the cumulative proportion developing POAG through final follow-up.

Conclusions: It is important to predict higher baseline risk of developing POAG based on intraocular pressure (IOP), corneal thickness, baseline visual field, and optic nerve status. Those individuals at highest risk will benefit from early prophylactic therapy to prevent POAG.

Reviewer's Comments: In addition to clinical factors that characterize an individual's risk of developing POAG, it is also important to consider age in making the decision of initiating treatment. Although younger patients may not have a higher rate of developing POAG per year, they have a greater life expectancy and therefore higher cumulative lifetime risk of developing POAG. Given the longer expected duration of exposure to IOP elevation than in older individuals, younger individuals should be considered to be at higher risk and earlier intervention to reduce this risk may be warranted. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Glaucoma, Ocular Hypertension, Medical Therapy

Print Tag: Refer to original journal article
Glaucoma results in greater optic nerve head excavation and loss of neural rim in comparison to ischemic optic neuropathy, even when a similar severity of retinal ganglion cell loss is present.

**Objective:** To compare topographic features of the optic disc in patients with glaucoma and those with arteritic or nonarteritic anterior ischemic optic neuropathy.

**Participants/Methods:** Patients for this study were recruited from 4 referral centers. Overall, 103 patients diagnosed with open-angle glaucoma were enrolled, as well as 53 patients with nonarteritic, and 18 patients with arteritic ischemic optic neuropathy. Each subject underwent optic disc imaging with the Heidelberg Retinal Tomography (HRT) instrument. In addition, nerve fiber layer thickness measurements were made by optical coherence tomography (OCT), and visual field testing was performed using Humphrey automated perimetry. HRT parameters were compared between glaucoma and ischemic optic neuropathy patients, accounting for the degree of retinal ganglion cell loss by OCT nerve fiber layer thickness and mean deviation on visual field testing.

**Results:** After adjustment for the severity of retinal ganglion cell injury, all HRT parameters were significantly different between patients with open-angle glaucoma and those with either arteritic or nonarteritic anterior ischemic optic neuropathy. At similar levels of optic nerve damage, glaucoma patients had larger and deeper cups, smaller volume of neural rim, and greater cup volume. All of these differences were highly statistically significant. No consistent differences were seen in optic disc topography between arteritic and nonarteritic anterior ischemic optic neuropathy patients.

**Conclusions:** Although ischemic optic neuropathy results in loss of retinal ganglion cells, significantly different optic disc topography is seen in comparison with open-angle glaucoma at any given level of retinal ganglion cell loss.

**Reviewer's Comments:** This study confirms the validity of the common clinical approach that is used to distinguish glaucoma from other optic neuropathies--assessment of the optic disk appearance. In addition, the history of acute vision loss distinguishes these conditions, as such changes are expected in ischemic optic neuropathy while absent in glaucoma. When historical information is unreliable, however, diagnostic confusion can result. It is imperative that a careful evaluation of the optic nerve head be made in order to distinguish between these conditions, and when the degree of visual field loss is out of proportion to the apparent optic disc cupping, then other diagnoses aside from glaucoma must be considered. (Reviewer-Scott D. Smith, MD, MPH).

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Intravitreous delivery of dexamethasone with a sustained-release drug delivery device is effective in reducing macular thickness and improving visual acuity in patients with diabetic macular edema.

**Objective:** To evaluate the safety and efficacy of a dexamethasone intravitreous drug delivery system (DDS) in patients with persistent diabetic macular edema.

**Design:** Randomized clinical trial.

**Participants/Methods:** Patients with diabetic macular edema that failed to respond to laser photocoagulation, and remained persistent for >90 days were enrolled in this study. Patients were randomly assigned to receive either 350 μg or 700 μg of the dexamethasone DDS, marketed commercially as Ozurdex. Baseline and follow-up visual acuity and retinal thickness measurements through 180 days allowed the evaluation of efficacy of the device. In addition, adverse events were recorded in order to document safety in treating this condition.

**Results:** A significantly greater proportion of patients receiving the Ozurdex DDS had best-corrected visual acuity improvement of ≥2 lines from baseline than those under observation. In the 700-μg group, 33% of patients showed this degree of visual acuity, while in the 350-μg group, 21% achieved this outcome. At 180 days follow-up, best-corrected visual acuity improvement of ≥2 lines was seen in 30% of eyes in the 700-μg group, but this was not statistically different from those in the 350-μg group or those under observation without treatment. A significant reduction in macular edema was also observed, and was statistically significant at the 90-day time point in both treatment groups. Although a high proportion of patients developed an increase in intraocular pressure (IOP) in the treatment groups, all patients had controlled IOP with glaucoma medication, and no patient required laser or surgical treatment for glaucoma.

**Conclusions:** In patients with persistent diabetic macular edema, an intravitreous dexamethasone drug delivery device is effective in reducing macular edema and improving visual acuity through at least 90 days of follow-up.

**Reviewer’s Comments:** Patients with persistent diabetic macular edema often have few treatment options when they fail to respond to laser therapy. In this frustrating condition, the intravitreal DDS of dexamethasone described here constitutes a potentially valuable new therapy. Further investigation is required to determine the relative efficacy of this treatment to other methods that have been attempted, including intravitreal injection of triamcinolone. In addition, further investigation will demonstrate whether adverse events such as IOP elevation may become more common with multiple repeated treatments, as may be required for long-term management of these patients. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Diabetes, Macular Edema, Dexamethasone Drug Delivery System

Print Tag: Refer to original journal article
Viral Retinitis May Occur After Intravitreal Steroid Injection

Viral Retinitis After Intravitreal Triamcinolone Injection in Patients With Predisposing Medical Comorbidities.
Shah AM, Oster SF, et al:

Am J Ophthalmol 2010; 149 (March): 443-440

Viral retinitis may occur as a complication of intravitreal steroid injection, particularly in patients with altered immune status.

**Objective:** To estimate the prevalence of viral retinitis after intravitreal steroid injection, and to propose potential risk factors for the development of this complication.

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

**Participants/Methods:** 736 patients who underwent intravitreal triamcinolone injection by 3 retinal specialists at a single academic center between September 2002 and November 2008 were reviewed. Review of medical records allowed the identification of demographic and clinical factors for each patient that permitted the evaluation of risk factors for the development of viral retinitis after treatment. The diagnosis of viral retinitis was made on the basis of the clinical appearance of retinal lesions. The number of steroid injections administered was identified, as well as other medical conditions that can result in immunosuppression. In addition, the concomitant use of medications, particularly oral steroids, was also included in order to determine whether this was related to the development of viral retinitis.

**Results:** Viral retinitis developed in 3 patients, yielding an overall prevalence of 0.41%. When categorizing patients on the basis of any systemic disease that could alter immune status, an overall prevalence in this population of 0.9% was observed. All 3 patients who developed viral retinitis had some immune-altering condition, including diabetes, HIV, or recent chemotherapy for treatment of ovarian cancer.

**Conclusions:** Viral retinitis is a potentially devastating complication that may occur after intravitreal injection of triamcinolone. The presence of systemic immune-altering disease appears to be a risk factor for the development of this complication.

**Reviewer’s Comments:** Clinicians who perform intravitreal steroid injections must bear in mind the potential development of this devastating infectious complication. Patients with altered immune status appear to be at greater risk for the development of viral retinitis, and follow-up evaluation to identify infectious complications and other known complications of intraocular steroid injection such as secondary glaucoma and cataract must be performed. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Viral Retinitis, Intraocular Steroid Injection

Print Tag: Refer to original journal article
Endothelial cell counts 6 months after penetrating keratoplasty of <1700 cells/mm² are associated with a higher rate of graft failure.

**Objective:** To determine whether operative and/or postoperative central endothelial cell density is predictive of the long-term clinical outcome after penetrating keratoplasty.

**Design:** Prospective interventional cohort study.

**Methods:** Data for this analysis came from a subset of patients enrolled in the Cornea Donor Study who had baseline and follow-up endothelial cell density measurements by specular microscopy every 6 months through 5 years of follow-up. Patients enrolled in the study were between the ages of 40 and 80 years and had non-inflammatory corneal disease, principally Fuchs endothelial dystrophy or pseudophakic bullous keratopathy. Statistical analysis allowed the determination of the relationship between baseline and follow-up endothelial cell density and the subsequent development of corneal graft failure. Graft failure was defined by loss of central graft therapy sufficient to compromise vision for a minimum of 3 consecutive months.

**Results:** Preoperative endothelial cell density was not found to be predictive of eventual graft failure. However, endothelial cell density measured at 6 months after therapy was predictive of subsequent graft failure. Patients with cell counts <1700 cells/mm² demonstrated a 13% failure rate during the remaining 4.5 years of the study. In contrast, patients with cell densities >2500/mm² had a failure rate of only 2% and those with cell densities between 1700 and 2500 had a rate of failure of only 3%. In addition, it was found that some patients with extremely low cell counts retained clear graft throughout the entire study. Overall, 14% of patients with clear grafts at the end of 5 years follow-up had endothelial cell density <500 cells/mm².

**Conclusions:** Preoperative endothelial cell density is unrelated to graft failure from endothelial decompensation. In contrast, 6-month follow-up endothelial cell densities are strongly predictive of the eventual clinical outcome of penetrating keratoplasty.

**Reviewer's Comments:** It is important to note that all grafts used in the study had baseline endothelial cell densities of at least 2300 cells/mm². So long as the eye bank is doing its job in providing corneas with sufficient baseline endothelial cell density, this does not seem to be a relevant factor in the eventual clinical outcome. The authors do not recommend serial specular microscopy simply for purposes of prognostication. However specular microscopy performed 6 months after surgery can provide important prognostic information, with those having cell counts >1700 cells/mm² having extremely low failure rates, according to their findings. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Keratoplasty, Endothelial Graft Failure, Endothelial Cell Density

Print Tag: Refer to original journal article
Polymerase chain reaction analysis of specimens obtained from the cornea of patients with late-onset varicella-zoster virus dendriform keratitis suggests active viral reproduction within these lesions.

**Objective:** To describe the clinical characteristics and course of treatment of patients affected by late-onset varicella-zoster virus (VZV) dendriform keratitis.

**Design:** Retrospective clinical case series.

**Methods:** Medical records were reviewed of a consecutive series of 20 patients with onset of dendriform corneal lesions beginning at least 2 weeks after onset of VZV keratitis. Epithelial lesions were evaluated for the presence of VZV DNA by polymerase chain reaction assay. Demographic and clinical characteristics of patients were reviewed and analyzed to determine risk factors for the development of recurrent lesions.

**Results:** The mean age of the 20 patients included in the analysis was 65 years. Clinical characteristics of the corneal lesions showed greater variability than is typically seen with herpes simplex virus-associated dendritic keratitis. VZV DNA was identified in 15 of 16 cases tested. All patients responded promptly to systemic or topical antiviral therapy. In total, 53% of patients demonstrated at least 1 recurrence during follow-up, with 80% of those having recurrence demonstrating multiple recurrences. No demographic or clinical characteristics were found to be predictive of an increased risk of recurrence of dendritic keratitis.

**Conclusions:** Late dendriform keratitis associated with herpes zoster ophthalmicus appeared to demonstrate active VZV infection. Patients typically respond well to topical or systemic antiviral agents.

**Reviewer's Comments:** This study is important in that it illustrates the infectious nature of late-onset dendritic keratitis in patients following VZV corneal infection. This form of viral keratitis has often been considered to be a non-infectious inflammatory form of keratitis due to immune system activation against inactive viral remnants. In spite of treatment, multiple recurrences may occur, suggesting a potential role of long-term, preventive treatment with systemic antiviral therapy. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Cornea, Infection, Varicella Zoster Virus

Print Tag: Refer to original journal article
Objective: To evaluate the functional impact of stereoacuity in the performance of fine motor skills.

Participants/Methods: 143 subjects between the ages of 10 and 30 years with a history of strabismus who had normal, reduced, or no stereoacuity were enrolled in this study. Subjects were asked to perform 3 types of tasks: placement of pegs into a pegboard, threading beads over a needle, and pouring water from a pitcher into measuring cups. Overall assessment of the time and accuracy of these tests was scored and statistical analysis allowed the identification of the relationship between the level of stereoacuity and performance on the tasks. Tasks were performed 6 times each, 3 times under binocular and 3 times under monocular conditions.

Results: Subjects without stereoacuity performed worse on the pegboard and bead tests in comparison to those with normal or reduced stereoacuity. The greatest difference in performance was seen between those with normal stereoacuity and those without stereoacuity, with those having reduced acuity having intermediate results. However, under monocular conditions, individuals without stereoacuity performed slightly better than those with stereoacuity, indicating that some degree of adaptation to the absence of stereoacuity occurs. On the other hand, under binocular testing conditions the lack of stereoacuity resulted in impaired performance on 2 of the 3 tests.

Conclusions: Performance of tasks that require fine skills is decreased in individuals with a history of strabismus who lack stereoacuity.

Reviewer's Comments: The results of this study support the concept of early intervention in children with strabismus in order to achieve alignment at a young age, improving the possibility of development of normal stereoacuity. Although some degree of compensation may be achieved in those children who do not develop stereoacuity, their level of performance of fine motor skills remains impaired in comparison to those who develop normal stereoacuity. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Strabismus, Stereoacuity, Fine Motor Skills
Print Tag: Refer to original journal article
Riboflavin/ultraviolet A corneal collagen crosslinking provides improved corneal topography and visual acuity that appears to remain stable through at least 4 years of follow-up.

**Objective:** To evaluate the long-term efficacy of riboflavin/ultraviolet A corneal collagen crosslinking in patients with progressive keratoconus.

**Design:** Prospective nonrandomized clinical trial.

**Participants/Methods:** Results of 44 patients with progressive keratoconus, who underwent riboflavin/ultraviolet A corneal collagen crosslinking for treatment of progressive keratoconus, who had at least 4 years of follow-up after treatment were included in the study. The patients had documented progression of the corneal steepening within 6 months prior to enrollment. All patients were between the ages of 10 and 40 years at time of treatment. Individuals with a corneal thickness <400 μm at its thinnest point, corneal curvature of >55 D, or who had other corneal disease aside from keratoconus were excluded. The patients underwent a single session of riboflavin/ultraviolet A corneal collagen crosslinking after a comprehensive baseline evaluation. Follow-up examination included measurement of best-corrected and uncorrected visual acuity, corneal topography, and pachymetry. Comparison to baseline values allowed the evaluation of long-term clinical outcomes after this treatment.

**Results:** A mean reduction of corneal curvature of 2 D was noted after treatment and remained stable from 12 to 48 months of follow-up. In contrast, contralateral untreated eyes showed a mean progression of 1.5 D of corneal steepening during the same follow-up period. Improvement of best-corrected visual acuity was observed in all 44 patients, with a mean improvement of 1.9 Snellen lines of best-corrected acuity and 2.7 Snellen lines of uncorrected visual acuity.

**Conclusions:** Long-term stability of keratoconus is achieved after riboflavin/ultraviolet A corneal collagen crosslinking.

**Reviewer’s Comments:** This study is important in that it illustrates the potential of this treatment to achieve long-term stability of keratoconus through strengthening of the collagen fibers by biochemical corneal collagen crosslinking. This offers hope for patients with keratoconus to avoid penetrating keratoplasty, which had up to this point been the only option for management of patients who failed to achieve good visual results with hard contact lenses. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Keratoconus, Riboflavin/Ultraviolet A Corneal Collagen Crosslinking

Print Tag: Refer to original journal article
The use of cohesive viscoelastics tends to result in less IOL rotational stability during viscoelastic removal than the use of dispersive viscoelastics.

**Objective:** To evaluate the rotational stability of a single-piece hydrophobic acrylic intraocular lens (IOL) during removal of cohesive or dispersive viscoelastics.

**Design:** Prospective comparative clinical study.

**Methods:** 60 eyes of 60 patients undergoing routine phacoemulsification were enrolled in the study. Patients were randomly assigned to receive either a cohesive viscoelastic (Healon GV) or dispersive viscoelastic (Viscoat) during IOL implantation. Image analysis of intraoperative video recordings allowed the measurement of IOL rotation during viscoelastic removal. Statistical analysis allowed comparison of the rotational stability between patients who had the 2 different types of viscoelastics during surgery.

**Results:** The mean intraoperative rotation of the IOL was 7.4 degrees in the dispersive viscoelastic group and was significantly greater in the cohesive viscoelastic group at 13.1 degrees; this difference was statistically significant ($P < 0.001$). While 70% of patients maintained alignment within 10% in the dispersive viscoelastic group, only 30% of patients maintained this degree of rotational stability during removal in the cohesive viscoelastic group. Counterclockwise rotation of the IOL was observed in 33% of cases.

**Conclusions:** The use of a dispersive viscoelastic results in less IOL rotation during viscoelastic removal.

**Reviewer's Comments:** Rotational stability is a critical factor in achieving good clinical outcomes after toric IOL implantation, a procedure that is becoming increasingly common as IOL design has advanced in recent years. It must be noted that dispersive viscoelastics are more difficult to remove from the eye, and that retained viscoelastic behind the IOL may result in postoperative rotational instability. My personal preference is to use a cohesive viscoelastic, but to use a second instrument such as a Sinskey hook through the paracentesis to stabilize the IOL during viscoelastic removal and to gently express the viscoelastic from behind the IOL to create contact and thus friction between the IOL and the posterior capsule. This results in excellent rotational stability. (Reviewer-Scott D. Smith, MD, MPH).
Eye Redness After Strabismus Surgery -- How Long Does It Last?

Duration of Conjunctival Redness Following Adult Strabismus Surgery.
Escardó-Paton JA, Harrad RA:

J AAPOS 2009; 13 (December): 583-586

**According to most patients, conjunctival redness resolves approximately 10 weeks after strabismus surgery.**

**Background:** Typically, patients who undergo strabismus surgery will develop conjunctival redness over the operated muscle. How long this persists is not clear.

**Objective:** To assess the time for postoperative eye redness to resolve after strabismus surgery. To determine the effect of adjustable sutures and previous strabismus surgery on this duration.

**Design:** Patient questionnaire.

**Participants:** 53 postoperative patients from a single center in the United Kingdom.

**Methods:** A questionnaire was given to patients on the same day as their strabismus surgery during a 4-year period. Preoperatively, patients were told that their eye would be red following surgery for a period of time. Patients were asked to complete the questionnaire when their eye returned to baseline color. Patients were asked to quantify the degree of redness on a weekly basis on a 0 to 3 scale, with 0 being baseline color and 3 being very red. If patients had persistent redness beyond 24 weeks, they were asked to send in the questionnaire with the appropriate redness score. Only horizontal eye muscles were assessed, since the eyelid would hide vertical muscle redness. Patients had to be aged ≥18 years and have an understanding of the questionnaire. The muscle surgery was performed using a limbus-based incision. All procedures used the same sutures to reattach the eye muscle and to close the conjunctiva. Adjustments, if necessary, were done 4 hours postoperatively. Patients took a steroid/antibiotic drop 4 times daily for 2 weeks postoperatively.

**Results:** 101 questionnaires were given out, and 53 (52%) were returned. Of 93 muscles involved, previous surgery was performed in 47 cases; 46 had no surgery. In 50 cases, adjustable knots were placed, and 15 (30%) had adjustments. The median duration of redness was 10 weeks. There were slight variations in duration depending on whether the muscle was a “virgin” operation (9.5 weeks), reoperation (11 weeks), adjustable suture (11 weeks), recessed (9.5 weeks), or resected (11 weeks). There was no difference in gender, but older patients tended to retain redness longer; 75% of patients experienced resolution by 15 weeks.

**Conclusions:** Patients perceive that conjunctival redness resolves approximately 10 weeks after strabismus surgery. It does not seem to significantly affect the timing, whether it is a reoperation or an adjustable suture is used.

**Reviewer's Comments:** I have always thought of eye redness as being present for only a month or so. Perhaps the difference is a reflection of patients having more of a keen eye toward their own appearance. (Reviewer-Michael S. Lee, MD).

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Keywords: Redness, Conjunctival, Postoperative, Strabismus Surgery

Print Tag: Refer to original journal article
Neuroimaging in patients with isolated, painless Horner syndrome is usually of low yield.

**Background:** The oculosympathetic pathway runs from the hypothalamus down to the upper cervical cord, over the apex of the lung, back up the carotid artery, into the cavernous sinus, and through the orbit to the pupillary dilator muscle. This is a lot of “real estate” with numerous potential causes.

**Objective:** To determine the diagnostic yield of imaging adults with Horner syndrome.

**Design:** Retrospective observational case series.

**Participants:** 52 patients with Horner syndrome from 2 institutions in Israel.

**Methods:** Inpatients and outpatients were included. The patients were divided into 3 groups: group 1, patients in whom the cause was obvious at the time of neuro-ophthalmic evaluation; group 2, patients in whom the diagnosis was suspected and a targeted evaluation was performed; and group 3, patients in whom the etiology was unclear and full imaging of the oculosympathetic pathway was performed.

**Results:** There were 24 inpatients and 28 outpatients. There were 24 women and 28 men with a mean age of 50 years. Group 1 included 32 patients with strokes, post-surgical, congenital, trauma, and known tumors along the oculosympathetic pathway. These patients did not undergo any further evaluation. Group 2 included 11 patients. Seven patients had acute painful Horner syndrome, and imaging revealed a carotid dissection in 3 patients. Three patients had ipsilateral sixth nerve palsy, and imaging showed a cavernous sinus mass. One patient had arm numbness, and imaging demonstrated a cervical mass. Group 3 included 9 patients, all of whom had isolated, painless Horner syndrome. Six patients had the Horner syndrome for at least 1 year. Neuroimaging revealed a thyroid carcinoma in 1 patient and normal results in the other 8.

**Conclusions:** In most cases of Horner syndrome, the etiology is either known or suspected at the time of neuro-ophthalmic evaluation. In cases of isolated, painless Horner syndrome, diagnostic imaging is low yield.

**Reviewer’s Comments:** Sometimes patients are referred to me with Horner syndrome, and the referring doctor has already imaged the entire oculosympathetic pathway already. Therefore, I have nothing more to offer the patient. The doctor is worried that he or she missed something because the testing was normal. This study confirms that it is okay to have a normal scan in the setting of isolated, painless Horner syndrome. (Reviewer-Michael S. Lee, MD).

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Keywords: Horner Syndrome, Diagnosis, Imaging, Neuroimaging, Workup

Print Tag: Refer to original journal article
Combined Surgery Yields Similar Results

*Idiopathic Epiretinal Macular Membrane and Cataract Extraction: Combined Versus Consecutive Surgery.*

Dugas B, Ouled-Moussa R, et al:

Am J Ophthalmol 2010; 149 (February): 302-306

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**Combined vitrectomy and phacoemulsification gives similar clinical outcomes to sequential surgery in patients with epiretinal membrane and cataract.**

**Objective:** To assess the clinical outcome of pars plana vitrectomy and membrane peeling (PPV/MP) with phacoemulsification performed as a combined procedure or as 2 sequential procedures in patients with epiretinal membrane.

**Design:** Retrospective clinical case series.

**Methods:** Medical records were reviewed of a consecutive series of 174 patients who underwent PPV/MP and phacoemulsification with implantation of a posterior chamber intraocular lens at 2 academic centers. Clinical and demographic information were recorded including whether the procedures were performed as a combined surgery or whether the cataract surgery was performed at a later date. Clinical outcomes that were assessed included distance and near visual acuity, as well as central macular thickness as assessed by optical coherence tomography.

**Results:** At 1-year follow-up after the final procedure, best-corrected visual acuity was significantly improved in both groups ($P < 0.0001$). In addition, there was a significant reduction of central macular thickness seen in both groups ($P < 0.0001$). Comparison of the combined and sequential surgery groups showed no difference in either the best-corrected visual acuity or the central macular thickness.

**Conclusions:** In patients with visually significant epiretinal membrane and cataract, similar clinical outcomes are achieved when the procedure is performed as a combined surgery or when sequential procedures are performed.

**Reviewer’s Comments:** Vitrectomy results in relatively rapid progression of nuclear sclerosis in phakic patients. As this study demonstrates similar clinical outcomes in combined versus sequential vitrectomy and cataract extraction, the combined procedure is often a preferable option in patients who are already developing some degree of nuclear sclerosis. Progression to a more visually significant cataract often occurs within 1 to 2 years of surgery. Removal of the cataract at the time of the initial surgery alleviates the need for cataract surgery at a later time. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Vitrectomy, Cataract Surgery

Print Tag: Refer to original journal article
In contrast to earlier reports, this clinical trial shows no association between the use of thiazolidinediones and development of diabetic macular edema.

**Objective:** To evaluate the association between the use of thiazolidinediones and the development of diabetic macular edema.

**Design:** Substudy of a randomized clinical trial.

**Methods:** The Eye Substudy of the Action to Control Cardiovascular Risk in Diabetes (ACCORD) trial was designed to test a variety of interventions to control blood glucose and lipid levels and blood pressure on the development and progression of diabetic retinopathy. Baseline fundus photographs and visual acuity measurements were obtained in study participants. Photographs were evaluated by masked graders who classified participants on the basis of the presence of clinically significant diabetic macular edema. Further analysis allowed the determination of the association of this clinical finding with the use of thiazolidinediones.

**Results:** Among the 3473 participants who had baseline fundus photography, 20% had used thiazolidinediones for control of blood glucose levels. Diabetic macular edema was present in 6.9% of the study population. There was no difference in the prevalence of diabetic macular edema among those who did and did not use thiazolidinediones.

**Conclusions:** This study found no association between the use of thiazolidinediones and the presence of diabetic macular edema.

**Reviewer’s Comments:** Thiazolidinediones are a class of medication that has been used to manage hyperglycemia in patients with diabetes mellitus. Some case reports have been published suggesting that fluid retention associated with the use of these drugs may contribute to the development of diabetic macular edema. This clinical trial evaluated prospective data capable of addressing this question without the limitations of earlier retrospective studies. The present results show that these drugs appear to be safe to use in diabetic patients without contributing to this important complication of the disease. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Diabetic Retinopathy, Thiazolidinediones, Macular Edema

Print Tag: Refer to original journal article
Objective: To investigate photoreceptor disruption in patients with macula-off retinal detachment and to evaluate the association between photoreceptor disruption and visual outcomes after surgery.

Design: Retrospective clinical case series.

Methods: A consecutive series of 20 patients with macula-off retinal detachment underwent serial scanning of the macula with spectral-domain optical coherence tomography (SD-OCT) to evaluate the integrity of the macular photoreceptors. Imaging was performed 1 month, 3 months, and 6 months after successful retinal reattachment was accomplished by pars plana vitrectomy with gas tamponade.

Results: Classification of images was performed on the basis of the presence or absence of a disrupted inner segment/outer segment (IS/OS) line. Disruption of the IS/OS line was seen in 55% of eyes at 1 month and in 40% of eyes 3 months after surgery. In those eyes with available images taken 6 months after surgery, the proportion with persistent disruption of the IS/OS line was 17%. Serous detachment of the fovea was seen in 40% of eyes 1 month after surgery and in 35% of eyes 3 months after surgery. A significant correlation was seen between the presence of an intact IS/OS line and the best-corrected visual acuity. Those eyes with a serous foveal detachment had similar visual acuity as those without a detachment if the IS/OS line was intact.

Conclusions: Gradual recovery of photoreceptor disruption can be seen following successful reattachment of the retina in patients with a macula-off retinal detachment. This recovery is associated with a corresponding improvement in best-corrected visual acuity.

Reviewer's Comments: This study illustrates the potential of the retinal photoreceptors to recover following successful retinal detachment surgery as long as complete photoreceptor degeneration has not occurred. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Retinal Detachment, Photoreceptors

Print Tag: Refer to original journal article
Reduced visual acuity due to macular cysts in patients with X-linked retinoschisis may respond to treatment with topical dorzolamide.

**Objective:** To investigate the efficacy of treatment of macular cysts in patients with X-linked retinoschisis with topical dorzolamide 2%.

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

**Methods:** A consecutive series of 15 patients (19 eyes) ≥18 years of age managed in a single academic center with X-linked retinoschisis was evaluated in this study. A comprehensive baseline evaluation was performed in all patients that included imaging of the macula with optical coherence tomography (OCT) to document the presence and severity of macular cystic lesions. All patients were treated with topical dorzolamide 2% three times daily. Follow-up evaluation with repeat OCT imaging of the macula and measurement of visual acuity allowed the evaluation of the efficacy of treatment.

**Results:** Improvement in visual acuity was observed in 69% of eyes. After an initial response, 25% of treated eyes showed a recurrence of macular cystic lesions. A reduction in central foveal thickness on OCT images was seen in 59% of eyes.

**Conclusions:** These results suggest that topical dorzolamide 2% may be useful in treating patients with macular cystic lesions due to X-linked retinoschisis.

**Reviewer's Comments:** Topical dorzolamide has shown efficacy in treating some patients with cystoid macular edema due to uveitis, retinitis pigmentosa, and in conjunction with epiretinal membranes. This prompted the investigators to evaluate its efficacy in treating macular cysts in patients with X-linked retinoschisis. Although the number of patients included in this study was relatively small, the results are promising enough to warrant further investigation. Future studies with a control group are needed to verify the efficacy of this treatment. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Retinoschisis, Cystic Macular Lesions, Topical Dorzolamide

Print Tag: Refer to original journal article
ICG Angiography Helps Predict Response to Tx for CSC

Association Between the Efficacy of Photodynamic Therapy and Indocyanine Green Angiography Findings for Central Serous Chorioretinopathy.

Inoue R, Sawa M, et al:

Am J Ophthalmol 2010; 149 (March): 441-446

The severity of leakage seen on ICG angiography is predictive of the success of treatment of CSC chorioretinopathy with PDT.

**Objective:** To determine the association between findings on indocyanine green (ICG) angiography and the efficacy of photodynamic therapy (PDT) in the treatment of central serous chorioretinopathy (CSC).

**Design:** Observational clinical case series.

**Methods:** A consecutive series of 32 eyes of 27 patients with chronic CSC and symptoms persisting at least 6 months were included in this study. All patients had follow-up of at least 1 year after treatment. Baseline clinical evaluation included ICG angiography. Subsequent treatment with PDT was performed with energy reduced to a range of 36 to 42 mJ/cm². Baseline middle phase ICG images were classified as having intense, intermediate, or no hyperfluorescence. The results of PDT were compared between patients in each of these 3 categories of ICG findings.

**Results:** Intense hyperfluorescence was observed in 72% of eyes compared to intermediate hyperfluorescence in 19% and no hyperfluorescence in 9%. Complete resolution of subretinal fluid was seen in 100% of eyes with intense or intermediate hyperfluorescence. In contrast, no eyes without hyperfluorescence on ICG angiography had resolution of subretinal fluid after PDT. Recurrence of subretinal fluid was more commonly seen in eyes with intermediate hyperfluorescence compared to those with intense hyperfluorescence.

**Conclusions:** Greater hyperfluorescence on ICG angiography is predictive of a better response to PDT for the treatment of CSC.

**Reviewer’s Comments:** This study illustrates how ICG angiography can be used to identify patients who will benefit most from PDT for the treatment of CSC. The authors do comment, however, that there is some evidence that this form of treatment may result in atrophic lesions of the retinal pigment epithelium in patients with chronic CSC. Reduction of the irradiation time and total energy delivery to levels lower than those used in the Treatment of Age-Related Macular Degeneration With Photodynamic Therapy (TAP) Study may reduce the likelihood of developing this potential complication. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Central Serous Chorioretinopathy, Photodynamic Therapy, Indocyanine Green Angiography

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**Dorzolamide and Timolol Reduce IOP**

*Effect of Dorzolamide and Timolol on Ocular Pressure: Blood Flow Relationship in Patients With Primary Open-Angle Glaucoma and Ocular Hypertension.*


Invest Ophthalmol Vis Sci 2010; 51 (March): 1289-1296

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IOP reduction with timolol or dorzolamide reduces the abnormal effect of systemic blood pressure on ocular blood flow seen in glaucoma patients.

**Objective:** To determine whether the topical administration of timolol and dorzolamide alters the abnormal pattern of ocular blood flow in patients with primary open-angle glaucoma (POAG) or ocular hypertension (OHTN).

**Design:** Prospective interventional clinical study.

**Participants/Methods:** 140 patients with POAG or OHTN were enrolled in this study. The same study population had been previously evaluated in another study that demonstrated evidence of abnormal ocular blood flow parameters indicative of abnormal autoregulation. Patients were randomly assigned to receive either topical timolol or dorzolamide for 6 months. All patients included in the final analysis demonstrated efficacy of intraocular pressure (IOP) reduction with treatment. Ocular blood flow parameters were measured before and after treatment to evaluate the effect of each medication on ocular blood flow. Methods used to measure ocular blood flow included scanning laser Doppler flowmetry to measure blood flow in the temporal neuroretinal rim and laser interferometry to measure pulsatile choroidal blood flow.

**Results:** All ocular blood flow parameters demonstrated a significant relationship with systemic blood pressure at baseline. The effect of blood pressure on these parameters was significantly reduced following treatment with either timolol or dorzolamide.

**Conclusions:** Normalization of the pattern of ocular blood flow and its relationship to systemic blood pressure is seen after treatment with timolol or dorzolamide in patients with POAG or OHTN.

**Reviewer's Comments:** Previous studies have demonstrated abnormal autoregulation of ocular blood flow in glaucoma patients. This study evaluated the effects of administration of topical timolol and dorzolamide on these blood flow parameters. The results suggest that IOP reduction and improved ocular blood flow occur with use of these drugs. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Glaucoma, Medical Treatment, Ocular Blood Flow

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Central Visual Field Loss Occurs Earlier in Patients With NTG

Visual Field Progression Differences Between Normal-Tension and Exfoliative High-Tension Glaucoma.

Ahrlich KG, De Moraes CGV, et al:

Invent Ophthalmol Vis Sci 2010; 51 (March): 1458-1463

Although similar rates of visual field loss are seen in patients with NTG or XHTG, central loss is more commonly seen in patients with NTG.

**Objective:** To compare the pattern of visual field loss in patients with normal-tension glaucoma (NTG) and exfoliative high-tension glaucoma (XHTG).

**Design:** Retrospective, comparative, clinical case series.

**Methods:** All patients with a series of ≥5 sequential visual field tests in a large database from a referral glaucoma practice were identified. Patients were diagnosed as having glaucoma based upon the presence of characteristic glaucomatous excavation of the optic nerve head with a corresponding visual field defect. Patients were further classified as having NTG if all measurements of intraocular pressure (IOP) were <21 mm Hg before and after initiating treatment. All patients with exfoliative glaucoma and IOP ≥21 mm Hg prior to treatment were identified. The rate of change and pattern of visual field loss were compared between the 2 groups.

**Results:** IOP was significantly higher in the XHTG patients than NTG patients during the follow-up period (16.5 mm Hg vs 13.3 mm Hg; \(P < 0.01\)). The rate of global visual field loss was greater in XHTG patients than those with NTG (−0.64 dB/year vs −0.35 dB/year; \(P < 0.01\)). After adjusting for the level of IOP, age, and central corneal thickness, a similar rate of change of global visual field loss was seen between NTG and XHTG patients. The pattern of visual field loss was, however, different between the 2 groups, with 75% of NTG patients showing loss within the paracentral region compared to 57% in the XHTG group.

**Conclusions:** After adjusting for IOP, age, and central corneal thickness, rates of visual field loss are similar between NTG and XHTG patients. However, there is a stronger tendency for central visual field loss in NTG patients.

**Reviewer's Comments:** The observation that central visual field loss is more likely to occur earlier in the course of disease in patients with NTG suggests that more careful monitoring and more aggressive treatment to lower IOP are warranted in these patients. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Glaucoma, Visual Field Loss, Normal-Tension/Exfoliative High-Tension Glaucoma

Print Tag: Refer to original journal article
Younger Patients More Likely to Require YAG Laser Posterior Capsulotomy

Lundqvist B, Mönestam E:

Am J Ophthalmol 2010; 149 (February): 238-244

Patients who are younger at the time of cataract surgery are more likely than older patients to require eventual YAG laser posterior capsulotomy.

**Objective:** To investigate the long-term visual and subjective outcomes in adult patients <65 years of age who undergo cataract surgery.

**Design:** Prospective, longitudinal, population-based cohort study.

**Participants/Methods:** 810 patients with visually significant cataracts, who required cataract surgery, were enrolled in this study. The study divided patients into the subset patients who were <65 years of age (n=116) at the time of surgery and the remaining patients, who were ≥65 years of age at the time of surgery. A comprehensive ophthalmic examination was completed at baseline within 2 months of the time of surgery. Visual outcomes were reported on the first eye to undergo surgery and were also reported on the better seeing eye at each follow-up time point. All patients underwent sutureless clear corneal phacoemulsification with implantation of an intraocular lens (IOL). The vast majority (94%) had implantation of an acrylic foldable posterior chamber lens. Patients underwent periodic follow-up evaluation through 10 years of follow-up. Visual outcomes, complications of surgery, and subsequent interventions were recorded.

**Results:** Stable visual acuity within 1 line of the early postoperative acuity was seen in the majority of patients through 10 years of follow-up after surgery but was more commonly observed in the younger age group (82% vs 63%; \( P =0.00003 \)). A higher proportion of patients in the younger age category required YAG laser posterior capsulotomy (37% vs 20%; \( P =0.003 \)). A larger drop in subjective visual function, as assessed by a visual function questionnaire (VF-14), was seen in older patients.

**Conclusions:** Visual function remains stable through 10 years of follow-up after cataract surgery in the majority of patients, particularly those in the younger age group (<65 years of age). Posterior capsule opacification requiring YAG laser posterior capsulotomy is more common in younger patients.

**Reviewer's Comments:** It is well known that children who require cataract surgery almost universally develop posterior capsule opacification (PCO). Consequently, many who perform cataract surgery in pediatric patients perform primary posterior capsulotomy, especially in young children who cannot cooperate with laser procedures. This study demonstrates that age is also a factor in the development of PCO in the adult age group. It is important to note, however, that in spite of the development of PCO, its treatment with YAG laser posterior capsulotomy results in improved vision that remains stable over the long term. (Reviewer-Scott D. Smith, MD, MPH).

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**Keywords:** YAG Laser, Posterior Capsulotomy

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Amniotic Membrane, Topical Corticosteroids Improve Outcome in SJS and TEN

Management of Acute Stevens-Johnson Syndrome and Toxic Epidermal Necrolysis Utilizing Amniotic Membrane and Topical Corticosteroids.
Shammas MC, Lai EC, et al:
Am J Ophthalmol 2010; 149 (February): 203-213

Complete coverage of the ocular surface with amniotic membrane in conjunction with topical corticosteroids can result in preservation of the ocular surface and a good visual outcome in patients with SJS.

**Objective:** To describe the clinical outcome of a new approach to treatment of Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN).

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

**Methods:** Medical records were reviewed of a consecutive series of 12 eyes of 6 patients with biopsy-proven SJS or TEN who underwent treatment with partial or complete coverage of the ocular surface with amniotic membrane within 2 weeks of disease onset. In addition to surgical placement of amniotic membrane, topical fluorometholone ointment 0.1% was applied every 1 to 2 hours for 1 to 2 weeks, as well as topical moxifloxacin for antibiotic prophylaxis. Follow-up evaluation allowed the determination of the visual outcome and assessment of the condition of the ocular surface after resolution of the acute inflammatory phase.

**Results:** The mean follow-up time was 7.7 months. Four patients underwent complete coverage of the ocular surface with amniotic membrane. These patients had a final visual outcome of 20/40 or better and an intact ocular surface in both eyes. Two patients who underwent partial coverage of the ocular surface with amniotic membrane developed cicatricial ocular surface changes, and 1 developed a corneal perforation.

**Conclusions:** Complete coverage of the ocular surface with amniotic membrane in conjunction with topical corticosteroids can result in preservation of the ocular surface and a good visual outcome in patients with SJS or TEN.

**Reviewer's Comments:** SJS and TEN can result in catastrophic injury to the ocular surface with loss of limbal stem cells and a poor visual outcome. The technique described in this study offers potential for dramatically improved visual outcomes and should be considered in patients who develop these severe anterior segment diseases. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Stevens-Johnson Syndrome, Toxic Epidermal Necrolysis

Print Tag: Refer to original journal article
Subconjunctival delivery of a sustained-release antibiotic/steroid combination could be useful following cataract surgery by preventing problems associated with failure to adhere to recommended medication use.

**Objective:** To compare the efficacy of a sustained-release preparation of subconjunctival ciprofloxacin and triamcinolone (DuoCat) to that of topical ciprofloxacin as antibiotic prophylaxis.

**Design:** In vivo laboratory investigation.

**Methods:** Animal studies were conducted evaluating the aqueous and vitreous levels of antibiotic achieved following subconjunctival injection of a sustained-release preparation of ciprofloxacin and triamcinolone; these were compared to the penetration of a single dose of topical ciprofloxacin 0.3%. A second study was performed in 45 rabbits that underwent intracameral injection of *Staphylococcus aureus* followed by subconjunctival administration of the ciprofloxacin/triamcinolone preparation, topical ciprofloxacin drops given every 4 hours, or balanced salt solution eye drops given every 4 hours. A standardized grading scale was used to compare the severity of ocular inflammation between the 3 groups.

**Results:** Higher intraocular ciprofloxacin levels were achieved with the sustained-release subconjunctival preparation than with topical ciprofloxacin. Both of the 2 treated groups had similar severity scores 24 hours after intracameral injection of bacteria, with no significant difference between groups. In contrast, control eyes that did not receive either of the ciprofloxacin regimens had significantly greater ocular inflammation following injection.

**Conclusions:** A sustained-release preparation of ciprofloxacin and triamcinolone delivered as a subconjunctival injection shows promise as a postoperative medication regimen following ocular surgery.

**Reviewer's Comments:** This study demonstrated the potential application of a combined steroid and antibiotic therapy that can be delivered in a single dose after ocular surgery that appears to have similar efficacy to a topical antibiotic regimen. Higher intraocular drug levels and a similar level of efficacy in an animal model of endophthalmitis were seen and should prompt further investigation of this novel method of drug delivery for treatment following cataract surgery. This single-dose drug delivery would also have the benefit of avoiding problems associated with patient failure to adhere to recommended postoperative medication use. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Cataract Surgery, Antibiotics, Anti-Infective Prophylaxis

Print Tag: Refer to original journal article