

Topical Autologous Plasma May Lead to Corneal Nerve Regeneration

Corneal Nerve Regeneration in Neurotrophic Keratopathy Following Autologous Plasma Therapy.

Rao K, Leveque L, Pflugfelder SC:

Br J Ophthalmol 2010; 94 (May): 584-591

Autologous plasma treatment appears to result in corneal nerve regeneration in patients with neurotrophic keratopathy.

Objective: To evaluate the effect of topical autologous plasma on the corneal surface and corneal nerves in patients with neurotrophic keratopathy (NK).

Design: Prospective interventional clinical study.

Participants/Methods: 11 eyes of 6 patients with NK were evaluated in this study. Baseline evaluation included a complete ophthalmic examination and measurement of corneal sensation with Cochet-Bonnet aesthesiometry. Imaging of the corneal surface by confocal microscopy was used to measure the number and size of corneal nerves at baseline. Patients donated blood, which was used to prepare sterile autologous plasma that was provided to them for use during the study. In addition to the use of topical nonpreserved artificial tears, autologous plasma was used 8 times daily for 1 month, and then was reduced to 4 times daily through the remainder of the study. Follow-up evaluation allowed the assessment of treatment with autologous plasma on corneal healing and regeneration of corneal nerves.

Results: Best-corrected visual acuity significantly improved in all eyes after treatment. The degree of corneal fluorescein staining, and severity of punctate keratopathy also improved in all cases. A significant increase in corneal sensation was also measured by Cochet-Bonnet aesthesiometry. Confocal microscopy demonstrated an increase in the number, length, and diameter of corneal nerves following treatment.

Conclusions: Topical therapy with autologous plasma appears to result in clinical improvement of keratopathy, as well as regeneration of corneal nerves.

Reviewer's Comments: NK is a potentially sight-threatening condition that can result from any condition that affects trigeminal innervation to the cornea. Herpes simplex and zoster infection, trigeminal injury through trauma or ablation, or direct injury to the corneal nerves through LASIK or penetrating keratoplasty can lead to this condition. This study demonstrates the potential of autologous plasma not only in improving the ocular surface, but also in regenerating corneal nerves. Further prospective studies are needed to verify and better characterize the benefits of autologous plasma, but this treatment offers hope to individuals affected by this condition. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Cornea, Neurotrophic Keratopathy

Print Tag: Refer to original journal article

Trachoma Control Programs Reduce Infection

Estimation of Effects of Community Intervention With Antibiotics, Facial Cleanliness, and Environmental Improvement (A,F,E) in Five Districts of Ethiopia Hyperendemic for Trachoma.

Ngondi J, Gebre T, et al:

Br J Ophthalmol 2010; 94 (March): 278-281

Antibiotics, facial cleanliness, and environmental improvement each play an important role in the control of glaucoma in endemic regions.

Objective: To evaluate the impact of various interventions on control of active trachoma in a hyperendemic region of Ethiopia.

Design: Prospective evaluation of a community intervention for trachoma control.

Methods: Cluster random surveys were performed in 5 districts of Ethiopia where a World Health Organization (WHO)-recommended trachoma control program had been implemented for 3 years. Children between the ages of 1 and 9 years were examined for signs of active trachoma, and additional questionnaire and follow-up evaluation was undertaken to evaluate the frequency of azithromycin antibiotic use by the children, presence of facial cleanliness, and availability of a pit latrine in their household. Statistical analysis evaluated each of these 3 factors and their impact on the likelihood of having active trachoma at the time of follow-up.

Results: 1813 children were included in the analysis. Number of times treated with azithromycin, number of months since last mass azithromycin treatment, presence of a clean face, and availability of a household pit latrine were all significant predictors of a lower probability of having active trachoma at the time of follow-up.

Conclusions: This study demonstrates the importance of each element of the WHO-recommended trachoma control program in minimizing the impact of trachoma in endemic regions.

Reviewer's Comments: Trachoma remains a common cause of blindness in large areas of the developing world. This study demonstrates the importance of each element of currently recommended trachoma control programs in minimizing the impact of this disease. While eventual economic development should eradicate trachoma through improved sanitation, continuation of antibiotic distribution programs is important in minimizing the impact of this blinding disease in endemic regions. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Trachoma, Community Intervention

Print Tag: Refer to original journal article

IOL Design Affects PCO Rate After Cataract Surgery

Clinical Consequences of Acrylic Intraocular Lens Material and Design: Nd:YAG-Laser Capsulotomy Rates in 3 x 300 Eyes 5 Years After Phacoemulsification.

Johansson B:

Br J Ophthalmol 2010; 94 (April): 450-455

Differences in IOL design result in significant variation in posterior capsule opacification rates during the first 5 years after surgery.

Objective: To investigate the effect of intraocular lens (IOL) design on the need for YAG posterior capsulotomy during the first 5 years after phacoemulsification.

Design: Retrospective comparative clinical study.

Participants/Methods: Medical records were obtained of 900 patients who underwent clear corneal phacoemulsification at a single university during a 5-year period. In total, 300 patients were selected at random from groups having 3 different IOL types implanted. One group had the AMO AR40, a hydrophobic acrylic lens with a rounded posterior optic edge. The second group had the AMO AR40e implanted, which is of similar design but has a sharp posterior optic edge. The third group had the Bausch & Lomb BL27 hydrophilic acrylic IOL implanted, which has a sharp posterior optic edge and has single-piece acrylic haptics without angulation. Five-year follow-up data allowed the evaluation of posterior capsule opacification (PCO) requiring YAG capsulotomy in each of the groups, which were compared statistically.

Results: 24% of eyes required YAG posterior capsulotomy during the first 5 years after surgery. Statistically significant differences in the rate of PCO requiring YAG capsulotomy were seen between the 3 groups. Eyes with the hydrophobic acrylic IOL with the sharp posterior optic edge had the lowest rate of posterior capsulotomy, with 17% requiring this procedure. Those with the hydrophobic acrylic lens with the rounded optic edge had an intermediate capsule opacification rate of 24%, while those with the hydrophilic acrylic lens had the highest rate of 30%.

Conclusions: Differences in acrylic IOL design result in significant differences in PCO rates during the first 5 years after cataract surgery.

Reviewer's Comments: Although PCO is common and easily managed with YAG posterior capsulotomy, in some areas of the world where access to follow-up care after cataract surgery is more limited, PCO can result in significant morbidity. As a result, it is important to understand factors associated with the development of this complication. This study demonstrates that IOL design is an important predictor of PCO, with the sharp posterior optic edge being a particularly important factor in hydrophobic acrylic lenses. Whether hydrophilic lens materials result in PCO at a higher rate or whether other differences in the IOL design are to blame for the higher rates observed in this study will require further investigation. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: YAG Laser Capsulotomy, IOL Design, Phacoemulsification

Print Tag: Refer to original journal article

Custom Selection of Aspheric IOL Improves Postop Contrast Sensitivity

Measurement of Corneal Aberrations for Customisation of Intraocular Lens Asphericity: Impact on Quality of Vision After Micro-Incision Cataract Surgery.

Nochez Y, Favard A, et al:

Br J Ophthalmol 2010; 94 (April): 440-444

Individual selection of IOL asphericity based on preoperative wavefront measurement of spherical aberrations results in improved mesopic contrast sensitivity following cataract surgery.

Objective: To compare the quality of vision of patients with customised aspheric intraocular lenses (IOL) versus patients implanted with zero-aberrations IOL after a 1.8-mm micro-incision cataract surgery (MICS).

Methods: 43 eyes of patients scheduled for routine cataract surgery were enrolled in the study. Seventeen eyes were in the reference group that received zero aberration aspheric Acri.smart 46LC posterior chamber IOL. Twenty-six eyes received a customized aspheric IOL based upon preoperative measurements of corneal spherical by wavefront aberrations. The goal of postoperative spherical aberrations of +0.10 μm was sought in this group. All patients underwent the same surgical procedure by a single experienced cataract surgeon. Postoperative refraction, best-corrected visual acuity, contrast sensitivity, and ocular wavefront aberrations were performed in all patients 6 months after surgery.

Results: No significant difference in postoperative best-corrected visual acuity was seen between the 2 groups. However, mesopic contrast sensitivity was significantly better in the custom group at both intermediate and high spatial frequencies ($P < 0.001$). Photopic contrast sensitivity was similar in both groups. Wavefront demonstrated lower spherical aberrations in the custom group compared to those who received the zero aberration aspheric IOL.

Conclusions: Individual selection of IOL asphericity based on preoperative wavefront measurement of spherical aberrations results in improved mesopic contrast sensitivity following cataract surgery.

Reviewer's Comments: Patients are becoming increasingly demanding with regard to visual outcomes after cataract surgery. This study demonstrates that individualization of the placement of an aspheric IOL matched to the patient's preoperative spherical aberrations can result in improved contrast sensitivity. This approach of customization of IOL selection according to wavefront aberrations may become more common in order to meet the high expectations of patients following cataract surgery. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Cataract Surgery, IOL Design

Print Tag: Refer to original journal article

Oral Acetaminophen Can Reduce Pain During, After Phacoemulsification

Oral Acetaminophen (Paracetamol) for Additional Analgesia in Phacoemulsification Cataract Surgery Performed Using Topical Anesthesia: Randomized Double-Masked Placebo-Controlled Trial.

Kaluzny BJ, Kazmierczak K, et al:

J Cataract Refract Surg 2010; 36 (March): 402-406

Oral acetaminophen 1 g given 1 hour prior to topical clear corneal phacoemulsification reduces intraoperative and postoperative pain.

Objective: To evaluate the efficacy of 1 g oral acetaminophen given in addition to topical anesthesia prior to clear corneal phacoemulsification with topical anesthesia in reducing intraoperative and postoperative pain.

Design: Randomized double-masked placebo-controlled clinical trial.

Participants/Methods: 160 patients between the ages of 50 and 90 years undergoing phacoemulsification through clear corneal incision under topical anesthesia were enrolled in the study. Patients were randomly assigned to the treatment group, which received a 1 g dose of oral acetaminophen 1 hour prior to surgery or to a control group that received 400 mg of vitamin C. Patients and caregivers were all masked as to the treatment group. All patients received IV sedation using a similar regimen, as well as 3 doses of topical tetracaine 0.5% preoperatively. Clear corneal phacoemulsification with implantation of an acrylic foldable posterior chamber intraocular lens was performed in all patients. Fifteen minutes after surgery, patients were asked to rate their intraoperative pain experience on a scale of 0 to 10. Eight to 12 hours postoperatively, a similar evaluation of pain was made. Statistical analysis allowed the comparison of intraoperative and postoperative pain experienced by patients in the acetaminophen and control groups.

Results: There were no significant differences in clinical or demographic characteristics of patients in the 2 groups. The intraoperative demeanor score graded by the surgeon did not differ between the 2 groups. However, a statistically significant reduction in intraoperative and postoperative pain, of approximately 1 unit on the 10-point scale, was seen in the acetaminophen-treated patients compared to those in the control group.

Conclusions: Preoperative oral administration of acetaminophen 1 g was effective in reducing intraoperative and postoperative pain in patients undergoing clear corneal phacoemulsification with topical anesthesia.

Reviewer's Comments: The low cost, ease, and safety of administration of oral acetaminophen prior to cataract surgery all speak in favor of the use of this simple intervention to improve pain control during and after topical clear corneal phacoemulsification. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Analgesics, Cataract Surgery

Print Tag: Refer to original journal article

Low Aspiration Parameters Reduce Corneal Edema

Impact of High and Low Aspiration Parameters on Postoperative Outcomes of Phacoemulsification: Randomized Clinical Trial.

Vasavada AR, Praveen MR, et al:

J Cataract Refract Surg 2010; 36 (April): 588-593

The use of lower fluidic parameters during phacoemulsification can lead to less corneal edema postoperatively.

Objective: To compare the effect of fluidic parameters on postoperative corneal edema after phacoemulsification cataract surgery.

Design: Randomized controlled clinical trial.

Participants/Methods: 50 patients undergoing routine cataract surgery were enrolled in this clinical trial; 25 patients were assigned randomly into each of 2 different groups based on the use of different fluidic parameters during surgery. The low-fluidic parameter group used an aspiration-flow rate of 25 mL/minute and a bottle height between 70 and 90 cm. The maximum vacuum used during phacoemulsification was 400 mm Hg. In the high-fluidic parameter group, aspiration-flow rate was set at 40 mL/minute and the bottle height between 90 and 110 cm. The maximum vacuum setting was 650 mm Hg. Preoperative comparison of central corneal thickness and endothelial cell density allowed the evaluation of the different fluidic parameters on the cornea following surgery.

Results: Postoperative central corneal thickness was greater in the high-fluidic parameter group compared to the low-fluidic parameter group, with a 13.4% increase in central corneal thickness from baseline compared to a 6.5% increase in the other group. Central corneal thickness returned to baseline levels within 1 week in the low-fluidic parameter group, but required 1 month to return to baseline in the high-fluidic parameter group. There were no statistically significant differences in the proportional change in endothelial cell density 3 months after surgery in either group. However, surgery time was increased in the low-fluidic parameter group, with a mean increase of 1 minute.

Conclusions: Low fluidic parameters can lead to less effect on the cornea after surgery, with less corneal edema during the first month following surgery.

Reviewer's Comments: Low fluidic parameters allow safer phacoemulsification of nuclear fragments posterior to the iris plane, since less turbid fluid movement results in lower likelihood of the capsular bag contacting the phacoemulsification tip. The low fluidic parameters also result in less turbidity of fluid flow in the anterior chamber and fewer nuclear fragments striking the corneal endothelium. Awareness of these issues and finding a balance between the speed and control of phacoemulsification by adjusting fluid parameters and bottle height can allow the cataract surgeon to optimize clinical outcomes. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Cataract Surgery

Print Tag: Refer to original journal article

H. pylori Infection Associated With Posner-Schlossman Syndrome

Association Between *Helicobacter pylori* Infection and Posner-Schlossman Syndrome.

Choi CY, Kim MS, et al:

Eye (Lond) 2010; 24 (January): 64-69

H. pylori infection occurs significantly more often in Posner-Schlossman syndrome patients than in the general population.

Objective: To investigate a possible association between *Helicobacter pylori* infection and Posner-Schlossman syndrome.

Design: Prospective observational comparative clinical study.

Participants/Methods: In this study, 40 subjects evaluated at a single referral center with Posner-Schlossman syndrome were included. A control group of 73 subjects with eyelid disease or cataract but without associated ocular disease was also evaluated. All subjects underwent serologic analysis for the presence of *H. pylori* infection using ELISA. The rate of serum positivity of anti-*H. pylori* IgG was compared between the 2 groups.

Results: A significantly higher proportion of Posner-Schlossman syndrome patients was seropositive for *H. pylori* than in the control group (80.0% vs 56.2%; $P=0.01$). Multivariate statistical analysis adjusting for age, gender, and various potential confounding systemic factors demonstrated that seropositivity for *H. pylori* IgG was a significant risk factor for Posner-Schlossman syndrome (OR, 4.84; $P=0.04$; 95% CI, 1.10 to 21.2).

Conclusions: *H. pylori* infection occurs significantly more often in Posner-Schlossman syndrome patients than in the general population.

Reviewer's Comments: Posner-Schlossman syndrome is a relatively uncommon form of anterior uveitis characterized by mild anterior chamber cell and flare, keratic precipitates, and extreme intraocular pressure elevation, usually in the range of 40 to 60 mm Hg. It tends to be particularly responsive to corticosteroid therapy and anti-glaucoma medications, but given its recurrent nature, significant glaucomatous optic nerve damage may occur over time. The results of this study emphasize the fact that the etiology of Posner-Schlossman syndrome remains uncertain. While there has been some evidence of herpes virus infection being associated with this condition, the present study shows a significant relationship to *H. pylori* infection, which has also been implicated in a variety of other systemic diseases. Further study will be required in order to elucidate the relationship between *H. pylori* infection and Posner-Schlossman syndrome, and to determine whether treatment for *H. pylori* may improve the clinical course of this disease. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Uveitis, Glaucoma

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Measured IOP Low After LASIK Using Rebound Tonometry

Effect of Laser In Situ Keratomileusis on Rebound Tonometry and Goldmann Applanation Tonometry.

Lam AKC, Wu R, et al:

J Cataract Refract Surg 2010; 36 (April): 631-636

Most methods of IOP measurement significantly underestimate pressure following LASIK, which must be considered in order to appropriately detect glaucoma.

Objective: To determine the influence of refractive surgery on measurement of intraocular pressure (IOP) using rebound tonometry and Goldmann applanation tonometry.

Design: Prospective, observational clinical study.

Methods: IOP measurements using the rebound tonometer and Goldmann applanation tonometer were performed 1 month before uneventful LASIK surgery in 96 eyes of 96 patients with myopia. Preoperative evaluation also included Orbscan II corneal pachymetry, with the thinnest corneal measurement being used as central corneal thickness for purposes of analysis. Repeat evaluation 1 month after performance of LASIK allowed evaluation of the effect of the surgical procedure on IOP measurement using each of the 2 devices.

Results: The mean preoperative IOP was measured to be 16.7 mm Hg by rebound tonometry and 15.4 mm Hg by Goldmann applanation. Central corneal thickness after LASIK changed from 545 microns to 450 microns 1 month postoperatively. Corresponding to the reduced corneal thickness, a significant reduction in measured IOP was seen with each of the devices. One-month postoperative IOP measurements were found to be 11.9 mm Hg with rebound tonometry and 12.0 mm Hg by Goldmann applanation.

Conclusions: Both rebound tonometry and applanation tonometry underestimate IOP after LASIK.

Reviewer's Comments: All ophthalmologists must be aware that patients who have undergone previous LASIK have falsely low IOP measurements after the procedure, which may lead to complacency in monitoring these individuals for glaucoma. A comprehensive eye examination is required on a regular basis in all individuals who have undergone LASIK in order to accurately detect the development of glaucomatous optic nerve damage, even at measured IOP levels that would not ordinarily predispose to glaucoma. Given the uncertainties of IOP measurement, it cannot be relied on for detecting glaucoma in this group. In fact, IOP is an unreliable detector of glaucoma in any population, and the problem is exacerbated by previous refractive surgery. Keeping these facts in mind is essential in avoiding a missed diagnosis leading to unnecessary vision loss. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Intraocular Pressure, Glaucoma, Refractive Surgery

Print Tag: Refer to original journal article

Combined Fluocinolone Acetonide Implant and Glaucoma Shunt Insertion Can Manage Uveitis, Glaucoma

Combined Fluocinolone Acetonide Intravitreal Insertion and Glaucoma Drainage Device Placement for Chronic Uveitis and Glaucoma.

Malone PE, Herndon LW, et al:

Am J Ophthalmol 2010; 149 (May): 800-806

Simultaneous Retisert and glaucoma drainage device implantation is effective in managing patients with chronic uveitis and glaucoma.

Objective: To evaluate the clinical outcomes of simultaneous implantation of a fluocinolone acetonide sustained-release intravitreal implant and a glaucoma drainage device in patients with chronic uveitis and elevated intraocular pressure (IOP) on maximum tolerated glaucoma therapy.

Design: Retrospective, observational clinical case series.

Methods: 7 eyes of 5 patients with chronic intermediate or posterior uveitis were included in the study. Each patient had uncontrolled inflammation and required implantation of a fluocinolone acetonide sustained-release implant (Retisert). In addition, each patient had elevated IOP in spite of maximum tolerated medical therapy. Simultaneous implantation of an Ahmed glaucoma valve and the Retisert implant were performed. Follow-up evaluation through 3 years postoperatively was performed to evaluate clinical outcomes.

Results: A significant reduction in the number of recurrences of ocular inflammation was observed after surgery. While the mean number of episodes of uveitis recurrence in the year after surgery was 3, no eye experienced any recurrence within 30 months after Retisert implantation. A significant improvement in visual acuity was also noted due to improved inflammation control and reduced macular edema. IOPs significantly decreased from a mean of 27.3 mm Hg to 14.6 mm Hg at 12 months after combined surgery. One eye required implantation of a second Ahmed valve for adequate IOP control.

Conclusions: Favorable results were observed, both with regard to control of inflammation and IOP in patients undergoing simultaneous fluocinolone acetonide implantation and placement of an Ahmed glaucoma valve.

Reviewer's Comments: Studies of the likelihood of development of uncontrolled IOP after placement of a Retisert implant have found a significant number of patients who require surgery, even when preoperative IOP was not elevated. This study showed excellent clinical outcomes in patients undergoing simultaneous surgery, such that consideration of this combined procedure is very rational when patients who need a Retisert implant already have elevated IOP in spite of medical therapy. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Uveitis, Glaucoma, IOP

Print Tag: Refer to original journal article

Confrontation VF Accuracy

Diagnostic Accuracy of Confrontation Visual Field Tests.

Kerr NM, Chew SSL, et al:

Neurology 2010; 74 (April 13): 1184-1190

What Is Best Confrontation Technique?

Background: Confrontation visual fields are part of the complete ophthalmologic examination and may pick up a field defect that requires formal perimetry. There are many ways to perform this screening evaluation, and it is not clear which method is the best.

Objective: To compare various confrontation visual field techniques with formal perimetry for diagnostic accuracy.

Design: Prospective, masked, randomized observational case series.

Participants: 163 patients from a neuro-ophthalmology clinic in New Zealand.

Methods: Patients were excluded for a visual acuity of worse than 20/200, inability to perform field examinations, and unreliable perimetry (fixation losses, false positives, or false negatives >33%). All patients underwent SITA-standard 24-2 Humphrey visual field testing. Eyes were divided into mild (better than -5 dB), moderate (-5 to -10 dB), and severe (worse than -10 dB) field defects. Confrontation techniques were performed randomly by 2 masked examiners using 7 different tests in a well-lit room: (1) any parts of the examiner's face missing; (2) counting 1 or 2 static fingers in each quadrant; (3) equal clarity of 2 index fingers presented simultaneously in the superior and inferior quadrants; (4) equal color for 2 red bottle caps presented simultaneously in the superior and inferior quadrants; (5) identification of the wiggling finger from 2 simultaneously presented index fingers; (6) identification of a wiggling finger when moved inward from peripheral field; and/or (7) identification a 5-mm red target is perceived as red when moved inward from the periphery.

Results: There were 332 eyes, but 31 were excluded for unreliable fields, leaving 301 eyes for analysis. A little more than half of the patients were female, with a mean age of 59 years. Field defects were mild in 40%, moderate in 25%, and severe in 35%. More than 75% were in front of the chiasm, and the rest were from chiasmal and retrochiasmal lesions. Counting the number of fingers in a quadrant had the worst sensitivity (25%) but the best specificity (100%). The kinetic 5-mm red target had the best overall sensitivity (74%) and very good specificity (93%). Interestingly, the 5-mm target was one of the best at picking up moderate and severe defects but not mild defects. The best test for mild defects was the red top comparison. The sensitivity of confrontation fields could be increased to 78% by combining the red kinetic test and static finger wiggle.

Conclusions: Counting fingers in a single quadrant is not a good way to test confrontation fields. The best method appears to be a kinetic 5-mm target.

Reviewer's Comments: I have not used this form of confrontation field, but it is worth a try. I am disappointed that the authors did not test double simultaneous counting fingers. (Reviewer-Michael S. Lee, MD).

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Keywords: Confrontation, Visual Fields, Perimetry, Sensitivity, Specificity, Accuracy

Print Tag: Refer to original journal article

Functional Vision Loss in Children -- How Long Does It Last?

Nonorganic (Psychogenic) Visual Loss in Children: A Retrospective Series.

Toldo I, Pinello L, et al:

J Neuroophthalmol 2010; 30 (March): 26-30

The overwhelming majority of children with functional vision loss enjoy complete recovery within 1 year of diagnosis.

Background: Nonorganic visual loss represents a decline in visual function in the absence of an ocular abnormality by ophthalmologic, electrophysiologic, and neuroimaging studies. It does not occur that often in children.

Objective: To describe the clinical evaluations, prognostic indicators, and natural history of nonorganic visual loss in patients aged <16 years.

Design: Retrospective, observational case series.

Participants: 58 patients from a single center in Italy.

Methods: The diagnosis of nonorganic visual loss was made after inconsistent results of various tests were discovered. These tests included visual evoked potentials, electroretinography, neuroimaging, contrast sensitivity, color vision testing, Goldmann perimetry, stereoacuity, Worth 4 dot testing, and full ophthalmologic examination. Follow-up included an ophthalmologic examination or a telephone interview. Statistical analysis was performed to determine if potential risk/prognostic factors existed.

Results: The 39 girls and 19 boys had a mean age of 9.6 years. The diagnosis was made in less than a month among 60% of patients and in less than 1 year in 97% (mean, 3 months). Three-fourths of patients had reduced acuity, and one-half had visual field loss. Of those with acuity loss, three-fourths were worse than 20/40. Of those with field loss, one-third showed tunnel fields. Headache or abdominal pain was also present in three-fourths of the patients. A stressful predisposing event at home or a psychosocial problem was reported in 70%. Only 3% received a new psychiatric diagnosis. Resolution occurred in 54 patients from 3 days to 4 years after the diagnosis (mean, 7 months), with one-half improving in the first 6 months and 85% improving in the first year. Four patients did not enjoy resolution, but symptoms have improved to fluctuating, less-intense phenomena. No significant risk factor for symptom development or prognostic factor for recovery was identified.

Conclusions: Functional vision loss occurs more commonly in girls with a mean age of approximately 10 years. Most patients recover within 1 year, and psychosocial stressors are commonly present. Psychiatric disease is rare.

Reviewer's Comments: The diagnosis of nonorganic visual loss is predicated on normalization of visual acuity and visual field. Presumably, the high rate of recovery here is based on the lack of secondary gain among children. It is possible that the 4 children who did not recover may have had subtle findings that went undetected. It is important to continue following these patients and to continue to test them if symptoms do not resolve. Keep in mind that some patients did not improve for 4 years in this study. Finally, although the authors use the term "nonorganic" visual loss throughout the paper, they put the term "psychogenic" in the title. I do not like this term, because it implies some sort of psychologic disorder. (Reviewer-Michael S. Lee, MD).

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Keywords: Visual Loss, Functional, Nonorganic, Nonphysiologic, Children, Pediatric

Print Tag: Refer to original journal article

RNFL Thickness Changes Over Time

Natural History of Leber's Hereditary Optic Neuropathy: Longitudinal Analysis of the Retinal Nerve Fiber Layer by Optical Coherence Tomography.

Barboni P, Carbonelli M, et al:

Ophthalmology 2010; 117 (March): 623-627

Some quadrants of retinal nerve fiber layer do not demonstrate thickening until 3 months after disease onset among patients with Leber hereditary optic neuropathy. This could indicate a potential therapeutic window of opportunity.

Background: Leber hereditary optic neuropathy (LHON) is a rare, maternally inherited disease that results in bilateral visual loss. Currently, there are no effective treatments for LHON.

Objective: To determine the temporal sequence of retinal nerve fiber layer (RNFL) measurements among a group of patients with LHON.

Design: Prospective, observational case series.

Participants: 4 patients with LHON from Italy and Brazil.

Methods: Patients with the 11778 mutation underwent RNFL thickness measurements using optical coherence tomography (OCT). Measurements were taken at 4 different times: (1) before any visual loss; (2) at the onset of visual loss; (3) 3 months after the onset of visual loss; and (4) 9 months after the onset of visual loss. Patients were excluded if they had any retinal or optic nerve disease other than LHON, the absence of measurements at either 9-month follow-up or before disease onset, or very slowly progressive visual symptoms. Using the fast RNFL program on the Stratus OCT version 4.0.1, data collected included the mean RNFL thickness and the 4 quadrant thicknesses.

Results: There were 6 eyes of 4 patients included in this study, with a mean age of onset of 33 years. Visual acuity was counting fingers among all eyes. The mean RNFL did not change at disease onset (124 microns) from baseline (108 microns), but was significantly increased at 3 months (139 microns) and decreased at 9 months (71 microns) of follow-up. The temporal quadrant was significantly thickened at disease onset (95 microns) from baseline (78 microns) and then returned to baseline at 3 months (77 microns) and showed substantial thinning at 9 months (37 microns). The inferior quadrant showed substantial thickening at onset (160 microns) from baseline (131 microns). This thickening increased more by 3 months (180 microns) and became significantly thinner than baseline at 9 months (83 microns). The superior and nasal quadrants did not change from baseline at disease onset, became thicker at 3 months, and thinned at 9 months.

Conclusions: The RNFL thickness changes over time in a non-uniform fashion. The inferior and temporal quadrants are affected first with later involvement of the superior and nasal quadrants. This late change could indicate a therapeutic window of opportunity.

Reviewer's Comments: This is a bit unexpected, but it gives us hope that we could initiate new neuroprotective strategies during the first 3 months after the onset of visual loss among LHON patients. I know this is only 6 eyes, but it is challenging to obtain longitudinal data among LHON patients, especially presymptomatic data. (Reviewer-Michael S. Lee, MD).

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Keywords: OCT, Retinal Nerve Fiber Layer, Leber Hereditary Optic Neuropathy

Print Tag: Refer to original journal article

Toric Phakic Posterior Chamber IOL Effective in Myopic Astigmatism

Collagen Copolymer Toric Posterior Chamber Phakic Intraocular Lens for Myopic Astigmatism: One-Year Follow-Up.

Alfonso JF, Fernández-Vega L, et al:

J Cataract Refract Surg 2010; 36 (April): 568-576

For patients with high levels of astigmatism who may not be candidates for corneal refractive surgery, phakic toric intraocular lenses are being developed that provide stable keratorefractive outcomes.

Objective: To evaluate the safety, efficacy, and predictability of a toric phakic posterior chamber intraocular lens (pIOL) for the correction of moderate to high myopic astigmatism.

Design: Prospective, non-randomized, interventional clinical case study.

Methods: Patients with moderate to high levels of myopic astigmatism with spherical component no greater than -12.50 D and cylinder component no greater than -4.00 D were eligible for implantation of a collagen copolymer toric pIOL. Eligible patients were at least 22 years of age, had a stable refractive error, and were free from other ocular disease. The implant was placed in the posterior chamber through a 3.2-mm clear corneal incision and was rotated to the proper alignment according to preoperative measurements of the axis of astigmatism. Laser iridotomy was performed in all patients 1 week before surgery. Postoperative evaluation through 12 months after surgery allowed the evaluation of clinical outcomes.

Results: 55 eyes of 38 patients underwent the procedure. The mean patient age was 35.4 years (range, 22 to 49 years). The mean preoperative spherical equivalent refractive error was -4.65 D, and the mean cylinder was -3.03 D. At 12 months, 94.5% of eyes were within ± 0.50 D of the intended spherical equivalent refractive error; 95.8% of eyes had ≤ 1 D of residual cylinder. Five eyes lost 1 or more lines of best-corrected visual acuity, while $>50\%$ of eyes gained 1 or more lines of acuity.

Conclusions: Stable clinical outcomes can be achieved with a toric pIOL for managing refractive error in patients with moderate to high myopic astigmatism.

Reviewer's Comments: Implantation of phakic IOLs has gained popularity as a refractive procedure for managing patients with higher levels of ametropia who are not suitable candidates for corneal refractive procedures. Although studies such as this demonstrate good short-term outcomes, further evaluation of these devices is needed to determine potential long-term complications such as cataract and glaucoma. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Phakic Intraocular Lens, Myopia, Astigmatism

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Patients Highly Satisfied With Toric IOL

Visual Function and Patient Experience After Bilateral Implantation of Toric Intraocular Lenses.

Ahmed IIK, Rocha G, et al:

J Cataract Refract Surg 2010; 36 (April): 609-616

Patient satisfaction is high after phacoemulsification with toric intraocular lens implantation in patients with corneal astigmatism and visually significant cataracts.

Objective: To evaluate clinical outcomes after phacoemulsification with toric intraocular lens (IOL) implantation in patients with bilateral corneal astigmatism and visually significant cataracts.

Design: Multicenter, prospective, interventional clinical study.

Methods/Participants: This multicenter study enrolled 117 patients with bilateral corneal astigmatism between 1.00 and 2.50 diopters and visually significant cataracts. All patients underwent sequential bilateral clear corneal phacoemulsification with implantation of an AcrySof toric posterior chamber IOL, placed in accordance with preoperative toric IOL calculations to offset corneal astigmatism. Postoperative evaluation 1 day and 1, 3, and 6 months postoperatively allowed determination of the visual and refractive outcome and IOL stability. Subjective patient satisfaction was also assessed by questionnaire.

Results: Binocular uncorrected distance visual acuity was 20/40 or better in 99% of patients, and was 20/20 or better in 63% of patients. The mean residual astigmatism was 0.4 diopters. Spherical equivalent refractive error was within 0.5 diopters of the target refraction in 77% of eyes, and was within 1.0 diopter in 99% of eyes. Postoperative IOL stability was high, with 91% of eyes having the axis of alignment within 5 degrees and 99% within 10 degrees. No distance correction was required in 69% of patients. Patients reported a significant reduction in glare and halo symptoms after surgery; 94% of patients reported satisfaction with surgery with a score of ≥ 7 on a scale of 10.

Conclusions: Bilateral phacoemulsification with toric IOL implantation results in stable visual and refractive outcomes and high patient satisfaction.

Reviewer's Comments: Toric IOLs represent an important advance in IOL design that can allow the cataract surgeon to provide stable refractive outcomes in patients with corneal astigmatism who need cataract surgery. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Intraocular Lens Design

Print Tag: Refer to original journal article

Implantation of Second Multifocal IOL in Ciliary Sulcus Can Improve Near Vision

Dual Intraocular Lens Implantation: Monofocal Lens in the Bag and Additional Diffractive Multifocal Lens in the Sulcus.

Gerten G, Kermani O, et al:

J Cataract Refract Surg 2009; 35 (December): 2136-2143

Implantation of a foldable diffractive multifocal IOL in the ciliary sulcus over a preexisting IOL in the capsular bag can provide improved uncorrected near vision in pseudophakic patients.

Objective: To evaluate the clinical outcome of implantation of a new diffractive multifocal intraocular lens (IOL) implanted as a "piggy-back" add-on lens in the ciliary sulcus.

Design: Prospective, interventional clinical case series.

Methods: 56 eyes of 30 patients who required cataract extraction were included in the study. Patients underwent phacoemulsification with implantation of a silicone monofocal foldable posterior chamber IOL in the capsular bag. A second multifocal IOL with a +3.50 D diffractive element was then implanted in the ciliary sulcus. The combination of the 2 lenses was intended to provide emmetropia at distance with good uncorrected near vision. Follow-up evaluation was performed 3 months postoperatively to determine the refractive outcome and the uncorrected distance and near visual acuity.

Results: The mean 3-month postoperative uncorrected distance visual acuity was 20/20, with a mean spherical equivalent refractive error of +0.01 D. The mean uncorrected intermediate visual acuity was 20/30, and the mean uncorrected near visual acuity was Jaeger 2. No complications such as iris chafing, pigment dispersion, iris capture of the IOL, or glaucoma were seen.

Conclusions: Implantation of a "piggy-back" multifocal IOL in the ciliary sulcus can provide good uncorrected distance and near visual acuity in patients with a monofocal IOL placed in the capsular bag.

Reviewer's Comments: This study suggests that subsequent implantation of a "piggy-back" multifocal IOL in the ciliary sulcus in a patient following previous cataract surgery may result in improved uncorrected intermediate and near visual acuity. Although this study did not report any complications of the second IOL being placed in the ciliary sulcus, there have been reported cases of pigment dispersion and glaucoma in patients with a piggy-back IOL implanted for correction of ametropia. If the low-power or no-power diffractive multifocal IOL used in this study is thinner than a typical piggy-back IOL, then this complication may be more uncommon. Nevertheless, more study in a larger patient population is needed before piggy-back IOL implantation for purposes of correcting near vision can be recommended on a routine basis. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Multifocal Intraocular Lenses, Implantation, Ciliary Sulcus, Cataract

Print Tag: Refer to original journal article

Autorefractometry Accurate After Implantation of Diffractive Multifocal IOL

Autorefractometry After Implantation of Diffractive Multifocal Intraocular Lenses.

Bissen-Miyajima H, Minami K, et al:

J Cataract Refract Surg 2010; 36 (April): 553–556

Autorefractors can be used with reasonable accuracy in patients with diffractive multifocal IOLs.

Objective: To investigate the correlation between the results of autorefractometry and manifest refractive error measurement in patients who have received diffractive multifocal intraocular lenses (IOLs) following phacoemulsification.

Design: Retrospective, noncomparative clinical study.

Methods: Medical records were reviewed of a consecutive series of 156 eyes of 84 patients who underwent phacoemulsification with implantation of a diffractive multifocal IOL in the capsular bag. All patients underwent surgery with implantation of an Abbott Medical Optics Tecnis ZM900 IOL. Postoperative measurement of refractive error by autorefractometry and by manifest subjective refraction was performed at least 1 month following surgery. The results of each method of measuring refractive error were compared.

Results: By autorefractometry, the mean residual spherical refractive error was $+0.13 \pm 0.66$ D. The corresponding spherical refractive error measured by subjective refraction was $+0.26 \pm 0.50$ D. The residual cylindrical refractive errors were 0.94 ± 0.58 D and 0.61 ± 0.48 D by autorefractometry and subjective refraction, respectively. Measurements by the 2 methods were highly correlated as demonstrated by linear regression analysis with r^2 values of approximately 0.7.

Conclusions: Good correlation is seen between the results of autorefractometry and manifest subjective refraction in patients following implantation of a diffractive multifocal IOL.

Reviewer's Comments: As implantation of diffractive multifocal IOLs becomes more common, correction of residual refractive error will become more common. It is comforting to know that our usual tools to help estimate refractive error, such as the autorefractor, can still function adequately to aid in the process of providing best refractive correction for these patients. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Multifocal IOLs, Autorefractometry

Print Tag: Refer to original journal article

Estrogen Receptors Play Role in Open-Angle Glaucoma in Women

Estrogen Receptor Beta Gene Polymorphism and Intraocular Pressure Elevation in Female Patients With Primary Open-Angle Glaucoma.

Mabuchi F, Sakurada Y, et al:

Am J Ophthalmol 2010; 149 (May): 826-830

Variation in the genetic polymorphism of the *ESR2* gene between women with open-angle glaucoma and others indicates that this receptor plays a role in IOP elevation and modifies the risk of developing the disease.

Objective: To evaluate genetic polymorphisms of the estrogen receptor beta (*ESR2*) gene in patients with primary open-angle glaucoma (POAG) and in normal control subjects.

Design: Case-control study.

Participants/Methods: 425 Japanese patients with POAG and 191 control subjects without glaucoma were recruited to participate in the study. Blood samples were obtained that allowed the determination of genetic polymorphisms of the *ESR2* gene in each subject. Subjects with glaucoma were classified as normal-tension glaucoma (NTG) or high-tension glaucoma (HTG) on the basis of pretreatment intraocular pressure (IOP) levels <21 mm Hg.

Results: No differences in genetic polymorphism of the *ESR2* gene were seen in men. In women, however, C allele of rs1256031 and G allele of rs4986938 were more common in those with HTG compared to control subjects. The maximum IOP of women heterozygous or homozygous for these alleles was significantly higher than other subjects.

Conclusions: In women, the *ESR2* gene appears to play a role in IOP elevation and modifies the risk of developing POAG.

Reviewer's Comments: Estrogens are steroid hormones that have significant physiologic effects. This study suggests that in women, who of course have higher physiologic estrogen levels than men, variation in the *ESR2* gene plays a role in how estrogen levels can affect IOP, which in turn modifies the risk of developing glaucoma. While the mechanism of this effect remains unknown, further study of this and of the effect of other steroid receptors on IOP elevation is likely to improve our understanding of the pathogenesis of IOP elevation in patients with glaucoma. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Open-Angle Glaucoma, Steroid, *ESR2*

Print Tag: Refer to original journal article

Combined Phacoemulsification/Trabeculectomy Increases Complications

Phacoemulsification vs Phacotrabeculectomy in Chronic Angle-Closure Glaucoma With Cataract Complications.

Tham CCY, Kwong YYY, et al:

Arch Ophthalmol 2010; 128 (March): 303-311

Fewer surgical complications are associated with cataract surgery alone in comparison to combined trabeculectomy with cataract surgery.

Objective: To compare the rate of surgical complications and the probability of glaucoma progression in patients with chronic angle-closure glaucoma (CACG) undergoing cataract surgery or cataract surgery combined with trabeculectomy.

Design: Randomized clinical trial.

Methods: Patients with CACG and visually significant cataract were recruited to participate in this study. Each patient was randomized to undergo either phacoemulsification alone or combined phacoemulsification with trabeculectomy. Patients were followed for 2 years postoperatively allowing the comparison of surgical complications and the probability of experiencing progression of glaucomatous optic disk damage or visual field loss during this time interval.

Results: 123 eyes of 123 patients were included in the study, some of which had medically controlled intraocular pressure (IOP) while others had medically uncontrolled IOP. There was no difference in the occurrence of intraoperative complications between the 2 groups. A statistically significantly higher proportion of patients in the combined surgery group experienced ≥ 1 postoperative complications (1.6% vs 24.6%; $P = 0.007$). Complications in the combined surgery group included shallow anterior chamber, choroidal effusion, wound leaks, and hypotony. No differences in the proportion of patients experiencing glaucoma progression or visual field progression were seen between groups. Subsequent trabeculectomy was required in 6.5% of patients in the cataract surgery group.

Conclusions: Cataract surgery alone is associated with fewer surgical complications and a similar rate of glaucoma progression compared to combined cataract surgery with trabeculectomy in patients with CACG.

Reviewer's Comments: Since cataract surgery alone is less prone to surgical complications, this is a better choice for the management of visually significant cataract in patients with glaucoma unless there is a significant risk of glaucoma progression. In patients whose IOP is uncontrolled in spite of glaucoma medications, combined surgery may remain the best option. In patients with CACG, however, recent studies have indicated that a substantial drop in IOP may occur from cataract surgery alone, making it a potential option even in patients with uncontrolled IOP. If combined surgery is not performed, patients should be warned that there is a small chance that an urgent glaucoma surgery could be required to manage a postoperative IOP spike that cannot be controlled medically. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Glaucoma, Filtering Surgery, Cataract Surgery

Print Tag: Refer to original journal article

Timolol Gel-Forming Solution Causes Temporary Optical Aberrations

Time Course of Changes in Ocular Wavefront Aberration After Instillation of 0.5% Timolol Gel-Forming Solution.

Hiraoka T, Daito M, et al:

Br J Ophthalmol 2010; 94 (April): 433-439

Optical aberrations induced by the tear film are present after instillation of timolol gel-forming solution, but return to normal within 30 minutes after treatment.

Objective: To assess the effect of timolol gel-forming solution (GFS) on optical aberrations of the eye and to evaluate the time course of these changes.

Design: Prospective, interventional clinical study.

Participants/Methods: 17 healthy volunteers without ocular disease were recruited to participate in the study. Wave front analysis was performed at baseline in each subject, then again 5 minutes, 30 minutes, and hourly for 12 hours after instillation of 1 drop of timolol 0.5% GFS. Additional measurements were made assessing changes in optical aberrations after blinking at different time points after treatment.

Results: Topical instillation of timolol 0.5% GFS resulted in a significant increase in higher-order aberrations at the 5-minute post-treatment time point. By the 30-minute time point, optical aberrations had returned to the baseline level. Blink-induced vertical coma was increased 5-minutes after instillation of timolol GFS and varied during the 10-seconds following blink.

Conclusions: Timolol GFS instillation results in optical aberrations that may cause variable visual acuity during the first several minutes after instillation.

Reviewer's Comments: This study demonstrates the optical effects of timolol GFS that some patients experience as annoying variation in visual acuity. The observation that these changes resolve within ≤ 30 minutes after instillation should aid the clinician in determining whether timolol GFS or other tear film disorders are responsible for variable visual acuity in the individual patient. Patients should be reassured that the changes in their vision are only temporary, and that they should wear off after a few minutes. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Glaucoma, Medical Therapy, Timolol

Print Tag: Refer to original journal article

Myopia Not Associated With Increased Glaucoma Progression

Influence of the Extent of Myopia on the Progression of Normal-Tension Glaucoma.

Sohn SW, Song JS, Kee C:

Am J Ophthalmol 2010; 149 (May): 831-838

Although myopia may be a risk factor for glaucoma, this study suggests that once it is diagnosed and treated, myopia does not result in more rapid progression of the disease than in nonmyopic patients.

Objective: To assess the impact of myopia on glaucoma progression in patients with normal-tension glaucoma (NTG).

Design: Retrospective, observational clinical case series.

Methods: Patients diagnosed with NTG on the basis of characteristic glaucomatous optic disk cupping and associated visual field loss with a maximum known intraocular pressure (IOP) <22 mm Hg were included in the study. Medical records of each patient were reviewed, including the results of serial visual field tests during a 12-year period. Subjects were categorized according to refractive error (emmetropia/hypermetropia, mild myopia between -0.76 D and -2.99 D, moderate myopia between -3.00 and -5.99 D, and severe myopia of at least -6.00 D). One eye was selected at random from each patient for assessment of the effect of myopia severity on glaucoma progression.

Results: No significant differences in baseline severity of glaucoma or in follow-up IOP were seen between groups. No significant differences were seen in the mean rate of change of mean deviation or of mean threshold values in Glaucoma Hemifield Test sectors as a function of myopia severity.

Conclusions: Myopia does not appear to influence the rate of progression of NTG in treated patients.

Reviewer's Comments: Myopia has been identified as a risk factor for the development of primary open-angle glaucoma in a number of epidemiologic studies. Although it may increase the risk of developing glaucoma, possibly through alteration in the connective tissue support structure for the optic nerve, it does not appear to further influence the rate of progression of glaucoma once treatment has been initiated. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Glaucoma, Myopia

Print Tag: Refer to original journal article

Pars Plana Vitrectomy May Reduce Inflammation in Pediatric Uveitis

Pars Plana Vitrectomy in the Management of Paediatric Uveitis: The Massachusetts Eye Research and Surgery Institution Experience.

Giuliari GP, Chang PY, et al:

Eye 2010; 24 (January): 7-13

Pars plana vitrectomy can be effective in reducing intraocular inflammation in the pediatric population with uveitis.

Objective: To evaluate the efficacy of pars plana vitrectomy (PPV) in the management of uveitis in the pediatric age group.

Design: Retrospective, interventional, clinical case series.

Methods: A consecutive series of 28 eyes of 20 patients ≤ 16 years of age with uveitis who underwent PPV at a single uveitis referral center was evaluated in this study. At the time of PPV, all eyes had active uveitis in spite of medical therapy. The underlying uveitis diagnosis was pars planitis in 54% of eyes, idiopathic panuveitis in 29% of eyes, and juvenile idiopathic arthritis-associated uveitis in 18% of eyes. The mean time between diagnosis and PPV was 19 months. The mean follow-up following PPV was 14 months.

Results: Uveitis control was achieved in 96% of eyes following PPV. Of the 6 eyes that had preoperative uncontrolled retinal vasculitis, 5 experienced resolution of inflammation. One eye experienced a rhegmatogenous retinal detachment that required further surgery with a scleral buckle.

Conclusions: PPV appears to result in improved control of inflammation in pediatric patients with uncontrolled uveitis in spite of medical therapy.

Reviewer's Comments: This study suggests that PPV may play a role in the management of pediatric uveitis that is refractory to therapy. Those eyes with retinal vasculitis were more likely to require ongoing medical therapy, but still appeared to respond favorably to PPV. Complications such as retinal detachment and cataract may occur, however, indicating that this approach should be pursued once medical therapy has been found to be inadequate to control the uveitis. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Uveitis, Vitrectomy

Print Tag: Refer to original journal article