Infectious Keratitis Uncommon, but Serious Complication Following LASIK

Infectious Keratitis in 204 586 LASIK Procedures.

Llovet F, de Rojas V, et al::

Ophthalmology 2010; 117 (February): 232-238

Flap lifting and irrigation combined with aggressive antibiotic therapy results in a good visual outcome for most patients who develop infectious keratitis after LASIK.

Objective: To evaluate incidence, risk factors, and visual outcomes of infectious keratitis following laser-assisted in situ keratomileusis (LASIK).

Design: Retrospective, non-comparative clinical case series.

Methods: Medical records were reviewed of 107,613 patients who underwent LASIK at a single center in Spain. Cases of infectious keratitis were identified from a computerized clinical database. Medical records were reviewed in detail of those patients who developed this complication to identify demographic and other clinical factors associated with this occurrence. Incidence of infection was computed based upon the occurrence in the total of population of LASIK patients, and clinical outcomes were evaluated based on a thorough review of the medical records.

Results: Post-LASIK infectious keratitis was diagnosed in 72 eyes of 63 patients. Onset of infection began within 1 week after surgery in 62.5% of cases. Although the majority of patients developed symptoms of pain, vision loss, or photophobia prior to diagnosis of infectious keratitis, nearly 20% were asymptomatic at the time that the infection was diagnosed at a routine follow-up appointment. Isolated organisms were all gram positive with the most common species being *Staphylococcus epidermidis* and *Streptococcus pneumoniae*. With immediate flat lift and irrigation as well as institution of aggressive antibiotic therapy, visual acuity of 20/20 or better was observed in 52.7% of cases, and acuity of 20/40 or better was observed in 93.1% of cases.

Conclusions: Incidence of post-LASIK infectious keratitis was 0.035% per procedure within 6 months of surgery. With early diagnosis and treatment, the majority of patients can still achieve a good visual outcome.

Reviewer's Comments: It is important to note that a significant minority of patients remained asymptomatic at the time of diagnosis. As a result, it is extremely important for patients to undergo routine surveillance during the first few weeks after surgery in order to allow the earliest possible diagnosis of infectious keratitis.

Additional Keywords: None

Print Tag: Refer to original journal article

Smoking Associated With Increased Risk of Uveitis

Cigarette Smoking as a Risk Factor for Uveitis.

Lin P, Loh AR, et al::

Ophthalmology 2010; 117 (March): 585-590

Cigarette smoking is associated with an increased risk of all subtypes of uveitis.

Objective: To determine the association between smoking and uveitis.

Design: Retrospective case-control study.

Methods: A consecutive series of 564 patients with ocular inflammatory disease seen at the Proctor Foundation in San Francisco between 2002 and 2007 were included in this study. A control group of patients seen in the general eye clinic with no history of ocular inflammatory disease was also recruited. At initial evaluation, all patients completed a questionnaire, which included self-reported history of smoking, where patients classified themselves as current smokers, former smokers, or nonsmokers. Statistical analysis allowed estimation of the magnitude of association between cigarette smoking and ocular inflammatory disease.

Results: The odds of a current or former smoker having ocular inflammatory disease were 2.2-fold higher than that of a patient who had never smoked. All subtypes of uveitis including anterior, intermediate, posterior, and panuveitis were all associated with smoking. Among those patients with uveitis, smokers had a significantly higher probability of having cystoid macular edema. While smoking increased the odds of having both noninfectious and infectious etiologies of uveitis, infectious uveitis was even more strongly associated with current or former smoking.

Conclusions: A history of smoking is significantly associated with all subtypes of uveitis, including infectious and noninfectious uveitis. Smoking was even more strongly associated with uveitis seen in combination with cystoid macular edema or with an infectious etiology.

Reviewer's Comments: Although these results need to be validated with a future investigation, the results shown here are sufficiently compelling to add uveitis to the list of reasons why patients should be counseled to discontinue smoking. Previous studies have demonstrated strong association between cataract development, and macular degeneration with cigarette smoking, and this study indicated that ocular inflammatory disease also is associated with smoking.

Additional Keywords: None

Print Tag: Refer to original journal article

Corneal Transplantation Using Robotic Microsurgery Technique Is Feasible

Robotic Microsurgery: Corneal Transplantation.

Bourges J-L, Hubschman J-P, et al::

Br J Ophthalmol 2009; 93 (December): 1672-1675

Corneal transplantation is feasible using the da Vinci robotic ocular microsurgery system.

Objective: To evaluate the da Vinci robotic surgical system for feasibility of use in ophthalmic microsurgery.

Design: Laboratory simulation of ophthalmic microsurgery.

Methods: Porcine and human eyes were used. Intravitreal injection of saline was performed to provide physiologic intraocular pressure. With still photography and video documentation, an experienced corneal surgeon completed trephination, removal of a cornea, and replacement of a corneal button in each of the study eyes. Suturing of the corneal button was performed with 4 cardinal, interrupted 10.0 nylon sutures and a running 11.0 nylon suture, including adjustment of suture tension.

Results: Using the da Vinci robotic surgical system, the penetrating keratoplastic procedures were successfully performed on both porcine and human eyes. Precise placement of sutures was possible without difficulty, even with instrumentation not specifically designed for ophthalmic surgery. **Conclusion:** Robotic surgical systems are feasible for use in ophthalmic microsurgery.

Reviewer's Comments: The surgeon reported that trephination of the cornea was the most difficult part of the procedure, but that the extreme mobility of the robotic wrist resulted in simplified placement of corneal sutures regardless of their orientation. While further work is needed to refine the technology for ophthalmic applications, this study demonstrates the feasibility of robotic surgery. This has potential applications both for refinement of surgical technique and for telemedicine performed by surgeons at a remote location. This type of technology may have a significant impact on ophthalmic surgery in the future.

Additional Keywords: None

Print Tag: Refer to original journal article

Intraocular Lens Design Change Improves Intermediate Vision

Functional Outcomes After Bilateral Implantation of Apodized Diffractive Aspheric Acrylic Intraocular Lenses With A +3.0 Or +4.0 Diopter Addition Power: Randomized Multicenter Clinical Study.

Maxwell WA, Cionni RJ, et al::

J Cataract Refract Surg 2009; 35 (December): 2054-2061

Significantly better uncorrected intermediate vision is achieved with the AcrySof® IQ ReSTOR® +3.0 diopter add power compared with the original +4.0 diopter add lens.

Objective: To evaluate the visual outcome after bilateral implantation of the AcrySof® ReSTOR® apodized diffractive aspheric acrylic intraocular lens (IOL) with a +3.0 or +4.0 diopter addition power.

Participants/Methods: 279 patients were randomly assigned to have bilateral implantation of the AcrySof IQ ReSTOR SN6AD3 IOL with a +4.0 diopter add power or an AcrySof IQ ReSTOR SN6AD1 IOL with a +3.0 diopter add power. All patients had bilateral, visually significant cataracts and were free from other ocular disease. Visual function evaluation was performed 6 months after the second IOL was implanted.

Results: Baseline clinical characteristics of groups were similar. There was no significant difference in the final corrected or uncorrected level of distance visual acuity in either group. Principal differences in the visual outcome were a significantly better level of uncorrected intermediate distance visual acuity in the +3.0 diopter group (mean acuity 20/25 vs. 20/40, *P*

Conclusions: A better level of intermediate vision, and a slightly further working distance for reading, are seen with the AcrySof ReSTOR +3.0 diopter add.

Reviewer's Comments: This modification in the design of the lens addresses some of the patient complaints that were noted with the stronger 4.0 diopter add of the original lens design. With the 3.0 diopter add, there is continuous range of good vision from distance to near without a gap in the intermediate range, as was sometimes noted by patients who have a higher add lens. In addition, some patients complained of having to hold the reading material too close, which is improved with the newer 3.0 diopter add lens design.

Additional Keywords: None

Print Tag: Refer to original journal article

IOP Decreases Following Cataract Surgery

Intraocular Pressure Reduction After Phacoemulsification With Intraocular Lens Implantation in Glaucomatous and Nonglaucomatous Eyes: Evaluation of a Causal Relationship Between the Natural Lens and Open-Angle Glaucoma.

Poley BJ, Lindstrom RL, et al::

J Cataract Refract Surg 2009; 35 (November): 1946-1955

Intraocular pressure reduction following cataract surgery is often seen in patients with glaucoma, and appears to be greater in those patients with higher baseline intraocular pressure.

Objective: To evaluate the long-term effect of phacoemulsification on intraocular pressure (IOP) following cataract surgery in patients with glaucoma.

Design: Retrospective, comparative clinical case series.

Methods: IOP before and after phacoemulsification with posterior chamber intraocular lens implantation was retrospectively evaluated in a consecutive series of 124 patients with glaucoma. Patients were categorized according to baseline IOP, and change in IOP 1 year after surgery was evaluated based upon the preoperative IOP category.

Results: In patients with baseline IOP of 23 to 29 mmHg, an 8.5 mmHg decrease in IOP was seen 1 year after surgery, representing a 34% decline. Similarly, patients with baseline IOP of 20 to 22 mmHg had a 4.6 mmHg drop, representing a 22% decrease. Patients with IOP in the 15 to 19 mmHg range also showed a smaller, but statistically significant reduction in IOP while those in the lowest IOP category had no reduction in IOP.

Conclusions: IOP may decrease following phacoemulsification of posterior chamber intraocular lens implantation in patients with glaucoma. Degree of IOP reduction appears to be greater in patients with higher baseline IOP.

Reviewer's Comments: Observations similar to those described in this study have led me to perform fewer combined phacoemulsification with trabeculectomy procedures in patients with glaucoma. Those patients whose IOP is reasonably well controlled, or even slightly elevated at the time of development of a visually significant cataract may have some degree of IOP improvement after cataract surgery. This is particularly helpful in patients with earlier stage glaucoma who could tolerate a perioperative IOP spike without developing significant glaucoma progression. Those patients with advanced glaucoma where an IOP spike would threaten to cause immediate vision loss should, in my opinion, still undergo combined cataract and glaucoma surgery.

Additional Keywords: None

Print Tag: Refer to original journal article

CSF Pressure Low in Patients With Normal-Tension Glaucoma

Cerebrospinal Fluid Pressure in Glaucoma: A Prospective Study.

Ren R, Jonas JB, et al::

Ophthalmology 2010; 117 (February): 259-266

Low cerebrospinal fluid pressure can result in a high trans-lamina cribrosa pressure gradient, which appears to be associated with normal tension glaucoma.

Objective: To assess whether cerebrospinal fluid pressure (CSF-P) differs between individuals with normal-tension glaucoma, high-pressure primary opening of glaucoma, and normal controlled subjects.

Design: Prospective, interventional clinical study.

Participants: 14 patients diagnosed with normal-tension glaucoma (intraocular pressure (IOP) never >21 mmHg) and 29 patients with primary opening of glaucoma with high IOP.

Methods: Diagnosis of glaucoma was based upon standardized criteria including glaucomatous visual field defects and abnormalities of the optic nerve. In addition, 71 control subjects without glaucoma were enrolled. All patients underwent a comprehensive ophthalmic examination and measurement of lumbar CSF-P. CSF-P measurements were made using standardized methodology to create uniform testing conditions and minimize random variability in the measurements. The trans-lamina cribrosa pressure gradient was calculated as the difference between CSF-P and IOP in each patient.

Results: Lumbar CSF-P was significantly lower in patients with normal-tension glaucoma than those with high-pressure glaucoma (9.5 vs 11.7 mmHg, *P*

Conclusions: Low CSF-P occurs in association with normal tension glaucoma. The trans-lamina cribrosa pressure gradient appears to be strongly correlated with the severity of glaucomatous visual field loss.

Reviewer's Comments: This study suggests that the trans-lamina cribrosa pressure gradient is an important factor in the pathogenesis of glaucoma. In those with high-pressure glaucoma, this gradient is elevated because of elevated intraocular pressure exerting a posterior force across the lamina-cribrosa. In contrast, those with normal tension glaucoma have a low CSF-P, resulting in less support to the lamina cribrosa and a similar trans-lamina gradient that can lead to mechanical forces on the optic nerve head. While further investigation is needed in order to verify the association between trans-lamina cribrosa pressure gradient and glaucoma, this study certainly supports the concept and suggests potential therapeutic options in the management of this disease.

Additional Keywords: None

Print Tag: Refer to original journal article

Spectral-Domain OCT Appears More Sensitive Than HRT in Identifying Glaucoma

Retinal Nerve Fiber Layer Imaging With Spectral-Domain Optical Coherence Tomography: A Study on Diagnostic Agreement With Heidelberg Retinal Tomograph.

Leung CK, Ye C, et al::

Ophthalmology 2010; 117 (February): 267-274

The diagnostic accuracy of spectral-domain optical coherence tomography in detecting glaucoma appears to be greater than topographic assessment using Heidelberg retinal tomography.

Objective: To compare the diagnostic agreement and performance in detecting glaucomatous optic nerve damage between the Heidelberg Retinal Tomograph (HRT) and Spectralis optical coherence tomography (OCT).

Design: Prospective, cross-sectional study.

Participants: 79 patients with glaucoma and 76 normal subjects.

Methods: One eye of each participant was imaged with the HRT and Spectralis OCT. Patients diagnosed with glaucoma had reproducible visual field defects and corresponding optic nerve changes, and were diagnosed with glaucoma by a glaucoma specialist. Specific criteria for classifying optic nerve images as being normal or abnormal were developed for each instrument, and the diagnostic accuracy of each was compared using the clinical diagnosis of glaucoma as the gold standard.

Results: Agreement between HRT and Spectralis OCT was only fair to moderate, with κ values ranging between 0.30 and 0.53, except for global values which showed good agreement with a κ value of 0.63. Using criteria of having a global or ≥1 sector measurement outside normal limits, OCT showed higher diagnostic accuracy than HRT with sensitivity of 91% compared to 80%, respectively, and specificity of 97% compared to 95%, respectively. The area under the receiver operating characteristics curve also demonstrated higher diagnostic accuracy for OCT than HRT (0.98 vs 0.90, respectively).

Conclusions: The diagnostic accuracy of the Spectralis OCT appears to be superior to HRT in classifying individuals with glaucoma.

Reviewer's Comments: Earlier studies comparing HRT to the earlier generation time domain OCT showed similar diagnostic accuracy. The greater resolution of imaging of spectral-domain OCT appears to have improved the diagnostic accuracy of OCT. Direct measurement of retinal nerve fiber layer thickness may offer greater sensitivity in detecting glaucoma compared to topographic assessment of the optic nerve with HRT, which may show greater confusion between tilted or anomalous optic nerves and glaucoma. Since OCT measures the former, and HRT primarily assesses the latter, this may explain the improved diagnostic accuracy of OCT. Monitoring patients with glaucoma over time for glaucoma progression can still be performed with a highly reproducible imaging using each of the devices, although software for detecting progression is more advanced at the current time for HRT than for OCT devices.

Additional Keywords: None

Print Tag: Refer to original journal article

Use Caution With OCT Images When Diagnosing Glaucoma

Scan Quality Effect on Glaucoma Discrimination by Glaucoma Imaging Devices.

Sung KR, Wollstein G, et al::

Br J Ophthalmol 2009; 93 (December): 1580-1584

Low image quality was associated with a higher probability of false-positive test results with optical coherence tomography.

Objective: To evaluate the effect of image quality on diagnostic capabilities of optic nerve imaging devices.

Design: Prospective clinical study.

Participants: 104 healthy subjects and 75 individuals with glaucoma.

Methods: One eye of each patient was selected at random and images were obtained with GDx-VCC, Heidelberg Retinal Tomography II (HCT), and Stratus optical coherence tomography (OCT). Quality parameters were defined for each instrument (quality score ≥8 for GDx, pixel standard deviation ≤50 for HRT, and signal strength ≥5 for OCT). Parameters used to classify eyes as being normal or glaucomatous included the GDx Nerve Fiber Indicator, HRT Moorfields regression analysis, and OCT mean retinal nerve fiber layer thickness. Logistic regression modeling was performed to determine the influence of signal strength on classification of glaucoma with each device.

Results: Image quality indicators for GDx and HRT were not found to be associated with the diagnostic classification of these devices. However, with OCT, higher signal strength corresponded to a lower probability of indicating glaucoma. In other words, low image quality was associated with a higher probability of false-positive test results with OCT.

Conclusions: Scan quality within the recommended range by the manufacturer does not affect the diagnostic capability of GDx or HRT, but appears to affect stratus OCT in glaucoma.

Reviewer's Comments: This study indicates that adequate image quality is of particular importance with OCT, and that low image quality test results are more likely to appear glaucomatous. Clinicians should be reluctant to use OCT images of low quality as this may lead to diagnostic confusion.

Additional Keywords: None

Print Tag: Refer to original journal article

Community Photoscreening Important in Identifying Children With Amblyopia

Amblyopia Therapy in Children Identified by Photoscreening.

Teed RG, Bui CM, et al::

Ophthalmology 2010; 117 (January): 159-162

Amblyopia treatment in children identified through a community photoscreening program was successful in over 80% of children referred for treatment.

Objective: To determine the efficacy of amblyopia treatment in children identified through a community photoscreening program.

Design: Retrospective clinical case series.

Methods: A retrospective review of medical records of 125 children with amblyopia who were identified by a community photoscreening program was performed. Children included in the study had baseline amblyopia of ≥2 lines of difference in visual acuity between the 2 eyes, and had no underlying ophthalmic or neurologic cause for reduction in visual acuity. Children underwent treatment with spectacle correction and daily patching, with some children receiving atropine penalization as an alternative therapy where patching was impractical. Successful outcome of amblyopia treatment was defined by an improvement in visual acuity of ≥3 lines or a final visual acuity of 20/30 or better in the amblyopic eye.

Results: Mean age of presentation was 3.6 years. The most common cause of amblyopia was anisometropia, present in 63% of children, followed by a combination of strabismus and anisometropia in 32% of children and strabismus alone in 5%. Treatment resulted in improved visual acuity, with a mean acuity at baseline of 20/84 and final visual acuity of 20/36. Using the criteria defined for successful treatment, 83% of children had successful outcomes.

Conclusions: Amblyopia treatment in children identified through photoscreening programs in the community is highly successful. This study supports the role of photoscreening programs in the identification and treatment of amblyopia.

Reviewer's Comments: In order for amblyopia therapy to be effective, photoscreening programs are important to identify children at risk, and follow through with referral as necessary. This study did not assess the likelihood of follow through on the part of parents, so those individuals who take part in photoscreening programs must be certain that proper referrals and education of parents takes place in order to provide children with opportunity for therapy. This study did, however, demonstrate that amblyopia therapy was successful in the vast majority of children who presented for treatment, indicating potential benefit of these programs in minimizing the impact of amblyopia in the public.

Additional Keywords: None

Print Tag: Refer to original journal article

Visual Outcome Similar With Daily, Alternate-Day Patching for Amblyopia

Randomized Evaluation of Spectacles Plus Alternate-Day Occlusion to Treat Amblyopia.

Agervi P, Kugelberg U, et al::

Ophthalmology 2010; 117 (February): 381-387

Alternate day patching appears to be equally effective to daily patching when used in conjunction with spectacle correction in treatment of amblyopia in children in the 4 to 5 year age range.

Objective: To compare daily versus alternate-day occlusion therapy in conjunction with spectacle correction for treatment of amblyopia in children aged 4 to 5 years.

Design: Prospective, randomized clinical trial.

Participants: 40 children with a median age of 4.3 years with untreated amblyopia.

Methods: Baseline visual acuity ranged between 20/60 and 20/400. All children underwent a complete examination and were found to have refractive or strabismic amblyopia. Spectacle correction was provided with a full cycloplegic refractive error. Children were randomly assigned to have a patching of ≥8 hours per day, or to have alternate-day patching of the same duration. Follow-up examinations over the course of 1 year were conducted in order to determine the efficacy of treatment in each group.

Results: Baseline visual acuity was similar in groups. Mean best corrected visual acuity in the amblyopic eye improved significantly in both groups, with no significant difference in the final visual acuity between daily and alternate day patching groups. Resolution of amblyopia, defined by improved visual acuity to within 1 line of the better eye, was seen in 72% of children in the daily patching group, and 75% in the alternate day patching group. A similar level of stereoacuity was achieved in both groups.

Conclusions: In children diagnosed with amblyopia aged 4 to 5 years, alternate-day patching appears to be equally effective to daily patching when used in conjunction with spectacle correction.

Reviewer's Comments: This study may offer pediatric ophthalmologists the opportunity to prescribe a more flexible patching regimen that can enhance compliance, without compromising the visual outcome. It is important to note that these results were applicable only to children aged 4 to 5 years, comparable to those who were involved in the study. Further investigation is needed to determine effective patching regimens in younger children.

Additional Keywords: None

Print Tag: Refer to original journal article

Objective Acuity by Optokinetic Nystagmus May Be Useful

Objective Measurement of Distance Visual Acuity Determined by Computerized Optokinetic Nystagmus Test.

Hyon JY, Yeo HE, et al::

Invest Ophthalmol Vis Sci 2010; 51 (February): 752-757

Computerized optokinetic nystagmus may be able to give an objective assessment of subjective visual acuity.

Background: Visual acuity testing requires a cooperative patient to identify objects on a chart. This can represent a challenge among patients with functional vision loss and those who are preverbal or nonverbal. Gratings require patients to have a minimum acuity to resolve the stripes.

Objective: To identify the correlation of objective acuity measured by computerized optokinetic nystagmus (OKN) and subjective acuity.

Design: Prospective, observational case series.

Participants: 83 eyes of 83 volunteers from a single center in Korea.

Methods: Normal volunteers were recruited and underwent an evaluation. Subjects were excluded for any ocular motor disorder or age

Results: There were 16 men and 67 women with a mean age of 48 years. Average subjective acuity was 20/20. Using the suppression method, 25 eyes continued to experience nystagmus despite the largest suppression stimulus used. Of the ones who responded, mean acuity was 3.8 (relative score). Mean acuity using the induction method was 0.30 (relative score). There was good, linear correlation between objective (suppression better than induction) and subjective acuity testing. Induction method showed significantly different subjective acuities for objective acuities of 0.2, 0.3, and 0.4. This was not different for 0.4, 0.5, and 0.6.

Conclusions: Computerized OKN could be used to objectively assess visual acuity.

Reviewer's Comments: This is interesting because they test OKN response in the distance instead of at near so it gives you more a sense of distance acuity. Although there is a linear correlation with subjective acuity among these groups, I don't know that there is a good way to assess acuity for individuals. Additionally, it is my opinion that the patient could still look at the target but accommodate and intentionally blur their vision.

Additional Keywords: None

Print Tag: Refer to original journal article

Occupation, Age, Gender Increases Risk of Pterygium

Prevalence and Risk Factors of Pterygium in a Southwestern Island of Japan: The Kumejima Study.

Shiroma H, Higa A, et al::

Am J Ophthalmol 2009; 148 (November): 766-771

Outdoor occupation and older age are risk factors for pterygium, strongly suggesting that sun exposure is a key factor in the pathogenesis of this condition.

Objective: To investigate factors associated with the presence of pterygium in a Japanese population.

Design: Cross-sectional, population-based epidemiologic study.

Participants: 3762 residents of a small island in southwestern Japan.

Methods: Study sample represented 81% of eligible residents. Residents who were aged ≥40 years were asked to undergo a comprehensive ophthalmic examination and to complete a questionnaire. The questionnaire assessed a wide range of factors including demographics, history of smoking, alcohol consumption, occupational history, use of sunglasses and/or hat, and use of glasses or contact lenses. Based upon the clinical examination, subjects were diagnosed with pterygium when a radially oriented fibrovascular lesion growing over the limbus onto the cornea was seen on slit lamp examination. Data analysis was conducted to identify factors associated with the presence of pterygium.

Results: Pterygium was present in ≥1 eye of 31% of subjects, and bilateral pterygium was present in 13% of subjects. In a multivariate logistic regression analysis, risk factors associated with the presence of pterygium included older age (*P* P*P* =0.02), and outdoor occupational history (*P*

Conclusions: Older age, male gender, and outdoor occupational history are associated with pterygium development.

Reviewer's Comments: Since sun exposure appears to be strongly associated with the development of pterygium, factors that can reduce exposure of the ocular surface to sunlight should be recommended to people who have early pterygium, or who are at risk for its development. Things such as sunglasses with ultraviolet filters and wearing of a hat may be beneficial in reducing the risk of pterygium development. Since ultraviolet light exposure is also a risk factor for the development of cataract and macular degeneration, such recommendations are beneficial for overall eye health.

Additional Keywords: None

Print Tag: Refer to original journal article

Scleral Buckling Surgery Appears Effective for Myopic Patients

Anterior Chamber Depth Is Significantly Decreased After Scleral Buckling Surgery.

Goezinne F, La Heij EC, et al::

Ophthalmology 2010; 117 (January): 79-85

A mean myopic shift of >2.5 diopters occurs in patients after scleral buckling with an encircling band for management of retinal detachment.

Objective: To evaluate the effect of scleral buckling (SB) surgery on anterior chamber depth (ACD) and axial length (AL) in myopic eyes.

Design: Prospective, consecutive clinical case series.

Participants: 38 consecutive patients with primary rhegmatogenous retinal detachment (RD) treated by SB using an encircling band and a radial or segmental buckle.

Methods: Patients underwent preoperative biometry using an IOLMaster to measure AL and anterior segment optical coherence tomography (OCT) to measure ACD. Postoperative biometry was repeated at 3 month intervals through 1 year of follow-up.

Results: A significant reduction in ACD was seen following SB surgery, which persisted through 9 months of follow-up, but returned to normal by the 1-year time point. A significant increase in AL was observed following surgery, which persisted throughout the entire follow-up period. Mean change in refractive error attributable to the increase in AL was -2.6 diopters.

Conclusions: A significant reduction in ACD is seen for several months following SB, with an eventual return to baseline values. A long-term increase in AL occurs following this surgery.

Reviewer's Comments: The results of this study have important implications for the refractive outcome following SB surgery, since myopic patients are at increased risk for RD. These patients may undergo refractive surgical procedures including phakic intraocular lens implantation that can increase the risk of RD. This study indicates that a significant myopic shift is expected following SB, and the reduced ACD may also result in corneal and lens complications from the phakic IOL. Refractive surgeons and their retinal colleagues who manage RD when it occurs should be aware of these issues in order to properly counsel these patients and give them reasonable expectations prior to surgery.

Additional Keywords: None

Print Tag: Refer to original journal article

Gene Identified That Influences Refractive Error

Role of the Hepatocyte Growth Factor Gene in Refractive Error.

Veerappan S, Pertile KK, et al::

Ophthalmology 2010; 117 (February): 239-245

The hepatocyte growth factor gene is the first gene identified to be associated with hyperopia, and also has been associated with myopia in some ethnic populations.

Objective: To identify specific genetic loci associated with refractive error.

Design: Prospective case-control study.

Participants: 551 adult subjects.

Methods: Participants were categorized based upon their refractive error at the time of enrollment in the study as having high myopia (refractive error ≤-6.00 D), low/moderate myopia (refractive error between -2.00 to -5.99 D), emmetropia (refractive error between -0.50 to +0.75 D), or hyperopia (refractive error >+2.00 D). Based on earlier work, the hepatocyte growth factor (HGF) gene was identified as a candidate gene that was investigated in this study. Genotyping of 9 tag single nucleotide polymorphisms (SNPs) that encompassed this gene was performed.

Results: Mean age of study participants was 55.4 years. Specific genetic markers from the HGF gene were associated with hyperopia and with low/moderate myopia. These markers were found to have an increased risk of hyperopia (>+2.00D) between 2- and 5-fold. In other ethnic population studies, genetic markers from this same gene were associated with low/moderate myopia.

Conclusions: Specific SNPs in the HGF gene are associated with the 2 principal types of refractive error: hyperopia and low/moderate myopia.

Reviewer's Comments: The findings from this study demonstrate the first gene associated with hyperopia. In addition, the same gene is associated with myopia in some ethnic populations, suggesting that it plays a key role in ocular development. This observation opens the door to additional work that will improve our understanding of the biological mechanisms that result in refractive error, as well as the process of emmetropization which remains poorly understood.

Additional Keywords: None

Print Tag: Refer to original journal article

Hormone Therapy May Increase Cataract Risk in Post-Menopausal Women

Hormone Replacement Therapy in Relation to Risk of Cataract Extraction: A Prospective Study of Women.

Lindblad BE, Håkansson N, et al::

Ophthalmology 2010; 117 (March): 424-430

Hormone replacement therapy in post-menopausal women may increase the risk of cataract, particularly when used in those who are moderate or heavy consumers of alcohol.

Objective: To investigate the association between hormone replacement therapy (HRT) and cataract development in postmenopausal women.

Design: Population-based, prospective cohort study.

Participants: 30,861 women aged ≥49 years.

Methods: Data for this study were derived from the Swedish Mammography Cohort. Each subject completed a self-administered questionnaire in 1997 which included information regarding the use of HRT, as well as other lifestyle factors. The women were then prospectively followed through 2005. Swedish cataract surgical procedures are all recorded in a national registry. This allowed the identification of all women in the study cohort who underwent cataract surgery during the study period. Statistical analysis allowed the determination of relationship between HRT and incidence of cataract surgery.

Results: After adjusting for the effects of age, alcohol consumption, smoking, diabetes, and other potential confounding factors, current users of HRT were 18% more likely to undergo cataract surgery than those who never used HRT. The effect of HRT on the need for cataract surgery was greater in those women who reported alcohol use of ≥1 drink/day, where a 42% increased likelihood of cataract surgery compared to those who neither used HRT nor reported alcohol consumption.

Conclusions: These data indicate that postmenopausal women using long-term HRT may have an increased rate of cataract development, particularly when HRT is used in association with alcohol consumption.

Reviewer's Comments: Previous retrospective or cross-sectional studies have demonstrated an association between HRT and cataracts. Results of this prospective study lend additional credibility to the concept that HRT increases the rate of cataract development. Further work is needed to elucidate the biological mechanisms underlying this association. If this association is confirmed in other studies, cataract development will need to be added to the list of potential harmful effects of HRT.

Additional Keywords: None

Print Tag: Refer to original journal article

Use of Glaucoma Medication Associated With Reduced Mortality

Association Between the Use of Glaucoma Medications and Mortality.

Stein JD, Newman-Casey PA, et al::

Arch Ophthalmol 2010; 129 (February): 235-240

Although further research is needed to determine the cause, use of glaucoma medication in glaucoma patients and suspects is associated with a lower mortality rate.

Objective: To investigate the relationship between glaucoma medication use and mortality in a population of glaucoma patients and glaucoma suspects.

Design: Longitudinal cohort study.

Participants: 21,506 participants who had glaucoma or were suspected of having glaucoma.

Methods: Health care claims from a large database of individuals enrolled in the Blue Care Network between 2003 and 2007 were used to complete this study. All enrollees carrying any glaucoma or glaucoma suspect diagnosis were identified. Prescription drug claims records were used to determine those individuals using any glaucoma medication. Mortality records were then used to determine all-cause mortality from those included in the analysis.

Results: Of participants, 237 died during the study period. Use of any glaucoma medication was associated with a 74% reduction in the rate of all-cause mortality, as determined by multivariate Cox regression that accounted for age, sex, and other potential confounding factors. This association remained significant for any class of glaucoma medication, or for the use of any combination of medications.

Conclusions: Among individuals with glaucoma or suspected of having glaucoma, glaucoma medication use is associated with a decreased risk of all-cause mortality.

Reviewer's Comments: There are a number of possible explanations for the association seen between glaucoma medication use and decreased mortality. Some glaucoma medications such as beta-blockers have important cardiovascular effects that can reduce blood pressure and decrease the oxygen demand of the heart. This and other systemic effects may account for this observation. Alternatively, among glaucoma patients and suspects, it is possible that healthier individuals are more likely to be prescribed glaucoma medications. In addition, it is possible that those patients who visit their ophthalmologist more regularly and are thus more likely to be prescribed glaucoma medications are more health conscious, and thus have lower mortality due to other healthy behaviors. Further research is needed to better elucidate the causes of this association, as it may have important implications for patients with glaucoma.

Additional Keywords: None

Print Tag: Refer to original journal article

SWAP May Not Offer Improved Early Detection of Glaucoma as Once Thought

The Ability of Short-Wavelength Automated Perimetry to Predict Conversion to Glaucoma.

van der Schoot J, Reus NJ, et al::

Ophthalmology 2010; 117 (January): 30-34

In contrast to previous reports, short-wavelength automated perimetry may not offer improved detection of early glaucoma compared to standard automated perimetry.

Objective: To compare the capability of standard automated perimetry (SAP) and short-wavelength automated perimetry (SWAP) to detect glaucomatous visual field loss.

Design: Prospective, longitudinal follow-up study.

Participants: 416 subjects with ocular hypertension who had intraocular pressure (IOP) between 22 and 32 mmHg at baseline.

Methods: At the time of enrollment, patients had no evidence of glaucomatous optic nerve damage and had normal results with both SAP and SWAP. During 7 to 10 years of follow-up, all subjects underwent SAP and SWAP every 6 months. Conversion to visual field loss on SAP was defined by the presence of 1 points below the 0.5% probability level, 2 clustered points below the 1% probability level, or 3 clustered points below the 2% probability level, or 4 clustered points below the 5% probability level. To be classified as conversion, the abnormal result had to be confirmed on a subsequent test within 1 year. The same criteria were used to define conversion by SWAP.

Results: During follow-up, 24 eyes of 21 patients showed conversion to glaucoma by SAP. Of these eyes, only 2 showed conversion to glaucoma by SWAP earlier than by SAP. In fact, SAP showed earlier conversion than SWAP in 15 cases.

Conclusions: The findings of this study do not support the concept that SWAP is more sensitive in detecting glaucoma at an earlier stage than SAP.

Reviewer's Comments: SWAP, which uses a blue target on a yellow background, was designed to isolate the function of a subset of ganglion cells that are believed to be affected earlier in the course of disease in patients with glaucoma, and thus to be more sensitive to early change in glaucoma. This longitudinal study does not support the concept, and suggests that in practice SAP is at least as sensitive in detecting glaucoma as SWAP. While these results are contradictory to earlier studies investigating SWAP, it is clear that SWAP has other limitations, such as being affected by lens opacity more than SAP making it prone to false positive test results on that basis.

Additional Keywords: None

Print Tag: Refer to original journal article

HRT II Has Limited Value in Population-Based Glaucoma Screening

Diagnostic Ability of Heidelberg Retina Tomography in Detecting Glaucoma in Population Setting: The Singapore Malay Eye Study.

Zheng Y, Wong TY, et al::

Ophthalmology 2010; 117 (February): 290-297

Heidelberg Retina Tomograph II does not offer high sensitivity and specificity in identifying glaucoma when used as a population-based screening tool.

Objective: To evaluate the performance of the Heidelberg Retina Tomograph II (HRT II) in diagnosing glaucoma.

Design: Population-based cross-sectional study.

Participants: 3280 persons of Malay ethnicity aged 40 to 80 years enrolled in the Singapore Malay Eye Study.

Methods: Of participants, 112 were found to have glaucoma based upon standard diagnostic criteria including optic nerve and visual field abnormality. A comparison group of 196 normal subjects was randomly selected from among the other study participants. The diagnostic accuracy of the HRT II to classify these individuals' glaucoma status was evaluated.

Results: A range of different criteria for defining abnormality by HRT II were evaluated. Setting a diagnostic specificity of 85%, sensitivity for detecting glaucoma by these criteria ranged from 62% to 67%. When setting specificity to 95%, sensitivity decreased to a range of 32% to 45%.

Conclusions: Current algorithms used by HRT II fail to accurately classify individuals with and without glaucoma with sufficient accuracy to make it a practical tool for population-based screening.

Reviewer's Comments: The authors found evidence in their data to suggest that the effect of optic disk size influenced the diagnostic accuracy of the instrument, and believe that optic disk size is not adequately accounted for by available algorithms. Since there is a large overlap of optic nerve morphology between glaucoma and normal, instruments that assess optic nerve damage by detecting nerve fiber layer defects may offer better diagnostic accuracy in detecting glaucoma. The HRT II may be very useful, however, in detecting change of the optic nerve over time in monitoring glaucoma patients for progression.

Additional Keywords: None

Print Tag: Refer to original journal article

Time-Domain OCT Not Accurate for Community-Based Glaucoma Screening

Screening for Glaucoma in High-Risk Populations Using Optical Coherence Tomography.

Li G, Fansi AK, et al::

Ophthalmology 2010; 117 (March): 453-461

Time-domain Stratus optical coherence tomography does not demonstrate high diagnostic accuracy for identifying glaucoma in community-based screening.

Objective: To estimate the diagnostic accuracy of time-domain optical coherence tomography (OCT) for glaucoma screening in a high-risk population.

Design: Cross-sectional clinical study.

Participants: 225 volunteer subjects.

Methods: Participants were recruited and examined consecutively at several community locations in Montreal, Canada, who responded to advertisements offering free glaucoma screening for people with a family history of glaucoma. Subjects underwent a complete eye examination by a glaucoma specialist including time-domain Stratus OCT imaging of the retinal nerve fiber layer (RNFL) and frequency doubling technology (FDT) automated perimetry. Based on the results of clinical examination and FDT perimetry, subjects were classified as having glaucoma, suspicion of glaucoma, or no glaucoma. Diagnostic performance of Stratus OCT and FDT were compared.

Results: The right eye of each subject was used for the analysis. Using a 5th percentile mean RNFL thickness as a cutoff to define normality, Stratus OCT demonstrated 67% sensitivity and 85% specificity for classifying subjects with regard to glaucoma. Using a stricter definition of abnormality of a 1st percentile cutoff, sensitivity decreased to 50% while specificity improved to 94%.

Conclusions: The diagnostic accuracy of Stratus OCT for community glaucoma screening is relatively low.

Reviewer's Comments: In an audio review this month, we saw that newer generation spectral-domain OCT performed better than Heidelberg retinal tomography in population-based glaucoma screening. This study confirms earlier reports indicating similar diagnostic performance between the earlier generation of OCT and HRT, suggesting that the improved image resolution attainable with spectral domain OCT offers advantages in terms of diagnostic accuracy for single image diagnosis of glaucoma.

Additional Keywords: None

Print Tag: Refer to original journal article

Ex-PRESS Glaucoma Shunt Appears Safe for MRI

Is the Ex-PRESS Glaucoma Shunt Magnetic Resonance Imaging Safe?

Geffen N, Trope GE, et al::

J Glaucoma 2010; 19 (February): 116-118

Although the Ex-PRESS Glaucoma Shunt is influenced by strong magnetic fields, it is likely that the force exerted on the implant from MRI scanners up to 3 Tesla is not clinically significant.

Objective: To investigate the safety of the Ex-PRESSTM glaucoma shunt during MRI.

Design: Laboratory investigation.

Methods: The effect of a magnetic field on the Ex-PRESS glaucoma implant was investigated in 4 different situations, each time being exposed to a 1.5 Tesla and a 3.0 Tesla magnetic field. First, the implant was placed in a water-filled dish. Second, this experiment was repeated with the implant in a dry dish, with higher frictional forces inhibiting movement of the implant. Third, the device was placed in the anterior chamber of a human cadaver eye, floating freely without scleral fixation. Finally, the device was implanted into a human cadaver eye with scleral fixation, similar to surgical implantation.

Results: During the wet dish test, the Ex-PRESS shunt immediately moved across the dish with both 1.5 and 3.0 Tesla magnetic fields. No movement of the device was noted with any of the other 3 testing conditions. Although the restrictions on equipment in the MRI scanning room prevented the use of any instruments to measure the forces on the Ex-PRESS implant, the lack of movement of the device in any of the testing conditions other than the wet dish test indicated that the forces exerted on the implant were small.

Conclusions: Forces exerted on the Ex-PRESS Glaucoma Shunt by MRI scanners up to 3 Tesla are not clinically significant.

Reviewer's Comments: This study provides sufficient evidence to reassure patients with this implant that they can have MRI imaging in scanners with up to 3 Tesla strength magnetic fields, stronger than that used in most clinical applications. The implant is, however, still subject to strong magnetic fields, but the forces on the implant are sufficiently small that the support provided by ocular tissues will prevent implant migration.

Additional Keywords: None

Print Tag: Refer to original journal article

RNFL Profile in Tilted Discs Are Very Different Than Normal Eyes

Characterization of Retinal Nerve Fiber Layer in Nonglaucomatous Eyes With Tilted Discs.

Law SK, Tamboli DA, et al::

Arch Ophthalmol 2010; 128 (January): 141-142

The retinal nerve fiber layer profile of tilted optic nerves is substantially different from normal eyes and should not be compared to the normative database in the optical coherence tomography machine.

Background: The diagnosis of glaucoma depends upon accurate, longitudinal assessment of the cup to disc ratio and the retinal nerve fiber layer (RNFL). This can be extremely challenging in a highly myopic eye with a tilted optic disc.

Objective: To characterize the RNFL of nonglaucomatous tilted optic discs using optical coherence tomography (OCT).

Design: Retrospective, observational case control series.

Participants: 32 tilted optic discs and 36 controls from a single tertiary-care institution in Los Angeles.

Methods: A stereoscopic photo database of >9000 optic discs was screened for tilted optic discs. There were 2 types of tilting: temporal and inferior. To be included, optic discs must have had the ratio of the vertical diameter of the disc to the horizontal diameter of the disc >1.4 for temporal tilting and rotated ≥75° along the horizontal meridian for inferior tilting. Patients with a history of glaucomatous visual field defect, elevated intraocular pressure, user of steroids, or any ocular disease were excluded. Each eye underwent peripapillary RNFL thickness measurements and was compared to age-matched, normal control eyes.

Results: There were 21 temporally tilted nerves and 11 inferiorly tilted nerves. Controls consisted of 57 eyes of 36 patients. Both the temporally tilted and inferiorly tilted nerve groups had significantly more myopia (-7.7D and -5.25D, respectively), astigmatism (1.0D and 1.7 D, respectively), and worse mean deviation (-2.7dB and -4.0dB, respectively) than the control eyes. Mean RNFL was 90µ in the temporally tilted group and 92µ in the inferiorly tilted group, which were significantly thinner than controls (102 µ). The superior peak of the RNFL was blunted in the inferiorly tilted group. The superior peak was shifted temporally in the temporally tilted group.

Conclusions: Tilted nerves have a significantly different RNFL profile than normal eyes. The superior peak is either blunted (inferior tilted nerves) or shifted temporally (temporally tilted nerves).

Reviewer's Comments: The RNFL in these eyes cannot be compared to the normative database in the OCT machine especially if the tilted nerve eye has a spherical refraction > -6D or a cylindrical refraction of >3D. Also, because the RNFL profile is shifted, there may be areas that appear thinned or thickened compared to normals when they are not. Instead, one can presumably follow RNFL over time in these eyes and compare future scans to past scans.

Additional Keywords: None

Print Tag: Refer to original journal article