Objective: To report the incidence of endophthalmitis after intravitreal drug injection with or without topical antibiotics.

Methods: Data from this study were derived from 2 prospective, randomized, clinical trials performed by the Diabetic Retinopathy Clinical Research Network in which patients received intraocular injections of either ranibizumab or triamcinolone. The study protocol required the use of topical Betadine and sterile preparation of the surgical field prior to performance of the injection. Use of preoperative and/or postoperative topical antibiotics was done at the discretion of the ophthalmologist performing the injection. Postoperative monitoring allowed the identification of cases of infectious endophthalmitis, and the results were compared between those patients who did or did not receive pre- or postoperative antibiotics.

Results: 3,226 intravitreal injections of ranibizumab and 612 injections of preservative-free triamcinolone were administered. Topical antibiotics were given on the day of injection in 9.4% of patients. Postoperative treatment with topical antibiotics was prescribed in 21.2% of patients, while 33.3% of patients received topical antibiotics neither before nor after the injection. Three cases of culture-positive endophthalmitis occurred after ranibizumab injection, yielding an overall incidence of 0.09%. No cases occurred after triamcinolone injection. All 3 patients who developed endophthalmitis received topical antibiotics for several days after the injection, but not prior to performance of the procedure.

Conclusions: These results suggest that the rate of endophthalmitis following intravitreal drug injection is low when a protocol of topical Betadine and sterile draping of the eye is used. The data do not suggest that topical antibiotics either before or after the procedure alter the rate of infection.

Reviewer's Comments: It must be emphasized that sterile preparation of the eye with topical Betadine and maintenance of a sterile field are critical in minimizing the risk of infection. Once that has been accomplished, the study suggests that the further use of topical antibiotics is not necessary. Of course, additional studies were required to definitively answer this question, but in this day in age of ever increasing concern about the cost of medical care, this study suggests that a cost savings can be achieved by elimination of unnecessary antibiotic therapy. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Posterior Segment Drug Delivery, Endophthalmitis, Intravitreal Injection

Print Tag: Refer to original journal article
Patients with high myopia have an increased incidence of RD that persists for at least 4 years after cataract surgery.

**Objective:** To identify risk factors associated with retinal detachment (RD) after cataract extraction with intraocular lens (IOL) implantation.

**Design:** Prospective cohort study of insurance claims records.

**Methods:** The records of 9388 consecutive insurance claims for cataract extraction with IOL implantation between August 1, 1999, and December 1, 2001, were collected from the Bureau of National Health Insurance of Taiwan. Available data included the patient's demographic information, medical history, refractive error, axial length, and intraoperative complications. In addition, the performance of neodymium-yttrium-aluminum-garnet posterior capsulotomy, and treatments for retinal complications were also available through 2007. Statistical comparison of the risks of developing RD were compared between groups stratified on the basis of axial length <23 mm, 23 to 26 mm, and >26 mm. In addition, other risk factors for the development of RD were identified.

**Results:** The cumulative 8-year risk of RD was 2.3%. Factors associated with an increased risk of RD included male gender, age <50 years, and increased axial length (>26 mm). In addition, a prior history of RD in the fellow eye was a significant predictor of RD after surgery. The cumulative risk of RD increased over time, and was significantly greater at least 4 years after the surgery, particularly in patients with higher myopia.

**Conclusions:** Patients with higher myopia appear to be at increased risk for late pseudophakic retinal detachment.

**Reviewer's Comments:** This study highlights the importance of counseling patients with regard to the risk of RD, and the risk factors mentioned in the study should be addressed in patients who are considering having cataract surgery. Younger patients, particularly those with long axial length, should be counseled that the risk of RD is greater than it is in other patients. It must be acknowledged, however, that whether or not the late occurrence of RD was associated with cataract surgery or would have occurred anyway in patients with high axial length is uncertain from the data presented in this uncontrolled study. It is possible that those with long axial length were destined to have RD even without cataract surgery, although significant changes in the vitreoretinal interface leading to peripheral retinal breaks certainly can occur, particularly in myopic patients after cataract surgery. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Myopia, Cataract Surgery, Retinal Detachment, Risk Factors

Print Tag: Refer to original journal article
Objective: To report the frequency on presentation and incidence of ocular complications and vision loss in patients with sympathetic ophthalmia and to identify factors associated with decreased vision in the sympathizing eye.

Design: Multicenter, retrospective, clinical case series.

Participants/Methods: A consecutive series of 85 patients diagnosed with sympathetic ophthalmia during a 25-year period at 3 academic tertiary referral centers was included in this study. Medical records were reviewed to document demographic and clinical factors in each case. Statistical analysis was performed to identify factors associated with visual acuity at the time of presentation and at final follow-up.

Results: Severe vision loss to a level of 20/200 or worse was noted in 26% of patients with sympathetic ophthalmia in the sympathizing eye. Progression of vision loss to a level of 20/200 or worse occurred at a rate of 10% per person-years of follow-up. Ocular complications of cataract, macular edema, glaucoma, and epiretinal membrane were common, occurring in 47% of patients at the time of presentation. An additional complication associated with worse visual outcome was exudative retinal detachment. Patients placed on systemic corticosteroid therapy at the time of initial diagnosis had a shorter duration of active inflammation and a better clinical outcome. Visual acuity of better than 20/50 at final follow-up occurred in 59% of patients, and 75% maintained vision of better than 20/200.

Conclusions: Ocular complications are common in sympathizing eyes of patients with sympathetic ophthalmia. With prompt initiation of steroid therapy, maintenance of good visual acuity in the sympathizing eye occurs in the majority of cases.

Reviewer's Comments: This study should remind us that in patients with ocular trauma, careful surveillance for the onset of intraocular inflammation in the unaffected eye is important to identify sympathetic ophthalmia as early as possible. Although this complication is uncommon, maintaining a high index of suspicion is important. In addition, we must remember that while rare, sympathetic ophthalmia can occur in situations other than penetrating ocular trauma, including routine ophthalmic surgery. (Reviewer-Scott D. Smith, MD, MPH).

© 2010, Oakstone Medical Publishing

Keywords: Sympathetic Uveitis

Print Tag: Refer to original journal article
Intravitreal Steroid Injection Reduces Diabetic Retinopathy Progression

Exploratory Analysis of Diabetic Retinopathy Progression Through 3 Years in a Randomized Clinical Trial That Compares Intravitreal Triamcinolone Acetonide With Focal/Grid Photocoagulation.

Bressler NM, Edwards AR, et al:

Arch Ophthalmol 2009; 127 (December): 1566-1571

Intraocular triamcinolone injections can reduce the rate of progression of diabetic retinopathy.

**Objective:** To investigate the effect of intravitreal triamcinolone on the progression of diabetic retinopathy.

**Methods:** Data from a clinical trial of the efficacy of triamcinolone versus laser therapy for treatment of diabetic macular edema were used for this study. The current study was focused on the effect of treatment on the progression of diabetic retinopathy, which was defined by conversion from nonproliferative to proliferative diabetic retinopathy or worsening by ≥2 severity levels on standardized fundus photography. Baseline follow-up fundus photographs were available for 1, 2, and 3 years of follow-up. Patients were randomly assigned to undergo focal/grid laser therapy or periodic injections of 1 mg or 4 mg of intravitreal triamcinolone.

**Results:** 840 eyes of 693 participants were enrolled in the study. At the 2-year follow-up, the cumulative probability of progression of retinopathy was 31% in the laser group, 29% in the 1-mg triamcinolone group, and 21% in the 4-mg triamcinolone group. This statistically significant difference in progression of diabetic retinopathy was sustained through the 3-year follow-up visit.

**Conclusions:** Intravitreal injection of triamcinolone appears to reduce the rate of progression of diabetic retinopathy.

**Reviewer’s Comments:** Based on these results, the authors do not recommend the use of intravitreal steroid injections to prevent progression of diabetic retinopathy. This observation is, nevertheless, important as intraocular steroid drug delivery systems are being introduced into clinical practice that may have potential benefits not only for the reduction of macular edema, but also for the slowing of the rate of progression of diabetic retinopathy itself. Further investigations are required before these results can be translated into clinical practice. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Diabetic Retinopathy, Intravitreal Triamcinolone, Effects, Laser Therapy

Print Tag: Refer to original journal article
Although patient discomfort appears to be slightly less with 25-gauge vitrectomy, pain is not a common problem, even with 20-gauge instrumentation.

Objective: To compare postoperative pain following pars plana vitrectomy using a 25-gauge and a 20-gauge vitrectomy system.

Participants/Methods: 40 patients with vitreoretinal pathology who required pars plana vitrectomy were enrolled in this randomized clinical trial. All patients had pathology amendable to management with 25-gauge vitrectomy instrumentation, including macular hole, epiretinal membrane, or vitreous hemorrhage. Patients were randomly assigned to undergo surgery using either the 20-gauge or the 25-gauge vitrectomy instrumentation. Postoperative pain was assessed using a standardized pain score throughout the first week of follow-up. Pain scores and the need for analgesia, as well as surgical time, were compared between the 2 groups.

Results: No statistically significant difference in pain scores was seen between the 2 groups. A slightly higher proportion of patients in the 20-gauge system required supplemental analgesia, suggesting a slight difference in overall pain between the 2 groups. However, only 7.2% of pain scores were at a level of ≥2, indicating that the majority of patients did not experience clinically significant pain in either group. Although the time to open and close at the beginning and end of the case was significantly shorter using the 25-gauge system, the time to perform the actual vitrectomy was shorter using the 20-gauge instrumentation, resulting in no significant difference in overall surgical time between the 2 groups.

Conclusions: Little to no difference in postoperative pain is experienced between patients undergoing vitrectomy surgery using a 20-gauge or 25-gauge vitrectomy system.

Reviewer's Comments: Surgeons who continue to prefer 20-gauge instrumentation for pars plana vitrectomy should not be concerned that they are subjecting their patients to significantly greater postoperative pain or ocular discomfort. (Reviewer-Scott D. Smith, MD, MPH).
**Sub-Tenon Triamcinolone Effective for Managing Non-Necrotizing Scleritis**

*Evaluation of Sub-Tenon Triamcinolone Acetonide Injections in the Treatment of Scleritis.*

Johnson KS, Chu DS:

Am J Ophthalmol 2010; 149 (January): 77-81

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**Objective:** To investigate the safety and efficacy of sub-Tenon triamcinolone acetonide (TA) injection in the management of patients with non-necrotizing scleritis.

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

**Methods:** Medical records were reviewed of a consecutive series of patients diagnosed with scleritis at a single institution, who were managed with 1 or more injections of sub-Tenon TA. Twelve eyes of 11 patients were included. Six of the 11 patients had known systemic inflammatory disease associated with scleritis. Patients with necrotizing scleritis were excluded due to concerns of scleral thinning and/or perforation that may occur in association with steroid injection. All patients were unsuccessfully managed with systemic nonsteroidal or corticosteroid medications leading to the consideration of periocular steroid injection. Baseline and follow-up examination allowed the documentation of subjective and objective indicators of ocular inflammation and their improvement after treatment.

**Results:** The initial follow-up examination occurred at a mean of 3 weeks after injection of 50 mg of sub-Tenon TA. Subjective improvements in symptoms of ocular inflammation were reported in 10 of 11 patients. In addition, clinical findings demonstrated improvement in these 10 patients, with complete resolution by the time of first follow-up in 4 of the 11 cases. Recurrence of scleral inflammation was observed (mean, 18 weeks) in 75% of patients. Retreatment with a subsequent sub-Tenon steroid injection resulted in improvement of symptoms and signs of ocular inflammation in the majority of patients.

**Conclusions:** Sub-Tenon TA injections may be useful in managing patients with non-necrotizing scleritis with improvement of both subjective and objective signs of scleral inflammation.

**Reviewer’s Comments:** Periocular steroid injection is widely used in the management of uveitis in order to avoid the numerous potential side effects of systemic nonsteroidal anti-inflammatory drugs (NSAIDs) and corticosteroids. This study suggests that a similar approach may be used for managing patients with non-necrotizing scleritis with good efficacy. Side effects of ocular hypertension and/or cataract progression may occur, and patients need to be followed carefully. There were no cases of significant scleral thinning reported in the series. It must be emphasized, however, that patients with necrotizing scleritis were not included in this study and such concerns about scleral perforation remain. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Scleritis, Drug Therapy, Triamcinolone Acetonide Injections

Print Tag: Refer to original journal article
Previously failed trabeculectomy is a risk factor for failure of a subsequent trabeculectomy surgery.

Objective: To evaluate long-term intraocular pressure (IOP) and risk factors for failure of repeat trabeculectomy with mitomycin C in patients with open-angle glaucoma (OAG).

Design: Retrospective, matched, case-control study.

Participants/Methods: 75 eyes of 67 patients who underwent repeat trabeculectomy after previously failed trabeculectomy were enrolled in the study. These patients were matched to a control group of patients who underwent the same procedure, but who had not undergone previous glaucoma surgery. The patients were matched with respect to age, gender, race, glaucoma subtype, preoperative IOP, and number of glaucoma medications. The definition of surgical success that was primarily reported in the results included IOP ≤15 mm of mercury and a reduction of at least 25% from baseline. Success rates based on these criteria were compared between initial and repeat trabeculectomy procedures.

Results: A statistically significantly higher rate of success was achieved in patients undergoing initial compared with repeat trabeculectomy. Using the criteria described above, the 3-year cumulative probability of success was 61.3% in patients undergoing initial and 41.3% in patients undergoing repeat trabeculectomy ($P = 0.02$).

Conclusions: Repeat trabeculectomy with mitomycin C is less successful in achieving control of IOP compared to initial trabeculectomy with mitomycin C at 3 years of follow-up.

Reviewer's Comments: That repeat trabeculectomy is less successful than the initial procedure in controlling IOP is the motivation for the evaluation of alternative surgical therapy, such as glaucoma implant surgery, in managing medically uncontrolled IOP in patients who have undergone previously failed trabeculectomy. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Open-Angle Glaucoma, Glaucoma Surgery, Initial/Repeat Trabeculectomy, Outcomes

Print Tag: Refer to original journal article
Complications of trabeculectomy with high-dose MMC (0.4 mg/mL for 4 minutes) are common.

**Objective:** To compare the 3-year success of surgery with the Baerveldt implant versus trabeculectomy with mitomycin C (MMC) in patients with medically uncontrolled glaucoma following prior ocular surgery.

**Participants/Methods:** Patients 18 to 85 years of age who had had a previous failed trabeculectomy or who had undergone cataract surgery with intraocular lens implantation, or both, and who had uncontrolled glaucoma with IOP between 18 and 40 mm Hg on maximum tolerated medical therapy were enrolled. Patients were randomly assigned to undergo a trabeculectomy with MMC (0.4 mg/mL for 4 minutes) or to have a 350-mm² Baerveldt glaucoma implant placed. Periodic follow-up examinations were conducted through 3 years of follow-up by the time this report was published. Clinical outcomes, including control of intraocular pressure (IOP), visual acuity, use of supplemental medical therapy, and surgical complications were reported. Surgical failure was defined by IOP ≤5 mm Hg, or >21 mm Hg, or IOP not reduced by at least 20%.

**Results:** 212 eyes were enrolled. The mean patient age was 71 years in both groups, and the mean baseline IOP was just over 25 mm Hg in both groups. At 3 years, the mean IOP in both groups was just over 13 mm Hg, with no statistically significant difference. The mean number of glaucoma medications was slightly higher in the tube group at 1.3 compared to 1.0, but this difference was also not statistically significant. Although the mean IOP was similar between the 2 groups, the cumulative probability of failure during the 3-year follow-up was higher in the trabeculectomy group than in the tube group. The probability of failure in trabeculectomy patients was just over 30% compared to 15% in the tube group. The reasons for treatment failure differed slightly between the 2 groups. In the tube group, most of the patients who experienced surgical failure did so as a result of inadequate IOP reduction and the need for glaucoma reoperation. In trabeculectomy patients, one-third of treatment failures occurred as a result of persistent hypotony.

**Conclusions:** The 3-year success rate of surgery with the glaucoma implant was higher than that following trabeculectomy with high-dose MMC.

**Reviewer's Comments:** Complications in the trabeculectomy group were high following surgery. This may be due to the fact that high-dose MMC was mandated by the study protocol. The high rates of complications in the trabeculectomy patients made the relatively high rates of complications in the Baerveldt implant group appear even more favorable. This study certainly supports the concept of a broader use of glaucoma implants in the surgical management of glaucoma. Further clinical trials are needed to determine whether nonvalved implants like the Baerveldt used in this study compare favorably to valved implants like the Ahmed Glaucoma Valve, which was designed to reduce the risk of hypotony-related complications. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Glaucoma Surgery, Baerveldt Implant, Trabeculectomy With MMC

Print Tag: Refer to original journal article
The inhalational anesthetic sevoflurane causes a reduction of IOP, which must be considered when performing examination under anesthesia in children.

**Objective:** To compare the intraocular pressure (IOP) measured in young children undergoing examination under anesthesia after ketamine and sevoflurane administration.

**Design:** Retrospective clinical case series.

**Methods:** This study involved a consecutive series of 16 eyes of 8 children who underwent examination under anesthesia at a single institution. Each child had definite or suspected glaucoma based on preoperative clinical examination. Induction of general anesthesia was accomplished with an IV dose of ketamine, and the IOP was measured 3 times alternately in each eye, as quickly as possible after the child was calm. Sevoflurane inhalational anesthetic was then started. After placement of a laryngeal mask airway, the IOP was again measured 3 times in each eye approximately 5 minutes later. The IOP measurements made after each anesthetic agent were compared statistically.

**Results:** The mean patient age was 55 months. Mean IOP after administration of sevoflurane was significantly lower than after ketamine (24.4 vs 17.0 mm Hg; \( P < 0.001 \)). The mean percentage of reduction in IOP after sevoflurane administration was 28.5%. The amount of IOP reduction varied widely between 0% and >75%. No relationship was found between ketamine IOP measurement and the proportional reduction in IOP after administration of sevoflurane.

**Conclusions:** Sevoflurane significantly lowers the IOP compared with ketamine.

**Reviewer's Comments:** The wide variability in IOP reduction after sevoflurane administration implies that ketamine administration is preferred for getting accurate IOP measurements in children undergoing examination under anesthesia. Measuring the IOP as quickly as possible after induction is also important in minimizing the possibility of significant variation between awake and anesthetized IOP values. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: IOP Measurement, Anesthetics

Print Tag: Refer to original journal article
Objective: To investigate how well initial visual field tests can be used to judge long-term progression rates in patients with glaucoma.

Design: Retrospective clinical study.

Participants/Methods: 100 consecutive patients with glaucoma who underwent visual field testing with a minimum of 10 SITA standard visual field tests were included in this study. The visual field index, an indicator of overall severity of visual field loss, was computed for each visual field test. Linear regression of the first 5 visual field tests allowed estimation of a rate of progression based on the early visual field test. Linear regression was then repeated on the entire series of visual field tests, and the rate of progression was compared between the 2 methods. In addition, final visual field index values were estimated using linear regression, and this was compared to the observed final visual field index for each patient.

Results: The mean follow-up was 8.2 years, and the average number of visual field tests was 11. The median rate of visual field index progression was -1.1% per year for the initial 5 test results and also for the entire series of visual fields. Seventy percent of patients had a final visual field index value within 10% of the predicted value based on the linear regression of the first 5 tests. A strong correlation was noted between the 2 methods of determining the visual field index, with a correlation coefficient of 0.84.

Conclusions: Linear extrapolation of visual field progression based on the 5 initial visual field tests appears to be a reliable predictor of future visual field loss in most glaucoma patients.

Reviewer's Comments: Event analysis, such as that long used as the preferred method for statistical interpretation of visual field tests, allows the determination of a statistically significant change in a particular visual field from baseline tests. However, event analysis does not indicate the magnitude of change or the rate of change over time. The type of regression analysis described in this study can be useful to the clinician as a supplement to event analysis to estimate the rate at which visual function is declining in each patient. This can be used in conjunction with the patient's age and severity of glaucoma to consider whether a clinically relevant rate of progression is occurring that would affect the patient's visual functioning within his or her lifetime. This type of analysis is in the process of being incorporated into the standard software of the Humphrey Field Analyzer. However, it is imperative that a sufficient number of visual fields (≥5) be available before evaluating a linear trend. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Visual Field Testing

Print Tag: Refer to original journal article
Improvement in visual acuity and vision related quality of life can be achieved with the use of the Boston Ocular Surface Prosthesis in patients with corneal ectasia or severe ocular surface disease refractory to traditional non-surgical intervention.

**Objective:** To evaluate the clinical efficacy of the Boston Ocular Surface Prosthesis in improving visual acuity and vision-related quality of life in patients with severe corneal ectasia, irregular astigmatism, or ocular surface disease.

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

**Participants/Methods:** 80 consecutive patients who were fitted with the Boston Ocular Surface Prosthesis in one or both eyes were included in this study. Patients had a range of anterior segment pathology including corneal ectasia due to keratoconus or severe ocular surface disease with chronic pain or other symptoms. Baseline visual acuity and vision-related quality of life were assessed by standardized methods. A follow-up examination allowed comparison of visual and quality-of-life outcomes after the device was in use.

**Results:** Of the 101 patients in whom fitting with the prosthesis was attempted, 80 patients were actually fitted with the prosthesis and were included in the study. Best-corrected visual acuity improved in 86% of patients. In addition, a statistically significant improvement in vision-related quality of life was observed, with 89% of patients showing an improvement in the visual functioning questionnaire score. Patients who were fit with the device for corneal ectasia showed more improvement in visual acuity, while those with anterior segment disease showed improvement in quality of life due to a reduction in pain and other ocular symptoms.

**Conclusions:** The Boston Ocular Surface Prosthesis can improve visual acuity and vision-related quality of life in patients with corneal ectasia, irregular astigmatism, and other types of ocular surface disease who have failed conventional therapy.

**Reviewer's Comments:** The Boston Ocular Surface Prosthesis is a specially designed scleral contact lens that is fit to each individual eye using computer-aided manufacturing technology. The device is fit onto the sclera and vaults the cornea, bathing the entire cornea in a pool of oxygenated artificial tears. The results of this study support the concept of this device. The findings also demonstrate the need for prospective clinical trials comparing the clinical outcomes of the prosthesis to surgical interventions, which are currently the standard method of managing patients with these difficult anterior segment conditions. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Keratoconus, Ocular Surface Disease

Print Tag: Refer to original journal article
Scleritis Often Not Associated With Identifiable Systemic Disease

Scleritis and Systemic Disease Association in a Community-Based Referral Practice.

Raiji VR, Palestine G, Parver DL:


An evaluation for systemic disease is important in patients with scleritis, but disease is often not identified if it has not already been diagnosed at the time of onset of ocular inflammation.

**Objective:** To evaluate the association between systemic disease and scleritis in a non-tertiary referral practice.

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

**Methods:** Medical records were reviewed of a consecutive series of patients referred to a non–university-based practice. The intent of this study was to evaluate a population of patients with scleritis more similar to what is seen in a typical general ophthalmologist’s practice, rather than the very complex condition of patients typically represented in publications from tertiary referral centers. All patients were diagnosed with scleritis based on standard clinical criteria and underwent a medical history and laboratory evaluation to identify associated systemic disease.

**Results:** 86 patients were included in the study; 64% of patients had scleritis without associated systemic disease. Of the 36% who had an identified associated systemic disorder, the most common was rheumatoid arthritis, followed by spondyloarthritis, IgA nephropathy, and sarcoidosis. Among those who had an associated systemic disease, 84% had already been diagnosed with the condition before the onset of scleritis. Patients whose systemic disease was diagnosed after the onset of scleritis were more likely to have a vasculitic condition as opposed to other infectious or rheumatologic conditions.

**Conclusions:** The association between scleritis and systemic disease in community-based populations may be weaker than that in previously reported trials.

**Reviewer’s Comments:** This study does not suggest that patients with scleritis do not require a comprehensive evaluation for systemic conditions. It does, however, imply that previous studies from university-based tertiary referral practices may have presented a picture of greater severity of disease than is encountered in more typical, community-based settings. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Uveitis, Systemic Disease

Print Tag: Refer to original journal article
Nasal mucosa appears to be a good source of tissue for autologous grafting to the ocular surface in patients with corneal limbal stem cell deficiency.

**Objective:** To investigate the clinical outcome of ocular surface reconstruction using nasal mucosa as a source of graft tissue in managing patients with cicatricial ocular surface diseases.

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

**Methods:** 6 eyes of 6 patients with cicatricial ocular surface disease in need of reconstructive surgery were included in this case series. Each patient had suffered a chemical burn that resulted in limbal stem cell deficiency. All patients underwent surgical reconstruction of the ocular surface, including removal of the cicatricial tissues, lysis of symblepharon, and autologous grafting of nasal mucosal tissue to the ocular surface. In 3 patients with extensive injuries, simultaneous autografting of the oral mucosa was also performed. A follow-up examination was performed to evaluate visual and anatomic outcomes after surgery. Graft tissues were also examined by immunohistochemistry to characterize the tissues.

**Results:** Immunohistochemistry revealed cellular characteristics of the nasal mucosa that were very similar to normal corneal and conjunctival cells. There was also an abundance of mucin-producing goblet cells as in normal conjunctiva. The vascular features of the nasal mucosa remained after transplantation. In all patients, the stability of the ocular surface recovered after grafting. In contrast to the rapid healing seen at the site of nasal mucosal grafting, thinning and delayed surface epithelialization were seen at sites of oral mucosal grafting.

**Conclusions:** Nasal mucosa appears to be a good source of tissue for autografting in patients who require surgical reconstruction of the ocular surface.

**Reviewer's Comments:** Nasal mucosa has several advantages as a source of graft tissue to the ocular surface, including an abundance of goblet cells and a well-developed parallel vasculature. As a result, it can offer good results in the management of difficult cases of cicatricial ocular surface disease. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Ocular Surface, Inflammation

Print Tag: Refer to original journal article
PK vs DALK in Keratoconus Patients


Jones MNA, Armitage WJ, et al:


The likelihood of achieving best-corrected visual acuity of 20/20 or better is higher with PK than with DALK.

Objective: To compare the outcomes of penetrating keratoplasty (PK) and deep anterior lamellar keratoplasty (DALK) in patients with keratoconus.

Methods: Patients included in this study were registered with the United Kingdom National Health Service Blood and Transplant registry. All patients had keratoconus that required surgical management and underwent either PK or DALK according to the surgeon’s preference. All patients included in the study had baseline and follow-up data reported 1, 2, and 5 years after surgery. Data included information on the occurrence of graft failure, graft rejection, surgical complications, best-corrected visual acuity, and refractive error. Outcomes were compared between patients who underwent PK versus DALK.

Results: 2152 patients were included in the study, with 81.6% of patients having PK. Graft failure was almost twice as common in patients who underwent DALK than in those who underwent PK, with a 3-year survival of approximately 95% in patients undergoing PK and 90% in DALK patients (P=0.006). Approximately one half of DALK graft failures occurred within the first 30 days after surgery, with graft and interface opacification being the most common cause. Final best-corrected acuity of 20/20 or better was achieved in 33% of patients after PK compared to 22% after DALK.

Conclusions: Graft failure appears to be more common following DALK than PK in patients with keratoconus.

Reviewer’s Comments: The potential advantage of DALK over PK is that, in patients with a healthy corneal endothelium such as in most cases of keratoconus, the patient's own endothelium remains, eliminating the risk of endothelial graft failure. Loss of endothelial cells due to surgical trauma is also avoided. This study, however, shows that other causes of graft failure still limit the success of DALK, and an overall lower level of best-corrected acuity is better with PK than with DALK in most cases. Surgeon experience with DALK may improve the results, so surgeons who are already experienced with the procedure may continue to select DALK over PK in patients who appear to be good candidates. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Keratoplasty, Keratoconus

Print Tag: Refer to original journal article
Oral Valacyclovir Does Not Reduce Transmission of HSV-1

A Double-Blind Placebo-Controlled Study to Evaluate Valacyclovir Alone and With Aspirin for Asymptomatic HSV-1 DNA Shedding in Human Tears and Saliva.

Kumar M, Hill JM, et al:

Although oral antiviral therapy is effective in improving the clinical course of HSV-1 ocular infection, it does not reduce viral shedding that may be responsible for person-to-person transmission of the virus.

Objective: To investigate the efficacy of oral acyclovir 500 mg/day once daily in reducing viral shedding in patients with latent herpes simplex type-1 (HSV-1) infection.

Design: Randomized, controlled clinical trial.

Participants/Methods: 45 volunteer subjects participated in the study. At the time of enrollment, a history of oral and ocular herpetic infection was provided. Individuals with active herpetic infection within 6 months were excluded. HSV-1 titers were also measured from blood samples of each participant. Subjects were divided into 3 groups. Group 1 received oral valacyclovir 500 mg/day alone. Group 2 received the same dose of valacyclovir and aspirin 350 mg/day, which has been shown in animal studies to reduce HSV-1 viral shedding. Group 3 received placebo therapy. Ocular and oral swab specimens were obtained twice daily for 30 days to measure HSV-1 viral shedding in tears and saliva of each subject by polymerase chain reaction.

Results: No differences in baseline HSV-1 titers or history of herpetic infection were found between groups. There were no differences between the 3 treatment groups in the number of viral DNA copies detected in tears or saliva at any time point during treatment.

Conclusions: Oral valacyclovir 500 mg/day therapy with or without adjunctive aspirin therapy is not effective in reducing viral shedding in individuals with latent HSV-1 infection.

Reviewer’s Comments: The results of this study are in contrast to those of other trials of HSV-2 viral shedding. Those trials demonstrated that oral valacyclovir therapy reduces viral shedding and likely decreases the risk of transmission of HSV-2, which is the most common cause of genital herpes infection. Awareness of the fact that person-to-person transmission of HSV-1 is not affected by oral antiviral therapy, at least at the dosage tested in this study (which is a commonly recommended dosage level for prophylactic therapy), is important for affected individuals to understand to minimize transmission to others. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Herpes Simplex, Ocular Infection

Print Tag: Refer to original journal article
Phacoemulsification with a clear corneal incision has a low risk of hemorrhagic complications and can be safely performed without prophylactic treatment in patients with factor XI deficiency.

Objective: To evaluate the risk of intraoperative and postoperative bleeding in patients with factor XI deficiency.

Design: Prospective, interventional clinical case series.

Methods: A consecutive series of patients with factor XI deficiency who required routine cataract surgery were included in this study. Surgery was performed by phacoemulsification under topical anesthesia using a clear corneal incision. No prophylactic intervention to address the factor XI deficiency was given. Subjects were evaluated for intraoperative and postoperative hemorrhagic complications.

Results: 7 patients with factor XI deficiency were enrolled in the study. Factor XI activity was measured in all subjects and was found to be extremely low (<1 U/dL) in 5 patients (71%) and between 3 and 11 U/dL in the remaining patients. The intraoperative and postoperative course was uneventful in all eyes, regardless of the level of activity of factor XI before surgery.

Conclusions: Cataract surgery by phacoemulsification with topical anesthesia and a clear corneal incision can be safely performed in patients with factor XI deficiency without the need to administer prophylactic therapy before surgery.

Reviewer's Comments: Factor XI is a clotting factor that promotes the generation of thrombin after initial formation of a clot. Individuals with factor XI deficiency have a condition known as hemophilia C. The results of this study compare favorably to those of other trials of clear corneal phacoemulsification in patients with bleeding tendency or who are on anticoagulation therapy. The absence of an incision through vascular tissue and the use of topical anesthesia without the need for needle penetration into the orbit yield a low risk of hemorrhage, even in patients who are predisposed. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Cataract Surgery, Complications

Print Tag: Refer to original journal article
Sequential Glaucoma Implants Lower IOP in Refractory Glaucoma

Sequential Glaucoma Implants in Refractory Glaucoma.

Anand A, Tello C, et al:


Sequential implantation of glaucoma implants can effectively control IOP in patients with refractory glaucoma when a single implant does not provide adequate IOP reduction.

**Objective:** To evaluate the efficacy of implantation of a second glaucoma implant in patients with refractory glaucoma and uncontrolled intraocular pressure (IOP) after implantation of an initial glaucoma implant.

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

**Methods:** Patients were identified who underwent implantation of a second glaucoma implant at a single tertiary referral center during a 12-year period. Medical records were reviewed to determine demographic and clinical characteristics of patients, and to record the course of IOP control and level of visual acuity after implantation of the second implant. Outcome measures evaluated in the study included surgical success, which was defined by an IOP <21 mm Hg with an IOP reduction >25% from baseline and without prolonged hypotony. In addition, the need for supplemental glaucoma medication was evaluated.

**Results:** 43 patients were included in the study. A variety of implant types were used, including primarily the Baerveldt and Ahmed implants. The mean follow-up after the second glaucoma implant was 32.6 ± 21.6 months. Using criterion 1, the success rate of the second glaucoma implant surgery was 83%, 75%, and 75% at 1 year, 2 years, and 3 years, respectively.

**Conclusions:** Sequential glaucoma implants can be effective in managing patients with complicated, refractory glaucoma when IOP control is inadequate after an initial glaucoma implant.

**Reviewer’s Comments:** This study demonstrates that, even in patients with a very complicated course and in whom multiple glaucoma surgeries have not successfully controlled IOP, implantation of a second glaucoma implant can offer the hope of improved IOP control. This information can be very reassuring to patients who are experiencing a complicated clinical course and who require multiple surgeries to reduce IOP. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Glaucoma Surgery

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Bevacizumab Improves Outcome of Trabeculectomy in Rabbit Model

Inhibition of Vascular Endothelial Growth Factor Reduces Scar Formation After Glaucoma Filtration Surgery.

Li Z, Van Bergen T, et al:

VEGF inhibitors offer a promising new method to improve the results of glaucoma filtration surgery by reducing vascular proliferation at the surgical site.

**Objective:** To investigate the effect of bevacizumab (Avastin) on wound healing after trabeculectomy.

**Design:** In vitro and in vivo experimental study.

**Methods:** Levels of vascular endothelial growth factor (VEGF) were measured in aqueous humor specimens from primary open-angle glaucoma patients undergoing trabeculectomy surgery. The level of expression of VEGF receptors was measured in cultured human Tenon's fibroblasts. Laboratory studies were conducted to determine the effect of inhibition of VEGF with bevacizumab on the growth of Tenon's fibroblasts. The in vivo effect of bevacizumab on wound healing was studied in a rabbit model. Trabeculectomy was performed in 34 New Zealand white rabbits. Subconjunctival bevacizumab injection was given in one eye, while the other eye served as an untreated control. The area and degree of conjunctival inflammation and the intraocular pressure (IOP) were compared between treated and control eyes.

**Results:** VEGF levels were increased in human aqueous specimens in patients undergoing glaucoma surgery compared to control patients undergoing cataract surgery. VEGF receptor expression was detected in human Tenon's fibroblasts. Fibroblast proliferation was stimulated by VEGF and was inhibited by exposure to bevacizumab. The degree of vascularity of the conjunctiva at the site of trabeculectomy was reduced in rabbit eyes treated with bevacizumab compared to control eyes following trabeculectomy. IOP was also significantly lower in bevacizumab-treated eyes.

**Conclusions:** These results support the potential use of VEGF inhibition in improving the clinical outcome of trabeculectomy.

**Reviewer's Comments:** Prospective clinical studies in humans are needed to confirm the benefit of VEGF inhibition with bevacizumab as adjunctive therapy for trabeculectomy. These results certainly support the potential benefits of this type of therapy and demonstrate that future investigations are warranted. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Vascular Endothelial Growth Factor, Glaucoma Surgery

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Design: Evaluation of data from cross-sectional cohort studies.

Methods: Data for this study were derived from the National Health and Nutrition Examination Survey (NHANES), which was initially conducted in 1971-1972 and was repeated at later dates, including 1999-2004. Participants in NHANES underwent a clinical examination that included an eye examination for all study subjects aged ≥4 years. In patients who had presenting acuity of 20/20 or better, the current corrective lens status was used to identify myopia. In those with worse visual acuity, retinoscopy was performed to measure refractive error. Study subjects with spherical equivalent refractive error of <0 diopters were classified as being myopic. A similar protocol was followed in each of the 2 cohorts to allow direct comparison of the prevalence of myopia.

Results: In subjects between the ages of 12 and 54 years, myopia prevalence was higher in 1999-2004 than in 1971-1972 (41.6% vs 25.0%; P <0.001). A similar pattern of increased myopia prevalence was seen in both white and black populations. In addition, the prevalence of myopia in all severity categories was higher in the later cohort.

Conclusions: The prevalence of myopia has increased in the United States during the past 30 years. Identification of risk factors for myopia may lead to the development of improved strategies for myopia prevention.

Reviewer's Comments: Various factors have been associated with myopia, including prolonged near work and reduced outdoor activity. Further study is needed to better understand the pathologic mechanisms at work in the development of myopia in order to develop effective strategies in its prevention. Although myopia can be easily managed with corrective lenses, reduction in its prevalence would have significant benefits in terms of cost and morbidity in the American population. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Myopia, Epidemiology

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Peeling of the internal limiting membrane may reduce the risk of subsequent reopening of a macular hole following pars plana vitrectomy.

**Objective:** To identify factors associated with reopening of macular holes following surgical closure by pars plana vitrectomy.

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

**Methods:** Medical records were reviewed of a consecutive series of patients who underwent pars plana vitrectomy for surgical closure of a macular hole. All patients included in the series had a full-thickness macular hole and underwent surgery either with or without peeling of the internal limiting membrane (ILM). Only patients with successful initial closure of the macular hole were included. All phakic patients aged >40 years underwent simultaneous phacoemulsification and intraocular lens implantation at the time of macular hole surgery. Follow-up evaluation allowed the identification of cases with reopening of the macular hole. Statistical analysis was performed to identify clinical and demographic factors associated with an increased risk of reopening of the macular hole.

**Results:** 877 eyes of 831 patients were included in the study. The mean age of patients was 64.9 ± 8.0 years. Combined cataract surgery was performed in 87% of patients. The mean follow-up after surgery was 57.7 months. Patients were categorized according to the performance or nonperformance of ILM peeling during surgery. Reopening of the macular hole occurred in only 0.4% of eyes that underwent ILM peeling, while this outcome occurred in 7.2% of eyes that did not undergo ILM peeling (P <0.001). Higher myopic refractive error and intraoperative retinal tears were associated with a higher risk of macular hole reopening in patients who did not have ILM peeling.

**Conclusions:** ILM peeling appears to decrease the risk of macular hole reopening after initially successful surgical closure.

**Reviewer's Comments:** Although the pathogenesis of macular hole reopening is not fully understood, this study suggests that ILM peeling alters the mechanical forces on the margins of a macular hole in a way that decreases the likelihood of reopening after initially successful surgical closure. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Vitrectomy, Macular Hole

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Metamorphopsia Reduced After Macular Hole Surgery

*Metamorphopsia Assessment Before and After Vitrectomy for Macular Hole.*

Krøyer K, Christensen U, et al:


Metamorphopsia is consistently reduced after successful surgical closure of a macular hole.

**Objective:** To evaluate the change in metamorphopsia after macular hole surgery.

**Design:** Data for this study came from the Copenhagen Macular Hole Study, a prospective, randomized clinical trial comparing different surgical methods for managing patients with full-thickness macular holes.

**Methods:** Patients included in the study had a stage 2 or 3 macular hole with best-corrected acuity in the affected eye of 20/200 or better. As part of the study, patients underwent comprehensive preoperative and postoperative examinations that included an evaluation of metamorphopsia using the retinal aniseikonia test, which projects a stimulus onto the macula that is perceived in a healthy eye as a single circle; however, in a patient with a macular hole that causes metamorphopsia, the stimulus is perceived as irregular half circles. Systematic alteration of the stimulus until the patient perceives a single half circle allows a quantified measure of the degree of metamorphopsia, reported in degrees of disparity between the 2 half-circle stimuli.

**Results:** 6 months after macular hole surgery, the mean measurement of disparity significantly decreased from 0.34° to <0.1°. The reduction in metamorphopsia was also associated with a significant improvement in best-corrected visual acuity, with a mean improvement of 9 letters on the ETDRS visual acuity chart.

**Conclusions:** In addition to improved visual acuity, consistent reduction in metamorphopsia is achieved with successful closure of macular holes.

**Reviewer's Comments:** Metamorphopsia results from displacement of photoreceptors from their original location. The significant reduction in postoperative metamorphopsia after macular hole surgery is consistent with successful repositioning of photoreceptors into their original location. The objective measures of reduced metamorphopsia correspond to subjective improvement in the majority of patients who undergo the procedure, supporting the use of this intervention for the management of macular holes. (Reviewer-Scott D. Smith, MD, MPH).

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Keywords: Macular Hole, Vitrectomy

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