5955 - A420
Wound Closure in Sutureless 23 Gauge Pars Plana Vitrectomy: UBM, Slit Lamp Photography, and top Results

**Purpose:** A recent change in pars plana vitrectomy (PPV) has been the advent of smaller gauge “sutureless” instrumentation. Sutureless systems are designed to create self-sealing and leak free sclerotomies. This study’s purpose was to evaluate sutureless 23 gauge (23G) wound integrity via ultrasonographic, photographic, and tonographic techniques using a retrospective case series analysis.

**Method:** Subjects had 23G PPV by one of four surgeons at our institution. Perioperative assessment of wound leaks was judged by the surgeon, and sutures placed where indicated. UBM ultrasonography, slit lamp photography, and tonography was performed at post operative day (POD) one.

**Results:** Well over half of 23G sclerotomies required sutured closure. In non-sutured sclerotomies, POD one slit lamp photographs demonstrate a dark area under the conjunctiva (Figure 1), giving the appearance of an open wound. UBM of the same site shows posterior wound closure (Figure 2). Neither post-operative hypopyon nor other peri or post-operative complications were noted. The low complication rate is comparable to our experience with 25G PPV cases over the same time frame. However, no 25G cases required sutured closure.

**Conclusion:** The 23G system combines the benefits of speed and efficiency of a 20G cutter with the sutureless technique of the 25G system. If the 23G wound is self-sealing at the end of surgery, it may still appear open externally on visual inspection. However, UBM data shows wound closure posteriorly. Still, at our institution, the rate of sutured sclerotomies is higher in the 23G vs. the 25G system.

CR: S.G. Adams, None; M. Peden, None; R. Ratnakaram, None; S. Kaushal, None
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5956 - A421
The Effect of Port Geometry on Vitrectomy: A Performance Analysis of Custom Probes Through Water and Tissue Removal Rates, Surgical Evaluation, and High-Speed Video
Eye Concepts, Doheny Retina Institute, Doheny Eye Institute, Department of Ophthalmology, Keck School of Medicine, University of Southern California, Los Angeles, CA.

**Purpose:** To determine the influence of port size on water and vitreous flow rates for 20 and 25-gauge vitreous cutters for later development and testing of novel tip designs.

**Methods:** Custom vitreous cutter tips were fabricated with different sized ports by cutting five successive circular apertures from 0.004 to 0.015 inches in a 25-gauge tip and eight successive circular apertures from 0.004 to 0.024 inches in a 20-gauge tip. These tips were operated at 1500 cuts per minute (CPM) with the Bausch and Lomb (St. Louis, MO) Lightning cutter. Porcine vitreous and water flow measurements were recorded at vacuum settings of 100, 200, 300, 400, and 500 mmHg (n=5). Five cutter tips were designed and fabricated for specific surgical functionalities such as prevention of retina from entering the port (grater), high flow (100% duty cycle), increased shearing ability (needle), shaving of the vitreous base (horizontal slit), precision tissue removal (vertical slit), dissection while cutting (dissector), and a combined tip with different port geometries on both sides. Tips were evaluated by water and porcine vitreous flow rates (n=5) at 200 mmHg and 1500 CPM, vacuum level required for the tip to cut porcine retina (n=10), time required to cut and aspirate a porcine lens (n=5), and surgical evaluation in encapsulated porcine eyes. High-speed video (1500 frames per second) with a Dalsa 1M150 (Waterloo, ON) camera helped evaluate instantaneous flow characteristics.

**Results:** Both vitreous and water flow asymptotically approached a maximum flow as the port diameter increased to the inner lumen of the cutting tip. The combined and 100% duty cycle ports held the highest water flow rates (p<0.05) while other ports held lower vitreous flow rates. The grater and vertical slit required the highest vacuum level to cut retina, giving them a larger operable range close to a detached retina (p<0.05). The control, needle, dissector, and 100% duty cycle geometries retained lens the fastest. Surgeons preferred the grater and horizontal tip for shaving the retina and the control tip for bulk vitreous removal. High-speed video illustrated tissue interaction with the tips.

**Conclusions:** As vitreous-cutter port diameter increases, flow rates level off. This indicates that after a point, large port diameters are not necessary for adequate flow. Furthermore, modifying the port geometry of a vitreous cutter affects its surgical interactions with tissue.

CR: C. DeBoer, None; S. Fang, None; M. McCormick, None; P. Bhadri, None; L.H. Lima, None; R. Kerns, None; M. Humayun, Bausch & Lomb, F.
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5957 - A422
What's the Difference Between Bevel Facing Upward and Downward in 23-Gauge Incision? Anterior Chamber OCT and Intracocular Pressure Analysis
Eye Institute, Los Angeles, CA; Jules Stein Eye Institute, Los Angeles, CA; Center for Surgical and Interventional Technology, Los Angeles, CA; ‘UCLA, Mechanical and Aerospace Engineering Department, Los Angeles, CA; Center for Surgical and Interventional Technology, Los Angeles, CA.

**Purpose:** To evaluate in human eyes submitted to pars-plana vitrectomy using 23-gauge one-step incision, (bevel-up X bevel-down) the following postoperative parameters: incision extension, incision area, incision leakage and intraocular pressure.

**Methods:** The 23-gauge one-step Alcon (Forth Worth, USA) trocar was used in 108 eyes. The eye stabilization was performed by Thornton ring and three angled incisions were performed. The patients were randomized in two groups: Group A- bevel facing upward (54 eyes) and Group B - bevel facing downward (54 eyes). One temporal incision was analyzed by the high-resolution mode of Anterior Chamber OCT- Visante (Carl Zeiss Meditec, Inc. Dublin, USA) for each eye. The measurement of incision extension and internal area were made by the software in the first postoperative day. Applanation Goldmann tonometer was also used for intraocular pressure measurement at the same timeline. Student T-test was performed to compare the results of both groups.

**Results:** There was no difference between groups regarding the incision area average: 0.32 mm2 (group A) and 0.44 mm2 (group B) (p=0.68). The average of wounds extension were similar in both groups (2.05mm group A and 1.93 mm group B) (p=0.92). The percentages of incisions that required sutures at the end of the surgical procedures due to leakage were 3.2 % (group A) and 2.6% (group B). Average of postoperative intraocular pressure was also similar in both groups (A= -10.6 mmHg, and B= -11.3 mmHg) (p=0.85).

**Conclusions:** This study showed no difference of incision area, incision extension and intraocular pressure at the first postoperative day between both 23 gauge incisions tested (bevel facing upward X downward). The incisions leakage at the end of the surgical procedure were also very similar in both techniques.

CR: O. Magalhaes, None; M.F. Avila, None; M. Maia, None; R. Nono, None; M.E. Farah, None; W. Nonex, None.
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5958 - A423
Robotic Retinal Surgery Using Novel Microhand Technology
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UCLA, Jules Stein Eye Institute, Los Angeles, CA; Center for Surgical and Interventional Technology, Los Angeles, CA; Center for Surgical and Interventional Technology, Los Angeles, CA.

**Purpose:** To investigate mechanical characteristics of microtechnology (MEMS) based “microhands” in order to perform surgical maneuvers on intraocular tissues, including the retinal surface.

**Methods:** Animal models are to be used to determine force required to perform various intraocular maneuvers. The basic mechanical characteristics of the newly fabricated MEMS “microhand” are evaluated. Potential intraocular surgical applications of the “microhand” are explored.

**Results:** The force required to safely manipulate intraocular tissues can vary from micro to millinewtons. The MEMS “microhand” may be a useful tool to determine force characteristics of various intraocular surgical maneuvers as they related to intraocular tissue manipulation.

**Conclusions:** The force required to safely manipulate or to damage intraocular structures may be important to building a successful microsurgical robot. The novel microhand may be a very useful in its current and future iterations.

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5959 - A424
Comparative (Contact vs. Noncontact) Evaluation of Utility of Optiflex Assistant System in Wide Angle Panoramic Vitreoretinal Surgery

**Purpose:** Wide angle viewing system usage in pars plana vitrectomy has shortened the duration of surgery and enhanced the surgical success rate of complicated retinal detachment surgeries. However, an assistant is needed during the course of surgery to stabilize the lens on the cornea. We evaluated Optiflex, a touch based new instrument (VOLK) which can be used as a surgical assistant during vitreoretinal surgeries utilizing both contact as well as non contact wide angle viewing systems.

**Methods:** Optiflex system is an accessory which can be used with all leading surgical microscopes. It utilizes a tension control unit and a flexible arm assembly which allows positioning of non contact and contact surgical lenses during vitreoretinal surgeries. The ophthalmic surgical lens is mounted to the flexible arm. When tension is applied through the power source the flexible arm locks into position stabilizing the lens over the cornea. The system is both motion sensitive or foot pedal operated and the surgeon can precisely adjust the position and orientation of the lens with out the need of a surgical assistant. Rate of intraoperative adjustment was significantly lower in noncontact lens usage (1.8 times) compared to (3.6times) in contact lens usage. (p<0.05)

**Conclusions:** Optiflex as a surgical assistant is a promising tool during retinal surgeries. It makes the surgeon independent and accelerates the surgical procedure without compromising the clarity, field of view, and magnification of the retina. Rate of required intraoperative adjustment is much lower in noncontact lens system usage.

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5960 - A425
IOL Opacification Following Retinal Surgery Combined With Intraocular Silicone Oil Endotamponade
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**Purpose:** Hydrophilic acrylic IOLs are widely used in cataract surgery due to their good biocompatibility. However, hydrophilic acrylic lenses show a high incidence of opacification as a result of opacification within the lens optics. Here we report that hydrophobic IOLs are also prone to opacification within a short time following vitreoretinal surgery with silicone oil endotamponade.

**Methods:** Hydrophobic IOLs were explanted due to opacification following silicone oil endotamponade for 3-4 months in 2 patients with a complex ocular surgical history. Analysis of the IOLs was performed using light microscopy, scanning electron microscopy and dispersive x-ray spectroscopy (EDX) analysis.

**Results:** An IOL (AcriTec® 44S) explanted from a patient with 5000 silicone oil (Siluron 5000, Geuder®) endotamponade for 3 months showed massive calcium deposits identified by EDX scattered on the anterior surface of the IOL. However the surface that had been covered by the lens capsule did not show any signs of opacification with a sharp line of demarcation at the thresit defect. The second IOL (AcrySoft® SN60AT UV), explanted from a patient with heavy silicone oil endotamponade (Oxane, Bausch&Lomb®) for 4 months, displayed a diffuse vacuolization ("glistering") of the entire lens body and haptics. The anterior surface of the IOL showed a granular appearance due to the presence of vacuoles, however the posterior surface that was protected by the lens capsule showed smooth surface.

**Conclusions:** It has been widely described that the hydrophilic acrylic IOL materials, have a tendency to calcify leading to opacification in patients with risk factors such as uveitis, diabetes and glaucoma. However hydrophobic polymers may also be prone to opacification at least in the presence of silicone oil. More research will be necessary to establish those conditions leading to lens opacification to avoid unnecessary intervention in patients with complicated surgical records.

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**Support:** None

5961 - A426
Intraocular Silicone Balloon for Endotamponades

**Purpose:** Non-resorbable endotamponades like silicone oil are tools in retinal detachment surgery. Problems can arise from emulsification or from silicone oil prolapses into the anterior chamber in hypotonic eyes. We developed a balloon containment system for liquid endotamponades to address the above mentioned problems.

**Methods:** Silicone foils with polyethylene glycol (PEG) coating were shown to be biocompatible (ARVO 2007 poster 5477). We developed several balloon models from this silicone material. Implantation and explantation techniques as well as intraoperative handling were tested in porcine cadaver eyes after lens and vitreous removal.

**Results:** Implantation was possible through a 4 mm pars plana sclerotommy. Fundus viewing was excellent with the balloon filled with balanced salt solution or silicone oil. It has been widely described that the hydrophilic acrylic IOL materials, have a tendency to calcify leading to opacification in patients with risk factors such as uveitis, diabetes and glaucoma. However hydrophobic polymers may also be prone to opacification at least in the presence of silicone oil. More research will be necessary to establish those conditions leading to lens opacification to avoid unnecessary intervention in patients with complicated surgical records.

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5962 - A427
Architecture of Oblique 25-Gauge Sutureless Vitrectomy Incisions

**Purpose:** To study the architecture of 25-gauge vitrectomy incisions constructed in an oblique manner using two different techniques.

**Methods:** Two sets of incisions were constructed by passing a trocar into the bare sclera of a human cadaver eye using two different techniques. An Alcon 25-gauge trocar-cannula system was used.

**Results:** In Group 1, incisions were constructed by passing the trocar in an oblique manner into the sclera up to the bevel (2 mm), before turning the trocar vertically to enter the vitreous cavity. In Group 2, incisions were constructed by passing the trocar in an oblique manner into the sclera up to the beginning of the cannula (3 mm), before turning the trocar vertically to enter the vitreous cavity. The incisions were analyzed histologically.

**Conclusions:** 25-gauge sclerotomy wounds constructed in an oblique manner using either of these techniques may show a single plane or a 2 plane structure. The two techniques have a similar likelihood of producing a two plane structure. The remainder of the incisions consisted of a single oblique plane of entry. The scleral fibers in the internal aspect of the wound were frayed in 7 out of 9 incisions (77%) in this group. In group 2, 3 of 9 incisions (33%) demonstrated a two plane structure, and the rest had a single oblique plane. The scleral fibers were frayed in 6 out of 9 incisions (66%) in the internal aspect of the wound in this group.

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5959 - 5962
Cannulated Optic Nerve Implants Are Biocompatible in Pig Eyes: A New Drainage and Drug Delivery System


Purpose: In a previous studies we evaluated histopathology features of a plastic optic nerve canula in rabbit eyes. (Invest Ophthalmol Vis Sci 2004;45: E Abstract 3222) and a metallic grade cannula. (Invest Ophthalmol Vis Sci 2006;47: E Abstract 4601). In the present study we evaluate biocompatibility of a different metallic optic nerve cannulated implant (MONCI) in pig eyes.

Methods: Seven pig eyes were implanted with two different designs of MONCI. One design was A) 460 microns in diameter and 2mm long and B) 250 microns in diameter and 3mm long. All eyes implants were placed after pars plana vitrectomy; at the nasal part of the optic nerve avoiding major vessels and penetrating the lamina cribrosa. Complete eye examination and fundus photography were performed every 3 days up to 1 month when enucleation was done for histopathology examination.

Results: There were no complications in the procedure. Perforation of the lamina cribrosa with the MONCI was performed easily. Hematoyxin and eosin (HE) staining showed minimal infiltration of lymphocytes and plasma cells that could be attributed to surgical trauma. Both HE and scanning electron microscopy showed preservation of the normal architecture of optic nerve.

Conclusions: MONCI placed in the optic nerve in pig eyes appears to be biocompatible at one month follow up. Future designs for drug delivery system and aqueous humor shunting between the vitreous cavity to the subarachnoidal space and orbit deserves to be explored.

CR: J. L. Guerrero-Naranjo, None; C. Salmon-de la Toba, None; R. Velez-Montoya, None; G. Garcia-Aguirre, None; M. Martinez-Castellanos, None; P. Luloh, None; M. Annen, None; V. Morales-Canton, None; N. Mandava, None; H. Quiroz-Mercado, None.

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Surgical Treatment of Large Submacular Hemorrhages After Intra vitreal Bevacizumab for Choroidal Neovascularization


Purpose: To evaluate the functional outcome of surgical treatment of large submacular hemorrhages (SMHs) after intra vitreal bevacizumab for choroidal neovascularization (CNV).

Methods: A prospective, interventional case series on 13 patients with large SMHs secondary to sub-retinal CNV occurring within one month after intra vitreal Bevacizumab. In 5 patients vitreous hemorrhage was also present and 1 patient had a serous-hemorrhagic retinal pigment epithelium (RPE) detachment. Preoperative visual acuity ranged from Light Perception to logMar 0.6. In 9 patients a full macular translocation (FMT) with 360 degree retinotomy was performed, 3 underwent an autologous RPE and choroid transplantation with 180 degree peripheral retinotomy and in one patient a 360 degree retinotomy was carried out. The surgical choice depended upon the diameter of the neovascular lesion, presence of healthy RPE and visual acuity of the fellow eye. A complete eye exam including best corrected visual acuity, dilated slit lamp biomicroscopy and colour fundus photograph was performed at baseline and at 1 week, 1 month and every three months thereafter. Fluorescein and ICG angiography and OCT were performed at each visit based on the visibility of the fundus. Follow up ranged between 4 and 21 months (median = 7).

Results: 88% (11) of patients had improvement (8) or stabilisation (3) of visual acuity. A complete removal of the SMH and of the neovascular lesion was obtained in all patients. No complications occurred during and after surgery. The full thickness patch of autologous RPE appeared flat, brown and well centered under the fovea in two patients, one had a wrinkled nasal margin. Furthermore, one patient after FMT had a progressive visual acuity reduction caused by an enlarging area of RPE atrophy involving the new fovea.

Conclusions: As the majority of patients had vision improvement or stabilisation, surgical removal of large SMHs with concomitant excision of the neovascular complex can be considered an effective approach in case of subretinal hemorrhages after intra vitreal Bevacizumab for CNV. Further evaluations are necessary to determine which patients will have the most benefit from this therapeutic method.

CR: G. Prijighe, None; A. Polito, None; S. Degli Esposti, None; B. Parolini, None; G. Pertile, None.

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Outcomes of 23-Gauge Vitrectomy Surgery for Primary Closure of Macular Holes


Purpose: To describe the initial experience, effectiveness, and safety profile of 23-gauge pars plana vitrectomy for primary closure of macular holes.

Methods: A single-center, retrospective, noncomparative, interventional case series was conducted of the initial 13 consecutive patients (14 eyes) who underwent 23-gauge transconjunctival sutureless vitrectomy by 5 surgeons from May 2007 through October 2007.

Results: Anatomic closure rate based on optical coherence tomography was eighty-six percent (12 of 14 eyes). Mean follow-up time was 61 days (range 32 to 104 days) and mean visual acuity improved from 20/214 at baseline to 20/86 (p=0.0328). No patients had postoperative hypotony, 4 patients required an intraoperative sutured sclerotomy, and intraoperative tears were noted and repaired in 2 patients.

Conclusions: Twenty-three-gauge vitrectomy is effective for the primary closure of macular holes. The efficacy and safety profile compare favorably with published rates for 20 and 25-gauge vitrectomy.

CR: J. Chang, None; T.W. Wiegand, None; C.R. Baumal, None; A.H. Rogers, None; E. Reichel, None; J.S. Duker, Alcon, C.

Support: None

Outcomes of Pars Plana Vitrectomy for Vitreous Hemorrhage Based on Duration and Etiology of Hemorrhage


Purpose: To determine visual outcomes of pars plana vitrectomy surgery for vitreous hemorrhages based on underlying etiology and duration of hemorrhage.

Methods: This was a retrospective chart review of patients who underwent pars plana vitrectomy for non clearing vitreous hemorrhage at the University of Chicago since August 2005. All surgeries were done by a single surgeon (S.H.L). All eyes had at least one month of follow up after surgery. Visual outcomes were categorized according to underlying etiology as well as duration of vitreous hemorrhage.

Results: Outcomes from surgery on 38 eyes in 32 patients were examined. Overall, the mean duration of vitreous hemorrhage was 3.8 months, with a range between 5 days and 15 months. The mean improvement in visual acuity was 3.2 lines. There was no correlation between duration of vitreous hemorrhage and number of lines of visual acuity gained (correlation coefficient 0.03). Underlying etiologies of vitreous hemorrhages included proliferative diabetic retinopathy, sickle cell retinopathy, retinal tear, branch retinal vein occlusion, hemiretinal vein occlusion, branch retinal artery occlusion, choroidal rupture, subretinal neovascularization with subfoveal hemorrhage, and valsalva retinopathy. Only 2 of 38 eyes ended up with no light perception.

Conclusions: Modern pars plana vitrectomy surgery for vitreous hemorrhage has a favorable visual outcome. We found no correlation between the duration of vitreous hemorrhage and recovery of vision after surgery. Our study also suggests that patients who undergo vitrectomy for vitreous hemorrhage due to non-diabetic etiologies can do as well as and there are no other serious comorbid conditions.

CR: R.C. Lin, None; S. Mehta, None; S.M. Hariprasad, None.

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Improvement in Visual Quality of Life After Traditional and Microincisional Vitrectomy Surgery


Purpose: To compare the effects of 20-, 23-, and 25-gauge pars plana vitrectomy (PPV) on vision-related quality-of-life (VR-QOL) and explore the association between self-reported visual quality-of-life and objective measures of visual function.

Methods: Thirty-one eyes (of 31 patients) were prospectively chosen to undergo 20- and 23-gauge microincisional vitrectomy. The National Eye Institute's 25-Item Visual Function Questionnaire (VFQ-25) was administered to all study patients pre-operatively as well as ten days, one month, and four months post-operatively. Multi-item scales rating different aspects of VR-QOL were compared at each interval, and their correlation to objective visual test performance before and after surgery was analyzed.

Results: Patients in all three surgical groups exhibited similar baseline values, both in terms of VR-QOL and objective visual acuity tests. In the ten-day post-operative period, patients who received microincisional vitrectomy surgery (MIVS, 23- or 25-gauge) exhibited significantly better improvement in the areas of general vision (p=0.038), ocular pain (p=0.043), distance activities (p=0.046), dependency (p=0.029), and overall VR-QOL (p=0.008) than patients who received the traditional 20-gauge procedure. In the one-month post-operative period, patients receiving MIVS exhibited significantly better improvement in the areas of cataract pain (p=0.047) and distance activities (p=0.044) than their traditional vitrectomy counterparts, but did not exhibit significantly better improvement in composite VFQ scores (p=0.269). After four months, the only significant improvement which arose between microincisional and 20-gauge patients was in their ease and comfort with driving (p=0.037).

Conclusions: In cases where traditional and microincisional vitrectomy are equally plausible, microincisional surgery can offer patients reduced pain, greater independence, and a better subjective perception of their vision in the immediate post-operative period.

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CR: To evaluate pain during 23G transconjunctival sutureless vitrectomy under topical anesthesia (lidocaine 2% gel).

Methods: 20 patients were included in this prospective study. Each patient was assigned to one of two groups: group 1 (lidocaine 2% gel) and group 2 (lidocaine 2% gel with propofol). Group 1 underwent the procedure under topical anesthesia, while group 2 also received intravenous sedation. The procedure was performed by the same surgeon, and all patients received the same treatment protocol. The primary outcome measures were pain scores, which were evaluated using a visual analog scale (VAS) before and after the procedure. A score of 0 indicated no pain, while a score of 10 indicated the worst possible pain.

Results: The mean VAS score before the procedure was 0.5 ± 0.3 in group 1 and 0.4 ± 0.2 in group 2. The mean VAS score after the procedure was 1.2 ± 0.4 in group 1 and 1.1 ± 0.3 in group 2. There was no statistically significant difference between the two groups (p = 0.3).

Conclusion: The use of topical anesthesia with lidocaine 2% gel and propofol provides effective pain relief during 23G transconjunctival vitrectomy.

Support: None
5975 - A440
Viscoelastic Fill of the Anterior Chamber as an Adjunct to Silicone Oil Injection: Surgical Outcome and Technical Concerns
Purpose: To determine if the use of viscoelastic to fill the anterior chamber (AC) during silicone oil injection is safe, with ability to manage intraocular pressure (IOP), to achieve near total silicone oil fill, and to attain improvement in visual outcome.
Methods: Retrospective review of consecutive series of silicone oil injection technique from 1990 to 2006 by a single surgeon with at least 1 year follow up.
Results: Two hundred forty-three eyes met inclusion criteria. The most common operative diagnosis was retinal detachment / proliferative vitreoretinopathy (61%), followed by proliferative diabetic retinopathy (10%), macular degeneration (10%), trauma (9%), miscellaneous peripheral non-perfusion (5%), infectious retinitis (3%), and other (2%). Balanced salt solution (BSS) was used to reform the AC in 42 eyes (17%), while sodium hyaluronate 1% (SH) was used to reform the AC in 201 eyes (85%). In the BSS group, the majority (91%) had no intraoperative (intravitreal) IOP lowering agents. In the SH group, no intra-op IOP lowering agents were used in 65 (33%), three topical IOP lowering agents were used in 42 (24%), and other combination in 4 (2%) eyes.
The mean pre-op day 1 IOP and post-op day 1 (POD1) IOP in the BSS group without use of intra-op IOP lowering agents was 14.6 mmHg and 21.7 mmHg. In the SH group without IOP lowering agents, the pressures were 11.8 mmHg and 26.6 mmHg, respectively. In the SH group with 3 or more IOP lowering agents, the pressures were 11.6 mmHg and 19.7 mmHg, respectively. Although all groups showed higher mean pressures on POD1, the SH filled eyes did not show a statistically higher rise at POD1 (p=0.058), post-op month 1 (p=0.704), and post-op month 12 (p=0.047). POD1 IOP was 40 mmHg in 10% of eyes in the SH group only, the majority of which were in the group without IOP lowering agents (75%). AC paracentesis was required in 5% (25%) of eyes in the subgroup, all of which did not receive intra-op IOP lowering agents.
In all patients, a greater than 95% silicone oil fill was obtained in 91% of eyes. The mean pre-op VA in the BSS group was 1.89 (logMAR), which improved to 1.39 at post-op month 12 visit (p=0.009). In the SH group, mean VA improved from 2.15 to 1.68, respectively (p=0.0001).
Conclusions: The use of viscoelastic to reform the AC during silicone injection does not disadvantage the eye. The use of three topical intra-op IOP lowering agents help obtaing a manageable IOP at POD 1. A near total silicone oil fill and improvement in VA can be achieved in a high percentage of cases using this technique.
CR: S.S. Mudvari, None; K.H. Pachal, None; T. Ho, None; N. Haffar, None. Support: None

5977 - A442
Surgical Results of First-Time Silicone Oil Taponade for Neovascular Glaucoma: A New Surgical Method for Neovascular Glaucoma
Purpose: To report good surgical results obtained using silicone oil taponade for neovascular glaucoma.
Methods: Thirteen eyes (11 patients) with neovascular glaucoma underwent pars plana vitrectomy and membrane peeling, and silicone oil taponade (PPL+PPV+EC+SO taponade) from 2004 July to 2007 January. Eyes were evaluated for intraocular pressure (IOP), number of antihypertensive eye drops/oral medications, and visual acuity (VA) at the first visit and 3 months postoperatively. Nine eyes (8 patients) that underwent subsequent silicone oil removal and intraocular lens (IOL) implantation (SO removal+IOL implantation) also were evaluated similarly 3 months postoperatively.
Results: At the first visit, before and 3 months after PPL+PPV+EC+SO taponade and 3 months after SO removal+IOL implantation, the average IOP values were, respectively, 29.1±19, 23.1±12, 13.5±1, and 17.1±10 mmHg; the average numbers of antihypertensive eye drops/oral medications were 0.7±1.4, 2.1±2.0, 0.6±0.7, and 1.2±1.2 tablets; and the average VA values were 0.11, 0.05, 0.03, and 0.04.
Conclusions: Good outcomes were achieved due to vitrectomy and panretinal photocoagulation to the pars plana by PPL+PPV and because migration of vascular endothelial growth factor and inflammatory cytokines to the anterior chamber that generally occurs postoperatively was prevented by preservation of the anterior capsule and SO taponade. SO taponade combined with PPL+PPV+EC can decrease IOP significantly in patients with neovascular glaucoma.
CR: N. Kimihito, None; F. Toyoda, None; K. Ishizaki, None; M. Takezawa, None; C. Mameuda, None; H. Yamagami, None; A. Kakushiti, None. Support: None

5976 - A441
Poly-N-Isopropylacrylamide (pNIPAM) for Sclerotomy Closure
L.H. Lim, J.H. Oh, M.E. Thompson, J. Weiland, R.N. Agrawal, D. Eliott, M.S. Humayun. Ophthalmology, Doheny Eye Institute, Los Angeles, CA; Chemstry, University of Southern California (USC), Los Angeles, CA.
Purpose: To study the use of poly-N-isopropylacrylamide (pNIPAM) for sclerotomy closure with transscleral polymer cable in an acute setting in rabbits. In initial studies, 50% poly-N-isopropylacrylamide (pNIPAM) liquid was applied on a patent 20-gauge sclerotomy in pigmented rabbits after a standard core vitrectomy and covered with conjunctiva during the test. In an acute study, pNIPAM was applied on the sclerotomies in 4 rabbit eyes, while the bottle height was kept constant at 70 mmHg for 1-2 hours. In the short term chronic study, pNIPAM was applied to the sclerotomy in 4 rabbits and the rabbits were followed up for 15 days, 1 month and 2 months. The animals underwent routine evaluation at regular intervals for intraocular pressure measurement (IOP), indirect ophthamoscopy, external and fundus photography and fluorescein angiography (FA). Secondly, pNIPAM was also applied to test closure of enlarged sclerotomy with a transscleral polymer cable in an acute setting in 2 rabbits. In one, pNIPAM alone was used to close the sclerotomy with a polymer cable. In another, interrupted 6-0 sutures supplemented pNIPAM.
Results: All rabbits underwent successful closure of the sclerotomies wound in the first set of experiments. pNIPAM created sufficient wound closure in all cases. There were no complications in the acute setting (low IOP) or on follow up (low IOP; fluorescein angiographically normal retinas or retinal folds/detachment, etc.). No leakage was observed through the sclerotomies while the bottle height was kept around 70 mmHg. The test was conducted with the scleral temperature at both above 32 degree Celsius (C) and when allowed temperature to stabilize to operating room temperature (~ 20 degree C). FA and/or fundus photography did not reveal any significant findings. For the transscleral cable study, leakage occurred at 40 mmHg when no sutures were taken. With added sutures, sclerotomy leaked at 60 mmHg.
Conclusions: pNIPAM can be used for routine sclerotomy closure, without significant complications. It can also close an enlarged sclerotomy even in the presence of a transscleral cable in an acute setting. Further evaluation is in progress to study long term outcomes.
CR: L.H. Lima, None; J.H. Oh, None; M.E. Thompson, None; J. Weiland, None; R.N. Agrawal, None; D. Eliott, None; M.S. Humayun, None. Support: NSf Grant EEC 0310723

5978 - A443
Revisiting 25-Gauge Transconjunctival Sutureless Vitrectomy: Still Worthwhile?
Purpose: To study our surgical experience of 25-gauge transconjunctival sutureless vitrectomy (25G TSV) in a variety of vitreoretinal diseases.
Methods: This is a retrospective review of 175 eyes of 171 patients who underwent 25G TSV from January 2003 to August 2006 at Flinders Medical Centre, Adelaide, Australia. The patients studied had to have a follow-up of at least 3 months. Five different groups were evaluated: A) RRD: rhegmatogenous retinal detachment (n=62), B) IMH: idiopathic macular hole (n=42), C) ERM: epiretinal membrane (n=41), D) VH: diabetic vitreous haemorrhage (n=23) and E) TRD: tractional retinal detachment associated with proliferative diabetic retinopathy (n=7). The RRD cases were treated with 25G TSV only. Main outcome measures included surgical success, reoperation rate, final visual acuity (VA), final intraocular pressure (IOP) and intraoperative and postoperative surgical complications.
Results: The overall mean follow-up was 10.8 months with a range of 3 months to 4.5 years. The overall mean VA was significantly improved (p<0.001) from 6/60 preoperatively to 6/18 at final follow up. The improvement was highest in the diabetic group. Vitrectomy was combined with simultaneous phacoemulsification and intraocular lens insertion in: 9 eyes with RRD, 8 eyes with IMH, 12 with ERM and 10 with VH. Day 1 postoperative IOP ranged from 0 to 58mmHg; and all cases but 13 (91.6%) returned to normal range at last review. Two cases of endophthalmitis (1.14%) happened earlier in the learning curve coinciding with subconjunctival (SC) antibiotics being discontinued in favour of topical treatment; no further cases happened since reverting to SC antibiotics. No intraoperative complications were noted. In group A, mean VA improved from 6/60 preoperatively to 6/18 postoperatively. Retattachment of the retina with a single operation was achieved in 55/62 RRD eyes (88.7%) whereas 9 (14.5%) required 2 or more operations. Redetachments occurred within the first 3 months. Two patients with ERM and one with IMH required subsequent retinal detachment surgery. Final anatomic success rate in all these cases was 100%.
Conclusions: 25G TSV is safe and effective but has a significant surgical learning curve.
CR: M.T. Sandinsha, None; C.F. de Souza, None; R. Essex, None; S.R. Lake, None; R.P. Phillips, None. Support: None
5979 - A444
The Incidence of Endophthalmitis Following Transconjunctival Sutureless 25-Gauge Vitrectomy Compared to 20-Gauge Vitrectomy
J.K. Chen1, R.N. Khurana2, Q. Nguyen3, D.V. Diri. 1School of Medicine, Johns Hopkins University, Baltimore, MD; 2The Wilmer Eye Institute, Johns Hopkins Hospital, Baltimore, MD.

**Purpose:** To determine the incidence of endophthalmitis following 25-gauge and standard 20-gauge vitrectomy.


**Main Outcome Measure:** Incidence of acute endophthalmitis occurring within the 14 day post-operative period.

**Results:** The event rates of post-operative endophthalmitis were 0.03 % (1/3046) after 20-gauge vitrectomy and 0.2 % (1/431) after 25-gauge vitrectomy (P = 0.23). In the endophthalmitis case that occurred after 25-gauge vitrectomy, a combined phacoemulsification cataract surgery was performed with the 25-gauge vitrectomy. Analyses of event rates of post-operative endophthalmitis after combination of phacoemulsification cataract surgery and vitrectomy were 0 % (0/170) for 20-gauge vitrectomy and 0.02 % (1/46) for 25-gauge surgery vitrectomy (P = 0.21).

**Conclusions:** There was an increased risk of post-operative endophthalmitis following 25-gauge vitrectomy in comparison to 20-gauge surgery; however, this difference was not statistically significant given the low number of measured outcomes.

**CR:** J.K. Chen, None; R.N. Khurana, None; Q. Nguyen, None; D.V. Diri, None. **Support:** None.

5981 - A446
Combination Submacular Anti-VEGF Therapy and Recombinant Tissue Plasminogen Activator for Management of Massive Submacular Hemorrhage in ARMD

**Purpose:** To retrospectively evaluate combination submacular anti-VEGF therapy and recombinant tissue plasminogen activator (rt-PA) for management of massive submacular hemorrhage in ARMD.

**Methods:** Two cases were reviewed retrospectively. Patient's underwent 25-gauge pars plana vitrectomy, surgical induction of posterior vitreous separation, submacular injection of both rt-PA and anti-VEGF therapy, and 20% SF, intraocular tamponade. Both patient's received their first postoperative intravitreally anti-VEGF injection 4-6 weeks after surgery. Pre and post-operative findings are reviewed.

**Results:**
**Patient #1**
An 84 year-old male with known ARMD presented with sudden, painless vision loss to CF at 4 feet and was diagnosed with a fresh, large submacular hemorrhage. He urgently underwent the procedure described above. The hemorrhage was successfully displaced and the visual acuity at last follow up was 20/70. The patient has continued to undergo regular intravitreal anti-VEGF injections. Findings include minimal persistent subretinal fluid and resolved submacular hemorrhage.

**Patient #2**
A 77 year-old female with known ARMD and a pigment epithelial detachment presented with sudden, painless vision loss. Preoperative vision was 20/125-2. She urgently underwent the procedure described above. At PDM P9, the visual acuity was 20/70-1 with an extramacular tear of the retinal pigment epithelium. She has continued to receive regular intravitreal anti-VEGF injections since her surgery.

**Conclusions:** Combination submacular anti-VEGF therapy delivered at the time of pars plana vitrectomy and submacular tissue plasminogen activator assisted hemorrhage displacement may be a viable treatment strategy for the management of patients with massive submacular hemorrhage. Prospective evaluation of this strategy may be warranted.

**CR:** S.P. Shah, None; J. Hubschman, None; C.R. Gonzales, None; S.D. Schwartz, None. **Support:** None.

5982 - A447
Combined Arteriovenous Sheathotomy and Intraoperative Intravitreal Triamcinolone Acetonide for Branch Retinal Vein Occlusion

**Purpose:** The purpose of this study is to describe the visual outcome following concomitant arteriovenous sheathotomy and intraoperative intravitreal triamcinolone acetonide (IVTA) for the treatment of branch retinal vein occlusion (BRVO). Secondary outcomes include change in central macular thickness as measured with optical coherence tomography (OCT) and venous perfusion on fluorescein angiography (FA).

**Methods:** This is a study this is a retrospective, interventional case series study approved by the IRB of the Harkness Eye Institute at Columbia University Medical Center. Four patients were included, all with unilateral BRVO and persistent poor visual acuity who underwent 25-gauge pars plana vitrectomy, arteriovenous sheathotomy, and injection of 4mg in 0.1cc of triamcinolone acetonide. Entry criteria for treatment included best corrected visual acuity (BCVA) of less than or equal to 20/100 for four or more months despite laser treatment and/or pharmacotherapy. BCVA was recorded pre-operatively and at months 1, 3, 6, 9, 12. OCT and FA were performed pre- and post-operatively for all patients.

**Results:** Mean logMAR acuity improved from a baseline of 20/124 to 20/122 at month 1, 20/53 at month 3 (p=NS), 20/74 at month 6 (p=NS), 20/59 at month 9 (p=0.09), and 20/47 at month 12 (p=0.007). All patients showed an improvement in perfusion on FA and a decrease in central macular thickness on OCT.

**Conclusions:** Although arteriovenous sheathotomy or intravitreal corticosteroids may be used individually in the past to treat BRVO with reported success, the efficacy from a combined treatment modality has not been described. Intraoperative IVTA may reduce inflammation resulting from arteriovenous sheathotomy, improving retinal vein decompression in a synergistic manner. In this study, patients with BRVO recalcitrant to previous laser and/or pharmacotherapy who were treated with combined arteriovenous sheathotomy and intra-operative IVTA demonstrated statistically improved vision at one year.

**CR:** E. Kim, None; S. Koreen, None; H.F. Fine, None; S. Chang, None; L. Delpriore, None. **Support:** Heed Foundation Fellowship.
5983 - A448

20, 23 and 25 Gauge Vitreous Cutters: Performance and Characteristics

Evaluation

J. Hubschman1, S. Reddy1, S.D. Schwartz1,2. 1Retina, Jules Stein Eye Institute, Los Angeles, CA; 2Center for Surgical and Interventional Technology, Los Angeles, CA.

Purpose: Performance evaluation of seven available vitreous cutters by measuring and comparing the flow rate, duty cycle and mechanical features.

Methods: Seven vitreous cutters were tested. For each probe, a total of 26 aspiration tests were performed in high and low viscosity environments. High frame rate camera was used to measure the closing time and to assess the duty cycle of each probe at different settings. The shaft stiffness was calculated for each of the 7 probes by measuring the displacement of the tip under a known constant force applied at the tip and at the working fulcrum. All the probes were then dissected and the internal lumen diameters were measured.

Results: Highly significant differences in flow rates and duty cycles were observed between the three different gauge groups (25, 23, and 20 gauge vitreous cutter) and also within each gauge group. Internal lumen diameters and probe stiffness characteristics are presented.

Conclusion: Vacuum, internal lumen diameter and duty cycle seems to be the critical features governing actual flow rate. Knowledge of duty cycle, flow rate and stiffness of the various probes may aid surgeons in making an educated choice and may improve patient care.

CR: J. Hubschman, DORC company, P; S. Reddy, None; S.D. Schwartz, Bausch and Lomb, C.

Support: None

5984 - A449

Challenges With Pars Plana Vitrectomy Through Presbyopia Correcting Intraocular Lenses

C.N. Singh1, A. Tewari2, G.K. Shah1. 1Ophthalmology, Vitreoretinal Division, Kresge Eye Institute, Wayne State University School of Medicine, Detroit, MI; 2Ophthalmology, Barnes Retina Institute, Washington University School of Medicine, Saint Louis, MO.

Purpose: Presbyopia correcting intraocular lenses (IOLs) are increasing in popularity among patients undergoing cataract surgery. Due to changes in the optics, performing pars plana vitrectomy through these lenses can be challenging. The purpose of this study is to identify these challenges and report strategies to minimize intraoperative complications.

Methods: Retrospective review of pars plana vitrectomies done in patients who had a presbyopia correcting intracocular lens. Outcomes analyzed included surgical indication, type of IOL, and intraoperative challenges and complications.

Results: Four cases were identified with surgical indications of epiretinal membrane (2 cases) and retinal detachment (2 cases). The following presbyopia correcting IOLs were noted: Crystalens (Eyeonics), ReSTOR (Alcon), and ReZoom (Advanced Medical Optics). Challenges encountered intraoperatively included maintaining centration of the optic, condensation of the optic during fluid-air exchange, and altered depth perception during macular membrane peeling. Strategies to minimize intraoperative complications included using viscoelastic on the posterior surface of the IOL to minimize condensation. Also, membrane peeling on the macula surface was performed with a pinch & grab technique of the membrane in the peripheral area, peeling circumferentially at the border of the central zone. A second membrane peel was carried out in the peripheral optical zone, staying only within this zone.

Conclusions: As these presbyopia correcting IOLs gain popularity among cataract patients, retinal surgeons need to be aware of the challenges of working through them when performing pars plana vitrectomy. However, with proper surgical techniques, intraoperative complications can be minimized.

CR: C.N. Singh, None; A. Tewari, None; G.K. Shah, None.

Support: None

5985 - A450

Sub-Tenon Anesthesia: An Efficacious and Safe Route for Pars Plana Vitrectomies

M. Dombrow, G. Ellikmos, N. Bhagat. University of Medicine and Dentistry of New Jersey, New Jersey Medical School, Newark, NJ.

Purpose: To report successful use of sub-tenon anesthesia for retinal surgery - pars plana vitrectomies (PPV).

Methods: A retrospective chart review was conducted of all retinal surgeries performed by one surgeon, NB, at University Hospital, Newark, New Jersey from October 2007 through November 2007 using sub-tenon anesthesia. The type of surgery performed, route and type of anesthesia, and complications of anesthesia were recorded.

Results: 30 patients underwent retinal surgery, 20-gauge PPVs during this time period; 14 of which were performed using sub-tenon anesthesia. The type of surgery performed, route and type of anesthesia, and complications of anesthesia were recorded.

Conclusion: Vacuum, internal lumen diameter and duty cycle seems to be the critical features governing actual flow rate. Knowledge of duty cycle, flow rate and stiffness of the various probes may aid surgeons in making an educated choice and may improve patient care.

CR: M. Dombrow, None; G. Ellikmos, None; N. Bhagat, None.

Support: Research to Prevent Blindness, Inc. NY; Lions Eye Research Foundation of New Jersey

5986 - A451

A Retrospective Review of a Consecutive Series of 25 G Vitrectomy for Primary Retinal Detachment

J.R. Gonder1, J.T. Gonder1. 1Ophthalmology, Ivey Eye Institute, London, ON, Canada; 2Faculty of Medicine, University of Calgary, Calgary, AB, Canada.

Purpose: To determine the surgical success of 25 G vitrectomy surgery for primary retinal detachments.

Methods: A retrospective chart review of a consecutive series of patients undergoing 25G vitrectomy surgery for primary retinal detachments was completed. The inclusion criteria included primary retinal detachment, PVR grade C or less, and phakic or pseudophakic status. The exclusion criteria were trauma, diabetes, PVR grade C or greater, scleral buckle and previous vitreoretinal surgery.

Results: 169 consecutive patients were identified. The age range was 17-87 years of age with a median age of 69. The follow-up period ranged from 0-82 weeks. 355 patients were successfully reattached with 1 25G vitrectomy surgery. The number of tears identified per patient ranged from 1-8 with the medial of 2 tears. 14 (9%) patients had a redetachment. The redetachment was attributed to a new tear (8 pts.), PVR (8 pts.), inferior tear (hole) (5 pts.) Of those that redetached 6 patients were reattached with one repeat 25G vitrectomy surgery while 8 patients required a combined vitrectomy/scleral buckle surgery. 40/169 patients had a followup of 12 weeks or greater. In this group the pre-operative visual acuity ranged from 20/20-60/HM with a median of 20/200. 36/169 patients were classified as macular off detachments. The post-operative visual acuity ranged from 20/15-60/HM.

Conclusions: Primary 25G vitrectomy surgery appears to be a safe and effective surgical approach to primary retinal detachments in phakic or pseudophakic patients. The reattachment rate and the visual outcome appear to be as good as the rates reported with scleral buckle alone and scleral buckle combined with vitrectomy.

CR: J.R. Gonder, None; J.T. Gonder, None.

Support: None
25-Gauge Vitrectomy for 173 Consecutive Macular Pacers: Results and Complications


Purpose: In patients requiring surgical management of vitreoretinal diseases, there is often concomitant anterior segment pathology. Combined vitrectomy and anterior segment surgery provides the benefit of a single procedure with less postoperative recovery time. However, combined surgery presents a unique set complications. In this study, we describe operative outcomes and complications of combined vitrectinal and anterior segment surgery for various disease states.

Methods: A retrospective review of 154 patients (158 eyes) undergoing combined pars plana vitrectomy with various anterior segment procedures. Indications for vitrectomy included IOL subluxation (45%), complex cataract (60%), retained lens fragments (8%), aphakia (5%), retinal detachment (8%), complications of proliferative diabetic retinopathy (7), macular hole (2), epiretinal membrane (14), glaucoma (4), and silicone oil removal (5). Mean followup time was approximately 6 months (187 days).

Results: Visual acuity improved or remained stable in 86.7% of eyes. Common complications included hyphema (5%), elevated IOP (4.4%), RD (5%), CME (3.1%), and hypotony (2.5%). Some complications had a higher incidence depending on the type of procedure, such as hyphema associated with removal of dislocated IOL (13.3%).

Conclusions: Combined vitrectomy and anterior segment surgery is a viable alternative to sequential procedures for a variety of disease states. In this relatively large case series, there was good visual rehabilitation with a low rate of complications.

Support: None

Outcomes of Combined Vitreoretinal and Anterior Segment Procedures

D.S. Liao, J.S. Heier

Purpose: To report on visual outcomes of 23-gauge transconjunctival surgery combined with cataract surgery, intraocular lens implantation, and primary posterior capsulotomy for the management of a variety of vitreoretinal diseases.

Methods: A prospective, interventional case study was conducted. A review of a consecutive series of 36 eyes of 36 patients who underwent 23-gauge transconjunctival surgery combined with phacoemulsification and intraocular lens implantation with primary posterior capsulotomy for epiretinal membrane (n = 12), idiopathic macular hole (n = 9), non-clearing vitreous haemorrhage (n = 10), rhegmatogenous retinal detachment (n = 5). Main outcome measures included pre and postoperative visual acuity, intraocular pressure, operating time, intra and postoperative complications.

Results: The mean follow-up period was 8 months. The mean overall visual acuity improved from 6/36 pre-operatively to 6/12 post-operatively at final visit. Fifteen cases required internal gas tamponade. Mean postoperative intraocular pressure on the first day was 14 mm of Hg. Operative time was shortened for vitreoretinal procedures considering the use of 23G transconjunctival sutureless vitrectomy. No intraoperative complications were noted attributable to small-gauge instruments and no cases required conversion to 20-gauge standard instrumentation. However, three patients required suture placement to one sclerotomy site. No case of endophthalmitis was observed throughout the follow-up period. None of the patients required further intervention.

Conclusions: 23-gauge vitrectomy combined with cataract surgery and primary posterior capsulotomy is a safe and effective system for the management of a variety of vitreoretinal diseases. This technique exposes the patient only once to the surgery related complications and provides the best possible visual outcome with only one surgical intervention.

Support: None

Outcomes of 23 Gauge Transconjunctival Sutureless Vitrectomy Combined With Cataract Surgery and Primary Posterior Capsulotomy

M.H. Soni, L. Tan, G. Murthy

Purpose: To report on surgical outcomes of 23-gauge transconjunctival surgery combined with cataract surgery, intraocular lens implant and primary posterior capsulotomy for the management of a variety of vitreoretinal diseases.

Methods: A retrospective, interventional case study was conducted. A review of a consecutive series of 36 eyes of 36 patients who underwent 23-gauge transconjunctival surgery combined with phacoemulsification and intraocular lens implantation with primary posterior capsulotomy for epiretinal membrane (n = 12), idiopathic macular hole (n = 9), non-clearing vitreous haemorrhage (n = 10), rhegmatogenous retinal detachment (n = 5). Main outcome measures included pre and postoperative visual acuity, intraocular pressure, operating time, intra and postoperative complications.

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Support: None

Vitreoretinal Tamponade Use

D. Jani, J. Küntzler

Purpose: To report surgical outcomes of 23-gauge transconjunctival surgery combined with cataract surgery, intraocular lens implantation and primary posterior capsulotomy for the management of a variety of vitreoretinal diseases.

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Support: None

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Results: The mean follow-up period was 8 months. The mean overall visual acuity improved from 6/36 pre-operatively to 6/12 post-operatively at final visit. Fifteen cases required internal gas tamponade. Mean postoperative intraocular pressure on the first day was 14 mm of Hg. Operative time was shortened for vitreoretinal procedures considering the use of 23G transconjunctival sutureless vitrectomy. No intraoperative complications were noted attributable to small-gauge instruments and no cases required conversion to 20-gauge standard instrumentation. However, three patients required suture placement to one sclerotomy site. No case of endophthalmitis was observed throughout the follow-up period. None of the patients required further intervention.

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Support: None
Support: & Lomb, C; Alcon, C.

561. Vitreo-retinal Surgical Techniques Organizing Section: RE

rate of cataract progression at 2 years may be significant. The conclusions:
Cataract progression following 25-gauge vitrectomy surgery seems
extraction within 2 years follow up after 25-gauge vitrectomy.
variety of indications, including mainly macular diagnoses. At the close of surgery,
lost to follow up (last visit less than 2 years status post 25-gauge vitrectomy surgery).
was graded during slit lamp examination using the Lens Opacities Classification
nuclear, cortical, and posterior subcapsular lens opacities
were undertaken, there was no increase in intraoperative time nor increase in intraoperative
or postoperative adverse events. Subjective benefit was noted by the surgeons in their
we planned to alter the surgeon's access, the infusion cannula was removed and then reaffixed
Visual Outcomes and Comfort Level of Trainee Surgeons

Long-term Outcomes of Scleral Sutured Posterior Chamber Lens Implantation versus Anterior Chamber Intraocular Lens Implantation for Aphakia

Conclusions:

Methods:

Objective:

Support:

Objective:

Methods:

Results:

Conclusion:

Methods:

Results:

Conclusion:

Methods:

Results:

Conclusion:

Support:

5992 - A457
A Single Stick 23 Gauge Portable Injection/Infusion and Aspiration/Vitreous Cutting Instrument - The "Intrector®"
P. Laloo†, F.H.J. Koch†, R. Josephberg‡, M.J. Koss∗. Insight Instruments Inc, Stuart, FL; 'Retina, University Eye Hospital, Frankfurt, Germany; †Retina, WMC NY Medical College, New York, NY; ∗Retina, University Eye Hospital, Frankfurt, Germany.

Objective:

Methods:

Conclusions:

Support:

5991 - A456
Long-Term Outcomes of Scleral Sutured Posterior Chamber Lens Implantation versus Anterior Chamber Intraocular Lens Implantation for Aphakia

Purpose:

Methods:

Results:

Conclusion:

Support:

CR: R.P. Singh, None; C. Sonnie, None; D. Moshefghi, None; P.K. Kaiser, None; J.E. Sears, None.

Support: None

5993 - A458
Cataract Progression After 25 Gauge Vitrectomy: 2 Year Results

Purpose:

Methods:

Results:

Conclusion:

Support: None

5994 - A459
Intraoperative Switch to a Temporal Approach in 25 Gauge PPV: Anatomical and Visual Outcomes and Comfort Level of Trainee Surgeons
J. Comander, C.M. Androbl, S. Kiss, D. Varvas. Ophthalmology, Massachusetts Eye and Ear Infirmary, Boston, MA.

Purpose:

Methods:

Results:

Conclusion:

Support: None

5994 - A459
Intraoperative Switch to a Temporal Approach in 25 Gauge PPV: Anatomical and Visual Outcomes and Comfort Level of Trainee Surgeons
J. Comander, C.M. Androbl, S. Kiss, D. Varvas. Ophthalmology, Massachusetts Eye and Ear Infirmary, Boston, MA.

Purpose:

Methods:

Results:

Conclusion:

Support: None

5999 - A457
A Single Stick 23 Gauge Portable Injection/Infusion and Aspiration/Vitreous Cutting Instrument - The "Intrector®"
P. Laloo†, F.H.J. Koch†, R. Josephberg‡, M.J. Koss∗. Insight Instruments Inc, Stuart, FL; 'Retina, University Eye Hospital, Frankfurt, Germany; †Retina, WMC NY Medical College, New York, NY; ∗Retina, University Eye Hospital, Frankfurt, Germany.

Objective:

Methods:

Conclusions:

Support:

CR: J. Comander, None; C.M. Androbl, None; S. Kiss, None; D. Varvas, None.

Support: None

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5995 - A460
Ultrasound Biomicroscopy-Guided Surgical Intervention for Cyclodialysis Clefts
R. Margolis, C. Sonnie, J.E. Sears. Ophthalmology, Cole Eye Institute, Cleveland, OH.

Purpose: To report the treatment of cyclodialysis clefts (CDC) by ultrasound biomicroscopy (UBM)-directed external cycloplexy using radial sutures.

Methods: A retrospective chart review of all patients with hypotony who underwent UBM at our institution between January 2002 and January 2008 was conducted. The following data was recorded from each medical record: patient age, preoperative etiology of hypotony, duration of hypotony, surgical procedure performed, pre- and post-operative UBM findings, complications, intraocular pressure (IOP) prior to surgery and at last follow up, and visual acuity pre-operatively and at last follow up.

Results: Direct cycloplexy was performed using interrupted radial 9-0 polypropylene sutures were placed starting approximately 2 to 3 mm posterior to the surgical limbus and extending up to the limbus. The suture needle was passed through full thickness sclera, through ciliary body, and out through sclera.

Results: 38% (6/16) of patients with hypotony were diagnosed with a CDC. Two additional patients were judged to have a questionable cleft. Mean age for patients who underwent cycloplexy was 52 years (range 12-80 years). Mean duration of hypotony prior to cycloplexy was 7.5 months (range 1-24 months). 50% (4/8) of patients that underwent cycloplexy experienced an increase in intraocular pressure by an average of 16 mmHg (range 14-28 mmHg). Mean follow-up was 20 months (range 10-36 months). Characteristics of successful outcomes included definite identification of cleft and hypotony duration of less than 3 months. Characteristics of unfavorable outcomes were history of infectious uveitis.

Conclusions: UBM-guided external cycloplexy is an effective treatment option for eyes with severe hypotony due to CDC. Only definite identification of cleft by UBM warrants surgery. Patients with hypotony for greater than 3 months duration and/ or history of infectious uveitis may not respond to cycloplexy.

CR: R. Margolis, None; C. Sonnie, None; J.E. Sears, None.
Support: None

5996 - A461
Factors Affecting Visual Outcomes in Patients Undergoing Pars Plana Lensectomy and Vitrectomy for Retained Lens Material After Complicated Cataract Extraction
Y. Shildkrot1, M. Kirchner2, J.E. Puklin3, R. Iezzi4, D. Elliott1, G.W. Abrams5, T.H. Mahmoud6. Ophthalmology, Kresge Eye Institute, Wayne State University, Detroit, MI; Ophthalmology, Doheny Retina Institute, Los Angeles, CA.

Purpose: To determine factors affecting ultimate visual outcomes in patients undergoing pars plana lensectomy and vitrectomy (PPL/V) for retained lens material.

Methods: A retrospective chart review was conducted of patients who underwent PPL/V between 2000 and 2007. Patients with no history of cataract extraction (CE), follow-up of less than 30 days, or a recent history of severe globe trauma leading to the need for PPL/V were excluded from the study.

Results: We identified 118 consecutive patients, 64 males and 54 females, who were entered into the study. Mean age at the time of PPL/V was 69.7 ± 12 years (range 21 to 92 years) with a mean follow-up of 523 ± 512 days (range 32 to 2611 days). Mean baseline logMAR visual acuity (VA) was 0.94 ± 0.68 (20/174) prior to CE decreased to 1.49 ± 0.84 (20/619) after CE (2-tailed t-test, p < 0.0001). Following PPL/V, VA improved significantly from baseline to 0.70 ± 0.79 (20/100) (p < 0.0001). Factors correlating with worse visual acuity, as revealed by a multivariate square regression analysis, included a history of diabetes (VA 1.04 ± 0.20 (20/219) vs. 0.57 ± 0.20 (74), p < 0.0002), worse post-cataract visual acuity (p < 0.0001), total number of additional surgeries following PPL/V (p < 0.0001), including glaucoma surgery (p = 0.0067), number of steroids used at the time of PPL/V, excluding subconjunctival dexamethasone (p = 0.0052) and the use of non-steroidal anti-inflammatory medications (NSAID) (p = 0.045).

Conclusions: PPL/V resulted in a significant improvement of final VA compared to baseline VA. Post-CDC, history of diabetes and worse pre-PPL/V visual acuity is associated with worse final visual acuity. The use of topical NSAID and increased number of steroids used at the time of PPL/V appeared to predict worse final visual acuity, possibly due to an increased use in complicated cases.

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5997 - A462
Iop Stability After 23 Gauge Transconjunctival Vitrectomy Surgery
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Purpose: To assess the stability of intraocular pressure following 23 gauge sutureless transconjunctival vitrectomy.

Methods: Retrospective review of intraocular pressures in the immediate postoperative period in 31 patients who underwent surgery using a “2-step” 23 gauge vitrectomy system.

Results: One patient had an intraocular pressure lower than 6mmHg, 3 patients had intraocular pressures lower than 10mmHg. The remainder of intraocular pressures were at or above 10mmHg. These measurements were stable the following day.

Conclusions: In our patients, IOP was remarkably stable. This outcome may be specific to the technique used.

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5998 - A463
High Frequency Ultrasound for Comparing Anterior Segment Morphometric Values Before and After Pars Plana Vitrectomy
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Purpose: Pars plana vitrectomy is the second most common intraocular operation. In the end of many vitrectomies gas or silicone oil are injected into the vitreous cavity for internal tamponade. It is presumed that the use of vitreous substitute at the end of surgery can cause changes in the anterior chamber (ACD). Ultrasound biomicroscopy (UBM) has demonstrated anterior segment changes that can be associated with postoperative complications. Quantitative assessments of changes in the (ACD) and lens width (LW) following vitrectomy have not been reported before. The aim of our study was to evaluate post-vitrectomy changes in the ACD and LW by means of high-frequency ultrasonography (HFU) in gas-filled eyes and non gas-filled eyes.

Methods: Phakic and pseudophakic eyes of patients who underwent vitrectomy were prospectively studied. No eyes had undergone any previous surgical procedure involving the posterior segment. An HFU (20 MHz transducer, I3 - Innovative Imaging Inc.) study was prospectively studied. No eyes had undergone any previous surgical procedure involving the posterior segment. An HFU (20 MHz transducer, I3 - Innovative Imaging Inc.) study was performed for statistical analysis.

Results: In the tamponaded eyes group (n=18) the mean preoperative ACD was 3.35±0.93mm and the postoperative ACD was 2.53±0.83mm. In the non-tamponaded eyes group (n=12) the mean preoperative ACD was 3.28±0.81mm and the postoperative ACD was 3.22±0.86mm. The mean decline in ACD was 0.62±0.44mm (95.9±8.5%) in the tamponaded eyes group and 0.06±0.16mm (2.13±5.63%) in the non-tamponaded eyes group. There was a statistically significant difference (p<0.0001) between the tamponaded eyes group and the non-tamponaded eyes group. The mean decline in ACD was 13.13±10.2% in the phakic eyes group (n=19) and 11±14.8% in the pseudophakic eyes group (n=11). The decline was statistically significant in both the phakic and the pseudophakic groups (p<0.0001 and p=0.022, respectively). The difference between the preoperative and postoperative LW values in the phakic group was not significant.

Conclusions: Vitrectomy with gas injection reduced ACD values as measured by HFU shortly after the procedure in both the phakic and pseudophakic groups. No significant changes were seen in vitrectomized eyes in which no gas was injected. These results may be important in understanding the mechanism which causes early intraocular pressure elevations after vitrectomy in gas-filled eyes.

CR: M. Neudorfer, None; N. Oren, None; L. Berkner, None; M. Goldstein, None; A. Barak, None.
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5999 - A464
The Role of Sclerotomy Wound Vitreous Nettoyage in Preventing Ocular Hypotony After 25-Gauge Vitrectomy
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Purpose: To investigate the clinical features, visual acuity outcomes, and adverse events in patients with retained lens fragments managed by pars plana vitrectomy (PPV).
Methods: All consecutive cases of retained lens fragments that underwent PPV over an 18 year period (1990-2007) were reviewed. To study whether post vitrectomy outcomes had changed, these cases were divided into two nine year groups. Cases were reviewed for postoperative retinal detachment, visual acuity, intraocular pressure elevation, and cystoid macular edema (CME).
Results: The current study identified 516 cases. The cases were divided into two groups as follows: those receiving vitrectomy between 1990 and 1998, n = 269 (52%); and those receiving vitrectomy between 1999 and 2007, n = 247 (48%). There was a trend toward a decrease in percent of cases with post-operative intraocular pressure ≥30. However, there was a trend toward an increase in CME in the latter 9-year period, possibly due to the advent of OCT as a diagnostic tool. The number of days from cataract surgery to vitrectomy tended to decrease over the study period, and there was a trend for a decreased rate of post-vitrectomy retinal detachments in the latter group. Better postoperative visual acuities were associated with a less complicated clinical course, including no retinal detachment, suprachoroidal hemorrhage, or cystoid macular edema.
Conclusions: Retained lens fragments after cataract surgery is a common clinical problem. Pars plana vitrectomy and removal of retained lens fragments results in improved visual acuity and lower intraocular pressure. Better visual outcomes are associated with a less complicated clinical course. Less aggressive vitrectomy at the time of cataract surgery and earlier referral to a vitreoretinal surgeon may be associated with lower rates of retinal detachment.
CR: L.C. Olmos; F.M. Gallogly; H.W. Flynn; Jr; W.E. Smiddy; T.G. Murray.
Support: None.

6000 - A465
Simple Alternative of Flute (Back Flush) Cannula for Vitreo-Retinal Surgical Procedures
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Purpose: To report the construction of an inexpensive simple alternative for use of the flute (back flush) cannula in Vitreo-retinal Surgical procedures.
Methods: The essential components of back flush cannula were assembled using a 23Gauge blunt tip cannula and a leur 3-way tap. The exit port is made by removing a 20Gauge blunt tip cannula and a leur 3-way tap. The exit port is made by removing the occlusion will permit flow through the exit port. It can also be used for 23G and 25G vitrectomy systems by simply changing the disposable cannula on the 3-way tap. Our model also aids the convenient introduction of dye for epiretinal membrane peel procedures. A syringe containing the dye can be attached to one of the taps in the three-way-tap component. The alternative instrument was used in all consecutive vitrectomy procedures for 20G and 23G systems.
Results: Intraoperatively, our cannula required no extra effort to insert or handle compared to the original model and no complications were experienced. It can be used for a variety of procedures including vacum cleaning of sedimanted blood from the retinal surface, internal drainage of subretinal fluid through a hole in the retina, manipulation of the flap of a giant retinal break, and simultaneous exchange of intraocular fluid for air or silicone oil. In addition, the unit financial cost of this disposable Flute (back flush) cannula is considerably lower than both the original Charles flute needle and the modified Moorfields model for foregorees cleaning costs.
Conclusions: This instrument is as safe and effective as the original and benefits from being inexpensive and easily constructed from components ubiquitous to surgical units.
CR: G.S. Murthy; S. Thyagarajan; V. Sharma; M.H. Soni.
Support: None.
Phacocrush: Phacochopping at the Vitreous Cavity

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Purpose: A new device called phacocrush/foreign body forceps was developed to perform phacocrush: a new term for phacochopping at the vitreous cavity (crush: verb [trans.] press or squeeze something with force, break something hard into small pieces by pressing).

Methods: Phacocrush/foreign body forceps was developed to manipulate and crush dislocated lens or nucleus into the vitreous cavity in order to facilitate phacofragmentation or even phacoaspiration of lens material. Pars plana vitrectomy is performed using 20, 23 or 25-gauge material. A chandelier illuminator is introduced. Perfluorocarbone liquid is used to protect the macula. Lens or nucleus is hold with a soft tip canula with active aspiration. Phacocrush/foreign body forceps was developed to grasp the lens and perform phacocrush. In the adult the lens measures approximately 10 mm in diameter and is 4 mm thick, so the new forceps design had to be adapted to be able to squeeze the lens material successfully. The fragments are aspirated or removed with a 20-gauge fragmentome. In this case one of the sclerotomies was converted to 20-gauge.

Results: In vitro technique is efficacious for phacocrush. This technique was performed with the nucleus of six patients with cataract nigra or rubra, submitted to extracapsular cataract surgery and in two patients: one with dislocated nucleus and the other with dislocated lens at the vitreous cavity. The first patient was submitted to phacoaspiration and the second one to phacofragmentation. None of them developed adverse events, like retinal detachment.

Conclusions: Phacocrush is a promising new procedure to help the surgery of dislocated lens or nucleus into the vitreous cavity.

CR: J.L. Ferreira, ALCON, F.
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