punctate hyperreflective vitreous opacities seen on handheld spectral domain optical coherence tomography (SD-OCT).
Methods: This is a prospective observational study of infants requiring ROP screening between July 2015 and December 2017. Infants were imaged using handheld SD-OCT at the time of routine examinations. Trained graders masked to the clinical assessment analyzed each OCT scan of the right eye for vitreoretinal findings. Disagreement was mediated by a third trained grader. Punctate hyperreflective vitreous opacities seen on OCT were correlated with clinical ROP severity and other OCT vitreoretinal pathologies.
Results: Among 93 infants studied (51% male, mean gestational age 28.3 $\pm$ 2.9 weeks, mean birthweight 1008.2 kg $\pm$ 287.8 g), 22/93 (38%) developed ROP (14/93 [15%] stage 3). Agreement for OCT graders was 91% ($\kappa = 0.8$; $P < 0.001$). Punctate hyperreflective vitreous opacities developed in 31/93 (33%) of infants and were associated with the presence of ROP ($P = 0.005$), maximum ROP stage ($P = 0.005$), and pre-plus or plus disease ($P = 0.002$).
Discussion: Punctate hyperreflective vitreous opacities seen on handheld SD-OCT were strongly correlated with presence of ROP, maximum stage, and pre-plus or plus disease among premature infants screened for ROP. The opacities may represent cellular proliferation, protein or hemoglobin associated with advanced ROP.
Conclusions: Punctate hyperreflective vitreous opacities on OCT are a marker for advanced ROP. Further study should explore handheld SD-OCT as a noninvasive ROP screening tool.

Posters

041 Biomechanical analysis of ligatures and technique for managing drainage tubes in pediatric glaucoma. Carolina Adams, Steven Kane, Steven Brooks
Introduction: Absorbable ligatures are often used with glaucoma drainage tubes to avoid early postoperative hypotony. We sought to measure the force required to ligate a drainage tube and to develop a modified technique to promote earlier release in pediatric patients, where plate encapsulation occurs more quickly than in adults.
Methods: A precision digital force gauge was used to measure the tensile strength of several common ophthalmic sutures, and the necessary tensile force required to achieve tube ligation. A novel technique for tube ligation was devised to allow sutures as small as 10-0 to be effectively used.
Results: The mean tensile strengths of unknotted sutures varied from 211 $\pm$ 127 g for 10-0 Vicryl to 477 $\pm$ 69 g for 6-0 chromic gut. The mean tensile force required to ligate a Baerveldt or Ahmed tube was 35.9 $\pm$ 0.9 g. However, 9-0 or 10-0 Vicryl could not be reliably used for ligation, due to breakage, unless a modified technique was employed, wherein the tube was first stretched to reduce its thickness and diameter.
Discussion: Frictional forces inherent to knot tying make it unfeasible to reliably use 9-0 or 10-0 Vicryl to ligate a drainage tube, despite the unknotted threads possessing apparently sufficient tensile strength. Our modified ligation technique overcomes this issue, allowing a wider range, of suture choices, and the potential for achieving more rapid release in pediatric cases.
Conclusions: A novel modification in technique allows the use of very small guage sutures to ligate tubes in glaucoma drainage implants, allowing for potentially faster release times that may be favorable in managing pediatric glaucomas.

042 Determination of the strabismus surgery dosage accuracy using a new technology. Satenik G. Agagulyan, Elena A. Kudryashova, Victoria O. Balasanyan, Igor E. Aznauryan
Introduction: Accurate dosage of strabismus surgery is one of the most important issues in strabismology. The aim of this study was to show the accuracy of mathematical computer program 'Strabo' with the use of Gazelab technology. Gazelab technology shows the motility of eyes and the angle of deviation with one eye closed and both eyes open.
Methods: All patients passed standard pre- and postoperative ophthalmologic examinations. Additionally all patients undergone Gazelab Free or 5-point test before and on the 7th day after surgery.
Results: Eleven patients were operated on (mean age, 5.8 $\pm$ 1.5 years). The average value of the deviation with one eye covered was 34.7° $\pm$ 12.2°; with two eyes open, 27.7° $\pm$ 13.9°. Evaluation of the effectiveness of surgery dosage was measured by postoperative angle of strabismus measured by Gazelab technology. The average value of the deviation after surgery with one eye covered was 12.45° $\pm$ 7.1°; with two eyes open, 10.3° $\pm$ 6.1°. Mathematical surgery simulation differed from the actual surgical results by only $\pm$ 4.7°.
Discussion: Results obtained after the strabismus surgery correlated with the expected results that was received by "Strabo" program.
Conclusions: A mathematical model of the surgery allows to distribute the surgical effect on both eyes with a high cosmetic and functional result.

043 Digital biometry in children undergoing cataract surgery in vitrectomized eyes. Sumita S. Agarkar, Swathi Mailankody
Introduction: To report the accuracy of biometry in children undergoing cataract surgery in vitrectomised eyes using SRK-II formula.
Methods: A retrospective review of medical records of children undergoing cataract surgery between 2008 and 2017 with a prior history of pars plana vitrectomy was done. Biometry was performed using Ocuscan Rxp (Alcon)and keratometry was performed using a handheld keratometer IOL power calculation was performed under general anesthesia in uncooperative children Adjustment in speed was made in silicon oil filled eyes. The main outcome variable studied was absolute prediction error (APE). APE was calculated as absolute difference between target refraction and postoperative refraction obtained at 6 weeks.
Results: A total of 92 eyes of 90 patients were included. Mean age at surgery was 12.04 $\pm$ 3.33 years. Mean axial length was 24.85 $\pm$ 1.94 mm. Mean APE using SRK -II formula was 1.29 $\pm$ 1.12 for the entire group. However, 35% of the eyes had APE between 0 and 0.5. APE was affected by axial length ($P = 0.007$).
Discussion: IOL power calculation remains challenging in children specially in younger children Various studies over the years have reported mean prediction error involving several different formulae. Kekunnaya et al reported mean APE of 2.27 with SRK 2 There is no such data available for Vitrectomised eyes. Children in this study were older as well as had longer axial lengths compared to that in litreture.
Conclusions: Prediction error using SRK-II formula in vitrectomized pediatric eyes is comparable to that in nonvitrectomized eyes as reported in litreture.

044 Effect of oral propranolol in astigmatism-induced orbital hemangioma. Nora Aldohayan, Yasser Al-Thnayan
Introduction: Capillary hemangiomas are the most common orbital tumor in infancy, with a course of rapid proliferation followed by spontaneous regression. It may cause astigmatism or amblyopia

reaching up to 60% of the cases. We report 2 cases with amblyogenic orbital hemangioma that has been treated with oral propranolol with remarkable response.

Methods: We reviewed 7 patients with orbital capillary hemangioma that presented to our clinic between 2012-2018, Of these, 2 cases displayed amblyogenic astigmatism, with refraction +0.50 −7.00 ×170 of the right eye and +0.5 −7.50 ×160 of the right eye of an 11-month-old girl and a 2-month-old boy, respectively. Oral propranolol was started with dose of 0.3mg/kg/day TID then gradually increased. Refraction was recorded after initiating propranolol.

Results: The first case showed refraction of +2.00 −2.50 ×180 7 months after starting treatment, while the second case showed refraction of +4.00 −4.50 ×70 after 9 days of starting treatment, and 1-month follow-up displayed +3.00 −2.50 D ×135. Adverse events were not encountered.

Discussion: Oral propranolol has decreased the cylindric power in both cases with 64.29% decrease in the first case in the course of 7 months, and 66.67% for the second case, in 1 month, however propranolol demonstrated a rapid improvement in after only 9 days of starting the treatment reaching to −4.50 DC down from −7.50 DC with over 35% drop in cylindric power.

Conclusions: Oral propranolol decreases cylindric power significantly to nonamblyogenic levels in orbital hemangioma in a short duration varying from 1 to 7 months.

045 The relationship between optic canal size and severity of papilledema in children with intracranial hypertension. Anastasia A. Alex, Hilliary E. Inger, Hersh Varma, Catherine O. Jordan, Shawn C. Aylward, Jeremy Jones, David L. Rogers

Introduction: Bony optic canal size has been proposed to affect the dynamics of cerebrospinal fluid pressure from the cranium to the subarachnoid space within the optic nerve sheath. This may contribute to variations in clinically observed optic nerve edema (ONE) in patients with intracranial hypertension (IH). The purpose of this study was to determine if a relationship exists between optic canal size and the grade of clinically observed ONE in pediatric IH patients.

Methods: Presenting ophthalmologic exam information and the results of intracranial imaging were collected retrospectively for 35 pediatric IH patients (70 eyes). Volumetric T1 magnetic resonance imaging (MRI) brain scans were reviewed by a neuroradiologist who was masked to the ONE grades. Cross-sectional area (CSA) of the narrowest region of the optic canal was measured using OSIRIX software. Spearman correlation and ANOVA testing was performed to study the relationship between CSA and ONE grade.

Results: Optic canal CSA and ONE were not significantly correlated ($r = 0.02$; $P = 0.84$). There were no significant differences among average optic canal CSA when compared according to ONE grade ($F [5,62] = 1.22$, $P = 0.31$).

Discussion: Although an association of the optic canal CSA and ONE grade has been reported previously in adults with IH, there was no significant relationship found in our study of pediatric IH patients.

Conclusions: Our study suggests that the optic canal size in children with IH may not be associated with the severity of papilledema observed on physical exam.

046 Quality of life and visual perception in children and young adults with anophthalmia and microphthalmia treated with ocular prosthesis. Marita Andersson Gronlund, Beatrice Casslén, Ylva Jugard, Rezhna Taha Najim, Marie Odersjo, Alexandra Topa

Introduction: The aim was to evaluate health-related quality of life (HRQoL), vision-related (VR)QoL and visual perceptual problems (VPPs) among anophthalmia (A) and microphthalmia (M) patients treated with ocular prosthesis.

Methods: Seveneteen individuals (mean age, 9.0 years; range, 1.7-32.8) with unilateral A/M participated. Four validated instruments measuring HR- and VR-QoL were used: (1) PedsQL, consisting of physical and psychosocial (emotional, social and school functioning) self-report (≥5years) and parent-proxy (2-18 years); (2) CVFQ (≤7 years); (3) EYEQ (≥8 years); 4) VFQ-25 (≥21 years). VPPs were assessed by history taking.

Results: A/M patients and their parents scored low in HR-QoL compared with controls (PedsQL total score: 60.9; 69.6 vs 83.0; 87.61; $P < 0.0001$). No difference between children and parents were found, however, parents trended to underestimate their children's emotional state. A/M children having subnormal visual acuity (VA; ft ≤20/32; logMAR ≥0.20), scored lower in school functioning compared with normal sighted A/M children ($P = 0.026$). CVFQ and EYEQ showed no difference in VR-QoL regarding A/M children compared with controls or children having subnormal VA or not. 8/12 A/M children exhibited VPPs in one or more areas compared with 4/118 controls ($P < 0.0001$).

Discussion: A/M individuals have poor HR-QoL and increased VPPs. No difference in QoL was found between children and parents even though the children trended to score lower in emotional well-being. Individuals with A/M having subnormal vision rated significant less capability in school functioning.

Conclusions: These neglected problems elucidate the necessity of thorough examination, individual assessment followed by appropriate treatment and support concerning children diagnosed with A/M treated with ocular prosthesis.

047 Structural changes of the ciliary body and ciliary processes measured by ultrasound biomicroscopy of primary congenital glaucoma in comparison to glaucoma following congenital cataract surgery. Laura Andrews, Laura Kueny, Camilo Martinez, Joy Li, Adrianna Lee, Osamah Saeedi, Moran Roni Levin, Mona Kaleem, Bethany Karwoski, Marlet Bazemore, Marijean Miller, Mohamad Jaafar, Janet Leath Alexander, William P. Madigan

Introduction: Glaucoma is an important cause of pediatric blindness. Our study aims to better understand ciliary body structural parameters and differences in patients with Primary Congenital Glaucoma (PCG) and Glaucoma Following Congenital Cataract Surgery (GFCCS).

Methods: This is an ongoing prospective comparative study conducted at Children's National Medical Center and University of Maryland comparing patients with PCG and GFCCS undergoing exam under anesthesia. Eyes without any ocular pathology are used for comparison. Longitudinal ultrasound biomicroscopy (UBM) was performed for all patients. Image analysis was performed using ImageJ software to measure 6 structural parameters of the ciliary body (CB) and ciliary processes (CP).

Results: Nine PCG eyes and 6 GFCCS eyes were compared with 25 control eyes. CP integrated density and CP area were significantly lower in patients with glaucoma compared to controls ($P = 0.0428$ and 00485, resp.). PCG CP thickness and CP integrated density were also significantly lower in comparison to GFCCS ($P = 0.0041$ and 0.000024 resp.). However, CB thickness was significantly lower in patients with GFCCS compared to PCG ($P = 0.01129$).

Discussion: Our study demonstrates quantifiable differences between the CB and CP in patients with PCG in comparison to both