

rectus recession has specifically been shown to decrease the distance-near disparity. Our results confirm prior data and also showed that lateral rectus resection too decreased the distance-near disparity. Dose-response relationship will be discussed.

**Conclusions:** Both medial rectus recession and lateral rectus resection are effective treatment for divergence insufficiency, with both decreasing distance-near disparity.

#### 039 Natural history of retinal hemorrhage in children with abusive or accidental head trauma. Wendy S. Chen, Brian Forbes, Gui-Shuang Ying, Jiayan Huang, Gil Binenbaum

**Introduction:** Retinal hemorrhage (RH) is an important sign of abusive head trauma. Ophthalmologists are commonly asked to infer injury timing with limited data to guide them. We sought to describe the natural history of RH in children with head trauma and identify patterns that might suggest chronicity.

**Methods:** Retrospective cohort study of children age <2 years at the Children's Hospital of Philadelphia during 2001-2009 with abusive or accidental head trauma, RH on initial fundus examination within 72 hours of presentation, and one or more follow-up examinations. Each RH type was graded as none, mild, moderate, severe.

**Results:** 104 eyes of 52 children qualified. Intra-RH was present in 91 eyes (62 too-numerous-to-count). At 1 week, intra-RH resolved to none or mild (<10 hemorrhages) in 99%. The longest an isolated intra-RH persisted was 32 days. Pre-RH was present in 68 eyes, persisting 5-111 days. Upon initial examination, 22% eyes had only intra-RH, 66% both pre and intra, 0% only pre; at 2 weeks, 3% intra, 18% both, 45% pre. In no cases did RH worsen. 10 eyes had folds, 19 retinoschisis.

**Discussion:** The time course observed matches birth-related RH studies. Traumatic pre-RH did not occur without intra-RH, suggesting a spectrum relating to increasing trauma severity (intra-RH, then co-incident pre-RH, then folds/retinoschisis).

**Conclusions:** In young children, most intra-RH clear quickly, within a week, while pre-RH may persist for many weeks. The presence of pre-RH with no or only mild intra-RH indicates that head trauma occurred days or more prior to the eye examination.

#### 040 Early results of slanted recession of the lateral rectus muscle for intermittent exotropia with convergence weakness. Bo Young Chun, Kyung Min Kang

**Purpose:** To evaluate the efficacy of slanted recession of the lateral rectus (LR) muscle for intermittent exotropia (IXT) with convergence weakness.

**Methods:** A retrospective analysis was made of all patients who underwent slanted LR recession between January 2010 and June 2012 for IXT with convergence weakness. Twenty-nine patients were included in this study. All patients had their follow-up duration more than 3 months. The medical records were reviewed and the following parameters were recorded and analyzed: patients sex, age, preoperative and postoperative ocular alignment at distance and near and changes of their stereopsis.

**Results:** The study group was composed of 14 males and 15 females, with a mean age of 10.8. Preoperative mean deviation angle was  $31.9^{\Delta} \pm 5.4^{\Delta}$  at distance and  $42.6^{\Delta} \pm 5.8^{\Delta}$  at near. Slanted LR recession reduced the deviation angles to  $2.7^{\Delta}$  at distance and  $3.4^{\Delta}$  at near at 3 months. In addition, the mean difference between the distance and near deviation angles was significantly reduced from  $10.7^{\Delta}$  preoperatively to  $0.7^{\Delta}$  at 3 months postoperatively ( $P < 0.05$ ). The mean stereopsis was significantly increased from 435 arcsec preoperatively to 94.4 arcsec at 3 months postoperatively ( $P < 0.05$ ).

**Discussion:** Slanted recession of the LR was effective in reducing near-distance differences. This surgical technique also demonstrated a positive impact on stereopsis.

**Conclusions:** It is suggested that the slanted recession of the LR will decrease relatively high recurrence rate of IXT with convergence weakness, however, further work will focus on the long-term stability of ocular alignment in these patients.

#### 041 Ocular findings in children who underwent expansion cranioplasty with distraction osteogenesis for craniosynostosis. Seung Ah Chung, Soolienah Rhiu, Soo Han Yoon Jong, Bok Lee

**Purpose:** To describe the prevalence and nature of ocular comorbidity in children with craniosynostosis before and after expansion cranioplasty.

**Methods:** We retrospectively reviewed the medical records of 88 consecutive children who underwent expansion cranioplasty with distraction osteogenesis for craniosynostosis. Recorded data included the following: patient demographics, ocular motility, cycloplegic refraction, intraocular pressure measured with tonopen, examination of the anterior and posterior segment, intracranial pressure, and procedures for craniofacial correction. Ocular findings were assessed before and 6 months after surgery.

**Results:** Children with a mean age of 24.4 months were treated for their craniosynostosis (27 were coronal, and 61 were sagittal and lambdoid). Ocular motility test was available for 85 of 88 patients. Of 85 patients, 63 (74.1%) had strabismus: 36 had exodeviation, 22 had esodeviation, and 14 had vertical deviation. Ametropia was found in 46.5% of patients: 36.3% had hypermetropia of +2.00 D or more and 10.2% had myopia of less than -0.50 D. Astigmatism of 1.50 D or more was in 31 cases (35.2%). Anisometropia, astigmatism, and head tilt occurred more frequently on the contralateral side to the fused suture ( $P = 0.038$ ). Procedures for craniofacial correction improved abnormal head posture, but not refraction.

**Discussion:** Patients who needed expansion cranioplasty were at risk for strabismus, ametropia, and astigmatism, especially who with unilateral synostosis in the eye contralateral to the synostosis. Neurosurgical correction did not show any effect on ocular findings other than abnormal head posture.

**Conclusions:** Our findings support the importance of ocular evaluation and management in these children.

#### 042 The optic nerve and retinal vasculature in albinism: Normal or abnormal? Julie A. Conley, Alejandra Decanini Mancera, Ann M. Holleschau, C. Gail Summers

**Introduction:** Albinism, an inherited disorder resulting in reduced ocular melanin, is usually associated with reduced best-corrected visual acuity (BCVA), nystagmus, foveal hypoplasia and iris transillumination. The purpose of this study is to describe the optic nerve (ON) anatomy and peripapillary retinal vasculature in albinism and to examine the relationship to BCVA.

**Methods:** This IRB-approved study is a retrospective review of 34 patients with albinism and 51 controls seen at the University of Minnesota. The ON and peripapillary vasculature were analyzed by fundus photos using Ophthavision.

**Results:** Our data indicate that the optic disc diameter (DD) and ON area are statistically smaller in albinism than controls ( $p < 0.001$ ;  $P = 0.0008$ ). Using DD to disc-macula ratio, with macula determined as center of foveal avascular zone, more patients with albinism qualified as optic nerve hypoplasia. Significantly more patients with albinism had a double ring sign, situs inversus and a nasally-directed artery ( $p$  at least  $< 0.0148$ ). There was no significant difference between