7/31/2023 12:00 am

Pediatric Retina, ROP Symposium

Incidence and Timing of Treatment-Requiring Retinopathy of Prematurity in Nanopremature and Micropremature Infants in the United States

- Edward Wood, MD, FASRS
- Shannon Scarboro
- Gopal Karsaliya
- Clio Harper, MD
- Hashem Ghoraba, MD, MSc, MRCSEd(Ophth)
- Darius Moshfeghi, MD, FASRS
- Hasenin Al-khersan, MD
- Hailey Robles-Holmes, BS
- Kenneth Fan
- Audina Berrocal, MD FASRS
- Sandra Hoyek, MD
- Nimesh Patel, MD
- Rocco Sbrocca, BS
- Antonio Capone, MD
- Kimberly Drenser, MD

Objective: We hypothesized that extremely premature infants termed “micropremature” and “nanopremature” have a higher incidence of treatment-requiring ROP at an earlier post-menstrual age (PMA) than currently known.
Purpose: Premature babies are being born smaller and sicker than ever before. The purpose of this study was to analyze the incidence and timing of treatment-requiring ROP in extreme prematurity, specifically in infants categorized as micropremature and nanopremature herein. These findings could potentially impact ROP screening and guide practitioners towards improved visual outcomes for the smallest of babies.
Methods: In this retrospective, multicenter, cohort study, five sites collected data on patients that fit the inclusion criteria of nanopremature and micropremature infants: Austin Retina Associates, Austin, TX (ARA); Bascom Palmer Eye Institute, Miami, FL (BPEI); Associated Retinal Consultants at William Beaumont Hospital, Royal Oak, MI (ARC); Massachusetts Eye and Ear Infirmary, Boston, MA (MEEI); and Stanford Byers Eye Institute, Stanford, CA (BEI). All sites collected data from 1/1/2013-6/1/2022, with the exceptions of BPEI who collected data from 1/1/2013-12/31/2019 and MEEI who collected data from 1/1/2002-1/1/2021. This study was performed with approval from the IRB at the University of Texas in Austin, TX. To meet the inclusion criteria we defined the following: “nanopremature” infants born at <24 weeks of gestation or BW< 600 grams and “micropremature” infants born between 24-26 weeks gestation or BW between 600-799 g. Qualifying patients were then divided into the following cohorts: those that met the definition of micropremature by GA only (n=1324), those that met the definition of micropremature by BW only (n=1161), those that met the definition of micropremature by GA and BW (n= 703), those that met the definition of nanopremature by GA only (n=335), those that met the definition of nanopremature by BW only (n=490), and those that met the definition of nanopremature by GA and BW (n=161).
Results: For all patients screened for ROP, 8.52% required treatment with an average treatment PMA of 35 5/7 weeks (250.37 days). The chances of requiring treatment for ROP was significantly higher in all of the micropremature and nanopremature cohorts compared to all patients screened (p-value < 0.001) (Table 1). The PMA of the first treatment for all cohorts was normalized (Fig 1) with nanopremature infants by GA and BW having an average treatment age of 35 weeks PMA (244 days) and micro and nanopremature having much thinner curves, indicating a narrower window of time when treatment was required.
Conclusion: In this multicenter retrospective review of 7,293 infants (14,586 eyes) screened for retinopathy of prematurity across 5 centers in the United States reflecting all 5 major US regions, extremely premature infants defined as ‘nanopremature’ and ‘micropremature’ have a significantly higher chance of developing treatment-requiring ROP compared to larger premature babies (p-value < 0.001 for all cohorts, Table 1).

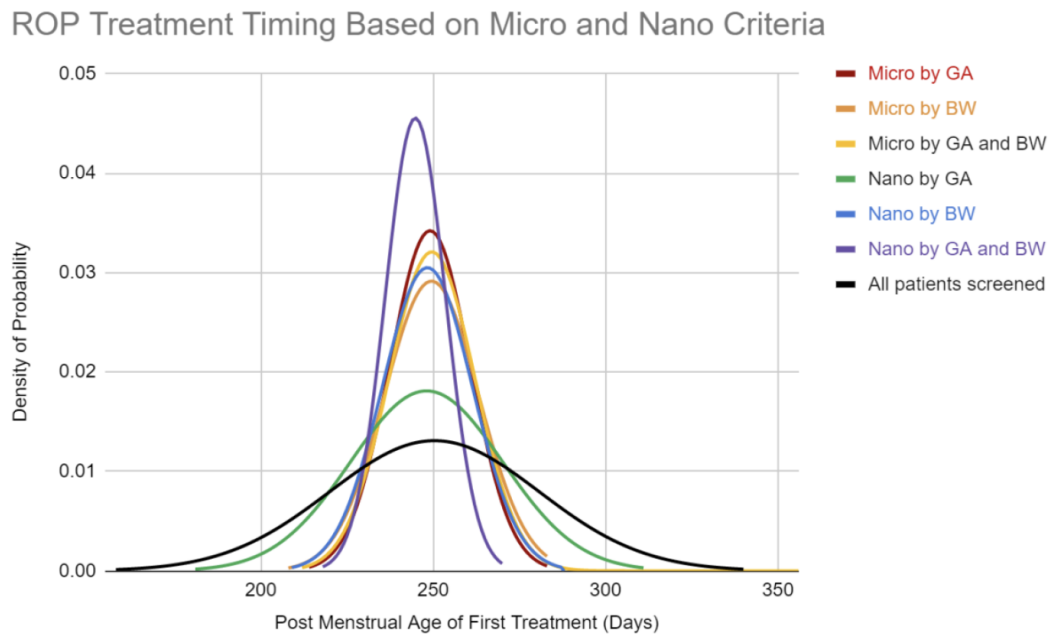
IRB APPROVAL Yes

Table 1: Percent Requiring Treatment Across Cohorts.

	Patients screened	Patients treated	Average PMA of treatment, weeks	Average PMA of treatment, days	Percent Requiring Treatment	P-Value when compared to control
Micro by GA	1324	380	35 4/7	249.096	28.70091	<0.001
Micro by BW	1161	294	35 5/7	249.522	25.32300	<0.001
Micro by GA and BW	703	213	35 5/7	249.612	30.29872	<0.001
Nano by GA	335	169	35 3/7	248.08	50.44776	<0.001
Nano by BW	490	232	35 3/7	248.316	47.34694	<0.001
Nano by GA and BW	161	106	35	244.834	65.83851	<0.001
All patients screened, regardless of GA or BW	7293	621	36	252.08	8.515	0.5

Percent Requiring Treatment Across Cohorts

Figure 1: Normalized Bell Curve for the Treatment of ROP.



Normalized Bell Curve for the Treatment of ROP

7/31/2023 12:00 am

Pediatric Retina, ROP Symposium

Retinopathy of Prematurity Outcomes of Neonates Meeting Only a Single Screening Criterion: Proposal of the TWO-ROP Algorithm

- Nimesh Patel, MD
- Sandra Hoyek, MD
- Hasenin Al-khersan, MD
- Kenneth Fan, MD
- Nicolas Yannuzzi, MD
- Jose Davila, MD
- Audina Berrocal, MD FASRS

Objective: Current screening guidelines for retinopathy of prematurity (ROP) need to be reevaluated to ensure that they are both effective and efficient in the identification of ROP.
Purpose: To assess the rates of ROP and treatment-warranted ROP in a modern set of patients meeting zero or one of the current ROP screening criteria.
Methods: This is a single center, single screener, retrospective, consecutive series of 9,350 infants screened for ROP at the Jackson Memorial Hospital (JMH) Neonatal Intensive Care Unit (NICU) from 2009-2020 by a single pediatric retina specialist (AMB). The patients are from a data set of 25,567 patients meeting a birth criteria of <32 weeks' gestational age (GA) or a birthweight (BW) of <1500 g. Data on the full population can be found in the American Ophthalmological Society thesis. Inclusion criteria for this analysis were patients in three categories: group 1 composed of BW < 1500g and GA ≥ 30 weeks, group 2 composed of BW ≥ 1500g and GA < 30 weeks, group 3 composed of BW ≥ 1500g and GA ≥ 30 weeks. All infants transferred from outside institutions were excluded. Data collected included demographics, zone and stage of ROP, presence of plus disease, tunica vasculosa lentis, and treatment required.
Results: Out of 7,520 patients with reported BW and GA, 1,612 (21.4%) patients met the inclusion criteria. The number of patients in group 1, 2, and 3 was 466 (6.19%), 23 (0.31%), and 1123 (14.93%) respectively. The number of patients diagnosed with ROP was 20 (4.29%) in group 1, 1 (4.35%) in group 2, and 12 (1.07%) in group 3, P < .001. Mean age at ROP diagnosis in group 1, 2, and 3 was 35.88 weeks (range 32.9 – 42.7), 35.7 weeks and 35.29 weeks (range 33.6 – 37.1) respectively (P = .77). Mean interval between birth and ROP diagnosis was 36.25 days (range 12 – 75) in group 1, 47 days in group 2 and 23.33 days (range 10 - 39) in group 3 (P = .05). No cases of stage 3, zone 1 or plus disease were recorded. No patient met the treatment criteria.
Conclusion: Patients meeting one screening criterion had a low rate of ROP (<5%), with no stage 3, zone 1, or plus disease. No patients required treatment. We propose a possible algorithm (TWO-ROP) in appropriate NICUs, with an amendment in screening protocol for this low-risk population to include only an outpatient screening exam within 1 week of discharge, or at 40 weeks if inpatient, to decrease the inpatient ROP screening burden while maintaining safety. Further external validation of this protocol would be required.

IRB APPROVAL Yes

	Group 1 ≥30weeks <1500g	Group 2 <30weeks ≥1500g	Group 3 ≥30weeks ≥1500g	p-value
Total number of patients	466	23	1123	-
Mean birth weight (g)	1268.6	1662	2095.2	< .001*
Mean gestational age (weeks)	31.43	28.73	33.97	< .001*
ROP patients (%)	20 (4.29)	1 (4.35)	12 (1.07)	< .001*
Treatment-warranted ROP	0	0	0	-

Table 1. Comparison of the Mean Birth Weight, Gestational Age, Number of ROP patients, and Number of Treatments Between the Three Groups Screened for Retinopathy of Prematurity (ROP)

Characteristics of the Three Groups Screened for Retinopathy of Prematurity

	Group 1 ≥30weeks <1500g	Group 2 <30weeks ≥1500g	Group 3 ≥30weeks ≥1500g	p-value
Total number of patients	20	1	12	
Mean birth weight (g)	1216.25	1530	1652.67	< .001*
Mean gestational age (weeks)	30.7	29	31.97	.001*
Mean age at diagnosis (weeks)	35.88	35.7	35.29	0.77
Mean interval between birth and ROP diagnosis (days)	36.25	47	23.33	0.0502
Treatment-warranted ROP	0	0	0	

Table 2. Comparison of the Mean Birth Weight, Gestational Age, Age at ROP Diagnosis, Interval to Diagnosis and Number of Treatments Between the Three Groups with Retinopathy of Prematurity (ROP)

Diagnosis of Retinopathy of Prematurity in the Three Screening Groups

7/31/2023 12:00 am

Pediatric Retina, ROP Symposium

Longitudinal Image-Based Assessment of Retinopathy of Prematurity (LONGROP) Study: Simulated Bedside Indirect Ophthalmoscopy vs Telemedicine

- Darius Moshfeghi, MD, FASRS
- Jochen Kumm, PhD
- Hashem Ghoraba, MD, MSc, MRCSEd(Ophth)
- Tatiana Rosenblatt, MD

Objective: Is telemedicine superior to binocular indirect ophthalmoscopy for retinopathy of prematurity (ROP) disease change?
Purpose: We hypothesized that telemedicine (TELE) screening was superior to simulated BIO (sBIO) for the detection of ROP change (better/same/worse) when evaluated by pediatric retinal specialists.
Methods: Prospective cohort study. Curated, published image database of 40 patients in two closely matched cohorts: Set 1 (S1,1-20), Set 2 (S2, 21-40). Twelve graders randomized into a screening group A (sBIO) or B (TELE). In weeks 1-6 for S1, half the graders (1,2,3,5,8) were assigned to A (10 minutes per patient with drawings, total 200 minutes per week) and the other half (4,5,7,9) to B (unlimited time longitudinal images comparison) to determine whether ROP had improved, worsened, or stayed the same compared to the prior week ("gestalt" score) (Fig 1). In weeks 7-12 for S2, the graders switched techniques. Primary outcome was comparison of graders' weekly gestalt scores to gold standard reference scores for superiority.

Results: Cohorts: Patient cohorts were evenly balanced with respect to disease change (*always stable*, 17.5% vs 2.5%, *always worsening*, 40.0% vs 42.5%, and variable, 55.0% vs 42.5%, 1 vs 2, p=0.076). Treatment was also balanced (30.0% and 35.0% of S1 and S2). **Primary Outcome**: No difference. Accuracy 51.7% BIO vs 51.9% TELE (p=0.95). TELE outperformed sBIO in S1 57.0% vs 53.0% (p=0.11) and whereas sBIO outperformed TELE in S2, 50.1% vs 47.6 (p=0.32). The highest agreement with the reference occurred when all exams exhibited no change (91.5% vs 93.5%, sBIO and TELE, p=0.46) and the worst agreement when the exams always demonstrated worsening (46.5% vs 47.1%, sBIO and TELE, p=0.93). Agreement across the entire time series per eye was uncommon: 19.0% vs 21.5%, sBIO vs TELE in S1 (p=0.68), and 3.1% vs 6.5% in S2 (p=0.23). **Graders**: Nine graders completed the study. Agreement amongst graders ranged from 45.0%- 61.0% in S1 and 36.0%-62% in S2. For the outcome of BIO vs Tele by original assignements: graders (1,2,3,5,8) 53% vs 47.6% (p=0.019) were significantly better at sBIO and graders (4,5,7,9) were signficantly better at TELE, 50.1% vs 57.0% (p=0.007). Both sets of graders did worse in weeks 7-12 (S2). There was an inverse correlation between agreement with Gestalt and ROP change for all graders and within in groups: agreement was higher in stable disease, lower in worsening disease (Cor. coeff=-0.51, p<0.0001) (Fig 2).
Conclusion: Detection of change (ie tempo, better/same/worse) was independent of screening technique by expert graders. Both grader groups did significantly better in the first 6 weeks relative to the second 6 weeks, indicative of a fatigue factor. Because the grading groups switched in S2, we demonstrated that grader performance was biased by initial screening technique assignment. The fatigue factor is supported by the amount of work (20 patients per week) and time (10 min/patient). Finally, we demonstrated that graders had high correlation with reference standard when images were stable, worse when images worsened.

IRB APPROVAL Yes

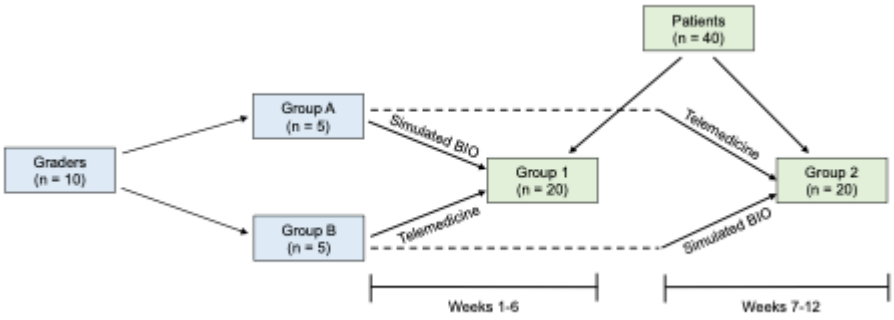


Fig 1.Schematic of study structure. *BIO – bedside indirect ophthalmoscopy

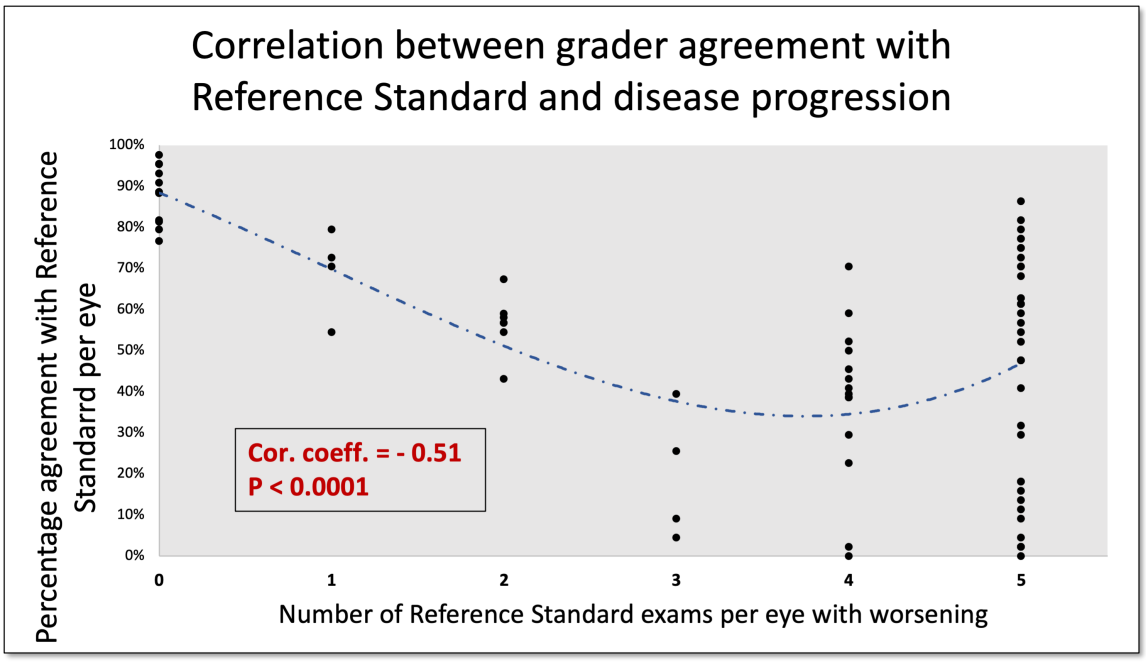


Fig 2. Inverse correlation between disease worsening and agreement.

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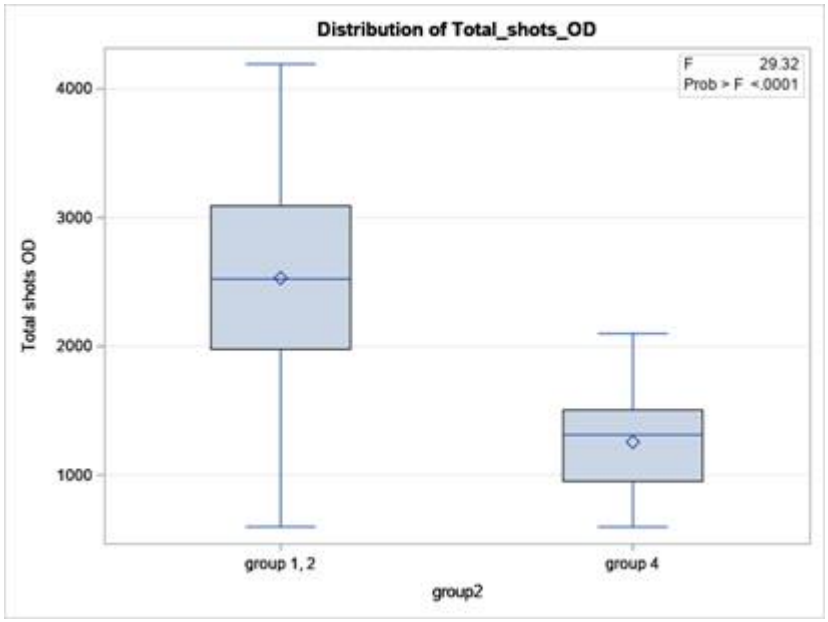
Pediatric Retina, ROP Symposium

Quantifying Laser Burn Spots to Peripheral Avascular Retina Post-Bevacizumab Treatment in Retinopathy of Prematurity Infants at Different Age Groups

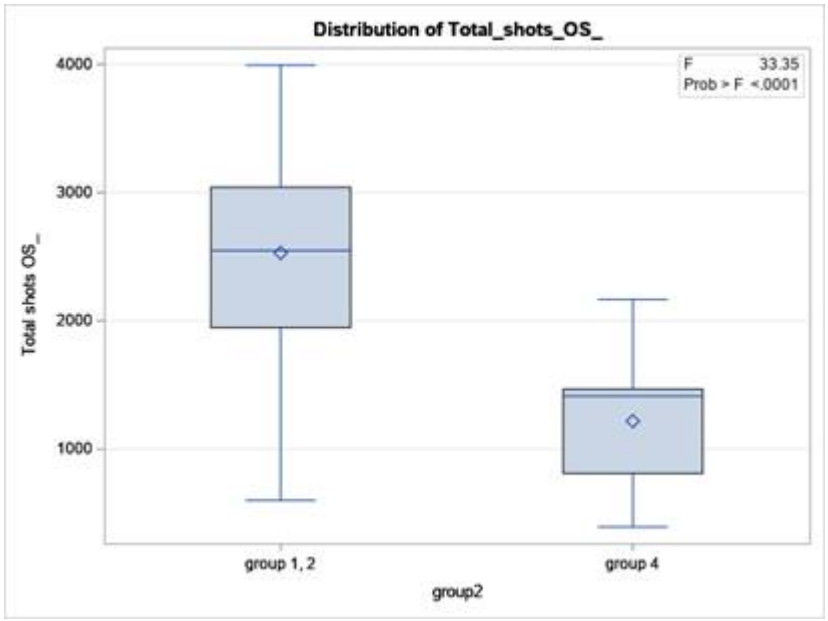
- Swati Agarwal-Sinha, MD, FASRS
- Wei Xue, PhD

Objective: Is there a benefit to provide laser to the peripheral avascular retina in infants post-treatment with bevacizumab at ≤60 weeks PMA?
Purpose: Laser photocoagulation done to the peripheral avascular retina post bevacizumab based on the premature infant's age carries risk of immediate and late sight-threatening laser induced complications. The aim of this study was to quantify the laser burn spots to the peripheral avascular retina (PAR) in infants post intravitreal bevacizumab (IVB) injection for retinopathy of prematurity (ROP) at different age groups.
Methods: An observational, longitudinal clinical study of 142 eyes of 71 infants treated with laser photocoagulation to PAR for type-1 ROP post IVB (0.75mg/0.03ml). The laser burn spots, power, duration, and interval to the PAR were noted from 4 groups. Group 1 and 2 infants had zone 1 and zone 2 ROP respectively who received laser ≤60 weeks post-menstrual age (PMA). Group 3 received laser at ≥ 61 weeks PMA until one-year chronological age and Group 4 received laser post one year of chronological age until three years of age.
Results: Mean gestational age (GA) and birth weight (BW) was 25 weeks PMA and 727 grams. 134 eyes had type 1 ROP, and 8 eyes had aggressive posterior ROP, of which 82 eyes had zone 1 and 60 eyes had zone 2 ROP at first treatment. 63 infants received IVB prior to laser of which 56 had bilateral injections and 7 unilateral. The average age at laser for Group 1 and 2 was 42 weeks PMA; group 3, 71 weeks PMA and group 4, 25 months chronological age. The average laser spots in right and left eye in group 1 were 2817/2019; group 2, 2242/2274; group 3, 2139/1756 and group 4, 1255/1218 resp. Non-parametric test was used to compare total shots in right and left eye between gr 1 and gr 2, gr 3 and 4, combined gr 1-2 and 3 and combined gr 1-2 and 4. Quantifying laser total shots performed in gr1 and gr2 at ≤60 weeks PMA and gr 4 beyond one of age was noted to be statistically significant ($p<0.0001$). Laser power, duration and interval compared between left and right eye in all groups were similar.
Conclusion: Delaying laser beyond one year of age when treated with standard dosage of IVB (0.625 to 0.75 mg) to PAR decreases the total laser shots given significantly thereby decreasing risk of immediate complications like choroidal/retinal detachments, macular changes, and long-term effects of high myopia, anisometropia, amblyopia and visual compromise in the growing infant eye.

IRB APPROVAL Yes



Quantifying laser total shots in gr1 and gr2 and gr4 in right eye



Quantifying laser total shots in gr1 and gr2 and gr4 in left eye

7/31/2023 12:00 am

Pediatric Retina, ROP Symposium

Development and Evaluation of an Artificial Intelligence Algorithm for Pediatric Retinal Disease Screening Using Widefield Fundus Photography

- Lejla Vajzovic, MD, FASRS
- Nita Valikodath, MD, MS
- Stephanie Hsu,, MD
- Somayyeh Soltanian-Zadeh, PhD
- Xi Chen, MD, PhD
- Cynthia Toth, MD
- Sina Farsiu, PhD

Objective: Is pediatric retinal disease screening feasible using artificial intelligence and wide-field fundus photography?
Purpose: The purpose of this study is to develop and evaluate an artificial intelligence algorithm for screening of pathology on wide-field fundus photos in pediatric patients.
Methods: Optos wide-field fundus photos were obtained from patients from pediatric retina clinics from the Duke Eye Center from 2014 to 2020. A reference standards was established for each image based on image interpretation by a retina fellow and chart review of the attending physician's image interpretation, exam findings and clinical diagnosis. Presence of artifact, field of view, and abnormality of the retina, optic nerve, vessels and media were recorded. A convolutional neural network was trained using the graded images to identify images as normal or abnormal. ResNet50 which is pre-trained on the ImageNet dataset served as the backbone of the final neural network classifier.
Results: In this preliminary study, 239 wide-field fundus photos were evaluated from 89 eyes of 71 patients. There were 61 (25.5%) normal images and 179 (74.9%) abnormal images. Recall score was 0.83 ± 0.07, precision was 0.92 ± 0.04, and specificity was 0.81 ± 0.07 of the deep learning algorithm. Area under the receiver operating curve of identifying abnormal images was 0.91 ± 0.02 and F1 score was 0.87 ± 0.04. The most frequent exam findings/diagnoses were prior laser/cryotherapy (59, 24.7%), retinal detachment (26 images, 10.9% of images), and vascular abnormality (23, 9.6%).
Conclusion: This preliminary study showed that the AI algorithm demonstrated reasonable performance in identifying pathology on wide-field fundus photos. Further training of the algorithm is needed prior to implementation in clinical settings for screening for pediatric retinal diseases.

IRB APPROVAL Yes

7/31/2023 12:00 am

Pediatric Retina, ROP Symposium

Utility of Confirmatory Genetic Testing for Retinal Detachment Prophylaxis in Children With Suspected Stickler Syndrome

- Franco Recchia, MD

Objective: To report the incidence of RD in children with genetically proven Stickler syndrome treated with prophylactic retinopexy, compared with the incidence of RD among gene-negative clinically suspected cases who went untreated.
Purpose: Heritable RD is most commonly associated with mutations in the *COL2A1* or *COL11A1* genes and is often accompanied by systemic abnormalities of connective tissue (Stickler syndrome). Published studies justify prophylactic retinopexy to minimize vision loss. However, inconsistent patient ascertainment, limited genetic confirmation, and variable retinopexy technique preclude clear guidance of whom, when, and how to treat. This work comunicates real-world rates of genetically proven cases, retinopexy success, and natural history of genetically-unproven cases.

Methods: Clinical records of all children with clinically suspected Stickler syndrome were reviewed. Suspicion was based on RD or high myopia **PLUS** ≥1 of the following: other ocular signs (contralateral RD, cataract, vitreopathy); nonocular signs (orofacial changes, arthropathy, hearing loss); family history (RD or cleft palate). All children underwent genetic testing for *COL 2A1* and *COL11A1* mutations. Primary outcome measure was occurrence of RD. Secondary outcome measure was genetic confirmation in suspected cases.
Results: 44 consecutive children were identified as "Stickler suspected", of whom 5 were excluded due to limited follow-up or no genetic testing. Of 39 Stickler suspects (median age 8 yrs, 45% girls), 5 presented with bilateral RD; 12 with unilateral RD (5 from giant retinal tear [GRT]), and 22 with no RD. Pathogenic COL2A1 or COL11A1 variants were found in 27 (68%), including all 5 with bilateral RD. A variant of unknown significance in COL11A1 was detected in 2 children, and no pathogenic variant was detected in 10 (27%), including 2 presenting with unilateral RD. Genetically-confirmed eyes (n=32) eligible for prophylactic retinopexy were treated with either laser cerclage (360 degrees of 3-5 rows of confluent burns anterior to the equator, n=27) or with scleral buckling (n=5 GRT cases). Twenty eyes of the 12 genetically-negative patients received no prophylactic retinopexy. Median followup was 35 months (range 12 mos to 10 yrs). RD occurred in two of 32 Stickler-confirmed eyes (6%) treated prophylactically. No RD was observed in any untreated Stickler gene-negative eyes.

Conclusion: Genetic testing in children suspected of Stickler syndrome confirms the diagnosis in 2/3 of cases. Prophylactic retinopexy in genetically confirmed cases reduces the rate of RD, but efficacy of retinopexy in genetically unconfirmed cases is unclear. These findings may help to guide patterns and urgency of treatment in children with "clinically suspected" Stickler syndrome. Additionally, these real-world data can inform a clinical trial to evaluate the optimal parameters of prophylactic retinopexy in children at highest risk for RD.

IRB APPROVAL Yes

7/31/2023 12:00 am

Pediatric Retina, ROP Symposium

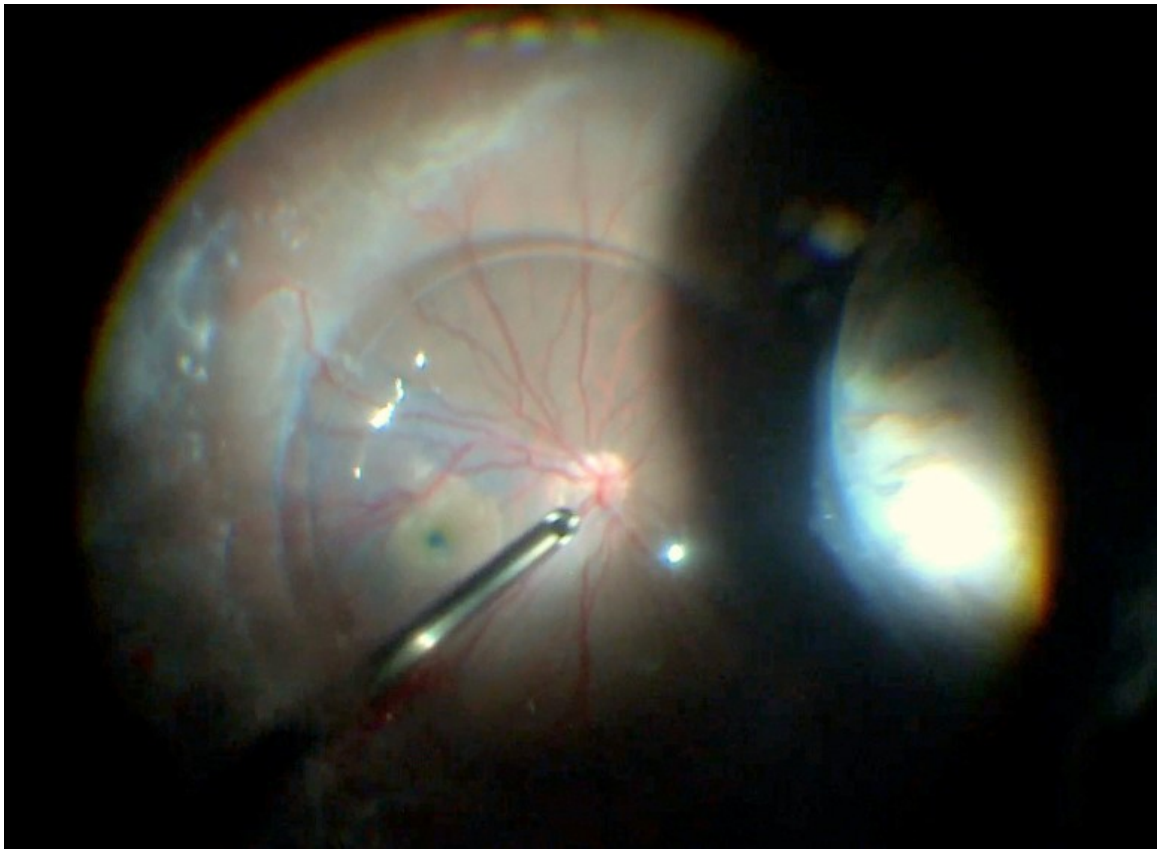
Management and Surgical Outcomes of Pediatric Retinal Detachment Associated With Familial Exudative Vitreoretinopathy

- Vishal Agrawal, MD, FRCS,FACS,FASRS
- Sonal Kalia, MS

Objective: What is the management protocol for pediatric retinal detachement secondary to FEVR and what is the long term prognosis after surgery.
Purpose: To report the clinical profile, management, and long-term anatomical and visual acuity (VA) outcomes of pediatric macula-off rhegmatogenous retinal detachment (RRD) secondary to familial exudative vitreoretinopathy (FEVR).
Methods: This was a prospective, interventional study of consecutive pediatric patients with FEVR having macula-off RRD presenting to a tertiary eye care center in India from December 2014 to July 2019.The diagnostic criteria utilized to confirm FEVR were: 1) lack of peripheral retinal vascular development in ≥1 eye, 2) birth at full term or preterm with a disease course incompatible with retinopathy of prematurity (ROP), and 3) variable degrees of nonperfusion, vitreoretinal traction, subretinal exudation, or retinal neovascularization occurring at any age. The inclusion criteria for the study were: 1) a diagnosis of FEVR as described above, 2) presence of an RRD with macula off, for which the patient underwent surgical intervention, and 3) age ≤18 years. Patients were excluded if they had a prior history of any intraocular surgery or if the diagnosis of FEVR was uncertain. 14 eyes of 13 patients were included in this study. Of these, 10 (76.92%) were males and 3 (23.08%) were females. The mean (±SD) age of the children at the time of diagnosis was 12.14 (±3.23) years (range 6–18 years). Bilateral surgery was performed in one patient (7.69%). Scleral buckling was done for patients having peripheral retinal proliferation involving less than two quadrants. For patients with ≥2 quadrant involvement of fibrovascular proliferation or with its presence at the posterior pole, a primary PPV was undertaken. Silicone oil removal was done 6–9 months following the PPV.Demographic & clinical data including age, referral diagnosis, BCVA, FEVR staging, surgical details, complications, & postoperative data were collected and analyzed.

Results: Out of the 14 eyes with RRD secondary to FEVR, Four eyes underwent SB.10 eyes (71.43%) underwent primary vitrectomy with silicone oil injection . All 10 eyes underwent silicone oil removal after 6–9 months.The patients were followed up for a mean (+SD) duration of 3.32 (±1.34) years, ranging from 1.5 to 5 years. At the final follow-up visit, the mean (±SD) postoperative LogMAR visual acuity improved significantly to 0.6 (±0.31) (Snellen equivalent 6/24; ranging from 6/9 to 6/36) ($P < 0.00001$). Successful anatomical reattachment of the retina was achieved in all the 13/14 eyes (92.85%) at the final visit. One patient developed sub-silicone oil proliferation leading to retinal re-detachment.
Conclusion: FEVR can give rise to RRD at an early age with male gender predisposition. A strong suspicion of FEVR in pediatric eyes with a meticulous clinical and angiographic evaluation of both eyes can bring us to the correct diagnosis and appropriate treatment. Our study shows that timely surgical intervention, either by SB procedure or vitrectomy, is highly effective in achieving anatomical and functional success over the long term.

IRB APPROVAL No - no IRB



Intra operative pic of PPV for pediatric RD secondary to FEVR .

7/31/2023 12:00 am

Pediatric Retina, ROP Symposium

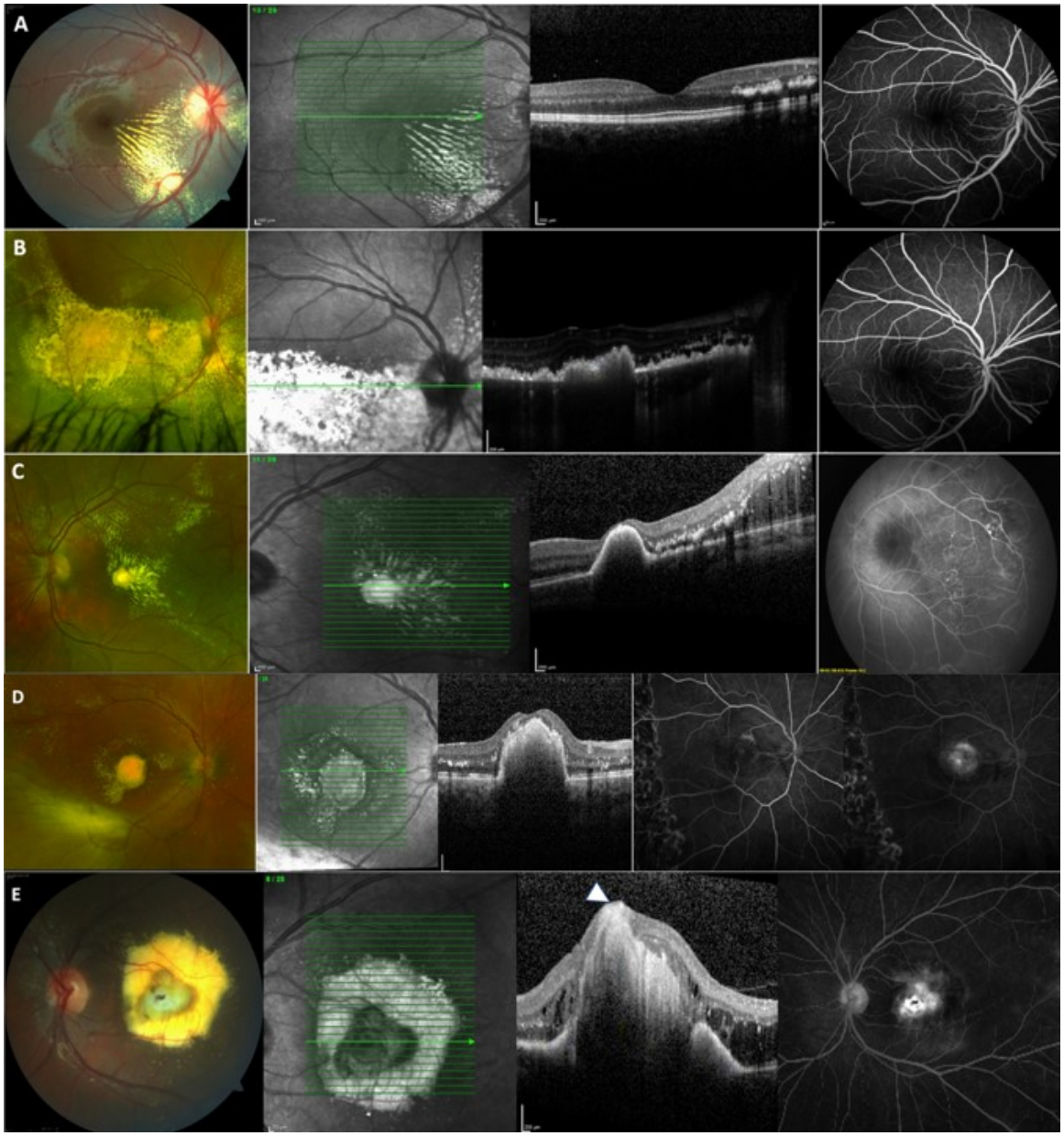
The Mystery of Subfoveal Nodule in Coats Disease

- Sengul Ozdek, MD, FEBO, FASRS
- Ece Özdemir Zeydanlı, MD, FEBO, FICO
- Baran Ozdemir
- Murat Yuksel
- Tuba Atalay
- Murat Hasanreisoglu, MD
- Gokhan Gurelik

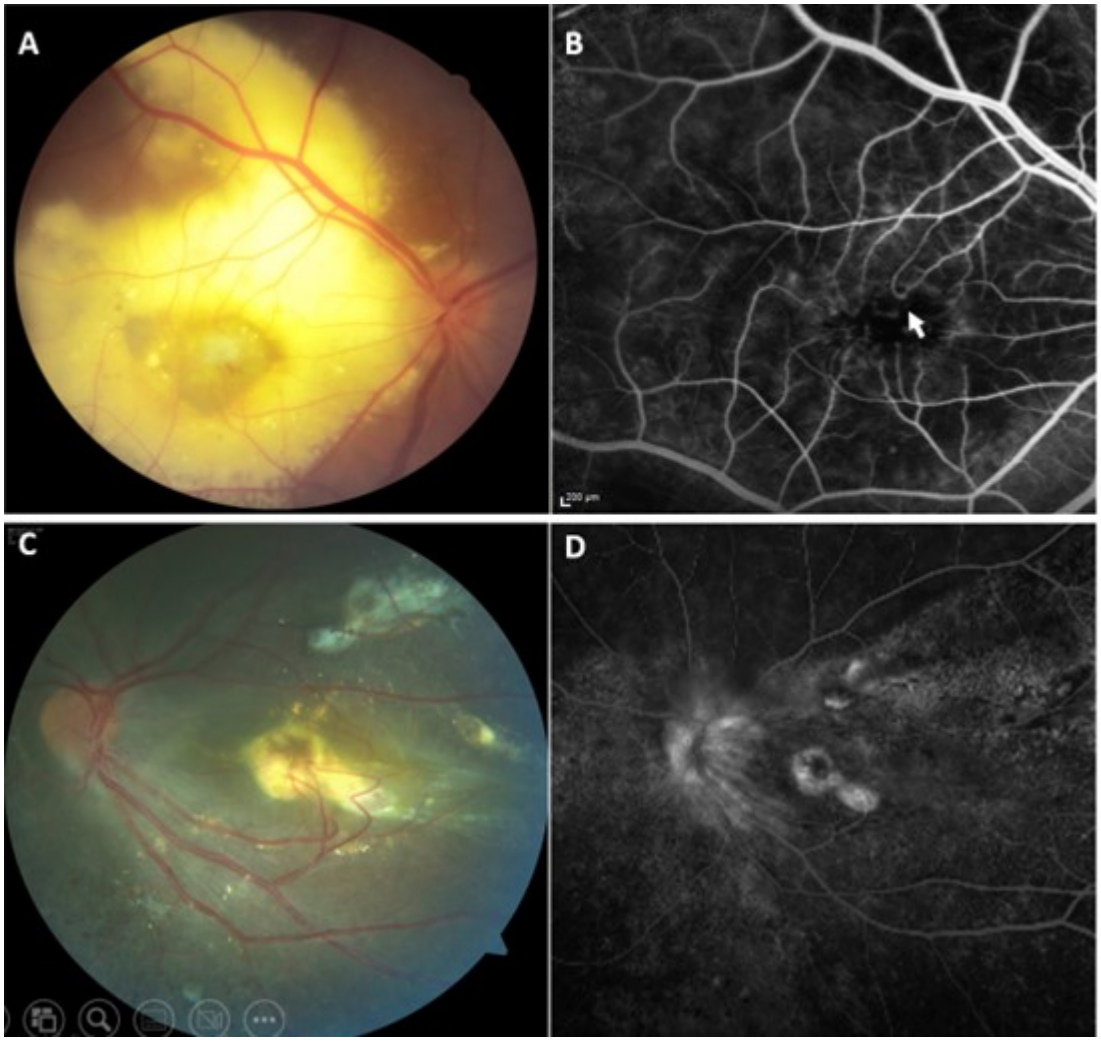
Objective: What is the prevalence of subfoveal nodule (SFN) in patients with Coats' disease and what are the causative factors associated with SFN development?
Purpose: To investigate the prevalence, developmental stages, clinical and demographic factors affecting the development of subfoveal nodule (SFN) in patients with Coats' disease.
Methods: The medical records and multimodal images of patients with Coats' disease were reviewed retrospectively in a tertiary university setting. Patients with Coats' disease at stages from 2A to 3A were included. SFN development was divided into five stages according to clinical features as follows: Stage 0, macular exudation without subfoveal hard exudate; stage 1, subfoveal exudation; stage 2, packaging of exudates; stage 3, vascularization of SFN; stage 4, subfoveal fibrotic scar. The factors which may have role in the formation and the tempo of SFN development were analyzed.
Results: Study included 43 eyes of 42 patients with Coats' disease which met the inclusion criteria with a mean age of 6.9±3.9 years and a mean of follow-up of 31.1±29.5 months. The prevalence of SFN was 48% at the beginning which ended up with 95% at the final follow-up. There was no difference in baseline demographic and clinical characteristics among patients with different SFN stages. Patients developing SFN earlier than 9 months were significantly younger than those in longer period (>9 months) (5.6±3.2 vs 8.9±4.5, p=0.010), and the mean number of intravitreal (IV) anti-vascular endothelial growth factor (anti-VEGF) injection per year was lower in the latter group (3.6±1.2 vs 1.4±1.2, p=0.001). The risk of early SFN development was found to be increased 2.4 times in patients younger than 7 years of age and 4 times in patients who received 3 or less IV anti-VEGF injections per year. Patients with considerably good final best-corrected visual acuity (BCVA) (<1.3 logMAR) had a higher mean number of IV anti-VEGF injections per year than those with poor final BCVA (≥1.3 LogMAR) (p=0.025).

Conclusion: SFN is commonly seen in Coats' disease and its prevalence was found 95% in our study. Anti-VEGF injection seems to decelerate SFN development and improve the functional result.

IRB APPROVAL Yes



Classification of subfoveal nodule: Stages 0(a), 1(b), 2(c), 3(d), 4(e)



Vascular features of subfoveal nodules