SESSION: Updates on Imaging
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Moderators: Mehmet Numan Alp, Ali Erginay

Evaluation of retinal microvascular structures changes by optical coherence tomography angiography in rheumatoid arthritis using hydroxychloroquine

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Purpose: To evaluate retinal microvascular structure changes in patients with rheumatoid arthritis (RA) using hydroxychloroquine (HCQ) by optical coherent tomography angiography (OCTA).
Methods: In this cross-sectional study 67 eyes of RA patients and 36 eyes of healthy controls were evaluated. The vascular structures of RA patients using short (<5 years) (n=34), and long-term (>5 years) (n=33) HCQ without retinopathy were evaluated with OCTA. Vessel density (VD) (%) in superficial (SCP) and deep capillary plexus (DCP), flow area of outer retina (mm²), flow area of choriocapillaris (mm²) and foveal avascular zone (FAZ) were compared with healthy controls.
Results: The mean VD in SCPlayer parafovea-temporal region was significantly lower than healthy controls (p=0.042) and patients using HCQ >5 years (p=0.041). There was found a significantly reduced VD in DCP layer whole retina, superior-hemi, fovea, parafovea-superior-hemi, parafovea-inferior-hemi, parafovea-temporal, parafovea-nazal, parafovea-inferior regions in the using HQ <5 years compared with healthy controls and using HQ>5 years. There was a significantly decreased FAZ in the using HQ <5years group (control and HCQ<5years p=0.004; HCQ<5years and HCQ>5years p=0.045). FAZ values of the control group and using HCQ >5 years group were similar (p=0.598). It was found positive correlation between VD in DCP layer whole (%) region and daily dose (mg/day) (r=0.297, p=0.043). There was positive correlation between VD in DCP layer whole (%) region and cumulative dose (g) (r=0.406, p=0.009).
Conclusion: While VD in SCP layer parafovea-temporal region and VD in DCP layers reduced in patients using HCQ < 5 years, it was found similar in control group and patients using HCQ >5 years. Long-term use of HCQ may have a protective effect on

retinal vascular structures in RA. OCTA may be a useful imaging modality to evaluate the ocular vascular structure of patients with RA using HCQ.

Keywords: Optical coherence tomography angiography, rheumatoid arthritis, hydroxychloroquine

Oral Fluorescein Angiography using Broadline Imaging Technology for retinal disease

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Purpose: To evaluate use of oral fluorescein angiography using broadline imaging widefield fundus camera in various retinal diseases. Methods: 445 eyes in 236 patients underwent Oral Fluorescein Angiography. 25 mg/kg body weight (1 ampule for every 25 Kg) Dye dissolved in 30 ml sugar free juice was given to patient followed by another 30 ml juice without the dye. Angiograms were taken at regular intervals (Every minute for first 5 minutes followed by every two minutes for 5 10 minutes followed by every 5 minutes upto 30 minutes). Observations: Good to average quality images were obtained in 99.1% images. Earliest images were obtained as soon as 1 min 35 seconds (Mean 8'45"). Incidence of nausea/vomiting was significantly less with oral angiography as compared to IV FFA(0.84% vs 5.79%). Discussion: Oral FA is safer with less side effects. It is less invasive with no risks of venipuncture. It is specially preferable in children and in patients with previous problems with IV use. Oral FA is dynamic, reproducible & multiple procedures can be done simultaneously. Conclusions: OFA is safe, less invasive, well tolerated procedure with high sensitivity. Quality images can be obtained in >99% eyes. It can be performed in most indications. To obtain a comprehensive evaluation in common retinal diseases and to reduce risks and discomfort of the IVFA, oral FA may be considered for clinical purposes.

Keywords: Fluorescein, Angiography, Optical Coherence Tomography

Comparing the Effects of Silicone-Oil and Perfluoropropane Gas Tamponade on Macular Microcirculation in Rhegmatogenous Retinal Detachment Treated with Vitrectomy: An Optical Coherence Tomography Angiography Study

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Purpose: This study aimed to compare changes in optical coherence tomography angiography (OCTA) among patients with rhegmatogenous retinal detachments (RRD) who underwent pars plana vitrectomy (PPV) with either silicone-oil or perfluoropropane (C3F8) gas tamponade.
Materials-Method: A retrospective study was conducted to evaluate the outcomes of patients with macula-off retinal detachment (RRD) who underwent a single pars plana vitrectomy (PPV) surgery. The study population consisted of patients who received either silicone oil or 14% C3F8 gas as the endotamponade during surgery. Detailed ophthalmological examinations and OCTA measurements were performed using the DRI-OCT Triton device (Topcon, Inc, Tokyo, Japan), a swept-source OCT device, after the removal of silicone-oil in eyes with silicone-oil and three months post-operatively in eyes with gas. The measurements assessed various parameters, including vessel density (VD) and foveal avascular zone (FAZ) area, were compared between the two groups.
Results: The study enrolled 39 patients, with 16 (41%) females and 23 (59%) males, who had a mean age of 56.61±9.00, ranging from 28-74. Of the total eyes treated, 21 (53.8%) received silicone-oil tamponade, and 18 (46.2%) received C3F8 tamponade. The silicone-oil tamponade group had significantly lower VD in the superficial capillary plexus (SCP), outer retina, and choriocapillaris than the gas tamponade group (p=0.02, p=0.001, p=0.000 respectively).
However, no significant differences were observed between the two groups regarding FAZ area and deep capillary plexus (DCP) VD.
Conclusion: These findings suggest that the choice of endotamponade agents in patients with macula-off retinal detachment may have an impact on retinal vascular changes. Further studies are needed to confirm these results and determine the long-term effects of different endotamponade agents.

Keywords: OCTA, silicone-oil, retinal vascular density

Correlation of the clinical findings with the extend of deep vascular plexus changes in patients with macular telangiectasia type 2: An OCTA study

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Purpose: To evaluate optical coherence tomography angiography (OCTA) characteristics of macular telangiectasia (MacTel) type 2 patients at different stages according to the latest MacTel classification.
Methods: This study included 55 eyes of 31 MacTel type 2 cases. Two masked readers graded patients' eyes according to recent multimodal classification of MacTel Research Group. The extend of the deep vascular plexus (DVP) changes on OCTA was classified based on the location. The vessel densities of the retinal capillary plexi were measured.
Results: The mean age was 65.8±9.5 years.According to the recent MacTel classification, there were seven eyes(12.7%) with grade 1 (noncentral ellipsoid-zone break), 24 eyes(43.6%) with grade 2 (central ellipsoid-zone break), two eyes(3.6%) with grade 3 (noncentral pigment), two eyes(3.6%) with grade 4 (OCT hyper-reflectivity), ten eyes(18.2%) with grade 5 (central pigment), and ten eyes(18.2%) with grade 6 (macular neovascularization). On OCTA, DVP alteration was limited to temporal to fovea in 18 eyes (32.7%), spread nasally in 9 eyes (16.4%), spread circumferentially in 18 eyes (32.7%). In the remaining 10 eyes (18.2%), outer retinal neovascularization was observed. There was a statistically significant strong correlation between the severity of the MacTel type 2 and the extend of the DVP changes (rho=0.644, $p<0.001$). The severity grade was also correlated with the superficial and deep parafoveal temporal vessel densities (rho= -0.570, $p<0.001$, rho= -0.363, $p=0.006$, respectively). As the severity of involvement increased, significant rarefactions were observed in both superficial and deep mean parafoveal temporal vessel densities ($p<0.001$, $p=0.019$, respectively).
Conclusion: Vascular and neurodegenerative mechanisms play a role in the pathogenesis of MacTel type 2. According to the results of this study, the structural severity of the disease substantially linked with the extend of the DVP changes. These findings imply that these changes exhibit a parallel course in the natural history of MacTel Type 2.

Keywords: deep vascular plexus, macular telangiectasia type 2, optical coherence tomography angiography

The place of a new Wide-Field Swept Source Optical Coherence Tomography Angiography Canon Xephilio in retinal diseases

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Purpose:
To invistigate the ability and the benefit of a recently developed, Canon Xephilio WF-SSOCT-S1 for detecting peripheral lesions in retinal diseases.
Methods:
A total of 120 patients (215 eyes) with different pathologies (diabetic retinopathy, branch vein occlusion, Coat's disease, occlusive vasculitis, high myopia, retinal detachment, tumors ...) were included in the study. All patients were examined by Canon Xephilio with 23mm radial or cross line B-scans and mosaic of five 23x20mm OCTA scans. Patients were also imaged at the same visit using UWF Optos California or Zeiss PlexElite 2.0 (mosaic of five 12x12mm OCTA scans and 16mm B-scan cross-line). We compared two imaging systems with Xephilio.
Results:
With Xephilio 23x20 mm image corresponds to 80° viewing angle. And the mosaic of 5 images which is approximately up to 31x27mm is larger than the mosaic obteined with five 12x12mm PlexElite and covers a large part of 200° California. So Xephilo allows us to explore more peripheral retina..
Conclusions:
WF Xephilio OCTA is clinically useful in detecting peripheral retinal pathologies. With futur improvments and upgrades in both hardware and software, it will be a mainstream device in our daily practice.

Keywords: Imaging, Ultra wide-field OCTA, retina

Prominent Henle fiber layer in optical coherence tomography

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Aim: To evaluate the presence of prominent Henle fiber layer (HFL) using optical coherence tomography (OCT).
Methods: This study included 45 patients who were randomly selected among patients presenting for routine eye control. The inclusion criteria for the participants were a best corrected visual acuity of 1.0 or better refractive error of +4 to -4 diopters (D), <3 D of a cylinder, and normal clinical ocular findings. All patients underwent Spectral-domain OCT imaging after dilation, and only the right eye of each patient was used for evaluation.
Results: Of the patients included in the study, 29 were female (64.4%), and 16 were male (35.6%). The mean age was 22.0 ± 7.15 (12-44) years. We detected the prominent HFL layer in 17 eyes (18.9%)
Conclusion: Correct detection of the Henle fiber layer is essential in the differential diagnosis of various retinal pathologies. The pupil should be correctly centralized during the OCT imaging so that HFL can be measured accurately.

Keywords: henle fiber layer, optical coherence tomography

Long Term OCT Changes After Treatment in Chronic CSCR

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Purpose: To analyse long-term OCT changes in patients with chronic central serous chorioretinopathy (CSCR).
Setting/Venue: Hacettepe University School of Medicine
Methods: Twenty-nine eyes of 20 patients with chronic CSCR were included in the study. All subjects underwent ophthalmological examination including enhanced-depth imaging optical coherence tomography (EDI-OCT) (Heidelberg engineering Inc. USA). Central macular thickness (CMT) and sub-foveal choroidal thickness (SCT) recorded at the time of initial diagnosis and at the last visit were evaluated. Presence of pigment epithelial detachment (PED) accompanying serous elevation, neovascularization and choroidal rift at the initial visit were noted. The treatment modalities employed were also recorded.
Results: The study included 9 females and 11 males with a mean age of 55.5± 8.8 years. The mean follow-up time was 4.1± 2.3 years. For treatment six eyes received topical nepafenac drops, 9 eyes anti-VEGF injections only (8.0± 2.3), 7 eyes only photodynamic therapy (PDT) (1.4± 0.5), and 7 eyes received PDT and injection. At the initial diagnosis PED, neovascularization, and choroidal rift were detected in 11, 5, 3 eyes respectively. There was a significant reduction in CMT at the last follow-up ($p < 0.001$), but not in SCT. No correlation was found between change in OCT parameters and the treatment modalities.
Conclusion: Though CMT decreased with treatment in chronic CSCR in this study, there was no significant change in SCT.

Keywords: chronic central serous chorioretinopathy, central macular thickness, sub-foveal choroidal thickness

The role of Peripheral retinal OCT in vitreoretinal disorders

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Studying the peripheral retina with new widefield and ultra-widefield imaging modalities, including OCT is a research field of growing interest, as it allows for a more in-depth analysis of the anatomy and ultrastructure of the peripheral retina.
The aim of this study is to evaluate the use of peripheral ultra-widefield OCT in the characterization of peripheral retinal degenerations, by means of a multimodal platform imaging (Optos Silverstone).
We performed a retrospective cross-sectional observational study of 55 patients (48 eyes) with
peripheral retinal degenerations, evaluated at the Careggi University Hospital (Florence) between March 2021 and August 2023. Each patient underwent fundus examination and multimodal imaging, including peripheral scans using Swept Source OCT.
We evaluated different types of peripheral retinal degeneration: lattice degeneration, microcystic degeneration, snail track degeneration, retinal tufts, retinal tears, peripheral retinal holes, peripheral retinoschisis. We evaluated these principle OCT Findings: presence of vitreous traction, detached edges, subretinal and intraretinal fluid, adjacent mycrocystic changes, and artifacts such as inverted image.
In conclusion, we hypothesize that the characterization of peripheral retinal degenerations using
ultra-widefield imaging SS-OCT provides information that can directly influence the clinical management, such as evaluation of prophylactic laser therapy.

Keywords: peripheral OCT, SS-OCT, peripheral retinal degeneration

Peripheral and central retinal vascular changes in asymptomatic family members of patients with familial exudative vitreoretinopathy

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Purpose: To evaluate the peripheral vascular changes and effects of these on macular microvasculature in asymptomatic family members of familial exudative vitreoretinopathy (FEVR) patients.
Methods: A retrospective study including 61 eyes of asymptomatic family members of FEVR patients. Retinal abnormalities were assessed via ultra-widefield fluorescein angiography (UWF-FA) and optical coherence tomography angiography (OCTA). Eyes were grouped into 3: The first group comprised of eyes with normal findings on UWF-FA; the second group comprised of eyes with abnormal findings on UWF-FA but without any retinal ischemia and the third group involved eyes with retinal ischemia or neovascularization.
Results: Best corrected visual acuity (BCVA) was 20/20 in all eyes. 40 eyes (65.6%) had abnormalities on UWF-FA. The most common feature was peripheral vascular looping, increased tortuosity, and anastomosis (63.9%). ODM/ODD ratio was higher in group 3 compared to group1 and 2. Deep foveal VD was lower in group1 compared to group 2 and 3. The mean FAZ area and perimeter were smaller in group 2 and 3 compared to group1.
Conclusion: Even asymptomatic family members of FEVR patients may have significant peripheral retinal vascular abnormalities which may be associated with smaller optic disc, macular ectopia and macular microvascular changes.

Keywords: familial exudative vitreoretinopathy, optical coherence tomography angiography, ultra-wide field fluorescein angiography