

Natural course and multimodal imaging in a male patient with Acute Macular Neuroretinopathy associated with the consumption of anabolic steroids

Smoustopoulos G, Bontzos G ,Nikiforou K, Garnavou-Xirou C, Xirou T

Department of Ophthalmology, Korgialenio Benakio Hospital, Athens, Greece

Financial Disclosures: None

Conflicts of Interest: None

Natural course and multimodal imaging in a male patient with Acute Macular Neuroretinopathy associated with the consumption of anabolic steroids

PURPOSE: Acute Macular Neuroretinopathy (AMN) is an infrequent condition characterized by acute onset of paracentral scotomas and metamorphopsia that correlate with the clinically evident retinal alterations. Intraretinal, wedge shaped lesions occur with the apex directed towards the fovea. Although the pathogenesis of AMN is ambiguous, recent studies suggest a microvascular occlusive component of the lesions.

CASE PRESENTATION A 42-year-old, male presented to the emergency department complaining of sudden, painless, monocular paracentral scotoma and symptoms of metamorphopsia in the right eye. His medical and ophthalmic history was unremarkable, with the exception of heavy use of anabolic steroid supplements, due to his intense involvement with bodybuilding. During ophthalmic examination bilateral visual acuity was 20/20. Dilated fundus examination of the affected eye, revealed a hypopigmented wedge shaped lesion in the nasal macula pointing to the fovea. The lesion was well demarcated in near infrared reflectance (NIR) imaging, appearing dark with discrete margins. SD-OCT revealed hyper-reflectivity of the outer plexiform layer and adjacent outer nuclear layer with associated disruption of the ellipsoidal zone. OCT angiography revealed no significant vascular changes in superficial and deep plexus or choriocapillaris. The documented lesion, was corresponding well to the alterations in the Amsler grid.

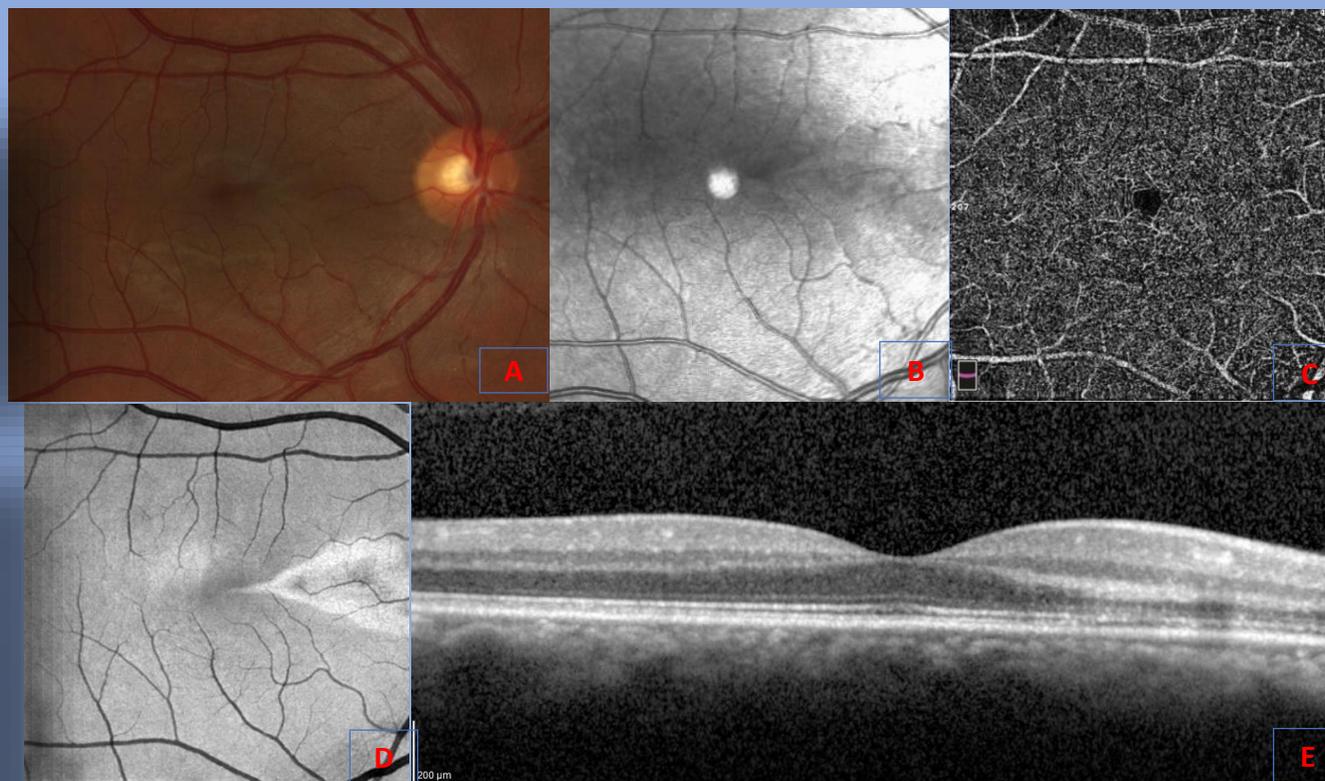


Figure 1. Multimodal imaging of the patient's right eye, during initial presentation. **(A)**. Color fundus photo, shows the hypopigmented wedge shaped lesion in the nasal macula pointing to the fovea. **(B)** Near infrared fundus imaging shows the wedge shaped lesion **(C)** OCT-A, revealed no significant vascular changes in deep retinal plexus **(D)** Characteristic en face OCT of outer retina segmentation shows a hyperreflective patch **(E)**. SD-OCT of the patient's right eye upon presentation, hyper-reflectivity of outer plexiform layer and adjacent outer nuclear layer and associated disruption of the ellipsoidal zone.



Natural course and multimodal imaging in a male patient with Acute Macular Neuroretinopathy associated with the consumption of anabolic steroids

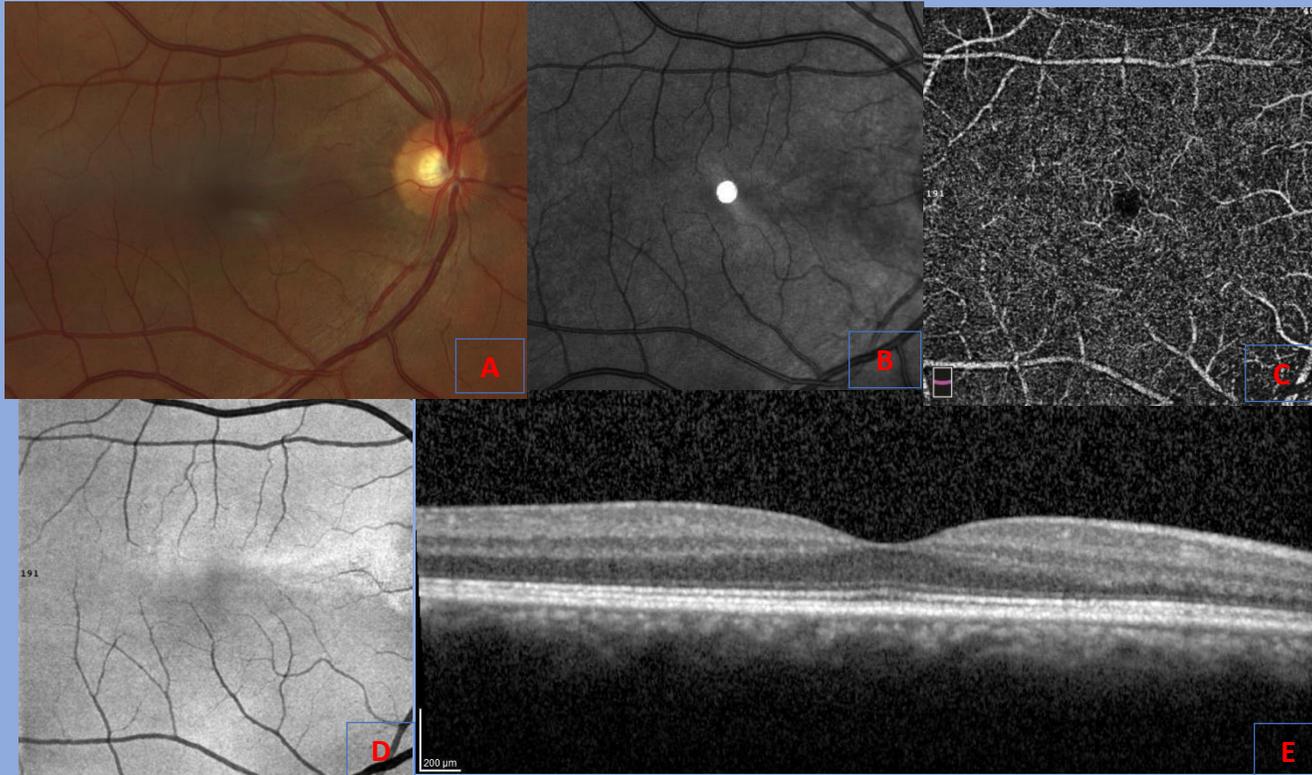


Figure 3. Multimodal imaging of the right eye, one year later. **(A,B)** Fundus photo and NIR fundus reflectance, shows semi-complete regression and fading of the parafoveal lesion. **(C)** OCT-A imaging, deep vascular plexus reveals no significant alterations. **(D)** En face OCT showed amelioration of the hyperreflective band **(E)** In SD-OCT mild thinning of the outer retinal layers becomes apparent, with a slight decrease of the CMT.

CASE PRESENTATION: One year later the patient attended for follow up examination. The patient reported amelioration of the symptoms, but not complete resolution of metamorphopsia. Fundus examination and NIR revealed partial regression and fading of the parafoveal lesion. Persistent changes identified in SD-OCT with fragmentary hyper-reflectivity and mild atrophy of the outer nuclear and plexiform layers. The ellipsoid zone defects were almost fully reversed.

CONCLUSION: Anabolic-androgenic steroid abuse has been associated, in literature, with an increased risk of thrombotic events. Vascular compromise of the deep retinal plexus has been suggested as a possible pathophysiological mechanism of AMN. Multimodal imaging highlights clinical findings, facilitates initial diagnosis and follow up, thus providing a better insight into the underlying pathophysiology. Taking into consideration the vascular component of this clinical entity, we could possibly assume a potential relation between anabolic supplements and the emergence of AMN.

1. Bhavsar KV, Lin S, Rahimy E, Joseph A, Freund KB, Sarraf D, Cunningham ET Jr., Acute Macular Neuroretinopathy: A Comprehensive Review of the Literature, *Survey of Ophthalmology* (2016), doi: 10.1016/j.survophthal.2016.03.003
2. Casalino G, Arrigo A, Romano F, Munk MR, Bandello F, Parodi MB. Acute macular neuroretinopathy: pathogenetic insights from optical coherence tomography angiography. *Br J Ophthalmol.* 2019 Mar;103(3):410-414. doi: 10.1136/bjophthalmol-2018-312197. Epub 2018 May 29. PMID: 29844084
3. Chang S, Münster AB, Gram J, Sidelmann JJ. Anabolic Androgenic Steroid Abuse: The Effects on Thrombosis Risk, Coagulation, and Fibrinolysis. *Semin Thromb Hemost.* 2018 Nov;44(8):734-746. doi: 10.1055/s-0038-1670639. Epub 2018 Sep 28. PMID: 30267392.