IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 18, Issue 8 Ser. 14 (August. 2019), PP 15-19
www.iosrjournals.org

Oct Findings in High Myopic Patients

Dr. Jitendra Kumar[1], Dr. Samya Singh[2], Dr. Amisha Garg[3]
[1.] *Associate Professor & Head, Dept. of ophthalmology, MLB Medical College Jhansi, India.*
[2, 3] *Junior Resident, Dept. of ophthalmology, MLB Medical College Jhansi, India.*
Corresponding author: Dr. Jitendra Kumar

Abstract-
Purpose - *to study the Oct findings in high myopic patients*
Methods- *This was a prospective observational study that involved 100 eyes of 50 patients with high myopia complaining of recent diminution of vision. OCT examination was done through dilated pupils,OCT examination was done through a dilated pupil using commercially available*
Results-*There were 30 females and 20 males and was done in the age group 15-30 years*
Epiretinal membrane was present in 32 eyes. Vitreomacular traction (anteroposterior traction) was detected in 5 eyes. . Macular retinoschisiswas present in 20eyes
Conclusion-*Optical coherence tomography (OCT) has enhanced our understanding of changes in different ocular layers when axial myopia progresses and the globe is stretched. These findings consist of dehiscence of retinal layers known as retinoschisis, paravascular inner retinal cleavage, cysts and lamellar holes, peripapillaryintrachoroidal cavitation, tractional internal limiting membrane detachment, macular holes (lamellar and full thickness), posterior retinal detachment, and choroidal neovascular membranes. In this review, recent observations regarding retinal changes in highly myopic eyes explored by OCT are described to highlight structural findings that cannot be diagnosed by simple ophthalmoscopy*
Keywords: *High myopia, optical coherence tomography, retinoschisis*

Date of Submission: 14-08-2019 Date of Acceptance: 30-08-2019

I. Introduction

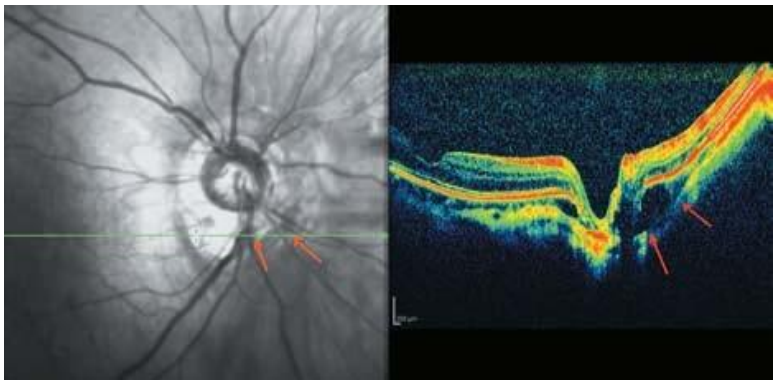
Myopia is a result of complex hereditary and environmental factors with a strong evidence for association with long term intensive near visual activity particularly reading.[1] High myopia is defined as a refractive error of more than -6 dioptres with an axial length usually greater than 26 mm. pathological or degenerative myopia is characterized by progressive anteroposterior elongation of the scleral envelope associated with a range of secondary ocular changes principally thought to relate to mechanical stretching of the involved tissues.[2] It is a significant cause of legal blindness with maculopathy the most common cause of visual loss.

Optical coherence tomography (OCT) has recently made it possible to explore changes in ocular layers as axial myopia progresses and the globe is stretched).The OCT ophthalmoscope produces longitudinal retinal B-scans and coronal C-scans.Therefore, it provides information not readily available by conventional imaging techniques or fundus examination.

Clinical Features

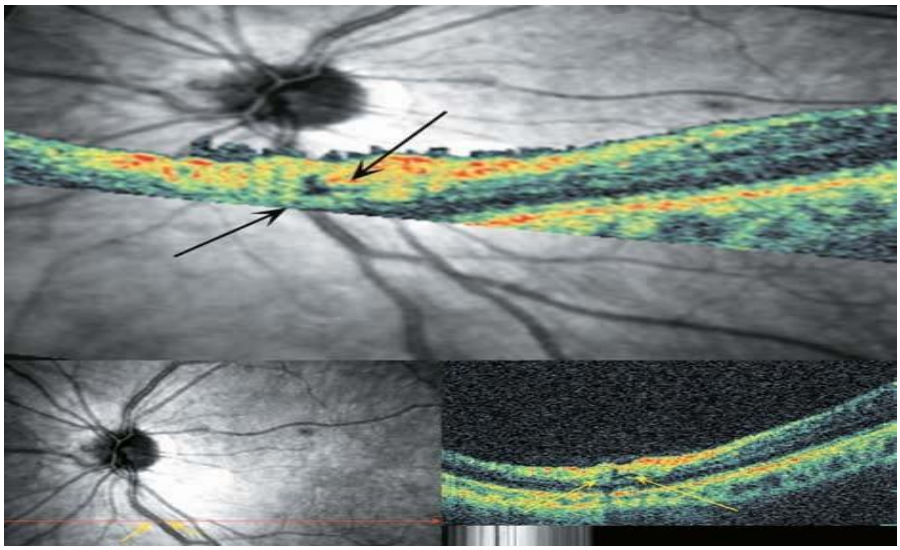
Peripapillarintrachoroidal cavitation- frequently described as peripapillary detachment of pathological myopia(PDPM), may occur adjacent to the nerve commonly inferiorly. Clinically it ,may be evident as a small yellowish-orange peripapillary area typically inferior to the disc. It can generally be identified on OCT. Visual field defects are common and frequently mimic glaucoma.

The pathogenesis of PDPM is not clear, but vitreous fluid may be the source of disruption of the choroidandfluid accumulation. Because of its predominant location inferior to the optic nerve in their study, Freund et al[3]suggested that PDPM is an incomplete form of choroidal coloboma, However, Toranzoet al[4] hypothesized that progression of peripapillarystaphyloma may result in separation of the sclera from the RPE due to cavitation within the choroidIt is possible that progression of the staphyloma separates the connection of the choroid to the optic nerve (named collagenous limiting tissue of Elschning) resulting in retraction of the choroid from the optic nerve margins



Paravascular Retinal Cysts

Paravascular retinal cysts were originally described histopathologicallyas retinal rarefaction around retinal vasculature in autopsied eyes.On OCT they appear as small hollow spaces mainly around large retinalvessels. Patients with paravascular retinal cysts were significantly older, had higher myopia, longer axial length, and a higher incidence of posteriorstaphyloma



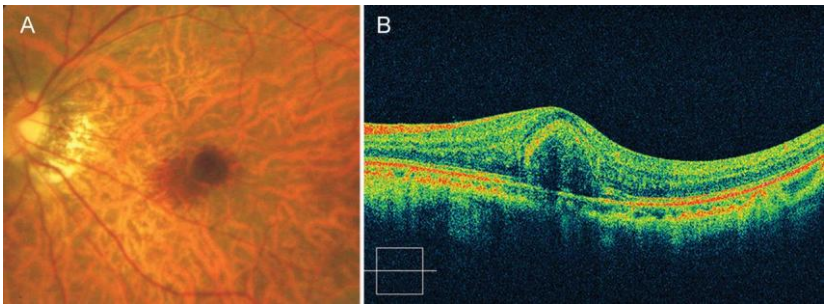
Macular retinochisis(foveochisis) macular retinal detachment without macular hole formation may occur in highly myopic eyes with posterior staphyloma probably as a result of vitreous traction. HalfofpatientswithMFShavebeenreported to develop retinal detachment or macular holes within two or more years of follow-up[5].Therefore, serial OCT examinations should be performed in these patients

Paravascular Lamellar Holes

The pathogenesis of paravascular lamellar holes has not been elucidated. OCT scans across the superior and inferior vascular arcades can detect such lesions adjacent to paravascular retinal cysts. It seems that detachment of theposterior hyaloid or rupture of the inner wallof paravascularretinal cysts are responsible for creation of paravascular lamellar holes and thatparavascular retinal cysts are the precursors oflamellar holes.The incidence of internal limiting membrane (ILM) detachment and macular retinoschisisis significantly higher in eyes with paravascular lamellar holes than those with other paravascularabnormalities

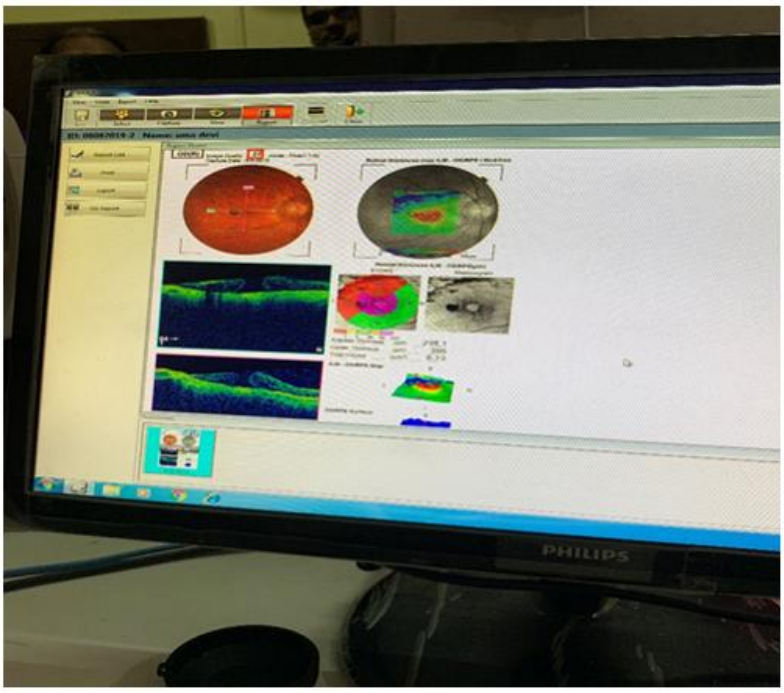
Choroidal Neovascular Membrane

Choroidal neovascular membrane (CNV) is considered to be the most important sight- threatening complication of high myopia. Myopic CNV has been classified into active, scar and atrophic stages[6].In active stage, OCT displays the neovascular tuft as a highly reflective dome-shape elevation above the RPE.In the scar stage, only the surface of the neovascular tuft shows high reflectivity and the tissue underneath is markedly attenuated.In the atrophic stage, the CNV becomes flat and chorioretinal atrophy around the regressed CNV is highly reflective



Macular Hole

Macular hole formation in myopic eyes has multiple etiologies. Expansion of the globe, tractional components and growth of neovascular membranes through clefts in the posterior pole may create partial thickness and/ orfull-thicknessmacularholes



Rhegmatogenous retinal detachment

More common in high myopia,the pathogenesis including increased frequency of PVD, lattice degeneration, asymptomatic atrophic holes, myopic macular holes and occasionally giant retinal tears**.**

Tractional Internal Limiting Membrane Detachment

Differentiation of ILM detachment from epiretinal membrane is based on the presence of columns that bridge the membrane to the retinal surface

Posterior staphyloma

Is a peripapillary or macular ectasia of posterior sclera due to focal thinning and expansion present in about a third of eyes with pathological myopia. Associations include macular hole,dome shaped macula, an overlying anterior bulge typically involving retina, RPE and inner choroid best shown on OCT.

II. Method and Material

This was a prospective observational study that involved 100 eyes of 50 patients with high my opia complaining of recent diminution of vision. Patients were recruited from the OPD of MLB MEDICAL college, Jhansi ,Uttar Pradesh and were followed from 1st January 2019- 1st August 2019. It was pedrformed under the the Helsinki Declaration of 1975, as revised in 2000. The necessary permission from the Ethical and Research Committee was obtained for the study

Inclusion criteria

1. All patients between the agegroup 15-30 years who presented to the OPD of MLB medical College Jhansi with the complaint of dimunition of vision recently and who were found to have a myopia of -6D or more on autorefractometry

Exclusion criteria

1.Patients outside the age group of 15-30 years
2.Patients with ocular systemic diseases(like diabetes) that could affect the retina
3.Patients with other retinal disorders
4.Patients with recent intraocular surgery
5.Patients with the history of trauma
6.Mentally or physically unfit patients

All patients were subjected to a detailed history taking, refraction using Topcon autorefractometer and best corrected visual acuity (VA) measurement. All patients had complete ophthalmic examination including biomicroscopic fundus examination with 90Dlens and indirect phthalmology with 20D, fundus photography, and fluoresceinangio graphy using Topcon camera.

Optical coherence tomography examination was done through dilated pupils,OCT examination was done through a dilated pupil using commercially available Cirrus HD-OCT Model 4000 - Carl Zeiss Meditec, Inc., Dublin, California, USA or Spectralis OCT Heidelberg Engineering, Heidelberg

III. Results

A total of 50 eyes of 50 patients were studied. We included only eyes with a recent complaint of diminution of vision. There were 20 males and 30 females and 60%of the studied eyes were the right eyes

All eyes had one or more chorioretinalfeaturestypicalof degenerative myopia (tigroid fundus, stretched vascular arcades, peripapillaryatrophy, chorioretinalatrophy, and lacquer cracks.

Table1: OCT finding sin relation to the degree of myopia

	Total	**Myopiafrom-8 to -15D**	**Myopia from number−16to−23D**
ERM	32	15	17
AP traction	5	0	4
Lamellar hole	5	2	3
Full thickness hole	2	0	2
Retinoschisis	4	0	4
ILM detachment	3	1	2
Dome-shaped macula	2	0	2
CNV	7	3	4
Sensory retinal detachment	0	0	0
Atrophy of retinal layers	5	2	3

IV. Discussion

Spectral domain (SD)-OCT has made it possible to discover macular changes which go unseen in conventional biomicroscopic examination and which give rise to unexplained low VA values. Optical coherence tomography has shown that myopic macular retinoschisis (also called foveoschisis) is not uncommon in highly myopic eyes.. In 2004, Panozzo and Mercanti[7] retrospectively reviewed their medical records and OCT findings for 125 eyes with high myopia. They found epiretinal traction in 58 eyes (46.4%) and retinal damage in 43 eyes (34.4%), of which 36 had epiretinal traction (83.7%). They were the first to use the term “MTM” to refer to these pathologies of the posterior pole in high myopia, such as macular retinoschisis, shallow retinal detachment without retinal holes, lamellar macular holes, and macular holes with or without retinal detachment Enhanced SD-OCT images enabled improved visualization of the fine structures associated with macular retinoschisis, such as multiple columnar structure. Shimada et al [8]suggested in a longitudinal study of five eyes with retinoschisis that progressed to a foveal retinal detachment using time-domain OCT that inward traction was transmitted to the outer retina through the foveal columnar structures in the retinoschisis layer.

Several other studies have attempted to determine the prevalence of macular changes in high myopia by OCT. Baba et al.[9] looked at 134 eyes of 78 consecutive patients with high myopia, with and without visual symptoms, attending a high myopia clinic in Tokyo. This study looked for the particular feature of foveal retinal detachment without macular hole, which is thought to be a precursor to macular hole formation. They found the prevalence for foveal retinal detachment of 9% (seven eyes). All seven eyes with foveal retinal detachment also showed severe myopic fundus changes (focal chorioretinal atrophy or bare sclera), with vision ranging from better than 20/50 to below 20/200 Based on OCT, a dome-shaped macula was first described by Gaucher[10] et al as an unexpected finding in myopic staphyloma and was characterized as an inward convexity of the macula that occurred in highly myopic eyes within the concavity of a posterior staphyloma. They suggested that the dome-shaped macula may be the result of changes in choroidal thickness or to changes in scleral shape in highly myopic eyes. Subsequently, Imamura et al.,[11] by using enhanced depth imaging OCT, reported that the dome-shaped macula is the result of a localized variation in thickness of the sclera in the macular area. In our study, we found dome shaped macula in two eyes.

V. Conclusion

Individuals with high myopia are subject to various retinal pathologies including posterior pole and peripapillary lesions. Because of extreme retinal thinning and chorioretinal changes in these persons, simple fundus examination may miss subtle retinal pathologies. OCT is an accurate tool which can localize such anatomical changes. It seems to be the paraclinical test of choice for highly myopic eyes

References

[1]. Kanski's Clinical Ophthalmology, Eighth Edition
[2]. kanski's Clinical Ophthalmology, Eighth Edition
[3]. Freund KB, Ciardella AP, Yannuzzi LA, Pece A, Goldbaum M, Kokame GT, et al. Peripapillary detachment in pathologic myopia. Arch Ophthalmol 2003;121:197-204
[4]. Toranzo J, Cohen SY, Erginay A, Gaudric A. Peripapillary intrachoroidal cavitation in myopia. Am J Ophthalmol 2005;140:731-732
[5]. Shimada N, Ohno-Matsui K, Baba T, Futagami S, Tokoro T, Mochizuki M. Natural course of macular retinoschisis in highly myopic eyes without macular hole or retinal detachment. Am J Ophthalmol 2006;142:497-500
[6]. Baba T, Ohno-Matsui K, Yoshida T, Yasuzumi K, Futagami S, Tokoro T, et al. Optical coherence tomography of choroidal neovascularization in high myopia. Acta Ophthalmol Scand 2002;80:82-87.
[7]. [7Panozzo G, Mercanti A. Vitrectomy for myopic traction maculopathy. Arch Ophthalmol 2007;125:767-72.
[8]. Shimada N, Ohno-Matsui K, Yoshida T, Futagami S, Tokoro T, Mochizuki M. Development of macular hole and macular retinoschisis in eyes with myopic choroidal neovascularization. Am J Ophthalmol 2008;145:155-61.
[9]. Baba T, Ohno-Matsui K, Futagami S, Yoshida T, Yasuzumi K, Kojima A, et al. Prevalence and characteristics of foveal retinal detachment without macular hole in high myopia. Am J Ophthalmol 2003;135:338-42.
[10]. Gaucher D, Erginay A, Lecleire-Collet A, Haouchine B, Puech M, Cohen SY, et al. Dome-shaped macula in eyes with myopic posterior staphyloma. Am J Ophthalmol 2008;145:909-14.
[11]. Imamura Y, Iida T, Maruko I, Zweifel SA, Spaide RF. Enhanced depth imaging optical coherence tomography of the sclera in dome-shaped macula. Am J Ophthalmol 2011;151:297-302