IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 13, Issue 7 Ver. II (July. 2014), PP 52-55
www.iosrjournals.org

Role of Optical Coherence Tomography as a Diagnostic Tool in Macular Diseases

Dr. NirmalaJyothi Pamu[1], Dr.Krishnaveni Avvaru[2] and Dr.V.Suryanarayana[3].
[1.] *Assistant Professor of Ophtalmology,* [2.] *Professor of Community Medicine,* [3.] *Retd Professor of Opthalmology, Andhra Medical college,Visakhapatnam.*

Abstract*: Back ground: Optimal coherence tomography (OCT) is a non contactnon invasive newer diagnostic tool that can perform tomography cross sectional imaging of biological tissues with <10 micron axial resolution using light waves near infrared beam.*
Methodology: Hospital based study conducted on 50 patients having macular diseases who attended DR RSPR Govt. regional eye hospital, Visakhapatnam. Each patient underwent a complete ophthalmic examination including best corrected visual acuity slit lamp biomicroscopy, IOP recording and fundus evaluation by indirect Opthalmoscopy with+90 D lens. In addition fundus photographs were taken. Routine blood examination and urine examination were done. Then the patients were subjected to evaluation of posterior segment by OCT.
Results: Of the 50 cases on whom the OCT was done, majority (32%) were diabetic macular Oedema, followed by central serous Retinopathy (24%) and Epiretinal membrane was seen in 10% cases. Among the study participants, 7 patients presented with macular holes. Two patients had full thickness macular holes and five patients had lamellar holes.
Conclusion: Diagnosis is confirmed by OCT gives additional information regarding pathological presentation, so help in the management.It may beneficially impact the visual disability by diagnosing a disease at an earlier stage.
Key words:*Optical coherence tomography, Macular diseases, diagnostic tool.*

I. Introduction

Optical coherence tomography (OCT) is a non contactnon invasive newer diagnostic tool that can perform tomography cross sectional imaging of biological tissues with <10 micron axial resolution using light waves near infrared beam[1]. OCT is based on principle of Michelson interferometer in which low coherence infrared beam (820 nm) is projected on to retina. Light passing though the eye is reflected by structures in different retinal layers and achieves 2 dimensional (or) 3 dimensional cross sectional imaging of Retina by measuring the echo delay and intensity of back reflected infrared light from internal tissue structures[2]. The emergence of OCT in the recent years has changed forever, the way we look at retina it represents a major advance in the diagnostics of macular diseases. Hence an attempt was made to study the role of OCT as a diagnostic tool in macular diseases and to obtain additional information regarding disease morphology for better understanding and management of diseases.

II. Materials and Methods

It was a hospital based study conducted on 50 patients who attended DR RSPR Govt. regional eye hospital Visakhapatnam. A detailed history was taken. Age, gender, systemic and ocular problems were recorded. We included in this study, only those patients who were observed clinically having lesions in macular area. Each patient underwent a complete ophthalmic examination inducing best corrected visual acuity slit lamp biomicroscopy, IOP recording and fundus evaluation by indirect Opthalmoscopy with + 90 D lens. In addition fundus photographs were taken. Routine blood examination and urine examinations were done. Then the patients were subjected to evaluation of posterior segment by OCT.Informed consent was taken and those who were willing to participate were included in the study. The data was analyzed and relevant statistical testes were applied.

III. Results

In our study 30 were males & 20 were females. Age distribution of study population ranged from 28-75 years with Mean age of 59 years. Of the 50 cases on whom the OCT was done, majority (32%) were diabetic macular Oedema, followed by central serous Retinopathy (24%) and Epiretinal membrane was seen in 10% cases.

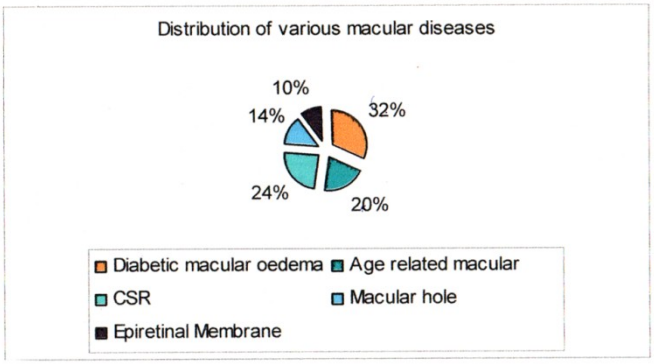


Fig No:1

Among diabetic macular oedema cases, 3 structural changes were identified i.e. spongiform macular oedema was seen in 9 cases (56%) ,cystoid macular oedema was seen in 5 cases (31%) and the rest, 2 cases had serous Retinal detachments (13%).

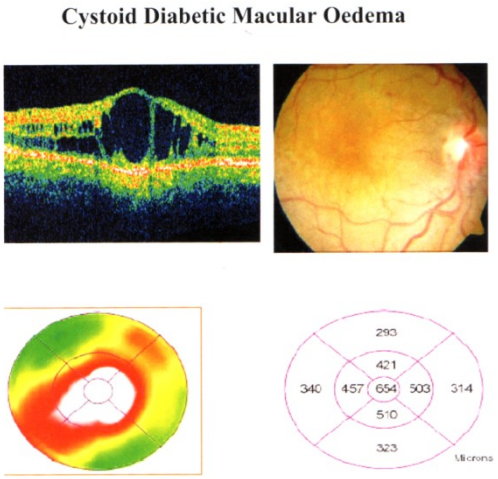


Fig No:2

In our study 10 patients had Age related Macular degeneration among whom 7 patients had non-neovascular ARMD and 3 had neovasular ARMD.

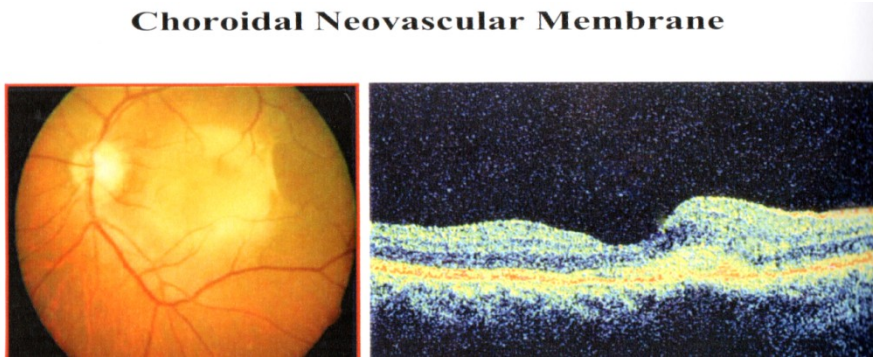


Fig No:3

Out of 50 clinically diagnosed macular disease patients, 10 patients had central serous retinopathy with male preponderance in the ratio of 9:1. OCT imaging confirmed serous retinal detachments in all cases.

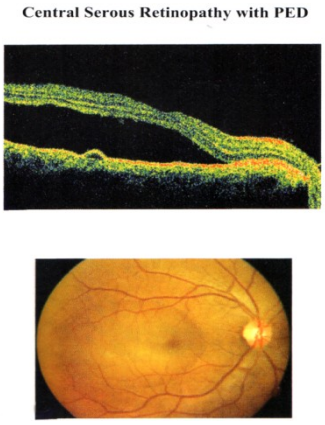
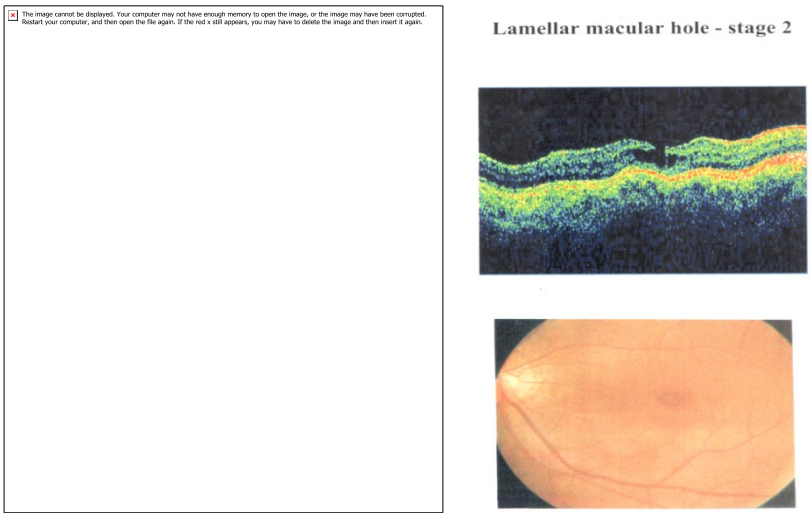


Fig No: 4

Epiretinal membrane was diagnosed clinically in 5 patients and OCT confirmed all the cases of ERM. Nerve fiber layer distortion and loss of Foveal contour was identified by OCT.

Among the study participants, 7 patients presented with macular holes. Two patients had full thickness macular holes and five patients had lamellar holes.

Lamellar macular holes were seen in inner retinal layers which were inverted mushroom in shape. Outer retinal layers were normal. Both lamellar holes were in stage 2.



IV. Discussion

OCT helps in identifying different patterns of macular oedema and decision regarding management strategy depends on OCT findings. In our study 3 patterns of macula oedema were identified, which was in concurrence with the findings of Otaniet al[3]where they also observed similar patterns i.e. Spongiform, cystoid form, and serous retinal detachment.

Where as in contrast Kim by et al detected 5 morphological patterns of diabetic macular oedema. In our study 10 patients had ARMD. OCT identified subfoveal fluid accumulation which was not detected clinically.Hee MR et al[4,5] in their study stated that OCT was useful in evaluating sub retinal and intraretinal fluid.CSR was seen in 10 patients and OCT imaging showed serous Retinal detachment in all the cases.Masahiro Miura et al[5] in their study stated that OCT assists in rapid non invasive assessment of CSR. Similarly they stated that OCT was able to differentiate occult CNVM focal leakage point from CSR. In our study OCT detected all the patients with macula holes and tomographic information provided by OCT lead to better understanding of pathogenesis of Macula hole information. Similarly,Hee MR et al stated that OCT was useful in visualizing macular holes.

In our study OCT was helpful in detecting ARMD and it also identified Sub Retinal fluid. Similar finding was reported by Hee MR et al.

V. Conclusion

OCT not only confirms the Diagnosis but also gives additional information regarding disease morphology, and pathological presentations of macular diseases for better understanding and management of diseases.

Bibliography

[1]. ATLAS-Optical coherence Tonography of macular diseases 2004 Vishaligupta, Amod Gupta &Mangat R Dogra-First Edition Jaypee Brothers and Medical Publishers (P) Ltd.
[2]. Focus on Macular Diseases 2007 first edition –SandeepSaxena and Jaypee Brothers and Medical Publishers.
[3]. Otani T, Kishi S, Maruyama Y Patterns of diabetic macular edema with optical tomography, AM J Opthalmol (1999) 127:688-93(ISSN: 0002-9394).
[4]. HeeMR,PulifitoCA,WongC,DukerJS,ReichelE,Rutledge B Quantitative assessment of macular edema with optical coherence tomography, Arch Opthalmology,1995 August 113(8),1019-29.
[5]. HeeMR,IzlattJA,SwansonEA,HuangD,SchumanJS,LinCP,PuliafitoCA,FujimotoJG.Optical coherence tomography of the human retina. Arch Opthalmol.1995 mar;113(3):325-32.
[6]. Masahiro Miura,MD,AnnE.Elsner,PhD,AnkeWeber,MD,MichaelC.Cheney,MS,MasahiroOsako,MD,MasahikoUsui,MD, imaging Polarimetry in Central Serous Choriorepathy,Am J Opthalmol, 2005 December,140(6):1014-1019.