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Evaluation of Macular Thickness in Patients Underwent Combined Cataract and Epiretinal Membrane Surgery

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Abstract

Cataract and idiopathic epiretinal membrane (ERM) are eye diseases especially seen in elderly people. We may observe them at the same time. Both surgeries may affect macular thickness and combining surgery may worsen macular edema. Total 54 cases that were operated for ERM, combined with cataract surgery or vitrectomy only, were included the study. Pre-operative, post- operative 1st week, 1st month, 3rd month and 6th month macular OCT images were taken. Macular thickness (MT) was decreased in both groups at the end of six months. When we compared the both groups measurements no difference was found. Pre-operative MT values and last visual acuity were correlated weakly. Visual acuity was also increased in both groups. But this was not significant between groups. In this study we found that combined surgery was not increasing macular thickness more than vitrectomy only in ERM surgery.

Keywords: Epiretinal membrane; Macula; Phacoemulsification; Vitrectomy

Introduction

Epiretinal membranes (ERM) are avascular fibro cellular proliferations at the vitreoretinal junctions [1]. Idiopathic epiretinal membranes are mostly seen in elderly people [2].

Cataract is pathology of crystalline lens that is also seen elderly people. Both cataract and ERM should affect the visual acuity and may be observed at the same time. Performing surgery in the same session may reduce cost and shorten the postoperative recovery [3].

Phacoemulsification surgery without any complication may affect macula. Cystoid macular edema (CME) is a cause of vision decrease after both complicated and uncomplicated cataract surgery and release of prostaglandins is the reason even after minimal traumatic surgery [4]. Degenring studied on 108 nondiabetic and 24 diabetic patients, measured their macular thicknesses (MT) by SD-OCT before surgery and performed uncomplicated phacoemulsification and intraocular lens implantation. After surgery they followed up the patients and measured MTs' in every visit up to four weeks and found that the mean of the measurements increased from 183 ± 27 to 191 ± 37 microns at the end of the study [5]. Clinically and approved by optical coherence tomography, CME after uncomplicated cataract surgery is present in around 0%, 1%-2%, 35% respectively [6-8].

ERMs' deteriorates visual acuity and also distorts images. Vitreomacular traction is present when vitreous separation is incomplete and an area of attachment of the ERM to the posterior hyaloid remains. The membrane may be associated with the presence of CME on fundus fluorescein angiography. Cataract appears in 47%-80% of cases and frequently requires surgical treatment within 2 years after the vitrectomy performed [9]. In this study our objective is to evaluate the macular thickness (MT) differences in early periods of combined cataract and vitrectomy and only vitrectomy surgery performed for patients who have epiretinal membrane.

Materials and Methods

Subjects

Between 2009-2015, selected 54 patients who were being performed pars plana vitrectomy or combined with cataract surgery for ERM are included the study. For 28 patients only vitrectomy and for 26 combined surgery was performed. Patients with ERM secondary to uveitis or trauma or associated with simultaneous retinal detachments, who have myopia more than 6D, were excluded. Patients operated for cataract after 6 months was also an exclusion criterion. Indication for ERM surgery is decreased vision below 20/80 measured by Snellen acuity test and combined cataract surgery if fundus periphery is not observed well.

Before surgery an informed consent was taken from all patients. The protocol was in accordance with the tenets of the Decleration of Helsinki. Visual acuity was measured with Snellen chart; results are converted into logMAR values. With a calibrated Goldman applanation tonometer ocular tension was measured. Anterior and posterior segment examinations were performed. Macular OCT images were taken by Cirrus HD-OCT (Zeiss Meditech AG, Jena, Germany). From The patients' preoperative charts data concerning age, sex was gathered.

Surgery

Nepafenac drop is instilled three times for all patients before surgery. All surgeries are done by the same surgeon (Kocak I). Under local anesthesia first 23G vitrectomy ports were opened. After core and peripheral vitrectomy, if not detached, by using suction mode, posterior vitreous cortex was elevated and then vitrectomised. Trypan Blue was applied with another injector on macula from one port,

irrigation was stopped, waited for a 2 minutes and then epiretinal membrane was grasped from thickest side region and peeled with membrane forceps. Afterwards brilliant blue was applied on macula and ILM pinched with forceps and peeled. Peripheral retina was checked for tears. Air fluid exchange was made and C3F8 is injected, the ports were removed. Nephafenac sodium and topical antibiotics were instilled. In combined group under local anesthesia vitrectomy ports are opened first than clear corneal and two side port incisions are made. After capsulorhexis, hydrodissection, hydrodelineation, phacoemulsification, cortical cleaning, Alcon SA 60 intraocular lens is implanted in the capsular bag. After this, ERM surgery is performed. Nephafenac drop is also applied to this group. Post operatively macular OCT images are taken first week, after one month, 3rd month and 6th month from every patient in both groups.

Statistical analysis

One way ANOVA for repeating measurements test is used for significance of macular thickness (MT) results in each group, Man-Whitney U test for to compare MT results of both groups,Wilcoxon Rank Test for to compare visual acuities in preoperatively and at the end of the study and correlation analysis for analyze any relation between pre-operative MT measurements and last visual acuity.

Results

The mean age for combined surgery group was 68.16 ± 3.37 and 66.76 ± 8.36 for other group. Female/Male ratio was 15/13 and 14/12 respectively. MT was decreased significantly after the surgery in combined group (0.043, $p<0.05$) and in vitrectomy group (0.04). But when we compare the results between two groups there was no significant difference ($p=0.59$, $p<0.001$). The Mean MT values of both groups' at the beginning and at the end of the study are shown in Table 1. The mean MT values of all measurements of both groups are shown in Figure 1.

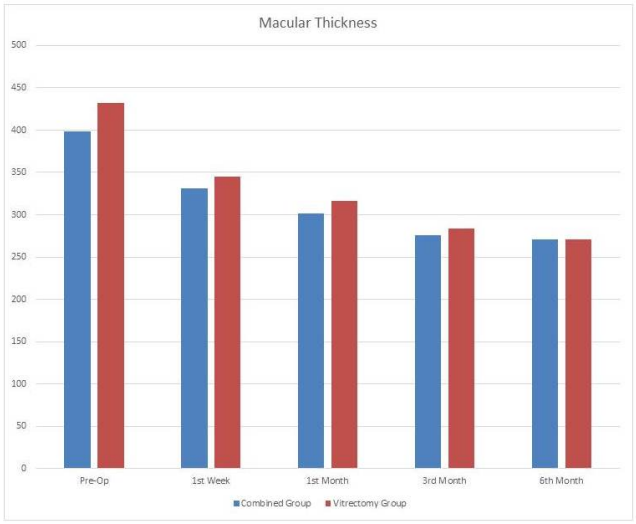

Figure 1: Macular thickness measurements of combined surgery and vitrectomy group.

There was a positive but not strong correlation between end visual acuity and pre- operative MT measurements in combined surgery group ($r=0.58$, $p<0.1$) and vitrectomy group ($r=0.41$, $p<0.1$). Visual acuity change between preoperative and at the 6th month measurements was significant (Table 2). It was increased in both groups.

	Combined Surgery Group	ERM Surgery Only Group	p- value
Mean MT before surgery	398 ± 63	432 ± 30	0.58
Mean MT latest	271 ± 34	271 ± 07	0.41

Table 1: Mean macular thickness (MT) values of combined surgery and ERM surgery only group at the beginning and at the 6th month (latest) of the study.

Corneal edema was seen in 3 patients in combined surgery group and in 1 in other group lasted more than a week. Retinal detachment was observed in one patient in vitrectomy only group and operated immediately. No intravitreal hemorrhage and no endophthalmitis was seen in both groups. No posterior capsule rupture was seen after phacoemulsification in combined group. Two case undergone cataract surgeries in vitrectomy only group at the end of six months, three cases in combined surgery group had temporary elevated intraocular pressure elevation and medicated for a short period. Recurrence of membrane is seen in one case also in this group. There was 3 pseudophakic patiens in vitrectomy group who were operated more than a year before.

Conclusion

Since vitreoretinal surgery for epiretinal membrane is described by Machemer, today it's being performed worldwide. Improvement in visual acuity is seen 75%-85% of cases [10]. Different techniques are used. In technique as described by Peyman is, after standard pars plana vitrectomy ERM is elevated by a pick and then grasped by a forceps and peeled [11]. We were not used pick, elevated and peeled membrane by forceps. Non vitrectomised techniques are also described but recurrence rate is too high and floaters are mostly seen [12]. At the beginning only ERM peeling was enough but today it's generally accepted to peel also internal limiting membrane because of reduced recurrence rate [13]. So we also preferred peeling ILM. In Perrier's study trypan blue was used for ERM peeling. And no related toxicity was found for one year follow up [14]. No side effect was seen by using trypan blue dye for ERM in our cases. We directly applied it on the macula and waited for two minutes by stopping the irrigation without air-fluid exchange. Because of its side effects on ganglion cells ICG is not used and brilliant blue is preferred for ILM peeling. There are reports about increasing complications in cataract surgery in vasectomized eye [15]. It's pointed out that if surgeons wait longer for cataract extraction, they could be faced with perioperative complications. In our study two patients were undergone surgery at the

end of six months and no complication was seen. A common complication of combined surgery is PCO but this is generally seen as a long-term complication and was not seen in our short term study [16]. In our study we found reduction in MT measurements in both groups. At the end of six months mean MT was 271 ± 71.99 and 269.07 ± 108 microns respectively and it was better than the measurements in Dugas study (406 ± 74 in combined group, 416 ± 84 in vitrectomy group) [17] . There wasn't MT difference between two groups in Yiu and co-workers [18] study that was similar with our results. Mean MT of vitrectomy only group seems a little bit higher than the other group but at the end of the study they were almost equal in our study. Visual acuity change in our study was also significant as these two authors' results and our cases mean ages were younger.

It's defined in the prospective non randomized controlled clinical study of Mylonas et al that the mean MT was greater after successful cataract surgery in cases that were operated for ERM before [19]. Various theories have been proposed for the MT increase including releasing of inflammatory mediators during the surgery [20]. Nepafenac, as a non- steroidal anti-inflammatory drug, prevents cystoid macular edema especially in diabetics after cataract surgery [21]. We instilled it before and after surgeries of both groups. This may affect MT but needs prospective randomized clinical study. In a new study, Kauffmann showed preoperative prognostic factors for combined surgery in idiopathic ERM is pointed out such as age, disease duration and photoreceptor layer impairment [22]. Also in this study Kauffmann and co-workers found that there was no correlation between initial MT and final visual acuity in their combined surgery group. We found weak but positive correlation. We didn't studied on factors predicted by Kauffmann and this may be one the weakness of our report and the others are our limited cease series and it's a retrospective study. The reason for this study limited to 6 months is we wanted to do measurements before cataract surgery of vitrectomy only group. The other authors were continued to measure MT also after phacoemulsification.

As conclusion we found that uncomplicated cataract surgery was not increased macular thickness when combined with vitrectomy in ERM surgery.

References

1. Fraser-Bell S, Guzowski M, Rochtchina E, Wang JJ, Mitchell P (2003) Five year cumulative incidence and progression of epiretinal membranes: The Blue Mountain Eye Study. Ophthalmology 110: 34-40.
2. Aung KZ, Makeyeva G, Adams MK, Chong EW, Busija L, et al. (2013) The prevalence and risk factors of epiretinal membranes: The Melbourne Collaborative Cohort Study. Retina 33: 1026-1034.
3. Alexandrakis G, Chaudry NA, Flynn HW JR, Murray TG (1999) Combined cataract surgery, intraocular lens insertion and vitrectomy in the eyes with idiopathic epiretinal membrane surgery. Ophthalmic Surgical Lasers 30: 327-328.
4. American Academy of Ophthalmology (2011) Lens and Cataract. Edited by American Academy of Ophthalmology. Singapore, LEO, pp. 193-195.
5. Degenring RF, Vey S, Kamppeter B, Budde WM, Sonas JB, Sauder G (2007) Effect of uncomplicated phacoemulsification on the central retina in diabetic and non-diabetic subjects. Graefes Arch Clin Exp Ophthalmol 245: 18-23.
6. Vukicevic M, Gin T, Al-Qureshi S (2012) Prevalence of OCT diagnosed postoperative cystoid macular edema in Patients following uncomplicated phacoemulsification cataract surgery. Clin Experiment Ophthalmol 40: 282-287.
7. Henderson BA, Kim JY, Ament CS, Ferrufino- Ponce ZK, Grabowska A, Cremers SL (2007) Clinical pseudophakic cystoid macular edema. Risk factors for development and duration after treathment. J Cataract Refract Surg 33: 1550-1558.
8. Loewenstein A, Zor D (2010) Post-surgical cystoid macular edema. Dev Ophthalmol 47: 148-159.
9. Cherfan GM, Michels RG, de Bustros S, Enger C, Glaser BM (1991) Nuclear sclerotic cataract after vitrectomy for idiopathic epiretinal membranes causing macular pucker. Am J Ophthalmol 11: 434-438.
10. McDonald HR, Verre WP, Aaberg TM (1986) Surgical management in idiopathic epiretinal membranes. Ophthalmology 93: 978-983.
11. Peyman GA, Meffert SA, Chou F, Conway MD (eds.) (2001) Vitreoretinal Surgical Techniques. Martin Dunitz Ltd., London, p. 328.
12. Sawa M, Ohji M, Kusaka S, Sagaguchi H, Gomi F, et al. (2005) Nonvitrectomising vitreous surgery for Epiretinal Membrane: Long term follow up. Ophthalmology 112: 1402-1408.
13. Charles S (2011) Vitreous Microsurgery. Lippincott Williams and Wilkins, Philadelphia, pp. 160.
14. Perrier M, Sebag M (2003) Epiretinal membrane surgery assisted by trypan blue. Am J Ophthalmol 135: 909-911.
15. Pardo- Munoz A, Muriel-Herrero A, Abraira V, Muriel A, Munoz-Negrete FJ, Murube J (2006) Phacoemulsification in previously vitrectomized patients: An analysis of the surgical results in 100 eyes as well as the factors contributing to the cataract formation. Eur J Ophthalmol 16: 52-59.
16. Scharwey K, Pavlovic S, Jacobi KW (1999) Combined clear corneal phacoemulsification, vitreoretinal surgery and intraocular lens implantation. J Cataract Refract Surg 25: 693-698.
17. Dugas B, Ouled- Moussa R, Lafontaine PO, Guillaubey A, Berrod JP, Hubert I, M.Bron A, Creuzot CP (2010) Idiopathic Epiretinal Macular Membrane and Cataract Extraction: Combined versus Consecutive Surgery. Am J Ophthalmol 149: 302-306.
18. Yiu G, Marra KV, Magley S, Krishnan S, Sandhu H, Kovacs K, Kuperwaser M, Arroyo JG (2013) Surgical outcomes after epiretinal membrane peeling combined with cataract surgery. Br J Ophthalmol 97: 1197-1201.
19. Mylonas G, Sacu S, Deák G, Dunavoelgyi R, Buehl W, et al. (2013) Macular Edema Following Cataract Surgery in Eyes With Previous 23-Gauge Vitrectomy and Peeling of the Internal Limiting Membrane. Am J Ophthalmol 155: 253-259.
20. Flach AJ (1998) The incidence, pathogenesis and treatment of cystoid macular edema following cataract Surgery. Trans Am Ophthlamol Soc 96: 557-634.
21. Ramakrishnan S, Baskaran P, Talwar P, Venkatesh R (2015) Prospective, Randomized study comparing the Effect of 0.1% Nepafenac and 0.4% Ketorolac Tromethamine on Macular Thickness in Cataract Surgery Patients With Low Risk for Cystoid Macular Edema. Asia Pac J Ophthalmol (Phila) 4: 216-220.
22. Kauffmann Y, Ramel JC, Lefebvre A, Isaico R, De Lazzer A, et al. (2015) Preoperative Prognostic Factors and Predicitive Score in Patients Operated On For Combined Cataract And Idiopathic Epiretinal Membrane. Am J Ophthalmol 160: 185-192.