American Journal of Medical Sciences and Medicine, 2015, Vol. 3, No. 5, 67-69
Available online at http://pubs.sciepub.com/ajmsm/3/5/2

DOI:10.12691/ajmsm-3-5-2

Systemic Steroid for Exudative Retinal Detachment Following Laser Photocoagulation for Retinopathy of Prematurity

Emrah Utku Kabatas MD[1,*], Pinar Altiaylik Ozer MD FEBO[1], Bengi Ece Kurtul MD[1], Naciye Kabatas MD[2], Serdar Beken MD[1], Aysegul Zenciroglu MD[1], Nurullah Okumus MD[1]

[1]Department of Ophthalmology, Dr. Sami Ulus Maternity and Children's Health and Diseases Training and Research Hospital, Ankara, Turkey
[2]Department of Ophthalmology, Diskapi Yildirim Beyazit Training and Research Hospital, Ankara, Turkey
*Corresponding author: dremrahutku@yahoo.com

Abstract Retinopathy of prematurity (ROP) is one of the causes of blindness in childhood. The treatment modalities of this disease are laser photocoagulation (LP) and/or intravitreal anti-VEGF agents. But there are many side effects of the laser treatment such as lens opacity, iris and cornea burns, retinal and choroidal hemorrhages. Exudative retinal detachment (ERD) has been reported as a rare complication of LP for the treatment of ROP. But there is no consensus about how to treat of this condition. Here we present a case of ERD after LP for ROP although appropriate laser settings and successfully treated by systemic steroid administration.

Keywords: *exudative retinal detachment, laser photocoagulation, retinopathy of prematurity, steroid*

Cite This Article: Emrah Utku Kabatas MD, Pinar Altiaylik Ozer MD FEBO, Bengi Ece Kurtul MD, Naciye Kabatas MD, Serdar Beken MD, Aysegul Zenciroglu MD, and Nurullah Okumus MD, "Systemic Steroid for Exudative Retinal Detachment Following Laser Photocoagulation for Retinopathy of Prematurity." *American Journal of Medical Sciences and Medicine*, vol. 3, no. 5 (2015): 67-69. doi: 10.12691/ajmsm-3-5-2.

1. Introduction

Retinopathy of prematurity results from important changes occurring in the posterior retinal vessels of eyes of premature infants and may lead to blindness if not treated in a timely manner [1]. Cryotherapy was the first method used in ROP treatment, but it was later abandoned due to its disadvantages [2]. Laser photocoagulation of the avascular peripheral retina has been the standard treatment of ROP [3]. The most common reported complications of LP for ROP are lens opacity, iris and cornea burns, retinal and choroidal hemorrhages [4,5]. However, there is limited data on the development of ERD following LP performed for ROP [6-11]. Exudative retinal detachment is characterized by the accumulation of subretinal fluid in the absence of retinal breaks or traction. It may occur in a variety of vascular, inflammatory and neoplastic diseases in which fluid leaks outside the vessels and accumulates under the retina [12]. Exudative retinal detachment has also been reported as the complication of both cryotherapy and LP for ROP [6-11]. But there is no consensus about how to treat of this condition. While some authors suggest to wait, the others suggest to use intravitreal anti-VEGF agents or systemic steroid use [6,8,11]. Herein, we presented a case of ERD developed after LP for ROP and successfully treated by steroid administration.

2. Case Report

A male premature baby was born via cesarean section at 26 weeks of gestation with a birth weight of 880 grams. In the delivery room, he received surfactant after intubation and was immediately transferred to neonatal intensive care unit. He needed continuous positive air pressure (CPAP) support for two weeks. Initial ROP screening examination was at 31 0/7 weeks of postmenstrual age (PMA) during which there was no evidence of ROP. The infant was screened every 1 week to 2 weeks according to the guidelines of the Early Treatment for Retinopathy of Prematurity Study [11]. At 35 weeks of PMA, he was noted to have 12 clock hours of stage 1 ROP in zone II with no evidence of plus disease. The fundoscopic examination at 38 weeks of PMA revealed 6 clock hours of stage 2 ROP and 6 clock hours of stage 3 ROP with plus disease (for 7 clock hours) in zone II.

The pupils *were* dilated with topical application of 2.5% *phenylephrine hydrochloride* (Mydfrin, Alcon, USA) and *0.5*% *tropicamide* (Tropamide, Bilim, Turkey). By using a 28-D lens and 810 nm diode laser, tiny laser shots were applied (1040 shots for the right eye and 1069 shots for the left eye) under laser power set at 200 mw, 150ms of pulse duration, and 300ms of pulse interval. Diode laser was performed without any complications.

At postoperative period, topical 0.1% dexamethasone (5x1gtt) (*Maxidex, Alcon, USA*) and 0.5% tropicamide (3x1gtt) were applied to both eyes. No perioperative complications occurred. However, ERD developed on the right eye on the 3rd postoperative day and on the left eye on the 6th postoperative day (Figure 1, Figure 2). No traction was detected. Intravenous dexamethasone (0.6 mg/kg per day) was added to the treatment after parental consent. Exudative retinal detachment was resorbed on the 20th postoperative day, and extensive subretinal exudation

was observed in the fovea at 41 weeks of PMA. The fundoscopic examination performed at 46 weeks of PMA showed a stable retinal appearance, foveal pigmentation, and minimal retinal exudation.

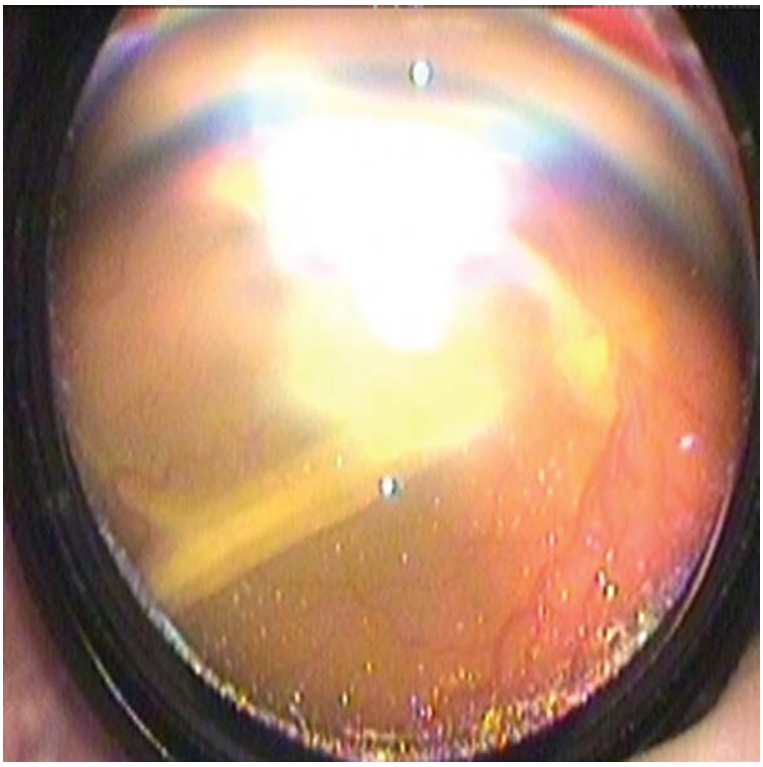

Figure 1. Exudative retinal detachment in right eye

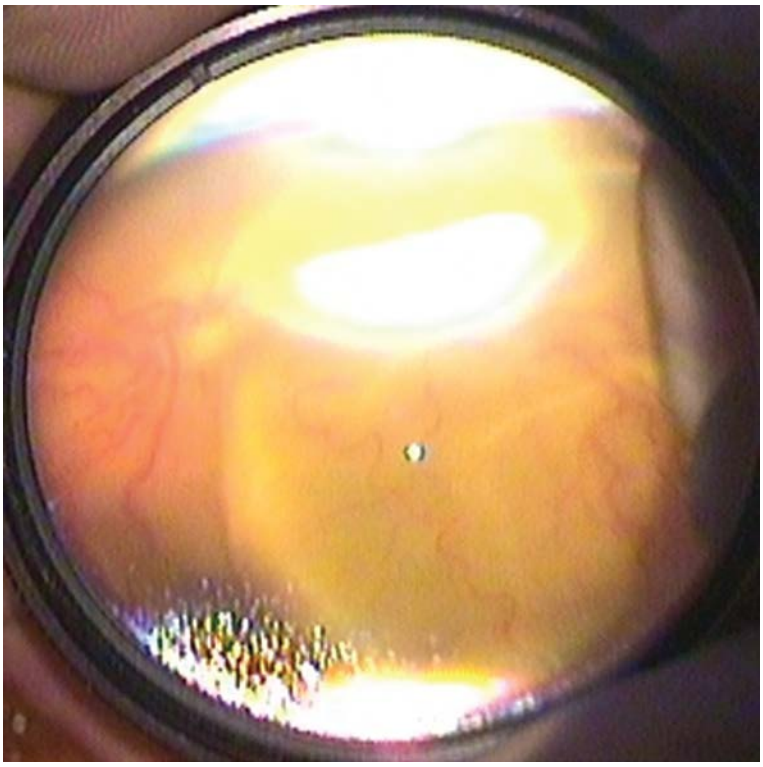

Figure 2. Exudative retinal detachment in left eye

3. Discussion

The most common reported complications of LP for ROP are lens opacity, iris and cornea burns, retinal and choroidal hemorrhages [4,5]. However, there is limited data on the development of ERD following LP performed for ROP [6-11]. In this report, we presented a case of ERD that occurred following LP for ROP at 35 weeks of PMA, which interestingly did not occur immediately after treatment, and resolved by intravenous steroid treatment.

In animal models, Marmor et al. showed that LP resulted in ERD by causing damage in the retinal pigment epithelium (RPE) and choriocapillaris [13]. Noonan and

Clark reported acute ERD occurred immediately after LP performed for the treatment of threshold ROP [7]. Berman and Deutsch found bilateral pigment epithelial detachment immediately after ROP examination [8]. In these cases, ERD showed spontaneous resorption within 2-3 weeks, and the development of ERD was attributed to the hemodynamic changes caused by 2.5% phenylephrine in choriocapillaris.

Ehmann et al described the association of ERD with ROP by the instability of the inner blood retinal barrier seen in stage 3 ROP with plus disease, combined with further inflammatory insult secondary to laser therapy [9]. They propose that this may lead to a vasoactive response resulting in subretinal exudate accumulation and retinal detachment [9].

Moshfeghi et al. described three cases of ERD developed following LP performed after 40 weeks of PMA for ROP [6]. They reported that they used topical and systemic steroids in the patients and noted resorption in ERD. The authors suggested that premature infants who require LP for ROP at >40 weeks of PMA might be predisposed to develop ERD.They claimed that the advanced age of the infants would result in better developed choriocapillaris and more extensive exudation [6].

Muni et al. also described an ERD in a premature who previously received LP for zone II stage 3 ROP with plus disease at 40 weeks [14]. They just observed the case and reported a complete resolution at 50 weeks with residual macular subretinal exudates. Lalwani et al. reported a case of bilateral ERD 3 weeks after LP [11]. The case was then treated with intravitreal Bevacizumab in both eyes. After supplemental LP, the left eye remained stable, whereas the right eye developed a tractional retinal detachment.

Armada et al reported a severe case of ERD following LP for ROP, which was managed by external subretinal drainage, bevacizumab and scleral buckling [10]. This case is the only reported ROP case patient which necessitated surgical management in for ERD.

In the present cases, the development of ERD was also attributed to the injury of RPE and choriocapillaris caused by LP. The administration of topical and systemic steroid treatment provided recovery in the clinical picture of our patients. The effect of the steroid was considered to be related to the decreased inflammation in RPE and choriocapillaris. However, the rare occurrence of this complication and spontaneous resorption in some cases suggest the involvement of other factors.

In conclusion, we would like to emphasize that ERD might be occur as a complication of LP during the treatment of ROP. Potential benefits of topical and systemic steroids should be taken into consideration in the treatment of this condition.

Acknowledgement

There is no government or non government support for the study. There is no financial support for the study, either. The authors adhered to Declaration of Helsinki and all state laws in our country. The parent of our patient was asked to give informed concent form before being enrolled in the study.

References

[1] Section on Ophthalmology American Academy of Pediatrics; American Academy of Ophthalmology; American Association for Pediatric Ophthalmology and Strabismus. Screening examination of premature infants for retinopathy of prematurity. *Pediatrics.* 2006; 117:572-576.

[2] Azad RV, Pasumala L, Kumar H, et al. Prospective randomized evaluation of diode-laser and cryotherapy in prethreshold retinopathy of prematurity. *Clin Experiment Ophthalmol*. 2004; 32: 251-254.

[3] Chen J, Stahl A, Hellstrom A, Smith LE.Current update on retinopathy of prematurity: screening and treatment. *Curr Opin Pediatr*. 2011;23(2):173-178.

[4] Irvine WD, Smiddy WE, Nicholson DH. Corneal and iris burns with laser indirect ophthalmoscope. *Am J Ophthalmol.* 1990; 110:311-314.

[5] Preslan MW. Laser therapy for retinopathy of prematurity. *J Pediatr Ophthalmol Strabismus.* 1993;30:80-83.

[6] Moshfeghi DM, Silva RA, Berrocal AM.Exudative Retinal Detachment following Photocoagulation in Older Premature Infants For Retinopathy of Prematurity: Description and Management. *Retina*. 2014;34(1):83-86.

[7] Noonan CP, Clark DI Acute serous detachment with argon laser photocoagulation in retinopathy of prematurity *JAAPOS.* 1997;1(3):183-184

[8] Berman DH, Deutsch JA. Bilateral spontaneous pigment epithelial detachments in a premature neonate. *Arch Ophthalmol*. 1994; 112161-112164

[9] Ehmann D, Greve M. Intravitreal bevacizumab for exudative retinal detachment post laser therapy for retinopathy of prematurity. *Can J Ophthalmol*. 2014;49(2):228-31.

[10] Armada- Maresca F, Peralta-Calvo J, Pastora-Salvador N, Grabowska A, Vallejo-Garcia External subretinal drainage, bevacizumab, and scleral buckling for complete exudative retinal detachment after photocoagulation in retinopathy of prematurity. *J.Retin Cases Brief Rep*. 2014;8(1):33-6.

[11] Lalwani GA, Berrocal AM, Murray TG, et al. Off-label use of intravitreal bevacizumab (Avastin) for salvage treatment in progressive threshold retinopathy of prematurity. *Retina*. 2008;28(3Suppl.):S13-S18.

[12] Newman H, Finger PT, Chin KJ, Pavlick AC Systemic bevacizumab (Avastin) for exudative retinal detachment secondary to choroidal melanoma. *Eur J Ophthalmol*. 2011; 21(6): 796-801.

[13] Marmor MF, Yao XY. Conditions necessary for the formation of serous detachment. Experimental evidence from the cat. *ArchOphthalmol* 1994;112:830-838.

[14] Muni RH, KohlyRP, Charonis AC,Lee TC.Retinoschis is detected with handheld spectral-domain optical coherence tomography in neonates with advanced retinopathy of prematurity. *Arch Ophthalmol*. 2010; 128: 57-62.