DOI: 10.4274/tjo.41.02 Original Article / *Özgün Araştırma*

Comparison Between Efficacy of Triamcinolone Acetonide and Bevacizumab in a Case with Type 2A Idiopathic Parafoveal Telangiectasia

Tip 2 İdiopatik Parafoveal Telenjektazili Bir Olguda Bevacizumab ile Triamsinolon Asetonidin Karşılaştırılması

Yasin Toklu, Sabri Raza, Mustafa Alpaslan Anayol, Bülent Özkan, Ayşegül Koçak Altıntaş, Şaban Şimşek
Atatürk Training and Research Hospital, First Ophthalmology Clinic, Bilkent, Ankara, Turkey

Summary

Purpose: To compare the efficacy of intravitreal triamcinolone acetonide and bevacizumab in the treatment of a case of type 2A idiopathic parafoveal telangiectasia (IPT).

Material and Method: A 55-year-old man with complaint of decreased vision in both eyes was diagnosed as type 2A IPT after a complete ophthalmological examination, fundus fluorescein angiography (FA) and optical coherence tomography (OCT). We injected intravitreally 4 mg /0.1 cc of triamcinolone acetonide into the right eye and 24 hours later 1.25 mg /0.05 cc of bevacizumab into the left eye. The patient was evaluated on the first day, first week, first month, and the third month with FA and OCT.

Results: Before treatment, best-corrected visual acuity (BCVA) was 5/100 in the right eye and 5/10 in the left eye. At the first-week post-treatment visit, BCVA improved to 5/10 in the right eye and 10/10 in the left eye. On FA, edema in the temporal foveal area was detected in both eyes. This macular edema began to decrease at the first-week visit. Visual acuity was the same on the first- and third-month visits. The FA findings also remained the same. During this 3-month follow-up period, the patient did not need any other additional treatment.

Discussion: Intravitreal injections of triamcinolone acetonide and bevacizumab are optional modalities in the treatment of type 2 IPT. The efficacy and permanence of influence-duration of action of triamcinolone acetonide and bevacizumab were similar in our case. *(Turk J Ophthalmol 2011; 41: 6-9)*

Key Words: Type 2A idiopathic parafoveal telangiectasia, triamcinolone acetonide, bevacizumab

Özet

Amaç: Tip 2 İdiopatik Parafoveal Telenjektazili (İPT) bir olgunun tedavisinde intravitreal bevacizumab ile triamsinolon asetonidin etkinliğinin karşılaştırılması.

Gereç ve Yöntem: Elli beş yaşındaki erkek hasta, her iki gözde görme azalması şikayeti ile kliniğimize başvurdu. Ayrıntılı oftalmolojik muayene, fundus flöresein anjiografi (FFA) ve optik koherans tomografi (OKT) sonuçlarına dayanarak hastaya Tip 2A İPT tanısı kondu. Tedavi olarak hastanın sağ gözüne intravitreal 4 mg/0,1 cc triamsinolon asetonit, sol gözüne ise 24 saat sonra 1,25 mg / 0,05 cc intravitreal bevacizumab uygulandı. Hasta enjeksiyonlardan sonra 1. gün, 1. hafta, 1. ay ve 3.ay sonunda FFA ve OKT ile değerlendirildi.

Sonuçlar: Tedavi öncesi hastanın en iyi düzeltilmiş görme keskinliği sağ gözde 5/100, sol gözde ise 5/10 idi. Tedavi sonrası birinci haftada hastanın sağ görmesi 5/10, solda ise 10/10 ulaştı. FFA' da her iki gözde fovea temporalinde ödem tespit edildi. Bu makular ödem tedaviden 1 hafta sonra azalmaya başladı. Görme keskinliği 1. ay ve 3. ay sonunda aynı seviyede kaldı. FFA bulguları da aynı şekilde sebat etti. Bu 3 aylık süresi boyunca hastaya ek tedavi yapılması gerekmedi.

Tartışma: İntravitreal triamsinolon asetonit ve bevacizumab Tip 2 İPT tedavisinde alternatif seçeneklerdir. Bu olguda hem triamsinolon asetonit hem bevacizumab'ın etkili olduğunu, etkinliklerinin ve etkinlik sürelerinin benzer olduğunu gösterdik. *(Turk J Ophthalmol 2011; 41: 6-9)*

Anahtar Kelimeler: Tip 2 idiopatik parafoveal telenjektazi, triamsinolon asetonit, bevacizumab

Address for Correspondence/Yazışma Adresi: Dr. Sabri Raza, Atatürk Training and Research Hospital First Ophthalmology Clinic Bilkent Ankara, Turkey
Gsm: +90 507 738 17 97 E-mail: sabri_raza@yahoo.com **Received/Geliş Tarihi:** 04.02.2010 **Accepted/Kabul Tarihi** 26.10.2010

Introduction

Idiopathic parafoveal telangiectasia (IPT) is a rare retinal disorder characterized by a dilated retinal capillary network at the foveal area.[1] Gass and Blodi[2] have classified IPT into three types. Type 2 IPT is the most common one. It appears at the 5th and 6th decade of life with complaints of progressive decrease in the visual acuity and metamorphopsia.[3] In 1/3 of patients, diabetes mellitus or impaired glucose tolerance is detected.[4] The dilated parafoveal capillary network in fluorescein angiography (FA) and especially the diffuse leakage at the late phase on the temporal area of the fovea are the typical findings of IPT.[5]

Vascular endothelial growth factor (VEGF) has been shown to have an important role in the development of abnormal vessels and vascular permeability. It has been demonstrated that inhibition of VEGF intravitreally prevents neovascularization and stabilizes the blood-retinal barrier.[6] Recently, it has been thought that VEGF has the main role in the pathogenesis of IPT.[7] In this case, we aimed to compare the effects of intravitreal bevacizumab (IVB) and intravitreal triamcinolone acetonide (IVTA) in the treatment of IPT.

Case Report

A 50-year-old man was admitted to our clinic with complaint of decreased vision, especially in the right eye. The decrease of vision started 6 months ago and got progressively worse. From the patient history, we learned that he has a well-controlled diabetes mellitus for 6 years. The best-corrected visual acuities (BCVA) were 5/100 and 5/10 on the right and left eye, respectively. There were no any particular findings in the examination of the anterior segment. The intraocular pressures were in normal limits in both eyes. Fundus examination revealed telangiectatic vessels in both maculae, especially in the temporal area of the fovea (Figure 1). Also decrement in the foveal brightness was detected. The fundus angiogram showed hyperfluorescence due to telangiectatic vessels in the early phase of FA and macular edema, especially in the right eye, in the late phase of the FA (Figure 2, 3). Although the resolution of optical coherence tomography (OCT) was not very high, it revealed relatively normal anatomy of the fovea, despite the hyperfluorescence detected on FA (Figure 4). The patient with these findings was diagnosed as type 2A IPT. As treatment option, IVTA was planned on the right eye and IVB on the left eye. Informed consent was taken from the patient for the treatment procedure. Firstly, in operating room conditions, after cleaning the fornices in the right eye with 5% betadine, 4 mg-0.1 cc of triamcinolone acetonide was injected intravitreally with a 27 gauge needle in the inferior temporal quadrant 4 mm from the pars plana. 24 hours later, in the same conditions, 1.25 mg-0.05 cc of bevacizumab was injected in the left eye. As prophylaxis, an antibiotic from third-generation fluoroquinolones (ofloxacine) was given four times a day for a week. The patient was evaluated on the first day, first week, first month, and the third month after the injections. No complications related to the injections were observed on these visits. On the first-week visit, the BCVA was 5/10 on the right eye and 10/10 on the left eye. The visual acuities were

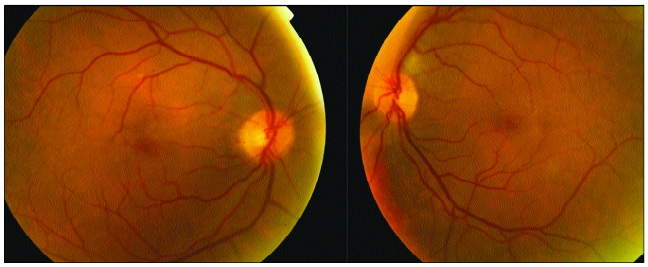

Figure 1. Fundus photos of the patient before the injections

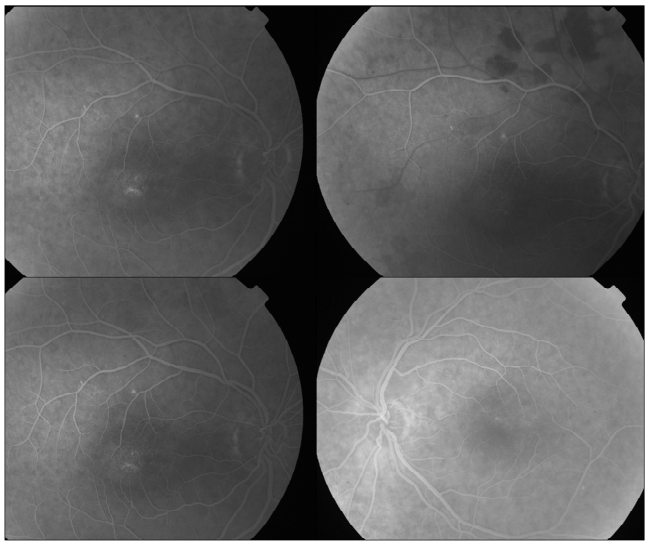

Figure 2. FA of the patient before the injections, early phase of FA

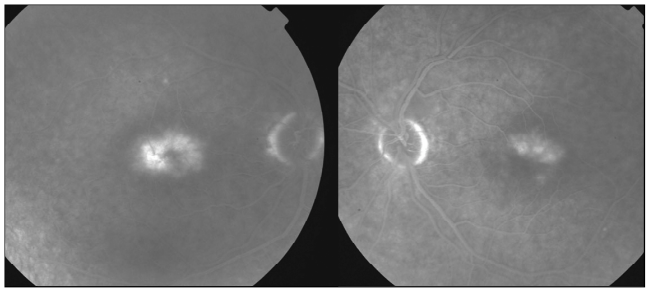

Figure 3. FA of the patient before the injections, late phase of FA

the same on the first- and third-month follow-up visits. On control FA, there was significant decrement of fluorescence in the early phase especially in the left eye and also decrement in the leakage in the late phase (Figure 5). The patient did not need any additional treatment during this time period.

Discussion

In 1993, IPT has been classified into three groups by Gass and Blodi. The classification and staging of the disease are basically made on FA findings. Group 1A refers to unilateral congenital parafoveal telangiectasis with telangiectatic capillaries temporal to the fovea; group 1B -unilateral, idiopathic, focal juxtafoveal telangiectasis with a small focal area of incompetent capillaries next to the foveal avascular zone; group 2A - bilateral idiopathic acquired parafoveal telangiectasis with retinal thickening temporal to the fovea, right-angled venules, retinal pigment epithelial (RPE) hyperplastic plaques, subretinal neovascularization and crystalline deposits; group 2B - juvenile occult familial IPT; group 3A- occlusive IPT with casual visual loss due to obliteration of perifoveal capillaries; and group 3B is occlusive IPT associated with central nervous system vasculopathy. Moreover, Gass and Blodi divided the development of group 2A into 5 stages. Stage 1 is usually found on FA, with staining and leakage at the level of the RPE. Stage 2 is characterized by the loss of transparency of the parafoveal retina with capillary telangiectasis visible only by FA. In stage 3, dilated right-angled venules develop and FA demonstrates unusual capillary dilatation and staining in the outer retina. In stage 4, stellate foci of superficial retinal pigmentation due to migrating RPE cells are observed along the right-angled venules. In stage 5, there is an evidence of retinal neovascularization or exudation from new vessels in the subretinal space. The visual prognosis is poor because of the foveal atrophy due to retinal edema, central scar on the RPE and occasionally due to the development of the choroidal neovascularization (CNV).[2]

In IPT, vascular changes occur in the deep retinal capillary network, leading to intraretinal neovascularization with an unknown mechanism. There is no capillary ischaemia or inflammation. The vasogenic cellular mechanism may be the provoking factor for progressive degeneration of the endothelial cells of retinal capillaries.[8]

Intravitreal application of steroids in the treatment of macular edema is useful because of some biological effects. Steroids inhibit the biosynthesis of leukotrienes and prostaglandins. They stabilize the blood-retinal barrier and also downregulate the synthesis of VEGF.[1] Due to these effects of steroids, they have been used also in the treatment of macular edema seen in IPT.

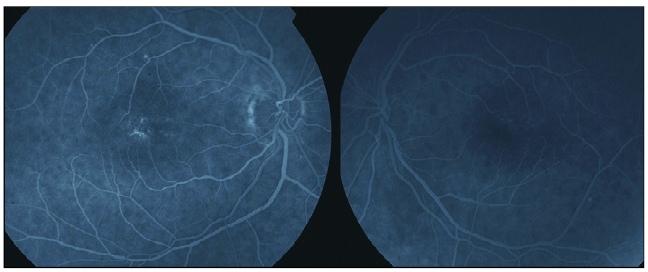

Figure 4. FA of the patient 3 months after the injection

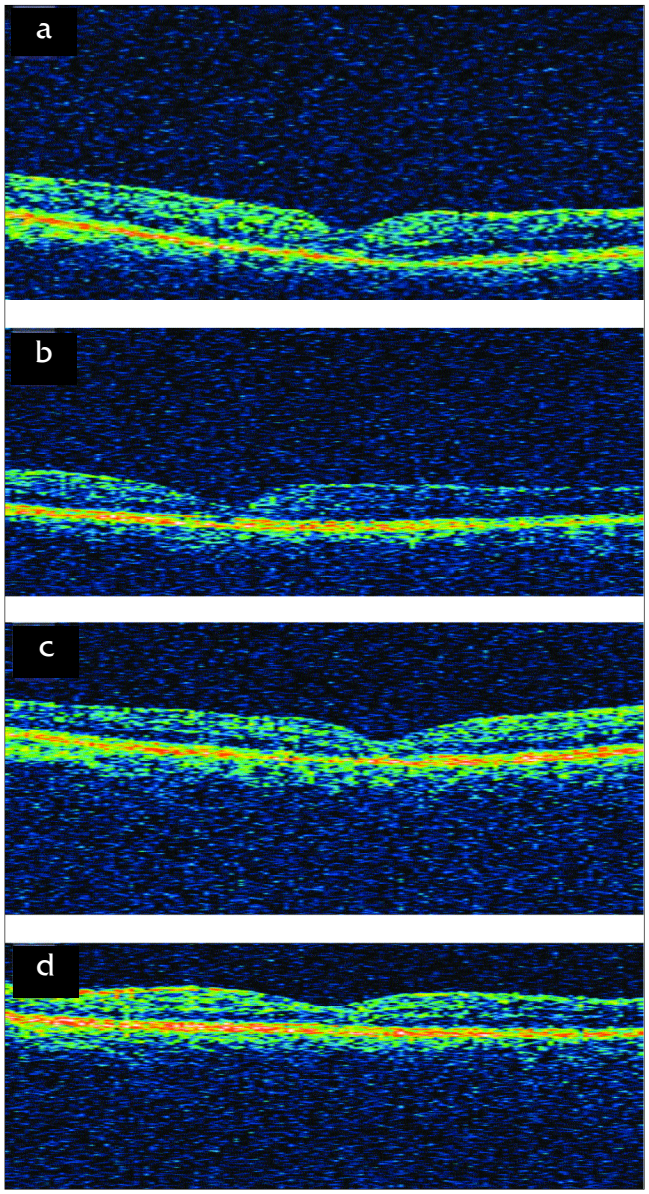

Figure 5. a) OCT of the patient. a. right eye before the injection, **b)** left eye before the injection, **c)** right eye three months after the injection, **d)** left eye 3 months after the injection

Alldredge and Garretson[9], in a case with type 2 IPT, during an 8-week follow-up after injection of 4 mg triamcinolone acetonide in the right eye, detected two lines improvement in the BCVA, whereas no change was observed in the BCVA in the non-injected eye.[9] In another study, also triamcinolone acetonide was found to be effective in the treatment of IPT.[10] In our case, intravitreal TA resulted in decrease in the macular edema and also increased significantly the visual acuity.

Green et al. in their histopathologic study showed that in type 2 IPT, constriction in the capillary vessels and cellular proliferation of basal membrane may cause increase in the thickness of the retinal capillary vessel walls. Because of this structural disorder, the exchange of oxygen and substrates between capillary network and sensorial retina is impaired, so hypoxia develops and as a response to this hypoxia, VEGF is released from the retinal cells.[11] Type 2 IPT is a chronic process, therefore, VEGF has a long-term effect on the pathogenesis of type 2 IPT. IVB abolishes the effects of VEGF by inhibiting all isomers of VEGF. Charbel et al.[3] have shown that inhibition of VEGF by IVB is associated with a decrease in retinal thickness and a reduction in angiographic leakage in type 2 IPT in short term. In our case, we detected a decrease in the vascular leakage on FA in the eye injected with a single dose of IVB. Consistent with this finding, BCVA also increased.

OCT is a noninvasive imaging technology that provides cross-sectional images of the retina. OCT has added to the understanding of morphologic alterations in IPT. In a recent study, OCT showed some characteristic findings for all stages of type 2A. Those included the presence of highly reflective dots in the inner retina corresponding with vessels on FA, presence of hyporeflective intraretinal spaces within and under the retina, blunting of the foveal pit, and presence of an area of outer and inner retina with similar reflectivity.[12] Moreover, Gupta et al.[13] suggested that hyporeflective spaces seen on OCT may represent intraretinal cystic spaces secondary to atrophy of the retinal receptors and other retinal cells, most likely Muller cells. It is possible that the cystic spaces are not visualized with FA because they are filled with a lightly staining fibrillar material on the inner plexiform layer, the outer nuclear layer, and the outer plexiform layer as reported in light and electron microscopy by Green et al.[14] In the presented case, the OCT images may not show the characteristic findings of IPT because of the low resolution of OCT. The OCT used in the above-cited references was spectral-domain OCT, so this issue may explain the relatively normal anatomy of the macula detected on OCT in the presented case.

In the literature, it is well known that triamcinolone acetonide or bevacizumab given intravitreally can pass into the systemic circulation.[15] It is possible that the dose of the drugs that pass in systemic circulation can also affect the pathologies in the non-injected eye. In this case, the effect of the drugs on the telangiectasia in both eyes can be explained also by this mechanism.

In conclusion, we think that intravitreal injection of triamcinolone acetonide and bevacizumab are optional modalities in the treatment of type 2 IPT. The efficacy and duration of action of triamcinolone acetonide and bevacizumab were similar in our case. Besides, these findings warrant further studies with larger number of patients and long-term follow-up.

References

1. Arevalo JF, Sanchez JG, Garcia RA et al. Indocyanine-green-mediated photothrombosis (IMP) with intravitreal triamcinolone acetonide for macular edema secondary to group 2A idiopathic parafoveal telangiectasis without choroidal neovascularization: a pilot study. Graefes Arch Clin Exp Ophthalmol. 2007;245:1673-80.
2. Gass JD, Blodi BA. Idiopathic juxtafoveolar retinal telangiectasis. Update of classification and follow-up study. Ophthalmology. 1993;100:1536-46.
3. Charbel Issa P, Holz FG, Scholl HP. Findings in fluorescein angiography and optical coherence tomography after intravitreal bevacizumab in type 2 idiopathic macular telangiectasia. Ophthalmology. 2007;114:1736-42.
4. Millay RH, Klein ML, Handelman IL, Watzke RC. Abnormal glucose metabolism and parafoveal telangiectasia. Am J Ophthalmol. 1986 15;102:363-70.
5. Paunescu LA, Ko TH, Duker JS, Chan A, Drexler W, Schuman JS, Fujimoto JG. Idiopathic juxtafoveal retinal telangiectasis: new findings by ultrahigh-resolution optical coherence tomography. Ophthalmology. 2006;113:48-57.
6. Avery RL, Pearlman J, Pieramici DJ et al. Intravitreal bevacizumab (Avastin) in the treatment of proliferative diabetic retinopathy. Ophthalmology. 2006;113:1695-705.
7. Charbel Issa P, Holz FG, Scholl HP. Intravitreal bevacizumab for the treatment of type 2 idiopathic macular telengiectasis. Retin Cases Brief Rep. In pres.
8. Yannuzzi LA, Bardal AM, Freund KB, Chen KJ, Eandi CM, Blodi B. Idiopathic macular telangiectasia. Arch Ophthalmol. 2006;124:450-60.
9. Alldredge CD, Garretson BR. Intravitreal triamcinolone for the treatment of juxtafoveal telangiectasis. Retina. 2003;23:113-6.
10. Cakir M, Kapran Z, Basar D, Utine CA, Eroglu F, Perente I. Optical coherence tomography evaluation of macular edema after intravitreal triamcinolone acetonide in patients with parafoveal telangiectasis. Eur J Ophthalmol. 2006;16:711-7.
11. Green WR, Quigley HA, De la Cruz Z, Cohen B. Parafoveal retinal telangiectasis. Light and electron microscopy studies. Trans Ophthalmol Soc U K. 1980;100:162-70.
12. Sanchez JG, Garcia RA, Wu L et al. Optical coherence tomography characteristics of group 2A idiopathic parafoveal telangiectasis. Retina. 2007;27:1214-20.
13. Gupta V, Gupta A, Dogra MR, Agarwal A. Optical coherence tomography in group 2A idiopathic juxtafoveolar telangiectasis. Ophthalmic Surg Lasers Imaging. 2005;36:482-6.
14. Green WR, Quigley HA, de la Cruz Z, Cohen B. Parafoveal retinal telangiectasis: light and electron microscopy studies. Retina. 2005;25:162-70.
15. Nomoto H, Shiraga F, Kuno N et al. Pharmacokinetics of bevacizumab after topical, subconjunctival, and intravitreal administration in rabbits. Invest Ophthalmol Vis Sci. 2009;50:4807-13.