This is an Open Access article licensed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs 3.0 License (www.karger.com/OA-license), applicable to the online version of the article only. Distribution for non-commercial purposes only.

Central Serous Chorioretinopathy with Subretinal Deposition of Fibrin-Like Material and Its Prompt Response to Ranibizumab Injections

Chrysanthos Symeonidis^a Konstantinos Kaprinis^a
Kyriakos Manthos^a Sofia Androudi^b
Konstantinos Anastassilakis^a Stavros A. Dimitrakos^a

^a2nd Department of Ophthalmology, Aristotle University of Thessaloniki, Thessaloniki, and ^bDepartment of Ophthalmology, University of Thessaly, Larissa, Greece

Key Words

Central serous chorioretinopathy · Fibrin · Ranibizumab · Optical coherence tomography

Abstract

Purpose: Central serous chorioretinopathy (CSCR) manifests as neurosensory detachment of the macula and can be attributed to focal or multifocal leakage in the retinal pigment epithelium (RPE). Fibrin accumulation in the subretinal space is an unusual and heretofore unreported visually damaging manifestation of severe CSCR.

Methods: The patient was followed up with the use of biomicroscopy, fluorescein angiography, and optical coherence tomography (OCT).

Results: A 32-year-old woman was referred to our department complaining of metamorphopsia and decreased visual acuity in the right eye. Best-corrected visual acuity (BCVA) was 20/40 in the right eye and 20/20 in the left eye. Biomicroscopy revealed an irregularly shaped foveal elevation and wrinkling in the right eye. OCT showed a steep neurosensory retina elevation with a highly reflective material accumulation in the subretinal space, presumably fibrin. Our diagnosis was CSCR complicated by subretinal fibrin accumulation. Since most of these cases resolve spontaneously, the patient was kept under observation; 1 month later, the fibrin accumulation had expanded subfoveally (BCVA 20/200). The patient was offered 3 intravitreal ranibizumab injections. After the initial injection, BCVA improved to 20/50 and, after the 3 injections, to 20/30. Two months later (BCVA 20/30), fresh leakage was observed at the margin of the original lesion, and an additional intravitreal ranibizumab injection was performed. After another 2 months, BCVA stabilized at 20/25 and remained stable throughout the 12 months after the initial injection.

Conclusions: Prompt recognition of CSCR complicated by subretinal fibrin and immediate intervention may result in recovery from this potentially devastating complication. Ranibizumab may be an alternative treatment option in the management of refractory CSCR complicated by subretinal fibrin accumulation.

Introduction

Central serous chorioretinopathy (CSCR) manifests as neurosensory detachment of the macula and can be attributed to focal or multifocal leakage in the retinal pigment epithelium (RPE) [1]. While described as a disease of healthy, type-A personality men, it has also been reported in women [2], and is associated with pregnancy. It typically develops in the third trimester and resolves spontaneously within 1–2 months after delivery [2].

Fibrin accumulation in the subretinal space is an unusual visually damaging manifestation of severe CSCR [1–3]. Schatz et al. [3], reported 6 cases (average age 40 years) with CSCR containing fibrin in the subretinal space that later developed into a subretinal fibrotic scar, with subsequent subretinal fibrosis and severe visual loss (20/400 or worse).

In this case report, we present the rapid and impressive response to ranibizumab in a case of CSCR complicated by accumulation of subretinal fibrin.

Case Report

A 32-year-old woman was referred to our department complaining of metamorphopsia and decrease of visual acuity in the right eye. She reported ongoing significant marital problems and a pregnancy during the previous 18 months. Best-corrected visual acuity (BCVA) was 20/40 and 20/20 in the right and left eye, respectively. Dilated fundus examination revealed an irregularly shaped foveal elevation and wrinkling. In addition, fluorescein angiography (FA) showed partial dye masking in the affected area during the early phase followed by ink-blot leakage and subsequent pooling in the superior margin, not involving the fovea (fig. 1). In the left eye, we observed old window defects and two small RPE detachments. Indocyanine green angiography revealed no signs of neovascularization or polyp-like vascular abnormalities. Optical coherence tomography (OCT) showed a serous elevation of the retina and a shallow RPE detachment, with subretinal accumulation of highly reflective material (presumably fibrin).

Our initial diagnostic approach was to follow up the patient keeping in mind that this was a case of CSCR complicated by fibrin deposition in the subretinal space.

After 1 month, BCVA decreased to 20/200 and the OCT revealed a more irregular subretinal accumulation of highly reflective material that was now involving the fovea (fig. 2). The patient was treated with 3 courses of intravitreal ranibizumab injections. After the first injection, BCVA improved to 20/50 while the FA leakage had nearly diminished. OCT revealed a slight neurosensory retina elevation without any apparent subretinal exudation (fig. 3). Two more intravitreal ranibizumab injections were repeated at monthly intervals. Two months later, visual acuity was 20/30, while metamorphopsia was still persisting. During the follow-up period, a new leakage area was observed at the margin of the original lesion. One more intravitreal ranibizumab injection was offered. In the following 2 months, BCVA stabilized at 20/25 and remained stable for the following 12 months, without any apparent significant FA leakage (fig. 1).

Discussion

The presence of fibrin with spontaneous resolution in the majority of CSCR cases has been previously reported [1]. Subretinal fibrin and other extracellular matrix molecules appear to stimulate the RPE to undergo fibrous metaplasia, which results in subretinal fibrotic scar formation and other sequelae, all of which can lead to severe visual loss [3].

In our patient, a steep neurosensory retinal elevation with an extrafoveal subretinal deposition of a fibrin-like material was observed several months after delivery. Subsequent fibrinolysis of this meshwork resulted in an amorphous, homogenous subretinal accumulation with involvement of the fovea and significant reduction of the visual acuity. Due to the presence of subfoveal fluid, we decided to offer a 3-injection course of intravitreal ranibizumab which resulted in rapid subretinal material (fibrin) absorption and improvement of both BCVA and foveal contour confirmed by OCT.

According to the literature [1, 2], in the majority of relevant cases, there is gradual resolution of this fibrin-like material accumulation as a result of a resumption of normal RPE function (in pregnant women, in particular it, resolves spontaneously within 1–2 months after delivery). Schatz et al. [3], reported 6 cases (average age 40 years) with CSCR containing fibrin in the subretinal space which developed into a subretinal fibrotic scar. Scar formation was followed by a tenting up of the macula, vascularization of the fibrosis (subretinal neovascularization), or a retinal pigment epithelial rip. Four of the 7 eyes with subretinal fibrosis had severe visual loss (20/400 or worse).

Ranibizumab has been reported to be an effective treatment of choroidal neovascularization related to chronic CSCR. However, residual intraretinal or subretinal fluid in addition to increased choroidal permeability persisted in a small case series [4]. Ranibizumab has been shown to have no significant direct effect on the choriocapillaris in animal models [5]. Conversely, recent evidence from in vitro studies suggests that ranibizumab may decrease RPE barrier function by temporarily enhancing RPE permeability for a small number of days [6]. In this case, it is not clear whether intravitreal ranibizumab contributed to the dissolution of the fibrin-like material, and it is conceivable that resolution may have occurred without any intervention. In contrast, the rapid response to ranibizumab may suggest that this anti-VEGF agent may be an alternative treatment option in the management of refractory CSCR complicated by subretinal fibrin accumulation. Further experimental studies investigating the potential anti-VEGF effect on modulating RPE function (e.g. ion pump activation) are required to validate this hypothesis.

Disclosure Statement

None of the authors has received financial support for the completion of this study. Regarding the results of this study, none of the authors has any proprietary interest.

Fig. 1. Subretinal deposition of a fibrin-like material in the right eye at baseline visit: **a** Red-free photo; **b** FA during the early phase (15 s); **c** FA during the late phase (8 min and 51 s), and **d** OCT scans depicting a steep neurosensory retinal elevation and a shallow RPE detachment with an accumulation of a fibrin-like material with high reflectivity.

Fig. 2. **a** Red-free photo; **b** FA during the early phase (16 s); **c** FA during the late phase (17 min and 09 s), showing macular involvement, and **d** OCT scan of the first follow-up performed after treatment discontinuation. Fibrinolysis of the fibrin-like meshwork resulted in an amorphous, homogenous subretinal accumulation with involvement of the fovea.

Fig. 3. **a** FA during the early phase (15 s); **b** FA during the late phase (7 min and 09 s); **c** OCT 4 weeks after the first ranibizumab injection revealing a small quantity of subretinal fluid but no fibrin-like accumulation; **d** FA during the early phase (16 s); **e** FA during the late phase (7 min and 40 s) showing localized fibrosis and, and **f** OCT 4 weeks after the fourth ranibizumab injection showing absence of subretinal fluid.

References

1. Ie D, Yannuzzi LA, Spaide RF, Rabb MF, Blair NP, Daily MJ: Subretinal exudative deposits in central serous chorioretinopathy. *Br J Ophthalmol* 1993;77:349–353.
2. Quillen DA, Gass DM, Brod RD, Gardner TW, Blankenship GW, Gottlieb JL: Central serous chorioretinopathy in women. *Ophthalmology* 1996;103:72–79.
3. Schatz H, McDonald HR, et al: Subretinal fibrosis in central serous chorioretinopathy. *Ophthalmology* 1995;102:1077–1088.
4. Konstantinidis L, Mantel I, Zografos L, Ambresin A: Intravitreal ranibizumab in the treatment of choroidal neovascularization associated with idiopathic central serous chorioretinopathy. *Eur J Ophthalmol* 2010;20:955–958.
5. Kim IK, Husain D, Michaud N, et al: Effect of intravitreal injection of ranibizumab in combination with verteporfin PDT on normal primate retina and choroid. *Invest Ophthalmol Vis Sci* 2006;47:357–363.
6. Miura Y, Klettner A, Roider J: VEGF antagonists decrease barrier function of retinal pigment epithelium in vitro: possible participation of intracellular glutathione. *Invest Ophthalmol Vis Sci* 2010;51:4848–4855.