DOI: 10.4274/tjo.galenos.2022.96461
Turk J Ophthalmol 2022;52:142-146

Case Report

Half-fluence Photodynamic Therapy for Central Serous Chorioretinopathy in a Patient Receiving Corticosteroids for Behçet's Uveitis

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Abstract

Corticosteroid-induced central serous chorioretinopathy (CSCR) has been reported to develop in many intraocular inflammatory diseases and usually resolves spontaneously after discontinuation of corticosteroids. Patients without any improvement may require alternative therapies. In this case report, we present the case of a 35-year-old man with Behçet's disease who had complaints of decreased vision due to CSCR in his left eye while using systemic corticosteroids along with cyclosporine and azathioprine. Half-fluence photodynamic therapy (PDT) was performed because the CSCR did not regress despite discontinuation of systemic corticosteroids. After treatment, his visual acuity increased with complete resolution of the subfoveal fluid. Half-fluence PDT seems to be an effective and safe treatment for patients who develop acute CSCR while under systemic or local corticosteroid therapy for intraocular inflammatory diseases such as Behçet's uveitis and do not improve despite steroid discontinuation.

Keywords: Behçet's disease, uveitis, central serous chorioretinopathy, steroid, photodynamic therapy

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Received: 19.08.2021 **Accepted:** 05.01.2022

Cite this article as: Özdemir HB, Zhoroeva N, Çakar Özdal P, Özdek Ş. Half-fluence Photodynamic Therapy for Central Serous Chorioretinopathy in a Patient Receiving Corticosteroids for Behçet's Uveitis. Turk J Ophthalmol 2022;52:142-146

Introduction

Central serous chorioretinopathy (CSCR) causes an idiopathic serous detachment of the neurosensory retina due to leakage at the level of the retinal pigment epithelium (RPE) secondary to hyperpermeability of the choriocapillaris.[1] Although the exact mechanisms causing CSCR have not been elucidated, many associations have been suggested. Steroids, both endogenous and exogenous, have the strongest known association with CSCR.[2]

CSCR is not uncommon in patients receiving systemic or local corticosteroids for any type of uveitis. Corticosteroid-induced CSCR has been reported to develop in many intraocular inflammatory diseases such as Behçet's disease, Vogt-Koyanagi-Harada (VKH) disease, HLA-B27-associated uveitis, and birdshot chorioretinopathy. The occurrence of CSCR in such diseases can be misdiagnosed as uveitis activation.[3,4,5,6] This misjudgment may cause worsening of CSCR-related choroidal hyperpermeability and serous detachment due to increased corticosteroid dose. Most cases of CSCR develop while under treatment for uveitis and regress after cessation of corticosteroid therapy, with an increase in visual acuity.[7]

Here, we present a patient who developed acute CSCR during systemic steroid therapy for Behçet's uveitis.

Case Report

A 35-year-old man diagnosed with Behçet's uveitis for 2 years presented to our clinic with decreased visual acuity in his left eye. At the time of presentation, the patient was using oral methylprednisolone 16 mg/day, oral cyclosporine 100 mg/day, and oral azathioprine 50 mg/day for 3 years. Visual acuity was 1.0 in the right eye and 0.5 in the left eye on Snellen chart (decimal units). Bilateral anterior segment examination was unremarkable. No cells or haze were detected in the vitreous of either eye (Figure 1A), while peripheral retinal vascular sheathing and RPE changes at the fovea were observed in the left eye (Figure 1B). Fundus autofluorescence was normal in the right eye (Figure 1C) and showed speckled hyperfluorescence in the macula extending inferiorly in the left eye (Figure 1D). Optical coherence tomography (OCT) was normal in the right eye (Figure 1E) and revealed serous macular detachment, increased choroidal thickness, and focal pigment epithelial changes consistent with CSCR in the left eye (Figure 1F). Fluorescein angiography (FA) showed bilateral optic nerve head hyperfluorescence (Figure 2A, 2D, 2F) and diffuse "fern-like" vascular leakage and peripheral ischemia in the left eye (Figure 2A, 2F). There was pinpoint focal hyperfluorescence resembling CSCR leakage in the early-mid and late phases in the left eye (Figure 2A, 2F). Indocyanine green angiography (ICGA) revealed dilated choroidal vessels in both eyes (Figure 2B, 2C) and late focal hypercyanescence in the macula indicating choroidal hyperpermeability in the left eye (Figure 2G). Late-phase ICGA findings were unremarkable in the right eye (Figure 2E). OCT angiography (OCTA) was performed to investigate the presence of macular neovascularization (MNV) but did not reveal this complication (Figure 3).

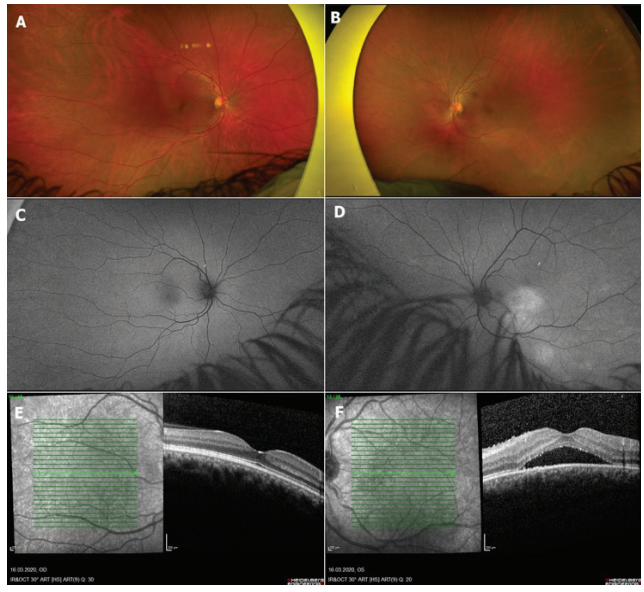

Figure 1. Multimodal imaging of the patient at presentation. Widefield fundus photography was unremarkable in the right eye (RE) (A) and retina pigment epithelium changes and peripheral vascular sheathing were observed in the left eye (LE) (B). Fundus autofluorescence showed normal autofluorescence in the RE (C) and speckled hyperautofluorescence in the macula extending inferiorly in the LE (D). There was no pathology in OCT of the RE (E) but serous macular detachment was present in the LE (F)
OCT: Optical coherence tomography

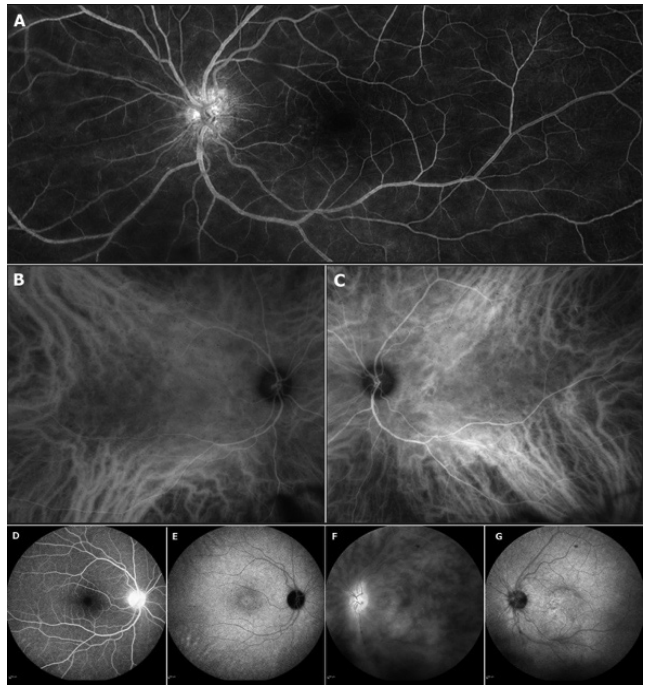

Figure 2. Fluorescein angiography (FA) and indocyanine green angiography (ICGA) were performed at presentation. FA of the left eye (LE) revealed optic nerve head hyperfluorescence, perivascular leakage, and multifocal leakage points which enlarged in the late phase (A). ICGA revealed bilateral dilated choroidal vessels in the early phase (B, C). Late-phase FA revealed bilateral optic nerve hyperfluorescence (D, F) and diffuse perivascular leakage in the LE (F). Late-phase ICGA was normal in the right eye (E) but a focal hyperpermeability area was observed in the macula of the LE (G)

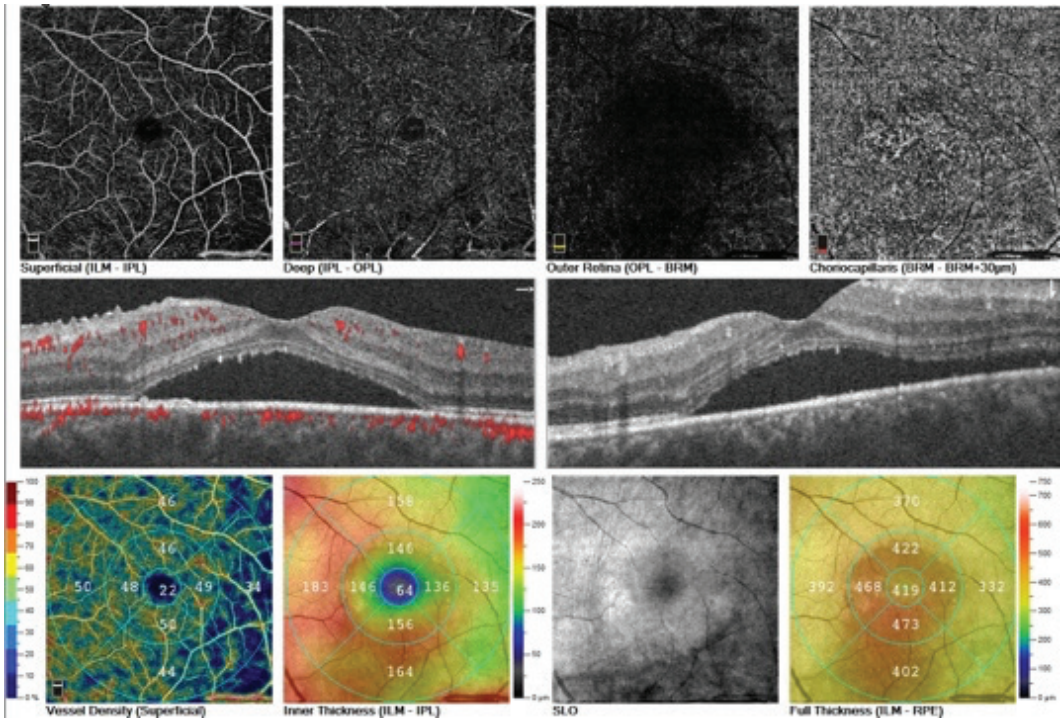

Figure 3. There was no macular neovascularization in optical coherence tomography angiography of the left eye

The patient was referred to the rheumatology department for cessation of steroid and administration of a biological agent. After systemic re-assessment, oral methylprednisolone was tapered and stopped, cyclosporine and azathioprine were discontinued, and intravenous infliximab (IFX) 400 mg/month was initiated after the loading dose. The patient was observed for 3 months after corticosteroid cessation, which resulted in only a slight decrease in the amount of subretinal fluid (Figure 4A-B). Therefore, we decided to perform half-fluence (25 J/cm^2) photodynamic therapy (PDT) with 6 mg/m^2 verteporfin (Visudyne, Novartis Ophthalmics AG, USA). The subretinal fluid completely resolved and BCVA increased to 0.7 at 1 month after PDT (Figure 4C). No recurrence of CSCR or exacerbation of uveitis has been observed during 6 months of follow-up. The patient was instructed not to use any kind of steroids via any route of administration.

Discussion

To the best of our knowledge, this is the first report of a case of CSCR that occurred in a patient with Behçet's uveitis under corticosteroid treatment and resolved with PDT.

Corticosteroid-related CSCR may develop in patients with posterior uveitis with or without an associated systemic condition, such as in Behçet's disease, VKH disease, birdshot chorioretinopathy, systemic lupus erythematosus, and sarcoidosis. Khairallah et al.[2] published a large series including 20 eyes of 14 patients with uveitis who developed corticosteroid-induced CSCR and reported that 14 eyes of 9 patients had Behçet's uveitis. Multimodal imaging including OCT, FA, and ICGA may help to distinguish CSCR from other uveitis entities.[8,9] OCT may reveal dome-shaped serous macular detachment and pigment epithelial detachment that might suggest CSCR. Increased choroidal thickness in CSCR can be assessed with EDI-OCT. FA findings may be masked by perivascular leakage or macular edema caused by uveitis. ICGA may reveal multiple areas of choroidal hyperpermeability in the mid-to-late phases in CSCR. In the present case, dome-shaped serous macular detachment on OCT, increased choroidal thickness on EDI-OCT, multifocal pinpoint leakage on FA, and late hypercyanescence indicating choroidal hyperpermeability at the macula in ICGA led us to diagnose corticosteroid-related CSCR concomitant with Behçet's uveitis.

As acute CSCR usually resolves spontaneously within 2 to 3 months, observation after discontinuing corticosteroids is the first step in treatment.[2] However, if patients must remain on corticosteroids, reductions in steroid dose have been shown to increase the speed of CSCR resolution.[2] Sharma et al.[10] reported that corticosteroid cessation alone resulted in retinal reattachment in 87.5% of eyes in a median of 49 days and an increase in visual acuity of ≥2 Snellen lines in 62% of eyes. Conventional immunosuppressives or biological agents should be given for sustained control of inflammation plus corticosteroid-sparing effect.[11] In our case, we switched the treatment to IFX to suppress retinal vasculitis and reduce the need for corticosteroids.

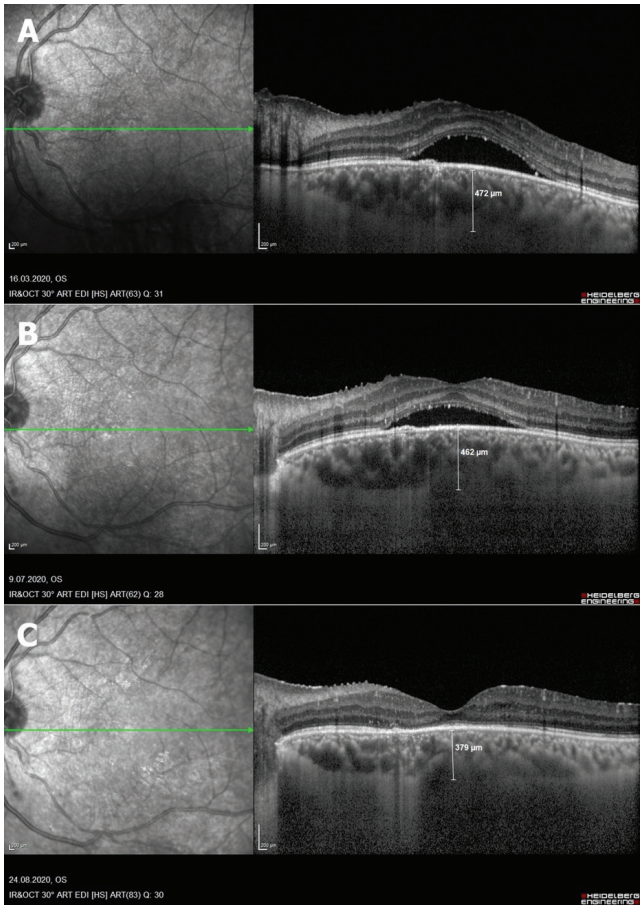

Figure 4. Enhanced depth imaging optical coherence tomography (EDI-OCT) images demonstrated serous macular detachment, minimal double-layer sign on the nasal edge of the detachment, and thickened choroid at presentation (A), slightly regressed subfoveal fluid 3 months after corticosteroid cessation (B), and completely resolved subfoveal fluid and thinned choroid 1 month after photodynamic therapy (C)

Patients who do not show any improvement on CSCR after a few months of observation may require alternative therapies such as laser photocoagulation, intravitreal anti-VEGF injections, or PDT. PDT with verteporfin, a photosensitizer that accumulates in vessels and helps target therapy, causes endothelial damage and vascular hypoperfusion to inhibit the choroidal hyperpermeability seen in CSCR.[12] PDT was first described for the treatment of CSCR using standard dosing protocols (6.0 mg/m^2, 50 J/cm^2). This standard PDT protocol is effective, but has been linked to some complications such as photosensitivity, transient visual loss, RPE atrophy, choriocapillaris ischemia, and secondary choroidal neovascularization.[13] To improve the safety of PDT, modified treatment parameters such as using half-fluence light energy or half-dose verteporfin have been considered.[14] Many retrospective studies in the literature have reported that the efficacy of half-dose and half-fluence PDT is similar,[14,15,16] except a multicenter retrospective study conducted by Nicolo et al.[17] They reported faster reabsorption and less recurrence with half-dose PDT, but both treatment modalities had equal visual improvement and safety in 12-month follow-up. On the other hand, Cheng et al.[18] reported in their prospective, randomized, observer-masked comparison study that the two methods were similarly effective and even caused comparable choroidal hypoperfusion. Therefore, strategy selection may be appropriate according to the characteristics of the patients. Half-dose can be chosen for patients with light sensitivity, and half-fluence for patients with difficulty in cooperation.[18] We chose half-fluence PDT treatment, considering that it would be difficult for our patient to cooperate. After the treatment with half-fluence PDT (25 J/cm^2), the patient's BCVA improved from 0.5 to 0.7, and OCT showed a complete reduction in subfoveal fluid in the left eye at 1 month. We did not observe any complication or exacerbation of uveitis related to PDT or recurrence of CSCR during 6 months of follow-up.

In conclusion, half-fluence PDT is a safe and effective technique for uveitis patients who develop corticosteroid-induced CSCR that persists after corticosteroid discontinuation.

Ethics

Informed Consent: Written informed consent was obtained from the patient.

Peer-review: Externally peer reviewed.

Authorship Contributions

Surgical and Medical Practices: H.B.Ö., P.Ç.Ö., Concept: H.B.Ö., N.Z., P.Ö.Ç., Ş.Ö., Design: H.B.Ö., N.Z., P.Ö.Ç., Ş.Ö., Data Collection or Processing: H.B.Ö., N.Z., Analysis or Interpretation: H.B.Ö., N.Z., P.Ö.Ç., Ş.Ö., Literature Search: H.B.Ö., N.Z., Writing: H.B.Ö., N.Z.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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