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Recurrent Bilateral Chronic Central Serous Chorioretinopathy Treated with Anti-VEGF

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ABSTRACT
Introduction: After diabetic retinopathy, branch retinal vein occlusion, and age-related macular degeneration, central serous chorioretinopathy (CSC) is the fourth most frequent retinopathy. Males in their 20s to 50s who have acute or subacute central vision loss or distortion are usually the ones who develop CSC, males more than females. Localized serous macula detachment is its defining feature. Within three to six months, the majority of instances resolve on their own and return to normal vision, but in certain situations, laser or medication treatment may be necessary.
Case: A 45-year-old male came with a chief complaint of gradually blurred vision in his right eye since a month ago. Optical computed tomography (OCT) examination showed an accumulation of sub-retinal fluid (SRF) suggestive of CSC. His visual acuity was declining even after being given oral spironolactone for 1 month, so he was scheduled for intravitreal injection Anti-Vascular Endothelial Growth Factor Therapy (Anti-VEGF). After three times in injection right eye the visual acuity improved. One month later he had a chief complaint of gradually blurred vision in his left eye. After three times in injection left eye, CSC in both eyes resolved and the visual acuity improved. Three years later he came back with a chief complaint on both eyes like three years ago.
Conclusion: Normally resolution of symptoms from CSC takes several months, treatment with anti-VEGF injection an efficient way to treat CSC resolution time and improve vision.
Keywords: anti-VEGF, bilateral CSC, OCT

ABSTRAK
Pendahuluan: *Central Serous Chorioretinopathy* (CSC) merupakan retinopati tersering keempat setelah degenerasi makula terkait usia, retinopati diabetik, dan oklusi vena cabang retina. CSC biasanya terjadi pada pria berusia 20-50 tahun yang menunjukkan kehilangan atau distorsi penglihatan sentral akut atau sub-akut, lebih banyak pada laki-laki daripada perempuan. Hal ini ditandai dengan pelepasan makula serosa yang terlokalisasi. Sebagian besar kasus sembuh secara spontan dan penglihatan normal dalam waktu 3 sampai 6 bulan, namun dalam beberapa kasus pengobatan dengan obat-obatan atau laser harus dipertimbangkan.
Kasus: Seorang laki-laki berusia 45 tahun datang dengan keluhan utama penglihatan kabur pada mata kanannya sejak 1 bulan yang lalu. Pemeriksaan *Optical Computed Tomography* (OCT) menunjukkan akumulasi cairan sub-retina yang diduga CSC. Ketajaman penglihatannya menurun bahkan setelah diberikan spironolakton oral selama 1 bulan, sehingga ia dijadwalkan untuk menjalani suntikan Intravitreal terapi Anti-VEGF. Setelah tiga kali penyuntikan mata kanan ketajaman penglihatannya membaik. Satu bulan kemudian penglihatan kabur pada mata kirinya. Setelah tiga kali penyuntikan pada mata kiri, CSC kedua mata teratasi dan ketajaman penglihatan membaik. Tiga tahun kemudian dia datang kembali dengan keluhan utama pada kedua matanya sama seperti tiga tahun lalu.
Kesimpulan: Perbaikan gejala pada pasien CSC terjadi dalam beberapa bulan, pengobatan dengan injeksi anti VEGF merupakan cara yang efisien untuk mengatasi gejala CSC dan meningkatkan penglihatan.
Kata Kunci: anti-VEGF, bilateral CSC, OCT

INTRODUCTION

Localized serous detachment of the macula, either with or without focal serous pigment epithelial detachment (PED), is the hallmark of CSC, a retinal condition. It mostly affects young men between the ages of 20 and 50. Bennet first used the phrase "central serous retinopathy" to refer to this illness, while Gass provided the pathophysiology. Albert V. Graefe initially identified this ailment as central recurring retinitis in 1866.[1-2]

The patient reports having blurry vision, distorted visuals, and items appearing smaller than they actually are. Within three to six months, the majority of cases end on their own. Sometimes CSC returns or lasts longer than six months. Macular degeneration, foveal atrophy, and RPE alterations are caused by chronic CSC. The need for early intervention can be indicated by the patient's or the pilot's visual demands for an early recovery, recurrent illness, a serious deterioration in vision persistent CSC in the other eye. Anti-VEGF and mineralocorticoid receptor antagonists have also been tested as treatments for cases that do not improve, in addition to laser photocoagulation and photodynamic therapy. [1-4.]

A treatment anti-VEGF has been suggested to lessen choroidal hyperpermeability. Studies on CSC have documented the effects of aflibercept, ranibizumab, and bevacizumab. Anti-VEGF medicines are not supported by either level 1 or level 2 evidence in CSC.[2-4] In this case study, anti-VEGF treatment was given for bilateral recurrent CSC.

CASE

A 45-year-old male came with a chief complaint of gradually blurred vision in his right eye since a month ago with metamorphopsia. He had a similar complaint 4 years ago but resolved spontaneously. He denied any symptoms of floaters, photopsia, metamorphopsia, micropsia, paracentral scotoma, and red eye. He had psychological stress and no history of trauma, surgery, or any medication use.

General examinations of this patient were within normal limits, with a high blood pressure of 170/80 mmHg. The left and right eyes have respective visual acuities of 0.9 Log 40 and 0.1 Log 70. Examinations of the anterior segments of both eyes were normal. Funduscopic examination of the right eye showed a round papil, flat retina, and decreased foveal reflex, of the left eye within normal limit.

Optical computed tomography (OCT) of the macula of the right eye showed an elevation of the neurosensory retina with an optically fluid accumulation with a central macula thickness of 587 μm, has a thick coat on its inner surface suggestive of CSC, OCT macula of the left eye showed no abnormality. The patient was then diagnosed with CSC in his right eye. He was given an aldosterone receptor antagonist (spironolactone) 1x25mg and was asked to come one month later for a follow-up.

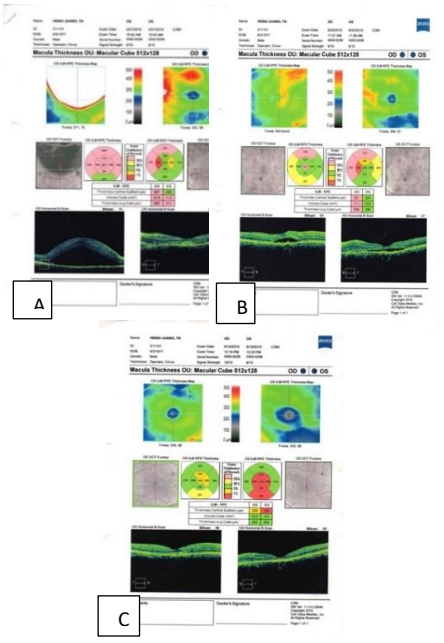

Figure 1. (A) Macular OCT before Injection Anti-VEGF, (B) Progressivity, and (C) After Anti-VEGF Treatment

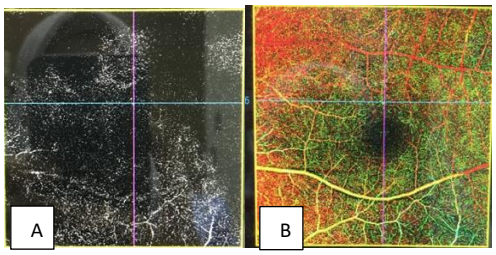

Figure 2. OCT-A (A) Avascular and (B) Depth Enconded, CNV scar appears

One month later, the patient arrived with worse vision in his right eye. The right eye's visual acuity was 0.9 log 35 and 0.1 log 70 for his left eye. Anterior and posterior segment examinations showed similar findings as one month prior. The patient was advised to schedule an injection of anti-VEGF right eye three times.

He complained of a blurry left eye three months later; on OCT left eye, there was an elevation of the neurosensory retina and sub-retina fluid accumulation, and he also scheduled injections of anti-VEGF in the left eye three times. Four months later, after getting anti-VEGF injections three times in both eyes, no elevation was seen on the OCT, and the patient was diagnosed with CSC; both eyes resolved. He was asked to follow up three months later.

The patient three years later, complained of blurry eyes 3 months ago, the visual acuity of the right and left eye were 0.3 Log 38 and 0.7 Log 19. Anterior segment examinations of both eyes were normal. Funduscopic examination of the right eye flat retina, cdr 0.6, cupping; left eye showed round papillae, flat retina, and decreased foveal reflex; suggested an OCT examination, OCT-A, and Fundus Fluorescein Angiography (FFA); he was given spironolactone 1x50 mg and consult to glaucoma unit for diagnosis confirmation, to be secondary glaucoma in the right eye. Two months later, the patient's visual acuity was 0,2 Log 45 and the left eye was 0,8 Log 12. Spironolactone was suggested to stop. Two months later, he was controlled for the visual acuity decrease in the right eye (0.01 log 45) and left eye (4/60); FFA showed chronic areas and new destruction; the patient was to be observed in 3 months.

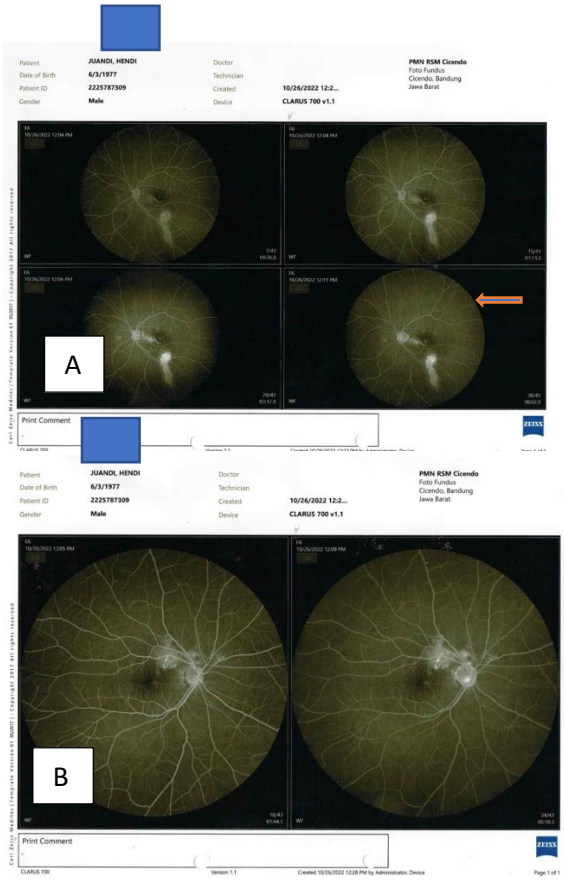

Figure 3. OS (A) and OD (B) leakage hyper fluorescence, chronic form of CSC exhibit many small leaks

DISCUSSION

A frequent eye condition called central serous chorioretinopathy is characterized by serous retinal detachment of the macular areas and destruction to the retinal pigment epithelium, which leads to RPE atrophy, neurosensory retinal separation, and serous pigment epithelium detachment (PED). Although CSC usually go away on their own, they can occasionally become persistent. Men are afflicted more commonly than women, and it typically affects young or middle-aged adults, ages 25 to 50. It is typically unilateral. CSC

usually manifests as a limited serous detachment of the neurosensory retina including the macula's area devoid of lipid exudates or subretinal blood. The sloping borders of the serous detachment gradually meld in with the normally attached retina of the posterior pole. It can occasionally be linked to one or more serous PEDs.[3,4]

Patients with CSC frequently report having blurry vision, usually in only one eye, and experiencing concomitant image distortion (metamorphopsia). This impaired vision is typically experienced as a black patch or scotoma in the center visual field. Compared to people under 50 (28.4%), those over 50% of cases of bilateral disease with RPE loss and choroidal neovascularization are more likely to affect 50 people. Additionally, according to Mohabati et al., 2018c and Otsuka et al. (2002), up to 84% of patients with severe cCSC exhibit bilateral disease activity and bilateral SRF accumulation. One of the main risk factors for these people with bilateral severe cCSC is significant vision impairment (Mohabati et al., 2018c; Mrejen et al., 2019). According to Mohabati et al., 2018c and Mrejen et al., 2019 patients with bilateral severe cCSC are quite likely to experience significant vision impairment. Approximately six times as many guys as females are affected by CSC. Caucasian, African American, and Asian groups all showed comparable rates of CSC. [2, 4, 8, 9] This patient, a 45-year-old man with bilateral CSC, is also male. These findings support the previously known prevalence of CSC.

Patients describe a range of symptoms, including the abrupt onset of blurred or dim vision, micropsia, metamorphopsia, paracentral scotoma, decreased color vision, and prolonged afterimages. Other common symptoms include mild dyschromatopsia (abnormal color perception), reduced contrast sensitivity, and micropsia (reduction of the apparent size of objects). CSC, however, might also show no symptoms. Individuals with CSC exhibit a wide range of visual acuity. Although visual acuity varies from 20/20 to 20/200, most patients have a greater level of vision than 20/30. A minor hyperopic correction can typically help with decreased visual acuity.[3-6] Patients in this study also experienced decreased vision, with also complained of metamorphopsia. Accumulation of subretinal fluid causing detachment of RPE was evident in this case.

CSC is often acute (aCSC), resulting in only one sickness episode over the patient's lifetime; but, it can also become chronic (cCSC) and recurrent. Thirty to fifty percent of patients will experience a recurrence of aCSC within a year; this can either spontaneously resolve again or result in ongoing vision impairment. On fluorescein angiography, acute CSC is typically unilateral and is characterized by one or more focal leaks at the level of the RPE. Five percent of cases are the chronic variety, also called Type II CSC. Because it depends on both the existence of prolonged RPE alterations and a temporal criterion (the length of the serous retinal detachment), the definition of cCSC may be a little unclear. Studies vary in the length of time beyond which CSC is deemed chronic; it can range from three to six months. When cCSC occurs, there is typically a bilateral diffuse abnormality of the RPE rather than focalized abnormality, which results in the chronic subretinal fluid. If the course of the disease lasts shorter than three months, CSC is said to as acute. Diffuse RPE leakage on fluorescein angiography is its defining feature.[2,4,7]

To diagnose CSC, a routine retinal exam is typically utilized. Optical coherence tomography (OCT) confirms the central shallow serous retinal detachment found during this examination. Fluorescein and/or indocyanine green (ICG) angiography, as well as optical coherence tomography angiography (OCTA), are used to rule out

alternative differential diagnoses and direct treatment, frequently performed. OCT can be useful in monitoring the resolution of chronic CSC patients. Bilateral choroidal thickening has been detected by enhanced depth imaging OCT technology. The look of an inkblot, the smokestack pattern, and a marginally growing patch are typical features of fluorescein angiography. Another method for ruling out subretinal neovascularization is fluorescein angiography. The CSC does not have a disk leak. When fundus fluorescein angiography (FA) is performed on individuals with CSC, hyperreflective areas on the infrared image coincide with the leaky areas on the FA. The ink blot appearance (31%), smokestack pattern (12%), and minimally growing spot (7%) are typical fluorescein angiography findings. Fundus autofluorescence (FAF) photography, which uses the stimulated emission of light from endogenous fluorophores—lipofuscin being the most important—provides functional images of the fundus at 488 nm.[10–12] The majority of individuals with central serous chorioretinopathy get excellent visual outcomes, and the condition typically cures on its own within two to three months. Currently, the standard of care for newly presenting cases is observation. Regarding acute, recurring, and chronic CSC in patients who are functionally monocular. There are two types of treatment: medicinal and laser therapy. Aspirin, intravitreal anti-VEGF injections, anti-adrenergic drugs, anti-corticosteroids, and other medications have all been used to treat CSC.[3-5,11] In this study the patient suggested an OCT examination, OCT-A, and Fundus Fluorescein Angiography (FFA) gradually to compare and evaluate.

Early anti-VEGF therapy for CSCR patients who exhibit apparent or suspected CNV. We also investigated the potential significance of anti-VEGF medication in the management of patients with CSCR who have apparent or suspected CNV. Studies have demonstrated that the following mechanisms contribute to the disruption of the outer blood-retinal barrier (BRB), impaired RPE drainage, involvement of inflammatory cells (macrophages, microglia), and release of pro-inflammatory mediators (VEGF, placental growth factor, interleukin-1 beta (IL-1β), intercellular cell adhesion molecule-1 (ICAM-1), and monocyte chemoattractant protein-1 (MCP-1)) are the factors that lead to the formation of SRF in CSCR coexisting putative or visible CNV. The rationale for anti-vascular endothelial growth factor (VEGF) application medicines is that choroidal disease may cause high VEGF levels. Studies have revealed that VEGF levels in CSCR patients and control patients are comparable, though. anti-VEGF that made use of bevacizumab, ranibizumab, and aflibercept. Anti-VEGF medication is beneficial for patients whose CSCR and concurrent choroidal neovascularization are verified by FA or OCT-angiography. Three suggested that anti-VEGF would be a viable treatment option for chronic CSC, one demonstrated that anti-VEGF helped treat acute CSC, and one proposed that anti-VEGF might be useful in treating both acute and chronic CSC. limits choroidal hyperpermeability by preventing vascular leakage in an efficient manner. Increased VEGF expression is frequently linked to choroidal hyperpermeability, even though patients with CSC do not have elevated VEGF levels in their aqueous humor. Numerous studies have shown that anti-VEGF medication therapy is successful in treating both acute and chronic CSC, with satisfactory functional short-term outcomes.[8, 11-14]

Sadda et al. use of mineralocorticoid receptor antagonists (eplerenone or spironolactone) has shown some benefit in anecdotal reports. However, a recent randomized placebo-controlled trial using eplerenone in chronic CSC demonstrated no benefit with the medication (25 mg/ day

for 1 week, increasing to 50 mg/day for up to 12 months).[2,10,11] The patient in this study had received spironolactone and anti-VEGF therapy. The sub-retinal fluid (SRF) resolved after the dose of anti-VEGF, so in this patient, CSC resolved post anti-VEGF did not resolve spontaneously. However, there was recurring three years after, The possibilities that can cause recurrence of CSC in this patient are longstanding hypertension, not maintaining lifestyle modification, and stress management.

Several laser treatments have been proposed to be the choice of treatment for CSC, such as focal argon laser photocoagulation, photodynamic therapy (PDT), and subthreshold micropulse laser photocoagulation. PDT may be used for sub-foveal or diffuse leaks in CSC. Laser photocoagulation therapy is no longer preferred for CSC, as secondary CNV occurred in the immediate postoperative period in up to 2% of eyes treated with this modality.[2, 3, 12,15]

This patient's prognosis is dubia ad bonam for quo ad functionam and quo ad vitam. The majority of cases of central serous chorioretinopathy are self-limited. Only observation and resorption of subretinal fluid can occur in 3 - 4 months. Vision improvement is usually directly proportional, but can reach 1 year. The prognosis of quo ad sanationam is dubia because the recurrence rate of this disease is quite high, reaching 40-50%.

CONCLUSION

A prevalent retinal illness, central serous chorioretinopathy has a high etiology, pathophysiology, and recurrence rate. The effects on the retina are often self-limiting, yet retinal pigment epithelium atrophy or gradual, irreversible photoreceptor damage might cause permanent vision loss in certain individuals. It is most strongly linked to hypercortisolism and is thought to be caused by secondary RPE dysfunction and choroidal hyperpermeability, which in turn produce serous retinal detachment. Individualized therapy appears to be the most effective therapeutic option for CSC etiology. The following recurring CSC, a large serous detachment, the patient's demands, a history of the fellow eye not responding well to initial surveillance, or recurrent CSC are some of the circumstances that may prompt early treatment. CSC is self-limiting, anti-VEGF medicine is a potentially effective alternate approach for treating persistent CSC.

REFERENCE

1. Kim SJ, Fawzi A, Kovach JL, Patel S, Recchia FM, Sobrin L, et al. 2022- 2023 Basic and Clinical Science Course, Section 12: Retina and Vitreous. In: Basic and Clinical Science Course. San Francisco; 2022. p. 215–21.
2. Sadda SR., Sarraf D., Freund K.B., Hinton DR., Scachat A.P., Wilkinson C.P., et al. RYAN'S RETINA Section 3: Choroidal vascular. ELSEVIER. Los Angeles; 2022. p. 1530-49
3. Gupta A, Tripathy K. Central Serous Chorioretinopathy. Statpearls NCBI Books. August 2022. 55:1-21
4. Hanumunthadu, Daren, Tan, Anna C S; Singh, Sumit Randhir; Sahu, Niroj Kumar; Chhablani, Jay. Management of Chronic Central Serous Chorioretinopathy. Indian Journal of ophthalmology. 2018;66(12):1704-1714
5. Van Rijssen TJ, van Dijk EHC, Yzer S, Ohno-Matsui K, Keunen JEE, Schlingemann RO, et al. Central serous chorioretinopathy: Towards an evidence-based treatment guideline. Progress in Retinal and Eye Research. 2019 Nov;73:100770.
6. Semeraro F, Morescalchi F, Russo A, Gambicorti E, Pilotto A, Parmeggiani F, et al. Central Serous Chorioretinopathy: Pathogenesis and Management. OPTH. 2019 Dec;Volume 13:2341–52.
7. Kido A, Miyake M, Tamura H, Hiragi S, Kimura T, Ohtera S, et al. Incidence of central serous chorioretinopathy (2011–2018): a nationwide population-based cohort study of Japan. Br J Ophthalmol. 2021 Jul 14; 319403: 74-9.
8. Alwassia AA, Adhi M, Duker JS. Bilateral simultaneous central serous chorioretinopathy in a teenage girl with systemic arterial hypertension. Int Ophthalmol. 2018 Feb;33(1):79–82.
9. Liew G, Quin G, Gillies M, Fraser-Bell S. Central serous chorioretinopathy: a review of epidemiology and pathophysiology. *Clin Experiment Ophthalmol*. 2018;41(2):201-141.
10. Gonçalves AN, Scott IU, Jorge R. Alternative management of central serous chorioretinopathy using intravitreal metoprolol. Int J Retin Vitr. 2022 Dec;8(1):50.
11. Zhang Y, Zhang J, Sun X. The Efficacy of Anti-VEGF Therapy for Putative or Visible CNV in Central Serous Chorioretinopathy by Optical

Coherence Tomography Angiography. Ahmadieh H, editor. Journal of Ophthalmology. 2022 Sep 28;2022:1–11.
12. Ji S, Wei Y, Chen J, Tang S. Clinical efficacy of anti-VEGF medications for central serous chorioretinopathy: a meta-analysis. Int J Clin Pharm. 2017 Jun;39(3):514–21.
13. Ammar Fardhana, Ansyori A, Amin R. Diagnosis and Management of Central Serous Chorioretinopathy. sjo. 2020 Jun 20;3(1):44–50
14. Mohabati D, Boon CJ, Yzer S. Risk of Recurrence and Transition to Chronic Disease in Acute Central Serous Chorioretinopathy. OPTH. 2020 Apr;Volume 14:1165–75.
15. Sartini F, Figus M, Nardi M, Casini G, Posarelli C. Non-resolving, recurrent and chronic central serous chorioretinopathy: available treatment options. Eye. 2019 Jul;33(7):1035–43.