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Case Report Open Access

Bilateral Chronic Central Serous Chorioretinopathy (CSCR) Induced by Long-Term Testosterone Treatment

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Abstract:

Purpose: We reported a rare case of bilateral chronic central serous chorioretinopathy (CSCR) induced by long-term exogenous testosterone treatment.

Method: A case report.

Result: A 52-year-old man with medical history of diabetes mellitus, hypertension, diabetes insipidus and hypogonadism presented to our ophthalmologic clinic with unstable blurred vision of right eye for more than 5 years and vision loss of left eye since childhood injury. Optical coherence tomography (OCT) showed subfoveal fluid in both of his eyes. Fluorescein angiography (FA) revealed fluorescein in multiple leaking points around the arcade area, which appeared hyperfluorescence not only in early phase but sustained fluorescein pooling till late phase in both eyes. According to his medical records, he received intramuscular testosterone injection every two weeks as treatment of hypogonadism for more than 10 years. His serum level of testosterone was higher than normal range. After focal photocoagulation in his right eye combined with decreasing frequency of testosterone intramuscular injection, the subfoveal fluid in both of his eyes totally resolved with vision improvement.

Conclusion: Testosterone related bilateral CSCR was rarely reported previously. It's very important to review patients' medical conditions and medications if there were unresolved or repeated episodes of bilateral CSCR.

Keywords: Chronic central serous chorioretinopathy; Testosterone; Androgen

Introduction

Chronic central serous chorioretinopathy (CSCR) is characterized by recurrent or persistent accumulation of transparent fluid below the neurosensory retina at the posterior pole leading to prolonged macular serous detachment for at least 6 months [1], whereas the recognition in recent clinical trials was 3 months [2,3]. Acute episodes of CSCR usually resolved spontaneously with a good visual prognosis, while chronic form, characterized by long-standing subretinal fluid accompanied with yellowish precipitates and wide-spread retinal pigment epithelium (RPE) atrophy, may end up with photoreceptors death and further permanent visual loss. RPE dysfunction or damage [4] itself worsens efficiently and completely reabsorption of chronic subretinal fluid.

CSCR is associated with various risk factors, which may elevate glucocorticoids level in the serum such as psychosocial stress, Type A personality, steroid strategy, Cushing syndrome, and pregnancy and which may affect androgen levels including male gender and middle age [5]. Furthermore, exogenous testosterone, one of the androgenic factors, may also be found the role of pathogenesis leading to CSCR in sporadic case reports [5-7].

We reported a rare case of bilateral chronic CSCR. The male patient was under long-term exogenous testosterone treatment due to hypogonadism for more than 10 years. After adjustment of the dose of exogenous testosterone, the serous subfoveal fluid in both eyes was completely resolved with vision improvement.

Case Report

A 52-year-old male patient with medical history of diabetes mellitus, hypertension, diabetes insipidus and hypogonadism was under regular medication treatment and follow-up for several years. He presented to our ophthalmologic clinic with unstable blurred vision of right eye for more than 5 years and vision loss of left eye since childhood injury. Tracing back to his ophthalmic medical records, his best-corrected visual acuity (BCVA) of right eye was 10/20 and left one was hand motion at his first ophthalmic visit 5 years ago. Optical coherence tomography (OCT) showed preretinal membrane with subfoveal fluid in his right eye and fovea thickness thinning with subfoveal fluid in his left eye.

Lost followed-up since then, he appeared again for still blurred vision of right eye. The vision in his right eye was declined to 6/20 and hand motion in his left one. Anterior segments were both within normal limits. Fundus showed some wrinkles around macula area in his right eye and macula mottling in both eyes with disc pale in his left eye. Some patches of RPE atrophy spread lower to the arcade retina with gravitational descending tracts in his left eye (Figure 1A). Fluorescein angiography (FA) revealed fluorescein leaked obviously from multiple points around the arcade area and peripapillary area. The hyperfluorescence appeared not only in the relatively early phase

(Figure 1B) but also sustained vigorously pooling till late phase in both eyes (Figure 1C).

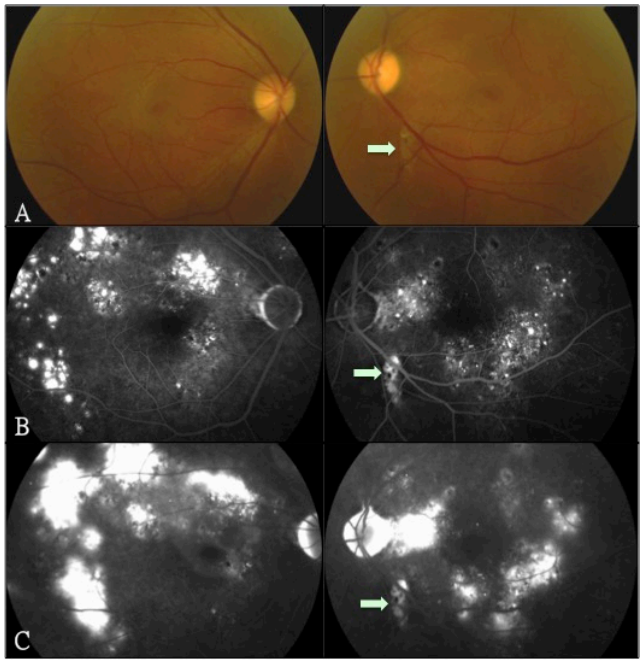

Figure 1: A Fundus showed some wrinkles around macula area in his right eye and macula mottling in both eyes with disc pale in his left eye. Green arrow indicates a small patch of RPE atrophy, gravity-induced descending tract. **B** FA presented obviously fluorescein leaking from multiple points around the arcade area in the relatively early phase. **C** In the late phase, fluorescein appeared vigorously pooling in both eyes.

OCT revealed subretinal fluid in both eyes with more fluid and distinct epiretinal membrane covered fovea in his right one (Figure 2). Focal photocoagulation at the leaking points of temporal retina around arcade was performed in his right eye. The subretinal fluid of right eye decreased gradually but did not resolved completely three months later (Figure 3) with vision of right eye improved to 10/20. However, the subretinal fluid of left eye remained the same as before.

Reviewing his medical records, he was given intramuscular injection of Testosterone (250 mg/ml) every two weeks for more than 10 years. Laboratory testing revealed a serum testosterone level of 16.00 ng/ml, which was higher than the normal range of 1.42-9.23 ng/ml. The frequency of Testosterone injection was adjusted from every two weeks to once a month in the next two months. The subretinal fluid of right eye totally resolved with vision of right eye advanced to 12/20 after 2 months. Simultaneously, the subretinal fluid of left eye also disappeared (Figure 4) with vision made better to counting finger. From FA, previous vigorous leaking ceased without pooling at late phase in both eyes (Figure 5).

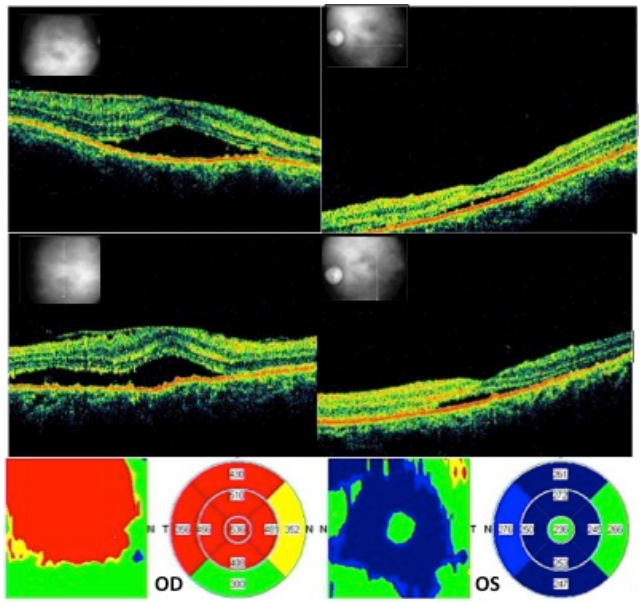

Figure 2: OCT revealed subretinal fluid in both eyes with more fluid and distinct epiretinal membrane covered fovea in his right eye.

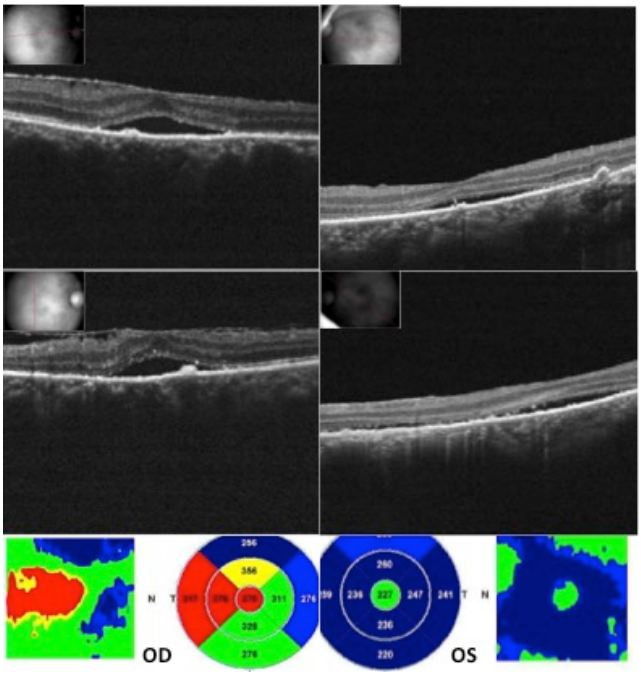

Figure 3: The subretinal fluid of right eye decreased but not totally resolved three months later. However, the subretinal fluid of left eye seemed the same as before.

His serum testosterone level declined to 9.84 ng/ml, which was around the high limit of normal range. He was kept following up for 3 months without any recurrent subretinal fluid in both eyes.

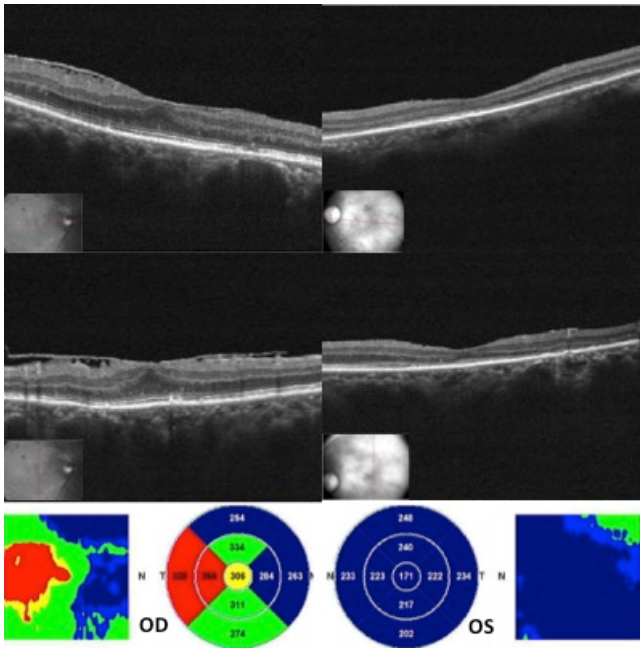

Figure 4: The subretinal fluid of right eye totally resolved 2 months later after adjustment of exogenous testosterone. Simultaneously, the subretinal fluid of left eye also completely disappeared.

Discussion

In 1965, Maumenne [8] first described about the leakage at the level of the RPE according to the FA. Gass [9,10] who detailed the fluorescein angiographic characteristics of CSCR then proposed that a focal increase in the permeability of the choriocapillaris was the primary cause of damage to the overlying RPE, which could produce detachment of the RPE, serous detachment and serofibrinous subretinal exudation. The hallmark of FA in CSCR is a single pinpoint leak with smokestack fluorescein pattern at the level of RPE in the early phase and keeps localized fluorescein pooling in the late phase. However, chronic CSCR with long-standing subretinal fluid and diffuse retinal pigment epitheliopathy (DRPE) which result in widespread RPE damage may present multiple pinpoint leaks with extensive fluorescein leakage around the arcade or peripapillary areas from FA. Additionally, clinical findings may include RPE atrophy with underlying choroidal vascular patterns, RPE pigment clumpings, and gravity –driven descending tracts [11].

Exogenous testosterone, one of the androgens, is known treatment for men with deficiency of testosterone such as hypogonadism through intramuscular injection, which may cause fluctuation of plasma testosterone levels. Although testosterone has never been directly implicated as a factor in the pathogenesis of CSCR, there was some case reports [5-7] in this decade proved that testosterone really plays a role in the development of CSCR. Laboratory evidence demonstrated that human RPE and mammalian choroidal cells possess androgen receptors and messenger RNA for 5α-reductase, the enzyme for conversion from testosterone to dihydrotestosterone (DHT), a more potent metabolite [12]. Testosterone also influences the expression of syndecan, an extracellular matrix receptor, which may be implicated in epithelial cell adhesion to the extracellular matrix [13]. Furthermore, testosterone is vasoactive hormone, which activates vasodilation in several vascular beds [14]. To sum up, exogenous testosterone may increase its plasma level to promote primarily choroidal blood flow and secondarily choroidal vessels permeability, which lead to the damage of RPE and further results into CSCR.

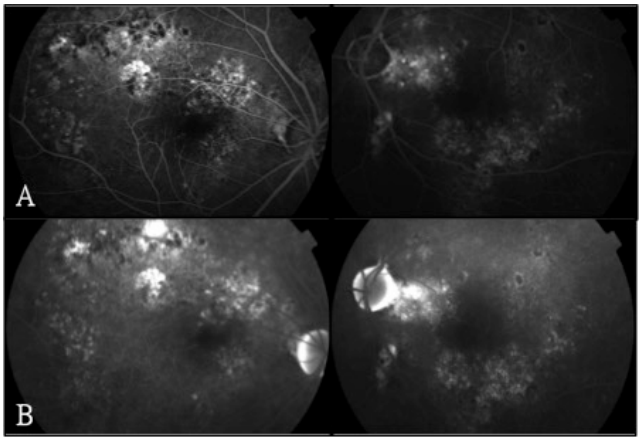

Figure 5: From FA, previously vigorous leaking ceased (A) without pooling at late phase (B) in both eyes. There was just fluorescein staining without leakage.

However, several studies have displayed that the serum testosterone level didn't elevate in cases of CSCR [15]. It is possible that testosterone might not be the main reason leading to CSCR in those cases. In contrast, our patient had a history of hypogonadism under exogenous testosterone treatment for more than 10 years with proof of higher serum testosterone level. Unlike previous case reports of acute CSCR [5-7], bilateral chronic CSCR in our case was confirmed according to the appearance of FA that multiple pinpoint leaks with extensive fluorescein leakage around the arcade or peripapillary areas in both eyes with gravity –driven descending tracts in his left eye. Before adjusting his exogenous testosterone injection frequency, his condition of bilateral CSCR remained in chronic form for 5 years. Even after focal photocoagulation at the leaking points over temporal retina in his right eye, the subretinal fluid did not resolved completely until we adjusted the frequency of exogenous testosterone injection. In conclusion, we reported a rare case of chronic CSCR induced by treatment of long-term exogenous testosterone. It's very important to review patients' medical conditions and medications if there were unresolved or repeated episodes of bilateral CSCR.

The authors have no competing or financial interests in this article.

Patient consent

Consent of the patient was obtained.

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