

Iron deficiency anemia presenting with central retinal vein occlusion and stellate figure in the macula

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Abstract: An 18-year-old woman complaining of visual disturbance in her left eye was referred to our hospital. The best-corrected visual acuity (BCVA) in the left eye was 0.6. Fundus examination revealed tortuous retinal veins and macular edema with stellate figure. Optical coherence tomography (OCT) showed that the macular thickness was increased to 539 μm . In addition, hyper-reflective substances were detected in the Henle fiber layer. On laboratory findings, she had iron deficiency anemia (IDA). Therefore, we diagnosed the condition as a central retinal vein occlusion (CRVO) caused by IDA. Systemic administration of elemental iron was initiated. The BCVA improved to 1.2, the macular edema dramatically resolved, and the macular thickness was reduced to 219 μm 1 month later. Changes in microstructural findings and visual acuity were analogous during recovery of macular edema in our patient. We should be aware of IDA for young female presented CRVO.

Keywords: Iron deficiency anemia, Central retinal vein occlusion, Macular edema, stellate figure in the macula, Optical coherence tomography.

INTRODUCTION

Central retinal vein occlusion (CRVO) is most commonly seen in older patients. CRVO in young adults is occasionally associated with systemic diseases such as hypertension, diabetes, hyperlipidemia, and hematological abnormalities [1, 2]. A stellate figure in the macular region (macular star) is found in many conditions [3]. The combined signs of macular star, vessel caliber changes, and hemorrhages may indicate hypertension, diabetes, papilledema, optic neuritis, or chronic nephritis, depending on the patient. The spokes in the wheel of the exudate extending from the macular hub may be sparse or numerous, thin lines or broad elevated exudates. All exudate lines become fine dots before complete absorption. Several reports have described CRVO in patients with iron deficiency anemia (IDA) [4-8], but reports describing CRVO with macular star are extremely rare [8]. Trivedi *et al.*; [8] firstly described a 16-year-old girl with IDA presented as preretinal hemorrhages with macular star. Furthermore, several reports in the literature have

described a stellate figure with CRVO [1-3], but reports describing CRVO with a stellate figure in the macula as examined by optical coherence tomography (OCT) are extremely rare [9]. Herein, we report a case of CRVO with stellate figure in the macula in an 18-year-old woman with IDA

CASE REPORT

An 18-year-old Japanese woman complaining of a 1-week history of visual disturbance in the left eye was referred to our hospital. Her personal and family histories were unremarkable. On ophthalmic examination, the best-corrected visual acuity (BCVA) in the right eye was 1.2 and the acuity in the left eye was 0.6. The ocular pressures were normal. Slit lamp examination did not reveal abnormalities in either anterior segment. Fundus examination revealed tortuous retinal veins and macular edema with stellate figure in the left eye (Figure 1B). In contrast, no abnormal findings were observed in the right eye (Figure 1A).

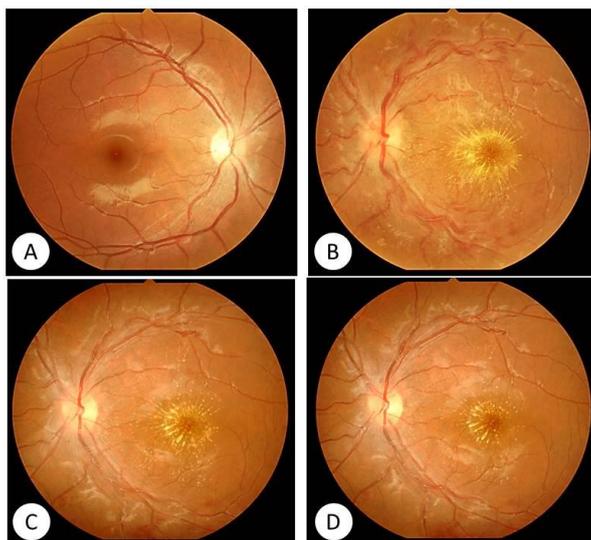


Fig 1: Fundus photographs of the right (A) and left (B - D) eyes (A, B: initial visit, C, two weeks after the initial visit, D: one month after the initial visit)

Fluorescein angiography demonstrated marked hyper fluorescence of the retinal veins and optic disc in the left eye (Figure 2A, B).

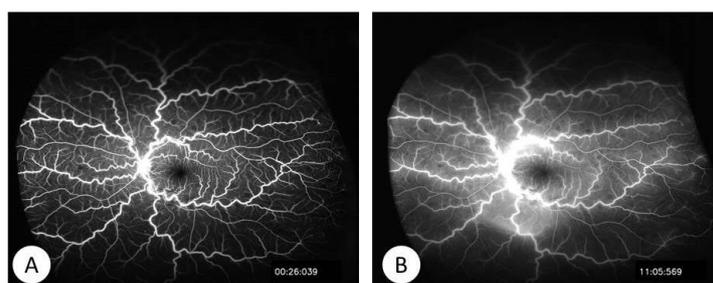


Fig 2: Left fluorescein angiography (A: early phase, B: late phase)

Note marked hyper fluorescence of the retinal veins and optic disc (B). OCT revealed increased macular thickness (539 μm) and hyper-reflectivity in

the outer plexiform layer. Furthermore, hyper-reflective substances were detected in the Henle fiber layer (HFL) (Figure 3B, arrows).

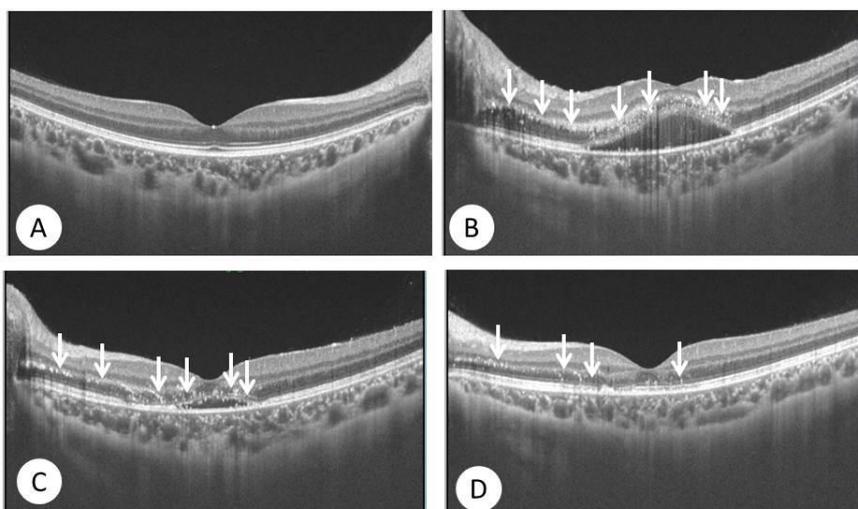


Fig 3: OCT images of the right (A) and left (B - D) eyes (A, B: initial visit, C, two weeks after the initial visit, D: one month after the initial visit)

On blood laboratory findings, a complete blood count showed IDA, with hemoglobin of 6.2 g/dL, hematocrit of 21.7%, MCH of 15.5 pg, serum iron of 10mg/dL, iron binding capacity of 460 mg/dL, and ferritin of 3.0 ng/ml. We diagnosed the condition as a CRVO due to IDA. The patient was started on elemental iron (100mg daily) as oral tablet. The BCVA improved to 0.8, the retinal edema dramatically reduced, and the macular thickness was reduced to 279 μ m two week later (Figure 3B). The BCVA recovered to 1.2, the stellate figure showed gradual improvement one month later (Figure 1C and D), and the hyper-reflective substances detected in the HFL had transformed to fine dots (Figure 3C and D, arrows), and the macular thickness was reduced to 219 μ m.

DISCUSSION

Although CRVO in young adults is occasionally associated with a systemic disease, the cause is unknown in the vast majority of cases. In the largest case series analysis of CRVO in young adults, Fong *et al.*; [2] evaluated 102 patients. According to their report, no medical problems were found in 49 patients (48%). In contrast, associated systemic diseases were noted in 52 patients. Of the 52 patients, 26 had hypertension, 8 had heart disease, and 6 had hyperlipidemia. Anemia was found in only 3 patients.

Several reports have described CRVO in patients with IDA [4-8], but reports describing CRVO with macular star are extremely rare [8]. Trivedi *et al.*; [8] firstly described a 16-year-old girl with IDA presented as preretinal hemorrhages with macular star. Interestingly, the present case highlights the fact that macular edema may result from CRVO. From the point of view of retinal exudates, Fong *et al.*; [1] described that the presence of an exudate in young adults with CRVO appears to indicate a better prognosis for visual outcome. The reason for the better prognosis may be that the macular exudate indicates both some reabsorption of fluid and some degree of CRVO resolution. In our patient, the BCVA recovered to 1.2 and the stellate figure showed gradual improvement one month after administration of elemental iron.

Reports describing CRVO with a stellate figure in the macula as examined by OCT are extremely rare [9]. We previously reported that the hyper-reflective substances corresponding to a hard exudate in the Henle fiber layer (HFL) following improvement of macular edema were detected on OCT. Similarly, changes in microstructural findings and visual acuity were analogous during recovery of macular edema in this present patient. OCT was useful for demonstrating macular edema visualization as well as localization of hard exudates in the HFL in a patient with a stellate figure in the macula. Finally, we should be aware of IDA for young female presented CRVO.

DISCLOSURE

No conflicts of interest are declared in relation to this paper.

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