A Presentation of Megaloblastic Anemia: Retinal Hemorrhages

Megaloblastik Anemi Olgu Sunumu: Retinal Kanamalar

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ABSTRACT

A 27-year-old woman with blurred vision in her right eye was evaluated. She was on a strict vegetarian diet for a long time. She had bilateral retinal hemorrhages. The patient was diagnosed with megaloblastic anemia according to laboratory studies. After treatment with intramuscular B12 supplement, dramatic resolution of retinal hemorrhages and improvement in visual acuity was observed.

Keywords: Megaloblastic anemia, retinal hemorrhages, vitamin B12.

ÖZ

Sağ gözde görme bulanıklığı olan 27 yaşındaki bir kadın değerlendirildi. Uzun zamandır sıkı bir vejetaryen diyetindeydi. Bilateral retinal kanamalar mevcuttu. Laboratuvar sonuçlarına göre hastaya megaloblastik anemi tanısı konuldu. İntramüsküler B12 takviyesiyle tedavi sonrasında, retinal kanamalarda dramatik çözülme ve görme keskinliğinde düzelme gözlendi.

Anahtar kelimeler: Megaloblastik anemi, retinal kanamalar, vitamin B12.

INTRODUCTION

Megaloblastic anemia results most often from deficiencies of vitamin B_{12} and folate, which causes ineffective erythropoiesis. Deficiency of vitamin B12 or folate result a defect in DNA synthesis and of abnormally large red blood cells formation occurred as a result. Since DNA synthesis impaired, cell maturation become defective and more mature RBC precursors are destroyed in the bone marrow prior to entering the blood stream. Immature cell precursors entering blood stream, which cause large and dysfunctional cells, become apparent in blood stream.[1-3] In the present study, the involvement of retina was assessed due to megaloblastic anemia in a female patient. The study was conducted in accordance with the principles of the Declaration of Helsinki, and medical ethics committee approval was received. Written informed consent was obtained from the participant.

CASE

A 27-year-old woman admitted to Emergency Room (ER) with blurred vision in her right eye, which was started one day ago. The corrected visual acuities (VA) were 20/200, OD and 20/20, OS. Ophthalmic examination revealed bilaterally pale tarsal conjunctiva, discretely icteric bulbar conjunctiva and widespread superficial and premacular hemorrhages were present in both fundi and with foveal involvement in right eye (Figure 1; with Digital Fundus Camera Canon CF-60DS, Canon Inc., New York, NY). Fluorescein angiography confirmed the superficial nature of the retinal hemorrhages, and no neovascularization was identified. Optical coherence tomography (OCT: Cirrus model HD-OCT 4000, software version 5.1.1.6; Carl Zeiss Meditec, Inc, Dublin, CA) imaging revealed a retinal thickening caused by sub-internal limitan membrane (ILM) accumulation of hyperreflective deposits, which was evaluated as sub-ILM hemorrhages. (Figure 2)

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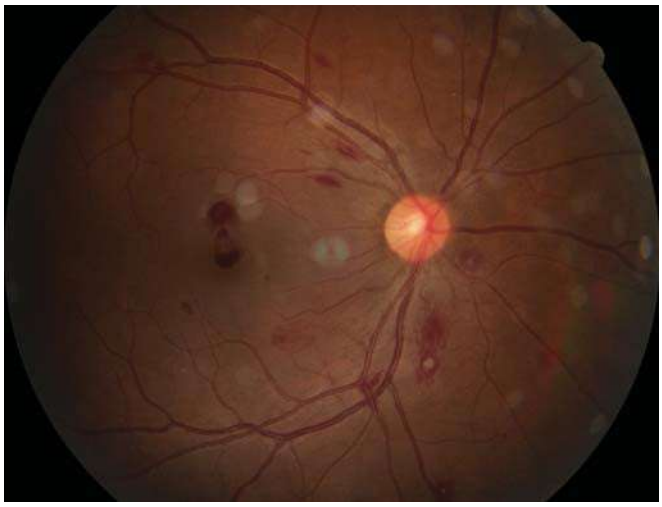

Figure 1. *Retinal hemorrhages in right eye with foveal involvement and also there are two Roth spots.*

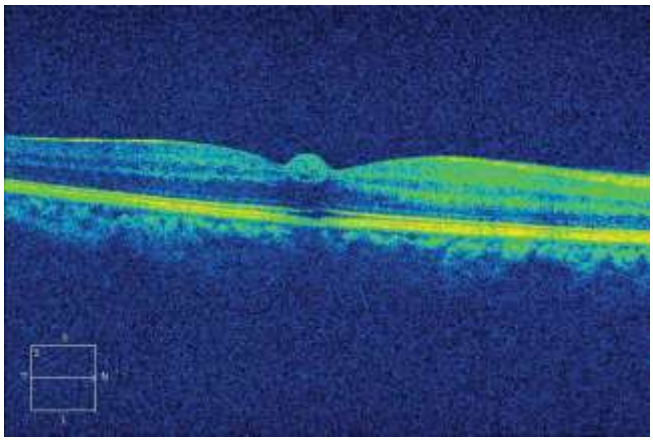

Figure 2. *Sub-internal limitan membrane (ILM) accumulation of hyperreflective deposits in optical coherence tomography (OCT)*

In addition, preceding these symptoms, she complained also marked lethargy and burning sensation in the lower limbs, angina pectoris, fatigue and dyspnea. She was on a strict vegetarian diet since she was 12 years old. History of patient and findings of ophthalmologic examination cause suspicion of a possible anemia.

Immediate laboratory work-up showed: megaloblastic anemia caused by vitamin B12 deficiency with Hb 3.68 g/dl↓↓, Hct 10.9%↓↓, MCH 42.3 pg↑, MCV 122.3 fl↑, thrombocytes 124 × 10^9/l↓↓, vitamin B12 <30 pmol↓↓, folate 4.6 µg/l, bilirubin 2.12 mg/dl↑, γ-GT 365 U/l↑, D-dimer 2,520 µg/l↑, LDH 6281 U/l ↑↑↑, AST 102 U/l ↑,ALT 53U/l ↑,CRP and ESR normal.

Because of life-threatening condition, patient was consulted to the department of internal medicine and hematology respectively. Immediately three unite of erythrocyte suspension admitted and subsequent causal therapy with intramuscular vitamin B12 supplements resulted in resolution of the retinal changes and the megaloblastic anemia with subsequent rise in VA. Both the megaloblastic anemia and retinal changes resolved promptly after she received adequate 3-month treatment.

DISCUSSION

It is known that beside thrombocytopenia there is also platelet dysfunction in megaloblastic anemia, which is resulted with bleeding diathesis.[4] It has been found that platelet response to agonists like adenosine diphosphate (ADP), restocetin and epinephrine is significantly decreased in vitamin B 12 deficiency indicating defect in platelet aggregation, which improves on vitamin replacement.[5] Severe anemia, (hemoglobin < 8 g/dL), can cause retinal hemorrhages. Bleeding manifestations were seen in patients with severe anemia and thrombocytopenia, especially in those with combined deficiency.[6, 7] Occurrence of bilateral retinal hemorrhages due to megaloblastic anemia with thrombocytopenia has been reported in a 33-year- old chronic alcoholic patient with both vitamin B12 and folate deficiency and in a 17- year old pure vegetarian patient with vitamin B12 deficiency.[8, 9]

Retinal hemorrhages in heavy anemia have been described as ‘flame shaped’ hemorrhages that occur within nerve fiber layers, ‘round’ or ‘dot’ hemorrhages that are found deep in the outer retinal layers. A Roth spot, seen most commonly in acute bacterial endocarditis is a red spot (caused by hemorrhage) with a characteristic pale white center and this white center usually represents fibrin-platelet plugs.[10] A Roth spot can be seen in leukemia, diabetes, intracranial hemorrhage, hypertensive retinopathy, subacute bacterial endocarditis and in HIV retinopathy.[11] The pathogenesis of retinopathy in severe anemia in a patient with vitamin B12 deficiency could be due to hypoxic injury to the vascular endothelium causing increased permeability, capillary leakage and intra-retinal bleed.[12]

The present case highlights occurrence of retinal hemorrhages in a 27 years-old patient with vitamin B12 deficiency. Our patient who is without any history of trauma or bleeding dyscrasias but a pure vegan with evidence of vitamin B12 deficiency presented with bilateral retinal hemorrhages. The initial platelet count in our patient was 124 × 10^9/l and this by itself would not usually result in a retinal bleed unless there is an associated severe anemia or platelet dysfunction due to cobalamine deficiency.

In conclusion, vitamin B12 deficiency is an important and easily treatable cause of retinal and sub-hyaloid hemorrhage, which is reversible and easily treatable.

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