Clinical and treatment approach to Eales' disease in Northeast Brazil

Clínica e tratamento de doença de Eales no Nordeste do Brasil

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ABSTRACT

Eales' disease is an idiopathic peripheral vascular occlusive disease characterized by inflammation, ischemia, and abnormal retinal vascularization. It primarily affects healthy young adults and typically manifests bilaterally. Diagnosis is mainly clinical; however, it requires exclusion of other systemic infections and ocular conditions. Recurrent vitreous hemorrhage is a hallmark of this condition. Early treatment significantly improves visual prognosis. Herein, we report a case series of patients diagnosed in Northeast Brazil.

RESUMO

A doença de Eales é uma vasculopatia idiopática oclusiva periférica caracterizada por inflamação, isquemia e vascularização retiniana. Afeta principalmente jovens saudáveis e frequentemente é bilateral. O diagnostico é clínico, entretanto, requer exclusão de outras doenças sistêmicas, infecciosas e oculares. A hemorragia vítrea recorrente é sua apresentação principal. O prognostico visual é bom, se tratado precocemente. Reportamos aqui uma série de casos diagnosticados no Nordeste do Brasil.

INTRODUCTION

Eales' disease (ED) was first described in 1880 and initially observed in seven young males. Globally, it exhibits a male-to-female ratio of 20:1.[1] The disease affects the peripheral retinal vasculature, leading to retinal non-perfusion, ischemia, neovascularization, and vitreous hemorrhage.[2] It is characterized by recurrent vitreous hemorrhage, and associations with various diseases, particularly tuberculosis, have been noted. Herein, we report a case series of four patients with ED who presented with a vitreous hemorrhage. Although ED is diagnosed through exclusion, it necessitates evaluating both ocular and systemic conditions, including infections and systemic diseases. This series reports cases diagnosed in Northeast Brazil.

CASE REPORTS

We evaluated eight eyes of four patients diagnosed with ED. We ruled out systemic diseases that can cause retinal vasculitis including sarcoidosis, systemic lupus erythematosus, diabetes mellitus, sickle cell disease. Infectious diseases, such as tuberculosis, syphilis, and toxoplasmosis were investigated as well. A comprehensive history, examination, and complete serum workup were conducted for all patients. Best-corrected visual acuity, biomicroscopy, fundoscopy, fluorescein angiography and optical computed tomography (OCT) were performed for each patient.

Case 1

During a routine visit, a 37-year-old woman reported a diagnosis of "bilateral peripheral occlusive vasculopathy" that had been present for 4 years. She had no relevant medical history. On examination, her best-corrected visual acuity (BCVA) was 20/20 in both eyes (OU), and anterior segment examination revealed no abnormalities. Intraocular pressure (IOP) measured 14 mmHg in OU. Fundoscopy showed bilateral vitreous hemorrhage. Fuorescein angiography identified active retinal neovascularization in the periphery of the left eye (OS). Laboratory investigations yielded normal results. She underwent bilateral laser photocoagulation treatment. Six months later, the right eye (OD) remained stable, while neovascularization persisted in the OS. Additional laser and anti-vascular endothelial growth factor (VEGF) injection were administered in the OS. Two years after treatment initiation, her visual acuity remained normal (Figure 1).

Case 2

A 52-year-old male presented with sudden visual loss in his OD and sought ophthalmological consultation. His medical history was unremarkable. Best-corrected visual acuity was 20/20 in the OD and hand movements in the OS. Biomicroscopy revealed no abnormalities, and IOP was 12 mmHg in OU. Fundoscopy of the OD showed sheathing of vessels in the peripheral retina, while the OS exhibited vitreous hemorrhage. Fluorescein angiography indicated dye leakage surrounding veins in the peripheral retina of the OD. The diagnosis of ED was made. Treatment for the OS included one intravitreal injection of anti-VEGF, vitrectomy, and laser photocoagulation. The OD was monitored without immediate intervention. One year later, BCVA remained 20/20 in the OD and improved to 20/25 in the OS (Figure 2).

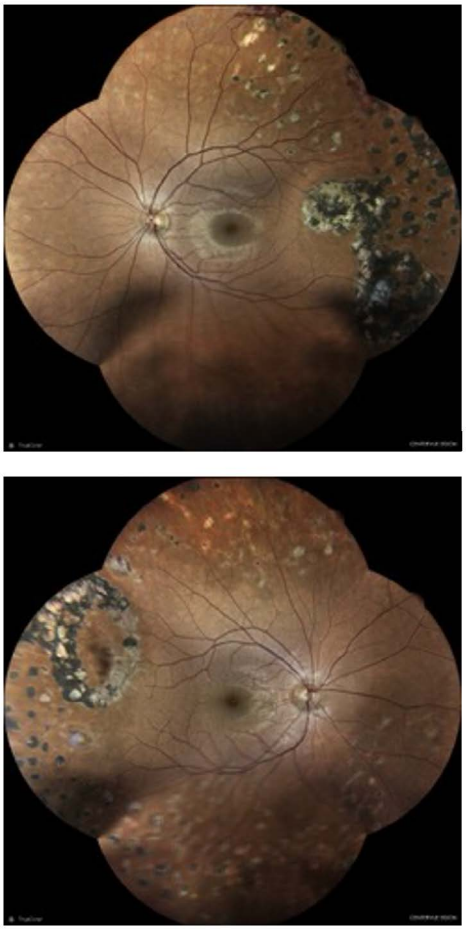

Figure 1. Fundus images after treatment showing the lasers scars.

Case 3

A 28-year-old male presented with complaints of reduced vision, redness, and pain in his OD. He had no relevant medical history. On examination, BCVA was light perception in the OD and 20/60 in the OS. Anterior segment examination of the OD showed 2+ flare and +4 cells, with

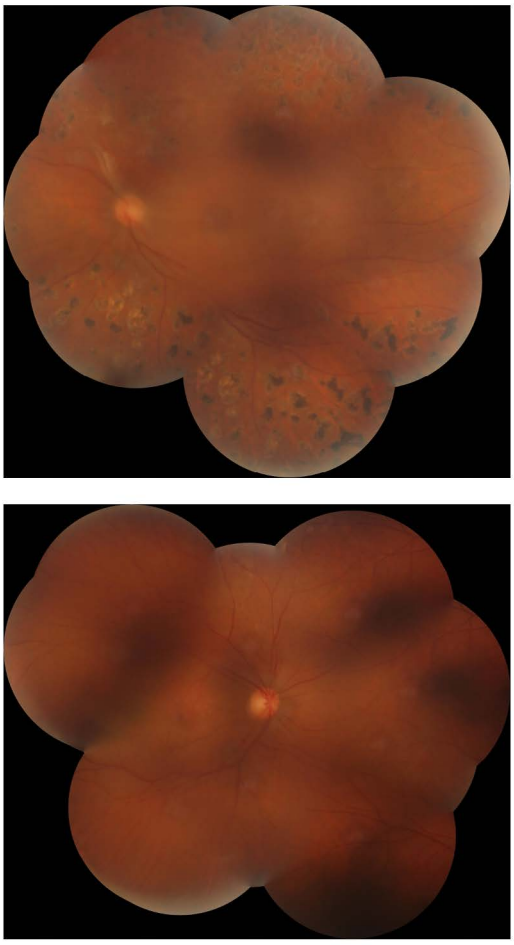

Figure 2. Color retina images showing laser scar in the left eye.

pupillary seclusion noted, while the OS revealed +2 flare and +4 cells. Ocular pressure measured 14 mmHg in OU. Fundus examination of the OD indicated retinal detachment and neovascularization in OU. Fluorescein angiography confirmed active retinal neovascularization in the OS. The patient was diagnosed with ED associated with pulmonary tuberculosis. Owing to the complexity of retinal detachment in the OD, no immediate treatment was pursued. Treatment for the OS included laser photocoagulation. However, one month later, the patient returned with vitreous hemorrhage in the OS. Therefore, he underwent phacoemulsification, anti-VEGF intravitreal injection, vitrectomy, and additional laser photocoagulation. At the 4-month follow-up, visual acuity remained 20/60 in the OS with no signs of neovascularization.

Case 4

A 31-year-old male presented with complaints of reduced vision in OU. He reported diminished visual acuity in the OD due to retinal vasculitis over the past year, for which he had received treatment including intravitreal anti-VEGF injection and vitrectomy owing to retinal detachment. During treatment, the patient developed retinal vasculitis in the OS and underwent laser photocoagulation. He had no other comorbidity. On examination, his best-corrected visual acuity was light perception in the OD and 20/30 in the OS. Biomicroscopy revealed no abnormalities, and IOP measured 14 mmHg in OU. Fundoscopy of the OD showed total tractional retinal detachment, while the OS revealed neovascularization and tractional fibrous proliferation. Fluorescein angiography confirmed active neovascularization in the OS. Eales' disease was diagnosed, and laser photocoagulation was performed in the OS, while no immediate treatment was pursued for the OD because of the complexity of the retinal detachment. He later presented with subtle vitreous hemorrhage in the OS, prompting further intervention including anti-VEGF injection, vitrectomy, and additional laser photocoagulation. One year later, visual acuity remained stable in OU.

DISCUSSION

In 1880, Henry Eales, a British ophthalmologist, first described ED. A male-to-female ratio of 20:1 has been reported worldwide. The mean age at presentation is 29.9 years (range: 11-59 years). It is more prevalent in India and Middle Eastern countries, with cases reported worldwide. Patients may also have a history of epistaxis, chronic constipation, headache, or alterations in peripheral circulation.[1] Eales' disease is a form of bilateral occlusive periphlebitis affecting healthy young males. Although ED is primarily diagnosed through exclusion, it requires evaluation of ocular and systemic conditions. Eales' disease has a wide spectrum of clinical presentations. The initial symptoms are often bilateral decreased vision, photopsia, and floaters. Visual acuity may range from 20/20 to light perception. Eales' disease may present with non-granulomatous uveitis, rubeosis iridis, and neovascular glaucoma. Vitreous hemorrhage is a hallmark of this disease. Additional findings include perivascular venous sheathing, exudates, capillary non-perfusion, retinal detachment, and neovascularization. In severe cases and late stages, macular edema may also occur.[3] Recent studies have proposed immunological, molecular, biological, and biochemical mechanisms that theorize free-radical-mediated damage and oxidative stress, human leukocyte antigens, retinal autoimmunity, and the potential role of *Mycobacterium tuberculosis* infection. The etiology seems to be multifactorial and is presumed to be an immunological response triggered by exposure to an exogenous

agent.[4] The most prevalent etiological theory is hypersensitivity to tuberculoprotein. Vasculitis in ED is believed to be a hypersensitivity response.[5] Differential diagnoses range from autoimmunity-related causes of retinal phlebitis to infectious diseases. Eales' disease is diagnosed by excluding other conditions. Fuorescein angiography plays a crucial role in detecting and monitoring this disease. Widefield fluorescein angiography is recommended because of its ability to visualize the peripheral retina, where ED predominantly affects retinal vasculature, aiding in early disease detection. OCT is valuable for evaluating macular status, particularly in detecting macular edema at various disease stages. Laboratory tests are neither sensitive nor specific for ED.

Saxena et al. propose a new classification system for ED: stage 1: (1a) periphlebitis of small caliber vessel with superficial retinal hemorrhages, (1b) periphlebitis of large caliber vessels with superficial retinal hemorrhages; stage 2: (2a) capillary non-perfusion, (2b) neovascularization elsewhere or of the disc; stage 3: (3a) fibrovascular proliferation, (3b) vitreous hemorrhage; stage 4: (4a) traction or combined rhegmatogenous retinal detachment, (4b) rubeosis iridis, neovascular glaucoma, complicated cataract, and optic atrophy.[6] The management of ED depends upon the stage of the disease. It includes no treatment, use of oral or periocular steroids in the perivasculitis stage, and anti-VEGF intravitreal injections and laser photocoagulation in the proliferative stage. Vitreous surgery is indicated for non-resolving vitreous hemorrhage and retinal detachment.[7,8] Anti-tuberculosis treatment is administered when tuberculosis is suspected or confirmed. The prognosis of ED is good with appropriate treatment. In our case series, the final visual acuity outcomes were as follows. Cases 1 and 2 achieved normal visual acuity, specifically 20/20 and 20/25, respectively. In cases 3 and 4, one eye in each case had light perception owing to retinal detachment, while the other eye had visual acuities of 20/60 and 20/30, respectively. The average follow-up duration was 13 months. Regarding demographic characteristics, males accounted for 75% of the cases in our series, which aligns with the literature (71 to 100%). Bilateral involvement was observed in all cases (100%) in our series, consistent with the reported literature (72 to 90%). Presenting symptoms included vitreous hemorrhage in two cases and retinal neovascularization in the other two cases. Literature emphasizes vitreous hemorrhage as a hallmark feature of ED.

Eales' disease is a bilateral vasculitis that mostly affects healthy young males who present with vitreous hemorrhage. It is primarily diagnosed through clinical exclusion, as it lacks a specific and conclusive diagnostic test. However, treatment protocols involving anti-VEGF, laser photocoagulation, and vitrectomy, when indicated, are well-established and typically lead to a good prognosis. Early initiation of treatment is crucial for achieving favorable prognosis.

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