Abstract

Purpose: To report the case of a patient with persistent vitreous hemorrhage in the right eye (RE) caused by occlusive retinal vasculitis secondary to tuberculosis.

Methods: Male patient, 35 years old, with Indian ancestry, no history of previous systemic illness. First presented to our outpatient clinic with decreased visual acuity in the RE, lasting eight months. On exam, best-corrected visual acuity (BCVA) RE was <5/200 and BCVA in the left eye (LE) was 20/20. Keratic precipitates were visible and anterior chamber flare was described as 1+; extensive vitreous hemorrhage was present precluding fundus observation. Fundus fluorescein angiography (FFA) performed on his LE was normal. He was started on topical steroids and submitted to pars plana vitrectomy plus intraoperative retinal photocoagulation on his RE for peripheral retinal ischemia.

Results: Post-surgery exam, BCVA in the RE was 20/100 and the LE was 20/20, no anterior chamber reaction bilaterally. Macular edema with exuberant vascular tortuosity and “phantom” vessels in RE. FA confirmed active occlusive vasculitis on the RE. Diagnostic workup was positive for a 28mm induration tuberculin test, supporting the diagnosis of ocular tuberculosis. The patient was started on anti-tuberculosis medication. Three months later, BCVA in the RE was 20/25 with no anterior chamber reaction in both eyes. Eighteen months later, the patient maintains good bilateral visual acuity without any evidence of disease reactivation.

Conclusions: In the described clinical case, there was a good response after anti-tuberculosis treatment not associated with oral corticosteroid therapy, with improved visual acuity and remission of inflammatory angiographic signs, stressing the importance of searching tuberculosis etiology in cases of retinal vasculitis.

Keywords: Vitreous hemorrhage, retinal vasculitis, ocular tuberculosis, anti-tuberculosis therapy.

INTRODUCTION

Ocular tuberculosis has an incidence of 1 to 2%, with a varied clinical presentation, which includes granulomatous uveitis, choroiditis, choroidal granuloma, and panuveitis. Retinal vasculitis is a form of tuberculosis presentation involving primarily retinal veins in an occlusive pattern.1,2

we report here the case of a patient with a persistent vitreous hemorrhage in the right eye secondary to occlusive tuberculosis retinal vasculitis.

CASE REPORT

Male patient, 35 years old, with Indian ancestry, with no history of previous systemic illness. First presented to our outpatient clinic with a two years history of decreased visual acuity (VA) in the RE. He has been treated for idiopathic retinal vasculitis without definitive diagnosis with oral prednisolone (80 mg/day) for two months with no improvement. He reported severe deterioration of VA RE during the last eight months. On ophthalmic examination: best corrected visual acuity (BCVA) in the RE was <5/200 and in the left eye (LE) 20/20; granulomatous endothelial keratic precipitates and anterior chamber flare 1+
in the RE; extensive vitreous hemorrhage in the RE, precluding fundus observation (Figure 1).

Fundus fluorescein angiography (FFA) was performed for the study of the contralateral eye, which revealed no alterations. The patient was treated with topical corticosteroid and submitted to pars plana vitrectomy (PPV) because of dense vitreous hemorrhage plus intraoperative retinal photocoagulation in the RE, applied to areas of retinal ischemia with associated neovascularization.

Two weeks after surgery, the patient had BCVA in the RE of 20/100 and the LE of 20/20, no inflammation in the anterior segment OU, but showed macular edema in the RE, with vascular tortuosity and "phantom" vessels (Figures 2 and 3).

The FFA confirmed an active occlusive vasculitis in the RE, with venous contrast diffusion, also present in the optic disc (Figure 4). Ancillary tests revealed a positive Mantoux test with a 28mm induration area.

Data from the ophthalmological examination, coupled with the positive Mantoux test, strongly suggested the diagnosis of ocular tuberculosis. The patient started antibiotic therapy: isoniazid (H) + rifampicin (R) + pyrazinamide (Z) + ethambutol (E) - HRZE for 2 months and HR for 10 months. Three months after starting anti-tuberculosis therapy, the patient presented BCVA in the RE 20/25 and remission of inflammatory activity confirmed by FFA and optical coherence tomography (OCT) (Figures 5 and 6).

Eighteen months after the termination of the anti-tuberculosis therapy, patient maintains good VA OU without any evidence of disease reactivation.

**DISCUSSION**

We describe a clinical case of occlusive retinal vasculitis complicated by retinal neovascularization and vitreous hemorrhage of tuberculosis etiology. The patient initiated anti-tuberculosis therapy and showed clinical improvement and no sign of reactivation 18 months after the treatment.

Although ocular tuberculosis does not present pathognomonic lesions, some signs during ophthalmic examination may be considered indicators of this etiology. In the presence of anterior granulomatous uveitis, multifocal/serpiginous choroiditis, choroidal nodules or retinal vasculitis, tuberculosis should be regarded as a probable cause. In a retrospective study, Gupta et al analyzed the ophthalmological findings of 386 patients diagnosed with uveitis and concluded that the presence of retinal vasculitis, as well as broad-based posterior synechiae and serpiginous choroiditis, was significantly more frequent in patients with tuberculosis uveitis.

The mechanisms of ocular involvement in tuberculosis include bacillary invasion and immunological changes (type IV hypersensitivity reaction) responsible for inflammatory processes. Retinal vasculitis may represent a hypersensitivity
response to *M. tuberculosis* or be secondary to direct infection by Koch's bacillus. Retinal vasculitis secondary to tuberculosis mostly affects the veins and, rarely, the arteries. Clinical features include vitritis, retinal hemorrhages, retinal neovascularization, and neuroretinitis.\(^2\)\(^3\) In a 2001 study, Gupta et al\(^4\) reported the clinical features of 13 patients with retinal vasculitis secondary to tuberculosis diagnosed through aqueous and vitreous humor PCR. The most frequent findings were vitritis (100%), followed by snowball vitreous (89.4%), neovascularization (57.8%), retinal hemorrhages (52.6%), neuroretinitis (52.6%), focal choroiditis (47.3%), vitreous hemorrhage (26.3%) and serous retinal detachment (15.7%). In the present study, all patients were treated with anti-tuberculosis with or without association with systemic corticosteroid therapy, all patients with retinal neovascularization were treated with LASER photocoagulation, and one of the patients with vitreous hemorrhage underwent PPV. After a 12-month follow-up, all patients had resolution of the retinal vasculitis, without recurrences.\(^3\)

In fact, peripheral occlusive retinal vasculitis has been associated with tuberculosis. In a recent report, Agrawal et al\(^5\) reported the clinical features and outcomes of 110 patients with peripheral retinal vasculitis and 69 (62.72%) of them had presumed tubercular retinal vasculitis. The authors of the refereed paper concluded that presumed tubercular retinal vasculitis often affects young males of Asian descent, vitreous hemorrhage is a common clinical finding and a good response to anti-tuberculosis therapy was observed in most of them (85.19%). This clinical profile is concordant to the one described in the present case report.

Patricio et al\(^6\) reported a case of a patient with recurrent vitreous hemorrhages, vascular sheathing, capillary nonperfusion, and neovascularization, with clinical recovery and no recurrences over a period of 15 months after the institution of anti-tuberculosis treatment. Nayak et al\(^7\) also described a patient with unilateral retinal periphlebitis, retinal and pre-retinal hemorrhages and areas of capillary non-perfusion, and a serpiginous-like choroiditis in the other eye.

Remission of the clinical condition with anti-tuberculosis therapy was also observed, and no recurrence of inflammation over 18 months of follow-up. In the latter case, oral corticosteroids were started one week after anti-tuberculosis therapy. Therefore, it is important to highlight that retinal vascular involvement, especially if occlusive and associated with inflammation, is quite suggestive of ocular tuberculosis. Although, Kopsachilis et al\(^8\) reported a case of a patient with branch retinal vein occlusion who developed bilateral papilledema due to tuberculosis in the central nervous system in the absence of active uveitis.

In the reported case, a good response was observed after the introduction of anti-tuberculosis therapy. The therapeutic test was based on the diagnosis of

**Figure 4.** FFA RE before starting the antituberculous therapy – hyperfluorescence of the optic disc, macula, and midperiphery vessels. Retinal vessels tortuosity, mostly veins.

**Figure 5.** FFA RE 5 months after starting the antituberculous therapy – absence of anomalous areas of diffusion of contrast.

**Figure 6.** OCT RE 5 after starting the antituberculous therapy – absence of intra/subretinal fluid.
tuberculosis retinal vasculitis, which was reinforced by the absence of relapses after anti-tuberculosis therapy cessation. In addition to anti-tuberculosis therapy, retinal photoacoagulation in the areas of capillary non-perfusion and PPV in cases of persistent vitreous hemorrhage\textsuperscript{2-4}, the treatment for tuberculosis retinal vasculitis also includes oral corticosteroid therapy.\textsuperscript{3,9,10}

Although it is a controversial topic, tuberculosis retinal vasculitis probably occurs through an immune mediated hypersensitivity mechanism.\textsuperscript{3} According to this hypothesis, \textit{Mycobacterium tuberculosis} may persist in the ocular tissues and initiate an immune mediated response that manifests clinically as vasculitis\textsuperscript{3}, the latter being usually treated with systemic corticosteroid therapy. Indeed, treatment with oral corticosteroids is an integral part of the therapeutic protocol of patients with uveitis of tuberculosis etiology in some reference centers, especially in those cases with posterior involvement.\textsuperscript{3,9,10}

In a descriptive study of 2009, Yasaratne et al\textsuperscript{10} analyzed the response to anti-tuberculosis therapy in a series of 23 cases of ocular tuberculosis, in which all patients were also treated with oral prednisolone (0.5-1 mg/kg/day). In another retrospective study from 2008, Bansal et al\textsuperscript{9} examined the impact of anti-tuberculosis therapy in patients with uveitis and latent/manifest tuberculosis. The group of patients treated with antibiotic drugs (216 patients) was treated simultaneously with corticosteroids (topical, periocular and/or oral) and, in 123 of these patients, systemic corticosteroid therapy was administered by posterior involvement.

In the clinical case described, with severe occlusive retinal vasculitis, we chose not to perform oral corticosteroid treatment given that this case showed a long evolution; hence, we decided to wait for the therapeutic response to the antibacterial drugs. Evident improvement was observed during the antibacterial treatment, namely the recovery of VA and remission of angiographic inflammatory signs, which underline the importance of the investigation of tuberculosis etiology in cases of retinal vasculitis.

On the other hand, although the case reported corresponds to a severe and prolonged retinal vasculitis, there was a rapid, complete and long-term response to the elimination of vascular and optic disc inflammation associated with \textit{Mycobacterium tuberculosis} with anti-tuberculosatic drugs without the need of systemic anti-inflammatory therapy, as would be advocated. Thus, this case adds relevance as it suggests that direct infection may be more significant than currently considered in the etiopathogenesis of retinal vasculitis and demonstrates that, even if the underlying mechanism is immune mediated, the elimination of the bacterium may be sufficient to treat these cases definitively and without relapses.

References