

Chorioretinal atrophy in a patient with Buerger's disease

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RESUMO

A doença de Buerger é uma vasculopatia inflamatória oclusiva que afecta os vasos de pequeno e médio calibre, sobretudo arteriais, das extremidades e que está associada ao tabagismo. O envolvimento visceral é pouco frequente e as complicações oculares são ainda mais raras, eventualmente caracterizadas por oclusões vasculares retinianas.

Reportamos o caso de um doente com doença de Buerger com diversas complicações sistémicas associadas que se apresentou com diminuição progressiva e bilateral da acuidade visual. À observação oftalmológica, registou-se uma atrofia coriorretiniana difusa em ambos os olhos com marcado prolongamento do tempo braço-retina na angiografia fluoresceínica. O doente negou quaisquer antecedentes familiares compatíveis com distrofias coriorretinianas.

Para o nosso conhecimento, este é o primeiro caso publicado de doença de Buerger com complicações oculares graves associadas.

Palavras-chave

Buerger, coriorretiniana, atrofia, vasculopatia, oclusão.

ABSTRACT

Buerger's disease is an occlusive inflammatory vasculopathy of the small and medium-sized vessels, predominantly arterial, of the extremities largely associated with smoking. Visceral involvement is uncommon and ocular complications are even rarer, possibly characterized by retinal vascular occlusions.

We report a case of a patient diagnosed with Buerger's disease with important systemic vascular involvement who presented with progressive bilateral visual acuity decrease. Careful ophthalmological examination revealed a diffuse chorioretinal atrophy in both eyes and markedly delayed arm-to-retina time in fluorescein angiography. There was no family history of retinal dystrophies. To our knowledge, this is the first reported case of Buerger's disease with such dramatic ocular manifestations.

Keywords

Buerger, chorioretinal, atrophy, vasculopathy, occlusion.

INTRODUCTION

Buerger's disease (BD), or thromboangiitis obliterans, is an inflammatory occlusive vasculopathy characterized

by the development of segmental occlusions of small and medium-sized vessels, particularly arterial. Its pathophysiology is not completely understood but the immune system seems to have a major role, having been already

detected antiendothelial antibodies in patients with BD. An hypersensitivity response to cigarettes' constituents, especially nicotine, is possibly responsible for the endothelial damage. Histopathologic studies revealed an initial polymorphonuclear infiltrate on the vascular walls and the development of an immune cellular thrombus on the lumen; later, there is a replacement of the neutrophils by mononuclear cells, fibroblasts and giant cells, with perivascular fibrosis in the more advanced cases^{1,2}. The estimated prevalence is 12.6-20:100 000, higher in the Indian, Korean and Ashkenazi populations. Its incidence is also higher in men younger than forty, although it has been noted an increase in its prevalence between female patients by the also increasing number of women who smoke³.

Clinically, BD tends to manifest by signs of arterial insufficiency or a migratory thrombophlebitis, accompanied by intense pain, even at rest, possibly related to nerve involvement and release of inflammatory mediators. The involvement of the vessels of the extremities is the rule, especially of the radial and tibial arteries, leading to necrosis which may require amputation of the distal segments. Other frequent associations include Raynaud's phenomenon and claudication of the affected extremity (usually confined to the calves and feet or the forearms and hands). Patients seem to be otherwise healthy, with no other systemic symptoms. Visceral involvement is rare and available published cases with ocular complications are even fewer, possibly characterized by retinal vascular occlusions⁴ – predominantly of the arterial branches – and secondary neovascularization with its consequences; normotensional glaucoma⁵ and changes in the anterior segment vessels⁶ are also mentioned, although less frequently.

We report, to our knowledge, the first case of BD with extensive chorioretinal atrophy, with no positive family history of retinal dystrophies, which we believe to be secondary to an important compromise of the retinal and choroidal vasculature.

CASE REPORT

M.P.A., male Caucasian patient, sixty-four years old, driver, previous smoker (15 pack-year), was seen in our ophthalmology department for progressive bilateral visual acuity decrease and nyctalopia, which he started to note 10 years ago. He was diagnosed with BD in his thirties and had already been submitted to several procedures over the years, including amputation of some of his hands' and feet's fingers as well as to endovascular treatments due to significant carotid and iliac compromise. He denied any

other relevant conditions, such as hypertension, diabetes, coagulation disorders or autoimmune diseases. He also denied any past or current chronic medication, including other treatments for BD targeting his vascular compromise. Trips abroad were also excluded, having never left his country, Portugal. His family history was also negative to any relevant systemic or ocular diseases, namely retinal or choroidal dystrophies.

On careful examination, his best corrected visual acuity was of counting fingers on his right eye and 0.7 (Snellen chart) on his left eye, with a refraction of +1.5D in both eyes. Pupil examination and ocular motility were both unremarkable. The anterior segment was normal on slit-lamp observation, with only phacosclerosis. Intraocular pressure was 12mmHg bilaterally. Fundus examination revealed extensive confluent areas of chorioretinal atrophy with involvement of the posterior pole except in the perifoveal area of the left eye, where it remained some normal sharply demarcated retinal tissue. The atrophy extended to the

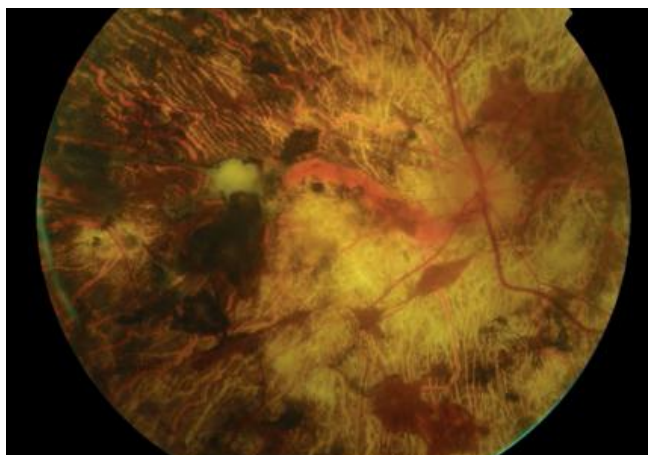


Fig. 1 |

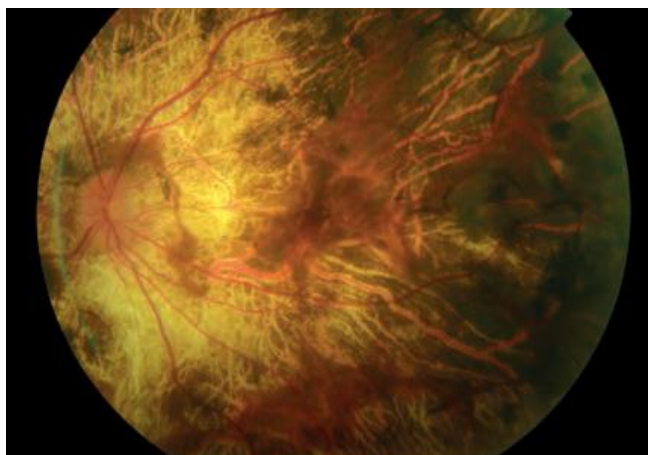


Fig. 2 |

periphery in a multifocal pattern, and it was also evident an important diffuse arteriolar narrowing (Figs. 1 and 2). The vitreous was clear, with no signs of inflammation, and both optic discs looked relatively healthy.

Based on the clinical findings, it was requested a fluorescein angiography (FA), spectral domain optic coherence tomography (SD-OCT), visual field tests and electroretinography (ERG). Considering the differential diagnosis with choroideremia, an X-linked recessive disorder, it was also suggested a complete ophthalmologic examination of both his brothers.

INVESTIGATIONS

The FA revealed a marked delay in the arm-to-retina time (27 seconds), as well as areas of staining compatible with the diffuse chorioretinal atrophy (Figs. 3 and 4), with multifocal extension to the periphery (Fig. 5). In the right

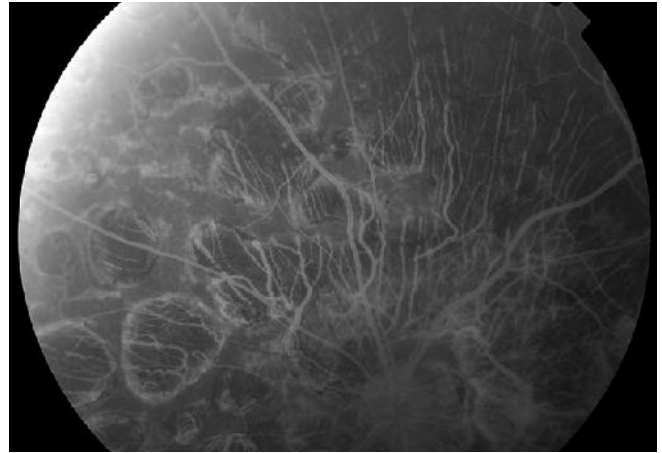


Fig. 5 |

eye, there was an evident exposure of the sclera in the foveal area, while in the left eye the retinal tissue was still spared in the fovea and perifovea, in a stellate pattern, explaining the visual acuity. SD-OCT confirmed this findings, registering an important reduction in the thickness of the internal and external layers of the retina except in the fovea of the left eye, which maintained a normal architecture (Figs. 6 and 7).

Visual field testing using the Octopus Perimeter revealed a bilateral generalized retinal sensitivity reduction and presence of a small central island of vision in the left eye.

Flash ERG, scotopic ERG and photopic ERG all showed extremely diminished amplitudes of both a and b waves.

Ophthalmologic examination of both his siblings proved to be completely unremarkable, in particular with no retinal or choroidal abnormalities similar to the patient's.

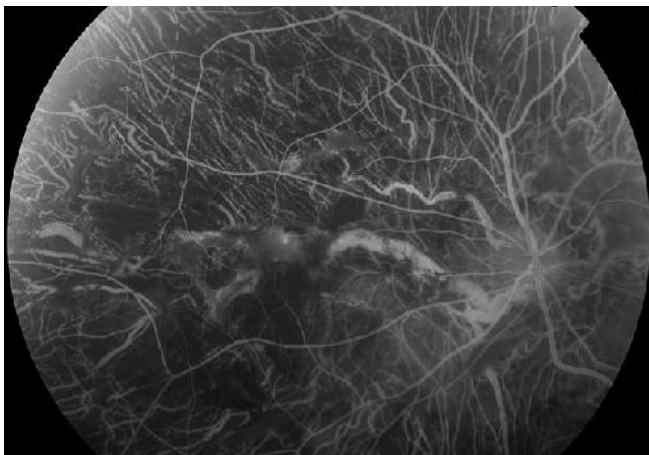


Fig. 3 |

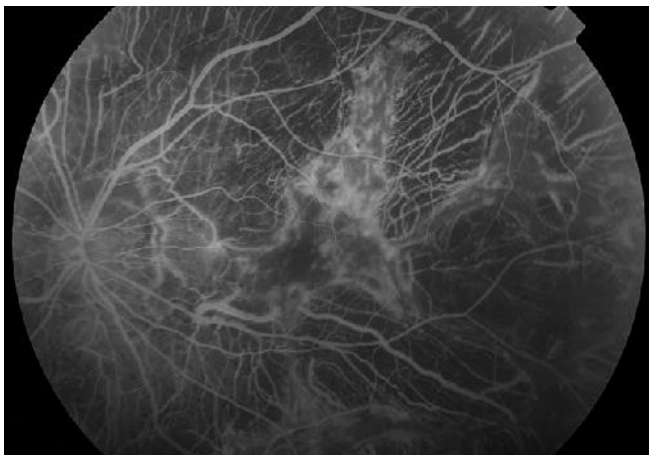


Fig. 4 |

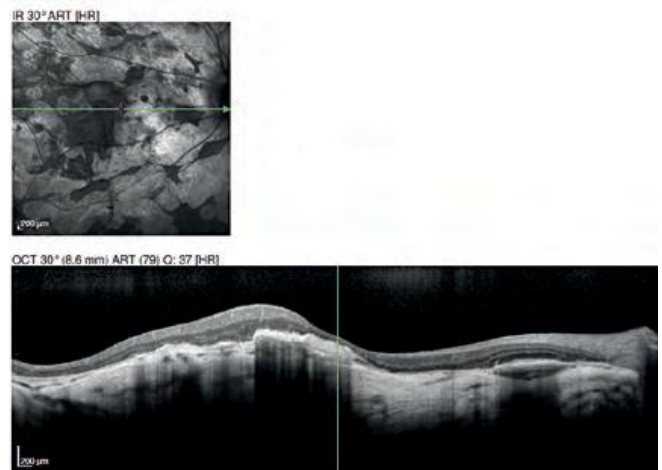


Fig. 6 |



Fig. 7 |

DIFFERENTIAL DIAGNOSIS

Even though a number of other causes could explain the chorioretinal atrophy seen in our patient - high myopia, hypertensive choroidopathy or chronic therapy with thioridazine or deferoxamine, for example - his medical history was relevant only to BD with associated distal, iliac and carotid involvement. The most important differential in this case, therefore, is a generalized choroidal and retinal dystrophy, namely choroideremia. This dystrophy could justify the clinical and fundoscopic findings in our patient, such as the bilaterally diminished visual acuity, nyctalopia and corresponding visual field changes, as well as the arteriolar narrowing and relatively spared optic discs and foveal area of the left eye, which is possible even in advanced cases^{7,8}.

An immunoblot analysis with anti-REP-1 antibody⁹ (which would show absence of immunohistochemical staining of REP-1 protein in cells from peripheral tissues, with a predictive value of 100% in male patients, since all known mutations in the choroideremia gene CHM result in truncated or completely absent REP-1 protein) and genetic testing for CHM mutations¹⁰ (with sensitivity and specificity values > 98%) could confirm this dystrophy, but we were unable to conduct those. However, various aspects are against this diagnosis. Choroideremia typically manifests in an earlier age, usually in the first decade of life, and is frequently associated with other ocular findings, such as posterior subcapsular lens changes and fine fibrillar degeneration of the vitreous, both absent in our case. The lack of a positive family history and its low prevalence¹¹, estimated to be around 1:50-100 000), also make this diagnosis very unlikely. In addition, our patient presented with other

changes which are not found in choroideremia such as a marked arm-to-retina delay. Considering the already mentioned diffuse systemic vascular involvement in our patient, we think it's possible and even likely this delay and secondary chorioretinal atrophy could be caused by BD.

TREATMENT

We decided to give an antiplatelet agent (acetylsalicylic acid 150mg/day), although the only proven therapeutic measure is smoking cessation¹², which our patient had already successfully accomplished.

Other measures have been tried to deal with the ischemia of the extremities, such as the use of calcium-channel blockers, systemic prostaglandin analogues or revascularization procedures, but with limited success and their effects on retinal vasculature compromise have yet to be studied.

OUTCOME AND FOLLOW-UP

Although an improvement in his right eye's vision is impossible due to the macular lesions, the patient maintains a relatively good visual acuity in his left eye, at a one year follow-up. Every effort should be therefore made to preserve the remaining vision with close monitoring and screening of other ocular comorbidities. We also decided to prescribe a platelet aggregator inhibitor as a prophylactic measure (with systemic effects), although no published data supports this measure.

DISCUSSION

BD, or thromboangiitis obliterans, is an uncommon vascular disease with which not many ophthalmologists are particularly familiar. Its rarity also means that reports of atypical manifestations and involvement of other organs and systems not usually affected are not frequent, making it sometimes difficult to correctly interpret such cases.

Some authors described cases of retinal vascular occlusions in patients with BD who showed vascular narrowing, retinal atrophy and secondary pigmentary changes, thought to be related to the involvement of the central artery and vein of the retina^{4,5} by the systemic vasculopathy. This same vascular compromise, characterized not only by segmental occlusions of the small and medium-sized vessels but also by a disturbance of the vasodilation process with vasospasm could also lead in certain patients

to normotensional glaucoma⁵, in which vascular factors seem to have a substantial role in its development and progression.

On par with the previously described changes, the anterior segment can also be affected in some of these patients, as depicted in an article in which its authors mention a reduction in the arteriolar caliber and an increase in the venular tortuosity due to flow redistribution in the conjunctival vessels of nine patients with BD⁶.

In fact, being a systemic disease, it seems unlikely there is no associated compromise of the ocular circulation, even though most patients present with more peripheral changes. It is then possible that ophthalmic complications are underdiagnosed in BD.

In conclusion, while it is not completely possible to exclude the presence of a dystrophy such as choroideremia as cause of the extensive chorioretinal atrophy verified, the late presentation, lack of other frequently associated findings and presence of angiographically proven arm-to-retina delay, negative family history with normal examination of his siblings and rarity of both diseases makes this diagnosis unlikely. Therefore, we believe that the ocular findings reported are secondary to a significant compromise of the retinal and choroidal vasculature, in accordance to the important distal, carotid and iliac arterial insufficiency already present in our patient, a complication of Buerger's disease never published before.

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Presented as a poster in the 56th Congress of the Portuguese Ophthalmology Society (SPO).

No commercial interests to report.

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