

## CASE REPORT

## CENTRAL RETINAL ARTERY OCCLUSION SECONDARY TO DENGUE FEVER

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Dengue fever is endemic in the tropics and subtropics and has become a worldwide health threat in recent years. Dengue-related ocular complications are increasingly being reported from countries in South-East Asia. The authors report the first documented case of a patient with dengue fever who developed central retinal artery occlusion in addition to many other eye complications such as severe ptosis and complete internal and external ophthalmoplegia during her convalescent phase. The disease was confirmed by specific serological tests. Despite treatment, severe visual impairment occurred in this case.

**Keywords:** Dengue, retinal artery occlusion, vasculitis

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## INTRODUCTION

Dengue fever is a mosquito transmitted viral disease. It is endemic mainly in South-East Asia and Africa. It occurs in over 100 countries, with an estimated 100 million cases per year and more than 2.5 billion people stay at risk worldwide.<sup>1</sup> Vector of dengue infection is the mosquito *Aedes aegypti*. Man is the major vertebrate host and also the most important mean of dispersion of the illness. Outbreaks of this disease have affected many people in Pakistan and resulted in a lot of casualties especially in the Punjab province.

Various ophthalmic complications associated with dengue fever are being observed more frequently in recent times. However, only a few isolated case reports have been published in the literature.<sup>2,3</sup>

To our knowledge, we are reporting the first case of central retinal artery occlusion (CRAO) in a patient with dengue fever.

## CASE REPORT

A previously healthy, 50-year-old woman was hospitalized for acute-onset of high fever, myalgia and arthralgia. A detailed history along with haematological and serological investigations established the diagnosis of classical dengue fever (a positive IgM antibody titer). Other infections such as typhoid and malaria were ruled out. Routine gynaecological examination was unremarkable in this post-menopausal lady. On routine ophthalmic examination she had bilateral cataract with 6/18 vision in right eye and 6/12 in left eye. Seven days later, during her convalescent phase, she developed sudden loss of vision and ptosis in the left eye (Figure-1).

Best corrected visual acuity was 6/18 in the right eye and only light perception in her left eye. She also developed complete left ptosis, peri-orbital oedema, conjunctival congestion, non-reacting, dilated pupil and complete ophthalmoplegia in the left eye (Figure-2). Only slight action of the left superior oblique muscle

was visible (Figure-3). On slit-lamp examination, anterior segment revealed cataracts in both eyes, more marked in the right eye than left. No cells or flare were observed in the anterior chamber or anterior vitreous. Examination of the right fundus was unremarkable. Fundus examination of the left eye showed faded retinal whitening at the posterior pole with narrowing and occlusion of the retinal vessels and a cherry red spot.

Fluorescein angiogram of the left eye showed narrowing of the central retinal artery, blocked background fluorescence in the area of whitening and delayed arteriovenous transit in the affected vessels. Staining of the occluded artery was observed in the late phase. A diagnosis of left central retinal artery occlusion was made and she was treated with 20% intravenous mannitol followed by ocular massage in an attempt to restore the retinal circulation but in vain. She was followed up for three months. She underwent uneventful phaco surgery in the right and achieved 6/9 uncorrected vision, however visual acuity remained only light perception in the left eye.



Figure-1: Ptosis of left eye



Figure-2: Ophthalmoplegia in the left eye



Figure-3: Left superior oblique muscle was visible

## DISCUSSION

Dengue fever is increasingly becoming a global challenge. There is neither any specific treatment available nor any immediate prospect of a proper vaccine, and the mosquito control measures in most of the hyper-endemic areas are inadequate.<sup>4</sup> Dengue fever and its ocular manifestations in Europeans is an uncommon condition, although expanding tourism to tropical countries may lead to an increase in the number of cases.<sup>5</sup> Ophthalmic manifestations of dengue fever are rare but diverse, involving ocular structures from vitreous to uvea.<sup>1,6</sup> Patients with dengue fever may develop vision-threatening complication. Various reported ocular manifestations of dengue fever include sub-conjunctival hemorrhage<sup>4</sup>, bilateral vitreous hemorrhage<sup>7</sup>, macular hemorrhage<sup>2</sup>, intra-retinal hemorrhages<sup>5</sup>, Roth spots, cotton-wool spots<sup>5</sup>, bilateral choroidal effusion<sup>8</sup>, relative central scotoma<sup>5</sup>, retinal oedema, blurring of the optic disc, maculopathy<sup>5</sup> and bilateral peri-orbital ecchymosis.<sup>9</sup>

The pathogenesis of ocular complications in dengue fever is not fully understood.<sup>10</sup> Thrombocytopenia in severe dengue may predispose to severe hemorrhagic disorders.<sup>10</sup> However, the clinical presentation and behaviour of these complications suggest an immunogenic aetiology rather than an infective one.<sup>10</sup> Both viral and host immune factors are probably involved in the pathogenesis of ocular complications of dengue fever.<sup>11</sup> In individuals predisposed to autoimmune disease, particularly females and patients with partial C4 deficiency, dengue infection may provide the antigenic trigger for immune complex deposition in retinal vessels.<sup>10</sup> Different clinico-pathologic manifestations may be caused by different pathogenic mechanisms: hepatic injury may relate more to viral factors; whereas vascular hyper-permeability, contributing to most ocular manifestations, may be mediated predominantly by the immune response.<sup>12</sup> Ocular involvement in the convalescent phase of the systemic disease also implicates a host immune response rather than a direct virus infection.<sup>1</sup> Viral genetic mutations have been demonstrated to occur within the various serotypes; however the biologic effects induced by these mutations are as yet uncharacterized.<sup>10,13</sup> More research needs to be undertaken in order to adequately establish the pathogenesis of these ocular manifestations.

Though retinal capillary non-perfusion secondary to dengue fever has been reported to occur at the macula as well as midperiphery<sup>6</sup>, we are aware of

only a single report of branch retinal artery occlusion secondary to dengue fever.<sup>11</sup> This complication, which leads to profound and permanent visual impairment, occurred in spite of minimal vasculitis and in the absence of severe systemic disease. Ophthalmologists should therefore be at high alert and be on the lookout that despite moderate systemic involvement with dengue fever major ocular complications may sometimes occur. We, for the first time, report a case of total ophthalmoplegia and central retinal artery occlusion in a patient with dengue fever. To the best of our knowledge, not a single case of central retinal artery occlusion related to dengue fever has been reported to date. While ocular involvement is rarely seen in dengue fever, due to the emergence of multiple dengue serotypes, the incidence of dengue fever is on the rise especially in our part of the World. Therefore we should be prepared to face an increase in dengue related ophthalmic morbidity. A keen awareness of dengue related ophthalmic complications among treating physicians will help in timely referral of these patients for appropriate ophthalmic management.

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