Case Report

Fulminant Orbital Cellulitis – A Rare Presentation of Endogenous Endophthalmitis

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ABSTRACT

Background: Endogenous endophthalmitis refers to the intraocular infection resulting via haematogenous spread from the distant foci. Dengue is an important health problem in India with varied ophthalmic manifestations either due to viremia, immunologic phenomenon, or haemorrhagic tendency.

Case: We report an unusual presentation of endogenous endophthalmitis as fulminant orbital cellulitis in a young adult patient having a history of dengue fever.

Observations: Young male having history of dengue fever presented with complaints of sudden pain, swelling, redness, and loss of vision in the left eye. His clinical features and radiographic examination were suggestive of orbital cellulitis with pan-ophthalmitis, which rapidly progressed to endophthalmitis.

Conclusion: This case highlights the role of orbital vessels as a possible route for occurrence of endophthalmitis in a case of orbital cellulitis.

Key words: Dengue; endophthalmitis; orbital cellulitis; panophthalmitis.

INTRODUCTION

Endophthalmitis is inflammation of the intraocular cavity which if not managed promptly can lead to visual loss and also has high risk of mortality. Sheu (2017) describes endogenous endophthalmitis when the route of infection is haematogenous spread from a distant focus. Dengue is an important health problem in India. Apart from being a systemic condition, it also has ophthalmic implications. As proposed by Rudzinski et al. (2020), the mechanisms of post-dengue ophthalmic manifestations are direct viral replication, immunologic phenomenon and haemorrhagic manifestations due to low platelet counts. We report an unusual case of orbital cellulitis with pan-ophthalmitis rapidly progressing to endogenous endophthalmitis in a seropositive dengue patient.

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CASE REPORT

A 28-year-old gentleman, presented in ophthalmology emergency with complaints of sudden pain, swelling, redness, and loss of vision in left eye for six hours. He had a history of dengue with thrombocytopenia (Platelet 34,000/microL) 10 days before presentation. He had received intravenous fluid injection at a local health centre in his village, one day prior to presentation; the details of which were not available. According to the patient, after 3-4 hours of receiving the injection, he developed the above-mentioned symptoms in left eye. On examination, the patient was afebrile, alert and well-oriented to time, place, and person. His vision in right eye was 20/20 and the ophthalmic examination in right eye was unremarkable. His left eye vision was Nil Perception of Light (NPL). His left eye examination showed restriction of all extraocular muscle movements; tense, tender, and swollen eyelids; conjunctival chemosis with overriding on cornea and cornea was clear to the extent seen (Figure 1A). His B-scan ultrasonography (USG) scan revealed few low reflective, mobile dot echoes in vitreous which were comparable to the other eye; thickened retina-choroidal-scleral complex (RCS) (3.6mm), T sign and widened Optic Nerve Head (ONH) shadow (Figure 1B). His Non-Contrast Computed Tomography(NCCT)-Scan on the day of presentation showed left orbital proptosis, fat stranding, superior rectus thickening, bulky extraocular muscles and bulky retrobulbar part of optic nerve (Figure 1C). His blood reports showed raised total Leukocyte count (15.9*10(9)/L), normal platelet count, raised Erythrocyte Sedimentation rate (ESR) and C - reactive protein (CRP). His serum Immunoglobulin G (IgG) for dengue antibodies was positive. His blood culture, fungal serology, and conjunctival swab were negative. His urine culture revealed growth of mixed bacterial flora. Provisional diagnosis of orbital cellulitis with pan-ophthalmitis was made. He was started on broad spectrum antibiotics (Injection Metronidazole, Vancomycin, and Ceftriaxone). However, the patient did not show any signs of improvement. Contrast Enhanced Magnetic Resonance Imaging (CE-MRI) was done two days after presentation to rule out orbital pseudotumor which revealed

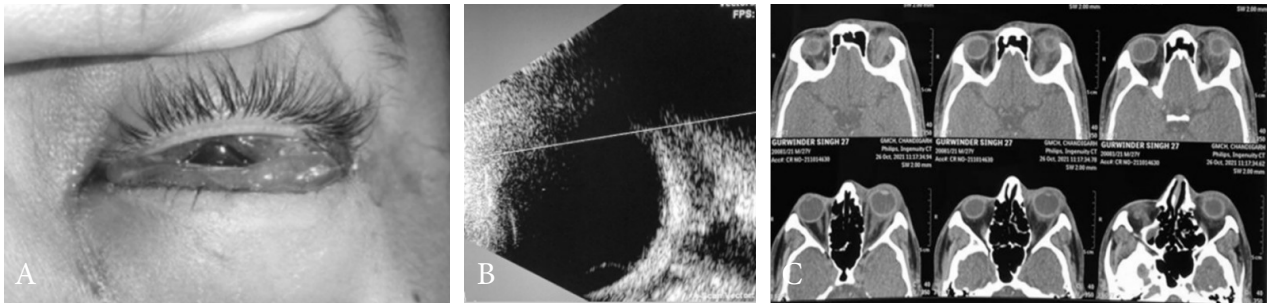

Figure 1A: On presentation, External photograph of left eye showing tense, tender and swollen eyelids; chemosed conjunctiva overriding cornea; partly visible clear cornea. Figure 1B: Ultrasound showing few low reflective, mobile dot echoes in vitreous which were comparable to the other eye, retina-choroidal-scleral complex (RCS) thickening of 3.6 mm, T-sign and widened ONH shadow. Figure 1C: Non-Contrast CT-Scan Orbit on the day of presentation showing left orbital proptosis, fat stranding, superior rectus thickening, bulky extraocular muscles and bulky retrobulbar part of optic nerve.

diffuse left orbital cellulitis, proptosis, orbital compartment syndrome, partial collapse of left globe with scleral discontinuity at places and endophthalmitis (Figure 2A). USG-guided fluid aspiration for microbiology and cytology evaluation was planned but due to the tight globe, it was not practically possible. The B-scan USG done on the next day revealed plenty of moderate reflective, mobile dot echoes in the vitreous with RCS thickening (3.8mm) and resolving T sign (Figure 2B). Patient was not willing for evisceration. He was continued on the broad-spectrum antibiotics for fourteen days. After the third day of antibiotics, gradual improvement in orbital inflammatory signs was seen. The anterior chamber revealed hypopyon. Figure 3A shows the external photograph of the left eye on Day 7. At two weeks, the left eye had regained mobility. However, the eye was pre-phthisical on his last follow up at one month after presentation (Figure 3B and 3C).

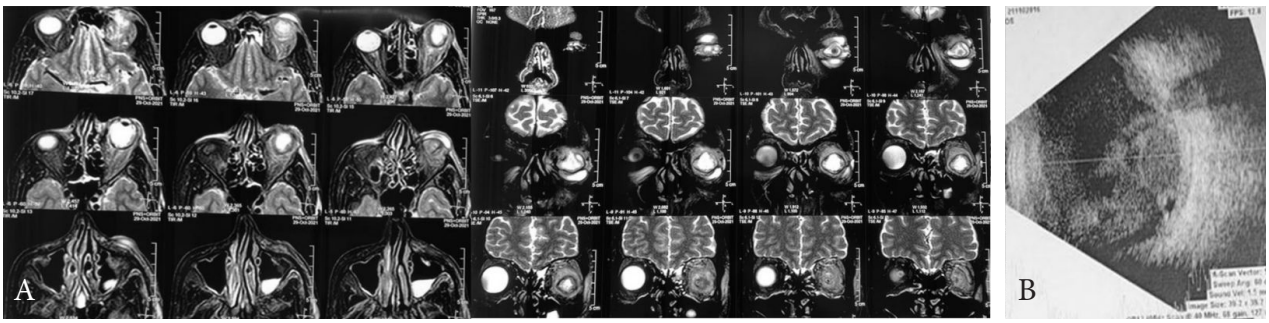

Figure 2A: Two days after presentation, Contrast Enhanced MRI showing diffuse left orbital cellulitis, proptosis, orbital compartment syndrome, partial collapse of left globe with scleral discontinuity at places and endophthalmitis. Figure 2B: B-scan ultrasonography on third day after presentation, showing plenty of moderate reflective, mobile dot echoes in the vitreous with RCS thickening of (3.8mm), resolving T sign and widened Optic Nerve Head shadow.

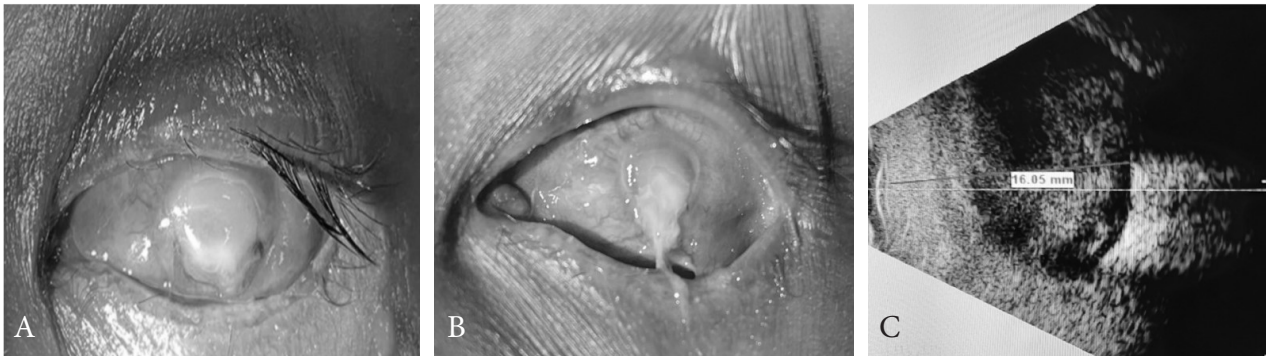

Figure 3A: External photograph on Day seven showing improvement in eyelids swelling and conjunctival chemosis with hypopyon. Figure 3B: External photograph at first month of follow up showing sunken eyeball, resolved eyelid swelling and chemosis, corneal sloughing hypopyon. Figure 3C: B-scan ultrasonography at first month showing vitreous full of moderate reflective mobile dot echoes, attached retina, reduced RCS thickening and reduced axial length of 16.0 mm.

DISCUSSION

This case describes an unusual presentation of endophthalmitis in a young adult after intravenous injection and having a history of dengue fever.

Guedira et al. (2018) have described co-existence of orbital cellulitis with panophthalmitis as described before. However, in present case this rapidly progressed to endogenous endophthalmitis. To the best of our knowledge, there is only one other case report from United States by Ghiam et al. (2019), where due to disproportionate signs of orbital inflammation as compared to endogenous endophthalmitis, the authors believed the infection began primarily in the orbit and spread inwardly to the eye. The case was observed in young diabetic, who also had a history of intravenous drug abuse.

The explanation for the sequence of events in our case is unclear. We assume it could be due to the infection which primarily began in the orbit and spread towards the eye. In orbital cellulitis, compression of the feeder vessels and inflammation may result in infarction of sclera, choroid, retina, or optic nerve and may lead to septic uveitis, choroiditis with a cloudiness of the vitreous, including septic panophthalmitis. Kamal et al. (2018) noted direct spread of organisms to the site of damage, or secondary infection, or inflammatory mediators of the immune response can cause destruction of intraocular tissues in pan-ophthalmitis.

Orbital cellulitis, panophthalmitis and endophthalmitis are known complications of dengue fever. Vijitha et al. (2021) have noted that four eyes in their case series had orbital cellulitis coexistent with panophthalmitis. Three of these eyes developed phthisis and one eye was eviscerated.

The shortcoming of the case is that the aetiology of the massive inflammation cannot be ascertained. Conjunctival swab, blood cultures, and fungal serology were negative. But the fact that the inflammation responded well to treatment with systemic antibiotics only suggests a possible infective cause. Nannan Panday et al. (2019) have documented that yield of blood cultures to detect bacteremia is inefficient. The source of infection could be the intravenous fluid, which he received by the local health practitioner in his village. Endogenous endophthalmitis presumably due to contaminated intravenous fluid is noted before by Chaudhry et al. (2012) and Dogra et al. (2018). However, the role of post-dengue inflammatory mechanisms cannot be ruled out. Case reports of endogenous endophthalmitis in a seropositive dengue patient which either had positive blood culture[5] or positive conjunctival swab[10] are noted prior by Kamal et al. (2018) and Sriram et al. (2015).

The case is definitely unique as this chronology of ophthalmic manifestations is not described before. The rapid worsening of orbital cellulitis to panophthalmitis to endophthalmitis is noteworthy.

CONCLUSION

Dengue fever has various ophthalmic implications which can be sight threatening. Very rarely, endogenous endophthalmitis may be preceded by orbital cellulitis. This case highlights the role of orbital vessels as a possible route for occurrence of endophthalmitis in a case of orbital cellulitis.

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