CASE REPORT

The blinding bug found in the eye

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SUMMARY

Tubercular uveitis is a common manifestation of tuberculosis (TB) in TB-endemic countries. Due to lack of gold standard diagnostic tests for confirming intraocular TB, it is often either underdiagnosed or rarely over diagnosed. We report a case of a 28-year-old woman with diminution of vision in the left eye. She was started on antitubercular treatment (ATT) and steroids but she did not comply with the treatment. She developed progressive painful loss of vision consequently and was treated with vitrectomy and silicone oil tamponade. After a complete course of ATT, she recovered, salvaging of eye and restoration of some vision was possible. *Mycobacterium tuberculosis* is rarely demonstrated in the ocular fluid samples of the suspected cases of TB due to the paucibacillary nature of the disease. A vitreous sample can be obtained from these patients. Surgical intervention in the form of vitrectomy and silicone oil tamponade can help in avoiding enucleation/ evisceration.

BACKGROUND

Tubercular uveitis is a common manifestation of tuberculosis (TB) in TB-endemic countries. Due to lack of gold standard diagnostic tests for confirming intraocular TB (IOTB), it is often either underdiagnosed or rarely over diagnosed.

CASE PRESENTATION

A 28-year-old female patient presented with the complaints of blurring of vision in the left eye for the last 3 months.

On examination, the best corrected visual acuity (BCVA) was 6/6, N6 in the right eye and hand movements close to face in the left eye. The intraocular pressure by applanation tonometry was 14 mm Hg in the right eye and 20 mm Hg in the left eye. Slit-lamp examination of the right eye was normal and the left eye showed small old keratic precipitates on the corneal endothelium, anterior chamber cells of grade 1+ and pigments on the anterior lens capsule (figure 1A). Fundus examination of the right eye showed a small yellowish lesion temporal to the fovea and the left eye had a hazy view with vitreous haze and cells of grade 4 (figure 1B,C). An ultrasound B-scan of the left eye showed a well-attached retina with multiple low reflective dots echoes and few membranous echoes in the vitreous cavity.

INVESTIGATIONS

Haematological investigations showed a raised erythrocyte sedimentation rate of 45 mm in the first hour by Westergren's method and the

interferon-gamma release assay (QuantiFERON-TB Gold test) for *Mycobacterium tuberculosis* was negative. The Mantoux test with 5PPD units was negative. Sputum examination for acid-fast bacilli (AFB) was negative. Chest X-ray (posteroanterior view) showed normal bronchovascular markings. Contrast-enhanced CT scan of the thorax showed focal areas of nodular parenchymal opacities in both the lung fields.

DIFFERENTIAL DIAGNOSIS

Ocular sarcoidosis.

TREATMENT

She was evaluated by the pulmonologist and started on antitubercular treatment (ATT) comprising four drug regime: rifampicin 600 mg/day, isoniazid 300 mg/day, ethambutol 1200 mg/day and pyrazinamide 1500 mg/day along with systemic corticosteroids 1.5 mg/kg wt. Topical prednisolone acetate eye drop (1%) 1 hourly and atropine eye drop (1%) two times per day in the left eye were started.

Follow-up at 1 month showed deterioration of vision in the left eye to the inaccurate projection of rays with no view of the fundus. On detailed history taking, she was found to be non-compliant with ATT drugs. She was referred to the pulmonologist and counselled again for completing the systemic treatment.

OUTCOME AND FOLLOW-UP

Two weeks later, she presented with severe pain in the left eye. The cornea was steamy and the IOP was 36 mm Hg. On examination, there was neovascularisation of the iris with a non-dilating pupil with no view of the fundus. Ultrasound B-scan of the left eye showed multiple dot and membranous echoes of low to moderate reflectivity in the vitreous cavity and a well-attached retina. She was given an intravitreal injection (1.25 mg/0.1 mL) of bevacizumab (off-label use) in the left eye under strict aseptic precautions.

She was followed up on the first day and 1 week. At 1 week follow-up after injection, there was a regression of iris neovascularisation with a non-dilating pupil and no view of the fundus. She subsequently underwent lensectomy, pars plana vitrectomy and silicone oil injection in the left eye under general anaesthesia and guarded visual prognosis. The vitreous sample was sent for microbiological examination, PCR for *M. tuberculosis* and GeneXpert analysis.

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Figure 1 (A) Slit-lamp photograph of the left eye showing small old keratic precipitates on the corneal endothelium, anterior chamber cells of grade 1+ and pigments on the anterior lens capsule. (B) Right eye fundus photograph showing small choroidal granuloma temporal to fovea. (C) Left eye fundus photograph showing a very hazy view with vitreous haze and cells.

Postoperatively, the left eye had circumciliary congestion and the fundus showed a well-attached retina with few yellow exudates in the vitreous cavity and silicone oil in situ (figure 2A,B). The GeneXpert analysis of the vitreous sample showed that *M. tuberculosis* was rifampicin sensitive. Microbiological examination of the vitreous sample showed AFB on Ziehl-Neelsen (ZN) staining (figure 3) and growth of *M. tuberculosis* on Lowenstein-Jenson media. She was continued on systemic ATT, oral corticosteroids 1.5 mg/kg wt and topical moxifloxacin (0.3%), prednisolone acetate (1%) and atropine (1%) eye drops in the left eye.

Follow-up was done at 1 month, 3 months and 6 months after surgery. At her final visit, the best corrected visual acuity in the right eye was 6/6, N6 and hand movements in the left eye. Slit-lamp examination showed no evidence of iris neovascularisation. Fundus examination showed few exudates in the vitreous cavity with silicone oil in situ. She was advised to complete her ATT along with tapering dose of systemic corticosteroids.

DISCUSSION

Uveal involvement is a common feature of IOTB.¹ There are various clinical manifestations of IOTB such as anterior uveitis with granulomatous inflammation, intermediate uveitis and posterior uveitis in the form of choroidal tubercle, vasculitis, choroiditis and rarely neuroretinitis or endophthalmitis.²

Figure 2 (A) Slit-lamp photograph of the left eye showing circumciliary congestion. (B) Left eye fundus photograph showing a hazy view of the fundus with yellow exudates in the vitreous cavity.

The gold standard for diagnosis of TB is isolation of AFB on smear or culture from ocular fluids or tissue specimens but at the same time, the diagnosis becomes challenging as it is difficult to intervene in these patients and secondly, clinical samples may contain only a few organisms for ZN staining and no viable organisms for culture.³

In previously published reports, diagnosis of tubercular uveitis was made only after histopathological or microbiological examination following a major intervention like enucleation.⁴

Figure 3 Microbiological examination of the vitreous sample showing acid fast bacilli on Ziehl-Neelsen staining.

Review of the literature shows that it is extremely rare to isolate AFB from the ocular fluid samples. In one case series of five cases, published by Biswas *et al*, they have reported AFB on ZN staining from an aqueous tap of four patients and a vitreous specimen of one patient.⁵ We also report the isolation of AFB on ZN staining from the vitreous sample collected during pars plana vitrectomy which is said to be a rare finding. The isolation of the organisms in the anterior chamber or vitreous fluid aspirate depends on the stage of the disease and can be seen once the impacted organisms are released from the subretinal space into the vitreous cavity.

Managing an IOTB is difficult if not diagnosed at an early stage especially with an upcoming resistance to the conventional ATT. Also, the efficacy of systemic ATT in IOTB maybe compromised secondary to ischaemia which sets in early in these cases.³

The DNA amplification techniques have been used for the diagnosis of mycobacterial infection and PCR has proven to be both sensitive and specific for the same.⁶ PCR of aqueous samples for the diagnosis of IOTB has been described.⁷ In our case, the GeneXpert PCR was done which showed rifampicin sensitivity, however, the patient did not respond to the treatment.

In the case series by Biswas *et al*, two out of five patients responded to treatment and three continued to deteriorate despite treatment and eventually had to undergo enucleation or evisceration.⁵ In a series of 12 patients suspected of IOTB, a good response was seen only in three cases by Rosen *et al*.⁸ Our patient was not very compliant to the treatment initially and eventually developed neovascularisation of the iris with a non-dilating pupil and later underwent pars plana vitrectomy and silicone oil injection. This management was different from all the reported cases in the literature where most of the cases not responding to treatment underwent enucleation or evisceration leading to loss of the eye however in our case we were able to salvage the eye at least for a year by injecting silicone oil. This highlights the fact that surgical intervention can be considered as a management option for non-responders and thereby helps to maintain the cosmesis.

Learning points

- ▶ A high level of suspicion is there for ocular tuberculosis (TB) especially in TB endemic countries.
- ▶ Early diagnosis and management can help in salvaging the eye.
- ▶ One must rule out multidrug-resistant TB in patients not responding to regular anti tubercular treatment.
- ▶ Surgical intervention in the form of pars plana vitrectomy and silicone oil injection can help in avoiding enucleation/evisceration.

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