

## Case Series

# A Series of Ocular Tuberculosis Cases from A Rural Tertiary Care Center in West Bengal

Uttam Biswas<sup>1</sup>, Soumya Ray<sup>2</sup>, Pallabi Raychaudhuri<sup>3</sup>, Asim Kumar Dey<sup>4</sup>

Tuberculosis in Eye can have diverse presentations leads to diagnostic difficulty. If no extra-ocular tubercular lesions are found then it becomes a challenge to diagnose & treat. Here authors present 6 cases of Ocular Tuberculosis without any associated extra-ocular tubercular lesions. One case of tubercular anterior uveitis, eales disease, solitary Choroidal Tuberculoma, bilateral multiple Choroidal Tuberculoma, multifocal & serpiginous like Choroiditis are presented here. All of them were resolved with first line anti-tubercular regimen and corticosteroids. Authors recommend initial visual assessment for all Tuberculosis cases to diagnose & treat hidden cases of Ocular Tuberculosis which may be sight threatening.

[J Indian Med Assoc 2023; 121(3): 55-8]

**Key words :** Ocular Tuberculosis, Uveitis, Tuberculoma, Eales disease, Choroiditis, Case series.

Ocular Tuberculosis includes any infection in or around the Eye. It may be either an active infection or related to delayed hypersensitivity. In primary Ocular Tuberculosis, the eye is the initial portal of entry into the body, whereas the secondary one is defined as an infection resulting from contagious spread from an adjacent structure or hematogenous dissemination. Almost every tissue of the Eye and its adnexa can get affected.

As Tuberculosis in Eye has diverse presentations so it is sometimes difficult to diagnose the intra-ocular Tuberculosis. In case of intra-ocular Tuberculosis microbiological confirmation is difficult due to problems in sample collection. So, a high index of suspicion is required to diagnose intra-ocular Tuberculosis<sup>1</sup>. Response to anti-tubercular therapy can be indirect evidence of intra-ocular tuberculosis in some cases.

Case definitions are as per the standard definitions laid by Central TB Division & ICMR<sup>2</sup> —

**Presumptive Ocular TB :** A patient with one of the following clinical presentations :

Granulomatous anterior-uveitis/ Intermediate uveitis, with/without healed/active focallesions/Posterior uveitis, including subretinal abscess, choroidal/disc granuloma, multifocal choroiditis, retinal periphlebitis and multifocal

<sup>1</sup>MD, MRCP, Associate Professor, Department of Medicine, Burdwan Medical College and Hospital, Burdwan 713104 and Corresponding Author

<sup>2</sup>MBBS, MS, RMO *Cum* Clinical Tutor, Department of Ophthalmology, Bankura Sammilani Medical College and Hospital, Bankura 722101

<sup>3</sup>MBBS, MS, Senior Resident *cum* Contractual Medical Officer, Department of Ophthalmology, B N Bose Hospital, Barrackpore North 24 Pgs 700120

<sup>4</sup>MBBS, MS, Professor and Head, Department of Ophthalmology, Gouri Devi Institute of Medical Sciences and Hospital, Paschim Bardhaman 713212

Received on : 12/12/2021

Accepted on : 03/11/2022

### Editor's Comment :

- Being in a Tuberculosis endemic country though ocular Tuberculosis is rare, still it can be vision threatening.
- Ophthalmologists should be very careful to diagnose the disease & its treatment response. It needs urgent research including a large sample or a community-based study of Ocular Tuberculosis.

serpiginouschoroiditis/ Panuveitis. Rarely, scleritis (anterior and posterior), interstitial and disciform keratitis.

Possible ocular TB: Patients with the following (1, 2 and 3 together or 1 and 4) are diagnosed as having possible Ocular TB :

- 1) At least one clinical sign suggestive of ocular TB (Presumptive ocular TB)
- 2) X-ray/CT chest not consistent with TB infection and no clinical evidence of extra-ocular TB
- 3) At least one of the following: Documented exposure to TB or Immunological evidence of TB infection
- 4) Molecular evidence of Mycobacterial tuberculosis-infection.

### PRESENTATION OF CASES

Here we are presenting six possible Ocular TB cases. All the patients reported at Eye Department of Tertiary Care Centre in West Bengal. After careful & detailed history taking comprehensive ophthalmic examination was performed & documented in case record form. No evidence of extra-ocular organ involvement due to Tuberculosis was found. Mantoux test was positive in all of them. Thus all 6 cases satisfy the first 1,2,3 criteria of case definition (vide introduction) together. So, according to case definition all of them are diagnosed as Possible Ocular TB. Patients were treated & followed up according to standard RNTCP protocol<sup>3</sup>.

### Case 1 :

This patient came to OPD with complaining of occasional redness & dimness of vision of Right Eye

(vision 6/18). After thorough examination it was revealed of Chronic Anterior Uveitis with frequent relapses. Possible associations with collagen vascular disease were ruled out. It was diagnosed as Tubercular Chronic Anterior Uveitis. Details discussed in the figure (Fig 1).

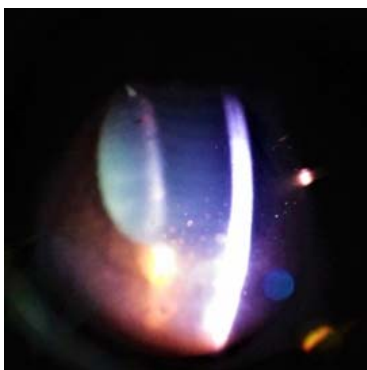


Fig 1 — shows chronic anterior uveitis with mutton fat KPs (keratic precipitate) & posterior synechiae.

Standard anti-tubercular medications were introduced according to RNTCP protocol. Isoniazid, rifampicin, ethambutol, pyrazinamide for initial 2 months & isoniazid, rifampicin & ethambutol for further 4 months were continued. Initially oral prednisolone (1mg/kg/day) was given for 4 weeks, later on tapered on through 6 weeks. Patient responded with complete resolution of anterior uveitis. Vision was improved to 6/6 with correction.

**Case 2 :**

This young male presented with vitreous hemorrhage in one Eye. Vitrectomy was done initially. On Fundoscopy it was found that in both eyes there is mid-peripheral venous sheathing & old organized vitreous hemorrhage. Fundus Fluorescence Angiography reveals multiple leakage points throughout inflamed vessels with one old pigmented scar. Details explained in the figure description (Fig 2). Patient was initially diagnosed as

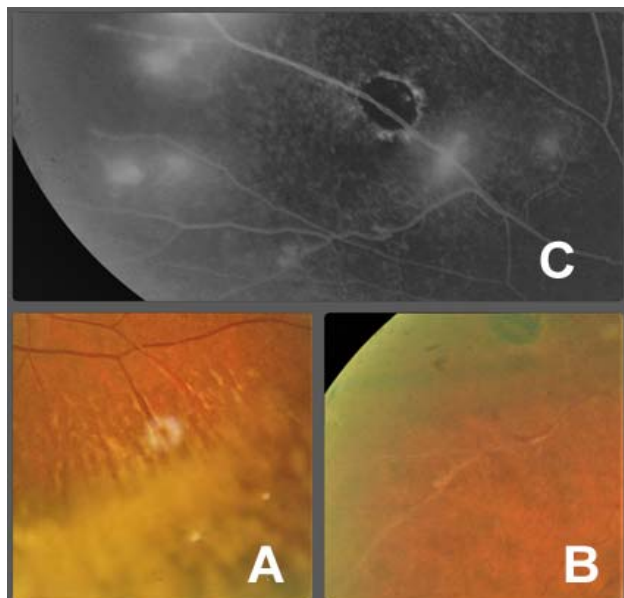


Fig 2 — shows clinical photograph of case 2. (A) retinal vasculitis with old organized haemorrhages of Eales disease. (B) shows vascular sheathing with an old pigmented scar. (C) Fundus Fluorescence Angiography picture with leakage from inflamed vessels with an old pigmented punched out scar lesion.

Eales disease. Standard antitubercular medications were introduced according to RNTCP protocol. Isoniazid, rifampicin, ethambutol, pyrazinamide for initial 2 months & isoniazid, rifampicin & ethambutol for further 4 months were continued. Initially oral prednisolone (1mg/kg/day) was given for 4 weeks, later on tapered on through 6 weeks. Patient responded well with resolution of inflammation of vessels as revealed by fundus fluorescence angiography.

**Case 3 :**

During routine clinical examination a solitary choroidal tuberculoma was discovered in this patient. Fundus fluorescence angiography reveals leakage of dye from the tuberculoma as the lesion was active. Details

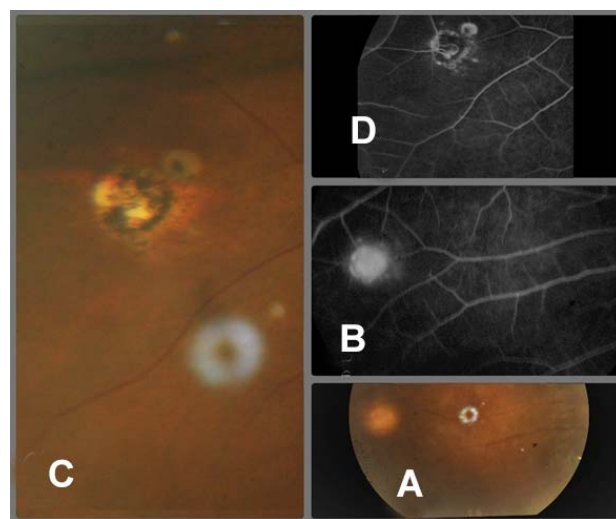


Fig 3 — shows colour Fundus photograph of case 3. (A) solitary choroidal tuberculoma at the time of diagnosis. (B) Fluorescence Angiography picture of the tuberculoma at the time of diagnosis showing leakage of dye. (C) healed, pigmented reduced in size of the tuberculoma at completion of Anti-tubercular Therapy (ATT). (D) Fluorescence Angiography picture of the Tuberculoma at the completion of ATT. Now as the lesion healed, it doesn't show leakage of dye.

discussed in the figure description (Fig 3).

Standard antitubercular medications were introduced according to RNTCP protocol. Isoniazid, rifampicin, ethambutol, pyrazinamide for initial 2 months & isoniazid, rifampicin & ethambutol for further 4 months were continued. Initially oral prednisolone (1mg/kg/day) was given for 4 weeks, later on tapered on through 6 weeks. Patient responded well with resolution of Tuberculoma. Tuberculoma reduced in size & become pigmented. Leakage of dye in Fundus Fluorescence Angiography was also reduced.

**Case 4 :**

A patient presented with complaining of dimness of vision in both eyes for last 1 year. His vision was initially recorded as 6/60 in both eyes. On Fundus examination it was revealed that there was vitreous haze with multiple Choroidal Tuberculoma in both eyes. The presence of

Choroidal Tuberculoma was further confirmed by USG B scan. Fluorescence angiography showed active tuberculoma with leakage of dyes. Details described inside the figure foot notes (Fig 4). So patient was initially diagnosed as Bilateral Multiple Choroidal Tuberculoma. Standard antitubercular medications were introduced according to RNTCP protocol. Isoniazid, rifampicin, ethambutol, pyrazinamide for initial 2 months & isoniazid, rifampicin & ethambutol for further 7 months were continued. Total 9 months of anti-tubercular medication was given. Initially oral prednisolone (1mg/kg/day) was given for 4 weeks, later on tapered on through 6 weeks. Patient responded well with resolution of vitritis. Tuberculoma reduced in size & become pigmented. Leakage of dye in Fundus Fluorescence Angiography also reduced. Final vision was improved to 6/12 in right eye & 6/18 in left eye.

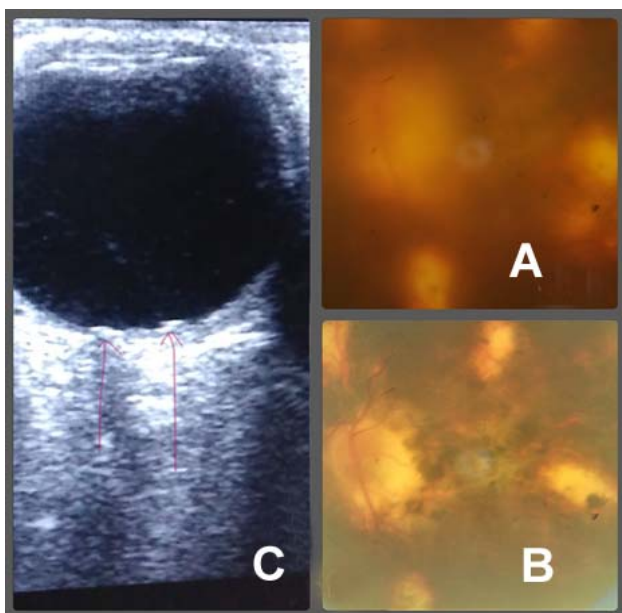


Fig 4 — shows clinical photograph of case 4 having bilateral multiple choroidal tuberculoma. (A) vitreous haze obscuring the view of fundus having multiple choroidal tuberculoma at the beginning of Anti-tubercular Therapy. (B) resolved vitreous haze, fundus showing multiple choroidal tuberculoma much reduced in size with minimum pigmentation at the end of ATT. (C) USG B scan showing choroidal tuberculoma (pointed with arrow marks)

#### Case 5 :

A patient presented with dimness of vision in his Left eye. Initially vision was 6/24 in Left Eye. On fundus examination it was found multifocal choroiditis. Details are given in the figure legend (Fig 5). Standard anti-tubercular medications were introduced according to RNTCP protocol. Isoniazid, rifampicin, ethambutol, pyrazinamide for initial 2 months & isoniazid, rifampicin & ethambutol for further 4 months were continued. Initially oral prednisolone (1mg/kg/day) was given for 4 weeks, later on tapered on through 6 weeks. At the end of 6 months of Anti-tubercular Therapy it was found that

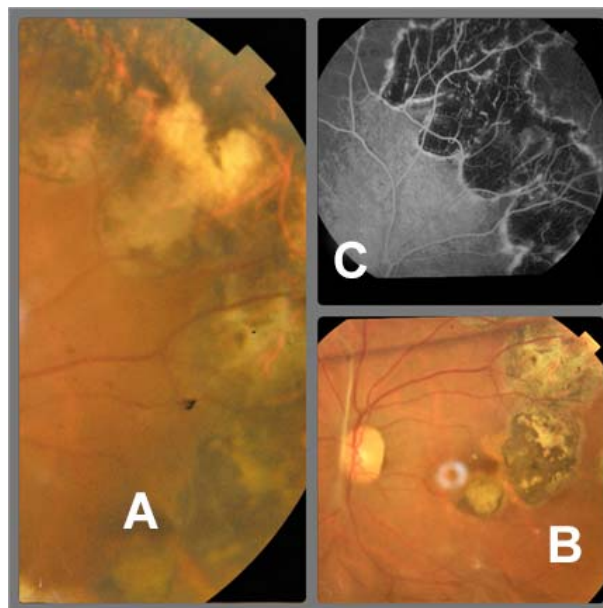


Fig 5 — shows fundus photograph of case 5. (A) multifocal choroiditis at the time of diagnosis. (B) lesions healed with pigmentation, permanent scarring & reduced in size at the end of ATT. (C) Fluorescence Angiography was also revealed healed lesions at the end of ATT.

lesions healed with pigmentation. Fluorescence angiography was also revealed healed lesions. Vision improved to 6/12 in left eye.

#### Case 6 :

A patient presented with dimness of vision in right Eye. (Vision 6/36) On Fundus examination it was diagnosed as serpiginous like choroiditis. Elaborately described inside the figure legend (Fig 6).

Standard anti-tubercular medications were introduced according to RNTCP protocol. Isoniazid, rifampicin, ethambutol, pyrazinamide for initial 2 months & isoniazid, rifampicin & ethambutol for further 7 months were continued. Total 9 months of anti-tubercular therapy was given. Initially oral prednisolone (1mg/kg/day) was given for 4 weeks, later on tapered on through 6 weeks. Final vision improved to 6/18. Lesions healed with pigmentation.

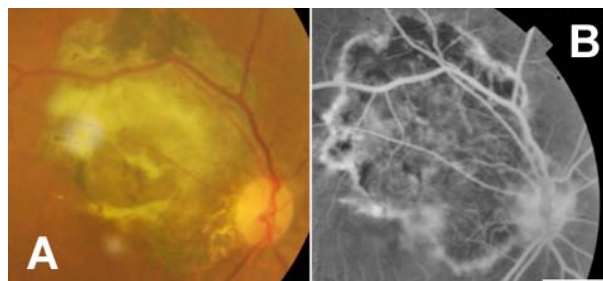


Fig 6 — shows clinical photograph of case 6. (A) serpiginous like choroiditis in the colour fundus photography. (B) The same lesion with fundus fluorescence angiography with active borders (hyperfluorescence) & central area is inactive (hypofluorescence)

## DISCUSSION

Tuberculosis in Eye is very mysterious in its presentations & towards treatment response. Here authors share experience of dealing with 6 possible Ocular Tuberculosis cases without any extra-ocular tubercular lesions.

To diagnose Ocular Tuberculosis sometimes Clinicians, depend on indirect evidences. Mantoux test can be indirect evidence. As direct microbiological conformation is difficult for suspected Ocular Tuberculosis cases, authors depend on presumptive signs of Ocular Tuberculosis and some indirect evidences. The reliability of mantoux test in diagnosing of ocular tuberculosis has been debated profusely. Though the test is not mandatory<sup>2</sup> in India, in an experimental rabbit model Mantoux test has been shown to correlate directly with ocular hypersensitivity, indicating this test may be useful in diagnosis of Ocular Disease<sup>4</sup>. As Mantoux test is immunological evidence of tubercular infection, we performed Mantoux test in all 6 cases.

Uveal tissue involvement in Tuberculosis has been counted as one of the most important signs of Ocular Tuberculosis. Case 1 had Chronic Anterior-uveitis which clearly indicate tubercular hypersensitivity reactions. Tubercular bacilli are rarely found in the patients of Uveitis. A study from India documents out of 1273 Uveitis patients 5 cases of microbiologically proven tubercular uveitis that is only 0.39% prevalence<sup>5</sup>.

Case 2 had Eales disease. The association of Eales disease with Tuberculosis has been well documented in literature. But it remains unclear whether or not Tuberculosis directly causing this phenomenon or it resulting from a hypersensitivity reaction<sup>6</sup>. Recently M tuberculosis DNA has been detected by PCR in a vitreous fluid specimen shows the association of M Tuberculosis with Eales disease<sup>7</sup>.

Choroidal Tuberculoma develops from a hematogenous spread of the tubercular bacilli occurs when a caseous pulmonary lesion erodes into the blood vessels or the lymphatic channels. So Tuberculoma is an active tubercular infection. Supporting the observation of Massaro and colleagues<sup>8</sup> regarding choroidal tubercles that case 3 had solitary choroidal Tuberculoma & case 4 had bilateral multiple choroidal Tuberculoma without any extra-ocular TB.

The exact mechanism of Choroiditis in Tuberculosis remains unknown. The Choroiditis may be due to immune-mediated hypersensitivity reaction in the presence of a few acid-fast bacteria in the choroid or retinal pigment epithelium<sup>2</sup>. Association of multifocal & serpiginous like Choroiditis with Tuberculosis has been well documented in literature<sup>9</sup>. Our case 5 had multifocal Choroiditis & case 6 had serpiginous like Choroiditis.

Regarding treatment it can be emphasized although four first line drugs are standard of care, steroids are

frequently necessary to control inflammation of vital ocular structures. Steroids in Ocular TB is used as similar manner in other extra-pulmonary Tuberculosis. The duration of anti-tubercular therapy is usually 6 months. But in some cases, as the lesions are not completely resolved, anti-tubercular medication was continued upto 9 months. Authors followed the same treatment protocol as per Central TB Division & ICMR<sup>8</sup>. Here response to anti-tubercular drugs becomes indirect evidence of Tuberculosis itself.

## CONCLUSION

Our observations strongly recommend to do a baseline visual assessment including dilated Fundus examination in cases of chronic inflammatory ocular condition and high index of suspicion is mandatory for the Ophthalmologist to diagnose a case of Ocular Tuberculosis. Co-existing Ocular Tuberculosis can be diagnosed in case of extra-ocular TB at the same time so that timely introduction of appropriate treatment can prevent Ocular Tuberculosis related morbidity.

## REFERENCES

- 1 Sharma A, Thapa B, Lavaju P — Ocular tuberculosis: an update. *Nepal J Ophthalmol* 2011; **3(5)**: 52-67.
- 2 Ocular TB — Index-TB guidelines. Guideline on extra-pulmonary tuberculosis for India. New Delhi: Ministry of Health & Family Welfare. Central Tuberculosis Division; [internet] [cited 2021 Aug 15]. Available from: <https://tbcindia.gov.in/showfile.php?lid=3245>
- 3 Technical and Operational Guidelines for TB Control in India 2016. New Delhi: Ministry of Health & Family Welfare. Central Tuberculosis Division; [internet] [cited 2021 Sep 19]. Available from: <https://tbcindia.gov.in/showfile.php?lid=3219>
- 4 Woods AC, Burkey EL, Friedenwald JS — Experimental studies of ocular tuberculosis. Relation of cutaneous sensitivity to ocular sensitivity in the normal rabbit infected by injection of tubercle bacilli into the anterior chamber. *Arch Ophthalmol* 1938; **19**: 245-50.
- 5 Biswas J, Narain S, Das D, Ganesh SK — Pattern of uveitis in a referral uveitis clinic in India. *Int Ophthalmol* 1996-7; **20**: 223-8.
- 6 Madhavan HN, Therese KL, Doraiswamy K — Further investigations on the association of Mycobacterium tuberculosis with Eales' disease. *Indian J Ophthalmol* 2002; **50**: 35-9.
- 7 Madhavan HN, Therese KL, Gunisha P, Jayanthi U, Biswas J — Polymerase chain reaction for detection of Mycobacterium tuberculosis in epiretinal membrane in Eales' disease. *Invest Ophthalmol Vis Sci* 2000; **41(3)**: 822
- 8 Massaro D, Katz S, Sachs M — Choroidal Tubercles. A Clue to Hematogenous Tuberculosis. *Ann Intern Med* 1964; **60**: 231-41.
- 9 Wiehler U, Mackensen F, Max R, Dalpke A, Zimmermann S, Becker M — Tuberculosis: An Underestimated Cause of Serpiginous Choroiditis? *Investigative Ophthalmology & Visual Science* 2007; **48**: 348.