

# Tuberculous choroiditis masquerading as sympathetic ophthalmia: a case report

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**SUMMARY** A 26-year-old Chinese man was admitted to this clinic due to decreased vision in his right eye for 4 days and painful protrusion in his left eye for 20 days. He had no perception of light in his left eye and perception of hand motion (HM) in his right eye. Examinations revealed that the left eye's lens and iris had protruded, and corneoscleral perforation. The right eye had an anterior chamber reaction and severe exudative retinal detachment that were confirmed by fluorescein angiography. Systemic examinations failed to identify a cause. The presumptive diagnosis was sympathetic ophthalmia of the right eye. Therefore, systemic steroid treatment was administered and enucleation of the left eye was performed. Although steroid treatment had been initiated, exudative detachment did not vary markedly. A pathological examination of the left eye revealed ocular tuberculosis, and anti-tuberculosis treatment resulted in a gradual reduction in subretinal fluid as well as improved vision.

**Keywords** ocular tuberculosis, sympathetic ophthalmia, choroiditis

## 1. Introduction

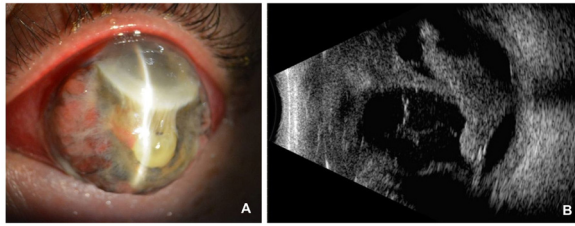
The eye is an organ often affected by extrapulmonary tuberculosis, and all ocular tissues can be affected, such as the eyelids, orbit, conjunctiva, plica semilunaris, lacrimal caruncle, sclera, retina, choroid, and optic nerve. Because of its slow and abundant blood flow, the choroid is a tissue most often affected by ocular tuberculosis (1). This poses a diagnostic challenge because of its protean clinical manifestations (2,3). Ocular tuberculosis is often diagnosed empirically in the absence of a microbial culture or pathological evidence (4). Tuberculosis can also induce endophthalmitis or panophthalmitis (5-8), but such conditions are extremely rare. Fewer than 20 cases have been reported worldwide (8), most of which necessitated enucleation or evisceration (9).

Presented here is a case of severe ocular tuberculosis where corneoscleral perforation with tubercular panophthalmitis was diagnosed based on a histopathological examination of the patient's left eye, in addition to severe exudative retinal detachment due to tuberculous choroiditis in the right eye.

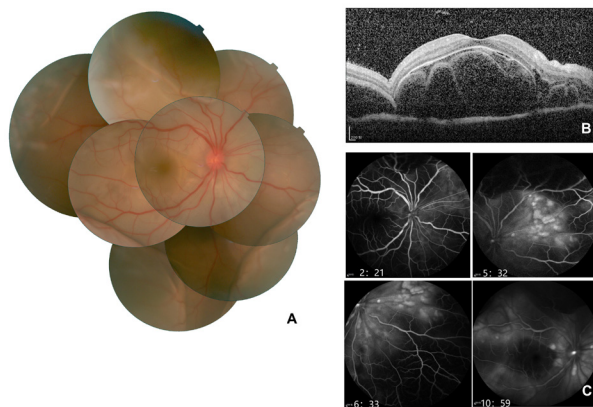
## 2. Case Report

A 26-year-old Chinese man from a medically underserved area was admitted to this clinic due to reduced vision for 4 months, complete loss of vision for

2 months, painful protrusion in the left eye for 20 days, and a sudden reduction in vision in the right eye for 4 days. There was no perception of light in the left eye and perception of hand motion (HM) in the right eye. Examinations revealed that his left eye's lens and iris had protruded, corneoscleral perforation was evident, and the cornea was highly opaque. B-scan ultrasonography revealed an irregular strong echo in the ocular cavity, and layers of retina and choroid were thickened inside the eye (Figure 1). An anterior segment examination of the right eye revealed conjunctival congestion, mild corneal edema, granulomatous keratic precipitates (KPs) (+), anterior chamber flare (+), cells (+), and a dilated pupil (diameter:4.5 mm); a posterior segment examination revealed vitreous cavity cells (+), optic disc swelling, retinal vascular dilation, and severe exudative retinal detachment (Figure 2A) that was confirmed by optical coherence tomography (OCT) (Figure 2B) and fluorescein angiography (FA) (Figure 2C). FA revealed multifocal hypofluorescent areas throughout all of the frames and progressive patchy hyperfluorescence in the late frames, and especially on the nasal side of the optic disc, indicating choroidal leakage. Systemic examinations that included chest radiography, routine blood tests, a human immunodeficiency virus (HIV) test, a syphilis test, and screening for immune diseases failed to identify a cause. Before admission, the patient's left eye had been treated despite lack of a definitive diagnosis. The

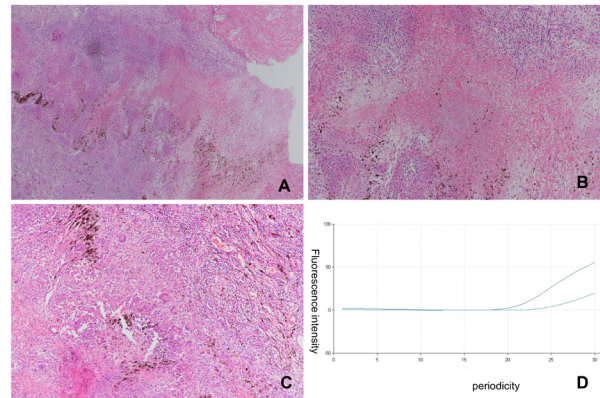


**Figure 1.** (A), The left eye had a protruded lens and iris at the corneoscleral perforation with an extensive opaque cornea. (B), The anterior segment could not be distinguished in B-scan ultrasonography, an irregular strong echo was present in the ocular cavity, and layers of retina and choroid had thickened.

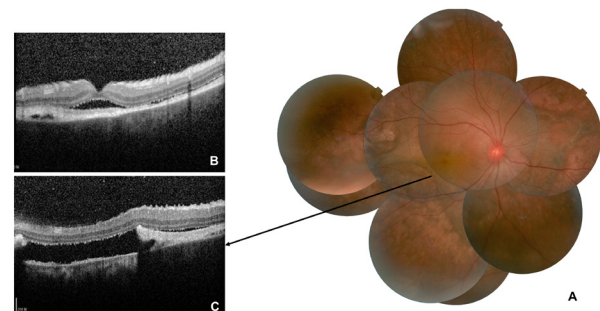


**Figure 2.** (A), Photography of the right eye revealed congestion and a blurred boundary of the optic disc, vascular dilation, retinal edema, and exudative retinal detachment. (B), OCT confirmed retinal edema and a large volume of subretinal fluid in the posterior area. (C), FA revealed multifocal hypofluorescent areas throughout all of the frames and progressive patchy hyperfluorescence in the late frames, and especially on the nasal side of the optic disc.

patient had no previous history of systemic or infectious diseases. He also had no history of trauma. Considering granulomatous inflammation and severe exudative retinal detachment in the right eye and perforation in the left eye, the presumptive diagnosis was sympathetic ophthalmia of the right eye. Therefore systemic steroid treatment was administered (infusion of 1,000 mg of methylprednisolone per day). Anti-inflammatory eye drops (tobramycin dexamethasone, pranoprofen, and compound tropicamide) were administered to the right eye as well. Enucleation of the left eye was performed. After 4 days of steroid treatment, vision did not change, and both the anterior chamber reaction and exudative retinal detachment improved slightly. However, a final pathological examination of the left eye revealed ocular tuberculosis. Multiple choroidal granulomas with caseous necrosis were present and a polymerase chain reaction (PCR) to identify tuberculosis-DNA (TB-DNA) was positive (Figure 3), although Ziehl-Neelsen staining of histopathology specimens did not reveal acid-fast bacilli. Accordingly, systemic steroid treatment was stopped except for the focal eye drops, which were adjusted according to follow-ups. The patient was transferred to



**Figure 3.** A pathological examination of the left eye revealed (A), part of the choroid had been entirely destroyed by granulomas, which were mainly infiltration by lymphocytes and monocytes/macrophages. (B), caseous necrosis. (C), Langerhans cells were evident. (D), Results of fluorescent probe PCR of TB-DNA were positive: the curve matched the positive control curve.



**Figure 4.** (A), 1.5 months after anti-tuberculosis treatment, previous retinal edema and detachment resolved; (B), OCT confirmed that the retinal edema and detachment had resolved; (C), Deposits and subretinal pigment accumulation in the posterior area.

a tuberculosis hospital to undergo further examinations, which confirmed tuberculosis, and then started on anti-tuberculosis therapy. After 1.5 months, vision in the right eye improved to counting fingers (CF) 50 cm. The anterior chamber reaction in the right eye had almost disappeared except for the dilated pupil, and previous retinal edema and retinal detachment improved as well (Figure 4). Therapeutic efficacy confirmed tuberculous choroiditis in the right eye.

### 3. Discussion

Presented here is a rare case of severe ocular tuberculosis masquerading as sympathetic ophthalmia, and this condition was eventually corrected.

All of the ocular tissues may be affected by tuberculosis (4); in the current case, tuberculosis in the left eye manifested as panophthalmitis. Because of its slow and abundant blood flow, the choroid is a tissue most often affected (1). Tuberculous choroiditis presents in various ways such as granulomatous uveitis, inflammatory and non-inflammatory conditions such as tumors, macular degeneration, and non-infectious

autoimmune uveitis (1,2), posing a diagnostic challenge (Table 1).

In 60% of cases, extrapulmonary tuberculosis is not accompanied by pulmonary tuberculosis (9), indicating the difficulty of identifying that condition *via* routine screening of the lung. Ocular tuberculosis is difficult to diagnosed empirically in the absence of a microbial culture or pathological evidence (11). In the current case, there was no noteworthy history of conditions affecting the left eye, corneoscleral perforation was evident, and

the patient was healthy except for his eye problems. Moreover systemic examinations did not identify a cause, so the condition was misdiagnosed as sympathetic ophthalmia of the right eye following a penetrating injury of the left eye. The diagnosis of exudative retinal detachment led to administration of high-dose systemic corticosteroid therapy, but improvement in exudative retinal detachment was limited. The left eye was enucleated, which may have helped to gauge preoperative diagnostic accuracy and to provide a safety net for any unsuspected pathology (12). The final pathological examination revealed tuberculosis despite negative acid-fast staining. However, negative results could not exclude tuberculosis because only 54-86% of *Mycobacterium tuberculosis* bacilli (MTB) can be detected by Ziehl-Neelsen acid-fast staining (13). After further confirmation, anti-tuberculosis treatment was initiated and had satisfactory efficacy.

The detailed stages of diagnosis and therapy are listed in the Table 2. The pathological examination as described here was crucial to making a precise diagnosis. In addition, there are only a handful of reported cases where histopathological evidence corroborated the existence of tuberculosis (14,15).

Although tuberculosis has been controlled quite well over the past several decades in China (16), ocular tuberculosis typically appears in atypical forms. The current case indicates that ophthalmologists should be extremely watchful to avoid a missed diagnosis or misdiagnosis.

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**Table 1. Clinical manifestations of intraocular tuberculosis (10)**

Tissue	Possible presentations
Anterior uvea/Pars plana	Granulomatous anterior uveitis Iris nodules Iris atrophy Intermediate uveitis
Choroid	Tubercles Tuberculomas Abscesses Choroiditis
Retina	Macular edema Intra- or preretinal hemorrhage Retinitis Vasculitis Neovascularization Neuroretinitis Eales disease
Optic nerve	Optic neuritis Retrobulbar neuritis Papillitis Papilledema Tubercles
Globe	Panuveitis Endophthalmitis Panophthalmitis Globe rupture

**Table 2. Detailed diagnosis and therapy**

Day 1 <i>Presumed diagnosis:</i> sympathetic ophthalmia	No history of systemic or infectious diseases. No trauma or surgery.  Left eye: corneoscleral perforation; Right eye: anterior chamber reaction and severe exudative retinal detachment.  OCT, FFA, Ultrasound B scan, <i>etc.</i> Chest radiography, blood routine, HIV, syphilis, immune diseases screening, <i>etc.</i>
Day 2	Systemic steroid venous transfusion; Anti-inflammatory eyedrops for the right eye; Enucleation of the left eye.
Day 5	Pathologic diagnosis of the left eye revealed ocular tuberculosis. Steroid treatment was stopped.  Exudative retinal detachment improved only slightly; Vision did not change.
Day 7 <i>Modified diagnosis:</i> tuberculous choroiditis	Anti-tuberculosis therapy began.
Day 52	Anti-tuberculosis treatment had satisfactory efficacy.

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