CASE REPORT

Beyond the Lungs: Presumptive Tuberculous Dacryoadenitis Associated with Latent Tuberculosis Infection

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ABSTRACT

We report a case of a 30-year-old woman working in a tuberculosis laboratory who presented with a two-week history of right periorbital swelling, pain, and redness. Examination revealed right eye dacryoadenitis with scleritis. Given her occupational exposure, strongly positive tuberculin skin test (TST) and positive Interferon-gamma Release Assay (IGRA) results, a presumptive diagnosis of orbital tuberculosis was made, despite the absence of microbiological or histopathological confirmation. The patient received anti-tuberculosis therapy, resulting in complete resolution of symptoms. This case highlights that dacryoadenitis with scleritis, though uncommon, should be considered in the differential diagnosis of atypical orbital presentations, particularly in endemic settings.

INTRODUCTION

Tuberculosis (TB) is a communicable infection caused by *Mycobacterium tuberculosis* (MTB), an obligate aerobic acid-fast bacillus. It can affect various organs and result in a broad spectrum of disease.[1] Although TB typically affects the lungs, it can also affect other sites including the eye, resulting in ocular TB, with reported incidence rates ranging from 1.4% to 5.74%.[2] TB of the lacrimal gland is a rare entity; it is more commonly found in India and other endemic areas.[3] Remarkably few cases of tubercular dacryoadenitis have been documented in the literature. Agrawal et al. reported only one case of lacrimal gland involvement out of 14 cases of orbital TB in India, over a period of 5 years.[4] In another retrospective case series conducted in Malaysia, 34 ocular TB cases were observed over a period of 6 years in a tertiary hospital with no reported cases of tuberculous dacryoadenitis.[5] We report a case of TB presenting as dacryoadenitis in a 30-year-old healthcare worker in Malaysia. In the absence of microbiological or histopathological confirmation, the diagnosis of orbital tuberculosis was presumptive, based on clinical presentation, radiological findings, immunological evidence of tuberculosis exposure, and therapeutic response.

CASE REPORT

A 30-year-old woman with underlying polycystic ovary syndrome presented with a two-week history of right periorbital swelling. The swelling had gradually worsened in size and redness, associated with right-sided headache, diplopia on up gaze, pain on eye movement, and photophobia. There was no associated eye discharge or visual acuity impairment. She denied systemic symptoms such as fever, dry cough, weight loss, or night sweats, as well as any history of insect bites or ocular trauma. She was employed as a laboratory assistant in an Infectious Unit Laboratory, handling tuberculosis-related specimens.

Upon examination, best corrected visual acuity in both eyes was 6/9 with no relative afferent pupillary defect. There was diffuse right periorbital swelling involving the upper and lower eyelids (Figure 1). Tenderness was noted over the right lacrimal fossa with no palpable mass. Right eye conjunctiva showed dilated tortuous vessel temporally (Figure 2) which was tender upon palpation and the vessels did not blanch with topical phenylephrine 2.5%. There was no pulsatile exophthalmos or bruits on auscultation. The patient had restricted dextroelevation and elevation over the right eye resulting in diplopia (Figure 3). Right eye intraocular pressure was 14 mmHg. Fundoscopy showed pink, well-defined optic disc, clear vitreous with no vasculitis or retinitis. Left eye examination was unremarkable. Systemic examination was normal; there was no cervical, axillary or pelvic lymphadenopathy.

Complete haematological profile, liver function tests, renal function tests and chest radiography were done and found to be within normal limits. The erythrocyte sedimentation rate was raised to 20 mm/Hr with positive TST measuring 30 mm of induration. Interferon-gamma release assay (IGRA) test was positive. Other infective markers were negative. The patient did not have diabetes mellitus or HIV infection. Contrast-enhanced computed tomography of the brain and orbit showed a well-defined hypodense lesion located at the lateral wall of the right orbit without any bony erosion or periostitis was seen, indicating right lacrimal gland enlargement (Figure 4). The patient was initially managed with intravenous amoxicillin–clavulanate (Augmentin) 1.2 g three times daily for seven days, in combination with oral ibuprofen 400 mg daily and topical Maxitrol administered every four hours to the right eye. This regimen resulted in minimal clinical improvement, suggesting the low likelihood of a pyogenic bacterial dacryoadenitis.

The lacrimal gland enlargement demonstrated a progressive course and occurred within a TB-endemic context. The lack of response to broad-spectrum antibiotic therapy raised suspicion for an atypical or granulomatous aetiology and contributed to the decision to escalate treatment. This patient was co-managed by a Chest Physician. Given the absence of microbiological confirmation and in accordance with national guidelines, the patient was treated as having latent tuberculosis infection with a short-course anti-tuberculous regimen, including Akurit-2 (Isoniazid 75 mg and Rifampicin 150 mg) 5 tablets daily and Pyridoxine 20 mg daily. During follow-up one month later, complete regression of right periorbital swelling and conjunctival redness were seen. Bilateral eye ocular motility was full and diplopia resolved.



Figure 1: Clinical photograph showing diffuse swelling of the right periorbital region involving both the upper and lower eyelids, consistent with inflammatory orbital involvement.



Figure 2: Clinical photograph demonstrating dilated and tortuous conjunctival vessels in the right eye, non-blanching with topical phenylephrine, supporting the presence of associated scleritis.

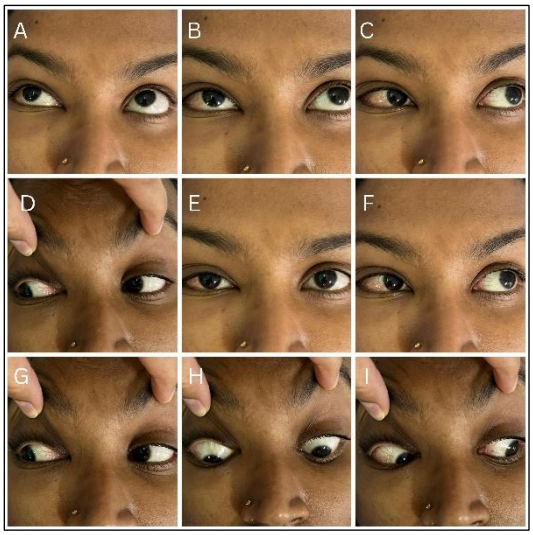


Figure 3: Ocular motility examination showing limitation of right eye movement during dextroelevation (A) and elevation (B), correlating clinically with orbital inflammation resulting in diplopia.

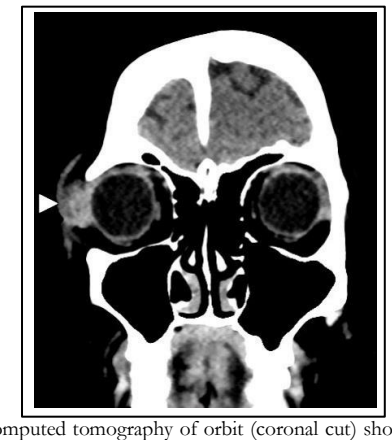


Figure 4: Computed tomography of orbit (coronal cut) shows well-defined hypodense lesion located at the lateral wall of the right orbit (arrowhead) without any bony erosion or periostitis.

DISCUSSION

Orbital tuberculosis (OTB) represents a rare extrapulmonary manifestation of TB. Despite its rarity, it is highly recognized for its potential to cause devastating outcomes due to pathological damage to various structures of the eye. The incidence of OTB ranges from 1.4% to 5.74%.[2] Fewer than 25 cases with similar clinical and radiological features have been reported, with over 50% of patients of Indian descent. [3]

OTB is classified as (i) classical periostitis; (ii) orbital soft tissue tuberculoma or cold abscess, with no bony destruction; (iii) orbital TB with evidence of bony involvement (iv) orbital spread from the paranasal sinuses; and (v) tuberculous dacryoadenitis.[6] Tuberculous dacryoadenitis typically manifests as eyelid swelling, often mimicking dacryoadenitis of a bacterial entity or benign mixed tumours of the lacrimal gland. Proptosis secondary to mass effect, ophthalmoplegia due to restricted extraocular muscle movement, and diplopia were found in most cases.

This case highlights similar clinical manifestations, as the patient developed preseptal cellulitis and ophthalmoplegia resulting in diplopia. Involvement of the orbit as seen in our case suggests a hematogenous source of infection. However, examination and investigations did not reveal any systemic involvement. TB is one possible infectious cause of scleritis and among other ocular inflammatory manifestations as depicted in the case report. The two pathogenic mechanisms involved in the development of infectious scleritis are direct invasion of MTB resulting in the destruction of the tissue as well as the immune reactions triggered by the infective agent.[7]

Diagnosing OTB is often challenging to ophthalmologists. While the isolation of M. tuberculosis remains the gold standard, positive cultures from lacrimal gland secretions, biopsy or fine needle aspirations are extremely rare. The detection of acid-fast bacilli (AFB) with Ziehl-Neelsen or auramine-rhodamine stain shows low yield, and MTB cultures, though definitive, require 6-8 weeks to provide results.[8] Madge et al. obtained only 18 positive MTB cultures out of 59 cases with typical histologic features and systemic confirmation of TB.[6] Histopathological examination requires a sufficiently large amount of sample, which is not feasible in this case as the lacrimal gland swelling is not clinically visible and it imposes additional risk in the already inflamed orbit. In the reported case, the patient showed positive response to topical steroid and oral anti-inflammatory drugs, negating the need for tissue biopsy.

Imaging modalities are pivotal in the evaluation of orbital tuberculosis, particularly given that chest radiographs may be normal in up to 70% of cases. In this patient, CT of the brain and orbit demonstrated preseptal cellulitis with mild enlargement of the right lacrimal gland, while coronal CT revealed a well-defined hypodense lesion along the lateral orbital wall without bony erosion or periostitis. Such findings of lacrimal gland enlargement and a discrete hypodense orbital lesion in the absence of bone involvement are consistent with manifestations of orbital tuberculosis.[9]

The diagnosis of OTB is presumptive in most of the reported cases. Positive tuberculin skin test (TST), Interferon-gamma release assays (IGRA), and lesion imaging findings play important roles in establishing the diagnosis. Both TST and IGRA involve the principle of cell-mediated immunity. While TST detects skin hypersensitivity to MTB antigens, the IGRA measures the interferon-γ release after in vitro stimulation of patients' lymphocytes with MTB specific antigens. Unlike TST, IGRA is unaffected by Bacillus Calmette-Guérin (BCG) vaccination or exposure to atypical MTB, making it more specific for MTB infection or prior exposure. Other possible diagnoses such as bacterial or viral infections, and orbital tumours were considered and excluded based on clinical presentation, laboratory results, and imaging characteristics.

The patient was co-managed with a chest physician in accordance with the Malaysian Clinical Practice Guidelines (CPG) for the Management of Tuberculosis (2021).[10] The patient was a healthcare worker with significant occupational exposure, a strongly positive tuberculin skin test, and a positive interferon-gamma release assay, but showed no evidence of active pulmonary tuberculosis. There was no microbiological or histopathological evidence to confirm active extrapulmonary tuberculosis. Based on the Malaysian CPG, the case was classified as latent tuberculosis infection (LTBI), and a three-month anti-tuberculous treatment regimen was recommended. The patient demonstrated clinical improvement, with no evidence of disease progression during subsequent follow-up.

CONCLUSION

Orbital inflammation, including dacryoadenitis and scleritis, can be an uncommon manifestation associated with tuberculosis, particularly in TB-endemic regions. Establishing a diagnosis of orbital tuberculosis can be challenging, necessitating a complete workup to exclude other causes. Although presumptive tubercular dacryoadenitis is very rare, it is crucial to have a high index of clinical suspicion, especially in patients with occupational or epidemiological risk factors. Prompt recognition and early commencement of ATT in carefully selected cases are crucial for good clinical outcomes, as reported in our case.

KEY MESSAGES

This case illustrates a rare presentation of tuberculosis-associated orbital inflammation, characterized by concurrent dacryoadenitis and scleritis in a healthcare worker. The absence of pulmonary involvement and initial microbiological confirmation highlights the diagnostic challenges inherent to isolated ocular tuberculosis. Clinicians should maintain a high index of suspicion for atypical ocular manifestations in patients with relevant epidemiological risk factors.

DECLARATION OF PATIENT CONSENT

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initials will not be published, and due efforts will be made to conceal the identity, but anonymity cannot be guaranteed.

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Nil

CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interests related to this paper.

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