



Primary Conjunctival Tuberculosis

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Abstract

A 12-year-old girl was referred to our clinic because of unilateral conjunctivitis not responding to treatment. In the left eye, lower bulbar and tarsal conjunctiva had a polypoidal appearance due to micronodules and there was a subconjunctival nodular mass in the inferior fornix. Systemic examination was unremarkable except for a left preauricular lymphadenopathy. Excision biopsy of the subconjunctival mass revealed a granulomatous inflammation with caseation necrosis, but acid-fast bacilli (AFB) was negative. Fine needle-aspiration biopsy of the preauricular lymph node was performed. In microbiological examination, both AFB and mycobacterial culture were positive. The isolated mycobacteria strains were identified as *Mycobacterium tuberculosis* complex and full remission was achieved with 6 months of anti-tuberculosis treatment. Although primary tuberculous conjunctivitis is a very rare condition, it should be considered in the differential diagnosis of treatment-resistant unilateral conjunctivitis. For definitive diagnosis, microbiological and histopathological examinations should be performed both in conjunctiva and regional lymph node.

Keywords: Conjunctival tuberculosis, tuberculous conjunctivitis, tuberculosis

Introduction

Conjunctival tuberculosis is a rare condition. The first definitive conjunctival tuberculosis case was recorded by Koaster in 1873 and numerous cases were reported until the early part of the 20th century.¹ In 1912, Eyre¹ reviewed a total of 206 cases with their 24 cases and described the characteristics of conjunctival tuberculosis in detail. Since then, conjunctival involvement has gradually decreased due to advances in the treatment of pulmonary tuberculosis.² In recent decades, only isolated case reports of conjunctival tuberculosis have been published.^{3,4,5,6,7,8,9} Conjunctival involvement is usually through direct inoculation of the organism to the conjunctiva or with contagious spread.^{1,2} Conjunctival lesions are generally accompanied by regional lymphadenopathy, but the association with pulmonary tuberculosis is rare.¹ For definitive diagnosis, *Mycobacterium tuberculosis* organisms must be identified in conjunctival biopsy specimens by direct microscopy or culture.⁹

Histopathological examination and molecular techniques such as polymerase chain reaction (PCR) are also helpful in diagnosis.^{3,4}

Case Report

A 12-year-old girl was referred to our clinic in July 2011 with treatment-resistant unilateral conjunctivitis. Conjunctival culture had been done several times, but no pathogen had been detected. She had been diagnosed with adenoviral conjunctivitis and treated with various topical antibiotics and corticosteroids for 4 months; however, the symptoms had progressed gradually despite treatment. On examination, her uncorrected visual acuity was 20/20 in both eyes. Examination of the right eye was unremarkable. In the left eye, the conjunctiva was hyperemic and the lower eyelid was slightly edematous (Figure 1a). There was a subconjunctival nodular mass in the inferior fornix. Biomicroscopic examination showed that the lower bulbar and tarsal conjunctiva had a polypoidal appearance due to multiple micronodules and mucopurulent discharge (Figure 1b). The rest

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of the ocular examination was normal. Systemic examination was unremarkable except for an enlarged left preauricular lymph node. Since previous conjunctival cultures were negative, we initially suspected a non-infectious granulomatous disease and ordered laboratory tests. Hematologic and biochemical parameters including hemoglobin, white cell count and differential, erythrocyte sedimentation rate, liver function tests, electrolytes, urea, creatinine, glucose, C-reactive protein, angiotensin-converting enzyme and antineutrophilic cytoplasmic antibodies levels were normal. Human immunodeficiency virus testing and syphilis serology were negative. Chest radiography findings were normal, and there were no enlarged hilar lymph nodes. A computed tomography scan of the orbits showed preseptal thickening of the left eyelid and a cystic lesion 1.5 cm in diameter under the skin in the left preauricular region.

The subconjunctival mass was excised totally. Histopathological examination revealed a granulomatous inflammation with extensive caseous necrosis, but Ziehl Neelsen staining for acid-fast bacilli (AFB) was negative. Meanwhile, the preauricular lymph node enlarged and became fluctuant (Figure 2a). Fine-needle aspiration biopsy of the preauricular

lymph node was performed. In microbiological examination, both AFB (Figure 2b) and mycobacterial culture (MGIT 960, Becton Dickinson) were positive. The isolated mycobacteria strains were identified as *Mycobacterium tuberculosis* complex by MGIT TBc identification test (MGIT 960, Becton, Dickinson and Company Sparks, USA) and determined sensitive to first-line antituberculosis drugs using the MGIT 960 system (Becton Dickinson, USA). Systemic examination and investigations were repeated for systemic tuberculosis. Sputum, gastric aspirate and urine showed no AFB, and cultures were negative. Her family screening for tuberculosis was also negative. As there was no evidence for systemic tuberculosis in other parts of the body, her diagnosis was considered primary conjunctival tuberculosis. A 4-drug antituberculosis treatment regimen was initiated with isoniazid 10 mg/kg, rifampicin 10 mg/kg, pyrazinamide 20 mg/kg, and streptomycin 1 g/day. A month later, the dose of streptomycin was reduced to 2 g/week. At the end of the second month, pyrazinamide and streptomycin were stopped, isoniazid and rifampicin were continued for 6 months. The conjunctival lesions showed significant improvement in the third month and completely resolved by the end of treatment (Figure 3a, b). The lymph node abscess burst spontaneously and healed with scarring. No recurrence was observed in a 2-year follow-up period.

Discussion

Tuberculosis is still an important global health problem. According to the World Health Organization (WHO), in 2011, there were an estimated 8.7 million new cases of tuberculosis globally, equivalent to 125 cases per 100,000 population. About 60% of cases are in the South-East Asia and Western Pacific regions. The African region has 24% of the world's cases.¹⁰ Although tuberculosis is widespread worldwide, conjunctival involvement is very rare. Most of the cases reported in recent decades have come from endemic regions;^{3,4} however, there have been a few case reports from developed countries.^{5,6,7,8,9}

Turkey is in the WHO European region and has a relatively high tuberculosis incidence rate, 28 cases per 100,000 population.¹⁰ In Turkey, a few cases of primary ocular and orbital tuberculosis were published previously,^{11,12,13} but to our knowledge, no cases of primary conjunctival tuberculosis have been reported. Moreover, only 4 cases of conjunctival tuberculosis have been reported from the WHO European region in last 5 decades.^{5,6,7,8} Three of the cases were diagnosed with primary conjunctival tuberculosis. Interestingly, these three cases were health professionals (general practitioner, microbiologist, and radiologist) who often encountered *Mycobacterium tuberculosis* and it was thought that the conjunctival lesions were probably due to direct inoculation of mycobacteria to the conjunctiva.^{6,7,8} Our patient was a 12-year-old student and her family screening for tuberculosis is negative. It could not be determined where she came into contact with tuberculosis and how the conjunctival inoculation occurred.

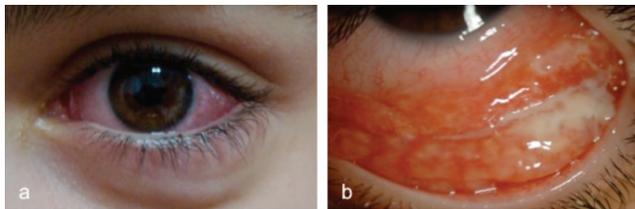


Figure 1. a) Conjunctivitis and lid edema due to subconjunctival nodular mass in the lower fornix. b) The lower bulbar and tarsal conjunctiva were congested and had a polypoidal appearance due to multiple micro nodules. There were mucopurulent secretion and fibrinous membranes over the ulcerated areas

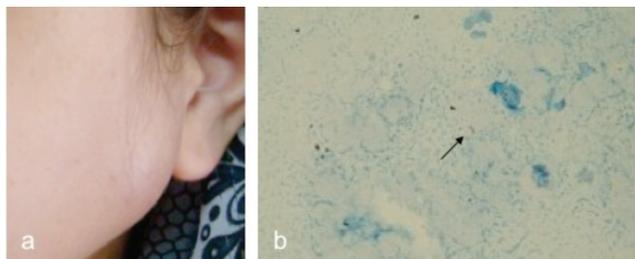


Figure 2. a) The enlarged and fluctuant preauricular lymph node. b) Acid-fast bacillus in the fine needle aspiration biopsy of the enlarged preauricular lymph node

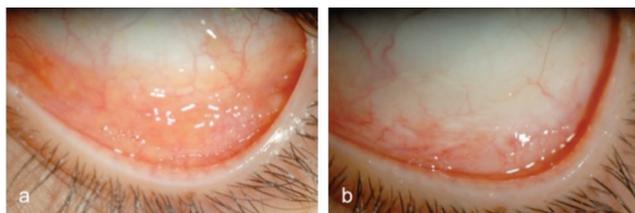


Figure 3. a) In the third month of treatment, there was marked reduction in the conjunctival lesions. b) The conjunctival lesions were completely resolved at the end of treatment

Today, it is very unlikely that tuberculosis would come to mind as a cause of conjunctivitis, even in endemic areas.⁴ Furthermore, variations in the clinical picture complicate the diagnosis. Eyre¹ classified the conjunctival lesions as ulcerative, nodular, hypertrophic granulomatous and pedunculated masses based on the morphological characteristics. In our case, the morphological features of conjunctival lesions resembled nodular and hypertrophic granulomatous types. However, a diagnosis cannot be established on the basis of the lesions' morphological features. We initially suspected a systemic granulomatous disease such as sarcoidosis, due to the chronic and refractory symptoms. The possibility of tuberculosis conjunctivitis was considered when histopathological examination of the subconjunctival nodule revealed granulomatous inflammation with caseous necrosis.

The definitive diagnosis of conjunctival tuberculosis requires identification of mycobacterium organisms in biopsy specimens by direct microscopy or culture. However, detection of mycobacteria may not be possible in small biopsy samples. In cases in which AFB and culture are negative, PCR amplification of mycobacterial DNA fragments in the tissue or biopsy specimens can be useful in the diagnosis.^{4,13,14} In our case, the conjunctival biopsy was negative for AFB. Fortunately, the preauricular lymph node was fluctuant and microbiological examination of lymph node biopsy confirmed the diagnosis of conjunctival tuberculosis.

Although primary tuberculous conjunctivitis is now a very rare entity, it should be considered in the differential diagnosis of unilateral chronic conjunctivitis not responding to treatment. For definitive diagnosis, microbiological and histopathological examinations should be performed both in the conjunctiva and regional lymph nodes.

Ethics

Informed Consent: It was taken.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: Nilgün Solmaz, Feyza Önder, Nedime Demir, Özlem Altuntaş Aydın, Concept: Nilgün Solmaz,

Design: Nilgün Solmaz, Data Collection or Processing: Nilgün Solmaz, Analysis or Interpretation: Nilgün Solmaz, Feyza Önder, Özlem Altuntaş Aydın, Literature Search: Nilgün Solmaz, Writing: Nilgün Solmaz.

Conflict of Interest: No conflict of interest was declared by the authors.

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