Case Report

Bilateral Endogenous Endophthalmitis in Disseminated NTM Infection: A Case Report

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A 47-year-old Thai female with underlying Sweet's syndrome and disseminated non-tuberculous mycobacterial infection presented with a history of blurred vision on both eyes after being lost to follow-up for eight months. The visual acuity was hand motion on the right eye and counting finger on the left eye. There was moderate inflammation in the anterior chamber and vitreous cavity. Multiple foci of round chorioretinitis were found throughout the fundus on both eyes. The patient denied intravitreous tapping and antibiotic injection. Nevertheless, specimens from several sites were collected for culture and sensitivity test. The result of the culture and sensitivity test revealed rapidly growing mycobacteria on specimens taken from the right inguinal lymph node. The presented case may demonstrate the rare event of bilateral endogenous endophthalmitis with chorioretinitis arising from non-tuberculous mycobacterial infection. The pattern of chorioretinitis demonstrated by the presented report may provide useful clinical information for this rare condition.

Keywords: *Endophthalmitis, Chorioretinitis, Non-tuberculous mycobacterium*

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Mycobacterial infection caused by organisms other than *M. tuberculosis* or *M. bovis* has been variously referred to as anonymous, atypical, chromogenic, or unclassified mycobacterial infection, but is perhaps best designated as Non-tuberculous. In 1959, Runyon reported a classification system of non-tuberculous mycobacteria[1] based on the characteristics of culture and sensitivity test (Table 1). Although Runyon's groups brought some order to the consideration of non-tuberculous mycobacteria (NTM), as more and more species of mycobacteria were recognized then, this categorization became less useful. An American Thoracic Society (ATS)[2] statement on NTM disease has provided a useful classification of NTM based on the clinical manifestations (Table 2).

Non-tuberculous mycobacterium is a rare causative agent of ocular infection. NTM ocular infections can be manifested as keratitis, scleritis, endophthalmitis, or orbital granuloma. They occurred in association with ocular trauma[3-6], contact lens use[7,8], corneal procedure especially laser in situ keratomileusis (LASIK)[9-16], extraocular surgery including tear duct probing[17], scleral buckling and dacryocystorhinostomy (DCR)[18], intraocular surgery including cataract surgery[19-23], penetrating keratoplasty (PKP)[24-26] and intravitreal triamcinolone injection (IVTA)[27]. From the authors' knowledge, all of the previous reports of NTM ocular infection were due to exogenous cause including NTM endophthalmitis. The presented case may demonstrate a very rare event of NTM endogenous endophthalmitis with chorioretinitis.

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Case Report

A 47-year-old Thai female presented with prolonged fever, chronic cough, weight loss, and rash. The patient did not have any underlying diseases. Generalized erythematous plaque and papules, multiple lymphadenopathy and hepatosplenomegaly were found on physical examination. Serum anti-HIV was negative. Organism was not found from skin lesion. Lymph node biopsy at the right inguinal region was positive for AFB staining and the pathological finding showed chronic inflammation. Lymph node culture revealed rapidly growing mycobacteria (RGM). Chest

Table 1. The Runyon's classification of non-tuberculous mycobacteria

Runyon's groups	Cultural characteristics	Organisms
I	Photochromogens: develop yellow pigment when exposed to light	*M. kansa* *M. marinum* *M. simiae* *M. asiaticum*
II	Scotochromogens: develop yellow-orange pigment when exposed to light	*M. scrofulaceum* *M. szulgai*
III	Nonchromogens: no pigment developed when exposed to light	*M. avium* *M. intracellulare* *M. terrae* *M. ulcerans* *M. heamophilum*
IV	Rapid growers: take only 2-3 days to reach full growth in culture	*M. chelonae* *M. abscessus* *M. fortuitum* *M. smegmatis*

Table 2. An American Thoracic Society statement on NTM disease

Clinical disease	Common organisms
Pulmonary disease	*M. avium complex, M. kansasii, M. abscessus, M. fortuitum, M. xenopi, M. malmoense*
Lymphadenitis	*M. avium comples, M. fortuitum, M. chelonae*
Cutaneous disease	*M. marinum, M. fortuitum, M. chelonae, M. abscessus, M. ulcerans*
Disseminated disease	*M. avium complex, M. kansasii, M. chelonae, M. haemophilum, M. abscessus*

X-ray was normal. Multiple lymphadenopathy without mass lesion were found on abdominal ultrasound. The patient was diagnosed as disseminated NTM infection and Sweet's syndrome. She was treated by oral clarithromycin, ofloxacin, and prednisolone. Unfortunately, the patient was lost to follow-up for eight months. She returned to the infectious clinic with the same symptoms with additional blurred vision on both eyes. Complete blood count showed anemia and mild leukocytosis. Blood chemistry was normal. Urine analysis and stool exam were normal. Sputum AFB staining was done every day for three days and no organism was found. Chest X-ray was normal. Specimens from many sites were collected for culture and sensitivity test. Hemoculture for mycobacteria was negative. Tip of cut down and urine cultures were negative. Sputum culture grew normal flora. Lymph node biopsy was done and the culture grew rapidly growing mycobacteria. The organism detected was sensitive to bactrim and imipenem. It, however, resisted to isoniazid (INH), ethambutol, rifampicin, ofloxacin, and ciprofloxacin. The patient was diagnosed as disseminated NTM infection, Sweet syndrome, and anemia from chronic disease. The patient was treated with intravenous imipenem injection, 500 mg every eight hours, and received oral clarithromycin 500 mg bid and ofloxacin 200 mg bid. According to the unstable clinical course, ophthalmologist consultation was performed after five days of hospitalization. Upon the ophthalmologic evaluation, the visual acuity was hand motion on the right eye and counting finger on the left eye. The intraocular pressures were 10 mmHg on the right eye and 5 mmHg on the left eye. There were superficial punctate keratitis at inferior cornea of both eyes. Moderate inflammation, cell/flare 3+/4+, with plasmoid aqueous in nearly total anterior chamber of both eyes were found. The pupils were semi-dilated and slightly reacted to light on both eyes without relative afferent pupillary defect (RAPD). Mild nuclear sclerosis was found on both eyes. Fundus examination showed moderate inflammation with multiple round chorioretinitis throughout the retina, size 200-500 um, on both eyes (Fig. 1A). After discussion with regard to the risk and benefit of intravitreal tapping and

intravitreal antibiotic injection, the patient refused the procedure. According to the clinical manifestations as well as evidence obtained from culture and sensitivity test, this patient was finally diagnosed with NTM endogenous endophthalmitis with chorioretinitis on both eyes for this patient. The authors treated the patient with moxifloxacin eye drop hourly, 1% prednisolone acetate eye drop every two hours and 1% atropine eye drop once a day. After discussion with an infectious specialist, the authors decided to use short course oral prednisolone 45 mg per day for one week as additional treatment. The plasmoid aqeous disappeared in two days of steroid treatment. After clinical improvement was detected, the authors then taped off the topical prednisolone. By one week of treatment, only mild intraocular inflammation was detected whereas chorioretinal lesions dramatically improved. Due to media opacity, no epimacular membrane was confirmed by optical coherent tomography (OCT). The patient was discharged after two weeks of intravenous imipenem injection. Home medication included moxifloxacin eye drop every six hours, oral glatifloxacin, oral clarithromycin, and oral ofloxacin. After nine weeks of treatment, the visual acuity was 6/18 on both eyes and no intraocular inflammation was found. The fundus examination showed generalized chorioretinal scars, attenuated vessels, and retinal neovascularization on both eyes (Fig. 1B). Due to the poor compliance to follow-up, panretinal laser photocoagulation was performed in the same period. The presented case may demonstrate the rare event of bilateral endogenous endophthalmitis with multiple chorioretinitis arising from non-tuberculous mycobacterial infection, which was successfully treated without intravitreal antibiotic injection.

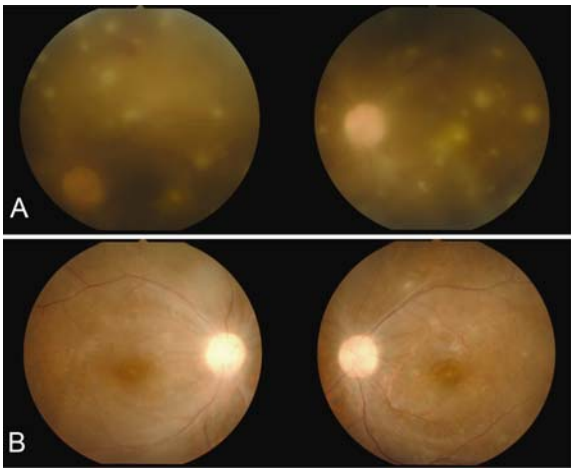

Fig. 1 Fundus photography. A) Moderate vitreous haziness and multiple round chorioretinitis were found throughout the retina in both eyes. B) There were multiple small chorioretinal scars and generalized attenuated vessels in both eyes

Discussion

NTM is a rare causative agent of ocular infection. All reported cases were caused by rapidly growing mycobacteria (RGM), Runyon's group IV. RGM infections have been associated with exposure to various water sources such as fish tanks, swimming pools, hot tubs, and fresh water sites. Apart from patients with AIDS, disseminated disease by NTM is rare. It is usually associated with some form of immunosuppression such as corticosteroid therapy, use of negative immunomodulating drugs and transplant patients. In the northeast region of Thailand, patients frequently use alternative or herbal medicine that usually contains corticosteroid. The patient reported in the present study also revealed a history of herbal medicine taking prior to development of visual symptoms. She presented with moon face, truncal obesity, and cushinoid appearance. The authors, therefore, assumed that corticosteroid use was one of the risk factors for NTM infection in the presented patient. The associations of Sweet's syndrome with NTM infection have previously been described. Most of them were caused by RGM[28-31]. The mechanism may involve direct invasion of vessel walls by tubercle bacilli, the deposition of immune complex, and delayed type hypersensitivity.

Non-tuberculous mycobacteria species are a rare cause of endophthalmitis. From literature review, there are five cases reported of NTM endophthalmitis. All of them were due to exogenous causes that occurred following cataract surgery[19-21], multiple corneal transplantation[24] and intravitreal triamcinolone injection (IVTA)[27]. Most of the reported cases became blind. There was only one reported case; occurring following cataract surgery, in which focal chorioretinitis and vasculitis were described. Although chorioretinitis demonstrated in the presented patient may be caused by other organisms, the pattern like this has not been described before. In this case, specimens from several parts of the body were collected for culture and sensitivity test. The result of culture and sensitivity test, however, revealed growth of organism only from the specimen taken from the lymph node.

Nowadays, there has been no consensus on standard treatment for NTM infection. Most authorities recommended antimicrobial therapy for the species of non-tuberculous mycobacteria detected. Determination of NTM species, however, requires sophisticated investigations including biochemical testing, DNA probes evaluation, or high-pressure liquid chromatography. Due to the limitation of resource and technology required for NTM species identification, the precise NTM species of organism causing problem in the present reported case was not uncovered. A final agreement of combination antimicrobial therapy was then made among the physicians taking care of this patient. The patient responded well to the treatments given. The present reported case, thus, may be the first case of endogenous endophthalmitis arising from NTM infection. The pattern of chorioretinitis demonstrated in the present reported case may provide very useful new clinical information for diagnosis of this very rare clinical entity.

Potential conflicts of interest

None.

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รายงานการติดเชื้อในลูกตาทั้งสองข้างจากเชื้อ non-tuberculous mycobacteria ในผู้ป่วย disseminated NTM infection

สุพัชญ์ สีนะวัฒน์, ยศอนันต์ ยศไพบูลย์, สุธาสินี สีนะวัฒน์

หญิงไทยอายุ 47 ปี ป่วยเป็นโรค Sweet syndrome และติดเชื้อ non-tuberculous mycobacteria มาพบแพทย์ด้วยอาการตามัวทั้งสองข้าง ภายหลังขาดการรักษาต่อเนื่องเป็นระยะเวลานาน 8 เดือน ระดับการมองเห็นของตาขวาสามารถมองเห็นเพียงมือโบกและตาซ้ายสามารถนับจำนวนนิ้วได้ในระยะ 1 ฟุต ตรวจตาพบมีการอักเสบระดับปานกลางในช่องด้านหน้าลูกตาและวุ้นตา มีการติดเชื้อที่จอตารูปร่าง กลมกระจายทั่วไปในตาทั้งสองข้าง ผู้ป่วยปฏิเสธการดูดวุ้นตาออกมาตรวจรวมทั้งการฉีดยาปฏิชีวนะเข้าวุ้นตา อย่างไรก็ตาม ได้ทำการเพาะเชื้อจากหลายตำแหน่งในร่างกายแต่มีเพียงการเพาะเชื้อจากต่อมน้ำเหลืองที่บริเวณขาหนีบด้านขวา เท่านั้นที่ขึ้นเชื้อ mycobacteria ดังนั้น ผู้ป่วยรายนี้อาจเกิดการติดเชื้อ non-tuberculous mycobacteria ในวุ้นตาและจอตาในตาทั้งสองข้างจากการแพร่กระจายเชื้อมาตามกระแสเลือด ซึ่งลักษณะการ ติดเชื้อที่จอตาอาจให้ข้อมูลทางคลินิกใหม่ที่เป็นประโยชน์ต่อไปในอนาคต