A rare cause of acquired esotropia: Leprosy

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Leprosy is an infective chronic granulomatous disease involving the skin and peripheral nerves caused by *Mycobacterium leprae*. Complications such as lagophthalmos, corneal opacity and uveitis are common, but cranial nerve involvement is rarely seen. The fifth and seventh cranial nerves are most commonly involved. We report a case of acquired esotropia due to sixth nerve palsy following a rare cranial nerve involvement by leprosy.

Key words: Acquired esotropia, lepromatous leprosy, nervus abducens paralysis, sixth cranial nerve palsy

Eye complications occur in high rates of leprosy cases. *Mycobacterium leprae* can affect extraocular tissues, anterior segment or, rarely, the posterior segment. It may also involve the seventh and ophthalmic division of the fifth cranial nerve, but rarely. We present a case report on a patient with a diagnosis of lepromatous leprosy for 58 years and who developed many leprosy-related complications which affected his face, extremities, eyes and its adnexa. By exception, this patient acquired esotropia due to sixth nerve palsy following a rare cranial nerve involvement by leprosy, which has been reported only one time in the literature.

A 64-year-old male patient with no medical history of systemic disease was admitted to our outpatient clinic with esotropia in his right eye that developed four months ago. The patient said that he had diplopia that had started around five-and-half months ago, but it disappeared when esotropia occurred. He had a 58-year history of leprosy. The patient has not been receiving active treatment for the last 20 years and has been followed up at a national leprosy hospital with the diagnosis of lepromatous leprosy and undergone...
annual bacilli controls. He received inpatient treatment four times (range 6–48 months) between 1960 and 1980. In 1970, due to bilateral facial nerve palsy, he underwent surgery for ectropion in both eyes. There was no uveitis attack in his records. At the final examination, ulnar and medial nerve functions were absent. Long-term lepromatous leprosy sequelae were present on both hands and face [Fig. 1]. His hands had hypopigmented plaques due to leprosy, bilateral sclerosis and claw-hand deformity and right-hand thumb reduction [Fig. 1].

In our ophthalmologic examination, best corrected visual acuity for the right eye was 0.7 and for the left eye was 0.8. The right eye had an esotropia above 45° with the Hirschberg test. Outward gaze was limited in the right eye [Fig. 1]. He did not have complaints of diplopia. Corneal hyposensitization was detected with touching a wisp of the cotton-tipped applicator. Both eyes had lagophthalmos and ectropion in the lower eyelids [Fig. 1]. The anterior chambers were free of cells and flare, grade 2 nuclear sclerosis was observed in the lenses bilaterally. Bilateral ocular pressures were normal and fundus examination revealed no pathology. Vertical eye movements (saccades and pursuit) and convergence were normal with physical examination, but, unfortunately, we have not had any opportunity to test eye movements with any eye tracking device. Unfortunately, Hess chart and forced duction test could not be done due to low compliance.

Magnetic resonance imaging (MRI) of the orbit and brain was requested. On the orbital MRI, the right lateral rectus muscle was atrophic, and globe medially and inwardly rotated due to abducens paralysis [Fig. 2]. The patient was referred to the neurology department. The neurologist proved sixth nerve palsy involvement of existing primary disease by excluding other neurological diseases. The patient was diagnosed with sixth nerve palsy due to lepromatous leprosy. He was then referred to the leprosy clinic.
Discussion

Leprosy is an infective and chronic systemic granulomatous disease caused by an acid-fast bacillus *Mycobacterium leprae* (Hansen’s bacillus) which has an affinity to peripheral tissues.[1] Eye complications are seen in over 90% of leprosy cases.[2] Lid involvements and lagophthalmos are most common involvements. As a result of facial nerve neuropathy ectropion, lagophthalmos and exposure keratopathy develops. Surgical treatment of eyelid malposition may be necessary. Our patient had several eyelid surgeries for lagophthalmos. Uveitis and retinal lesions can also be seen in leprosy, but fortunately, we did not observe any of them in our examination.

Cranial nerve involvement is rare, if it is involved, the ophthalmic branch of the fifth cranial nerve and the seventh cranial nerve tend to be involved.[3,5,6] Gopinath et al.[6] reported that frequency of cranial nerve involvment varies from 10% to 22%. Kumar et al.[3] and Gourie-Devi et al.[3] reviewed cranial involvements in leprosy, and none of them reported sixth nerve involvement. We searched PubMed, Google, and Google Scholar and only one article about sixth nerve involvement of leprosy from India was found, but it was a type I reaction. The patient had prednisolone, and lateral rectus paralysis was reversible.[7] But our patient had chronic long-term leprosy, and his esotropia was irreversible. It is reported that cranial nerve involvements tend to be more common in patients with the lepromatous type of leprosy of longer duration, as our patient had, but cranial nerve involvement can occur in other forms of leprosy and short-duration disease, like the mentioned patient who had sixth nerve palsy.[3,7]

Sixth nerve palsy is the most common acquired cranial nerve palsy in adults, and vasculopathy, trauma, demyelinating diseases and intracranial lesions or infections are frequently responsible for the etiology. These diseases excluded the patient’s medical history, laboratory tests and physical examination. In sixth nerve palsy, full recovery can be seen but if esotropia remains, treatments such as surgery and botulinum toxin injection should be considered, but our patient refused all surgical interventions. It can be thought that sixth cranial nerve involvement of leprosy will not be seen much due to the anatomy of the sixth cranial nerve, which has a long course in the subarachnoid space, close to the base of the brain and is quite deep. But some extraordinary involvements have been previously reported, like the affection of the central nervous system and spinal cord.[8–10] The mechanisms behind how leprosy affects the brain are unsolved, but evidence shows that leprosy can affect the central nervous system and spinal cord and further larger investigations should be done.

In conclusion, the involvement of cranial nerves due to leprosy can be seen. Sixth nerve palsy due to chronic and long-term leprosy may occur. Patients with leprosy should be examined in detail along with cranial nerves system examinations with a periodic fashion. Finally, leprosy should be considered in the differential diagnosis of sixth nerve palsy.