



A Case of Neurosyphilis Presenting with Multiple Cranial Neuropathy

Çoklu Kafa Çifti Tutulumuyla Seyreden Bir Nörosifiliz Olgusu

Eda Kılıç Çoban, Mehmet Ali Aldan, Sedat Gez, Nilüfer Kale, Mesude Özerden, Nazan Sakallı, Aysun Soysal
Bakırköy Training and Research Hospital of Psychiatry, 3rd Clinic of Neurology and Neurosurgery, İstanbul, Turkey

Summary

Syphilis is a sexually-transmitted disease caused by the spirochete bacterium *Treponema pallidum*. Central nervous system involvement can occur in every stage of the disease. It is classified into: acute syphilitic meningitis, meningovascular syphilis, and parenchymatous neurosyphilis. Acute basilar syphilitic meningitis is characterized primarily by the presence of cranial nerve involvement. As cranial nerve enhancement may be seen in a broad range of diseases, it can be the only clinical feature of neurosyphilis.

Keywords: Neurosyphilis, cranial neuropathy, meningitis

Öz

Sifiliz, bir spiroket olan *Treponema pallidum* tarafından oluşan cinsel yolla bulaşan bir hastalıktır. Hastalıkta merkezi sinir sistemi tutulumu her dönemde gözlenebilir. Hastalık en sık akut sifilitik menenjit, meningovasküler sifiliz ve parankimal nörosifiliz olarak karşımıza çıkar. Akut baziller sifilitik menenjit primer olarak kafa çifti tutulumu ile kendini gösterir. Çoklu kafa çiftleri mevcudiyeti merkezi sinir sistemi tutulumu yapan pek çok hastalıkta görülebilmekle birlikte nörosifilizin de tek klinik bulgusu olabilir.

Anahtar Kelimeler: Nörosifiliz, kafa çiftleri, menenjit

Introduction

Neurosyphilis is a sexually-transmitted infection caused by the spirochete bacterium *Treponema pallidum*. It is associated with chronic course, reactivation, and multisystemic involvement. The microorganism enters the central nervous system (CNS) after an inoculation period, which takes 3-18 months. CNS involvement can be seen anytime in the course of the disease. Acute syphilitic meningitis, meningovascular syphilis, and parenchymal neurosyphilis are the most common forms of the disease. Syphilitic meningitis is thought to be caused by small vessel arteritis-associated direct meningeal inflammation and occurs two years

after the initial exposure. Acute basilar syphilitic meningitis presents with cranial nerve involvement.

Multiple cranial nerve involvements with ocular findings can be seen in various diseases with CNS involvements such as neurosyphilis (1). Herein, we report a patient who presented with cranial neuropathies, predominantly with visual disturbances, but without meningeal irritation signs, to draw attention to neurosyphilis.

Case Report

A man aged 38 years was admitted to the emergency department with double vision, right eyelid drooping, numbness

Address for Correspondence/Yazışma Adresi: Eda Kılıç Çoban MD, Bakırköy Training and Research Hospital of Psychiatry, Clinic of Neurology and Neurosurgery 3rd, İstanbul, Turkey

Phone: +90 212 543 65 65-18 40 E-mail: eda_coban@yahoo.com

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on the left side of his face, and hearing loss on the left side. Neurologic examination showed right ptosis, restriction of right eye movements except lateral gaze, and hypoesthesia on the right side of the face in the trigeminal trace. The right pupil size was 5 millimeters in diameter (Figure 1, 2). The sense of vibration in then lower extremities was decreased. There were no signs of meningeal irritation. Cranial magnetic resonance imaging (MRI) showed contrast enhancement in the right oculomotor, bilateral trigeminal, facial, vestibulocochlear nerve roots (Figure 3, 4). An audiogram showed mild sensorineural hearing loss in the left ear. Eighty lymphocytes were counted in cerebrospinal fluid (CSF) and the protein level of CSF was 51.9 mg/dL. Venereal Disease Research Laboratory (VDRL) test was negative in the CSF sample. VDRL-rapid plasma reagin (RPR) (1/16) and *Treponema pallidum* hemagglutination assay (TPHA) (1/5210) tests were positive in the serum sample, and the fluorescent treponemal antibody (FTA)-absorption (ABS) test was positive in the CSF sample. Serologic tests for human immunodeficiency virus (HIV) and other diseases were negative. Twenty four million units per day were given

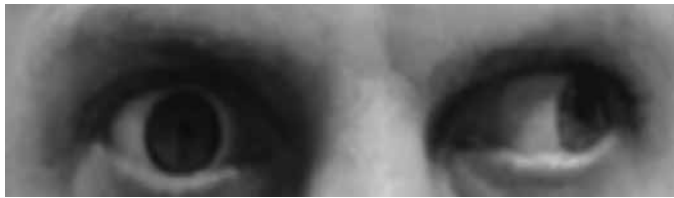


Figure 1. Impairment of right eye in inward looking



Figure 2. Impairment of right eye in upward looking

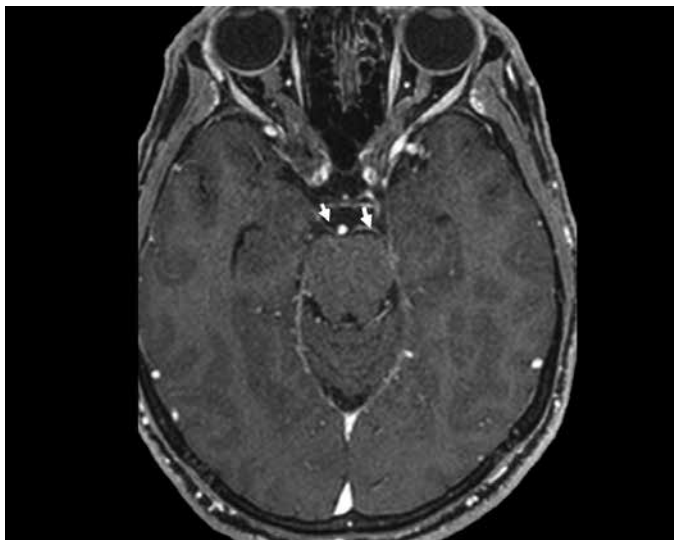


Figure 3. Contrast enhancements in bilateral 3. cranial nerves

for three weeks. Ptosis improved on the first week of treatment. Repeated CSF investigation was normal. A rapid improvement in clinical state was achieved.

Discussion

Syphilis was called “the great imitator” in the past because it can manifest almost any symptom. It was considered in differential diagnosis of any ocular problems in past times when it was more common (2). In the antibiotic era, the number of patients with the classic form of neurosyphilis has decreased while the frequency of subtle and atypical forms has increased (3,4). These atypical presentations cause problems in the diagnosis of neurosyphilis.

Syphilis is a sexually-transmitted disease and unsafe sexual practices among homosexuals and number of patients with HIV increase its frequency. It presents in three stages. Primary stage presents with chancre and regional lymphadenopathy, which turns to the secondary stage within 2–4 weeks through the spread of microorganism via blood circulation, if no treatment is given. In this stage, involvement of CNS and aseptic meningitis can be seen. After symptoms of the secondary stage ameliorate, the tertiary stage begins following at least five years of a latent period.

CNS involvement can be seen weeks or years after the initial infection in any stage of the disease. CNS involvement is usually seen in the tertiary stage but also in the secondary stage. Acute syphilitic meningitis, meningovascular syphilis, and parenchymal neurosyphilis are major presentations of the disease; however, most patients are asymptomatic (5,6).

Parenchymal neurosyphilis is associated with widespread parenchymal damage and demyelination of dorsal root ganglions, which presents as tabes dorsalis. Meningovascular syphilis presents with focal neurologic signs and global dysfunction of CNS-involving seizures, hemiplegia, insomnia, personality changes, and dementia. Acute syphilitic meningitis presents with headache, confusion, and meningeal irritation signs. Meningeal irritation can effect cranial nerves at the brain and cause cranial neuropathies. Meningeal irritation can effect cranial nerves at the brain and cause

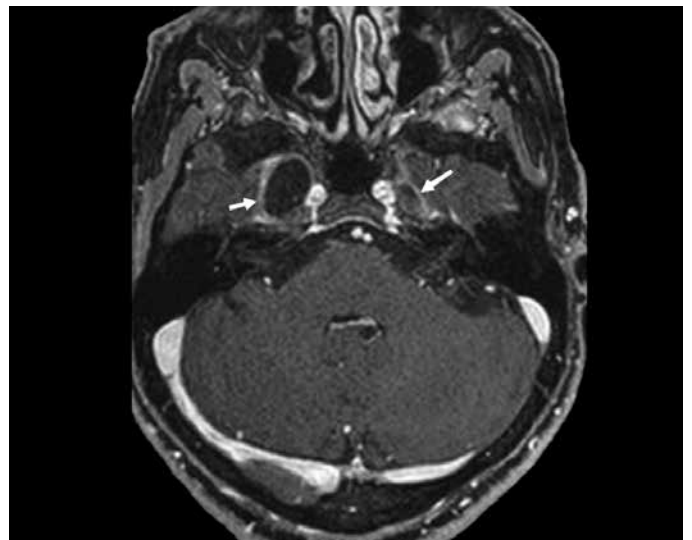


Figure 4. Contrast enhancements in bilateral 7. cranial nerves

cranial neuropathies which the 7th and 8th cranial nerves are the commonly effected nerves. Involvement of the 2nd, 3rd, and 6th cranial nerves have also been reported (7).

Our patient was admitted to the emergency department with cranial neuropathies without meningeal irritation signs. Neurologic examination showed involvements of 3rd, 5th, and 8th cranial nerves and dorsal root ganglions.

In neurosyphilis, cranial nerve involvement is caused by basilar meningitis, which causes inflammation; in the meningovascular form, ischemia of nerves or compression of gummas may cause cranial nerve involvement (8). Multiple cranial nerve involvement suggested the syphilitic basilar meningitis form of the disease in our patient.

Cranial imagings may show various findings in patients with neurosyphilis (Table 1) (9). Cranial MRI showed contrast enhancement in the 3rd, 5th, 7th, and 8th cranial nerves and no parenchymal involvement in our patient.

Neoplastic, granulomatous, infectious processes may cause cranial nerve involvement. Our patient had no history of malignancy, which excluded the diagnosis of leptomeningeal carcinomatosis and lymphoma. The diagnosis of granulomatous meningitis secondary to systemic sarcoidosis was excluded because there was no optic chiasm involvement, the CSF Angiotensin-converting enzyme level was normal, and thorax CT was normal. Serologic tests for herpes simplex, varicella, citomegalovirus, HIV, Lyme disease, and tuberculosis were negative.

Our patient had no history of sexually-transmitted disease and level of anti-HIV antibodies in serum was negative. However, in seroconversion time, patients may not have detectable levels of HIV antibodies in the blood, so we planned to repeat the test 3 months later. Syphilis is mostly sexually transmitted but there are other routes of transmission. In our patient's wife, VDRL and

FTA-ABS tests were negative, which suggests the disease could have been acquired in childhood in our patient.

Positive serum VDRL-RPR and TPHA and CSF FTA-ABS tests and rapid improvement in clinical state and CSF findings to intravenous penicillin treatment suggested the diagnosis of neurosyphilis in our patient.

We want to highlight that neurosyphilis can present with any symptoms. In a conscious patient with multiple cranial nerve involvements without meningeal irritation signs, neurosyphilis must be kept in mind in the differential diagnosis.

Ethics

Informed Consent: Consent form was filled out by all participants.

Peer-review: External and internal peer-reviewed.

Authorship Contributions

Concept: Eda Kılıç Çoban, Aysun Soysal, Design: Eda Kılıç Çoban, Mesude Özerden, Nilüfer Kale, Data Collection or Processing: Eda Kılıç Çoban, Mehmet Ali Aldan, Sedat Gez, Analysis or Interpretation: Eda Kılıç Çoban, Literature Search: Eda Kılıç Çoban, Mehmet Ali Aldan, Nazan Sakallı, Writing: Eda Kılıç Çoban.

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Table 1. Cranial magnetic resonance imaging findings in neurosyphilis

Cerebral atrophy
Cortico-subcortical infarctions
Infarctions in brain stem and basal ganglia
Leptomeningeal contrast enhancement
Syphilitic gummas
Lepto-meningeal granuloma
Non-specific white matter changes
Arteritis (especially Heubner arteritis)