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Case Report

A Rare Case of Neurosyphilis with Facial Paralysis and Vertigo During Pregnancy: A Case Report

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ABSTRACT

Diagnosis of neurosyphilis is difficult because it is rare and often presents with obscure symptoms since any organ can be affected. Pregnant women infected with syphilis can transmit syphilis to the fetus through mother-to-child transmission, which can lead to adverse pregnancy outcomes. Early diagnosis is important in high-risk patients such as pregnant women, but there is no universal agreement on syphilis screening. A 26-year-old pregnant woman presented at 8 weeks' gestation with right facial paralysis and vertigo. Evaluation of cerebrospinal fluid by lumbar puncture revealed elevated protein levels and positivity for Rapid plasma reaction (RPR) and treponema pallidum latex agglutination (TPLA), leading to a diagnosis of neurosyphilis. She was treated with intravenous ampicillin for 14 days and oral amoxicillin for another 14 days. Both vertigo and facial paralysis improved. Newborn screening showed no evidence of congenital syphilis. Neurosyphilis should be considered in the differential diagnosis of facial paralysis and vertigo.

INTRODUCTION

Syphilis is caused by the spirochete bacterium *Treponema pallidum*. Penicillin has reduced the incidence of syphilis over the past several decades. However, recent surveys have shown a remarkable increase in the prevalence of infectious syphilis[1]. Treponemes are challenging to culture and current diagnostic methods rely on immunological reactions. Patients with syphilis can develop neurosyphilis, and its symptoms include facial paralysis and vertigo. However, due to the variability in its onset and nonspecific clinical manifestations, syphilis is rarely identified as the cause of facial paralysis or vertigo. Consequently, diagnosis and treatment are often delayed and, in some cases, missed unless an immunological response is performed. Timely diagnosis and appropriate management of syphilis are critical to prevent a variety of adverse outcomes, especially in pregnant women. The World Health Organization estimates that 1.5 million cases of gestational syphilis occur each year[2].

Here, we report a case of early neurosyphilis in a 26-year-old Japanese woman who presented with facial paralysis and vertigo and responded to penicillin treatment.

CASE PRESENTATION

A 26-year-old Japanese woman, gravida 1, para 0, at 8 weeks of gestation, presented to our hospital with a 1-day history of right-sided facial palsy. No accompanying symptoms such as fever or earaches were present and no signs of auricular vesicles or meningeal irritation were observed. Physical examination revealed weakness of the right orbicularis oculus and buccal and masseter muscles.

The right facial nerve palsy grade was IV (House-Brackmann grade) and the ipsilateral stapedial reflex was negative. Complete blood count and biochemical markers were within normal ranges. Bell's palsy was suspected based on the clinical symptoms, and the patient was initially treated with steroids. Routine blood tests performed prior to steroid administration included serological tests for hepatitis B virus, human immunodeficiency virus (HIV), and syphilis. Serological tests for hepatitis B and HIV viruses yielded negative results. However, rapid plasma reaction (RPR) and Treponema pallidum latex agglutination (TPLA) tests were positive (RPR: 33.3 R.U./TPLA: 261.7 T.U.). Given the positive results, we considered the possibility of neurosyphilis and obtained cerebrospinal fluid. CSF analysis revealed an elevated protein level of 47.7 mg/dL(normal range: 10–40 mg/dL), and a positive RPR and TPLA test (RPR: 2.3 R.U./TPLA: 25.2 T.U.). The CSF was negative for varicella zoster virus antibodies, and T2-weighted head magnetic resonance imaging (MRI) revealed hypointense areas in the right cerebellar bridge angle (Figure 1).

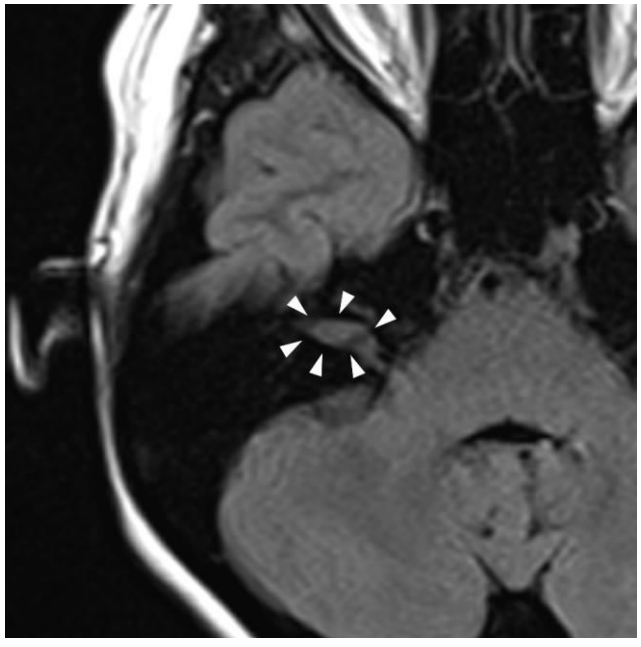

Figure 1: Head MRI (T2 star weighted image) revealed high-intensity areas (arrows) at the internal auditory canal.

The patient was diagnosed with neurosyphilis and admitted the next day to the Infectious Diseases Department for treatment. Upon admission, the patient complained of vertigo, with no other symptoms such as hearing loss or tinnitus observed. Clinical neurological examination revealed a positive Romberg test result and spontaneous nystagmus on the left side. Caloric test results were unresponsive on the right side, indicating canal paresis. Ampicillin (4 g every 6 hours) was administered intravenously for 14 days. Considering its effects on the fetus, steroids were not administered. No fever or side effects were observed, and by day 7 of admission, the vertigo had resolved, and the facial nerve palsy improved to House-Brackmann grade III. All other medical conditions were managed appropriately. She was discharged 14 days after admission and continued oral amoxicillin (500 mg every 8 h) for 14 days. Vitamin B12 (0.5 mg three times daily) was administered orally for a 6-month period. At the 6-month follow-up, facial nerve function had completely recovered (grade I), and the ipsilateral stapedial reflex was positive. Maternal RPR titer was repeated at 6 months from the time the initial titer was drawn, showing an expected 4-fold decline indicating adequate treatment (2.6 R.U.). However, the Caloric test remained unresponsive, and the cervical vestibular-evoked myogenic potentials were also unresponsive (Figure 2).

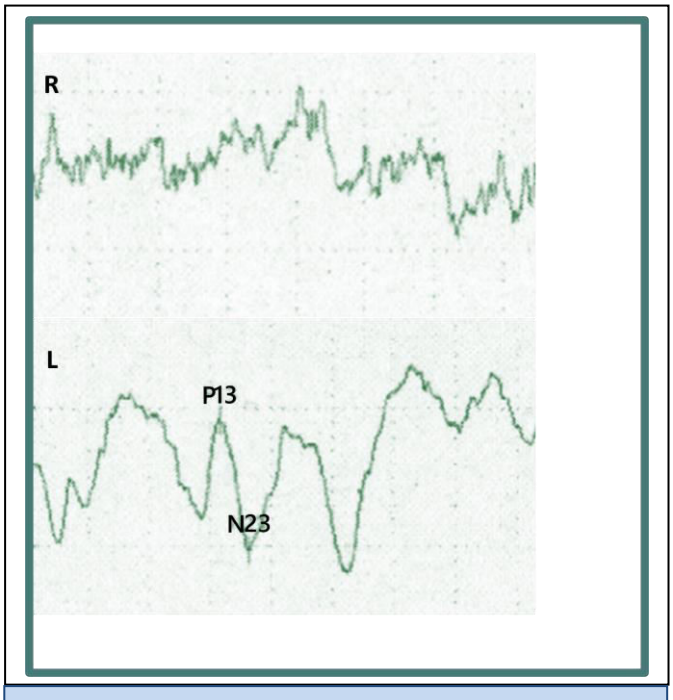

Figure 2: Results of the cervical vestibular evoked myogenic potentials after 6 months of treatment.

The test was performed with a click sound of 105 dBnHL. The data demonstrated an obvious decrease in the gain, accompanied by saccade movement.

She underwent an antenatal checkup at our obstetrics department. Ultrasound examination results in the second and third trimesters of pregnancy were normal. She delivered a baby boy weighing 2790 g at 39 weeks of gestation through natural means, with APGAR scores of 9 and 9 at 1 and 5 minutes, respectively. No clinical signs of congenital syphilis were observed.

Neonatal RPR and IgM-FTA-ABS were performed at birth, followed by intravenous administration of Penicillin G for 10 days. Both RPR and IgM-FTA-ABS results were nonresponsive. The infant was discharged home at 6 days of age and followed up as an outpatient. At the 10-month checkup, RPR and TPLA tests were negative (RPR: 0.0 R.U./TPLA: 0.0 T.U.), ruling out syphilis, and follow-up was completed.

DISCUSSION

Bell's palsy was initially suspected in this case; however, based on positive syphilis serology and spinal fluid findings, neurosyphilis was conclusively diagnosed. Syphilis tends to affect the central nervous system and, according to one review, is reported to be present in 25–60% of syphilitic patients[3]. Syphilis is a treatable disease. However, intravenous administration is necessary when the CNS is affected. In general, neurosyphilis is diagnosed based on clinical findings such as the presence of CSF pleocytosis and a positive CSF RPR test. The CSF RPR test is highly specific (94%) but has a diagnostic sensitivity of 27%[4]. The central nervous system can be affected at any stage of the disease, from a few weeks to several years after disease onset. However, neurosyphilis is often missed in the early stages of syphilis infection. Neurosyphilis is classified into early neurosyphilis, which mainly invades the meninges and cranial nerves, and late neurosyphilis, which invades the brain and spine[3]. In the present case, the patient suffered from cranial nerve damage, including facial paralysis and vertigo, which are characteristics of early neurosyphilis.

Steroids were not administered in this case due to patient's pregnancy, and the potential effects on the fetus were considered. After six months of treatment, facial paralysis and vertigo were completely relieved. Although facial nerve function improved, vestibular nerve function did not. Animal experiments in guinea pigs have shown that Schwann cells play an important role in peripheral nerve repair[5]. Additionally, in a study using human specimens, the facial nerve contained more Schwann cells than the vestibulocochlear nerve[6]. We speculate that the vestibular nerves may be more susceptible to damage from syphilis due to the paucity of Schwann cells. Although there is no strong evidence supporting the use of steroids in combination with PCG therapy for facial nerve palsy or vertigo due to neurosyphilis, such treatment may prevent neuropathy and promote neurological recovery.

Syphilis is a global public health crisis, and the rate of infection during pregnancy is increasing. Although clinical symptoms may be atypical and difficult to diagnose, routine serological testing is recommended at the time of the initial examination, with an increased index of suspicion for syphilis infection, especially in pregnant women, due to the high risk of congenital infection if the disease is untreated. In this case, no serious maternal complications developed, and the neonate did not develop syphilis. However, regnancy and neonatal outcomes specifically associated with neurosyphilis are currently unknown and require case collection and subsequent reporting.

CONCLUSION

The case presented here highlights neurosyphilis manifesting as facial nerve involvement during pregnancy. The suspicion of syphilis in patients presenting with neurological symptoms should be raised, and neurosyphilis should be considered as a differential diagnosis, especially in high-risk patients such as pregnant women.

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The authors declare no conflicts of interest regarding this study.

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