J Infect Chemother 25 (2019) 362–364

Contents lists available at ScienceDirect

Journal of Infection and Chemotherapy

journal homepage: http://www.elsevier.com/locate/jic

Case Report

Early neurosyphilis presenting with multiple cranial nerve palsies: A case report of management by combined penicillin-corticosteroid treatment

Hiroshi Komamura [a], Takaaki Nakamura [a, *], Junpei Kobayashi [b], Ryuhei Harada [a], Kaoru Endo [a], Masaki Ogura [c], Jun Higuchi [a]

[a] Division of Neurology, Sendai City Hospital, 1-1-1 Asutonagamachi, Taihaku-ku, Sendai 982-8502, Miyagi, Japan
[b] Department of Neurology, National Hospital Organization Yonezawa Hospital, 26100-1, Misawa, Yonezawa, Yamagata, Japan
[c] Division of Otolaryngology, Sendai City Hospital, 1-1-1 Asutonagamachi, Taihaku-ku, Sendai, Miyagi, Japan

ARTICLE INFO

Article history:
Received 26 June 2018
Received in revised form
16 August 2018
Accepted 11 November 2018
Available online 8 December 2018

Keywords:
Neurosyphilis
Corticosteroid
Cranial nerve palsy
HIV-negative
Treponema pallidum

ABSTRACT

Early neurosyphilis commonly appears in basilar meninges, and its meningeal inflammation can spread to neighboring cranial nerves, resulting in some cranial nerve palsies. Herein, we report a case of a 51-year-old man who presented with right peripheral facial nerve palsy. His symptoms completely disappeared with prednisolone monotherapy without antibiotics use and were not exacerbated during clinical treatment. However, 2 months after remission of seventh cranial neuropathy, fifth and eighth cranial neuropathies appeared on the right side. Serologic tests for syphilis were revealed to be abnormal. Finally, the patient was diagnosed with early neurosyphilis with multiple cranial palsies. His neurological symptoms were markedly improved by combined penicillin-corticosteroid treatment. Systemic corticosteroids could be effective as adjunctive therapy to ameliorate neurological sequelae in early neurosyphilis.

1. Introduction

Neurosyphilis is defined as any involvement of the central nervous system resulting from infection with the spirochete *Treponema pallidum*. Clinical manifestations of neurosyphilis comprise an asymptomatic form, as well as early and late stages. Early neurosyphilis is mainly characterized by meningeal inflammation and vascular lesions of the leptomeninges, while late neurosyphilis involves parenchyma of the brain or spine, including general paresis and tabes dorsalis. Treatment for neurosyphilis is antibiotic therapy, such as aqueous crystalline penicillin, amoxicillin, ceftriaxone, or doxycycline. Corticosteroid treatment before and during antibiotic use aids in prevention of the Jarisch–Herxheimer reaction. Although combined penicillin-corticosteroid treatment has the potential to improve cochleovestibular symptoms due to neurosyphilis [1], the effectiveness of corticosteroid therapy as an adjunctive treatment to improve neurological sequelae in neurosyphilis is not yet clear. Here, we report a case of early neurosyphilis with multiple cranial neuropathies, which was successfully managed by adjunctive corticosteroid treatment.

2. Case report

A 51-year-old man with right facial paralysis visited our clinic and was tentatively diagnosed with Bell's palsy. He recovered fully after treatment with prednisolone 30 mg for 2 weeks. Two months later, however, he was admitted to our hospital because of gradually worsening neurological symptoms, including hypoesthesia on the right side of his face and right hearing loss. His past medical history has been remarkably insignificant, and he frequently had a sexual intercourse with commercial sex worker on the past years. Neurological examination revealed gaze-evoked nystagmus to the right, hypoesthesia in the innervation areas of the first and second branches of the right trigeminal nerve, and sensorineural hearing loss on the right side, without meningeal signs. Audiography showed unilateral hearing loss, with a mean loss of 75 dB on the right side. Serum rapid plasma regain (RPR), *T. pallidum*

Abbreviations: CSF, cerebrospinal fluid; FTA-ABS, fluorescent treponemal antibody absorption; RPR, rapid plasma regain; TPHA, *Treponema pallidum* hemagglutination.

* Corresponding author.
E-mail address: takaaki@med.tohoku.ac.jp (T. Nakamura).

https://doi.org/10.1016/j.jiac.2018.11.007
1341-321X/

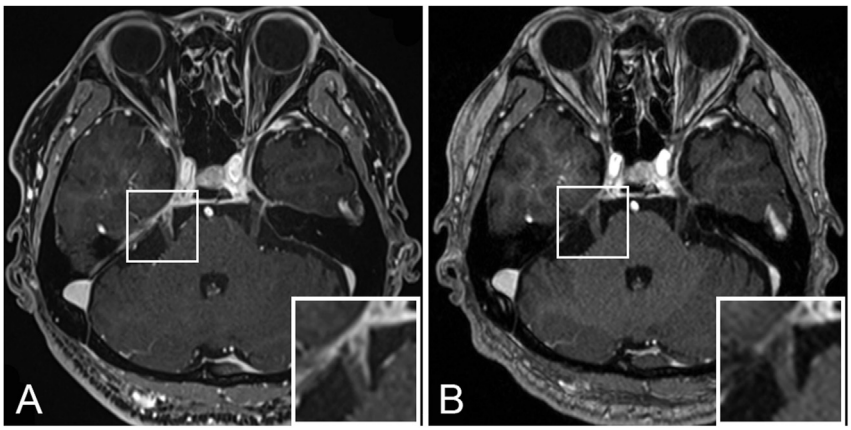

Fig. 1. Magnetic resonance imaging of the brain (A) on admission and (B) at 2 months after treatment. (A) Contrast-enhanced T1-weighted imaging showed hyperintense lesions in the medial side of the right trigeminal nerve. (B) Contrast enhancement in the right trigeminal nerve almost disappeared. *White square* indicates the magnified area.

hemagglutination (TPHA) tests were positive (serum RPR 1:16 (negative < 1:1); serum TPHA ≥ 1:5120 (negative < 1:80)). Laboratory test for human immunodeficiency virus was negative. Cerebrospinal fluid (CSF) examinations showed a mononuclear cell count of 180/μL with normal total protein level (35 mg/dL). CSF TPHA and fluorescent treponemal antibody absorption (FTA-ABS) were positive (CSF TPHA 1:128 (negative < 1:4); CSF FTA-ABS 1:40 (negative <1:5)), while CSF RPR was minimally positive (CSF RPR 1:1). Magnetic resonance imaging of the brain showed hyperintense lesions in the medial side of the right trigeminal nerve on contrast-enhanced T1-weighted imaging (Fig. 1A). We diagnosed the patient with early neurosyphilis with multiple cranial nerve palsies based on the criteria [2–4]. He was treated with intravenous penicillin G (24×10^6 U/day) and oral prednisolone (30 mg/day, and decreasing by 5–10 mg every 5 days until discontinuation). Two weeks after starting treatment, all neurological symptoms were significantly improved, and contrast enhancement in the right trigeminal nerve almost disappeared (Fig. 1B). We confirmed that his neurological findings were not exacerbated and serum RPR titer returned to weakly reactive (serum RPR 1:1) by 3 months later (a fourfold change in titer indicated a clinically significant difference between two nontreponemal test results [4]).

3. Discussion

Herein, we reported a patient with early neurosyphilis who presented with multiple cranial nerve palsies. Early neurosyphilis commonly appears in basilar meninges, and its meningeal inflammation can spread to neighboring cranial nerves, resulting in the onset of cranial nerve palsies. Involvement of the optic, oculomotor, trigeminal, abducens, facial, and auditory nerves has been reported [5,6]. Notably, his initial episode of seventh cranial neuropathy was alleviated by treatment with prednisolone monotherapy and not exacerbated during the course of clinical treatment. Finally, neurosyphilis-related recurrent cranial neuropathies in the fifth and eighth cranial nerves were treated by combined penicillin-corticosteroid therapy. This clinical course of seventh cranial neuropathy indicated that cranial neuropathies caused by early neurosyphilis could be mainly due to secondary inflammation spreading from basal meningitis, rather than direct tissue invasion of *T. pallidum*.

There have been no clinical studies regarding the usefulness of corticosteroid therapy for neurosyphilis. However, our experience suggests that corticosteroids may be useful as an adjunctive treatment to ameliorate neurological sequelae in patients with early neurosyphilis presenting with cranial neuropathies. Also in the treatment of ocular syphilis including optic neuritis and uveitis, systemic corticosteroids may constitute an important adjunctive therapy to ameliorate visual sequelae [7,8]. Moreover, there have been a few reports of gummatous syphilis treated by corticosteroids without antibiotics [9,10]. Gummatous lesions are assumed to be composed of granulomatous inflammation associated with syphilis, in which syphilitic bodies are seldom detected [11]. Therefore, corticosteroid treatment could be effective in some clinical forms of neurosyphilis, such as early neurosyphilis manifesting as cranial neuropathy or ocular syphilis, and gummatous syphilis.

Although facial nerve involvement completely improved with corticosteroid monotherapy before a conclusive diagnosis of early neurosyphilis was made in the present patient, other cranial nerve palsies appeared, which required additional antibiotic therapy. Thus, it is important to exclude treponemal disease in any patient with cranial nerve palsy. In conclusion, prompt diagnosis and combined penicillin-corticosteroid therapy may improve neurological prognosis in early neurosyphilis with cranial nerve palsy.

Funding

This report did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Authorship

All authors meet the ICMJE authorship criteria.

Conflicts of interest

None.

Acknowledgement

None.

References

[1] Yimtae K, Srirompotong S, Lertsukprasert K. Otosyphilis: a review of 85 cases. Otolaryngol Head Neck Surg 2007;136:67–71.
[2] Janier M, Hegyi V, Dupin N, Unemo M, Tiplica GS, Potocnik M, et al. 2014 european guideline on the management of syphilis. J Eur Acad Dermatol Venereol 2014;28:1581–93.
[3] Levchik N, Ponomareva M, Surganova V, Zilberberg N, Kungurov N. Criteria for the diagnosis of neurosyphilis in cerebrospinal fluid: relationships with intrathecal immunoglobulin synthesis and blood-cerebrospinal fluid barrier dysfunction. Sex Transm Dis 2013;40:917–22.

[4] Workowski KA, Bolan GA. Sexually transmitted diseases treatment guidelines, 2015. MMWR Recomm Rep 2015;64:1–137.
[5] Brightbill TC, Ihmeidan IH, Post MJ, Berger JR, Katz DA. Neurosyphilis in hiv-positive and hiv-negative patients: neuroimaging findings. AJNR Am J Neuroradiol 1995;16:703–11.
[6] Cassilde AL, Barnaud G, Baccar S, Mortier E. Sudden-onset bilateral deafness revealing early neurosyphilis. Eur Ann Otorhinolaryngol Head Neck Dis 2014;131:389–91.
[7] Aldave AJ, King JA, Cunningham Jr ET. Ocular syphilis. Curr Opin Ophthalmol 2001;12:433–41.
[8] Chao JR, Khurana RN, Fawzi AA, Reddy HS, Rao NA. Syphilis: reemergence of an old adversary. Ophthalmology 2006;113:2074–9.
[9] Fleet WS, Watson RT, Ballinger WE. Resolution of gumma with steroid therapy. Neurology 1986;36:1104–7.
[10] Herrold JM. A syphilitic cerebral gumma manifesting as a brain-stem mass lesion that responded to corticosteroid monotherapy. Mayo Clin Proc 1994;69:960–1.
[11] Carlson JA, Dabiri G, Cribier B, Sell S. The immunopathobiology of syphilis: the manifestations and course of syphilis are determined by the level of delayed-type hypersensitivity. Am J Dermatopathol 2011;33:433–60.