HOSTED BY
ELSEVIER
CrossMark
Available online at www.sciencedirect.com
ScienceDirect
Radiology of Infectious Diseases 2 (2015) 5–10
www.elsevier.com/locate/jrid

# MRI demonstrations of AIDS complicated by toxoplasma gondii infection in cervical spinal cord with 3 cases reports

Yun-fang Li, Hong-jun Li*, Qi Zhang, Jiao-jiao Liu, Wei Wang, Yan-yan Zhang

*Department of Diagnostic Radiology, Affiliated Beijing You'an Hospital, Capital Medical University, Beijing 100069, China*

Received 27 December 2014; accepted 19 March 2015
Available online 8 May 2015

**Abstract**

*Objective*: To understand the imaging demonstrations of AIDS complicated by Toxoplasma gondii infection in cervical spinal cord.
*Methods*: A total of 3 cases AIDS complicated by Toxoplasma gondii infection in cervical spinal cord was retrospectively analyzed for their imaging demonstrations. All received plain MRI scanning of cervical spine and its enhanced scanning. Additional examinations of MRI plain scanning of head and chest and their enhanced scanning were performed for 1 case. Toxoplasma gondii antibody detection found two cases with positive Toxoplasma gondii antibodies of both IgA and IgG, one case with negative Toxoplasma gondii antibodies of IgA but positive IgG. The post-therapeutic reexaminations found obviously shrunk foci in 2 cases, disappeared foci in the other. One case had multiple foci in different regions while the other 2 singular only found in cervical spinal cord.
*Results*: By MRI plain scanning, the spinal cords were found thickened and swollen and the foci demonstrating low T1 and low T2 signals. In addition, the surrounding edema demonstrated long strip liked high T1 and high T2 signals. By enhanced MRI scanning, the foci demonstrated ring shaped, spiral shaped or target shaped enhancement.
*Conclusions*: Cases of AIDS with intracerebral and/or intra-spinal multiple foci as well as findings of ring shaped, spiral shaped or nodular shaped enhancement by enhanced MRI scanning highly indicate the diagnosis of cerebral and/or spinal infections. Findings by MRI scanning are characteristic rather than specific. MRI is an effective way for the diagnosis of cerebral and/or spinal infection of toxoplasma gondii.


*Keywords:* AIDS; Cervical spine; Toxoplasma gondii infection; MRI demonstration

AIDS, standing for Acquired Immune Deficiency Syndrome, may cause a series of opportunistic organism infections, parasitic infections, infarction, hemorrhage and neoplasms, followed by fatal syndromes. As we know, Toxoplasmosis of central nervous system is commonly seen in patients with immunodeficiency [1,2]. Cerebral and/or spinal infection of toxoplasma gondii is a people zoonosis extensively infected by various species of mammals. Toxoplasmic encephalitis commonly occurs in AIDS patients with frequent recurrence, even with subsequent serious acute infections. However, spinal cord infections or simultaneous multiple cerebral and/or spinal involvements have been rarely reported. To get a further knowledge about MRI demonstrations of AIDS complicated by cervical spinal infection of toxoplasma gondii, the MRI demonstrations of this group was analyzed and evaluated. And the clinical value of diagnostic imaging on AIDS complicated by Toxoplasma gondii infection in cervical spinal cord was assessed.

## 1. Materials and methods

Totally 3 cases of AIDS complicated by cervical spinal infection of toxoplasma gondii were recruited as the subjects who paid the visit during Feb., 1998 and Sept., 2006 and definitely diagnosed by Center for Disease Control (CDC). They were all male patients, with their ages ranging from 24

* Corresponding author.
*E-mail address:* lihongjun00113@126.com (H.-j. Li).
Peer review under responsibility of Beijing You'an Hospital affiliated to Capital Medical University.

http://dx.doi.org/10.1016/j.jrid.2015.04.002

years to 55 years. The infectious routes were drug abuse for 2 cases and sexually transmitted for the other and their disease course ranged from 1 year to 3 years. The symptoms, neurologically, were headache and memory regression in all 3 cases, gait instability and blury vision for all 3 cases and unconsciousness during the clinic visit for 2 cases. Focal symptoms included hemiparesis, defective coordination, sensory disability of half-body and aphasia. Toxoplasma gondii antibodies of IgA and IgG were detected by Western blotting in Yan'an Hospital, Kunming City of Yunnan Province and People's Hospital of Hezhou City, Guangxi Zhuang Autonomous Area. CD4+ lymphocytes count was detected in CDC of Yunnan province and People's Hospital of Hezhou City, Guangxi Zhuang Autonomous Area. Totally 2 cases had positive findings of both antibodies and the other having negative IgA findings and positive IgG findings. All the cases received immunological and therapeutic diagnosis.

The criteria for clinical diagnosis included clinical symptoms of psychiatry and neurology; laboratory CD4+ lymphocytes count being less than 100 cells/ul; slightly increased leukocytes in cerebrospinal fluid; serum positive findings of Toxoplasma gondii antibodies (IgA and IgG); therapeutic diagnosis; cerebrospinal puncture for biopsy and histopathological examinations. The methods for examination were MRI plain scanning and enhanced scanning for all 3 cases, 2 with Simens Magneton superconductive 1.5 T magnetic resonance imaging system in SE sequence, axial T1WI (TR = 550 ms, TE = 15 ms) and T2WI (TR = 2200 ms, TE = 90 ms) with FA 90°, field of vision 250, matrix of 256 × 256, layer thickness of 6 mm and layer spacing of 2 mm; coronal T1WI with layer thickness of 6 mm and layer spacing of 2 mm; sagittal T1WI with layer thickness of 6 mm, layer spacing of 2 mm and matrix of 256 × 256. The contrast agent of IV-Gd-DTPA was used 15 ml for the diagnostic imaging. The other case was scanned with domestically manufactured OPER-0.35T permanent-magnet magnetic resonance imaging system in FSE sequence, axial T1WI (TR = 380 ms , TE = 20 ms) and T2WI (TR = 4000 ms, TE = 131 ms) with field of vision 250, FA 90°, layer thickness of 5 mm and layer spacing of 6 mm; coronal T1WI with layer thickness of 5 mm, layer spacing of 6 mm; sagittal T1WI with layer thickness of 5 mm, layer spacing of 6 mm and matrix of 256 × 256. The contrast agent of IV-Gd-DTPA 15 ml was used.

A male AIDS patient with the comfirmative diagnosis by CDC, aged 34 years, having a history of drug abuse, suffering from bilateral upper extremities numbness for one month; CD4+ lymphocytes count being 57cells/μl; MRI demonstrating thickened and swollen cervical spinal cord, low T1 and low T2 signals of the foci, strip liked high T1 and high T2 signals of its peripheral edema; Enhanced MRI demonstrating abnormal target shaped or ring shaped enhancement of intraspinal foci as the arrowheads indicating (Figs. 1 and 2).

A male AIDS patient aged 36 years with confirmative diagnosis by CDC, having a history of drug abuse and venereal disease, suffering from bilateral upper extremities numbness for 2 weeks; CD4+ lymphocytes count being 89 cells/μl; MRI demonstrating local swollen and thickened cervical spinal cords, equal T1 and slightly low T2 signals as arrowheads


Fig. 1. MRI for a AIDS complicated by cervical spinal infection of toxoplasma gondii.

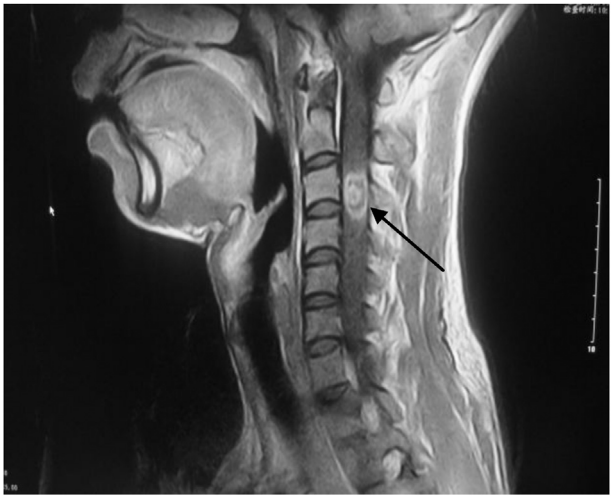

Fig. 2. MRI for a AIDS complicated by cervical spinal infection of toxoplasma gondii.

indicating (Figs. 3 and 4); Enhanced MRI demonstrating ring shaped enhancement as the arrowheads indicating (Figs. 5 and 6); Obviously shrunk foci 2 weeks after Sulfonamides medication therapy to fight against toxoplasma gondii as the arrowhead indicating (Fig. 7).

A male AIDS patient aged 28 years with the confirmative diagnosis by CDC, having a history of drug abuse, with symptoms of dizziness, nausea, bilateral extremities numbness for 2 months and atrophy of upper extremities; CD4+ lymphocytes count being 47 cells/μl; MRI demonstrating abnormal nodular shaped enhancement of brain, specifically beside the right lateral ventricle of brain (Fig. 8); local swollen and thickened cervical spinal cord with obvious edema and strip liked high T2 signal (Fig. 9); staged strip liked high T2