

Brain Magnetic Resonance Imaging of Werner Syndrome

Yasushi Shibata¹, MD, PhD

¹ Department of Neurosurgery, University of Tsukuba, Mito Medical Center, Mito Kyodo General Hospital, Mito, Ibaraki, 310-0015, Japan.

Conflict-of-interest statement: The author(s) declare(s) that there is no conflict of interest regarding the publication of this paper.

Open-Access: This article is an open-access article which was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

Correspondence to: Yasushi Shibata, Department of Neurosurgery, University of Tsukuba, Mito Medical Center, Mito Kyodo General Hospital, Mito, Ibaraki, 310-0015, Japan.

Email: yshibata@md.tsukuba.ac.jp

Telephone: +81-29231-2371

Fax: +81-29231-5137

Received: February 16, 2021

Revised: March 4, 2021

Accepted: March 6, 2021

Published online: March 15, 2021

ABSTRACT

Neuroradiological studies of neurologically asymptomatic cases of Werner syndrome are lacking. We report MRI finding including T2* or SWI for a Werner syndrome patient.

Key words: CVD; MRI; SWI; Werner syndrome

© 2021 The Author(s). Published by ACT Publishing Group Ltd. All rights reserved.

Shibata Y. Brain Magnetic Resonance Imaging of Werner Syndrome. *International Journal of Radiology* 2021; **8(1)**: 261-263 Available from: URL: <http://www.ghrnet.org/index.php/ijr/article/view/3116>

INTRODUCTION

Werner syndrome, first described by Otto Werner in 1904, is a rare genetic disease characterized by premature senescence. Autosomal recessive inheritance and a mutation at chromosome 8p have been recognized^[1,2]. The mean life expectancy is 55 years old as of 2008. The main causes of death are neoplasm and cardiac or cerebrovascular accidents. Neuroradiological studies of neurologically asymptomatic cases of Werner syndrome are lacking.

CASE REPORT

A 48-year-old male patient who had been diagnosed with Werner syndrome visited our hospital complaining of a mild headache. His growth had stopped around 14 years old. His height was 157 cm, and his body weight was 36 kg. He had had white hair for 20 years old. He had been diagnosed with hyperparathyroidism, cataracts, hyperlipidemia, and osteoporosis and showed a bird-like face, scleroderma, skin ulcer, and calcification of the foot. Both of his parents had had malignancies. He was married but had no children. A neurological examination revealed no abnormalities. Brain magnetic resonance imaging (MRI) demonstrated diffuse cerebral atrophy. No ischemia or tumor was observed. Susceptibility weighted imaging (SWI) showed multiple microbleeds at the brainstem and basal ganglia (Figure 1). Magnetic resonance angiography showed normal findings. His headache was mild and non-specific, so we diagnosed him with a tension-type headache.

DISCUSSION

The diagnostic criteria of Werner syndrome are shown in table. Although neurological symptoms are not an early sign of Werner syndrome, some neurological abnormalities, like dementia, brain tumor, and cerebrovascular accidents, have been reported in Werner syndrome patients^[1,2]. Only some reports have described the MRI findings of Werner syndrome patients, including cerebral atrophy, ischemia, vascular accidents, and tumor^[3-8]. We found only a few reports including the findings of T2* or SWI for a Werner syndrome patient^[9]. Werner syndrome may be associated with a high risk of not only ischemic but also hemorrhagic cerebrovascular diseases.

Legend of Figure: Brain MRI, T1 weighted(A) and T2 weighted(B) images demonstrated diffuse cerebral atrophy. No ischemia or tumor

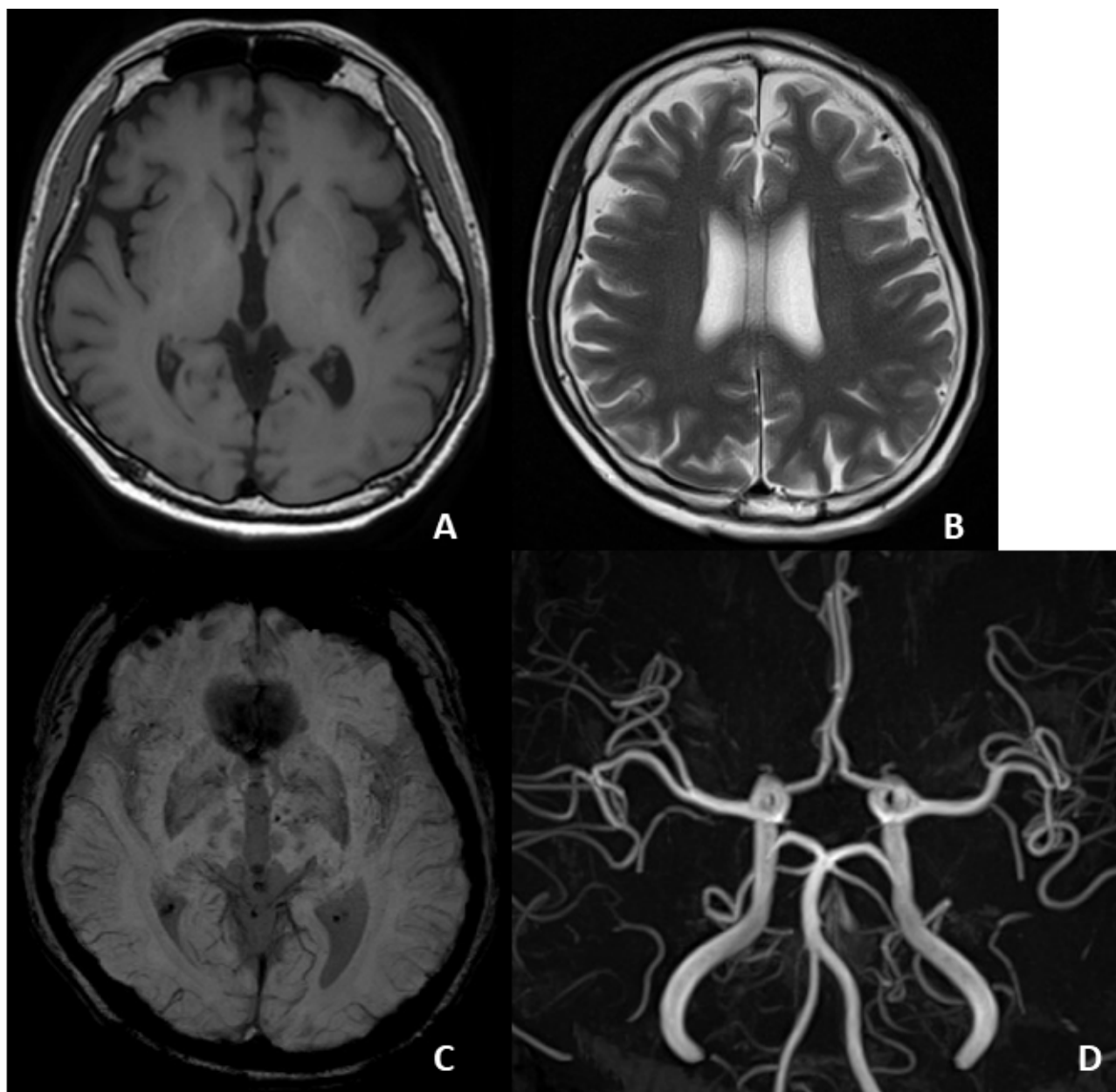


Figure 1 Brain MRI, T1 weighted(A) and T2 weighted(B) images demonstrated diffuse cerebral atrophy. No ischemia or tumor was observed. SWI(C) showed multiple microbleeds at the brainstem and basal ganglia. Magnetic resonance angiography(D) showed normal findings.

was observed. SWI(C) showed multiple microbleeds at the brainstem and basal ganglia. Magnetic resonance angiography(D) showed normal findings.

Table 1 diagnostic criteria of Werner syndrome[1].

| | |
|---|--|
| 1 | short stature, light bodyweight, slender, beak-shaped nose |
| 2 | Premature senescence: bird-like appearance, alopecia/gray hair, hoarseness, diffuse arteriosclerosis, juvenile bilateral cataracts, osteoporosis |
| 3 | Scleroderma-like skin changes; atrophic skin and muscle, hyperkeratosis, telangiectasis, ulcer, calcification, hyperpigmentation |
| 4 | Endocrine abnormalities: Diabetes mellitus, hypogonadism, dyslipidemia |

REFERENCES

- Goto M, Ishikawa Y, Sugimoto M, Furuichi Y. Werner syndrome: a changing pattern of clinical manifestations in Japan (1917~2008). *Biosci Trends*. 2013; **7(1)**: 13-22. [PMID: 23524889]
- Oshima J, Sidorova JM, Monnat RJ. Werner syndrome: Clinical features, pathogenesis and potential therapeutic interventions. *Ageing Research Reviews*. 2017 Jan; **33**: 105-114. [PMID: 26993153 PMCID: PMC5025328]; [DOI: 10.1016/j.arr.2016.03.002]
- Kakigi R, Endo C, Neshige R, Kohno H, Kuroda Y. Accelerated aging of the brain in Werner's syndrome. *Neurology*. 1992; **42(4)**: 922-922. [PMID: 1565253]; [DOI: 10.1212/wnl.42.4.922]
- Abe M, Umehara F, Nakagawa M, Izumo S, Osame M. A case of Werner syndrome associated with spastic paraparesis and peripheral neuropathy. *Rinsho Shinkeigaku*. Apr 1993; **33(4)**: 411-415. [PMID: 8396517]
- Yanagawa Y, Nakau H, Kita H, Kita H, Shimizu A, Chigasaki H. [Werner's syndrome associated with meningioma and a cerebrovascular disorder]. *No To Shinkei*. 1994; **46(11)**: 1069-1074. [PMID: 7873280]
- Postiglione A, Soricelli A, Covelli EM, et al. Premature aging in Werner's syndrome spares the central nervous system. *Neurobiology of Aging*. 1996; **17(3)**: 325-330. [PMID: 8725892]; [DOI:

10.1016/0197-4580(96)00033-4]

7. Kawamura H, Mori S, Murano S, Yokote K, Tamura K, Saito Y. Werner's syndrome associated with progressive subcortical vascular encephalopathy of the Binswanger type. *Jpn J Geriatr.* 1999; **36**(9): 648-651. [PMID: 10572450]; [DOI: 10.3143/geriatrics.36.648]
8. Tsurubuchi T, Yamamoto T, Tsukada Y, Matsuda M, Nakai K, Matsumura A. Meningioma Associated With Werner Syndrome Case Report. *Neurologia medico-chirurgica.* 2008; **48**(10): 470-473. [PMID: 18948683]; [DOI: 10.2176/nmc.48.470]
9. Seixas JC, Pedroso JL, Fukuda TG, et al. Teaching Neuro Images: A prematurely aging patient presenting with severe leukoaraiosis and stroke. *Neurology.* 2012; **78**: e113-e114. [PMID: 22547774]; [DOI: 10.1212/WNL.0b013e318254470f]