Journal of Clinical Neuroscience xxx (2018) xxx–xxx

Contents lists available at ScienceDirect

Journal of Clinical Neuroscience

journal homepage: www.elsevier.com/locate/jocn

Case report

Three cases of spondylotic myelopathy at the C7-T1 level

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ARTICLE INFO

Article history:
Received 17 March 2018
Accepted 24 June 2018
Available online xxxx

Keywords:
Cervicothoracic junction
Myelopathy
Gait disturbance

1. Introduction

Seventh cervical spine and first thoracic spine (C7-T1) single level myelopathy is very rare because of its anatomical characteristics.

To clarify the characteristics of C7-T1 myelopathy, here we report three cases of C7-T1 myelopathy that were successfully treated by surgery.

2. Case reports

2.1. Case 1

A 47-year-old man felt numbness below the trunk and his gait was disturbed for 3 months. His gait disturbance required him to walk with a cane. On examination, a positive Romberg sign, hyperactive deep tendon reflexes in bilateral lower extremities were observed. Sensory disturbance was detected on the trunk. Plain lateral radiographs showed no spinal canal stenosis in the cervical spine. A sagittal reconstructed computed tomogram (CT) indicated facet joint arthrosis. The spinal cord at C7-T1 showed swelling with a slightly higher signal intensity on MRI T2-weighted images. He underwent C7-T1 laminectomy and fusion (Fig. 1). His Japanese Orthopaedic Association (JOA) score, which excluded upper extremity scores, with a possible total of 11 points, improved from 6.5 to 7 points at 1-year follow up.

2.2. Case 2

A 70-year-old man complained of gait disturbance for a month. His gait was slightly spastic. Examination revealed a positive Romberg sign and decreased pain sensation below the trunk. Sagittal CT indicated facet joint arthrosis. Spinal cord at C7-T1 showed swelling with a high signal intensity lesion on MRI T2-weighted images. He underwent C3–C6 laminoplasty and C7–T1 laminectomy (Fig. 2). His JOA score improved from 6.5 points to 8 points.

2.3. Case 3

A 78-year-old man had numbness below the trunk and gait disturbance for 3 months. He found it impossible to walk unassisted. Neurological examination revealed muscle weakness below the bilateral iliopsoas, and diminished pain sensation on and below the T10 dermatomes. MRI revealed severe spinal cord compression at the C7-T1 level caused by a central-type of disc herniation. He underwent C7-T1 laminectomy and facet fusion with posterior instrumentation followed by C3-7 laminoplasty were performed (Fig. 3). His JOA score improved 7 points to 8.5 points at 1-year follow up.

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https://doi.org/10.1016/j.jocn.2018.06.034

Please cite this article in press as: Okuwaki S et al. Three cases of spondylotic myelopathy at the C7-T1 level. J Clin Neurosci (2018), https://doi.org/10.1016/j.jocn.2018.06.034

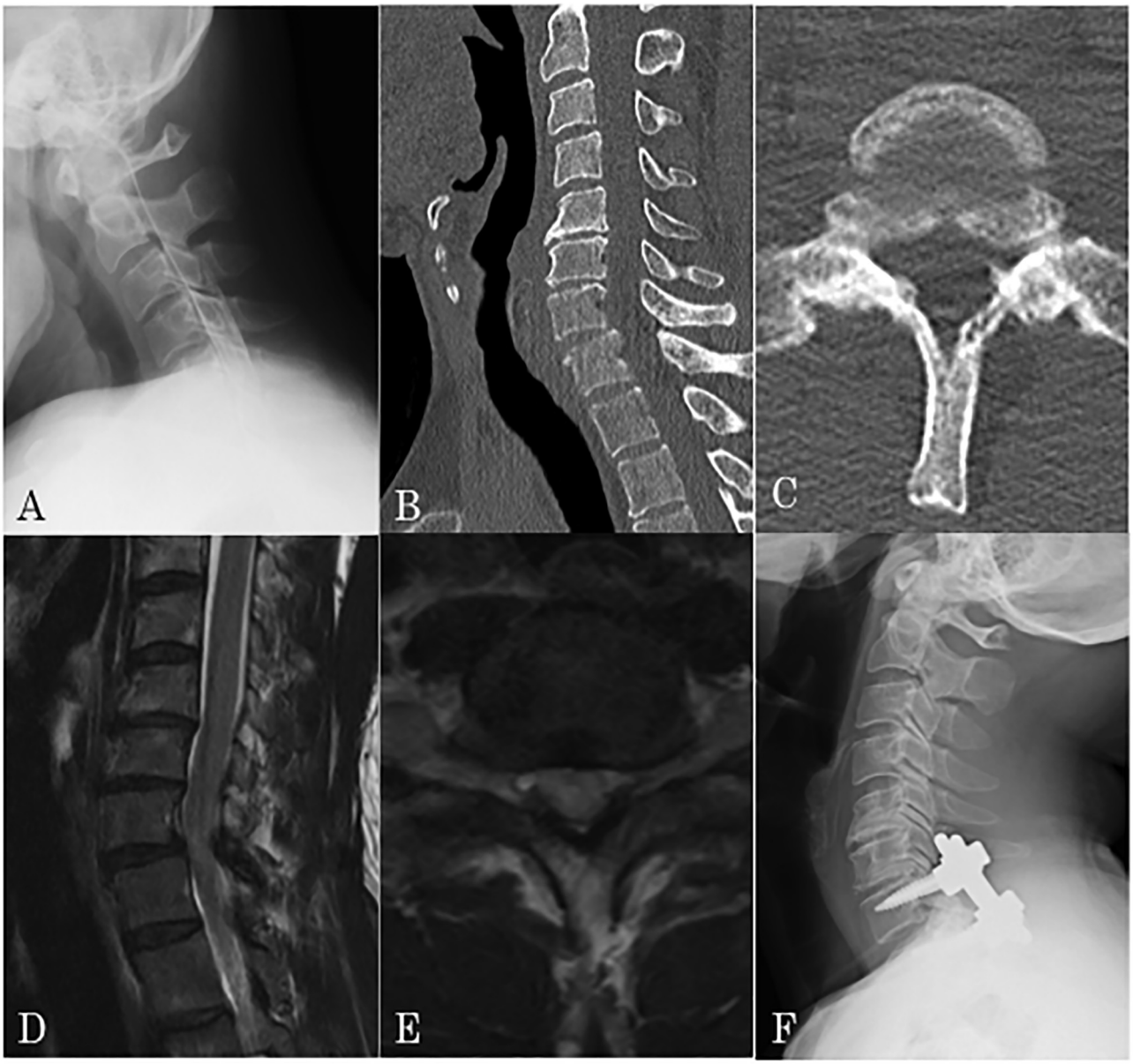

Fig. 1. (A) Preoperative lateral view radiograph of cervical spine. Apparent abnormality could not be detected. (B) Sagittal reconstructed computed tomography (CT). (C) Axial image of CT-myelography at C7-T1 level. The spinal cord is compressed from both sides and shows atrophy. The C7-T1 facet joint indicates severe arthrosis with bony spur extending into the spinal canal. (D) Magnetic resonance imaging (MRI) T2-weighted sagittal plane. Spinal cord is compressed at C7-T1 level mainly from posterior. Note the intramedullary signal change at C7-T1 level. (E) Axial plane of MRI T2-weighted image. The spinal cord at C7 shows swelling with a region of slightly higher signal intensity. (F) Postoperative lateral view radiograph of cervical spine. C7-T1 laminectomy and facet fusion with posterior instrumentation were performed.

3. Discussion

There have been several reports on C7-T1 level myelopathy. Boulous reported a case of C7-T1 level myelopathy caused by degenerative spondylolisthesis [1]. Kan-hing reported a case of C7-T1 level myelopathy caused by ossification of the yellow ligament [2]. Aizawa reported a case of C7-T1 level myelopathy caused by facet joint arthrosis [3]. Serikyaku reported four cases of C7-T1 level myelopathy caused by degenerative processes of the spine [4]. Yunoki reported a case of C7-T1 level myelopathy caused by disc herniation [5].

The rarity of C7-T1 level myelopathy is attributed to its anatomical characteristics as follows: small range of motion and lack of a Luschka joint. The main causes of degenerative cervical spondylolisthesis are disc degeneration followed by facet joint arthrosis. Because disc degeneration leads to collapse of the disc space, the facet joints may override. Increased stress with flexion and extension may stretch the disc and ligaments, allowing slippage to occur [6,7]. Except for C1-C2, C7-T1 shows the smallest range of motion in all directions, which leads to minor spondylotic changes in the intervertebral disc and facet joints at this spinal level [8] compared with that in the other cervical spine levels. One of the other specific anatomical characteristics of the C7-T1 level is that C7-T1 lacks Luschka joints. As a result, the C7-T1 intervertebral disc is more likely to herniate laterally, which might cause radiculopathy rather than myelopathy [9].

Please cite this article in press as: Okuwaki S et al. Three cases of spondylotic myelopathy at the C7-T1 level. J Clin Neurosci (2018), https://doi.org/10.1016/j.jocn.2018.06.034