

Sudden Onset of Tetraparesis During Taking of Magnetic Resonance Imaging in a Patient with Undiagnosed Cervical Spinal Stenosis: A Case Report

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ABSTRACT

Objective: To report a case with sudden-onset tetraparesis during taking magnetic resonance imaging (MRI).

Case report: A 73-year-old man was referred with complaints of paresis of his arms and legs. His tetraparesis had developed suddenly while an MRI was performed 10 days before. He had a severe tetraparesis with 0/5 motor strength in his legs and 2/5 motor strength in his arms. On the MRI, a serious spinal stenosis at C3-4 and C4-5 levels and a faint myelopathic signal of the spinal cord at the level of the C4-5 disc space were seen. After posterior decompression, the patient's tetraparesis improved gradually and he could walk independently and perform his daily activities with mild spasticity after 13 months.

Conclusion: It is known that sudden neurological deficits may be seen in cervical trauma in patients with cervical spinal stenosis due to spondylosis. However, this case who did not have a trauma history showed us that a long period of positioning the neck beyond the patient's control, even during the execution of MRI, may cause sudden deterioration.

Keywords: spinal stenosis, spinal cord compression, complications, quadriplegia

ÖZET

Daha önce tanı konulmamış servikal dar kanal olgusunda manyetik rezonans görüntüleme sırasında ani gelişen tetraparezi: Olgu sunumu

Amaç: Manyetik rezonans görüntüleme (MRG) sırasında ani başlangıçlı tetraparezi gelişen bir olgunun sunulması amaçlandı.

Olgu sunumu: Kollarında ve bacaklarında güçsüzlük olan 73 yaşında erkek hasta kliniğimize gönderildi. On gün önce MRG çekimi sırasında hastada aniden tetraparezi gelişmişti. Kollarda 2/5, bacaklarda 0/5 kas gücüyle giden tetraparezi saptandı. MRG'de C3-4 ve C4-5 düzeylerinde ileri spinal dar kanal ve C4-5 disk seviyesinde omurilik içinde hiperintensite izlendi. Arkadan dekompresyon sonrası hastanın tetraparezi giderek düzeldi ve 13 ay sonra hafif bir spastisite ile desteksiz yürür ve günlük işlerini yapabilir hale gelmişti.

Sonuç: Spondilozla bağlı servikal dar kanal olgularında travma sonrası ani nörolojik defisitler gelişebileceği iyi bilinir. Oysa travma öyküsü olmayan bu olgu, hastanın kontrol edemeyeceği uzun süreli boyun pozisyonlarında, hatta MRG çekimi sırasında bile ani nörolojik kötüleşme ortaya çıkabileceğini göstermiştir.

Anahtar kelimeler: komplikasyon, spinal dar kanal, omurilik basısı, kuadripleji

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Introduction

In cervical spondylotic myelopathy (CSM), the typical clinical course involves either a gradual or an episodic increase in symptoms and neurologic deficits, with impairment evolving over a period of months to years (1). Only 4.4 to 5% of the

patients presented with acute neurologic deterioration, which is described almost exclusively in traumatic situations (2,3). Only a few cases with acute neurologic deterioration without trauma history are found in the literature (1,4,5).

We report a rare case with sudden-onset tetraparesis developing on the magnetic resonance imaging (MRI) table during recording.

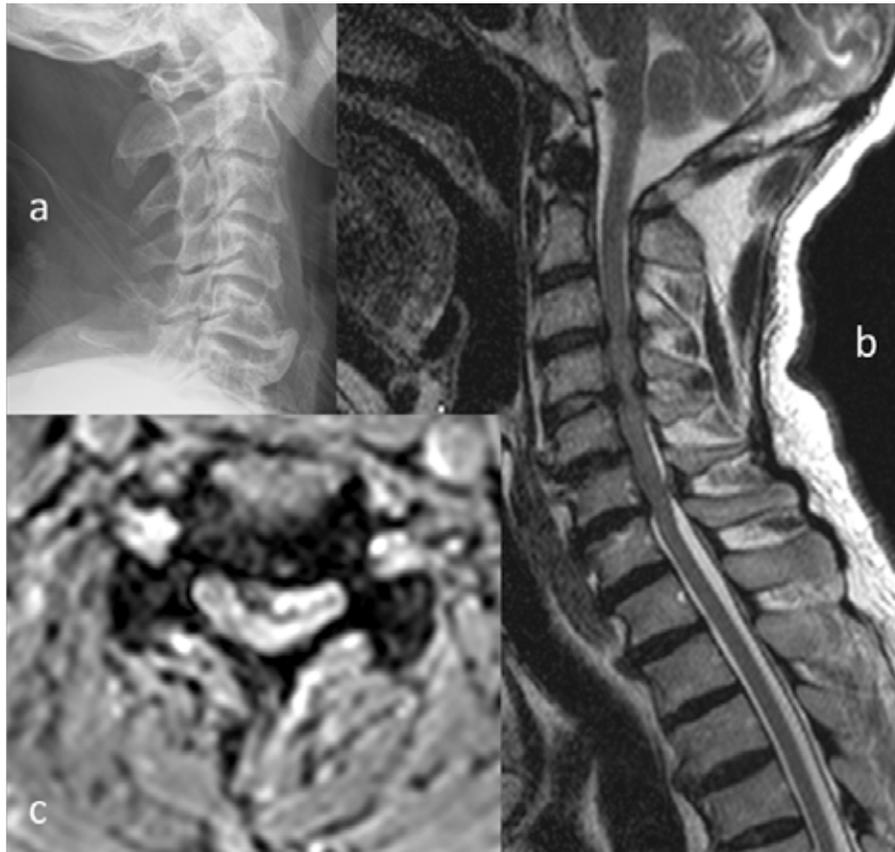


Figure 1: Preoperative lateral cervical radiograph (a), and sagittal (b) and axial (c) T2-weighted MRI sections showing C3-4, C4-5 and C6-7 spinal stenosis and hyperintensity in the spinal cord at the level of the C4-5 disc space.

Case Report

A 73-year-old man was referred to our clinic from a hospital in another city. He had been admitted to the neurosurgery outpatient clinic in that hospital for complaints of pain in his neck, arms and legs without any neurological deficit. Cervical and lumbar spinal MRI lasting about 30 minutes had been performed 10 days before. The patient could not move his arms and legs after being taken out of the MRI scanner.

At examination, a tetraparesis with a 0/5 motor strength in his legs and a 2/5 motor strength in his arms with a mild hypoesthesia under the upper thoracic dermatomes was detected. Babinski sign and Hoffmann reflex were positive on both sides. The cervical radiographs showed significant cervical spondylosis with preserved cervical alignment (Figure 1a). Cervical MRI revealed a serious spinal stenosis at C3-4 and C4-5 levels and a faint myelopathic signal of the spinal cord at the level of the C4-5 disc space (Figures 1b, c, and d).

After C3-4 total and C5 partial laminectomies, his tetraparesis improved gradually. Control radiographs and MRI showed normal alignment and hyperintensity in the spinal cord at the C4-5 level (Figures 2 a, b, c, and d). After 13 months, the patient could walk independently and was able to perform his daily activities with a mild spasticity. There was no deformity on the control lateral cervical X-ray image on his last follow-up (Figure 3).

Discussion

Static and dynamic factors are the main contributing components to compression of the cervical spinal cord (6). The static factors are structural spondylotic abnormalities causing canal stenosis and subsequent cord compression. Disc herniation, osteophytes developing into the spinal canal, facet joint hypertrophy, and thickness and ossification of the ligaments are the main components of the static factors. In addition, presence of congenital cervical spinal stenosis

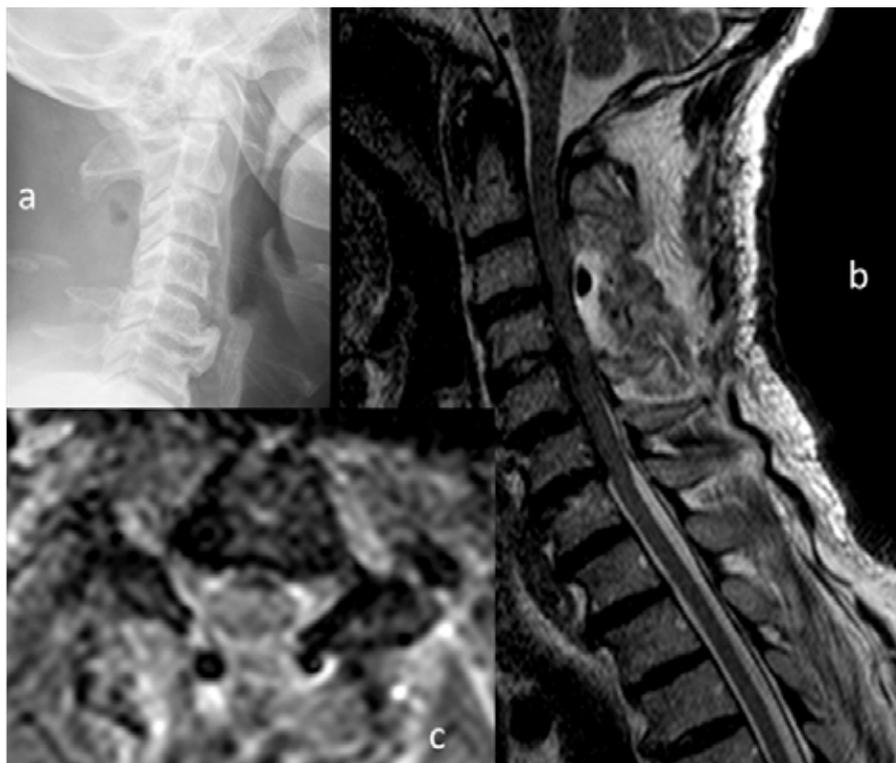


Figure 2: Postoperative lateral cervical radiograph (a), and sagittal (b) and axial (c) T2-weighted MRI sections showing laminectomy defects. The hyperintensity in the spinal cord was seen clearly after decompression.



Figure 3: Lateral cervical X-ray image after 13 months. There was no deformity.

accentuates the effects of these components (7).

If hypermobility of the cervical spinal joints is present, repetitive microtraumas occur due to flexion and extension during daily activities. Sometimes, these dynamic injuries may be the main factor causing development of spinal cord injury and myelopathy (6).

Stenosis of the cervical spinal canal may cause development of cervical spinal myelopathy (CSM). There is no high-degree evidence regarding the natural history of this disorder in the literature. According to the moderate evidence of small clinical studies, 20 to 62% of the patients deteriorate progressively (6).

The typical deterioration course of CSM is either a gradual or an episodic increase in symptoms and neurological deficits over a period of months to years. Acute deterioration is not frequently seen. Clarke and Robinson (3) reported a rapid onset in only 5% of cases with CSM. It usually develops after minor to moderate traumas (1). Oshima et al. (2) reported a series consisting of 45 patients with clinical findings of mild CSM and with increased signal intensity on T2-weighted MRI. Two patients of (4.4%) had acute spinal cord injury after minor

trauma. Acute deterioration of neurological findings without the presence of a trauma is very rare.

Young et al. (1) also reported such a case. A 56-year-old man developed tetraplegia during a 1-hour nap, and his MRI of the cervical spine revealed canal stenosis and hyperintensity in the spinal cord on T2-weighted images.

Suzuki et al. (4) reported such a case with sudden-onset tetraplegia without trauma and presence of previously known cervical disc herniation and congenital spinal canal stenosis. They also found 4 similar cases in the literature and concluded that patients with multilevel cervical disc herniation with or without developmental canal stenosis may develop nontraumatic acute paraplegia. Liu et al. (5) reported a case with acute paraplegia without trauma due to cervical disc herniation and spinal stenosis, and they found 6 similar cases in the literature. In some of these cases reported by Suzuki et al. (4) and Liu et al. (5), there was no spinal stenosis and the cause of tetraparesis was acute huge cervical disc herniation.

Our case developed acute neurological deterioration culminating in severe tetraparesis during taking of MRI requiring to stay in a cervical extension position for about 30 minutes. The patient improved almost fully after cervical decompression. Suzuki et al. (4) suggested that a hypoxic event may occur during the insult causing deterioration in these cases, such as the long duration of extension in our case, and there may be an ischemia-reperfusion injury after the insult. Therefore, although some cases reported by Suzuki et al. (4) and Liu et al. (5) did not

improve despite early decompression, it seems appropriate to perform urgent multilevel decompression in anticipation of spinal cord swelling that will develop due to ischemia-reperfusion injury. In most cases in the literature, including the one reported here, neurological findings improved after decompression of the spinal cord.

Conclusions

It is known that sudden neurological deficits may be seen in cervical trauma in patients with cervical spinal stenosis due to spondylosis. However, this case showed that a long period of forced neck positioning beyond the control of the patient, even during taking of MRI, may cause sudden deterioration.

Contribution Categories	Name of Author
Follow up of the case	F.K.G., C.I., A.T., A.T., O.Y.A., M.S.V., M.Y., M.O., E.C.
Literature review	F.K.G., C.I., A.T., I.G., B.E., A.T., O.Y.A., M.S.V., M.Y., M.O., E.C.
Manuscript writing	C.I., A.T., I.G., B.E., A.T., O.Y.A., M.S.V., E.D., M.Y., M.O., E.C.
Manuscript review and revision	F.K.G., I.G., B.E., E.D.

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