

Adult SCIWORA Presented With Stroke Clinic: A Case Report

İnme Kliniğiyle Başvuran Erişkin SCIWORA: Olgu Sunumu

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ABSTRACT

Spinal cord injury without vertebral abnormalities (SCIWORA) accompanying radiography and tomography is common in the pediatric population. However, very few cases have been reported so far in adults and it is a very rare condition. Magnetic resonance imaging (MRI) has become a preferred investigation for the diagnosis of SCIWORA with its increased availability and utilization in recent years. Here we report a case of adult SCIWORA involving cervical spinal cord, characterized by focal neurologic features.

ÖZET

Radyografi veya tomografide vertebral bir patoloji olmaksızın görülen omurilik yaralanması (SCIWORA) pediatrik popülasyonda yaygındır. Ancak yetişkinlerde şimdiye kadar çok az vaka bildirilmiştir ve çok nadir görülen bir durumdur. Manyetik rezonans görüntüleme (MRG), son yıllarda artan kullanılabilirliği ve kullanımı ile SCIWORA tanısı için tercih edilen bir inceleme haline gelmiştir. Burada servikal omuriliği tutan ve fokal nörolojik özelliklerle karakterize bir erişkin SCIWORA olgusu sunulmaktadır.

Keywords:SCIWORA
Spinal concussion
Adult**Anahtar Kelimeler:**SCIWORA
Spinal konküzyon
Yetişkin**INTRODUCTION**

With the increase in life expectancy, an older society has emerged throughout the world (1). Emergency physicians are confronted with elderly trauma patients every day and making a diagnosis may be a bit more troublesome than younger patients. It can be difficult to understand whether trauma is the cause or the result, especially in patients with neurological findings. External pressures to the spinal cord, the internal structure of the spinal cord and existing lesions are best visualized by magnetic resonance imaging (MRI) (2).

Spinal cord injury without vertebral abnormalities (SCIWORA) accompanying radiography and tomography is common in the pediatric population. However, very few cases have been reported so far in adults and it is a very rare condition. These injuries can occur for a variety of reasons, such as falls, traffic accidents, sports accidents and other traumatic events. The diagnosis and treatment of spinal cord injuries may differ depending on the age of the patient, the type and severity of the injury. Therefore, a better understanding of spinal contusions in older adults is of great importance to determine appropriate treatment strategies. Magnetic resonance imaging (MRI) has become a preferred investigation for the diagnosis of SCIWORA with its increased availability and utilization in recent years. In addition, MRI gives us information about the location and severity of the cord lesion (3-6). Here we report a case of adult SCIWORA involving cervical spinal cord, characterized by focal neurologic features.

CASE REPORT

A 84-year-old male patient was brought to the emergency service with the complaint of falling. He stated that he could not move because of not being able to move his right arm and right leg after the patient fell, and that he was found and brought to the hospital by his neighbors 2 hours later. It was learned that he did not have any disease in his past medical history. On physical examination, the patient's vital signs were within normal limits. Glasgow coma scale (GCS) was 15/15. In neck examination, there was no pain during movements. Urinary and bowel functions were normal. Muscle tone was normal on motor examination. According to the MRC (Medical Research Council) grading, the patient's motor strength in the right upper and lower extremities was 2 out of 5. In addition, decreased sensation and deep tendon reflexes of the right upper and lower extremities were observed. Other systemic examinations were normal. There were no abnormalities in the computerized tomography (CT) scan of the brain and cervical spine. Afterwards, brain diffusion-weighted MRI was performed to exclude ischemic stroke, but diffusion restriction was not observed. At the follow-up examination 4 hours later, the motor power of the patient was 3/5 in the right upper and lower extremities according to the MRC rating. Later on, cervical spine MRI was performed which showed right paramedian and right intraforaminal broad bottom bulging was observed at C4-C5 level. There was spinal cord compression. Right neural foramen was narrowed. Right neural corner compression

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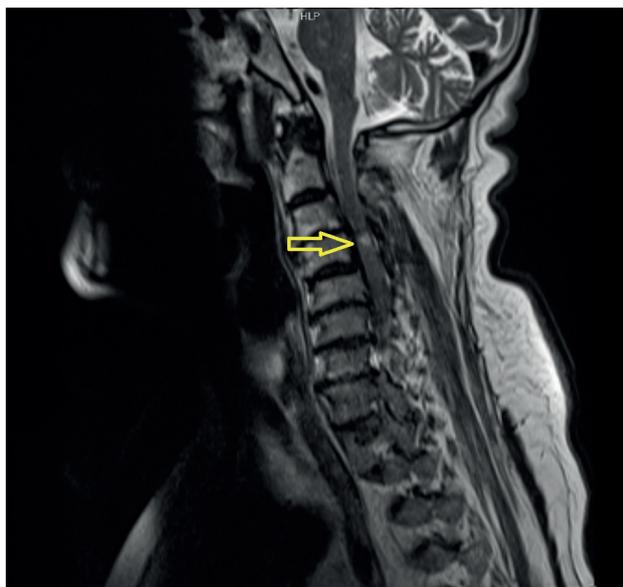


Figure 1: Spinal cord concussion is seen at the location indicated by the arrow.

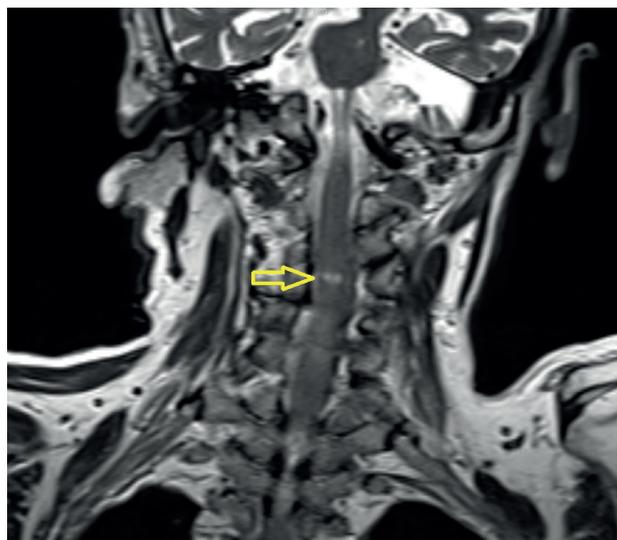


Figure 2: Spinal cord concussion is seen at the location indicated by the arrow.

was available. In the central part of the spinal cord at the level of C4, a 5.8 mm myelomalacic region, hypointense in the T1A series and hyperintense in the T2A series, was observed and this image was interpreted in favor of spinal concussion (Figure 1-2). According to the clinical presentation and MRI results, the patient was diagnosed as SCIWORA. The patient, who was consulted by neurosurgery, was recommended follow-up in intensive care. The patient was followed up in the intensive care unit for 15 days. The patient, whose neurological deficit improved, was discharged.

DISCUSSION

Although spinal cord injury without comorbid vertebral abnormalities in radiography and tomography is common in the pediatric population, it can also be rarely seen in adults. SCIWORA may occur as a result of hyperextension of the cervical vertebrae in patients with pre-existing cervical spondylosis, cervical canal stenosis, or posterior longitudinal ligament ossification. The underlying mechanism of central cord syndrome in elderly patients is probably different from that seen in younger patients. The prevalence of canal stenosis in elderly patients is thought to be important in the formation of SCIWORA (5,6).

Pang and Wilberger reported that the most likely mechanisms in the development of SCIWORA are hyperflexion, hyperextension, longitudinal distraction and ischemia. However, the exact pathophysiology is still unconfirmed (6). The diagnosis of SCIWORA is made by physical symptoms, neurological examination and radiographic imaging methods. We know that MRI is the best diagnostic method to evaluate traumatic SCI (7).

Spinal concussion (SC) is defined as cord neuropraxia and is a clinical condition that can be seen after spinal trauma. Most frequently encountered in athletes, SC is often recognized by post-traumatic clinical symptoms to the cervical region. This is thought to be related to the fact that this region is more mobile and more vulnerable to trauma than other areas of the spine. In this clinical status,

sensory and motor symptoms can occur simultaneously, and clinical signs completely regress within hours or a few days. However radiological examinations do not show any evidence that the cord is influenced, motor and/or sensory effects are observed in bilateral extremities. SC and SCIWORA cases are clinically similar. Neurological findings associated with the affected spinal cord appear in both groups, and neither presents radiological findings with cord injury. In the literature, patients with neurological findings, in which no effect can be observed in the vertebral column, are described as SCIWORA, but cord injury can be detected by MRI (7,8).

The anamnesis reliability was unclear in our patient because of his age and living alone.

The patient's old age and neurological deficit in our examination caused us to suspect that the patient had an ischemic stroke in the first place. However, the absence of any pathology in the diffusion-weighted brain MRI led us to advanced research. Most geriatric patients with cervical spine injuries have a history of trauma in etiology. However, cervical spine injury may be secondary to a minor mechanism that the patient does not find appreciable. When we investigated further because the patient's neurological findings and history of trauma were ongoing, we found that the patient had a spinal contusion in the medulla spinalis at the C4 level.

There is no strict rule for the treatment of SCIWORA, and there is a clear difference in opinion between surgeons on surgical and conservative management (2). High-dose methylprednisolone administration to patients with SCIWORA is a controversial issue in the literature. However, some studies have shown favorable effects of 24-hour methylprednisolone treatment starting within 8 hours after injury in patients with acute non-penetrating SCI on patient prognosis (4,9).

Our patient was followed up in the intensive care unit without methylprednisolone treatment. However, it was observed that the symptoms regressed within days.

CONCLUSION

As a result, neurologic signs associated with cervical trauma can range from mild paresthesia to paraplegia. Especially in elderly patients, it may be difficult to distinguish whether these neurologic symptoms are a consequence or a cause of the trauma. This case report is intended to draw attention to SCIWORA, a rare condition in adults, and to encourage emergency physicians to consider such

conditions. Considering that such situations may be further complicated in the elderly population, patients' neurologic symptoms should be carefully evaluated and appropriate diagnostic and treatment plans should be determined. Further study and increased awareness of such cases may help healthcare professionals in emergency departments to recognize and manage this rare condition.

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REFERENCES

1. Doğan NÖ, Akıncı E, Gümüş H, Akıllı NB, Aksel G. Predictors of Inhospital Mortality in Geriatric Patients Presenting to the Emergency Department With Ischemic Stroke. *Clin Appl Thromb Hemost*. 2016;22(3):280-4. doi: 10.1177/1076029614550820.
2. Miyajima F, Furlan JC, Aarabi B, Arnold PM, Fehlings MG. Acute cervical traumatic spinal cord injury: MR imaging findings correlated with neurologic outcome--prospective study with 100 consecutive patients. *Radiology*. 2007;243(3):820-7. doi: 10.1148/radiol.2433060583.
3. Khan AA, Mahmood S, Saif T, Gul A. Spinal cord injury without radiographic abnormality (SCIWORA) in adults: A report of two cases. *J Pak Med Assoc*. 2017;67(8):1275-1277.
4. Bonfanti L, Donelli V, Lunian M, Cerasti D, Cobianchi F, Cervellin G. Adult Spinal Cord Injury Without Radiographic Abnormality (SCIWORA). Two case reports and a narrative review. *Acta Biomed*. 2019;89(4):593-598. doi: 10.23750/abm.v89i4.7532.
5. Machino M, Ando K, Kobayashi K, Ota K, Morozumi M, Tanaka S, et al. MR T2 image classification in adult patients of cervical spinal cord injury without radiographic abnormality: A predictor of surgical outcome. *Clin Neurol Neurosurg*. 2019;177:1-5. doi: 10.1016/j.clineuro.2018.12.010.
6. Pang D, Wilberger JE Jr. Spinal cord injury without radiographic abnormalities in children. *J Neurosurg*. 1982;57(1):114-29. doi: 10.3171/jns.1982.57.1.0114.
7. Tewari MK, Gifti DS, Singh P, Khosla VK, Mathuriya SN, Gupta SK, et al. Diagnosis and prognostication of adult spinal cord injury without radiographic abnormality using magnetic resonance imaging: analysis of 40 patients. *Surg Neurol*. 2005;63(3):204-9. doi: 10.1016/j.surneu.2004.05.042.
8. Asan Z. Spinal Concussion in Adults: Transient Neuropraxia of Spinal Cord Exposed to Vertical Forces. *World Neurosurg*. 2018;114:1284-1289. doi: 10.1016/j.wneu.2018.03.198.
9. Kumar R, Lim J, Mekary RA, Rattani A, Dewan MC, Sharif SY, et al. Traumatic Spinal Injury: Global Epidemiology and Worldwide Volume. *World Neurosurg*. 2018;113:345-363. doi: 10.1016/j.wneu.2018.02.033.