SCIWORA at Thoracic Level in an Adult: A Case Report

Erişkinde Torakal Seviyede SCIWORA: Olgu Sunumu

Erişkinde SCIWORA / SCIWORA in an Adult

Seniz Akcay Yalbuzdag[1], Taciser Kaya[1], Ilker Sengul[1], Altinay Goksel Karatepe[1], Zehra Hilal Adibelli[2]
[1]Physical Medicine and Rehabilitation, [2]Radiology, Izmir Bozyaka Education and Research Hospital, Izmir, Turkey

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Özet

SCIWORA daha sıklıkla çocuklarda tanımlanmış olmasına rağmen, az sayıda yayında erişkinde SCIWORA olguları bildirilmiştir. 27 yaşında erkek hasta, kliniğimize 8 metre yüksekten düşme ve eşzamanlı torakal bölgeye olan künt travma sonrası gelişen parapleji tablosu ile sevkedildi. Hastanın nörolojik seviyesi , Amerikan Spinal Yaralanma Bozukluk skalası' na göre T11 (AIS) C olarak belirlendi. Servikal, torakal, lomber ve beyin manyetik rezonans görüntülemeleri (MRG) T8-9, T9-10 intervertebral disk protrüzyonu dışında herhangi bir spinal kord veya ligamentöz yaralanma ile uyumlu değildi. Ürodinamik çalışma sonuçları flask nörojenik mesane ile uyumluydu. Hasta nörolojik rehabilitasyon programına alındı. Nörolojik rehabilitasyon programından sonra hastanın fonksiyonel durumunda parsiyel iyileşme gözlendi. MRG' de spinal kord anormalliği saptanmadığı durumlarda SCIWORA tanısını koymak zor olabilir. Bu yüzden tanı spinal şokun sonlanmasına kadar gecikebilir.

Anahtar Kelimeler

SCIWORA; Spinal Kord Yaralanması; Erişkin

Abstract

Although SCIWORA has been reported more prevalent in children, few case reports published SCIWORA in adults. Twenty seven year old man transferred to our rehabilitation unit with paraplegia arose after fall from height of 8 and concurrent blunt trauma to thoracic region. The neurological level was of T11 American Spinal Injury Association Impairment Scale (AIS) C. Magnetic resonance imaging (MRI) findings of both brain, and spine didn't prove any significant abnormalities except the protrusion of intervertebral discs at the levels of T8-9, and T9-10. Urodynamic study findings were compatible with flaccid neurogenic bladder. He enrolled in the neurological rehabilitation program. After neurological rehabilitation program partial improvement observed in his functional status. The diagnosis of SCIWORA without any abnormality in the spine with MRI may be challenging. Therefore the diagnosis might retard until the termination of spinal shock.

Keywords

SCIWORA; Spinal Cord Injury; Adult

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Corresponding Author: Seniz Akcay Yalbuzdag, Physical Medicine and Rehabilitation, Izmir Bozyaka Education and Research Hospital, Izmir, Turkey.
T.: +90 2322505050 GSM: +905333798669 E-Mail: senizakcay@hotmail.com

Introduction

SCIWORA has been described as spinal cord injury without any abnormalities in both radiography, and computed tomography [1]. Availability and increasing usage magnetic resonance imaging (MRI), the diagnosis of SCIWORA resulted in differences in the diagnosis of SCIWORA, with regard to definition, and classification. The term 'spinal cord injury without radiologic evidence of trauma' (SCIWORET) was recommended recently for adults who has no evidence of trauma on plain radiographs, and computed tomography [2]

The spinal cord is more vulnerable to injury without radiographic abnormality in children by comparison with adults and it affects mostly the cervical spine [1]. Hereby we present an atypical case of adult SCIWORA in the thoracic region without any abnormality identified at the spinal cord detected by MRI.

Case Report

Twenty seven year old male was transferred to our tertiary inpatient rehabilitation unit with paraplegia, which has developed after falling from a height of 8 meters and concurrent blunt trauma to thoracic region. He described weakness, numbness in lower extremities accompanying with urinary and bowel incontinence. The initial manual muscle testing revealed that, the hip flexors, and knee extensors were of grade 1/5, and other muscle groups were of grade 0/5 motor function at lower extremities. Dermatomas under T-11 were all anesthethic. He had no relevant disease history except the L4-5 disc herniation operation 5 months ago. Neither bulbocavernous nor anal reflexes were detected. Deep tendon reflexes couldn't be detected. Voluntary anal contraction was obtained. The neurological deficit of patient classified by using American Spinal Injury Association impairment Scale (AIS) as T11 AIS-C. Electroneuromyographic (EMG) findings were unremarkable in both nerve conduction studies and needle EMG. Urodynamic study findings were compatible with flaccid neurogenic bladder. According to MRI examination, there was no spinal cord or ligamentous injury. The only findings were of the protrusion of T8-9, T9-10 intervertebral disc material, and obliteration of subarachnoid space (Figure 1, 2). Rehabilitation program performed, including muscle-strengthening, balance-training, and gait-training for one hour each day. He learned transfers, then started practicing standing up in the parallel bars with the assistance of the posterior shell orthosis. Clean intermittent catheterization was performed for neurogenic bladder management 6 times per day. According to the follow-up test after four weeks, bulbocavernous reflex returned, and bilaterally achilles clonus were obtained. Manual muscle testing revealed at the time of discharge; hip flexors were of 3/5, knee extensors, were of 4/5, ankle dorsiflexors, plantar flexors, toe extensors were of 2/5, and 1/5, respectively. He was walking with the assistance of the left knee-ankle-foot orthosis (KAFO) and walker.



Figure 1. Midsagittal, T2-weighted MR Scan (TR/TE, 3500 /120) shows that the signal intensity of the thoracic spinal cord is normal. A double, contiguous minimal disc protrusion in the thoracic spine (T8-T9, T9-T10) is seen.



Figure 2. Axial T2-weighted image shows that there is a small left paracentral disc protrusion effacing the subarachnoid space at T8-T9, but the signal intensity of thoracic cord at this level is normal.

Discussion

SCIWORA was described more prevalent in children due to the increased spinal flexibility and higher head/cervical spinal length ratio, and the difficulties in radiographic assessment of spine in the immature skeleton [1]. Thoracic spinal injury in adults without any vertebral fractures or discoligamentous injury has been reported very rarely and all MRI investigations showed myelum contusion or cord edema in these reports [3]. SCIWORA in adults without significant spinal cord or ligamentous injury is a very rare described entity in the literature. In our case we reported only intervertebral disc protrusion on MRI examination. Our patient was 27 years old, the spinal canal diameter was normal. MRI findings didn't prove any facilitating factors for SCIWORA as, ligamentum flavum hypertrophy, spinal stenosis or spondylosis. He defined falling from a height of 8 meters and concurrent blunt trauma to the thoracic region.

Boese et al. collected the data of SCIWORA in adults consisted of 164 cases by classification with MRI as type I if there were no detectable abnormalities, type IIa with extraneural abnormalities, type II b with intraneural abnormalities, type IIc with

both intraneural and extraneural abnormalities [4]. The authors defined that extraneural abnormalities were protrusion of intervertebral disc or herniation, ligamentum flavum bulging, posterior longitudinal ligament ossification, spondylosis, ligamentous abnormalities, prevertebral soft tissue swelling. They reported 7.1% SCIWORA with no MRI abnormalities, 11.7% with extraneural abnormalities, 36.9% with intraneural abnormalities, and 44.3% with both intraneural and extraneural abnormalities[4]. They reported that AIS D was the neurological severity level which was associated with most favorable outcome [4]. They also examined the relationship between MRI findings and functional outcome. Individuals classified in group type I had significantly better prognosis when compared with type II. In patients with abnormal MRI findings, type IIa was found to achieve more favorable outcomes among type IIa, IIb, IIc [4]. On the other hand, Lui et al. recently reported that the prognosis of SCIWORA is not related to MRI findings [5]. Sharma et al. reported that cord edema was related to the best functional outcome while hemorrhage was associated with the worst outcome in adults with SCIWORA [6]. Our patient was AIS C, and type IIa MRI classification, and he achieved partial neurological improvement during rehabilitation.

SCIWORA without any abnormality based on MRI findings is very rarely described in the literature. Recently Park et al. reported a patient with no abnormalities in terms of pathological reflexes, urodynamic findings, and on MRI examination [7]. Delialioglu et al. reported a case SCIWORET with cervicothoracic injury at the level of C7-T1, classified AIS B initially, and progressed to AIS D after the rehabilitation program. In contrast to our report, the MRI demonstrated the myelomalacic field in this report [8].

Conclusion

The term SCIWORA was defined as SCI by MRI with the absence of fracture or subluxation by plain x-ray and/or CT scan. The relevant group of patients remains a clinical challenge for both neurosurgeons and physiatrists because of the difficulty during the diagnostic process. Moreover the spinal shock period may constitute a suspicion of peripheral nerve lesion or neural root avulsion. Although we had a suspicion of cauda equina syndrome in our case, the absence of peripheral nerve involvement on electrodiagnostic study, the termination of spinal shock, and emerging the signs of upper nerve involvement directed the diagnose to SCIWORA. Diagnose of SCIWORA in adults may take more time than expected. Even the SCIWORA in children is a clinical challenge during the acute process, management of SCIWORA in adults may be more difficult for clinician with the absence of abnormality in MRI.

Competing interests

The authors declare that they have no competing interests.

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