

BROWN-SEQUARD SYNDROME (CASE REPORT-UNUSUAL PRESENTATION)

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ABSTRACT

A 48-year-old male with a stab wound on his neck was admitted with a delayed Brown-Sequard syndrome that had not been noticed on the first examination because of the lacking features of spinal canal penetration. Apart from a direct hemisection of the spinal cord by the stab, the neurological insult was a consequence of the compression exerted by the fractured and depressed left lamina of the axis. Urgent surgical decompression of the spinal canal resulted with a complete neurological recovery.

Key words: Brown-Sequard syndrome, Spinal cord injury, Stab wound, Surgical treatment

ÖZET

BROWN-SEQUARD SENDROMU

Boynunda kesici alet yaralanması olan 48 yaşında bir erkek hasta, spinal kanal penetrasyonuna ait bulgularının olmaması nedeniyle ilk bakıda gözden kaçan gecikmiş Brown-Sequard sendromu tanısı ile yatırıldı. Nörolojik hasar spinal kordun yarı kesisinden ziyade kırılarak çöken aksis sol laminasının uyguladığı baskının bir sonucuydu. Spinal kanalın acil dekompresyonu tam bir nörolojik iyileşme ile sonuçlandı.

Anahtar sözcükler: Brown-Sequard sendromu, Cerrahi tedavi, Kesici alet yarası, Spinal kord yaralanması

INTRODUCTION

Not much of the stab wounds of the neck reach the spinal cord because of its bony and ligamentous envelope. In more than fifty per cent of patients with neurological deficits, spinal hemisection is the most common cause of the cord injury and results with the Brown-Sequard syndrome (BSS) (7). The BSS involves ipsilateral loss of motor function, proprioception, and vibratory sensation, combined with contralateral loss of pain and temperature sensation (4, 8, 9). Thus, its natural recovery is the best among other incomplete cord lesions (9, 11, 13). However, the role of surgery is usually limited to preventing complications (3) and it is important not to skip a group of patients in which the surgical treatment may improve neurological deficits. Obtaining a clear history and performing thorough clinical and radiological examinations

are necessary to explore such patients that are accompanied with spinal cord compression (5, 6, 8).

In this report, we present a patient with the BSS that occurred by the compression of a fractured and depressed cervical lamina following a stab injury and resolved immediately after an urgent surgical decompression.

CASE REPORT

A 48-year-old male was brought to the emergency unit at 31/ 03/ 1998 because of a stab wound on the neck. History obtained from his friends revealed that he had been stabbed on his neck during a fight about 3 hours before his arrival and the first aid was given in a local health center with the concealing of the stabbing history. Since he was neurologically intact and x-ray was

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interpreted as normal, he was discharged after the closure of the skin wound. As soon as having noticed a rapidly progressing weakness in his left-sided extremities at home, he was brought to our hospital that time. On physical examination, a sutured skin wound of 10 cm extending from the left retromastoid region to the left posterior cervical triangle was observed. But, neither other signs of trauma nor cerebrospinal fluid (CSF) leakage was accompanied. He was found to be conscious, cooperating, and oriented. His cranial neurologic examination was intact and no associated cranial nerve deficit was elicited. However, he had a serious left-sided flaccid motor dysfunction as grade 0/5 in the arm and grade 1/5 in the leg, accompanied with the loss of deep tendon reflexes. He also had the loss of vibratory and position sensations as well as the ability of discriminating two points below C4 level on the left side and the thermo-algesic hemianesthesia below the same level on the right side. Both the anal tonus and reflex were spared. Roentgenograms of the cervical spine (Figure 1) showed some irregularities of the posterior elements of the axis that was later interpreted as a depression of fractured left lamina of the axis compressing the spinal cord with computerized tomography (CT). No associated finding suggesting the presence of CSF loculus, hemorrhage, trapped air or foreign body was demonstrated on the initial CT scanning (Figure 2). After diagnosing the patient's injury, high-dose methyl prednisolone was prescribed and the patient was operated urgently. Fractured lamina of the axis compressing the dural sac laterally was identified and removed via a posterior approach. Dura mater was observed to be intact and no damage regarding the adjacent significant structures was seen.

The postoperative period was uneventful. The patient developed a complete recovery of neurologic deficits on the 10th postoperative day and was discharged without any neurological deficit. The repeat CT scanning performed in the 3rd postoperative month demonstrated

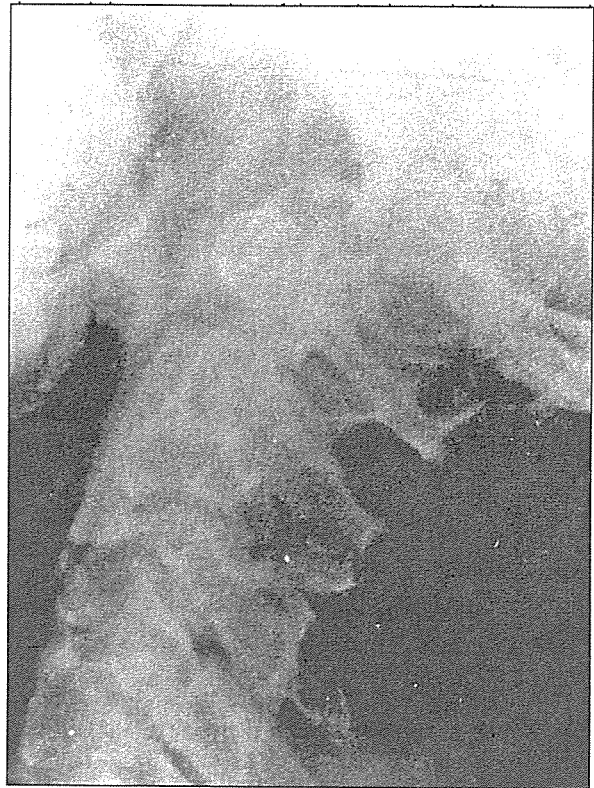


Figure 1. On lateral projection of the cervical spine, some irregularities of posterior elements of the axis could be seen suggesting a fracture.

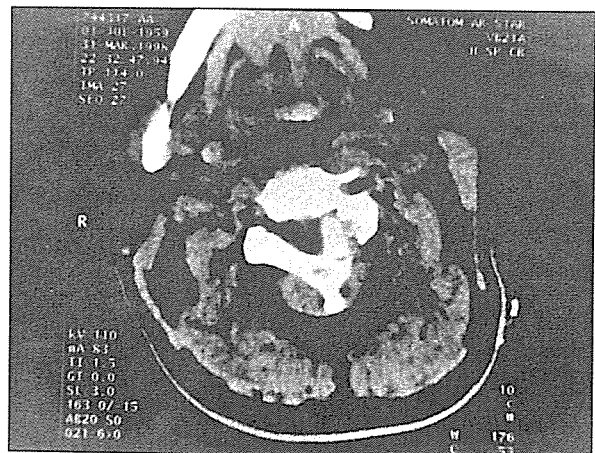


Figure 2. Initial computerized tomographic scanning revealed a spinal cord compression due to the depressed fracture of the left lamina of the axis.



Figure 3. Repeat computerized tomography demonstrated total removal of the fractured and depressed left lamina of the axis and the associated return of the dural sac to its normal configuration.

DISCUSSION

The percentage of patients sustaining an incomplete spinal cord lesion following a stab injury is higher than the percentage of incomplete lesions associated with other pathologies (7). Spinal cord injury following stab wounds results in motor incomplete lesions in 63% of the patients and the motor recovery is no greater than previously reported for other etiologies (13). About 50% of those motor incomplete lesions are indicative of BSS (7). In the majority of those patients, stab penetrates the spinal canal and damages the meninges and the spinal cord. The relatively more horizontal position of the cervical laminae may enhance its entrance to the spinal canal.

In cases with the neurological deficit or CSF leakage, it may be easy to predict the site where the stab has reached the spinal canal. In addition, an exploratory operation is recommended in such patients (6). Alternatively, conservative therapy may also be preferred especially in patients with intact neurological function (2). However, the lack of such predictive findings does not exclude any possible threat to the spinal cord. Since the BSS recovers better than the other incomplete cord lesions such as the central and anterior cord syndromes, missing of pathologies leading to secondary deteriorations should be accepted as one of the main pitfalls in the

management of stabbed patients (6,9,11).

X-ray imaging may be unsatisfactory for the requirements of making a right diagnosis, because not only its ability to demonstrate minor bony changes is inferior to that of CT, but also it gives no information about neural structures. In our patient, we were able to predict the site of injury on the spinal canal with roentgenograms. In the subacute period following a spinal stabbing, myelographic documentation of a dural defect and associated CSF leakage can also be achieved during the radiological survey (12). On the other hand, CT may offer a more detailed information about injury when compared with the two former investigations. Fracture of an any vertebral part, loculus of CSF, hemorrhage or trapping of air may easily be demonstrated indicating a possible penetration into the spinal canal. Page et al., reported a case who later presented with a BSS that was attributed to the formation of a loculus of CSF and they obtained some neurological improvement with the evacuation of this loculus (6). Under emergency conditions, CT was also very helpful in the explanation of the neurological insult in our patient. It enabled us to identify the depressed lamina and its compression on the spinal cord. However, the changes such as contusions (4), occurred by stabbing on the spinal cord interpreted best with magnetic resonance imaging (MRI). Besides, the causes of a secondary neurological deterioration such as spinal epidural hematoma (10), edema of the bulbospinal junction (1), or foreign materials can be demonstrated with MRI. Lee et al. reported a case with delayed paraplegia on the second day after a stab injury of the spine that recovered to a BSS following emergency surgery (5). They attributed that deterioration to the herniation of spinal cord through a dural defect that was visible on MRI.

Patients with stab wounds reaching deep to the subcutaneous tissue should be evaluated either neurologically or radiologically in order to explore any surgically treatable pathology that may lead to further

neurological deteriorations. This is significant especially in patients with the BSS which is likely to recover better than the other cord syndromes when treated appropriately in time.

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