Turkish Neurosurgery 2008, Vol: 18, No: 3, 298-301

Stab Injury of the Thoracic Spinal Cord: Case Report

Torasik Omuriliğin Bıçakla Yaralanması: Olgu Sunumu

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ABSTRACT

Stab injuries of the spinal cord are rare. We report a case of a 22-year-old male who was hospitalized because of a spinal cord injury resulting from a stab wound in the posterior thoracolumbar area. On admission, the patient had 2/5 muscle strength of the right leg (monoparesis) and hypoesthesia below the L1 level. Radiological investigation revealed the retained tip of a knife that penetrated the spinal canal at the T12 level. An urgent right T12 hemilaminotomy was performed and retained knife fragment was removed. Six months after operation, the motor deficit had completely improved although hypoesthesia was still present. Surgery should be considered as the first-line treatment in cases of incomplete injuries of the spinal cord with retained metallic object.

KEY WORDS: Spinal cord injury, Stab injury, Surgical treatment

ÖZ

Omuriliğin bıçakla yaralanmaları nadir görülmektedir. Posterior torakolomber bölgede bıçaklanma sonrası omurilik yaralanması nedeniyle yatırılan 22 yaşında erkek hasta sunuldu. Nörolojik muayenesinde, sağda bacakta 2/5 motor kaybı (monoparezi) ve L 1 seviyesinin altında hipoestezisi mevcuttu. Radyolojik incelemede, T12 seviyesinde spinal kanal içine penetre olmuş bıçak ucu tesbit edildi. Acil operasyona alındı ve bıçak parçası çıkarıldı. Postoperatif 6. ayda motor defisiti tamamen düzeldi ancak hipoestezisi devam ediyordu. Omuriliğin kesici aletlerle tam olmayan penetran yaralanmalarında cerrahi tedavi öncelikle düşünülmelidir.

ANAHTAR SÖZCÜKLER: Bıçak yaralanması, Cerrahi tedavi, Omurilik hasarı

Received : 18.08.2007
Accepted : 02.06.2008

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INTRODUCTION

Stab injury of the spinal cord is a rare occurrence and its incidence varies according to the country. In the United States, only 1% of the spinal cord injuries result from stabbing (1). In a large series from South Africa, 25% of spinal cord injuries were reported to result from sharp injuries and 84.2% of these sharp injuries resulted from stabbing (9). Most of the injuries are caused by hemi-section of the spinal cord that results in incomplete neurological deficits (9). Herein, we report a patient who developed neurological deficit due to knife injury in the lower thoracic region and whose deficit resolved after surgery to remove a retained foreign body. The causative mechanism, diagnostic tools and treatment modalities are also discussed.

CASE REPORT

A 26-year-old male patient was referred to our hospital from another medical center after being stabbed in his back. His blood pressure was 110/75 mmHg and heart rate was 82 beats/min on admission. His physical examination revealed multiple lacerations, especially on the upper extremities, abrasion and ecchymosis on the neck and a 2 cm wide laceration on the right thoracolumbar region that was repaired primarily. On neurological examination, the patient had 2/5 muscle strength on the right leg (monoparesis) and hypoesthesia below the L1 level; the strength and sensory function were normal on the left leg. His total blood count and routine biochemical tests were within normal limits. X-ray of the thoracolumbar spine revealed a broken tip of a knife at the posterior portion of the T12 vertebral body (Figure 1). The metallic object that traversed the spinal cord and stuck into the T12 corpus was detected on thoracic computed tomography as well (Figure 2). The patient underwent urgent surgery in the prone position. Following a midline T11-L1 skin incision, a metallic object was detected between the laminae of L1 and T12 at the right side. A right T12 hemilaminotomy disclosed that the knife penetrated the dura mater and entered the spinal cord. The metallic object was removed and the dura mater was repaired primarily (Figure 3). The patient experienced complete recovery of his motor deficit 6 months postoperatively although the hypoesthesia persisted.

Figure 1: *Anteroposterior x-ray showed a broken metallic object at T 12 level.*

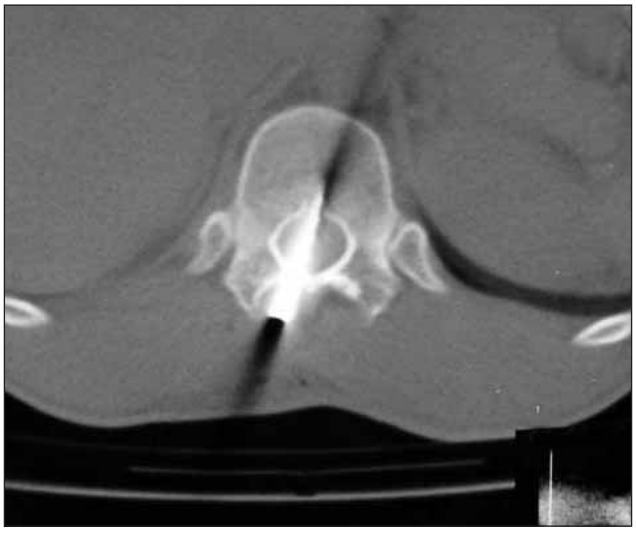

Figure 2: *Computed tomography revealed a metallic object penetrating the spinal canal diagonally and stuck in the the posterior portion of the vertebral body.*

DISCUSSION

Although stab injuries of the spinal cord are rare entities, they are generally isolated injuries (12,14). Approximately all of the injuries occur due to assaults from the back. Upper thoracic, cervical and lumbar regions are mostly affected whereas involvement of the lower thoracic region is rare (7,9). The knife itself, or rarely its tip, can be lodged in the bone or surrounding tissue during the attack (6,8). In our case, the tip had traversed the spinal cord for a distance of 10 cm and lodged through the posterior part of the T12 corpus from the right side. The

Figure 3: *Broken portion of the knife.*

Brown-Sequard Syndrome occurs in 2/3 of the affected patients due to incomplete cord injury and generally the left side is affected (2,3,9).

The injury is thought to occur in the following manner: the knife traverses the spinal cord through a groove in the posterior side of the lamina, passes through the interlaminar space in the sagittal plane and affects the spinal cord by passing through the articular capsule via the transverse processes in the coronal plane (3,9). Moreover as a result of the stabbing, the artery of Adamkiewicz, which lies to the left of the aorta in 80 % of the cases and generally enters the spinal cord through T8 and T12 levels and supplies the anterior part of the spinal cord, is reported to be injured; injury to this artery has resulted in infarction (3, 5,10).

In cases with suspected spinal cord injury due to stabbing, x-ray radiographs are recommended to detect the level of lesion and penetration into the spinal canal. CT is recommended for further evaluation to detect the bony fragment and the relation between the knife and the spinal cord. Although CT is not preferred due to metal artifact, bone density images better show the relation between the knife and the spinal cord and bony fragments (11). Preoperative MR is not recommended in cases that involve metal material because of the risk of movement due to the strong magnetic field that may worsen the neurological deficit (6). However, after obtaining X-ray images and confirming that there is no retained metallic object in the wounded region, MR images may be taken. Magnetic resonance angiography is recommended for injuries at lower cervical levels and injuries between thoracic 8 and 12 vertebral segments in order to exclude the possibility of arterial occlusion and arteriovenous fistula in traumatic aneurysms (11).

Surgery for stab injuries of the spinal cord with complete neurological deficits is still under debate. The accepted management of incomplete injuries involves removal of the metallic foreign material. Although late complications such as myelopathy (4), intramedullary abscess (15), progressive neurological deficit (6) and symptomatic pseudomeningocele (2) have been reported due to foreign material, no spinal instability has been reported. In cases with retained stabbing metal material, surgery should be considered to prevent late complications.

Prognosis for the stab injuries is better than the gunshot wound with recovery being reported in more than 66% of incomplete injuries (13). In our case, the motor deficit was totally recovered 6 months postoperatively.

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