Revista Chilena de Neurocirugía 40: 2014

# Traumatic extrusion of C5-C6 intervertebral disc associated to mielopathy without bone lesion: Report of 2 cases and review

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*Rev. Chil. Neurocirugía 40: 49-52, 2014*

**Abstract**

The authors reports two cases of cervical disc herniation caused by trauma without osseous lesions in articular facets, vertebral bodies or dislocations. It constitutes uncommon lesions in spinal cord injury. The literature is reviewed.

**Key words:** Cervical disc herniation. Trauma. Osseous lesions absent. Review literature.

## Introduction

Traumatic cervical mielopathy due to cervical disc rupture without osseous lesion (fracture of vertebral body and facet joint, or dislocations) is a rare event[4,6,10]. In this cases diagnostic imaging (simple radiography and computadorized tomography) are generally normal and magnetic resonance imaging is the only way to diagnosis. The latter should be performed as soon as possible, before any procedure of vertebral stabilization[2,7,15].

In this article two cases of traumatic cervical disc herniation without osseous lesions, with normal simple radiography and computarized tomography, but abnormal magnetic resonance imaging, are reported.

Clinical aspects, imaging diagnosis, surgical treatment and follow-up are discussed. Literature is reviewed.

## Case reports

### Case 1

WSO, male, 23-year-old, was referred reporting falling to the ground during a game of football 24h ago. Clinical examination showed acute onset quadriplegia, sensitivity level at C6, featuring an anterior medullary syndrome. Had urinary retention and hypotonia of the anal sphincter. The simple cervical radiography and computarized tomography (Figure 1) were normal.

MRI showed complete extrusion C5-C6, with intense signal from myelopathy extending from C4 to C7 in T2-weighted, with strong compression on the anterior surface of the spinal level C5-C6 (Figure 2).

Anterior microdiscectomy was performed in C5-C6, removing bulky intervertebral disc consisting of the nucleus pulposus and annulus fibrosus. Fusion was performed placed iliac crest graft tri-cortical and titanium plate at this level. The patient was discharged with neurologic status unchanged and there was no clinical improvement during follow-up in a year.

### Case 2

GRA, male, 40-year-old, was referred with eyewitness reporting trampling being treated in the emergency department with signs of tetraparesis, more intense in the upper limbs, lower limbs discreet handling, and sensitivity level at C6, featuring a central medullary syndrome. She also had anal sphincter hypotonia and urinary retention.

Simple radiography and computadorized tomography were normal (Figure 3); MRI showed a large disc herniation C5-C6 with signs of myelopathy that stretched

**Figure 1.** Simple cervical radiograph showed normality.

**Figure 2.** Sagittal MRI showing T2-weighted cervical disc fragment extrusion at C5-C6 disc and signs of myelopathy (hyperintense on T2) extending from C4 to C7.

**Figure 4.** Sagittal T2-weighted MRI showing disc fragment extruded C5-C6 compressing the spinal myelopathy and signal (hyperintense) extending from C5 to C6.

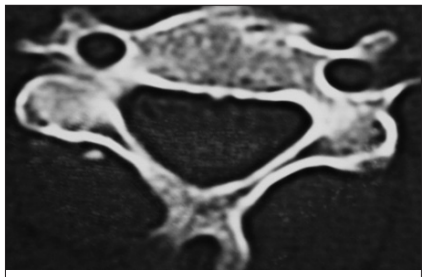

**Figure 3.** CT scan showing facet joint and C5 posterior arch integrity.

the vertebral levels C5 to C6 (Figure 4).
Anterior microdiscectomy C5-C6 was performed with removal of the intervertebral disc consisting of the nucleus pulposus and annulus fibrosus with caudal extension, placement of interbody cage and titanium plate.
The patient was gradually improving motor deficit after 6 months, with recovery of sphincter function.

## Discussion

The literature describes several cases of cervical myelopathy without traumatic injury of the articular facets and without retrolistesis associated to central cord syndrome[1,6,8,15,19]. However, there are few case reports of complete extrusion of intervertebral disc with myelopathy with severe anterior spinal cord syndrome, caused by this extrusion bending and distraction, with subsequent spontaneous reduction and radiographic examinations of the cervical spine normal, as simple radiography and computadorized tomography[21].
In most emergency services, the initial evaluation of patients with cervical spinal cord injury is done in the emergency room using protocols such as ATLS® (Advanced Trauma Life Support) initially using simple radiography and subsequently performing the computorized tomography. Only in special situations and in places where conditions permit techniques can be performed magnetic resonance imaging (MRI) of the cervical spine[12,13,14].

In both cases presented here, radiologic exams (simple radiography and computadorized tomography of the cervical spine) were normal, in other words not noticeable misalignment, bone fractures or decreased disc space.
According the dynamics of trauma, it is possible that these patients have experienced a violent hyperflexion with disc space distraction and posterior bone realignment with incomplete extrusion of disc material, since MRI shows hyperintense signal on the disc at C5-C6 both cases, but with sufficient volume to produce severe myelopathy (Figures 2 and 4).
Another important and main reason of this publication relates to the importance of performing MRI in these patients and the timing of realization of the same.
The first patient was transferred to another city and MRI was performed 24 hours after the accident. Although neurological deficit was immediate diagnosis and treatment were performed later. It is possible that this has had an impact on

prognosis and recovery of spinal cord function, because the patient remained with the neurological unchanged from admission.

On the other hand, some authors [17] demonstrated that even in patients with spinal cord injuries, the only favorable prognostic factors for recovery of spinal cord function are: patient age and the presence of anterior syndrome or Brown-Sequard syndrome.

Injuries to the central medulla, featuring a central medullary syndrome type are difficult to recover[4,15]. The use of steroids, timing of stabilization or even immediate decompression have not changed the prognosis of these patients[10,15].

In case 2, the clinical condition at admission was a central cord syndrome, associated injury to the sport and the patient operated 24 hours after admission. Despite a central medullary syndrome this patient presented a more favorable course and recover their movement after 6 months of the accident.

In the general population traumatic disc herniation, there have been reported when displacement of facets with an incidence of 54-80% of cases[4,19,21,22].

Forces intense hyperflexion and distraction can lead not only to thrust unilateral or bilateral facet joints, and the blade fracture, fracture of the spinous processes, and previously ruptured anterior longitudinal ligament, and especially rupture of the fibrous ring and disc extrusion intervertebral which may cause or aggravate an existing myelopathy[1,15,18,20].

For this reason it is recommended to always perform MRI before the reductions and closed prior discectomy when contemplating a reduction and fixation of the posterior facet[22].

It is described worsening of the neurological patients with traumatic facet dislocation underwent cervical traction. MRI performed in these patients after cervical traction showed the presence of disc material within the spinal canal compressing the cervical cord[3].

In the sports cervical disc injuries and herniations in the athletes are less common than lumbar disc injuries and usually affect older athletes[23]. Albright et al. noted an increased incidence of cervical disc disease in high-performance athletes participating in football and wrestling compared with the general population[1]. In contrast, Mundt et al. concluded that athletes participating in noncontact sports might actually be protected against the development of cervical or lumbar disc herniation[16]. The mechanism of this apparent protection was hypothesized to be due to improved muscular conditioning that protected the disc from pathologic stresses placed on the spine. Cervical disc disease is traditionally classified as either soft- or hard-disc disease[23].

Acute cervical disc disruptions that occur as a result of sports participation have been hypothesized to result from uncontrolled lateral bending of the neck[1]. Hard-disc disease generally represents a more chronic, degenerative process with a diminished disc height and the formation of marginal osteophytes[22].

The degenerative spectrum of disc disease probably begins early in life and proceeds through a series of recognizable steps preceding most if not all symptomatic disc herniations[16]. Athletes with symptomatic disc degenerative and acute disc herniations most often present with varying degrees of neck or arm pain[14]. Although the types of symptoms are similar in athletes and nonathletes, the symptoms of herniation may be more pronounced in athletes, due to the demands of the specific sport[16].

As with non-athletes, the initial treatment for almost all herniated cervical discs in athletes should be non-operative. Useful treatment modalities include rest, activity modification, anti-inflammatory medication, immobilization, cervical traction, and occasionally therapeutic injections. Only in rare situations involving myelopathy or a progressive neurologic deficit should surgery be contemplated during the initial 6 to 8 weeks of symptoms. In most athletes, the acute radicular symptoms will begin to subside in this initial period. As the symptoms improve, gentle exercises can gradually be instituted, emphasizing isometric strengthening and cervical range of motion, followed by sports-specific exercises and drills. Sporting activities can be restarted when the athlete is asymptomatic and has regained full strength and mobility[23].

In the minority of cases, with symptoms of arm pain persisting despite conservative measures, surgery is a reasonable consideration. Surgical treatment can be successfully undertaken from either an anterior or posterior approach. Although some have suggested that an athlete may achieve a quicker recovery following laminoforaminotomy without fusion, a direct comparison between athletes undergoing the two types of surgery remains to be performed[16].

Following anterior discectomy and fusion at up to two levels, return to play can be considered following successful fusion and rehabilitation[16,23]. Lower level cervical fusions are at less risk when compared with more proximal cervical fusions, due to the ability of the fusion mass to distribute and absorb cervical stresses[20]. Patients with longer fusions are generally considered to be at risk for returning to contact sports, and therefore the participation of these athletes is individualized [23].

Thus, the description of these cases in this article aims to highlight the possibility of massive disc extrusions in patients suffering from spinal cord injury, even without major changes in RX and CT scans[11,22].

**Recibido: 18 de agosto de 2013**
**Aceptado: 10 de octubre de 2013**

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