Overlooked dislocation of C6/C7 vertebra with minimal neurologic deficit

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The beginning of 21 century was marked by an enormous increase in the number of traffic accidents, which led to an increasing number of multiple injured patients with associated injuries, especially injuries of cervical spine, because of its anatomical features. Even in the era of modern diagnostic procedures, cervical spine injuries are still often overlooked, especially in multiple injured patients and unconscious patients, and the consequences of undiagnosed injuries can be fatal. Very often there are ligamentous lesions, which can be detected only by using NMR, while the osteoarticular lesions can be diagnosed through careful clinical examination, X-rays and CT scan. This paper presents the case of female in the middle age with initially missed injury of the lower cervical spine segments, sustained in a car accident as a driver, with excellent results of treatment and complete recovery.

Key words: cervical spine injuries, road traffic accidents

INTRODUCTION

Increase number of traffic accidents lead to increase incidence of spine injuries, which are mostly caused by high energy trauma. In the USA occurred more then 10000 new cases of spine injuries per year, among them the young population is under the greatest risk and over the 80% of them are males.

The most frequent cause of spine injuries are: traffic accident (48%), falls from the height (21%), sport injuries (14%), other causes (2%). Cervical spine is injured in 54% of cases, following by thoracic (36%) and lumbar spine (10%).

Cervical spine injuries are not usually presented with obvious clinical signs. Therefore, these injuries are prone to being overlooked, especially in the presence of additional nonspinal injuries. Up to 20% of all spinal injuries are initially overlooked in multiple injured patients. Importance of cervical spine is that it is 4.5-times more likely to be missed than thoracolumbar injuries.

It is pointed that in case of polytrauma, 5-10% of them have cervical spine injuries.

Many times these patients also suffer from severe head injuries, sternal fractures and extremity fractures and fractures of other spinal levels. During clinical assessment, complaints of neck pain, head- and facial injuries, bruises from the safety belt, presens of a contusion or skin lesions of the thoracic and abdominal surface must be recorded. Drug abuse and neurological abnormalities can hide a cervical spine injury. Since up to 15% of patients had spinal injuries at two levels, a radiological investigation of the entire spine is a necessity, especially if an additional spinal injury is suspected.

We present the case of female patient who had been injured three months before the cervical spine injury had been diagnosed.

A CASE REPORT

A 55 Years old female patient was admitted to the Emergency Center, Clinical Center of Belgrade with the complaints of weakness of upper and lower extremity.

The patient sustained an injury 3 months ago in a traffic accident, as a car driver. X-rays were performed at the initially treating hospital, but these X-rays lacked cervical spine exposure to C7 resulting in an oversight of a C6/C7 fracture dislocation (picture 1). Initially, she was charged to home with the diagnosis of distend cervical muscle and the collar was applied.

All the time, between initial and second look, the patient complained of sensitive disorders at upper and lower extremity. Also, two weeks before she was admitted at the Emergency she was examined by the neurologist who indicated hospitalisation, but she refused it. Finally, she came walking, both with signs of spastic tetraparesis.
At the Emergency Center she was examined both by orthopaedic surgeon and neurologist. Initial neurological examination revealed intact cranial nerves, with pupils equal in size and reacting to light. She had 2/5 power in all four limbs, upper and lower limb reflexes were increased and the sensation status was without pathological findings.

Three plane X-rays (pictures 2) and CT (picture 3) scan had been done and it revealed a fracture-dislocation of C6/C7 with fractured lamina of C4, C5 and C6 vertebra (picture 4). We decided to perform an surgical procedures in two steps, because of the fact, that this was a three months old injury.

In the first step the posterior approach had been performed with adhesiolysis, laminectomy and the dura was released in the length of 1cm. In the second step the anterior spondylodesis with use of autograft from iliac crest had been performed. Postoperative period was satisfactory, without complications. The patient was able to walk with crutches. She was discharged from the hospital in good condition, without neurological pathological findings.

Follow up was done 6 months after surgery and the clinical and radiological findings were satisfactory (picture 5).

**DISCUSSION**

The injuries of lower segment of cervical spine (C3-C7/Th1) presents about 80% of all injuries of the cervical spine. The most common injured is C5 vertebra and the segment C5/C6. Osteoligamentous injuries of lower part of cervical spine are followed by the neurological complications in 73% of the cases (32% complete and 41% incomplete). This can be explained by narrow spinal canal in the region of cervical spine, very mobile neck, while thoracic spine is imobile, with significant impact of the head.

Well known lack of the standard x-rays of cervical spine is C6/C7 segment, who had been in many cases not presented. Bolinger has shown that the spine had been presented ordinary only in 56 patients (5%), which leaded to misdiagnosis of the injury of the lower part of cervical spine, which was case in our patient.

Some authors sugested manipulation with the cervical spine in order to present the lower part of the cervical spine on three-plan x-rays. But this manipulation can lead to the worsening of the clinical signs (neurological status).

Cervical spine injuries can be easy overlooked in patients with lack of clinical signs, unconscious patients, multiple injured patients and in patients with alcohol and drugs abusus.

In that case it is obligat to be familiar with the mechanism of the injury, complete radiological examination and good visualisation of the cervical spine (including upper thoracic spine), recognition of disco-ligamentous lesion (dynamic x-rays), two-level injuries, reevaluation of the

**PICTURE 1.**
INITIAL X-RAY, C6 AND C7 COULD NOT BE SEEN

**PICTURE 2.**
X-RAY ON THE DAY OF ADMISSION IN EMERGENCY CENTER
In patients with Glasgow Coma Scale up to the 13, a good clinical examination is better screening method than lateral x-rays. But when the symptoms are present, x-rays are obligatory. In all patients with pain in the middle part of the cervical spine, an x-ray examination is mandatory, even when the neurological findings is normal. Also dynamic radiograms are made in full flexion and extension. It is necessary to do three-plan x-rays and all cervical vertebra and first thoracic vertebra should be seen, before we make conclusion about injuries. When the flexion and extension movements are viable, there is a very decreased possibility for ligamentous injuries.

Common methods for cervical spine evaluation in critically injured patients are plain radiographs, cervical CT scan and functional flexion/extension views. Cervical CT scan is the most efficient imaging tool in detecting skeletal injuries, showing a sensitivity of 100%, comparing to lateral x-rays with sensitivity of 63%. CT scan should be a screening tool for the spine injuries in unconscious patients.

But CT scan could be negative in horizontal fractures and in fractures who had been hidden causing by artefacts (for example, teeths artefacts in C2 fractures) and then is recommended to combine CT and lateral x-ray. Ligamentous injuries can be only detected by MRI.

CONCLUSION

Besides meticulous evaluation, high quality x-rays in the cervical spine injury, CT scans are sometimes mandatory, both for the proper diagnosis and for better planning of the surgery, especially in the doubtful cases.

SUMMARY

PREVIDENA LUKSAČIJA C6/C7 SA MINIMALNIM NEUROLOŠKIM DEFIĆITOM

Početak 21. veka obeležen je enormnim povećanjem broja saobraćajnih nesreća, što je dovelo do povećanog broja teško povredjenih osoba sa udruženim povredama, a naročito povreda vratnog dela kičmenog stuba, zbog svojih anatomskih karakteristika. U eri savremenih dijagnostičkih procedura, povrede vratne kičme se još uvek veoma često previde, naročito ukoliko se radi o višestruko povredjenim pacijentima i pacijentima bez svesti, a posledice nedijagnostikovane povrede mogu biti fatalne.

Veoma često postoje ligamentarne lezije, koje se mogu detektovati samo uz pomoć dinamičkih snimaka, nuklearne magnetne rezonance-NMR, dok se koštano-zglobne lezije dijagnostikuju pre svega pažljivim kliničkim pregledom, rentgenskim snimcima i kompjuterizovanom tomo-grafijom-CT. U ovom radu prikazujemo slučaj ženske osobe srednjeg životnog doba kod koje je inicijalno previdjena povreda donjeg segmenta vratne kičme, koju je zadošila u saobraćajnoj nesreći kao vozač, sa odličnim rezultatima lečenja i potpunog oporavka.

Ključne reči: povrede vratne kičme, saobraćajni traumatizam,

REFERENCE


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