

Occipital Condyle Fracture: Case Report

Oksipital Kondil Kırığı: Olgu Sunumu

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Abstract: Fracture of the occipital condyle is a very rare injury. Complaints in these cases vary from upper cervical pain to the multiple cranial nerve palsies. We report the case of a traffic accident victim who had occipital condyle fracture with no clinical symptoms about these fracture. A fracture of the occipital condyle was diagnosed during investigations for middle cranial fossa fracture. High-resolution CT scan revealed a Type 2 occipital condyle fracture. MRI showed no damage to the spinal cord, nor to vascular and ligamentous structures. The patient wore a Philadelphia collar for 3 months, and then high-resolution CT scan showed that the fracture of the occipital condyle had healed. Investigation of the craniovertebral junction should be included in the cranial CT scan for patients with clinical signs of basis cranii fracture.

Key Words: Cervical pain, head injury, occipital condyle fracture

Özet: Oksipital kondil kırıkları nadir olgulardır. Yakınmalar sadece üst servikal bölge ağrısından multipl kranyal sinir felçlerine bağlı daha ağır fonksiyon bozukluklarına kadar değişebilir. Trafik kazası sonucu oksipital kondil kırığı saptanan ve kırığa bağlı herhangi bir yakınma ve bulgunun olmadığı bir olgu sunulmaktadır. Oksipital kondil kırığı orta fossa kırığı için yapılan tetkikler sırasında saptandı. Yüksek rezolüsyonlu bilgisayarlı tomografi Tip 2 oksipital kondil kırığının mevcudiyetini gösterdi. Manyetik rezonans görüntüleme tetkiki spinal kordda, vasküler ve ligamentöz yapılarda hasar olmadığını ortaya koydu. Üç aylık Philadelphia tipi kolar kullanımından sonra çekilen yüksek rezolüsyonlu bilgisayarlı tomografide kondil kırığının iyileştiği görüldü. Kafa tabanı kırığının klinik bulguları olan olgularda kranyovertebral bileşke bölgesinin tetkiki kranyal bilgisayarlı tomografinin parçası olmalıdır.

Anahtar Kelimeler: Boyun ağrısı, kafa travması, oksipital kondil kırığı

INTRODUCTION

Fracture of the occipital condyle was first described by Bell in 1817 (3). These fractures usually occur secondary to serious trauma. Patients may die during the early stages postinjury or may suffer from problems such as upper cervical pain and lower cranial nerve palsies (2,4,10,14,17,19,20). It is usually difficult to diagnose this fracture on plain x-ray films of the skull and craniovertebral junction. The most sensitive radiological examination is a high-resolution computed tomography (CT) scan of the atlantooccipital joint (18). We report a patient with fracture of the occipital condyle who was treated

conservatively. The patient presented with none of the complaints that typically accompany this type of injury, and was diagnosed during work-up for a middle cranial fossa fracture.

CASE REPORT

A 26-year-old man was admitted to our clinic with a history of being thrown forward over the handlebars and hitting headfirst on impact in a motorcycle accident. The patient never lost consciousness, but complained of pain in his right ear and left arm. Physical examination revealed a right temporal subgaleal hematoma, right otorrhea,

and right peripheral facial palsy. Cervical palpation was not painful, and plain x-rays of the cervical spine and skull showed no obvious fracture. Fractures of the left radius and ulna were diagnosed on plain films. A CT scan of the cranium and craniovertebral junction revealed a fracture of the right mastoid bone and a small right temporal epidural hematoma (EDH). The image also raised suspicion of a fracture of the left occipital condyle. Further neurodiagnostic information was obtained using high-resolution CT scan (Figure 1), 3D-CT scan (Figure 2), and magnetic resonance imaging (MRI) of the craniovertebral junction. High-resolution CT revealed a Type 2 occipital condyle fracture (OCF). MRI showed no damage to the spinal cord, or to vascular and ligamentous structures. Transcranial Doppler examination of the vertebral arteries confirmed normal blood flow. Repeat cranial CT scans done on tenth day of trauma showed that the EDH on the right side was resolving. The follow-up period was uneventful. The patient wore a Philadelphia collar for 3 months, and then after which high-resolution CT showed healing of the fracture.

DISCUSSION

A review of the literature on OCF yielded only 61 reported cases of survivors and 38 postmortem cases (1,2,4,5,6,7,13,16,17,20,22,24). Bushels and Burkhead's (6) postmortem examination of 112 fatal vehicle accidents included only two cases of OCF. Alker and colleagues (1) also found 2 cases in their series of 312 cases with fatal craniovertebral trauma. It should be kept in mind that these fractures are rare, and usually occur secondary to both serious and minor head trauma (10,17). In some cases, upper cervical pain may be the only complaint (8,17,18). Tuli et al. (20) reported one patient with OCF who

had no suspicious symptoms of neck pain, cranial nerve or other types of associated neurological deficits. They found the case during a retrospective study. Mariani and colleagues (12) reported an asymptomatic motorcycle accident victim in whom the only findings were prevertebral soft tissue bulging at C1-2 on a lateral plain cervical x-ray. In our case, although there was no complaint of pain even on palpation, the diagnosis was made by chance in an effort to work up a middle cranial fossa fracture on CT scan. Upon noting a suspected fracture of the left occipital condyle, we opted for further neurodiagnostic investigation using high-resolution CT, 3D-CT scan, and MRI of the craniovertebral junction. High-resolution CT allowed positive confirmation of a fracture of the left occipital condyle, and MRI showed no ligamentous or neurovascular damage. It is clear that this type of fracture may not always be detected on plain cervical x-rays. Considering the literature on OCF, it should be kept in mind that further neurodiagnostic tests are sometimes necessary, including sagittal and coronal reconstructed high-resolution CT scan and MRI of the craniovertebral region(16). The 3D-CT scan shows the exact anatomical relationship between the occipital condyle, jugular foramen, and craniovertebral junction (15,23). The tectorial membrane prevents hyperextension and hyperflexion of the atlantooccipital articulation, and excessive lateral flexion and rotation the alar ligaments (23). The integrity of both the alar ligaments and tectorial membrane is very important for stabilization in craniovertebral junction (2,9,11,20,21). Neurodiagnostic examination of the craniovertebral junction by MRI shows not only neurovascular structure, but also the integrity of ligamentous elements. Thus, this technique is a valuable tool for evaluating craniovertebral junction stability.

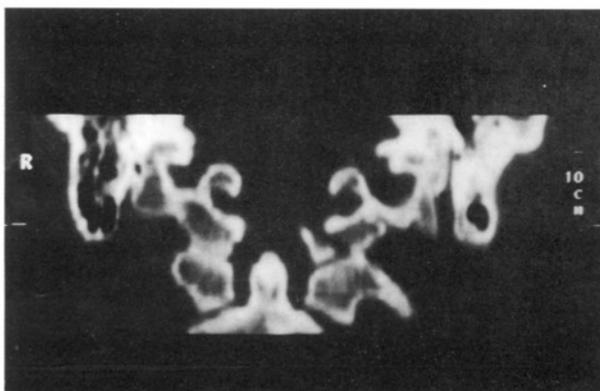


Figure 1: Axial CT scan showing fracture of the left occipital condyle.

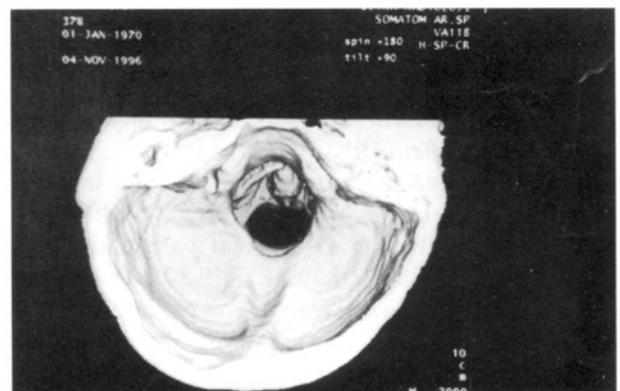


Figure 2: 3D-CT scan showing fracture of the left occipital condyle.

Anderson and Montesano (2) divided occipital condyle fractures into three types, all thought to be caused by different mechanisms. Type 1 is an impacted comminuted fracture that represents a bursting response to axial loading. Type 2 is a fractured condyle as part of a basilar skull fracture that extends to the foramen magnum. These two types are stable, while Type 3 is an avulsion fracture of the occipital condyle, and is potentially unstable. In general, the treatment for OCF is conservative. Due to their stability, fracture Types 1 and 2 can be treated with a Philadelphia collar. Type 3 fractures should be treated with a more rigid external orthosis. Bozboğa et al. (5) stated that surgical treatment is indicated when there is neurologic dysfunction resulting from neurovascular compression. Our case involved Type 2 OCF without neurovascular compression, and the Philadelphia collar was adequate for treatment.

In the literature, OCF is considered a possibility in cases that involve unconsciousness, lower cranial nerve deficits, upper cervical pain, or C1-4 prevertebral soft tissue edema that is visible on plain cervical x-rays. It is important that the possibility of this type of fracture should not be overlooked. In our case, OCF was diagnosed during the work-up for a suspected basis cranii fracture. Investigation of the craniovertebral junction should be included in the cranial CT scan whenever there is a clinical signs of basis cranii fracture.

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