CASE REPORT

Bilateral Occipital Condyle Fracture: Report of Two Cases

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ABSTRACT

Occipital condyle fractures are a rare finding in trauma victims. Bilateral fractures are even more unusual and have typically been reported in autopsy studies. We treated two patients with bilateral occipital condyle fractures who had only minor symptoms. Anderson and Montesano's classification,¹ possible cranial nerve palsies, diagnosis, and treatment of this rare fracture are discussed.

KEYWORDS: Occipital condyle fracture, neck pain, lower cranial nerve palsy

Sir Charles Bell (as reported by Tuli et al.²) first described occipital condyle fractures in 1817. Since then there have only been occasional reports of this fracture. In a literature review Tuli et al.² found 96 reported cases from 1817 to 1994, 38 of which were from postmortem studies.

Recently, the diagnosis of occipital condyle fractures has paralleled the increasing availability of computed tomography (CT).^{3,4} This pattern suggests that patients with this fracture were likely overlooked in the past. Bilateral fractures are even more rare. In a large autopsy study of 600 deaths caused by traffic accidents, 25 cases had occipital fractures, 16 of which were bilateral.²

We report two patients with bilateral fractures that, curiously, were admitted to our depart-

ment within 2 months, and we discuss the importance of diagnosis and treatment on outcome.

ILLUSTRATIVE CASES

Patient 1

A 37-year-old man fell from a height of about 2.5 meters while erecting a scaffold. His right shoulder and the right side of his head hit the ground, and he was unconscious for a couple of minutes. On examination the patient was alert and complained of headache, a slight neck pain, and pain in the lower thoracic region. His neurological examination showed

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Figure 1 Axial CT scan showing the bilateral Type II occipital condyle fracture (→) resulting from a transverse fracture of the petrous bone.

Figure 2 High-resolution CT scan showing the bilateral occipital condyle fracture with minimal displacement on the right side (→).

no deficits, especially no cervical or cranial nerve palsies. Plain radiography showed a skull fracture in the right occipital region and a stable anterior compression fracture of the 12th thoracic vertebral body. Plain cervical radiographs showed no abnormalities.

CT of the brain and skull showed a small, right-sided subdural hematoma and confirmed the presence of a skull fracture running through the petrous bone on the right side. There was also a fracture line in both the left and right occipital condyles presenting as a Type II occipital condyle fracture (Fig. 1). The cervical spine was immobilized with a hard collar for 3 months. At his 3-month follow-up examination, the patient stated that he had no pain. No nerve palsy was noted; no fracture line was visible on CT.

Patient 2

A 20-year-old man involved in a high-velocity traffic accident sustained a short period of unconsciousness. At the admitting community hospital,

he complained only of an occipital headache and neck pain. A CT examination showed an occipital-basal skull fracture as well as a petrosal bone fracture. The patient was transferred to our institution. On admission only a slight left-sided facial nerve palsy was noted. High-resolution CT confirmed the left-sided fracture of the petrous bone and the bilateral occipital condyle fractures (Type II) with minimal dislocation on the right side (Fig. 2). The patient was immobilized with a hard collar for 3 months. At his follow-up examination 3 months after injury the patient's facial nerve palsy had improved slightly. He had no other neurological deficits.

DISCUSSION

In about 80% of the cases, the cause of injury leading to occipital condyle fractures involves high-velocity motor vehicle accidents.⁵⁻⁷ Anderson and Montesano¹ proposed three distinct underlying mecha-

nisms. Type I is an impacted fracture resulting from axial loading and is typically stable. The fragments are generally comminuted with minimal displacement. Type II occipital condyle fractures occur as part of a basilar skull fracture resulting from a direct blow on the skull. These fractures are also stable because of the alar ligaments and tectorial membrane. Type III occipital condyle fractures, however, are considered potentially unstable as a result of lateral flexion or rotary forces pulling the alar ligaments.

Diagnosis of this rare fracture remains difficult. Plain skull radiographs may reveal skull fractures suspicious for condyle involvement, but plain radiographs of the cervical spine tend to appear normal.⁸⁻¹⁰ CT remains the diagnostic procedure of choice^{9,11} and helps detect intracerebral complications such as bone displacement or hemorrhage. CT should be used to evaluate patients with persistent neck pain⁹ even if they have no neurological deficits and normal radiographs.

The correct and early diagnosis of occipital condyle fractures is crucial because delayed nerve palsies can develop even if the fracture initially is associated with no cranial nerve deficits. Because of its proximity to the condyle, the hypoglossal nerve can be involved when the fracture transverses the hypoglossal canal. Demisch et al.¹² described a case where the first symptoms of nerve damage developed 2 months after the trauma. Orbay et al.⁹ reported the development of deficits after 3 months.

Another delicate location is the jugular foramen, which contains cranial nerves IX, X, and XI. Should the fracture line run through this foramen, paralysis of the nerves is possible. In the most severe cases, palsy of all four nerves develops.¹³⁻¹⁵ Unilateral paralysis of the last four cranial nerves is referred to as Collet-Sicard syndrome.^{14,15} However, damage to other cranial nerves, especially V through VIII, has also been described. Consequently, the possible findings in a clinical examination exhibit a wide range.²

The potential for serious deficits underlines the importance of obtaining a thorough examination of the patient and especially a thorough follow-up of patients without severe symptoms ini-

tially, because lower cranial nerve palsies also can occur in patients with a minor head injury.¹⁴

The treatment of a cranial nerve palsy caused by an occipital condyle fracture is usually conservative. We only found one patient who underwent surgical treatment for neural decompression.¹⁶

Although external rigid fixation (e.g., halo vest) might suffice, surgical stabilization of the fractured occipital condyle should be considered for patients with unstable (Type III) fractures. For stable fractures (Types I and II), immobilization in a hard collar is the treatment of choice. The duration of immobilization is not yet standardized, but like most authors, we recommend 3 months with a range of 4 weeks to 3 months.^{2,4-6,17}

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Commentary

This article provides a straightforward description of two patients suffering from an unusual skull base fracture and useful information for our readership. The discussion helps underscore the three accepted types of occipital fractures and how each type generally dictates prognosis and treatment.

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