Occipital neuralgia secondary to exuberant callus formation

Case report

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The authors report the case of a 78-year-old woman suffering from right occipital neuralgia in whom computerized tomography and magnetic resonance images demonstrated an irregular bone mass in the C-2 vertebral body. This “bone tumor” happened to be an exuberant callus formation that arose as a result of a previous axis body fracture. The patient’s occipital pain was immediately relieved after she underwent C2–3 root release.

KEY WORDS • occipital neuralgia • axis fracture

Occipital neuralgia can be attributed to multiple causes. Some of these are peripheral, such as myositis, traumatic scars, or fibrositis, and some are intradural, such as hypertrophic cervical pachymeningitis, cervical cord tumors, or Arnold–Chiari syndrome. Extradural causes, such as fractures of the atlas and pinching of the C-2 nerve root between the atlas and the axis in severe cervical injuries, have also been reported. A C1–2 arthrosis syndrome has also been postulated as a cause of occipital neuralgia.

Case Report

This 78-year-old woman was referred to us with complaints of neuralgic pain in her right suboccipital and retromastoid region. The pain was exacerbated by motion. The patient had been treated with various conservative measures without success for almost 1 year at a rehabilitation clinic. She had suffered a head trauma 1 year earlier while hiking, but had not sought medical care for a week, until the right occipital neuralgia pain had become persistent.

Examination. On examination, the patient’s neck motion range was significantly decreased and her pain was increased with motion. Neurologically she was intact. Computerized tomography (CT) scanning (Fig. 1 left) demonstrated a bone mass on the right half of the axis body that harbored not only different densities within, but also indirect signs of a possible fracture line. Magnetic resonance (MR) imaging (Fig. 1 center) showed a hypointense round mass occupying the entire right half of the axis body and partially invading the anterolateral subarachnoid space.

Operation. After the patient was placed in the lateral decubitus position with her head immobilized by a Mayfield clamp, a right unilateral cervical approach was initiated. The C-2 nerve root was released from the compression produced by the posterior atlantoepistrophe ligament, and a right foraminotomy was performed over the C2–3 nerve roots. Biopsy of the bone mass showed that it was soft bone. Neuropathological examination revealed normal bone tissue.

Postoperative Course. After surgery, the patient wore a neck collar for 3 weeks. She was relieved of her occipital neuralgia in the immediate postoperative period. A CT scan obtained 2 years after surgery (Fig. 1 right) demonstrated a good fusion with some remodeling of the callus mass.

Discussion

The neuroimaging diagnostic studies of this patient were somewhat intriguing, especially the MR imaging, because of the lack of a clear cause-and-effect relationship between a light fall and a large bone mass appearing in a geriatric patient complaining of untreatable occipital neuralgia. In viewing the case retrospectively and considering the CT scan, we recognize that an exuberant callus formation at the site of a previous fracture should have been suspected. At the time of operation, the option of adding some type of fusion procedure was considered because of our concern about the possible increase in instability after a hemilaminectomy in a patient with a previous axis body fracture. Consideration of the age of the patient and the exuberant callus led us to select a conservative approach and, thus, we decided to use only a neck collar for 3 weeks postoperatively.


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The most common axis fractures—odontoid and hangman’s—occur quite frequently. It is estimated that as many as 25% to 40% of patients with acute C-2 fractures die at the scene of the accident. Nevertheless, the neurological compromise of patients who survive an axis injury is remarkably low.

The unique anatomy of the axis allows a myriad of fracture possibilities. The rare fracture of the C-2 body proper occurs at the region between the base of the odontoid process and the pars interarticularis. In a recent review, Benzel, et al., suggested that the odontoid fractures classification of Anderson and D’Alonzo should be abandoned. Our patient’s condition belongs to the Type 2 axis fracture of the scheme introduced by Benzel, et al., a sagittally oriented comminuted burst fracture of the C-2 body caused by a relatively light axial load applied to the vertex of the calvaria. Because the fracture was not recognized and immobilized immediately, conditions were probably favorable for formation of the large callus.

Occipital neuralgia, also known as Arnold’s neuralgia, has traditionally been treated by peripheral avulsion of the greater occipital nerve. Some authors prefer to perform C-2 dorsal rhizotomy. Poletti proposed a C2–3 decompression, classifying the neuralgia as a root entrapment syndrome. Curiously, he reported the case of a patient who developed typical occipital neuralgia several years after cervical injury and fracture of the C-2 pedicle. The rationale for performing a decompression rather than a rhizotomy would be preference for a nondestructive method. We used a unilateral microsurgical approach in our patient. This allowed us to obtain a bone biopsy, while at the same time achieving a C2–3 nerve root decompression. The patient has remained asymptomatic for the last 7 years.

References


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