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Case Report

Transoral vertebroplasty for a C2 aneurysmal bone cyst

Liberto Brage, MD, Héctor Roldán, MD, PhD, Julio Plata-Bello, MD, PhD*, Diego Martel, MD, Víctor García-Marín, MD, PhD

Department of Neurosurgery, Hospital Universitario de Canarias, Carretera Ofra s/n La Cuesta. CP 38320. La Laguna, S/C de Tenerife, Spain

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Abstract

BACKGROUND CONTEXT: Aneurysmal bone cysts at the cervical spine represent a real challenge both diagnostically and therapeutically, especially in young patients.

PURPOSE: We present an unusual case of a C2 aneurysmal bone cyst expanding in the entire vertebral body in a girl successfully treated with a transoral vertebroplasty.

STUDY DESIGN: This is a case report study.

METHODS: We report the case of a 17-year-old girl with a history of cervical pain and occipital headache after a car accident. Routine x-rays disclosed a C2 lesion. Her neurologic examination was normal. Computed tomography showed a lytic lesion occupying almost the entire body of the C2 vertebra. The cortical bone was intact but notably thinned. Magnetic resonance imaging revealed a cystic image with blood inside. Transoral vertebroplasty was selected among other surgical options for the following reasons: (1) to improve the clinical symptoms, and (2) to prevent future vertebral collapse with devastating neurologic consequences. Under general anesthesia and continuous neurophysiological monitoring, we conducted a fluoroscopic-guided transoral vertebroplasty through a Jamshidi needle. A cytology sample from the cystic lesion was taken through the needle.

RESULTS: The blood smear showed no tumoral cellularity. There were no complications during surgery or postoperative infections. After 4 years of follow-up, the patient is pain-free and leads a normal life.

CONCLUSIONS: Transoral vertebroplasty seems to be a direct, safe, and effective technique to stabilize cystic lesions that endanger the stability of C2 and to improve symptoms. Aneurysmal bone cysts should be included in the differential diagnosis of lytic lesions at the C2 vertebral body.

Keywords: Axis; Aneurysmal bone cyst; Antibiotics; Stability; Transoral; Vertebroplasty

Introduction

Aneurysmal bone cysts (ABC), representing 1.4% of all primary bone tumors and 15% of all primary spine tumors [1], are a rare benign condition, sometimes self-limiting, and generally located in the posterior arch of the lumbar vertebrae, followed by the thoracic, cervical, and sacral segments [2]. Despite their benign nature, they can be locally aggressive, and can result in pathologic fractures and neurologic complications [3]. They can appear as primary bone lesions (in 70% of the cases) or secondary (in about 30%), when ABC-like areas are encountered inside other bone conditions (giant cell tumors, chondroblastoma, telangiectatic osteosarcoma, and osteoblastoma) [4]. Although not pathognomonic, ABC are usually diagnosed based on their typical radiological appearance, consisting of multilocular cysts with fluid-fluid levels on magnetic resonance imaging (MRI) and bony septations on computed tomography (CT) [5].

The treatment of ABC is controversial. Multiple treatment modalities have been tried with variable improvement and recurrence rates. The options include curettage with or without bone grafting, complete excision, arterial embolization, intralesional drug injections (steroid and calcitonin), and radiation [6]. Intralesional curettage is the technique most often used in the spine [7,8]. Nevertheless, complete excision is the optimal approach to achieve local control of the tumor as it

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* Corresponding author. Department of Neurosurgery, Hospital Universitario de Canarias, Carretera Ofra s/n La Cuesta. CP 38320. La Laguna, S/C de Tenerife, Spain. Tel.: +34 922 255 544 / +34 646 625 973.

E-mail address: jplata5@hotmail.com (J. Plata-Bello).

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prevents recurrence, but this treatment exposes the patient to high surgical morbidity [9,10]. Radiotherapy has been indicated in unresectable lesions as it has numerous and severe complications [11]. Arterial embolization has been used preoperatively to decrease surgical bleeding and also as a standalone approach for inoperable cases [12].

We report an unusual case of an ABC in the C2 affecting the entire vertebral body, which was successfully treated with transoral cementation in a girl, in addition to discussing the rationale for the selected treatment.

Methods

Our case is a 17-year-old girl who reported a long history of cervical pain and occipital headaches. She had previously sought out medical attention, but no clear diagnosis had been achieved. She was subsequently involved in a car accident and sustained a whiplash injury. On routine cervical x-rays, a radiolucent lesion in the C2 vertebral body was found (Fig. 1A). For this reason, she was referred to our hospital. On examination, the only physical finding was neck pain without any neurologic deficits. A CT scan showed a lytic expansile lesion occupying almost the entire body of the C2 with intact but notably thinned anterior and posterior cortical boundaries. Multiple partitions could be seen inside the cavity (Fig. 1B,C). Magnetic resonance imaging revealed a cystic lesion containing blood (Fig. 1C).

Given the symptoms, patient age, and structural compromise of the integrity of C2 by the lytic lesion, we decided to perform a transoral vertebroplasty with three main objectives: (1) to improve the clinical symptoms, (2) to prevent future vertebral collapse with devastating neurologic consequences, and (3) to obtain a pathological sample of the content of the lesion.

The surgery was performed under general anesthesia and continuous neurophysiological monitoring. The patient underwent systemic and local antibiotic prophylaxis in the oral cavity. The patient was placed in the supine position with the head hyperextended and a Dingman mouth gag was used. The inner part of the mouth was draped. The entry point was located in the throat with the aid of biplanar fluoroscopy (Fig. 2, Top). A Jamshidi needle was used to reach the lesion, allowing the evacuation of the hematic content, which was sent to the Pathology Department for postoperative diagnosis (Fig. 2, Bottom Left). We then performed the fluoroscopy-guided vertebroplasty

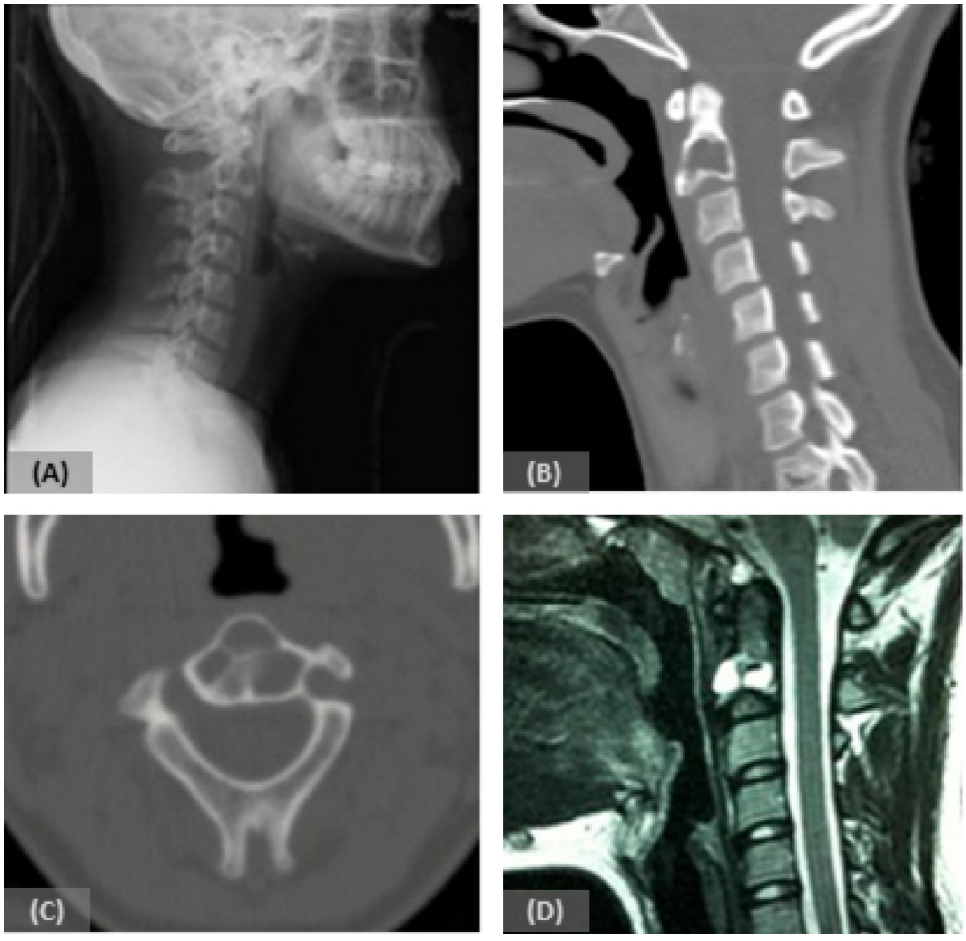

Fig. 1. Preoperative images: (A) Plain radiography showing a lytic lesion at the C2 body. (B, C) Sagittal and axial computed tomography (CT) scans demonstrating an expansile osteolytic lesion. Note the integrity of the thin cortical boundaries and multiple partitions in its interior. (D) Preoperative T2 weighted image (T2WI) magnetic resonance imaging (MRI) showing blood content inside the lesion.