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Clinical Studies

Transoral kyphoplasty for tumors in C2

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Abstract

BACKGROUND CONTEXT: The management of tumors of the C2 body remains controversial. In cancer patients, major procedures may be contraindicated, and nonoperative treatment could fail.
PURPOSE: To describe a new surgical technique, the transoral kyphoplasty, that we performed in 3 cases of tumors in C2 after nonoperative treatment failure.
STUDY DESIGN: Case series of three patients.
PATIENT SAMPLE: Three patients from the senior author's practice.
OUTCOME MEASURES: To reduce pain and avoid both C2 collapse and prolonged immobilization, transoral kyphoplasties were performed.
METHODS: From February 2004 to January 2006, three cases of tumors in C2 did not show healing after nonoperative treatments.
RESULTS: No complications and/or complaints were related to the procedure. There were no C2-related symptoms or neurological problems. The first patient died 8 months after surgery. The second and the third are alive with follow-ups of 2 years and 6 months, respectively. In all cases, cervical motion was restored, and patients are pain free, with no findings regarding pathologic mobility/instability on X-ray and computed tomography scan.
CONCLUSIONS: Transoral kyphoplasty proved to be safe, quick, and effective in reducing pain and avoiding vertebral collapse in patients with tumors in C2 not responding to nonoperative treatment.

Keywords: C2; Tumor; Transoral; Kyphoplasty; Surgical treatment; Conservative treatment failure

Introduction

Tumoral lytic lesions of the body of C2 may not be responsive to nonoperative treatment. In these cases, operative treatments such as internal surgical stabilization [1,2], percutaneous vertebroplasty [3,4], or transoral vertebroplasty [5–8] may be used. The four previous cases of transoral vertebroplasty proved to be a safe and effective technique for pain control and stabilization of the vertebra in C2 tumors such as angioma [5], multiple myeloma [6], aneurysmal bone cyst [7], and metastasis of thyroid origin [8]. This technique permits the maintenance of the normal cervical spine anatomy and avoids arthrodesis or fixation that may reduce the cervical spine range of motion. Kyphoplasty, versus vertebroplasty, in the thoracolumbar spine permits the injection of the PMMA in a predefined space created by the use of the balloon and correlates with a reduction in the complication rate [9–13]. Our purpose is to describe a new technique, the transoral kyphoplasty, that we performed in 3 cases of tumors in C2.

Surgical technique

The patient should be premedicated with intravenous antibiotics (2 g sodium cefazolin). This procedure requires the aid of biplanar fluoroscopic image guidance. Under general anesthesia, the patient is placed in a supine position on a radiotransparent operative table. A fiberoptically guided intubation is carried out via a transoral route, with the assistance of an otolaryngologist. Access to the oral cavity is provided by the insertion of a pharyngeal self-retainer

FDA device/drug status: not applicable.

Nothing of value received from a commercial entity related to this manuscript.

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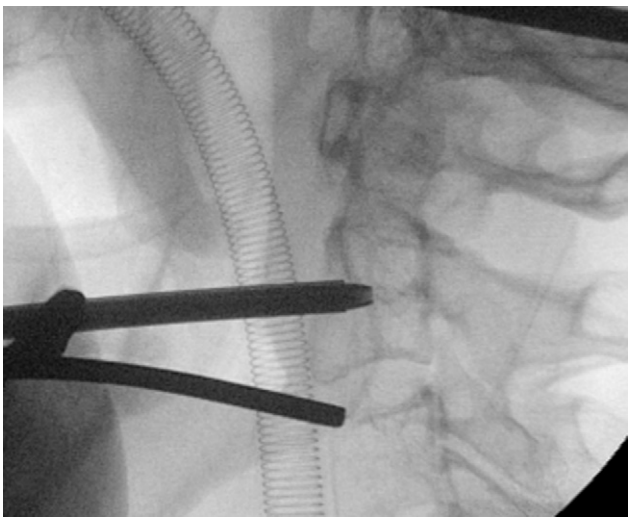

Fig. 1. The 11-gauge cannulated probe is placed through the pin into the C2 body lesion under fluoroscopic guidance to create the working channel.

between the left upper and lower molar teeth. The C1 anterior arch and C2 body should now be accessible to finger palpation. Perioral and oropharyngeal regions are then disinfected with povidone iodine (Braunol, 7.5%; B. Braun Melsungen, Melsungen, Germany). A guide pin (KyphX Osteo Introducer System; Kyphon Inc., Sunnyvale, CA) is then inserted under fluoroscopic monitoring. An 11-gauge cannulated probe (KyphX Osteo Introducer System) is placed into the C2 body lesion under fluoroscopic guidance through the pin to create the working channel (Fig. 1). A 10-mm balloon (KyphX Xpander Inflatable Bone Tamp, 10/3, Kyphon Inc.) is then placed into the bone through this channel and inflated/deflated to create a cavity inside the vertebral body until sufficient reduction of the collapsed vertebral body height is obtained. The balloon is then deflated and withdrawn, and the remaining cavity is filled with PMMA cement (KyphX HV-R Bone Cement, Kyphon Inc.) through a cannula with an inner stylet (KyphX Bone Filler Device, Kyphon Inc.) (Fig. 2). The probe is withdrawn, and hemostasis is achieved by pressing the posterior nasopharyngeal wall with a compress mounted on a clamp. After suturing, the patient is maintained on intravenous antibiotic (1 g sodium cefazolin every 8 hours) for 1 day.

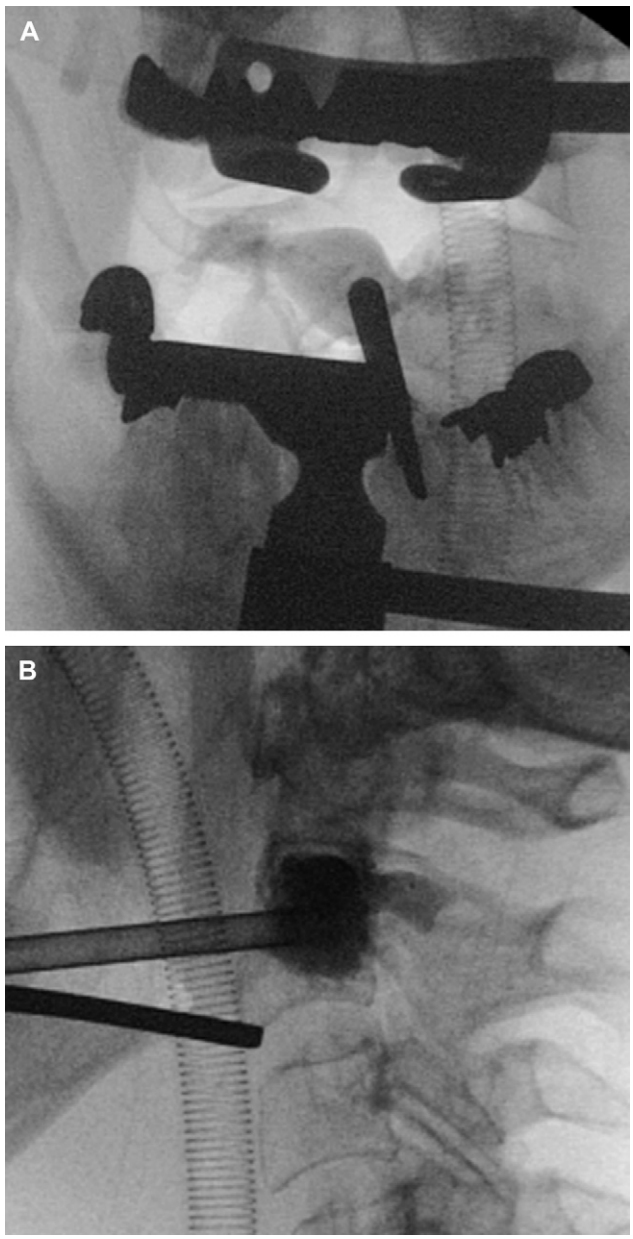

Fig. 2. When the cavity is created inside the vertebral body, the balloon is deflated and withdrawn, and the remaining cavity is filled with PMMA cement through a cannula with an inner stylet. Note the good final results in the (top) anteroposterior and (bottom) latero-lateral fluoroscopic views.

Case reports

Between February 2004 and January 2006, we performed three transoral kyphoplasties in patients with a tumor in C2. The first was a 55-year-old woman with a pathologic fracture of the body of C2 secondary to metastatic breast cancer (pT1cNOG2). She was initially treated by Halo Vest Fixation (Bremer Halo System, DePuy Spine, Johnson & Johnson Co., Raynham, MA) and had undergone quadrantectomy and axillary emptying, tamoxifen chemotherapy, and local radiotherapy with 50.4 Gy/F. During the next 3 months, the patient underwent three oncological therapy cycles (radiotherapy with 2Gy/5F and chemotherapy with epirubicin, taxotere, and exemestane). The second case was a 69-year-old woman with multiple myeloma and multiple osteolytic vertebral lesions (C2, T9, T10, T11, T12, and L1). She was initially treated with a rigid cervical orthoses and a rigid thoracolumbar brace. During the following 4 months, two CD34+ peripheral stem-cell transplantations were attempted after four prior vincristine, doxorubicin, and dexamethasone chemotherapy cycles and one ifosfamide, mesna, epirubicin, and etoposide chemotherapy cycle. Pamidronate and radiotherapy