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The Spine Journal 11 (2011) e13–e18

THE SPINE JOURNAL

Case Report

Thoracoscopic en bloc extirpation for subperiosteal osteoid osteoma of thoracic vertebral body: a rare variety and its therapeutic consideration

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Received 11 November 2010; revised 10 February 2011; accepted 10 March 2011

Abstract

BACKGROUND CONTEXT: Osteoid osteoma is a rare benign osteoblastic tumor. Approximately 10% to 20% of osteoid osteomas occur in the spine with a high trend to involve the posterior components; in turn, vertebral body involvement is uncommon. Osteoid osteoma has been classified into cortical, cancellous, and subperiosteal subtypes according to the localization of the nidus. Subperiosteal osteoid osteoma is extremely rare and has been reported mainly in the femoral neck and small bones of the hands and feet. To the best of our knowledge, subperiosteal osteoid osteoma arising in spine has never been reported previously.

PURPOSE: To illustrate a rare case of a 23-year-old female with painful scoliosis because of subperiosteal osteoid osteoma of ninth thoracic vertebra that was treated by thoracoscopic intervention.

STUDY DESIGN/SETTING: A case report and review of literature.

METHODS: Magnetic resonance imaging revealed the inflammation/edema pattern intensity at right side of both 9th and 10th thoracic vertebrae. Computed tomography demonstrated the round radiolucency surrounded by reactive bone formation (nidus) at the right anterolateral aspect of ninth thoracic vertebra. Taken all findings including anatomical localization of the lesion into consideration, we decided to use thoracoscopic intervention. Improvement of scoliosis was achieved 2 months after surgery. At the time of final follow-up, the patient was free of symptom and there was no clinical and radiologic evidence of recurrence of the tumor 1.5 years postoperatively.

RESULTS: Thoracoscopic intervention achieved en bloc extirpation of the nidus after partial removal of the 10th rib head. Thoracoscopic treatment has never been reported as a treatment modality of spinal osteoid osteoma. Within a few hours after the operation, the pain disappeared completely. Histopathological examination revealed that extracted lesion was compatible with osteoid osteoma.

CONCLUSIONS: The lesion described here demonstrates an extremely rare variety of spinal osteoid osteoma, which was successfully treated by an unprecedented thoracoscopic intervention. This alternative surgical approach enabled en bloc extirpation and effective correction of scoliosis while achieving a cosmetic satisfaction.

Keywords: Osteoid osteoma; Spine; Vertebral body; Subperiosteal subtype; Scoliosis; Thoracoscopy

Introduction

Osteoid osteoma is a benign bone tumor, which is differentiated from osteoblastoma by its size [1]. McLeod et al. [2] arbitrarily defined lesions with a diameter of 1.5 cm or less as osteoid osteoma and those with a diameter of greater than 1.5 cm as osteoblastoma. Theoretically speaking, osteoid osteoma can arise in any bone. However, osteoid osteoma predominantly localizes in the long bone, and its occurrence in the spine remains as low as 10% to 20% [3–6]. Among the infrequent spinal involvements, the lumbar spine is the most frequently affected (59%), whereas the thoracic spine is the least affected (12%) [3,7].

According to the localization of the nidus within the bone, osteoid osteoma has been classified into cortical, cancellous, and subperiosteal subtypes [8]. Being extremely rare, the

FDA device/drug status: not applicable.

Author disclosures: ***KM:*** Nothing to disclose. ***SI:*** Nothing to disclose. ***YS:*** Nothing to disclose. ***YM:*** Nothing to disclose.

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1529-9430/$ - see front matter
doi:10.1016/j.spinee.2011.03.015

subperiosteal subtype has received least attention [9]. Classically, curative treatment for osteoid osteoma has been surgical removal of the nidus [10,11]. Deactivation of the nidus with radio frequency thermal coagulation has been recently introduced as another modality of treatment [4,12].

In the present report, we describe an extremely rare case of subperiosteal osteoid osteoma arising in ninth thoracic vertebra. Its localization in the anterolateral aspect of vertebral body made it extremely difficult to reach the tumor through the routine transpedicular approach. Furthermore, the tumor developed in a subperiosteal fashion, and likely adverse injury to the adjacent arteries and nerves discouraged from applying conventional thermal coagulation.

In the present report, we describe an extremely rare case of subperiosteal osteoid osteoma, which was successfully extirpated by unprecedented thoracoscopic intervention. Although thermal coagulation becoming a standard modality of therapy for spinal tumor, thoracoscopic intervention may still constitute another therapeutic modality.

Case report

A 23-year-old female complained of right midback pain with a 3-month history and visited general internal medicine. She reported no history of trauma. All of conducted examinations including blood and urine tests at the initial consultation were normal except for scoliosis presented by a plain X-rays (Fig. 1, Left), which was considered as an idiopathic. Nonsteroidal anti-inflammatory drug was prescribed for the pain of unknown origin. Nonsteroidal anti-inflammatory drug was effective only during an early stage of her illness and the pain aggravated thereafter.

Subsequently, she was referred to psychiatric department because her persistent pain without overt cause was suspected of a psychosomatic origin. In turn, psychological examination revealed no abnormalities. Finally, she was referred to orthopedic department after the 6th month from the onset of the symptom. At this time point, nonsteroidal anti-inflammatory drug was no longer effective, particularly during nighttime. Her sleep was constantly disturbed by unremitting pain.

Magnetic resonance imaging revealed the inflammation/edema pattern intensity at right side of both 9th and 10th thoracic vertebrae (Fig. 2, Left). Computed tomography demonstrated the round radiolucency surrounded by reactive bone formation, so-called nidus, at the right anterolateral aspect of ninth thoracic vertebra (Fig. 2, Right).

The demonstrated lesion in the ninth thoracic vertebra was a likely cause of her clinical manifestations, thus, removal of this lesion was planned. Surgical removal of the

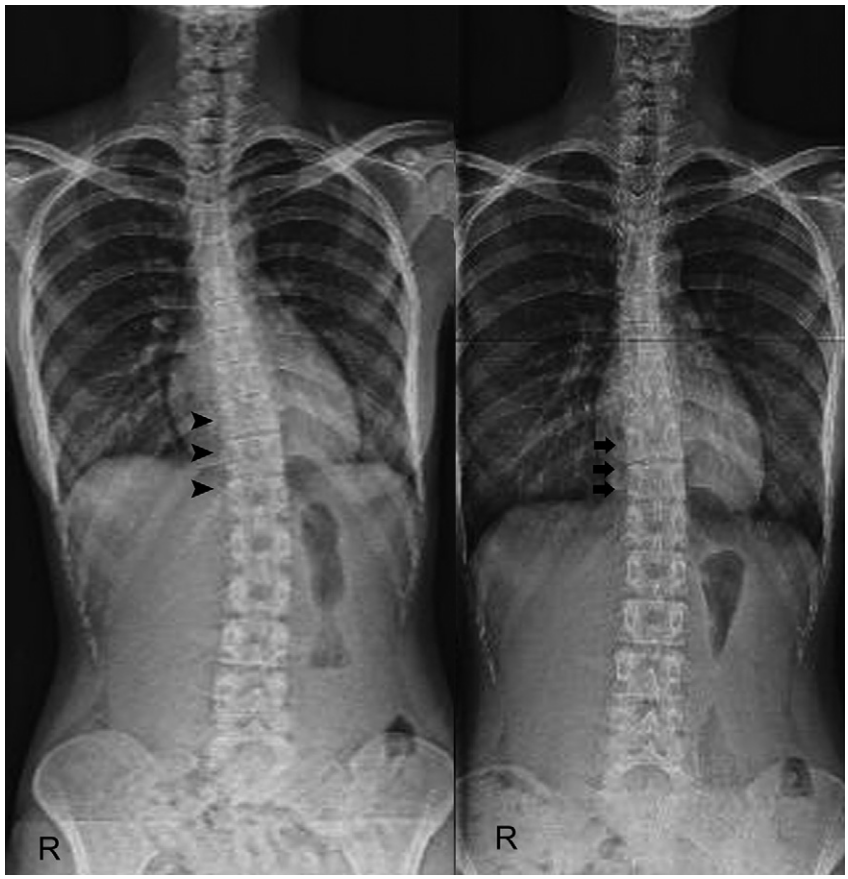

Fig. 1. Pre- and postoperative X-rays. (Left) Preoperative anteroposterior plain X-rays demonstrating the thoracic curve (arrowheads). (Right) Anteroposterior plain X-rays, made 2 months postoperatively, showing the improvement of the scoliosis (arrows).