Eosinophilic Granuloma of the Lumbar Spine in an Adult

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abstract

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Eosinophilic granuloma of the spine is a common benign disease in children and adolescents that rarely affects adults.

This article describes the case of a 32-year-old woman with a solitary eosinophilic granuloma presenting as a local lytic lesion at the L4 vertebral body. She presented with a 2-month history of low back pain without neurological deficits. Plain radiographs showed a lytic lesion of the L4 vertebral body. Computed tomography scans showed an osteolytic lesion surrounded by partial sclerotic change of the L4 vertebral body. Magnetic resonance imaging revealed a low-intensity lesion on T1-weighted images and a high-intensity lesion on T2-weighted images. A computed tomography-guided transpedicular needle biopsy of the L4 vertebral body was performed. The histological specimen stained with hematoxylin-eosin revealed features of eosinophilic granuloma with aggregates of Langerhans cells. On immunological studies, the diagnosis of eosinophilic granuloma was facilitated by diffuse immunoreactivity of S-100 protein and CD1a. For the 3-month period after biopsy, the patient was fitted with a corset and allowed to walk. Four months after biopsy, computed tomography scans showed that remodeling of the destructive lesion of the L4 vertebral body was occurring. Two years after initial onset, the patient had complete relief of low back pain and no neurologic deficit. Computed tomography scans showed full reconstitution of the lesion. This was a rare case of successful conservative treatment of eosinophilic granuloma of the lumbar spine in an adult. Conservative treatment may be considered in a patient with an eosinophilic granuloma with no neurological deficit or spinal instability.

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Figure: Immunohistochemical staining with S-100 protein (A) and CD1a (B) showing immunoreactivity of Langerhans cells (original magnification ×200).
Eosinophilic granuloma is regarded as a pediatric disease that rarely affects adults. Eosinophilic granuloma is a benign osteolytic lesion and is most commonly found in the skull, femur, rib, mandible, pelvis, and spine. Spinal involvement is less frequent. To the authors’ knowledge, 14 cases have been reported in the English literature of eosinophilic granuloma in the adult lumbar spine. \textsuperscript{1-13} This article describes the case of a 32-year-old woman with a solitary eosinophilic granuloma presenting as a local lytic lesion of the L4 vertebral body.

**CASE REPORT**

A 32-year-old woman presented with a 2-month history of low back pain. She reported no history of trauma, fever, weight loss, or other constitutional symptoms. On examination, she had tenderness on percussion of the spinous processes of the lower lumbar spine and limited lumbar spine range of motion due to pain. She had no motor or sensory disturbance in the lower limbs and no bowel or bladder dysfunction. She was afebrile, and all chemistry results, including alkaline phosphatase (195 U/l), serum measurements of tumor markers, hematology tests, and urinalysis, were normal.

Plain anteroposterior lumbar spine radiographs showed mild scoliosis, and later radiographs showed a destructive lesion of the anterior aspect of the L4 vertebral body. Sagittal magnetic resonance imaging (MRI) revealed that the L4 vertebral body showed iso- to low-intensity change on T1-weighted MRI and high-intensity change on T2-weighted MRI. Gadolinium-enhanced MRI showed diffuse enhancement of the L4 vertebral body lesion (Figure 1). Computed tomography (CT) scan showed an osteolytic lesion surrounded by partial sclerotic change of the L4 vertebral body (Figure 2). A bone scan showed increased isotope uptake at the L4 vertebra, but no other lesion was found. A preoperative diagnosis of metastatic bone tumor or primary bone tumor, such as Ewing’s sarcoma, was evoked. Thoracoabdominal CT scan and positron emission tomography showed no other lesion.

A CT-guided transpedicular needle biopsy of the L4 vertebral body was performed. Study of the histological specimen stained with hematoxylin-eosin revealed features of eosinophilic granuloma with aggregates of Langerhans cells (Figure 3). On immunological studies, the diagnosis of eosinophilic granuloma was facilitated by diffuse immunoreactivity of S-100 protein and CD1a (Figure 4).

For the 3-month period after biopsy, the patient was fitted with a customary hard corset and allowed to walk. Four months after biopsy, CT scans showed that remodelling of the destructive lesion of the L4 vertebral body was occurring (Figure 5). Two years after initial onset, the patient had complete low back pain relief and no neurologic deficit. Computed tomography scan showed full reconstitution of the lesion (Figure 5).

**DISCUSSION**

Eosinophilic granuloma of bone is a relatively uncommon disease; it constitutes less than 1% of all bone tumors. \textsuperscript{14} Spinal involvement has been reported in approximately 7% to 15% of cases. \textsuperscript{15} In the spines of adults, eosinophilic granuloma mainly involves the vertebral bodies,
orthopaedics

Case Report

with a predilection for the cervical spine (47%), followed by the thoracic (33%) and lumbar (20%) spines. In young children, most of the vertebral body can be affected by eosinophilic granuloma, which usually results in complete collapse, often described as vertebra plana. In adolescents and adults, relatively smaller areas are affected, and eosinophilic granuloma is not associated with vertebral body collapse. Thus, the spinal lesions may be asymptomatic on plain radiographs when an eosinophilic granuloma of the vertebral body is present without vertebral collapse. Computed tomography scans can show some presumptive signs, such as a lytic area with a sclerotic margin. Magnetic resonance imaging can demonstrate a hypo- or heterointense lesion on T1-weighted MRI and hyperintense lesion on T2-weighted MRI with dense-rim enhancement.

The clinical symptoms and radiographic findings of eosinophilic granuloma are not specific enough to diagnose the disease; histological confirmation is always needed in adults. The differential diagnoses should include metastatic tumor, myeloma, osteomyelitis, aneurysmal bone cyst, Ewing’s sarcoma, osteoblastoma, Gaucher’s disease, and acute leukemia. Biopsy plays an important role in diagnosis. The diagnosis of eosinophilic granuloma is based on histological and immunohistochemical identification. The basic pathological findings of eosinophilic granuloma are eosinophils and Langerhans cells. The diagnosis can be confirmed by immunohistochemical staining with CD1a and S-100 protein.

Eosinophilic granuloma is a self-limiting disease, and the prognosis is generally good. However, the exact etiology of eosinophilic granuloma remains unclear, and no standard principles of treatment exist. A variety of treatment strategies for adults with eosinophilic granuloma have been reported, including observation, radiation therapy, chemotherapy, and curettage of the lesion with or without reconstructive surgery. Many studies have suggested that the natural history of eosinophilic granuloma of the spine is usually benign and that conservative treatment is recommended. Surgical treatment should be required in selected cases of neurological impairment or compromising spinal instability.

Fourteen patients with eosinophilic granuloma have been previously reported in the adult lumbar spine; 9 were treated surgically and 4 were treated conservatively, including 2 patients treated with radiation therapy and 1 that was not described. The patient underwent conservative treatment with bracing. Bracing caused the low back pain to disappear, and radiological control showed no aggravation of collapse. Careful observation was continued with no additional treatments, such as chemotherapy or radiation. The current patient showed a satisfactory result at 2-year follow-up. Thus, immobilization of the affected spine was helpful. The authors suggest that an eosinophilic granuloma should be considered in the differential diagnosis of a destructive vertebral body tumor, and detailed histological identification by biopsy should be performed before surgical treatment.

Conclusion

Eosinophilic granuloma rarely affects the adult spine and should be considered in the differential diagnosis of a destructive vertebral body tumor. Conservative treatment may be considered in a patient...
with an eosinophilic granuloma with no neurological deficit or spinal instability.

REFERENCES


