Solitary Bone Cyst of the Cervical Spine
—Case Report—

Takao NAKAGAWA, Hirokazu KAWANO, and Toshihiko KUBOTA

Department of Neurosurgery, Fukui Medical School, Fukui

Abstract

A 63-year-old female presented with an extremely rare solitary bone cyst in the spine involving the C-5 vertebral body. Computed tomography showed an air-density area inside the cyst, without postcontrast enhancement. Magnetic resonance imaging demonstrated a low-intensity lesion on both T₁- and T₂-weighted images. At surgery, the cyst cavity contained no fluid. Histological examination of the surgical specimen revealed that the cyst wall was lined by a thin fibrous membrane. This rare bone cyst may have originated from a defect in the epiphyseal plate of the vertebral body.

Key words: bone cyst, computed tomography, histological diagnosis, magnetic resonance imaging, spine

Introduction

Solitary bone cyst (unicameral bone cyst) is common in the long tubular bones, but is very unusual in the spinal column. Only five cases of histologically proven solitary bone cyst involving the spine have been reported. We report a case of solitary bone cyst involving the C-5 vertebral body and discuss the clinical features, diagnosis, treatment, and pathogenesis.

Case Report

A 63-year-old female presented with right shoulder pain and numbness in the right upper extremity. One year previously she had undergone radical mastectomy for right breast cancer. The histological diagnosis was papillotubular carcinoma.

On admission, physical examination revealed paresthesia in the C6-8 dermatome of the right upper extremity. Plain x-ray films of the cervical spine showed spondylosis at the C5-6 space and a cystic lesion in the C-5 vertebral body (Fig. 1). Computed tomography (CT) showed an air-density area inside the cyst, without postcontrast enhancement (Fig. 2). Magnetic resonance (MR) imaging demonstrated this cystic lesion and a herniated disk at the C3-4 space compressing the spinal cord (Fig. 3). A technetium-99m bone scintigram showed no abnormalities.

She underwent discectomy and fusion with iliac bone graft at the C3-4 and C5-6 spaces. The cystic lesion cavity was lined with a thin membrane, but contained no fluid and was not connected with the disk space.

Histological examination of tissue removed from
the inner surface of the cavity revealed a fibrous membrane on bone-like tissue (Fig. 4). No malignant cells were detected. Immunohistochemical staining showed many cells in the fibrous membrane were positive for vimentin, epithelial membrane antigen, type I collagen, and type III collagen. Staining for desmin, cytokeratin, glial fibrillary acidic protein, and type II collagen was absent. These findings indicate that the cells probably originated from the mesenchyma. The diagnosis was solitary bone cyst.

After surgery, her right shoulder pain disappeared and the paresthesia was improved. Follow-up examination 13 months later showed no recurrence of the bone cyst in the cervical spine.

Discussion

Previous cases of histologically proven solitary bone cyst in the spine involved the C-4 vertebral body,2) the spinous process of L-25) or L-3,6) and the L-13) or L-24) vertebral body.

Pain was the only symptom observed in these cases, thought to be caused by microfracture of the involved bones. In our patient, none of the symptoms was caused by the C-5 bone cyst. However, surgery was necessary to exclude the possibility of metastatic lesion and to remove the herniated C3-4 disk.

Plain x-ray films demonstrated well-defined osteolytic lesions in all previous cases.1,2,4-6) CT was performed in three cases1,4) including ours, but MR imaging only in our case. CT and MR imaging detected no fluid-fluid levels, septations, or postcontrast enhancement in the cyst. These findings are the same as those of solitary bone cysts found in the usual sites.3,5)

Three patients with vertebral body involvement were treated with curettage and bone grafting.1,2,4) Two patients with spinous process involvement were treated by simple removal of the spinous process.5,6) No recurrence was reported in any patient.

The pathogenesis of solitary bone cyst remains unclear. Most authors favor a developmental defect of the epiphyseal plate as the cause of long bone lesions. The plate may in time grow away from the cyst. The plate eventually migrates to the distal metaphysis or diaphysis. Since the vertebral body has an epiphyseal plate until maturity, a developmental defect is possible in this site.3,5)
References


Address reprint requests to: T. Nakagawa, M.D., Department of Neurosurgery, Fukui Medical School, 23 Shimoaizuki, Matsuoka-cho, Yoshida-gun, Fukui 910-11, Japan.