Aneurysmal Bone Cyst Involving the Vertebral Column
A Case Report*

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An aneurysmal bone cyst was first described by Jaffe and Lichtenstein in 1942. In 1950 Lichtenstein described the lesion as a localized tumor occurring in long bones and vertebrae, and characterized by "blow out distention" of the skeletal contour; the term "aneurysmal" is therefore partly descriptive. The term also derives from another feature of the lesions, namely, that the cyst consists of many vascular spaces that grossly resemble a blood-filled cavity.

Since the original description the pathology of this lesion has been well documented by many authors. Aneurysmal bone cyst is most common in children and young adults, but it can occur later in life. Dahlin et al. report 2 cases out of 26, and Lichtenstein's 2 cases out of 9, occurring in the third decade, while in Sherman and Soong's series, there were 8 cases out of 48 who were over 30 years of age, the eldest being 61. The vertebral column is one of the common sites of involvement. It may appear in the vertebral body alone, the neural arch, or a combination of both. The neural arch is the most frequent site. The cyst causes localized distention and destruction of the affected bone and is limited peripherally by a thin shell. The radiographic features are distinctive: the cyst appears as an expansile lytic lesion surrounded by a fine cortical shell. However, if the vertebral body is involved, collapse of the body can obscure the classical features. The usual clinical features are those of a young person with pain and stiffness in some segment of the spine. As the lesion enlarges, there may be additional symptoms due to pressure on the cord or nerve roots. All these features appear in the following case.

Case Report

This 9-year-old boy had a 6 months' history of back pain radiating to the right buttock and calf, stiffness in the back, and a swelling in the right lumbar region. Two weeks prior to his admission, he had developed a limp and had noticed aggravation of his symptoms on coughing. There was no weight loss, sphincter dysfunction, fever, malaise, or past history of sepsis.

Examination. He was a well-developed boy who moved cautiously and walked with a slight limp on the right. The spine listed to the right with moderate paravertebral spasm. There was firm, tender fullness on the right side of the fifth lumbar vertebra in the iliolumbar angle. Back motion was limited by aggravation of the back pain. Examination of the legs revealed a right-sided weakness of the extensors of the foot and toes. Examination of sensation and the deep tendon reflexes was normal. Straight leg raising was possible to 40° on the right and 55° on the left.

General examination was normal. In particular, there were no petechiae, café au lait spots, bone tenderness, or abdominal mass; the genitalia were normal.

Laboratory Investigations. Blood and urine analyses were normal as was the alkaline phosphatase. Lumbar puncture revealed clear cerebrospinal fluid of normal pressure with a negative Queckenstedt test. Cerebrospinal fluid examination was normal including a total protein of 22 mg. per cent. X-ray of the chest and an intravenous pyelogram were normal. X-ray of the lumbar spine showed an expanding lesion involving the pedicle of the right side of the fifth lumbar vertebra extending to the lamina and up to the superior articular process (Fig. 1). That the rate of growth was rapid could be seen by comparing the x-ray 2 months prior to that taken immediately before surgery. The lumbar myelogram revealed a right-sided filling defect at the L-5 level.

Operation. A presumptive diagnosis of aneurysmal bone cyst was made and exploration of the lesion was carried out. As the soft tissues on the right side were reflected, there was a gush of bloody fluid. The cyst which had been entered extended from the right side of the spinous process to the transverse process of L-5; it had destroyed the lamina completely, as high as the lower margin of the lamina of L-4, and downward to the upper margin of the dorum of the sacrum which was slightly eroded. A frozen section of the cyst made at this stage confirmed the diagnosis. The roof of the cyst was then removed revealing that it had destroyed the articular facet of L-4 to 5 on the right and that anteriorly it had extended through the ligamentum flavum where it was found to be attached to the dural sac and the roots of L-5 and S-1. The 5th lumbar root was swollen. Curetage of the cyst was carried out. The tissue consisted of a reddish brown material surrounding a multilocular arrangement of spaces.

There was no evidence of instability of the spine and a routine closure was carried out. At no time was excessive hemorrhage encountered, the moderate blood loss being due to a steady ooze.

Postoperative Course. The patient was seen at 1 month, 2 months, and 4 months after surgery and complained of no pain. However, there was residual tenderness on palpation in the right lumbar region. Spinal
motion improved, but still was limited. His gait was guarded and the weakness of the toe extensors was improving. An x-ray 2 months after surgery showed evidence of sclerosis of the margins of the cystic cavity indicating early healing, and at 4 months considerable filling in with new bone had occurred (Fig. 2).

Pathological study demonstrated the classical features of an aneurysmal bone cyst (Fig. 3). The stroma of the cyst had a mature fibrous tissue containing bone spicules and osteoid tissue; throughout this connective tissue stroma were many good sized blood lakes. These blood lakes were lined in places with endothelial cells but had no muscularis layer in their walls. Scattered throughout the stroma in relation to the blood lakes were many multinuclear giant cells and foamy macrophages. The giant cells seen in the lesion were smaller and had fewer nuclei than those found in a giant cell tumor. There was no evidence of malignancy either in the stroma or in the blood vessels.

**Discussion**

As Lichtenstein⁴ pointed out, there is a lack of awareness that the same pathological entity of aneurysmal bone cyst not only occurs in the long bones but also in the vertebral column. Frequently the lesion has been interpreted as a giant cell tumor, a sarcoma, or a hemangioma of a vertebra, and with treatment had a favorable outcome.

It should be stressed that this lesion is a benign entity; in fact it is not considered to be a true neoplasm, but rather a vascular malformation.⁶,⁷ It also should be stressed that it occurs in the young age group and it is common in the vertebrae. Lichtenstein had 13 cases of aneurysmal bone cyst out of 50 which involved the vertebral column⁹ and Dahlin's figures show 5 cases out of 26.¹