Aneurysmal Bone Cyst: Rapid Deterioration in a Long-Standing Tumor

Haim Krissi, MD, Boris Kaplan, MD, Josef Shalev, MD, Joseph Sack, MD

Aneurysmal bone cyst, first described by Jaffe and Lichtenstein in 1942 as a rare, localized tumor of the long bones and spinal vertebrae, characterized by the “blowout distention” of the skeletal contour on a radiograph. This neoplasm, usually found in children and young adults, constitutes 1.4 percent of all primary bone tumors. The cyst is occasionally associated with other tumors of the bone, such as osteoblastoma, osteosarcoma, giant cell tumor, and fibrous dysplasia, and has occasionally been reported to occur at a site of previous trauma to the bone. There is a tendency toward rapid growth with local expansion, which can exert pressure on an adjacent structure.

Histologically, aneurysmal bone cyst is a cystic, osteolytic vascular tumor, replete with giant cells and fibrous septa. The tumor has a solid variant with fibroblastic proliferation, giant cell areas, stromal hemorrhage, and new bone production.

When an aneurysmal bone cyst appears in the spine, it is generally diagnosed within a few months after the onset of clinical symptoms, which include local pain and swelling accompanied by reactive local muscle stiffness and restriction of movement. Only in advanced and rare cases does the aneurysmal bone cyst exert pressure on the spinal cord, which can lead to neurologic deficits. We describe the diagnosis, management, and follow-up of an aneurysmal bone cyst in a 14-year-old girl.

Case Report
A 14-year-old girl complained of a 2-year history of recurrent episodes of nonradiating low-back pain, which lasted for several days and was relieved with nonsteroidal anti-inflammatory drugs. Two weeks before she was admitted to the hospital, the girl had begun to experience worsening of the occurrences.

Submitted, revised, 18 September 1998.
From the Department of Obstetrics and Gynecology (HK, BK, JS), Rabin Medical Center, Beilinson Campus, and the Department of Pediatrics (JS), The Chaim Sheba Medical Center, and Sackler Faculty of Medicine, Tel Aviv University, Israel. Address reprint requests to Boris Kaplan, MD, 14 Montefiore Street, Kiriat Ono, 55226, Israel.
both legs. A histologic examination of the cyst showed it to be an osteolytic lesion replete with giant cells and fibrous septa, with a few solid areas of fibroblasts (Figure 3).

At a 1-year follow-up examination the girl had resumed full daily activities; was pain-free; had normal muscle strength, sensitivity, and reflexes; and had no urinary incontinence.

Discussion

Primary tumors of the vertebrae are rare in infancy and childhood. An aneurysmal bone cyst is a rare, expanding benign lesion that appears most commonly in children and young adults, but can occur later in life. It has been suggested that aneurysmal bone cyst is not a true neoplasm, but rather a vascular malformation. It probably begins with an arteriovenous fistula inside the bone, expands into the medullar space, and forms a cyst with blood-filled spaces surrounded by a thin shell of periost. When the cyst appears in the spine, the neural arch is the level of D10-D12, with expansion to the vertebral body from the left. This process, which had a thin periosteal border, entered the spinal canal, pressing the cord forward and to the right (Figure 1). Magnetic resonance imaging (MRI) showed a space-occupying lesion at the level of D10-D12, extradurally pressing the spinal cord forward and to the right and destroying the pedicle and the lamina. On MRI with gadolinium injection, a nonhomogeneous multilobular process was seen (Figure 2). The tentative diagnosis was an aneurysmal bone cyst. During surgical exploration of the spine at the level of D10-D12, a gray-red mass 6 cm long was found invading the vertebrae through the left lamina to a depth of 2 cm from D10 and descending into the epidural space to D12. The tumor seemed to be epidural, attached to the dura, but easily separated from it. Cauterization and curettage of the cyst by way of a laminectomy were performed.

The patient's postoperative follow-up course was uneventful, and she rapidly regained strength in

Figure 1. Computed tomographic scan showing a lytic lesion in the posterior elements of the vertebrae at the D10-D12 level, with expansion to the vertebral body from the left. This process with a thin periosteal border enters the spinal canal, pressing the cord forward and to the right.

Figure 2. Magnetic resonance imaging after injection with gadolinium shows a nonhomogeneous multilobular lesion at D10-D12 level, extradurally pressing the spinal cord forward and to the right, destroying the pedicle and the lamina of the vertebra.
analgesia. Moreover, the abdominal radiograph did not indicate any pathologic finding because it was of an area below the level of the lesion, and the left nephrolithiasis found on a sonogram was misleading as a source of the pain. In retrospect, the physicians should have had a higher index of suspicion for bony lesion, and earlier thorough examinations, including CT or MRI, should have been performed.

In our case, prompt curettage of the bone cyst was successful, and there was no need for bone grafting. When possible, this method of treatment is preferred. Even either incomplete curettage or open biopsy can result in obliteration of the cyst. Radiotherapy has also been used effectively in patients who are at high risk for surgery or who are resistant to surgical treatment, although the possibility of grave complications, such as myelopathy, sarcomatous changes, and deformation of the vertebrae, make this mode of treatment undesirable. In large tumors that have a high risk of bleeding and in places where curettage would be difficult, such as the pelvis or spine, selective embolization of the tumor site is possible, followed by curettage, if necessary. The prognosis of aneurysmal bone cyst in children is most promising, although there is a high percentage of recurrence, mainly in the first year after the operation and in patients who undergo partial resection of the tumor. These children require more careful follow-up and might need additional treatment.

Conclusion
Aneurysmal bone cyst is a rare skeletal neoplasm, but it is only one of the various causes for low back pain that is a common complaint in the adolescent. The family physician and the pediatrician should be aware of these entities, be more aggressive when establishing their diagnosis of prolonged back pain, and include advanced imaging studies in their workup.

References
2. McArthur RA, Fisher RG. Aneurysmal bone cyst in-

Figure 3. Histologic sample of a cystic osteolytic lesion replete with giant cells, fibrous septa, and a few solid areas of fibroblasts.