Unicameral Bone Cyst

OVERVIEW
A unicameral bone cyst, sometimes called a simple bone cyst, is a benign fluid-filled cavity with a bone. This type of bone cyst may appear in virtually any bone, but most commonly is found near the shoulder or hip. This type of cyst occurs most frequently in children 5-15 years of age and affects males about twice as often as females. It is benign and does not spread to other bones. The cyst makes the bone prone to fracture and often the cyst is discovered when the child suffers a fracture. The fracture will usually heal despite the cyst. Often a cyst will heal or fill in spontaneously with time, especially as the child approaches maturity. If needed, especially for a cyst in the hip area, surgical treatment may be considered. Options include injections with steroids or other materials to stimulate the cyst to heal, or the cyst can be opened and packed with bone graft to obtain healing.

CAUSES
The causes for a unicameral bone cyst are not known. One theory is that a blockage of interstitial fluid or venous drainage leads to a fluid collection in a rapidly growing area of cancellous bone. One expert believes that there is congenital pocket of synovial tissue that produces extra fluid. Another idea is that there is increased enzyme activity causing ongoing erosion and increased osmotic pressure within the cyst. One group has reported specific genetic cellular abnormalities. Despite the lack of details on the cause of the cyst, there is little doubt with respect to diagnosis. Also, the rarity of the lesion in adults reinforces the expectation of spontaneous resolution.

DIAGNOSIS
Most of the time, bone cysts are asymptomatic. They are discovered when an x-ray is taken for another reason, such as a shoulder injury. Often a fracture has occurred through the cyst. The discovery of a bone cyst may be quite disconcerting to the child’s parents and family. It is well established that the bone cyst is benign.

A review of the patient’s past history, as well as their family’s past history relative to fractures, rheumatologic conditions, bone tumors, endocrine disease, and cancer, is appropriate. Physical examination includes a screening examination for other abnormalities. Further imaging, such as MRI, is not a routine part of the workup, but may be used for unusual or atypical situations.
The radiographic appearance is diagnostic. The cyst is radiolucent with a well defined margin and no adjacent reactive tissue. Sometimes there is thinning of adjacent areas of bone such that fracture or pain from microfracture may occur. If a fracture has occurred, there may be a characteristic "fallen leaf" sign. When cysts are immediately adjacent to a growth plate, they are referred to as active cysts, and, when they move away from the growth plate, they are considered to be latent cysts.

**TREATMENT**

In the absence of symptoms and mechanical compromise of the bone, no treatment may be necessary. With time and maturity, a unicameral bone cyst will usually fill in and remodel. There is evidence that spontaneous healing can occur following fracture, but it occurs in the minority of cases. Even if the cyst persists after healing of a fracture, it will still usually fill in and remodel as the bone matures and finishes growth. Repeat fracture can occur with return to activities, but again, the fractures will usually heal without difficulty.

Surgical treatment should be considered for cysts that have resulted in repetitive fractures or have caused weakening of a weight bearing bone. Options may be divided into open and percutaneous procedures. Open techniques include subtotal resection or curettage, followed by bone grafting with autograft, allograft, or bone graft substitutes. Percutaneous injection treatment started in 1974, when Dr. Scaglietti introduced steroid injections. His technique is a series of injections done in the operating room, usually 3 or 4 times, done every 3 months. Scaglietti reported complete healing in 55% and partial healing in the rest. 76% required multiple injections, some up to 9 injections. Other scientists have investigated injections of bone marrow or special growth factors. Multiple drills holes for mechanical disruption of the cyst wall also has been investigated as a treatment option. Another option is to fill the cyst cavity with bone graft or bone graft substitutes. This can often be done through one or two small incisions with special instruments. Even with surgery, the cyst can recur.

**COMPLICATIONS**

Injury to the growth plate may occur secondary to direct cyst expansion, pathologic fracture, or unintended mechanical disturbance during surgical intervention. Direct cyst expansion across the growth plate and into the epiphysis of the proximal humerus has been well documented by MRI. Growth arrest also has been reported following treatment either by local injection of steroid or curettage and bone grating and can occur in up 14% of cases. Steroid injection has been a successful treatment, even in the setting of cyst extension into the epiphysis.
EXPECTED OUTCOMES
The overall outcome and prognosis is good. The lesion is believed to resolve spontaneously in most cases if given enough time. Cases that present to the orthopedic surgeon typically are patients who demonstrate a combination of a cyst that has caused cortical thinning and the right stressful event, such as being tackled while playing football. In general, treatment may be summarized as doing nothing more than trying to promote natural healing.

MORE INFORMATION
Further information can be obtained on the internet. Your local public library can help you explore these sources if you are interested. Two good sites for expert and peer reviewed information are the American Academy of Orthopedic Surgeons at www.aaos.org and www.emedicine.com.

FEEDBACK
If you have questions or comments, please contact the office or submit them to the web site at www.pedortho.com.