



# Giant Cell Tumor of Bone Fact Sheet

## Giant Cell Tumor of Bone

Giant cell tumor of bone is a relatively uncommon, locally aggressive type of tumor composed of stromal cells and osteoclast-like giant cells. Although it is a benign primary bone tumor, it has the potential to spread to other bones or to the lung.<sup>1,2</sup> Typically, adults 20-40 years of age develop destructive bone lesions near the joints of the long bones of the leg or arm.<sup>3</sup> Most of the time patients are cured with surgery that removes the bone containing the tumor, but about 20 percent of the time, the tumor recurs within three years. When giant cell tumors recur, they may be more likely to spread to other parts of the body, especially if they recur multiple times.<sup>4</sup>

## Incidence and Prevalence of Giant Cell Tumor

Currently, about 800 new giant cell tumor cases are identified in the United States each year, which account for about one fifth of all benign primary bone tumors.<sup>4,5</sup> Unfortunately, 5 to 10 percent of patients with giant cell tumor may also have metastatic tumors. The incidence rate is more prevalent in patients with Paget's disease of the bone and in those of Chinese descent in which giant cell tumor may represent about 20 percent of all primary bone tumors, compared with 4 to 5 percent in other ethnic groups.<sup>1</sup>

Symptoms of giant cell tumor of bone include:

- **Pain, Tenderness and Swelling:** If the tumor has been growing for a long time, there may be instances of swelling.
- **Limitation of Motion:** If the tumor is close to a joint patients can have difficulty moving. This is exacerbated by pain and swelling.
- **Bone Fracture:** Some patients may not have any symptoms until they develop a pathologic fracture.<sup>6</sup>

The diagnosis of giant cell tumor relies on biopsies of the tumor and imaging of the bones using MRI, CT scans and PET scans.

## Current Treatments and Guidelines

Giant cell tumors will continue to grow and destroy bone if left untreated. The type of treatment depends on which bones are affected by the tumor and the patient's age and overall health. Where surgery has failed there is no standard of care, and measures such as radiation, tumor embolization and chemotherapy may be tried.

- **Surgery:** The extent of the surgery depends on the location and size of the tumor and may require amputation of the affected joint or limb, followed by placement of prosthesis. Some patients cannot be treated with surgery and currently, there are approximately 1,000 surgically unsalvageable patients.<sup>4</sup>
  - **Bone Grafting:** A surgical procedure in which healthy bone is transplanted from one part of the body to the affected area after the tumor is completely removed.
  - **Bone Reconstruction:** Reconstruction or replacement of the joint is sometimes necessary when the tumor has caused irreparable damage.
  - **Amputation:** Amputation is saved as a last resort.
- **Physical Therapy:** Physical therapy may help to improve strength and mobility to an affected joint or limb.

## Role of RANK Ligand in Giant Cell Tumor

Giant cell tumor of the bone is rich in RANK Ligand positive cells, which results in giant osteoclasts that destroy the bone locally.<sup>7,8</sup>



**Amgen  
Contact  
Information**

**Media:**  
Lisa Rooney  
Office: (805) 447-6437  
Mobile: (805) 559-0739  
lrooney@amgen.com

**Investor Relations:**  
(805) 447-1060  
investor.relations@amgen.com

## References

1. Lesley-Ann Goh, MBBS, FRCR, Consultant, Department of Diagnostic Radiology, WebMD, Giant Cell Tumor, June 27, 2007 National University Hospital. <http://www.emedicine.com/Radio/topic307.htm>
2. American Cancer Society. "What is Bone Cancer?" [http://www.cancer.org/docroot/CRI/content/CRI\\_2\\_4\\_1X/What\\_Is\\_bone\\_cancer\\_2.asp?sitearea=CRI](http://www.cancer.org/docroot/CRI/content/CRI_2_4_1X/What_Is_bone_cancer_2.asp?sitearea=CRI)
3. American Academy of Orthopedic Surgeons. Tumors. J. Sybil Biermann, MD. <http://orthoinfo.aaos.org/topic.cfm?topic=A00080>
4. Cancer: Principles & Practice of Oncology (7th Edition), 2005 Mendenhall et al Giant Cell Tumor of Bone. *Am J Clin Oncol* 2006; 29: 96-99.
5. Gamberi G, Serra M, Ragazzini P, Magagnoli G, Pazzaglia L, Ponticelli F, Ferrari C, Zanasi M, Bertoni F, Picci P, Benassi M (2003). "Identification of markers of possible prognostic value in 57 Giant Cell Tumors of Bone." *Oncol Rep* 10 (2): 351-6. PMID 12579271.
6. Oregon Health and Science University. Health Topics. "Giant Cell Tumor." <http://www.ohsu.edu/health/health-topics/topic.cfm?id=9507>
7. Roodman GD. Mechanisms of bone metastasis. *N Engl J Med*. 2004;350:1655-1664.
8. Fuller K, Wong B, Fox S, Choi Y, Chambers TJ. TRANCE is necessary and sufficient for osteoblast-mediated activation of bone resorption in osteoclasts. *J Exp Med*. 1998;188:997-1001.



Amgen Inc.  
One Amgen Center Drive  
Thousand Oaks, CA 91320-1789  
[www.amgen.com](http://www.amgen.com)