

## **The Outcome of Patients With Metastatic Giant Cell Tumor of Bone**

**Back ground:** Giant cell tumor of bone is a locally aggressive benign tumor of bone. Despite this classification, pulmonary metastasis develop in 3-5 % of patients. The natural history of the pulmonary metastases is variable and several treatment algorithms have been advocated.

### **Questions/Purposes**

What is the oncologic outcome of patients with metastatic GCT?

What is the role of systemic versus local (surgery) in the treatment of metastatic GCT?

**Patients/Methods:** An IRB approved retrospective review of the tumor registry and orthopedic oncology database was performed for patients with metastatic GCT who were diagnosed from 1970 – 2011. Demographics including gender, age, location of the primary disease and treatments rendered were examined. The cohort consisted of 27 female and 22 male patients and the median age was 33 years old. Descriptive statistics including mean, standard deviation, median, and range were presented for continuous variable, i.e. age. Frequency counts and percentages were provided for categorical variables (e.g. gender, race). Time from first metastasis to death was the primary endpoint and was plotted by the Kaplan-Meier method. The associations between risk factors and time to death were analyzed using Cox proportional hazard models. A p-value <0.05 was considered significant for all tests. All analyses were performed using SAS software (version 9.3; SAS Institute, Cary, NC).

**Results:** There were 28 patients who had local recurrences prior to the development of their first pulmonary metastasis. 13 patients died within 5 years after first metastasis. The 5-yr Kaplan-Meier survival rate after first pulmonary metastasis was 65.7%. In the multivariable models examining patients from primary diagnosis to death, surgical removal of the metastases and administration of interferon were associated with a significantly better survival compared to chemo alone ( $p=0.04$ ). Age (younger) at first metastases and male gender were independently associated with improved survival ( $p=0.04$  and  $0.02$ , respectively). Gender, site, size, recurrence prior to metastasis, and the duration between first diagnosis and first metastasis were not found to be associated with death.

**Conclusion:** The outcome of patients with metastatic giant cell tumor of bone remains unpredictable. Surgical removal of the pulmonary metastases and the administration of interferon was associated with better survival. The recent advent of improved systemic treatment for the primary disease may have a favorable impact on patients with metastatic disease as well.

### **Level of Evidence**

Level IV, prognostic study.