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**Title** Risk Factors for Local Recurrence after Intralesional Curettage for Giant Cell Tumors of Bone

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### **Background**

Intralesional treatment of giant cell tumors of bone (GCT) increases local recurrence rates compared with wide resection. Adjuvant treatment with PMMA has been proposed to reduce local recurrence rates. However, some surgeons believe that other factors are equally important.

### **Questions/Purposes**

To determine which patient demographics, tumor characteristics, or surgical/clinical parameters are risk factors for local recurrence after intralesional treatment of GCT.

### **Patients and Methods**

Retrospective data from a national cohort of all patients with GCT of the appendicular skeleton (n=74, M/F: 37/37, median age 29 (12-68 years), treated intralesionally between 1998 and 2013, was analyzed for association of risk factors with local recurrence using univariate, multivariate Cox regression and Kaplan-Meier survival analysis.

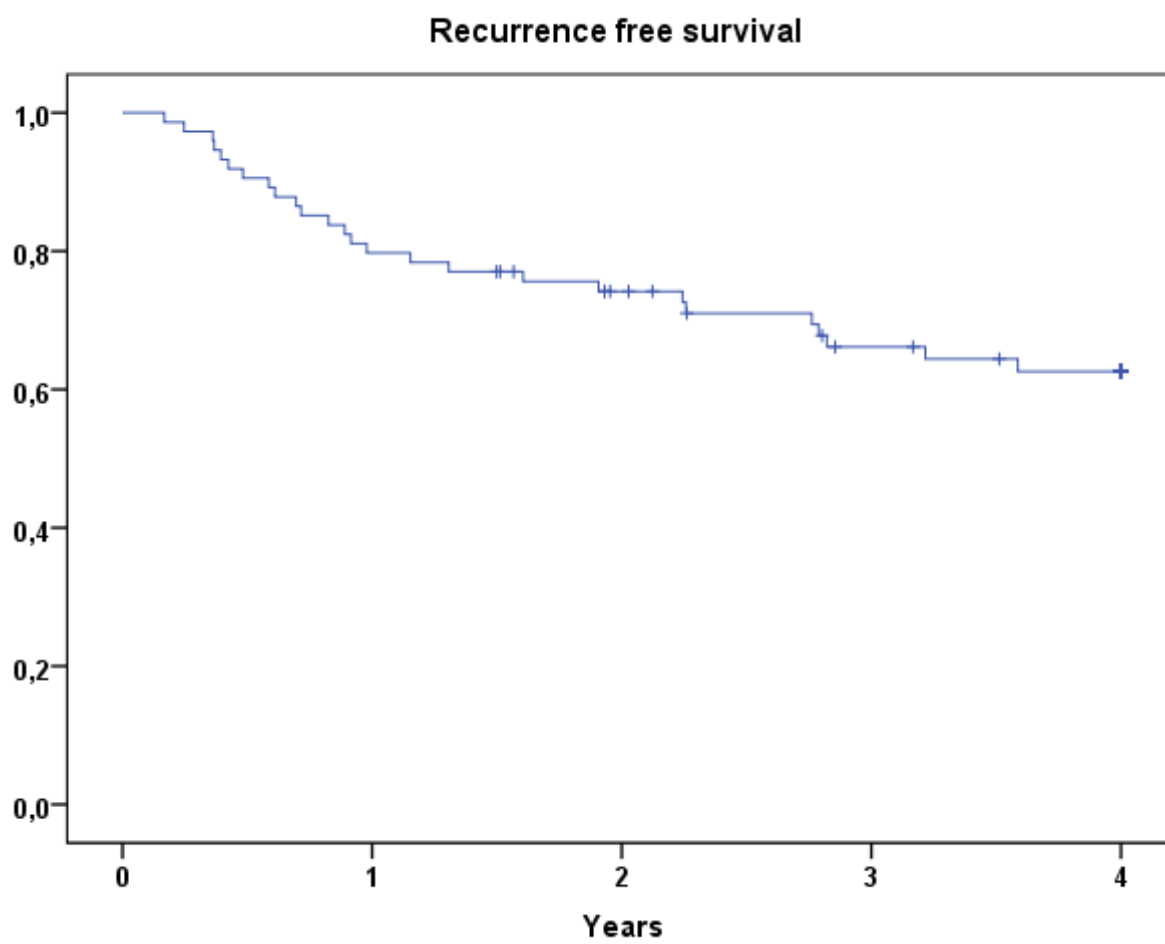
### **Results**

The cumulative 4-year recurrence rate was 37% (**Figure 1**). The only significant independent risk factors associated with local recurrence rate were “preoperative diagnosis confirmed by biopsy” (HR=0.30, CI:0.10-0.90) and “treatment at an oncology center” (HR=0.29 CI:0.08-0.99). There was no independent association between local recurrence rate and other parameters such as age, gender, tumor location and Campanacci grade, pathological fracture or the use of PMMA (**Table 1**).

### **Conclusions**

Our results suggest that confirmation of histological diagnosis before definitive surgery and referral to an orthopedic oncology center are important to avoid local recurrence of GCT. We recommend that surgery for GCT's is performed at a dedicated orthopedic oncology center, where biopsy typically is a part of the diagnostic routine. It seems that local adjuvant therapy with PMMA in itself is not a guarantee for a lower recurrence rate.

Figure 1.



**Table 1.**

Cox Proportional Hazard Model (n=74)	Univariate analysis		Multivariate analysis		Reference
	Hazard ratio (95%CI)	P-value	Hazard ratio (95%CI)	P-value	
<b>Demographics</b>					
Age at operation	0.79 (0.36 - 1.72)	0.552	0.80 (0.34 - 1.93)	0.626	<29 years (median)
Gender	1.32 (0.61 - 2.87)	0.485	1.15 (0.51 - 2.61)	0.740	Female
<b>Tumor characteristics</b>					
Location (upper/lower extr.)	0.64 (0.27 - 1.52)	0.311	0.66 (0.24 - 1.82)	0.424	Lower extremity
Grade (Campanacci)					
Grade 2	0.55 (0.16 - 1.94)	0.355	0.62 (0.16 - 2.45)	0.498	Grade 1
Grade 3	0.83 (0.39 - 2.14)	0.833	1.10 (0.45 - 2.70)	0.827	Grade 1
<b>Clinical/surgical</b>					
Pathological fracture	0.95 (0.40 - 2.27)	0.914	3.42 (0.95 - 12.38)	0.061	No fracture
Adjuvant (PMMA)	1.30 (0.59 - 2.86)	0.522	0.53 (0.18 - 1.56)	0.251	No PMMA
Preoperative biopsy	<b>0.45 (0.21 - 0.98)</b>	<b>*0.043</b>	<b>0.30 (0.10 - 0.90)</b>	<b>0.032*</b>	Biopsy performed
Treated at oncology center	0.53 (0.22 - 1.26)	0.152	<b>0.29 (0.08 - 0.99)</b>	<b>0.048*</b>	Treated at oncology center

**\*significant (p<0.05)**