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## Treatment of periprosthetic fractures in patients treated with a megaprosthesis after resection of a malignant bone tumour.

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### Background:

While tumour endoprosthetic reconstruction is the most common treatment after large segmental bone defects after tumour resection for primary and secondary bone tumours, periprosthetic fractures are extremely rare. However, accompanying chemotherapy, local radiation and long periods of non-weight bearing are compromising the bone quality significantly in a high percentage of patients. The treatment of periprosthetic fractures in tumour patients is extremely demanding. Osteosynthesis often fails due to the reduced bone quality and consolidation potential.

### Methods:

During January 2000 and Dezember 2012 we analysed 31 patients with periprosthetic fractures after tumour resection followed by reconstruction with megaendoprostheses. Initial diagnosis was predominantly primary high grade sarcoma, although 4 patients had bone metastasis of carcinoma. Chemotherapy was administered in 25 and local radiotherapy in 10 patients. The average patient age was 37,0 years. Fracture site was the humerus in 6, the femur in 16 and the tibia in 9 cases.

### Results:

Fracture occurred after a medium of 18.0 months after initial implantation. Cause of fracture was adequate trauma in 10 patients and inadequate in 21 patients (5x caused by tumour recurrence). Plate osteosynthesis was possible in 5 patients only. In 22 patients an exchange of the implant with an average bone loss of 7 cm (range 2-25 cm) was necessary. In 5 cases an additional joint replacement (2 x elbow joint, 3 x hip joint) was performed due to the absence of sufficient bone stock for a stem implantation. Recurrent sarcoma led to amputation in 2 cases. Complications were 2 periprosthetic infections requiring a two stage revision. One non-union after osteosynthesis was treated with an additional implant exchange.

However, finally all patients with limb salvage achieved full weight bearing in the latest follow up examinations.

### Conclusion:

Periprosthetic fractures in patients treated with tumourprosthesis are demanding. The common goal of treatment should always be the preservation of as much bone as possible for further revisions and an assessment of risks and benefits.

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