PP-002

Endoprosthetic reconstruction of the distal humerus: still a challenge in limb salvage surgery

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Introduction: The distal humerus is a rare location of bone tumors. Due to the complexity of the ellbow-joint, poor soft tissue coverage and the proximity of nerves and vessels both resection and endoprosthetic reconstruction is demanding. This retrospective study evaluates the clinical results and complications after distal humerus or total elbow resection and reconstruction with MUTARS tumour endoprosthesis in 13 patients.
Methods: All patients were traced by our tumour database. Patient files were reviewed for clinical information. Limb and prosthetic survival was estimated according Kaplan-Meier analysis. Postoperative function and patients' contentment have been assessed using the MSTS-Score.
Results: Between 1998 and 2014 we performed a resection of the distal humerus in 13 patients (median age 46 years). The predominant diagnoses were bone or soft tissue sarcomas (n=6), giant cell tumour (n=2) and renal cell carcinoma metastasis (n=2). According to Kaplan-Meier estimation limb survival was 78% after a median follow-up of 77 months (range 3-168). Local recurrence (Ewing`s sarcoma n=1, soft tissue sarcoma n=1, renal cell carcinoma n=1) was the reason for secondary amputation in all cases (n=3). All of these patients had a marginal or intralesional resection before. Prosthetic survival without any reoperation was 77% at 2 years and 62% at 5 years postoperatively. Prosthesis failure was mainly caused by aseptic loosening of the humerus stem in 36% (n=5), aseptic loosening of the ulna stem in 7% (n=1) and periprosthetic infection in 7% (n=1). One wound healing disturbance made a free radialis flap necessary in one patient. The mean Musculoskeletal Tumor Society score was 24 (range 19-30, n= 11). An extension gap over 10° was noted in 4 patients.
Conclusion: Our results suggest that limb salvage with a distal humerus or total elbow replacement can achieve good functional results in the majority of patients, although the complication rate with special emphasis on the loosening rate of the humerus stem is high. However, limb salvage was not achieved in 21% of patients due to local recurrence.