

## Tikhoff – Linberg operation and major resections of the shoulder girdle standard procedure for limb salvage in sarcoma patients

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**Background and objectives.** This study was undertaken to clarify the clinical results of limb-sparing Tikhoff-Linberg procedure and major resections in patients with malignant bone and soft-tissue tumors of the shoulder girdle in our institute between 1980 and 1999.

**Patients and methods.** From 1980 to 1999, 39 patients with malignant bone and soft tissue tumors of the shoulder girdle were treated at the Department of Surgical Oncology, Institute of Oncology Ljubljana. In 27 out of 39 patients, a limb-sparing surgical procedure was possible (19 patients had a Tikhoff-Linberg procedure, and 8 major resection of bone and soft tissue). There were 15 females and 12 males with age range 14 to 71 (median 40 years). Sixteen patients had bone, 10 soft-tissue sarcomas and one with a large bone metastasis of thyroid carcinoma. Five patients had chemotherapy, 2 postoperative irradiation and 4 patients had chemotherapy and irradiation. The follow-up period in limb-sparing group ranged from 4 months to 19 years 9 months (median 6 years 4 months).

**Results.** Currently, 15 patients are alive and disease-free from 1 year 3 months to 19 years (median 7 years 6 months); two died of other diseases, 9 died of the disease (4 of metastases and 5 of local recurrence and metastases) at a mean (SD) interval of 15 months after surgery (range 6-25 months). One patient was lost from follow-up 6 months after surgery, because he was not resident of Slovenia. From 26 patients, 7 developed local recurrence from 6 months to 10 years 3 months after surgery (median 4 years 8 months) and in 3 of them, amputation was required. The bone was reconstructed only in 6 patients (in 3 with prosthesis, in 2, vascularised fibular graft was used whereas in one intraoperative extracorporeal autogenous sterilized bone graft). Hand-elbow function was excellent in 11, good in 6 and fair in 2 patients.

**Conclusion.** Classical or modified Tikhoff-Linberg operation is a suitable limb sparing procedure for tumors of the shoulder girdle. A good hand-elbow function can be perserved; however, the problem are local recurrences occurring in approximately 27 percent in this as well as in the majority of reported series.

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