



O4:103

Does amputation offer survival-benefit over limb-salvage in patients with Osteosarcoma with poor chemo-necrosis and close margins?

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Introduction:

Despite advances in neo-adjuvant treatment for osteosarcoma, some patients have a poor response to chemotherapy. The prognosis in this group is considerably worse than those with a good response. Poor responders will generally have larger tumours. The dilemma that often arises is whether to do limb salvage with a narrow margin of excision or an outright amputation. If limb salvage is carried out with a close margin, does post-operative radiotherapy make any difference? This study aims to address these questions.

Material and methods:

All patients with limb osteosarcoma, poor response to chemotherapy ($\leq 90\%$ necrosis), and either inadequate margins on limb salvage (marginal or intra-lesional) or primary amputation were identified from a prospective database. This group was investigated in terms of overall survival and local control.

Results:

386 patients were included in the study (139 amputation, 206 limb salvage with marginal margins, 41 limb salvage with intralesional margins). Local recurrence (LR) developed in 16 (29%) with an intralesional margin, 42 (20%) of those with a marginal margin, and 10 (7%) with an amputation. Post-operative radiotherapy was used in 42 patients. The risk of LR in this group was 28% compared to 23% for those who did not have radiotherapy. The overall survival for the whole group was 40% at 5 years. The 5-year survival was 46% in those with marginal margins, 28% in those with an amputation, and 27% for those with an intralesional margin. In 21 patients who developed LR and synchronous metastases, none survived beyond 5 years. Patients who had limb salvage and then developed LR without metastases, had identical survival as patients who had primary amputation without subsequent LR.

Conclusion:

A marginal resection of osteosarcoma with a poor response to chemotherapy carries a poor overall prognosis. However, carrying out an amputation to avoid the risk of local recurrence offers no obvious survival benefit. The role of post-operative radiotherapy in these patients remains unclear.

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