



O6:110

Intraoperative extracorporeal irradiation and reimplantation of tibial malignant sarcomas after wide resection

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Background:

Diaphyseal tibial sarcomas are commonly treated with a wide resection and reconstructed with allografts with or without vascularised fibula, with reconstruction over a segmental transport or with the induced membrane technique. This is the first larger series presenting an alternative inexpensive and biological method that to our knowledge has not been reported on before.

Methods:

Eight Patients with primary malignant tibial sarcomas received local treatment in form of reimplantation of extracorporeally irradiated (ECI) autografts after its wide resection. The mean age at the time of diagnosis was 29 years (range 12.2 to 60). Radiation dose for the tibial segment was 50 Gy in all cases. ECI was combined with an ipsilateral vascularised fibula (n = 5) in those cases where a partial bone stock of the tibia could not be preserved. The functional results were expressed as the Musculoskeletal Tumor Society score (MTS) and the Toronto extremity salvage score (TESS). The mean clinical and radiological follow-up was 40 months (range, 12 to 66).

Results:

All patients had clear margins after the performed wide resection and were free of disease and without evidence for local recurrence at the time of the last follow up. There were postoperative complications in 3 patients. Full weight bearing was allowed at the time of radiological consolidation of the irradiated graft which was achieved after a mean of 6 months (range 3 to 12). The vascularised fibula autografts showed a significant hypertrophy in 8 of 10 junctions. The functional results were good and excellent in 7 of 8 patients in the MTS-Score and Toronto extremity salvage score.

Conclusion:

We conclude that ECI grafting, also in combination with vascularised fibula in large defects, is a suitable method for the treatment for localised and resectable tibial sarcomas with good to excellent functional results.

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