

Reconstruction after hemicortical resection of osteosarcoma using recycled frozen autograft treated with liquid nitrogen

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Introduction: We have reported the functional outcome of intentional marginal margin for osteosarcoma patients who had clinically good response to preoperative chemotherapy. The purpose of this study was to assess the functional outcome and complications of excision and preservation of the contralateral cortex of osteosarcoma lesion and reconstruction using tumor-bearing autografts treated with liquid nitrogen.

Methods: Four patients, with a mean age of 13 years, were enrolled in this study. The tumor sites were located in two femurs and two tibias. In hemicortical resection surgery, the contralateral cortex is preserved and an en block excision of the tumor is done, freezing in liquid nitrogen for 20 min, thawing at room temperature for 15 min, and thawing in distilled water for 15 min, followed by internal fixation. Time of bone union, incidence of complications, and limb function (ISOLS/MSTS score) were evaluated.

Results: The mean follow-up period was 39 months. Articular surface was preserved in three; one was frozen, including the articular surface. Bone union of the frozen autograft to the host bone was observed in all patients, with a mean duration of 7.5 months. Complications observed were superficial infection and we could control the infection and not need to remove the autograft. Limb function was rated as excellent in all four patients. Final patient status was CDF in all four patients.

Conclusion: Reconstruction after hemicortical resection of osteosarcoma using recycled frozen autograft treated with liquid nitrogen achieved favorable limb function; this would be a useful option.