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Microwave Hyperthermia Applied to Limb-salvage Surgery for Malignant Bone Tumors

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Background: Limb-salvage surgery has been widely used for the last several decades, and proved to be an effective way to treat malignant bone tumors. However, long-term complications of the implant and related-bone are unsolved problems. For the pelvic tumors, the situation is worse.

Methods: Instead of en bloc resection of the tumor-bearing bone, it is just dissected from surrounding normal tissues, then devitalized by hyperthermia in situ. After cleared and re-strengthening the dead bone, its mechanical property becomes strong enough to support the weight bearing.

Results : Between May 1992 and March 2010, 719 patients with malignant bone tumors of the extremities, and 252 patients with malignant pelvic tumors were treated by the novel method. The survival rate: over 3-year survival rate was 59.1% for high-grade malignancy, 88.7% for low-grade malignancy, which is nearly compared with the literature reports, but lower complication rate, better functional outcome, simplified surgical process (especially for the pelvic tumors) should be emphasized.

Conclusion: The applying of hyperthermia for treatment of bone tumors is an effective, simple, and inexpensive method. Hyperthermia should deserve more attention than it has received until now, and should be improved by high tech such as design of antenna, 3D monitoring temperature etc.

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