Biological Reconstruction for Children with Osteosarcoma Around the Knee

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Abstract

Introduction: Limb salvage in children with primary malignant bone tumours around the knee is challenging, with considerations such as shortening, bone and joint remodeling and high functional demands of active children. The ultimate aim for reconstruction is restoring a stable, painless and mobile joint. With improved survival rates from chemotherapy, reconstructive techniques should ideally last the child’s lifespan. We adopted a biological approach by preserving the patients’ native joint, with bony defects bridged by fibula grafts supplemented by autoclaved bone grafts infused with bone marrow. We conducted this retrospective review to determine if we were able to meet our objectives of reconstruction. Materials and Methods: A retrospective review of children with osteogenic sarcoma involving the distal femur or proximal tibia treated at our institution was done. Patients aged 13 years and below at the time of surgery who had undergone a limb salvage procedure that preserved the knee joint were included. Results: Nine patients were identified, 3 males and 6 females. The average age was 10.0 years (range, 7 to 13 years) at the time of surgery. Seven had tumours involving the distal femur while 2 had tumours involving the proximal tibia. There were no cases of local recurrence. Four of the 9 patients died from metastatic disease, the 5 surviving patients have no evidence of disease, and the average follow-up for survivors was 13.2 years. The average active range of motion for the knee joint was 96º (range, 50º to 130º). The average Musculoskeletal Tumour Society (MSTS) score was 26.3 (range, 23 to 30). Conclusion: We have observed this technique of limb salvage offers satisfactory limb function with long-term follow-up.


Keywords: Limb salvage, Malignant bone tumours