Semi-knee Tumor Prosthesis for Pediatric osteosarcomas around the Knee

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Background and Purpose  Limb salvage for pediatric osteosarcoma around the knee may cause leg-length discrepancy. To resolve this, an expandable prosthesis is popular now. However, in some situations, it is not available and semi-knee tumor prosthesis is a simple and useful alternative.

Methods  After resection of an osteosarcoma around the knee, the bone defect is reconstructed by a semi-knee tumor prosthesis. The epiphysis of the opposite side is kept intact to reduce leg-length discrepancy. The leg-length equalization procedure would not be considered until the limb shortening was greater than 4 cm and the relapse potential of the tumor reached a plateau. 40 cases treated with such a procedure between 2001 and 2013 were reviewed.

Results  Four of the 40 semi-knee prostheses were later removed owing to infection. Dislocation occurred in 3 patients, whose tumors were located in the distal femur. The average Musculoskeletal Tumor Society functional score was 24.2 (range, 14–30) and limb-length discrepancy at final follow-up was 6.1 cm (range, 2–10 cm). 15(38%) had implantation of an adult-type joint at final follow-up. Further leg-length equalization procedure is needed.

Conclusion  A semi-knee tumor prosthesis could spare the opposite epiphysis, provide a functional knee, and facilitate leg-length equalization procedure of the affected limb in the future. The semi-knee tumor prosthesis is cost-effective because it is cheap and the adult-type prosthesis and the lengthening procedures are considered only when necessary.