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11285 - Preliminary Outcomes Of Short-Stem Cemented Gmrs Modular Reconstructive Prosthesis For Revisions Of Lower Limb

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Abstract

Background Advances in medical oncology, surgical technique, and prosthesis design have considerably increased the longevity of endoprosthesis replacements after tumor resection. Subsequently, type 2 failure (aseptic loosening) has been the most common mode of failures according to literatures. Revisions for tumor endoprosthesis are especially challenging due to the limited bone quantity and poor quality that the patients still possess. Biological fixation is the goal for host-bone and prosthesis junction.

Questions/purposes The purpose of this study is to report the preliminary outcomes this short-stem cemented GMRS modular reconstructive prosthesis with with porous coating shoulder for revisions of low limb.

Patients and Methods Twenty-four patients who had type 2 failure of the prosthesis and treated with GMRS were included in this retrospective study. There were 14 males and 10 females. The mean age at first treatment was 29.5 years (range, 15-56). The primary diagnosis was osteosarcoma in 18 cases, giant

cell tumor of bone in 5 cases, and chondroblastoma in 1 case. The primary tumors located in 16 cases in the distal femur, 6 cases in the proximal tibia, and 2 case in the proximal femur. The short-stem cemented GMRS (Stryker) prosthesis systems are used in these revision surgeries. Cemented Short-stem could preserve more bone stock and have immediate stability. Bone grafting applied if the stem shorter than previous stem. Also GMRS prosthesis provides with a porous coating section over the shoulder region of the implant. The cortical onlay pedicle autograft and allografts are affixed to this section with wires. The potential advantages of this technique are the extracortical bone-bridging and ingrowth fixation to achieve biological fixation, which may share stress and prevent osteolysis by sealing off the critical region against the infiltration of wear particles. The intramedullary cavity was bone grafted, which was expected to provide further augmentation for the prosthesis. Extracortical bone incorporation was measured over a 4-cm length of the porous-coated region of the prosthesis in four zones (the medial and lateral aspects on anteroposterior radiographs and the anterior and posterior aspects on lateral radiographs) and was reported as the percentage of the total length (4 cm) covered by extracortical bone with a thickness of >1 mm. Body weight bearing was limited until medullary graft healing. The Musculoskeletal Tumor Society (MSTS) Score was reported.

Results In this series, the mean interval between the first surgery and the revision was 5.7 years (range, 2-9). With a mean follow-up of 26.3 months (range, 3-59), the average percentage of the porous-coated region that was covered by extracortical bone formation was 69.3% (range, 0-100%) for all patients. No patients developed aseptic loosening of the revision prosthesis at the most recent follow-up. There were no infections, periprosthetic fractures or implant breakage in this series. The mean Musculoskeletal Tumor Society score 28.8 (range, 26 to 30).

Conclusions Short stem with medullary grafting could preserve more bone stock to keep mega-prosthesis smaller. Cemented stem could offer immediate fixation and extra-cortex bone grafting could achieve biological fixation for the prosthesis. We demonstrate significant satisfactory short-term outcomes of this cemented GMRS modular reconstructive prosthesis for revisions of low limb. However, longer follow-up is required to prove the benefit of this prosthesis.

Level of Evidence: Therapeutic Level IV.